CDPH
Chicago Department of Public Health

Mpox Outbreak Management: Implications and Lessons Learned

Shane Zelencik, MPH, CIC, FAPIC

Objectives

- Summarize Chicago's Mpox response in healthcare settings, including case tracking, testing, facility communication, and response implementation.
- Discuss successes and challenges.
- Highlight tools and strategies that were used during the response.
- Explain Chicago's approach to Infection Prevention and Control within the jurisdiction.
- Discuss health equity implications.

Outline

- CDPH HAI/AR Program Background
- Provide Basic Information about Mpox
- Discuss CDPH’s Management of Mpox within Healthcare Settings
- Questions

CDPH Healthcare Associated Infections and Antimicrobial Resistance (HAI/AR) Team

- The HAI/AR team at CDPH is classified as the Healthcare Settings (HCS) Team.
- HCS partners closely with facilities including:
  - Acute Care Hospitals
  - Skilled Nursing Facilities (including ventilator-capable facilities)
  - Long Term Acute Care Hospitals
  - Ambulatory Clinics
  - Outpatient Dialysis
  - Dental Centers
  - Home Care Agencies
- Generally, provides infection prevention and control and antimicrobial stewardship support.

HCS Team Infection Prevention and Control Approach

- Be a resource that adds value or **makes life easier** for infection preventionists and healthcare facilities.
  - Leverage technology to avoid duplicated data entry or submission.
  - Provide expertise and training to facilities.
  - Conduct ICARs that provide meaningful feedback.
- **Connect healthcare facilities** to their colleagues and facilitate the sharing of information and solutions.
- **Provide tools** to facilities that they may not be able to access.
  - APIC Text
  - Books and reference materials
  - Expert speakers on meetings/roundtables
  - REDCap post exposure monitoring

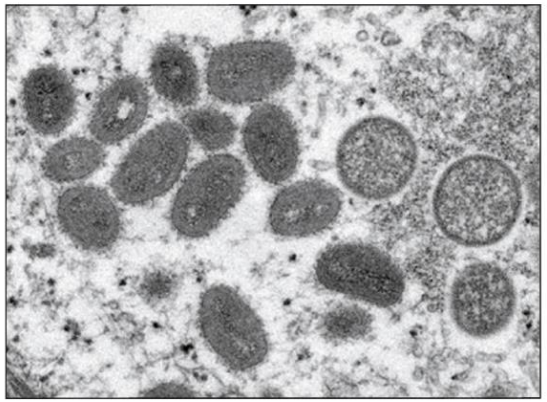
Mpox History

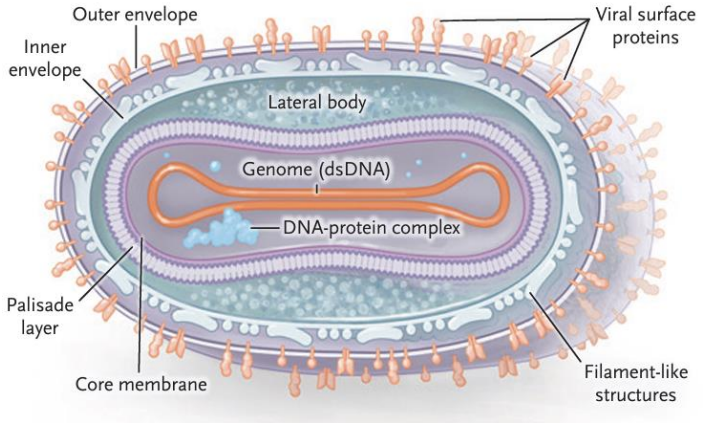
- Discovered in 1958 in Copenhagen during two outbreaks of smallpox-like disease in a colony of cynomolgus monkeys.
- First case of mpox in a human occurred in 1970 in the Democratic Republic of Congo.
- In 2003 the first cases were reported outside of Africa –
  - In the US and were associated to the importation of Gambian pouched rats from Ghana to Texas.
  - Rats transmitted the virus to prairie dogs housed in the same exotic animal facility.
  - Prairie dogs then infected humans, mostly young adults and children.
  - In 2018 sporadic cases and clusters were reported in the UK, Israel, Singapore, and the US.
  - Starting in May 2022, a series of mpox cases were identified in the UK, Portugal, and Italy, mostly involving men who have sex with men (MSM).

Gessain et al. N Engl J Med 2022;387:1783-93. DOI: 10.1056/NEJMra2208860

Mpox Virology

- Mpox is a disease caused caused by the Monkeypox virus.
- Large, enveloped, double-stranded DNA virus
- Family *Poxviridae*, subfamily *Chordopoxvirinae*, and genus *orthopoxvirus*.
- The same family of viruses that causes smallpox.
- These double-stranded DNA viruses are very similar genetically and antigenically, which accounts for cross-immunity.
- Vaccination against smallpox generally provides some protection against mpox.

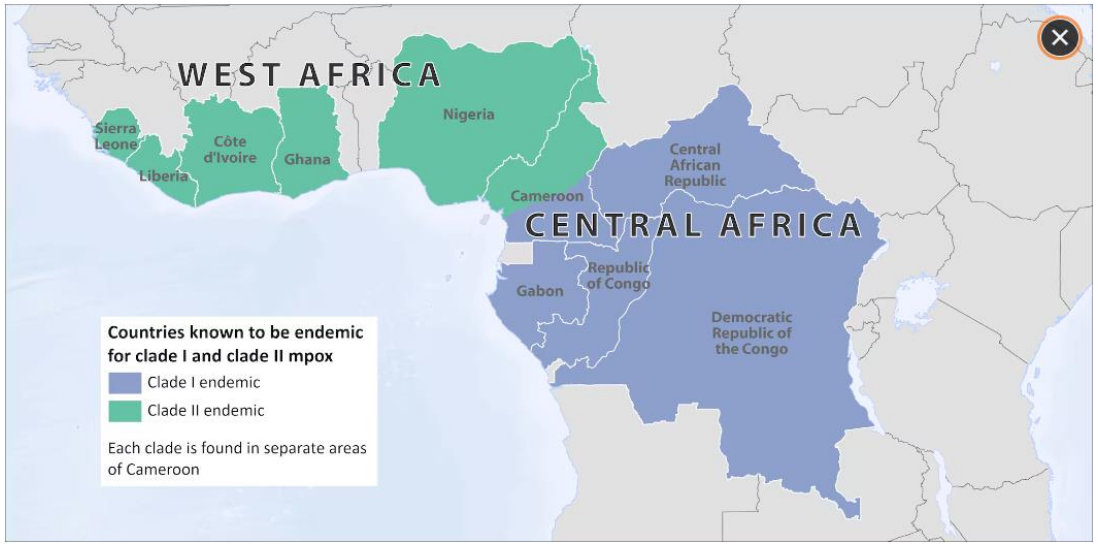




Gessain et al. N Engl J Med 2022;387:1783-93. DOI: 10.1056/NEJMra2208860

Mpox Virus Types

- **Clade I** causes more severe illness and deaths. Some outbreaks have killed up to 10% of the people who get sick, although more recent outbreaks have had lower death rates. Clade I is endemic to Central Africa.
- **Clade II** is the type that caused the global outbreak that began in 2022. Infections from clade II mpox are less severe. More than 99.9% of people survive. Clade II is endemic to West Africa.



https://www.cdc.gov/poxvirus/mpox/about/index.html

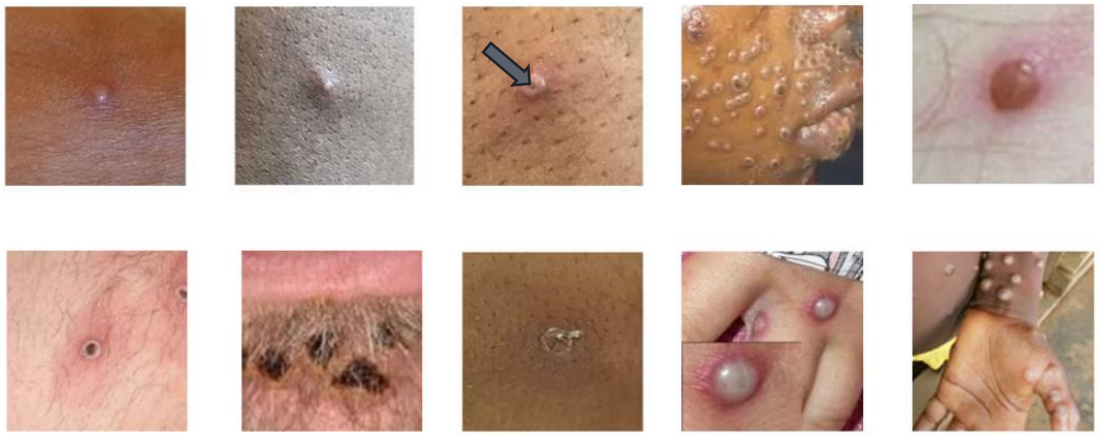
Mpox Clinical Presentation

- Three stages:
  - Incubation Period
    - Roughly 1-2 weeks (physicians recommended to monitor patients for 21 days)
    - Not considered contagious
  - Prodrome
    - Fever, malaise, headache, sore throat, cough, and (in many cases) swollen lymph nodes
    - May be contagious
  - Rash
    - May present without a recognized prodrome
    - Recent cases with only localized lesions
    - Contagious until all scabs have fallen off and a fresh layer of skin forms

https://www.cdc.gov/poxvirus/mpox/clinicians/clinical-recognition.html

Mpox Rash

- Lesions are firm or rubbery, well-circumscribed, deep-seated, and often develop umbilication (resembles a dot on the top of the lesion).
- During the current global outbreak of Clade II:
  - Lesions often occur in the genital and anorectal areas or in the mouth
  - Rash is not always disseminated across many sites on the body
  - Rash may be confined to only a few lesions or only a single lesion
  - Rash does not always appear on palms and soles



https://www.cdc.gov/poxvirus/mpox/clinicians/clinical-recognition.html

Mpox Transmission

- Can spread through direct contact with infected wild animals, through close contact (including intimate or sexual contact) with a person with mpox, and through contact with contaminated materials.
- Close contact spread typically includes:
  - Direct skin-to-skin contact with mpox rash or scabs from a person with mpox
  - Contact with saliva, upper respiratory secretions (mucus), and bodily fluids or lesions around the anus, rectum, or vagina from a person with mpox
  - Pregnant people with mpox can pass the virus to the fetus during pregnancy or to the newborn during and after birth.

https://www.cdc.gov/poxvirus/mpox/if-sick/transmission.html

Healthcare Infection Control Precautions

- A patient with suspected or confirmed mpox infection should be placed in a **single-person room; special air handling is not required.**
- Transported patients should use well fitted source control (e.g., a medical mask).
- Intubation, extubation, and any procedures likely to spread oral secretions should be performed in **an airborne infection isolation room.**
- **PPE used** should include: Gown, gloves, eye protection, and NIOSH-approved N95 respirator.
- Cleaning should be done with **EPA-registered List Q agent** (emerging viral pathogens claim).
- **Laundry** may be handled per normal processes with particular attention paid to **avoiding shaking.**
- Precautions should be maintained **until all lesions have crusted, those crusts have separated, and a fresh layer of healthy skin has formed underneath.**

https://www.cdc.gov/poxvirus/mpox/clinicians/infection-control-healthcare.html

Risk level of exposure	Exposure characteristics	Recommendations	
		Monitoring	PEP[¶]
Higher	Unprotected contact between an exposed individual's broken skin or mucous membranes and the skin lesions or bodily fluids from a patient with mpox (e.g., inadvertent splashes of patient saliva to the eyes or mouth of a person), or soiled materials (e.g., linens, clothing) -OR-	Yes	Recommended
	Being inside the patient's room or within 6 feet of a patient with mpox during any medical procedures that may create aerosols from oral secretions (e.g., cardiopulmonary resuscitation, intubation), or activities that may resuspend dried exudates (e.g., shaking of soiled linens), without wearing a NIOSH-approved particulate respirator with N95 filters or higher and eye protection		
Intermediate	Being within 6 feet for a total of 3 hours or more (cumulative) of an unmasked patient with mpox without wearing a facemask or respirator -OR-	Yes	Informed clinical decision making recommended on an individual basis to determine whether benefits of PEP outweigh risks of transmission or severe disease [¶¶]
	Unprotected contact between an exposed individual's intact skin and the skin lesions or bodily fluids from a patient with mpox, or soiled materials (e.g., linens, clothing) -OR-		
	Activities resulting in contact between an exposed individual's clothing and the patient with mpox's skin lesions or bodily fluids, or their soiled materials (e.g., during turning, bathing, or assisting with transfer) while not wearing a gown		
Lower	Entry into the contaminated room or patient care area of a patient with mpox without wearing all recommended PPE, and in the absence of any exposures above	Yes	None
No Risk	No contact with the patient with mpox, their contaminated materials, nor entry into the contaminated patient room or care area	No	None

https://www.cdc.gov/poxvirus/mpox/clinicians/infection-control-healthcare.html

Post Exposure Workup and Prophylaxis

- Patients exposed in healthcare facilities who have an mpox virus exposure and are asymptomatic do not need to be isolated.
- Asymptomatic exposed HCP do not need to be excluded from work.
- Monitor for signs and symptoms of mpox daily for 21 days after last exposure.
- If symptoms develop, isolate/exclude from work until rash is evaluated, testing occurs, and mpox is ruled out.
- Vaccine (Jynneos) can be given Post Exposure Prophylaxis (PEP) – 2 dose vaccine.
- PEP is most effective if given ≤ 14 days.

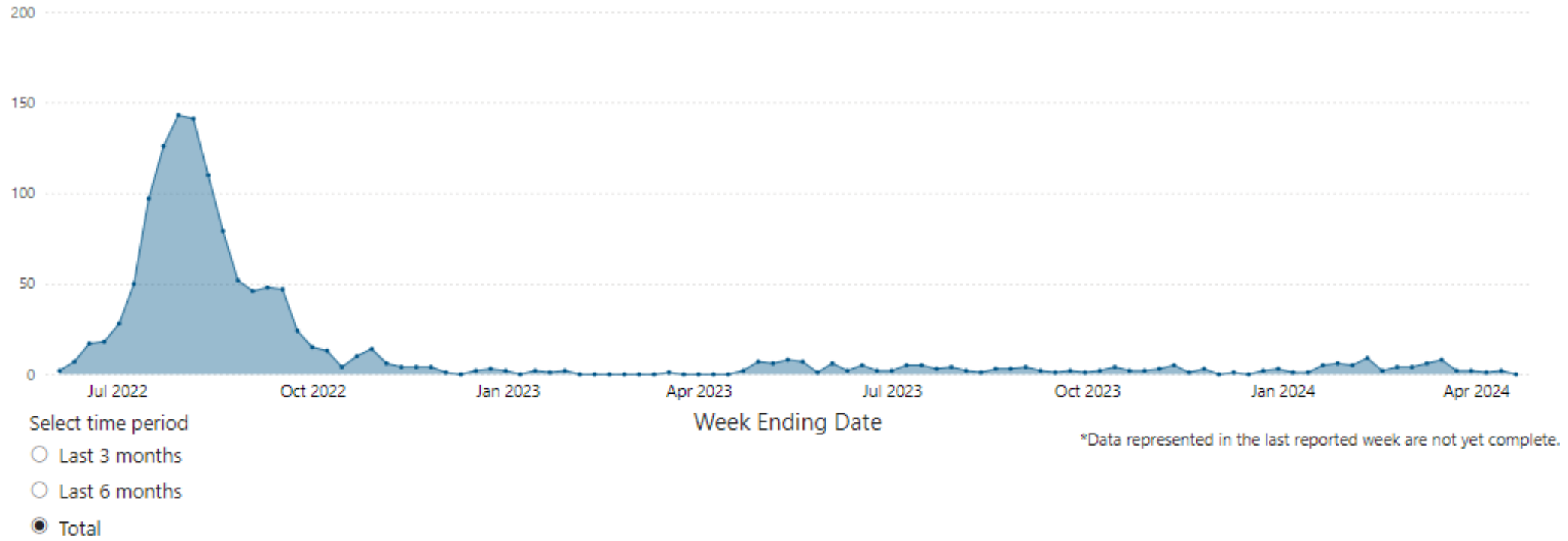
https://www.cdc.gov/poxvirus/mpox/clinicians/infection-control-healthcare.html
https://www.cdc.gov/poxvirus/mpox/vaccines/vaccine-recommendations.html
https://www.cdc.gov/poxvirus/mpox/vaccines/index.html

Mpox in Chicago

- In late-May, 2022 potential mpox (clade II) cases began to be reported in Chicago.
- Almost all cases were associated with men who have sex with men (MSM).
- Patients were typically presenting to outpatient clinics:
  - Sexual Health Clinics
  - Urgent/Immediate Care Centers
  - Federally Qualified Health Centers
  - Primary Care Offices
- Hospitalizations were rare, although some severe cases, particularly among patients with underlying immune compromise were noted.

Chicago Mpox Data

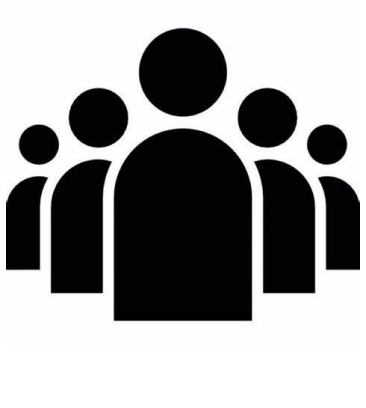
Cases	Hospitalizations	Deaths
1,293	82	4



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

Responses

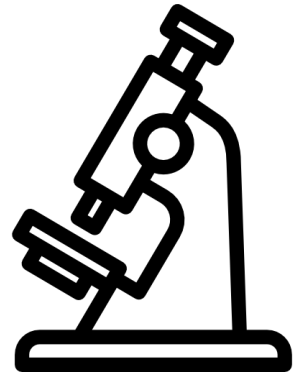
Reporting and Epidemiology



Community

Patient

Healthcare



Laboratory

Case Identification

- In May 2022, there were no commercial laboratories that could perform orthopoxvirus or mpox testing.
- Specimens were sent to the Illinois state lab for orthopoxvirus testing, which if positive, were subsequently confirmed as monkeypox virus by CDC.
- Providers were required to seek local health department approval for testing.
- Potential cases were identified as testing was sought.
- When commercial labs began testing, positives were identified through electronic lab reporting (ELR).
- Confirmed cases are required to be reported within 24 hours.

CDPH
Chicago Department of Public Health

CDPH Suspect Monkeypox Report Form

Many commercial laboratories are now authorized to perform monkeypox testing. Healthcare providers should reach out to their in-house or referral laboratory to establish the ability to submit specimens to a commercial laboratory performing monkeypox testing. CDPH approval is not required for commercial laboratory testing - if you are submitting to a commercial reference laboratory, do not complete this form.

CDPH approval is still required for testing being requested through the IDPH laboratory. To request public health testing, please complete the below form.

Criteria for testing at IDPH Laboratories are as follows:

- Urgent test based on clinical picture, including but not limited to:
  - severe disease (e.g. hemorrhagic disease, confluent lesions, sepsis, encephalitis, or other conditions requiring hospitalization)
  - individuals with likely monkeypox infections in unusual anatomical sites (e.g. eyes or mouth)
  - individuals being considered for Tecovirimat, imminently for any other clinical reason
- Urgent test based on individual risk:
  - those at risk of severe disease (e.g., immunocompromised, pediatric populations especially < 8 years, pregnant or breastfeeding women, individuals with one or more complications)
  - inability to be tested elsewhere due to expense of testing
- Urgent test based on epidemiological risk:
  - possible outbreaks of public health concern requiring especially prompt follow-up action, e.g., in congregate living settings (jails, homeless shelters, skilled nursing facilities, schools)
  - other situation deemed by the local health department as warranting testing at the state lab

The information you provide will facilitate testing approval. You will automatically receive a follow up email with initial steps for specimen collection and instructions for isolation. CDPH staff will reach out as soon as possible to confirm approval for monkeypox testing.

If you have any urgent questions, please call 311 (or 312-744-5000, if outside the city but regarding a Chicago resident)

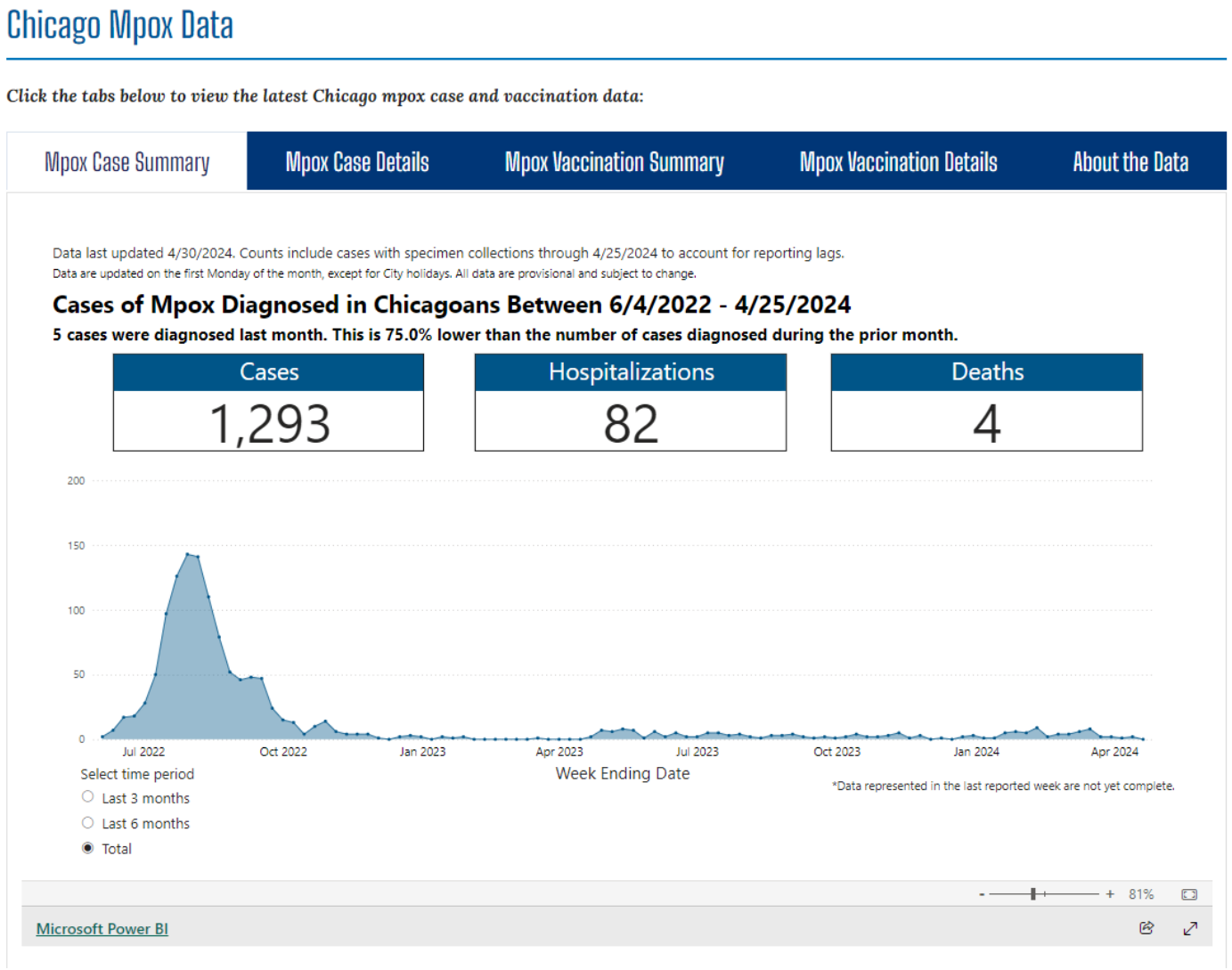
Lessons Learned:

- These forms can be used to gather preliminary epidemiologic data.
- Linking case reporting and laboratory testing requests can avoid underreporting.
- Facilities can be prioritized for follow-up or resources based on volume.

Collaborating with Partners

- Various teams within CDPH leveraged relationships with partners to educate and vaccinate at-risk populations.
- Communication to healthcare facilities occurred through existing channels such as HAN alerts and roundtables.
- Created publicly available **dashboards** to keep partners and the public updated.
- The HCS team also used ordering provider information from the laboratory requests to identify facilities that were the most affected by the outbreak.
- These facilities could be contacted directly to provide education on proper infection control procedures, laboratory test ordering, **exposure workups, issuing post-exposure prophylaxis,** and treating patients.

Mpox Dashboard



Lessons Learned:

- Dashboards are excellent ways of easily disseminating information.
- Interactive dashboards promote transparency and are engaging for healthcare partners and the public.
- Automation helps reduce the workload associated with report generation.
- Very effective storytelling tools.

Mpox Dashboard cont.

Chicago Mpox Data

Click the tabs below to view the latest Chicago mpox case and vaccination data:

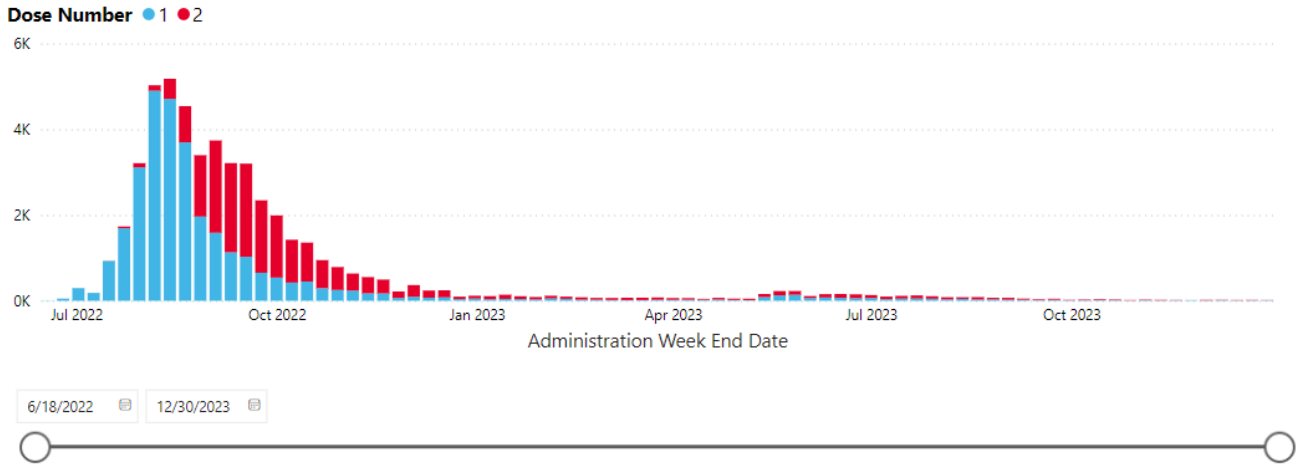
Mpox Case Summary | Mpox Case Details | Mpox Vaccination Summary | Mpox Vaccination Details | About the Data

As of January 8, 2024, the Chicago Mpox Vaccination Summary and Details dashboards will no longer be updated. The dashboards will remain available on this page and contain historical data on mpox vaccinations administered to Chicago residents from June 12, 2022 through December 30, 2023. Based on local epidemiology, updates to these dashboards may resume in the future.

Data last updated 01/08/2024. Counts include doses administered through 12/30/2023.

Doses of Mpox Vaccine Administered to Chicagoans Between 6/18/2022 - 12/30/2023

All Doses	First Doses	Second Doses
50,507	30,664	19,843



Identifying Potentially Exposed Healthcare Personnel (HCP)

- Incorporated questions about potential health care exposures into case interview questions to determine if the case visited other healthcare facilities prior to the diagnosing location.
- Requested a list of all HCP who may have had contact with the patient with mpox.
- Started by CDPH staff directly interviewing HCP to determine the exposure risk.
- As the outbreak grew, trained facility infection prevention and occupational health staff to conduct facility risk assessments.
- Developed a standardized questionnaire that fit exposures into the CDC rubric.

Did you work on this shift on this day? (Y/N)	
	If yes, was this shift overnight? (Y/N)
Did you enter the patient's room/same enclosed area? (Y/N)	
	If yes, list room/care locations by date.
	Can you estimate the cumulative duration in minutes?
What type of activities did you perform while in the patient's room or environment?	
Did you touch the patient? (Y/N)	
	If yes, list room/care locations by date.
Did you have contact with patient's secretions, excretions, surfaces in the room, or used medical equipment (even if patient not present)? (Y/N) If yes, describe in notes.	
Was the patient in an Airborne Infection Isolation Room (AIIR) when contact occurred? (Y/N) Note: AIIR not currently required.*	
Was the patient wearing a facemask? (Y/N/Not Applicable)	
Did you always wear the following PPE:	
	Gloves (Y/N)
	Gown (Y/N)
	Standard/Surgical Face Mask (Y/N)
	N95 respirator (Y/N)
	If N95, fit-tested in last year? (Y/N)
	PAPR & hood? (Y/N)
Goggles or Disposable Faceshield that covers the front and sides of the face? (Y/N) If yes, please specify type of eye protection in the notes.	
Did you have any issues with PPE (e.g. tears, needing change or replace PPE while in the room)? (Y/N) If yes, explain in notes.	

Lessons Learned:

- Matching questions to the healthcare exposure guidance made it easier to objectively assess HCP interactions for potential exposure.
- Building recommendations into the questionnaire reduces the documents needed.
- Creating documents like this can help train staff.

Were you inside the patient's room or within 6 feet of a patient during any procedures that may create aerosols from oral secretions, skin lesions, or resuspension of dried exudates (e.g., shaking of soiled linens)? (Y/N) If yes, list which procedures.
Did you have unprotected contact between your skin or mucous membranes and the skin, lesions, or bodily fluids from a patient (e.g., inadvertent splashes of patient saliva to the eyes or oral cavity, ungloved contact with patient), or contaminated materials (e.g., linens, clothing)?
Did you have any percutaneous exposures (i.e. needle sticks, cuts)? **(Y/N)** If yes, explain in notes.
Did you have any known direct skin-skin exposure to patient? (ex: patient needed to be restrained, or comfort touch, examination, repositioning patient etc.) **(Y/N)** If yes, explain in notes.
Did you have any contact with your unprotected clothing (e.g., sleeves) and the patient's skin lesions, bodily fluids, soiled linens, or dressings?
Was anyone else in the same room with you? (Y/N) If yes, explain in notes.
Did you perform hand hygiene after the patient encounter? (Y/N)

Exposure Risk Assessment and Public Health Recommendations

Employee Exposure Guidance	
High Risk Exposure - Call CDPH	
Unprotected contact between a person's skin or mucous membranes and the skin, lesions, or bodily fluids from a patient (e.g., inadvertent splashes of patient saliva to the eyes or oral cavity of a person, ungloved contact with patient), or contaminated materials (e.g., linens, clothing).	Active surveillance for symptoms, which includes measurement of temperature for 21 days following the exposure. Healthcare workers should check symptoms prior to reporting to work. **AND** Post Exposure Prophylaxis (PEP) Recommended.
Being inside the patient's room or within 6 feet of a patient during any procedures that may create aerosols from oral secretions, skin lesions, or resuspension of dried exudates (e.g., shaking of soiled linens), without wearing an N95 or equivalent respirator (or higher) and eye protection.	
Intermediate Risk Exposure - Call CDPH	
Being within 6 feet for 3 hours or more of an unmasked patient without wearing, at a minimum, a surgical mask.	Active surveillance for symptoms, which includes measurement of temperature for 21 days following the exposure. Healthcare workers should check symptoms prior to reporting to work. **AND** Post Exposure Prophylaxis (PEP) - Informed clinical decision making recommended on an individual basis to determine whether benefits of PEP outweigh risks.
Activities resulting in contact between sleeves and other parts of an individual's clothing and the patient's skin lesions or bodily fluids, or their soiled linens or dressings (e.g., turning, bathing, or assisting with transfer) while wearing gloves but not wearing a gown.	
Low Risk Exposure	
Entered the patient room without wearing eye protection on one or more occasions, regardless of duration of exposure.	Symptom monitoring daily for 21 days following the exposure. Healthcare workers should self-check for symptoms prior to reporting to work.
During all entries in the patient care area or room (except for during procedures listed above in the high-risk category), wore gown, gloves, eye protection, and at minimum, a surgical mask.	
Being within 6 feet of an unmasked patient for less than 3 hours without wearing at minimum, a surgical mask.	

- PEP recommended
- Active monitoring (21 days)

- PEP based on individualized assessment
- Active monitoring (21 days)

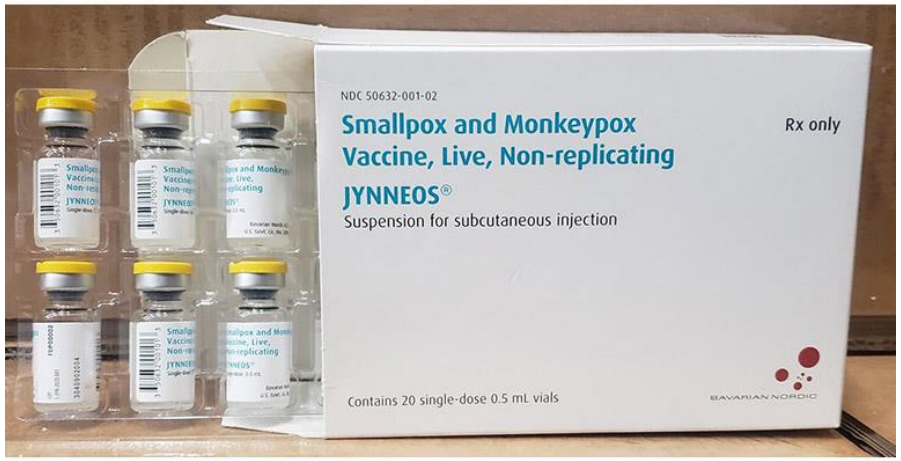
- Monitor only (self-check)

REDCap Projects

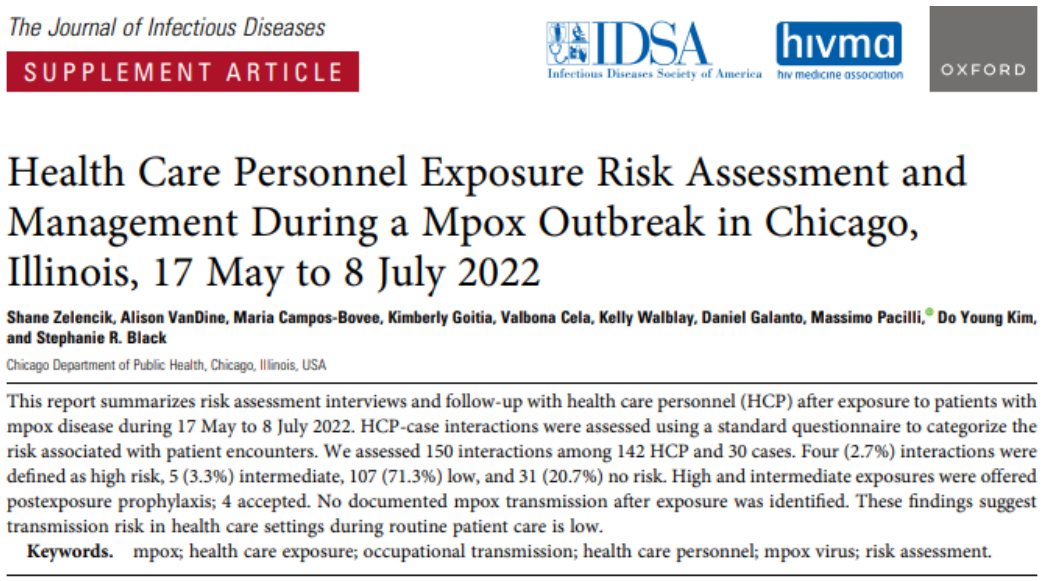
- Partnered with the Illinois Department of Public Health to create and revise REDCap projects to conduct case investigations, monitor exposures, and track requests for laboratory testing.
- Daily symptom monitoring for 21 days
  - Email
  - SMS
- Laboratory specimen tracking, including storage and reporting of results
- Epidemiologic analysis
- **Lesson Learned: Create Data Access Groups (DAGs) for specific facilities to enroll staff members in monitoring and track exposures**
  - Allow for occupational health services to monitor exposed staff and investigate exposures
  - Ensure that the health department has simultaneous access to cases and investigations

HCP Post Exposure Prophylaxis (PEP)

- The supply of vaccine was limited, and vaccine was only administered to HCP with High and Intermediate Exposures.
- Doses of Jynneos vaccine were distributed to facilities that were most likely to see patients with mpox.
- These doses could be used by occupational health if warranted.
- Exposed employees could also receive PEP at partnered clinics.



Outcomes



The Journal of Infectious Diseases

SUPPLEMENT ARTICLE

Health Care Personnel Exposure Risk Assessment and Management During a Mpox Outbreak in Chicago, Illinois, 17 May to 8 July 2022

Shane Zelencik, Alison VanDine, Maria Campos-Bovee, Kimberly Goitia, Valbona Cela, Kelly Walblay, Daniel Galanto, Massimo Pacilli, Do Young Kim, and Stephanie R. Black

Chicago Department of Public Health, Chicago, Illinois, USA

This report summarizes risk assessment interviews and follow-up with health care personnel (HCP) after exposure to patients with mpox disease during 17 May to 8 July 2022. HCP-case interactions were assessed using a standard questionnaire to categorize the risk associated with patient encounters. We assessed 150 interactions among 142 HCP and 30 cases. Four (2.7%) interactions were defined as high risk, 5 (3.3%) intermediate, 107 (71.3%) low, and 31 (20.7%) no risk. High and intermediate exposures were offered postexposure prophylaxis; 4 accepted. No documented mpox transmission after exposure was identified. These findings suggest transmission risk in health care settings during routine patient care is low.

Keywords. mpox; health care exposure; occupational transmission; health care personnel; mpox virus; risk assessment.

- Assessed 150 interactions among 142 HCP and 30 cases.
- 4 high risk interactions
- 5 intermediate risk interactions
- 107 low risk interactions
- 31 no risk interactions
- 9 high and intermediate exposures offered PEP, 4 accepted
- No documented mpox transmission to HCP

HCP Role	Risk Level	Type of Facility	Nature of Exposure	Case Details	Offered PEP	Received PEP
Medical Assistant	High	Outpatient Medical Clinic	Unprotected contact between HCP skin and patient lesions	Examined lesions on hands, while wearing only a surgical mask and no gloves.	Yes	Yes (1 dose)
Medical Assistant	High	Sexual Health Clinic	Within six feet of patient during a potentially aerosol generating procedure without N95 and Eye Protection Throat swabbing may generate aerosolized oral secretions.	Obtained a throat swab on a patient with facial lesions while only wearing a surgical mask and gloves.	Yes	No
Physician Assistant	High	Urgent/ Immediate Care	Within six feet of patient during a potentially aerosol generating procedure without N95 and Eye Protection Throat swabbing may generate aerosolized oral secretions.	Conducted a throat exam and obtained an oral swab while wearing only gloves and a surgical mask.	Yes	Yes
Medical Assistant	High	Infectious Diseases Clinic	Unprotected contact between HCP skin and patient lesions	Obtained blood pressure without gloves on a patient with a non-draining lesion on the wrist.	Yes	Yes

HCP Role	Risk Level	Type of Facility	Nature of Exposure	Case Details	Offered PEP	Received PEP
Physician	Intermediate	Hospital Unspecified Unit	Potential exposure of mucous membranes to patient bodily fluids Possible spray of vesicle fluid into unprotected eyes during unroofing.	Performed a physical exam, unroofed, and vigorously swabbed lesions, while only wearing gloves and a surgical mask without eye protection.	Yes	No
Physician	Intermediate	Outpatient Medical Clinic	Contact with lesions through non-fluid-resistant clothing Possible contact with patient lesions through HCP's clothing	Conducted a physical exam while only wearing gloves. Lesions were present on the patient's torso, extremities, and face.	Yes	No
Advanced Practice Nurse/Nurse Practitioner	Intermediate	Outpatient Medical Clinic	Contact with lesions through non-fluid-resistant clothing Possible contact with patient lesions through HCP's clothing	Examined patient's abdomen through a shirt without wearing gloves. Lesions were present on patient's chest, abdomen, and hands.	Yes	Yes
Physician Assistant	Intermediate	Urgent/ Immediate Care	Potential exposure of mucous membranes to patient bodily fluids Possible spray of vesicle fluid into unprotected eyes during unroofing.	Expressing fluid from lip lesion without eye protection.	Yes	No
Physician	Intermediate	Emergency Department	Contact with lesions through non-fluid-resistant clothing Possible contact with patient lesions through patient's clothing	Conducted an exam on a patient with lesions on face, head, neck, face, trunk, arms, legs, hands, feet, genitals and perianal area. Wore only gloves and face mask and believed there was contact with lesions through the patient's clothing.	Yes	No

Transmission to HCP is Possible

Needlesticks

Fomites or Inadvertent Contamination

Table 1
Demographic and clinical characteristics, course of disease and treatment provided in published cases of occupational MPOX virus infections during the current outbreak.

	Location and timing	Mode of exposure	Clinical symptoms	PCR Swabs	MPOX related treatment and vaccination	Use of PPE
Carvalho et al., Emerg Infect Dis, 2022	Brazil July 2022	Needlestick injury (finger). while gathering materials to discard in a sharps container when a needle perforated the glove	- Inoculation site after 5 d (nodule turned to vesicle) - Spread of lesions (hands, thigh, face). Total 7 lesions. Preceded generalized symptoms of fever and lymphadenopathy	Positive from the lesion Positive from OPX.	None	Wearing personal protective equipment, including gown, gloves, goggles, and mask.
Caldas JP et al., Emerg Infect Dis, 2022	Portugal July 2022	Needlestick injury (finger). There was no wound or bleeding.	- Inoculation site after 4 d(vesicle)	Positive from the lesion. Negative from OPX.	Since no signs appeared after the injury, at first the incident was not reported as an occupational exposure and was not considered for post-exposure prophylaxis treatment.	Wearing the recommended personal protective equipment; the gloves appeared intact.
Mendoza et al., Emerg Infect Dis, 2022	Florida July 2022	Needlestick injury (finger), while recapping the used needle after using it to create an opening in the vesicular lesion to facilitate direct contact of the swab with fluid in the lesion.	- Inoculation site after 10 d. - No additional lesions or other clinical signs or symptoms were reported	Positive from the lesion.	15 h after exposure first dose of a 2-dose JYNNEOS vaccination series was given for postexposure prophylaxis.	Not mentioned
Salvato et al., Emerg Infect Dis, 2022	Brazil July 2022	Suspected to be transmitted through fomite exposure with surfaces in the patient's home, own PPE, or outer surfaces of the specimen transport box.	HCP 1: - after 5 d - single lesion on finger. - systemic symptoms (lymphangitis in her left upper arm and worsened hyperemia). - Another local lesion. HCP 2: - after 5 d – single lesion on the forearm. - Systemic symptoms (fever and lymphadenopathy) - Spread of lesions (face).	Positive from the lesion. Selected samples from the patient and HCP-1 for whole-genome sequencing analysis which showed that the sequenced genomes were 100% identical.	none	HCPs wore PPE, including safety glasses, disposable isolation gowns, and N95 respiratory masks – during the sample collections. However, during the interview with the patient – did not wear gloves.
Le Pluart et al, Open Forum Infect Dis, 2022	France July 2022	Needlestick injury (Right thumb) during swab collection by medical resident.	- Inoculation site after 4 d – 1 single lesion (vesicle). - No systemic symptoms.	Positive from the lesion. Negative from OPX.	Within 3 h after exposure - received a dose of third-generation smallpox vaccine (Imvanex) for postexposure prophylaxis. The HCP's flat mates were also vaccinated.	Wearing appropriate PPE consisting of disposable gown, disposable gloves, FFP2 mask, and goggles.
Alarcón et al., Emerging infectious diseases, 2022	USA August 2022	Inadvertent contamination during specimen collection, contact with contaminated environmental surfaces or unrecognized skin contamination during glove doffing.	- Short prodrome of myalgia, fatigue, and mild headache. - Small, raised skin lesion on her left middle finger progressed to a blister with umbilication. - Systemic symptoms (fever, cough, sore throat) - Spread of lesions throughout her body (10 lesions).	Positive from the lesion.	2 wk course of oral tecovirimat. (It should be noted HCP's medical history significant for rheumatoid arthritis - treated with etanercept (Anti-TNF).	Wearing full PPE (N95 respirator, gown, and eye protection) when examining suspected patients and swabbing lesions. However, in 2 cases the HCP did not wear full PPE at first, and only when patient's symptoms raised her suspicion, changed to full PPE before swabbing the lesions.
Our case	Israel July 2022	Contact with infected fomites in the patient's vicinity, or minor and unnoticed trauma penetrating both glove and skin during specimen collection.	- After 4 d – 1 vesicle (index finger left hand). - Systemic symptoms (weakness and ascending lymphangitis in left arm) - Spread of lesions (back and toe).	Positive from the lesion. Negative from OPX. Whole genome sequencing were analyzed, comparing the mpox positive patients along with the sample from the affected physician identifying the most likely source of disease transmission.	On day 13, family members were vaccinated with third-generation smallpox vaccine (JYNNEOS)	Wearing appropriate PPE consisting of disposable gown, gloves, N-95 mask, and glasses.

PCR, polymerase chain reaction; PPE, personal protective equipment; USA, United States of America; OPX, oropharynx; HCP, health care personnel; TNF, tumor necrosis factor; d, days; h, hours; wk, weeks.

Safir A, Safir M, Henig O, et al. Nosocomial transmission of mpox virus to health care workers—an emerging occupational hazard: a case report and review of the literature. Amer J Infect Cont 2023; 51:1072–6.

Getting Back to Basics of Infection Prevention

- Personal Protective Equipment is effective.
- Standard and Transmission Based Precautions should be used.
- Environmental cleaning should not be overlooked.
- Sharps safety and environmental controls should be observed.
- Source control masking for COVID may have also had a protective effect.

Project Firstline (PFL)

- **Lesson Learned:** Outbreaks, particularly of novel pathogens, can create opportunities to highlight good infection control practice.
- With so much media attention paid to mpox during this time, CDPH created a PFL training module that focused on mpox.
- Originally, this presentation was very technical, but after working with the PFL/CDC team, it was simplified to be relevant to frontline HCP.
- The focus was on the fact that the bug might be novel, but the process of Infection Control is always the same.
- Remember the basics.

MONKEYPOX (MPV) INFECTION PREVENTION BASICS

PROJECT FIRSTLINE
CDC's National Training Collaborative for Healthcare Infection Prevention & Control

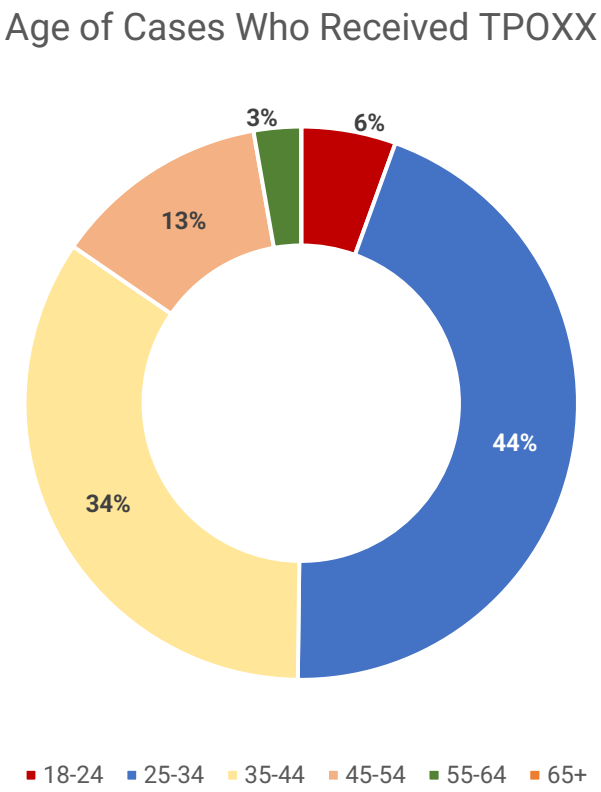
LEARNING OBJECTIVES

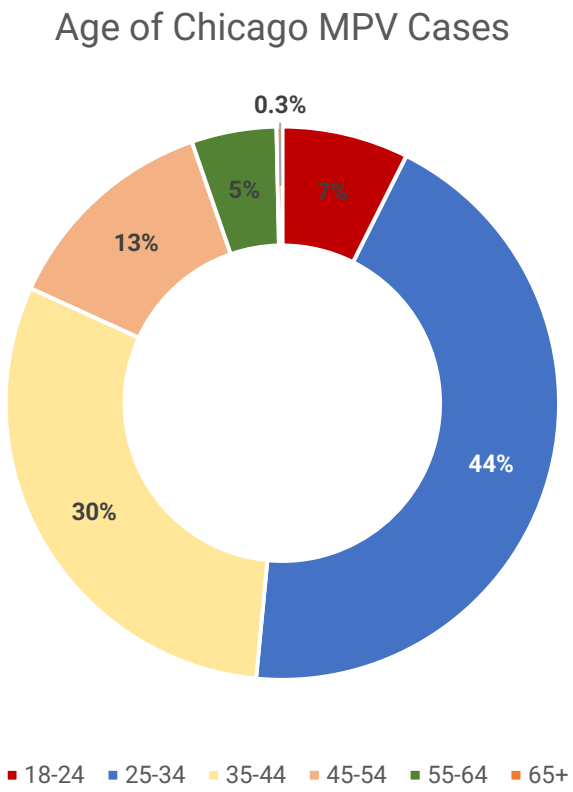
- Explain what monkeypox is and how it spreads.
- Understand your role with your facility's infection control and prevention.
- Explain one (1) primary way infection control actions play a role in keeping you safe from infectious disease exposures, like MPV.
- Explain one (1) infection control lesson we can learn from our MPV case studies.

Health Equity Implications

- Health equity is essential to the mission of CDPH, which is to work with communities and partners to create an equitable, safe, resilient and Healthy Chicago.
- A focus must be placed on providing vaccines and services in communities across the city, but especially in neighborhoods that are traditionally underserved.
  - Partnership with healthcare facilities across the jurisdiction
- Delivering messages that emphasize the importance of public health interventions without stigmatizing populations.
  - Communication strategies
- Ensuring that all affected individuals have access to treatment.

The age distribution for those who received TPOXX* is comparable to MPOX cases overall.

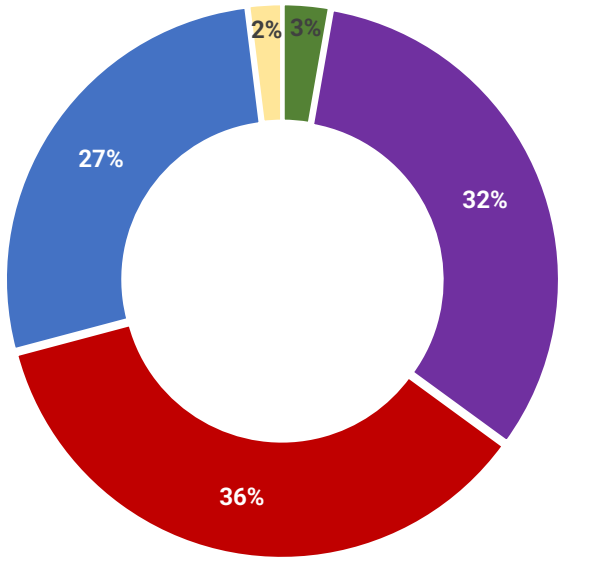




*TPOXX utilization includes access via Expanded Access-Investigational (EA-IND) New Drug Protocol and the Study of Tecovirimat for MPOX (STOMP).

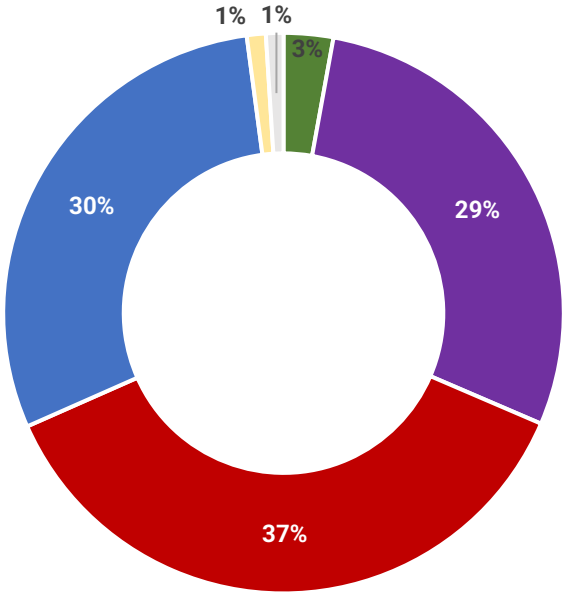
The race-ethnicity distribution for those who received TPOXX* is comparable to MPOX cases overall.

Race-ethnicity of Cases Who Received TPOXX



Asian, non-Latinx Black, non-Latinx White, non-Latinx
Latinx Other, non-Latinx Unknown

Race-ethnicity of Chicago MPV Cases



Asian, non-Latinx Black, non-Latinx White, non-Latinx
Latinx Other, non-Latinx Unknown

*TPOXX utilization includes access via EU-IND protocol and the STOMP trial.

Questions?

Shane Zelencik

Shane.Zelencik@cityofchicago.org