Mpox Outbreak Affecting Many Fully Vaccinated Men: Chicago, May–June 2023

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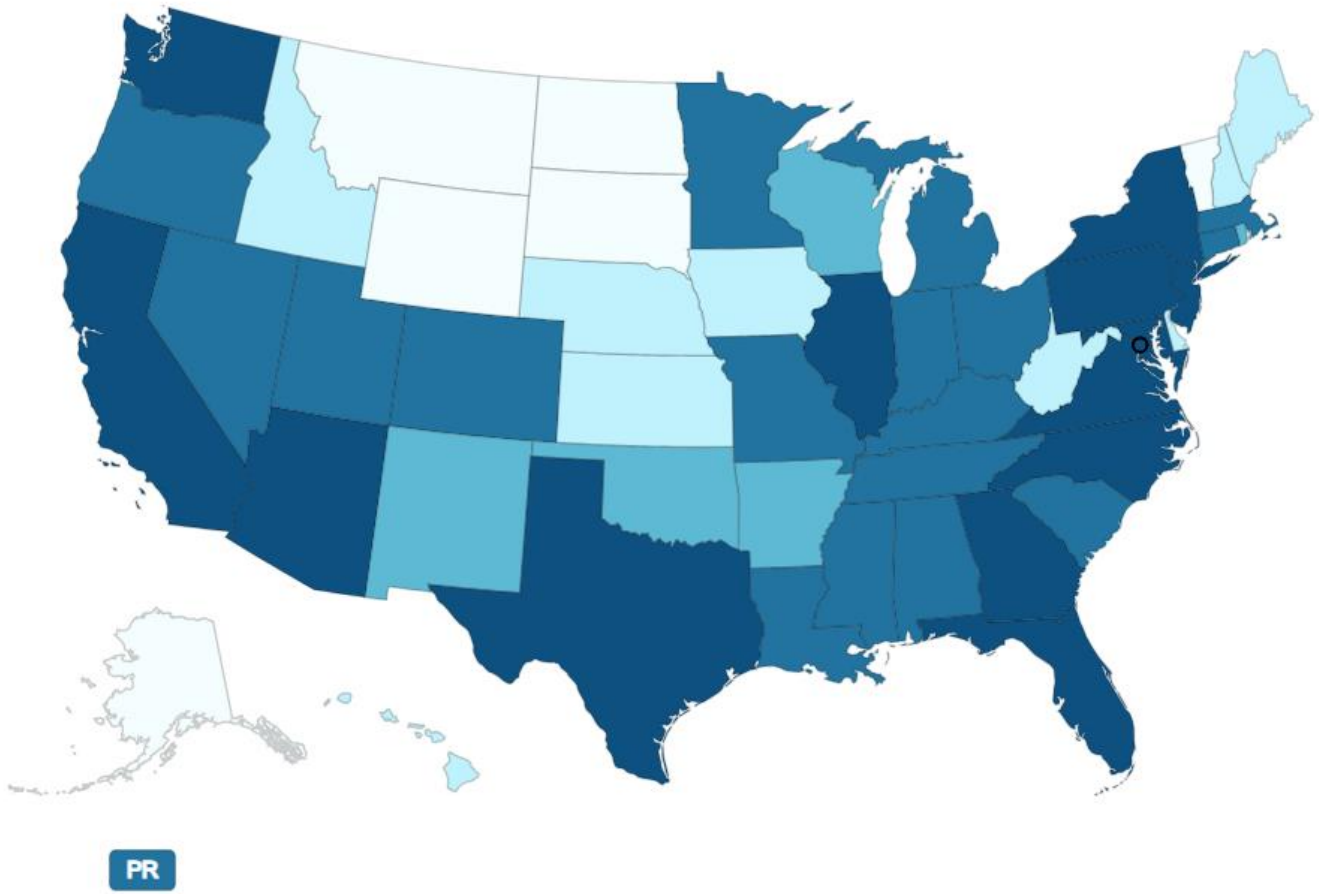
CDPH SID Bureau Provider Conference

June 27, 2024

Disclosure:
Presenter has no financial interest to disclose.

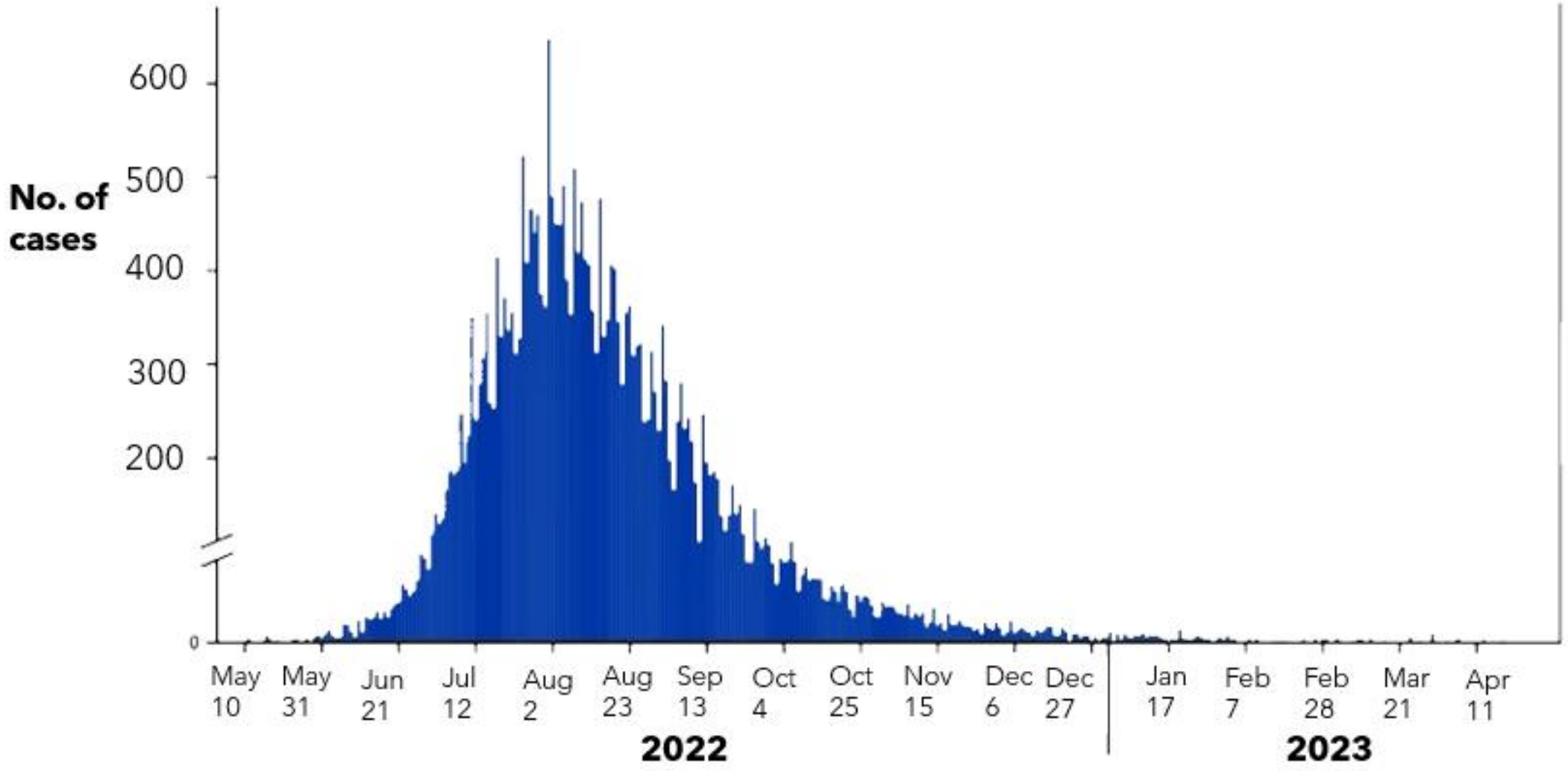
This continuing education activity is managed by The St. Louis STI/HIV Prevention Training Center and accredited by Missouri State Medical Association (MSMA) in cooperation with the Chicago Department of Public Health

There have been over 32,000 cases of mpox in the United States since 2022.



Affected countries promoted vaccination and harm reduction to control mpox.

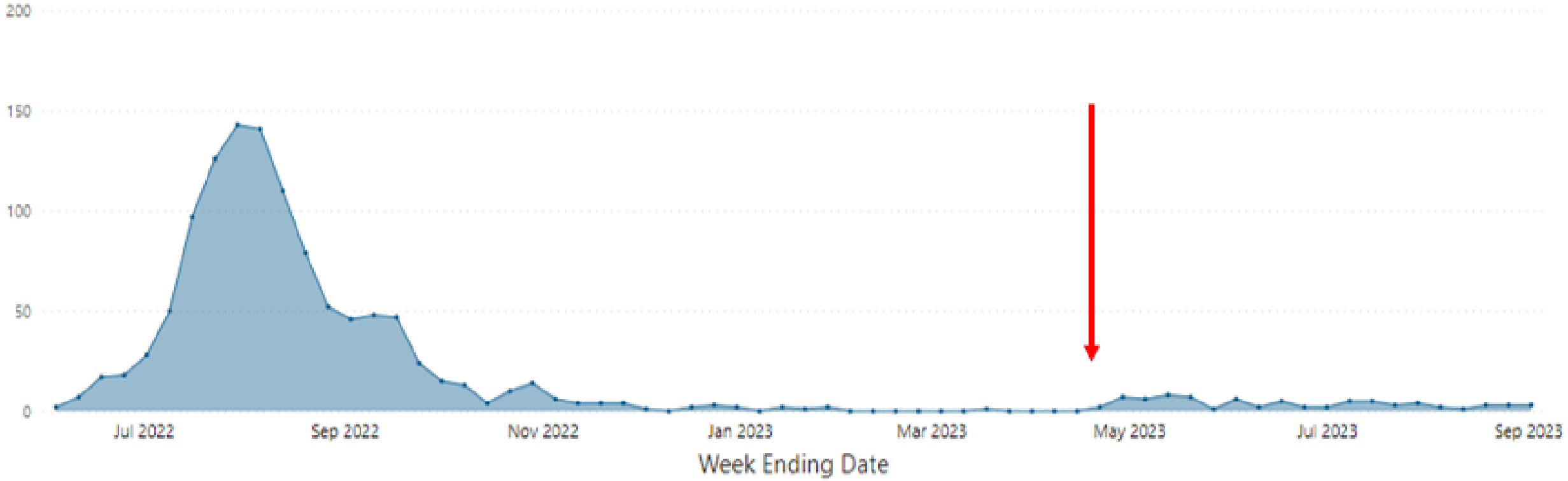
The mpox outbreak in 2023 had declined in most parts of the United States by early 2023.



McQuiston JH, Braden CR, Bowen MD, et al. The CDC Domestic Mpox Response — United States, 2022–2023. MMWR Morb Mortal Wkly Rep 2023;72:547–552. DOI: http://dx.doi.org/10.15585/mmwr.mm7220a2

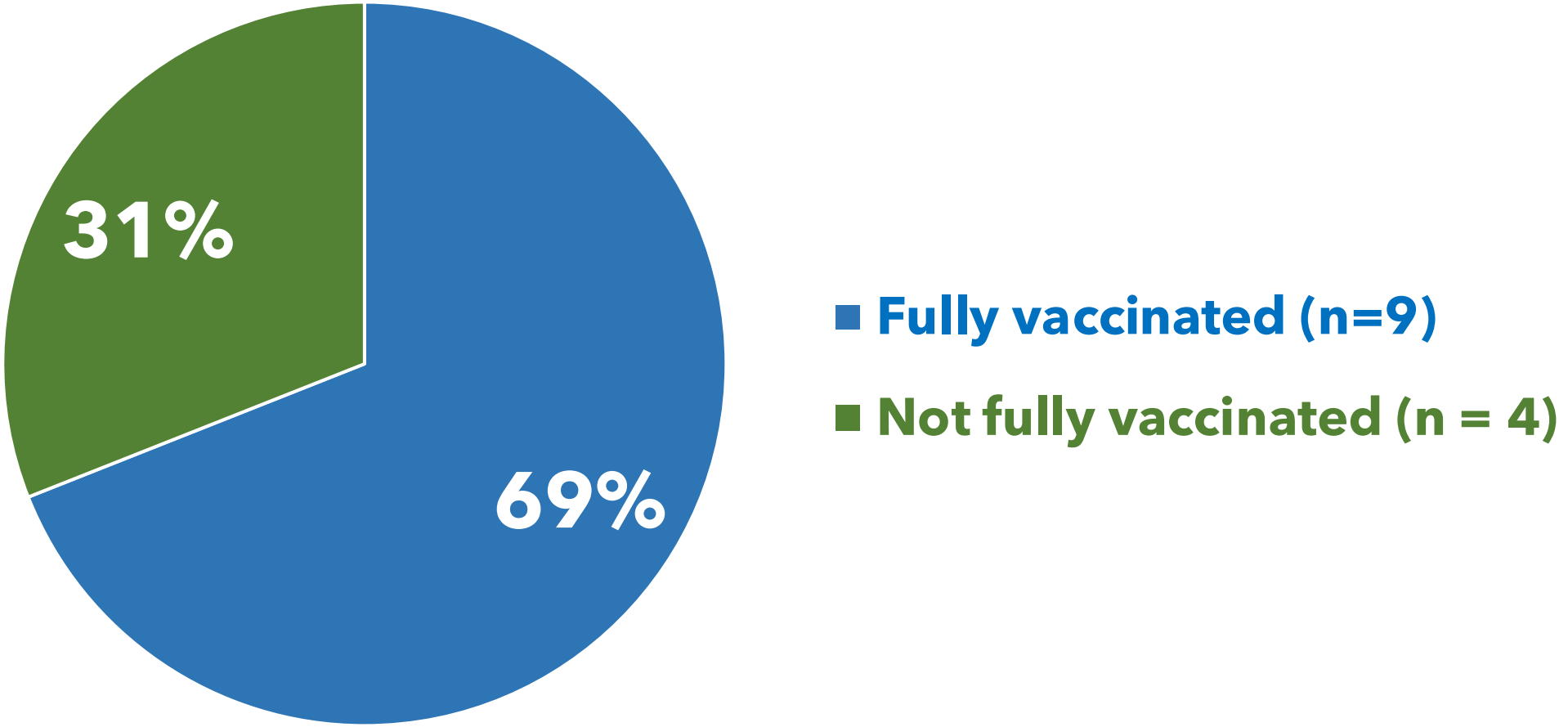
In May 2023, an increased number of cases were reported in Chicago.

Cases of mpox diagnosed in Chicagoans during 6/4/2022–8/31/2023



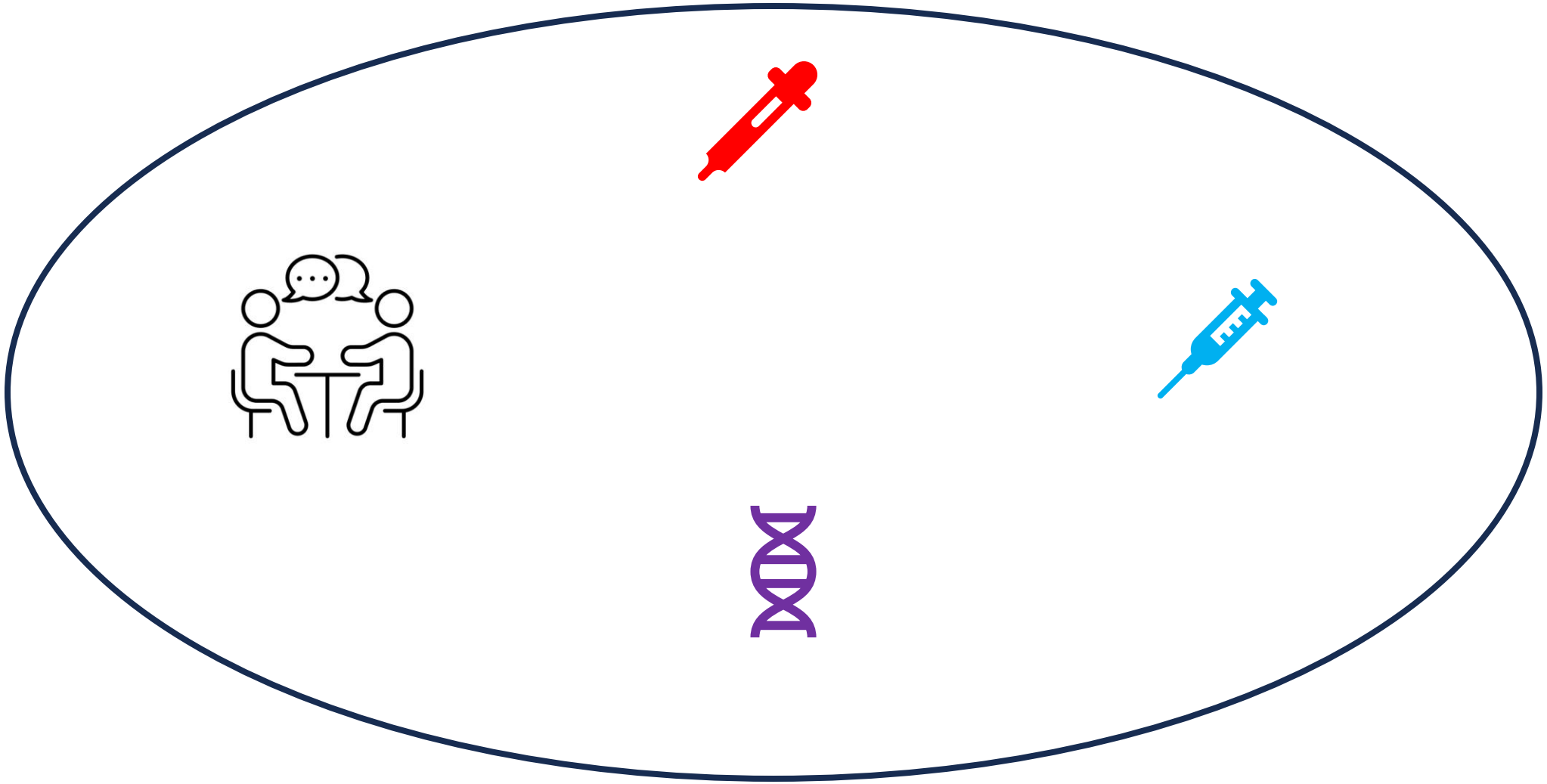
CDPH Mpox Dashboard
https://www.chicago.gov/city/en/depts/cdph/provdrs/infectious_disease/supp_info/mpox-home/mpox-dashboard.html

A concerning proportion of mpox patients initially identified were fully vaccinated.



Cases reported between April 17 and May 5, 2023

CDPH and CDC launched a multidisciplinary investigation to explain the cluster.



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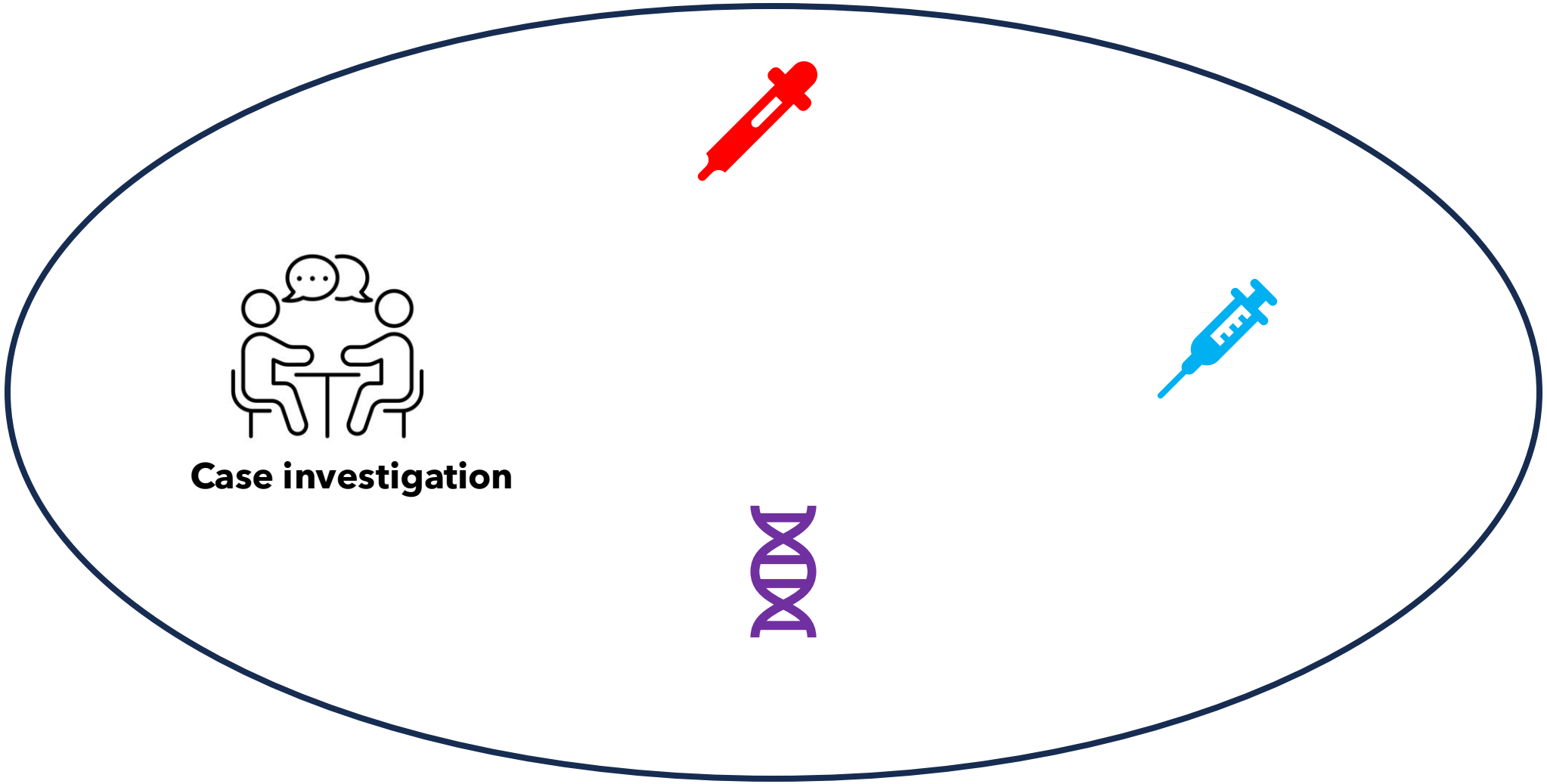

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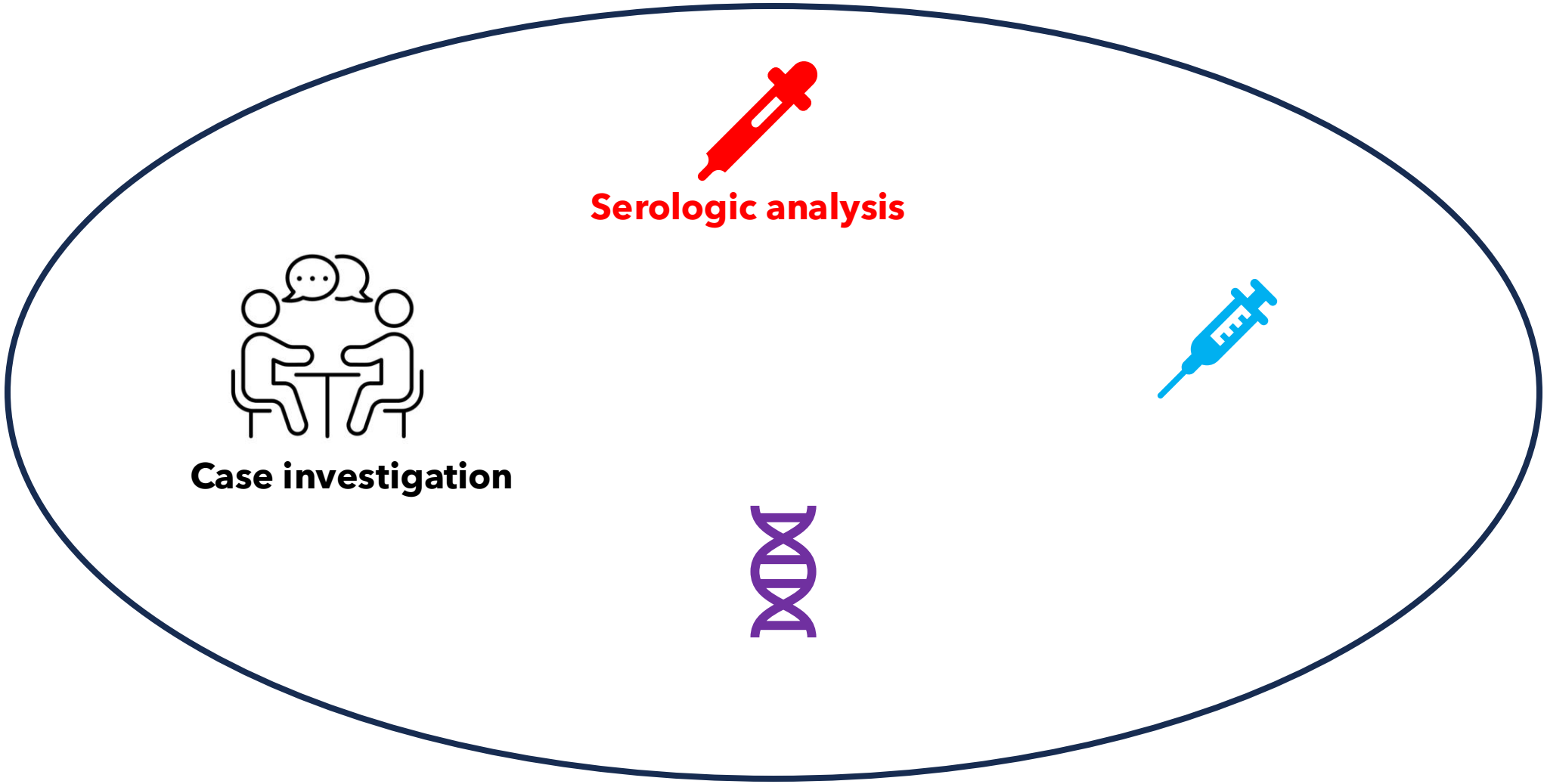

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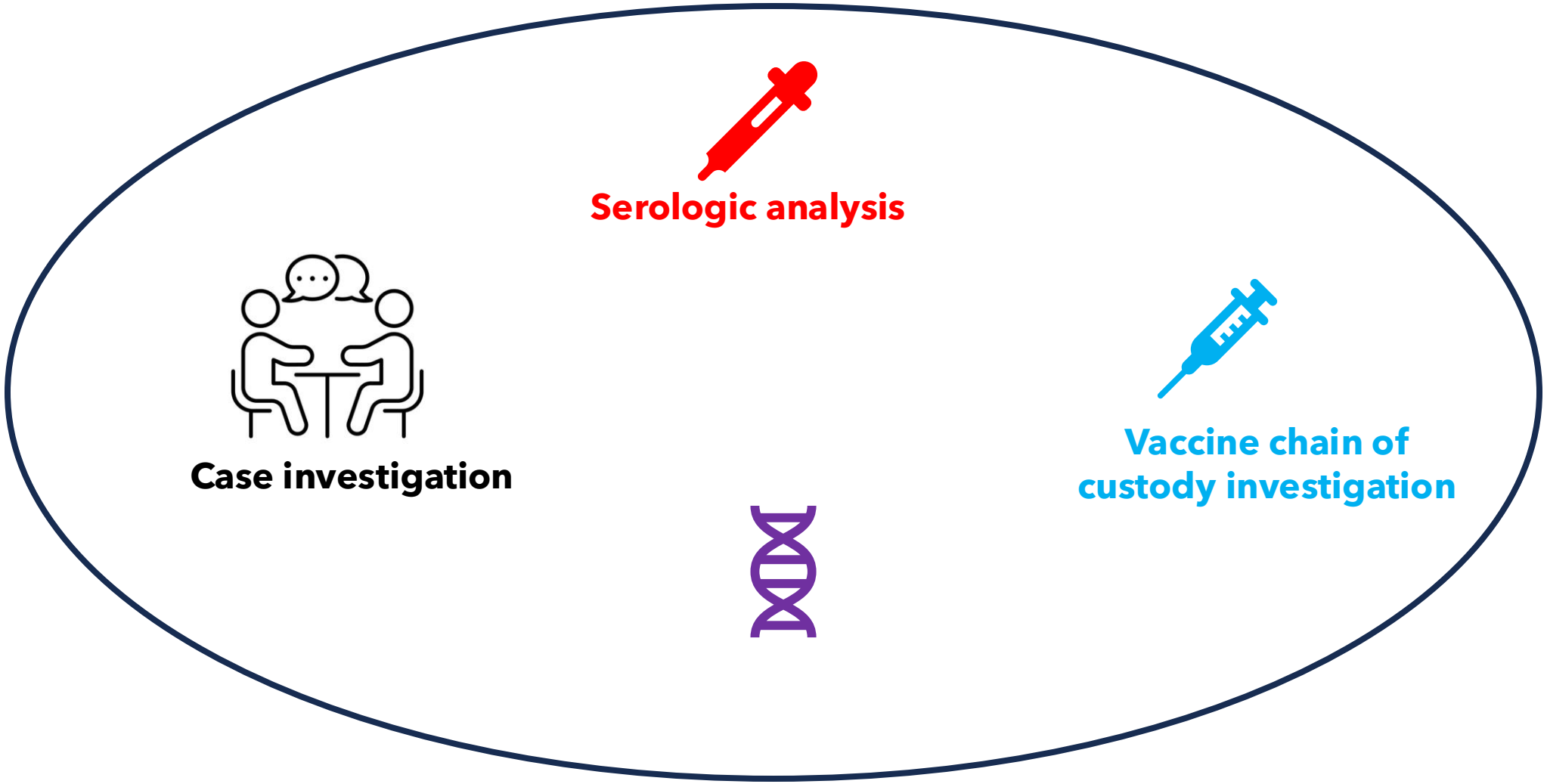

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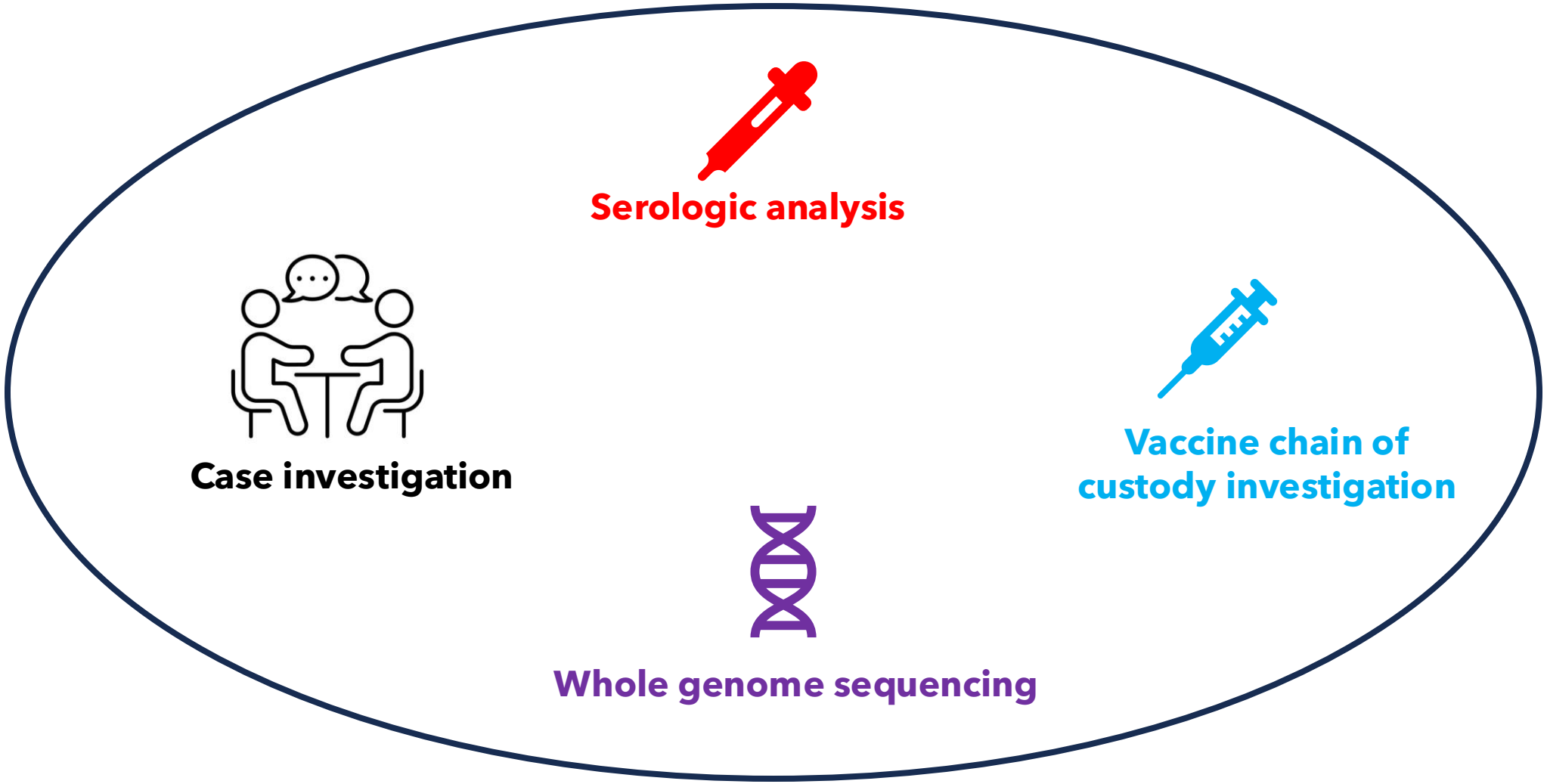


Case definition:

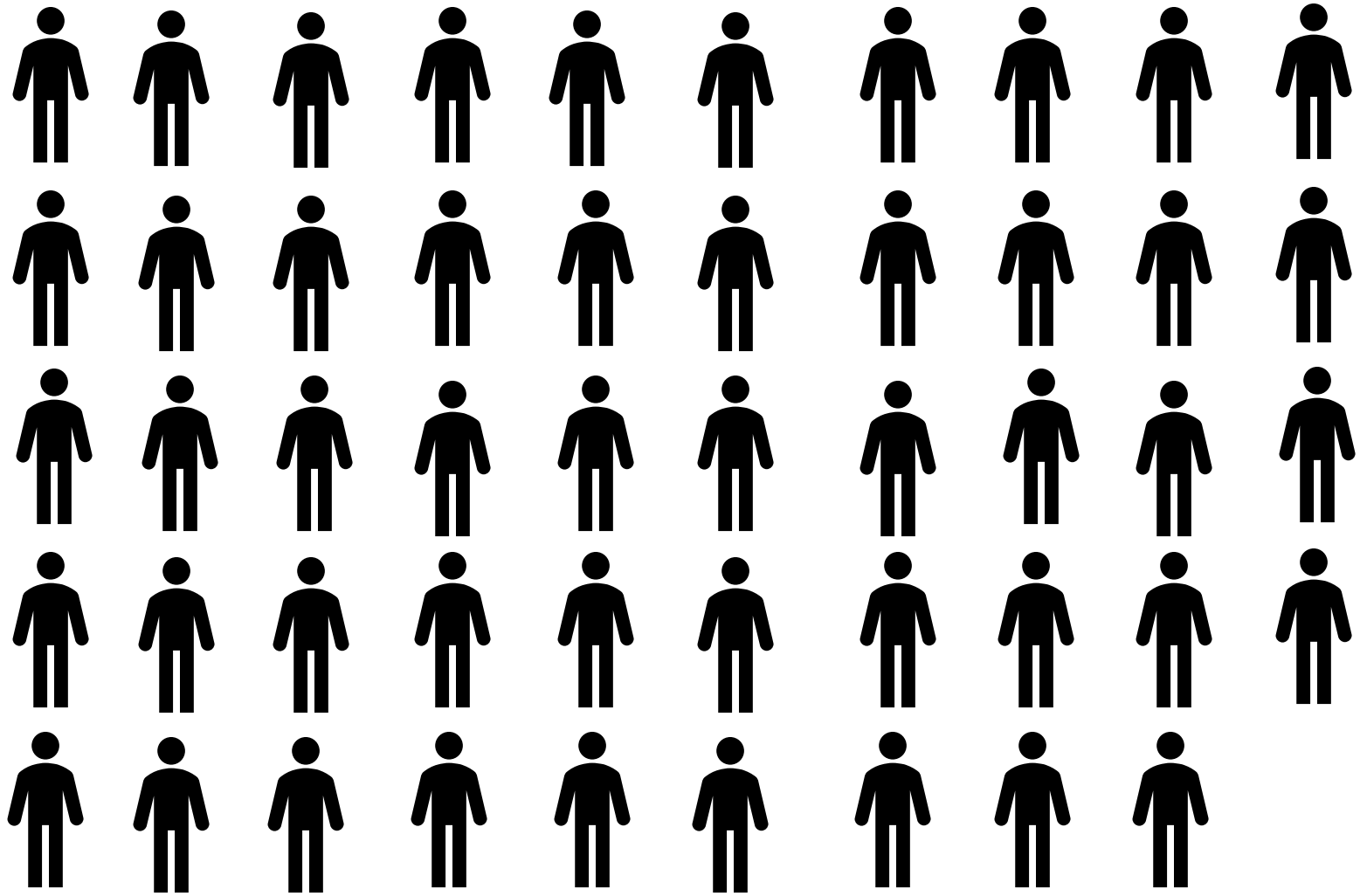
- Signs or symptoms of mpox in person with epidemiologic risk factors for mpox and laboratory confirmation identified March 18–June 27, 2023.
    - **Confirmed:** monkeypox virus positive
    - **Probable:** orthopoxvirus positive

Vaccination status:

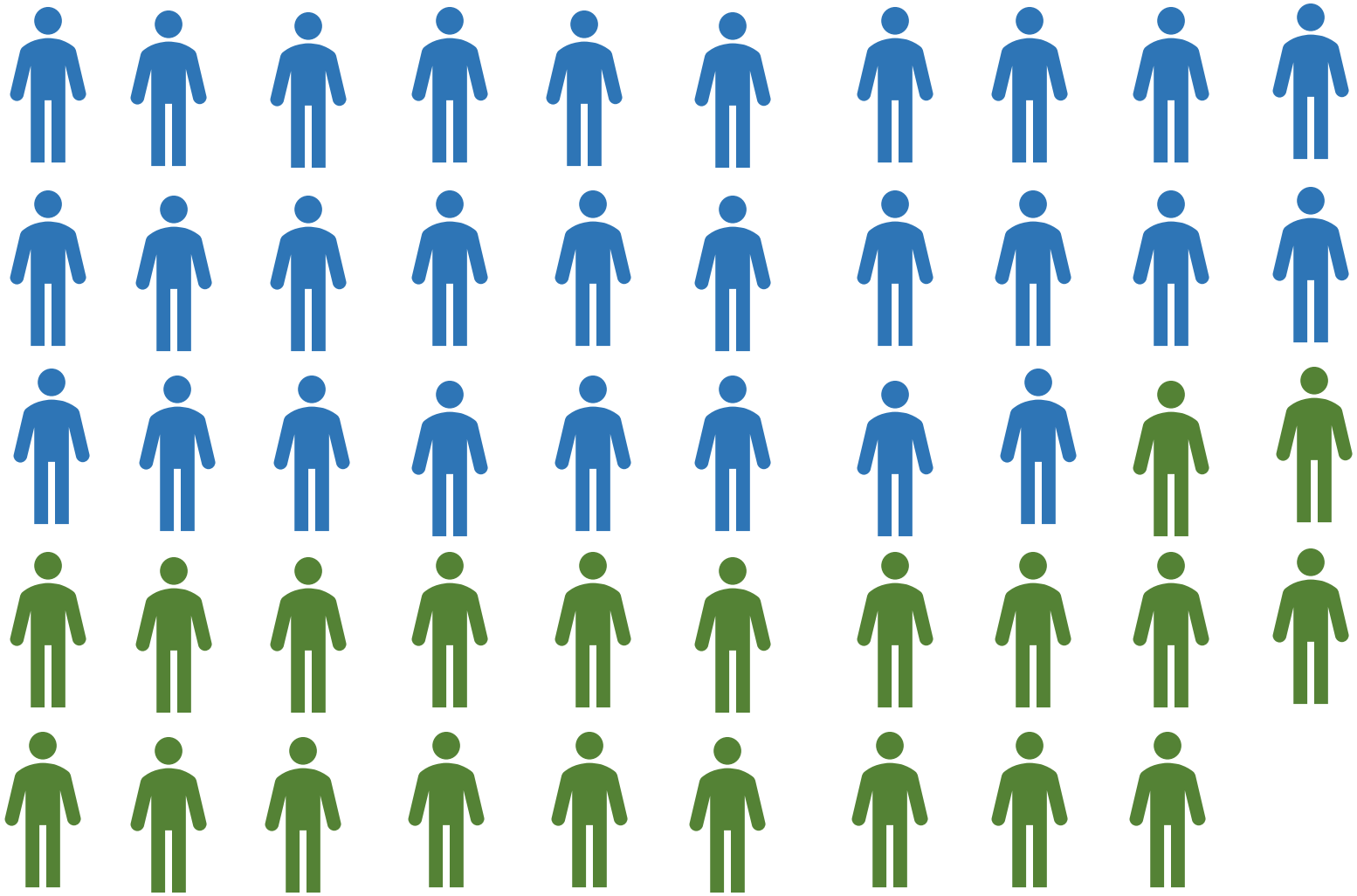
Fully vaccinated (FV): 2 doses of JYNNEOS or 1 dose of ACAM2000 before infection

Not fully vaccinated (NFV): ≤1 dose of JYNNEOS and no dose of ACAM2000

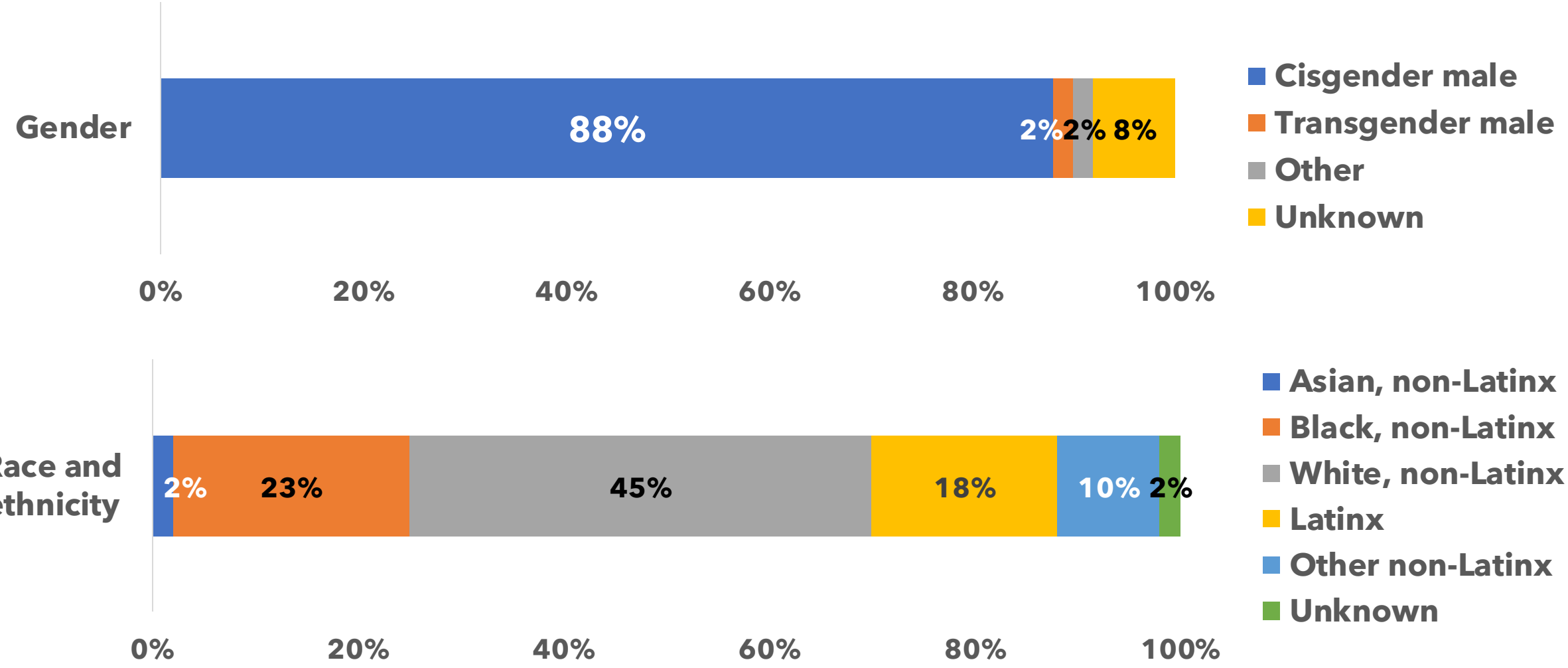
We identified 49 cluster patients,



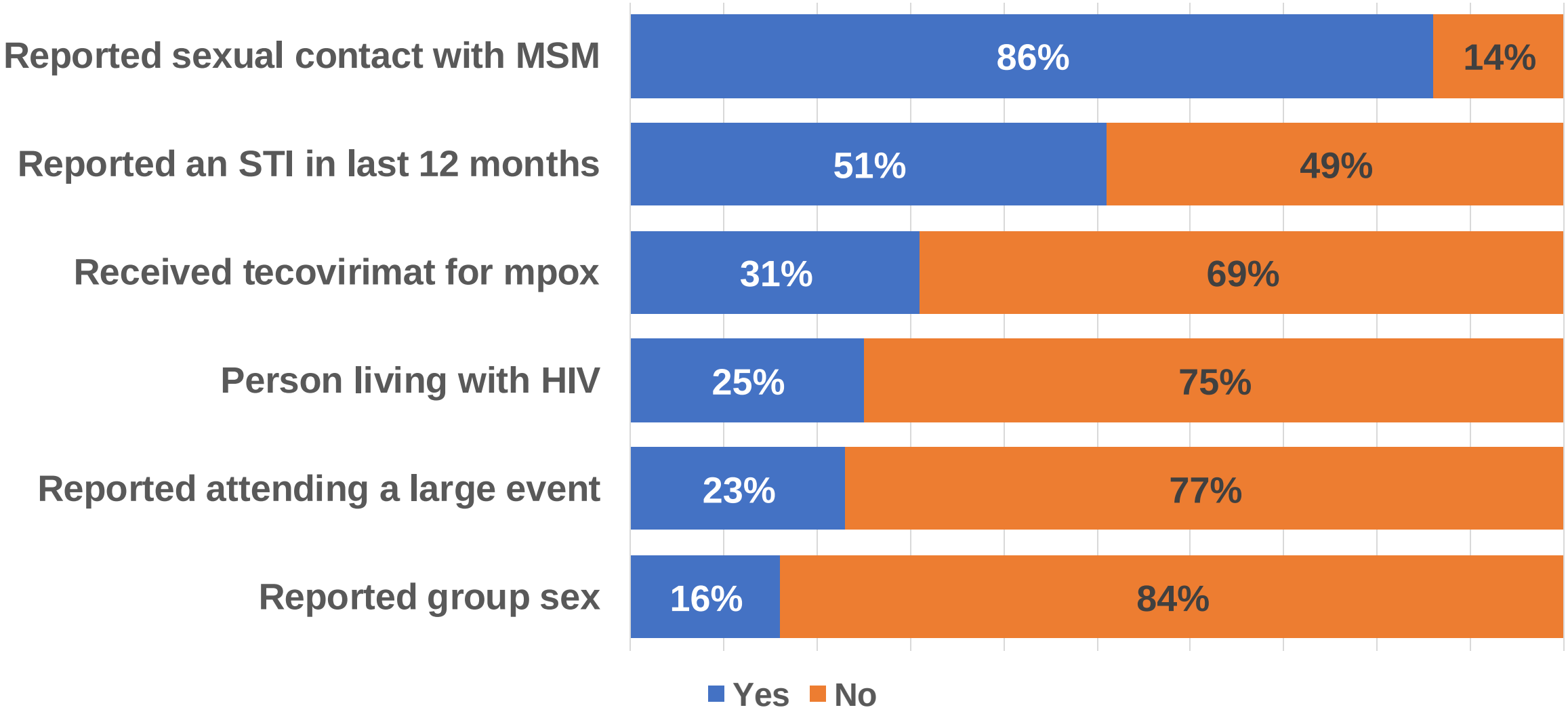
Including 28 fully vaccinated and 21 not fully vaccinated patients.



Most cluster patients were cisgender males, and White patients were the largest group.



We examined clinical factors and behaviors associated with mpox transmission among patients.



Characteristics by vaccination status

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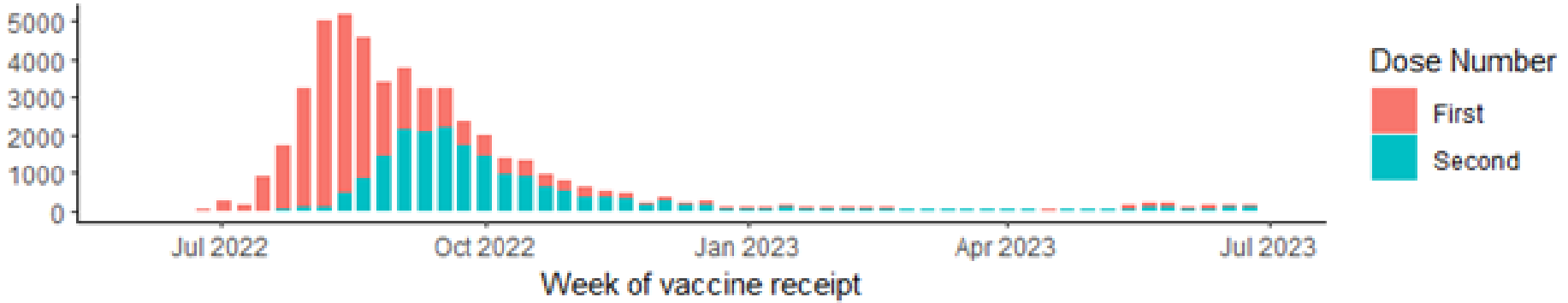
2 patients were hospitalized, both unvaccinated

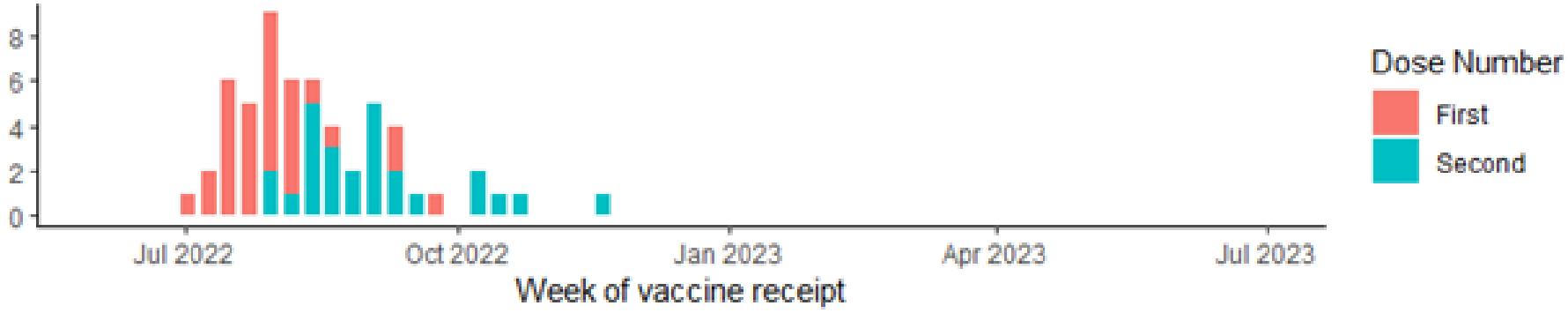
One with advanced HIV (CD4 count <200 cells/mm3)

Timing of vaccination for patients in this cluster was similar to all cases.

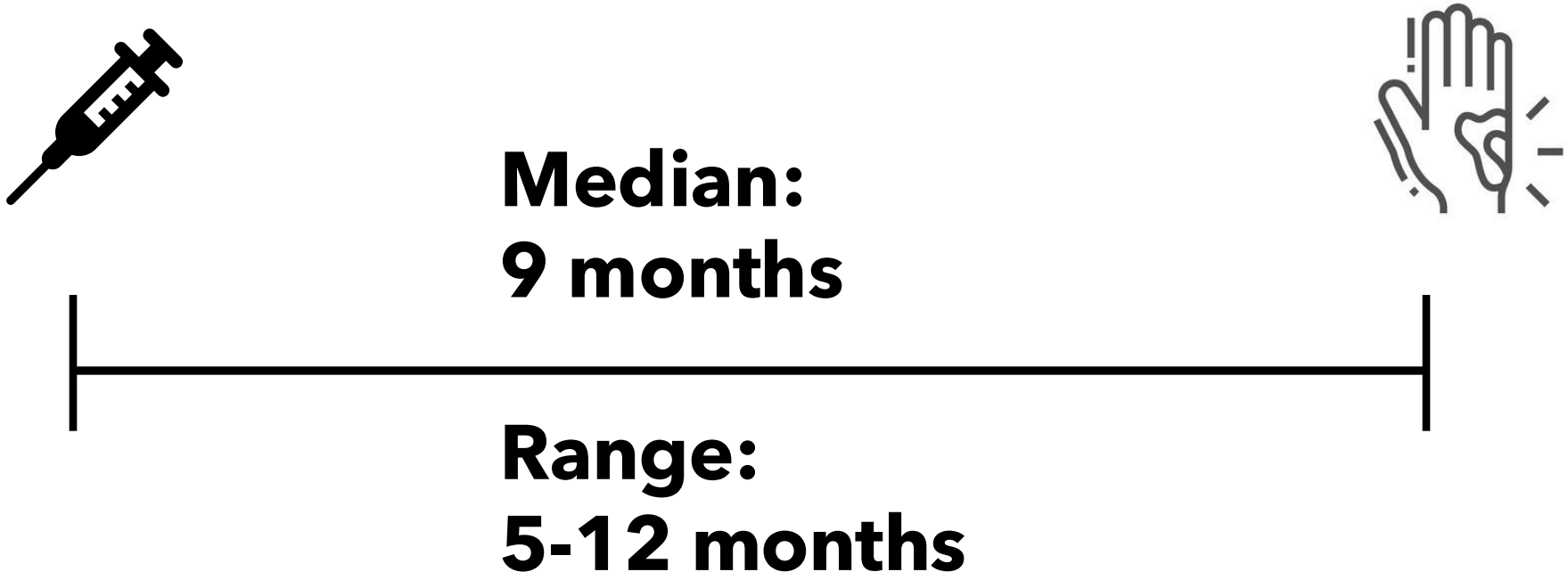
All vaccine doses given for mpox in Chicago



Vaccine doses given for mpox to cluster patients



Timing from vaccination to mpox disease



Serologic analysis revealed expected immune responses (n=13).

10 FV patients and **3 NFV patients (1 dose)** had serologic analysis

IgG **All positive** (median IgG = 1.28 (IQR = 1.25–1.38))

IgM **12 positive** (median IgM = 0.26 (IQR = 0.19–0.49))

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IgM values did not vary by number of doses received.

Vaccine Product Investigation

Vaccines given to cluster patients all came from **9** shipments from **6** lots at the Strategic National Stockpile (SNS) distributed throughout the United States.

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68% in a clinical setting,

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Only minor vaccine administration concerns were detected, affecting 2-3 doses.

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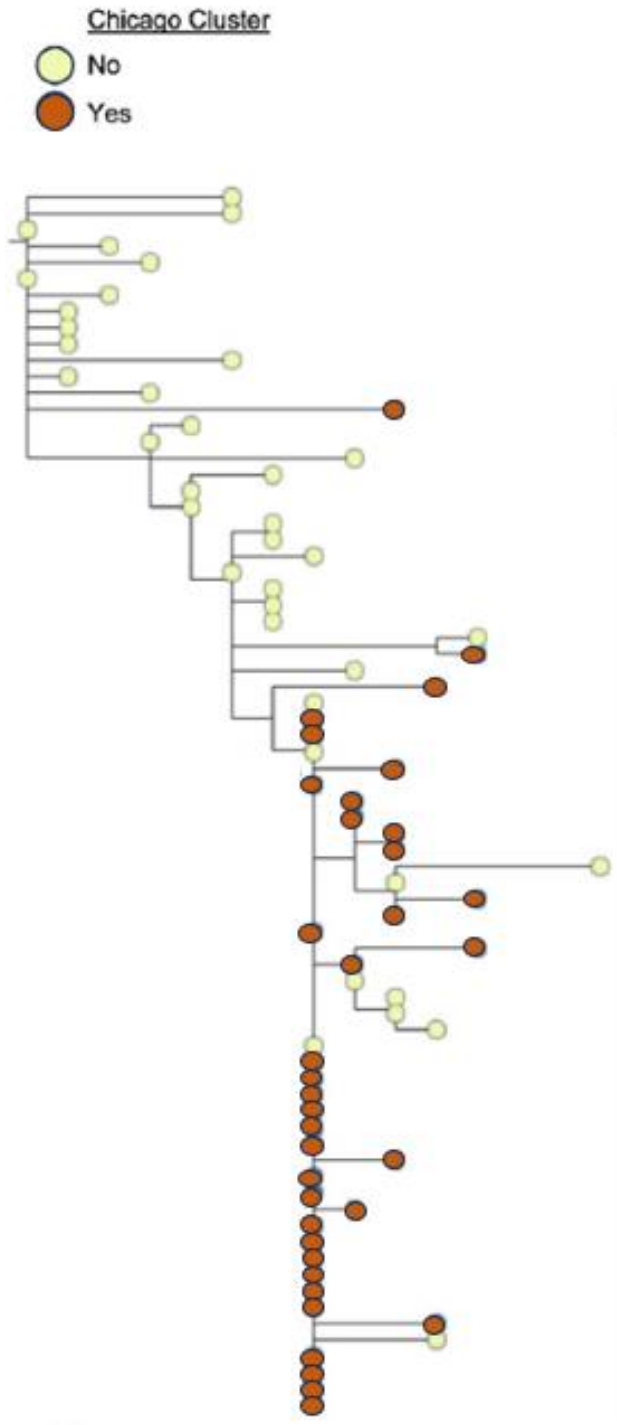

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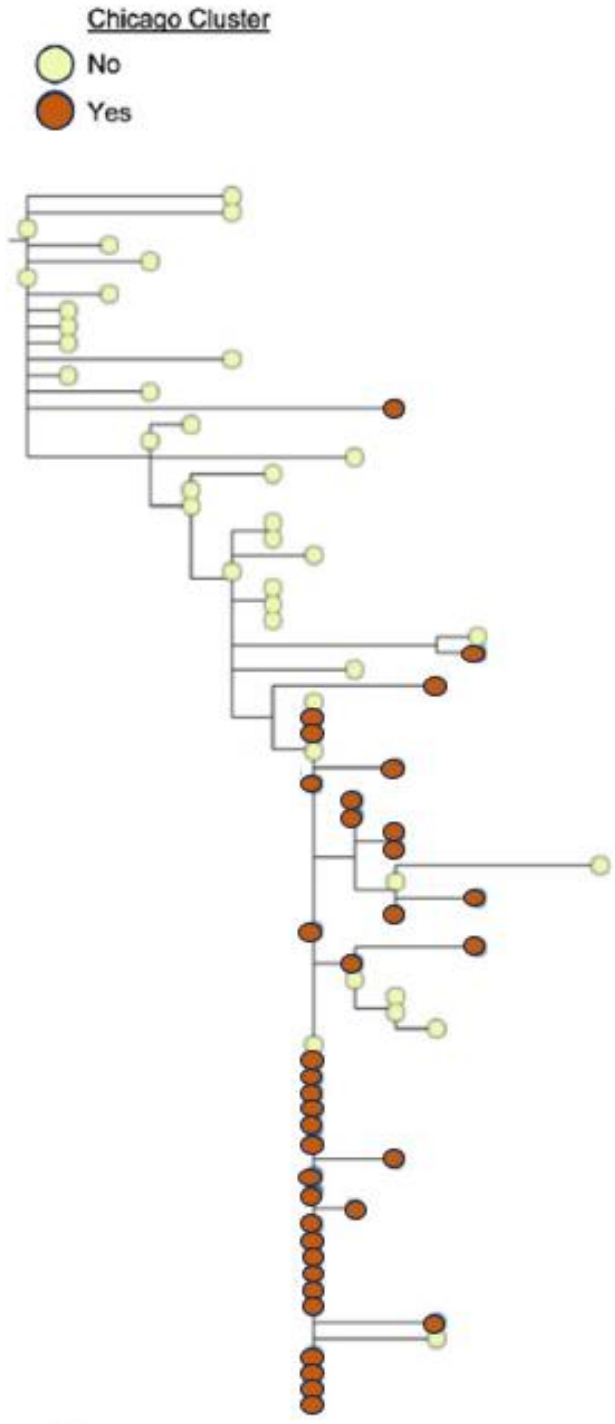

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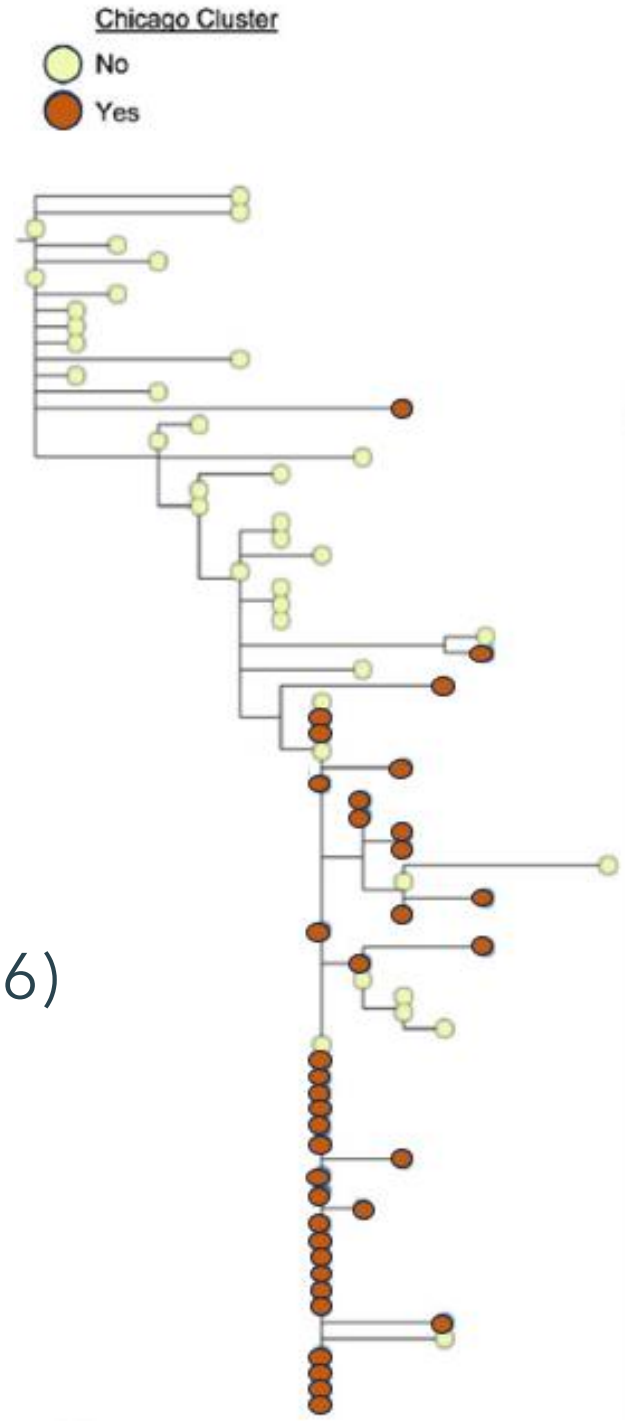
18 identical sequences and little genetic diversification

16 closely related (1-4 mutations); 2 less closely related (4-6)



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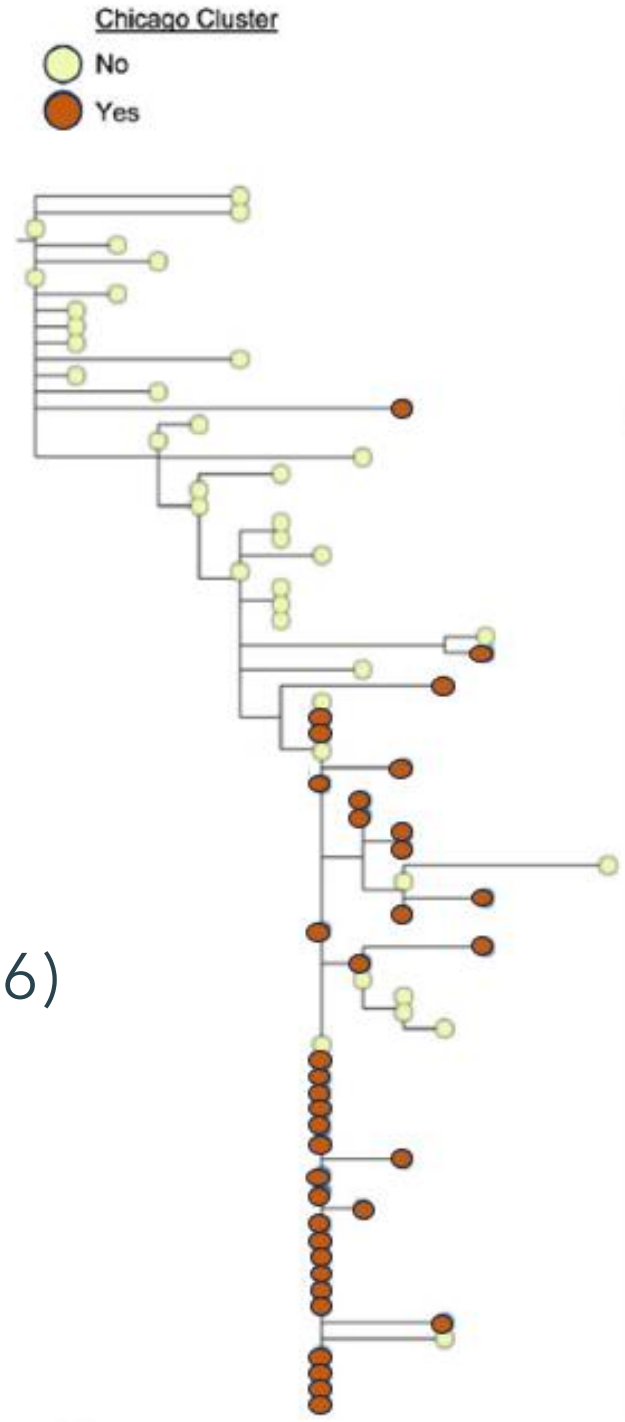
Few amino acid changes in B.1.20 Chicago cluster



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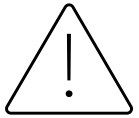
Conclusions and Recommendations



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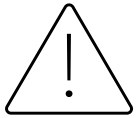

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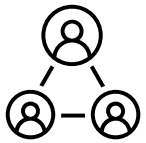

Syndemic approach critical for patients with mpox, HIV, other STIs, homelessness, and other mental health issues

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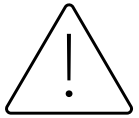

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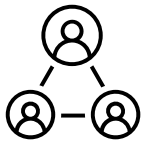

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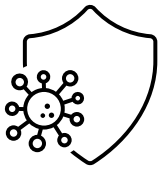

JYNNEOS vaccine effectiveness: 66%–88%

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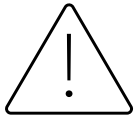

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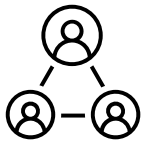

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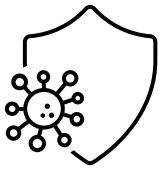

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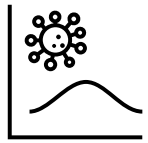

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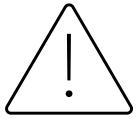

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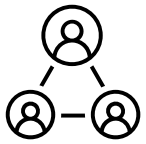

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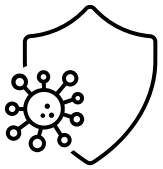

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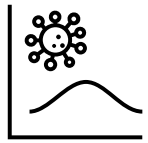

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Strong recommendation for JYNNEOS vaccine

Acknowledgments

Patients and Health Provider Participants

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Faisal Minhaj
Dawn Broussard
Ian Kracalik

Regional Innovative Public Health Laboratory

Hannah J. Barbian

US Strategic National Stockpile

Susan Gorman

Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 cdc.gov

Supplementary slides

Mpox is caused by a viral infection spread through contact with infected persons or animals.

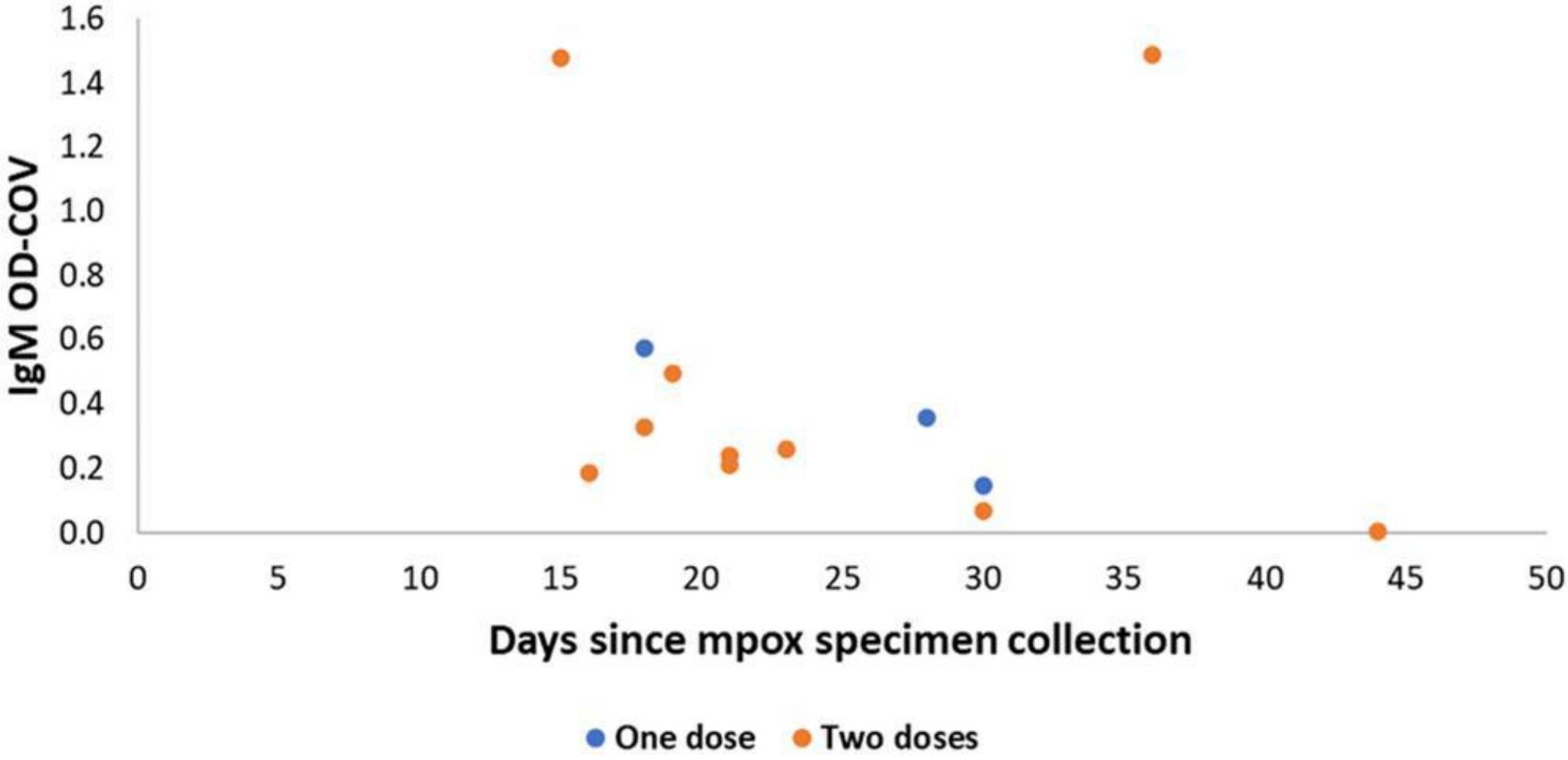
Vaccine Product Investigation

Some vaccine administration concerns were identified:

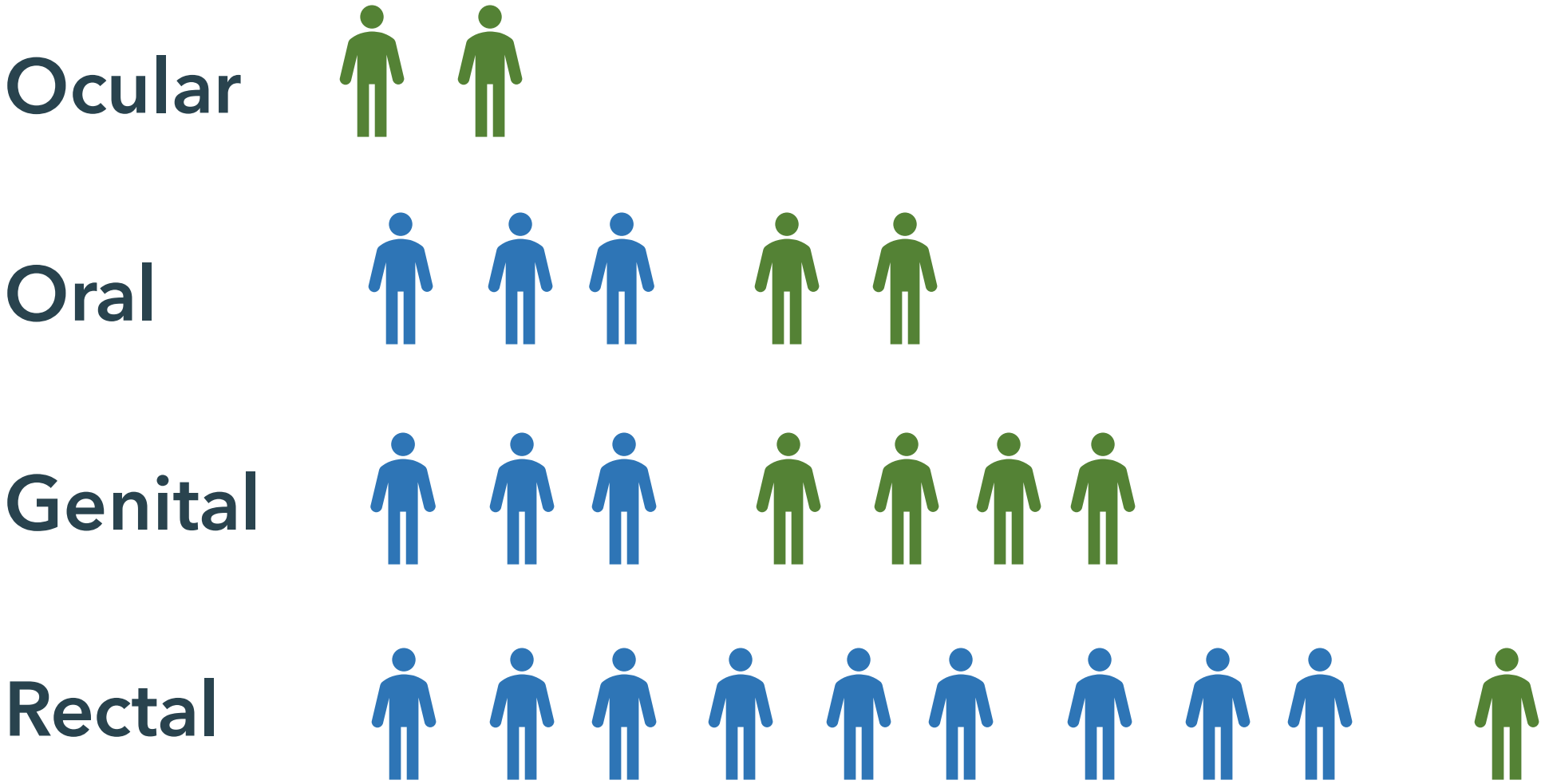
2 doses	Administration in a room where ambient temperature >25°C
1 dose	Use of punctured vials
2 doses	Use of pre-filled syringes before vaccine administration >2 minutes

These deviations did not solely affect cluster patients and could not explain vaccine compromise for the cluster.

Time from specimen collection to serology



Mucosal Areas Affected



Hospitalized patients

Advanced HIV (CD4 count <200 cells/mm^3)
Fungating Lesions
Bacterial superinfection

Virally suppressed (viral load <200 cells/mm^3)
Oropharyngeal Lesions
Pain swallowing

Tecovirimat Administration

15 Received Tecovirimat:

4 STOMP

11 EA IND Protocol / Open Label STOMP

Documented Indications:

1 - Ocular

2 - Oral

4 - Rectal lesions with painful/bloody defecation

1 - Fungating lesions

4 – PWH:

3 FV well controlled HIV (>500 cells/mm3, viral load <200 copies/ml)

1 unvaccinated with advanced HIV

Primary and secondary antibody responses

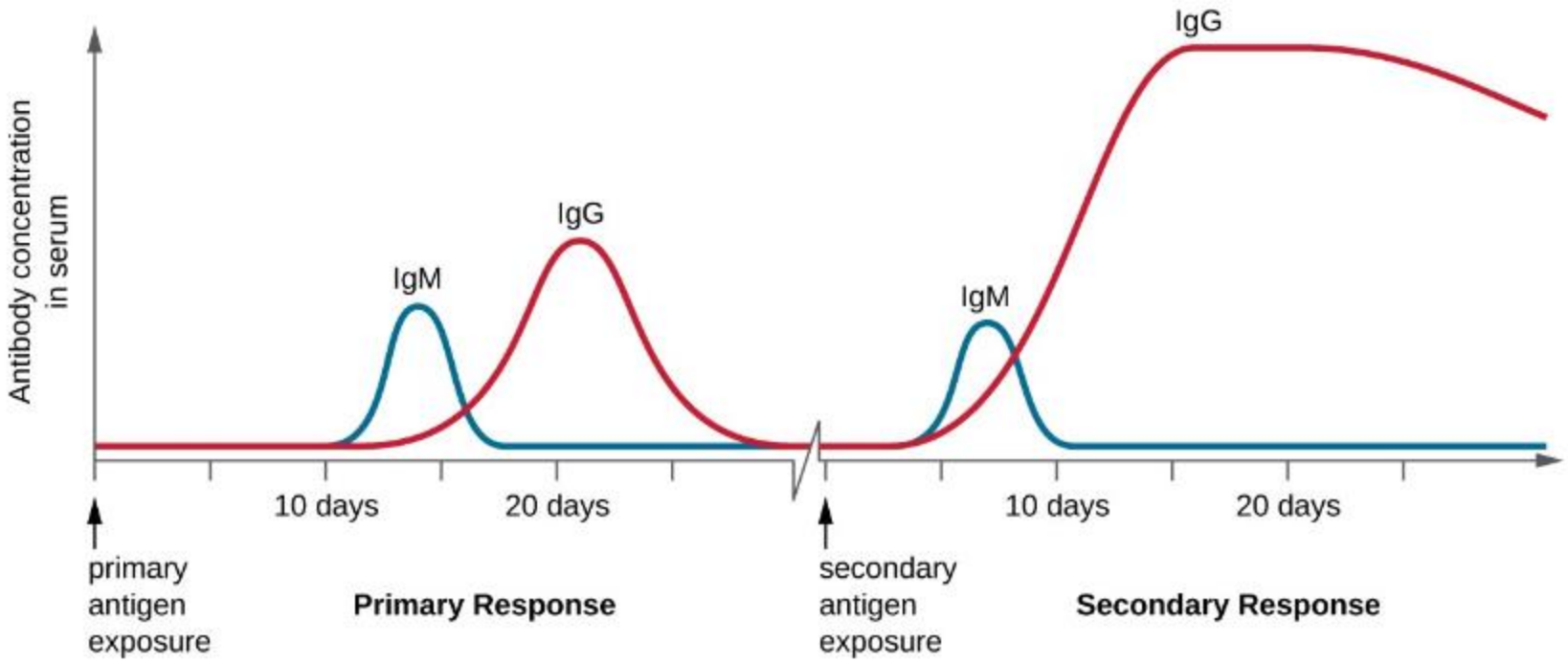


Figure 4. Compared to the primary response, the secondary antibody response occurs more quickly and produces antibody levels that are higher and more sustained. The secondary response mostly involves IgG.

https://courses.lumenlearning.com/suny-microbiology/chapter/b-lymphocytes-and-humoral-immunity/