



Monkeypox 2022

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Disclosure

- Relevant relationships with commercial entities
 - NONE
- Potential for conflicts of interest within this presentation
 - NONE
- Steps taken to review and mitigate potential bias
 - Not Applicable



Roadmap

- What is monkeypox?
- Clin / Epi Summary
- Previous Spread
- Recent World Outbreak



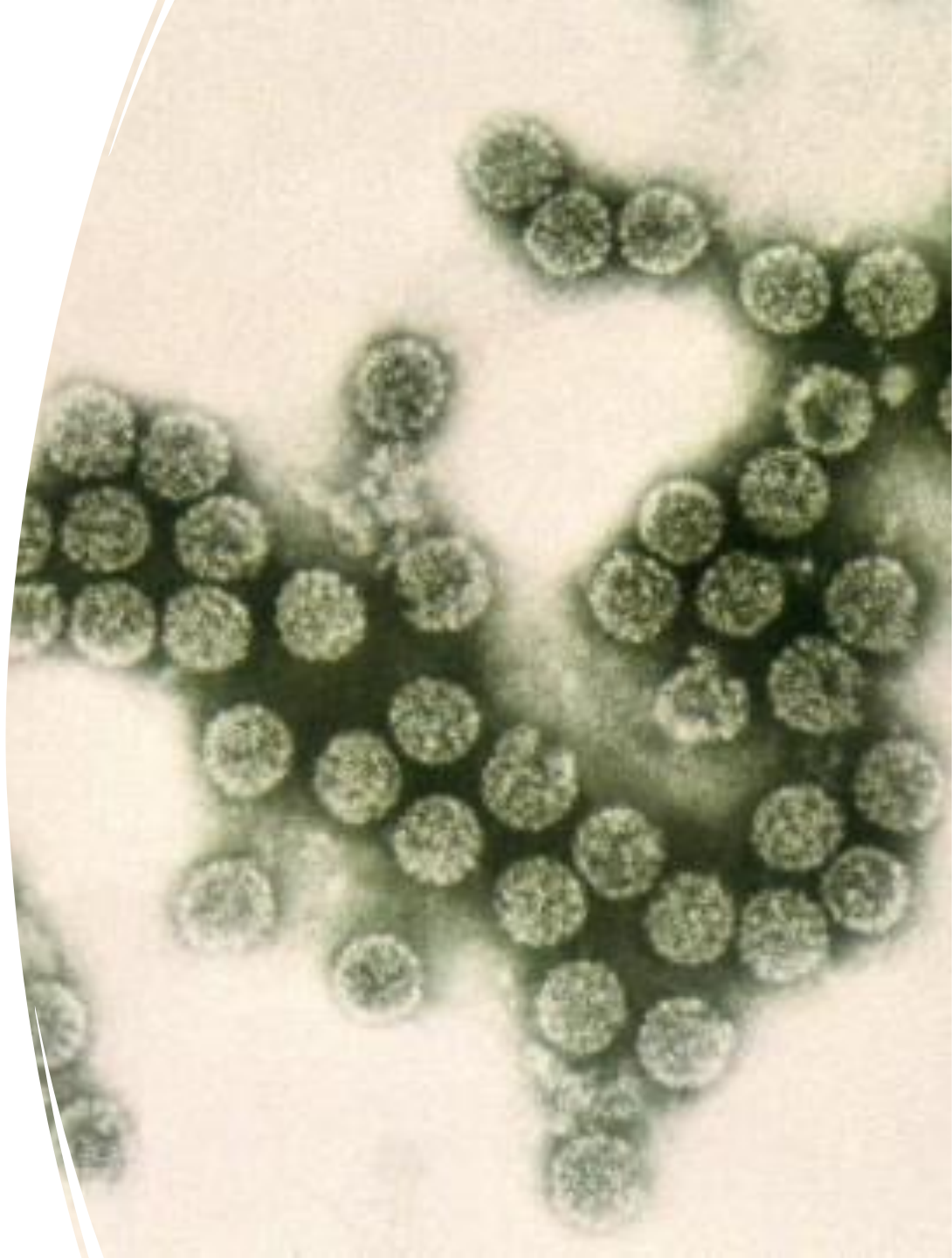


What is Monkeypox?

- Orthopoxvirus
- Same family as Smallpox, Cowpox
- First discovered Denmark 1958 in monkeys
- First Human case 1970 DRC (Zaire)

What is Monkeypox?

- Two main clades
 - West African
 - Central African
- WA tends to be less virulent



Fever
is not a sign
of ceftriaxone
deficiency



Transmission



Transmission

- Direct contact with infected fluid / resp droplets
- Close contact (e.g. skin to skin)
- Human to Human transmission prominent in 2022 epidemic



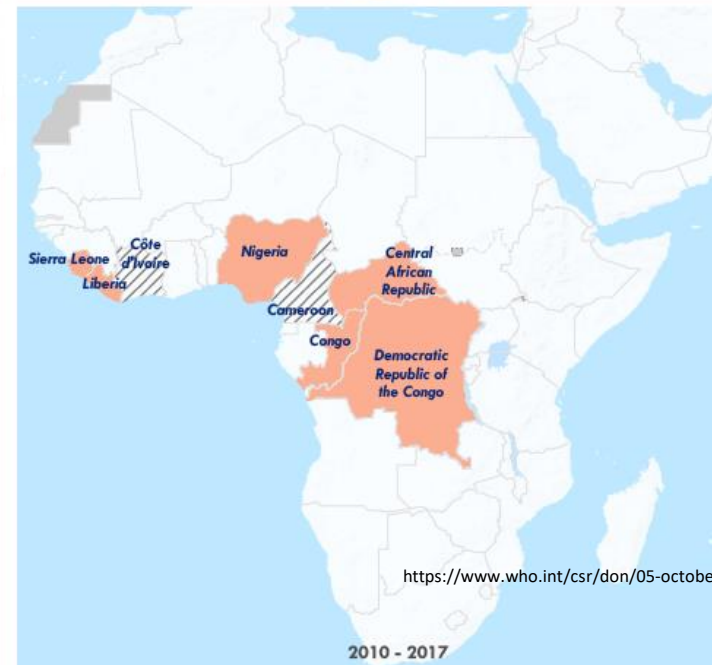
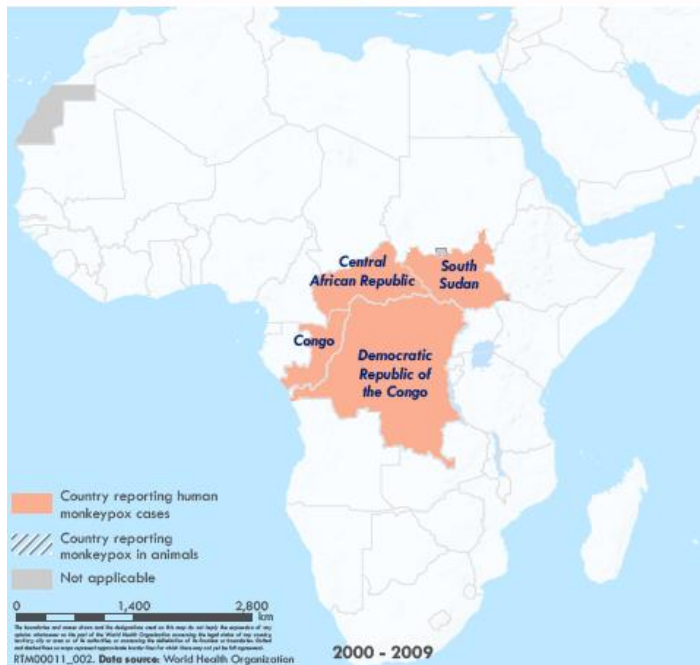
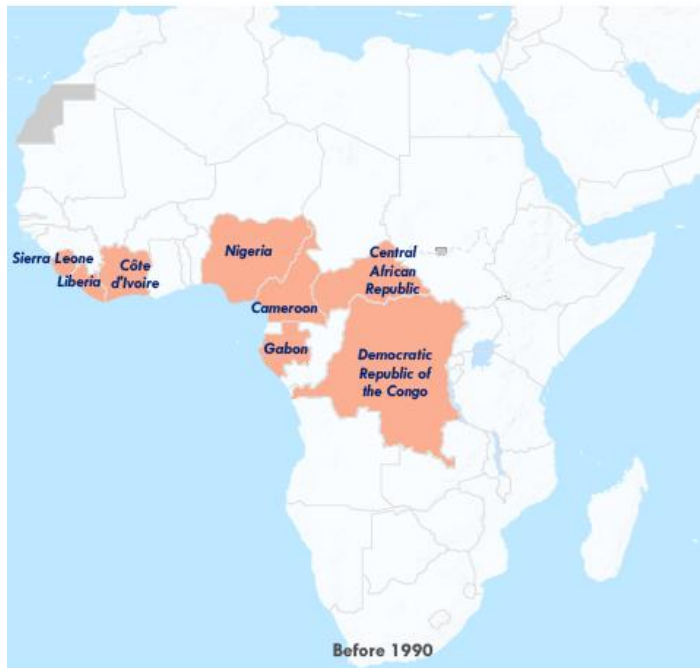
Transmission

- Reservoir not definitively known
- Likely sylvatic cycle in African small rodents

Geographic Distribution



African countries reporting human monkeypox cases, 1970 - 2017





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Endemic Countries

- Benin
- Cameroon
- Central African Republic
- Democratic Republic of the Congo
- Gabon
- Ghana
- Ivory Coast
- Liberia
- Nigeria
- Republic of the Congo
- Sierra Leone
- South Sudan.

Me after washing my hands for 20 seconds 57 times in one day





How does it present?

- Similar to smallpox
- Initial viral prodrome (non-specific)
- Lymphadenopathy*
- After 1-3d rash appears macules → pox → crusts



How does it present?

- Illness anywhere from 2-4 weeks
- Incubation period 1-2 weeks
- Most cases mild



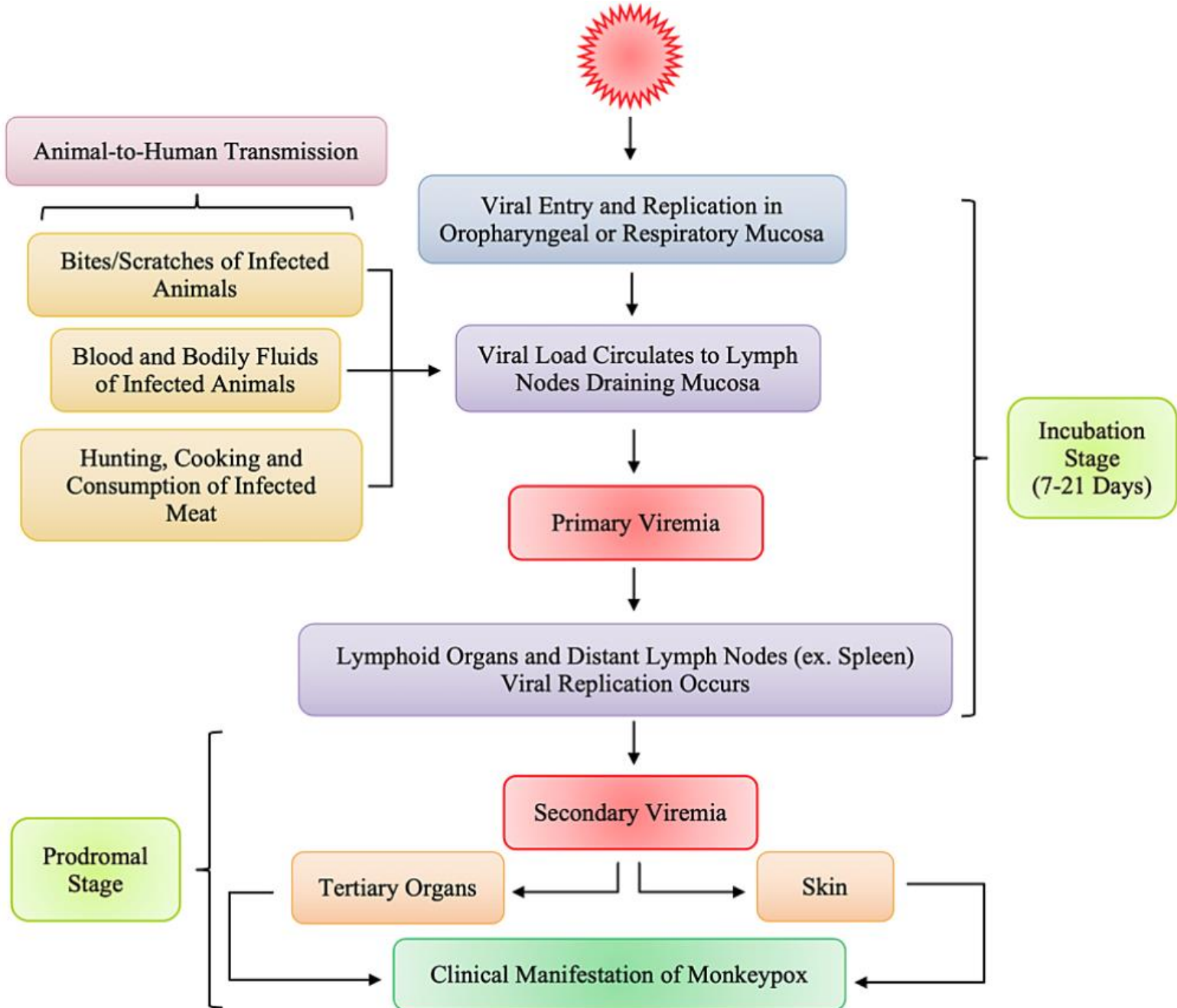


Figure 5: Proposed Pathogenesis of Monkeypox

How does it present?



<https://www.cmaj.ca/content/194/38/E1323>

<https://www.dermatologyadvisor.com/dermatology/monkeypox/article/691309/>



Other complications

- Myocarditis
- Encephalitis
- Secondary Bacterial infx
- Severe dysphagia (esophageal lesions)
- Severe proctalgia / encopresis





“Sorry – there’s a shortage of beds. On the bright side, you’re way more infectious than the guy next to you.”



World Outbreaks

US Outbreak 2003



- Exotic pet import from Ghana (rodents)
- Cages next to prairie dogs in facility
- 37 Confirmed, 10 Suspected cases across 5 states

The image features a stylized map of Nigeria where the geographical outline is filled with the colors of the Nigerian flag: green on the left and right sides, and white in the center. The map is centered on a white background. Overlaid on the map is a solid orange horizontal bar. Inside this bar, the text "Nigerian Outbreak 2017/18" is written in a bold, black, sans-serif font.

Nigerian Outbreak 2017/18

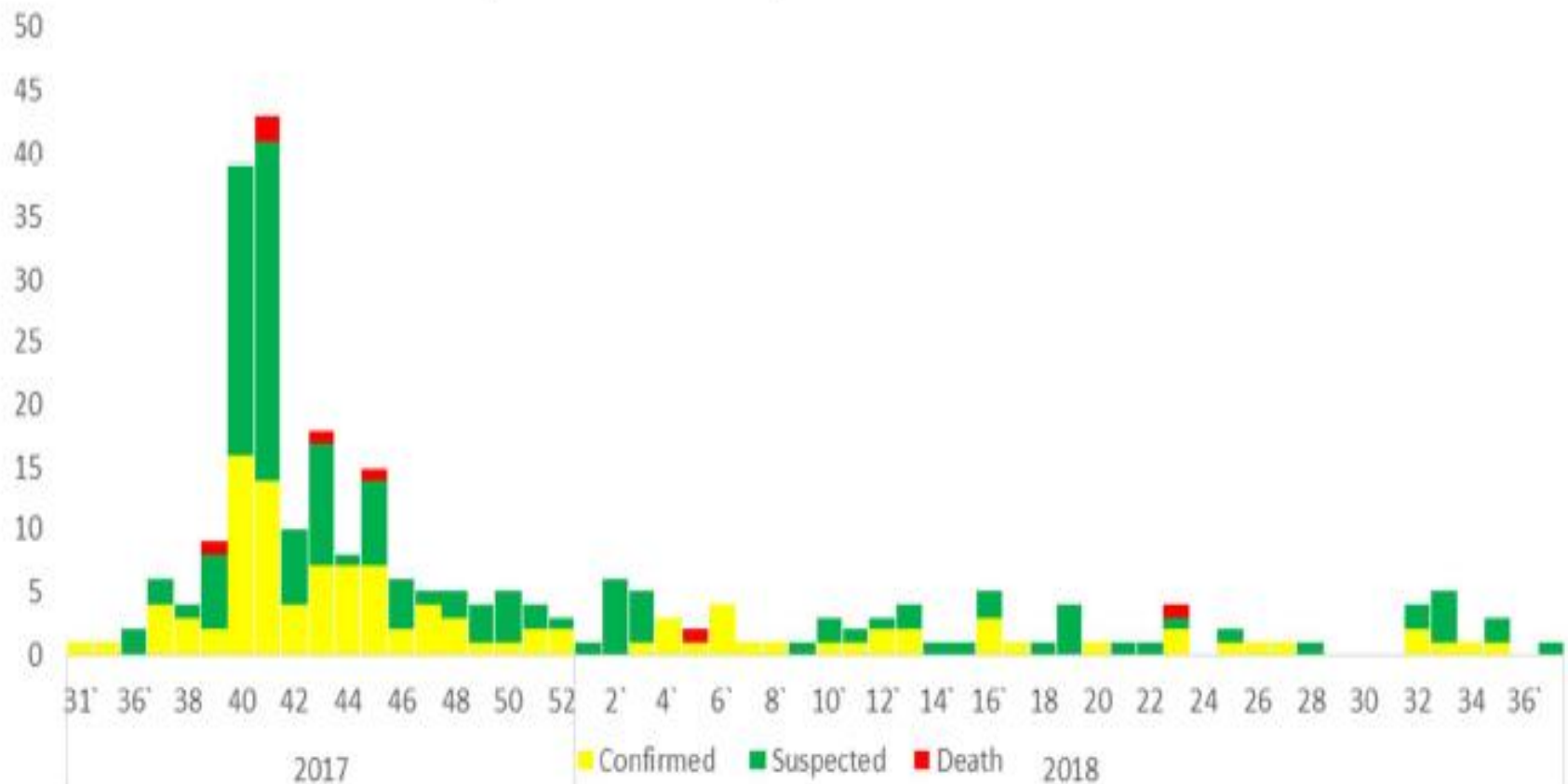
Nigerian Outbreak



- First cases Sep 2017
- 2018: 45 Confirmed + 114 Suspected
- 1 Death (HIV/AIDS)
- Widely Spread through country

Nigerian Outbreak

Nigeria monkeypox case distribution by Epi-week;
Week 32, 2017- Week 37, 2108



Imported Cases - UK

- 3 Cases total
- Case #1 – Nigerian naval office visiting Cornwall, UK for training exercise (from Abuja)
- Case #2 – UK Man back from 22d vacation to Southern Nigeria

Imported Cases - UK

- Case #3 – medic who looked after Case #2 in the hospital
- Smallpox vaccination given for prevention
- No other cases since

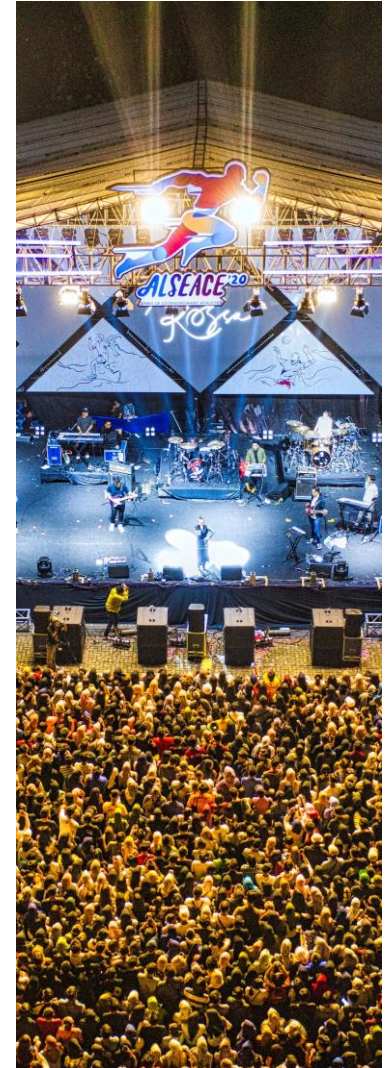
Imported Cases - Israel

- 1 Case total (expat)
- Israeli man lives & works Port Harcourt (Southern Nigeria)
- Presented Sep 2018 after 2nd UK case
- Concern over more cases to come



Monkeypox World Outbreak 2022

Why now?




Diseases without Borders

- Increased global travel
- Human encroachment on environment
- Susceptible population
- Amplifying countries / events
- Suitable vector



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The Changing Epidemiology of Chikungunya Fever

Infectious Disease Grand
Rounds

Dr. Sumon Chakrabarti PGY5

December 8, 2009

Diseases without Borders

- West Nile
- Chikungunya
- Zika Virus
- Monkeypox



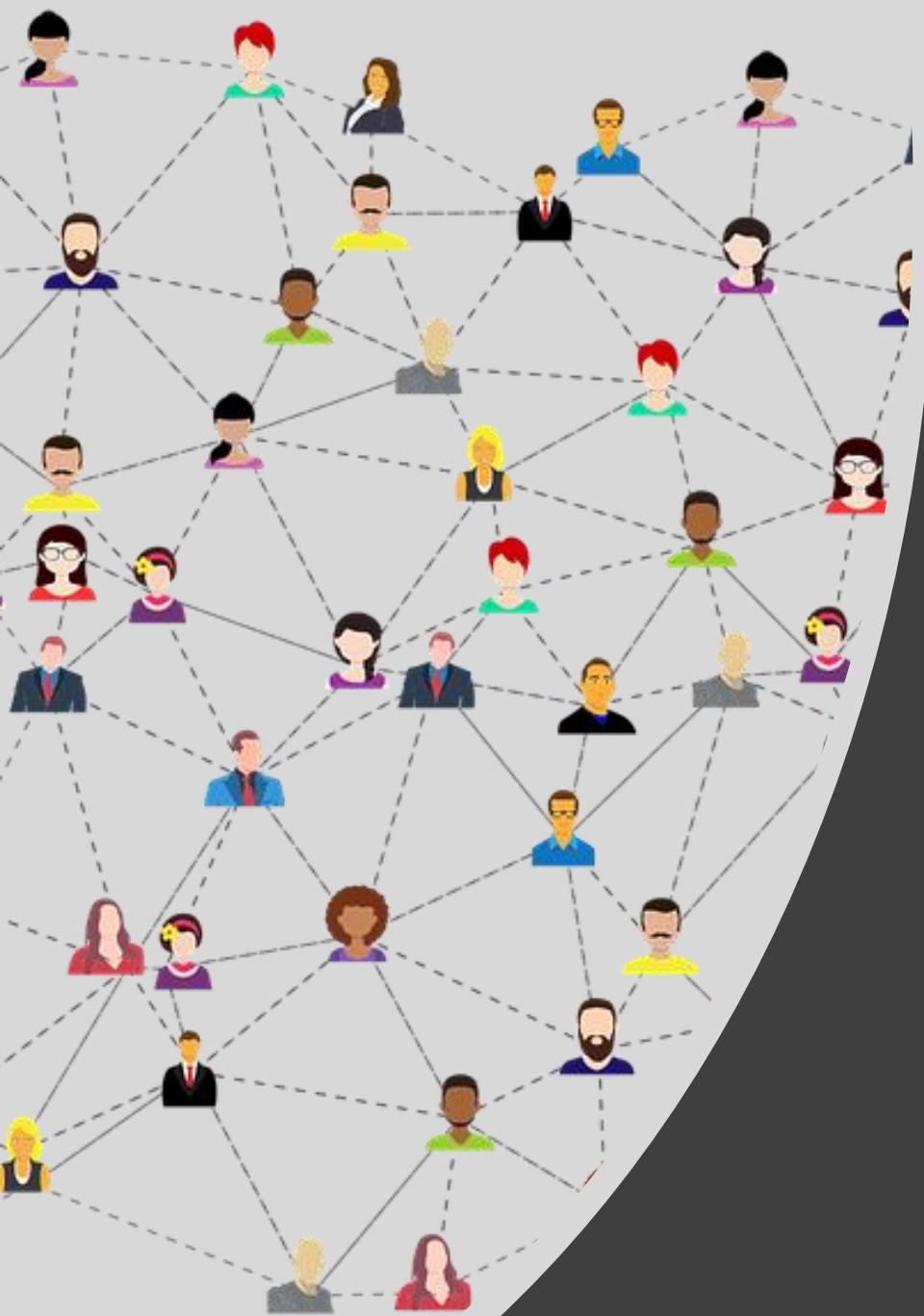
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Other Factors

- Waning & Absent immunity from smallpox vaccination
- After 1972, smallpox vaccine not given routinely in Canada





Social Networks

- Dec immunity to smallpox
- Restricted sexual network
- Pathogen factor (mode of spread, infectivity etc)
- What spreads in one region may not in others

Confirmed Cases

77,573

Total Cases

76,648

in locations that have not historically reported monkeypox

925

in locations that have historically reported monkeypox

Locations with cases

109

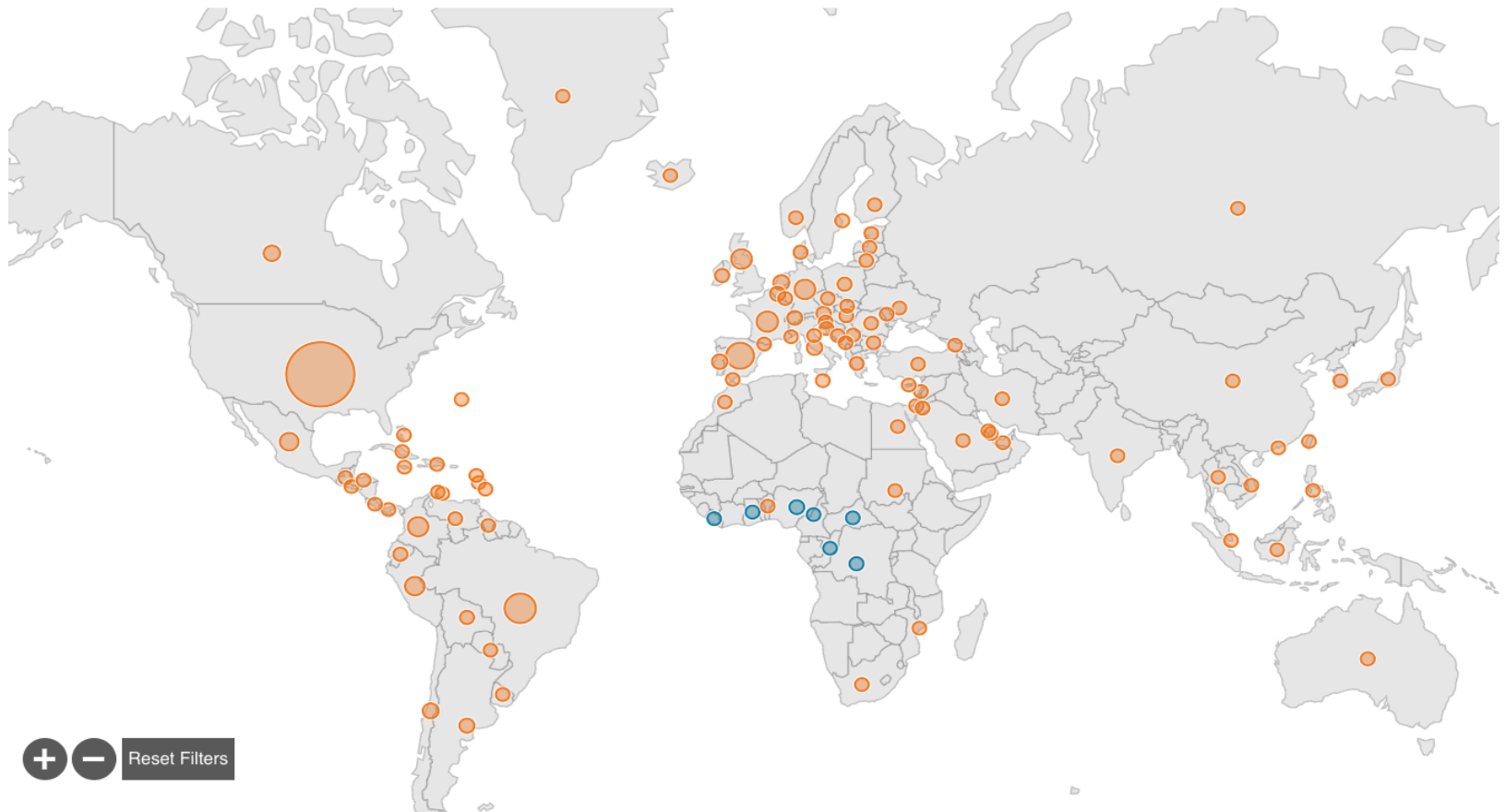
Total

102

Has not historically reported monkeypox

7

Has historically reported monkeypox



Legend

● Has not historically reported monkeypox

● Has historically reported monkeypox

Worldwide Case Burden

Location	Cases	Deaths
● United States Of America	28,492	8
● Brazil	9,226	8
● Spain	7,317	2
● France	4,094	0
● United Kingdom	3,701	0
● Germany	3,668	0
● Colombia	3,523	0
● Peru	3,110	0

Ontario Experience



Comparable with
other series

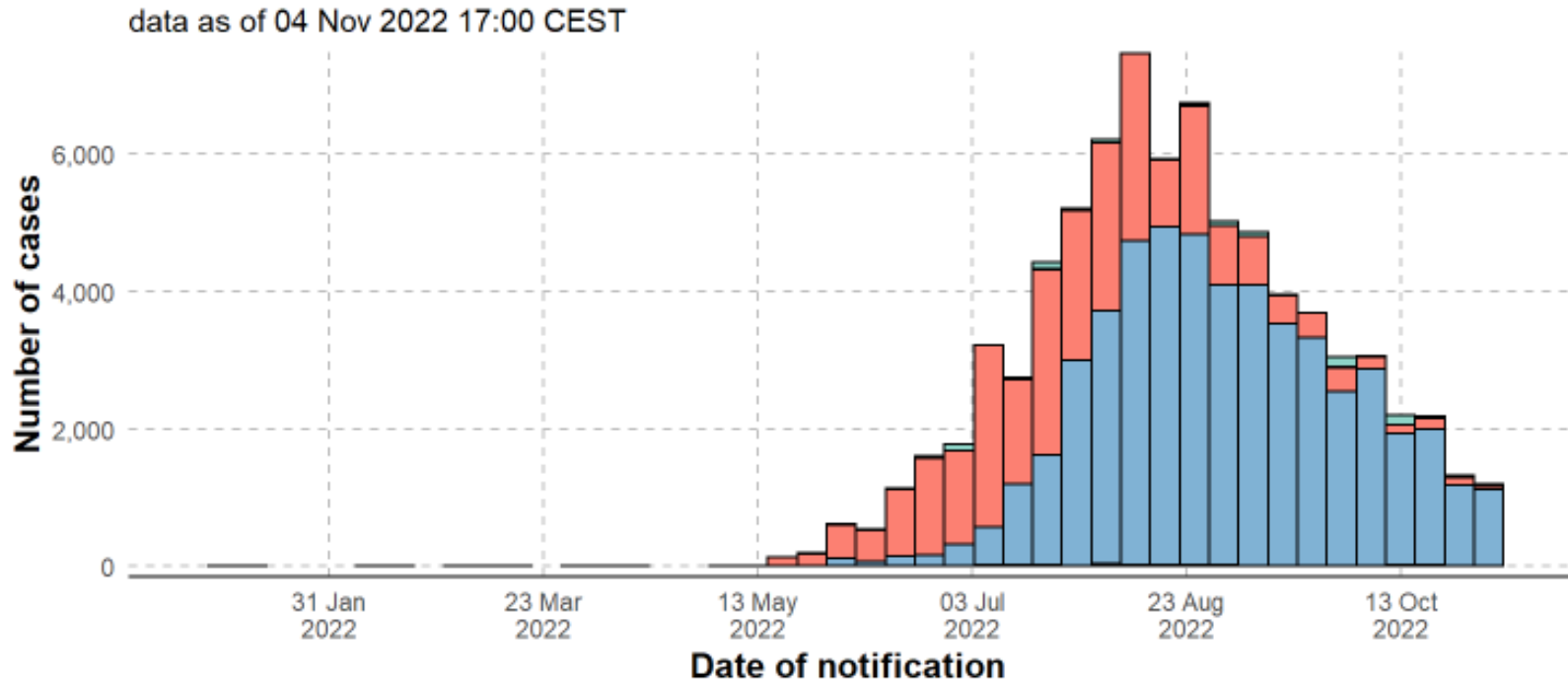
~700 cases, >99%
men

Majority MSM, small
proportion bisexual

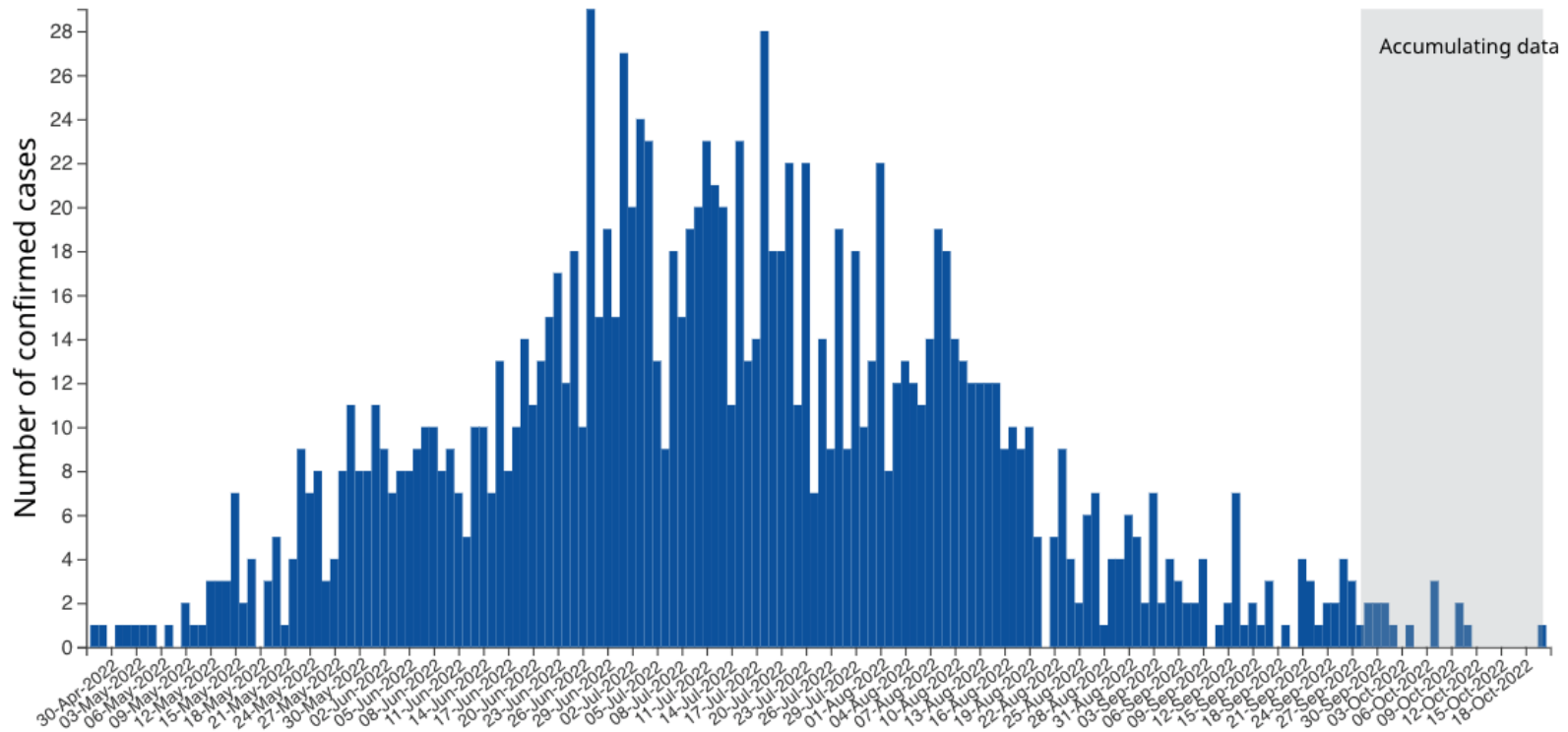
3% Hospitalization

World Monkeypox Epi

Epidemic curve shown for cases reported up to 04 Nov 2022 to avoid showing incomplete weeks of data.

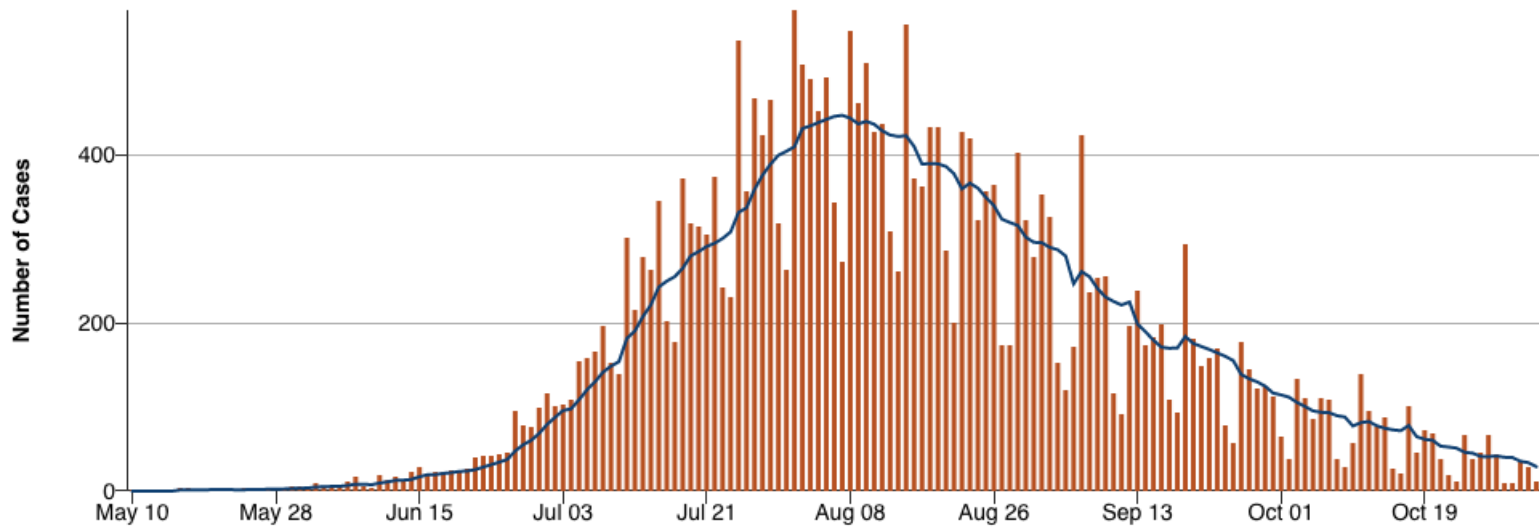


Canadian Monkeypox Epi



US Monkeypox Epi

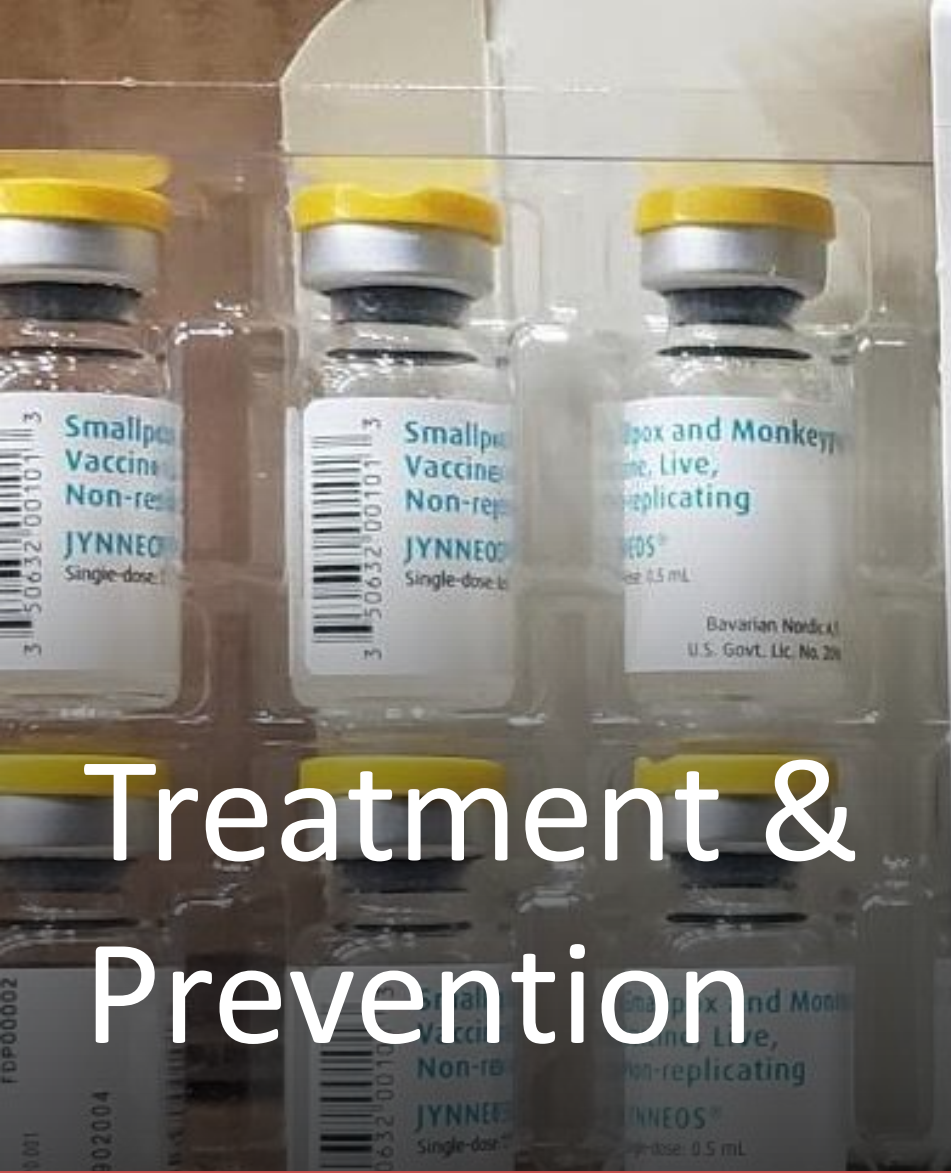
Daily Monkeypox Cases Reported* and 7 Day Daily Average



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"Wait, this one's a lawyer. We'd better wash our hands."



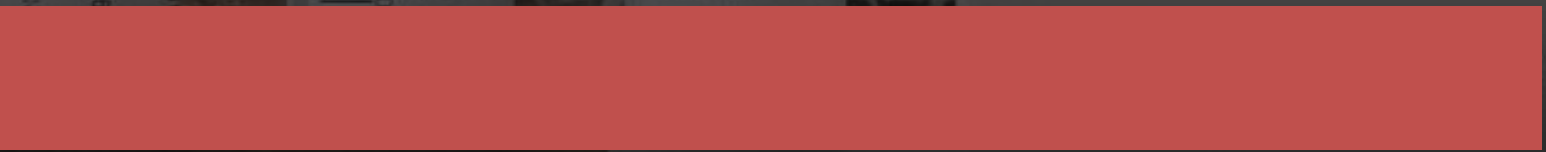
NDC 50632-001-02

Smallpox and Monkeypox Vaccine, Live, Non-replicating

JYNNEOS®

Suspension for subcutaneous injection

Treatment & Prevention



0.5 mL vials



NDC 50632-001-02

Smallpox and Monkeypox Vaccine, Live, Non-replicating

JYNNEOS[®]

Suspension for subcutaneous injection

Contains 20 single-dose 0.5 mL vials

Treatment & Prevention

- Smallpox vaccination (80% reduction in incidence)
- Tecovirimat (severe, hospitalized cases)
- Brin/cidofovir



NDC 50632-001-02

Smallpox and Monkeypox Vaccine, Live, Non-replicating

JYNNEOS®

Suspension for subcutaneous injection

Contains 20 single-dose 0.5 mL vials

Vaccination

- Vaccine rolled out to highest risk
- 1st dose coverage maximized
- Important to screen for other STIs



Infection Control

- N95 Respirator
- Gloves
- Gown
- Eye protection



Summary



Summary

1. Monkeypox is an Orthopoxvirus similar to smallpox
2. Human to human spread (resp droplets, skin-skin)
3. Ongoing transmission in one region can lead to global outbreaks



Summary

4. Social network patterns can amplify infectious diseases
5. Monkeypox epidemic is slowing down around the world
6. Best prevention is smallpox vacc for high risk



POLICE

**PUBLIC
CALL**

BOX



**THANK
YOU!**