



Mpox Outbreak: Syndemic Approach to Case Investigations

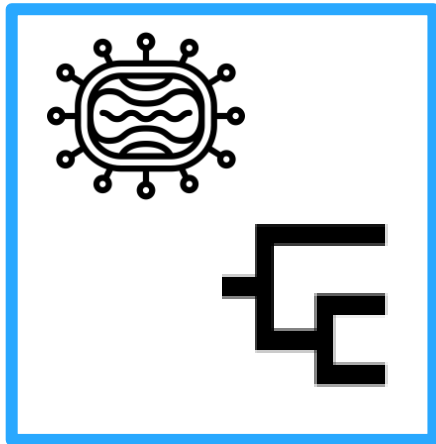
9/19/2023

Taylor Holly, MPH – Epidemiologist

Division of Public Health Services

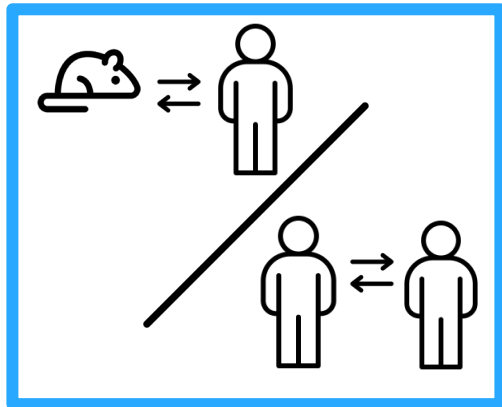
Syndemic Infectious Diseases Bureau

Mpox Background



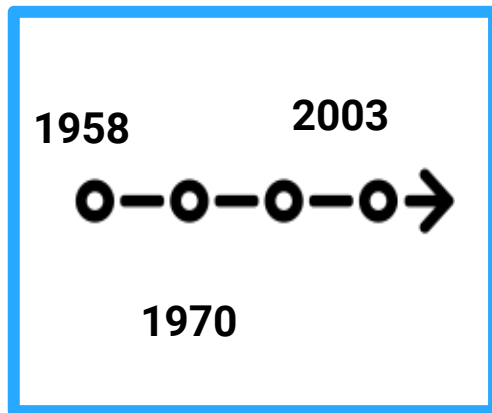
- Member of orthopoxvirus genus
- 2 virus Clades:
 - Clade I
 - Clade II

Mpox Background



- Animal to human transmission
- Human to human transmission

Mpox Background

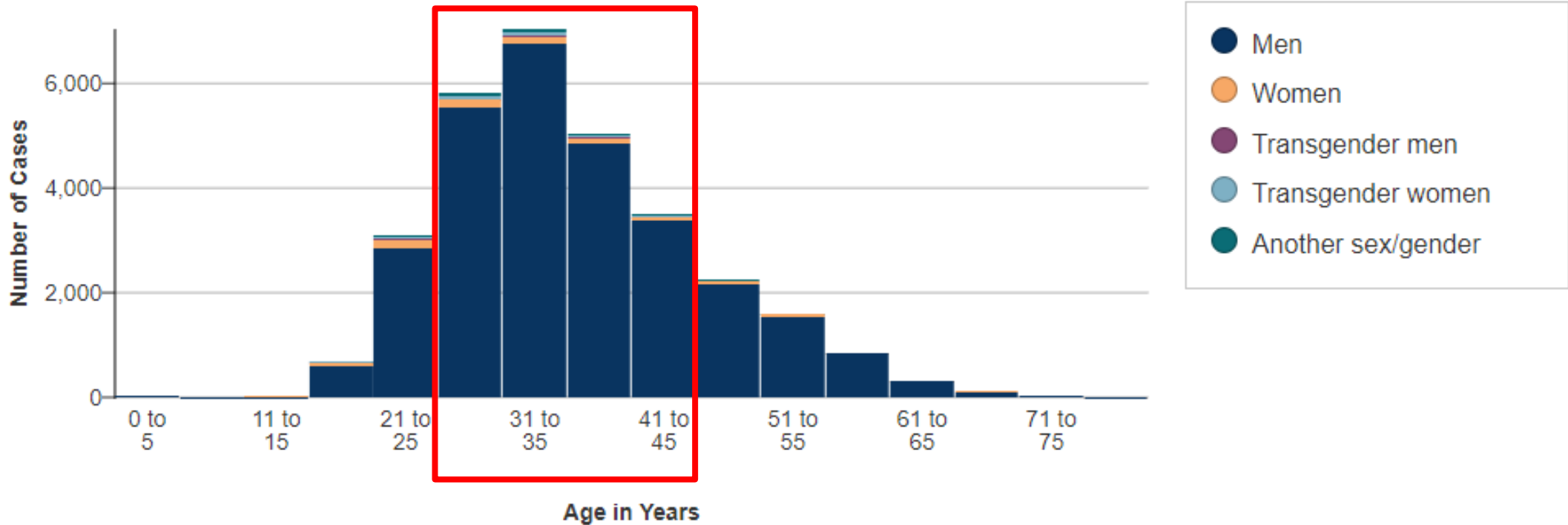


- 1958 First detected in **animals**
- 1970 First detected in **humans**
- 2003 **US imported animal** outbreak
- 2022 **Global** outbreak

Mpox Epidemiology, United States, 2022-2023



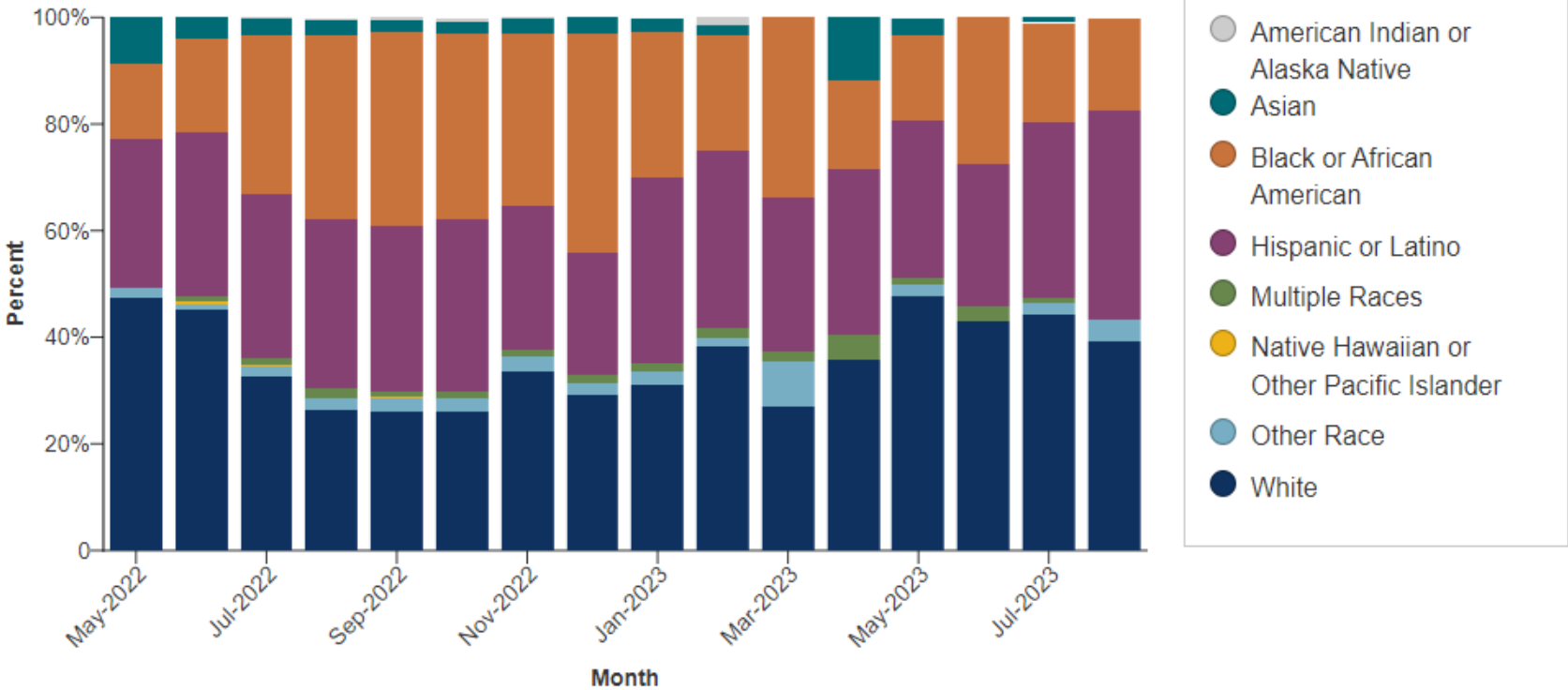
Mpox cases reported to CDC: Age and Gender



Mpox Epidemiology, United States, 2022-2023



Proportion of All Cases by Race and Ethnicity by Month



Clinical Presentation During the 2022 Outbreak



Necrotizing skin lesions in a patient with mpox and advanced HIV infection

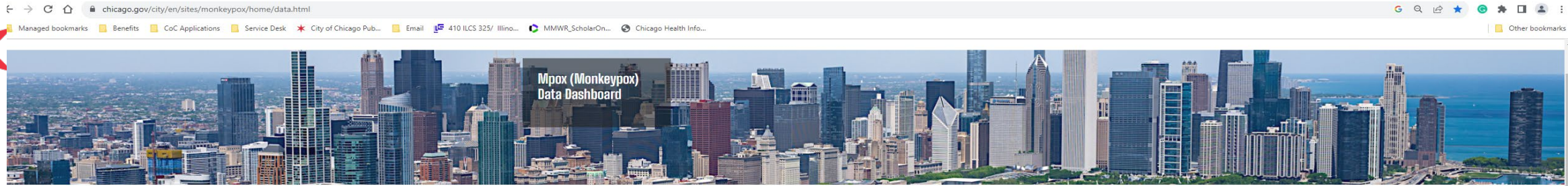


Ulcer on the distal tongue.



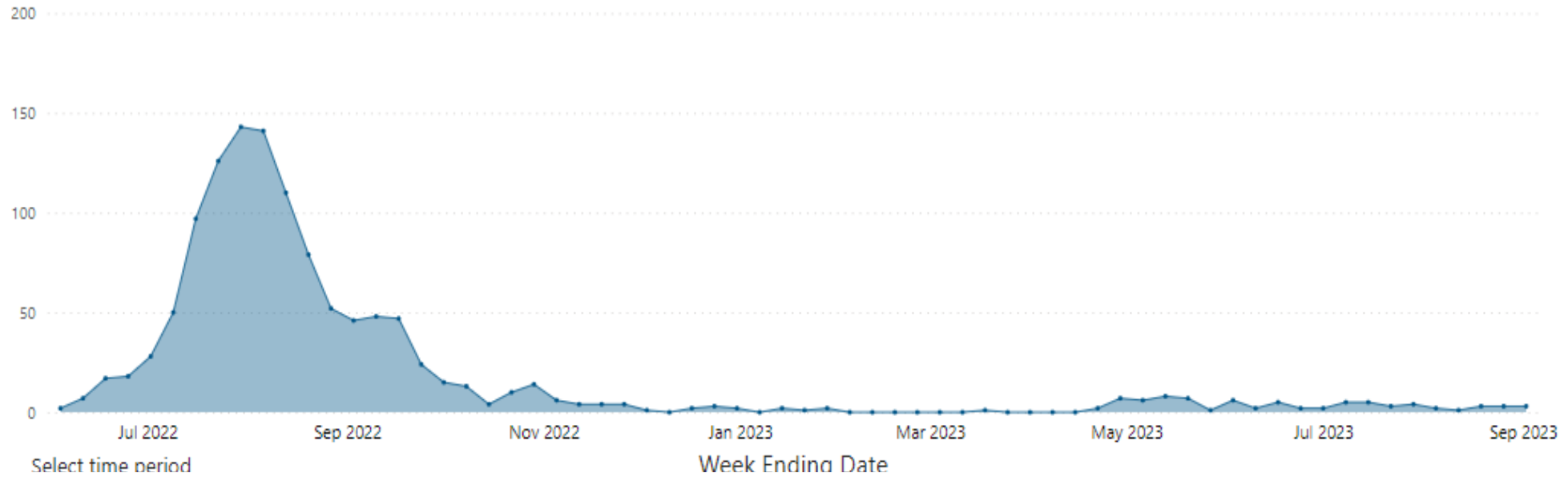
Primary inoculation site right index finger, 5/27/03. 14 days after prairie dog bites, 11 days after febrile illness, hospital day 5.

Epidemiology of Mpox in Chicago, IL



Home / Mpox Data Dashboard

i The Chicago Department of Public Health is investigating a recent increase in mpox cases among Chicago residents. For more information about these cases, see our recent [health alert](#). To learn more about how to protect yourself, visit our [mpox website](#).



Mpox Vaccination Since June 1st, 2022–August 7th, 2023*



30,436

First Doses Administered

19,580

Second Doses Administered

50,016

Total Doses Administered

Mpox Vaccination Coverage Since June 1st, 2022– August 7th, 2023*



61%

First Doses Administered

40%

Second Doses Administered

* Among estimated gay, bisexual, and other same gender loving men who have sex with men population in Chicago

Mpox Vaccination – Demographic characteristics



| Demographic | First Dose | Second Dose | Total |
|------------------|------------|-------------|--------|
| Age Group | | | |
| 18 – 24 Years | 2,275 | 961 | 3,236 |
| 25 – 34 Years | 11,543 | 6,834 | 18,377 |
| 35 – 44 Years | 7,610 | 5,156 | 12,766 |
| 45 – 54 Years | 4,328 | 3,086 | 7,414 |
| 55 – 64 Years | 3,466 | 2,628 | 6,094 |
| 65+ Years | 1,182 | 905 | 2,087 |
| Gender | | | |
| Female | 1,964 | 838 | 2,802 |
| Male | 28,007 | 18,484 | 46,491 |

Mpox Vaccination – Demographic characteristics



| Demographic | First Dose | Second Dose | Total | % overall |
|-----------------------|------------|-------------|--------|-----------|
| Race/Ethnicity | | | | |
| Latinx | 6,176 | 3,743 | 9,919 | 20% |
| Black, non-Latinx | 4,219 | 2,494 | 6,713 | 13% |
| White, non-Latinx | 15,621 | 10,822 | 26,443 | 53% |
| Asian, non-Latinx | 1,707 | 1,142 | 2,849 | 6% |
| AIAN, non-Latinx* | 98 | 58 | 156 | 1% |
| NHOPI, non-Latinx** | 55 | 29 | 84 | 1% |
| Other, non-Latinx | 1,753 | 998 | 2,751 | 6% |

* American Indian or Alaskan Native

** Native Hawaiian or Other Pacific Islander

Slide courtesy of Spencer Gorelick

Vaccination by Community Area, Chicago*



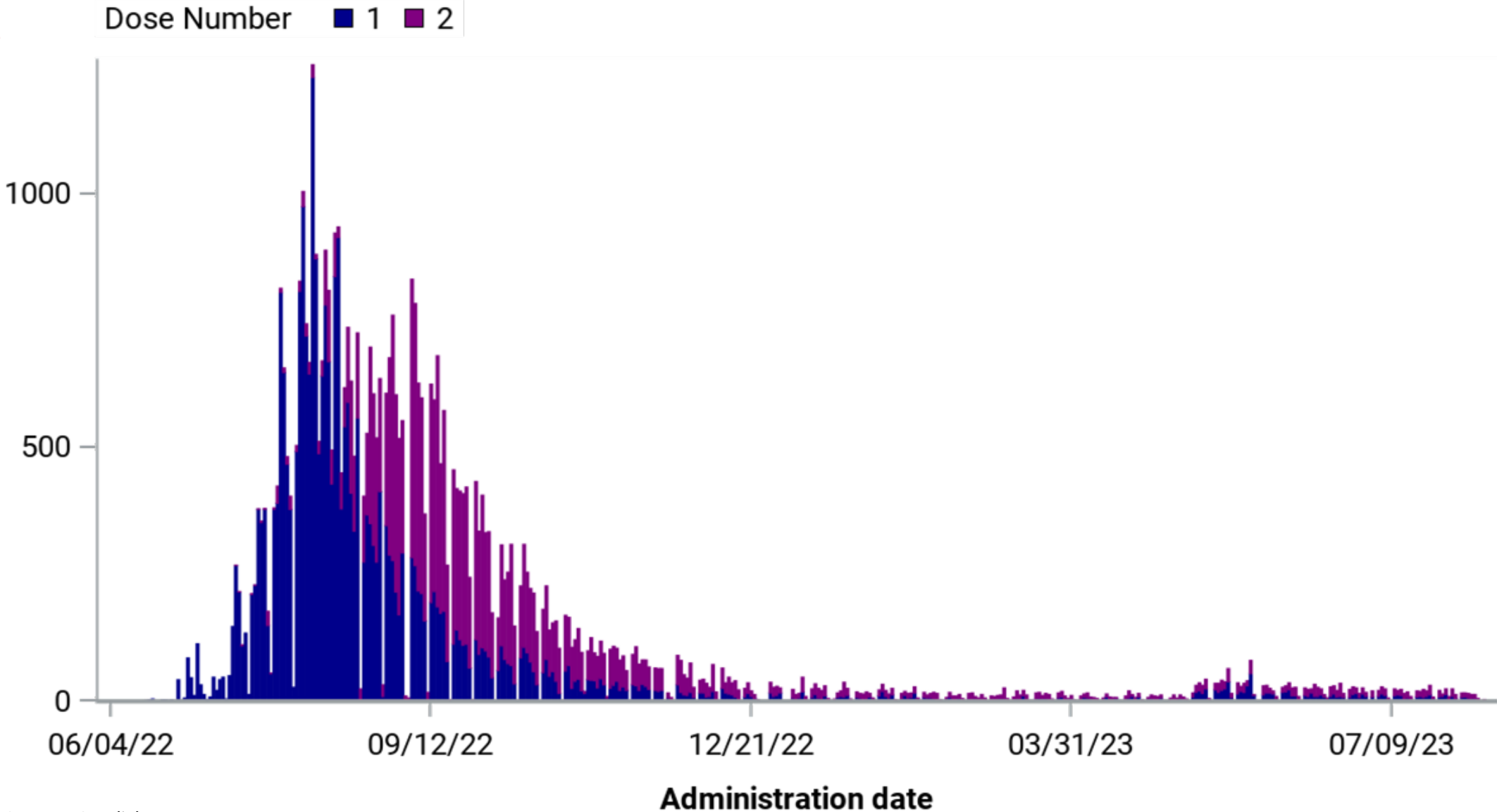
| Top 5 Community Areas | | | |
|-----------------------|-------------|--------------|-------|
| Community Area Name | First Doses | Second Doses | Total |
| Lake View | 5,578 | 3,817 | 9,395 |
| Uptown | 3,944 | 2,749 | 6,693 |
| Edgewater | 3,660 | 2,632 | 6,292 |
| Rogers Park | 1,752 | 1,216 | 2,968 |
| Near North Side | 1,414 | 876 | 2,290 |

| Bottom 5 Community Areas | | | |
|--------------------------|-------------|--------------|-------|
| Community Area Name | First Doses | Second Doses | Total |
| Mount Greenwood | 10 | 8 | 18 |
| Edison Park | 7 | 4 | 11 |
| Fuller Park | 6 | 3 | 9 |
| Burnside | 5 | 2 | 7 |
| Riverdale | 5 | 2 | 7 |

* Actual doses administered may be slightly higher due to errors in geocoding

Slide courtesy of Spencer Gorelick

Doses of Mpox vaccine administered to Chicago residents since June 2022



Slide courtesy of Spencer Gorelick



Health Alert



CDPH

Chicago Department
of Public Health

City of Chicago
Lori E. Lightfoot, Mayor

www.chicagohan.org

Chicago Department of Public Health
Allison Arwady MD MPH, Commissioner

RESURGENCE OF MPOX **Provider Update** **May 9, 2023**

Summary and Action Items

- Chicago Department of Public Health (CDPH) has identified a resurgence of cases of mpox (formerly monkeypox).
- From April 17th-May 5th 2023, 12 confirmed and one probable case of mpox were reported to CDPH. All cases were among symptomatic men. **Nine (69%) of 13 cases were among men who were fully vaccinated for mpox.**
- Transmission of mpox continues locally and disproportionately affects the same populations affected by Sexually Transmitted Infections (STIs) and human immunodeficiency virus (HIV).
- Healthcare providers are urged to remain diligent in screening and vaccinating at risk populations.
- Vaccination is an important tool in stopping the spread of mpox, although vaccine-induced immunity is not complete. **People who are vaccinated should continue to avoid close, skin-to-skin contact with someone who has mpox.**
- JYNNEOS is a 2-dose vaccine approved for the prevention of mpox and smallpox. All eligible Chicagoans should receive both doses of the vaccine for the best protection against mpox. The second dose should be given 4 weeks after the first dose. If more than 35 days has elapsed since the first dose was given, administer the second dose as soon as possible. **Vaccine boosters are not recommended at this time.**
- CDPH encourages healthcare providers to adopt a syndemic approach to addressing mpox and including incorporating mpox, STI and HIV screening, treatment and prevention into existing sexual health services.

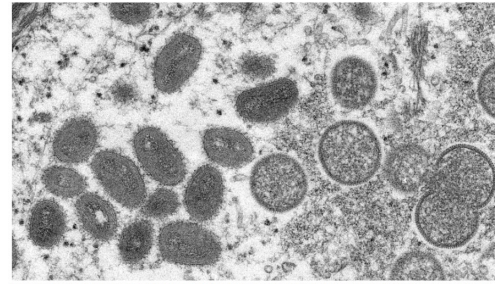




ABC7 Chicago
Monkeypox Chicago: Cases of Mpx on ...

HEALTH
Chicago Health Officials Sound Alarm as Mpx Cases Increase

Healthier Chronicle | May 23, 2023 2:53 pm



This electron microscope image shows mature, oval-shaped mumps viruses, left, and spherical immature viruses, right, from a human skin sample associated with a 2003 prairie dog outbreak. (Cynthia S. Goldsmith, Russell Regnery / CDC)

Mpx cases are once again rising in Chicago, health officials said Tuesday, urging those at highest risk to get vaccinated as soon as possible.



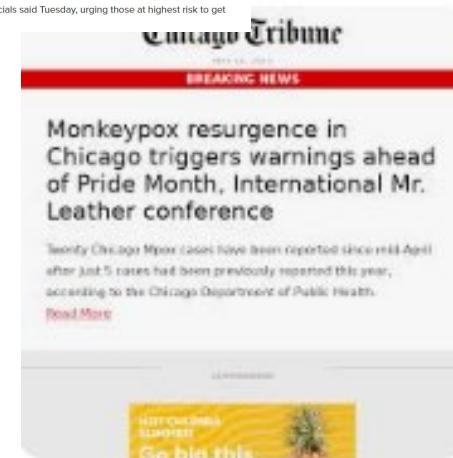
NBC News
CDC warns about mpx cases in Ch...



The Hill
CDC investigates possible mpx ...



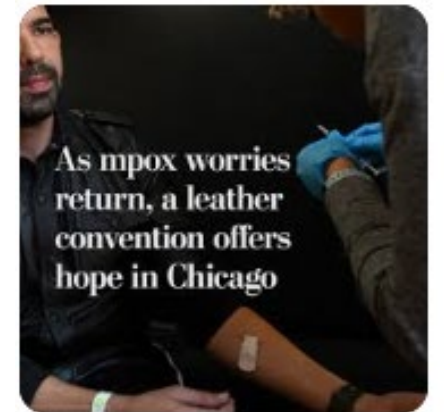
The Hill
Chicago mpx outbreak raises alar...



Deal Town
Monkeypox resurgence i...



CBS News
A dozen new mpx cases under ...



The Washington Post
Chicago's mpx control s...

Why Chicago? Mpox Cluster Investigation Overview

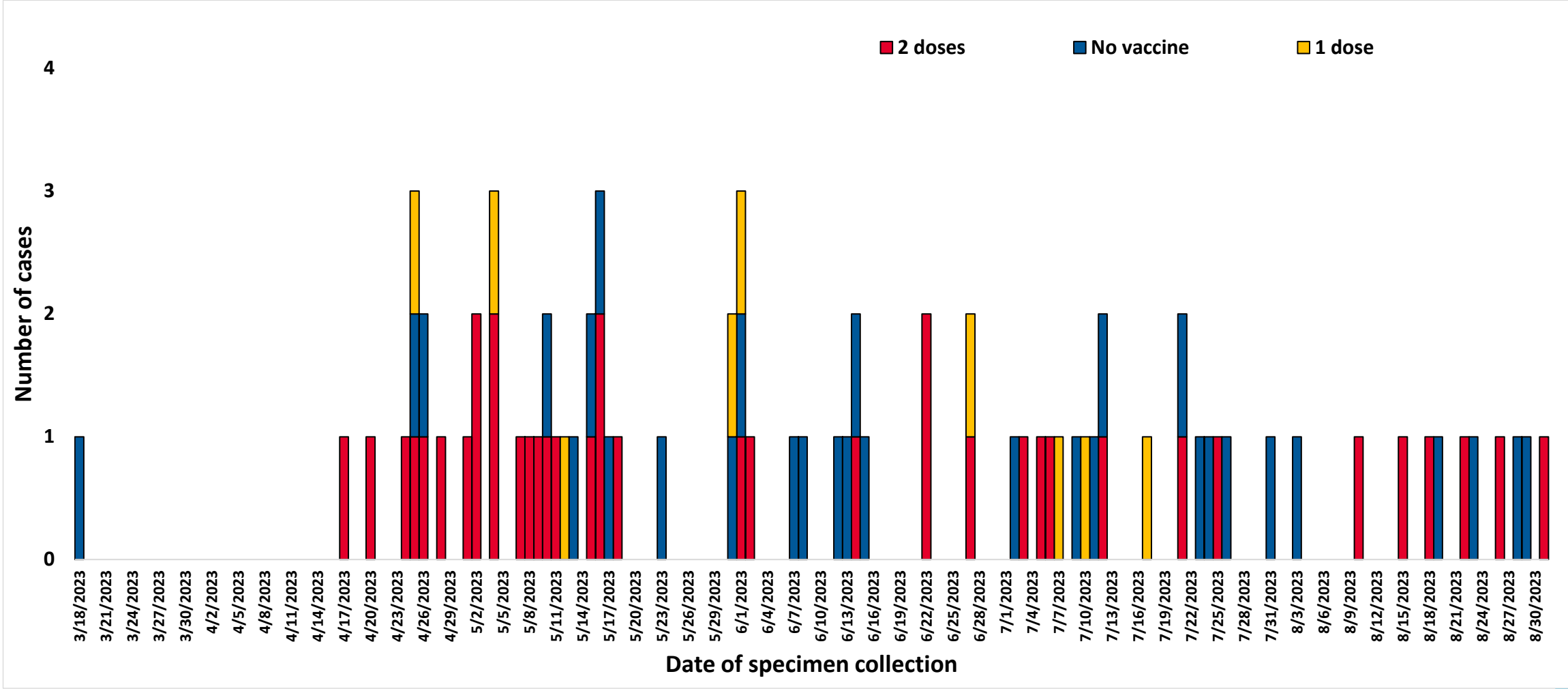


| Objective | Activities |
|---|---|
| Assess vaccinations administered to cases in the cluster | Interviews with partners along vaccine chain of custody and examined vaccine record and lot numbers |
| Compare severity of symptoms by vaccination status | Chart review and implementation of the Mpox Severity Score |
| Identify possible demographic, clinical and behavioral risk factors of infection | Enhanced case investigation |
| Characterize recent behavior and behavioral modifications among cases in the cluster, (i.e. risk compensation among vaccinated cases) | In-depth interviews with cases, key informant interviews with community partners |
| Assess serologic immune response among cases in the cluster who were previously vaccinated | Serology |
| Analyze potential genetic variation in MPXV | Whole genome sequencing |



*Slide courtesy of Emily Faherty

Mpox Cases: Epi Curve by Vaccination Status, Chicago, 3/18-8/31/23

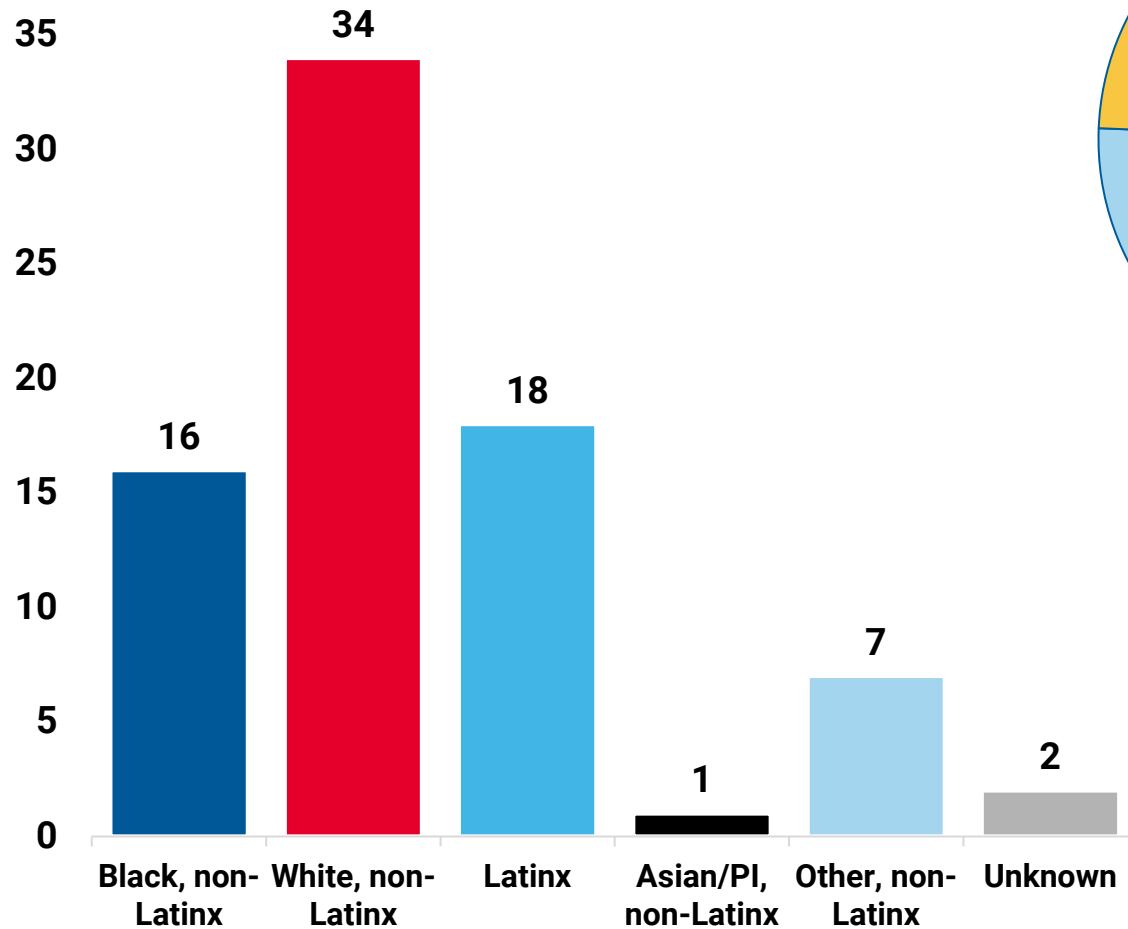


*Data is provisional as of 9/5/23 @ 2pm

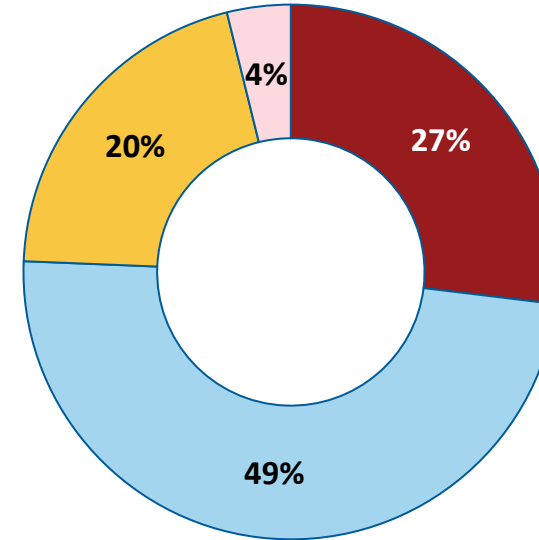
Recent Mpox Cases, Chicago, 3/18-8/31/23 (N=78)



Mpox cases by Race/Ethnicity



Mpox cases by age category



75.6% mpox cases among persons aged 20-39 yrs.

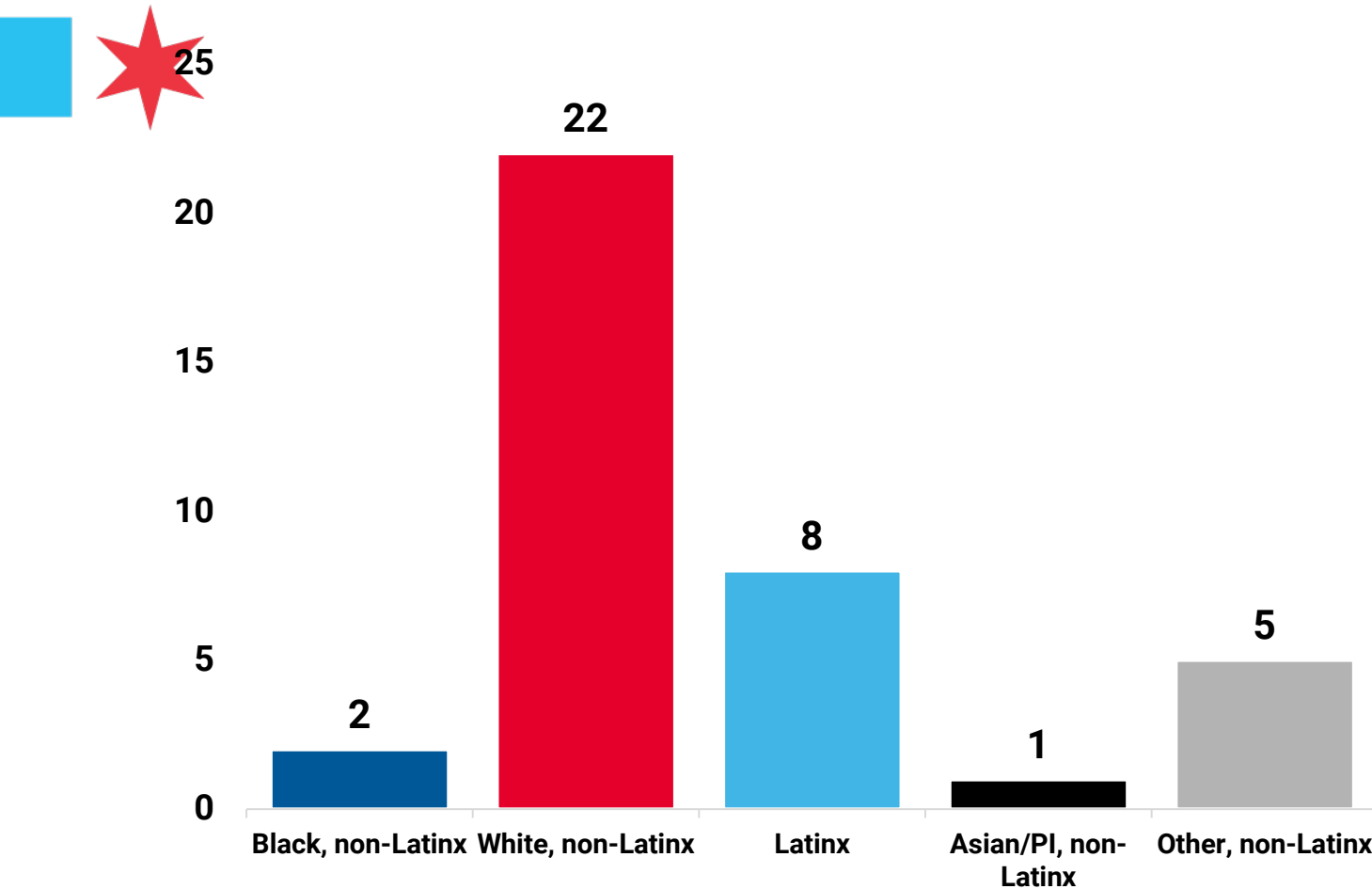
- 20-29
- 30-39
- 40-49
- 50+

BY THE NUMBERS

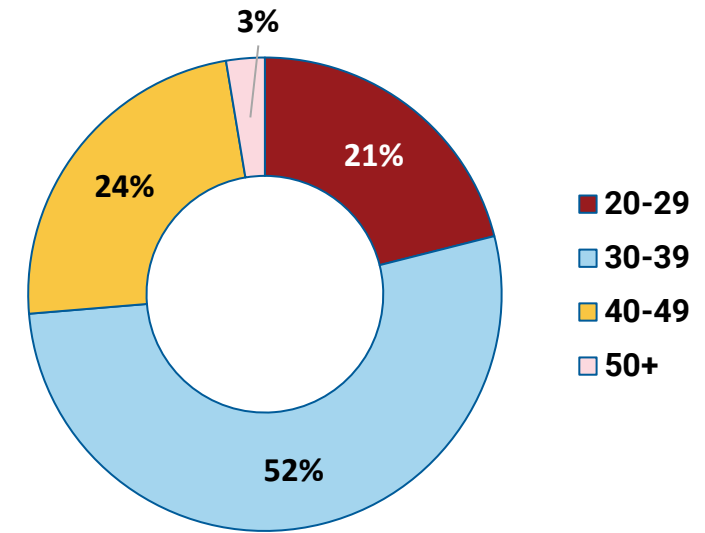
- 82% among gay, bisexual and other men who have sex with men (MSM)
- 85% among cisgender male

Previously Vaccinated Cases, Chicago, 3/18-8/31/23

Mpox cases by Race/Ethnicity



Mpox cases by age category



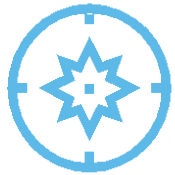
Median time from second mpox dose to specimen collection:

9 months

OF THE **38** recent mpox cases confirmed to be fully vaccinated:

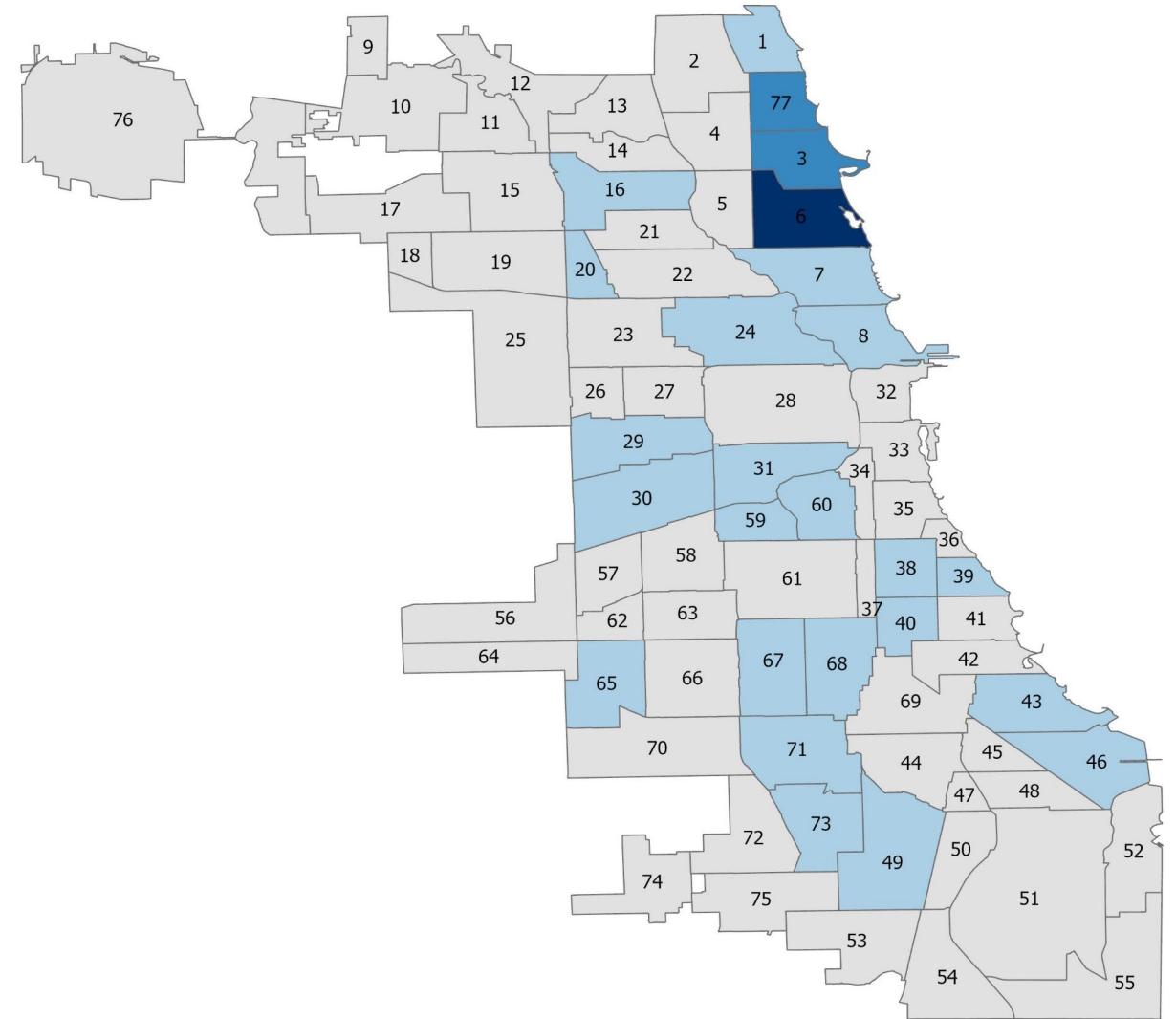
- 50%.....RECEIVED BOTH DOSES OR 1 DOSE(ACAM2000) SUBCUTANEOUSLY
- 36.8%.....RECEIVED 1 DOSE SUBCUTANEOUSLY AND 1 DOSE INTRADERMALLY
- 13.2%.....RECEIVED BOTH DOSES INTRADERMALLY

Recent Mpox Cases by Community Area, 3/18-8/31/23



Top three community areas with the **highest number of new mpox cases:**

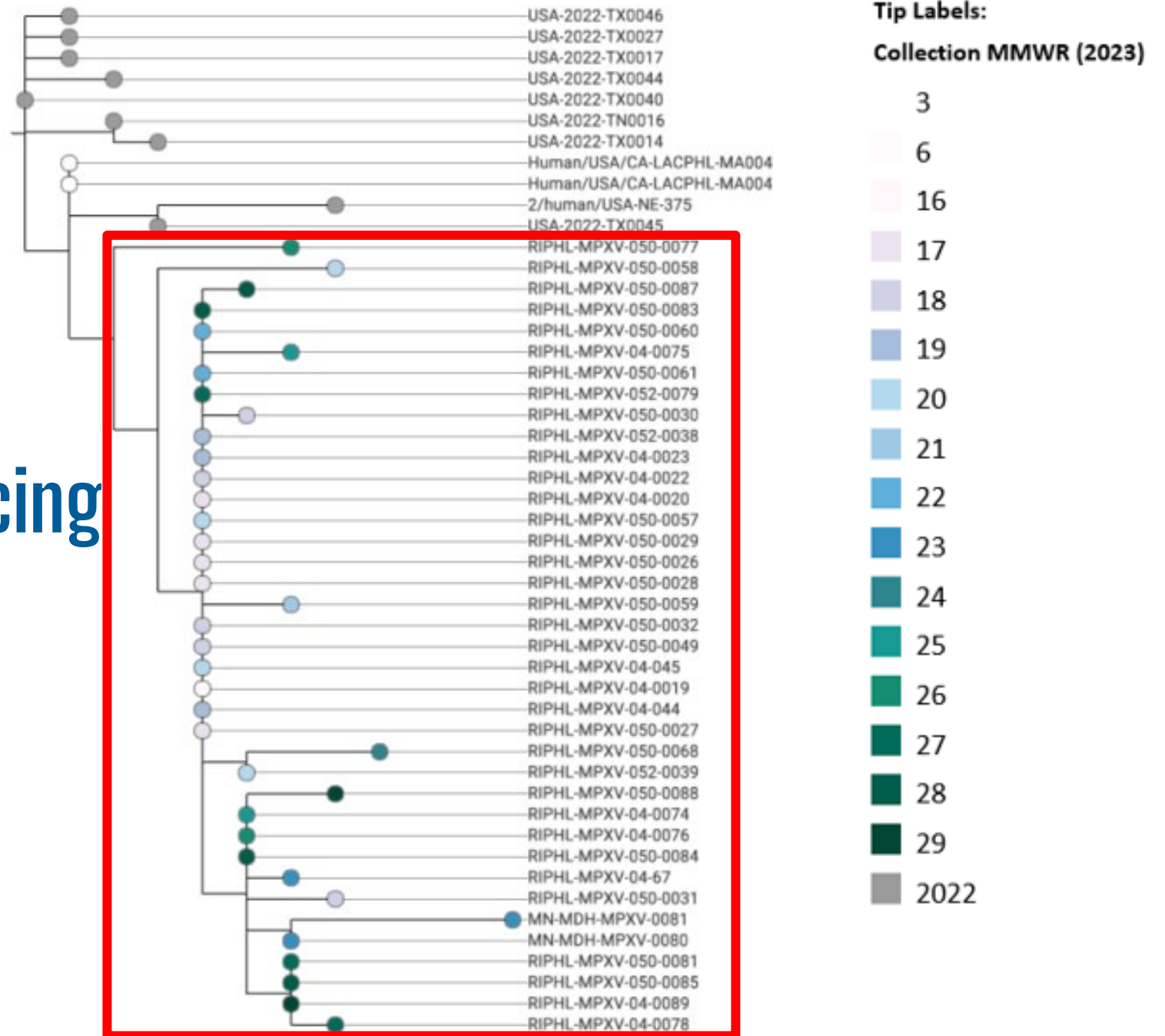
- Lake View (n=21)
- Uptown (n=13)
- Edgewater (n=10)



*Data is provisional as of 6/28/23 @ 2pm



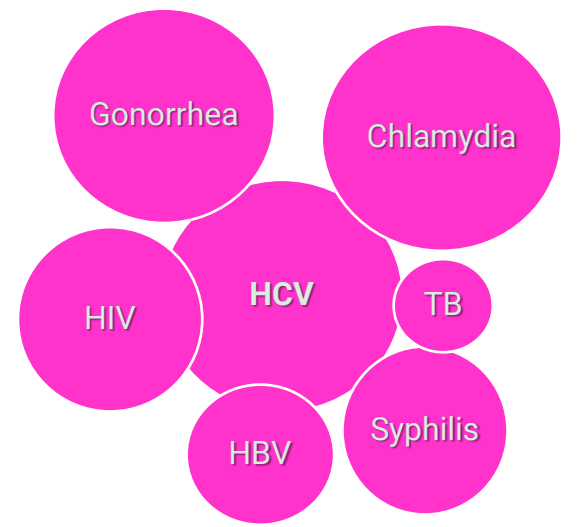
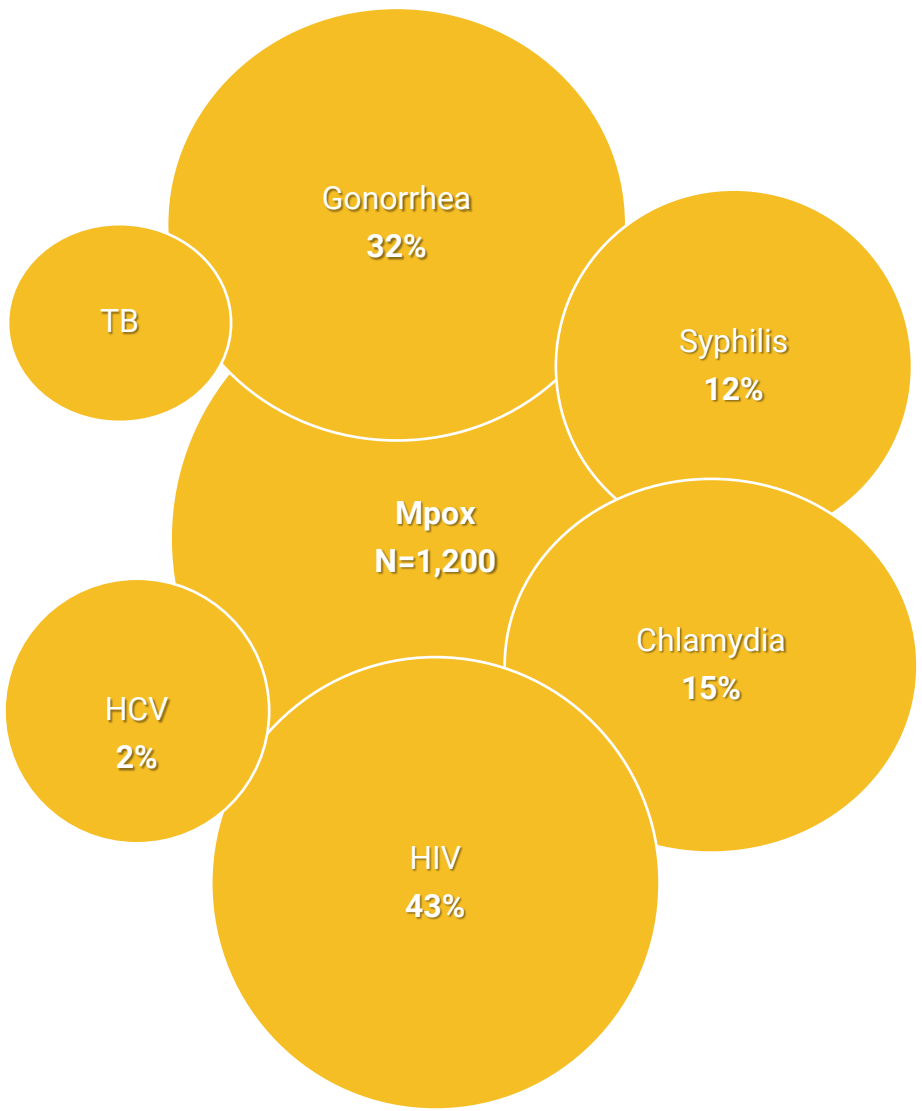
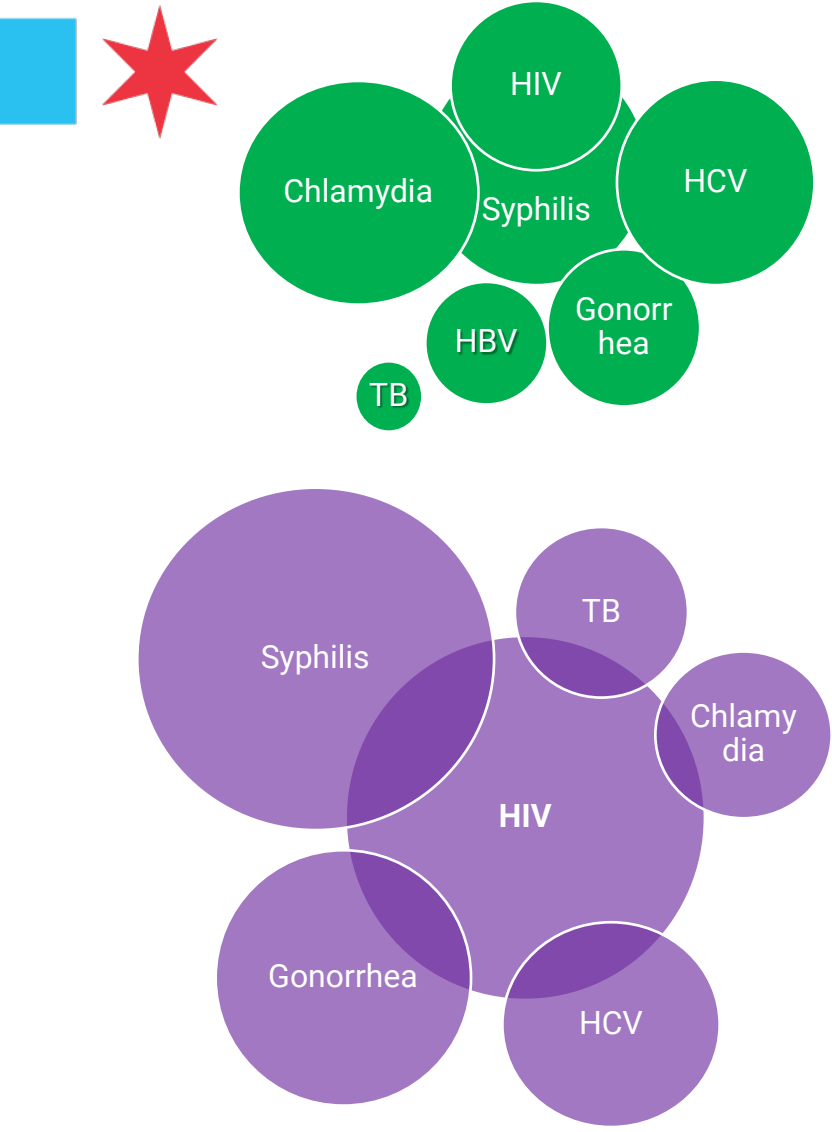
Whole Genome Sequencing





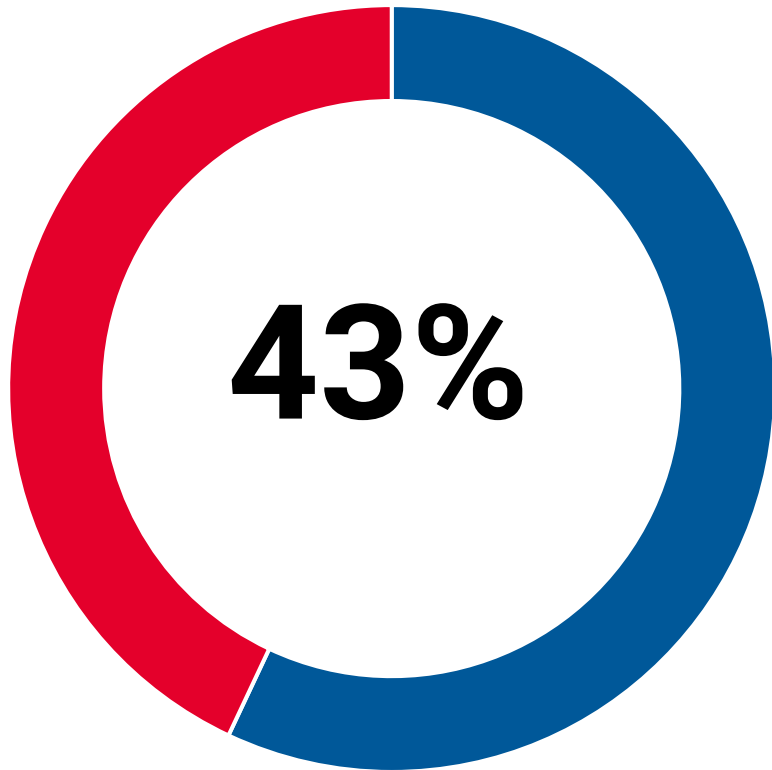
Syndemics are epidemics that interact with each other and by that interaction increase their adverse effects on the **health of communities**, that face systematic, structural, and other inequities.

Syndemics in Chicago



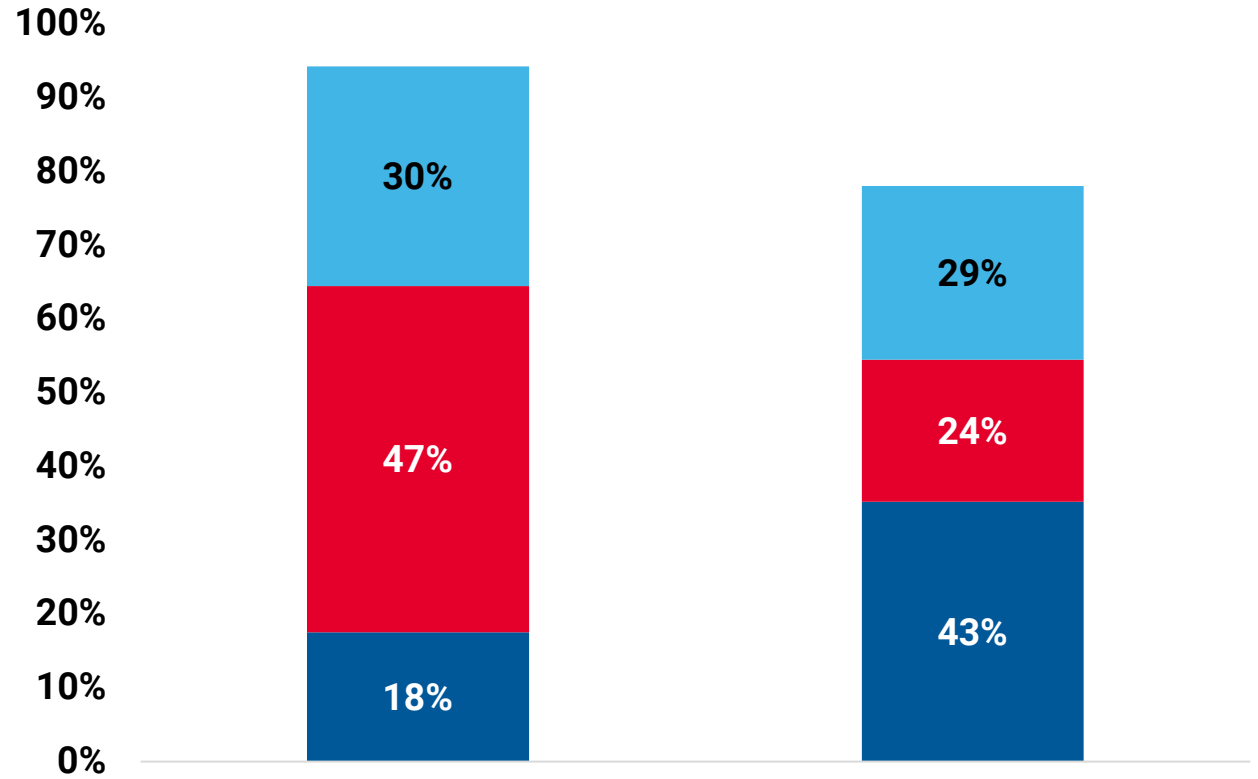
HIV/HBV co-infection data are not available. Research suggests 5-10% of PLWH are co-infected with HBV. (<https://www.ncbi.nlm.nih.gov/pubmed/20158604>)

Mpox and HIV Coinfection



■ Mpox ■ Mpox/HIV+

Race/Ethnicity comparison



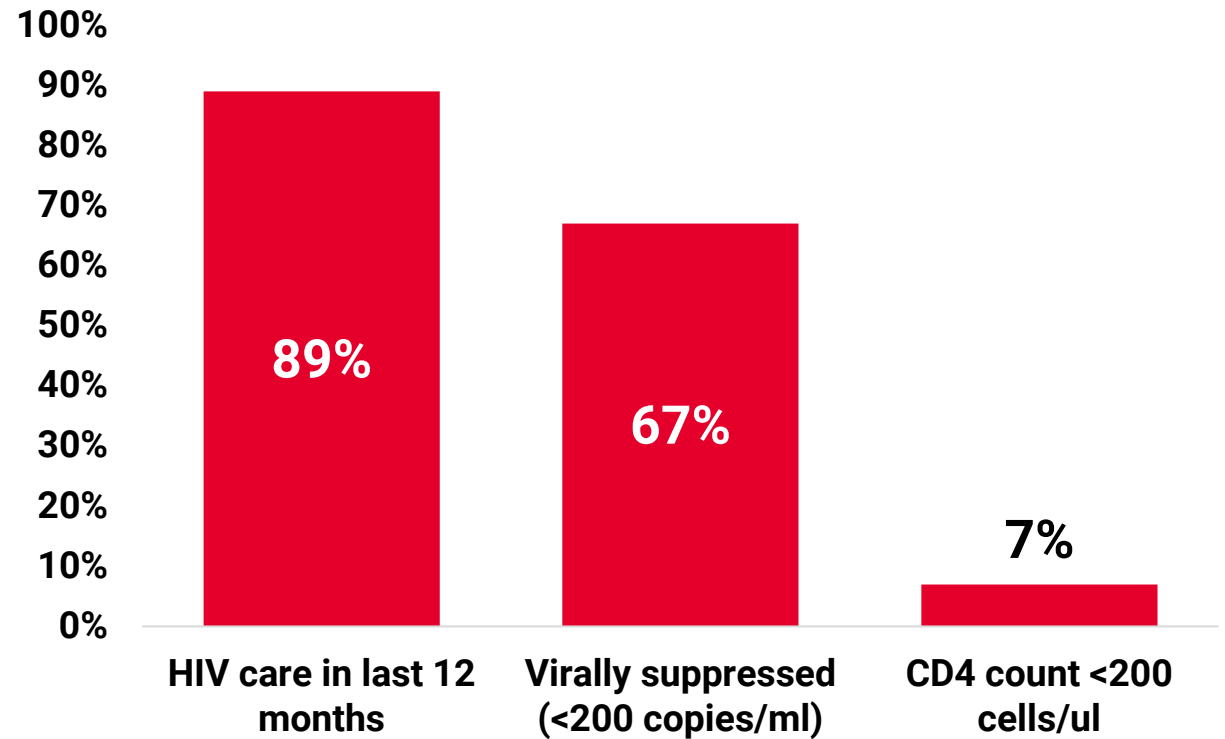
■ Black, non-Latinx ■ White, non-Latinx ■ Latinx

Mpox and HIV Coinfection

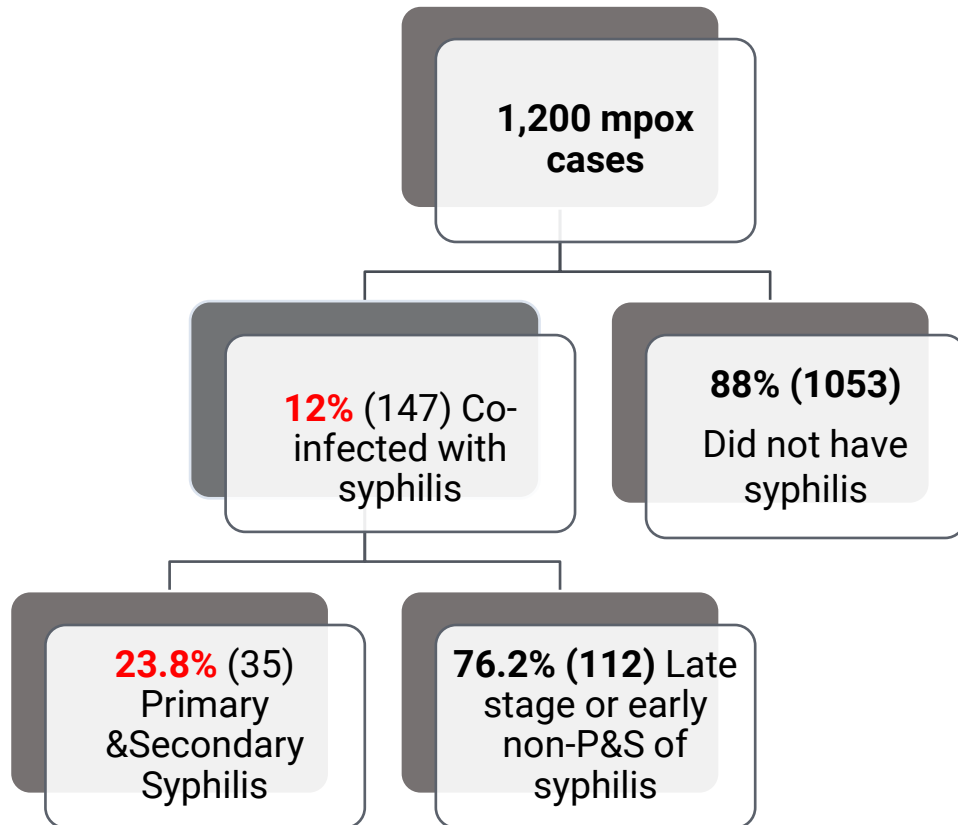


68% of all hospitalized cases are coinfecting with HIV

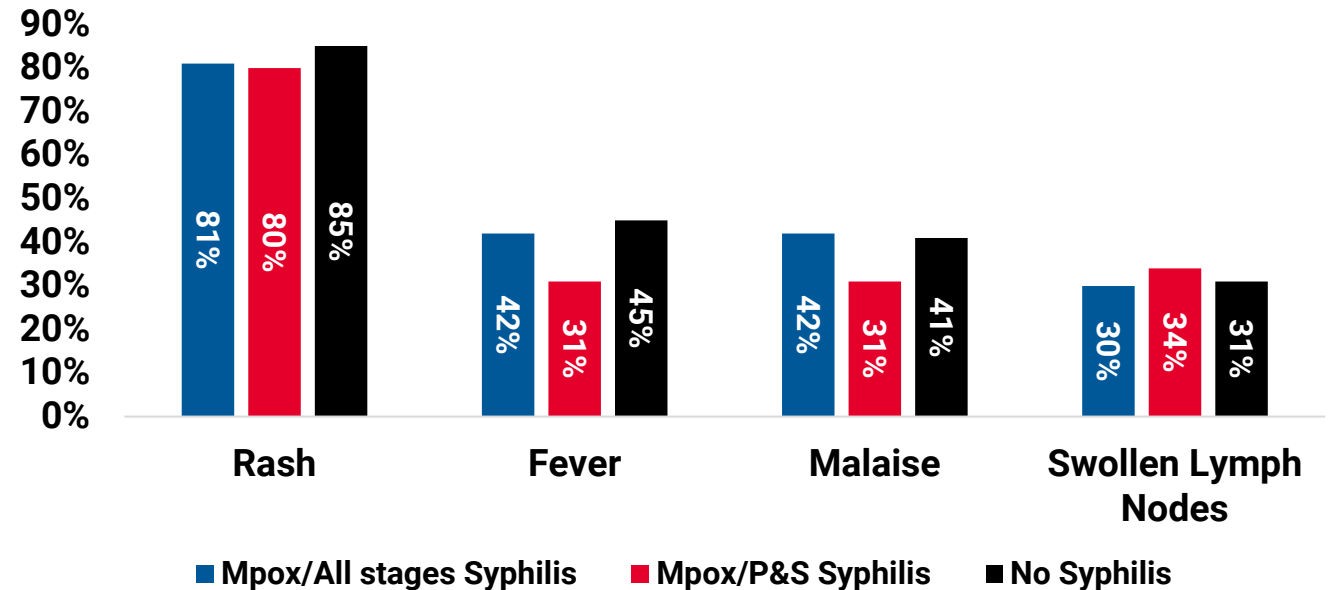
Mpox/HIV+ cases care status, viral load, and CD4 count



Mpox and Syphilis Coinfection



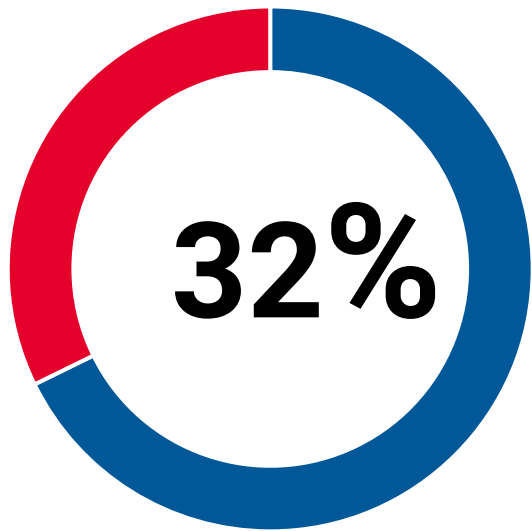
Signs and Symptoms by Syphilis Status



Mpox and Gonorrhea/Chlamydia Coinfection

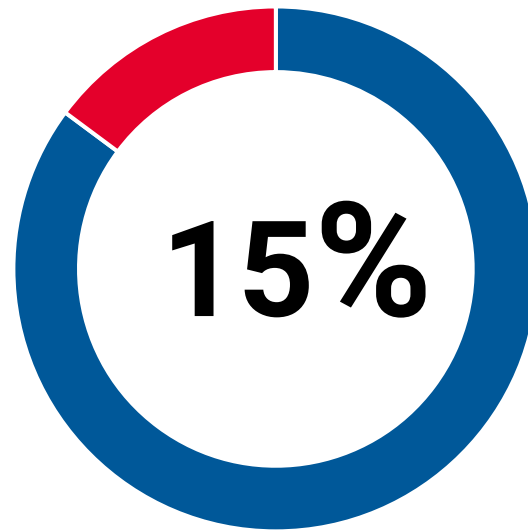


Mpox and Gonorrhea coinfection



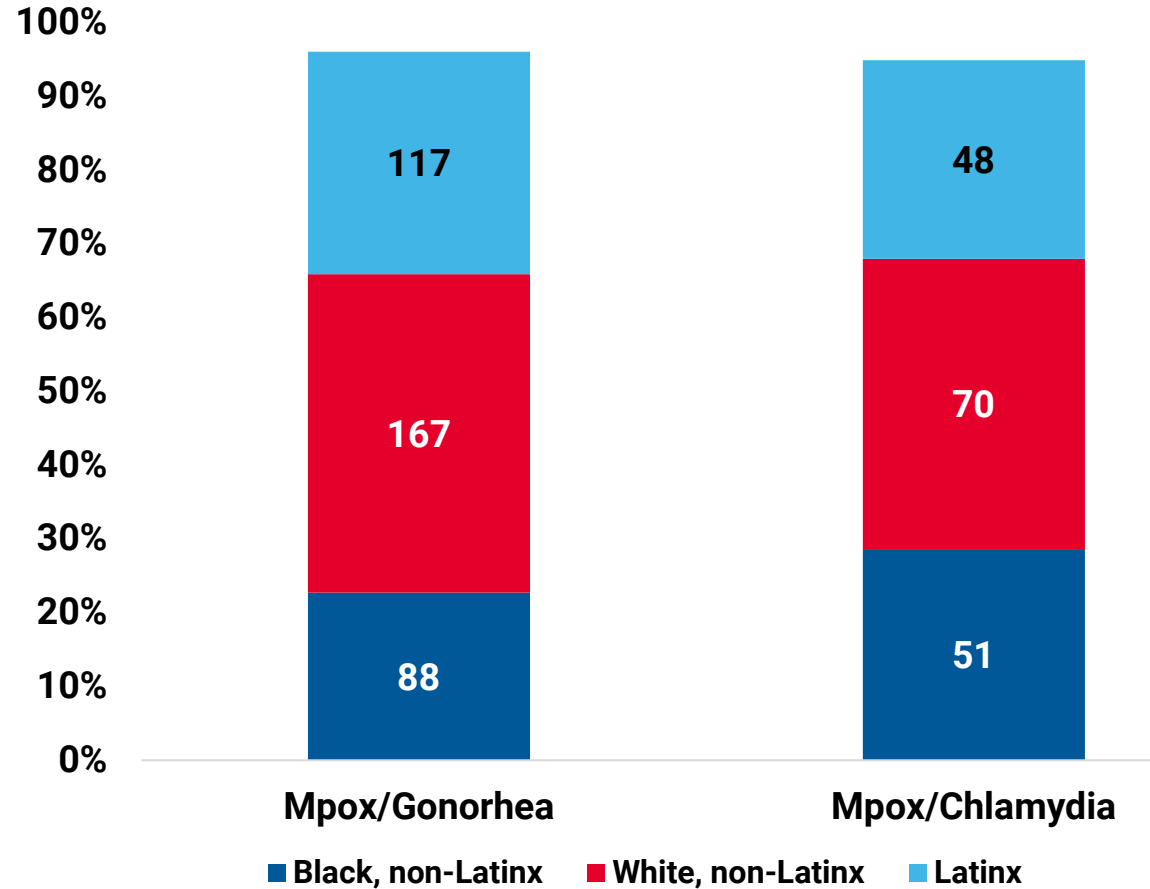
■ Mpox only ■ Mpox/Gonorrhea

Mpox and Chlamydia coinfection



■ Mpox only ■ Mpox/Chlamydia

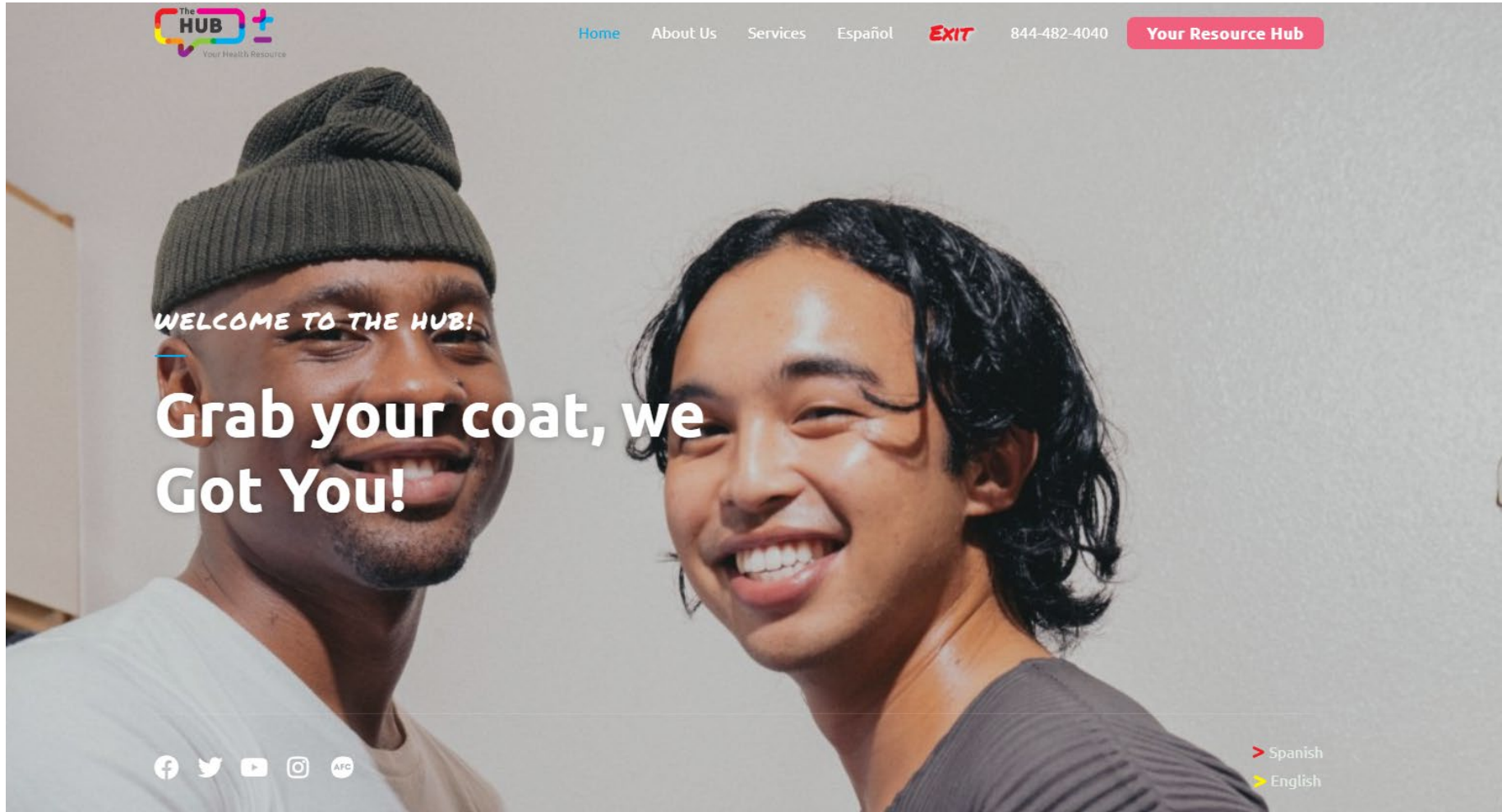
Race/Ethnicity among coinfecting cases





Takeaways

- Healthcare providers are encouraged to adopt a syndemic approach to addressing mpox:
- including incorporating mpox, STI and HIV screening, treatment and prevention into existing sexual health services.
 - Some patients may have concurrent STIs and an STI diagnosis does not rule out mpox.
- **Screen patients for HIV.**
 - If seropositive, ensure patient is connected to HIV care. Advanced HIV disease increases risks for severe mpox.
 - If seronegative, counsel patient about the benefits of HIV pre-exposure prophylaxis (PrEP) and, if interested, connect patient to a HIV PrEP provider.



- Please visit www.hivhub.org or call **1-844-HUB-4040** for those looking for LGBTQ+ related health care.



Acknowledgements

Irina Tabidze

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Ashley Becht
Michael Wazs
Patrick Stonehouse
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Thank you!

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