Mpox: Multi-Country Outbreak Updates

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February 14, 2024

1. Mpox Overview
2. Epidemiology of 2022 Mpox Outbreak
3. Collaboration with Public Health
4. Resources and Conclusions

Mpox Overview

About Mpox

- Rash illness caused by the Monkeypox virus
- Rare before 2022 outbreak
- Symptoms similar to smallpox, but milder illness
- Rarely fatal
- **Not** related to chickenpox

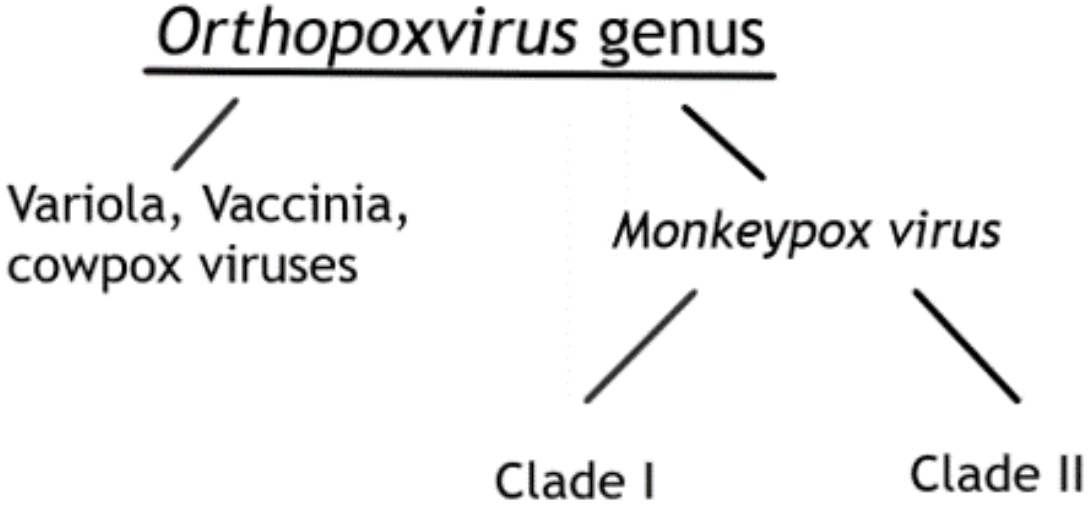
Background

- First discovered in 1958 when two outbreaks of pox-like disease occurred in research monkeys
  - Specific animal reservoir remains unknown
  - African rodents and non-human primates might harbor virus and infect people

- First human case in 1970 in the Democratic Republic of the Congo (DRC)

McCollum AM, Shelus V, Hill A, et al. Epidemiology of Human Mpox — Worldwide, 2018–2021. MMWR Morb Mortal Wkly Rep 2023;72:68–72.

Mpox Virus Microbiology



- Same family of viruses as smallpox
- Clade I: more severe illness
- Clade II: current global outbreak

Cases in Africa before the 2022 Outbreak

- Before 2022 outbreak, mpox cases occurred in people in central and western African countries
- Since 2014, annual number of cases in Africa has increased
  - May be due to environmental changes, human/animal movement, end of routine smallpox vaccination, improved detection and diagnosis, and genetic changes
- From 2018–2021, human cases reported from six African countries
  - Democratic Republic of Congo (Clade I) and Nigeria (Clade II) reported most of the cases

McCollum AM, Shelus V, Hill A, et al. Epidemiology of Human Mpox — Worldwide, 2018–2021. MMWR Morb Mortal Wkly Rep 2023;72:68–72.

U.S. Cases before the 2022 Outbreak

- Cases in people outside of Africa linked to international travel or imported animals
- In 2003, outbreak of 47 mpox cases from six states caused by contact with pet prairie dogs
  - Animals had been housed near imported small mammals from Ghana
  - First time human mpox reported outside of Africa
  - No infections caused exclusively by person-to-person contact
- Travel-associated case in July 2021 (TX) and November 2021 (MD)
  - Each U.S. case lived in U.S. and had traveled to Nigeria

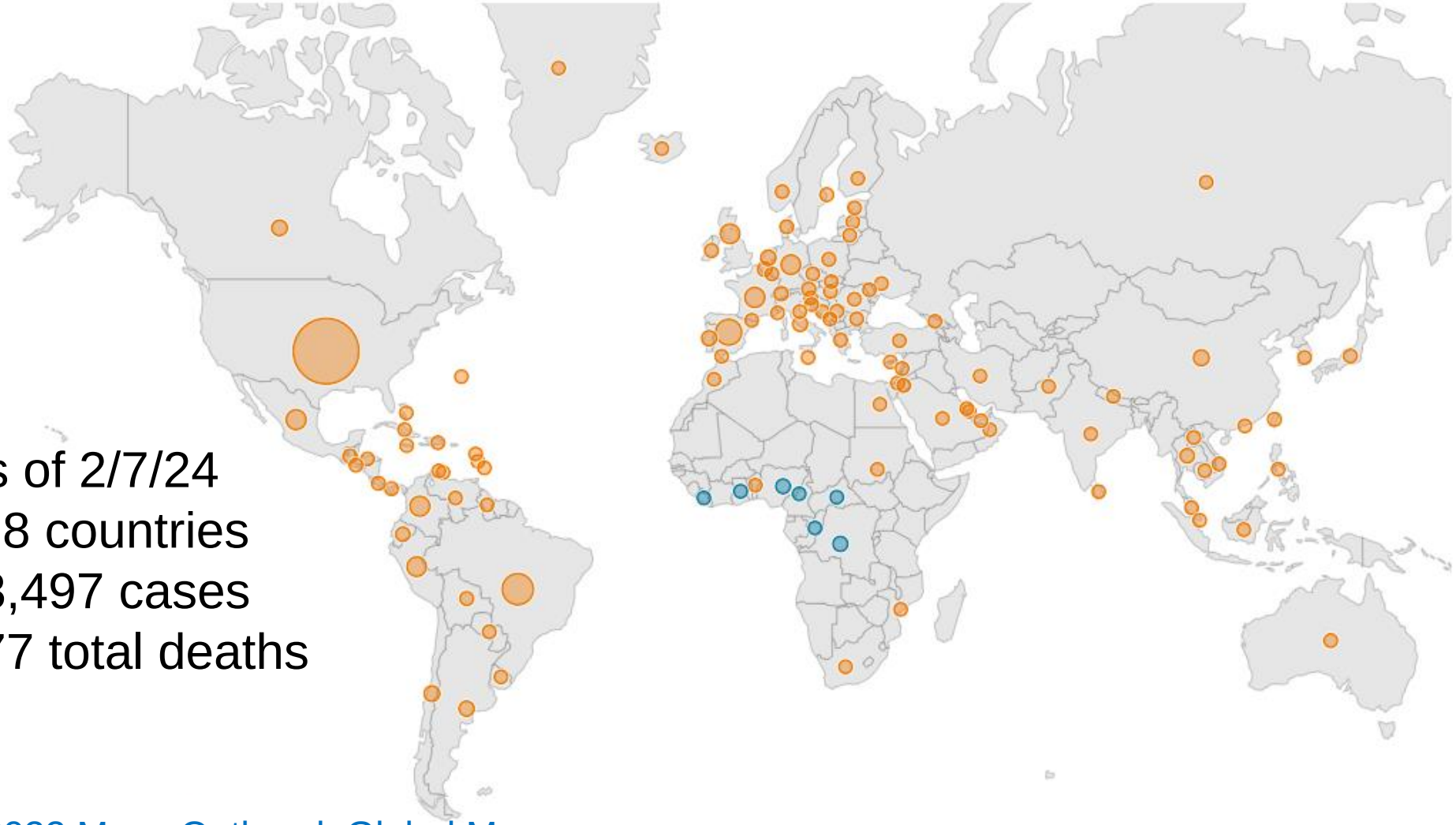
CDC Past U.S. Cases and Outbreaks

2022 Mpox Outbreak

May 2022 Multi-Country Outbreak

- May 2022: UK health officials announced confirmed mpox case in person returning from Nigeria
  - Additional cases identified and some occurred in people who did not travel to endemic area or have known epidemiologic link
- Cases rapidly increased and expanded to other countries
  - Noted cases primarily among men who have sex with men
- First U.S. case reported May 17, 2022
  - Additional cases subsequently reported, including first presumptive VA case on May 26, 2022 and confirmed by CDC the following day
  - Cases have been reported in all 50 states, Washington D.C., and Puerto Rico
- WHO declared outbreak a public health emergency of international concern in July 2022

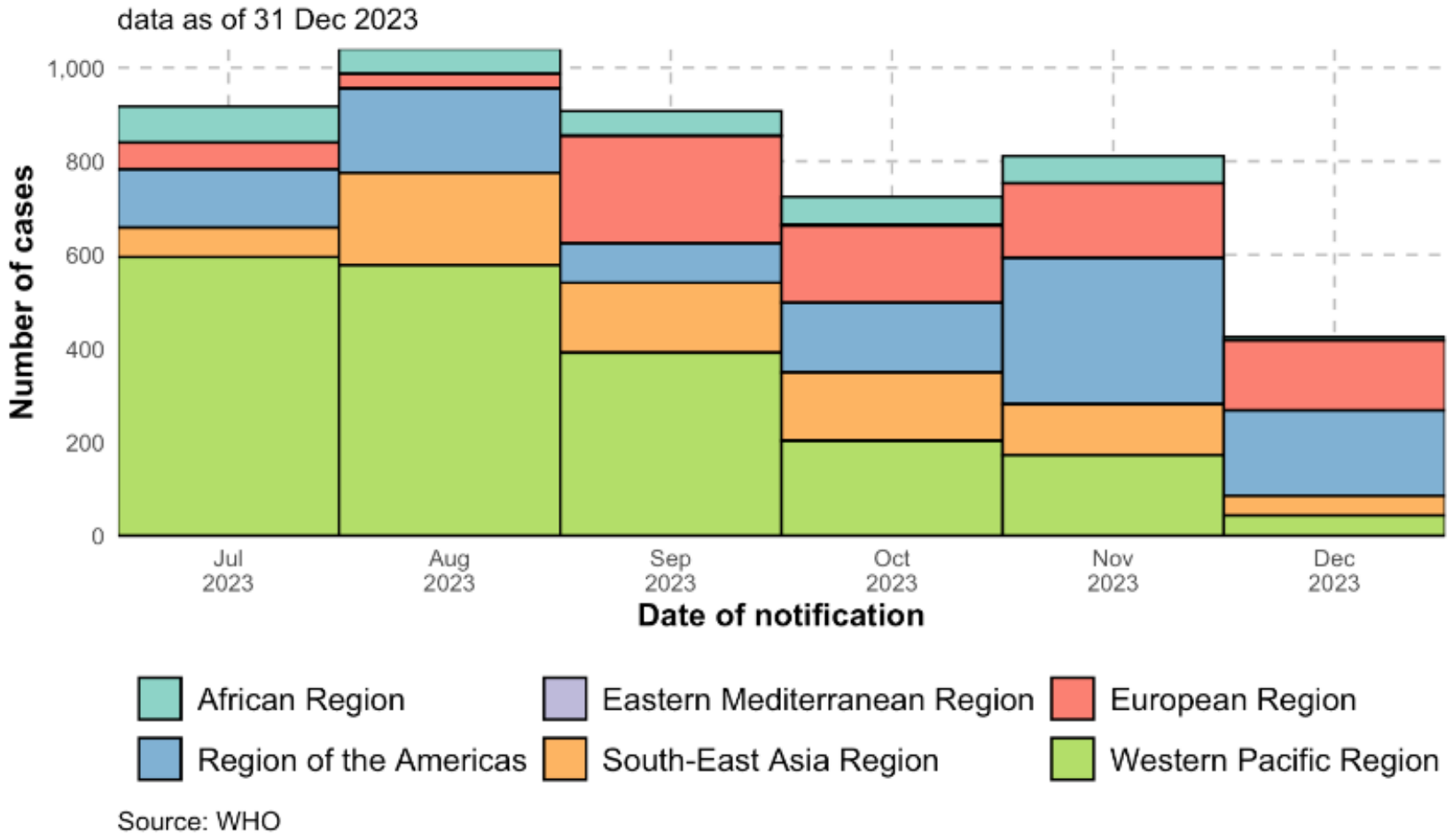
2022 Mpox Outbreak Global Map



As of 2/7/24
118 countries
93,497 cases
177 total deaths

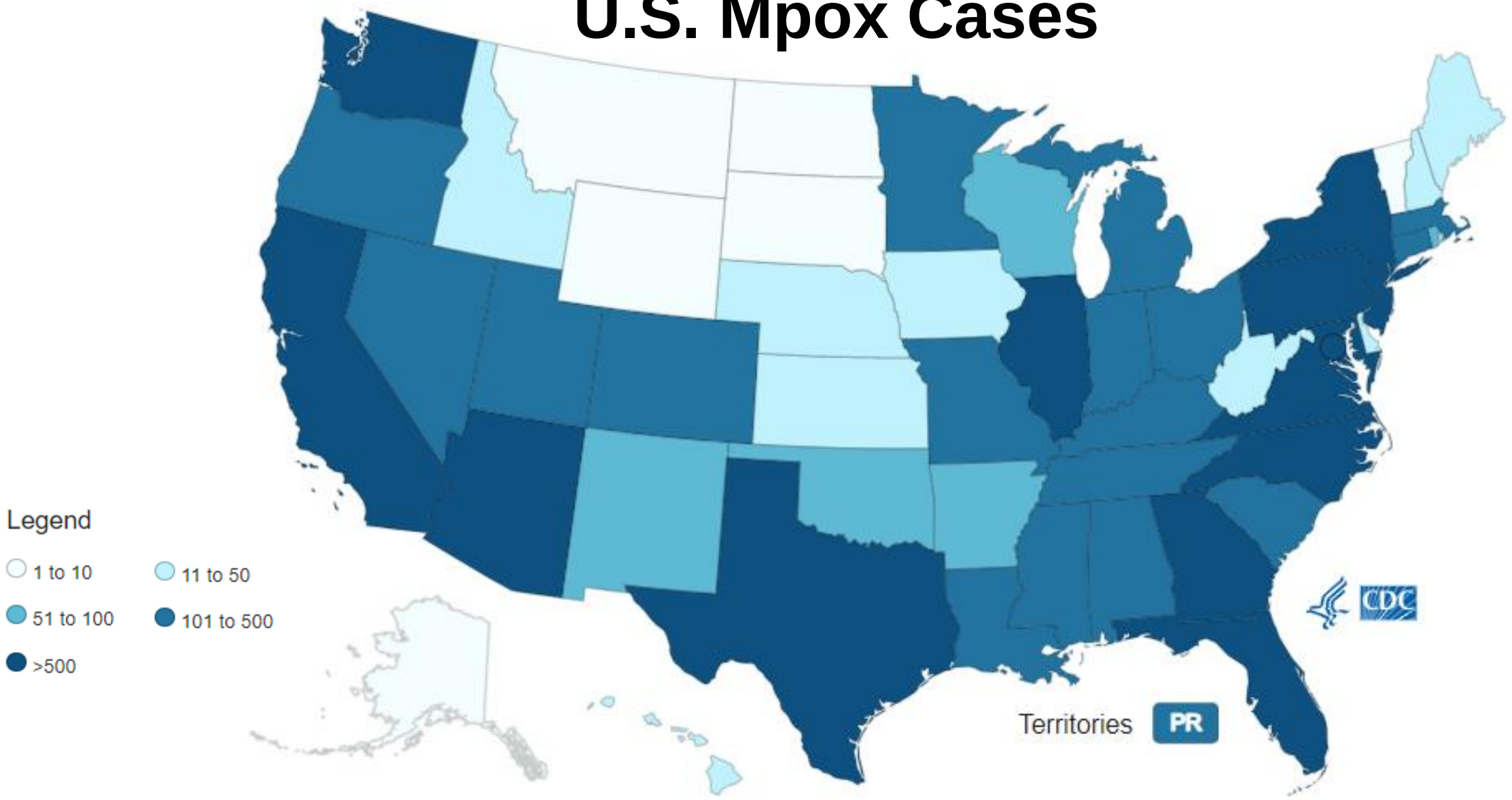
[2022 Mpox Outbreak Global Map]

Global Mpox Cases by Region



[2022-23 Mpox Outbreak: Global Trends]

U.S. Mpox Cases



[CDC 2022 U.S. Mpox Case Map (data as of January 11, 2024)]

VDH VIRGINIA DEPARTMENT OF HEALTH

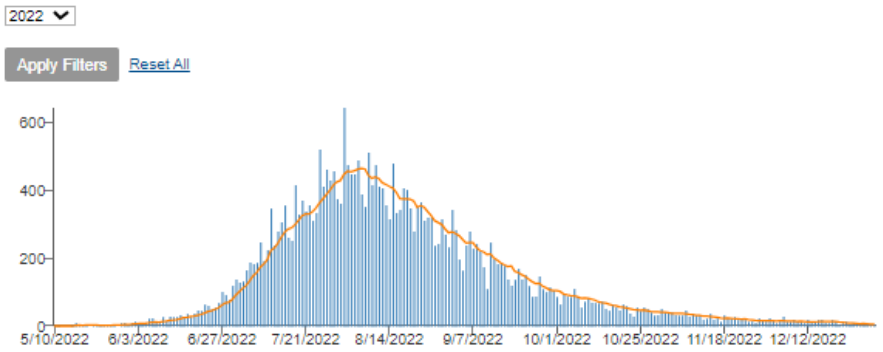
U.S. Epidemic Curve

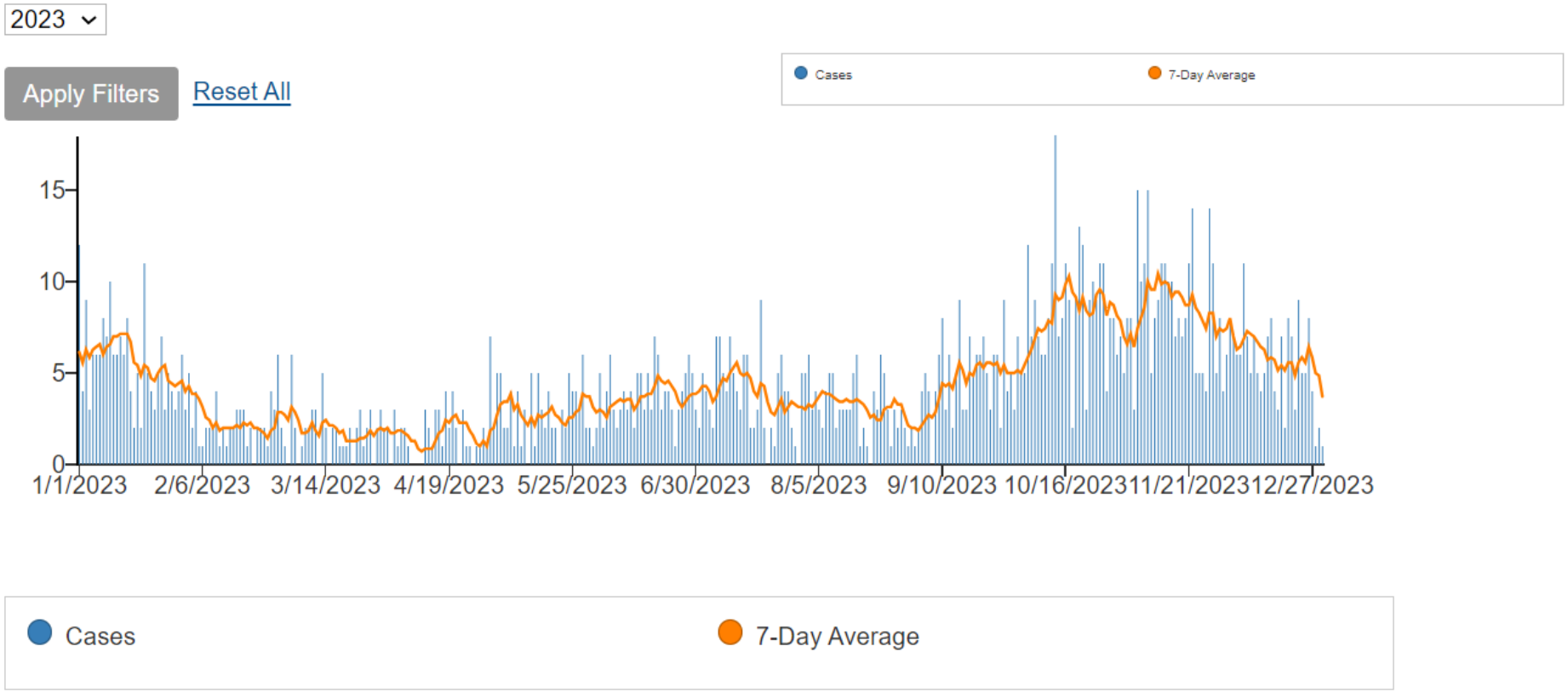
50
States + Washington D.C. and Puerto Rico

31,689
Cases

56
Deaths

2
Main surges in 2023 (Chicago, Los Angeles)

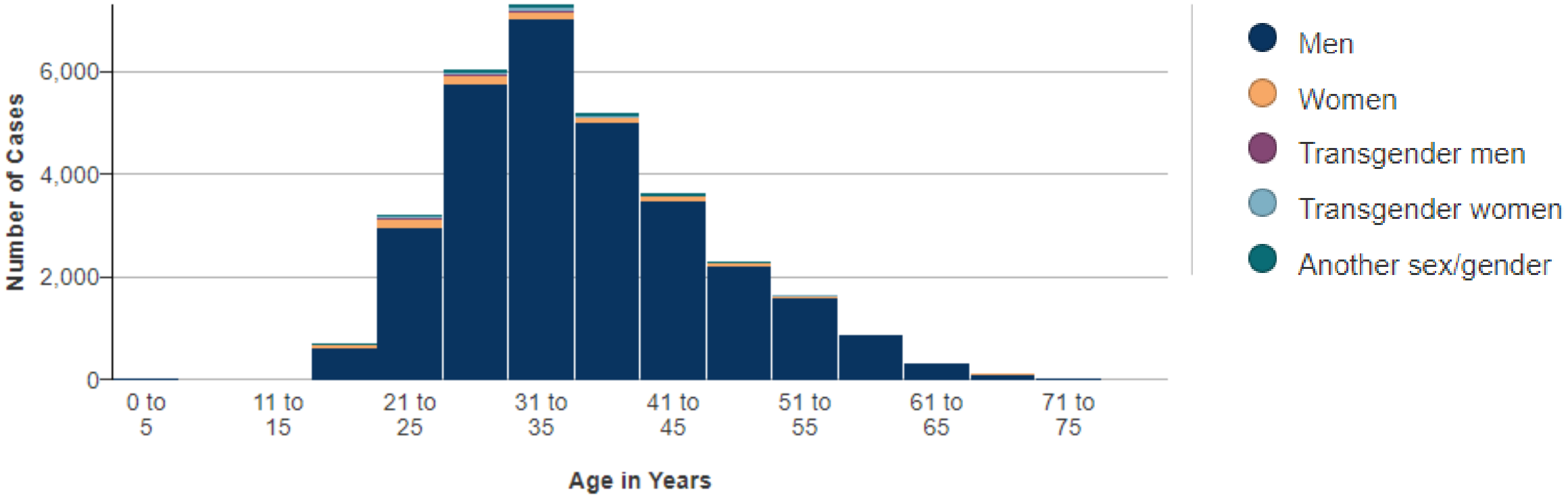




CDC. 2022 U.S. Case Trends (data as of January 11, 2024)

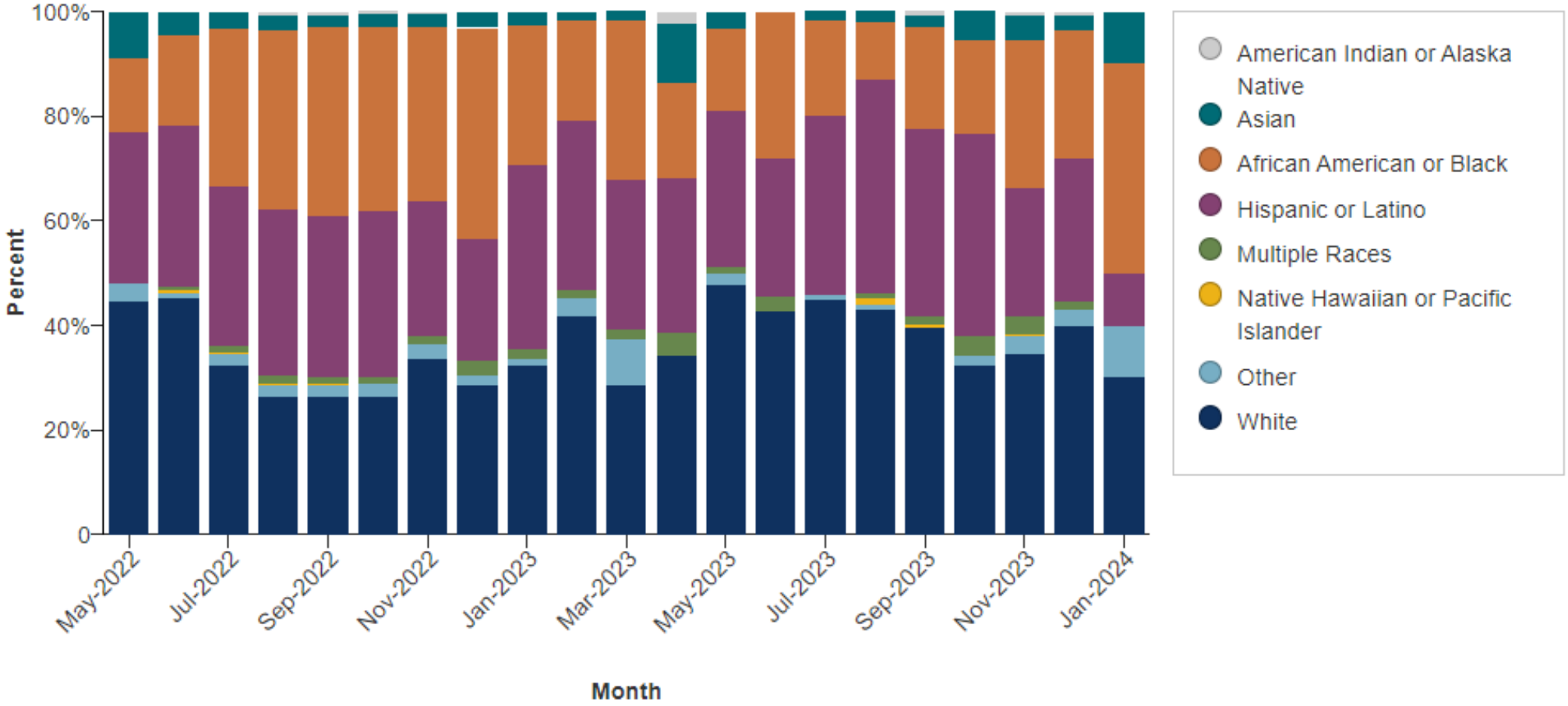
VDH VIRGINIA DEPARTMENT OF HEALTH

U.S. Cases by Age and Gender



[CDC Case Demographics (as of January 11, 2024)]

U.S. Cases by Race and Ethnicity



[CDC Case Demographics (as of January 11, 2024)]

Epidemiology of U.S. Cases, May 2022–2023

- Majority of cases in adult men who have sex with men
- 38% of cases in people with HIV
- Health disparities among racial and ethnic minority groups
- Disparities in fatal cases
  - Majority of deaths in Black people
  - HIV infection

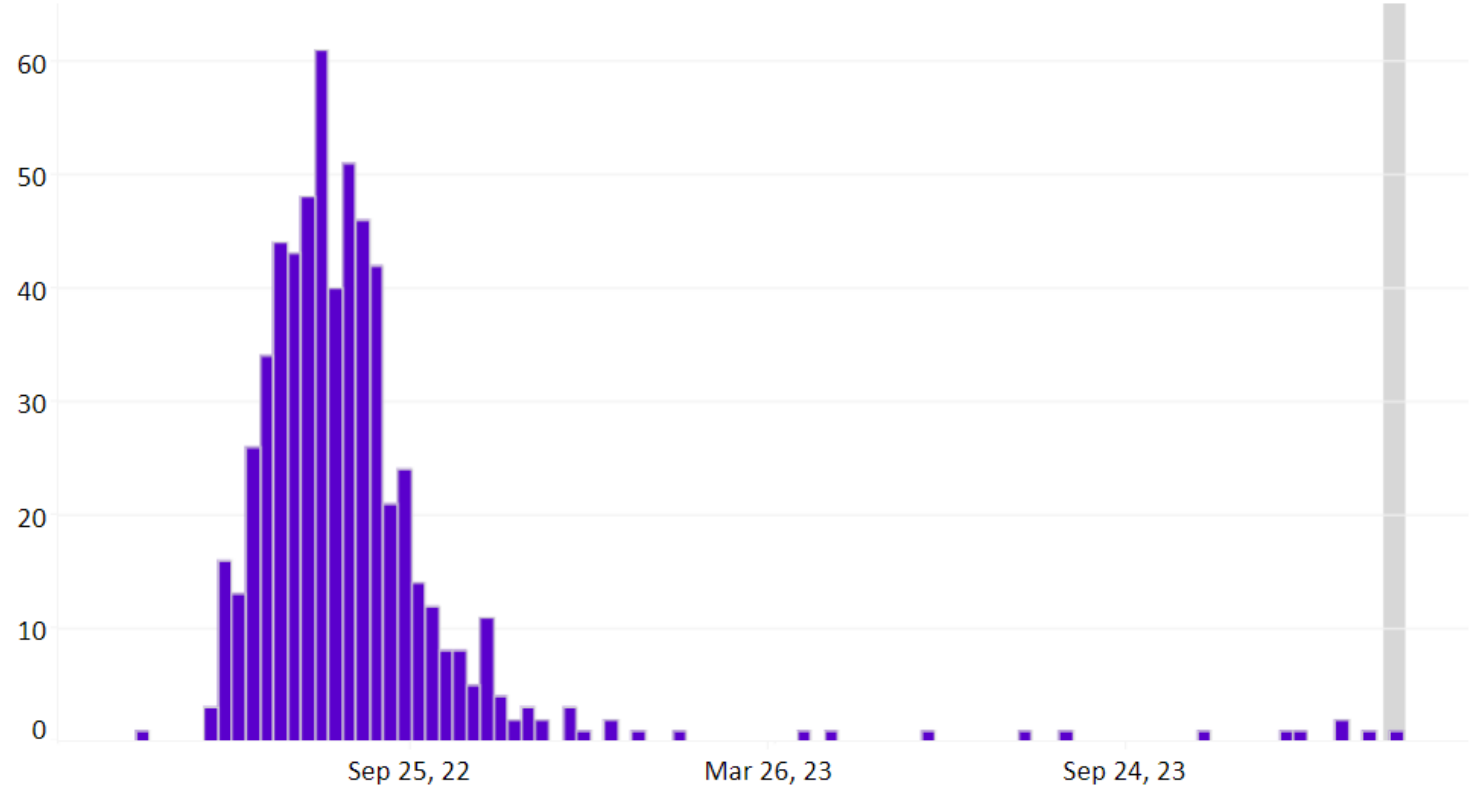
McQuiston JH, Braden CR, Bowen MD, et al. The CDC Domestic Mpox Response — United States, 2022–2023. MMWR Morb Mortal Wkly Rep 2023;72:547–552.

Virginia Epidemic Curve

Total Cases	Total Hospitalizations	Total Deaths
582	32	2

Number of Cases by Week

The graph shows the number of mpox cases reported to VDH by the date closest to when the person became ill or got tested for the mpox virus.



[Mpox Data in Virginia (data as of February 13, 2024)]

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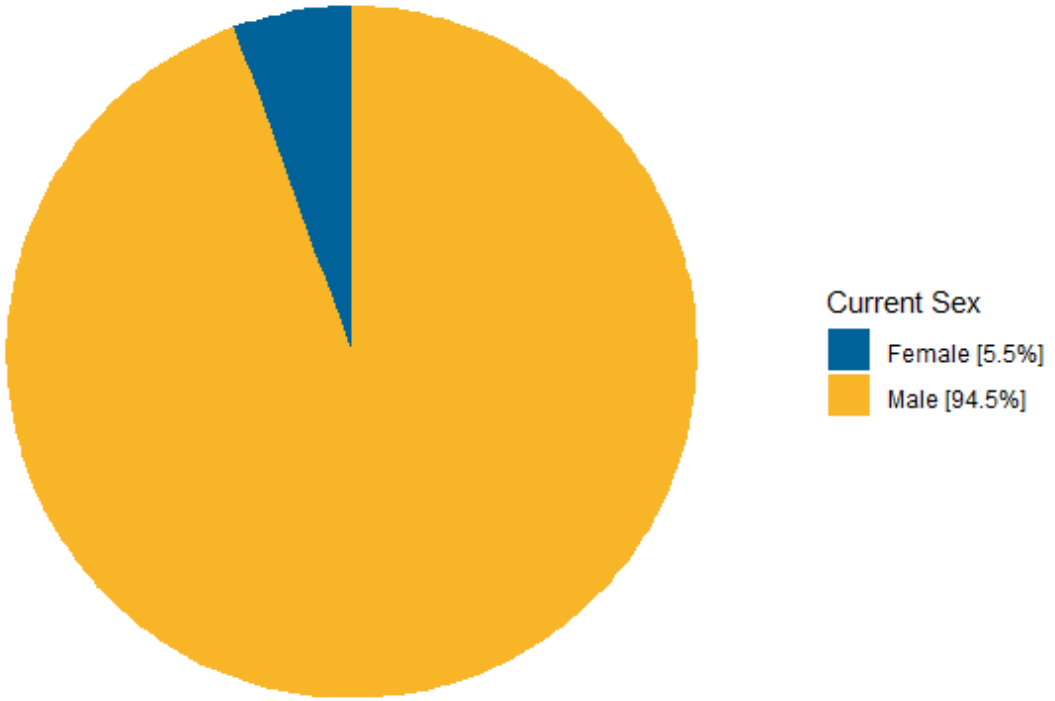
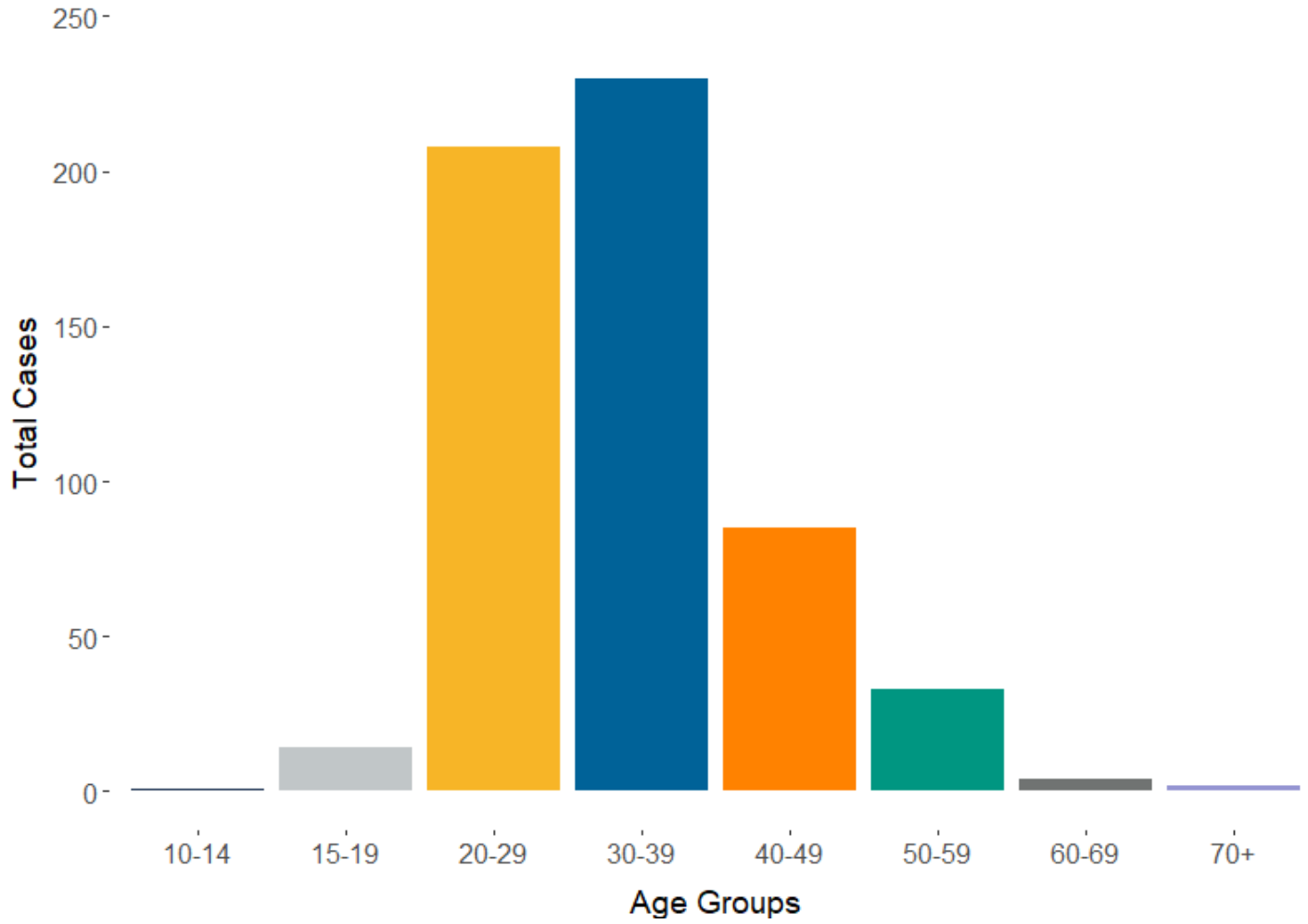
Virginia Cases by Sex

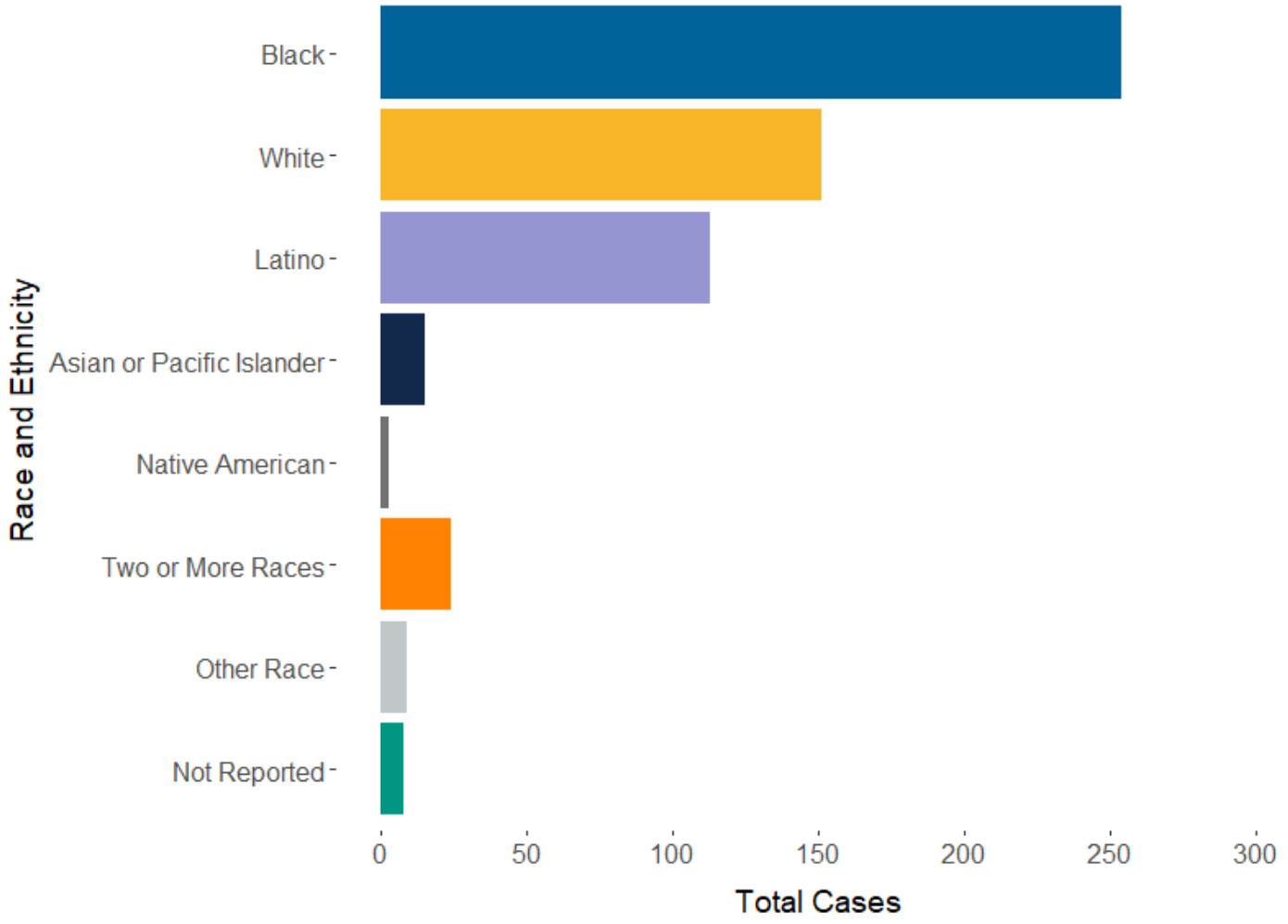


Virginia Cases by Age Group



VDH VIRGINIA DEPARTMENT OF HEALTH

Virginia Cases by Race and Ethnicity



VDH VIRGINIA DEPARTMENT OF HEALTH

Virginia Response

Test

Notify close contacts

Monitor symptoms

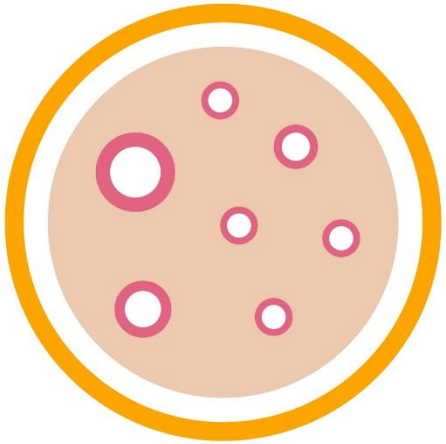
Facilitate treatment or vaccine

Wastewater Surveillance

[CDC Mpox Wastewater Surveillance Dashboard]

Mpox Transmission

INCUBATION PERIOD IS 3-17 DAYS



CONTACT WITH LESIONS

BODY FLUIDS

RESPIRATORY DROPLETS

CONTAMINATED MATERIALS

Clinical Features during 2022 Outbreak

- Classic mpox
  - Prodrome (fever, chills, fatigue, muscle aches, lymphadenopathy, respiratory symptoms) first, followed by rash several days later
  - Rash appears on face then centrifugal distribution (arms, legs, hands, feet)
  - Rash lesions in same stage, evolve together
    - Macular, papular, vesicular, then pustular
  - Illness generally self-limited and lasts 2-4 weeks

- Current mpox
  - Prodrome could follow rash or could be absent
  - Rash on mucosal areas, including genital, perianal, mouth
  - Lesions localized to one area and not all at same stage of development
  - Lesions could be itchy or painful

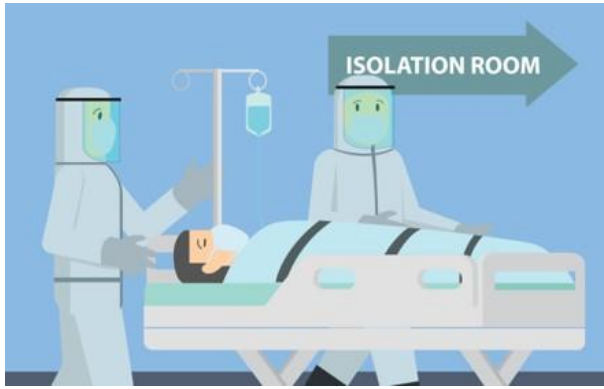
Severe Mpox in Immunocompromised Patients with HIV or Other Conditions

- Most severe cases were in people with untreated HIV
- Providers should:
  - **Test all sexually active adults and adolescents for HIV and other STIs, assess for other immunocompromising conditions**
  - Be aware of risk factors for severe manifestations
  - Consider treating immunocompromised people diagnosed with mpox with tecovirimat early and consider prolonged course
  - Consider tecovirimat resistance testing if persistent or progressive mpox
  - **Optimize immune function**
  - **Consult CDC Monkeypox Response Clinical Escalations Team** at eocevent482@cdc.gov or 770-448-7100

CDC Severe Manifestations of Monkeypox among People who are Immunocompromised Due to HIV or Other Conditions

CDC Severe Monkeypox in Hospitalized Patients — United States, August 10–October 10, 2022

Infection Prevention and Control



- Home
  - Isolate in room or separate from others for duration of illness
  - Limit exposure to pets and other people
  - Do not share potentially contaminated items
  - Avoid activities that may spread material from lesion
  - Routine cleaning and disinfection of commonly touched surfaces and items with EPA-registered disinfectant (such as List Q)
- Hospital
  - Isolate patient in single room
  - Use PPE: gown, gloves, N95 respirator, eye protection
  - Mask on patient and cover lesions if transported out of room

CDC Isolation and Infection Control at Home and CDC Infection Control in Healthcare Settings

Prevention during Outbreak

- Gay, bisexual, and other men who have sex with men make up majority of cases in outbreak
- Vaccinate before exposure or for postexposure prophylaxis (PEP)
  - PEP given ideally within 4 days to prevent infection or reduce severity
  - PEP effective if given 4 to 14 days after exposure
- **Avoid skin-to-skin** contact with people who have a rash that looks like an mpox virus rash
- If planning to attend a gathering where you might be in close proximity to others, consider the risk
- Temporarily limit number of sex partners to reduce exposure
- Wash hands frequently or use alcohol-based hand sanitizer

Current Status of Mpox Outbreak

- Mpox cases in U.S. have declined since Aug 2022 peak
  - Immunity (natural and vaccine) and behavior changes

- Spring and Summer 2023 Chicago and Los Angeles reported clusters of cases

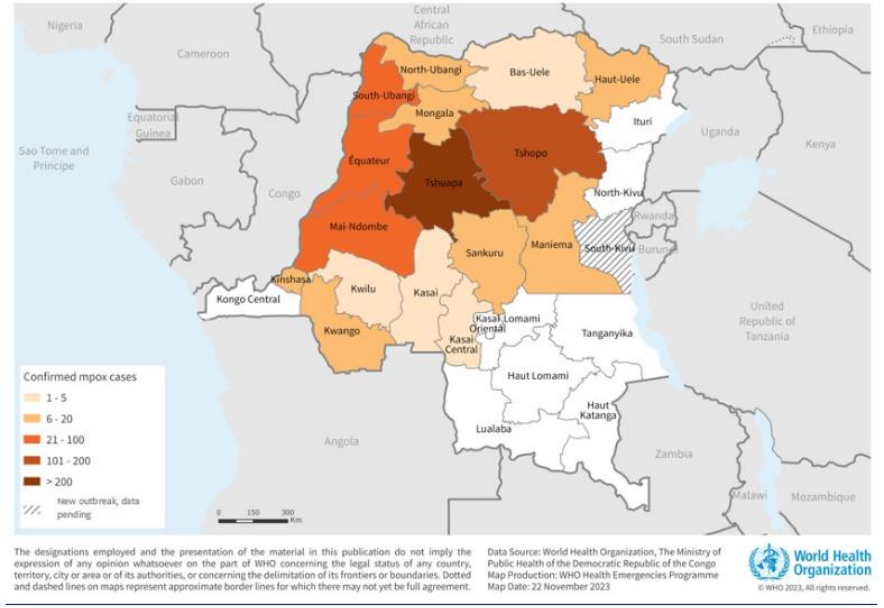
- San Francisco and other jurisdictions have also reported smaller increases
  - Highlights that mpox is not over
  - 2-dose JYNNEOS vaccine recommended for those at risk

Clade I MPXV Outbreak in Democratic Republic of the Congo

WHO issues report on DRC on November 23, 2023

- Cases caused by Clade I MPXV
- Clade I MPXV is more virulent, spreads more easily, and is classified as a Category A infectious agent
- First report of Clade I MPXV infections spread by sexual contact
- No changes expected in performance of tests, vaccine, or treatment
- WHO assesses risk as **moderate** for population in neighboring countries and for gay men, bisexual men, other men who have sex with men, and sex workers

Figure 2: Geographic distribution of confirmed mpox cases by province, Democratic Republic of the Congo, 1 January – 7 October 2023 (epi weeks 1 to 40)



[CDC 2022-2023 Outbreak Cases and Data](#) (as of 1/11/24)
[WHO Disease Outbreak News (11/23/23)](#)

Testing Suspected Cases with Travel to DRC

For suspected cases with travel to DRC in the 21 days before illness onset:

- For diagnostic testing, follow packaging and transporting regulations for Category B infectious substances
- Collect detailed travel and sexual health history
- Call LHD to rapidly report suspected case and coordinate clade-specific testing through DCLS
  - Ensure DCLS approval before shipment of specimens
  - DCLS is currently validating a clade-specific mpox test. Until that test is available, specimens for clade testing will be routed to DCLS and then to CDC.
  - Please remember that **multiple lesions should be swabbed and two swabs per lesion should be collected**. Additional instructions from DCLS are available.
- For waste management, until clade testing is completed:
  - Consider factors like patient's history, symptoms, other diseases in differential diagnosis
  - Contact LHD to discuss

CDC Health Advisory December 7, 2023

Collaboration With Public Health Mpox Takeaways for Providers

What Providers Can Do: General

Cases and news coverage substantially decreased, but mpox is still spreading and risk remains

- Keep mpox on radar
- Promote vaccination and increase awareness
- Use educational materials available on VDH Communications Resources website or CDC website
- Integrate mpox services into HIV and STI clinics and include mpox on your Sexual Health checklist

What Providers Can Do: Vaccination

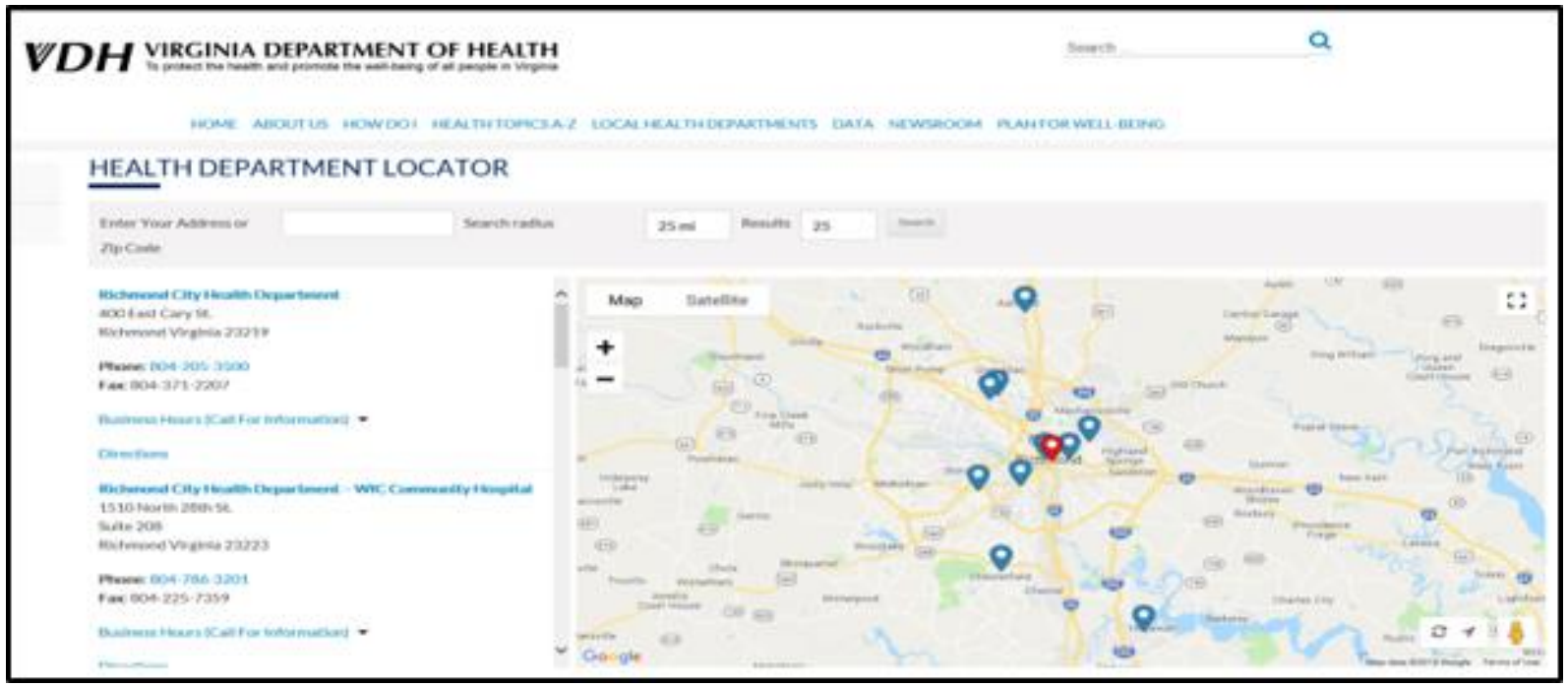
- JYNNEOS vaccine is safe, effective, and the best way to protect people at risk and stop the spread
- Need continued outreach and education to populations most affected with messages about vaccination and prevention
  - Both doses offer the best protection - never too late to get the 2nd dose
  - JYNNEOS vaccine coverage varies among jurisdictions
  - CDC MMWR March 2023 found despite administration of >1 million vaccine doses, only 23% of the at-risk population has been fully vaccinated
- If you aren't administering vaccine, consider doing so. Instructions for enrolling as a vaccine provider are available on Mpox HCP Vaccine Guidance webpage
  - If not possible, refer people to CDC's Mpox Vaccine Locator

What Providers Can Do: Testing

- If you suspect mpox, collect detailed sexual, social, and travel history for the 21 days before symptom onset
  - Test for mpox regardless of patient's history of mpox infection or vaccination
  - Test sexually active patients for HIV and other STIs and vice versa (concurrent infection possible)

- If patient traveled to the Democratic Republic of Congo in 21 days before symptom onset, contact LHD to coordinate sending test specimens to DCLS so they can be forwarded to CDC for **clade-specific testing**
  - Otherwise, specimens can be sent to commercial lab for testing

What Providers Can Do: Notify the Local Health Department of Suspected or Confirmed Mpox Case



LHD Locator: vdh.virginia.gov/health-department-locator/
Immediately report by Confidential Morbidity Report Form or phone
Encourage patient cooperation with health department

What Providers Can Do: Treatment

If you diagnose mpox, consider consult, encourage STOMP enrollment and cooperation with health department

- For CDC clinical consultation, call Emergency Operations Center (770-488-7100) or email poxvirus@cdc.gov
- STOMP Hotline (1-855-876-9997) open Mon-Fri 9 am –10 pm, Sat 9 am – 4 pm, and Sun 1–6 pm
- Rapidly report case to health department by phone or portal so VDH can trace contacts and offer vaccine as soon as possible to prevent infection or reduce severity of infection

What Providers Can Do: Stay Connected

- Sign up
  - VDH Healthcare Professional Newsletters
  - CDC COCA Updates and CDC HAN Updates
- Visit VDH's Mpox website
- VDH Trainings

Resources

VDH Resources

- VDH Mpox Website
- VDH Mpox Information for Healthcare Professionals
- VDH Case and Vaccine Dashboards

Communication Resources

- VDH Communications Resources webpage

Request Printed Materials

LHDs: https://redcap.vdh.virginia.gov/redcap/surveys/?s=DA4TXJRARHNJKKMX

Non-LHDs: https://redcap.vdh.virginia.gov/redcap/surveys/?s=CRKEFXNE7YLPTCF4

Conclusions

Risk to Most People is Low

- Current outbreak declined substantially since August 2022 but cases continue to occur in U.S., and Virginia has had a recent increase in reported cases

- People with mpox in current outbreak report
  - Close, sustained physical contact
  - Sexual contact

- Household contacts may be at increased risk

- Current focus on increasing awareness and education about mpox
  - Vaccination for people at risk for mpox

Healthcare Providers and Facilities Should…

- Consider mpox as a differential diagnosis in patients with diffuse or localized rash
- Incorporate mpox into routine STI and HIV care
- Consult and collaborate with the local health district
- Stay updated on latest information and recommendations
  - CDC Information for Healthcare Professionals
  - VDH Mpox HCP Webpage

Thank you!

Extra Slides

Mpox CoAg: The Basics

- CDC Public Health Crisis Response Cooperative Agreement” ("CoAg") that provides funding to support the mpox response from **January 2023 – January 2025**
- Assists jurisdictions in **responding to remaining cases**, **preventing future outbreaks** by increasing **vaccine accessibility, demand, and uptake**, specifically among populations recommended to receive vaccine, and **strengthening capabilities to prepare for, and respond to reintroduction** of cases
- All states are included to ensure equitable efforts to **increase vaccination coverage among populations at risk** of exposure are established, especially those that aim to **reduce vaccination disparities**, and that state health departments are **prepared to respond to future outbreaks** of cases

Mpox CoAg Activities in Virginia

Increase Vaccine Coverage, Uptake, and Accessibility

- Increase education
- Maintain and promote Mpox vaccine locator
- Ensure availability and administration in HIV and sexual health clinics
- Expand partnerships with CBOs, Comprehensive Harm Reduction clinics

Implement Communication Strategy

- Statewide ad campaign (Jun-Dec)
- Develop and maintain resources on website or The Comms Hub
- Print PRIDE or other materials for LHDs and community partners
- Identify network of influencers
- Engage in targeted outreach through channels
- Engage in social media messaging

Sustain Outreach and Education

Community Outreach

- Engage CBOs and AIDS Drug Assistance Advisory Committee
- Conduct 3 tele-town halls

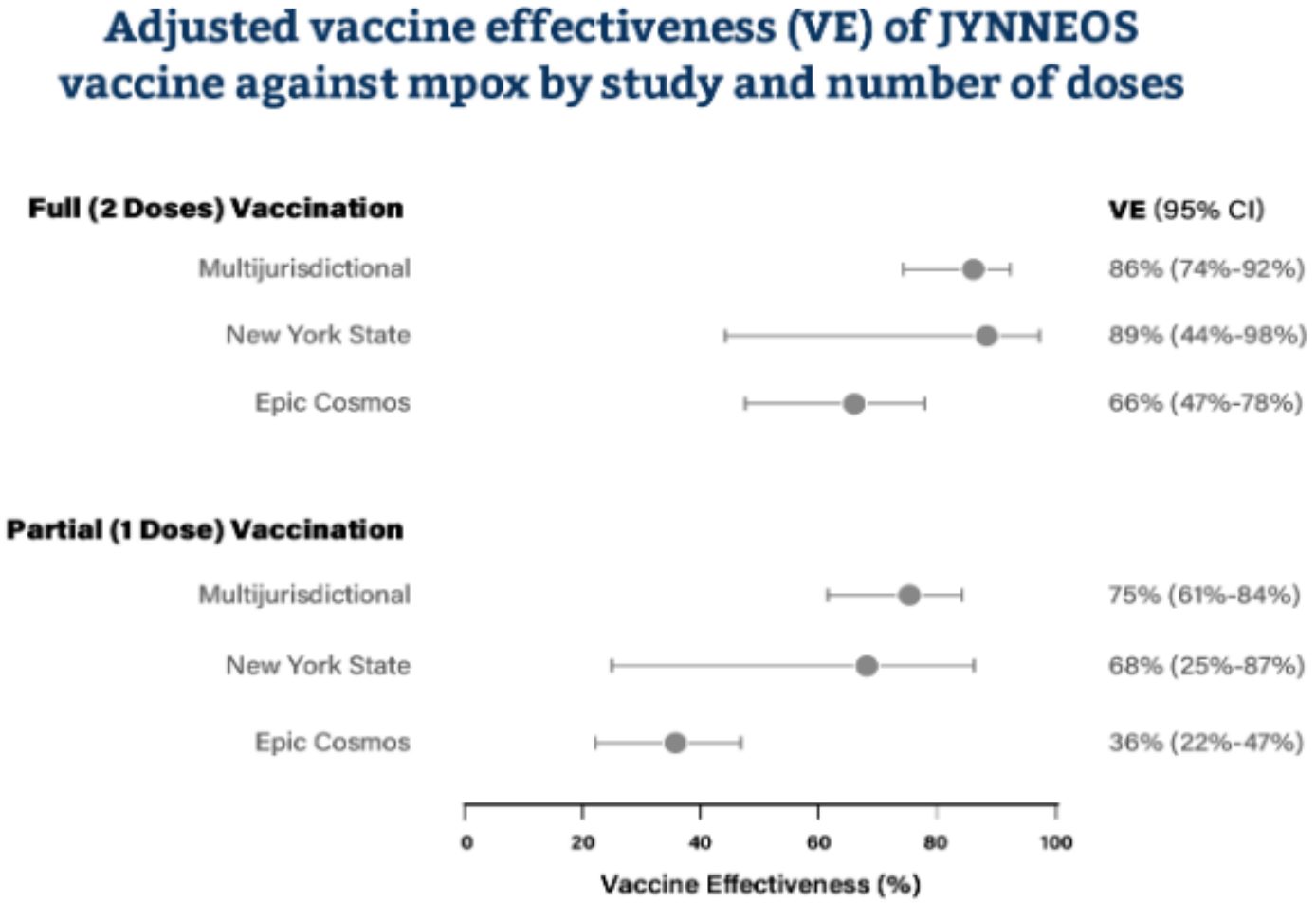
Clinician Outreach

- Engage and educate (webinars and newsletters)
- Strengthen relationships with providers serving LGTQIA
- Conduct 3-4 workshops for sexual health/HIV and other providers caring for at-risk people to share best practices and incorporate into routine care

Conduct Investigation/Surveillance

- Prepare for surge (refresh on Epi/DIS coordination, set threshold for press release, develop template)
- Integrate case/vaccination data
- Provide quarterly surveillance summaries
- Provide DCLS specimen collection kits and enhance capacity (automated extraction method)

JYNNEOS Vaccine Effectiveness



[CDC Vaccine Effectiveness] and [ACIP Meeting October 25, 2023]

Vaccine Effectiveness

- Infections after vaccination can occur, but are milder and less likely to result in hospitalization

- Key questions remain
  - Effectiveness in people with immunocompromising conditions
  - Duration of protection or if protection decreases over time

- People who are vaccinated are encouraged to continue to protect themselves
  - Avoid close, skin-to-skin contact with people who have a rash that looks like mpox
  - Avoid contact with objects that a person with mpox has used
  - Wash hands often

Mpox Vaccine Eligibility

Get the vaccine if you

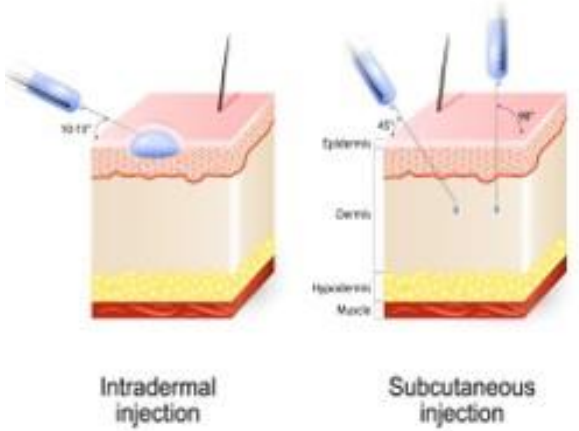
- Are a gay, bisexual, or other same-gender loving man who has sex with men or are transgender, gender non-binary, or gender-diverse.
- Have had sexual or intimate contact with someone who may have mpox. Get vaccinated as soon as possible after exposure, regardless of your sexual or gender identity.

AND if you, in the last 6 months, have had or expect to have

- One or more sexually transmitted infections
- A weakened immune system because of another illness, like HIV
- Sexual or intimate contact with a person who is at risk of mpox
- Anonymous sexual or intimate contact, or more than one sexual partner

[CDC Mpox Vaccination Basics]

JYNNEOS



- Intradermal (ID) or subcutaneous (SQ) injection
- 2-dose series, separated by 28 days
- Considered protected 14 days after second dose
- If 2nd dose not given during recommended interval, give as soon as possible
  - Don’t restart series even if 1st dose was given months or even a year ago
- No visible “take” with JYNNEOS administration
- Healthcare workers do not need to be vaccinated before administering
- Safe for most immunocompromised persons
- Can give at same time as other vaccines
  - Adolescents, young adult men might consider waiting 4 weeks between mpox and COVID-19 vaccines

Vaccine Administration

- People with suspected or confirmed mpox should be seen by a provider for testing and treatment (if indicated), not vaccinated
  - Vaccination given after the onset of mpox signs or symptoms is not expected to provide benefit
- SQ and ID dosing regimens are interchangeable
- People of any age with a history of developing keloid scars and individuals <18 years of age should receive vaccine via the SQ route
- **Patients with concerns about ID administration due to potential stigma or other personal reasons should be offered SQ doses**
- CDC recommends providers have both SQ and ID vaccine administration options available on site
- Providers should discuss which route of administration each patient prefers (for patients ≥18 years)

Vaccination by Non-LHD Providers

- As of October 2022, private providers can order and administer JYNNEOS
- Private providers need to enroll as an Mpox Vaccination Provider to order and administer JYNNEOS, following the steps below:

  1. Review current CDC Mpox Vaccination Program Provider Agreement
  2. Pre-register in VERIP and attest to Provider Agreement
  3. Email mpxquestions@vdh.virginia.gov and declare intent to order and administer JYNNEOS in accordance with agreement

- Additional instructions for ordering and administering vaccine available on the VDH Healthcare Providers Vaccine Guidance webpage

VDH Healthcare Provider Vaccine Guidance

Treatment Options: TPOXX

- **CDC offers clinical consultation service (email eocevent482@cdc.gov) or call CDC Emergency Operations Center at 770-488-7100**
- Tecovirimat may be considered for people
  - With **severe disease** (e.g., hemorrhagic disease, confluent lesions, sepsis, encephalitis, ocular or periorbital infection, or other conditions requiring hospitalization)
  - With involvement of **anatomic areas** that might result in serious sequelae that include scarring or strictures
  - Who are at **high risk of severe disease**:
    - People with severe immunocompromise
    - Pediatric patients, particularly those younger than 1 year of age
    - Pregnant or breastfeeding women
    - People with a condition affecting skin integrity
  - Visit CDC's Tecovirimat webpage for more information

CDC Treatment Information for Healthcare Professionals

Specimen Collection

- Wear appropriate PPE
- Collect swab from surface of lesion or crust from healing lesion
- Two swabs from each lesion (2-3 lesions should be sufficient)
- Different locations or lesions that appear different
- Use sterile synthetic swabs
  - Do not use cotton swabs
- Swab surface of lesion vigorously to collect adequate DNA
  - Do not de-roof or lance lesion before swabbing to avoid sharps injury
- Put each swab into separate container

CDC Guidelines for Collecting Specimens for Mpox Testing
Monkeypox Virus Infection Resulting from an Occupational Needlestick — Florida, 2022

Preparedness Checklist for Healthcare Facilities -1

- Provide situational awareness to staff
- Educate clinicians (e.g., rash identification)
- Ensure timely identification and isolation at triage
- Designate points of contact responsible for
  - Communicating with local health department
  - Providing internal updates to staff and volunteers

Preparedness Checklist for Healthcare Facilities - 2

- Review infection prevention protocols and CDC guidance
- Ensure availability of appropriate PPE and supplies
- Train, audit, and provide feedback on staff compliance
  - Core IPC practices
  - Hand hygiene, PPE donning doffing
- Review specimen collection, transport, & testing procedures
  - Follow CDC recommendations for safe specimen collection including not unroofing or aspirating lesions using sharp instruments during mpox lesion specimen collection

Mpox Preparedness Checklist for Healthcare Facilities
Important Safety Information for Mpox Specimen Collection & Infection Control

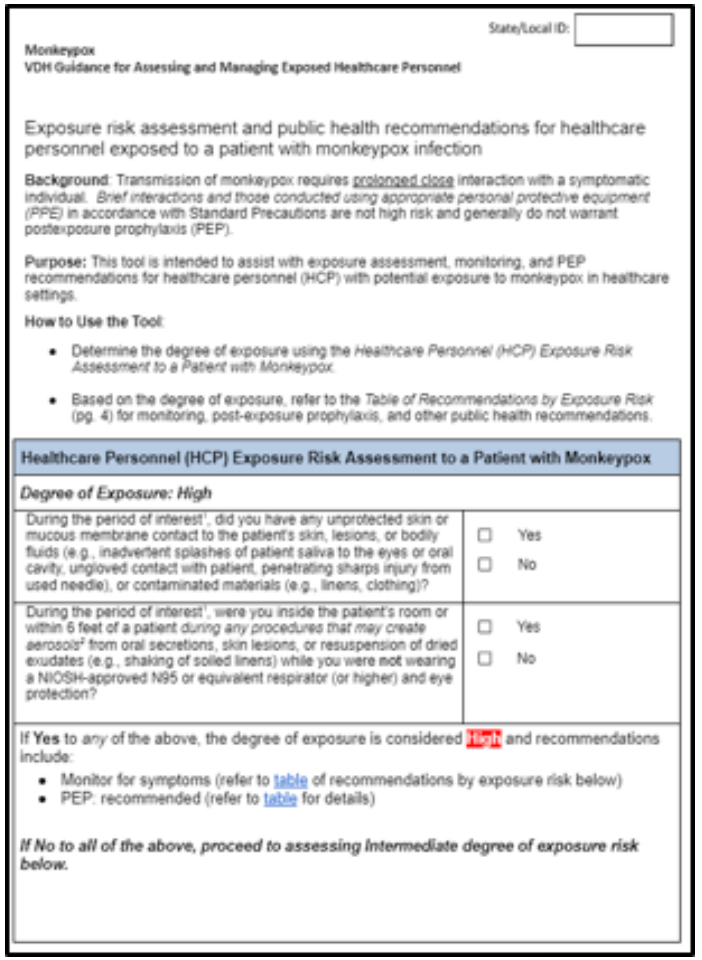
Preparedness Checklist for Healthcare Facilities - 3

- Review environmental cleaning procedures
- Ensure facility has an EPA List Q item
- Handle soiled laundry per CDC guidance
- Prepare a waste management plan
- Ensure staff vaccination records are up-to-date and accessible
- Protocol to screen and monitor potentially exposed or ill staff

Mpox Preparedness Checklist for Healthcare Facilities

HCP Risk Assessment Tool

- Assess exposures
- Monitor contacts
- Recommend appropriate use of PEP
- Facilities monitor their own staff
  - Consult LHD for unusual situations
  - Exposed, asymptomatic HCP do not need to be excluded from work



State/Local ID:

Monkeypox
VDH Guidance for Assessing and Managing Exposed Healthcare Personnel

Exposure risk assessment and public health recommendations for healthcare personnel exposed to a patient with monkeypox infection

Background: Transmission of monkeypox requires prolonged close interaction with a symptomatic individual. *Brief interactions and those conducted using appropriate personal protective equipment (PPE)* in accordance with Standard Precautions are not high risk and generally do not warrant postexposure prophylaxis (PEP).

Purpose: This tool is intended to assist with exposure assessment, monitoring, and PEP recommendations for healthcare personnel (HCP) with potential exposure to monkeypox in healthcare settings.

How to Use the Tool:

- Determine the degree of exposure using the *Healthcare Personnel (HCP) Exposure Risk Assessment to a Patient with Monkeypox*.
- Based on the degree of exposure, refer to the *Table of Recommendations by Exposure Risk* (pg. 4) for monitoring, post-exposure prophylaxis, and other public health recommendations.

Healthcare Personnel (HCP) Exposure Risk Assessment to a Patient with Monkeypox	
Degree of Exposure: High	
During the period of interest[1], did you have any unprotected skin or mucous membrane contact to the patient's skin, lesions, or bodily fluids (e.g., inadvertent splashes of patient saliva to the eyes or oral cavity, ungloved contact with patient, penetrating sharps injury from used needle), or contaminated materials (e.g., linens, clothing)?	☐ Yes ☐ No
During the period of interest[1], were you inside the patient's room or within 6 feet of a patient *during any procedures that may create aerosols*[2] from oral secretions, skin lesions, or resuspension of dried exudates (e.g., shaking of soiled linens) while you were not wearing a NIOSH-approved N95 or equivalent respirator (or higher) and eye protection?	☐ Yes ☐ No
If **Yes** to *any* of the above, the degree of exposure is considered High and recommendations include: • Monitor for symptoms (refer to table of recommendations by exposure risk below) • PEP: recommended (refer to table for details) ***If No to all of the above, proceed to assessing Intermediate degree of exposure risk below.***	

[VDH Mpox Website for Healthcare Professionals]

Case Definitions for Mpox

- Confirmed: Meets confirmatory laboratory criteria *(Monkeypox virus detected)*
- Probable: Meets presumptive laboratory criteria *(Orthopoxvirus or IgM antibody detected)*
- Suspected: Meets either new characteristic rash or clinical suspicion with at least 1 of these epi criteria:
  - Close/sexual contact
  - Travel outside US
  - Animal or animal product

Examples of Mpox Rashes

UK Health Security Agency