

# Mpox Training for Clinical Providers

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September 2024



# Acknowledgments

This training package has been developed through the

- USAID-funded EpiC project led by FHI 360.

This training event is being sponsored by:

- XXX

This resource is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the EpiC project and do not necessarily reflect the views of USAID or the United States Government. EpiC is a global cooperative agreement (7200AA19CA00002) led by FHI 360 with core partners Right to Care, Palladium International, and Population Services International (PSI).

# Technical resources

The training materials are based on the following resources:

- Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance. 10 June 2022, World Health Organization (WHO).
- Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021.
- Laboratory testing for the monkeypox virus: Interim guidance. 23 May 2022, WHO.
- Vaccines and immunization for monkeypox Interim guidance. 16 November 2022, WHO
- Surveillance, case investigation and contact tracing for mpox (monkeypox): Interim guidance. 22 December 2022, WHO.

# Goal of this curriculum

- Enhance the capacity of health care providers to fulfill their roles to:
  - Care for people affected by mpox
  - Implement the recommended protocols for the diagnosis, treatment, and prevention of mpox
  - Effectively contribute to the public health response to contain the spread of the outbreak



# Objectives of this curriculum

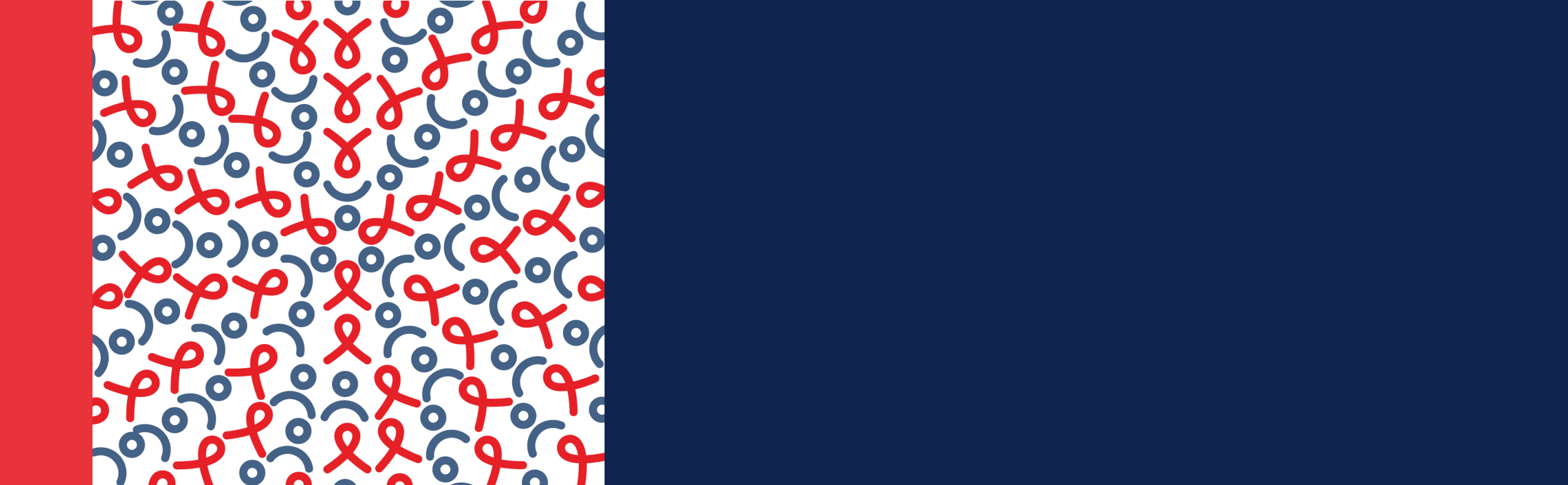
Participants who master the learning objectives of the training will demonstrate an understanding of the background, epidemiology, mode of transmission, diagnosis, treatment, and prevention of mpox, including features of the most recent outbreak declared a Public Health Emergency of International Concern in August 2024.

# Training etiquette

- Come prepared to engage in the learning process.
- Be on time.
- Keep an open mind.
- If you bring a laptop or tablet, don't cause a distraction to others by keyboarding or checking email.
- Leave your cell phone on vibrate or off and in your pocket or handbag.
- Participate; ask questions, speak so everyone in the room can hear you.
- Take notes.
- Return to your workplace prepared to discuss and implement what you learned.
- Provide evaluation feedback about the training experience and how it can be improved.
- During virtual training sessions, keep yourself muted and your video off to reduce background noises and improve internet connectivity. Use the chat box and icons; mute/unmute yourself and use video features as appropriate when interacting with the facilitator(s) and other participants.

# Training agenda

	Module	Time
-	OPENING	
1	Background	15 min
2	Epidemiology	15 min
3	Modes of transmission	15 min
4	Signs and symptoms	1 hr
5	Diagnosis	30 min
6	Case definition	15 min
7	Exposure	1 hr
8	Treatment	1 hr
9	Prevention	1 hr
10	Special considerations	30 min
11	Infection prevention and control	15 min
12	Communication and literacy	15 min
13	Surveillance, monitoring, and evaluation	30 min
14	EpiC response (optional)	15 min
-	CLOSING	



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## Module 1: Background

# Learning objectives

At the end of this module participants will be able to:

- Describe the background and history of mpox
- Describe the genetic clades of mpox
- Explain when, why, and who declared mpox a public health emergency
- Describe the key differences between the current (2024) outbreak and previous outbreaks

# Mpox, background and history (1)

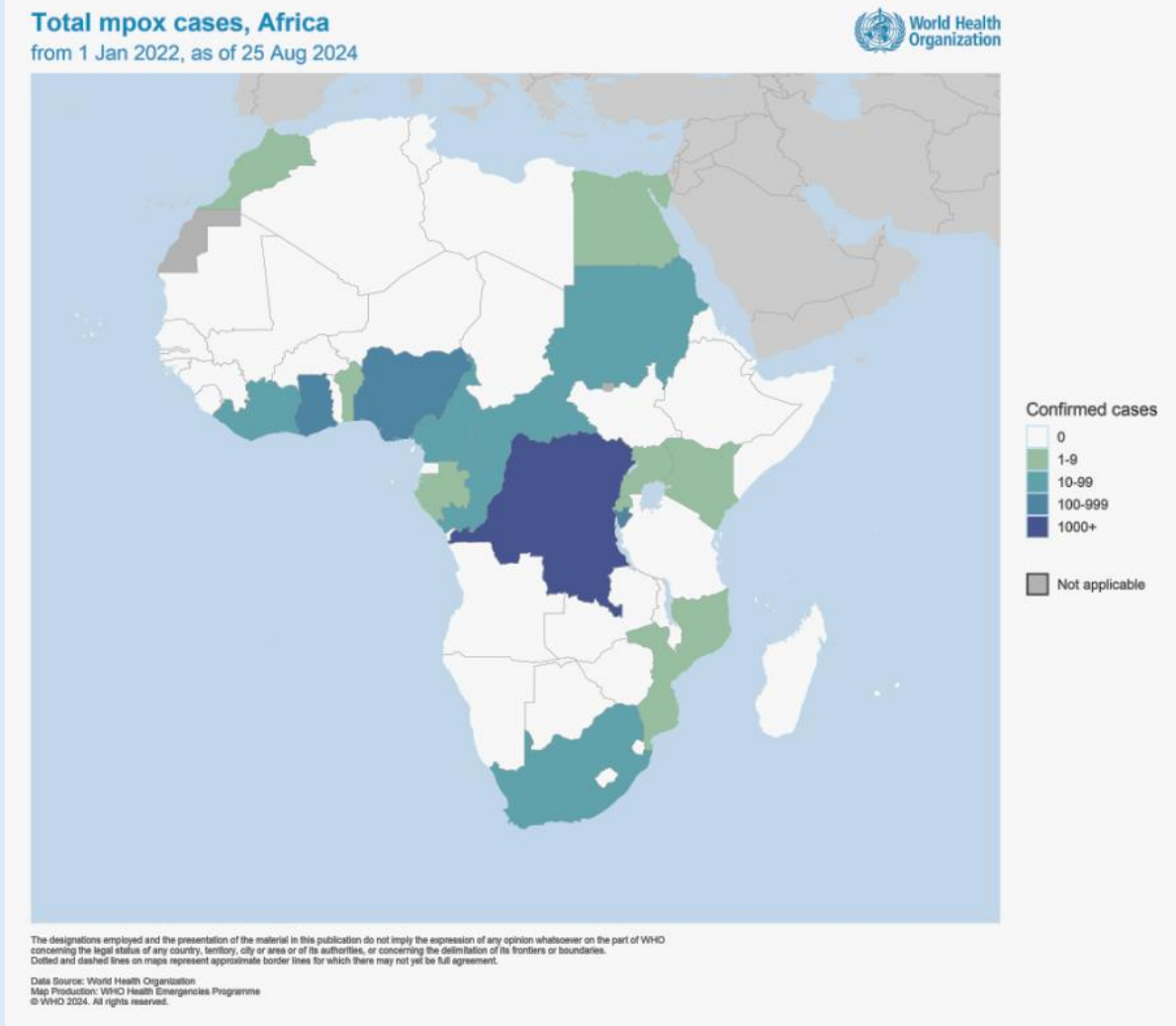
- Monkeypox virus (MPXV) is a double-stranded DNA virus, viral zoonotic disease (animals to humans), a member of the *Orthopoxvirus* (OPXV) genus within the Poxviridae family.
- Poxviruses cause disease in humans and many other animals → lesions, skin nodules, or disseminated rash.
- Other OPXV species pathogenic to humans include cowpox virus and variola virus.
- *Vaccinia virus* is also an OPXV; it is the source of the modern vaccine that was used to eradicate smallpox.
- In November 2022, WHO introduced the term “mpox” to reduce the stigma associated with the term monkeypox.

# Mpox, background and history (2)

1958	<ul style="list-style-type: none"><li>• Identified in laboratory monkeys in Denmark</li></ul>
1970	<ul style="list-style-type: none"><li>• Identified in humans in Democratic Republic of Congo</li><li>• Endemic in mammals in Central and West Africa; cases occurring in humans with varying outbreaks</li></ul>
1996	<ul style="list-style-type: none"><li>• Outbreak in DRC related to human-to-human transmission</li></ul>
2003	<ul style="list-style-type: none"><li>• Outbreak in United States linked to prairie dogs and a rat from Ghana</li></ul>
2017-19	<ul style="list-style-type: none"><li>• Outbreak in Nigeria</li></ul>
2022-2023	<ul style="list-style-type: none"><li>• Clade II detected in 116 countries, predominantly among sexual networks, MSM</li></ul>
2024	<ul style="list-style-type: none"><li>• Clade Ib in multiple African countries; epicenter in DRC</li></ul>

# Mpox is endemic in Central and West Africa

	Cumulative confirmed cases, 01Jan22–05Jun23	Cumulative confirmed cases, 2024
Benin	3	0
Cameroon	29	5
Central African Republic	30	45
Congo	5	19
Democratic Republic of Congo	739	3,235
Ghana	127	0
Liberia	13	5
Nigeria	842	40
Burundi	-	153



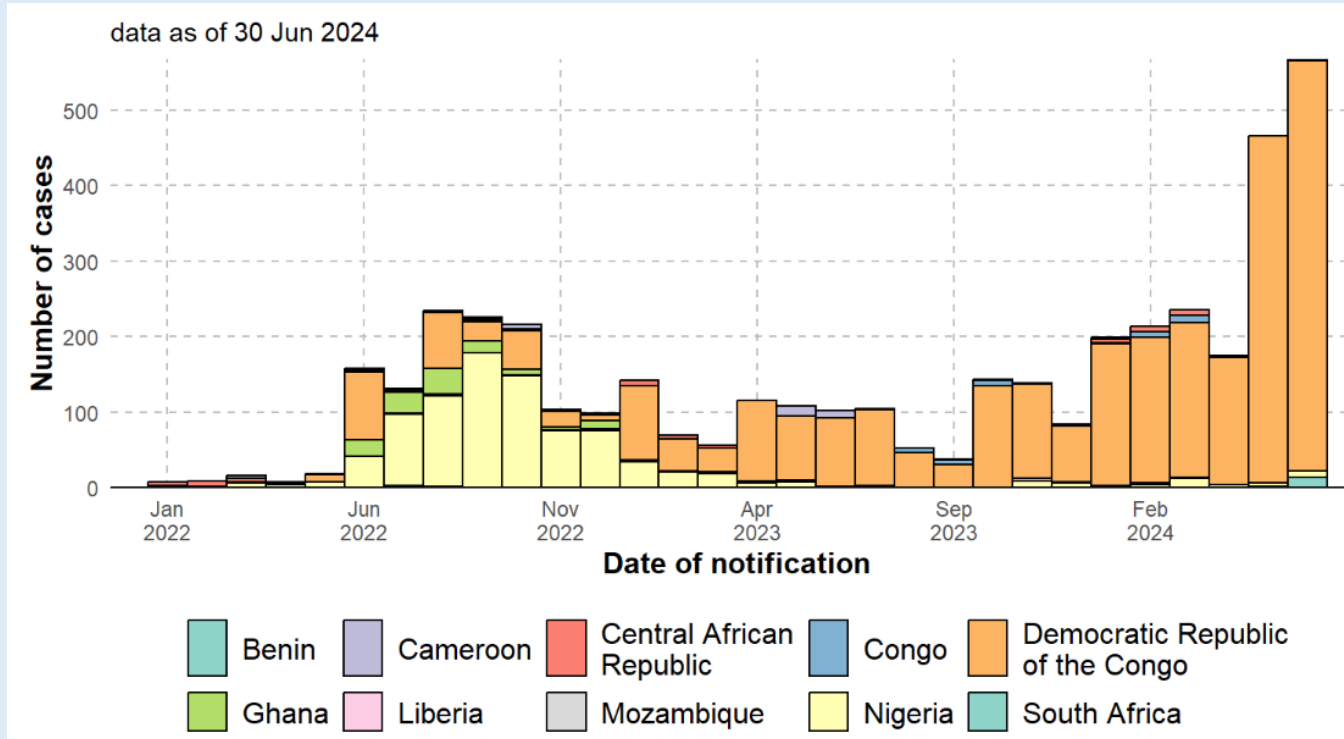
WHO [Internet]. Map of confirmed cases of mpox from Jan 2022, as of 25 Aug 2024. Geneva: WHO [updated 2024 Aug 28, cited 2024 Aug 30]. Available from: [2022-24 Mpox \(Monkeypox\) Outbreak: Global Trends \(shinyapps.io\)](#).



## 2022 – 2023: Mpox outbreak

- Beginning May 13, 2022, a high proportion of mpox cases were reported from countries **without previously documented mpox transmission**. This was the first time that cases and sustained chains of transmission were reported in countries without direct or immediate epidemiological links to areas of West or Central Africa.
- Rapid expansion (especially in countries where cases were never previously reported) was noted in several European countries and North and South America.
- The outbreak was declared a **Public Health Emergency of International Concern (PHEIC)** by WHO on July 23, 2022.

# Epidemic curve for Africa



[2024 Monkeypox Outbreak: Global Trends \(shinyapps.io\)](https://shinyapps.io)

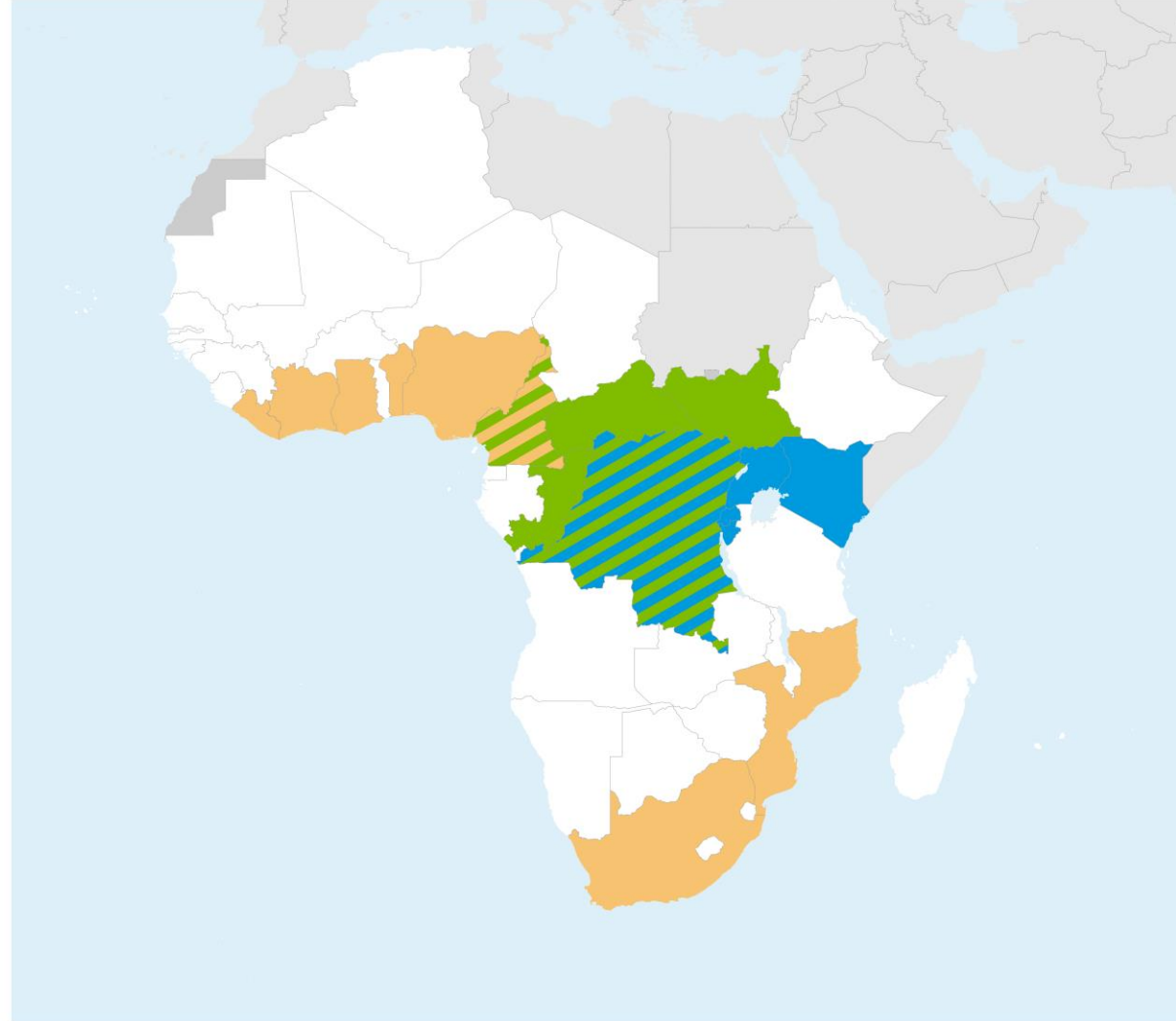
- As of August 2024, the situation of mpox in Africa has shown a significant increase in cases.
- By the end of July 2024, there were 14,250 cases reported in the African region, including 2,745 confirmed cases and 456 deaths.
- This represents a 160% increase in cases compared to the same period in 2023.
- The Democratic Republic of Congo (DRC) is the most affected, accounting for 96.3% of all cases and 97% of all deaths reported in Africa.
- Globally, these cases represent a significant portion of the mpox burden, with Africa accounting for 4% of global cases and 17% of global deaths

([WHO | Regional Office for Africa](#)) ([Africa CDC](#)).

# Epidemic map of mpox distribution: All clades in WHO African Region through August 18, 2024

## MPXV clades detected, African Region

from 1 Jan 2022, as of 18 Aug 2024



### MPXV clades detected

- Clade Ia
- Clade Ib
- Clade II
- Clades Ia and Ib
- Clades Ia and II
- No mpox reported

Not applicable

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization  
Map Production: WHO Health Emergencies Programme  
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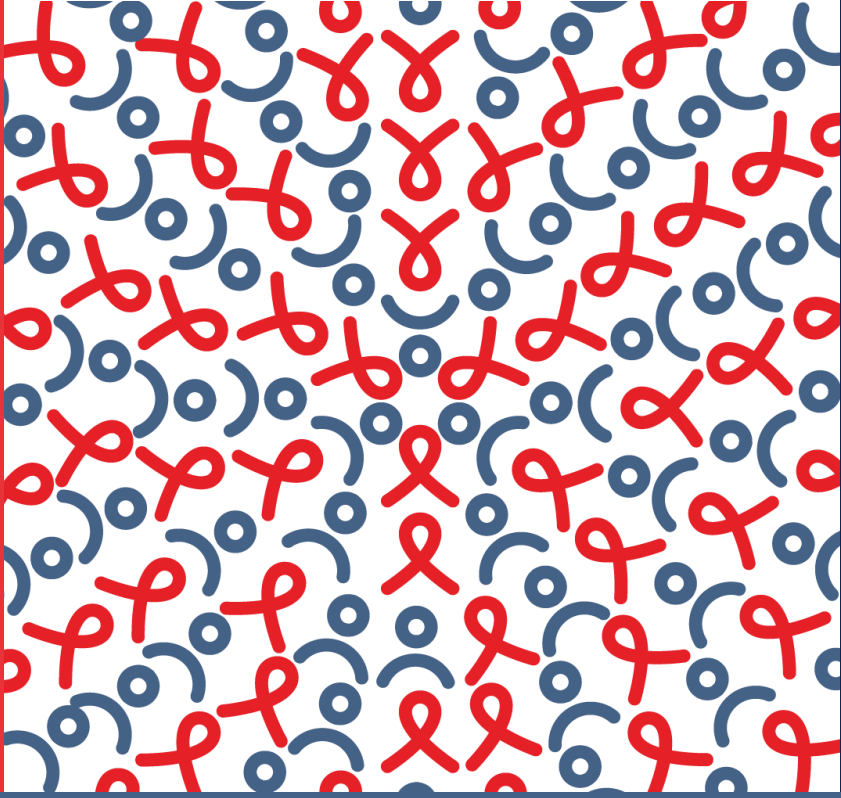
# 2024: Mpox outbreak declared PHEIC

- In September 2023, a new subclade (1b) was detected in DRC and quickly spread to multiple neighboring countries. Cases were also detected in Sweden, Pakistan, and Thailand.
- The current outbreak affects general populations and households; is no longer limited to sexual networks, MSM, and PLHIV.
- Children and adolescents (<15yo) are significantly affected by the current outbreak, with higher risk of severe illness, rates of total cases, and case fatality rates.
- No significant differences in clinical presentation, diagnostics, or management or treatment. Currently available vaccines have questionable efficacy; more research is needed.

	Clade II (IIa and IIb)	Clade I (Ib and Ia)
Endemic region	West Africa	Central Africa/Congo Basin
Outbreak	Cause of the 2022 global outbreak; clusters of sporadic cases globally, but no longer PHEIC	Likely emerged in late 2023; cause of 2024 outbreak in African region, with epicenter in DRC (Clade Ib)
Clinical course	Symptoms similar to those of Clade I Typically less severe symptoms; CFR approx 1%	More severe disease, higher risk of complications for children, and immunocompromised people. CFR 3–10%.
Affected populations & modes of transmission	Close bodily & intimate contact: Predominantly through sexual networks, affecting gay and bisexual men, men who have sex with men (MSM), and trans people.	Close bodily & intimate contact: inclusive of sexual networks but appears to be spreading through general population via household contact and general contact transmission. Children and adolescents <15 account for a high proportion of the cases and deaths in DRC.
Treatment	Symptomatic care and management of complications; some efficacy of antivirals	Symptomatic care and management of complications; questionable efficacy of antivirals
Vaccine	Available mpox vaccine with acceptable effectiveness/efficacy. Recommended for high-risk groups	Undetermined efficacy or effectiveness of current vaccines against Clade I infections. Recommended though no large-scale immunization campaigns planned.

Q&A





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## Module 2: Epidemiology

# Learning objectives

At the end of this module participants will be able to:

- Describe the recent epidemiological evolution of mpox
- Categorize the regions based on the risk
- Present the key epidemiological global figures and trends
- Present the global case profile
- Describe the country context



# Overview (1)

- Since January 1, 2022, cases of mpox have been reported from **121** WHO member states across all six WHO regions.
- Since May 13, 2022, a high proportion of these cases have been reported from countries without previously documented mpox transmission.
- Globally: As of July 31, 2024, a total of **102,997** laboratory-confirmed cases and **186** probable cases, including **223** deaths, have been reported to WHO.
- Africa Region: As of August 18, 2024, 12 countries have reported 3,562 confirmed cases, including 26 deaths. The three countries with the majority of cases in 2024 are the Democratic Republic of the Congo (n = 3 235), Burundi (n = 153), and Central African Republic (n = 45)
  - *A significant number of suspected cases that are clinically compatible with mpox are not tested due to limited diagnostic capacity and are never confirmed.*
- Confirmation of **one case of mpox** in a country is considered an **outbreak**.

## Overview (2)

- WHO assesses the **global risk** as **moderate**.
- On August 14, 2024, under the International Health Regulations (2005), the WHO Director General declared that the increase in mpox cases in DRC and its expansion to neighboring countries constitutes a Public Health Emergency of International Concern (PHEIC). This spread of mpox presents a public health risk to other member states and requires a coordinated international response.

Risk	Region
High	DRC, neighboring countries
Moderate	Europe Americas West Africa Eastern Mediterranean
Low	Southeast Asia Western Pacific

Source: WHO [Internet]. 2022-24 mpox (monkeypox) outbreak: global trends. Geneva: WHO [updated 2024 Aug 28; cited 2024 Aug 30]. Available from: [2022-24 mpox \(Monkeypox\) Outbreak: Global Trends \(shinyapps.io\)](#).

# Regional & global trends

Laboratory-confirmed cases as defined by WHO working case definition

## Key figures

WHO African Region

Global

Data as updated weekly; from 01 January 2022 to 18 August 2024

Total cases

5 940

Total deaths

48

Countries reporting cases

15

Total cases in 2024

3 562

Total deaths in 2024

26

Countries reporting cases  
in 2024

12

## Key figures

WHO African Region

Global

Data as updated monthly; from 01 January 2022 to 31 July 2024

Total cases

102 997

Total deaths

223

Countries reporting cases

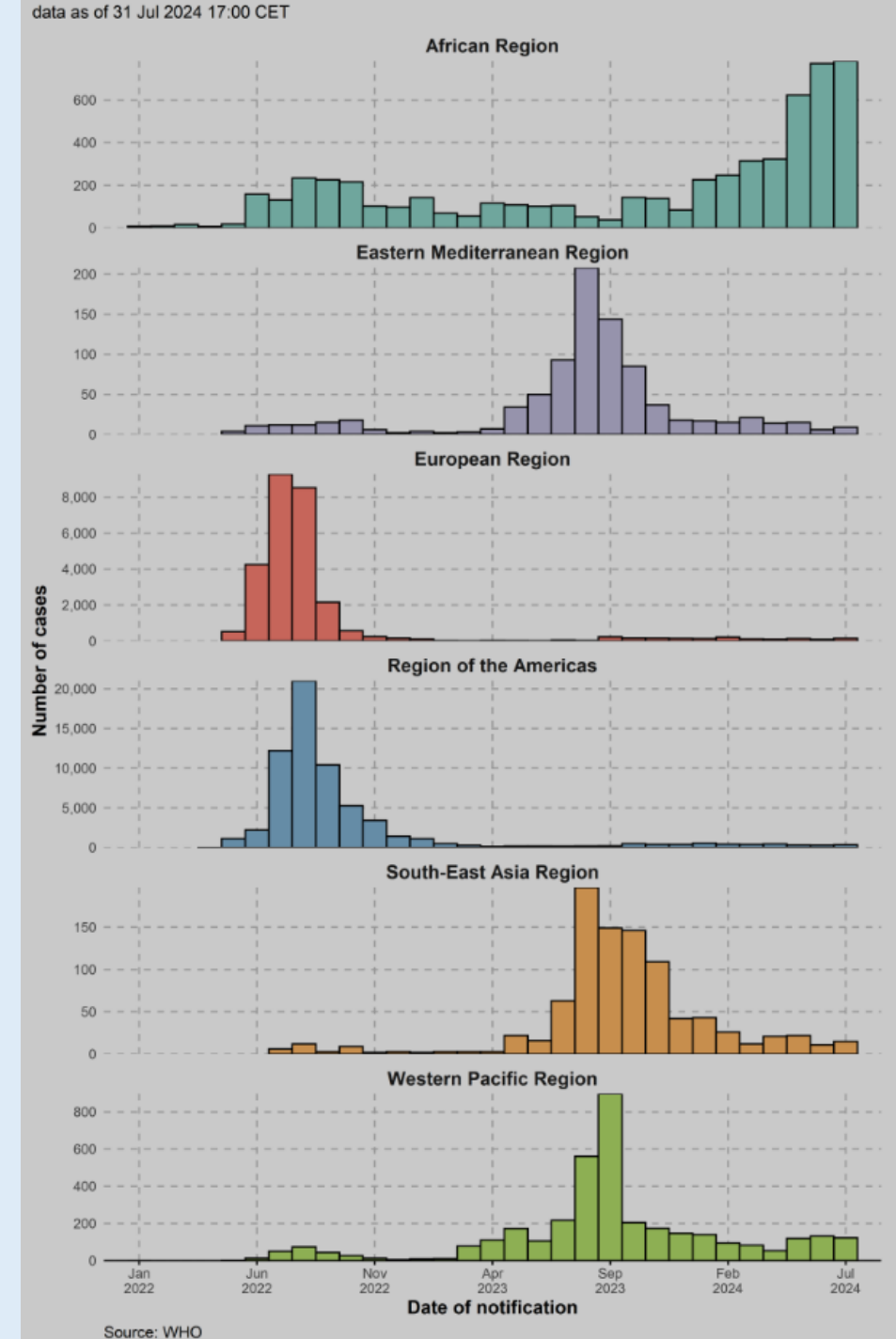
121

Source: WHO [Internet]. 2022-24 mpox (monkeypox) outbreak: global trends. Geneva: WHO [updated 2024 Aug 28; cited 2024 Aug 30]. Available from [Mpox \(Monkeypox\) Outbreak: Global Trends \(shinyapps.io\)](https://shinyapps.io/mpox/).

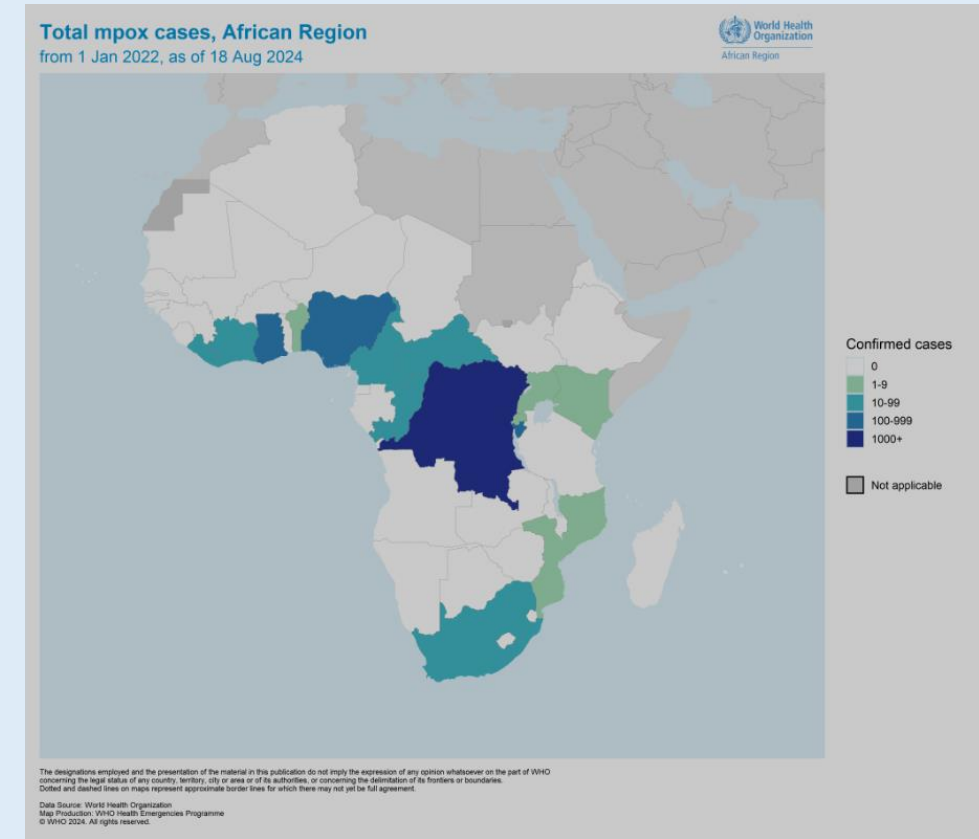
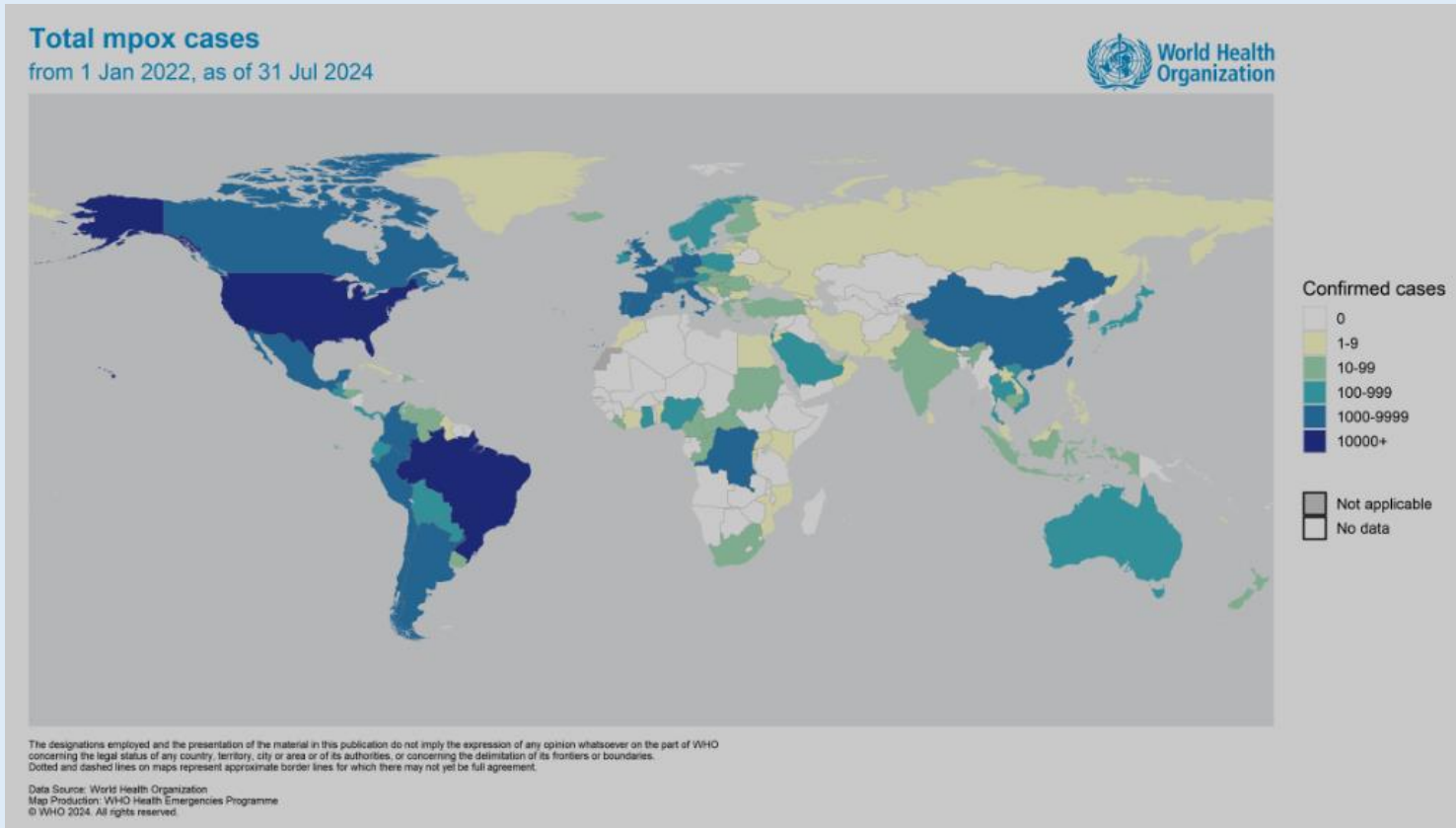
# Global cases by region: Epidemic curve

Epidemic curve shown by month for cases reported up to July 31, 2024, to avoid showing incomplete months of data. Note different y-axis scales

Source: WHO [Internet]. 2022-24 mpox (monkeypox) outbreak: global trends. Geneva: WHO [updated 2024 Aug 28; cited 2024 Aug 29]. Available from: [2022-24 Mpox \(Monkeypox\) Outbreak: Global Trends \(shinyapps.io\)](https://shinyapps.io/2022-24-Mpox-Outbreak-Global-Trends/).



# Total mpox cases, January 1 – July 31, 2024



Source: WHO [Internet]. 2022-24 mpox (monkeypox) outbreak: global trends. Geneva: WHO [updated 2024 Aug 28; cited 2024 Aug 29]. Available from: [2022-24 Mpox \(Monkeypox\) Outbreak: Global Trends \(shinyapps.io\)](https://shinyapps.io/2022-24-Mpox-Monkeypox-Outbreak-Global-Trends/).

# Case profile as of June 2024

**96.4%**

of cases with available data are male, the median age is 34 years

**79.4%**

are males between 18-44 years old

**85.8%**

identified as men who have sex with men (MSM) among cases with known data on sexual behavior

**51.9%**

of those with known HIV status were people living with HIV\*

**83.8%**

of all reported transmission events were through sexual encounter

**1.3%**

of the cases where age was available were 0-17 years old

**0.4%**

were 0-4 years old

**3.6%**

Of all cases with available data are female

**60**

cases were reported to be pregnant or recently pregnant

**66.7%**

of all settings in which cases were likely exposed, the most common was in party setting with sexual contacts

**1,312**

cases were reported to be health workers; most were exposed in the community

*\*Note that information on HIV status is not available for most cases, and for those for which it is available, it is likely to be skewed towards those reporting positive HIV results.*

*The ongoing outbreak is largely occurring in networks of men who have sex with men. Note that reported sexual behavior does not necessarily reflect who the case has had recent sexual history with nor does it imply sexual activity.*

# Country context

- Describe what is known about mpox in your country, including the response from the government and other relevant agencies.

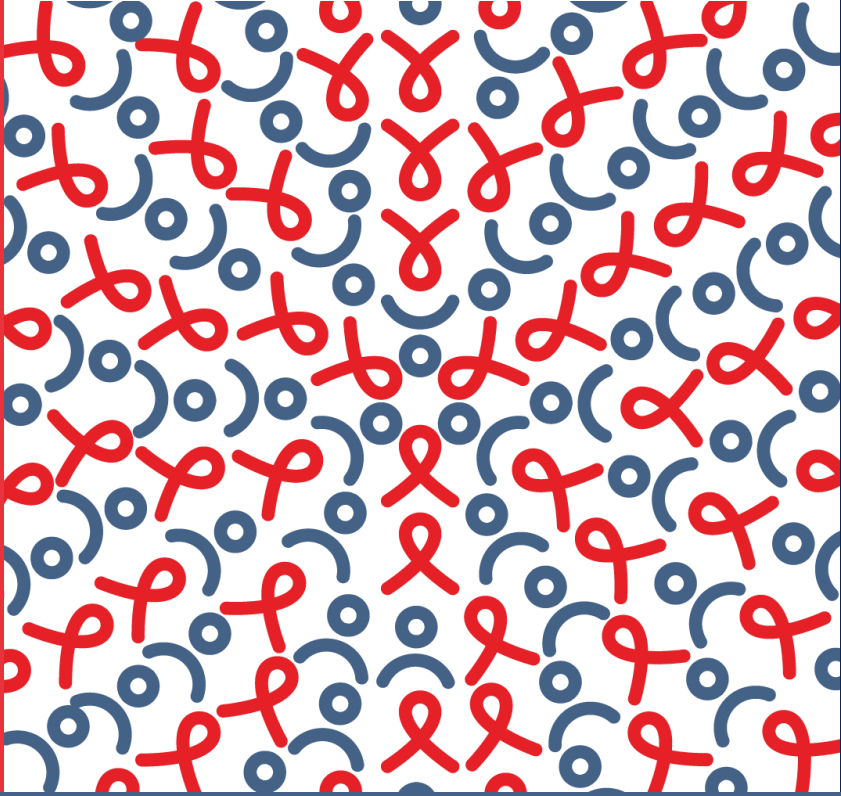
# Knowledge check

1. How many cases of confirmed mpox should be reported in a country to call it an outbreak?
2. Does the unexpected appearance of mpox in the absence of epidemiological links suggest undetected transmission?
3. What risk category is assigned to this region?
4. What is the sex at birth and median age of most of the reported cases of mpox?
5. Are most of the mpox cases from a specific key population category? If so, which one?
6. What proportion of mpox cases are HIV positive?
7. What is the mode of transmission among most of the mpox cases?



Q&A





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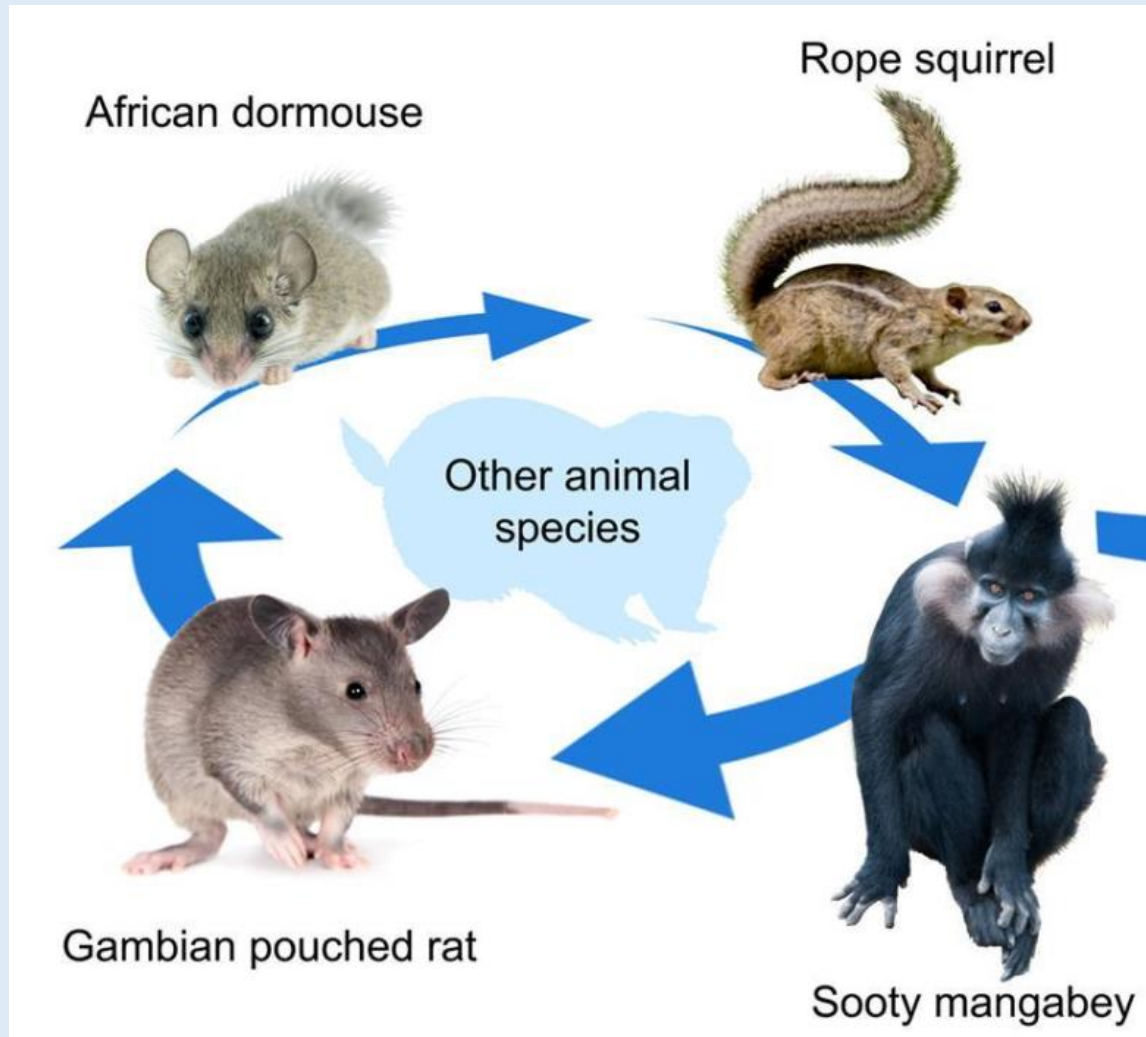
## Module 3: Modes of Transmission

# Learning objectives

At the end of this module participants will be able to:

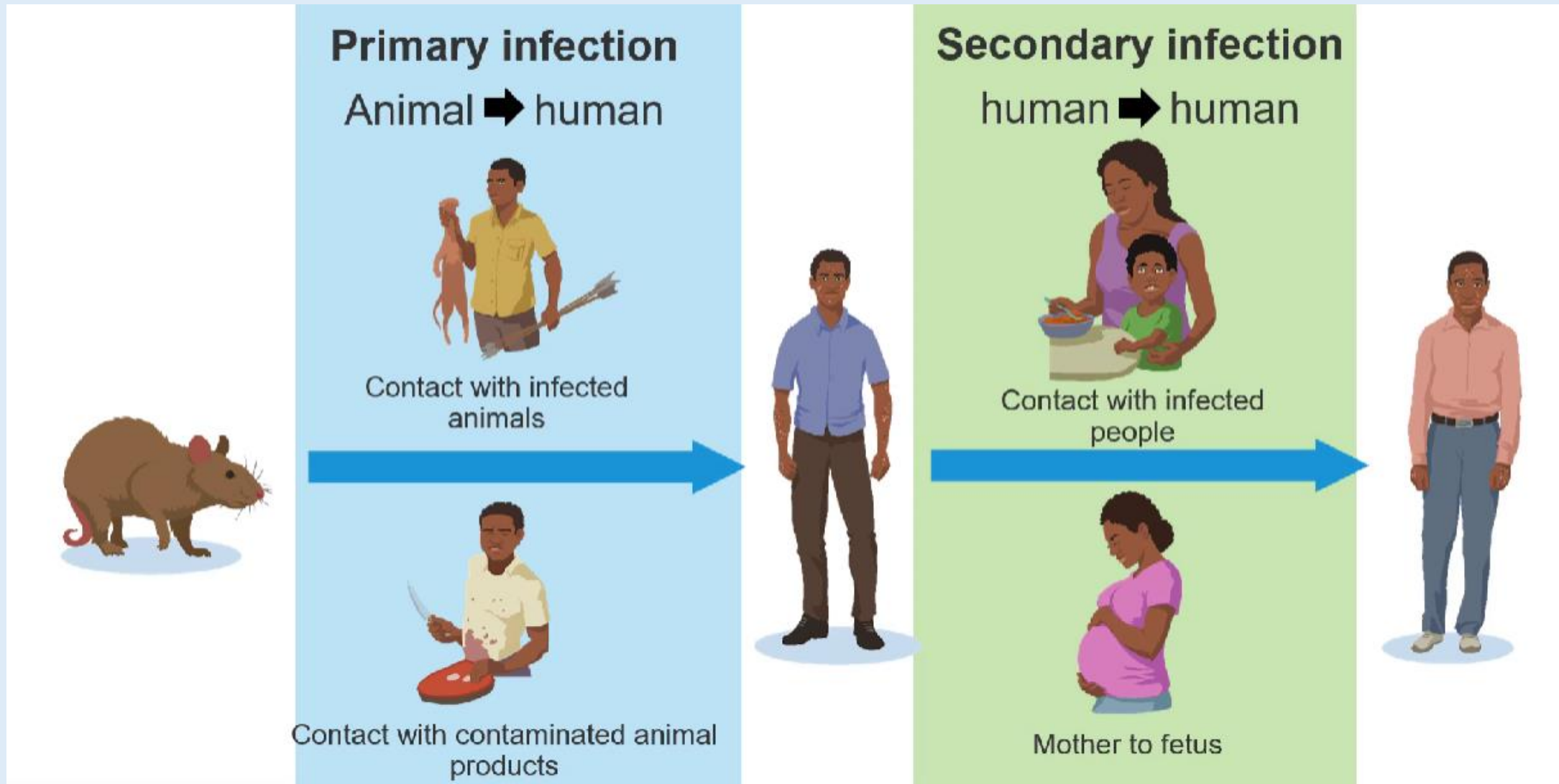
- List the animals associated with mpox infection
- Describe how mpox infection moves from animals to humans and from human to human
- Describe the main environmental and social factors for mpox emergence
- Refer to the modes of transmission when screening for mpox infection

# Animals associated with mpox

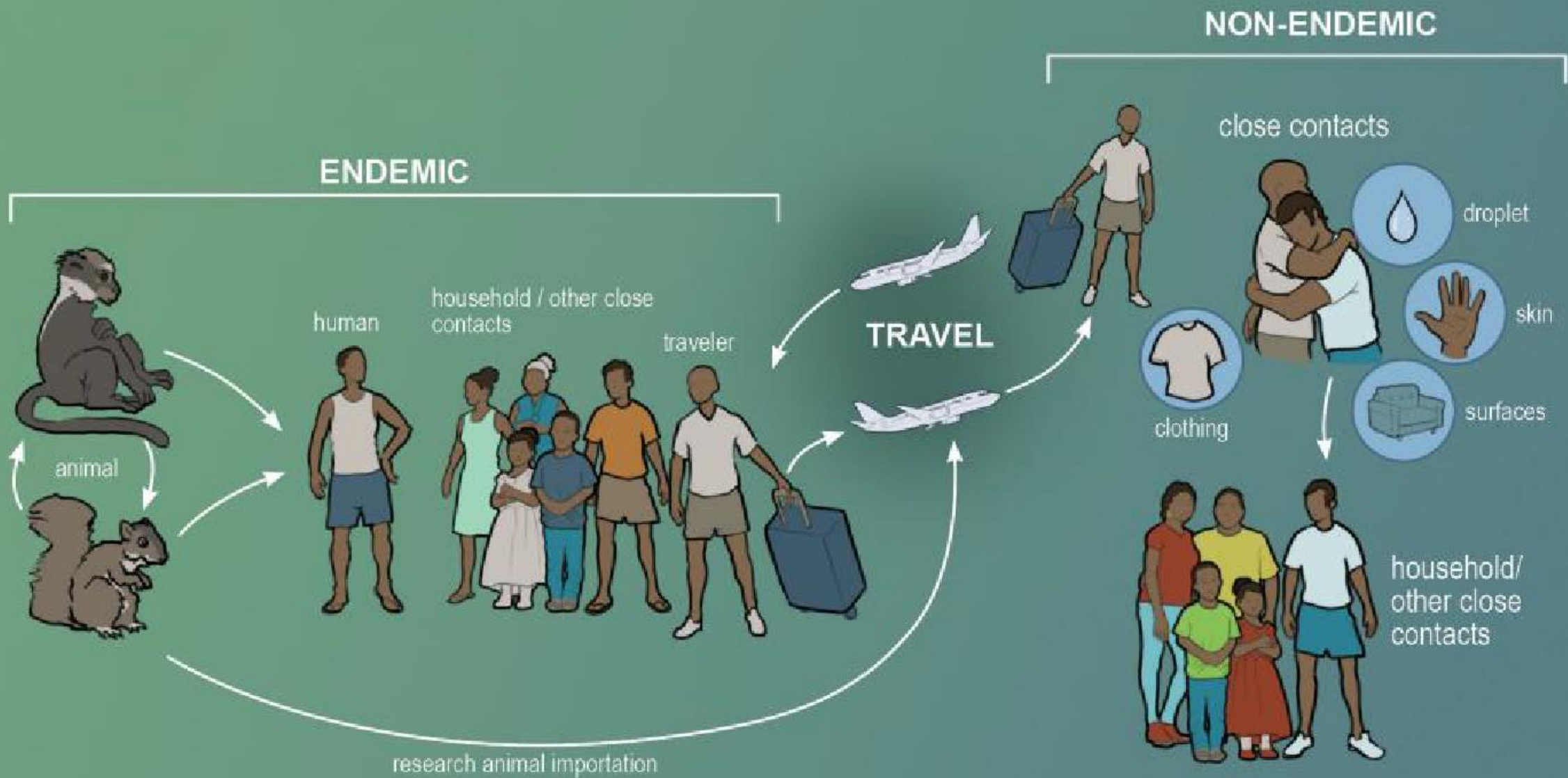


- MPXV is named due to its initial detection in monkeys.
- MPXV can primarily be found in rodents, however the reservoir is undetermined.

# Primary and secondary infection







Michael Konomos ©2022 Emory University

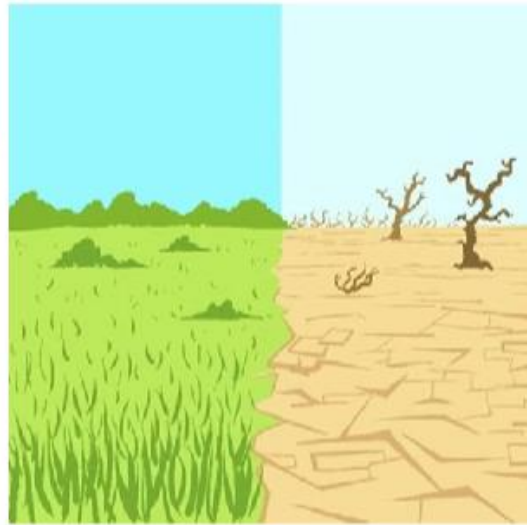
# Environmental and social factors



Deforestation



Civil unrest and  
poverty



Climate change



Cessation of  
smallpox  
vaccination

# Transmission

Unprotected **contact** with:

- Respiratory droplets
- Lesion material
- Body fluids
- Contaminated materials and surfaces

The virus can **enter through**:

- Respiratory tract
- Mucous membranes (eyes and mouth)
- Broken skin (e.g., animal bites)





# Transmission: Intimate & close body contact

- Oral, anal, and vaginal sex or touching the genitals (penis, testicles, labia, and vagina) or anus (butthole) of a person with mpox
- Hugging, massage, kissing, or prolonged face-to-face contact (i.e., talking, laughing)
- Touching fabrics and objects during sex that were used by a person with mpox and have not been disinfected, such as bedding, towels, fetish gear, and sex toys
- Close household contact: sharing sleeping, bathing and food preparation spaces and touching clothing, bedding, and commonly shared items
- From a pregnant person with mpox to their fetus through the placenta
- From infected animals, either by being scratched or bitten by the animal or by preparing or eating meat or using products from an infected animal

# Can mpox be transmitted through sexual activity?

- Mpox can be spread through oral, anal, and vaginal sex.
- In the past, mpox outbreaks have been linked to direct exposure to infected animals and animal products, with limited person-to-person spread.
- In the current mpox outbreak, the virus is spreading primarily through close personal contact from human to human.
- This may include contact with infectious lesions or respiratory secretions via close, sustained skin-to-skin contact that occurs during sex.
- However, any close, sustained skin-to-skin contact with someone who has mpox can spread the virus. The contact does not have to be exclusively intimate or sexual.

# Can mpox spread through water in pools, hot tubs, or splash pads ?

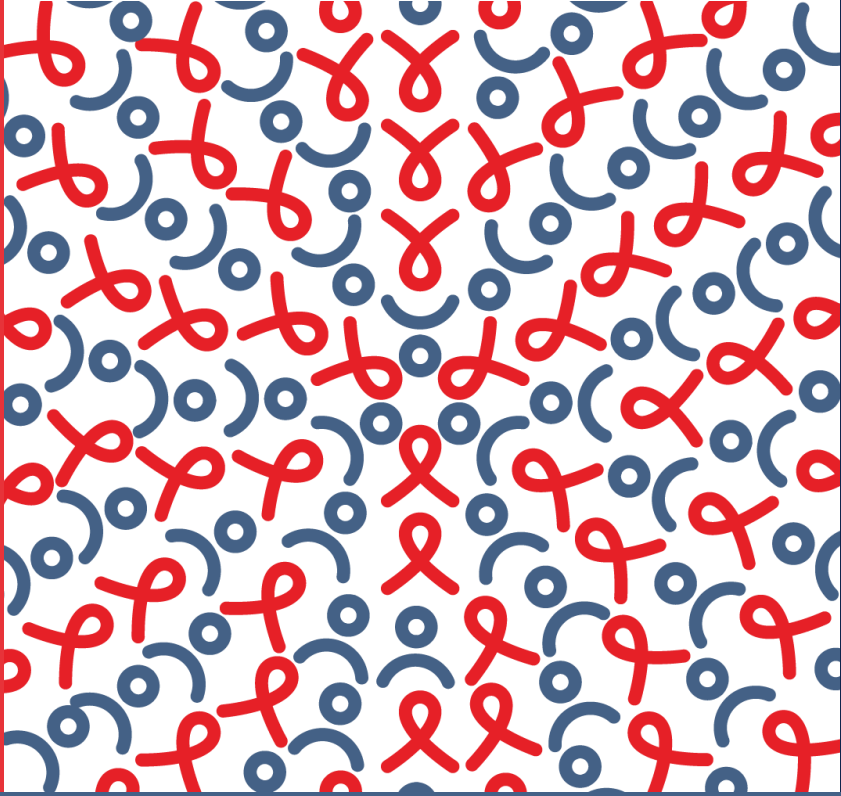
- No studies have found a clear link between mpox and water in pools, bathtubs, hot tubs, or splash pads; so, sharing waters carries low to no risk.
- The mpox virus is killed in water at the specific chlorine levels recommended for disinfection in recreational water, but not all public water sites may adhere to this recommended level.
- However, it is possible to spread mpox to others through close, skin-to-skin contact. It can also be spread by sharing objects that a person with mpox used, such as towels, kickboards, pool toys, or clothing.

# Knowledge check

1. In which category of animals is MPXV found?
2. What is the MPXV reservoir?
3. What is the definition of primary and secondary infection?
4. What are the main environmental and social factors for mpox emergence?
5. How is mpox transmitted?

Q&A





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## Module 4: Signs and Symptoms

# Learning objectives

At the end of this module participants will be able to:

- Describe the incubation period of mpox infection
- Describe the factors influencing the clinical course of mpox
- Recognize the signs and symptoms of mpox infection and clinical progression
- Account for atypical or uncommon manifestations
- Describe the possible differential diagnosis
- Offer skin care recommendations to clients with mpox infection
- Develop a comprehensive, person-centered plan of care to patients with mpox

The incubation period is 5–21 days. During this time, a person does not have symptoms and may feel fine. The illness typically lasts 2–4 weeks with supportive care.



The duration of the infectious period is until the skin lesions dry up, become crusts, and fall off, or mucosal lesions have disappeared.

Source: OpenWHO [Internet]. Mpox: Epidemiology, preparedness and response for African outbreak contexts. Geneva: WHO; 2021.



# Factors influencing the course of mpox

- Asymptomatic infection can occur
- Risk factors for severe illness
  - Children and adolescents
  - Immunodeficiency, including pregnancy
  - Invasive route of infection
  - Clade Ib variant
- Protective factors: prior smallpox vaccination
- Case fatality rate: Est. 3.2%–10%, higher among key demographics (i.e., children <15 years)

In DRC, where Clade Ib mpox cases have been reported in all 26 provinces, children younger than 15 account for 66% of reported cases and more than 82% of deaths.

Close contact, malnutrition, and lack of smallpox vaccination contribute to children's vulnerability

- 57 patients hospitalized with mpox
- 82% were HIV-positive
- 9% of whom were receiving antiretroviral therapy (ART) before mpox diagnosis

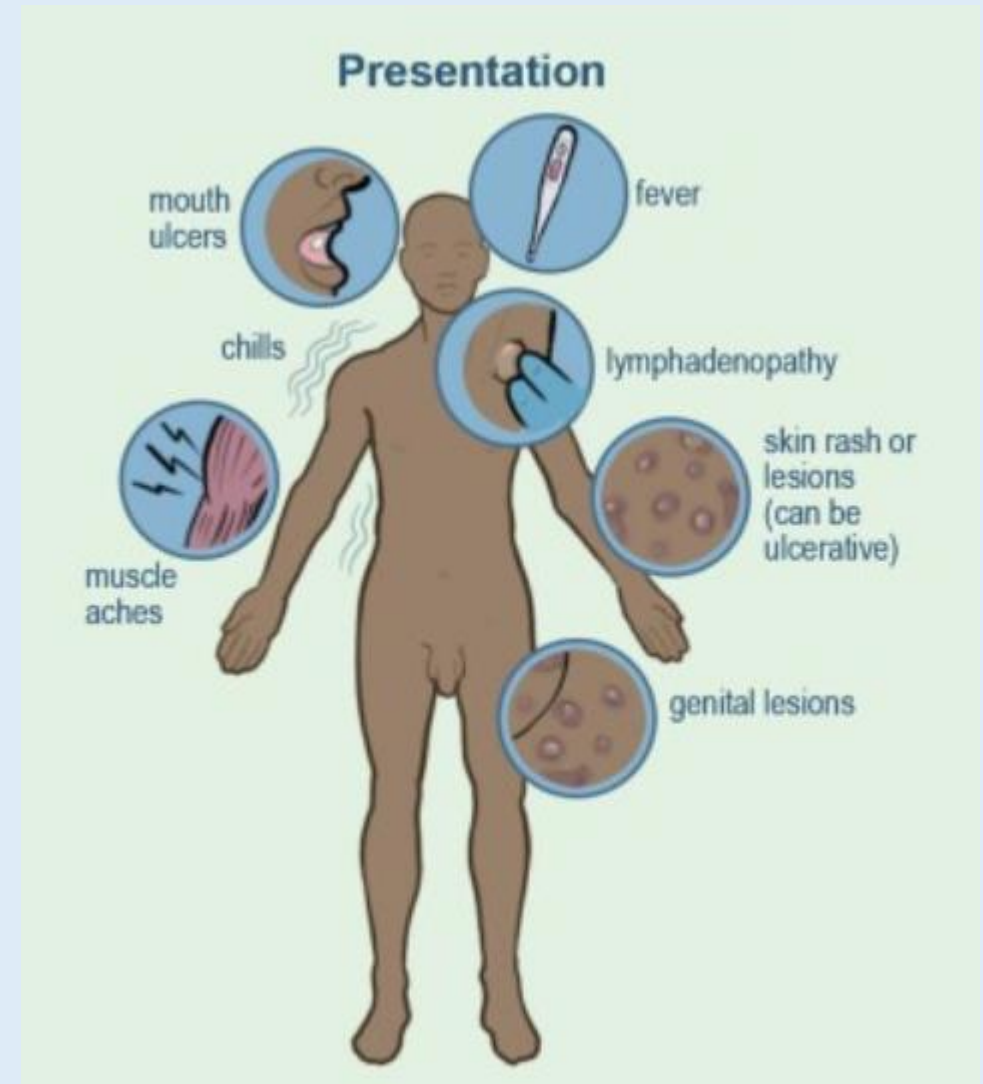
Source: Miller MJ, Cash-Goldwasser S, Marx GE, et al. Severe monkeypox in hospitalized patients—United States, Aug 10–Oct 10, 2022. CDC Morb Mortal Wkly Rpt. 2022;71:1412–17.

# Symptomatology

- Severity depends upon several factors, including health of individuals and the route of exposure.
- Clade I and Clade II cause similar clinical manifestations; risk of severe disease seems higher in Clade I.
- MPX virus may cause severe disease in certain population groups; diagnosis of severe MPXV should prompt clinicians to perform HIV testing.
- Most common presenting symptom is rash.

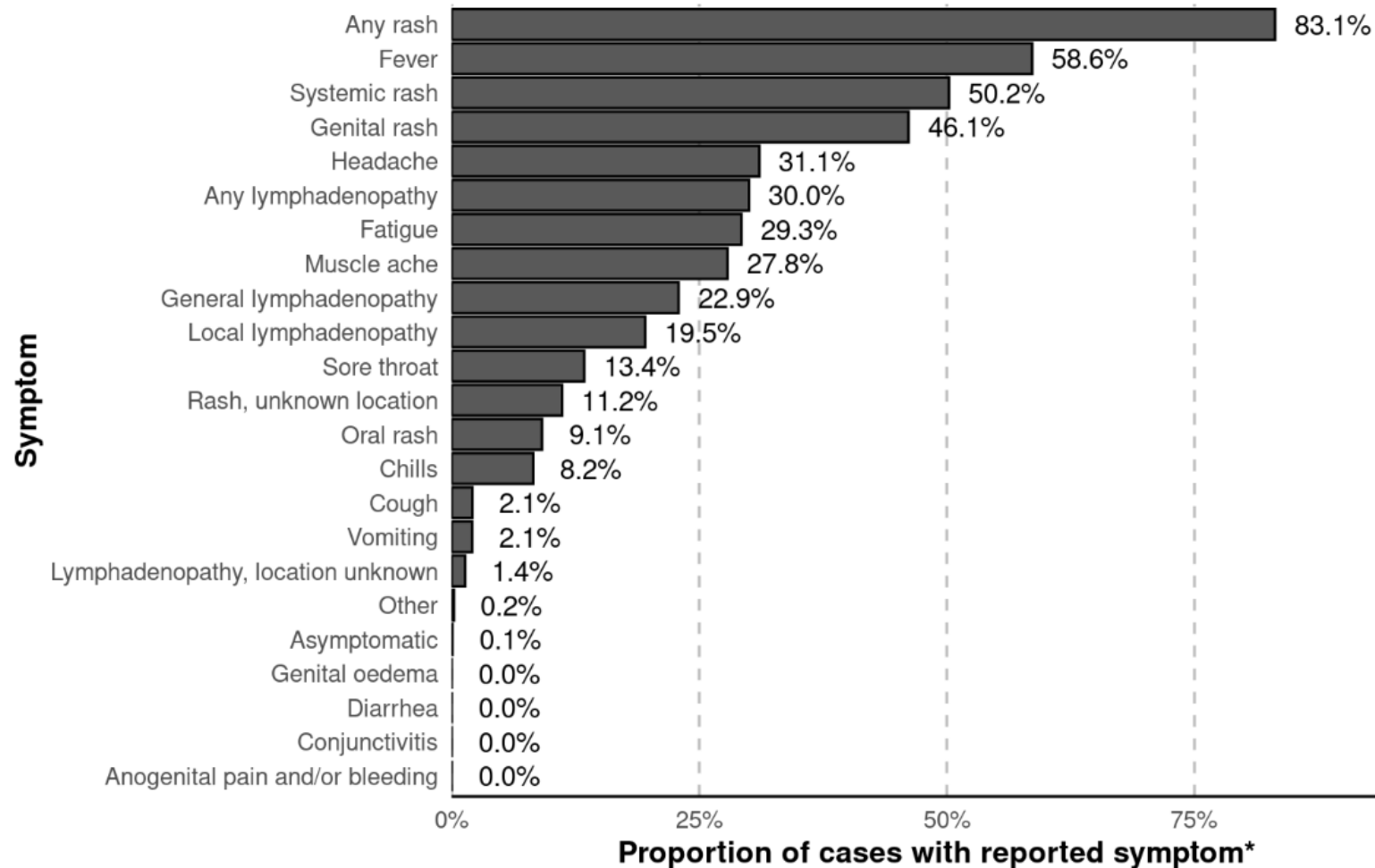
# Signs and symptoms

- Rash (lesions) on skin and/or mucous membranes.
- Other symptoms:
  - Fever, chills, swollen lymph nodes, exhaustion, muscle aches and backache, headache
  - Respiratory symptoms
- An individual may experience all or only a few symptoms.
- Sometimes, people have flu-like symptoms before the rash.
- Some people get a rash first, followed by other symptoms.
- Others only experience a rash.



Source: OpenWHO [Internet]. Mpox: Epidemiology, preparedness and response for African outbreak contexts. Geneva: WHO; 2021.

# Proportion of cases with reported symptoms



Source: WHO

\*29475 cases with at least one reported symptom from a country where at least two unique symptoms reported used as denominator

Graph refers to:

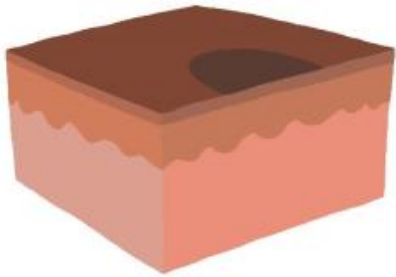
All cases, male and female.

Any rash refers to one or more rash symptoms (systemic, oral, genital, or unknown location).

Any lymphadenopathy refers to either general or local lymphadenopathy.

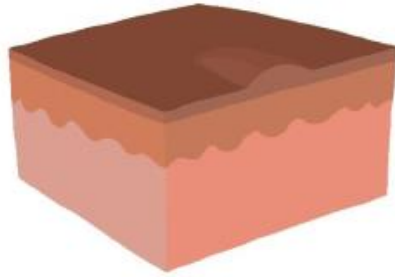
# Rash progression

**Macule**



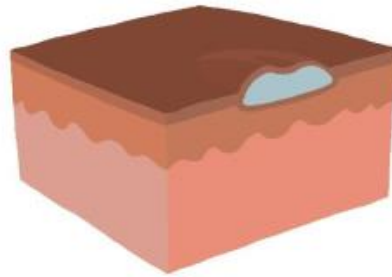
Credit: Emerg Infect Dis / N. Erez et al., 2018. Retrived from: <https://wwwnc.cdc.gov/eid/article/25/5/19-0076-f1>

**Papule**



Credit: NEJM/ D.Kurz et al .2004  
Retrived from: <https://www.nejm.org/doi/full/10.1056/NEJMoa032299>

**Vesicle**



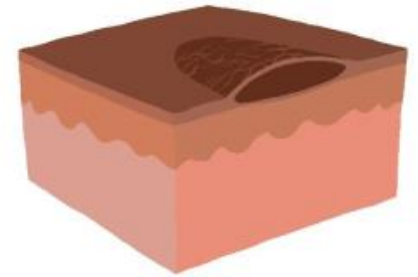
Credit: Andrea McCollum / CDC

**Pustule**



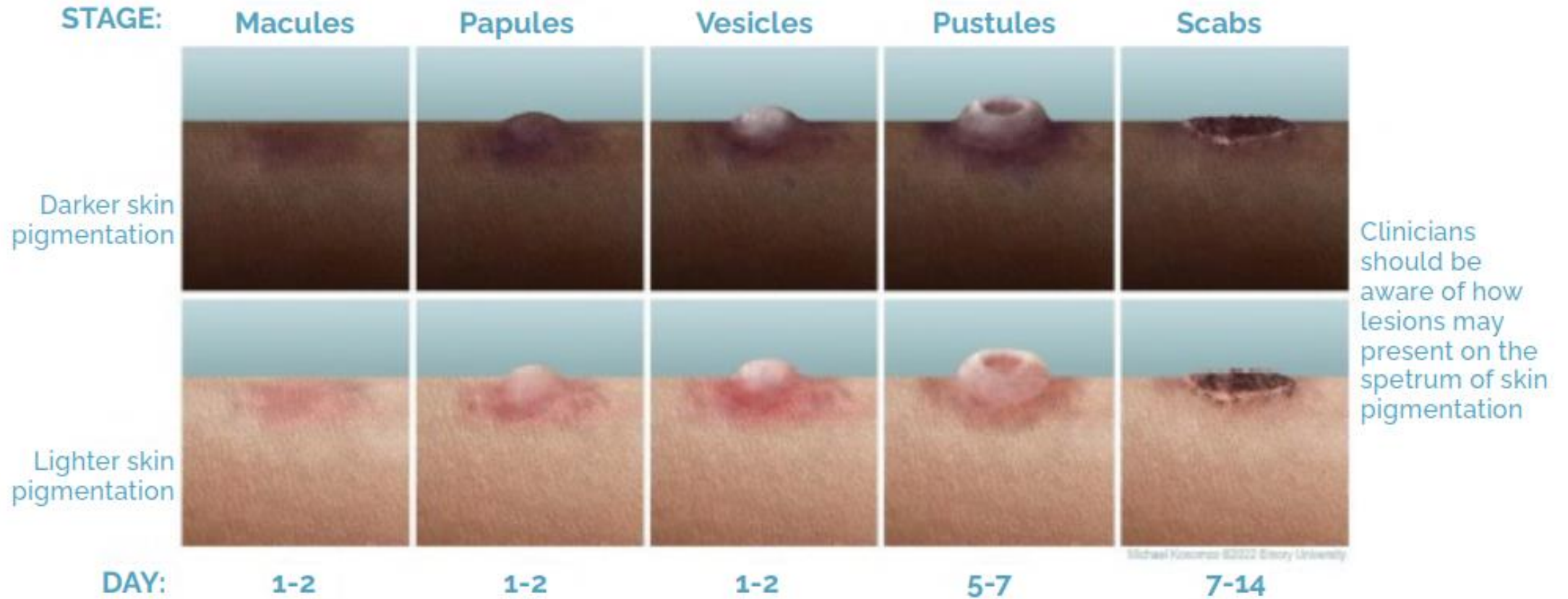
Credit: Toutou Likafi/ Kinshasa School of Public Health

**Crust**



Credit: P. Mbala /Institut Nationale de recherche biomédicale. DRC





Source: Titanji BK, Tegomoh B, Nematollahi S, et al. Monkeypox: a contemporary review for healthcare professionals. Open Forum Infect Dis. 2022;9(7):[10.1093/ofid/ofac310](https://doi.org/10.1093/ofid/ofac310).



# Evolution of lesions over time

# Development of **solitary lesion** on right upper inner thigh, tracking laterally to outer thigh

Day 9



Day 19



Day 24



Day 25



Day 46



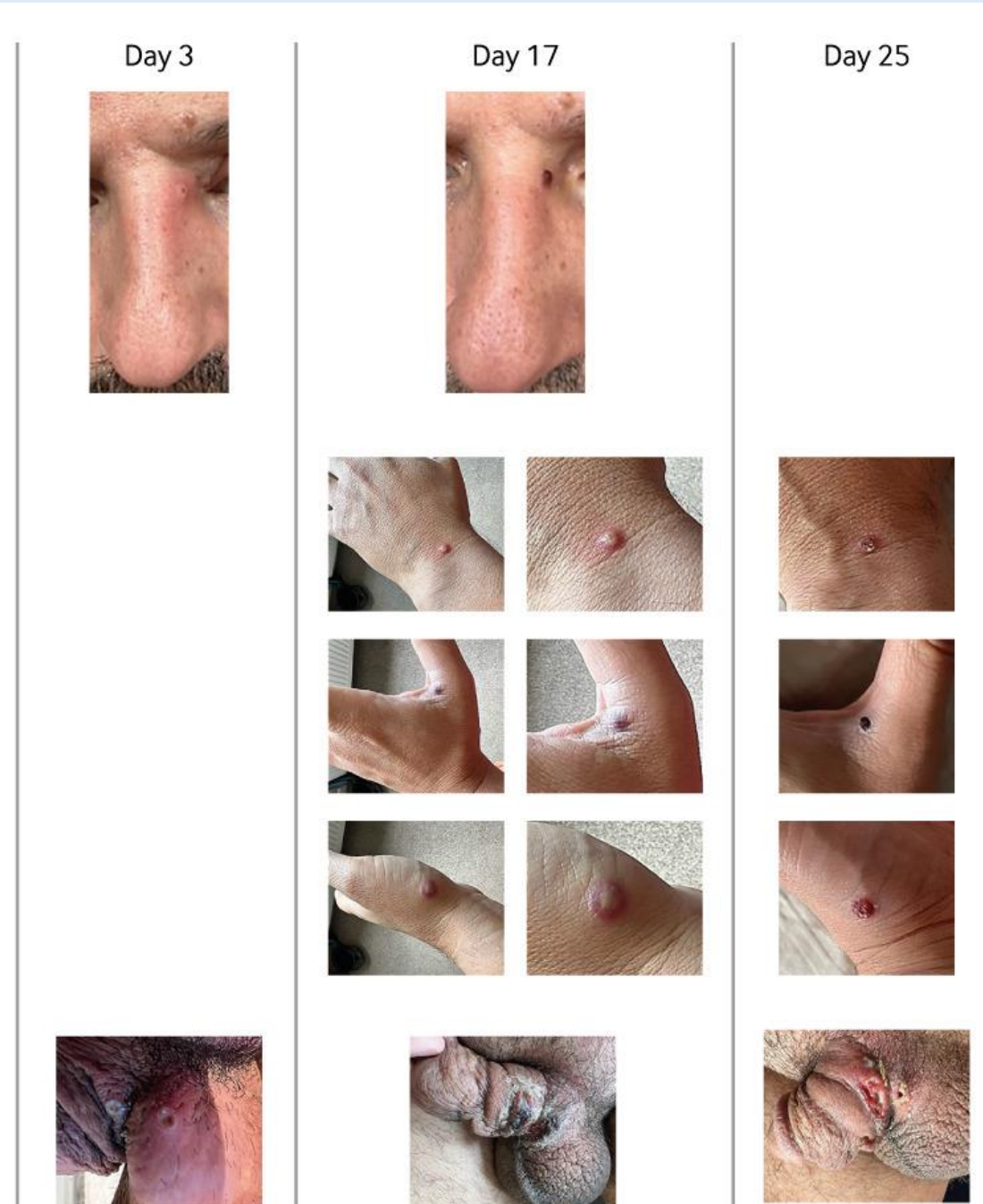
- 53-year-old man
- HIV positive
- Viral load <200 copies/mL
- On ART
- Single skin lesion on the thigh
- Initially this was a small papule on the medial right thigh but developed into a painful mass with surrounding erythema

Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)



Cutaneous lesions on the **nose, hand, and penis** over time.

On day 17 there were fresh pustular lesions on the hand, a partly scabbed lesion on the face, and fully scabbed lesions on the penis.



- 48-year-old man
- Polymorphic skin lesions having first noticed a single erosion on the scrotum
- Spread to the penile base and foreskin

Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)

## Synchronous evolution of the lesions



(A) Day 1

(B) Day 3

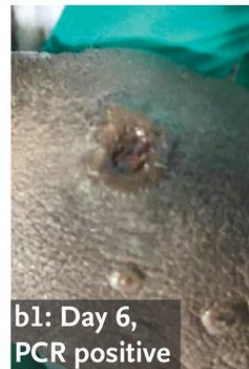
(C) Day 7

Source: Betancort-Plata C, et al. Monkeypox and HIV in the Canary Islands: a different pattern in a mobile population. Trop Med Infect Dis. 2022;7(10):[10.3390/tropicalmed7100318](https://doi.org/10.3390/tropicalmed7100318).



# Evolution of cutaneous lesions in a person with mpox

## A Evolution of Cutaneous Lesions

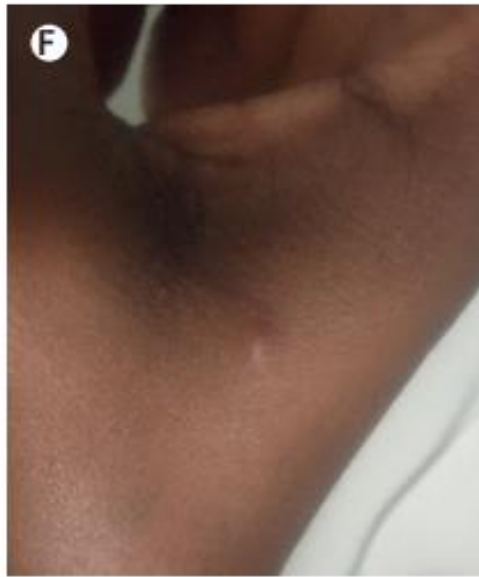


- a1 and a2 show facial lesions
- b1 through b3 show a penile lesion
- c1 and c2 show a lesion on the forehead





# **Skin and soft tissue lesions**



Skin and soft tissue features included:

- (A and D) vesicular or pustular lesions
- (B and C) macular lesions involving the palms and soles
- (D and E) a sub-ungual lesion
- (F and G) more subtle papules and smaller vesicles
- (H) deep abscess (arrow, image obtained during ultrasound-guided drainage)



# Symmetrical maculopapular rash of the torso, back, and buttocks

- 36-year-old man
- HIV positive
- Viral load  
<200 copies/mL
- On ART
- CD4 count  
>400 cells/ $\mu$ L
- Rapidly progressive  
maculopapular rash  
soon after developing  
perianal vesicles



Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)



- Positive treponemal antibodies
- Reactive rapid plasma reagin (RPR) test at a dilution of 1:1
- HIV negative
- *Neisseria gonorrhoeae* and *Chlamydia trachomatis* negative
- Panels A and B show scattered papulovesicular lesions on the chest that were present 2 days before admission.
- The lesions measure 2 mm in diameter, are filled with clear fluid, and have surrounding erythema.
- Panel C shows a lesion on the right palm that was present at the time of admission.
- Panel D shows a papulovesicular lesion on the left second finger, which was one of the last skin lesions to develop, approximately 2 weeks after the onset of symptoms.

Source: Basgoz N. [Case 24-2022: a 31-year-old man with perianal and penile ulcers, rectal pain, and rash](#). N Engl J Med. 2022;387:547-56.





- a. Upper limb pustules and cicatrized lesion in veno-puncture site (needle sharing with confirmed case). Below the cicatrized puncture lesion there is an abscess with isolation of methicillin-resistant *Staphylococcus aureus*
- b. Anal umbilicated pustules and abundant exudation in a patient with proctitis
- c. Three umbilicated lesions (small arrows) and moderate size painful ulcer in left lateral tongue side

- d. Three umbilicated pustules in penis foreskin
- e. Two trunk lesions in pustular and macular phases in a patient with diffuse trunk rash
- f. Two hand lesions in pustular and umbilicated pustule phases

Source: Caria J, et al. [Clinical and epidemiological features of hospitalized and ambulatory patients with human monkeypox infection: a retrospective observational study in Portugal](#). Infect Dis Rep. 2022;14(6):810–23.

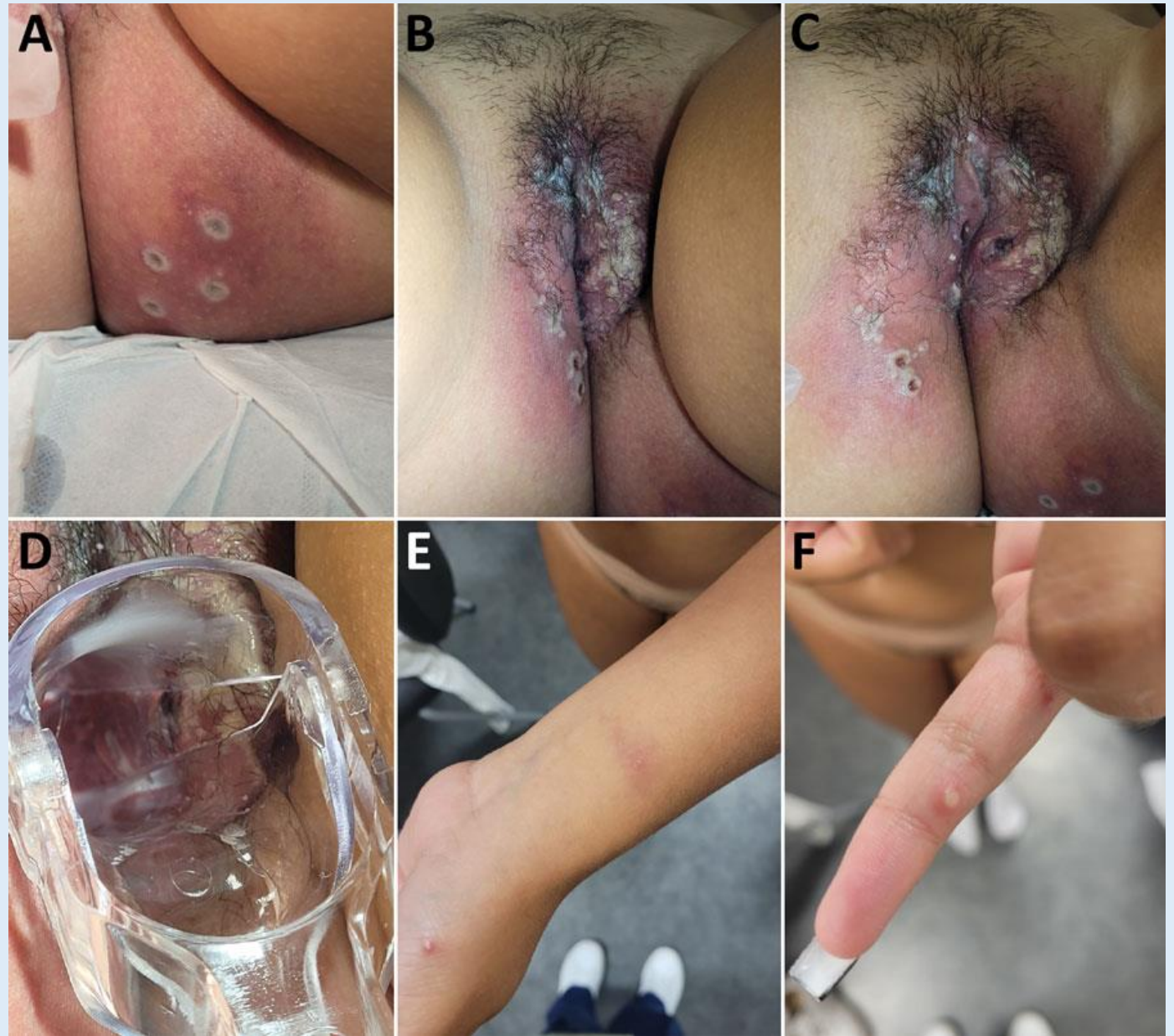


# Mpox in women

Young woman with MPXV infection after sexual intercourse, pustules in:

- gluteal area (A)
- genital area (B, C)
- intravaginal area (D)
- arm and hand (E)
- finger (F)

*France, September 2022*





## Morbilliform rash on

Buttocks (A)



Lower trunk (B)



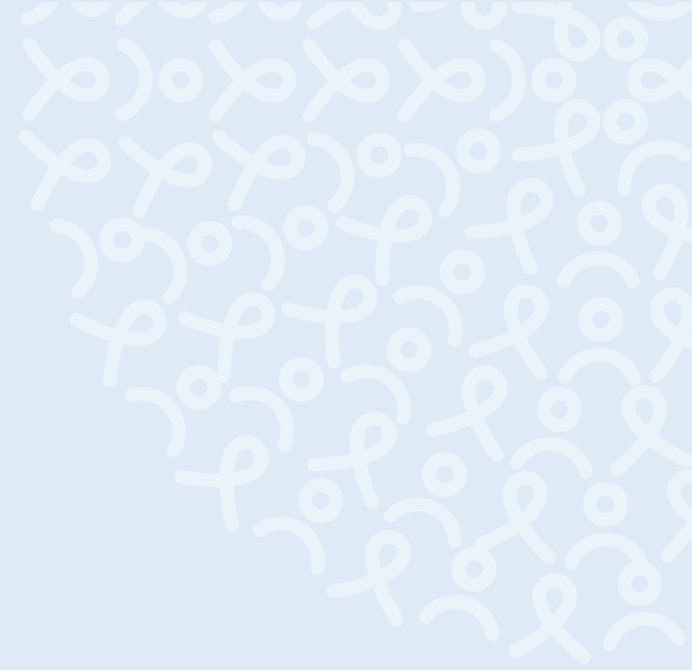
Forearm (C)



Morbilliform rash on thigh with  
area of confluent rash (D)

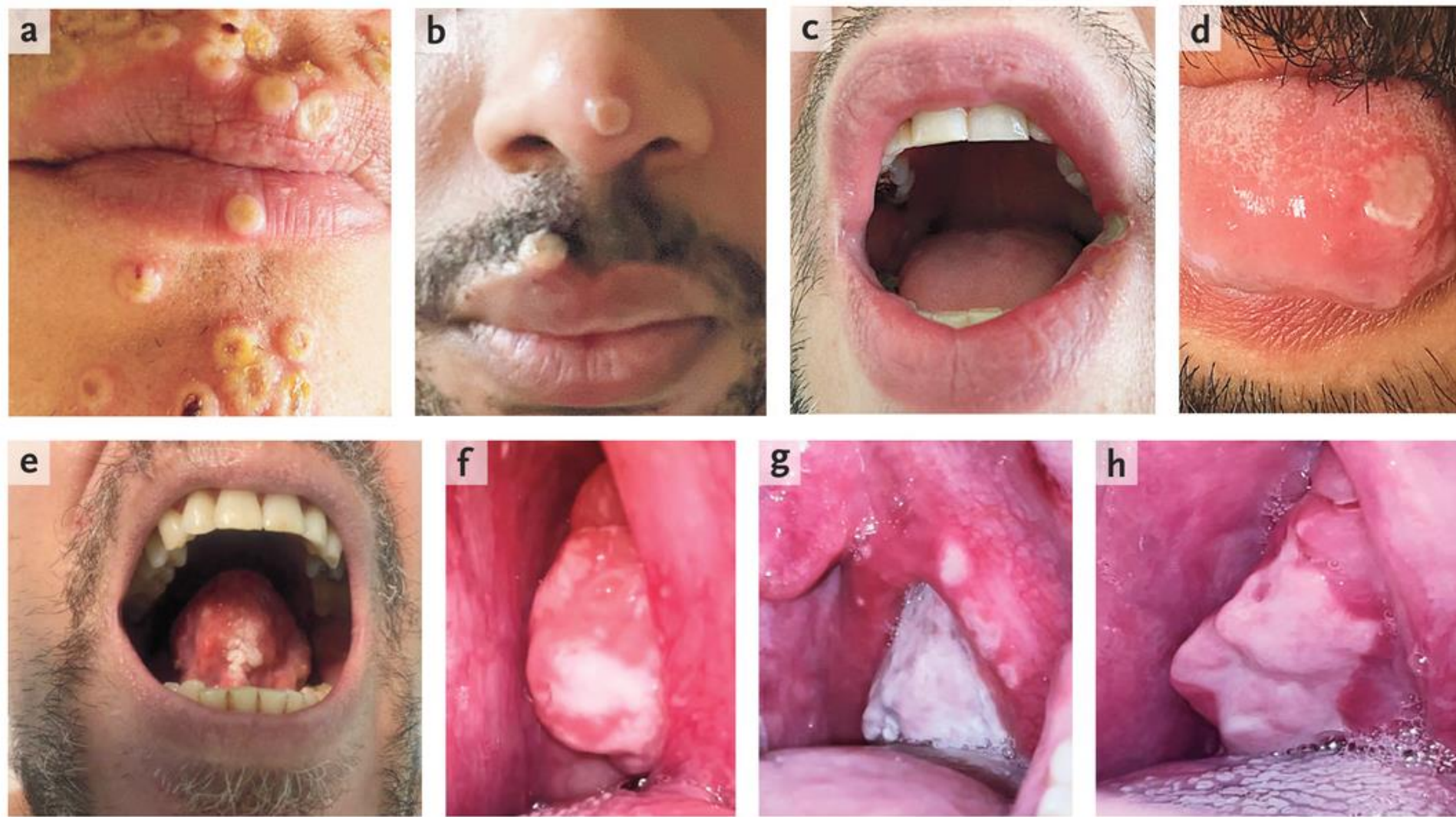
Source: Torres HM, et al. [Approaching monkeypox: a guide for clinicians](#). Top Antivir Med. 2022;30(4):575–81.

# Oral lesions





# Oral and perioral lesions



- **a:** perioral umbilicated lesions
- **b:** perioral vesicular lesion on day 8, PCR positive
- **c:** ulcer on the left corner of the mouth on day 7, PCR positive
- **d:** tongue ulcer
- **e:** tongue lesion on day 5, PCR positive
- **f, g, h:** pharyngeal lesions on day 0, 3, and 21, respectively, PCR positive on day 0 and 3 and negative on day 21

**(Left) Symmetrical erythematous maculopapular rash on back and upper arms, with areas of confluent erythema**

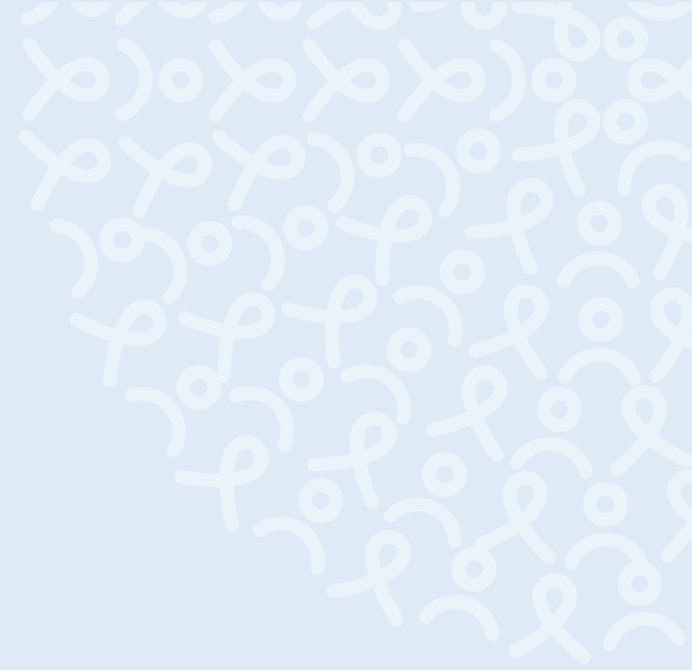


**(Right) Right tonsillar enlargement with an overlying pustular lesion and yellow-green exudate with slight deviation of the uvula**

- Male aged 25
- Right-sided neck pain, quickly followed by an erythematous, pruritic rash over the trunk
- Subsequently developed fever, progressively worsening right submandibular swelling, and pain, and reported fatigue
- Swelling increased, resulting in dysphagia and difficulty breathing

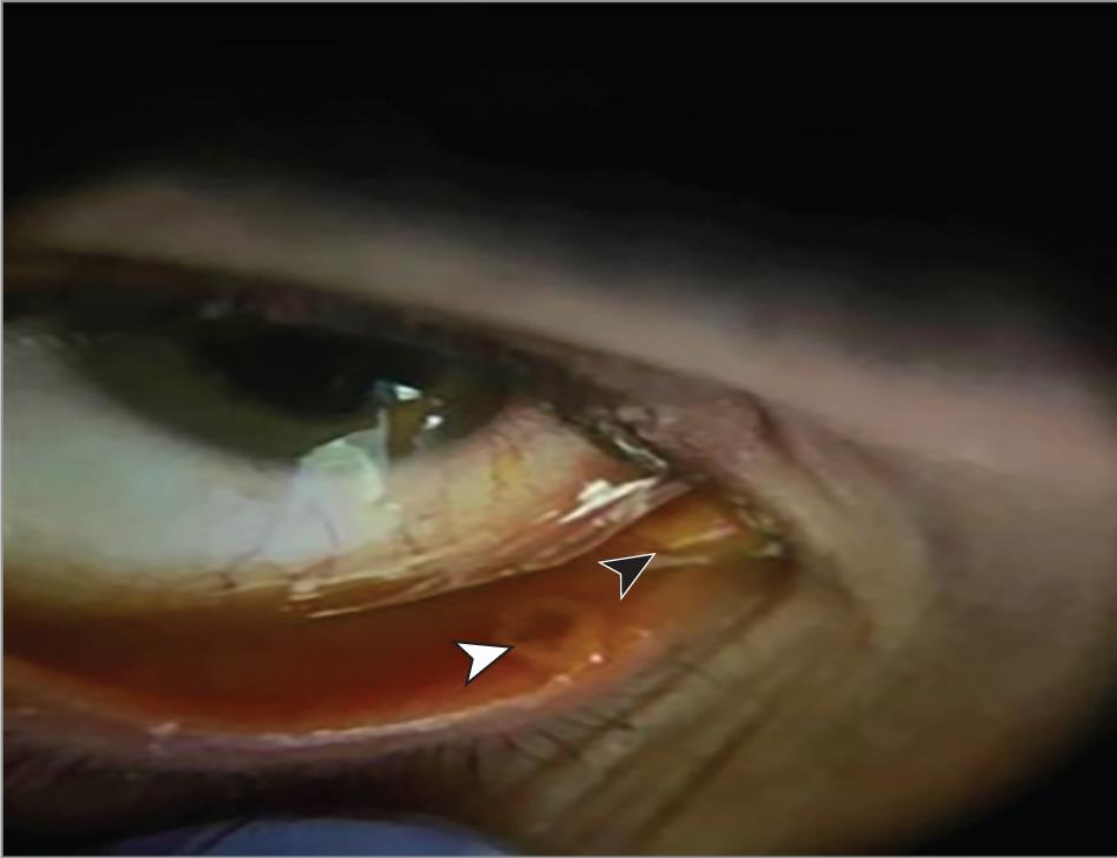
Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series](#). *BMJ*. 2022;378:e072410.

# Ocular lesions

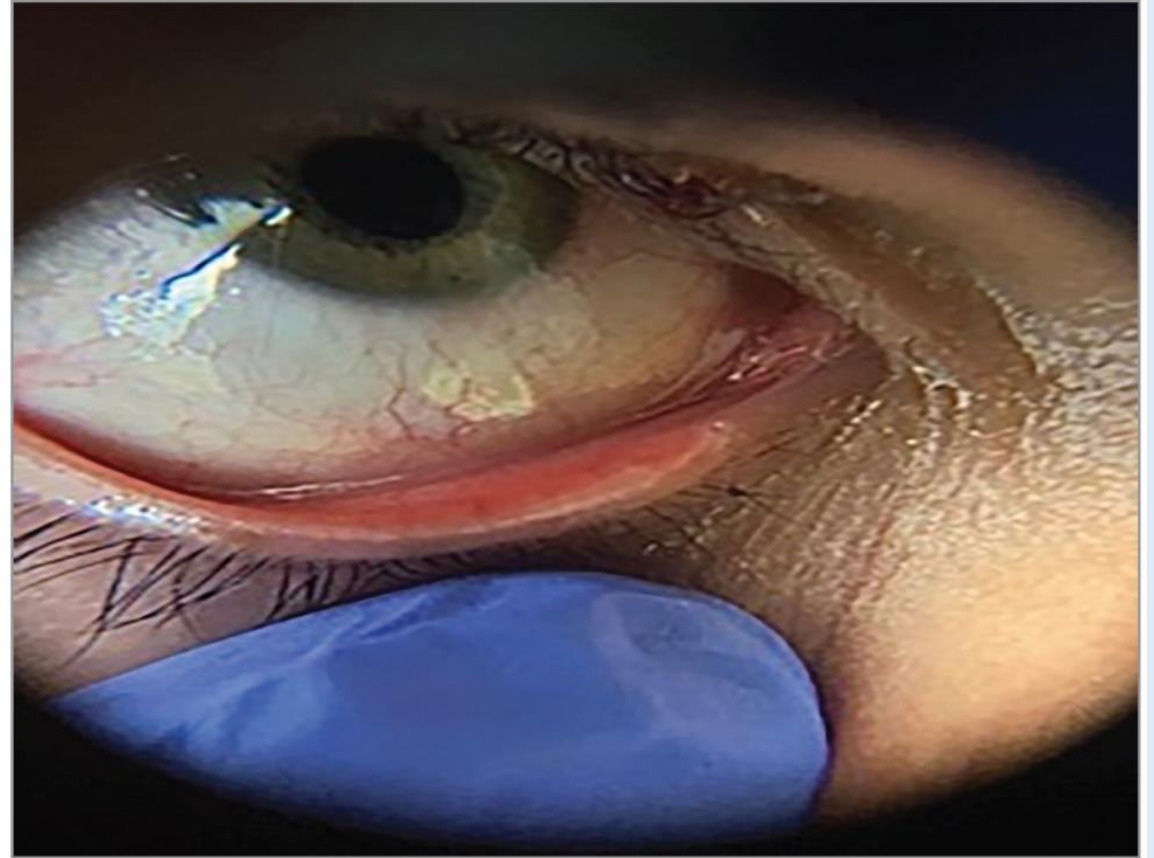




**A** Before treatment

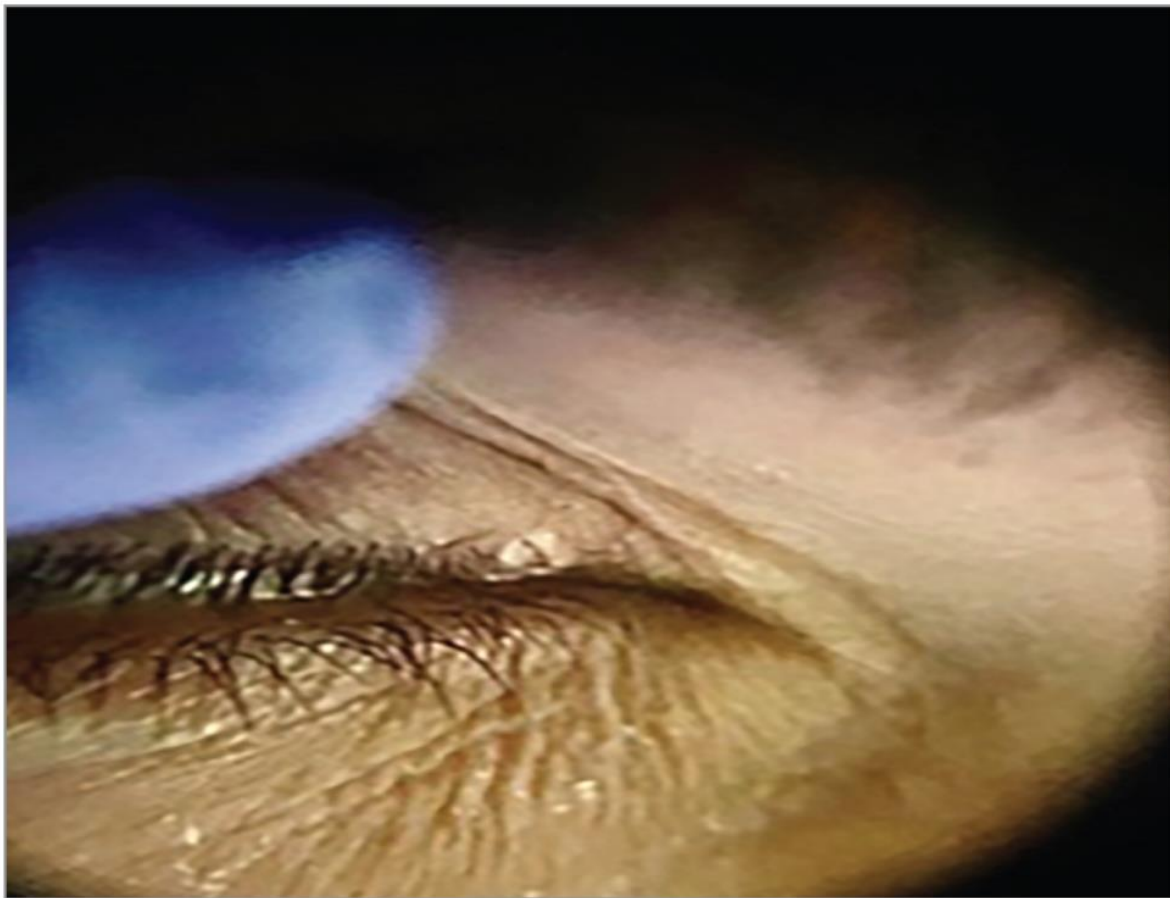


**B** 4 d After treatment

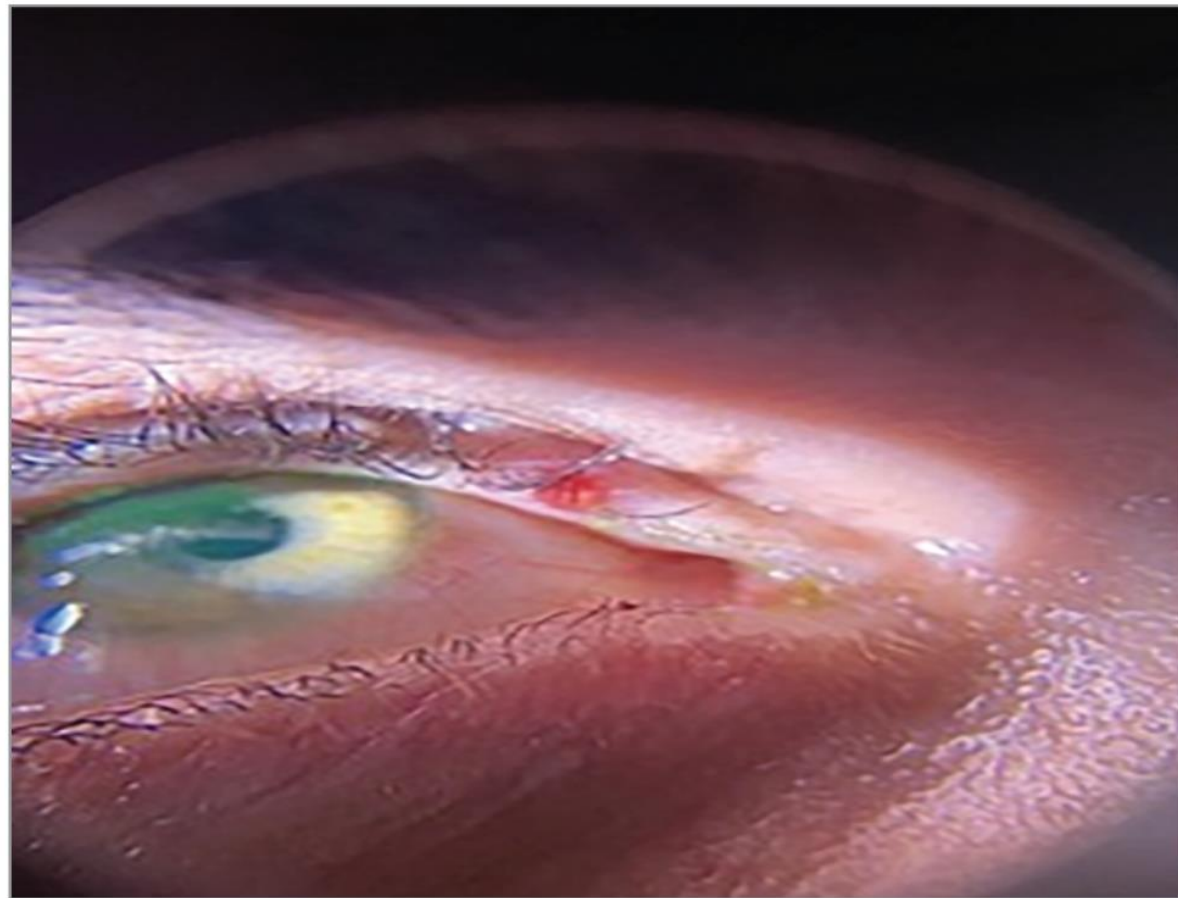


Palpebral (white arrowhead) and caruncular (black arrowhead) lesions before (A) and 4 days after (B) treatment with tecovirimat.

**A** Before treatment



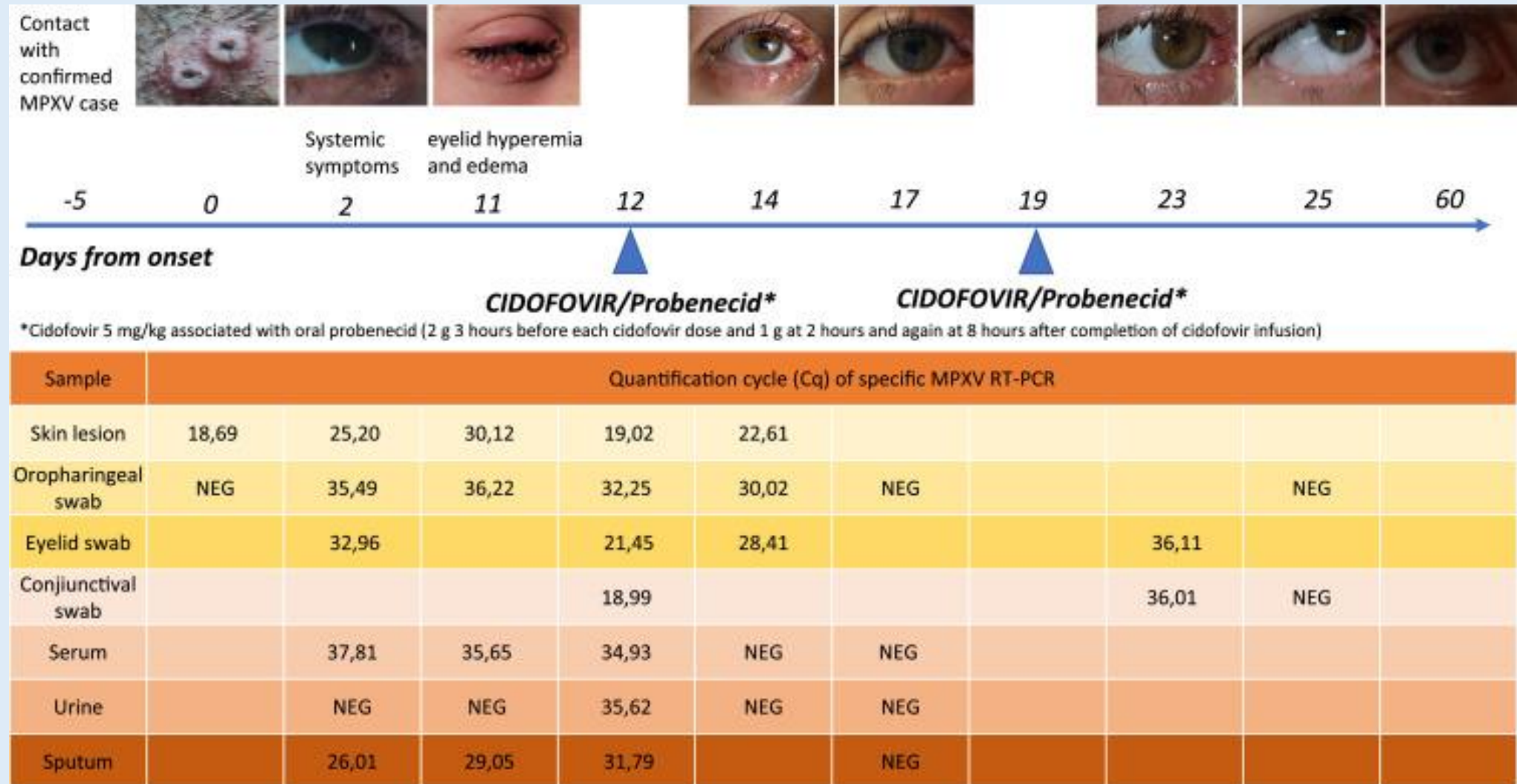
**B** 4 d After treatment

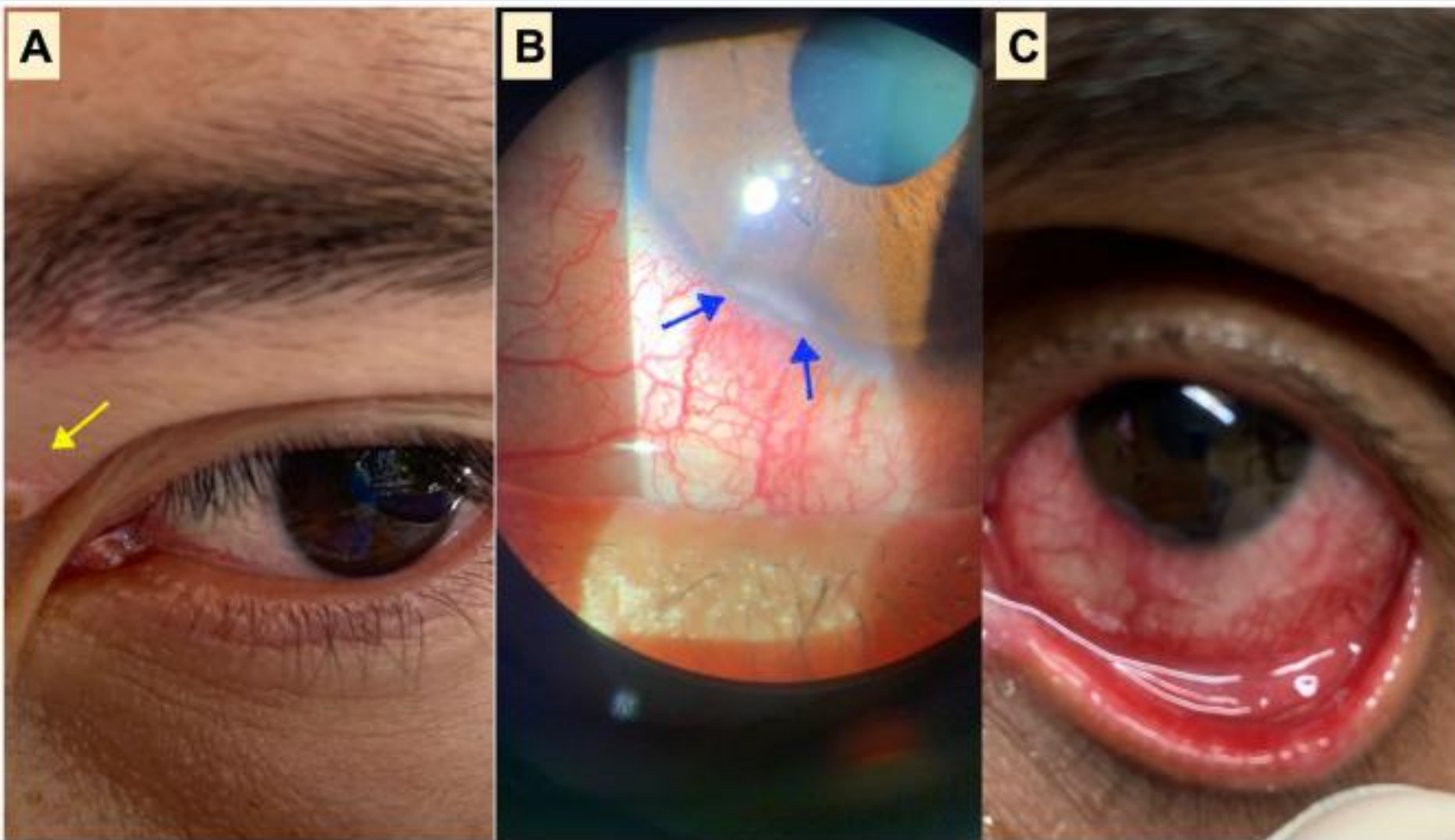


Eyelid margin lesion before (A) and 4 days after (B) treatment with tecovirimat.



# Timeline of clinical evolution and PCR positivity in biological samples collected





Source: Ng FYC, et al. Monkeypox and ocular implications in humans. Ocul Surf. 2023;27:13–15.

- **Patient #1 (A)** diagnosed with mpox presenting with vesicle on the left upper eyelid (yellow arrow). Patient had positive reverse transcriptase-polymerase chain reaction (RT-PCR) for mpox from the skin lesions and conjunctiva.
- **HIV-positive patient (patient #2) (B)** with the diagnosis of mpox infection presenting with peripheral keratitis (blue arrows). Reverse transcriptase-polymerase chain reaction (RT-PCR) was positive for mpox from conjunctival swab.
- **HIV positive patient (patient #3) (C)** with the diagnosis of mpox infection with hyperemic conjunctiva and serous discharge. Reverse transcriptase-polymerase chain reaction (RT-PCR) was positive for mpox from conjunctival swab.

# Lesions in HIV Infection





## Morphological type of lesions:

A. Small pustule (chest)

B. Large pustule (leg)

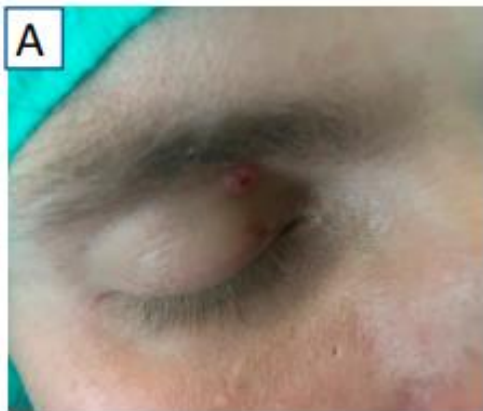
C. Papulo-pustule (white center, hand)

D. Papulo-pustule (black center, neck)

E. Chancriform ulcer (anus)

F. Atrophic scar (forehead)





Topographical distribution of lesions:

- A. Eyelid
- B. Perioral
- C. Tongue
- D. Chest
- E. Arm

Source: Betancort-Plata C, et al. Monkeypox and HIV in the Canary Islands: a different pattern in a mobile population. Trop Med Infect Dis. 2022;7(10):10.3390/tropicalmed7100318.



Topographical distribution of lesions (*continued*):

(F) Abdomen, genital area, and thighs

(G) Abdomen, genital area, and thighs



(A) Day 4



(B) Day 8

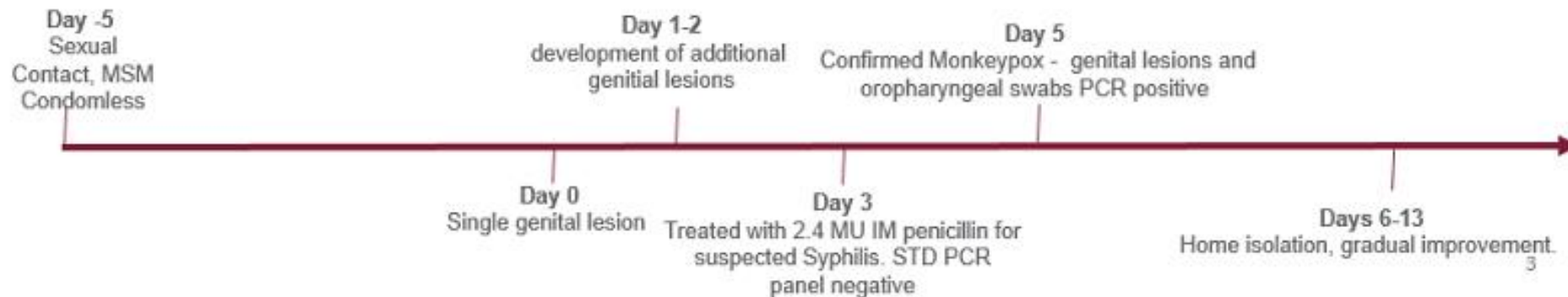
# Penile lesions





# Clinical evolution of penile lesions

**Figure 1:** Evolution of cutaneous lesions in an individual with Human Monkeypox infection first presented with several penile lesions. A shows penile lesions, B1-B2 show evolution of penile lesions after diagnosis. PCR status is indicated where available.



# Progression of penile lesions and penile oedema



Day 2



Day 3



Day 6 (admission)



Day 7



Day 8



Day 9



Day 10



Day 11



Day 16

- 34-year-old male
- Circumcised
- Multiple penile lesions with clinically significant associated oedema

Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)





- Macular rash and painful lymphadenopathy were observed in the right inguinal area (Panel A).
- Two ulcerated lesions and several umbilicated pustules were observed on the penis (Panel B).
- Additional examples of mpox genital lesions (Panels C and D).

# Progression of penile confluent lesions

Multiple lesions progressed to become confluent, subsequently forming a large ulcer



Day 3



Day 7



Day 11 (admission)



Day 16



Day 24

- 40-year-old man
- HIV positive
- Viral load <200 copies/mL
- On antiretroviral therapy
- CD4 count >500 cells/ $\mu$ L

Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)



## Secondary bacterial infection of penis due to *Staphylococcus aureus* and *Streptococcus dysgalactiae*

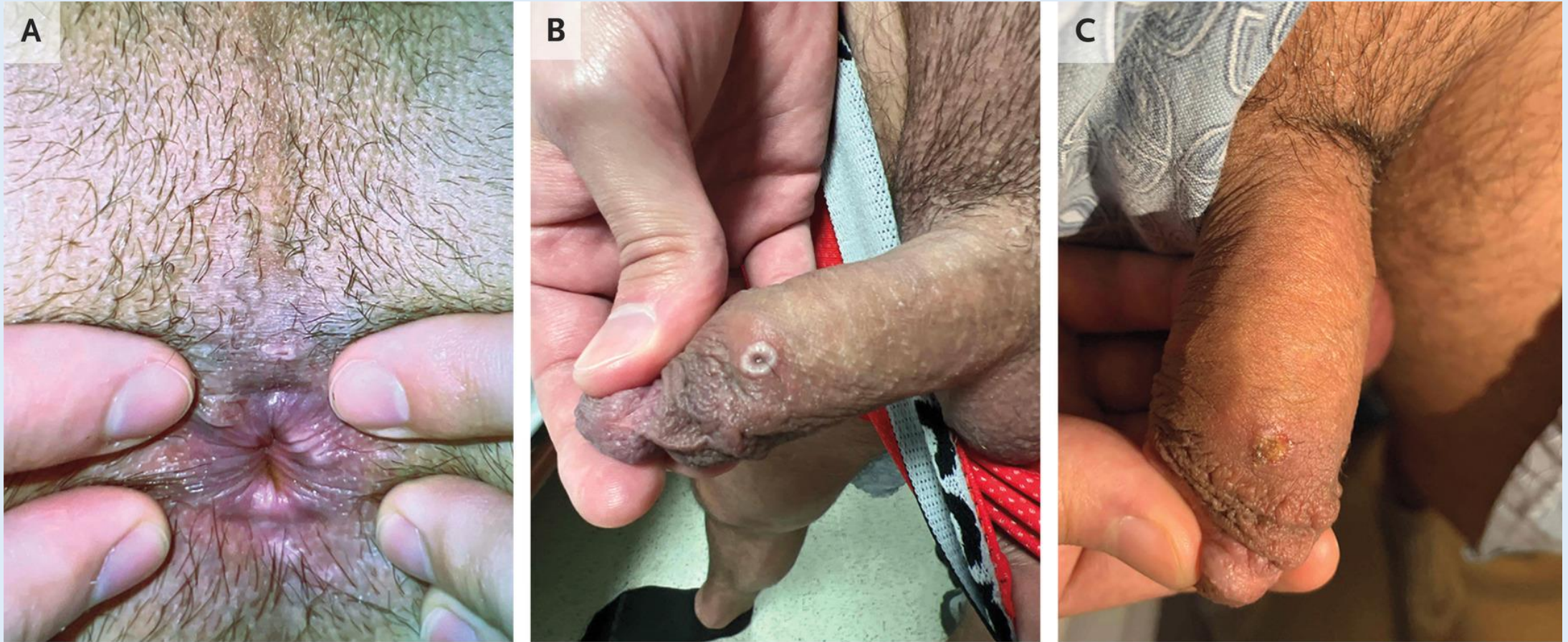


- 47-year-old man
- HIV positive
- Viral load <200 copies/mL
- On ART
- CD4 count 755 cells/ $\mu$ L
- Extensive genital lesions, penile swelling, and purulent penile discharge

Source: Patel A, et al. [Clinical features and novel presentations of human monkeypox in a central London centre during the 2022 outbreak: descriptive case series. BMJ. 2022;378:e072410.](#)

# Perianal, anal, and rectal lesions





- **A:** a tender perianal ulcer, measuring less than 1 cm in diameter, with raised, firm margins.
- **B:** an ulcer on the dorsum of the penile shaft, measuring 7 mm in diameter that is similar in appearance to the perianal ulcer.
- **C:** the ulcer has heaped margins around a central dry base.  
*In all panels, the patient's hands are shown.*





Source: Thornhill JP. [Monkeypox virus infection in humans across 16 countries — April–June 2022](#). N Engl J Med. 2022;387:679-91.

- **a:** anal and perianal lesions on day 6, PCR positive
- **b and c:** rectal and anal lesions in a single person, PCR positive
- **d:** perianal ulcers, PCR positive
- **e:** anal lesions
- **f:** umbilicated perianal lesion on day 3, PCR positive
- **g:** umbilicated perianal lesions on day 3, PCR positive
- **h:** perianal ulcer on day 2, PCR positive





Perianal pustules evolving into large ulcerative lesion (8 days)

- All individuals screened for MPXV were symptomatic and presented with pathognomonic skin lesions, either pustular papules with a central umbilicated dip, fluid-filled vesicles, ulcerations, or eschars.
- However, clinical presentation varied greatly according to the stages of mpox infection at the time of testing.



Penile lesions coalescing into large ulceration (8 days)





# Lesions in children

# Skin lesion in newborn infant

- Skin lesions on the hands and feet of a newborn infant
- Visible lesions range from vesicles to pustules; lesions that were beginning to form scabs are also shown
- Photographs were obtained on day 5 after the onset of rash







Source: Damon IK, et al. Discovery of monkeypox in Sudan: letter to editor. N Engl J Med. 2006;355:9862-63.



Source: WHO. Pocket book of hospital care for children: 2nd edition. Geneva: WHO; 2013. Available from: <https://www.who.int/publications/i/item/978-92-4-154837-3>.

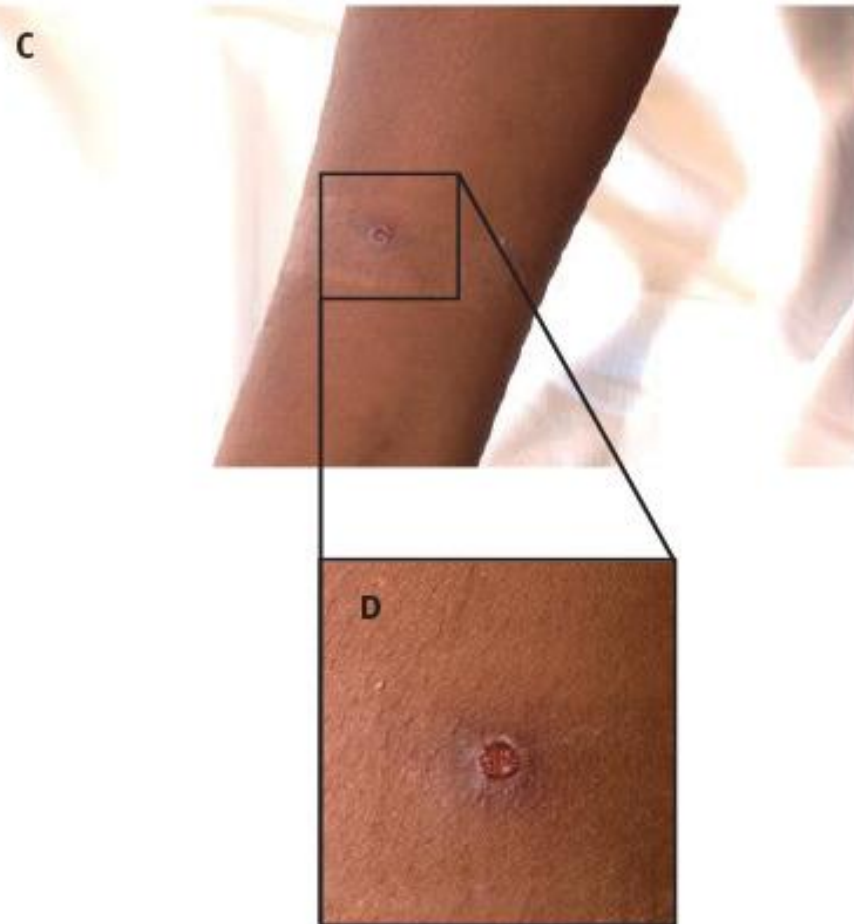


**Smallpox.** Credit: WHO/Isao Arita; [https://www.who.int/health-topics/smallpox#tab=tab\\_1](https://www.who.int/health-topics/smallpox#tab=tab_1)



**Mpox.** Credit: Nigeria Centre for Disease Control; [https://www.who.int/health-topics/monkeypox#tab=tab\\_1](https://www.who.int/health-topics/monkeypox#tab=tab_1).

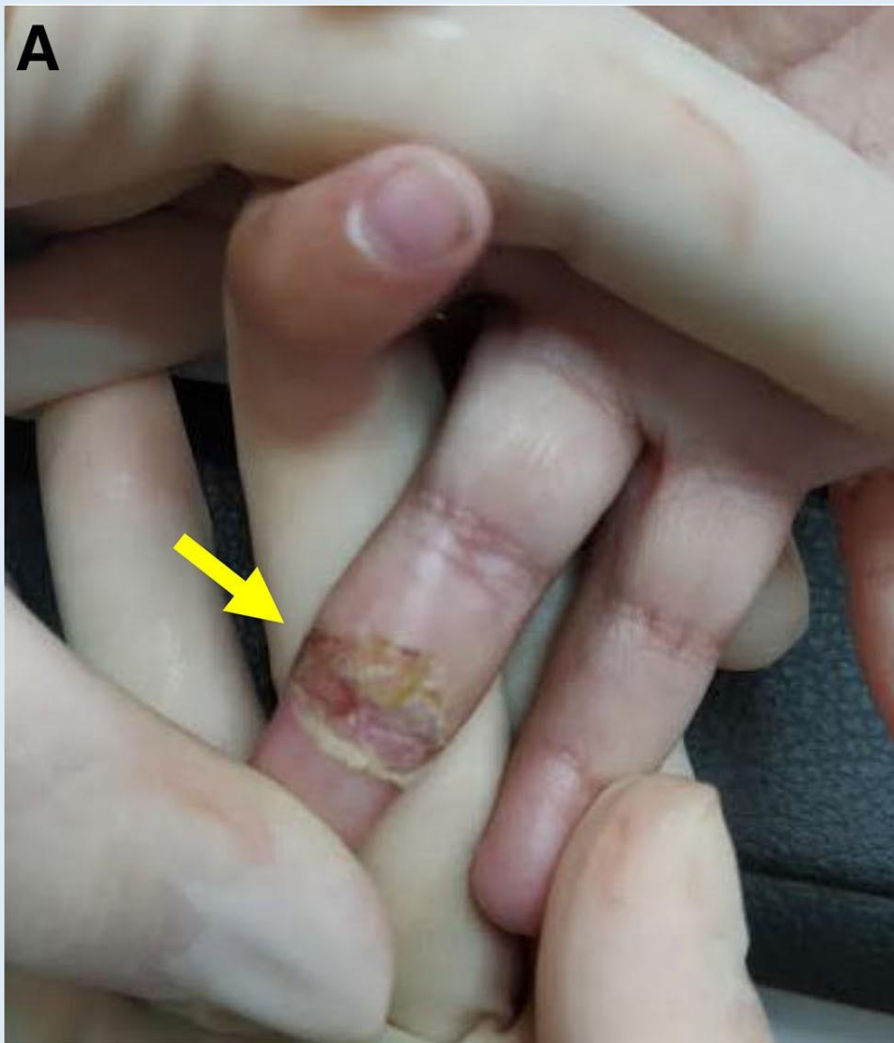




- **A:** two solitary lesions on the left lower jaw and cheek
- **B:** right shoulder
- **C:** right forearm
- **D:** forearm zoomed in

*Pictures were taken 10 days after appearance of the first lesion.*

- Age < 10 resident in Netherlands
- Chickenpox vax at age 5
- Returning from 1 week in Turkey
- No enlarged lymph nodes in the neck, armpits, or groin region
- Centrifugal distribution of 20 solitary, sharply demarcated, red-brown vesicles (left ear, left lower jaw, both forearms, both thighs, and on the back)
- No lesions in the oral cavity or genital region



**A:** Blistering lesions with a total loss of epidermis and dermis and exposition of the tendon.



**B:** Vesicle, which evolved into a pustule, and later to an abscess in the gluteal region.

- 13-month-old boy
- Vomiting, diarrhea, and fever
- Purulent blistering lesion on a finger and crusty lesions on the scalp and on a toe
- No traveling abroad in the last months
- Blistering lesion was drained taking a sample for bacterial culture and oral amoxicillin-clavulanate was prescribed.
- Methicillin-resistant *Staphylococcus aureus* was isolated, and treatment was changed to trimethoprim-sulfamethoxazole.
- After 48 hours, he presented a new gluteal warm and swollen lesion. The lesion evolved into an abscess and was drained.
- Positive mpox PCR

## Some atypical or uncommon manifestations with the current outbreak

- Few lesions or only a single lesion
- Absence of skin lesions, but with anal pain and bleeding
- Lesions restricted to genital or perineal/perianal area and do not spread further
- Rash appears at different (asynchronous) stages of development
- Lesions appear before the onset of fever, malaise, and other constitutional symptoms

## Rash resolved

- Pitted scars and/or areas of lighter or darker skin may remain after scabs have fallen off.
- After all scabs have fallen off and a fresh layer of skin has formed, a person is no longer contagious.



Credit: CDC / Brian W.J. Mahy



# Scabbed lesions

- **A:** On penis; note the varying stages of lesions present with adjacent pustule.
- **B:** Progression of ulcerated lesions; note the re-epithelization of the penile shaft lesion and scabbing of the pubic ulceration.
- **C:** Scabbed lesion





# Resolution of lesions

- After scabs have fallen on, there is formation of new skin (A, B, C).



# Long term consequences

- Long-term sequelae: pockmarks, scarring, or loss of pigmentation
- Corneal ulcer and blindness
- Complications of pregnancy: bleeding, miscarriage, stillbirth



Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021

# Practicum: Describe the lesions





- Lesions appeared 1–3 days after systemic symptoms, clustered (anal area 1A) or isolated (skin or penis 1B-1C).
- They typically began as raised, itchy papules secreting serous, with a central umbilication; over days, the central umbilication widened until the lesion opened and the scab formed about 2 weeks after symptom onset.

Source: Antinori A, et al. [Epidemiological, clinical and virological characteristics of four cases of monkeypox support transmission through sexual contact, Italy, May 2022](#). *Euro Surveill.* 2022;27(22):2200421.



Source: Gov.UK [Internet]. [Mpox \(monkeypox\): background information](#). London: UK [updated 2022 Aug 9, cited 2023 Apr 27].





Flat red bumps

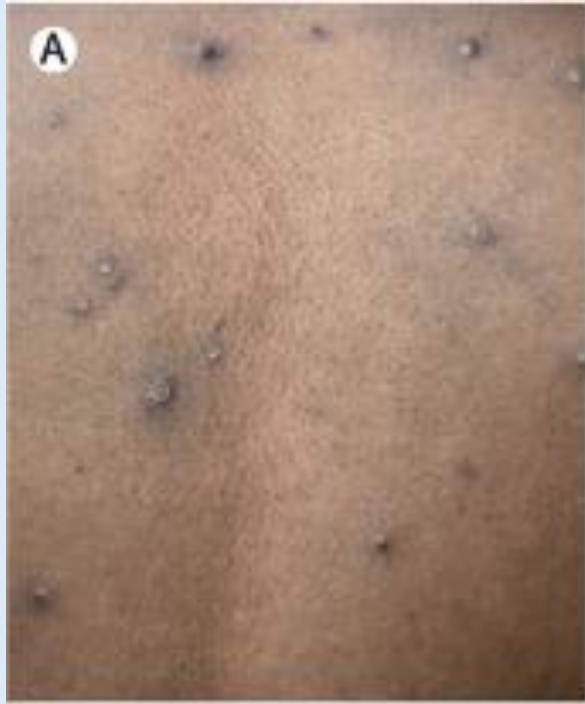
Firm fluid-filled  
raised bumps

Scabs that heal over  
many weeks



Dorsal surfaces of the hands of a mpox case patient, who was displaying the appearance of the characteristic rash during its recuperative stage

Source: Yvan J.F. Hutin et al. Outbreak of Human Monkeypox, Democratic Republic of Congo, 1996–1997. Emerging Infectious Diseases, Vol. 7, No. 3, May–June 2001.



Vesicular or  
pustular lesions



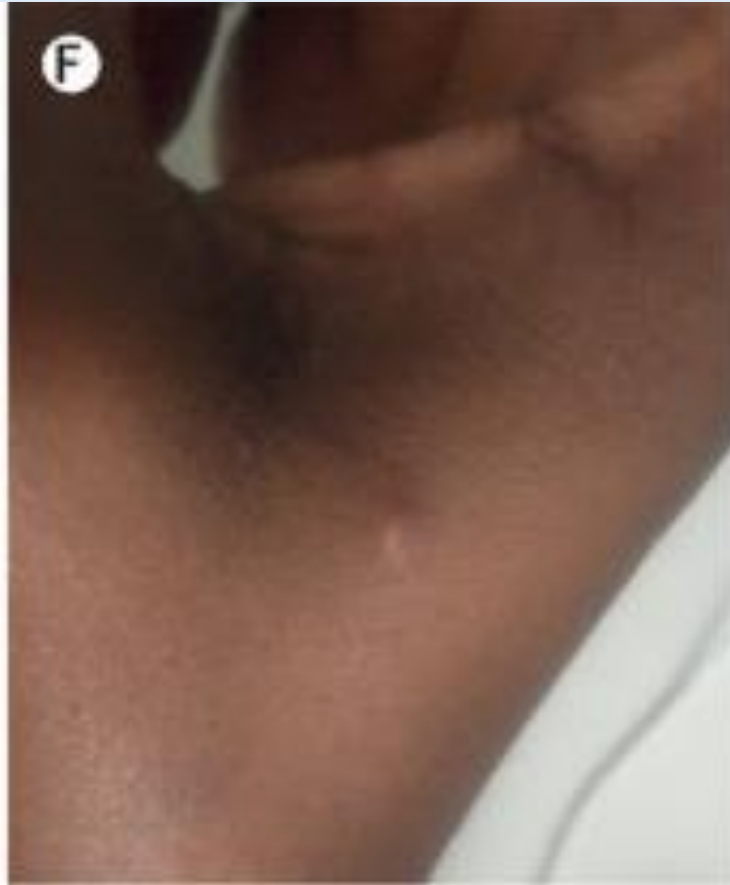
Macular lesions involving  
the palms and soles



Sub-ungual lesion  
and vesicular lesion



Sub-ungual lesion



More subtle papules and smaller vesicles







Numerous pustules  
on erythematous  
base with some  
central umbilication  
and acrofacial  
propensity



Maculo-papular-  
vesicular-pustular  
mpox skin lesions  
of varying sizes on  
the face



Papular-vesicular-pustular mpox skin lesions of varying sizes across the body





Papular-pustular mpox skin lesions on the hands, legs, and feet





Extensive papulo-pustular mpox rashes with crust and scar formation

Credit: Courtesy of Nigeria Centre for Disease Control, Abuja, Nigeria, appearing in Petersen E, et al. Human monkeypox: epidemiologic and clinical characteristics, diagnosis, and prevention, in *Infect Dis Clin North Am*. 2019;33(4):1027-43.



Single umbilicated pustular lesion on leg



Multiple umbilicated pustular lesions

Source: Girometti N, et al. [Demographic and clinical characteristics of confirmed human monkeypox virus cases in individuals attending a sexual health centre in London, UK: an observational analysis.](#) Lancet Infect Dis. 2022;22(8):1321–28.

- MSM
- Majority were unaware of contact with known mpox case, reported inconsistent condom use in the 3 weeks before symptom onset and at least one new sexual partner during the same period
- None reported travel to sub-Saharan Africa
- Majority presented with at least one skin lesion on the genital or perianal skin





A and B: Pustule-like lesions on a limb and dorsal hand



C: Cluster of papules, some with umbilication





A: Umbilicated lesion on penis.



B: Cluster of papules in the perianal region, many with umbilication



A: Ulcerations on palate and tonsil



B: Ulceration on penis



C: Ulcerations on penis and pubis

# **Additional atlas of images**





The palms of a mpox patient from Lodja, Democratic Republic of the Congo.

Source: BBC/Reuters photo





A woman shows symptoms of mpox in 2008 in the Democratic Republic of Congo.  
*Credit: Jeff Hutchens Getty Images*



*Credit: Central African Republic Ministry of Health*

Source: WHO training Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021



Source: WHO training Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021

## Examples of other conditions that present with similar-appearing skin lesions at the different stages of development

- Herpes simplex virus
- Varicella zoster virus
- Molluscum contagiosum virus
- Enterovirus
- Measles
- Scabies
- Treponema pallidum (syphilis)
- Bacterial skin infections
- Medication allergies
- Parapoxviruses (causing or related conditions)
- Chancroid
- Insect bites

		Monkeypox	Chickenpox	Measles
Symptoms	Fever	1-3 days before rash	1-2 days before rash	3-5 days before rash
	Rash appearance	Lesions often in one stage of development	Lesions often in multiple stages of development	Lesions often in multiple stages of development
	Rash development	Slow	Rapid	Rapid
	Rash distribution	More dense on face; present on palms and soles	More dense on trunk; Absent on palms and sole	Starts on face and spreads, sometimes reaching hands and feet
	Lymphadenopathy	Present	Absent	Occasional
	Death	Up to 10%	Rare	Varies widely

Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021



## Monkeypox



Credit: NCDC

## Chickenpox



Credit: NCDC

Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021



Credit: WHO./ Brian W J Mahy

**Monkeypox**



Credit: Centres for Disease Control and Prevention

**Chickenpox**



Credit: Centres for Disease Control and Prevention

**Measles**

# Skin care (1)



## **Wash skin with a mild soap and water.**

To avoid potential transmission, ask patients not to share towels, bath linens, or clothing with others.



## **Mpox lesions are considered infectious until they have healed.**

Scabs have fallen off and a fresh layer of intact skin has formed.

Therefore, all rashes should be covered to the extent possible (for example, by wearing long sleeves and long pants).



## **Keep affected sites and individual lesions covered.**

In general, all lesions of mpox are considered infectious (capable of transmitting infection) through contact, and it is advisable to keep affected sites and individual lesions covered.



## **Antiseptics or antibacterial agents**

are only required if there is concern for bacterial infection.



## **If the lesion becomes infected,**

patients should contact the health care provider immediately.

# Skin care (2)



**After lesions have healed,**  
if there is concern for scarring,  
silicone-based gels or sheeting may also be used.



**Sun protection**  
(broad spectrum SPF 30 or higher)  
should also be emphasized for several months  
after lesion resolution to avoid hyper or  
hypopigmentation of lesions or scars.



**No scratching.**  
Individuals with mpox lesions should be  
instructed not to scratch or unroof lesions or scabs,  
which may lead to secondary infection.  
Dermatologists should suggest keeping fingernails  
short to avoid unintentional scratching.



**To help soothe skin,  
baths may be taken.**

Alternatively, sitz baths and warm or  
cool compresses may help in soothing  
lesions in the anogenital region.

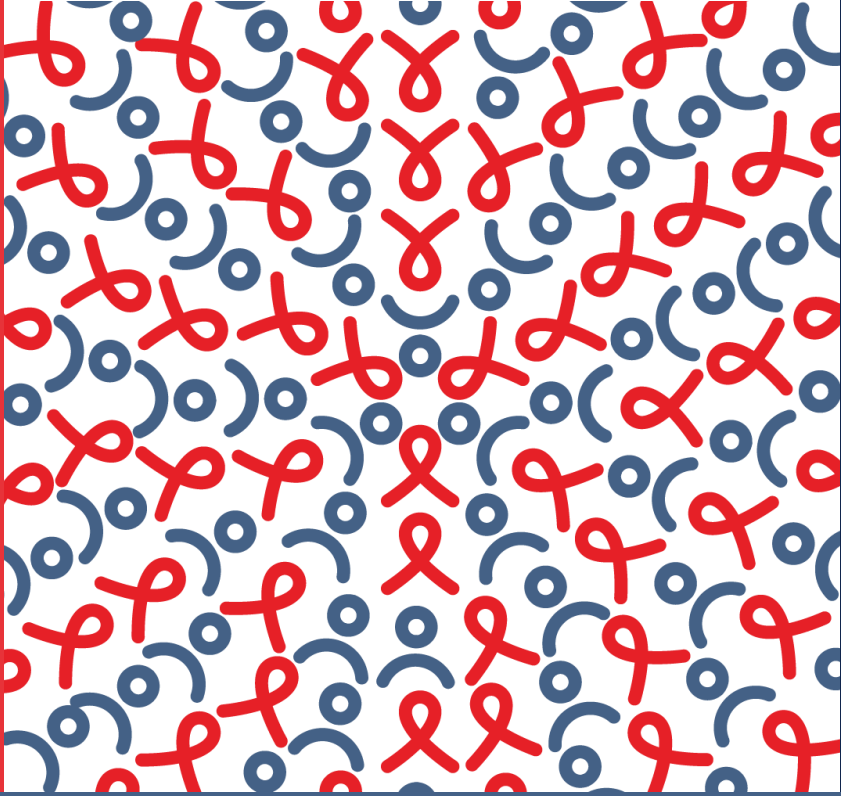


# Knowledge check

1. What is the incubation period of mpox infection?
2. How long does the illness typically last?
3. What are the stages of the mpox infection?
4. What are the signs and symptoms of mpox infection?
5. What are the stages of the rash progression?
6. Can mpox infection present through oral, genital, anorectal lesions?
7. Can mpox infection present in newborn, infants, and children?
8. What are the atypical or uncommon manifestations of mpox infection?
9. When is a person considered no longer contagious?
10. What are the main differential diagnoses?
11. What are the key differences between mpox, chickenpox, and smallpox?

Q&A





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## Module 5: Diagnosis

# Learning objectives

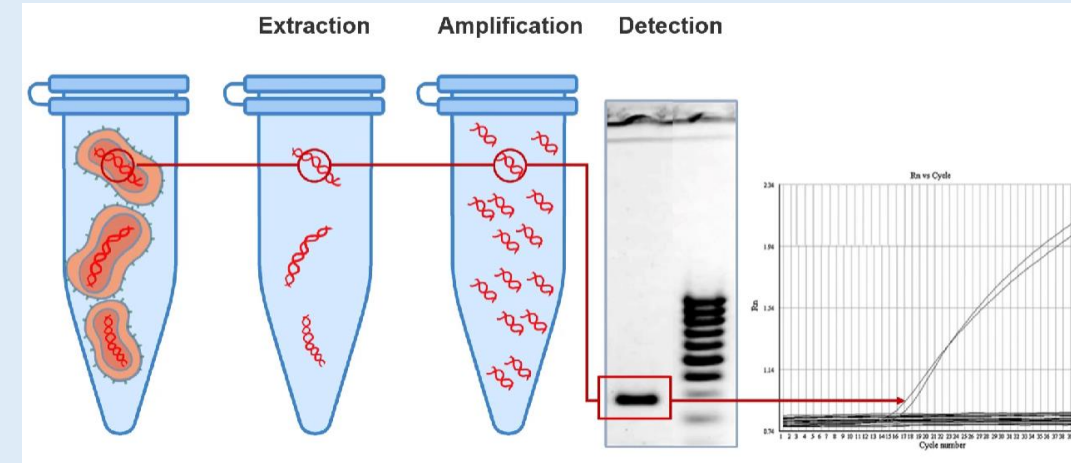
At the end of this module participants will be able to describe how to:

- Prescribe the correct test for the diagnosis of mpox infection
- Correctly collect the specimen for mpox test
- Comply with safety procedures
- Correctly store, pack, and transport mpox specimens
- Interpret the test result based on WHO algorithm



# Diagnostic test

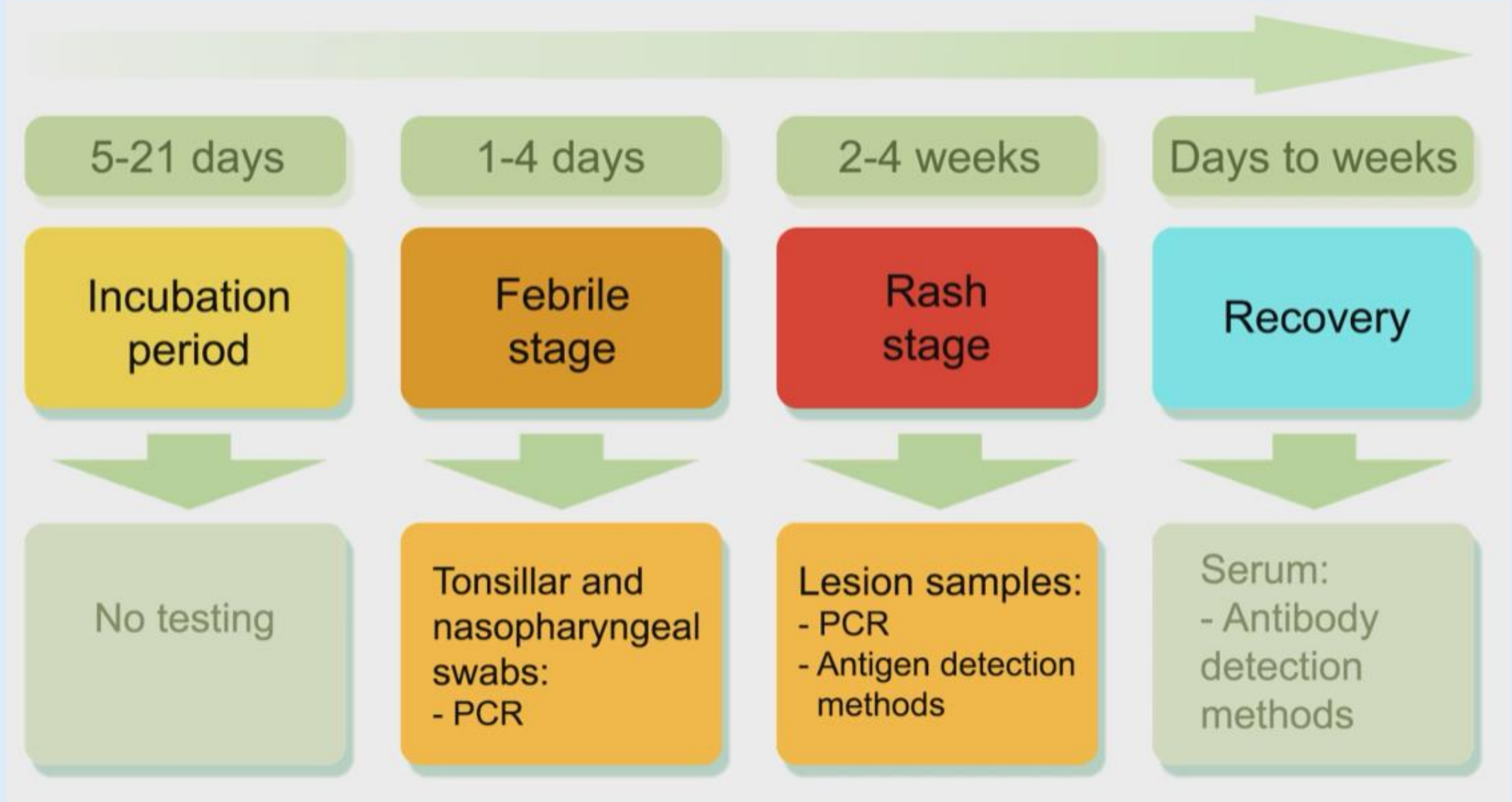
- Any individual that meets the suspected case definition of mpox should be offered testing in appropriately equipped laboratories by staff trained in the relevant technical and safety procedures.



Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021

- Confirmation of MPX virus infection is based on nucleic acid amplification testing (NAAT), using real-time or conventional polymerase chain reaction (PCR) for detection of unique sequences of viral DNA.
- PCR can be used alone, or in combination with sequencing.

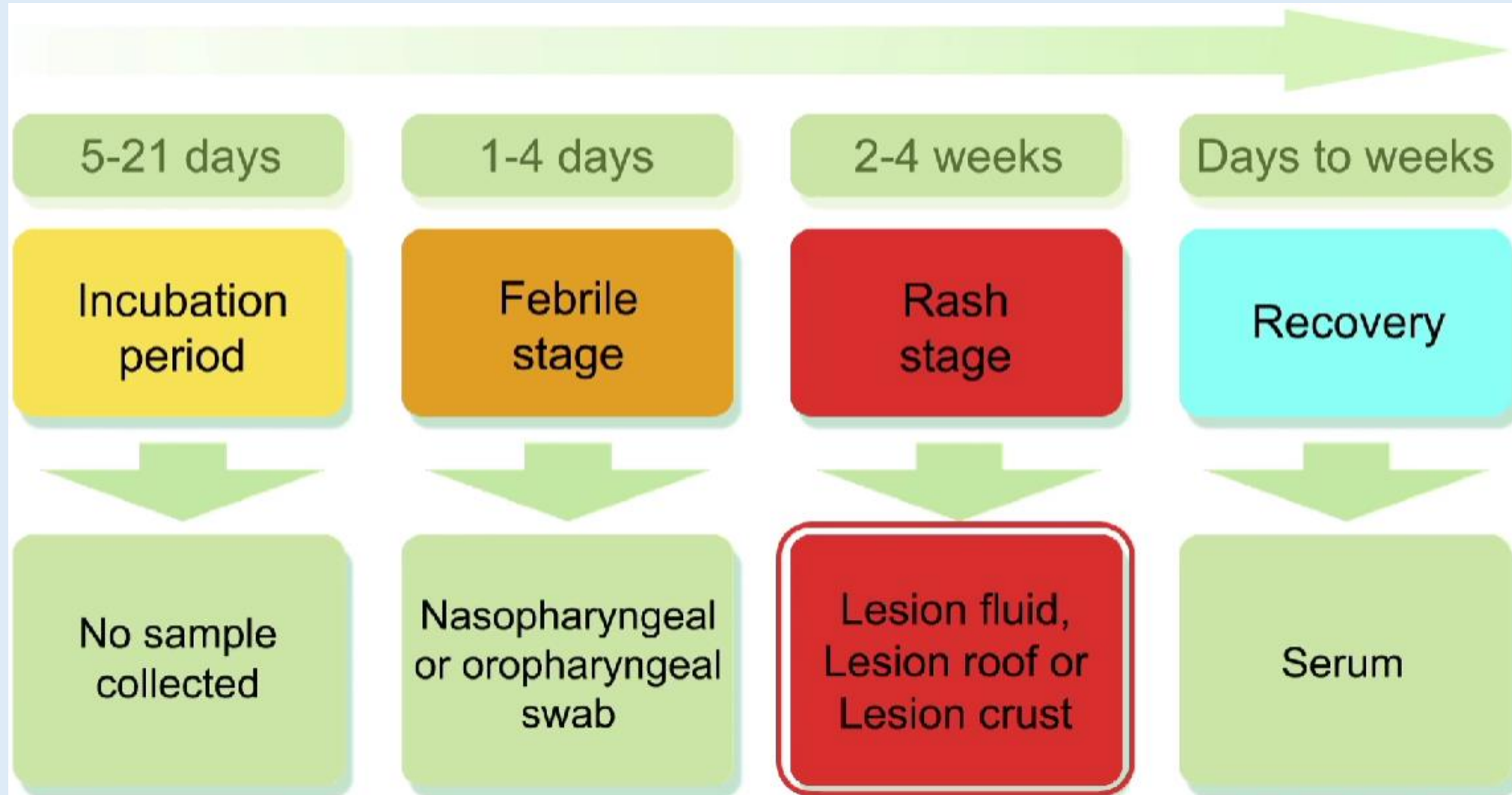
# Diagnostic test overview



# Type of specimen

- Skin lesion material, including swabs of lesion surface and/or exudate, roofs from more than one lesion, or lesion crusts
- All test results, positive or negative, including laboratory tests awaiting confirmation, should be immediately reported to:
  - National authorities and member states
  - WHO, under the IHR 2005

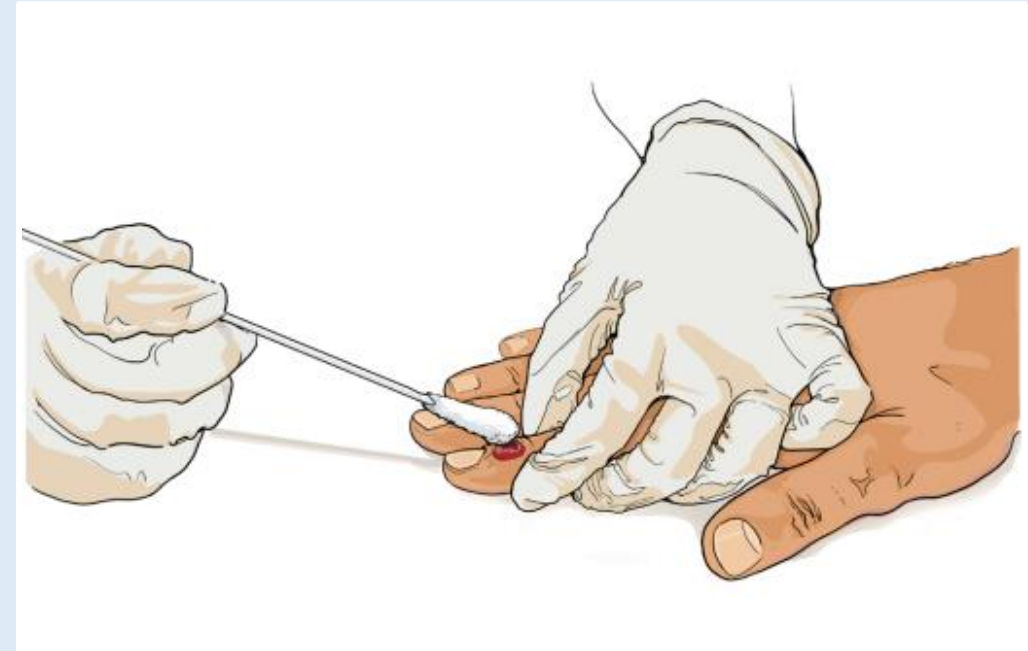
# Which specimen to collect and when





# Specimen to be collected (1)

- Swab the **skin lesion** vigorously
- Both dry swabs and swabs placed in viral transport media (VTM) can be used
- Collect two lesions of the same type in one single tube
- Do not mix lesions, crusts, and vesicular fluids in the same tube
- Two tubes may be collected to minimize risk of poor sampling or inhibitors
- Collecting an **oropharyngeal swab** is encouraged



Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021

## Specimen to be collected (2)

- Collection of additional specimen types **for research purposes** can be considered.
  - Urine, semen, rectal, and/or genital swab
  - EDTA blood
- Collection of a lesion biopsy during the macular stage should be considered only if clinically indicated
- **Antibody detection** from plasma or serum should not be used alone for diagnosis of mpox
- Recent vaccination may interfere with serological testing

# Lesion roofs and fluid - consumables



**Alcohol wipe**



**Disposable  
scalpel or  
plastic  
scraper**



**Dry polyester  
transport  
swabs**



**Screw-  
capped  
plastic tube  
with O-ring**

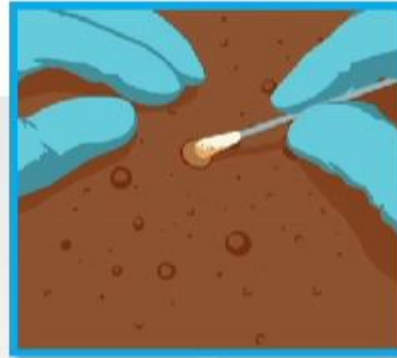
# Lesion roofs and fluid - procedures



Sanitize lesions



Remove  
lesion roof



Brush  
lesion base



Put swab in  
container



Put roof in  
container



# Lesions crusts - consumables



**Alcohol wipe**



**Sterile scalpel,  
lancet, plastic  
scraper, curette  
or needle**

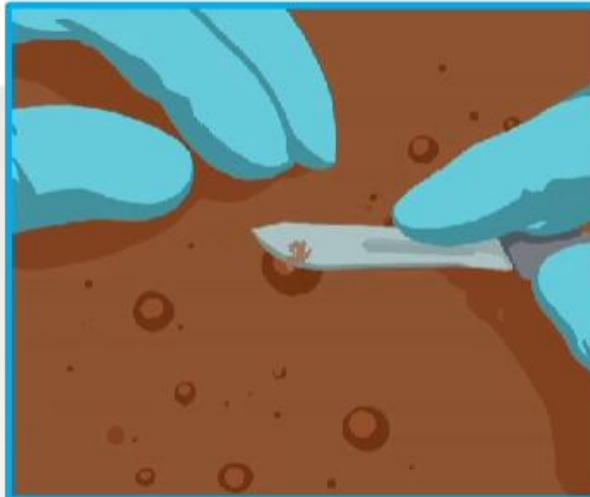


**Screw-capped  
plastic tube  
with O-ring**

# Lesion crusts - procedures



Sanitize lesions



Remove crusts



Put crust in  
container

# Serum - consumables



**Alcohol wipe**



**Sterile  
Syringe and  
needle**



**Serum  
separator  
tubes**



**Screw-  
capped  
plastic tube  
with O-ring**

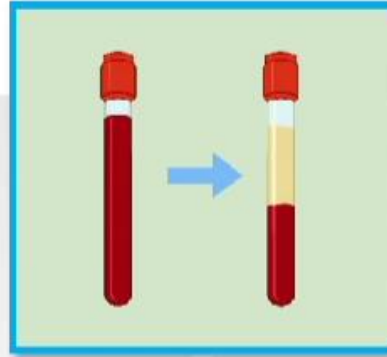
# Serum - procedures



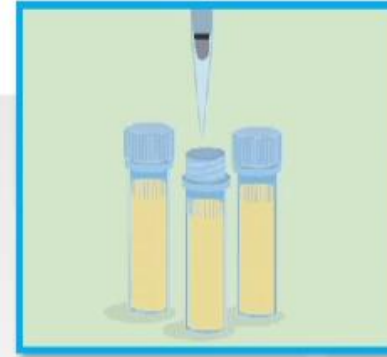
Sanitize  
collection area



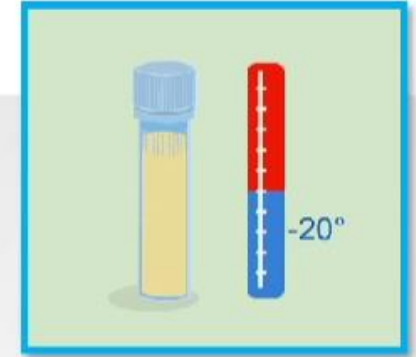
Draw blood



Allow to clot  
and centrifuge



Transfer serum  
into vials



Store tube  
at -20°C



# Oral/nasopharyngeal swabs - consumables



**Dry polyester  
transport  
swabs**

OR



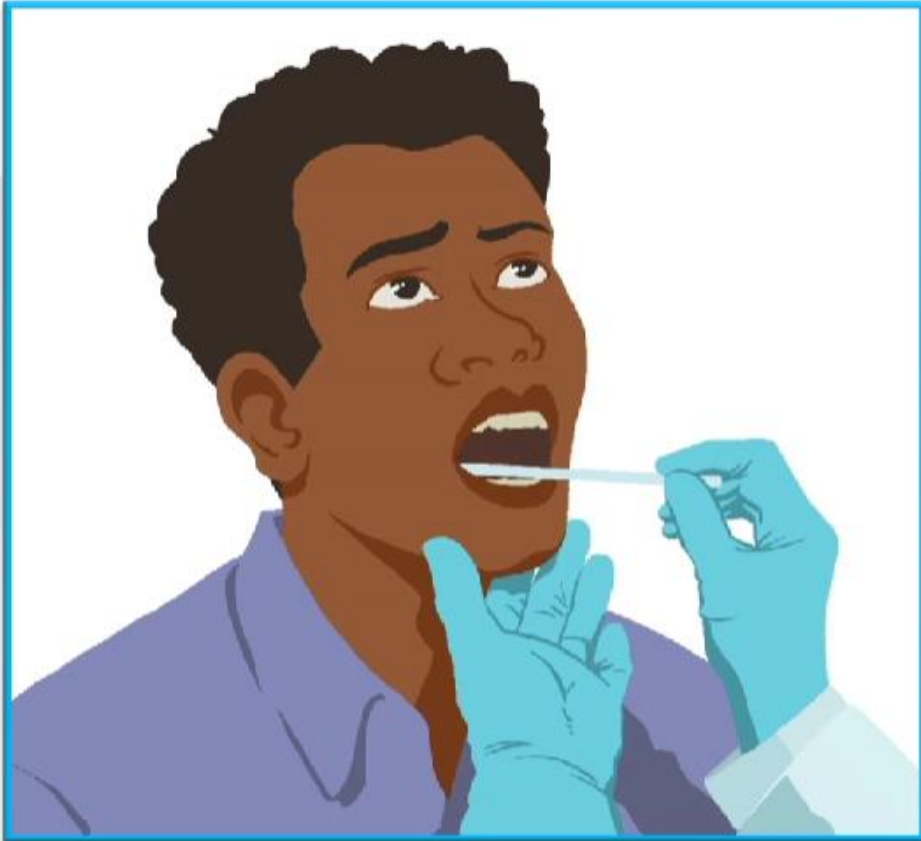
**Dry swab**

+



**Screw-  
capped  
plastic tube  
with O-ring**

# Oral/nasopharyngeal swabs - procedures



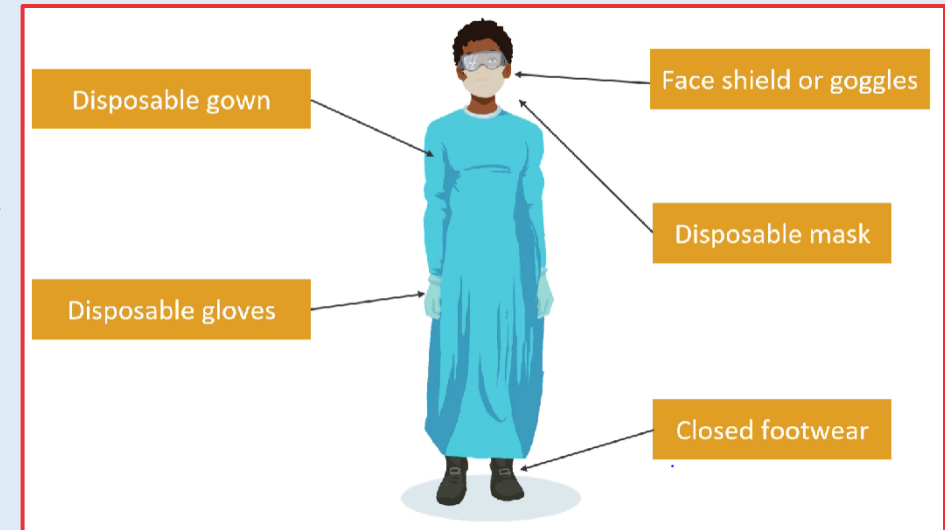
Brush tissue



Put swab in container

# Safety procedures

- Specimens collected for laboratory investigations should be regarded as potentially infectious and handled with caution.
- Minimize risk of laboratory transmission.
  - Limit testing to staff with proven competency
  - Wear appropriate PPE →
  - Use rigorously applied standard precautions
  - Avoid procedures that generate infectious aerosols
- Encourage vaccination among staff.
- Effective disinfectants include quaternary ammonium compounds and 0.5% (or 200 ppm) bleach (freshly made).
- Rigorously adhere to infection prevention and control guidelines during specimen collection and handling.



Source: Mpox: Epidemiology, preparedness and response for African outbreak contexts. OpenWHO, 2021

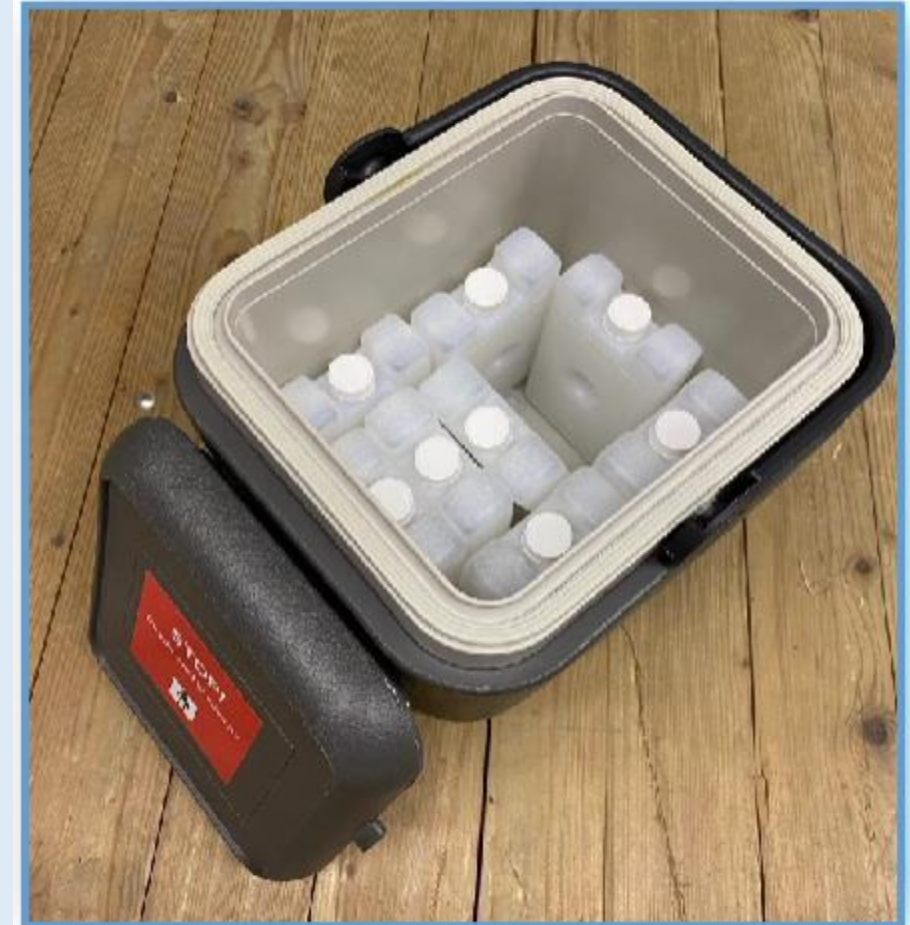
# Specimen storage

- **Refrigerate (2–8°C) or freeze (-20°C or lower) specimens within one hour** after collection.
  - If storage > 7 days → store specimens at -20°C or lower.
  - If storage > 60 days → store specimen at -70°C.
  - If cold chain not available → store specimen in a dark, cool environment, though room temperature shipment is not recommended.
  - Avoid repeated freeze-thaw cycles that reduce quality of specimens.
- Other requisite materials and equipment: transport containers and specimen collection bags and triple packaging, coolers and cold packs or dry ice, labels and permanent markers, personal protective equipment (PPE), and materials for decontamination of surfaces.



# Specimen collection and storage

Specimen type	Collection materials	Storage temperature	Collection purpose
Skin lesion material, including: <ul style="list-style-type: none"> <li>– swabs of lesion exudate</li> <li>– lesion roofs</li> <li>– lesion crusts</li> </ul>	Dacron or polyester flocked swabs with VTM or dry swab	Refrigerate (2–8 °C) or freeze (-20 °C or lower) within 1 hour of collection; -20°C or lower after 7 days	Recommended for diagnosis
Oropharyngeal swab	Dacron or polyester flocked swabs with VTM or dry swab	See above	Recommended for diagnosis if feasible, in addition to skin lesion material
Rectal and or genital swabs	Dacron or polyester flocked swabs with VTM or dry swab	See above	To be considered for research (following ethics guidelines)
Urine	Sterile collection tube	See above	To be considered for research (following ethics guidelines)
Semen	Sterile collection tube	Room temperature for <1h (then -20 °C or lower)	To be considered for research (following ethics guidelines)
Whole blood	Sterile collection tube with EDTA	See above	To be considered for research (following ethics guidelines)
Serum	Serum-separating tubes	Refrigerate (2–8 °C) or freeze (-20 °C or lower) within 1 hour of collection; -20°C or lower after 7 days	To be considered for serology to aid diagnosis or research (following ethics guidelines)
Plasma	collection tube with EDTA	See above	To be considered for serology to aid diagnosis or research (following ethics guidelines)

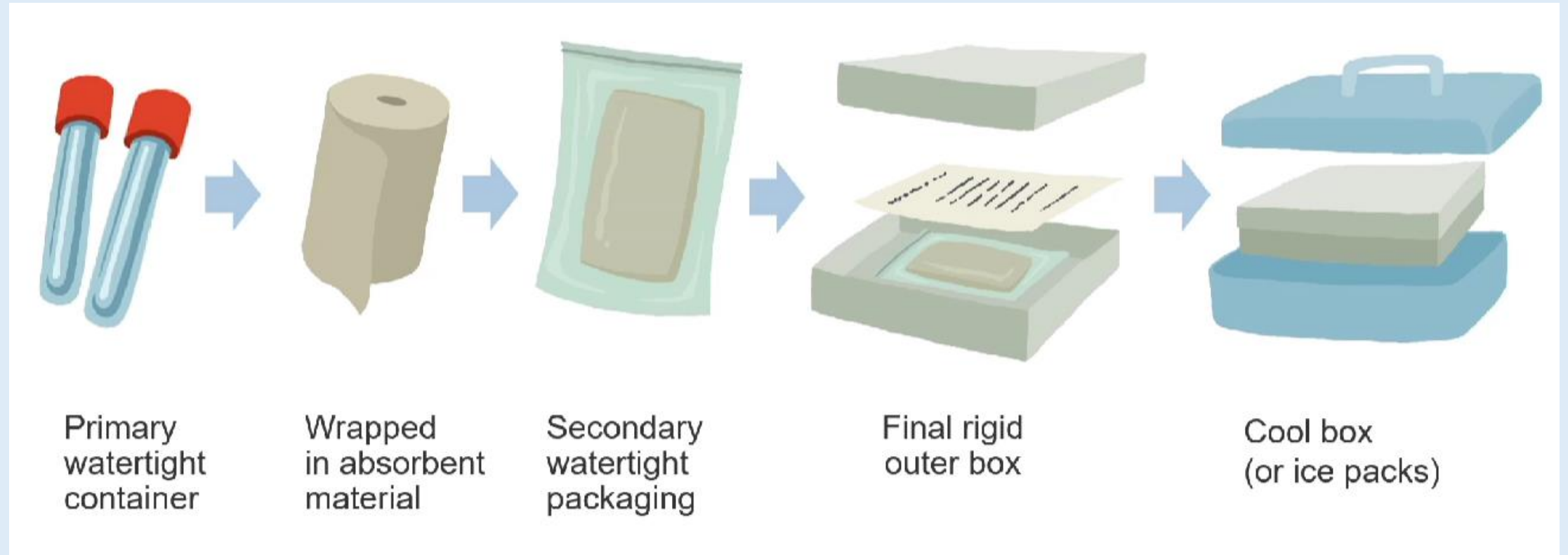


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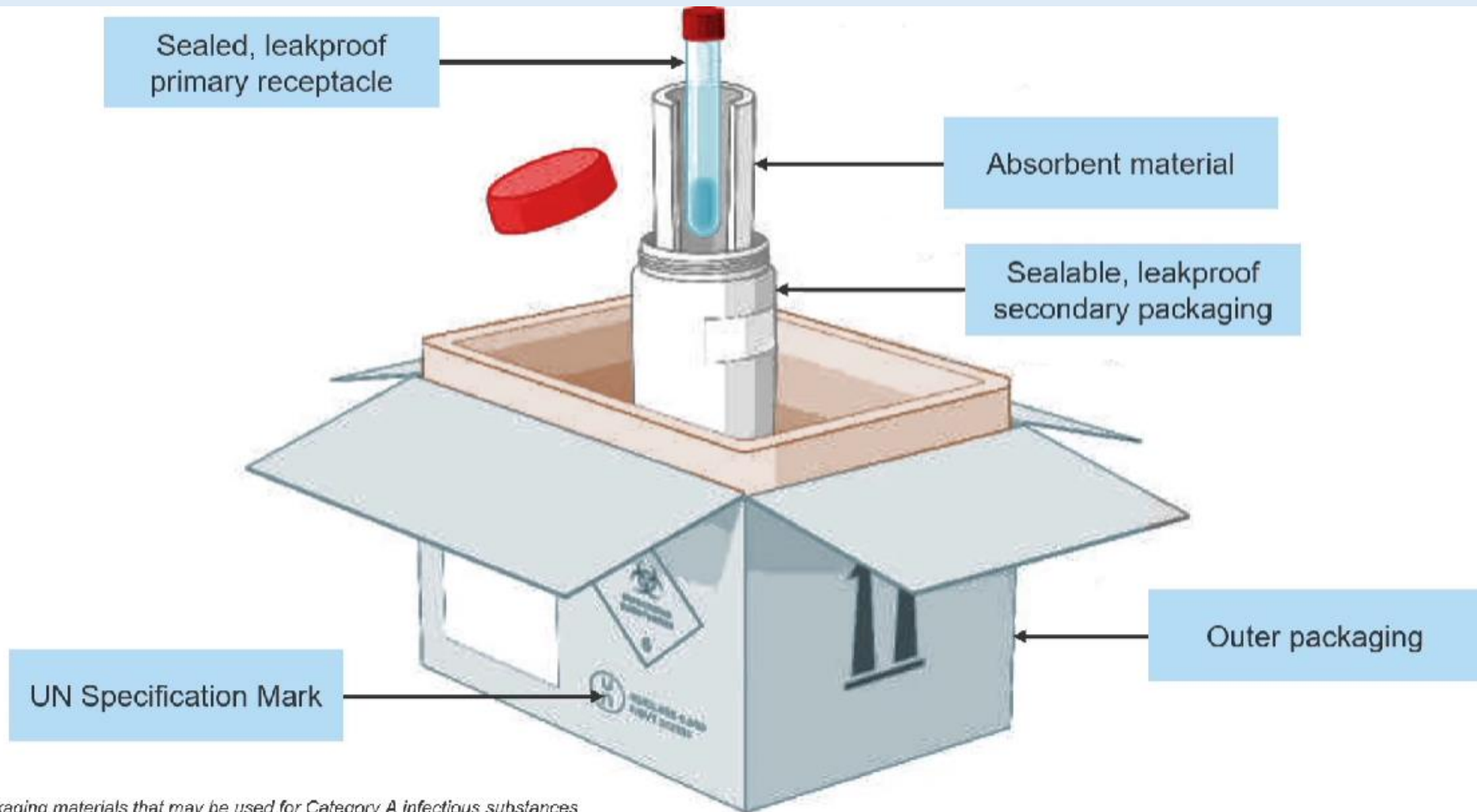
# Packaging and shipment of clinical specimens

- Transport specimens **as soon as possible after collection.**
- Comply with any applicable national and/or international regulations
- For international shipping, transport as Category A, UN2814 “infectious substance, affecting humans”.
- Use **triple packaging**, labelling, and documentation.
- Shipping requires a **dangerous goods certified shipper.**

# Basic triple packaging system



# Triple packaging for mpox specimen



*Example of triple packaging materials that may be used for Category A infectious substances*



# Laboratory testing methods and algorithm

- Confirmation of MPXV infection is based on nucleic acid amplification testing (NAAT), using real-time or conventional polymerase chain reaction (PCR) for detection of unique sequences of viral DNA.
- PCR can be used alone or in combination with sequencing.
- Several groups have developed validated PCR protocols for the detection of MPXV.
- Two-step protocols: first PCR detects OPXV; second PCR-based or sequencing to detect MPXV.
- Before an assay is utilized to test human clinical specimens within a laboratory, it should be validated and/or verified within the laboratory by appropriately trained staff.

# Interpretation of laboratory results (1)

- 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 positive detection using MPXV PCR assay in suspected cases indicates confirmation of MPXV infection.
- While it is preferable to perform MPXV specific confirmatory testing, positive detection using OPXV PCR assay is considered sufficient for laboratory confirmation of suspected cases.
- When the clinical presentation and epidemiology suggest an infection with MPXV despite negative PCR results, serological testing may be useful to further investigate prior infection for epidemiological purposes.

## Interpretation of laboratory results (2)

- Factors contributing to false-negative results: poor quality of specimen, wrong handling or shipping, technical reasons inherent to the test, e.g., DNA extraction failure.
- Genetic sequence data (GSD) provide valuable information to help understand the origins, epidemiology, and characteristics of the virus, for example, whether cases arise from a single introduction or multiple introductions from other locations.
- Sequencing of MPXV from as many positive specimens from as many different patients as possible is recommended at this stage.
- WHO encourages laboratories to share GSD.
- GSD can be generated using Sanger or next-generation sequencing (NGS) methods.

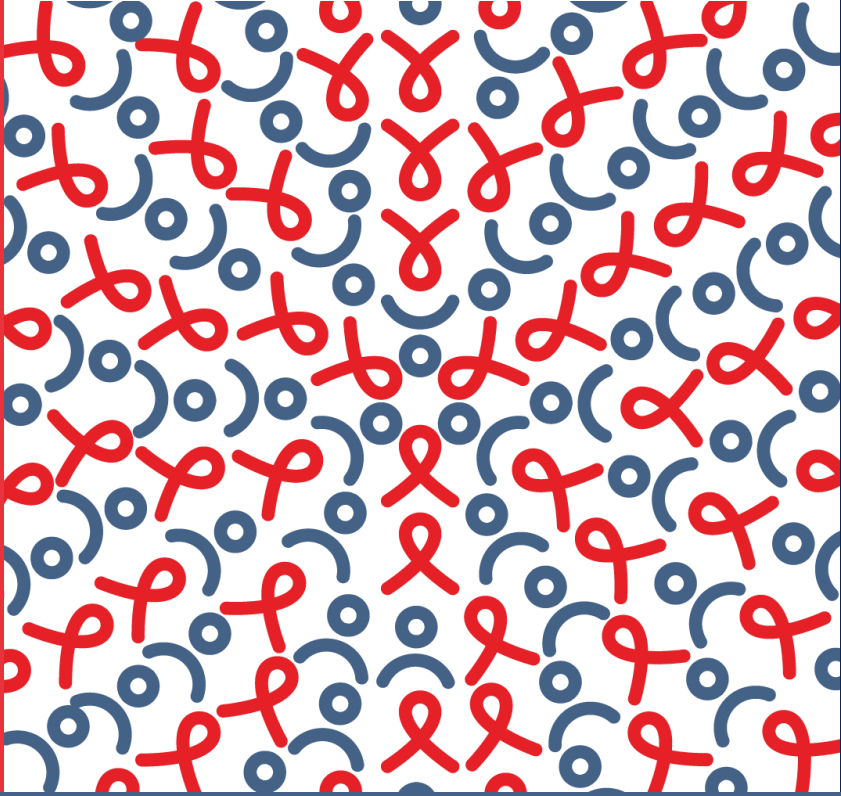
# Knowledge check

1. What type of test is used to confirm mpox infection?
2. Is positive detection using OPXV PCR assay sufficient for confirming suspected cases?
3. What are the factors contributing to false negative?
4. What type of specimens are collected?
5. From how many lesions should specimens be collected?
6. Is antibody detection used alone for diagnosis of mpox?
7. Can recent vaccination interfere with serological testing?
8. At what temperature and within what time from collection should specimens be stored?
9. What temperature to use if storage is longer than seven days?
10. What type of packaging is needed for transportation?



Q&A





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## Module 6: Case Definition

# Learning objectives

At the end of this module participants will be able to:

- Present each case definition

# Case definition

- Suspect case
- Probable case
- Confirmed case



# Suspect case

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
- Back pain
- Profound weakness or fatigue

**OR**

A person presenting since January 1, 2022, with an **unexplained** acute skin rash, mucosal lesions, or lymphadenopathy.

- **Skin rash** includes single or multiple lesions in the anogenital region or elsewhere.
- **Mucosal lesions** include single or multiple oral, conjunctival, urethral, penile, vaginal, or anorectal lesions or inflammation (proctitis), pain, and/or bleeding.

**AND**

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)
- Other locally relevant common causes of papular or vesicular rash

# Probable case

A person presenting since January 1, 2022, with an **unexplained** acute skin rash, mucosal lesions, or lymphadenopathy

- **Skin rash** includes single or multiple lesions in the anogenital region or elsewhere
- **Mucosal lesions** includes single or multiple oral, conjunctival, urethral, penile, vaginal, or anorectal, or inflammation (proctitis), pain, and/or bleeding

**AND**

One or more of the following:

- **Epidemiological link** to a **probable or confirmed** case of mpox in the 21 days before symptom onset
- **Multiple and/or casual sexual partners** in the 21 days before symptom onset
- A positive test result for orthopoxviral infection (e.g., OPXV-specific PCR **without** MPXV-specific PCR or sequencing)

2024 changes: probable case definition no longer includes identification as gay, bisexual, or MSM

Source: <https://www.who.int/emergencies/outbreak-toolkit/disease-outbreak-toolboxes/mpox-outbreak-toolbox#:~:text=Probable%20case,or%20elsewhere%20on%20the%20body.>

# Confirmed case

- Laboratory confirmed MPXV by detection of unique sequences of viral DNA by **real-time polymerase chain reaction (PCR) and/or sequencing**

- 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.

## 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**.
- 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.



# What is the case category?

- Male, aged 35, accesses clinic on February 5, 2022, because headache only
- He reports contact on January 26, 2022, with another male with positive test result for orthopoxviral infection



# What is the case category?

- Female, aged 29, accesses clinic on February 5, 2022, because vaginal lesions only
- She reports multiple and/or casual sexual partners in the 10 days before the onset of the lesions



# What is the case category?

- Male, aged 42, accesses clinic on February 5, 2022, because skin rash in anogenital area
- He self-identifies as “man who has sex with men”
- Laboratory reports a positive PCR test for mpox

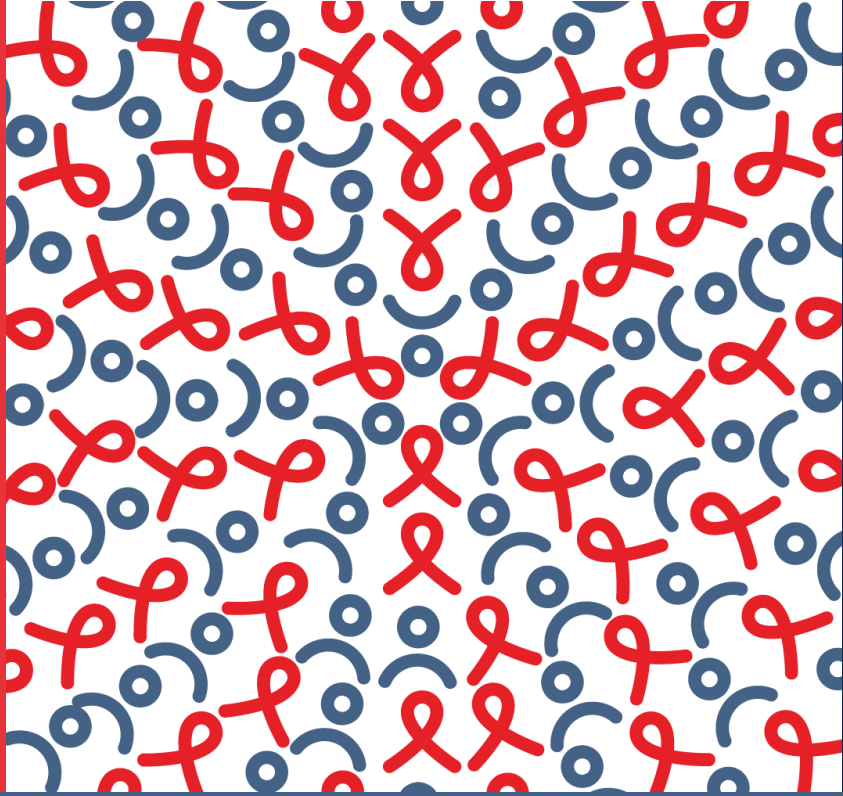
# Knowledge check

1. What is the definition of suspect case?
2. What is the definition of probable case?
3. What is the definition of confirmed case?
4. What is the definition of discarded case?

Q&A







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## Module 7: Exposure

# **Module 7.1: Occupational Exposure & Occupational Health**

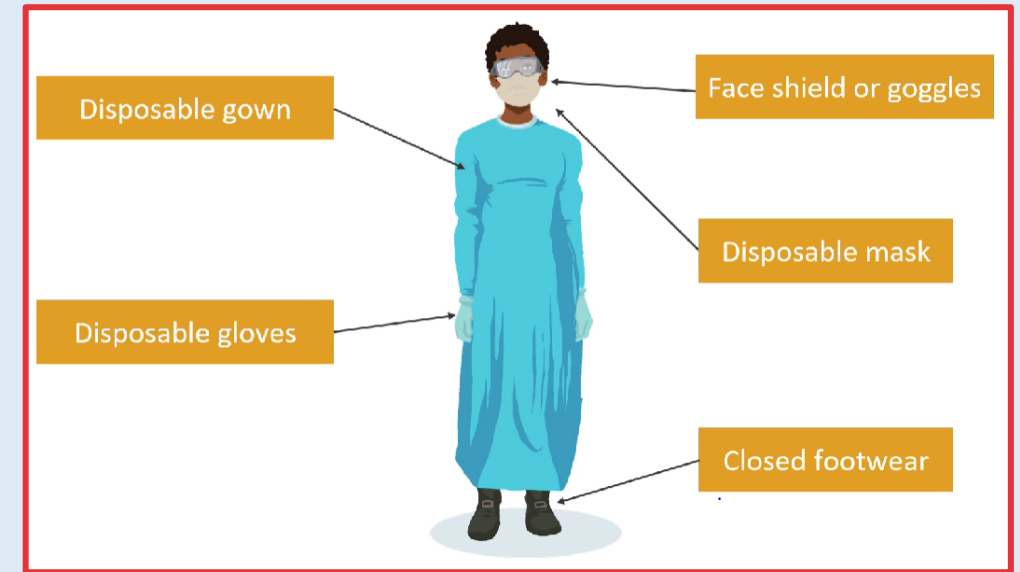
# Learning objectives

At the end of this module participants will be able to:

- Define occupational exposure
- Describe who is defined as occupationally exposed
- Properly manage occupational exposure

# How is occupational exposure defined?

- **Needlestick injuries with a probable, suspect, or confirmed case of mpox**
- **Not wearing appropriate personal protective equipment** → when in contact with a person who has a probable, suspect, or confirmed case of mpox



# Who could be occupationally exposed?

- Health care providers
- Case managers, personal care workers, and healers and practitioners of traditional medicine
- Health management and support workers
- Social workers, peer outreach workers, community workers
- Other occupational groups whose members work in acute care facilities and long-term care or community-based care



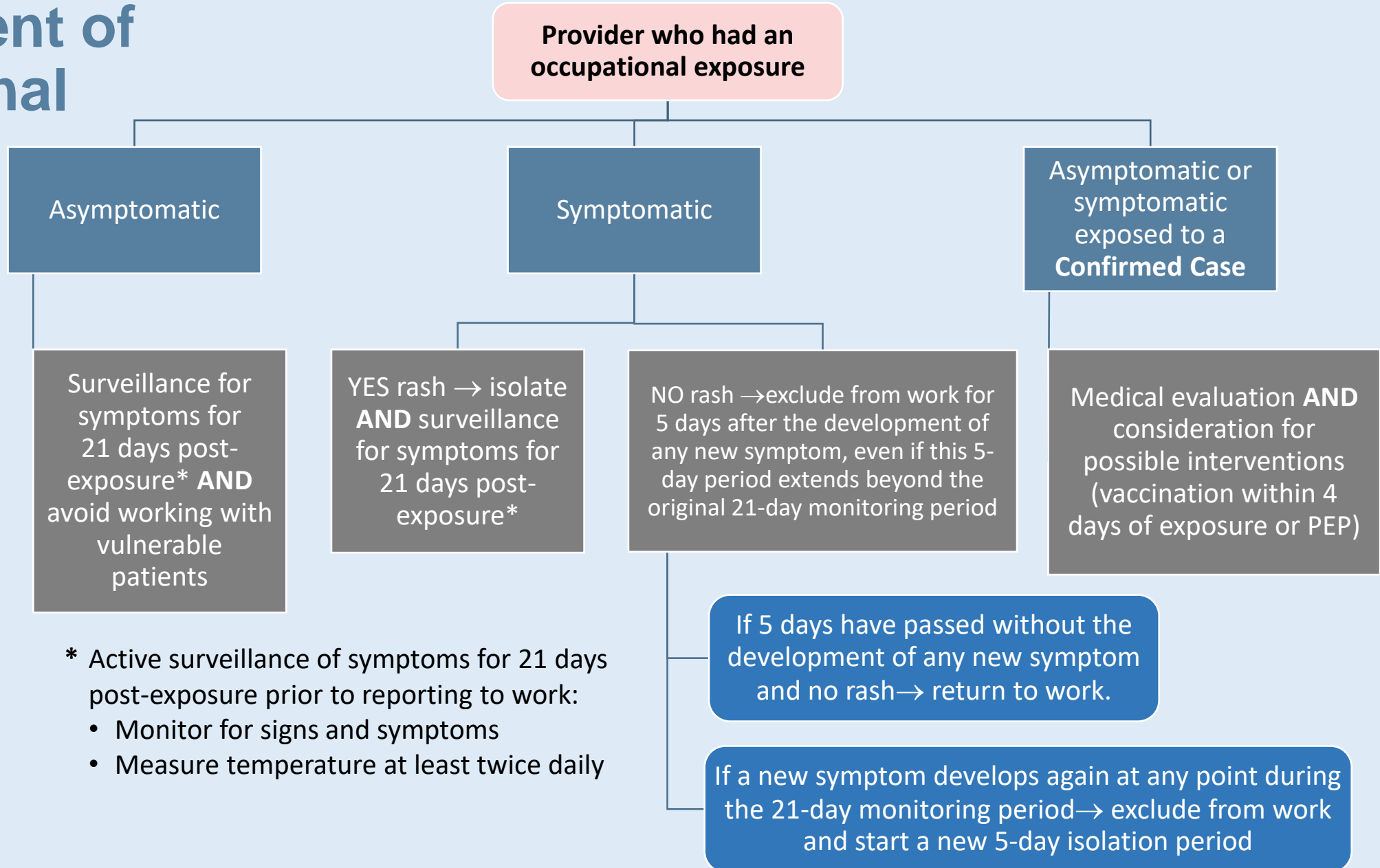
## Other considerations for occupational health and prevention of exposure

- All health and care workers, including community outreach workers and others listed in the previous slide, should have:
  - Reliable access to PPE and other infection prevention and control (IPC) materials
  - Regular and up-to-date training on the principles of IPC
  - Open and supportive lines of communication with supervisors to report potential exposures
- Occupational health includes mental health. All first responders and supervisors should remain aware of the psychosocial impact of mpox and the public health emergency response.
  - Mental health and psychosocial support resources should be accessible to all with occupational health risk.

# Assessment and management plans

- The assessment and management plans should be in accordance with national or subnational policies.
- Providers should notify, through the direct supervisor, infection control and occupational health and public health authorities of possible exposures to receive a medical evaluation and instructions for follow-up.

# Management of occupational exposure



# Knowledge check

1. Who could be occupationally exposed?
2. How is occupational exposure defined?
3. For how many days post-exposure should a person be monitored?
4. How often should the temperature be measured?

Q&A





## **Module 7.2:**

# **Contact Tracing**

# Learning objectives

At the end of this module participants will be able to:


- Present key principles of contact tracing
- Recognize and categorize contacts by level of risk
- Elicit all contacts and fill in contact elicitation forms
- Anticipate contact tracing challenges and implement solutions
- Work with a contact tracing team to reach and manage contacts

# Contact tracing: Key principles

- Contact tracing is a key public health measure to control mpox spread.
- It allows for interruption of transmission and identification of exposures.
- Interview people with cases to elicit contacts and venues.
- Contact identification and contact tracing should be initiated ASAP.
- Contacts should be notified within 24 hours of identification.
- If case is discarded, contact tracing may be stopped.

# Contact definition

- A contact is defined as a person who has been exposed to an infected person during the infection period—i.e., the period beginning with the onset of the index case's first symptoms and ending when all scabs have fallen off—and who has **one or more of the following exposures** with a person who has mpox.
- Providers potentially exposed WITH probable or confirmed case of mpox in the absence of proper use of appropriate personal protective equipment
- Newborns, infants, children of mothers with a case of mpox

- 
- Direct skin-to-skin physical contact (such as touching, hugging, kissing, intimate, or sexual)
  - 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
  - Respiratory exposure (possible inhalation) or eye mucosal exposure to lesion material (e.g., scabs/crusts) from an infected person

**Close proximity** defined as someone who was less than 6 feet or 1.5 meters away from an infected person for 15 minutes or more over a 24-hour period.

Exposure risk	Description of exposure
<b>High</b>	<p>Direct exposure of skin or mucous membranes to skin or respiratory secretions of a person with confirmed, probable, or suspected mpox, their body fluids (e.g., lesion vesicular or pustular fluid), or potentially infectious material (including clothing or bedding) if not wearing appropriate PPE. This includes:</p> <ul style="list-style-type: none"> <li>• inhalation of droplets or dust from cleaning contaminated rooms</li> <li>• mucosal exposure due to splashes from body fluids</li> <li>• physical contact with someone who has mpox, including direct contact during sexual activities. This includes face-to-face, skin-to-skin, or mouth-to-skin contact or exposure to body fluids or contaminated materials or objects (fomites)</li> <li>• normally sharing a residence (permanently or occasionally) during the presumed incubation period with a person who has been diagnosed with mpox, or</li> <li>• a penetrating sharps injury from a contaminated device or through contaminated gloves</li> </ul>
<b>Medium</b>	<p>No direct contact but close proximity in the same room or indoor physical space as a symptomatic patient with confirmed mpox if not wearing appropriate PPE</p>
<b>Low, minimal</b>	<p>Contact with a person with confirmed, probable, or suspected mpox or an environment that may be contaminated with MPX virus, while wearing appropriate PPE and without any known breaches of PPE or of donning and doffing procedures</p> <ul style="list-style-type: none"> <li>• community contact, such as being in an outdoor setting with a symptomatic case without any close proximity or physical contact</li> <li>• no known contact with a symptomatic mpox case in the last 21 days, or</li> <li>• laboratory personnel handling routine clinical blood samples or other specimens not directly related to mpox diagnostic testing</li> </ul>



# Contact tracing

**List all contacts**, recording:

- **Demographic** information
- **Date of contact** with a suspected, probable, or confirmed case
- **Type of exposure**
- **Date of onset** of fever or other prodromal symptoms or rash

**Monitor closely** for 21 days.

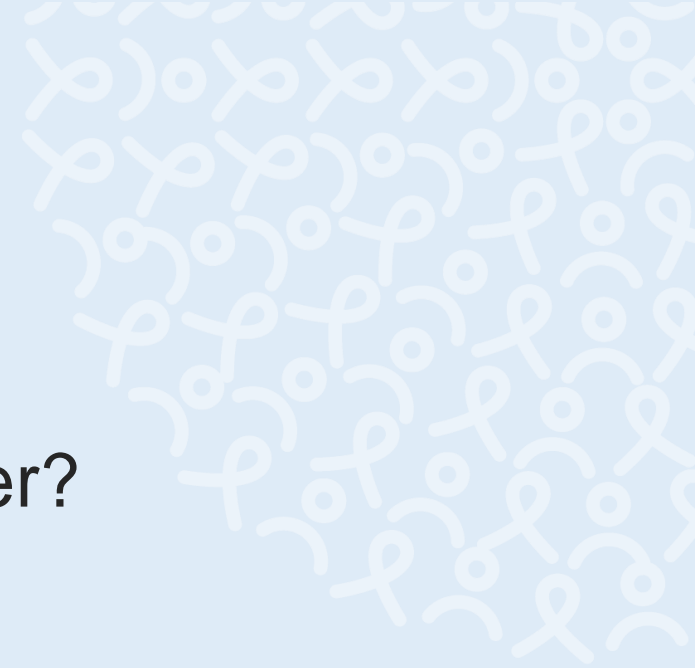


**Appendix 3: Contact Listing Form**

s/ no	Sur- name	Other names	Sex (M/F)	Age (yrs)	Rela- tion to case	Date of last contact with case	Type of contact (1,2 or 3)	Head of house- hold	Ad- dress	Town	LGA	Phone num- ber	Occupation

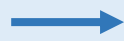
# Brainstorming

- How would you obtain history of sexual contacts (sexual history) in a culturally appropriate manner?



# What are the contexts in which contact might have taken place?

- Cases can be prompted to identify contacts across several contexts, including
- Use attendance lists, passenger manifests, etc., to further identify contacts.



- Household
- Workplace
- School/nursery
- Sexual contacts
- Health care (including laboratory exposure)
- Houses of worship
- Transportation
- Sports
- Bars/restaurants
- Social gatherings
- Festivals
- Any other recalled interactions

# Travel-related contact tracing

- Public health officials should work with transportation authorities, travel operators and public health counterparts 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., 6-plus hours), travelers seated in the same row, two rows in front, and two rows behind the sick traveler, as well as the cabin crew who served the individual, can be considered contacts.
- Any passenger or crew team member who did not report physical contact with a symptomatic case and was wearing PPE such as face mask for COVID-19 should not be considered an mpox contact.
- More specific evaluations for each scenario need to be assessed on a case-by-case basis by national and local health authorities.

# Contact tracing challenges

- Multiple anonymous sexual contacts
- Limited human resources for contact tracing
- Lack of experienced personnel in contact tracing
- Timeliness of contact tracing
- Stigma associated with mpox and MSM and sex practices (sex between men, group sex, sexualized drug use, sex in commercial venues)
- Varying level of trust in public health authorities





# Solutions menu (1)

- Trace as many contacts as possible within 3 weeks for the strategy of isolation and tracing of contacts to contribute to reducing transmission.
- Conduct case and contact interviews to identify risk factors and settings for targeted public health interventions.
- Train workforce in contact tracing.
- Collaborate with STI staff, who have experience in sexual health issues and have been trained on partner notification, to carry out contact tracing activities.
- Prioritize sexual contacts, contacts at higher risk of severe disease, household contacts, and providers who have experienced high-risk occupational exposure.

## Solutions menu (2)

- Engage community-based organizations to help design solutions that integrate community perspectives to build understanding and acceptance of the strategy.
- Conduct risk communication activities targeting those groups with anonymous sexual contacts.
- Collaborate with civil society organizations and trusted community-based organizations to mitigate stigma.
- Use respectful and inclusive language that does not link disease transmission to sexual orientation or sexual practices.

# Contact tracing procedures: Reaching contacts

Explain to case that the contacts can be reached through different modalities:

- **Directly by the case**, who can decide to inform or not the contact about their own clinical condition and refer the contact to the screening site (**Patient referral**).
- **Directly by the provider**, who, based on the case's consent, can inform (**Provider referral**) or not the contact (**Anonymous notification**) about the case's clinical condition and offer screening to the contact.

# Contact tracing procedures: Tools

- **Patient referral:** The case can be given a referral letter and/or written information, videos, or internet links about mpox contact tracing to share with the contacts.
- **Provider referral:** The provider can use written information, videos, or internet links about mpox contact tracing with the contacts.
- **Anonymous notification:** Contacts can be reached through App, anonymous SMS and/or email, and/or social media-based messages.

# Contact tracing procedures: Screening venues

- Health facility
- Community
  - Community center or drop-in center
  - Community venue, e.g., school, local government authorities' office
  - Home
  - Any other community venue that meets safety and privacy standards



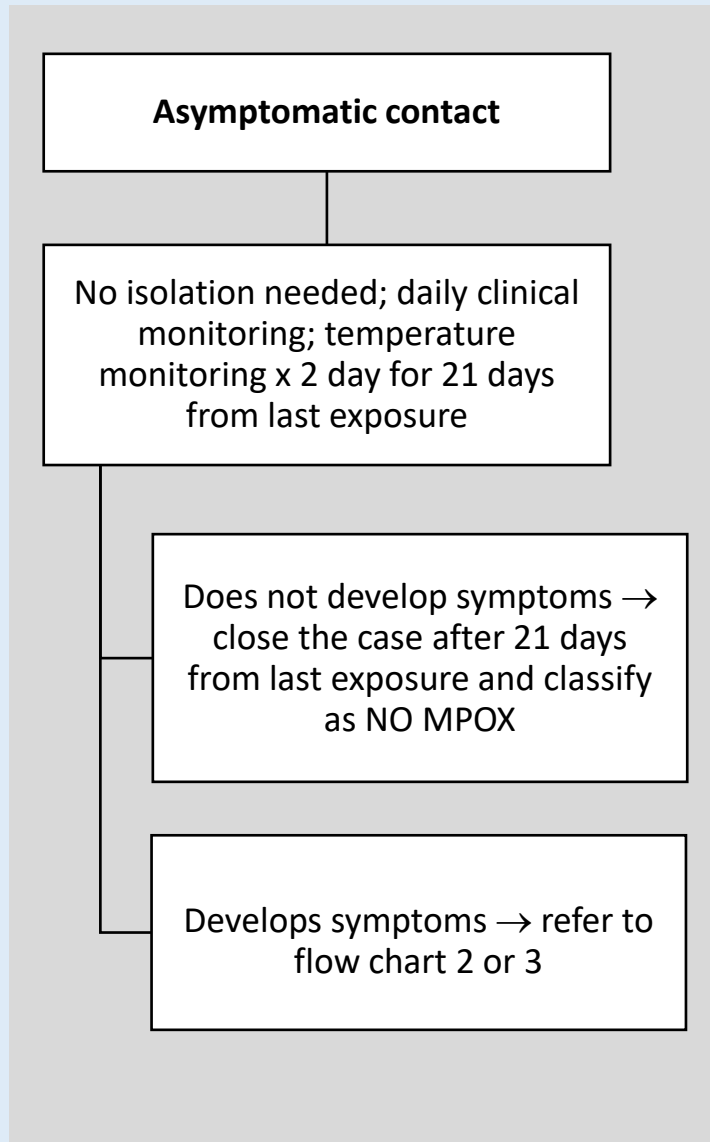
# Contact tracing procedures: Infection prevention and control (IPC)

- Screening should be conducted maintaining a distance of at least 1 meter from patients and using a “no touch” approach.
- Where these measures cannot be implemented or maintained, the provider should conduct a risk assessment to determine the level of PPE required according to the IPC recommendations in the context of mpox.
- Providers performing screening should follow the Hand hygiene in outpatient and home-based care and long-term care facilities: A guide to the application of the WHO multimodal hand hygiene improvement strategy and the “My Five Moments For Hand Hygiene” approach

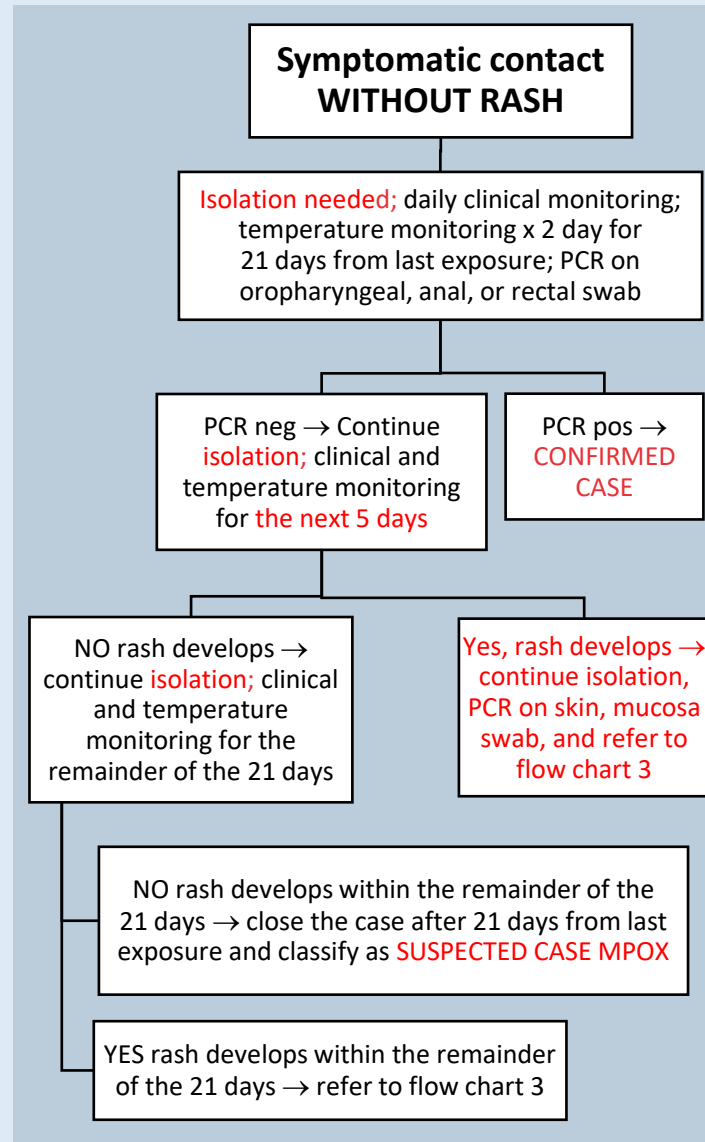
# Contacts' clinical monitoring

- Monitoring **daily for a period of 21 days from last contact** for signs and symptoms of concern → headache, fever, chills, sore throat, malaise, fatigue, rash, and lymphadenopathy.
- Contacts should monitor their **temperature twice daily**.

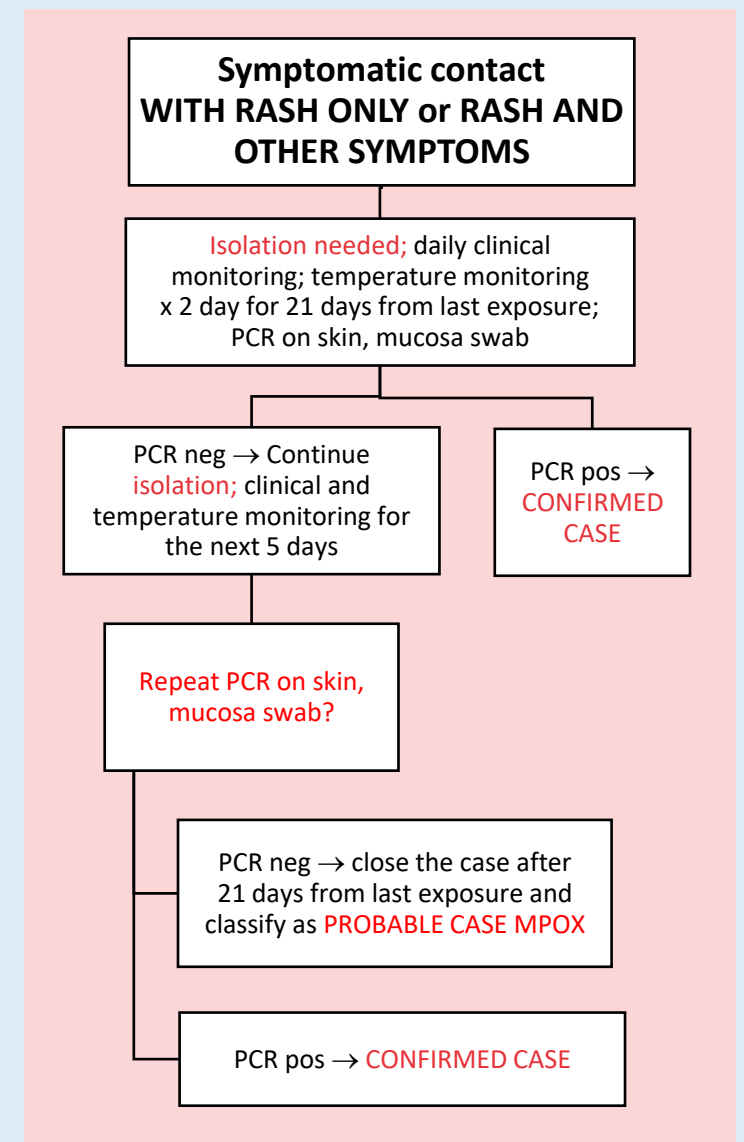
### FLOW CHART 1



### FLOW CHART 2



### FLOW CHART 3

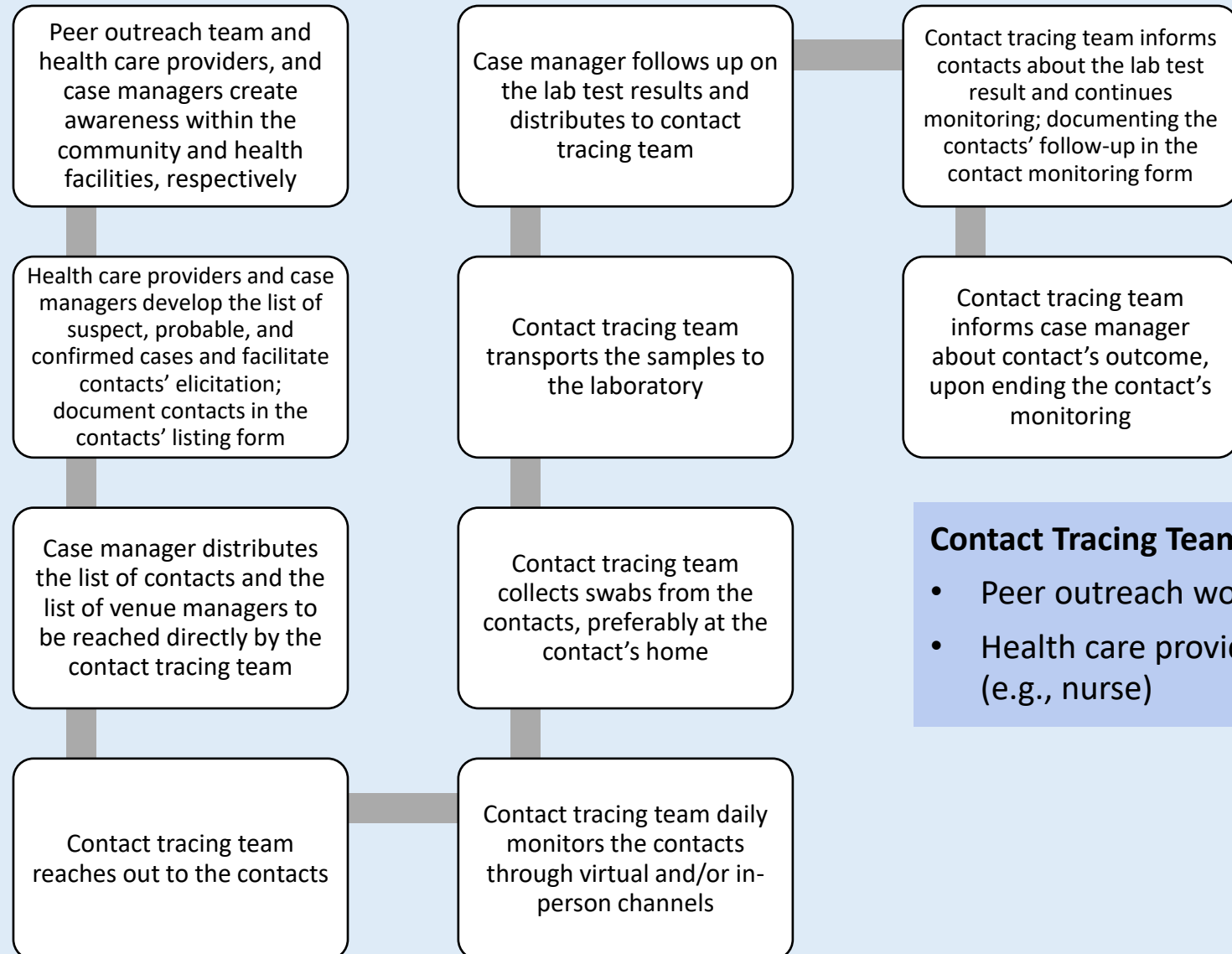


**Signs and symptoms:** Headache, fever, chills, sore throat, malaise, fatigue, rash, lymphadenopathy

# Assess risk of other infections

- Sexually transmitted infection (STI) within last 12 months
- Number of sexual partners within last 3 months
- Type of sexual contacts, e.g., new, occasional, established
- HIV status, ART/pre-exposure prophylaxis (PrEP) use
- Use of App to meet new partners
- Attending sex venues
- Having sex with men only or both men and women

# Contact tracing management



## Contact Tracing Team includes:

- Peer outreach worker
- Health care provider (e.g., nurse)

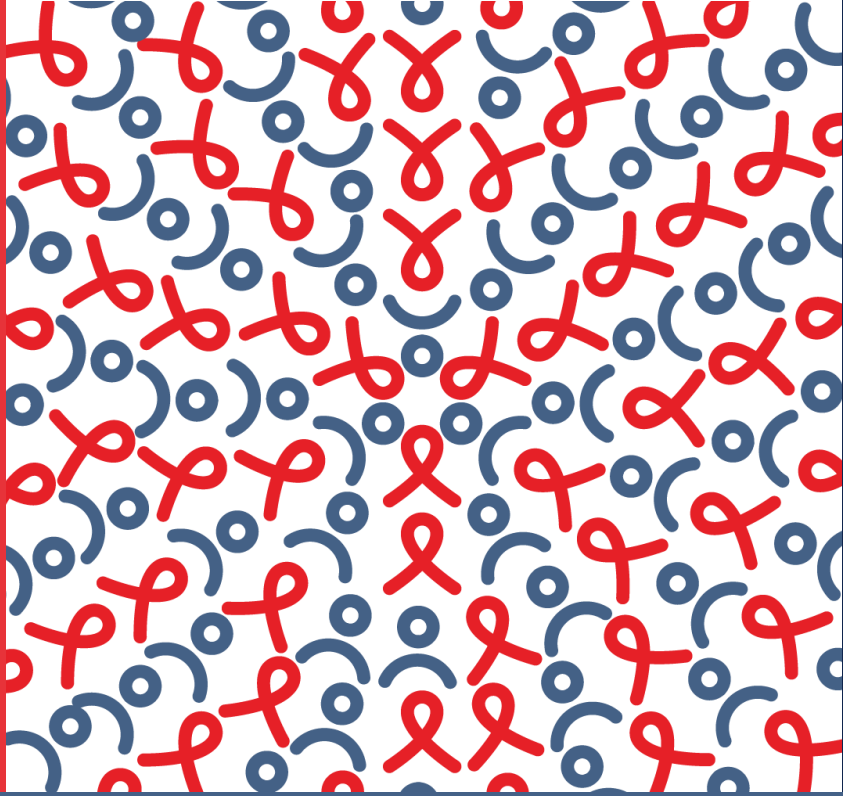


# Knowledge check

1. Why is contact tracing a public health measure to control mpox spreading?
2. What is the contact definition?
3. What are the contact risk categories and how are they defined?
4. What are the contact tracing challenges and solutions?
5. How can contacts be reached?
6. What are the screening venues?
7. How are contacts clinically monitored?

Q&A





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## Module 8: Treatment

## **Module 8.1: Treatment categories for mpox**

# Learning objectives

At the end of this module participants will be able to:

- Describe the key treatment categories for mpox
- Identify and prescribe the correct medication, dosage, and formulation to treat individuals with mpox infection based on their clinical presentation
- Identify and manage complications and severe mpox
- Define person-centered care: during and after mpox infection



# Treatment categories

- Symptomatic care
- Antimicrobial therapy
- Antivirals

# Symptomatic care (1)

## Fever – paracetamol

- **Adults:** 1g PO/IV every 6–8 hours. Maximum dose 4g every 24 hours or (2 g if history of chronic liver disease).
- **Neonates:** Oral dose 10–15 mg/kg every 6 hours. Maximum dose 40 mg/kg/day; IV dose 7.5 mg/kg every 6 hours, maximum dose 30 mg/kg day.
- **All other children:** 10–15 mg/kg every 6 hours, maximum dose 60 mg/kg /day.

## Mild pain control – paracetamol

- **Adults:** 1g PO/IV every 6–8 hours. Maximum dose 4g every 24 hours or (2 g if history of chronic liver disease).
- **Children:** Orally or IV 10–15 mg/kg/dose every 4–6 hours as required, maximum usual dose 60 mg/kg/day, but 90 mg/kg/day can be given for short period with medical supervision.

## Severe pain control – tramadol

- **Adults:** 50–100 mg PO/IV every 4–6 hours as needed, daily maximum 400 mg/day.
- **Children > 6 months:** 1–2 mg/kg every 4–6 hours, maximum 400 mg/day.

## Severe pain control – morphine (oral dose preferred if patient can tolerate; only use immediate release tablets for acute pain)

- **Adults:** Oral dose is 10 mg every 4 hours as needed; maximum dose is 60 mg/day. IV dose is 1–4 mg SQ/IV every 4 hours as needed – monitor SBP and RR prior to administration of morphine (hold for low SBP or respiratory rate).
- **Children:** Oral dose is 0.2–0.4 mg/kg/dose every 4 hours. Titrate dose to pain. IV dose is 0.05–0.1 mg/kg/dose every 4–6 hours as required.

## Antihistamine

- **Adults:** Loratadine 10 mg PO once daily.
- **Children (> 30 kg):** Loratadine 10 mg PO once daily.

# Symptomatic care (2)

## Nausea and vomiting

1. Ondansetron (associated with QT prolongation, thus it is important to note other medications that may also prolong the QT interval and to monitor regularly with ECGs if available).
  - **Adults:** 8 mg PO every 12 hours or 4 mg IV every 8 hours as needed.
  - **Children:** 0.15 mg/kg orally or IV 0.15 mg/kg every 12 hours, maximum dose 8 mg.
2. Promethazine
  - **Only for adults:** 12.5–25 mg orally every 4–6 hours as needed (can prolong QT interval).

## Dyspepsia

- **Adult:** Omeprazole 40 mg PO/IV every 24 hours.
- **Child:** Omeprazole: 5–10 kg: 5 mg once daily; 10–20 kg: 10 mg once daily;  $\geq 20$  kg: 20 mg once daily.

## Diarrhoea

- Diarrhoea should be managed conservatively. The use of anti-motility agents is not generally recommended given the potential for ileus.

## Anxiety

This may be a symptom patients experience particularly related to being in isolation or due to worsening symptoms.

- First-line therapy is to talk with a mental health counsellor.
- For moderate to severe anxiety, diazepam can be considered, but an evaluation of the patient's mental status should precede its use. Benzodiazepines should not be given to patients with altered mentation.
  - **Adults:** Diazepam 5–10 mg PO every 8 hours as needed as long as mentation is unaffected.
  - **Children:** Diazepam 0.05–0.1 mg/kg PO every 6 hours as needed. Continual supervision by a health aid is indicated to keep the child calm. Sedatives should only be used if necessary to perform procedures and give interventions.

# Antimicrobial therapy

- For treatment of impetigo, erysipelas, or cellulitis caused by a bacterial pathogen, as superinfection of a MPXV lesion
- Excludes skin infections caused by viral, fungal, or parasitic pathogens; necrotizing fasciitis; pyomyositis; severe infections with sepsis; and surgical site infections

# Adults

Antibiotic	Dose
Cloxacillin (flucloxacillin)	500 mg orally every 8 hours
Cefalexin	500 mg orally every 8 hours
Amoxicillin-clavulanic acid	500–125 mg orally every 8 hours
If concern for community acquired MRSA consider following treatment:	
Clindamycin	600 mg orally every 8 hours
Trimethoprim-sulfamethoxazole	800–160 mg orally every 12 hours
Doxycycline	100 mg orally every 12 hours
<b>Note: In the case of penicillin or beta-lactam allergy:</b> use clindamycin or trimethoprim-sulfamethoxazole.	

Source: WHO. [Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance](#), 10 June 2022. Geneva: WHO;2022.



# Children

Weight	Amoxicillin-clavulanic acid 40–50 mg/kg/dose of amoxicillin component every 12 hours OR 30 mg/kg/dose every 8 hours orally	Cefalexin 25 mg/kg/dose every 12 hours orally	Cloxacillin (flucloxacillin) in neonates: 25–50 mg/kg/dose twice daily; in children: 25 mg/kg/dose every 6 hours
3 < 6 kg	250 mg of amoxicillin/dose twice daily	125 mg every 12 hours	125 mg every 6 hours
6 < 10 kg	375 mg of amoxicillin/dose twice daily	250 mg every 12 hours	250 mg every 6 hours
10 < 15 kg	500 mg of amoxicillin/dose twice daily	375 mg every 12 hours	250 mg every 6 hours
15 < 20 kg	750 mg of amoxicillin/dose twice daily	500 mg every 12 hours	500 mg every 6 hours
20 < 30 kg	1000 mg of amoxicillin/dose twice daily	625 mg every 12 hours	750 mg every 6 hours
> 30 kg	Use adult dose	Use adult dose	Use adult dose

**Note: If concern for community-acquired MRSA consider clindamycin:** neonates 5 mg/kg/dose every 8 hours; children 10 mg/kg/dose every 8 hours.

Source: WHO. [Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance](#), 10 June 2022. Geneva: WHO;2022.

# Antivirals

Generally:

- No treatment approved specifically for mpox.
- Most people recover fully within 2 to 4 weeks without the need for medical treatment.
- Antivirals are mostly reserved for SEVERE cases (including individuals requiring hospitalization, children < 8 years, pregnant and breastfeeding women, PLHIV, and those with complications, aberrant infection, etc.).
- Efficacy of antivirals for treating orthopoxviruses was mostly from studies in-vitro/on animals. No evidence of efficacy in managing individuals with mpox infection.

# Antiviral products (1)

- **Tecovirimat (TPOXX, ST-246)**
  - Developed for the treatment of smallpox in adults and children
  - Available as oral capsules and intravenous formulations
- **Brincidofovir (also known as CMX001 or Tembexa)**
  - For treatment of human smallpox disease in adult and pediatric patients, including neonates
- **Cidofovir (Vistide)**
  - Used for treatment of cytomegalovirus (CMV) retinitis in PLHIV
- **Trifluridine (also known as Viroptic)**
  - Licensed for treatment of herpes keratoconjunctivitis/keratitis
  - Case reports of use for ocular orthopoxvirus infection
- **Vaccinia Immune Globulin Intravenous (VIG-IV)**
  - Consider use in severe cases

# Antiviral products (2)

	Tecovirimat	Brincidofovir	Cidofovir
<b>Treatment dose, route, duration (adults)</b> (65,66,71,73,76)	<b>Dose</b> <u>Oral</u> 600mg PO every 12 hours  <u>Intravenous*</u> 3 kg to < 35 kg: 6 mg/kg every 12 hours 35 kg to < 120 kg: 200 mg every 12 hours > 120 kg: 300 mg every 12 hours  *Must be administered over 6 hours  <b>Duration</b> 14 days	<b>Dose</b> <u>Oral</u> < 10 kg: 6 mg/kg 10–48 kg: 4 mg/kg > 48 kg: 200 mg (20 mL)  <b>Duration</b> Once weekly for 2 doses, on days 1 and 8	<b>Dose</b> <u>Intravenous</u> 5 mg/kg IV once weekly  Must be given with oral probenecid: 2 grams 3 hours prior to each dose and 1 gram at 2 and 8 hours after completion of the infusion  Must be given with at least 1 L of 0.9% normal saline over a 1–2 hour period before each infusion  <b>Duration</b> Once weekly × 2 weeks, then once every other week (based on treatment for CMV retinitis)

Source: WHO. [Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance](#). 10 June 2022. Geneva: WHO; 2022.

# Antiviral products (3)

	Tecovirimat	Brincidofovir	Cidofovir
<b>Treatment dose, route, duration (paediatrics)</b> (65,66,71,73,76)	<b>Dose</b> <u>Oral</u> 13–25 kg: 200 mg every 12 hours 25–40 kg: 400 mg every 12 hours > 40 kg: 600 mg every 12 hours  <u>Intravenous*</u> 3–35 kg: 6 mg/kg every 12 hours 35–120 kg: 200 mg every 12 hours > 120 kg: 300 mg every 12 hours  *Must be given over 6 hours  <b>Duration</b> 14 days	<b>Dose</b> <u>Oral</u> < 10 kg: 6 mg/kg 10–48 kg: 4 mg/kg > 48 kg: 200 mg (20 mL)  <b>Duration</b> Once weekly for 2 doses, on days 1 and 8	<b>Dose</b> <u>Intravenous</u> 5 mg/kg IV once weekly  Must be given with oral probenecid: 2 grams 3 hours prior to each dose and 1 gram at 2 and 8 hours after completion of the infusion  Must be given with at least 1 L of 0.9% normal saline over a 1–2 hour period prior to each infusion.  <b>Duration</b> Once weekly × 2 weeks, then once every other week (based on treatment for CMV retinitis)



# Antiviral products (4)

	Tecovirimat	Brincidofovir	Cidofovir
<b>Dosage forms and strength</b>	<b>Capsules:</b> 200 mg orange and black (65)  <b>Intravenous:</b> IV injection single-dose 200 mg/20mL (71)	<b>Tablets:</b> 100 mg, blue, oval shaped (73)  <b>Suspension:</b> lemon-lime flavoured suspension containing 10 mg/mL (73)	<b>Intravenous:</b> supplied as single-use vials 75 mg/mL for intravenous infusion (76)

Source: WHO. Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022. Geneva: WHO;2022.

# Antiviral products (5)

	Tecovirimat	Brincidofovir	Cidofovir
<b>Use in pregnancy</b>	No data from the use in pregnant women (65,66)	Not recommended  Administration to small animals resulted in embryotoxicity, decreased embryo-fetal survival, and/or structural malformations. It is recommended to use an alternative therapy if feasible (73)	Pregnancy class C  No adequate well controlled studies in pregnant women (76)
<b>Use in breastfeeding</b>	Unknown whether medicine or metabolites are excreted in human milk (65,66,70)	In studies with lactating rates, brincidofovir was detected in milk but not plasma of nursing pups (73)	Unknown (76)
<b>PEP dose, route, duration (adult)</b>	No data	No data	No data
<b>Mechanism of action</b>	Inhibits activity of the orthopoxvirus VP37 protein and inhibits viral envelope formation (65,69,70,72)	Inhibits polymerase mediated synthesis of DNA (73)	Inhibits DNA polymerase (79,80)
<b>Licensed for smallpox</b>	European Medicines Agency (2022)(65) US Food and Drug Administration (2021)(66) Health Canada (2021)(67)	US FDA (2021) (73) EMA (2016)	US CDC (EA-IND)
<b>Licensed for monkeypox</b>	European Medicines Agency (2022) (65,70) US CDC (EA-IND protocol)	US CDC (EA-IND protocol)	US CDC (EA-IND)

Source: WHO. Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022. Geneva: WHO; 2022.

# Trifluridine (Viroptic)

- It may be considered in cases of MPXV conjunctivitis and is recommended in cases of MPXV keratitis, in consultation with an ophthalmologist.
- In patients with corneal disease, including corneal ulcer, consider topical lubricants and/or antibiotics to prevent bacterial superinfection, which can be a vision-threatening complication of corneal ulcer.

# Vaccinia Immune Globulin Intravenous (VIG-IV)

- Composed of antibodies from individuals inoculated with the smallpox vaccine.
- It is unknown if a person with exposure to mpox or with severe infection would benefit from VIG; if used it should be in a clinical research context with prospective data collection.

# Treatment of complications

- Analgesia for post-acute lesion pain, including anal/rectal pain (i.e. lidocaine)
- Laxatives and hydration
- Enemas for proctitis
- Vitamin A supplements
- Antibiotics
- Surgical incision and drainage for abscesses
- Urethral catheterization for urethral pain
- Antivirals



## Person-centered care: During and after mpox

- Mpox—the disease and the outbreak—can be a source of significant distress, fear, and anxiety.
- WHO recommends prompt identification and assessment for anxiety and depressive symptoms in the context of mpox and initiation of basic psychosocial support strategies and first-line interventions for the management of new anxiety and depressive symptoms.
- Patients with mpox should receive compassionate, respectful, people-centered care consistently, while appropriate and adequate protection of household members, visitors, and health workers is ensured.

## Person-centered care: During and after mpox (2)

- All mpox patients should have access to comprehensive follow-up care, tailored to fit their needs. They should be counseled to monitor for new, changing, or persistent symptoms and seek appropriate care.
- Common post-infection sequelae may include:
  - Persistent pain after lesions have healed
  - Complicated skin infections
  - Vision loss or impairment (ocular/corneal lesions)
  - End organ damage in the event of severe cases that caused systemic complications
  - Mental health concerns: anxiety, depression

# Knowledge check

1. What are the main medications used for symptomatic care and for what symptoms?
2. When is antimicrobial therapy indicated?
3. What are the main antibiotics used for adults and children?
4. Antivirals are used for what type of cases?
5. What antivirals are available?
6. What is the antiviral formulation?

Q&A



## **Module 8.2: Complications and Severe Mpox**



# Learning objectives

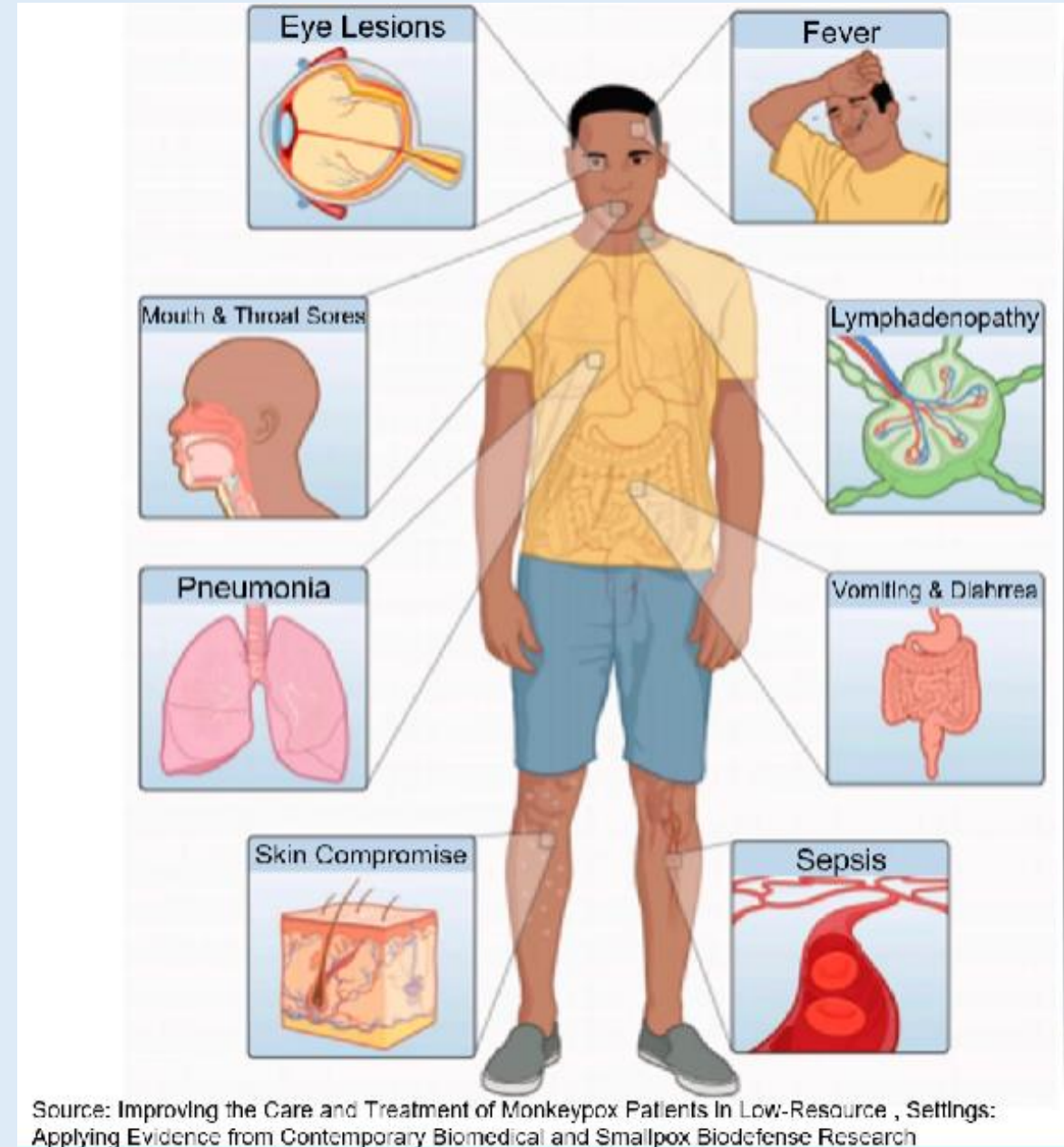
At the end of this module participants will be able to:

- Recognize the danger signs and complications of mpox
- Differentiate between less and more common complications
- Use the clinical care pathway flow chart for clinical management
- Conduct closer monitoring and clinical care of cases with complicated mpox infection
- Offer clinical management of complications and severe forms of mpox

# Complications of mpox

The course of the illness depends on overall health status.

- Bacterial infections of eye (4%) or skin (20%)
- Diarrhea and vomiting leading to dehydration (7%)
- Abscess with airways obstructions
- Bronchopneumonia
- Encephalitis, sepsis (<1%)



# Danger signs

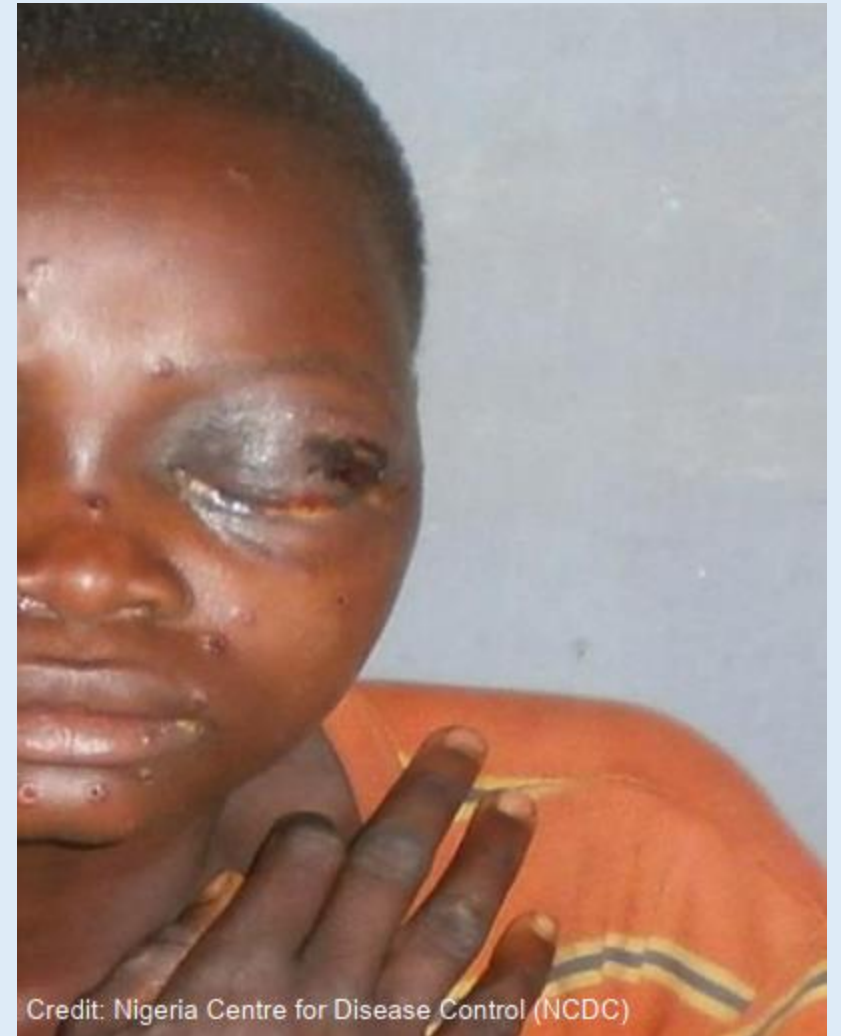
- Loss of vision
- Delirium, loss of consciousness, convulsions
- Respiratory distress
- Bleeding, inability to urinate
- Signs of sepsis

# More common complications

- Painful rash
- Proctitis/tenesmus
- Secondary skin infections
- Pharyngitis

# Less common complications

- Encephalitis
- Pneumonitis
- Keratitis
- Myocarditis
- Abscess
- Secondary bacterial infections
- Miscarriage
- Death





# Eye infection and ulcer



# Complications of mpox



**A:** Secondary infection of chin lesions

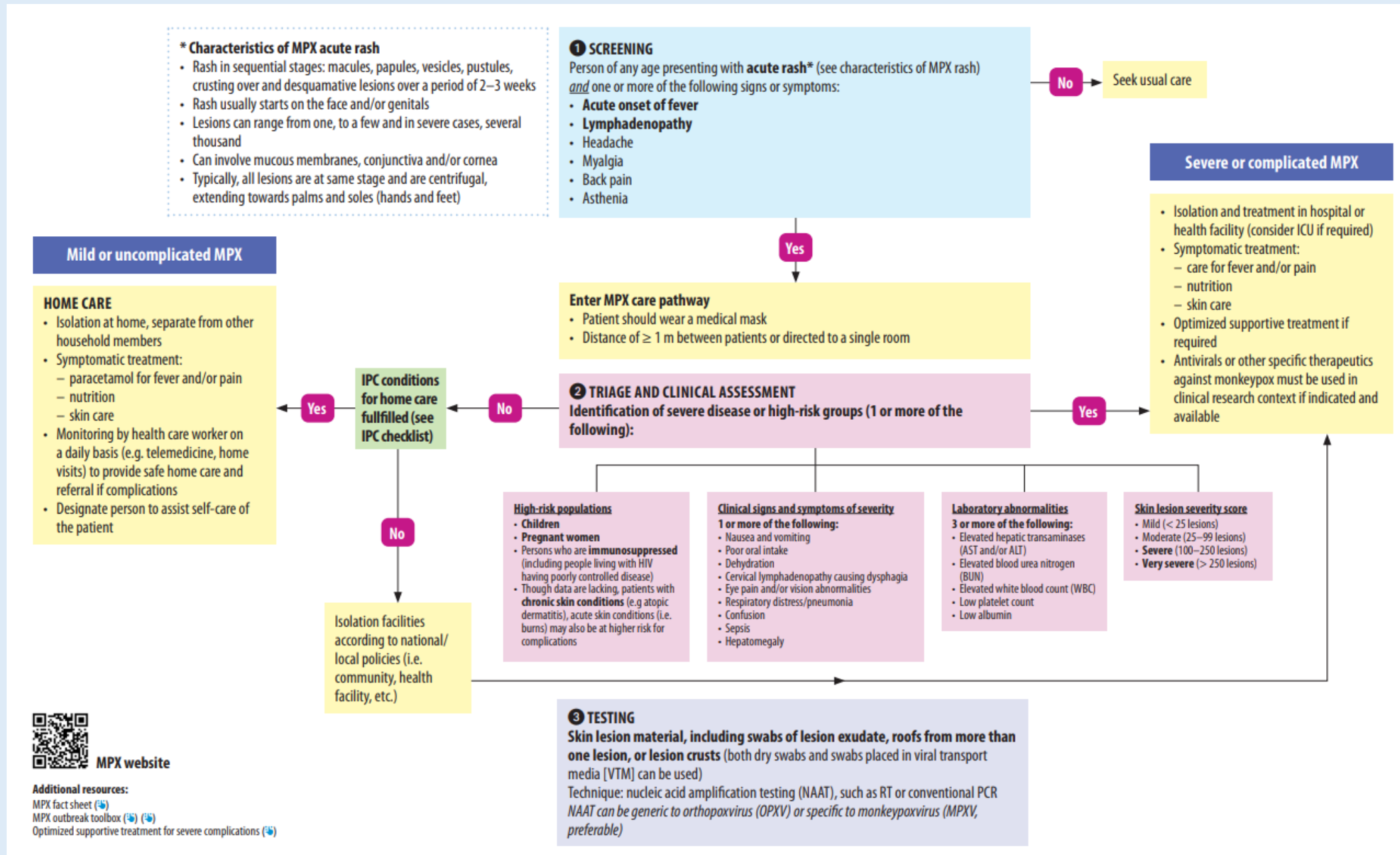


**B:** Appearance of infection shown in panel A 5 days later




**C:** Fissure and ulceration in the perianal region surrounded by papules and umbilicated lesions

# Mpox clinical care pathway – decision-making algorithm to be used at any health care point



# Vital signs and clinical features that need to be monitored

<b>Vital signs and pain assessment</b>	<ul style="list-style-type: none"> <li>• Temperature, heart rate, blood pressure, respiratory rate, peripheral oxygen saturation, level of consciousness using the alert, voice, pain, unresponsive scale (AVPU), point of care glucose, and body weight and height to calculate BMI and children's mid-upper arm circumference (MUAC)</li> <li>• Pain scale</li> </ul>
<b>General condition</b>	<ul style="list-style-type: none"> <li>• Is the patient able to eat and drink without support?</li> <li>• Is the patient able to sit and walk independently?</li> <li>• Has the patient had recent weight loss since onset of symptoms?</li> </ul>
<b>Rash characterization</b>	<ul style="list-style-type: none"> <li>• Stage of rash: macules, papules, vesicles, pustules, crusted over, exfoliation</li> <li>• Location of the rash (face, arms, torso, genitals, legs, mucosa)</li> <li>• Number of lesions (28,94): <ul style="list-style-type: none"> <li>– Mild (&lt; 25 skin lesions)</li> <li>– Moderate (25–99 skin lesions)</li> <li>– Severe (100–250 skin lesions)</li> <li>– Very severe (&gt; 250 skin lesions)</li> </ul> </li> <li>• If exfoliation present: % body affected (&gt; 10% is concerning)</li> </ul>
<b>Presence of bacterial secondary infection</b>	<ul style="list-style-type: none"> <li>• Cellulitis, abscess, pyomyositis, necrotizing soft tissue infection</li> </ul>
<b>Neurologic status</b>	<ul style="list-style-type: none"> <li>• AVPU, seizures, coma</li> </ul>
<b>Volume status</b>	<ul style="list-style-type: none"> <li>• Presence of dehydration: mild, moderate, or severe (see Table 9.2 for more details)</li> </ul>
<b>Signs of perfusion</b>	<ul style="list-style-type: none"> <li>• Pulse rate, strength, capillary refill</li> <li>• Urine output (&gt; 0.5 mL/kg/hr = good in adults; 1.0 mL/kg/hr in children)</li> <li>• Mottling of skin</li> </ul>
<b>Respiratory system</b>	<ul style="list-style-type: none"> <li>• Respiratory rate, SpO<sub>2</sub>, signs of respiratory distress</li> </ul>
<b>Nutritional assessment</b>	<ul style="list-style-type: none"> <li>• Change in appetite, weight loss, body weight, height, calculation of BMI, MUAC in children</li> <li>• Signs of malnutrition – use standardized tool (e.g. Malnutrition Universal Screening Tool) </li> </ul>
<b>Laboratory tests</b>	<ul style="list-style-type: none"> <li>• Na, K, HCO<sub>3</sub>, BUN, creatinine, AST, ALT, glucose, white blood count, Hg, platelet, PT/INR, Cl, calcium, albumin</li> </ul>

Source: WHO. Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022. Geneva: WHO; 2022.



# Classification of dehydration

	Mild (3–5% volume depletion)	Moderate (6–9% volume depletion)	Severe (> 10% volume depletion)
Pulse	Normal	Rapid	Rapid and weak or thready
Systolic blood pressure	Normal	Normal to low	Low
Buccal mucosa	Slightly dry	Dry	Parched
Skin turgor	Normal	—	Reduced
Urine output	Normal Adult (> 0.5 mL/kg/hr) Child (> 1 mL/kg/hr)	At or below Adult (< 0.5 mL/kg/hr) Child (< 1 mL/kg/hr) × 3 hours	Markedly reduced to anuric (< 0.5 mL/kg/hr x 3 hours)
Respiratory rate	No change	Increased	Increased
Ins and outs	Outs > ins	Outs > ins	Outs >> ins
Other	Increased thirst	Increased thirst	In infant, depressed fontanelle, cold skin



# Clinical management of complications and severe forms of mpox (1)

Complication	Treatment
<b>Skin exfoliation</b>	<ul style="list-style-type: none"><li>• Patients with heavy rash burden may develop exfoliation (in severe cases similar to partial thickness burns), that can be significant and lead to dehydration and protein loss.</li><li>• Estimate % skin affected and consider treatment as used for burns.</li><li>• Minimize insensible fluid loss and promote skin healing.</li><li>• Ensure adequate hydration and nutrition.</li><li>• Consult with appropriate consultants such as surgeon, dermatologist, and/or wound care specialists.</li><li>• Bedside or surgical debridement as needed.</li><li>• Skin grafting in rare and severe cases.</li></ul>
<b>Necrotizing soft tissue infection</b>	<ul style="list-style-type: none"><li>• This is a life-threatening condition of the deep soft tissue that affects the muscle fascia causing necrosis, tissue destruction, and systemic toxicity.</li><li>• Suspect if patient develops oedema, crepitus, malodorous discharge, or pain out of proportion to appearance of infection.</li><li>• Though can be caused by MPX virus, consider bacterial pathogens as well.</li><li>• Start broad spectrum antibiotics to cover Staphylococcus sp. and Streptococcus sp. Consult surgeon for this surgical emergency.</li></ul>

# Clinical management of complications and severe forms of mpox (2)

Complication	Treatment
<b>Pyomyositis</b>	<ul style="list-style-type: none"><li>• This occurs when pus develops within the muscle and should be suspected when the patient has muscle tenderness.</li><li>• Though this can be caused by MPX virus, it may also commonly be caused by skin flora such as Staphylococcus sp. or Streptococcus sp. Ultrasound can assist in diagnosis.</li><li>• Collect blood cultures, start broad spectrum antibiotics, and proceed to surgical incision and drainage.</li><li>• Send sample for microbiology and culture to support antimicrobial therapy selection.</li></ul>
<b>Cervical adenopathy</b>	<ul style="list-style-type: none"><li>• Can occur in up to 85.65% of cases with lymphadenopathy.</li><li>• When large cervical adenopathy is combined with multiple oropharyngeal lesions patients may be at risk for complications such as respiratory compromise and retropharyngeal abscesses. Patients are also at risk for dehydration due to decreased food and water intake.</li><li>• Consultation with appropriate specialists, such as surgeon, an anesthesiologist, and infectious disease clinicians. Under their care, in severe cases, steroids may be used.</li></ul>

# Clinical management of complications and severe forms of mpox (3)

Complication	Treatment
<b>Ocular lesions</b>	<ul style="list-style-type: none"><li>• One of the most significant sequelae of mpox is corneal scarring and loss of vision.</li><li>• Patients may present with nonspecific ocular symptoms such as conjunctivitis.</li><li>• Eye care with ophthalmologist evaluation.</li><li>• Ophthalmic antibiotics/antivirals if indicated for co-infection.</li><li>• Vitamin A supplementation, especially for malnourished children.</li><li>• Good eye care that includes eye lubrication and saline-soaked protective eye pads.</li><li>• Avoid steroid ointments (may prolong presence of mpox in ocular tissue).</li><li>• Trifluridine eye drops (sometimes used for other orthopoxviruses or herpetic eye infections) may be considered to hasten resolution of symptoms and prevent long-term damage from scarring, where available.</li></ul>

Source: WHO. Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022. Geneva: WHO; 2022.

# Clinical management of complications and severe forms of mpox (4)

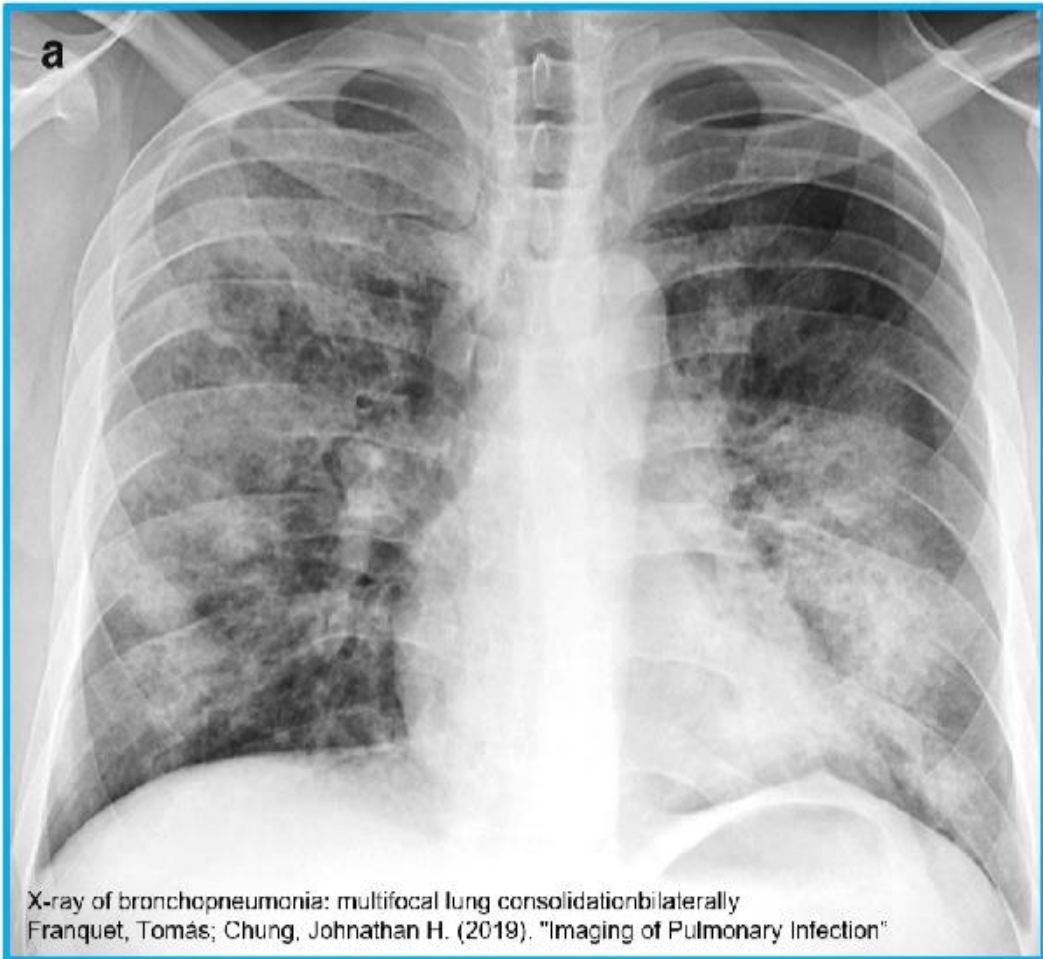
Complication	Treatment
<b>Pneumonia</b>	<ul style="list-style-type: none"><li>• Manage according to the WHO <i>Clinical Care for Severe Acute Respiratory Infection Toolkit</i>. <i>See also next slide for information specific to bronchopneumonia.</i></li></ul>
<b>Acute respiratory distress syndrome (ARDS)</b>	<ul style="list-style-type: none"><li>• Oxygen, non-invasive ventilation, mechanical ventilation</li><li>• Manage according to the WHO <i>Clinical Care for Severe Acute Respiratory Infection Toolkit</i>.</li></ul>
<b>Severe dehydration</b>	<ul style="list-style-type: none"><li>• Severe dehydration and hypovolemic shock can be seen in patients with mpox due to intravascular volume loss due to extensive rash and/or gastrointestinal losses due to diarrhea and vomiting accompanied by poor oral intake.</li><li>• Treatment for severe dehydration is resuscitation with intravenous or intraosseous (IV/IO) fluid, given as one or multiple boluses with close monitoring of fluid responsiveness. Adequate IV fluid intake refers to the volume that will correct signs of hypovolemia. See <i>Pocket Book of Hospital Care for Children</i>.</li></ul>

WHO. Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022. Geneva: WHO.

WHO. Clinical care of severe acute respiratory infections toolkit [COVID-19 adaptation update 2022]. Geneva: WHO; 2022.

WHO. Pocket book of hospital care for children: 2nd edition. Geneva: WHO; 2013. <https://www.who.int/publications/i/item/978-92-4-154837-3>.

# Bronchopneumonia



X-ray of bronchopneumonia: multifocal lung consolidation bilaterally  
Franquet, Tomás; Chung, Johnathan H. (2019). "Imaging of Pulmonary Infection"

[https://upload.wikimedia.org/wikipedia/commons/6/6e/X-ray\\_of\\_bronchopneumonia.png](https://upload.wikimedia.org/wikipedia/commons/6/6e/X-ray_of_bronchopneumonia.png)

- Occurs in up to 1 in 10 cases
- Tissue damage can occur throughout the lungs or consolidate in just one area, with or without a bacterial infection

## Supportive treatment

- Pulmonary hygiene and physiotherapy
- Supplementary oxygen
- Empirical treatment with antibiotics
- Bronchodilator medications
- Ventilation support

# Clinical management of complications and severe forms of mpox (5)

Complication	Treatment
<b>Sepsis and septic shock</b>	<ul style="list-style-type: none"><li>• Sepsis and septic shock differ from severe dehydration as they result from an immune response to an infection. Management of sepsis requires early identification; management of infection and supportive care, including fluid resuscitation to maintain organ perfusion to reduce and prevent further organ injury; and may also require vasopressors as well as control of infection</li><li>• See the <i>WHO Clinical Care for Severe Acute Respiratory Infection Toolkit</i> for more information about sepsis. <small>(WHO. Clinical care of severe acute respiratory infection toolkit [COVID-19 adaptation update 2022]. Geneva: WHO; 2022.)</small></li></ul>
<b>Encephalitis</b>	<ul style="list-style-type: none"><li>• Consider lumbar puncture for cerebrospinal fluid (CSF) evaluation to evaluate for other treatable conditions.</li><li>• Monitor and assess airway, breathing, circulation, disability (ABCD), and give emergency treatments.</li><li>• Monitor neurological status (AVPU).</li><li>• Control seizures with anti-epileptics.</li><li>• Give antibiotics/antivirals if indicated for co-infections. <small>(WHO. The WHO essential medicines list antibiotic book: improving antibiotic AWaReness. Geneva: WHO; 2021.)</small></li></ul>



# Clinical management of complications and severe forms of mpox (6)

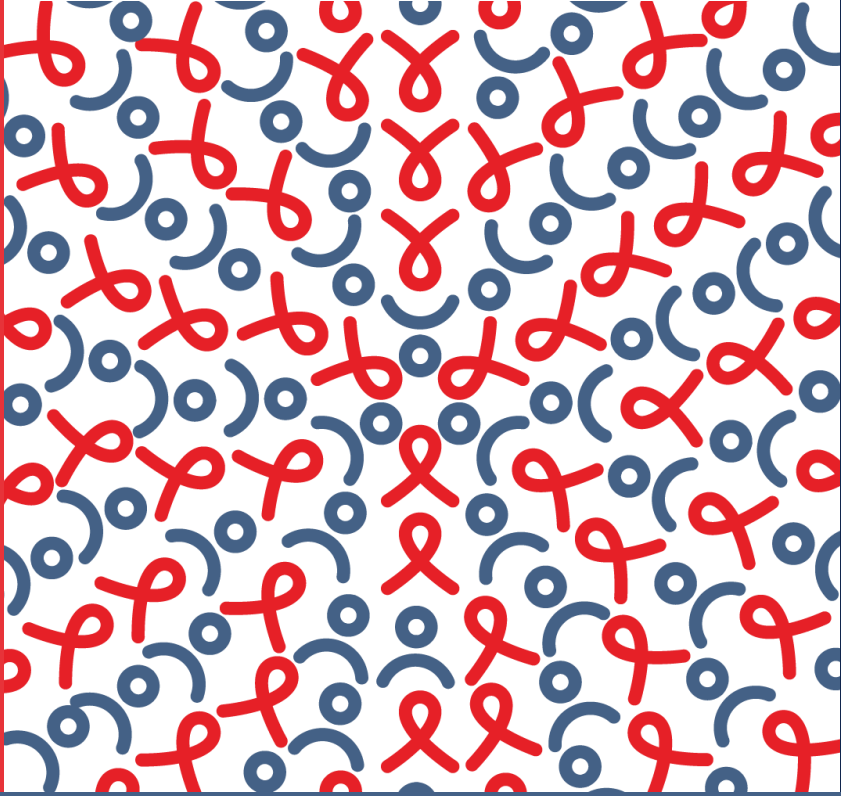
Complication	Treatment
<b>Nutritional considerations</b>	<ul style="list-style-type: none"><li>• Assess nutritional status of all patients. If food intake is limited due to weakness, patient should be assisted with feeding by a health care provider. If patient is unable to tolerate oral nutrition, consider enteral nutrition.</li><li>• Placement of a nasogastric tube by an experienced provider could be considered along with nasogastric feeding. Always ensure proper placement of nasogastric tube before administering feeds to avoid risk of aspiration.</li><li>• Take special care with patients at risk for re-feeding (critically unwell, low BMI, reduced food intake for &gt; 5 days, history of alcohol abuse, or receiving the following drugs: insulin, chemotherapy, antacids, or diuretics) and start enteral feeding slowly with close monitoring.</li><li>• Patients with reduced levels of consciousness are at risk for aspiration and should not be forced to eat. If severe malnutrition is present, refer to WHO published guideline.</li></ul>

# Knowledge check

1. What are the more common complications?
2. What are the less common complications?
3. What does WHO recommend for patients at high risk for complications and those with severe or complicated mpox?
4. What is the triage and clinical assessment to identify high risk and severe cases?
5. What is the clinical management of necrotizing soft tissue infection?
6. What is the clinical management of cervical adenopathy?
7. What is the clinical management of ocular lesions?
8. How does pneumonia present; and what is the supportive treatment?

Q&A





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## Module 9: Prevention

# Learning objectives

At the end of this module participants will be able to:

- Present the vaccination strategy
- Describe how to offer primary preventive vaccination to eligible clients
- Describe how to offer post-exposure preventive vaccination to eligible clients
- Describe how to offer correct vaccination to special population groups

# IPC: Cornerstone of Prevention

- Basic public health measures – like infection prevention & control (IPC) include:
  - Use of personal protective equipment (PPE) for caregivers
  - Avoiding close or intimate bodily contact with anyone exhibiting symptoms
  - Regular hand hygiene with adequate materials
  - Timely triage and isolation – with comprehensive supportive care – for suspect, probable or confirmed case patients for the duration of the infectious period, or until infection is ruled out.



# Vaccination strategy

Vaccination programs should be accompanied by

- A strong **information campaign** to inform vaccinees that:
  - It takes approximately 2 weeks from finalizing a complete series of vaccination (1 or 2 doses depending on product) for immunity to develop
  - The level of protection conferred by vaccination is currently unknown for the current outbreak (clades 1b and 1a)
- Robust **pharmacovigilance**

# Vaccination strategy

- **Mass vaccination is not required nor recommended for mpox at this time.** Broader use of vaccines for persons at risk may be warranted if justified by the evidence.
- Primary preventive (pre-exposure) vaccines and post-exposure preventive vaccines are recommended for select groups:
  - Individuals (but not limited to) those who self-identify as gay or bisexual, or other men who have sex with men (MSM) or other individuals with multiple sexual partners
  - Health workers at high risk of exposure, laboratory personnel working with orthopoxviruses, clinical laboratory personnel performing diagnostic testing for mpox, outbreak response team members (as designated by national public health authorities)

# Post-exposure preventive vaccination (PEPV)

- For **contacts** of cases, PEPV is recommended **within four days** of first exposure (and up to 14 days in the absence of symptoms), to prevent onset of disease or mitigate disease severity.
- **Children, pregnant women and immunocompromised** persons may be at risk of developing more severe disease. Therefore, *in case of limited vaccine supply*, these populations, if exposed, should be offered vaccination in priority
- Persons who have had a **two-dose** primary preventive (pre-exposure) vaccination and who become exposed (contacts) **should not receive PEPV** but should monitor for any symptoms up to 21 days after the last exposure.
- Persons who have contact with an mpox case **after their first dose and before their second dose**, should receive their second dose as scheduled.

# Vaccination strategy: Eligibility for primary prevention

Eligible individuals include, but are not limited to those who:

- Self-identify as gay or bisexual or other men who have sex with men or transgender, gender non-binary, or gender-diverse and in the last 6 months have had:
  - one or more STIs
  - one sexual partner; anonymous sexual or intimate contact;
  - sex at a commercial sex venue or in association with a large public event in a geographic area where mpox transmission is occurring
- Have had sexual or intimate contact with a person who is at risk of mpox, as described above
- Have had sexual or intimate contact with someone who may have mpox
- Are health workers at high risk of exposure, lab personnel working with orthopoxviruses, clinical lab personnel performing mpox diagnostic testing, or are designated by public health authorities as outbreak response team members

# Vaccination: Pre- and post-exposure

- Pre-exposure vaccination with an appropriate approved (or off-label) second- or third-generation vaccine
  - (e.g., Modified vaccinia Ankara–Bavarian Nordic (MVA-BN) or IMVANEX, ACAM2000®, LC16, or JYNNEOS)
- Vaccines can also be used as post-exposure prophylaxis among those who have been exposed.
  - Recommended prior to onset of any symptoms, ideally within four days of first exposure (and up to 14 days in the absence of symptoms), to prevent onset of disease or mitigate disease severity.

# Choice of vaccine

The following vaccines are currently available in some places.

Non-replicating vaccine	Minimally replicating vaccines	Replicating vaccinia-based vaccines
<ul style="list-style-type: none"><li>• MVA-BN</li></ul>	<ul style="list-style-type: none"><li>• LC16</li></ul>	<ul style="list-style-type: none"><li>• ACAM2000</li></ul>



# Vaccination: Who should get what?

- **For healthy adults:** replicating, non-replicating or minimally replicating vaccines are recommended.
- **For individuals for whom replicating or minimally replicating vaccine is contraindicated:** the non-replicating should be used.
  - These individuals include pregnant and breastfeeding women; severe immune deficiency; PLHIV with CD4 cell count of <200 cells  $\mu$ l; patients using immunosuppression therapies
- **For children:** where consideration is given to vaccination for PEPV, non-replicating or minimally replicating vaccines should be used.
- **Older adults** (>50 years), vaccinated against smallpox vaccines in the context of global smallpox eradication (before 1980), and who are eligible for PPV or PEPV, should be vaccinated irrespective of previous smallpox vaccination and/or visible smallpox scar.

# Vaccination dosing and timing



- The level and duration of protection is currently unknown.
- It takes approximately 2 weeks from time of finalizing a complete series (2 doses) of vaccination with non-replicating vaccines for peak immunity to develop.
- For the minimally and non-replicating vaccines, peak immunity is expected to occur 4 weeks after vaccination (1 dose).

# Smallpox and mpox vaccine options (19 August 2022)

	Vaccine (Manufacturer)	Licensed for smallpox (country, type, date)	Licensed for monkeypox (country, type, date)	Considerations	Presentation	Injection materials
Non-replicating vaccine	<b>MVA-BN (Bavarian Nordic)</b> Third generation	EU (Imvanex): has been authorised under <a href="#">exceptional circumstances</a> (2013) Canada (Imvamune): Full MA (2013) USA (Jynneos): Full MA (2019)	USA (Jynneos): Full MA (2019) Canada (Imvamune): Full MA (2019) EU (Imvanex): has been authorized under exceptional circumstances (2022)	Two doses four weeks apart. Liquid-frozen formulation, approved for use in the general adult population. The USA has granted emergency authorization for use in individuals 18 years and below (August 2022).	Liquid frozen or lyophilized (freeze-dried) Single dose vials (Multidose vials possible)	Needle and syringe (sub-cutaneous administration)
Minimally replicating vaccine	<b>LC16 (KM Biologics)</b> Third generation	Japan - Full MA (1975)	Japan: MA (August 2022)	Single dose. Approved for use in infants and children (all ages) as well as adults	Freeze-dried Multidose vials	Bifurcated needle
Replicating vaccinia-based vaccine	<b>ACAM2000 (Emergent BioSolutions)</b> Second generation	Multiple countries - Approved	USA - EIND for PEPV	Single dose. Approved for use in adults aged 18 – 64 years of age.	Freeze-dried Multidose vials	Bifurcated needle

EU: European Union (European  
Medicines Agency)

USA: United States of America  
(Food and Drug Administration)

Canada: Health Canada

MA: Market authorization

EIND: Emergency Investigational  
New Drug program of the U.S.  
Food and Drug Administration

PEPV: Post-exposure preventive  
vaccination

SEP: Smallpox eradication  
program

# Vaccination in the case of limited supply

Prioritized for receipt of vaccine following analysis of risks and benefits on a case-by-case basis

- Close contacts of mpox cases at risk of developing severe disease, such as
  - children
  - pregnant women
  - immunocompromised persons, including those on immunosuppressive therapy or living with poorly controlled HIV

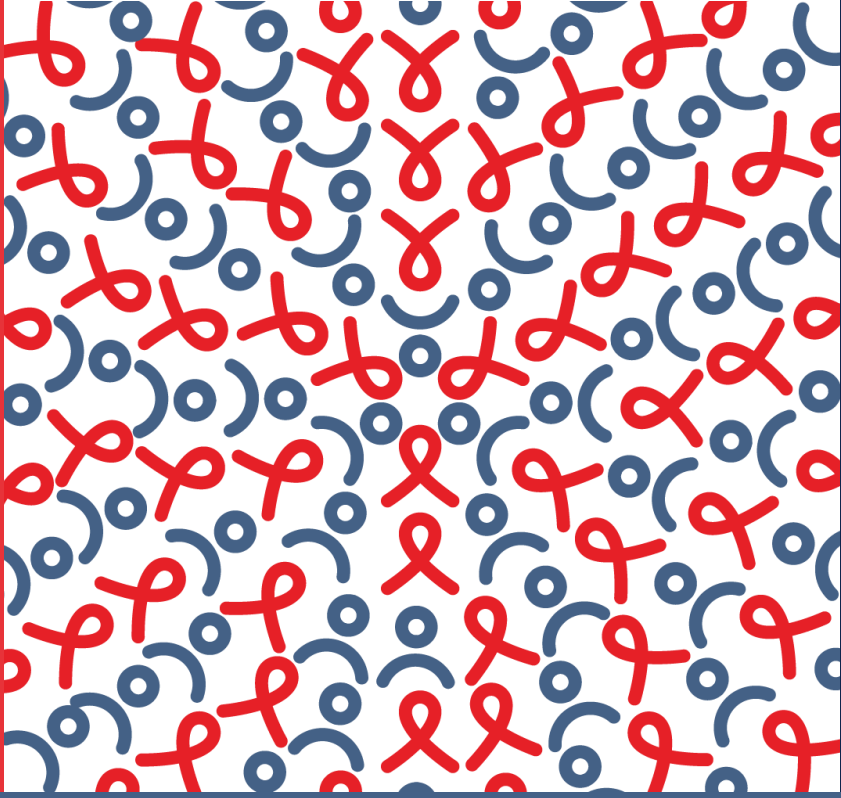
# Knowledge check

1. What are the key recommendations for cases and contacts to prevent transmission?
2. Is mass vaccination recommended?
3. For whom are primary preventive vaccines recommended?
4. For whom are post-exposure preventive vaccines recommended?
5. How are current vaccines for mpox categorized?
6. What are the names of the currently recommended vaccines?
7. What type of vaccines are recommended for healthy adults, PBFW, and children?

Q&A







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## Module 10: Special Considerations

# Learning objectives

At the end of this module participants will be able to:

- Account for and properly manage people living with HIV who are infected with mpox
- Account for and properly manage pregnant women who are infected with mpox
- Account for and properly manage children who are infected with mpox

# Mpox and key populations

- Anyone can get and spread mpox (regardless of sexual orientation or gender identity).
- However, current outbreak is primarily among men who identify as gay or bisexual, and other men who have sex with men.
- Current cases have atypical features.
- May be confused with STIs or other conditions (e.g., herpes and syphilis), however the diagnosis of an STI does not exclude mpox as a concurrent infection may be present, particularly anogenital lesions.
- The key population community must not be stigmatized and must be well educated about how to protect themselves, including ensuring rapid access to vaccination.

# Mpox and HIV (1)

- About half of the people with mpox whose status is known are HIV positive.
- HIV status is not linked with mpox severity.
- Among HIV-negative men with mpox, a majority were on PrEP.

# Mpox and HIV (2)

Data from *New England Journal of Medicine*:

- 528 mpox infections across North America, Mexico, Argentina, Europe, Australia, and Israel
- 98% of people with mpox infection were gay or bisexual men
- 41% were PLHIV with median CD4 680 cells per cubic millimeter of blood
- 96% of those were on ART and 95% had a viral load <50 copies/mL
- Three new cases of HIV were identified in people who were diagnosed with mpox
- 57% of the non-PLHIV in this study were on pre-exposure prophylaxis (PrEP)
- No deaths

## Monkeypox Virus Infection in Humans across 16 Countries — April–June 2022

J.P. Thornhill, S. Barkati, S. Walmsley, J. Rockstroh, A. Antinori, L.B. Harrison, R. Palich, A. Nori, I. Reeves, M.S. Habibi, V. Apea, C. Boesecke, L. Vandekerckhove, M. Yakubovsky, E. Sendagorta, J.L. Blanco, E. Florence, D. Moschese, F.M. Maltez, A. Goorhuis, V. Pourcher, P. Migaud, S. Noe, C. Pintado, F. Maggi, A.-B.E. Hansen, C. Hoffmann, J.I. Lezama, C. Mussini, A.M. Cattelan, K. Makofane, D. Tan, S. Nozza, J. Nemeth, M.B. Klein, and C.M. Orkin, for the SHARE-net Clinical Group\*

### ABSTRACT

#### BACKGROUND

Before April 2022, monkeypox virus infection in humans was seldom reported outside African regions where it is endemic. Currently, cases are occurring worldwide. Transmission, risk factors, clinical presentation, and outcomes of infection are poorly defined.

#### METHODS

We formed an international collaborative group of clinicians who contributed to an international case series to describe the presentation, clinical course, and outcomes of polymerase-chain-reaction–confirmed monkeypox virus infections.

#### RESULTS

We report 528 infections diagnosed between April 27 and June 24, 2022, at 43 sites in 16 countries. Overall, 98% of the persons with infection were gay or bisexual men, 75% were White, and 41% had human immunodeficiency virus infection; the median age was 38 years. Transmission was suspected to have occurred through sexual activity in 95% of the persons with infection. In this case series, 95% of the persons presented with a rash (with 64% having <10 lesions), 73% had anogenital lesions, and 41% had mucosal lesions (with 54 having a single genital lesion). Common systemic features preceding the rash included fever (62%), lethargy (41%), myalgia (31%), and headache (27%); lymphadenopathy was also common (reported in 56%). Concomitant sexually transmitted infections were reported in 109 of 377 persons (29%) who were tested. Among the 23 persons with a clear exposure history, the median incubation period was 7 days (range, 3 to 20). Monkeypox virus DNA was detected in 29 of the 32 persons in whom seminal fluid was analyzed. Antiviral treatment was given to 5% of the persons overall, and 70 (13%) were hospitalized; the reasons for hospitalization were pain management, mostly for severe anorectal pain (21 persons); soft-tissue superinfection (18); pharyngitis limiting oral intake (5); eye lesions (2); acute kidney injury (2); myocarditis (2); and infection-control purposes (13). No deaths were reported.

#### CONCLUSIONS

In this case series, monkeypox manifested with a variety of dermatologic and systemic clinical findings. The simultaneous identification of cases outside areas where monkeypox has traditionally been endemic highlights the need for rapid identification and diagnosis of cases to contain further community spread.

The authors' full names, academic degrees, and affiliations are listed in the Appendix. Prof. Orkin can be contacted at [c.m.orkin@qmul.ac.uk](mailto:c.m.orkin@qmul.ac.uk), or at the SHARE Collaborative, Centre for Immunobiology, Blizard Institute, Queen Mary University of London, 4 Newark St., London E1 2AT, United Kingdom.

\*The investigators in the SHARE-net clinical group are listed in the Supplementary Appendix, available at [NEJM.org](https://www.nejm.org).

Drs. Thornhill, Barkati, Klein, and Orkin contributed equally to this article.

This article was published on July 21, 2022, at [NEJM.org](https://www.nejm.org).

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Thornhill JP, et al. Monkeypox virus infection in humans across 16 countries—April–June 2022. *N Engl J Med*. 2022;387:679-91. doi: [10.1056/NEJMoa2207323](https://doi.org/10.1056/NEJMoa2207323).

## Mpox and HIV (3)

- Whether PLHIV are at greater risk of acquiring mpox or experiencing more severe cases has not been confirmed
- Non-virally suppressed PLHIV may be at increased risk
- PLHIV with well-controlled HIV and a high CD4 do not have more severe mpox illness
- Mpox in PLHIV may present as an atypical rash
- PLHIV who contract mpox should begin or re-initiate ART



## Mpox and HIV (4)

- Most of the commonly used HIV medications are considered safe for people on mpox treatment.
- Persons with and without HIV infection should follow the same guidance to protect themselves from mpox.
- Some people have been concurrently diagnosed with mpox, HIV, and other STIs. Therefore, testing for these infections should be offered when mpox is suspected or diagnosed.
- People taking PrEP for HIV prevention should also continue.

# Mpox in women during and after pregnancy

- Pregnant or recently pregnant women with mild or uncomplicated mpox may not require acute care in hospital.
- Those with severe or complicated disease should be admitted to improve maternal and fetal survival.
- Pregnant and recently pregnant women with mpox should have access to woman-centered, respectful, skilled care, including midwifery, obstetric, gynecologic, fetal medicine and neonatal care, mental health and psychosocial support, with readiness to care for maternal and neonatal complications.
- Induction of labor and caesarean section should only be undertaken when medically justified and based on maternal and fetal condition.
- Pregnant and recently pregnant women who recovered from mpox should receive routine antenatal, postpartum, or abortion care, as appropriate.
- Recommendation to stop breastfeeding for a mother with mpox should consider the general physical status of the mother and the severity of disease.

# Mpox in young children

- Newborn infants of mothers with mpox should be monitored closely for evidence of potential congenital or perinatal exposure or infection.
- Mothers and infants or young children can also be exposed through close contact.
- Children exposed to mpox should be fully vaccinated for their age according to the routine national immunization schedule and have their vaccinations up to date, when possible.

# Mpox in children and adolescents

- As the current outbreak (Clade Ib) appears to be disproportionately affecting and causing complications in children and adolescents <15, clinicians should prepare for unique approaches to pediatric care.
  - Nutrition & hydration
  - Medication dosing
  - Medical procedures
  - Immunization recommendations
  - Psychosocial and family support

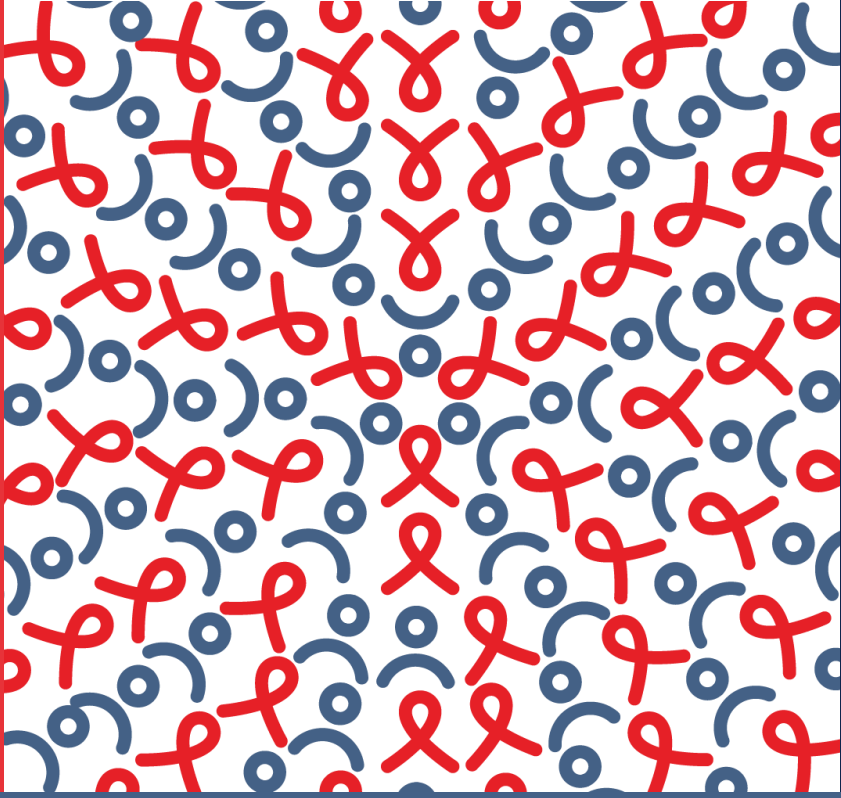
# Knowledge check

1. Are non-virally suppressed PLHIV at increased risk?
2. Can mpox in PLHIV present as an atypical rash?
3. Should PLHIV who contract mpox begin or re-initiate ART?
4. Are most of the HIV medications safe for people on mpox treatment?
5. Should people taking PrEP continue it?
6. Is induced labor or caesarean section recommended for pregnant women with mpox infection?
7. Should a mother with mpox stop breastfeeding?
8. Could newborn infants of mothers with mpox have congenital or perinatal exposure or infection?
9. What should mpox-exposed children receive?

Q&A







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## Module 11: Infection Prevention and Control (IPC)

# Learning objectives

At the end of this module participants will be able to describe how to:

- Comply with infection risk hygiene and cough etiquette
- Implement the steps for injection and medication safety
- Implement cleaning and disinfection measures
- Implement appropriate waste management
- Correctly isolate mpox cases
- Counsel cases and contacts on infection control and prevention measures and home isolation

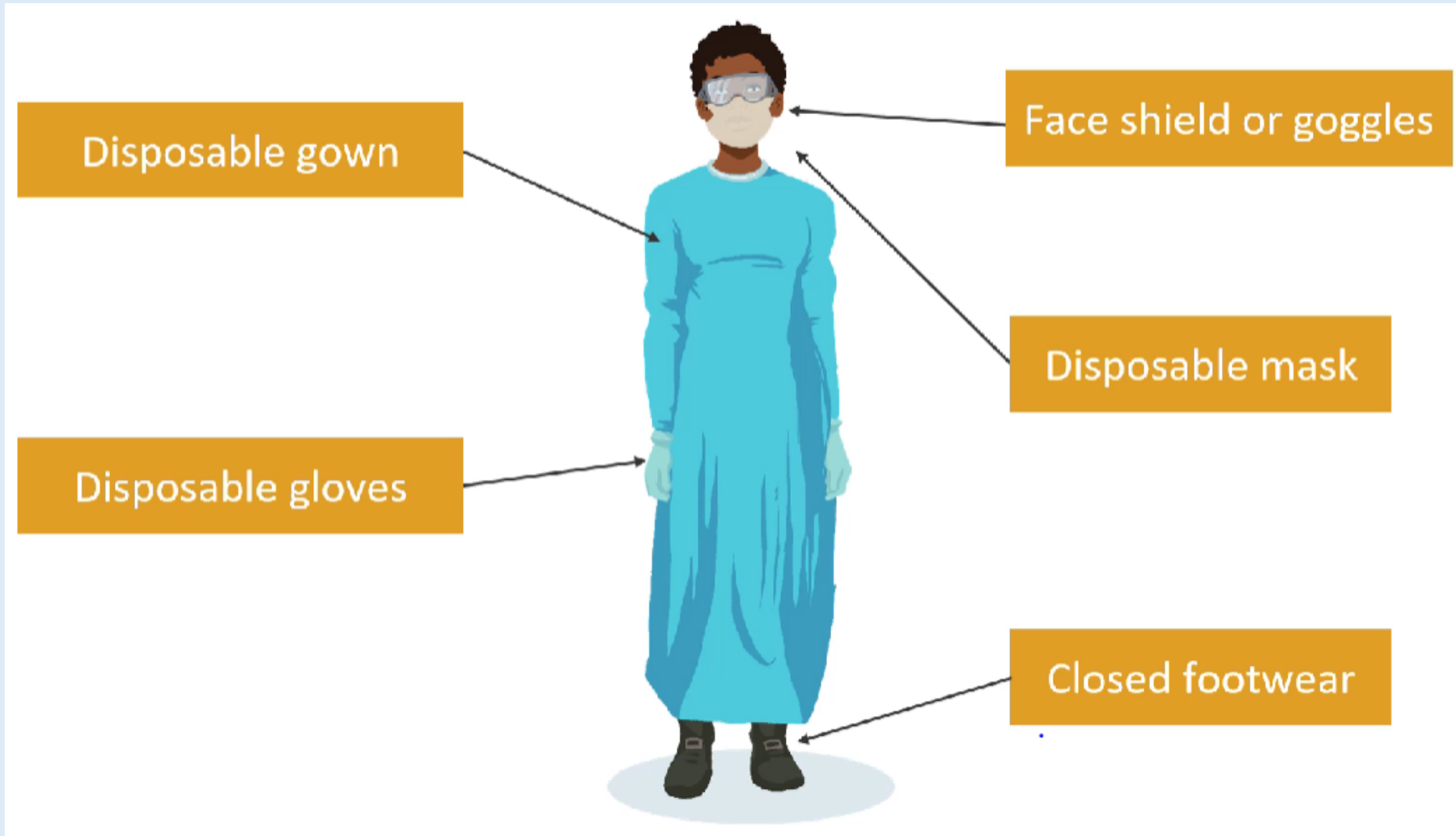
# Standard precaution

- Risk assessment
- Hand hygiene
- Respiratory hygiene and cough etiquette
- Personal protective equipment (PPE)
- Injection and medication safety
- Cleaning and disinfection procedures
- Waste management

# Respiratory hygiene and cough etiquette

- Ask patients to cover mouth and nose with a mask, tissue, or elbow when coughing or sneezing.
- Dispose of used tissues and masks in waste container.
- Clean hands after contact with respiratory secretions.
- Wear a medical mask.
- Stay at least 1 meter from the patient.

# Personal protective equipment (PPE)



# Injection and medication safety



## 7 STEPS for safe injection

1. A clean workplace
2. Clean hands and wear gloves
3. Use sterile injection equipment
4. Use each vial once for one patient
5. Properly disinfect skin before injection
6. Ensure sharps disposal
7. Ensure proper waste management



# Cleaning and disinfection

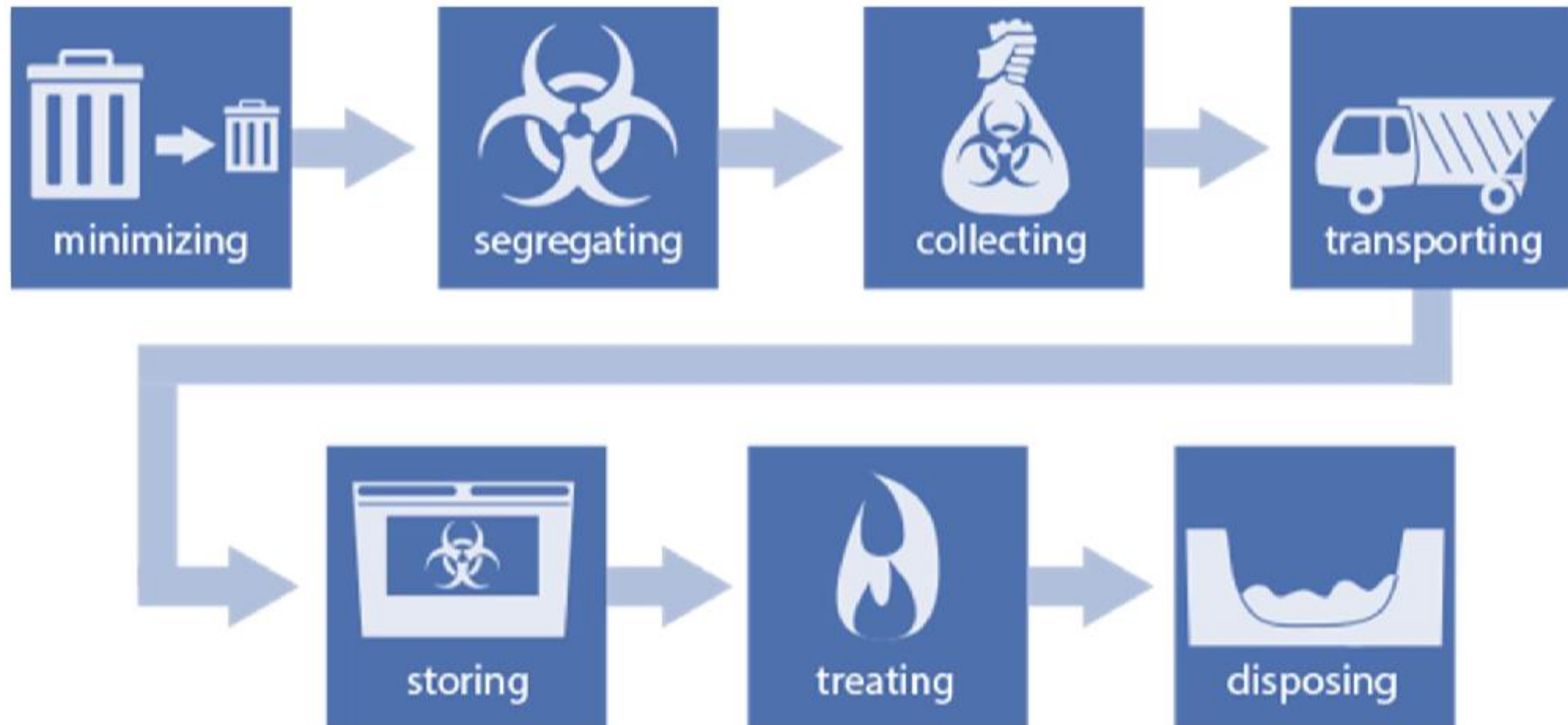


**Cleaning**

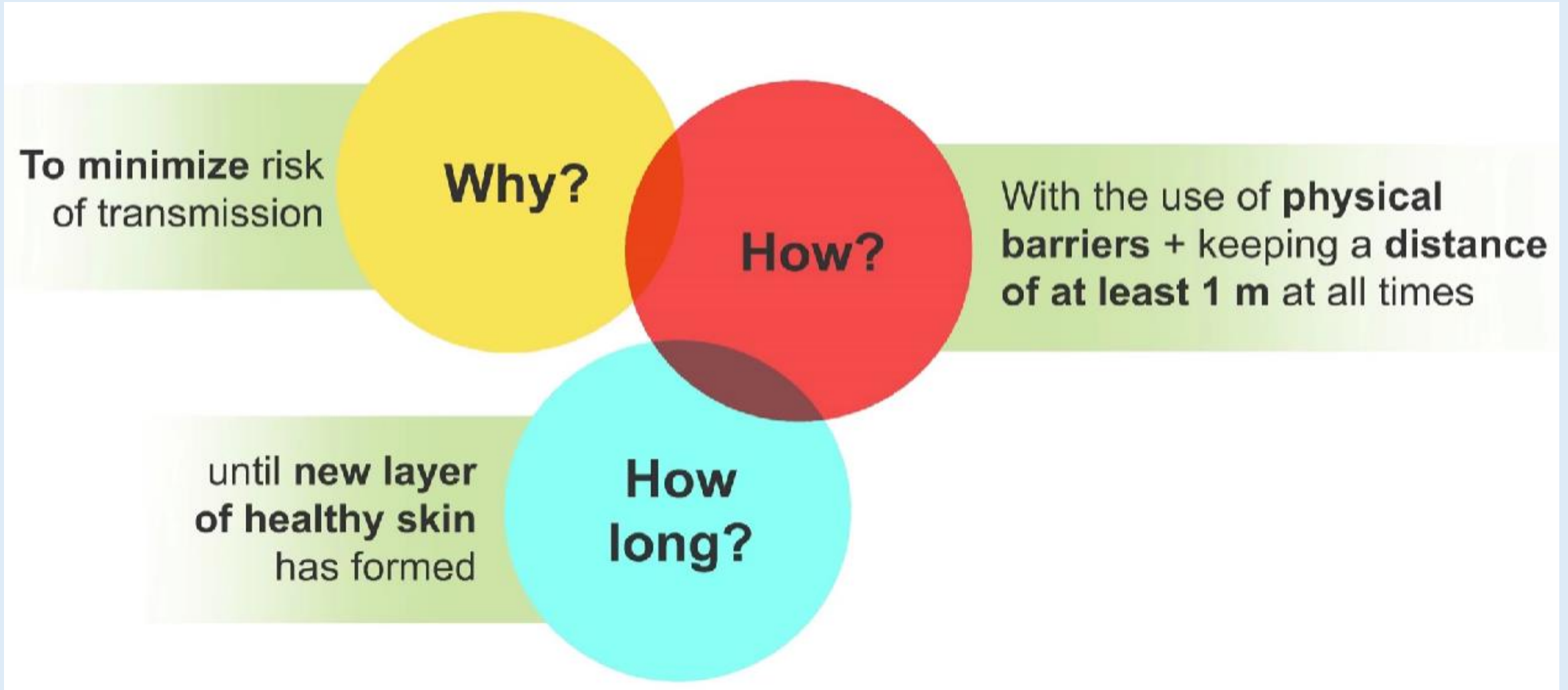


**Disinfection**

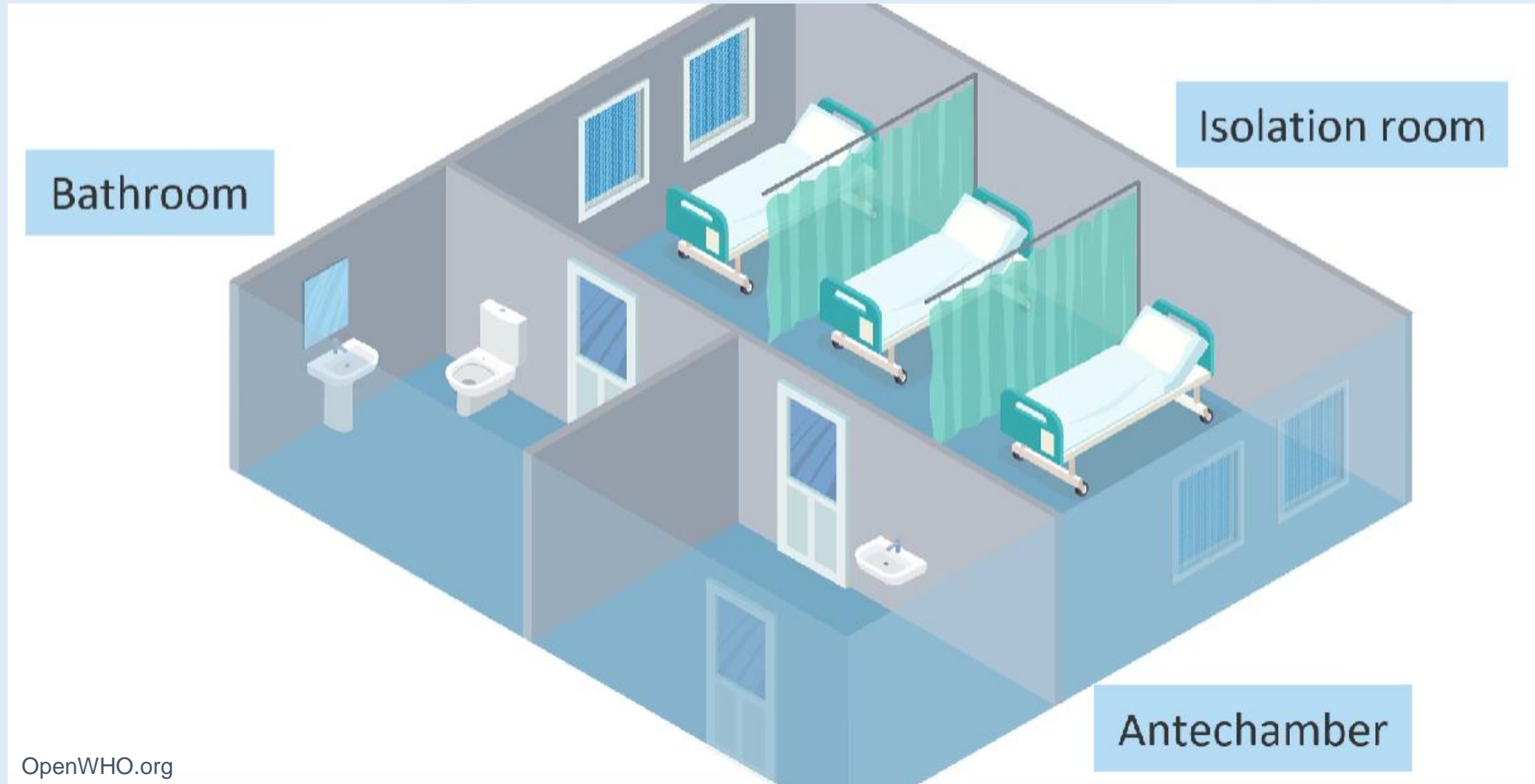
# Waste management



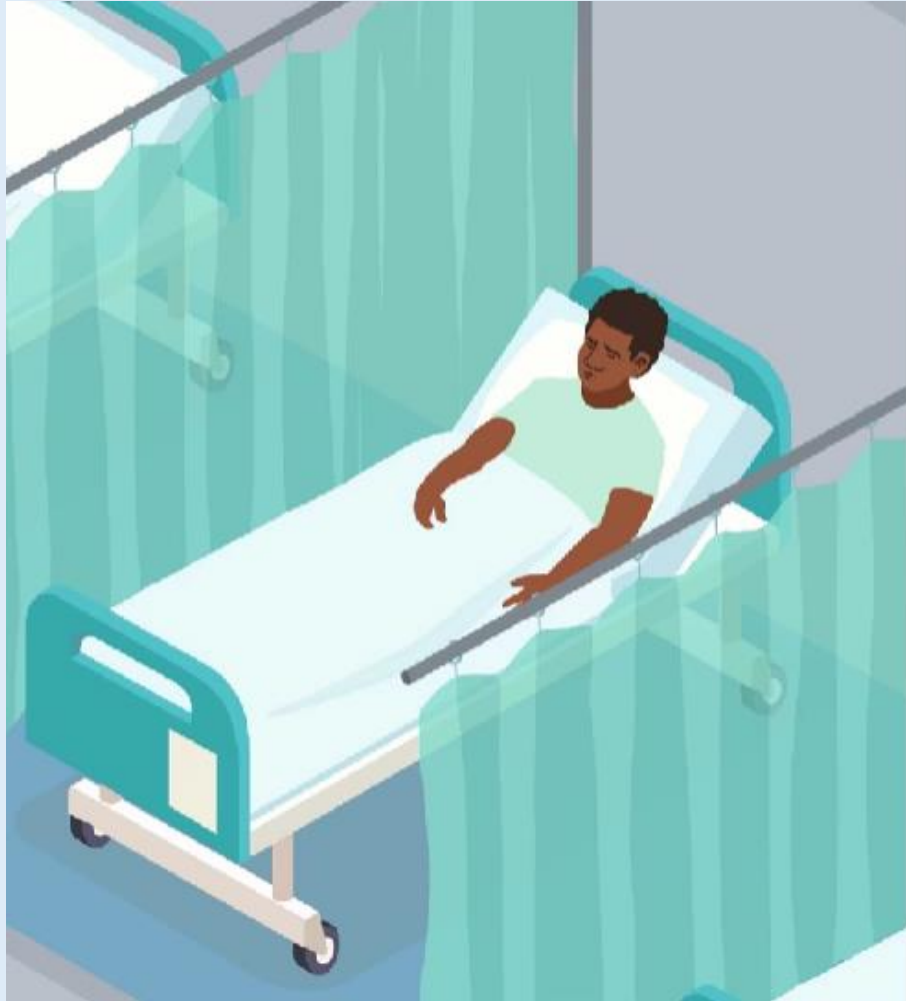
# Isolation of patients



# Isolation in a health facility



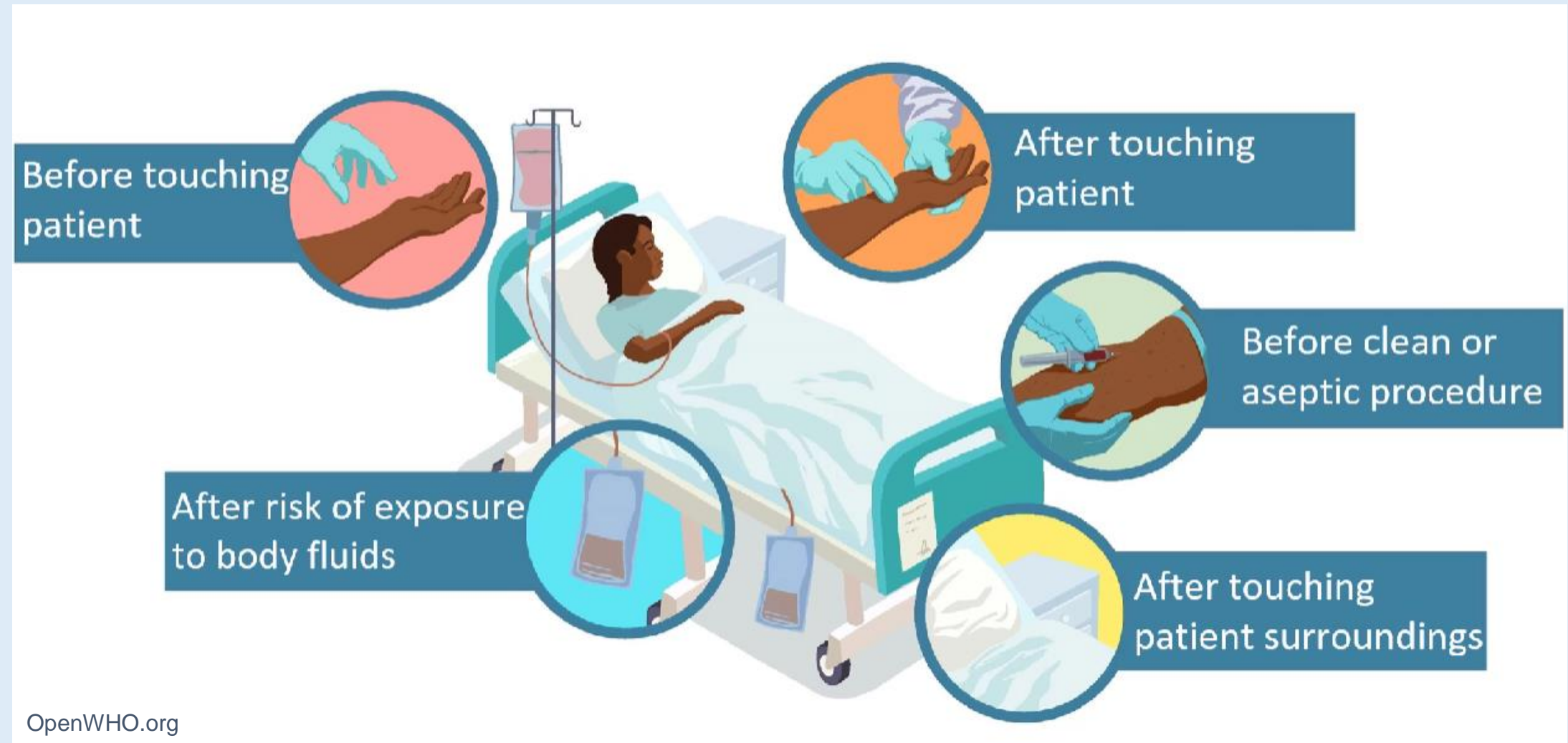
# Infection prevention and control during health care



- Isolation room or space
- Handwashing
- Gown, mask, goggles and gloves
- Cleaning and disinfection
- Waste management
- Safe handling of linens



# Five moments of hand hygiene





# Recommendations for cases and contacts

Recommendations	Symptomatic contacts	Asymptomatic contacts	Cases
Regularly practice hand hygiene and respiratory etiquette	<b>X</b>	<b>X</b>	<b>X</b>
Do not donate blood, cells, tissue, organs, breast milk, or semen	<b>X</b>	<b>X</b>	<b>X</b>
Continue routine daily activities such as going to work and attending school (i.e., no quarantine is necessary)		<b>X</b>	
Halt routine daily activities such as going to work and attending school (i.e., quarantine is necessary). Pre-school children: not attend day care, nursery, or other group settings during the contact follow-up period	<b>X</b>		<b>X</b>
Avoid undertaking any travel, including international, until they are determined as no longer constituting a public health risk	<b>X</b>	<b>X</b>	<b>X</b>
Avoid close direct contacts with animals (for 21 days after the last exposure*)	<b>X</b>	<b>X</b>	<b>X</b>
Abstain from sexual activities (for 21 days after the last exposure*)	<b>X</b>	<b>X</b>	<b>X</b>
Avoid contacts with immunocompromised people, newborn, infants, children, and pregnant women (for 21 days after the last exposure*)	<b>X</b>	<b>X</b>	<b>X</b>

\*applies to contacts only

# Home isolation

Limit contact with other household members; sleep in separate room.



Do not touch the rash or scabs of a person with mpox.



Avoid kissing, hugging, cuddling, and intimate or sexual contacts.



Wash your hands often with soap and water or use an alcohol-based hand sanitizer, especially before eating or touching your face and after you use the bathroom.



Avoid close contacts with newborns, infants, young children, pregnant women, and those with impaired immune systems.



Avoid contact with objects and materials that a person with mpox has used.



Do not share bedding, towels, wash cloths, toothbrushes, or razors.



Do not share food, drinks, cups, utensils, or dishes.



Avoid visitors at home.



Leave the house only in an emergency; postpone non-essential medical or dental care.

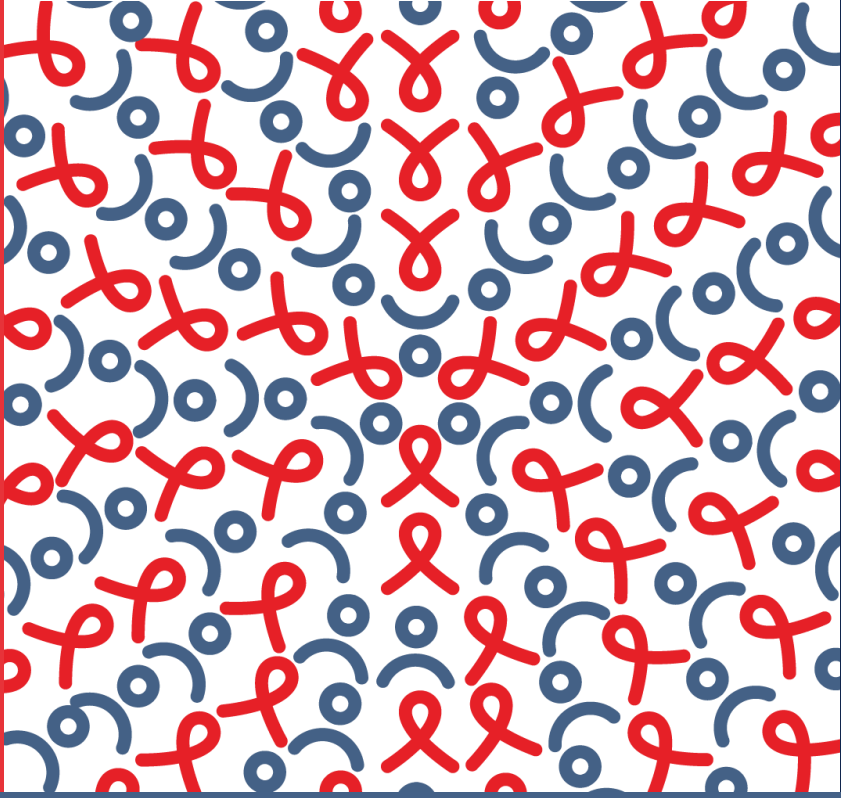


# Knowledge check

1. What are the respiratory hygiene and cough etiquette?
2. What PPE is required?
3. How should a patient be isolated?
4. What are the five moments of hand hygiene?
5. What are the key recommendations for mpox cases and contacts?
6. What are the measures for home isolation?

Q&A





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## Module 12: Communication and Literacy

# Learning objectives

At the end of this module participants will be able to:

- Refer to the general communication considerations and challenges when offering education and counseling about mpox infection
- Use the appropriate informational material when offering education and counseling about mpox infection



# General communication considerations

- Awareness raising among the general population is needed.
- Focus on routes of transmission (close contact, e.g., sex) without emphasizing **who** is most affected.
- Risk communication must be nonstigmatizing (toward affected populations and mpox) and actionable.
- Trusted communicators and channels will be key to acceptance of preventive measures.
- Media engagement will be critical to combating myths and misconceptions and avoiding stigmatization.

# Risk communication challenges

- Most media coverage is focused on *WHO* is affected by mpox not *HOW* it is transmitted
- Myths and misinformation are spreading (e.g., mpox linked to COVID-19 vaccination)
- New disease (for most) that is being defined by early media reports and myths and misinformation
- Stigmatization has slowed risk communication response in many countries

# Guidelines for reducing stigma and discrimination

Source: WHO. Risk communication and community engagement public health advice on understanding, preventing and addressing stigma and discrimination related to monkeypox. Geneva: WHO; 2022.

## Risk communications and community engagement public health advice on understanding, preventing and addressing stigma and discrimination related to monkeypox

1 September 2022

This public health advice from WHO provides information on the potential impact of stigma, recommended language and actions to counter stigmatizing attitudes and discriminatory behaviours and policies related to the monkeypox outbreak. It will be updated as more is known about effective strategies against stigma and discrimination in the context of this outbreak.

### Overview

An outbreak of monkeypox, a viral infectious disease, is currently being reported in countries where the disease had not been found before. The risk of monkeypox is not limited to any one community or any one place. Anyone who has close contact with someone who is infectious is at risk.

Outbreaks of monkeypox in newly affected countries have mostly been identified in communities of gay, bisexual and other men who have sex with men who have had recent sexual contact with a new partner or partners. Communities of trans and gender diverse people linked to the same sexual networks have also been affected.

While the risk is not limited to these groups, the outbreak has become an additional focus for stigma and discrimination directed against men who have sex with men, trans people and broader lesbian, gay, bisexual, trans, queer and intersex communities and their families. Similarly, stigma, discrimination and other expressions of racism towards communities from previously affected regions has increased as a result of the new outbreak of monkeypox.

**Stigma and discrimination connected to any disease, including monkeypox, are never acceptable. They can have a serious impact on health outcomes and undermine the outbreak response by making people reluctant to come forward or seek care. This increases the risk of transmission – both within the most affected communities and beyond.**

The impact of stigma and discrimination on the monkeypox outbreak must be mitigated through active strategies to prevent people being unable or unwilling to access health services and support and to create an enabling environment where people feel able to report their symptoms.

### A note before we start

People often stigmatize others without being aware that they're doing it, and without any malicious intent. People automatically make judgments about others without realizing how it might affect them. In fact, most people have felt ostracized or been treated like a minority at some time in their lives. We all find ourselves perpetuating harmful stereotypes or falling back on unconscious biases at times. Being aware of one's own unconscious bias is important, but even more important is to not allow those implicit biases to cause discrimination to be enabled or ignored.

Proactively reflecting and acting on our own language, behaviour and intentions as individuals and as agencies is essential to reducing the harm caused by stigma and discrimination. Having good intentions is not enough – this interim guidance is for everyone working on or concerned by monkeypox. Fear of perpetuating stigma and discrimination should not stop individuals and organizations from speaking up on important issues; the most important thing we can do is to be reflective, seek feedback, call out stigma and discrimination where we see it and be open to learning and changing our behaviour.

# Communication to general population

- Emphasize mpox is not a disease linked to sexual orientation.
- Repeat accurate information (over and over) to combat emerging rumors; stay “top of mind” for audiences, especially in social media feeds.
- Stress vaccination is not the only preventive measure – diagnostic testing for contact-tracing and other behavioral changes (e.g., infection prevention and control, limit sexual partners) are also important.
- Train media to provide accurate information and address stigmatizing language.

# Key approaches for affected populations

- Work with community representatives to design and adapt messaging and activities with specific audiences.
- Use community-led interventions deployed through trusted networks and platforms.
- Integrate mpox prevention and social and behavior change (SBC) communication into familiar sexual health programs (e.g., HIV prevention, HIV/STI testing, etc.).
- Consider “place-based” interventions (e.g., bars, clubs, saunas, etc.).
- Train providers, contact tracers, and others to help them identify stigmatizing behavior (and avoid it).

## Considerations for stakeholders

- Guidance related to messaging for men who have sex with men, other vulnerable populations, and health care providers
- Training and capacity building for health care providers
- Adapt QuickRes for tracking results of demand-creation activities and linkage to services for clients
- Support countries to build teams to conduct case and contact investigations



# Considerations for program managers

- Transmissions
- Signs and symptoms
- Key populations' risk
- Mpox and HIV
- Treatment and vaccine
- Prevention

Meeting Targets and Maintaining Epidemic Control (EpiC) Project

AUGUST | 2024

## Mpox Fact Sheet and Considerations for HIV Programs

Mpox is a disease caused by the mpox virus (MPXV). The virus belongs to the same family as the virus that causes smallpox and shares similar characteristics but usually presents with milder symptoms. Although mpox is endemic in countries within the rainforests of West and Central Africa and is related to contact with animals that serve as viral reservoirs, it has recently been identified in substantial numbers of people outside these regions. The two clades—branches on the phylogenetic tree—of the virus are the Congo Basin clade I and the West African clade II. Clade I MPXV is more transmissible and causes a higher proportion of severe infections than clade II MPXV.



Since January 1, 2022, cases of mpox have been reported to the World Health Organization (WHO) from 121 of its member states across all six WHO regions.<sup>1</sup> In the multi-country outbreak that began in 2022, cases were primarily found in historically non-endemic countries and locations with no direct travel links to the endemic region. Instead, most of the cases identified were from sexual health clinics in communities of gay, bisexual, and other men who have sex with men (MSM), especially those with multiple partners and extended sexual networks. Therefore, on July 23, 2022, WHO declared the multi-country mpox outbreak a public health emergency of international concern (PHEIC)—the highest public health alert.

From January 2022 through May, 2023, WHO reported 87,377 laboratory-confirmed mpox cases and 140 deaths from 111 reporting countries worldwide. This global outbreak was caused by clade II MPXV. The outbreak subsided significantly in late 2022 and early 2023; on May 19, 2023, WHO lifted the PHEIC.

However, mpox cases continue to be reported from non-endemic countries worldwide. The increase of clade I cases observed during 2023 in the Democratic Republic of the Congo (DRC) and neighboring countries that had not reported mpox before (Burundi, Kenya, Rwanda, and Uganda) confirms the importance of increasing human-to-human transmission, including sexual transmission.

<sup>1</sup> 2022-24 mpox (monkeypox) outbreak: global trends ([shinyapps.io](https://shinyapps.io))

This publication is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the EpiC project and do not necessarily reflect the views of USAID or the United States Government.

Source: Mpox Fact Sheet and Considerations for HIV Programs

# Considerations for community-based organizations

- What is mpox
- Who can get mpox
- How does mpox spread
- What are the symptoms of mpox
- How to protect yourself and others



## MPOX

A tool for community-based organizations

**1** What is mpox?



Mpox is a disease similar to smallpox caused by the mpox virus (*Orthopox virus*). It is called mpox because it was first detected in monkeys.

**2** Who can get mpox?



Anyone in close contact with a mpox infected person has a high risk of infection. Globally, outbreaks of mpox are more prevalent among men who have sex with men (MSM) and transgender people.

**3** How does mpox spread?



- Close physical contact with someone with mpox: including skin-to-skin, kissing (saliva), and sexual intercourse
- Through: bodily fluids, long-term face-to-face contact in long time (exchange of saliva)
- Share clothing, bedding, towels, eating utensils, dishes, or similar personal items that have been contaminated with the mpox virus via blisters and sores of an infected person

# Considerations for providers

- What is mpox
- How mpox spreads
- What are the symptoms of mpox
- Complications
- Differential diagnosis
- When to suspect a case of mpox
- How to educate the community
- What to do when encountering a suspect case



## MPOX

For health staff

Mpox is commonly found in Central and West Africa. An outbreak is currently taking place in numerous countries that do not typically have cases. Some cases have been identified in communities of gay, transgender, bisexual and other men who have sex with men.

### 1 What is mpox?

Mpox is a disease similar to smallpox caused by the mpox virus (Orthopox virus). It is called mpox because it was first detected in monkeys.

### 2 How does mpox spread?



- Close physical contact with a mpox patient who has symptoms including skin-to-skin contact, kissing (saliva), sexual intercourse
- Through bodily fluids shared during long-term face-to-face contact
- Possible infected through clothing, bedding, towels or objects like eating utensils/dishes that have been contaminated with the mpox virus from blisters, sores of an infected person

### 3 What are the symptoms of mpox?

Incubation period:  
5 -21 days

Common:  
6 - 13 days

- ✓ The first sign is fever
- ✓ Rash begins within one to three days of the start of a fever
  - The number of lesions can range from a few to several thousand
  - The rash is similar to smallpox, often centrifugal, tends to be concentrated on the face, palms of the hands, and soles of the feet. It can also be found on the mouth, genitals, and eyes
  - Lesions can be flat or slightly raised, filled with clear or yellowish fluid, and can then scab, dry up, and fall off
- ✓ Swollen lymph nodes
- ✓ Accompanying symptoms include headache, muscle aches, back pain, and low energy

# What community members need to know

03/08/2022



## MONKEYPOX: WHAT YOU NEED TO KNOW

### An outbreak of monkeypox is occurring in many countries:

- WHO has declared a public health emergency of international concern.
- Monkeypox is preventable. Most people recover fully, but some people can get seriously ill.
- Symptoms can be uncomfortable and painful.
- While monkeypox can affect anyone, most cases in this outbreak are among men who have sex with men
- What we know about the outbreak is changing fast – we are learning more every day

### Symptoms of monkeypox often include:

- Rash on face, hands, feet, body, perianal area or genitals
- Rash in mouth, throat, eyes, vagina and anus
- Fever
- Swollen lymph nodes
- Headaches
- Muscle and back aches
- Low energy
- Painful swelling inside your rectum (proctitis)
- Pain or difficulty when urinating



### You can catch monkeypox through close contact with someone who has symptoms including:

- Skin-to-skin (e.g., touching, anal and vaginal sex)
- Face-to-face (e.g., talking, singing, breathing)
- Mouth-to-skin (e.g., oral sex)
- Mouth-to-mouth (e.g., kissing)
- From contaminated bedding, towels, clothing, surfaces or objects



### Protect yourself from monkeypox:

- If someone you know is diagnosed with or has suspected monkeypox, avoid close contact with them
- Know the symptoms and check yourself regularly
- If you have symptoms, seek health advice and self-isolate while you wait to get tested
- Get vaccinated if it is available to you
- Follow advice to reduce the risk of infection if you live with someone who has monkeypox

### Monkeypox can spread through sex :

- People who have sex with multiple or new partners are most at risk
- Check yourself regularly for symptoms and ask partners to do the same
- If monkeypox is impacting your community, you can reduce your risk by reducing your number of sexual partners, waiting for a while before having sex with any new partners or taking a break from sex
- Have open, non-judgmental conversations. Swap contact details with sexual partners and agree to let each other know if you develop symptoms
- Condoms will prevent some STIs. They may also reduce your risk of exposure to monkeypox, but they will not prevent you becoming infected through close physical contact

### If you think you have monkeypox:

- Get advice from a health worker
- Get tested
- Isolate at home if your health worker recommends you do so
- Take care of your rash, physical and mental health
- Protect others by avoiding close contact with them
- If you are sharing a house with others while isolating, stay in separate rooms, frequently clean hands, clean/disinfect objects and surfaces often and open windows
- Avoid contact with your pets

Stigmatising people because of a disease is never ok.

Anyone can get or pass on monkeypox.  
Together, we can end this outbreak.

Source: WHO. Monkeypox: what you need to know. Geneva: WHO; 2022.



# What sex workers need to know

## Public health advice for sex workers on monkeypox

30 September 2022

### Overview

An outbreak of monkeypox, a viral infectious disease, is currently being reported in countries where the disease had not been found before. The risk of monkeypox is not limited to any one community or any one place. Anyone who has close contact with someone who is infectious is at risk.

Outbreaks of monkeypox in newly affected countries have mostly been identified in communities of gay, bisexual and other men who have sex with men who have had recent sexual contact with a new partner or partners. Communities of trans and gender diverse people linked to the same sexual networks have also been affected.

We know that this outbreak is concerning, especially for people who are unwell, their partners, families and communities, and for people whose work require close contact with others, including sex workers. Many sex workers will struggle financially if they are unable to work either by avoiding close contact with clients who have monkeypox or while isolating because they have suspected or confirmed monkeypox. This issue is likely to be particularly acute where there is no social protection or financial support available from their governments in their setting.

Some sex worker-led organizations established mutual aid schemes during the COVID-19 pandemic. Similar schemes may be possible in your country if organizations are beginning to develop emergency response funds for emerging health crises that prevent sex workers from earning an income. Identifying, establishing and raising awareness about these schemes is essential to create an environment in which sex workers can protect themselves and others from transmission.

### How to use this document

This document includes public health advice for sex workers of all genders on protecting themselves and others against monkeypox. It is intended for use by sex workers, sex worker-led organisations, community leaders, advocates, health service providers (especially those in sexual health service delivery) and organisations working to promote the health of sex workers.

The information in this document can be used as a basis for formal and informal community conversations, information sessions, or producing community information, to inform sex workers on how to protect themselves and others. **The information included here can and should be adapted to the local context and sex work setting depending on the needs of the community.**

### THE SHORT READ

#### Key points about monkeypox

Monkeypox is caused by a virus. Symptoms can include a rash, fever or body aches, among others.



Monkeypox can spread through touching, kissing, and oral, vaginal and anal sex.



To protect yourself and others:

- Know the symptoms and check yourself regularly
- Have open conversations with close contacts where it is safe to do so
- Avoid close contact with someone who has it
- Seek health advice and get tested if you have been exposed or have symptoms
- Isolate if you have monkeypox, whenever possible
- Get vaccinated if it is available to you



Having or being exposed to monkeypox is nothing to be ashamed of.



Anyone can get monkeypox.

Let's take care of each other and get rid of monkeypox together.

Source: WHO. [Public health advice for sex workers on monkeypox](#). Geneva: WHO; 2022.



## Protect yourself and others from monkeypox



- Know the symptoms and check yourself regularly; ask sexual partners to do the same.
- Reduce your risk by reducing your number of sexual partners, waiting for a while before having sex with any new partners, or taking a break from sex.
- Have open, nonjudgmental conversations. Swap contact details with new sexual partners and agree to let each other know if you develop symptoms.
- Condoms will prevent some STIs. They may also reduce your risk of exposure to mpox and could help reduce painful symptoms should you become infected, but they will not prevent you from becoming infected through close physical contact.
- If someone you know is diagnosed with or has suspected mpox, avoid close contact with them, including sexual contact.
- If you develop symptoms, seek health advice. You will be offered testing. Self-isolate while you wait for a test.
- If someone you know is diagnosed with or has suspected mpox, avoid close contact with them. Clean and disinfect environments that could have been contaminated with the virus from someone who is infectious.
- Stay informed about mpox in your area.
- Get vaccinated if it is available to you. If you've had a vaccine, be aware that full protection can take some weeks – avoiding sex during this period is a good idea.
- Combat misinformation by sharing only reliable, evidence-based, and non-stigmatizing information from trustworthy sources.



## Advice for men who have sex with men on preventing monkeypox





# What individuals with mpox need to know

## Recovering from monkeypox at home

If you think you might have monkeypox, self-isolate and contact a health worker immediately. If they advise that you isolate at home, keep in touch with them and seek immediate advice if your rash becomes more painful, shows signs of being infected (such as fever, redness or pus), if your fever, nausea or vomiting get worse, if you are unable to eat or drink, have difficulty breathing or if you feel dizzy or confused.

### How to take care of yourself if recovering at home:



Keep hydrated, eat well and get enough sleep. Use medication for pain and fever if needed.



#### Take care of your rash:



Don't scratch



Clean your hands before and after touching lesions



Keep your rash dry and uncovered



Keep rash clean with sterilised water/antiseptic



Rinse lesions in your mouth with salt water



Take warm baths with baking soda/Epsom salt



Use paracetamol to manage the discomfort of lesions, if needed

#### Take care of your mental health:



Do things you find relaxing/enjoyable



Stay connected



Exercise if you feel well enough and can do so while isolating



Ask for support if needed

### How to protect others if you are isolating at home:

**Avoid contact with anyone** until all of your lesions have scabbed over, fallen off and a fresh layer of skin has formed. Ask friends or family to deliver supplies.

#### If you live with other people:



Isolate in a separate room



Use a separate bathroom, or clean and disinfect (with household disinfectant) after each use



Clean hands frequently using soap and water or an alcohol-based hand sanitizer



Clean and disinfect frequently touched surfaces and objects with soap and water and household disinfectant



Avoid sweeping and vacuuming



Use separate dishes, cups, bedding, towels and electronics such as phones



Do your own laundry. Put everything in a plastic bag before carrying it to the washing machine. Use soap and water > 60 degrees.



Open windows

#### If you can't avoid being in the same room as someone else:



Cover rash with clothing/bandages



Avoid touching each other



Wear well-fitting medical masks



Open windows



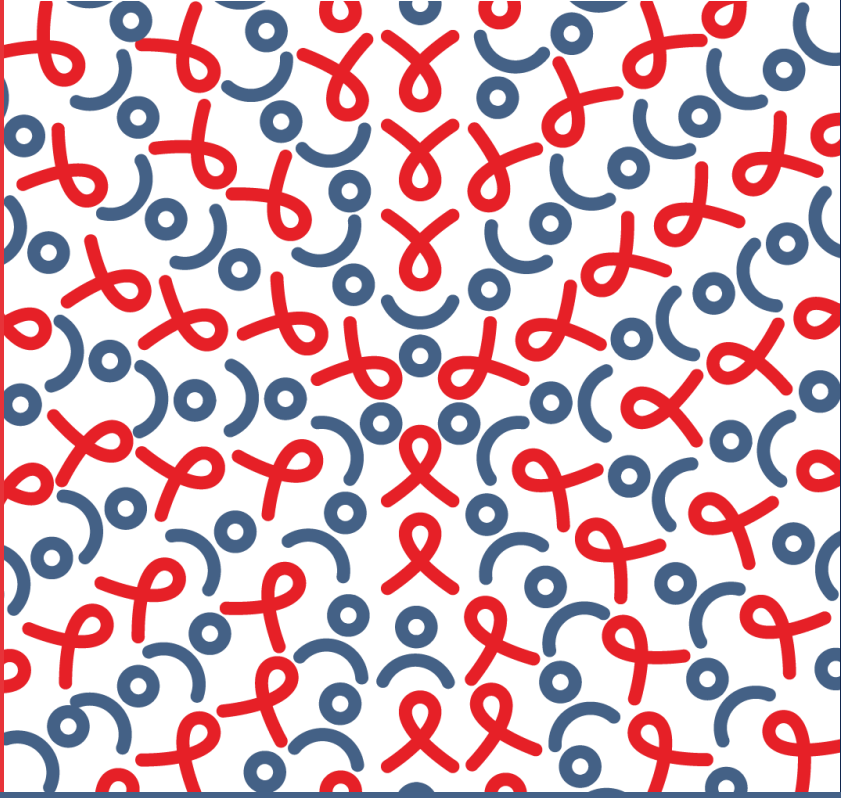
Clean hands often

# Knowledge check

1. What are the communication considerations?
2. What are the risk communication challenges?
3. What are the key principles about communicating with the general population?
4. What are the key communication approaches for affected populations?

Q&A





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## Module 13: Surveillance, Monitoring, and Evaluation

# Learning objectives

At the end of this module participants will be able to:

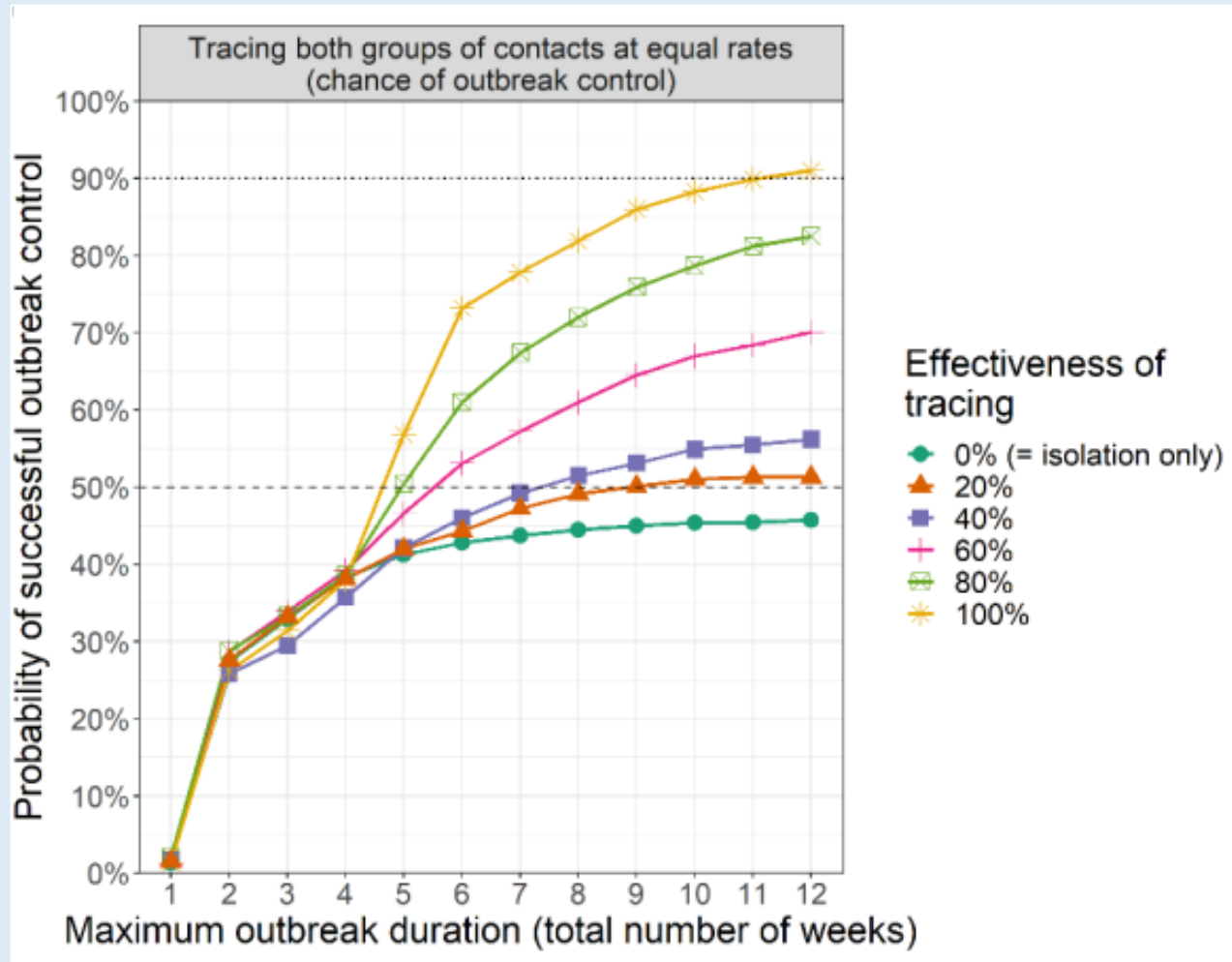
- Describe the goal and objectives of surveillance
- List and define the WHO and PEPFAR indicators
- Use the WHO monitoring and evaluation (M&E) tools
- Describe how indicators can be captured on QuickRes

# Surveillance

- The overall goal of surveillance, case investigation, and contact tracing is to stop human-to-human transmission and to control the outbreak.
- The key **objectives** of surveillance and case investigation for mpox in the current context are to:
  1. Provide optimal clinical care
  2. Isolate cases to prevent further transmission; identify, manage, and follow-up contacts to recognize early signs of infection
  3. Identify risk groups for infection and for severe disease
  4. Protect frontline providers
  5. Tailor effective control and prevention measures

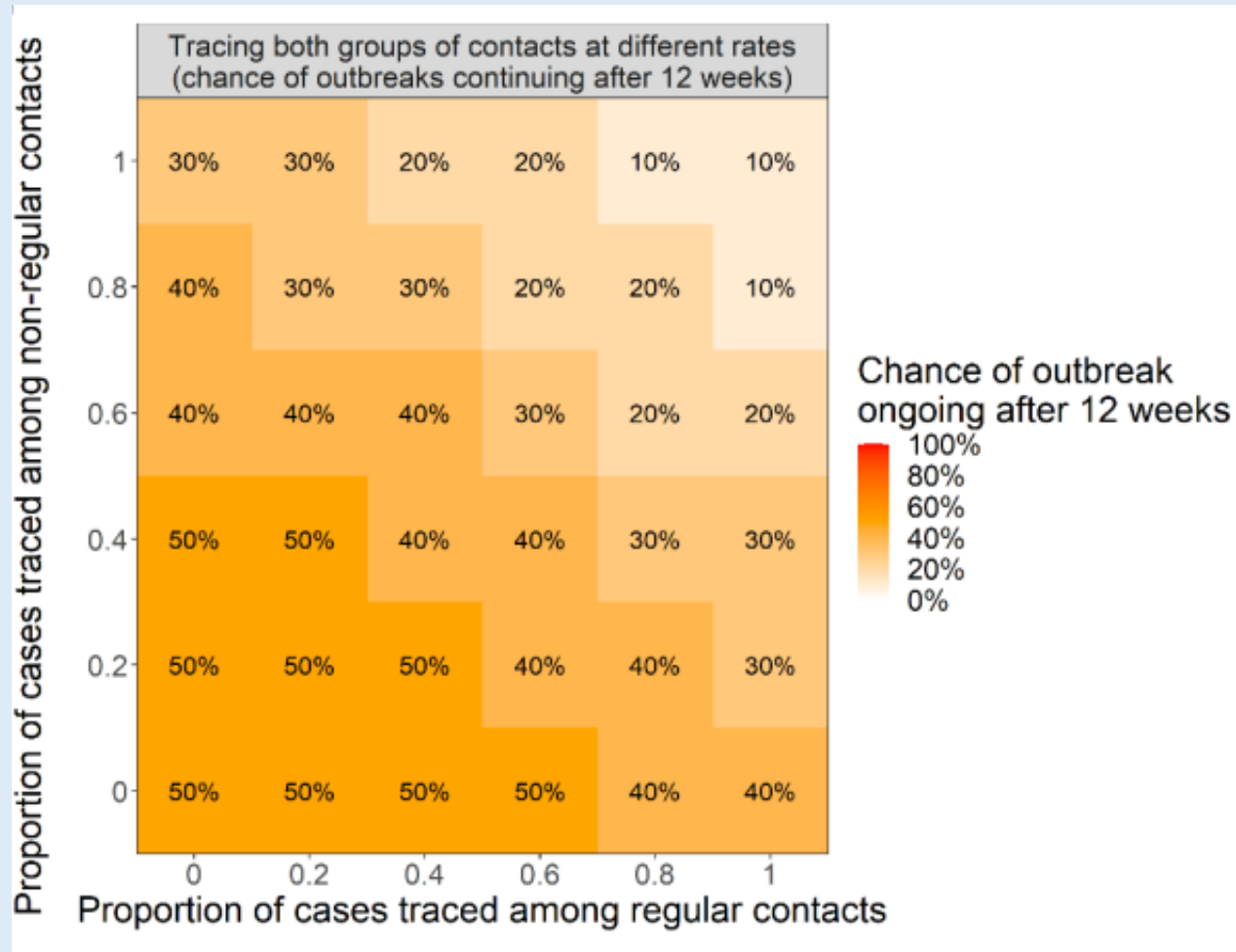


# Probability of successful outbreak control through tracing cases among the contacts



Simulation results of **successful** outbreak control over time, up to 12 weeks, where cases among the contacts are assumed to be traced with the same success rate

# Probability of unsuccessful outbreak control through tracing cases among the contacts



Simulation results of **unsuccessful** outbreak control over time, up to 12 weeks, for which contact tracing of contacts occurs at different success rates

# WHO indicators

- Proportion of suspect, probable, and confirmed cases with identified contacts
- Number of contacts reported per suspect, probable, and confirmed case
- Proportion of identified contacts with complete follow-up information
- Proportion of cases coming from a contact tracing list
- Proportion of high- and medium-risk contacts who received post-exposure prophylaxis

# Mpox death

- Death resulting from a clinically compatible illness in a **probable or confirmed** mpox case, unless there is a clear alternative cause of death that cannot be related to mpox infection (e.g., trauma).
- Diagnosis for mpox can also be confirmed after the death has occurred if there is sufficient lesion material to perform a PCR testing.
- There should be **no period of complete recovery** between the illness and death.

# PEPFAR-USAID indicators

- **MPX\_RISK\_REDUCTION:** Number of risk-reduction interventions implemented to minimize the spread of MPXV
- **MPX \_LAB\_SUPPORT:** Number of USAID-supported laboratories able to test for MPXV
- **MPX\_CASE:** Number of MPV cases detected through USAID-supported activities
- **MPX \_FAC\_SUPPORT:** Number of facilities receiving USAID support to strengthen infection prevention and control (IPC) practices
- **MPX \_TRAINED:** Number of people trained to prevent, detect, and respond to the MPXV outbreak
- **MPX \_RISK\_COMM:** Number of individuals reached with risk communications messaging about MPXV

WHO Indicator	QuickRes (QR)
Proportion of suspect, probable, and confirmed cases with identified contacts	We can add a disaggregation for records added to QR to have the case screening status as (1) suspect, (2) probable, or (3) confirmed; (however the definitions for this would not be presented in QR, that would be based on separate guidance and SOPs).
Number of contacts reported per suspect, probable, and confirmed case	The suspect, probable, and confirmed cases recorded on QR are linked to the client referral tool where we can track in a separate database the number of referrals each of those cases made and if “MPX” was selected from the list of conditions on the client referral tool for each of those contacts.
Proportion of identified contacts with complete follow-up information	For each contact referred on the client referral tool, QR will automatically book an incomplete appt with TBD appt date, time, provider, blank client name, but it will include “referral - MPX” under the services requested on the appt record and the phone number of the contact. At this stage it looks like a pending referral on the system, and then someone on the program side (contact investigator) should call the phone number, go into QR, and add the client name, other demographic info, and can then assign the record to a specific provider with date and time. When the record is saved, it will appear as an appt with a specific provider who can call the client and take them through the MPX screening and note the results on their same file as (0) not-suspect, (1) suspect, (2) probable, or (3) confirmed. This screening may also be done via an in-person appt (the provider/contact tracer SOPs would determine how that should be done).
Proportion of cases coming from a contact tracing list	As soon as the appt for the contact (which was auto-booked using the above-described method) has their MPX status changed to (2) probable or (3) confirmed, then we can track the number of cases that sourced as a contact.
Proportion of high- and medium-risk contacts who received post-exposure prophylaxis	At the contact stage, QR itself would not capture the risk of the contact/transmission. Right now, we only capture “MPX” from a list of services when the original case makes that referral and responds to the question: “If you potentially exposed this person to an infection, select the screening services we should recommend to them.” That said, if the client referral tool is managed by a program staff or health worker, they can use an SOP to ensure they only ever enter medium- and high-risk contacts on the client referral tool. Then, as those referrals are made, and appts booked for the contact, then on the contact’s appt, we can track the provision of post-exposure prophylaxis.
Monkeypox death	All MPX cases appear on QR as an appt where the MPX clinic action button is set to status: (2) probable, or (3) confirmed, then we can add that record to a new case management cohort called MPX. That means a case manager can be assigned to follow up with the client over time until they can close the case as recovered or died (or other status). However, there is no indication of the cause of death – only to mean that they died while on MPX case management and before they recovered, and the case is closed and does not require any additional follow-up.




PEPFAR-USAID Indicator	QuickRes
MPX_RISK_REDUCTION	QuickRes is not well suited to capture these kinds of # of activities type of indicators.
MPX _LAB_SUPPORT	It is possible to capture this. We would add all the USAID-supported labs to QuickRes, assign those labs an org unit that specifies if they are USAID or not USAID-supported. Then we can add a service offering for those labs on QuickRes that says MPX testing, we could make this unique from mpox screening as a service.
MPX_CASE	This can be captured on QuickRes, it is addressed above.
MPX _FAC_SUPPORT	QuickRes is not well suited to capture these kinds of # of activities type of indicators.
MPX _TRAINED	QuickRes is not well suited to capture these kinds of # of activities type of indicators.
MPX _RISK_COMM	Virtual communication platforms themselves can be used to track the number of “profiles” exposed to mpox risk communication messages, maybe not perfectly representing individuals. For instance, reach on Facebook ads or other social media platforms. Also, it is quite challenging or impossible to deduplicate reach between platforms so you could present disaggregated results by platform with an asterisk that the totals between each platform are likely to overlap slightly. QuickRes itself may be able to be used for tracking reach of individual risk communication; if, for instance, your risk communication is provided by a booked appt on QuickRes for a virtual or in-person consult on mpox with program staff, outreach worker, case manager, or provider.

## Go.Data platform: In-depth case investigation form


- Global Outbreak Alert and Response Network (GOARN)  
Go.data software is designed to facilitate rapid data entry, offer better visualization of chains of transmission, and runs in stand-alone and connected modes, enabling more flexible ways of working and improved data sharing.
- It allows for case and contact data collection and visualization of disease transmission that can help responders choose the right interventions to stop a disease from spreading.
- Available from: [Go.Data | GOARN \(who.int\)](https://www.who.int/go-data-goarn)

# Contacts listing form

Example  
from South  
Africa

**NATIONAL INSTITUTE FOR  
COMMUNICABLE DISEASES**  
Member of the National Health Laboratory Service

**MONKEYPOX CONTACT LISTING FORM**

**health**  
Department of Health  
REPUBLIC OF SOUTH AFRICA

**Case information**

Name	Surname	Contact details	Address/Location	Sub-district	District	Province	Date of symptom onset (dd/mm/yyyy)

**Contact information**

*For all information pertaining to location, please list information on where the contact will be residing for the monitoring period should need arise*

No	Name	Surname	Sex (M/F)	Age (yrs)	Relation to case	Date of last contact with case (dd/mm/yyyy)	Type of contact (1, 2, 3)*	Address/Location	City/Town	Sub- district	District	Province	Contact number	Occupation



**\*Types of contact**  
1 = Face-to-face exposure without wearing appropriate PPE  
2 = Direct physical contact with skin/skin lesions (e.g. sexual)  
3 = Contact with contaminated materials (e.g. clothing, bedding, utensils)

**Person completing form:**  
Name & Surname: \_\_\_\_\_ Occupation: \_\_\_\_\_ Contact number: \_\_\_\_\_ Date: \_\_\_\_\_ Facility name: \_\_\_\_\_

SA\_MONKEYPOX CLF\_27 May 2022

# Contacts monitoring form

Example  
from South  
Africa



**MONKEYPOX CONTACT MONITORING TOOL**

**Details of confirmed monkeypox case**

Name: \_\_\_\_\_ Surname: \_\_\_\_\_ Date of birth (dd/mm/yyyy): \_\_\_\_\_ Age (yrs): \_\_\_\_\_ Sex (M/F): \_\_\_\_\_

**Details of contact (person under observation)**

Name: \_\_\_\_\_ Surname: \_\_\_\_\_ Date of birth (dd/mm/yyyy): \_\_\_\_\_ Age (yrs): \_\_\_\_\_ Sex (M/F): \_\_\_\_\_

Address/Location: \_\_\_\_\_ Sub-district: \_\_\_\_\_ District: \_\_\_\_\_ Province: \_\_\_\_\_

Date of last contact with case: \_\_\_\_\_ Place of last contact: \_\_\_\_\_ Relation to case: \_\_\_\_\_

Type of contact (1, 2, 3): \_\_\_\_\_ Occupation: \_\_\_\_\_ Place of employment/School: \_\_\_\_\_

**Details of observation officer:** Name & Surname: \_\_\_\_\_ Contact number: \_\_\_\_\_ Occupation: \_\_\_\_\_

Person completing the form should initial daily in row 3 below\* - (next page) - may vary depend on type of monitoring (passive, active or direct)\*\*

**\*\* Passive monitoring:** persons under observation self-monitor themselves

**Active monitoring:** health official checks at least once a day if a person under observation has self-reported signs/symptoms

**Direct monitoring:** health official conduct daily physical visit

SA\_MONKEYPOX CMT version1 26 May 2022

Source: National Institute for Communicable Diseases (NICD). Surveillance: key reference documents—[contact monitoring tool](#) (Jun 2022) [Internet c. 2023]. Johannesburg: NICD; 2022.

# Case report form (WHO)

- Probable and confirmed cases of mpox should be reported as early as possible to WHO through national IHR focal points (NFPs) under Article 6 of the International Health Regulations (IHR 2005).
- The WHO Global Clinical Platform for Mpox (Monkeypox)



## Global Clinical Data Platform

# Monkeypox

## CASE REPORT FORM (CRF)

## INTRODUCTION

The Rapid Core CRF is designed to collect data obtained through examination, interview and review of hospital or clinic notes of patients with suspected, probable, or confirmed monkeypox infection. Data may be collected prospectively or retrospectively. The data collection period is defined as the period from hospital admission, or first clinic visit to discharge from care, transfer, death, or continued hospitalization without possibility of continued data collection.

This CRF has three modules:

- |                          |  |
|--------------------------|--|
| <b>Module 1:</b>         | To be completed on the first day of presentation or admission to the health centre (baseline visit).                     |
| <b>Module 2:</b>         | To be completed daily during hospital stay for as many days as resources allow, or on follow-up visits to health centre. |
| <b>Module 3:</b>         | To be completed at last visit, either hospital discharge, transfer, last outpatient follow-up or death.                  |
| <b>Pregnancy module:</b> | To be completed if currently pregnant or recently pregnant $\leq 21$ days.   |

## GENERAL GUIDANCE

Participant identification numbers consist of a site code and a participant number. You can register on the data management system by completing [MPX Registration Form](#), and our data management team will contact you with instructions for data entry and will assign you a 5-digit site code at that time. Please contact us at [monkeypox\\_clinicaldatapatform@who.int](mailto:monkeypox_clinicaldatapatform@who.int) for any further information.

# Mpox Case Investigation Form (CIF) and Case Reporting Form (CRF)

- WHO has updated the mpox case investigation form (CIF) and case reporting form (CRF) to include the latest information on symptomatology and epidemiological parameters, and to align with the recommendations of the latest mpox Emergency Committee meeting.
- The CIF has been designed to conduct in-depth epidemiological investigation of suspected, probable, and confirmed cases of mpox. It allows collection of information prospectively or retrospectively for both cases and their contacts.
- The full form is meant to serve as a tool for in-country use, and the data are not required to be reported to WHO.



# Line list and case investigation form (WHO)

Reporting County or State: \_\_\_\_\_ Date of Initial Report: \_\_\_\_\_

CaseID*	Case Initials	Age	Sex	Onset date	Current Status	Location	Case category	EpiLinks	Underlying conditions

**Case ID (IDSR /Epid No):** Unique identifier assigned to each case-patient

**Case name or initials**

**Age** in years or months under age 5 years; **Sex:** Male, Female, not known

**Symptom onset:** date mm/dd/yy; symptom type

**Rash onset :** Date mm/dd/yy; location of rash

**Current status:** Ill / recovered/, died

**Location:** Address, village, county / district, hospital

**Case category:** Confirmed, probable, suspect

**Epi Links:** Known exposures, affiliations or connections to other cases

**Underlying conditions:** Immunodeficiency, HIV status, malnutrition, medications

## Appendix 2: Nigeria Monkeypox Case Investigation Form

Epid number: \_\_\_\_\_  
Date of investigation: \_\_\_\_/\_\_\_\_/\_\_\_\_

Case reported by name \_\_\_\_\_ title \_\_\_\_\_ phone no. \_\_\_\_\_

**Section 1: Patient Identity**

1. Last Name \_\_\_\_\_ First Name \_\_\_\_\_
2. For children, father's name \_\_\_\_\_
3. Date of birth \_\_\_\_/\_\_\_\_/\_\_\_\_
4. Age in days (neonate) \_\_\_\_\_ Age in months (infant) \_\_\_\_\_ Age in years (others) \_\_\_\_\_
5. Gender ☐ M ☐ F
6. Village/settlement/street of residence during the last 3 weeks \_\_\_\_\_
7. State \_\_\_\_\_ LGA \_\_\_\_\_ WARD \_\_\_\_\_
8. Nationality \_\_\_\_\_ Ethnicity / Tribe \_\_\_\_\_
9. Occupation of the patient \_\_\_\_\_

**Section 2: Patient status**

10. Status of the patient: ☐ Alive ☐ Dead
11. If dead, date of death \_\_\_\_/\_\_\_\_/\_\_\_\_ Place of death: \_\_\_\_\_
12. Place of the funeral, name village: \_\_\_\_\_ LGA \_\_\_\_\_ State \_\_\_\_\_
13. Is a Smallpox vaccination scar present? ☐ Yes ☐ No

**Section 3 : Clinical History / Presentation**

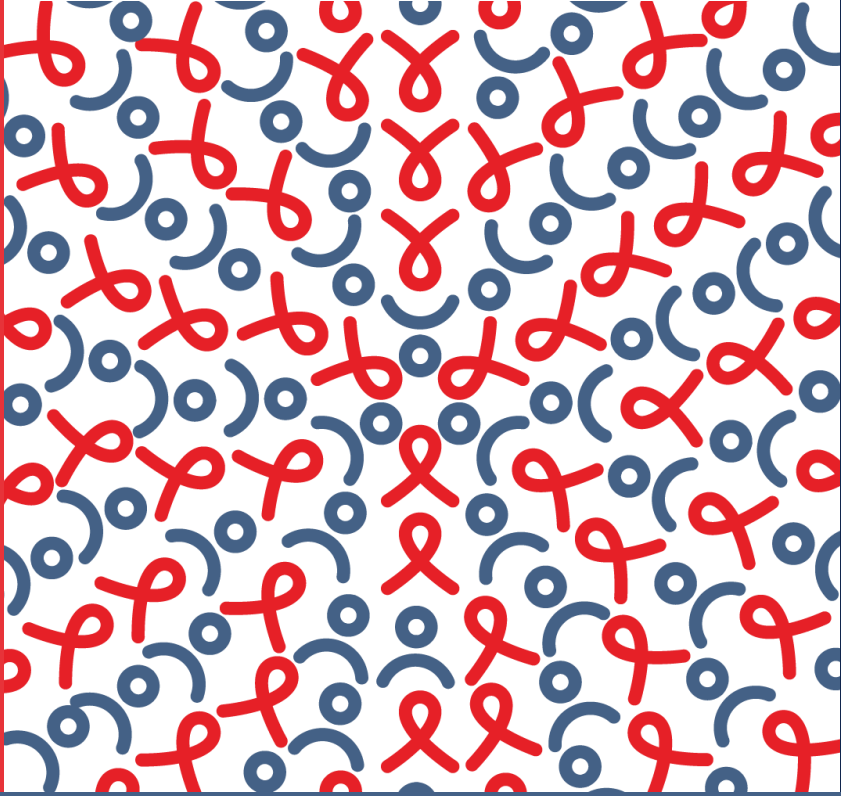
14. Date of onset of symptoms: \_\_\_\_/\_\_\_\_/\_\_\_\_
15. Name of the village / LGA/State where the patient got ill: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Country: \_\_\_\_\_
16. a. Did the patient travel anytime in the three weeks before becoming ill? ☐ Yes ☐ No  
b. If yes, indicate the places: (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_  
Others: \_\_\_\_\_
17. a. Did the patient travel during illness? ☐ Yes ☐ No  
b. If Yes, indicate the places: (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_  
Others: \_\_\_\_\_
18. Does the patient have a cutaneous eruption/rash? ☐ Yes ☐ No
19. If yes, date of onset for the rash: \_\_\_\_/\_\_\_\_/\_\_\_\_
20. Did the patient have fever? ☐ Yes ☐ No If yes, date of onset for the fever: \_\_\_\_/\_\_\_\_/\_\_\_\_
21. If there is active disease,
  - a. Are the lesions in the same state of development on the body? ☐ Yes ☐ No
  - b. Are all of the lesions the same size? ☐ Yes ☐ No
  - c. Are the lesions deep and profound? ☐ Yes ☐ No
22. Localisation of the lesions: ☐ Face ☐ Legs ☐ Soles of the feet ☐ Palms of the hands  
☐ Thorax ☐ Arms ☐ Genitals ☐ All over the body  
List other areas: \_\_\_\_\_
23. Did the patient develop ulcers? ☐ Yes ☐ No

# Knowledge check

1. What are the objectives of surveillance?
2. What are the WHO indicators?
3. What are the USAID indicators?
4. What indicators can QuickRes capture?
5. What case categories should be reported to WHO?

Q&A





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## Module 14: EpiC Response

# Learning objectives

At the end of this module participants will be able to:

- Describe the EpiC project scope and response to mpox

# Scope of the response under EpiC

- Risk communication and community engagement for men who have sex with men and other vulnerable populations and health care providers
- Training and capacity building for health care providers, including community-based teams
- Support for the adaptation of QuickRes for tracking results of demand-creation activities and linkage to services for clients
- Support to build teams to conduct case and contact investigations
- Support related to diagnostics and laboratory biosafety



# How EpiC is responding to mpox outbreak

- Engaged by USAID to lead efforts across six countries: Benin, Dominican Republic, Ghana, Guatemala, Jamaica, Morocco (MENA)
- Engagement of key populations community across several countries
- Development of fact sheet on mpox
- Webinars and technical meetings (internal and global)
- Engagement and collaboration with USAID missions, ministries of health, implementing partners, etc.

# How EpiC is supporting the response to mpox outbreak

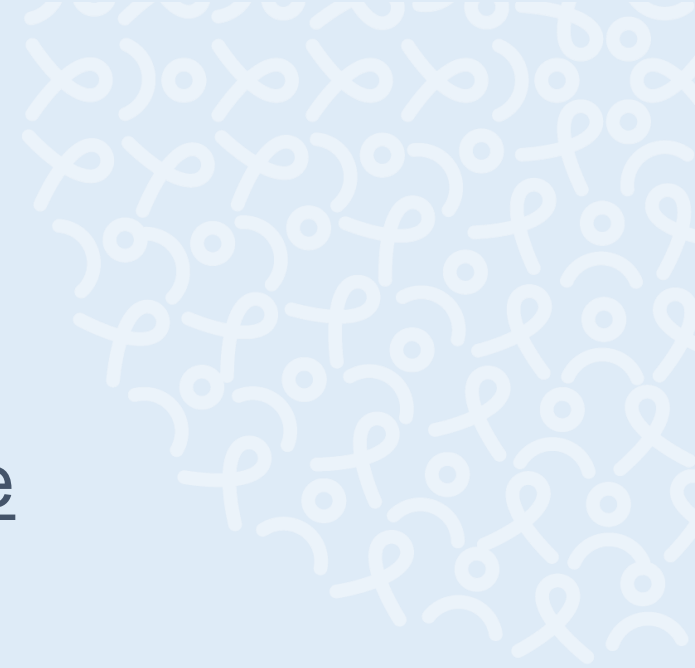
- Engaged by USAID to lead efforts across 9 countries: Benin, Burundi, Dominican Republic, DRC, Ghana, Guatemala, Jamaica, Morocco (MENA), and Nigeria
- Engagement of key populations community across several countries
- Development of factsheet on mpox (English, French, Portuguese, Spanish)
- Webinars and technical meetings (internal and global)
- Engagement and collaboration with USAID Missions, Ministries of Health, Implementing Partners, etc.

# Rapid and sustained community mobilization

- Developing prevention messages
- Sharing and amplifying scientifically correct information in a timely fashion
- Collaborating with all actors from public health to the private sector
- Promoting the vaccine and where and how to receive it

# Stay updated on the evolving WHO recommendations

- Third meeting of the International Health Regulations (2005) (IHR) Emergency Committee regarding the multi-country outbreak of mpox (who.int)



# Resources

- [Mpox \(monkeypox\) outbreak 2022 - Global \(who.int\)](#)
- [Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, 10 June 2022 \(who.int\)](#)
- [Mpox health topics page \(who.int\)](#)
- [Mpox Content Collection \(thelancet.com\)](#)
- [Mpox | CDC](#)
- [Monkeypox | Johns Hopkins Medicine](#)

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EpiC is a global cooperative agreement dedicated to achieving and maintaining HIV epidemic control. It is led by FHI 360 with core partners Right to Care, Palladium, and Population Services International (PSI).