Monkeypox

KwaZulu-Natal Department of Health

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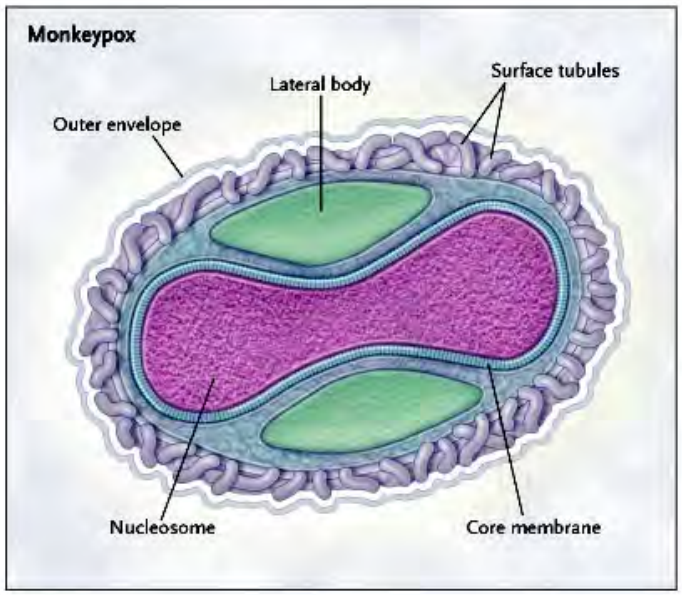
2 August 2022

Monkeypox



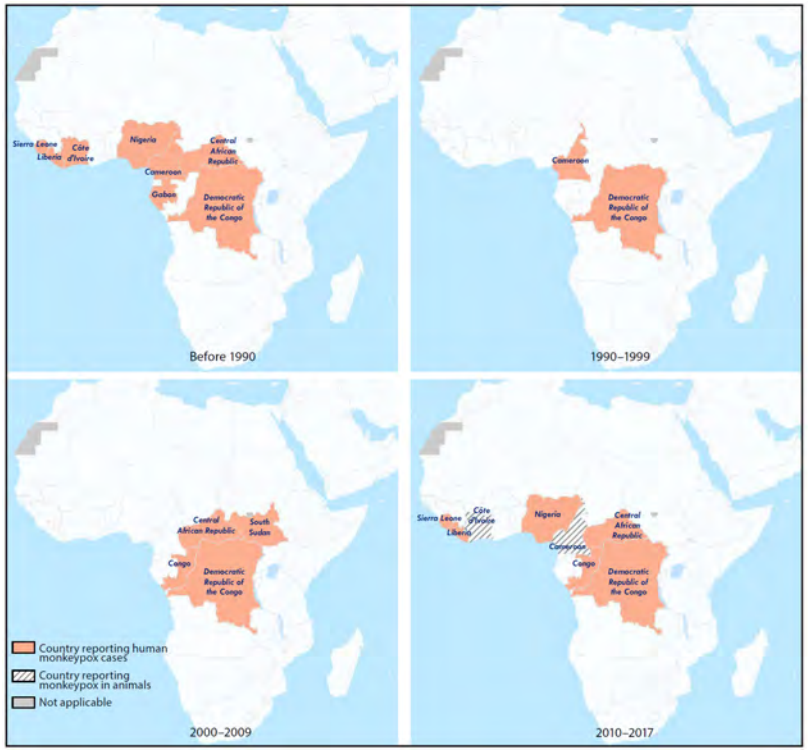
Monkeypox is a viral zoonotic disease caused by **monkeypox virus (MPXV)**

Monkeypox virus is a double-stranded DNA virus that belongs to the ***Orthopoxvirus*** genus of the ***Poxviridae*** family

Two MPXV clades (historically designated West Africa and Congo Basin clades) – current outbreak involves predominantly viruses from the West Africa clade

Frey SE & Belshe RB. NEJM 2004

History of monkeypox



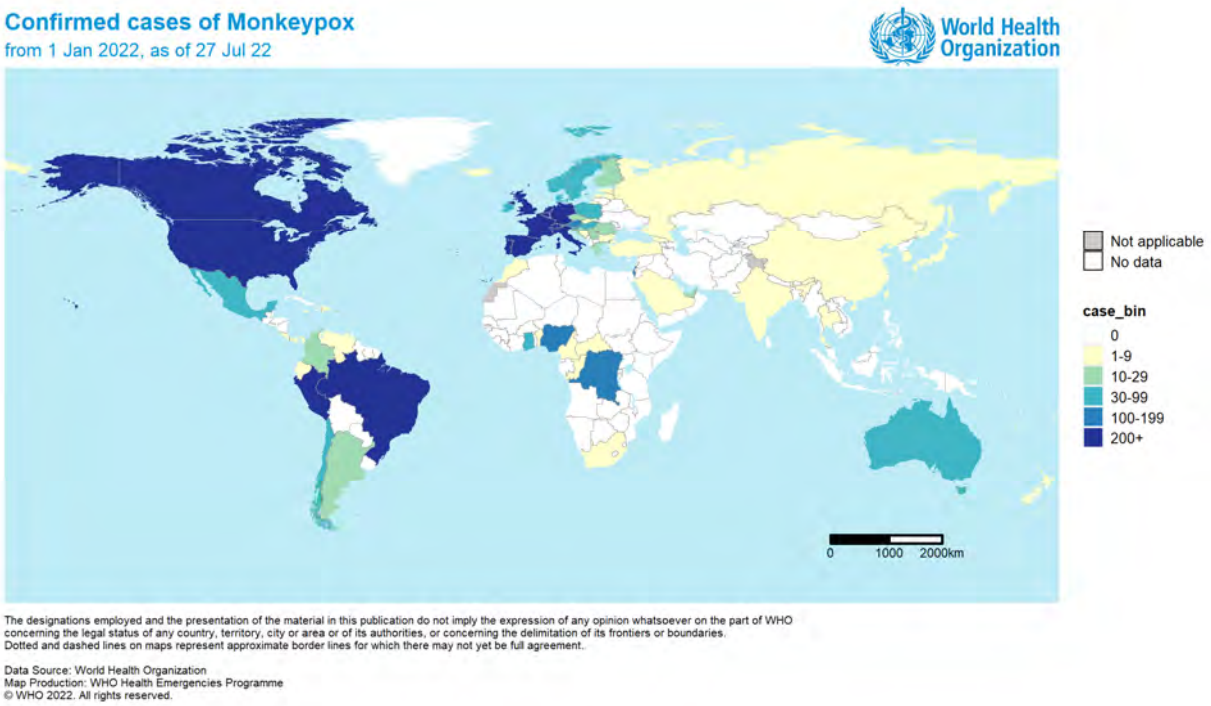
The name monkeypox originates from the initial discovery of the virus in monkeys being used for polio virus research in Denmark in 1958

First human case described in 1970 in DRC - prior to the current outbreak, human cases of monkeypox reported in 11 African countries (West & Central Africa)

Outbreak in US in 2003 (linked to infected pet prairie dogs) and other sporadic reports outside Africa in people with travel from affected African countries

WHO Weekly Epidemiological Record 2018; 93: 117-132

Current monkeypox outbreak

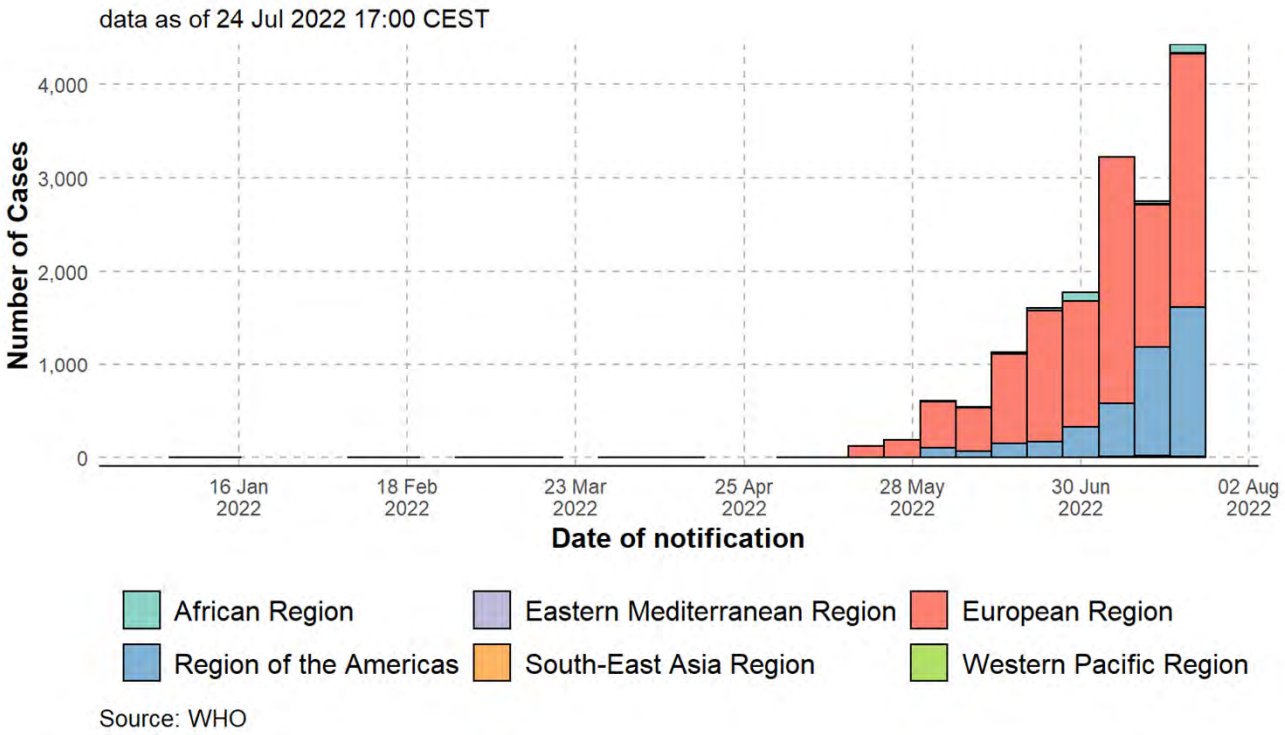


Over **20,000 confirmed cases** reported from **78 countries** across all WHO regions

On 21 July, WHO Director-General declared this outbreak a **Public Health Emergency of International Concern (PHEIC)**

https://worldhealthorg.shinyapps.io/mpx_global/

Current monkeypox outbreak

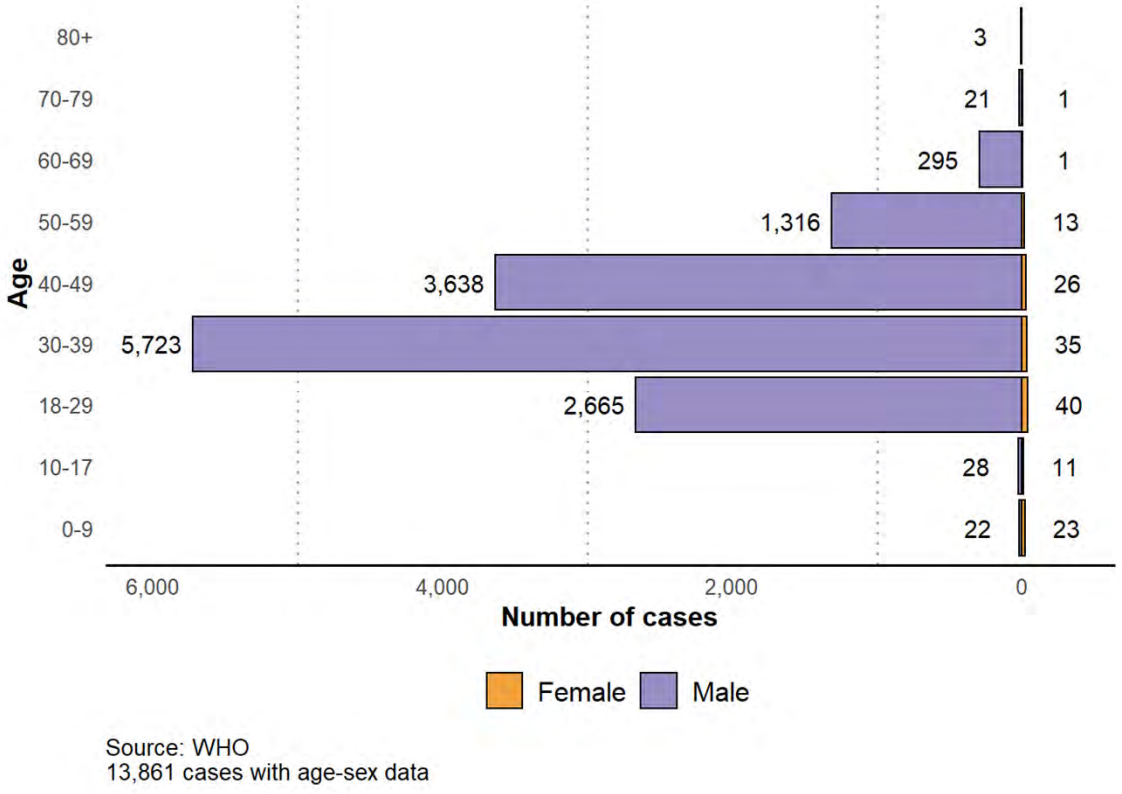


In this outbreak, most cases so far have been detected in Europe, North America and South America

Three cases reported from South Africa (GP, WC, LP) -first two no recent travel history

https://worldhealthorg.shinyapps.io/mpx_global/

Features of current monkeypox outbreak



Source: WHO
13,861 cases with age-sex data

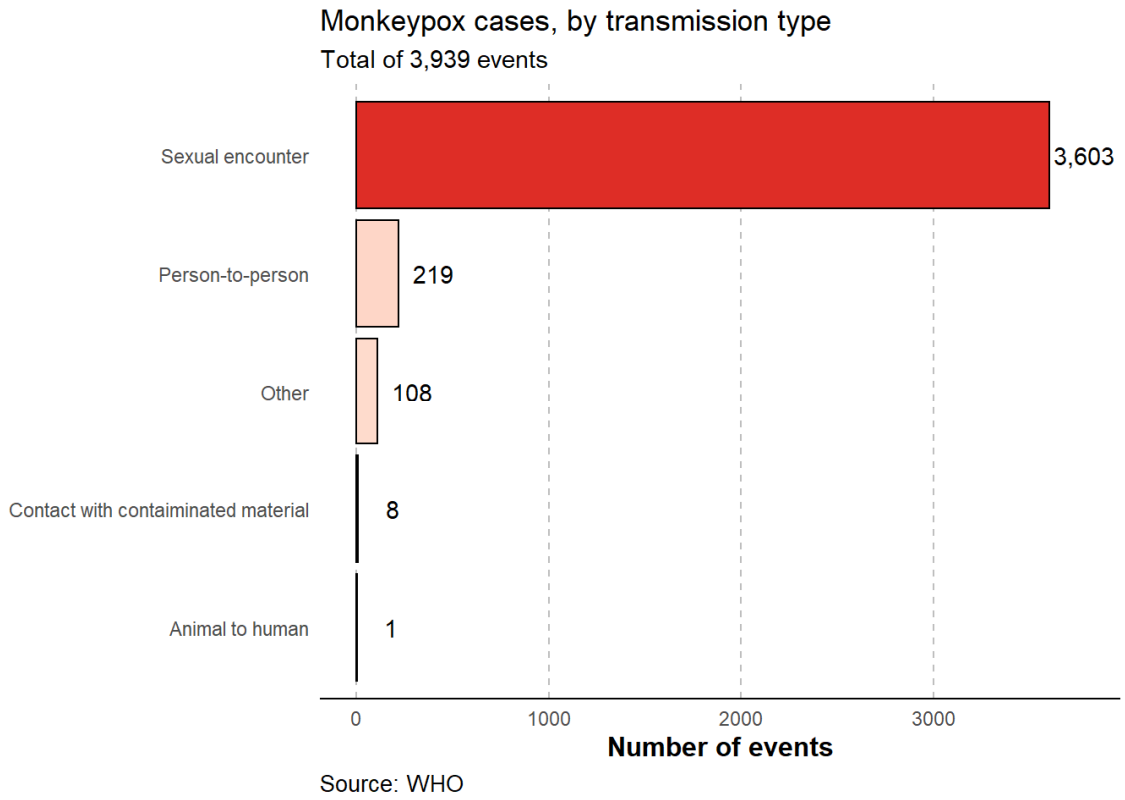
99% of reported cases with available data are male

Median age 36 years (interquartile range 31-43)

Most reported cases so far have been in gay, bisexual and other men who have sex with men (GBMSM) – spread in densely connected networks

https://worldhealthorg.shinyapps.io/mpx_global/

Features of current monkeypox outbreak



Of all reported types of transmission, a sexual encounter was reported most commonly

The specific role of transmission via skin-to-skin and skin-to-mucosa contact during sex vs. transmission via bodily fluids cannot currently be disentangled

https://worldhealthorg.shinyapps.io/mpx_global/

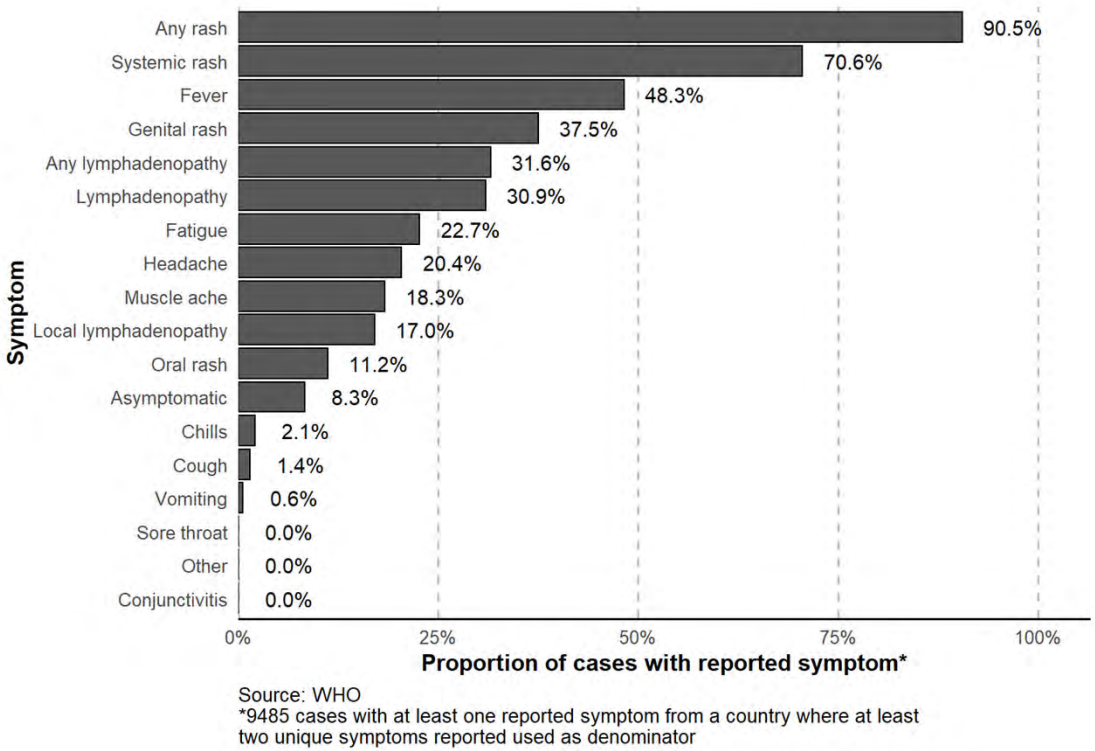
Transmission of monkeypox virus

- Human-to-human transmission through direct contact with infectious skin or mucocutaneous lesions (this includes face-to-face, skin-to-skin, mouth-to-mouth or mouth-to-skin contact) and respiratory droplets
- Transmission can also occur from the environment from contaminated clothing, linens or other objects (fomite transmission)
- Role of sexual transmission through semen not yet clear
- Transmission can occur from mother to fetus via the placenta
- A person with monkeypox is infectious from the time symptoms start until the rash has fully healed and a fresh layer of skin has formed

Clinical features

- Incubation period 5-21 days (usually 7-14 days)
- Classical description of monkeypox is of two phases of illness
  - Prodromal phase – fever, lymphadenopathy, headache, myalgia, asthenia
  - Rash starting on face then extremities (number of lesions varies) – rash can evolve from macules → papules → vesicles → pustules → crusts
- Monkeypox virus can cause severe disease in certain population groups - young children, pregnant women, and immunosuppressed persons
- Complications can include secondary bacterial skin/soft tissue infections, sepsis, pneumonia, encephalitis and ophthalmic disease

Clinical features



Source: WHO
*9485 cases with at least one reported symptom from a country where at least two unique symptoms reported used as denominator

Clinical features of many cases in ongoing outbreak considered ‘atypical’

Rash often localized with few or even solitary lesions

Symptoms and location of lesions will depend on inoculation site – be aware of other symptoms such as oral pain, difficulty swallowing, anorectal pain

https://worldhealthorg.shinyapps.io/mpx_global/

Clinical images – cutaneous lesions

a) Early vesicle, 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

UK Health Security Agency

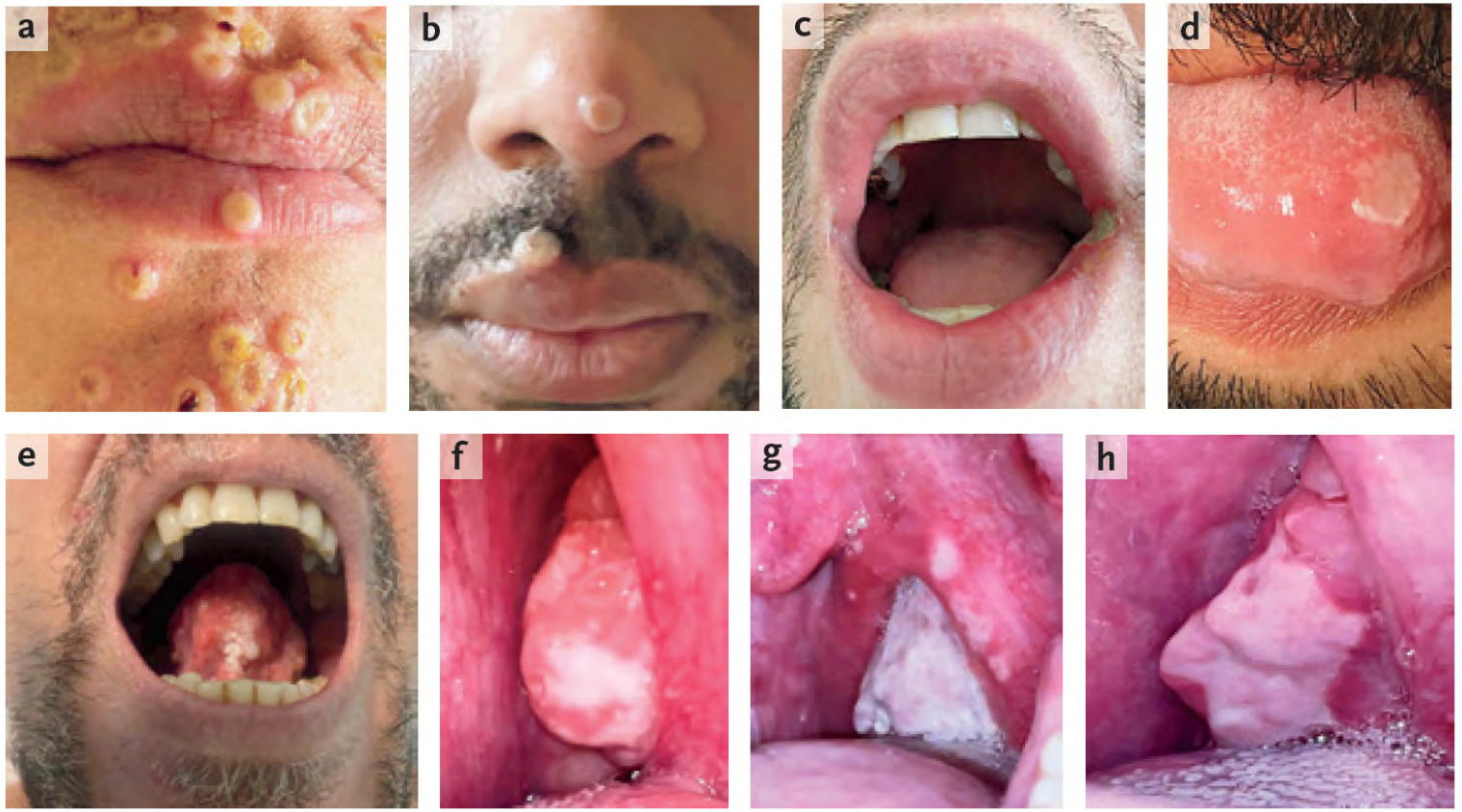
Clinical images – evolution of cutaneous lesions

Thornhill JP et al. NEJM 2022

Clinical images – penile lesions

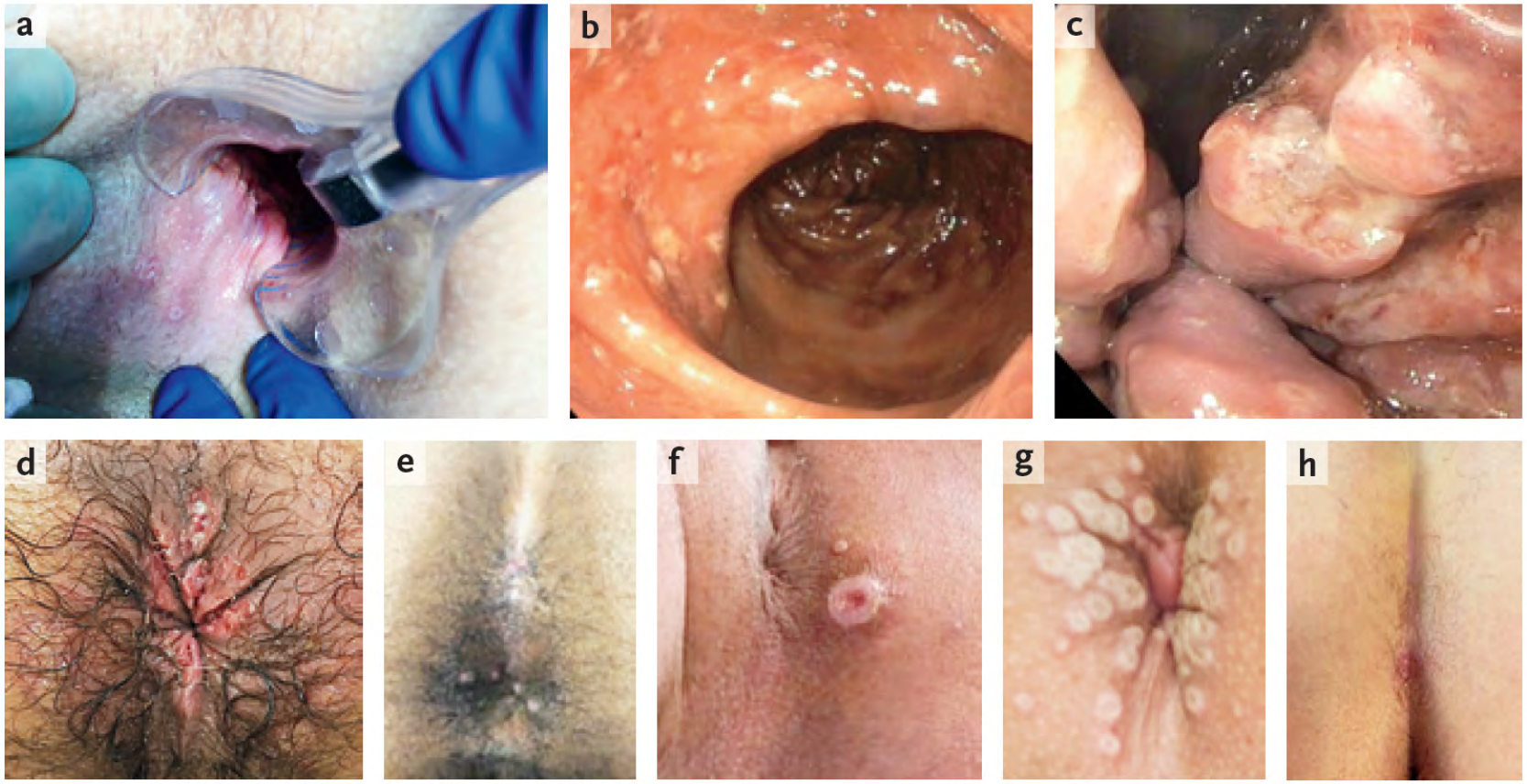
Patel A et al. BMJ 2022

Clinical images – oral/perioral lesions



Thornhill JP et al. NEJM 2022

Clinical images – perianal, anal and rectal lesions



Thornhill JP et al. NEJM 2022

Differential diagnosis

The rash which develops in monkeypox may resemble other infectious diseases or other conditions: varicella zoster virus (VZV, chickenpox), herpes simplex virus (HSV), primary or secondary syphilis, disseminated gonococcal infection, hand, foot and mouth disease, chancroid, lymphogranuloma venereum (LGV), granuloma inguinale, molluscum contagiosum, cryptococcosis, measles, scabies, vasculitis, other bacterial skin and soft tissue infections

Differential diagnosis will depend on nature and distribution of rash, and pattern of associated features - classically lymphadenopathy is helpful to differentiate monkeypox from chickenpox but this may be less helpful in current outbreak

Other diagnosis (especially STI) does not exclude monkeypox – could be concurrent infections

Case definitions – World Health Organization

Suspected case

A person of any age presenting with an unexplained acute rash

AND

One or more of the following signs or symptoms: Headache, acute onset of fever (>38.5°C), lymphadenopathy, myalgia, back pain, asthenia

AND

For which the following common causes of acute rash do not explain the clinical picture: chickenpox, herpes zoster, measles, Zika, dengue, chikungunya, herpes simplex, bacterial skin infections, disseminated *gonococcus* infection, syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, molluscum contagiosum, allergic reaction; and any other locally relevant common causes of papular or vesicular rash (*N.B. do not need negative lab tests for all these*)

Case definitions – World Health Organization

Probable case

A person meeting the case definition for a suspected case

AND

One or more of the following:

- Epidemiological link to a probable or confirmed case of monkeypox in the 21 days before symptom onset
- Reported travel history to a monkeypox endemic country in the 21 days before symptom onset
- Has had multiple or anonymous sexual partners in the 21 days before symptom onset
- Has a positive result of an *orthopoxvirus* serological assay, in the absence of smallpox vaccination or other known exposure to orthopoxviruses
- Is hospitalized due to the illness

Case definitions – World Health Organization

Confirmed case

A case meeting the definition of either a suspected or probable case and is laboratory confirmed for monkeypox virus by detection of unique sequences of viral DNA either by real-time polymerase chain reaction (PCR) and/or sequencing

Monkeypox investigation & diagnosis

STEP 1: REPORT THE SUSPECTED CASE TO THE NICD TO ALLOW A RISK ASSESSMENT TO BE CARRIED OUT AND GUIDE LABORATORY TESTING

- Contact the NICD Hotline **+27800 212 552**

STEP 2: COMPLETE THE CASE INVESTIGATION FORM

- Fully complete the case investigation form (available from www.nicd.ac.za/monkeypox)

STEP 3: SUBMIT SPECIMENS FOR SPECIALIZED LABORATORY INVESTIGATION

- The following specimens are used for the investigation:

Sample type	Collection materials	Comments
Skin lesion material: Swabs of lesion exudate / Aspirate of lesion fluid Lesion roof/s Lesion crust/s	Dacron or polyester flocked swabs with VTM or dry swab	**Preferred sample** **Required for all investigations**

https://www.nicd.ac.za/wp-content/uploads/2022/06/Annexure-B_Monkeypox_Case-Investigation-Form.pdf
https://www.nicd.ac.za/wp-content/uploads/2022/07/Laboratory-guidance_Monkeypox_010722.pdf

Monkeypox IPC

- Contact and droplet precautions should be implemented for any person suspected of monkeypox
- Airborne precautions should be implemented if chickenpox is suspected (until excluded)
- Ideally place patient in a well-ventilated single room with a dedicated bathroom or toilet
- Healthcare workers should wear PPE, including gloves, gown, a respirator (e.g. N95, FFP2) and eye protection
- Precautions should remain in place until all lesions have crusted, scabs have fallen off and a fresh layer of skin has formed underneath

Clinical management

- Clinical management in most cases largely supportive
  - Antipyretics for fever
  - Analgesia for pain
  - Antihistamines for pruritis
  - Oral salt water rinse/antiseptic for oral lesions
  - Warm baths and topical local anaesthetic for genital and anorectal lesions
  - Antibiotics for secondary bacterial skin/soft tissue infection (not for uncomplicated lesions)
  - Good hydration & nutrition

Monkeypox treatment

- Antivirals can be used in those that present with or develop severe disease, or individuals at higher risk of severe disease (e.g. immunocompromised)

- No antivirals currently available in South Africa

- Antivirals being used in other countries
  - Tecovirimat
  - Brincidofovir
  - Cidofovir

Monkeypox vaccination

- Smallpox vaccination provides some level of cross-protection to monkeypox (in SA smallpox vaccination ended in 1980, so most people under 40 years have not been vaccinated)
- Limited supply of second- and third-generation smallpox vaccines globally
- No vaccines currently available in South Africa
- Vaccines being used in some countries for post-exposure prophylaxis (close contacts) and pre-exposure prophylaxis in high-risk groups (e.g. GBMSM) and healthcare workers
- Mass vaccination not currently recommended

Further resources

NICD https://www.nicd.ac.za/diseases-a-z-index/monkeypox/

WHO general monkeypox resources https://www.who.int/health-topics/monkeypox

WHO current outbreak resources
https://www.who.int/emergencies/situations/monkeypox-oubreak-2022

WHO outbreak trends https://worldhealthorg.shinyapps.io/mpx_global/

OpenWHO training course https://openwho.org/courses/monkeypox-intermediate