Mpox Unveiled: *The New Viral Threat You Need To Know*

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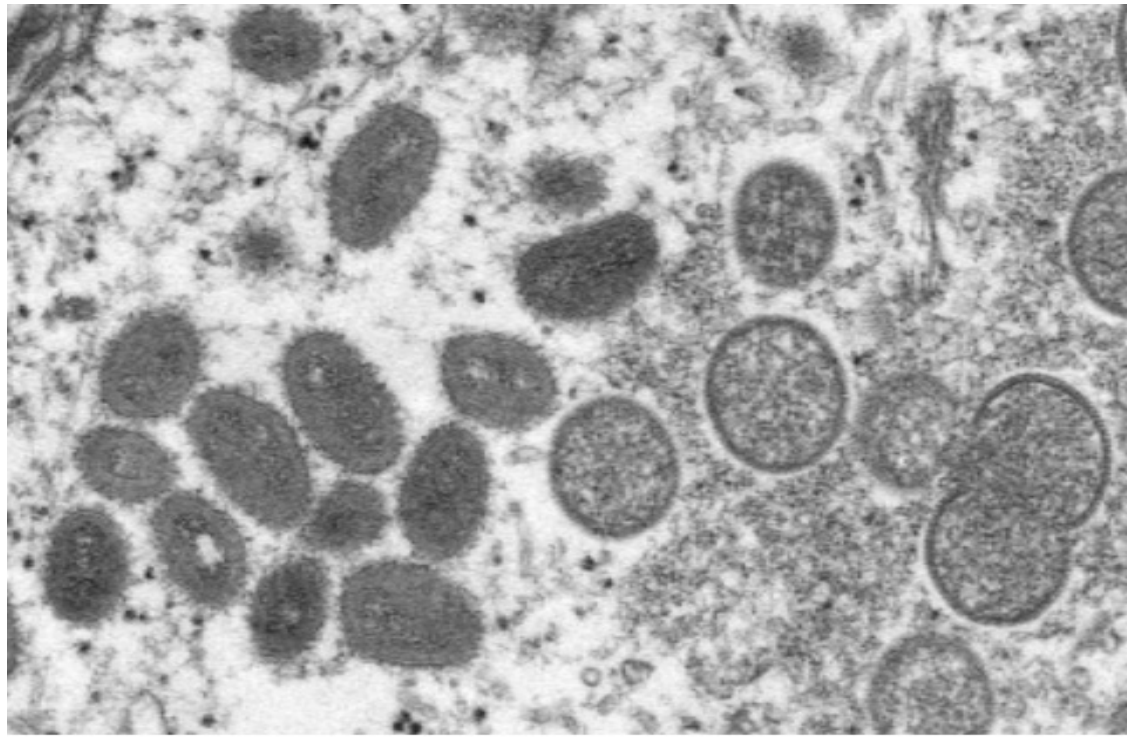
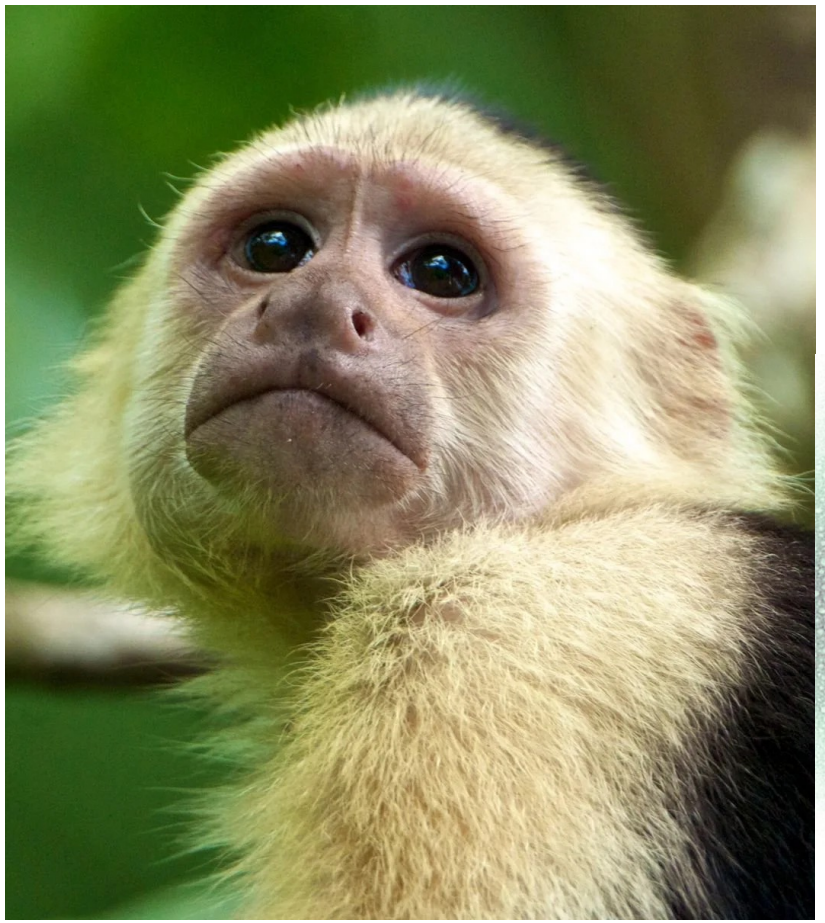
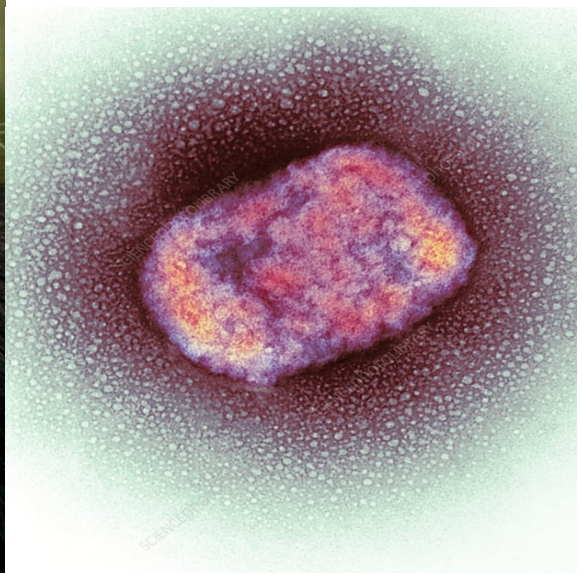
Outline

- Introduction
- Epidemiology
- Mode of transmission
- Case definition
- Clinical presentation
- Laboratory testing
- Case management & treatment
- Case notification & contact tracing
- Infection Prevention & Control (IPC)
- Health education & stigma
- References



Introduction





What is Mpox?

It is a viral zoonosis→transmitted to humans from animals

It is caused by the monkeypox virus →*orthopoxvirus* genus of the *Poxviridae* family.

There are two clades of monkeypox virus

- Congo Basin / Central African clade (Clade 1) & West African clade (Clade 2)

First discovery in a Danish laboratory in 1958.

The first human case→ in a child in the Democratic Republic of the Congo in 1970.

Mpox Clades

Clade 1

- Causes more severe illness and death
- Endemic to Central Africa

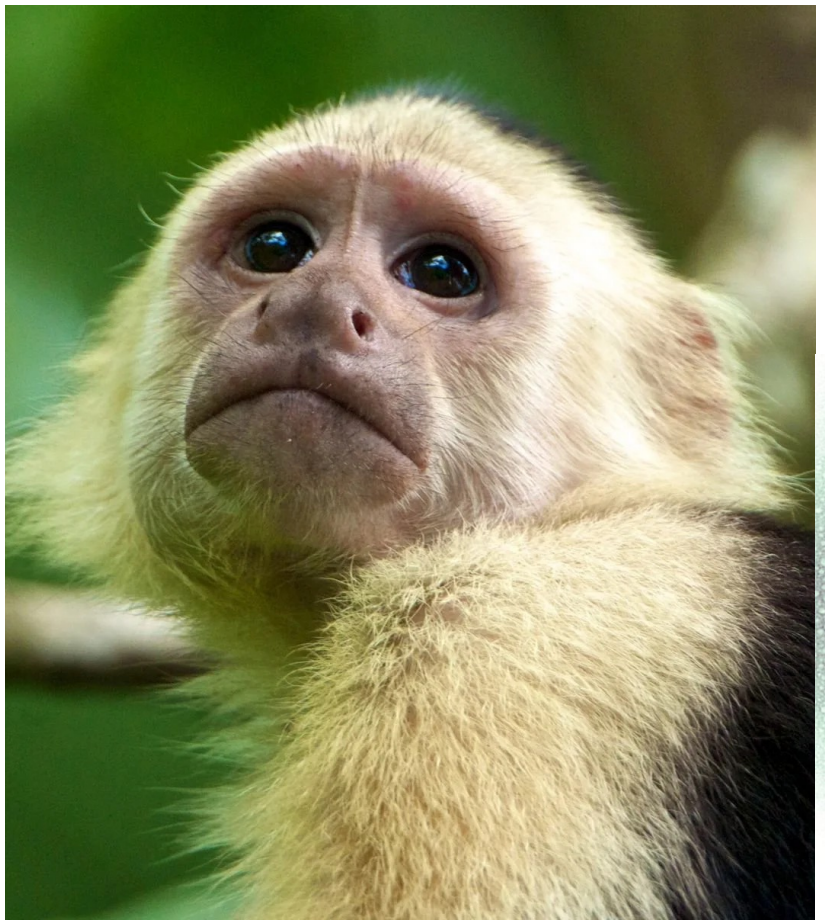
Clade 2

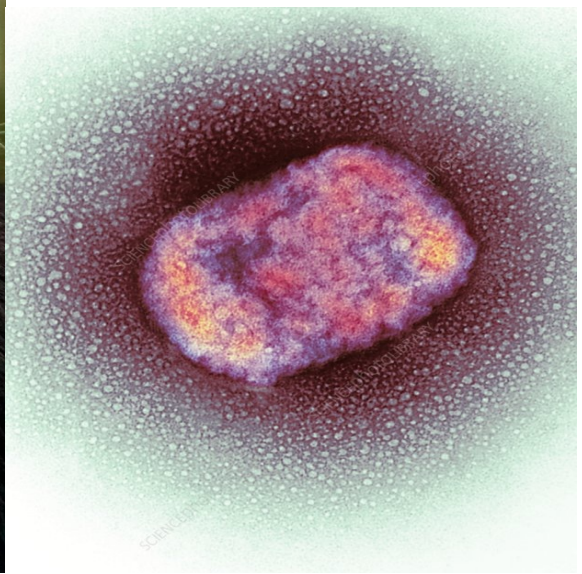
- The cause of the 2022 global outbreak: 99 176 cases worldwide and 208 deaths
- Less severe infection
- 99.9% infected people **survive**
- Endemic to West Africa

Timeline of Significant Events

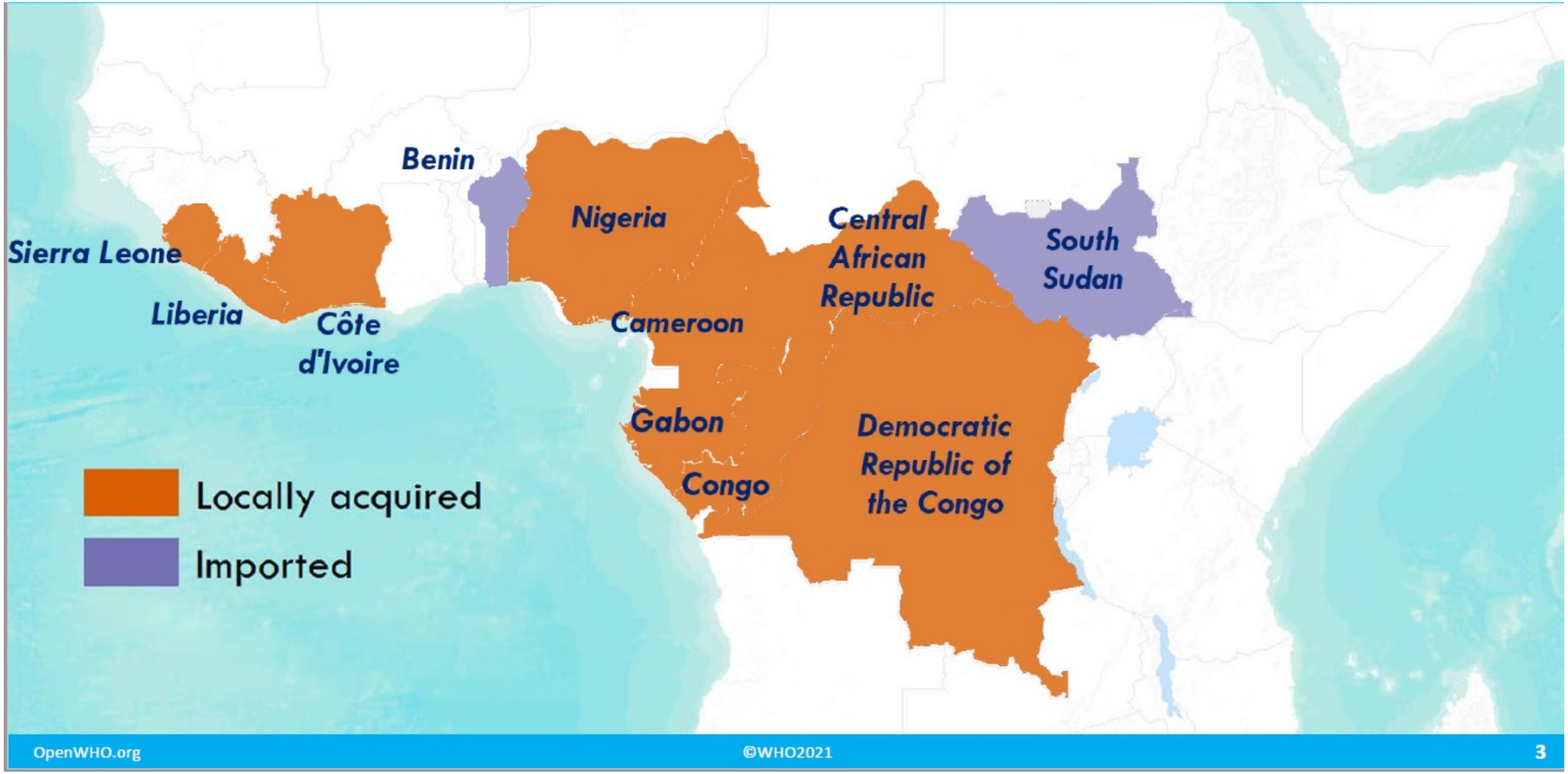
- **1958**: Mpox virus first isolated from research monkeys in Copenhagen, Denmar
- **1970**: First human case of mpox recorded in DRC.
- **1980s**: Smallpox vaccination stopped, potentially reducing cross-immunity agai mpox.
- **2003**: First human case outside Africa (USA) linked to exotic pet importation.
- **2018**: First imported human cases in UK, Israel, and Singapore.
- **2022**: Unprecedented global outbreak of clade IIb MPXV.
- **2023 mid-September**: Emergence of clade Ib MPXV in Kamituga, DRC.
- **2024, early**: Rapid increase in mpox cases in DRC and neighboring countries.
- **2024, July 25th - August 2nd**: First reported cases in Rwanda, Burundi, Kenya, an Uganda.
- **2024, August 15th**: First cases of clade Ib outside Africa

Epidemiology

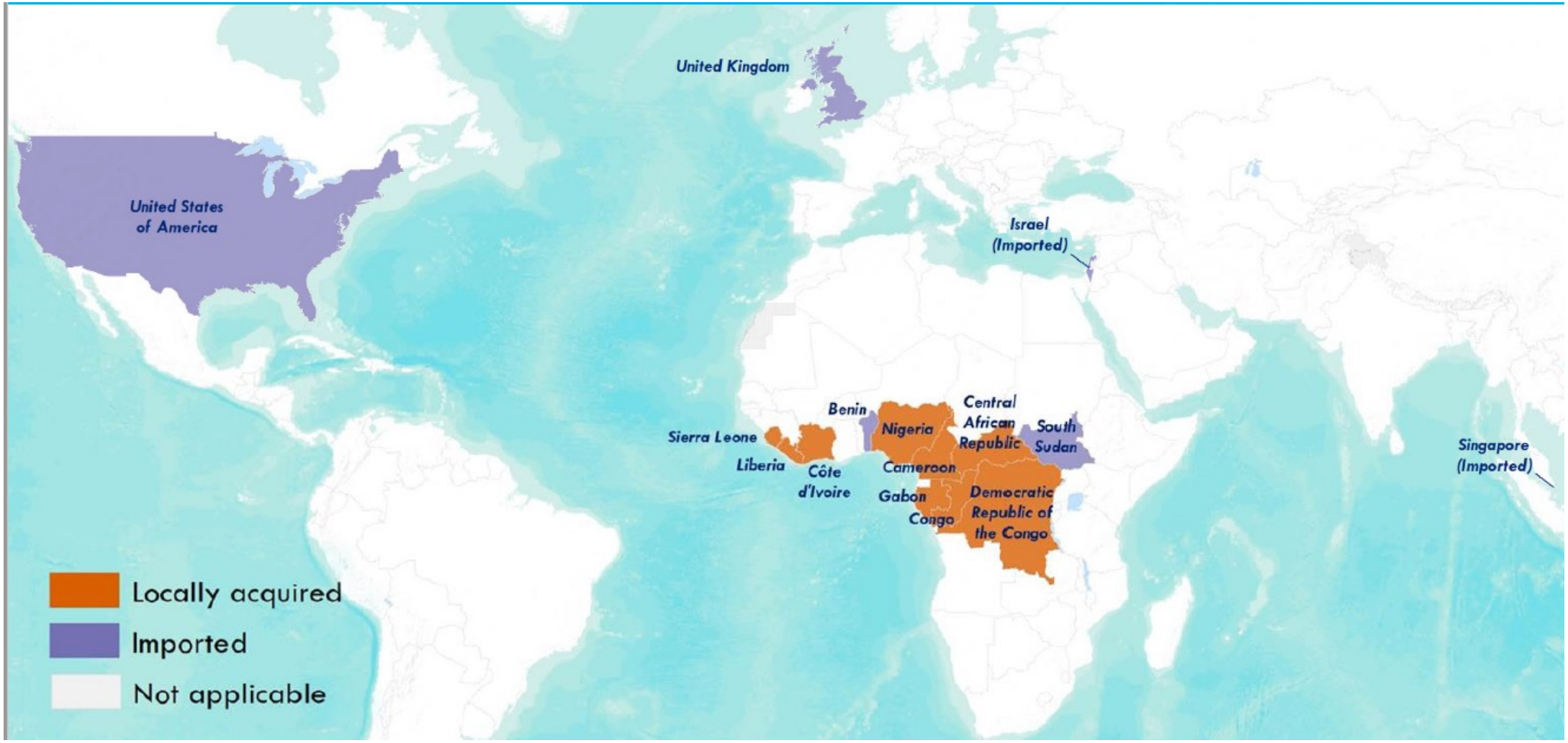




Human Mpox in Africa (1970-2021)

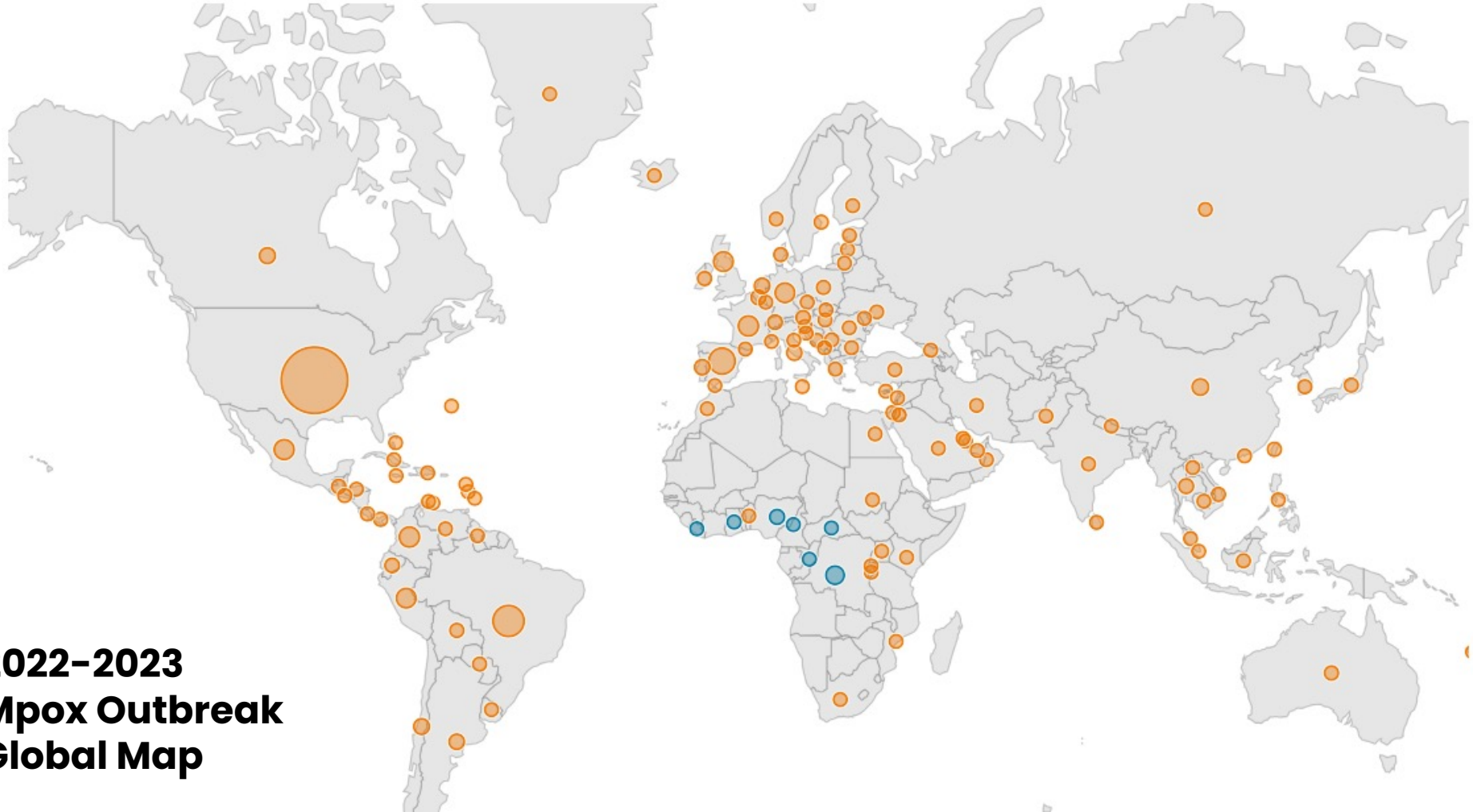


Worldwide data 1970-2021



Locations with cases

122	115	7
Total	Has not historically reported mpox	Has historically reported mpox



2022-2023 Mpox Outbreak Global Map

Demographics

ORIGINAL ARTICLE

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

John P. Thornhill, M.D., Ph.D., Sapha Barkati, M.D., Sharon Walmsley, M.D., Juergen Rockstroh, M.D., Andrea Antinori, M.D., Luke B. Harrison, M.D., Ph.D., Romain Palich, M.D., Ph.D., Achyuta Nori, M.D., Iain Reeves, M.D., Maximillian S. Habibi, M.D., Ph.D., Vanessa Apea, M.D., M.P.H., Christoph Boesecke, M.D., et al., for the SHARE-net Clinical Group*

Table 1. Demographic and Clinical Characteristics of the Persons with Monkeypox.*

Characteristic	All Persons (N=528)
Median age (range) — yr	38 (18–68)
Sex or gender — no. (%)	
Male	527 (>99)
Female	0
Trans or nonbinary	1 (<1)
Sexual orientation — no. (%)†	
Heterosexual	9 (2)
Homosexual	509 (96)
Bisexual	10 (2)
HIV positive — no. (%)	218 (41)
HIV negative or status unknown — no. (%)	310 (59)

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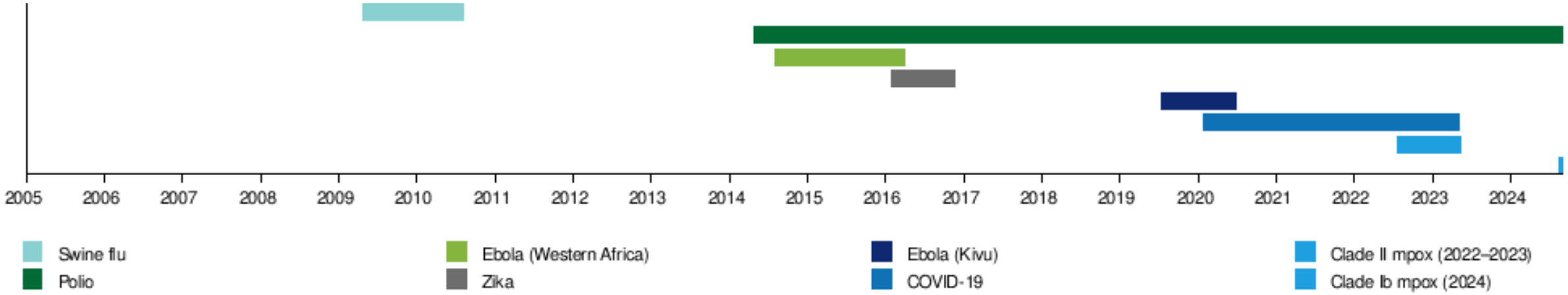
Characteristic	All Persons (N=528)
Medical setting of presentation — no. (%)	
Sexual health clinic	120 (23)
Emergency department	106 (20)
Primary care	20 (4)
Dermatology clinic	38 (7)
HIV clinic	154 (29)
Other hospital clinic	30 (6)
Private clinics or other	60 (11)
Medical care setting — no. (%)	
Inpatient	70 (13)
Outpatient	458 (87)

Patients seek for medical attention from different outpatient settings

Important to recognize and suspect!

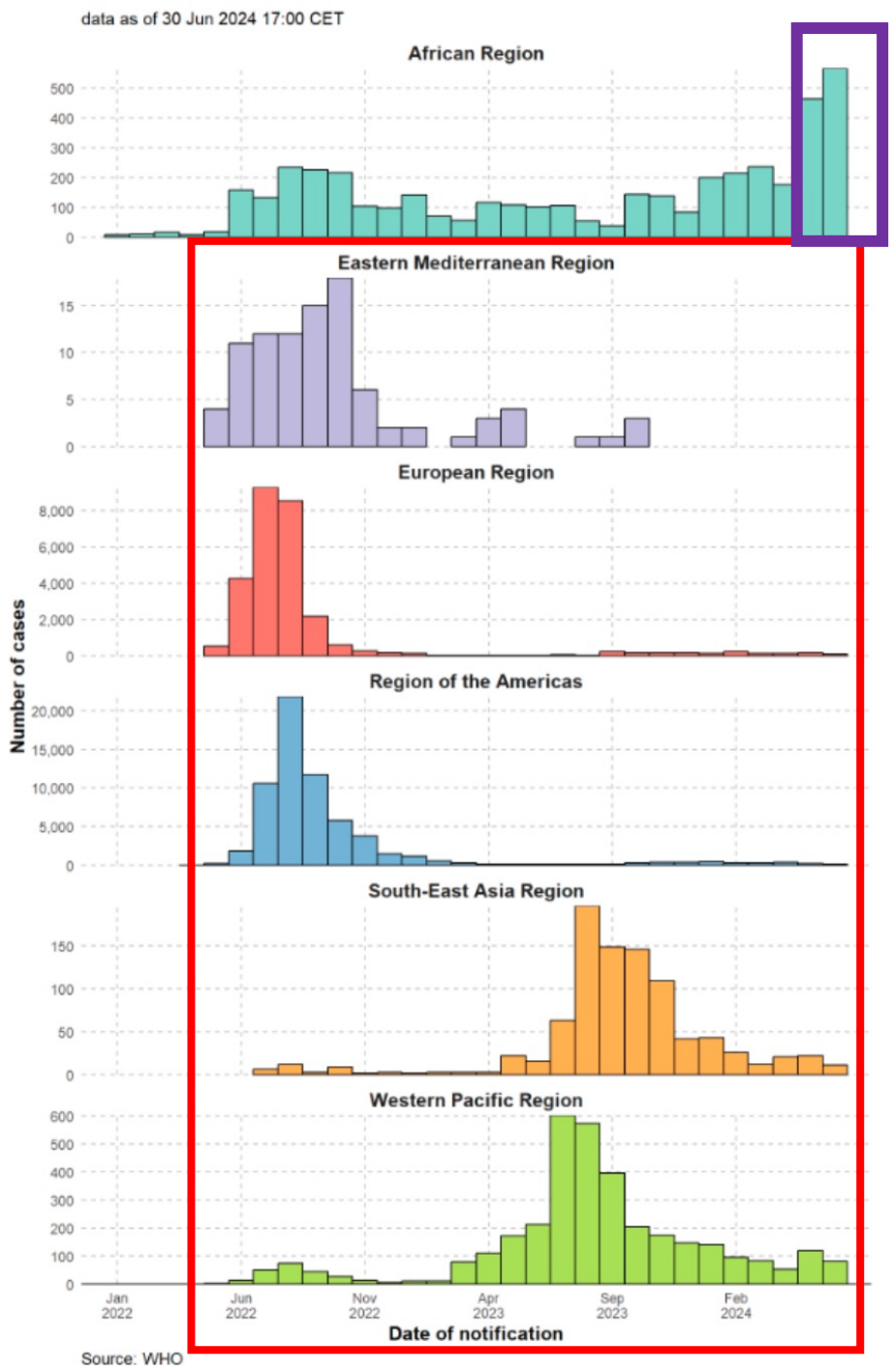
Public Health Emergency of International Concern (PHEIC)

An extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response



Which Mpox?

Mpox clade 2b



Mpox clade 1b

KEMENTERIAN KESIHATAN MALAYSIA

KENYATAAN MEDIA
KEMENTERIAN KESIHATAN MALAYSIA

KES POSITIF CACAR MONYET (MPOX) MALAYSIA

Kementerian Kesihatan Malaysia ingin memaklumkan mengenai dua (2) kes disahkan positif jangkitan mpox.

Kes pertama disahkan pada 26 Julai 2023, melibatkan seorang lelaki warga asing yang telah tinggal dan bekerja di Malaysia sejak April 2022. Beliau mempunyai sejarah perjalanan ke negara yang melaporkan kes mpox pada 6 Julai 2023 dan kembali semula ke Malaysia pada 10 Julai 2023. Beliau mula menunjukkan gejala pada 19 Julai 2023 dan lepuh mula muncul pada 23 Julai 2023. Beliau telah menjalani isolasi dan dibebaskan pada 10 Ogos 2023 setelah pulih sepenuhnya tanpa komplikasi. Beliau disyaki mendapat jangkitan semasa berada di luar negara iaitu negara yang melaporkan kes mpox.

Kes kedua pula adalah kontak kepada kes mpox pertama atau kes indeks. Beliau seorang lelaki warga tempatan yang mengalami gejala semasa dalam kuarantin kerana merupakan kontak kepada kes positif mpox. Beliau telah diarahkan menjalani kuarantin sejak 27 Julai 2023 dan disahkan positif mpox pada 29 Julai 2023. Beliau masih dalam tempoh isolasi dan dalam keadaan sihat.

Semua kontak bagi kes pertama telah dikenalpasti dan status kesihatan mereka telah dipantau. Tiada yang mengalami gejala jangkitan mpox kecuali kes kedua seperti dinyatakan di atas. Kes kedua tidak mempunyai sebarang kontak rapat.

Mpox adalah sejenis jangkitan disebabkan oleh virus mpox. Jangkitan berlaku melalui sentuhan rapat dengan individu yang mempunyai gejala dan tanda jangkitan mpox. Tempoh inkubasi sebelum individu menunjukkan gejala jangkitan mpox adalah antara 5 ke 21 hari dari tarikh pendedahan kepada jangkitan. Individu positif jangkitan mpox boleh menjangkiti orang lain sehari sebelum gejala muncul dan sehingga semua lepuh telah kering sepenuhnya. Lazimnya kes mpox akan sembuh sendiri tanpa sebarang rawatan khusus.

Semua pengembara yang tiba dari negara-negara melaporkan mpox dinasihatkan untuk memantau status kesihatan kendiri setiap hari termasuk gejala jangkitan mpox bagi tempoh selama 21 hari dari tarikh ketibaan di Malaysia. Gejala-gejala mpox adalah seperti demam, keletihan, sakit kepala serta ruam makulapapular yang bermula di muka kemudian menyebar ke tapak tangan dan tapak kaki diikuti bahagian-bahagian tubuh yang lain. Pesakit juga mungkin mengalami lenguh tubuh badan, sakit bahagian belakang badan atau sendi, kejang otot dan pembengkakan kelenjar limfa.

Semua pengamal perubatan diminta untuk peka terhadap individu dengan gejala lepuh yang datang mendapatkan rawatan, terutamanya dalam kalangan kumpulan berisiko tinggi (*key population*). Sejarah risiko kontak rapat dengan individu bergejala jangkitan mpox perlu didapatkan. Bagi kes yang disyaki mpox, swab lepuh, swab oral dan sampel darah/serum boleh dihantar ke makmal yang menyediakan perkhidmatan ujian pengesanan virus mpox. Pada masa ini, terdapat 10 buah makmal menyediakan perkhidmatan ujian pengesanan mpox; iaitu lapan (8) makmal kerajaan dan dua (2) makmal swasta. Kes disyaki mpox hendaklah dinotifikasi ke pejabat kesihatan berhampiran melalui Sistem e-Notifikasi agar siasatan lanjut serta langkah kawalan dapat dijalankan oleh Pejabat Kesihatan Daerah.

DATUK DR. MUHAMMAD RADZI ABU HASSAN
KETUA PENGARAH KESIHATAN
25 OGOS 2023

Regional cases (as of August 2024)

	2022	2023	2024
Malaysia	0	9	0
Singapore	18	32	12
Indonesia	73		14
Thailand	559		327 (11 deaths)

KEMENTERIAN KESIHATAN MALAYSIA

KENYATAAN MEDIA
KEMENTERIAN KESIHATAN MALAYSIA

SITUASI TERKINI MPOX DI MALAYSIA

Mpox telah diisytiharkan sebagai Kecemasan Kesihatan Awam yang Menjadi Kepentingan Antarabangsa (*Public Health Emergency of International Concern* - PHEIC) buat kali kedua pada 14 Ogos 2024 berikutan penularan *clade Ib* virus ini yang lebih pantas di Republik Demokratik Congo (DRC) dan negara-negara jiran di rantau Afrika.

Susulan itu, Kementerian Kesihatan Malaysia (KKM) telah mengaktifkan Bilik Gerakan mpox di Pusat Kesiapsiagaan dan Tindak Cepat Krisis (CPRC) Kebangsaan pada 16 Ogos 2024. CPRC Kebangsaan terus memantau situasi mpox serta menyelaraskan langkah-langkah kesiapsiagaan dan respon yang berkenaan.

Daripada 58 kes disyaki mpox yang telah dirujuk kepada KKM sepanjang tahun ini, **satu (1) kes telah disahkan positif mpox *clade II* pada 16 September 2024**. Dengan itu juga, semua 10 kes di Malaysia sejak 26 Julai 2023 sehingga kini adalah daripada *clade II* sahaja.

Pesakit tersebut merupakan seorang lelaki warganegara yang mula menunjukkan gejala demam, sakit tekak, dan batuk pada 11 September, manakala ruam mula muncul pada 12 September.

Mpox clade 1b

- Emerged in Sept 2023
- Democratic Republic of Congo: 15,000 infections, 500 deaths (85% children < 15 yo)
- Spread to Kenya, Rwanda, Burundi, Uganda
- One case in Sweden and Thailand (returning traveller)
- Virus introduced to more urban, more mobile and crowded areas
- Change in mode of transmission – *more sexual*

KETUA PENGARAH KESIHATAN MALAYSIA
Kementerian Kesihatan Malaysia
Aras 12, Blok E7, Kompleks E,
Pusat Pentadbiran Kerajaan Persekutuan
62590 PUTRAJAYA

Tel.: 03-8000 8000
Faks: 03-8889 5542

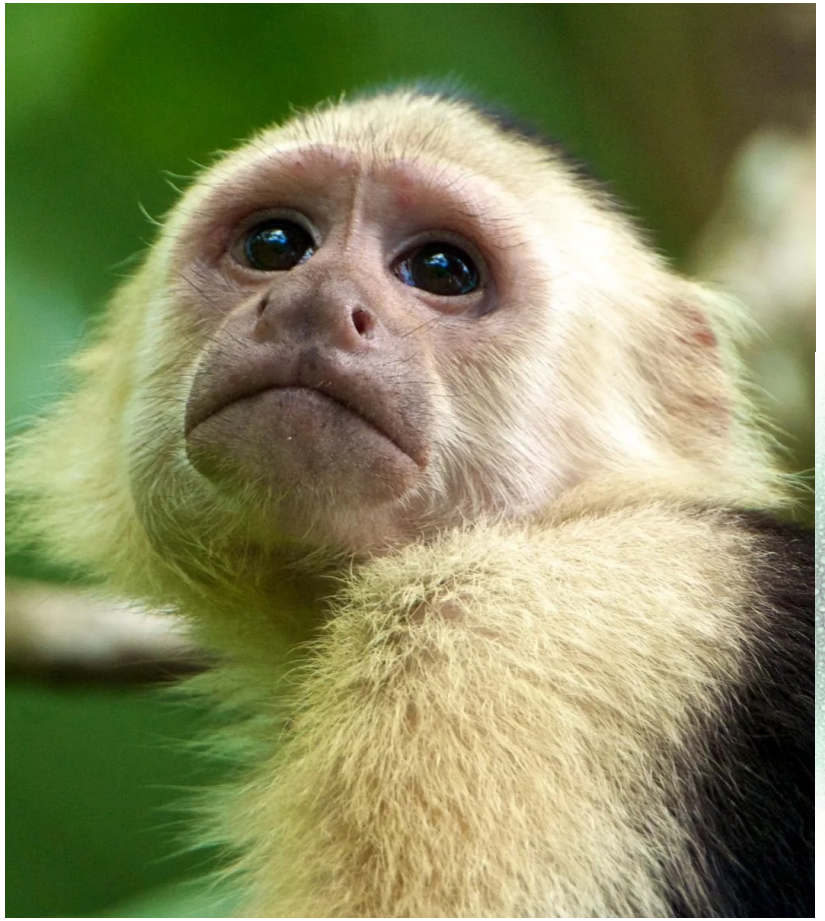
Ruj. Kami : KKM.600-27/9/5 JLD.3 (3)
Tarikh : 17 Ogos 2024

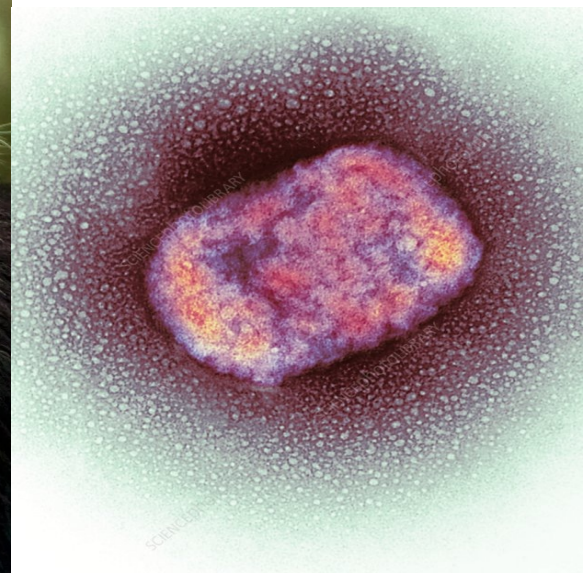
SENARAI EDARAN

YBhg. Dato' Seri/Datuk/Dato' Indera/Dato'/Datin Paduka/Datin/ Tuan/Puan,

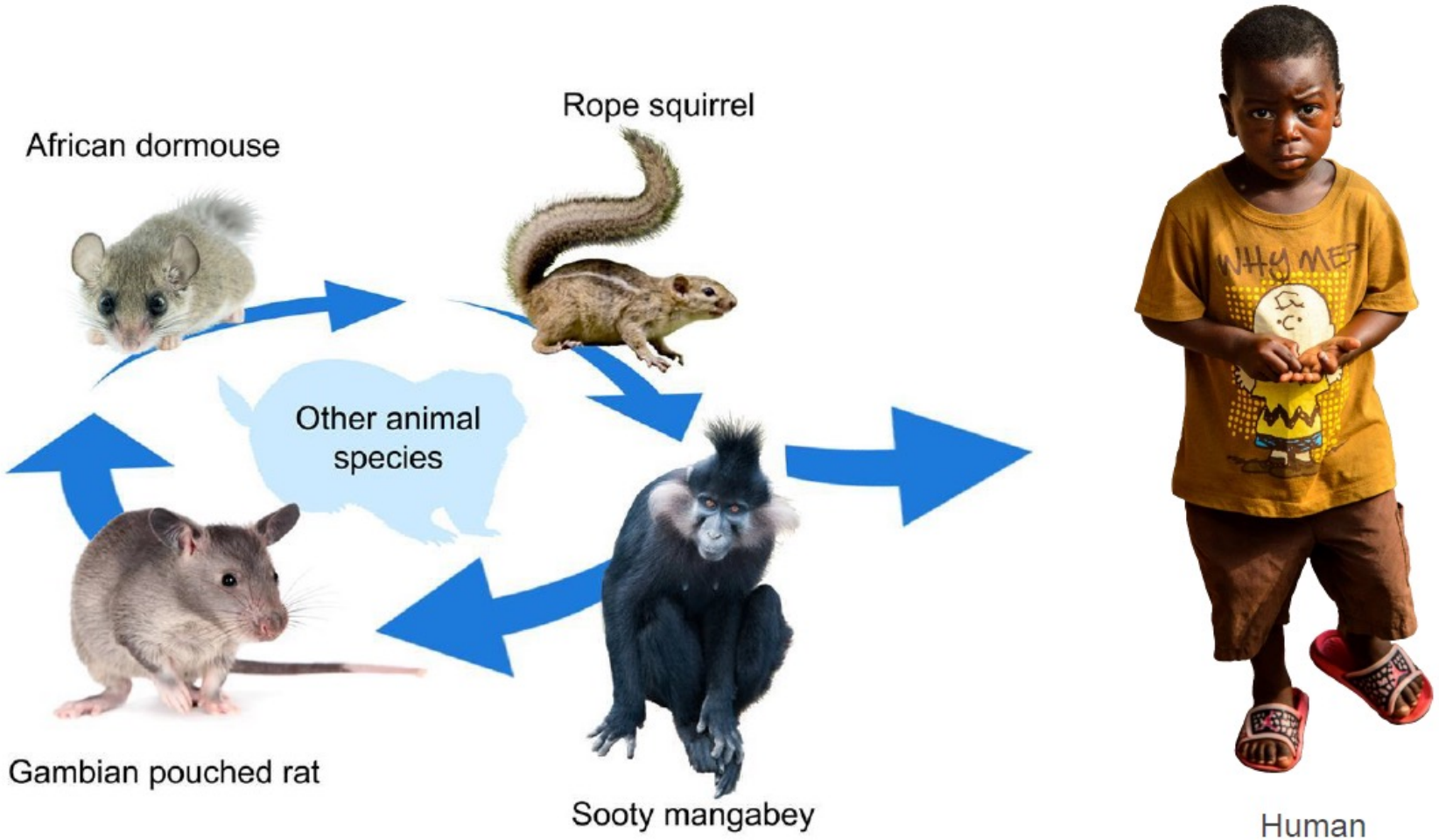
KESIAPSIAGAAN BAGI MENGHADAPI RISIKO JANGKITAN MPOX DI MALAYSIA BERIKUTAN PENGISYTIHARAN MPOX SEBAGAI KECEMASAN KESIHATAN AWAM YANG MENJADI KEPENTINGAN ANTARABANGSA (*PUBLIC HEALTH EMERGENCY OF INTERNATIONAL CONCERN* - PHEIC)

Mode of transmission





Possible animal reservoirs



Credit: African dormouse, Gambian pouched rat, Sooty mangabey, human image retrieved from 123rf

Credit: Rope squirrel retrieved from inaturalist.org / Luis Querido

Mode of transmission

Unprotected contact with:

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

How does Mpox spread?

IT'S NOT A TYPICAL STI

Animal to human transmission occurs via contact with or consumption of infected animals or contaminated urine and faeces

Human to human transmission can occur through respiratory droplets, but primarily through direct contact with infected secretions / lesions

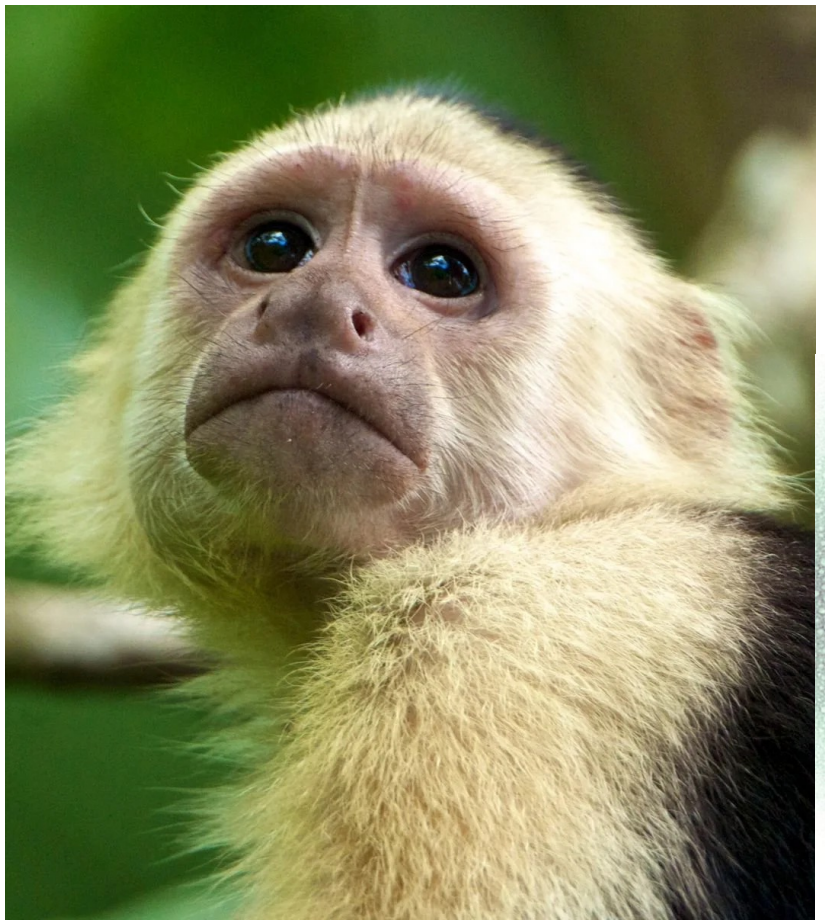
Though it has been detected, it remains unclear if monkeypox can be transmitted through semen or vaginal secretions

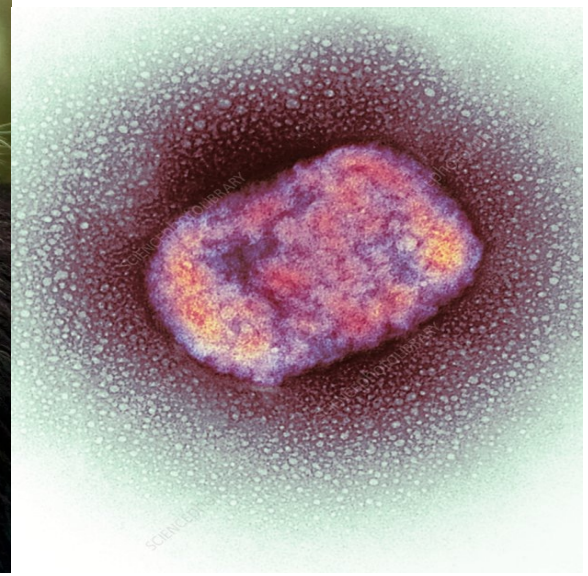
Vertical transmission

Current outbreak – overwhelmingly from close contact during sex

Lapa D, Carletti F, Mazzotta V, et al. Monkeypox virus isolation from semen sample collected in the early phase of infection in a patient with prolonged seminal viral shedding. Lancet Inf Dis. Published online August 2, 2022.

Case definition





1. Suspected case

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

OR

ii) A person presenting since 1 January 2022 with an unexplained acute skin rash, mucosal lesions or lymphadenopathy (swollen lymph nodes). The skin rash may include single or multiple lesions in the anogenital region or elsewhere on the body. Mucosal lesions may include single or multiple oral, conjunctival, urethral, penile, vaginal, or anorectal lesions. Anorectal lesions can also manifest as anorectal inflammation (proctitis), pain and/or bleeding.

AND

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

2. Probable case

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

AND

One or more of the following:

- has an epidemiological link a to a probable or confirmed case of mpox in the 21 days before symptom onset;
- has had multiple and/or casual sexual partners, either bisexual or MSM, in the 21 days before symptom onset;
- has detectable levels of anti-orthopoxvirus (OPXV) IgM antibody (during the period of 4 to 56 days after rash onset); or a four-fold rise in IgG antibody titer based on acute (up to day 5-7) and convalescent (day 21 onwards) samples; in the absence of a recent smallpox/mpox vaccination or other known exposure to OPXV;
- has a positive test result for orthopoxviral infection (e.g., OPXV-specific PCR without mpox virus - specific PCR or sequencing).

3. Confirmed case:

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

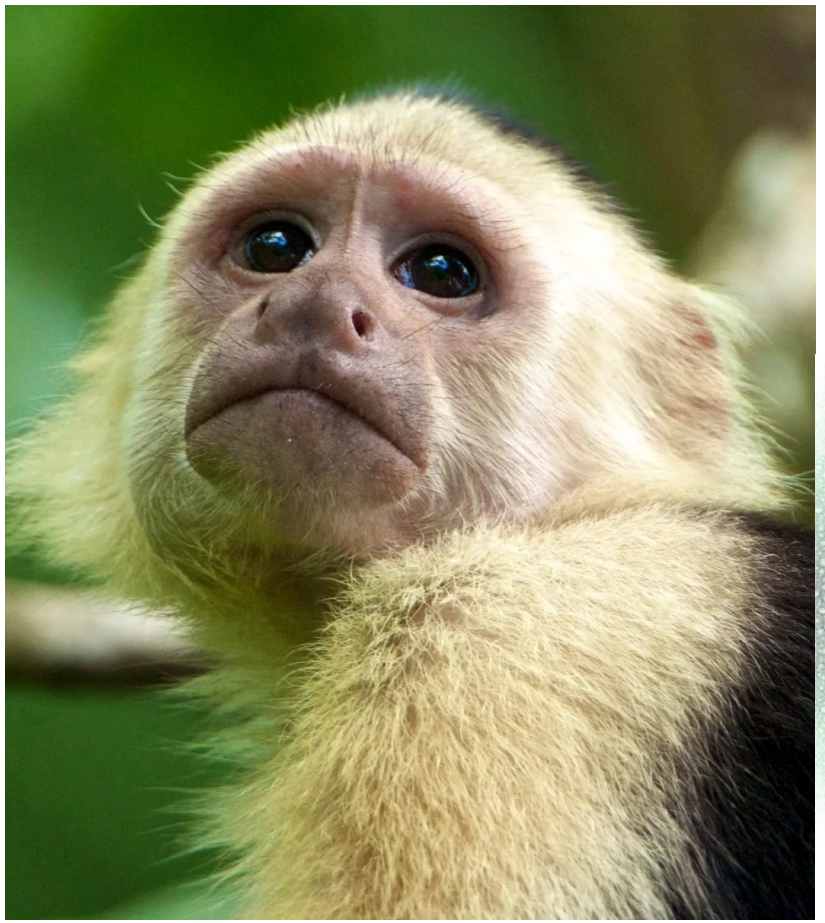
4. Discarded case:

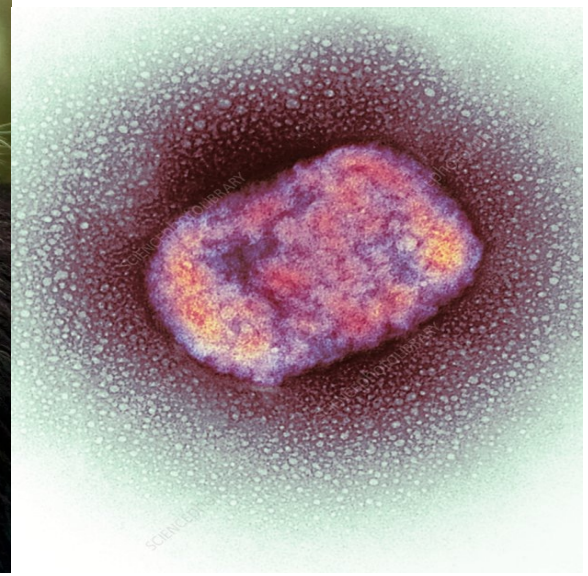
A suspected or probable case for which laboratory testing of lesion fluid, skin specimens or crusts by PCR and/or sequencing is negative for mpox virus.

A retrospectively detected probable case for which lesion testing can no longer be adequately performed (i.e., after the crusts fall off) and no other specimen is found PCR- positive, would remain classified as a probable case.

A suspected or probable case should not be discarded based on a negative result from an oropharyngeal, anal or rectal swab or from a blood test alone.

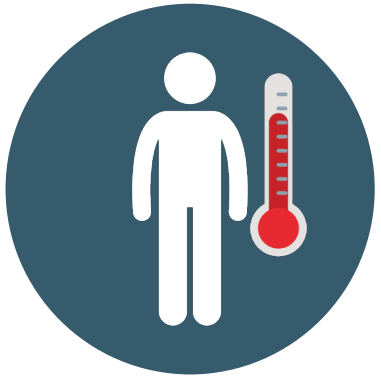
Clinical presentation



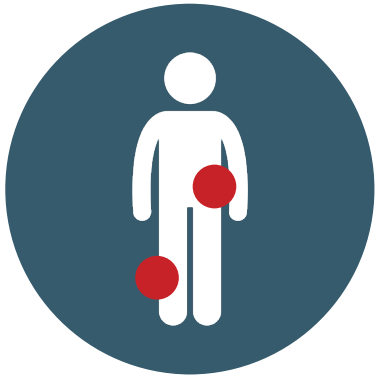


Mpox Symptoms

HEADACHE

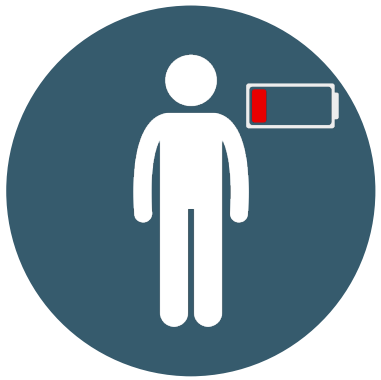


FEVER



MUSCLE ACHES

CHILLS



LOW ENERGY

SORE THROAT

SWOLLEN LYMPH NODES

SKIN RASH & LESION

World Health Organization

Monkeypox symptoms – an overview

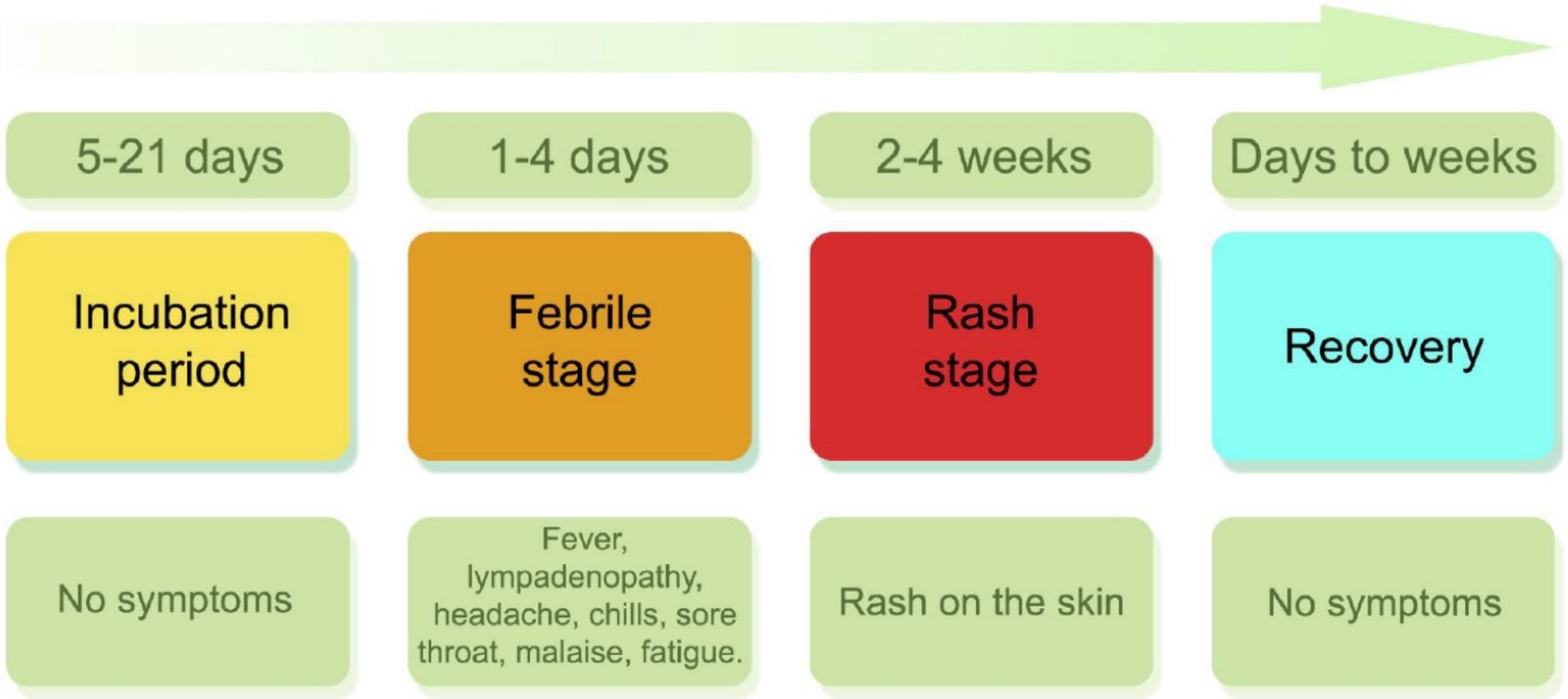


Table 3. Diagnosis and Clinical Characteristics of Monkeypox in the Case Series.*

Characteristic	All Persons (N=528)
Reported clinical features — no. (%)	
Rash or skin lesions	500 (95)
Fever	330 (62)
Lymphadenopathy	295 (56)
Pharyngitis	113 (21)
Headache	145 (27)
Lethargy or exhaustion	216 (41)
Myalgia	165 (31)
Low mood	54 (10)
Proctitis or anorectal pain	75 (14)
Description of rash — no./total no. with rash reported (%)	
Vesiculopustular	291/500 (58)
Macular	19/500 (4)
Single ulcer	54/500 (11)
Multiple ulcers	95/500 (19)
Other	41/500 (8)
No rash	28
<5	207 (39)
5–10	131 (25)
11–20	112 (21)
>20	56 (11)
No lesions or missing data	22 (4)

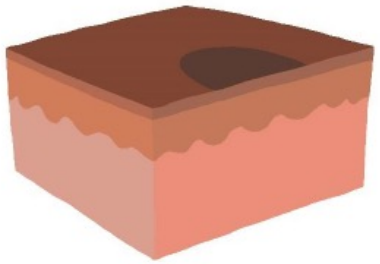
Clinical signs and symptoms

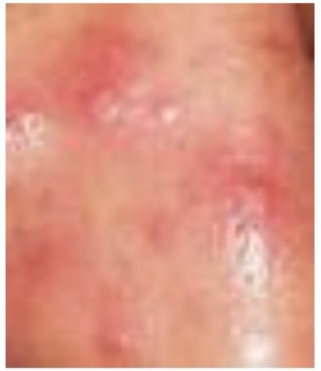
- **Skin lesions**
- Commonest location were:
- **Anogenital area (73%)**
- Trunks, arms or legs (55%)
- Face (25%)
- Palms and soles (10%)

Thornhill JP, Barkati S, Walmsley S, et al. Monkeypox virus infection in humans across 16 countries: Ap.

Rash stage

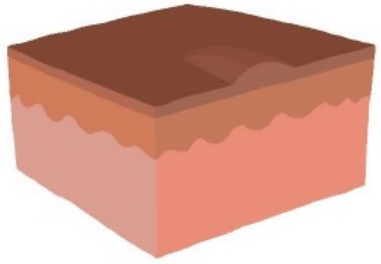
Macule

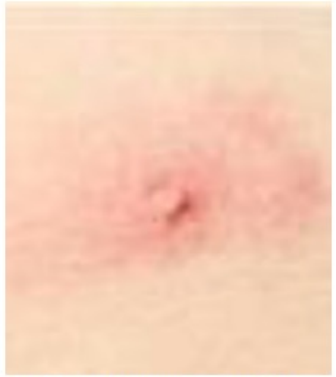




Credit: Emerg Infect Dis / N. Erez et al., 2018. Retrived from:https://wwwnc.cdc.gov/eid/article/25/5/19-0076-f1

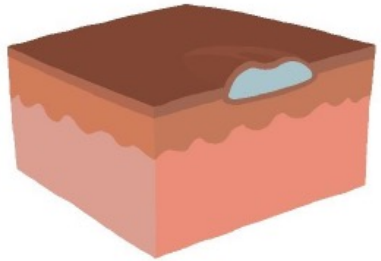
Papule

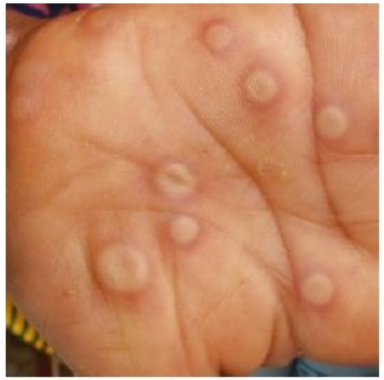




Credit: NEJM/ D.Kurz et al .2004 Retrived from: https://www.nejm.org/doi/full/10.1056/NEJMoa032299

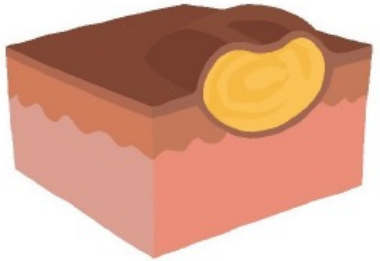
Vesicle

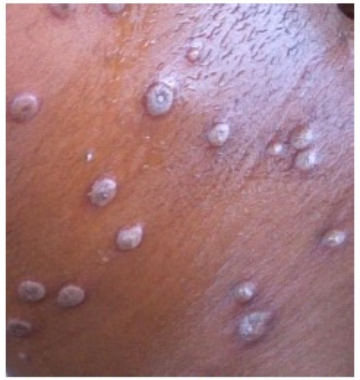




Credit: Andrea McCollum / CDC

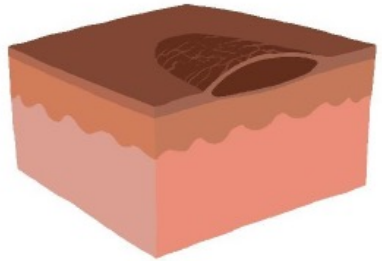
Pustule

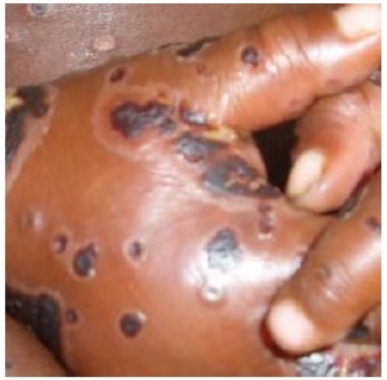




Credit: Toutou Likafi/ Kinshasa School of Public Health

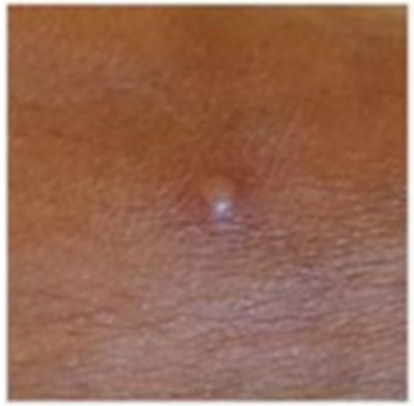
Crust





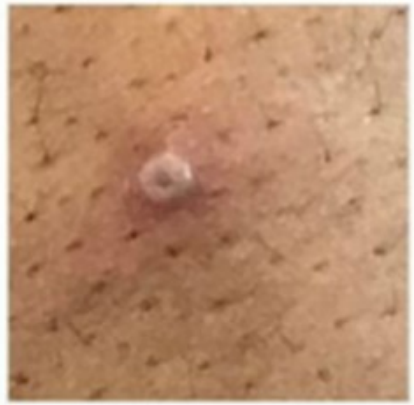
Credit: P. Mbala /Institut Nationale de recherche biomedicale. DRC

Typical Mpox rashes

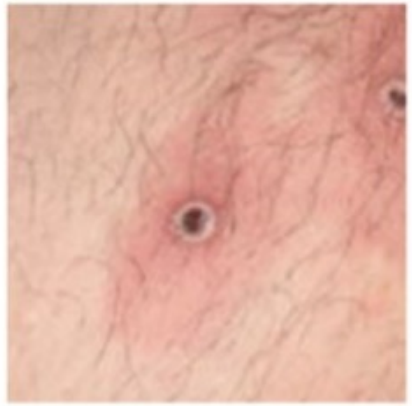


a) Early vesticle, 3mm diameter

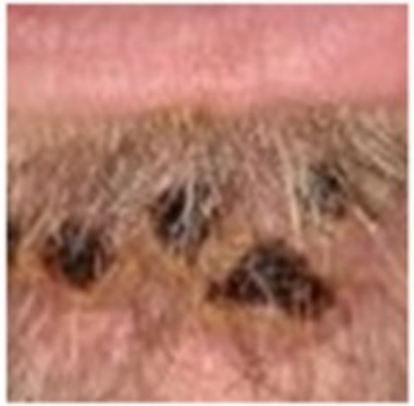
b) Small pustule, 2mm diameter



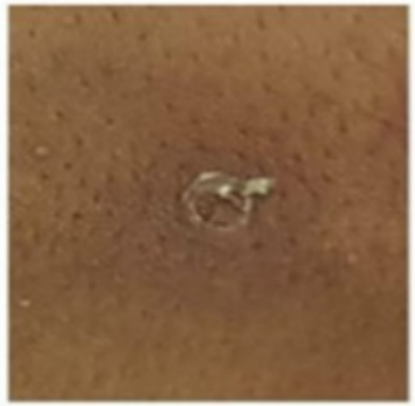
c) Umbilicated pustule, 3-4mm diameter



d) Ulcerated lesion 5mm diameter



e) Crusting of mature lesions



f) Partially removed scab

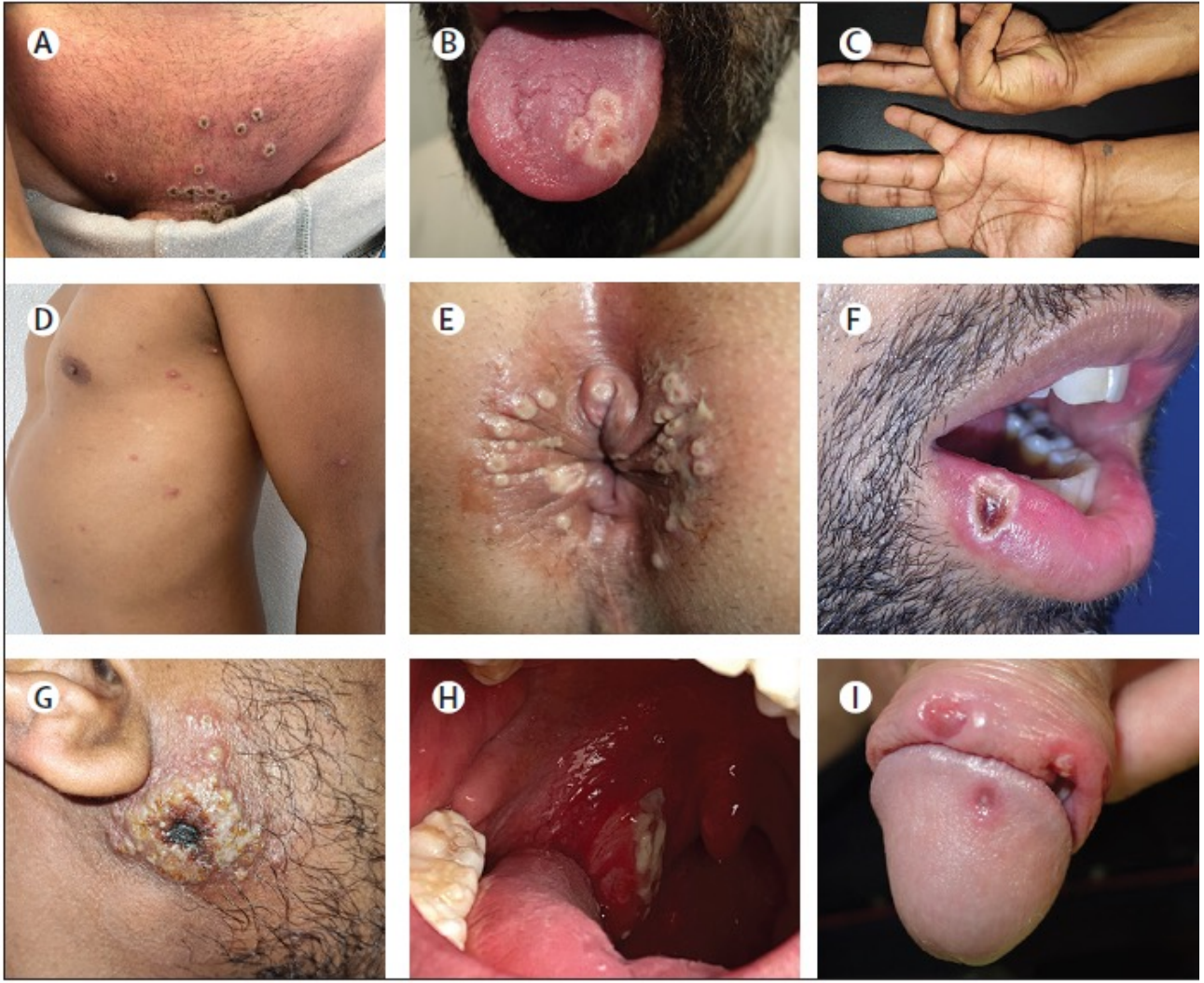


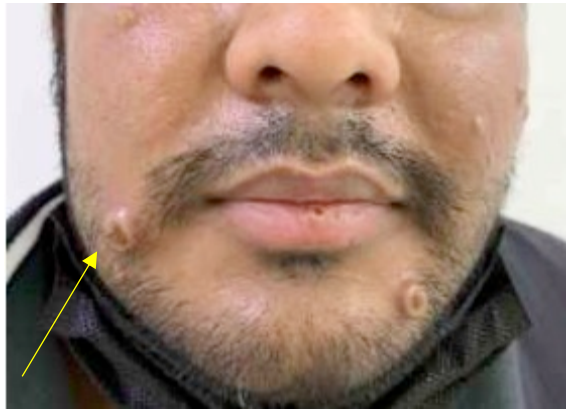
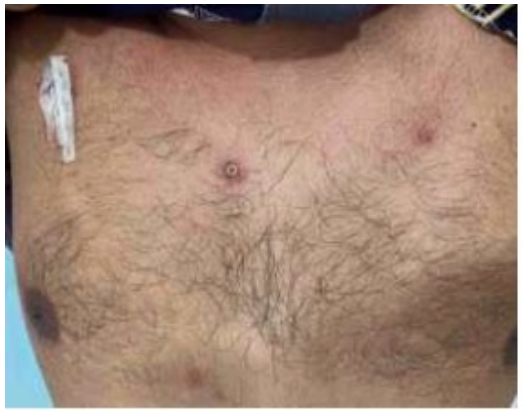
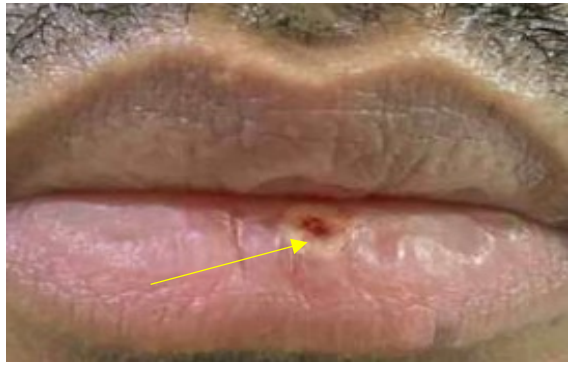
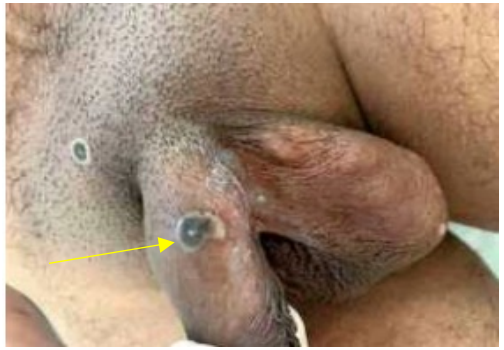
Figure 1: **Clinical presentation of monkeypox**
(A) Pustules in the genital and pubic region, in which the initial umbilication has progressed to necrotic crust with central depression. (B) Three semiconfluent pustular lesions with a depressed centre located on the left side of the tongue dorsum. (C) Pearly acral vesicles embedded in the thick stratum corneum of the palmar skin, shotty on palpation. (D) Scattered papules, pustules, and umbilicated pustules surrounded by an erythematous halo on the lateral aspect of the chest and left arm. (E) Pustules circumferentially distributed on the anal margin and perianal skin. (F) A pustular lesion with a crusted centre on the semimucosa of the lower lip, close to the right oral commissure. (G) Primary inoculation site with a large, crusted lesion on the right cheek. (H) The right palatine tonsil is reddened and enlarged and has a fibrin-covered ulcer. (I) The penile glans and foreskin have lesions of varying sizes and stages of evolution, with oedema surrounding the larger ulcer. Pictures A–C, E–G, and I were

- Classic cases: Febrile prodrome rash that may appear on any part of the body, with lesions evolve simultaneously
- Current global outbreak of Mpox: *Painless anogenital lesions often* ***without a prodrome***
- Observed in persons who have had close contact with an infected person or persons, including MSM

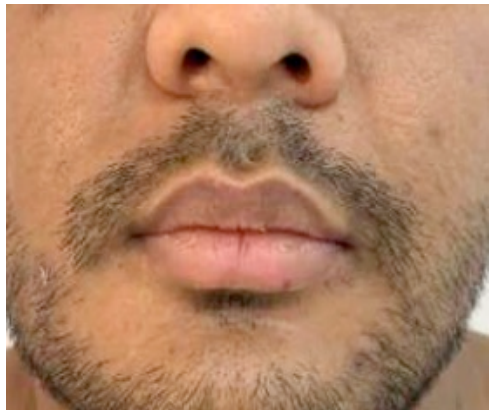
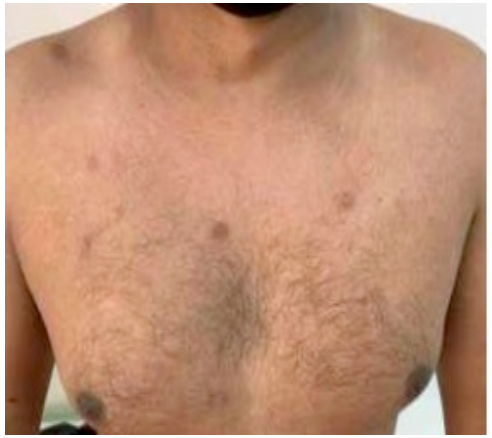
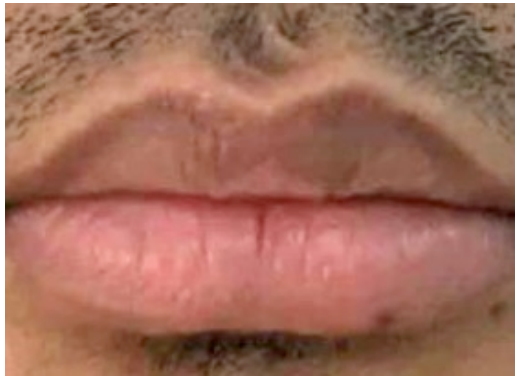
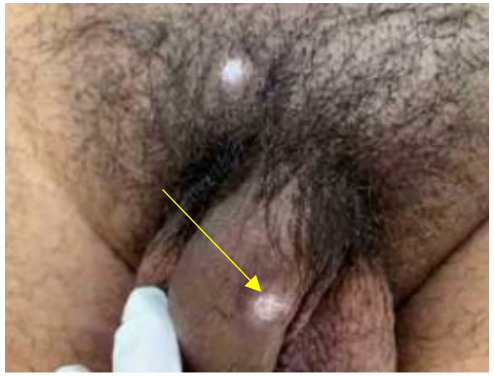
N Engl J Med 2022; 387:66
DOI: 10.1056/NEJMicm2206893.7 July 2022

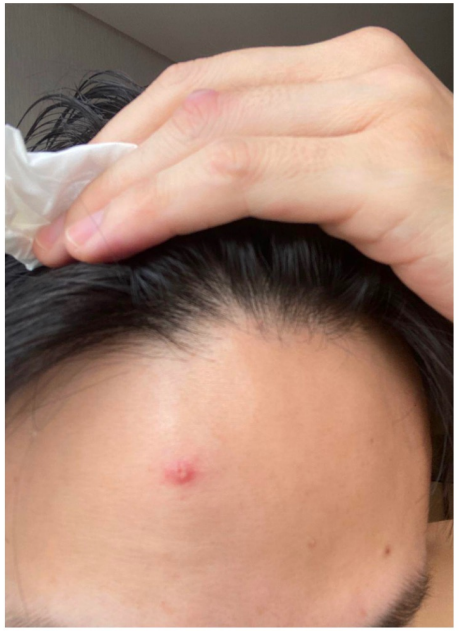
Evolution of Mpox rash

DAY 4 OF INFECTION

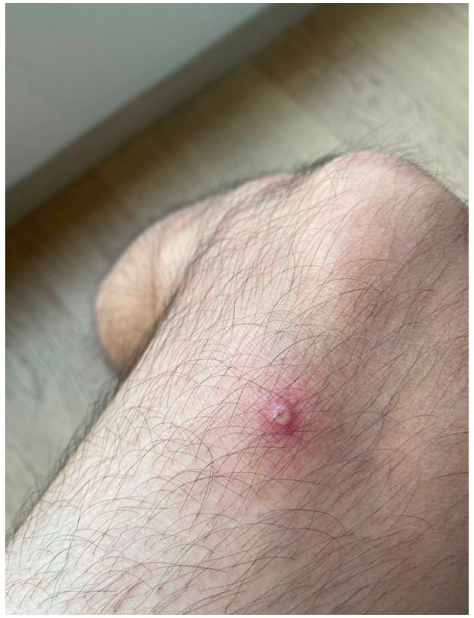
DAY 14 OF INFECTION

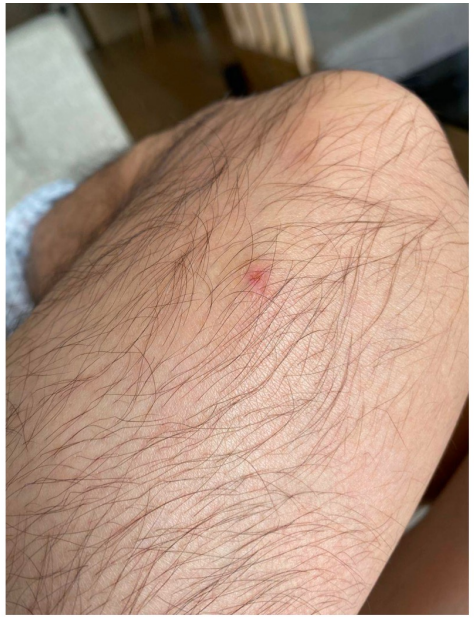


Day 5 of Rash (28/7/23)

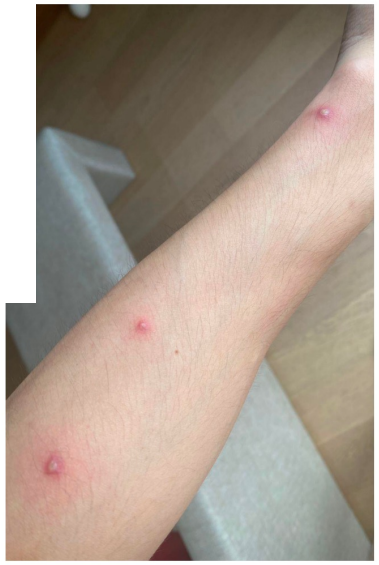
Day 18 of Rash (8/8/23)



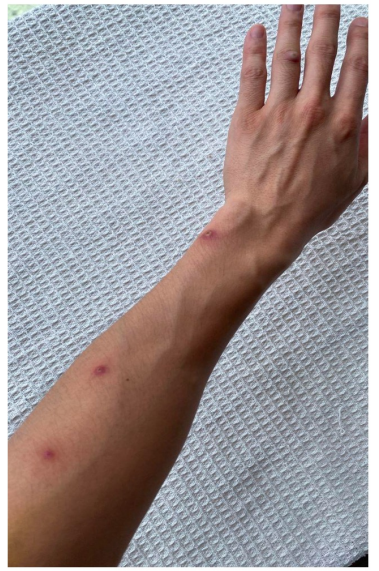
Day 5 of Rash (28/7/23)



Day 18 of Rash (8/8/23)



Day 5 of Rash (28/7/23)



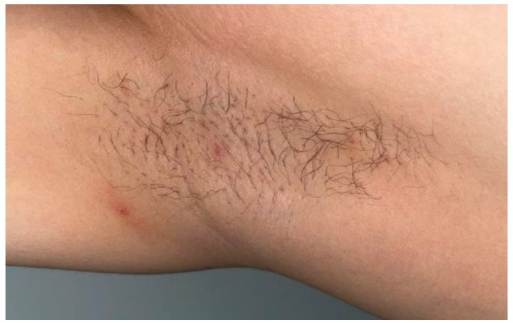
Day 8 of Rash (31/7/23)

Day 18 of Rash (8/8/23)

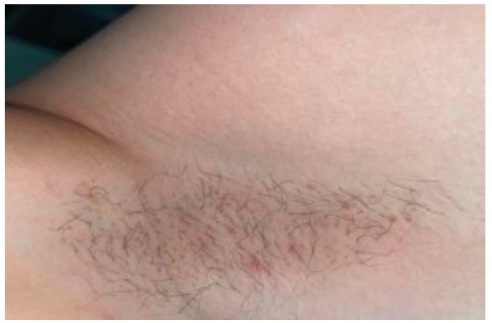
1st case

Courtesy of Dr Rosvinder Singh, Ex-Head of Disease Surveillance Division, JKWPKL&P

Day 5 (1/8/2023)



Day 15 (11/8/2023)



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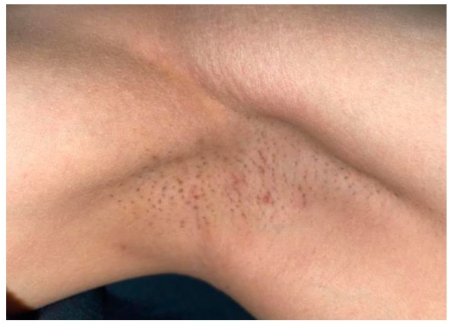
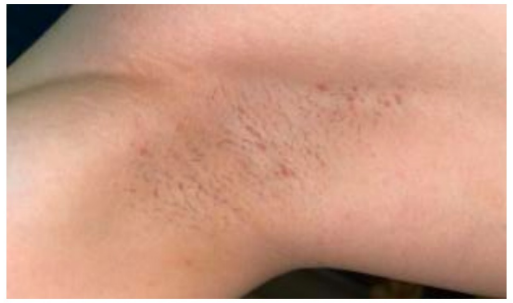
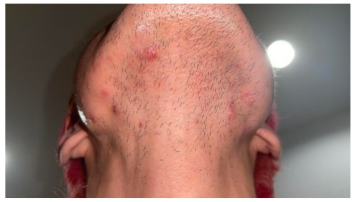


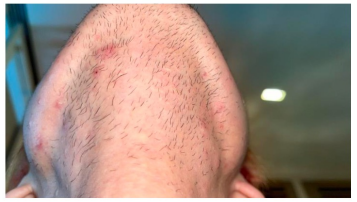
Day 24 (20/8/2023)



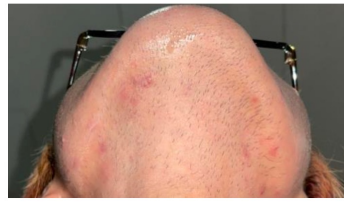
Day 5 (1/8/2023)



Day 15 (11/8/2023)



Day 19 (15/8/2023)



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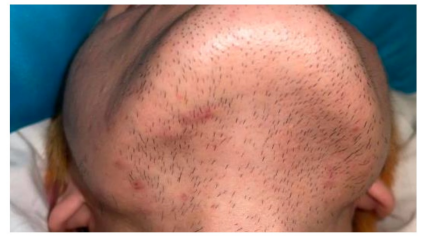

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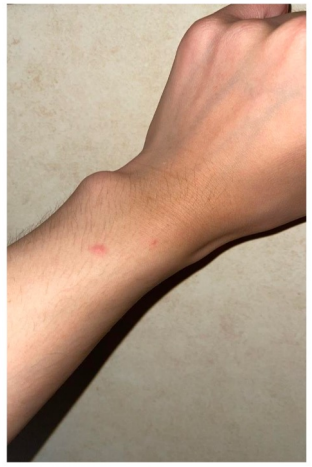
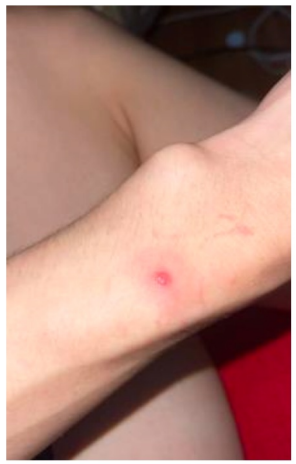
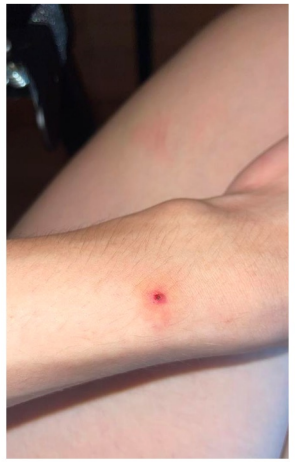


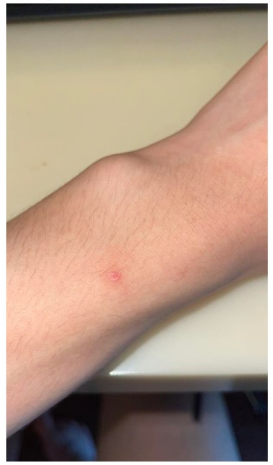
Day 5 (1/8/2023)



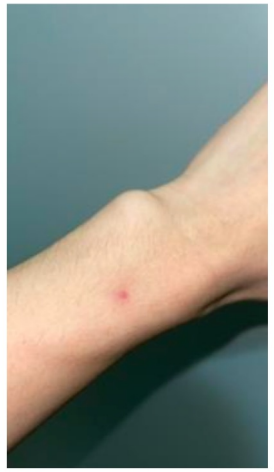
Day 8 (4/8/2023)



Day 15 (11/8/2023)



Day 19 (15/8/2023)



2nd case

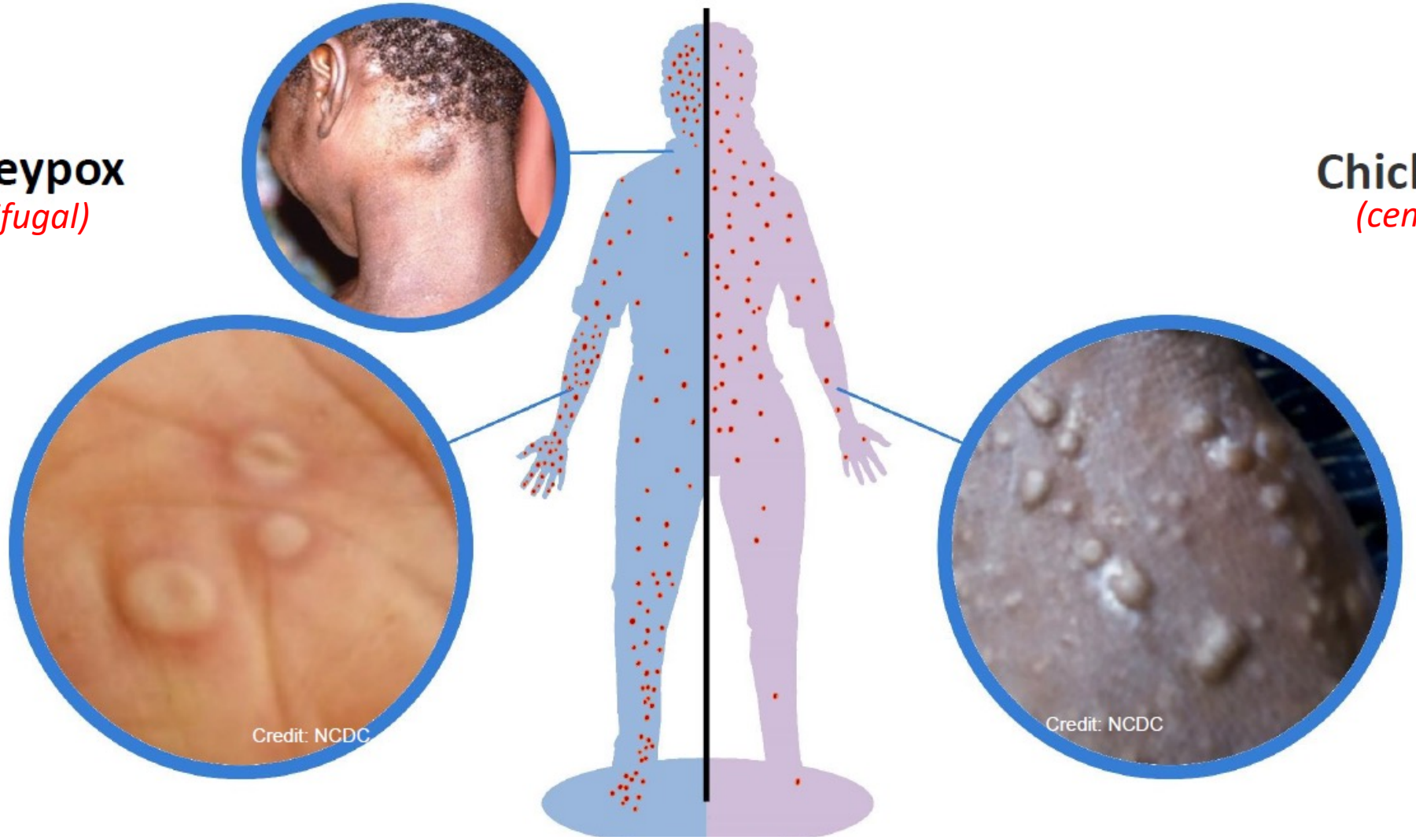
Courtesy of Dr Rosvinder Singh, Ex-Head of Disease Surveillance Division, JKWPKL&P

Possibility of other diagnosis

Symptoms	Monkeypox	Chickenpox	Measles
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

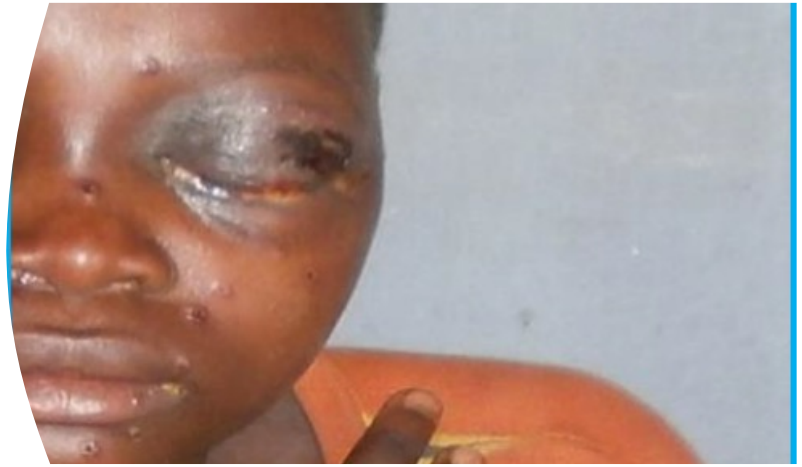
Comparison of vesicular rashes

Monkeypox
(centrifugal)



Chickenpox
(centripetal)

Complications

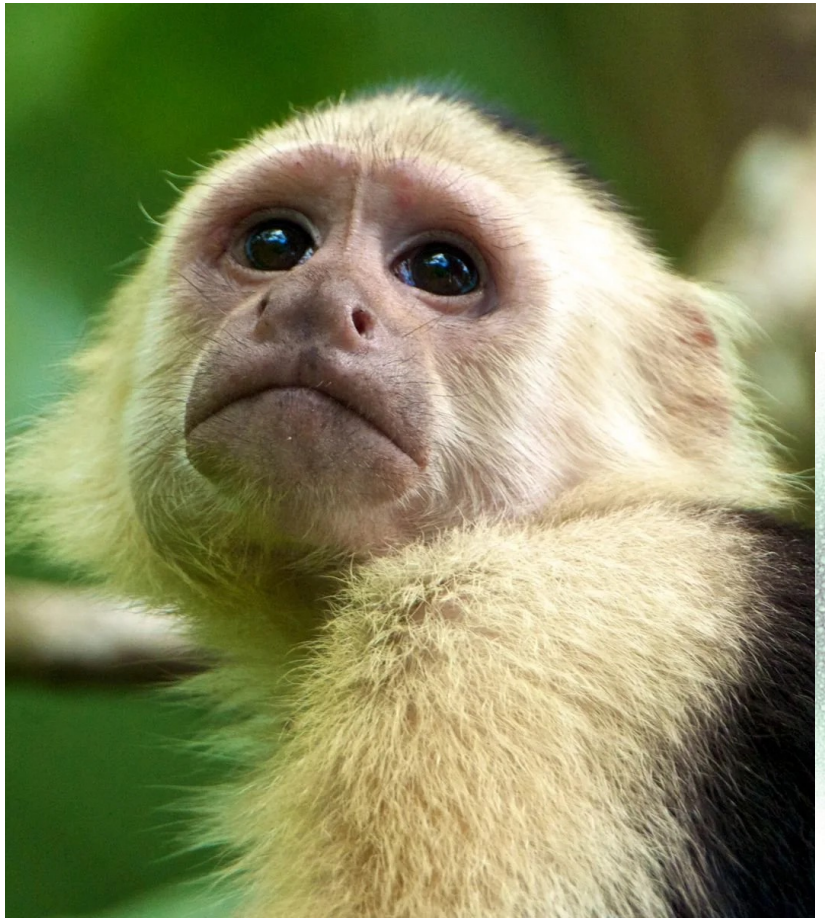


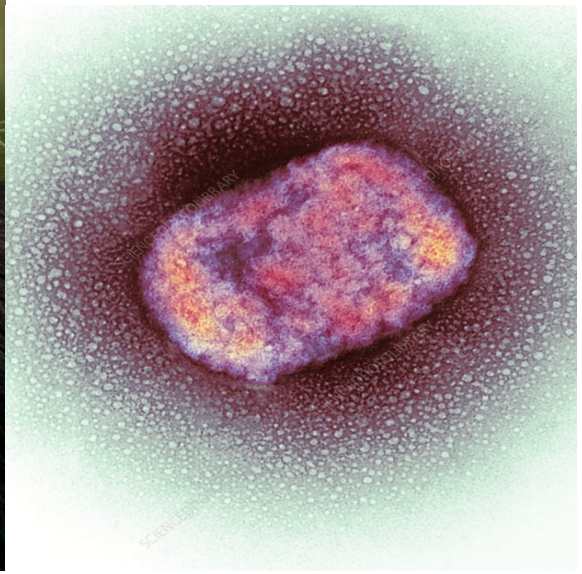
17. Experience of treating over 60 inpatients in this outbreak clade has demonstrated that individuals have needed hospitalisation for:

- Severe, refractory pain, commonly proctitis
- Eye disease
- Severe secondary bacterial infections or co-infection with STIs
- Multiple lesions or those that require surgical intervention
- Lesions associated with complications due to pain or swelling, e.g. constipation, urinary retention or inability to swallow
- Rarely, encephalitis and pneumonitis.

UKHSA. Mpox. 8th September 2018. Updated 6th July 2023. GOV.UK

Laboratory testing

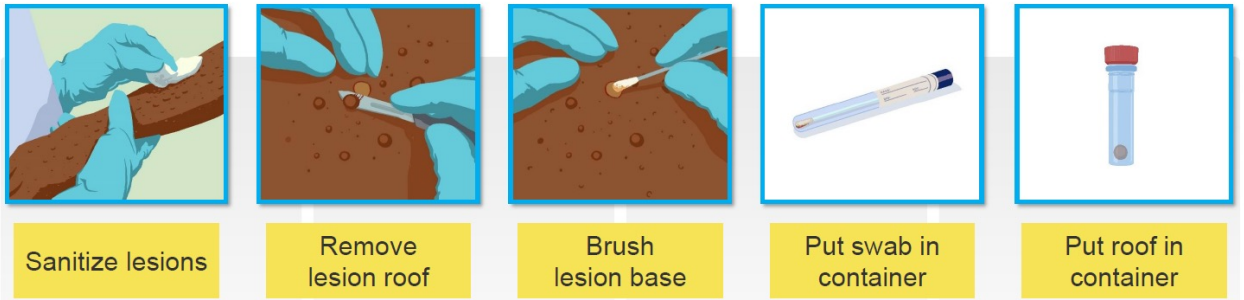


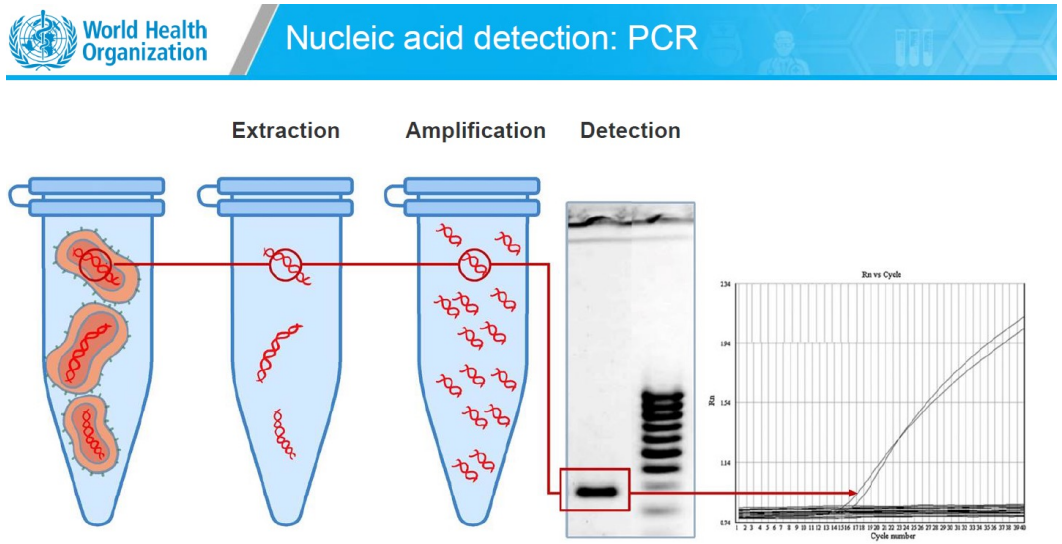


How to diagnose and detect?

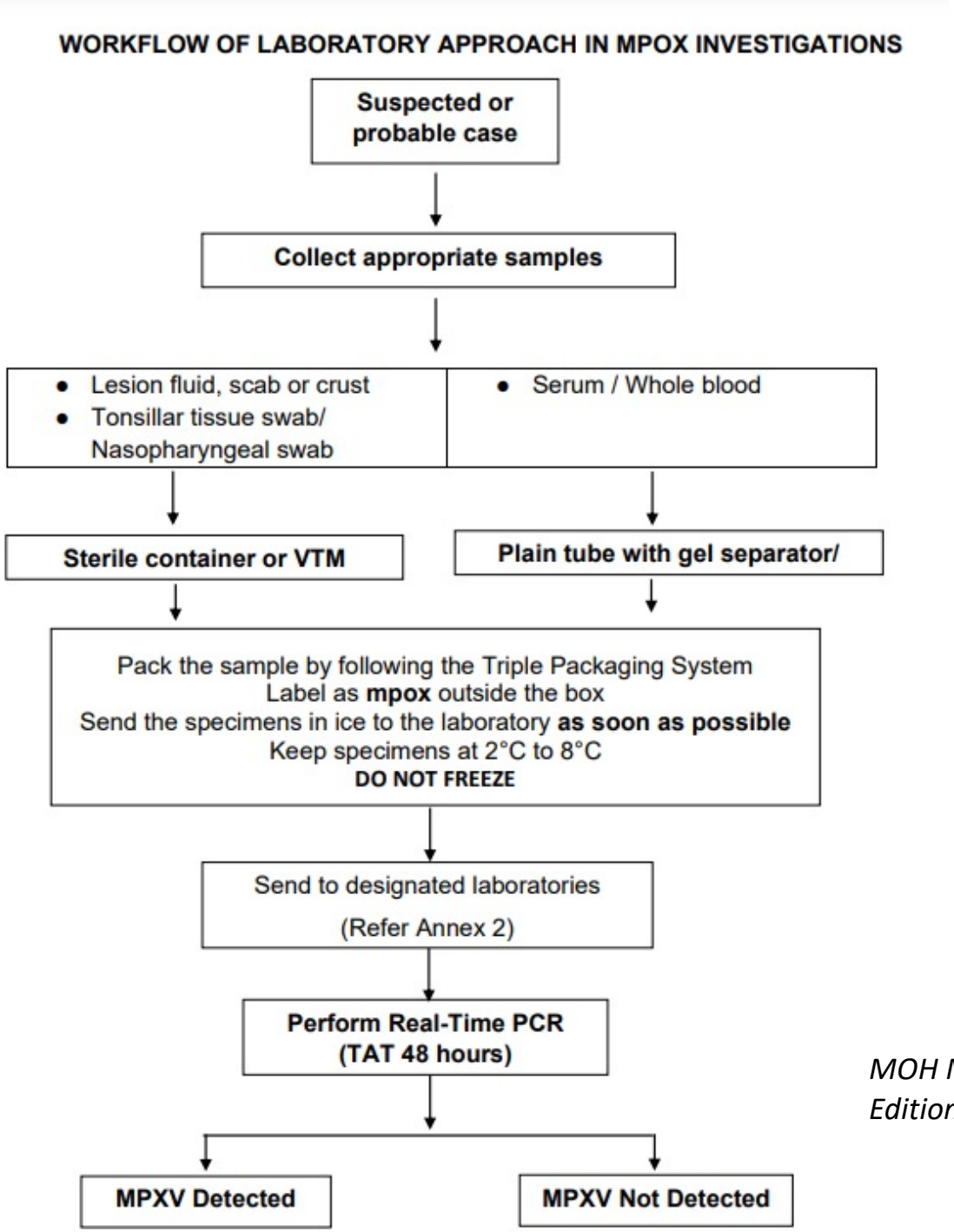
Table 1: Guidance on specimens for MPXV

Case Category	Disease Phase	Sign / Symptoms	Specimens to Collect
Suspected or probable case	Rash	Vesicles or Pustules	Lesion fluid, roof, or biopsy
		Scabs or Crusts	Lesion scab or crust
Contact	Prodrome	Early stage of fever	Tonsillar tissue swab
			Nasopharyngeal swab
			Blood (Plain Tube with gel separator/ EDTA)
Confirmed case	Post-Rash	Absent	Convalescent serum (gap 2 samples in 2-3 weeks after diagnosis)





MOH Malaysia Guidelines Mpox Management in Malaysia. 2nd Edition (Updated 18th January 2023)



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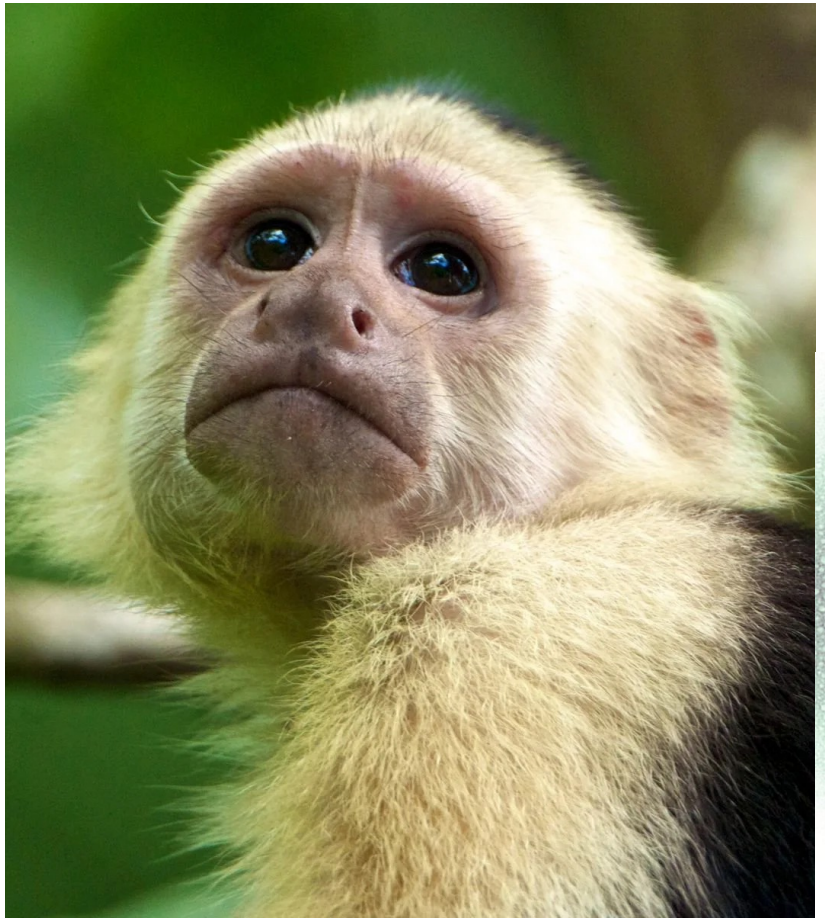
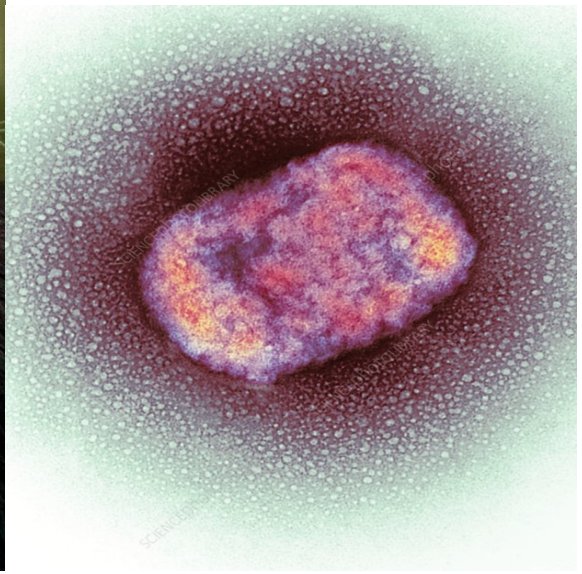
Private labs

9.	Neogenix Laboratories Sdn Bhd	Hospital atau klinik swasta
10.	Innoquest Pathology Sdn Bhd	
11.	PATHLAB Laboratory Malaysia	
12.	Dunia Wellness Laboratories Sdn Bhd	

*BP Healthcare
*Lablink Medical Laboratory

Case management & treatment





6. CASE MANAGEMENT

6.1 Management of Initial Mpox Cases in Malaysia

A suspected and probable mpox case should be quarantined at home while waiting for their laboratory result. Those who are not able to comply with home surveillance can be considered for admission.

Once confirmed mpox, the case should be issued an isolation order. Order to isolate oneself is issued under section 14 of Act 342 which says "*An authorized officer may cause any person who is infected or whom he has reason to believe to be infected to be removed to a quarantine station for treatment and may detain the person at the station until he can be discharged without danger to the public*". However, if isolation is carried out at their own house or any appropriate place, the requirement and risk of transmission should be explained to the patient and health supervision should be done regularly during the isolation period.

A confirmed case should be admitted to hospitals for isolation if:

i. they are in a dire situation that their health and condition need to monitored closely,
ii. they have multiple comorbidities and the likelihood for any complication to arise is high, and
iii. non-compliance to the isolation order other than hospital facilities can facilitate the transmission in the community.

Isolation precautions should be practiced until all lesions have resolved, and a fresh layer of skin has formed. The patient can be discharged from isolation upon assessment on the risk of diseases transmission to others.

Checklist for suitability of patients to undergo home surveillance:
(The checklist is provided as a guide, hence the assessment of patient suitability for home surveillance is tailored from one patient to another).

a. Has a separate bedroom with en-suite bathroom (preferable); if not, common bathroom with frequent disinfection.
b. Has access to food and other necessities.
c. Has access to face mask, glove and disinfectant at home.
d. Able to seek medical care if necessary and return with own private transport.
e. Able to adhere to instruction to follow home surveillance order.
f. Able to stay away (at least 2 meter apart) from the high-risk household members (e.g. individual > 60 years old, young children <2 years, pregnant women, people who are immunocompromised or who have chronic lung, kidney, heart disease).

6.2 Widespread Mpox Cases in Malaysia

Admission criteria

a. Patients who are clinically ill **OR** have the following symptoms:
   - Persistent fever beyond day 5
   - Exertional dyspnea, SpO_2 < 95% (at rest or at exertion)
   - Dehydration
   - Secondary infection of skin lesions
   - Reduced level of consciousness
   - Blurring of vision

b. Patients with uncontrolled medical conditions, immunocompromised status, pregnant women, extremes of age (< 2 years or > 60 years old).

c. Patients who do not fulfil the above criteria but are not suitable for home surveillance, to consider admission.

Treatment

Medical care setting — no. (%)	
Inpatient	70 (13)
Outpatient	458 (87)
Received monkeypox-specific treatment — no. (%)	25 (5)
Treatment used — no. (%)	
Cidofovir	12 (2)
Tecovirimat	8 (2)
Vaccinia immune globulin	1 (<1)
Other	2 (<1)

	Participants (n=181)
Outcomes	
Time to formation of dry crust, days	10·0 (7·0–12·5)
Admitted to hospital	
No	178 (98%)
Clinical management	2 (1%)
Social reasons	1 (1%)

- Majority of patients were managed in outpatient setting

- Main reasons of admission:

- Pain management (mostly for severe anogenital pain)
- Soft tissue superinfection

Eloy José Tarín-Vicente, Andrea Alemany, Manuel Agud-Dios, Maria Ubals et al. Clinical presentation and virology assessment of confirmed monkeypox virus cases in Spain: a prospective observational cohort study. The Lancet. Aug 8, 2022.

Eloy José Tarín-Vicente, Andrea Alemany, Manuel Agud-Dios, Maria Ubals

Mpox treatment is supportive

8.1 General Care

- Supportive care and symptomatic treatment, optimal nutritional support, maintain fluid and electrolytes balance, and close monitoring.
- Monitor vital signs (BP/PR/RR) 12 hourly to 8 hourly with increase in monitoring if indicated.
- Blood investigations, e.g. trend of FBC, CRP, LFT, RP, coagulation and blood culture according to clinical indications.
- Monitor sugar if indicated.
- Patients should not be routinely prescribed antibiotics unless suggestive of bacterial infection. Lesions should be monitored for secondary bacterial infection (i.e. cellulitis, abscess) and if present treated with antibiotics with activity against normal skin flora, including Streptococcus pyogenes and methicillin-sensitive Staphylococcus aureus (MSSA).

8.2 Skin care

Treatment objectives of skin care are:

- to prevent secondary bacterial infections
- to promote lesion healing
- to minimize insensible fluid loss

Therapeutic considerations

- Avoid scratching and picking the skin lesions.
- Wash/bath: Use gentle cleanser or soap twice a day.
- Apply calamine lotion twice a day for soothing effect and to relieve itch.
- Topical antibiotics/antiseptics can be applied onto the excoriated lesions.
- Avoid using topical corticosteroid onto the skin lesions.

Follow up/monitoring: to observe for the following signs:

- fever
- lesion count/rash burden
- pain/tenderness
- erythema
- edema
- exudate
- warmth

If ulcer or abscess developed:

- antiseptic wash with occlusive dressing

- systemic antibiotic to treat secondary bacterial infection
- consider surgical debridement for abscess or infected ulcers

8.3 Pain Management

- Pain is a common symptom of mpox virus infection, and specific considerations regarding management of pain as well as specific sites or complications of disease (e.g., proctitis) need to be addressed.
- Use pain score to assess pain.
- Paracetamol, NSAIDS are recommended for general pain control.
- Topical steroids and anaesthetics like lignocaine could also be considered for local pain relief. However, topical anaesthetics should be used with caution on broken skin or on open or draining wounds. Use disposable gloves and practice hand hygiene to minimise the risk of autoinoculation.
- Gabapentin and opioids can be used for short-term management of severe pain.

8.4 Proctitis

- Stool softeners should be considered to reduce pain associated with bowel movements.
- Warm sitz baths could be considered for symptomatic relief.
- Paracetamol, NSAIDS and topical anaesthetics can provide symptomatic relief.
- Severe pain may require opioids and adjunctive neuropathic pain agents like Gabapentin.
- Look out for complications like rectal perforation and perianal abscess.

8.5 Genital lesions

- Complications like penile oedema, paraphimosis/phimosis or secondary bacterial infections of the penis and scrotum need to be sought out.
- General pain control considerations as outlined above.

8.6 Oropharyngeal lesions

- Complications like tonsillar oedema, peritonsillar abscess and epiglottitis have been reported.
- Consider rinsing the mouth with clean salt water 4 times/day.
- Oral antiseptic like chlorhexidine mouth wash, local anaesthetic and analgesic mouth wash can also be considered.

8.7 Specific Treatment

Treatment should be considered for use in people with following clinical manifestations:

- Severe disease — haemorrhagic disease; large number of lesions such that they are confluent; sepsis; encephalitis; ocular or periorbital infections; or other conditions requiring hospitalization.
- Involvement of anatomic areas which might result in serious sequelae that include scarring or strictures — example: lesions directly involving the pharynx causing dysphagia, inability to control secretions, or need for parenteral feeding.
- High risk of severe disease – severely immunocompromised
- Pediatric populations – younger than 8 years of age
- Pregnant / breastfeeding women
- People with conditions affecting skin integrity – atopic dermatitis, eczema, burns

Currently there is no treatment approved specifically for mpox virus infections. However, antivirals developed for use in patients with smallpox may prove beneficial against mpox.

Antivirals like Tecovirimat, Cidofovir, Brincidofovir and Vaccinia Immune Globulin Intravenous have been listed as part of treatment considerations.

Antivirals - TECOVIRIMAT (TPOXX)

- Potent inhibitor of an orthopoxvirus protein required for the formation of an infectious virus particle that is essential for dissemination within an infected host

- UK, EUROPE – Approved for Mpox
- US- still an investigational agent

- 5 RCTs ongoing
- Cohort studies – no serious safety signals

Cochrane Database Syst Rev. 2023;3(3):CD015769. Epub 2023 Mar 14.

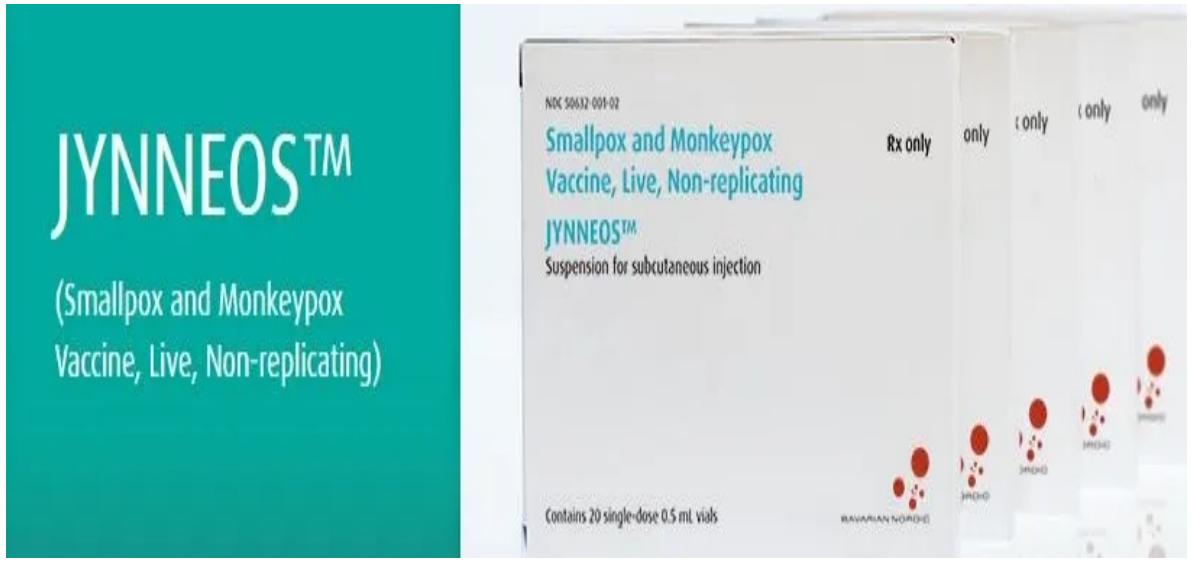
CDC June 2024

Indications for antiviral therapy in persons with mpox*

Population	Specific conditions
Patients who are severely immunocompromised (regardless of severity of mpox at time of presentation)	▪ HIV with CD4 <200 cells/microL ▪ Leukemia or lymphoma ▪ Generalized malignancy ▪ Solid organ transplantation ▪ Therapy with alkylating agents within 180 days prior to mpox illness onset ▪ Antimetabolites within 180 days prior to mpox illness onset ▪ Radiation therapy within 180 days prior to mpox illness onset ▪ Tumor necrosis factor inhibitors within 180 days prior to mpox illness onset ▪ High-dose corticosteroids (equivalent of 20 mg or greater of prednisone for at least 14 days) within 90 days prior to mpox illness onset ▪ Being a recipient with hematopoietic stem cell transplant <24 months post-transplant or ≥24 months but with graft-versus-host disease or disease relapse, or having autoimmune disease with immunodeficiency as a clinical component ▪ Other comparable severe immunocompromising condition
Persons with active skin conditions placing the person at higher risk for disseminated infection	▪ Eczema ▪ Burns ▪ Impetigo ▪ Active varicella-zoster virus infection ▪ Psoriasis ▪ Darier disease (keratosis follicularis)
Pregnant or lactating individuals (regardless of severity of mpox at time of presentation)	
Persons <18 years of age (regardless of severity of mpox at time of presentation)	
Patients with protracted or life-threatening manifestations of mpox at presentation	▪ Lesions affecting ≥25% of body surface that may be confluent, necrotic, and/or hemorrhagic in appearance or cause sepsis ▪ Disease resulting in airway compromise or affecting the nervous system ▪ Cardiac (eg, myocarditis) and/or neurologic disease (eg, encephalitis), which might occur in a small number of patients with mpox ▪ Ocular or periorbital infection, regardless of the time since infection onset

Vaccines (as PrEP or PEP)

- 2 vaccines available:
- **Modified Vaccinia Ankara (MVA)**
- **JYNNEOS (US), IMVANEX (EU), IMVAMUNE (Canada)** (FDA approved in USA and Canada for smallpox and monkeypox)
- Live, attenuated vaccine, 2 dose series, 28 days apart
- Peak antibody response occurs 2 weeks after 2nd dose of vaccine



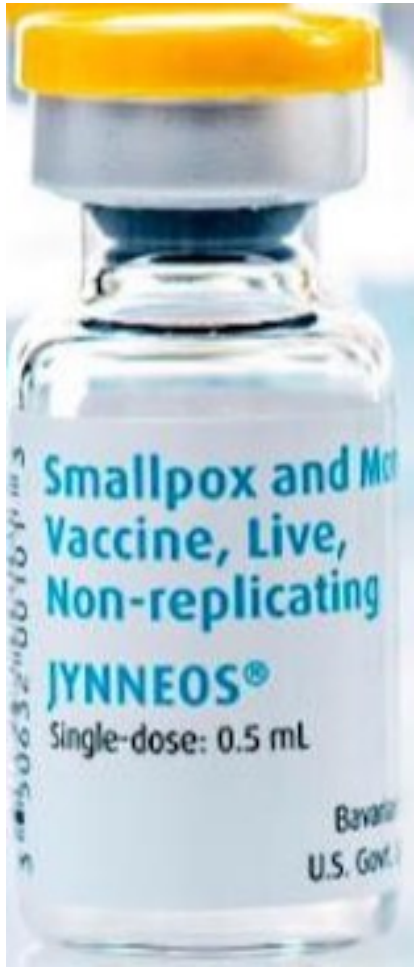
- **ACAM2000**, approved for smallpox only, but granted to use against monkeypox (IND)
- Live vaccine, selected patients
- Single dose only but requires multiple skin punctures

- Both are at least **85%** effective at preventing monkeypox

CDC. Monkeypox and smallpox vaccine guidance.

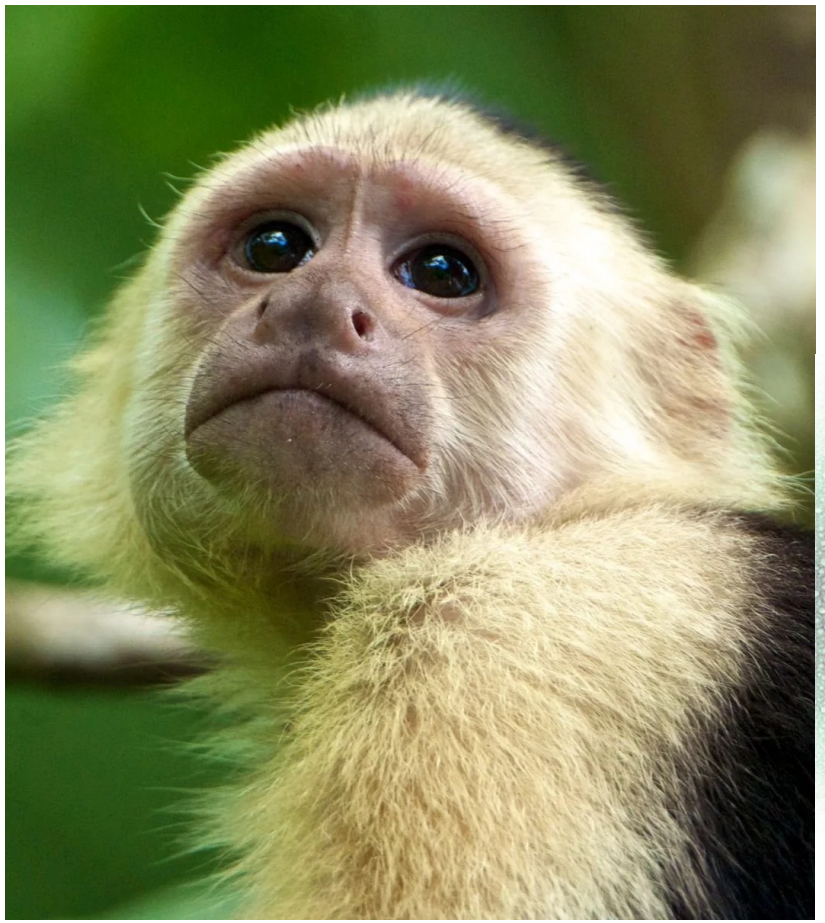
JYNNEOS

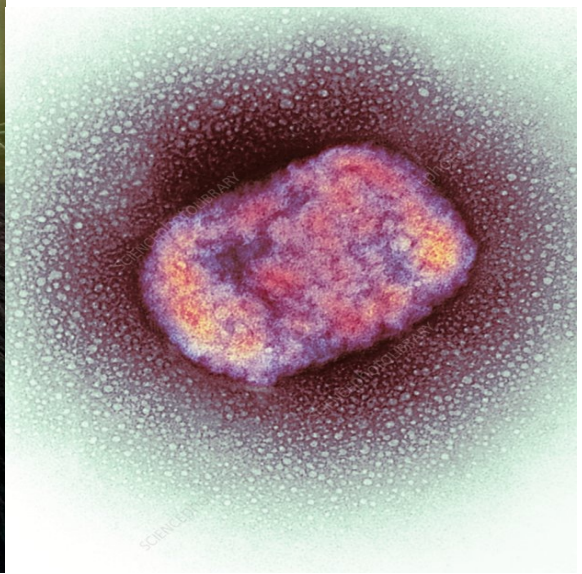
- JYNNEOS (@*Imvanex/Imvamune*), made by Bavarian Nordic, Denmark, contains a type of poxvirus that can't replicate but can trigger an immune response.



- 2013 – Approved for prevention of smallpox (Canada, EU)
- 2019 - Approved for prevention of smallpox and Mpox (US, Canada)
- 2022 – Approved for prevention of Mpox (EU)
- 2022 – Granted emergency use authorization for <18yrs of age (US)

Case notification & contact tracing





7. CASE NOTIFICATION

All suspected, probable or confirmed mpox cases must be notified to the District Health Office within 24 hours via phone call. This is then followed by the Borang Notifikasi Penyakit Berjangkit under “other life-threatening microbial infection” (Annex 4) or input patient’s information into the e-Notification System.

All notified mpox cases (suspected, probable or confirmed) must be investigated using the Investigation Form in Annex 5. It is to identify the source of the infection, so that preventive and control measures can be taken immediately to prevent its spread.

A suspected case should be issued Observation and Surveillance order at home or residence under section 15(1) of Prevention and Control of Infectious Disease Act 1988 [*Act 342*] while waiting for the laboratory test result (Annex 6). Patient should be explained on the importance of the surveillance and risk of transmission of the infection. Release order can be issued once the test is negative mpox virus (Annex 7).

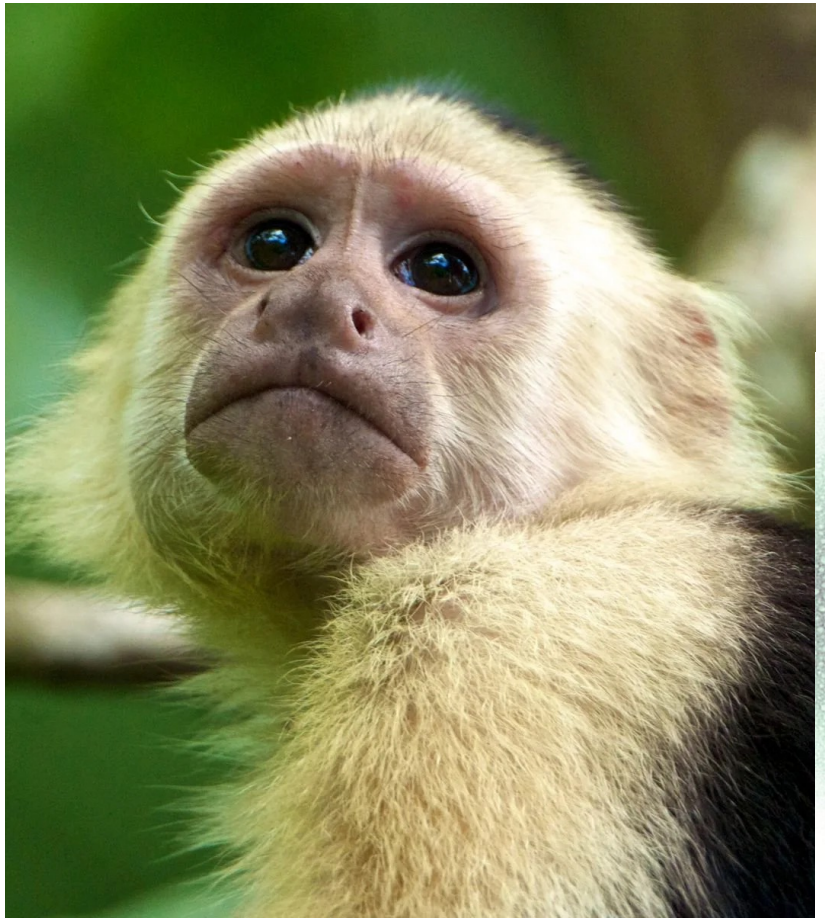
Contact tracing

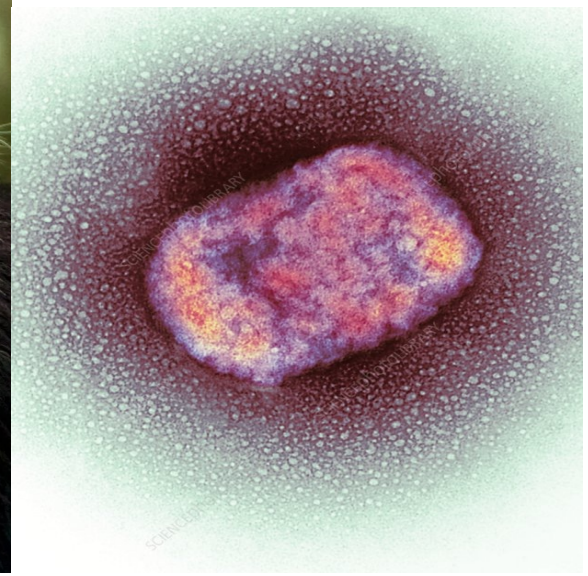
Exposure risk	Description	Example scenarios	Public health advice
High (category 3) Unprotected direct contact or high-risk environmental contact	Direct exposure of broken skin or mucous membranes to mpox case, their body fluids or potentially infectious material (including clothing or bedding) without wearing appropriate PPE[1,2] Penetrating sharps injury (including to cleaning or laboratory staff)	Sexual or intimate contact with or without a condom Higher risk household contacts who have had close skin to skin contact, for example frequent touching or cuddling, or who have shared bedding, clothing or towels with the case Body fluid in contact with eyes, nose, or mouth Penetrating sharps injury from used needle Person in room during aerosol-generating procedure without appropriate respiratory PPE[1,2] Changing a patient's bedding without appropriate PPE[1,2]	Passive monitoring Provide information sheet Avoid sexual or intimate contact and other activities involving skin to skin contact for 21 days from last exposure Avoid contact with immunosuppressed people[3], pregnant women, and children aged under 5 years where possible for 21 days from last exposure Consider exclusion from work following a risk assessment for 21 days if work involves skin to skin contact with immunosuppressed people[3], pregnant women or children aged under 5 years (not limited to healthcare workers) Contacts who are children do not require exclusion from school International travel is not advisable

UKHSA. Mpox. 8th September 2018. Updated 6th July 2023. GOV.UK

Exposure risk	Description	Example scenarios	Public health advice
Medium (category 2) Unprotected exposure to infectious materials including droplet or airborne potential route	Intact skin-only contact with an mpox case, their body fluids or potentially infectious material or contaminated fomite or Passengers seated directly next to mpox case on plane or No direct contact but within one metre for at least 15 minutes with an mpox case without wearing appropriate PPE[1,2]	Clinical examination of patient before diagnosis without appropriate PPE[1,2] Entering patient's room without wearing appropriate PPE[1,2] and within one metre for at least 15 minutes with the case Lower risk household contact: Individuals who live in the same household but do not meet the criteria of category 3 Sharing a car with case, or sitting next to case on plane Subsequent patients in consulting room after an mpox case was seen and prior to room cleaning Spillage or leakage of laboratory specimen onto intact skin	Passive monitoring Provide information sheet Avoid sexual or intimate contact and other activities involving skin to skin contact for 21 days from last exposure International travel is not advisable Contacts who are children do not require exclusion from school
Low (category 1) Protected physical or droplet exposure No physical contact, unlikely droplet exposure	Contact with mpox case or environment contaminated with MPXV while wearing appropriate PPE[1,2] (with no known breaches) or Healthcare worker (HCW) involved in care of an mpox case not wearing appropriate PPE[1,2] without direct contact and maintained a distance between one and 3 metres and no direct contact with contaminated objects Community contact between one and 3 metres of an mpox case or Passengers seated within 3 rows from an mpox case on plane	Healthcare staff wearing appropriate PPE[1,2] Healthcare staff entering patient room without PPE[1,2] and: a. without direct contact with patient or their body fluids and b. maintaining a distance of more than one metre from patient Person undertaking decontamination of rooms where an mpox case has stayed, while wearing appropriate PPE[1,2] Passengers who have been seated within 3 rows, but not directly next to, a case on plane	None

Infection Prevention & Control (IPC)





Preventing spread of infection

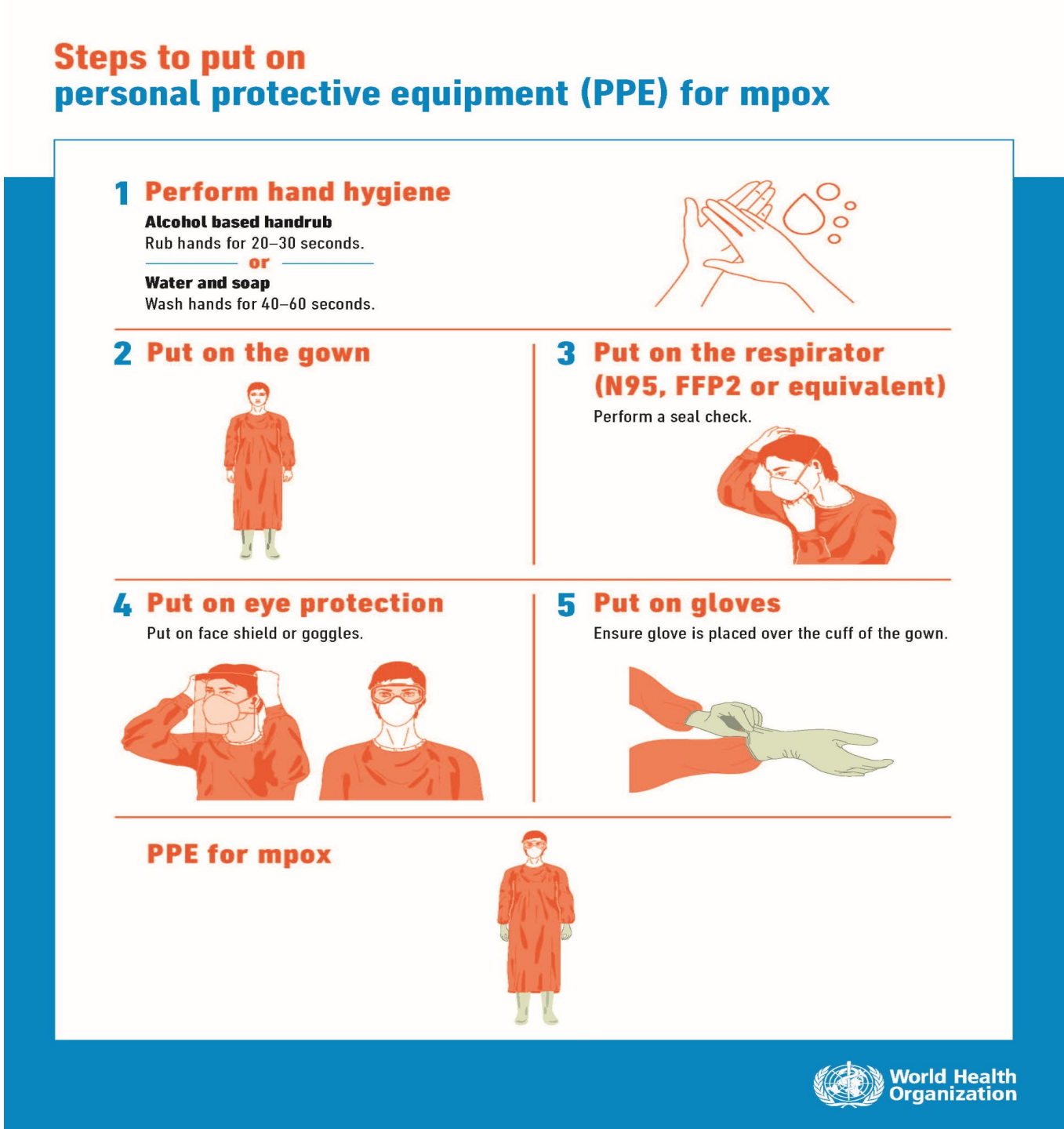
- **LEARN FROM COVID!**

1. Educate about common presentations and risk factors

2. Identify and isolate

3. Proper PPE

- PPE should be put on before entering the patient's room
- Dispose PPE prior to leaving the isolation room



Home isolation

UKHSA. Mpox. 8th September 2018.
Updated 6th July 2023. GOV.UK

- You should self-isolate at home until:

- you have not had a high temperature for at least 72 hours

- you have had no new lesions in the previous 48 hours

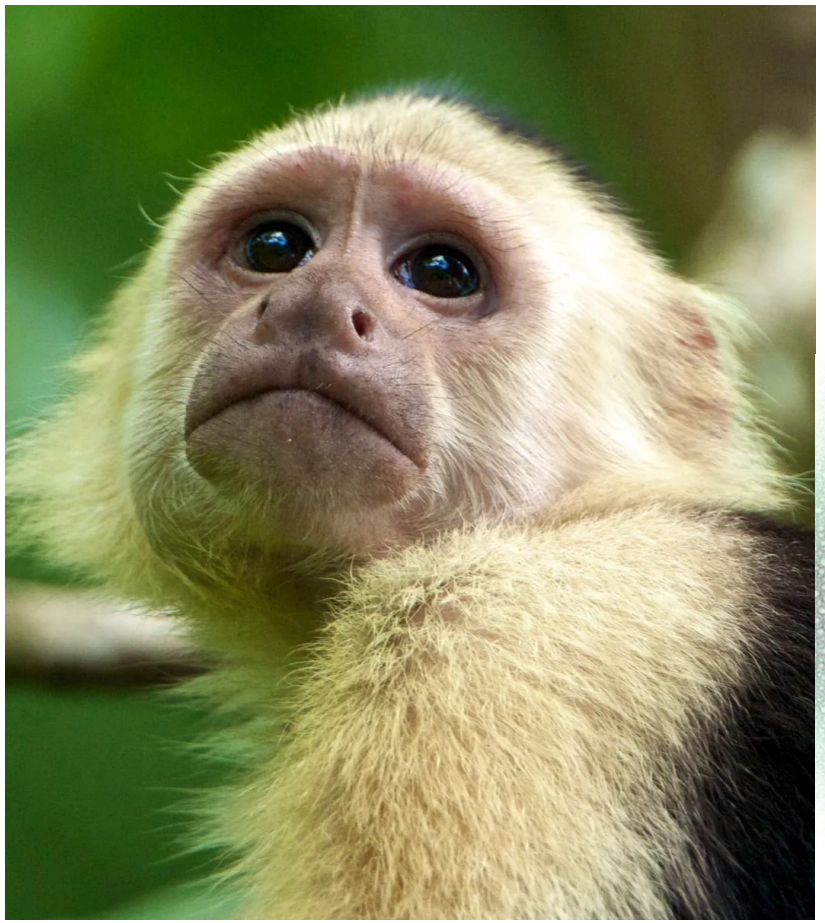
- all your lesions have scabbed over

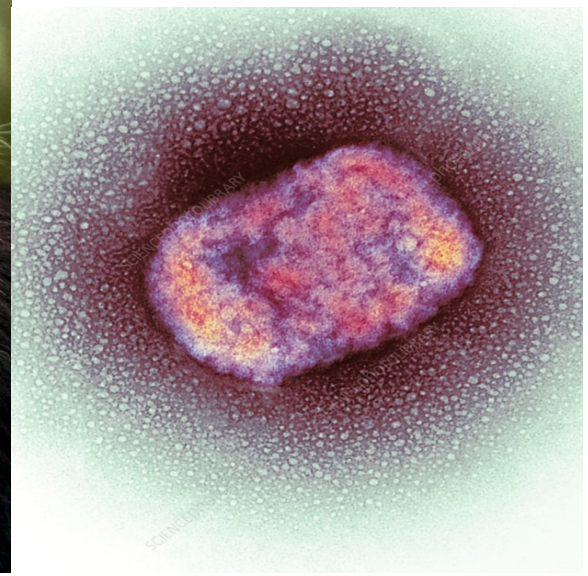
- you have no lesions in your mouth

- any lesions on your face, arms and hands have scabbed over, all the scabs have fallen off and a fresh layer of skin has formed underneath

- To protect other members of your household you should keep at least 3 steps (1 metre) away
- Only leave your home for essential purposes such as emergencies, urgent medical appointments, or for urgent health and wellbeing issues
- If you need to leave your home, make sure all skin lesions on your body are completely covered for example by wearing a long-sleeved top and full-length trousers. Wear a well-fitting surgical face mask or a double-layered face covering while you are outside your home
- Sleep in a separate room, if available, and do not share bedding
- Refrain from intimate or sexual activity. If you wish to resume sexual activity after your self-isolation has ended you should use a condom for 12 weeks after your rash has scabbed over and scabs have fallen off
- Use a separate bathroom from the rest of your household, if available. If you do not have a separate bathroom, follow the cleaning instructions
- Use your own toothbrush, towels and washcloths
- Use separate dishes, cups and cutlery
- Do not share food and drink
- Eat in a separate room – ask the people you live with to bring your meals to you
- Cover your mouth and nose with disposable tissues when you cough or sneeze and dispose of them in a bag – place this into a second disposable bag and tie it securely before disposing as usual with your household waste, then wash your hands thoroughly with soap and water for 20 seconds
- Clean your hands frequently throughout the day by washing with soap and water for 20 seconds – use a separate soap dispenser and hand towel from the rest of the household.

Health education & stigma





12. HEALTH EDUCATION

Health promotion and education is to be conducted through multiple channels and methods to:

- encourage people with symptoms to seek treatment and to confirm the diagnosis;
- isolate infected patients from others who could be at risk for infection;
- urge contact of mpox cases to stay home and observe symptoms and signs of mpox for 21 days from the last day of meeting the case;
- advice those caring for mpox patients to use personal protective equipment (PPE) when managing them;
- avoid contact with any materials, such as bedding and clothes that has been in contact with a mpox case;
- avoid contact with animals that could harbour the virus (including animals that are sick or that have been found dead in areas where mpox occurs); and
- practice good hand hygiene after contact with infected humans or animals, washing hands with soap and water or using an alcohol-based hand sanitizer.

Stigma in Mpox outbreak

Monkeypox

Monkeypox is spreading among gay men worldwide

People with well-controlled HIV are not at increased risk

Liz Highleyman | 25 May 2022

Monkeypox and gay men: Separating stigma from health advice

By Lauren Moss, LGBT correspondent & Josh Parry, LGBT producer
BBC News

28 May

News > World > Americas

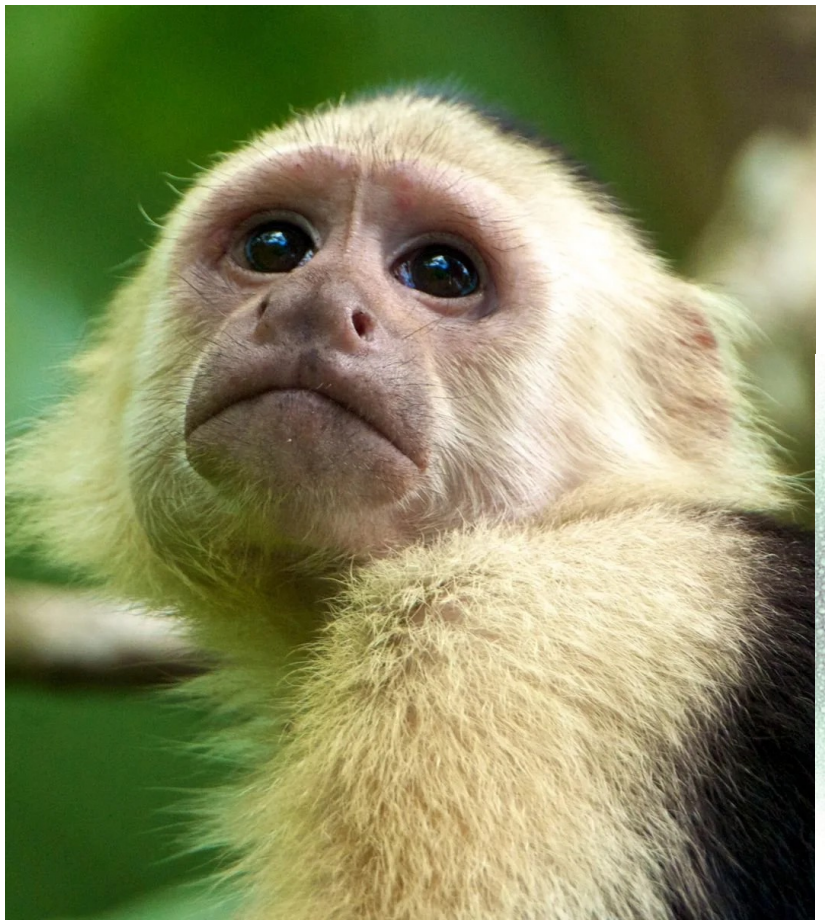
Anthony Fauci says LGBT community must be listened to in order to combat monkeypox

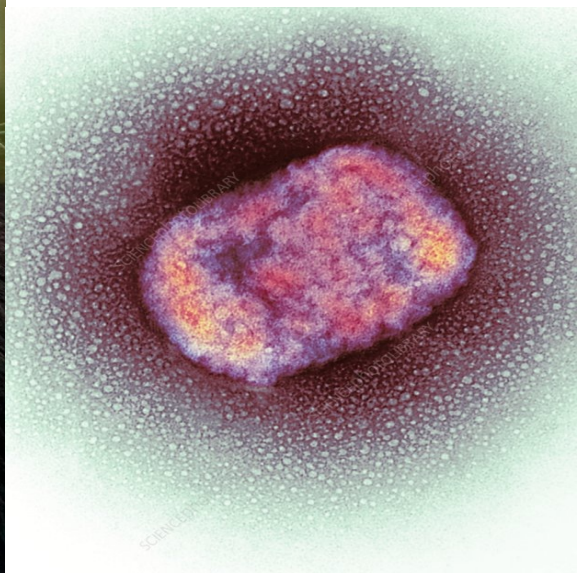
'The lessons we learned from HIV helped us with Covid, and the lessons we learned from HIV are helping us with monkeypox,' Dr Fauci said.

Take home message

- Unprecedented community transmission of Mpox in non-endemic countries
- 2 outbreaks:
  - Clade 2 (sexual transmission)
  - Clade 1 (travellers from Africa)
- Rapid identification and diagnosis to contain further community spread
  - *Be vigilant to the possibility of Mpox if characteristic rash is present*
- Although majority were GBMSM, it is NOT a GBMSM's disease; any one could get it!
  - *Non-stigmatization is important; otherwise it would drive the outbreak underground*
- Atypical features; may need to consider Mpox in at-risk persons presenting with traditional STI symptoms

References





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THANK YOU