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A Review of the Current Global Mpox Situation and the Public Health Approach to the Increase in Cases in Ontario

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September 17, 2024

Public Health Ontario Rounds

Presenter Disclosures

- **Austin Zygmunt**
  - Volunteer as a member of the Board of Directors of MAX Ottawa a non-governmental organization that provides health and wellness services, resources, and programs (including for mpox) for queer men and trans and non-binary people in Ottawa
  - I do not have any other relationships with a for-profit and/or a not-for-profit organization to disclose
- **Christine Navarro**
  - I do not have a relationship with a for-profit and/or a not-for-profit organization to disclose

Q&A Panel Disclosures

- **Maan Hasso**
  - I do not have a relationship with a for-profit and/or a not-for-profit organization to disclose
- **Michelle Science**
  - I do not have a relationship with a for-profit and/or a not-for-profit organization to disclose
- **Daniel Warshafsky**
  - I do not have a relationship with a for-profit and/or a not-for-profit organization to disclose

Objectives

1. Understand the epidemiology of mpox in Ontario and globally, including key differences between Clade I and Clade II infections.
2. Review key updates to the public health approach to mpox in Ontario including case and contact management, laboratory testing, and infection prevention and control measures.
3. Describe eligibility criteria for Modified Vaccinia Ankara - Bavarian Nordic vaccine (Imvamune®) in Ontario and its effectiveness in preventing mpox infection.

Outline

- Background on mpox
- Review global mpox situation
- Monkeypox Virus (MPXV) laboratory testing at Public Health Ontario (PHO)
- Update on current epidemiology in Ontario
- Review vaccine eligibility and effectiveness
- Key highlights of updated case and contact management guidance
- Review Infection Prevention and Control (IPAC) recommendations
- Question and Answer Panel

Mpox Background

MPXV Clades

- MPXV is an *orthopoxvirus* in the *Poxviridae* family
- MPXV has two distinct clades:
  - Clade I with subclade Ia and subclade Ib
  - Clade II with subclade IIa and subclade IIb
- MPXV subclade IIb, B.1 lineage was responsible for the global outbreak in 2022
- The new MPXV subclade Ib first emerged in Democratic Republic of Congo in September 2023

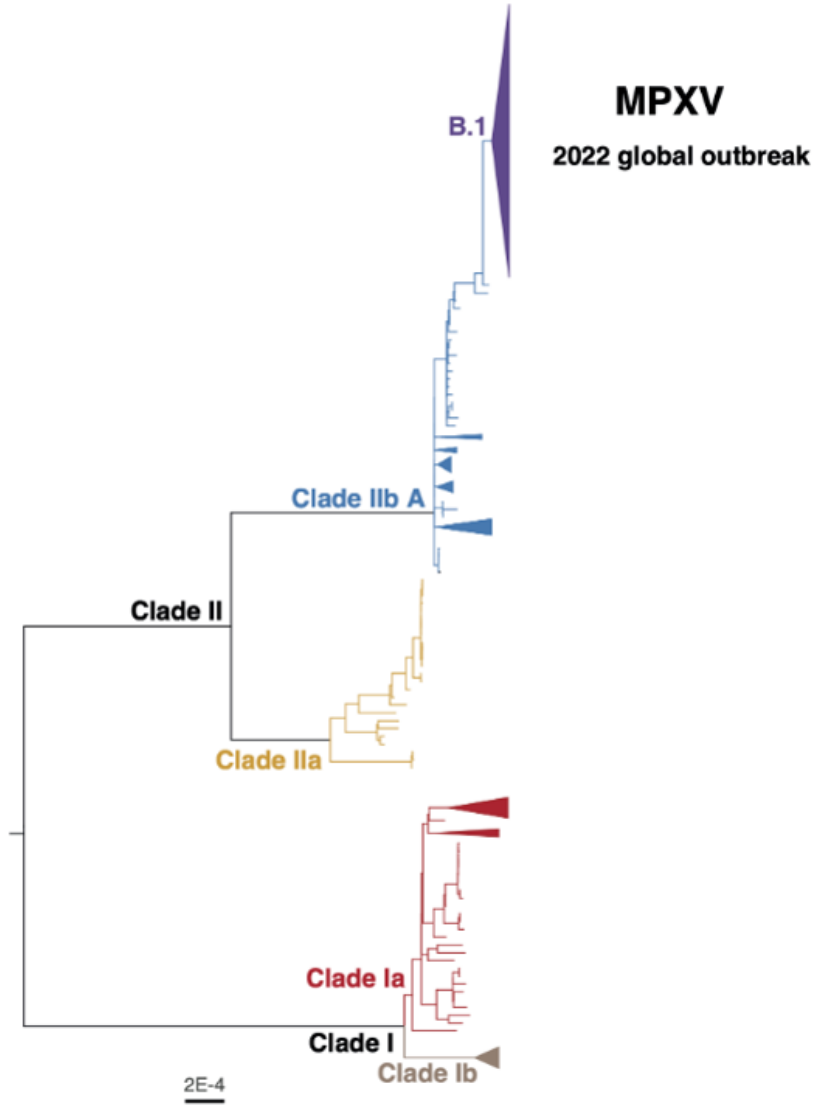


Image source: World Health Organization (WHO). 2022-24 Mpox (Monkeypox) outbreak: global trends [Internet]. Geneva: WHO; 2024 [cited 2024 Sep 5]. Available from: https://worldhealthorg.shinyapps.io/mpx_global/

MPXV Transmission

- **Person-to-person**
  - Close contact including skin-to-skin, mouth-to-mouth (e.g., kissing), and sexual contact
  - Respiratory droplets (e.g., coughing)
- **Animal-to-human**
  - Bites and scratches
  - Activities like hunting, cooking, eating
- **Other routes**
  - Contaminated objects (e.g., clothing, linen)
  - Needle injuries (e.g., health care setting, tattoo parlour)

Source: World Health Organization (WHO). Mpox transmission [Internet]. Geneva: WHO; 2024 [modified 2024 Aug 26; cited 2024 Sep 6]. Available from: https://www.who.int/news-room/fact-sheets/detail/mpox

MPXV Characteristics

- **Reservoir**
  - Animals, most commonly rodents
- **Incubation period**
  - 7 to 10 days (range: 3 to 21 days)
- **Period of communicability**
  - From symptom onset to when all scabs have crusted over, the scabs have fallen off, and a new layer of skin has formed underneath. This includes the healing of all mucosal surfaces (mouth, throat, eyes, vagina and anorectal area)
  - Some individuals may be infectious up to 4 days before the onset of symptoms (active area of research)

Source: Public Health Agency of Canada. Mpox (monkeypox): public health management of cases and contacts in Canada [Internet]. Ottawa, ON: Government of Canada; 2024 [modified 2024 Aug 23; cited 2024 Sept 6]. Available from: https://www.canada.ca/en/public-health/services/diseases/monkeypox/health-professionals/management-cases-contacts.html

Mpox Infection

- **Rash/lesions**
  - Often painful, last for 2−4 weeks, and progress through different stages (i.e., macules, papules, vesicles, pustules, and scabs)
  - Can begin on face and spread over the body or may occur only in area where contact was made (e.g., mouth, genitals)
  - Can precede or develop after other symptoms
- **Other common symptoms**
  - Fever
  - Headache
  - Chills
  - Lymphadenopathy
  - Muscle aches
- **High-risk for severe outcomes**
  - Individuals who are immunocompromised
  - Pregnant individuals
  - Children under 12 years of age

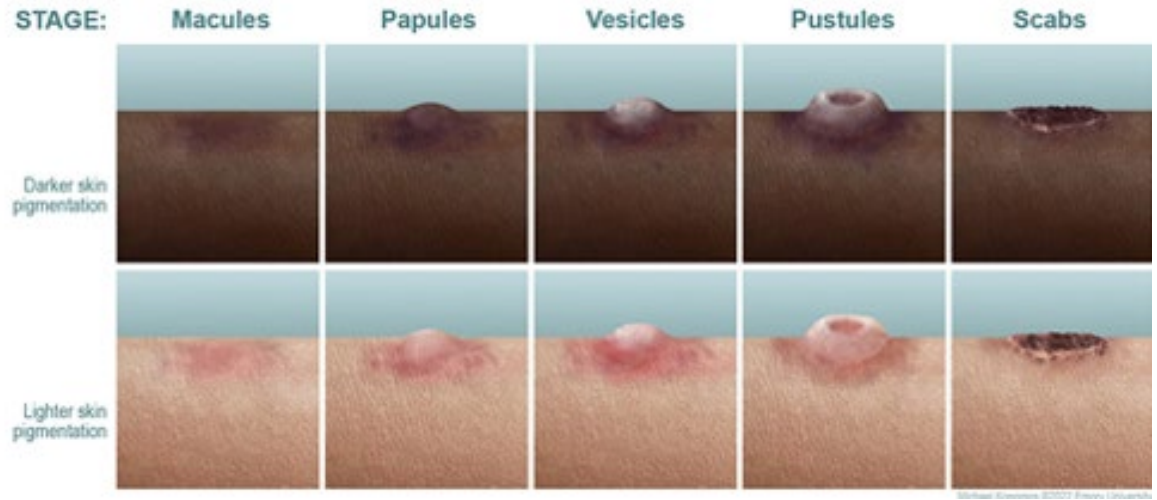


Image source: Nebraska Medicine. How does monkeypox start? Plus, 5 pictures to show how the bumps progress. [modified Oct 13, 2022; cited Sept 5, 2024]. Available from: https://www.nebraskamed.com/infectious-diseases/monkeypox/how-does-monkeypox-start-plus-5-pictures-to-show-how-the-bumps-progress

Source: Public Health Agency of Canada. Mpox (monkeypox): public health management of cases and contacts in Canada [Internet]. Ottawa, ON: Government of Canada; 2024 [modified 2024 Aug 23; cited 2024 Sept 6]. Available from: https://www.canada.ca/en/public-health/services/diseases/monkeypox/health-professionals/management-cases-contacts.html

Global 2022–2024 Mpox Outbreak

- In May 2022, mpox cases with no direct travel links to endemic areas were reported to the World Health Organization (WHO)
- On July 23, 2022 the WHO declared mpox a Public Health Emergency of International Concern (ended May 11, 2023)
- From January 1, 2022 to July 31, 2024 there have been over 100,000 laboratory confirmed cases from 121 countries
- The majority of cases globally have occurred in adult males (particularly those aged 18 to 44) who identify as gay, bi-sexual, or men who have sex with men
  - 3.6% of cases are female
  - 1.3% of cases are less than 18 years old

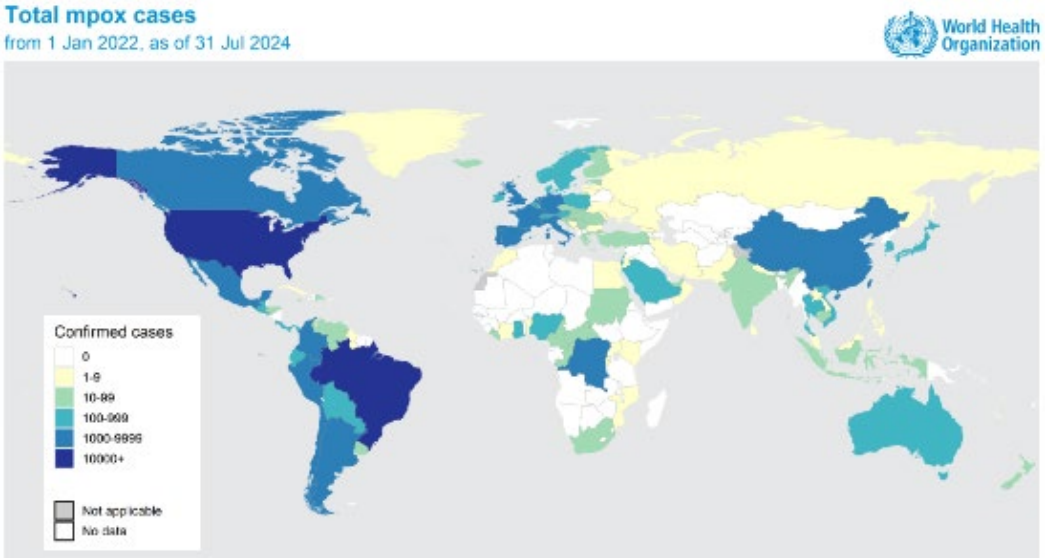


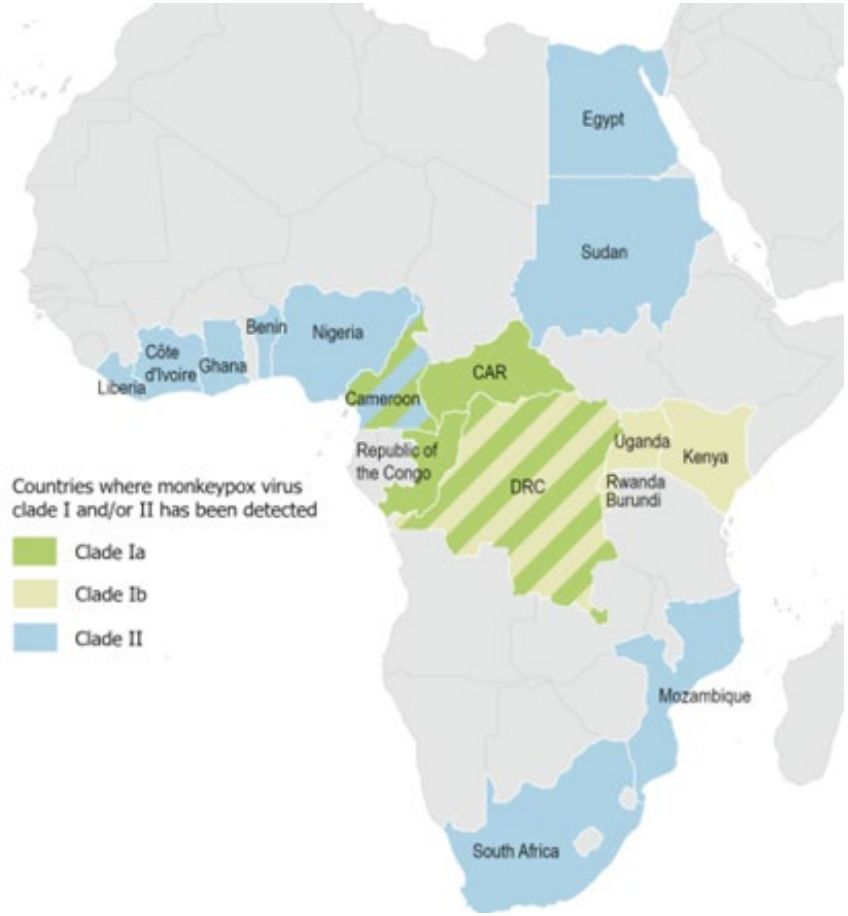
Image source: World Health Organization (WHO). 2022-24 Mpox (Monkeypox) outbreak: global trends [Internet]. Geneva: WHO; 2024 [cited 2024 Sep 5]. Available from: https://worldhealthorg.shinyapps.io/mpx_global/

Source: World Health Organization (WHO). 2022-24 Mpox (Monkeypox) outbreak: global trends [Internet]. Geneva: WHO; 2024 [cited 2024 Sep 5]. Available from: https://worldhealthorg.shinyapps.io/mpx_global/

Current Global Mpox Situation

World Health Organization (WHO) Declaration

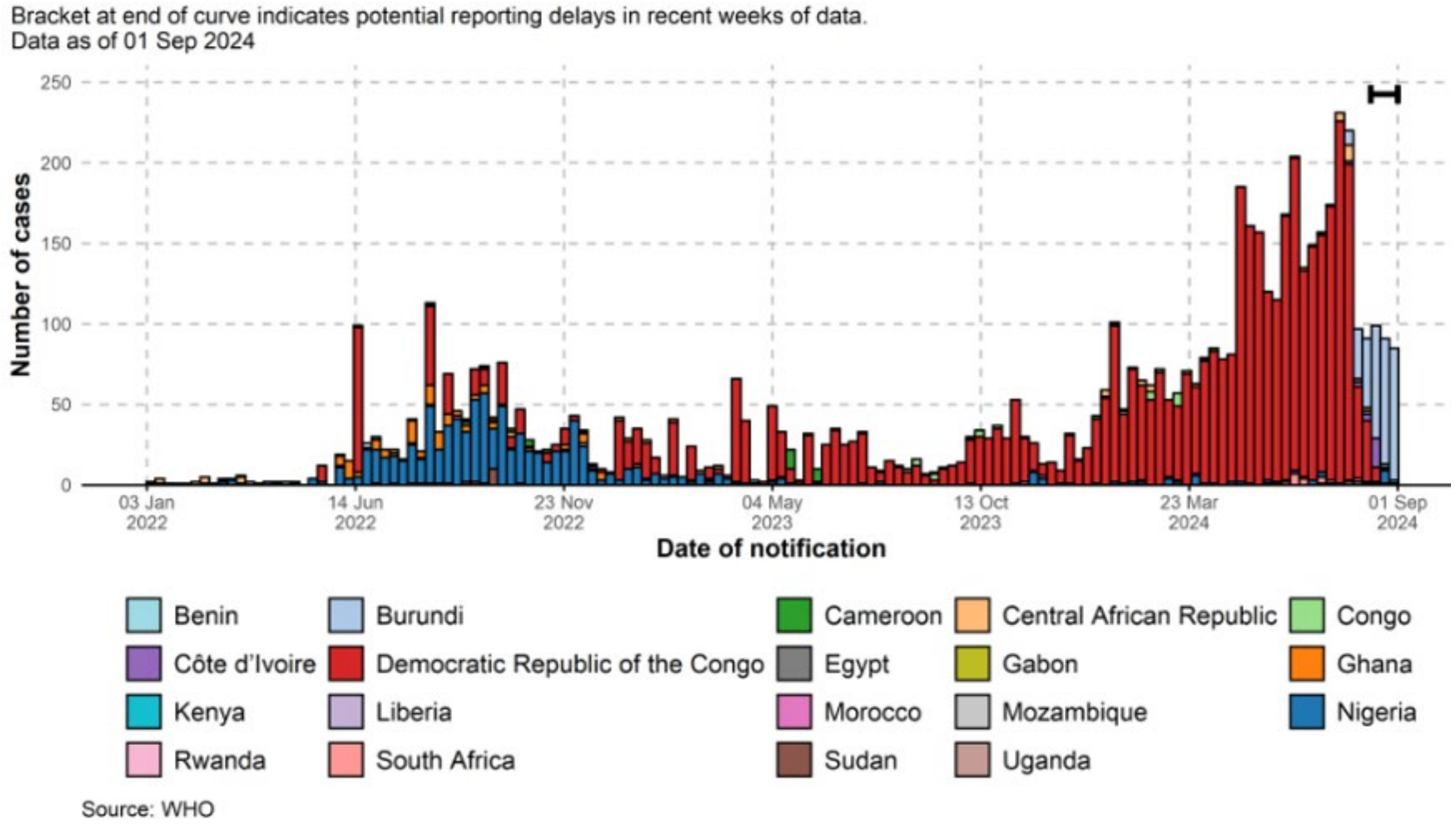
- On August 14, 2024, the WHO declared a Public Health Emergency of International Concern due to:
  - Spread of MPXV subclade Ib from the Democratic Republic of Congo to several countries where MPXV has not been previously detected (i.e., Kenya, Uganda, Rwanda, and Burundi)
  - Ongoing mpox outbreaks of other clades in Africa
- As of September 16, 2024, two countries outside of Africa have reported a travel-related mpox clade 1b case (Sweden and Thailand)



Sources:

- European Centre for Disease Control and Prevention (ECDC). Epidemiological update – week 35/2024: Mpox due to monkeypox virus clade I [Internet]. Solna: ECDC; 2024 [modified 2024 Sep 2; cited 2024 Sep 6]. Available from: https://www.ecdc.europa.eu/en/news-events/mpox-epidemiological-update-monkeypox-2-september-2024
- World Health Organization (WHO). First meeting of the International Health Regulations (2005) Emergency Committee regarding the upsurge of mpox 2024 [Internet]. Geneva: WHO; 2024 [modified 2024 Aug 19; cited 2024 Sep 6]. Available from: https://www.who.int/news/item/19-08-2024-first-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-upsurge-of-mpox-2024

Mpox in Africa: Data as of September 1, 2024



Source: World Health Organization (WHO). 2022-24 Mpox (Monkeypox) outbreak: global trends [Internet]. Geneva: WHO; 2024 [cited 2024 Sep 5]. Available from: https://worldhealthorg.shinyapps.io/mpx_global/

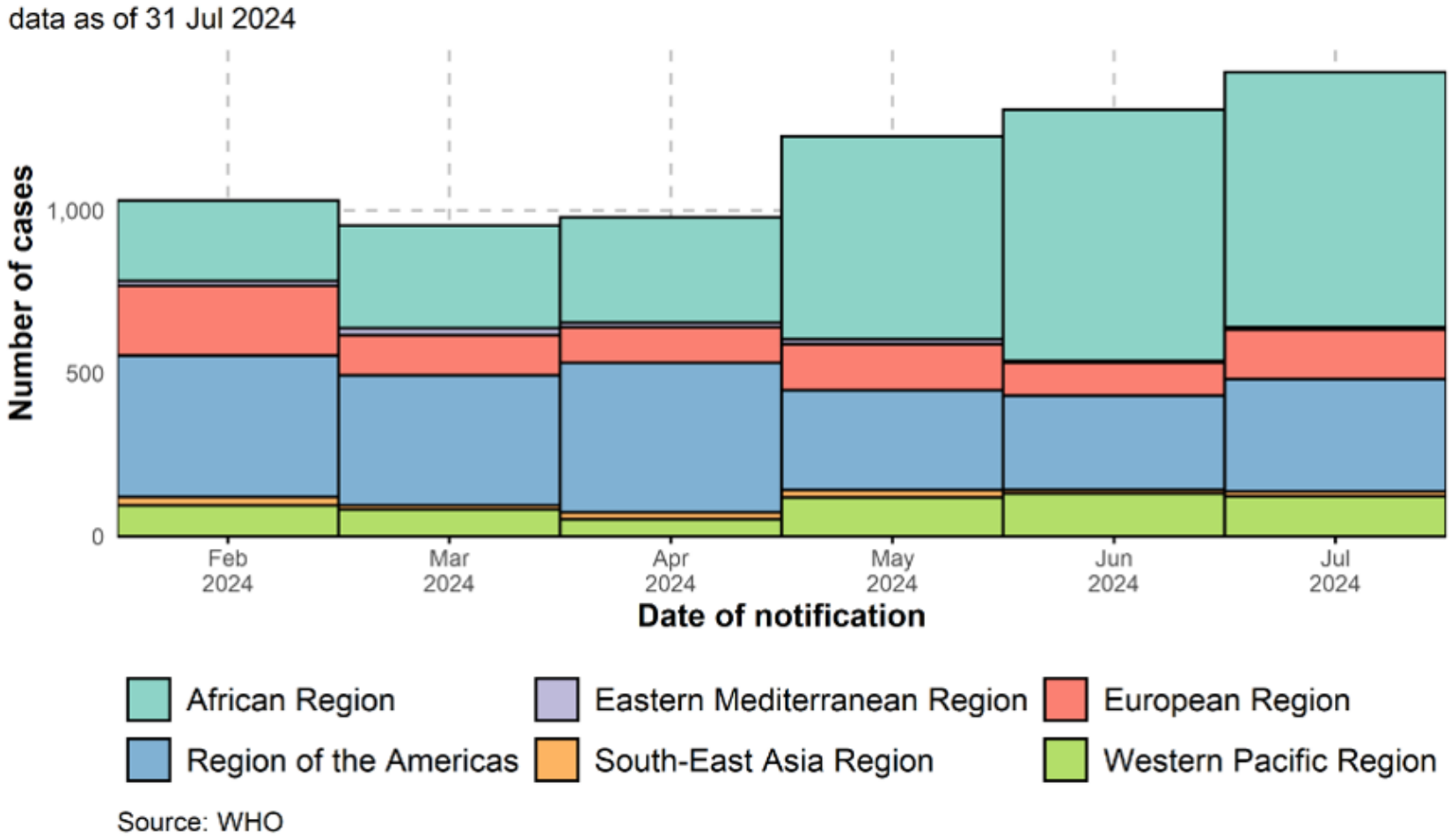
Emerging Information on Clade Ia and Ib MPXV in Africa

Characteristic	Subclade Ia	Subclade Ib
Key population affected	• Individuals < 15 years	• Individuals aged ≥ 15 years
Transmission	• Person-to-person through close non-sexual contact and animal-to-human • Transmission limited to endemic rural and forested areas	• Person-to-person through close contact including sexual and non-sexual contact • Transmission occurring in urban areas • Emerging evidence suggests that subclade Ib may be more transmissible than subclade Ia
Disease severity	• Clade I MPXV is more severe than Clade II	• Emerging evidence suggests that subclade Ib is less severe than subclade Ia

Sources:

- European Centre for Disease Control and Prevention (CDC). Epidemiological update – week 35/2024: Mpox due to monkeypox virus clade I [Internet]. Atlanta, GA: CDC; 2024 [modified 2024 Sept 2; cited 2024 Sept 6]. Available from https://www.ecdc.europa.eu/en/news-events/mpox-epidemiological-update-monkeypox-2-september-2024
- World Health Organization (WHO). First meeting of the International Health Regulations (2005) Emergency Committee regarding the upsurge of mpox, 2024 [Internet]. Geneva; WHO; 2024 [modified 2024 Aug 19; cited 2024 Sept 6]. Available from: https://www.who.int/news/item/19-08-2024-first-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-upsurge-of-mpox-2024
- Public Health Agency of Canada. Rapid risk assessment: clades 1a and 1b mpox virus (MPXV) multi-country outbreaks – public health implications for Canada [Internet]. Ottawa, ON: Government of Canada; 2024 [modified 2024 Sep 13; cited 2024 Sep 16]. Available from: https://www.canada.ca/en/public-health/services/emergency-preparedness-response/rapid-risk-assessments-public-health-professionals/rapid-risk-assessment-clades-1a-1b-mpox-virus-multi-country-outbreaks-public-health-implications-2024.html

Global Mpox Epidemiology: February 1 to July 31, 2024



Source: World Health Organization (WHO). First meeting of the International Health Regulations (2005) Emergency Committee regarding the upsurge of mpox 2024 [Internet]. Geneva: WHO; 2024 [modified 2024 Aug 19; cited 2024 Sep 6]. Available from: https://www.who.int/news/item/19-08-2024-first-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-upsurge-of-mpox-2024

Public Health Agency of Canada Clade Ia and Ib MPXV Risk Assessment

As of September 4, 2024

Question	Clade Ia MPXV estimate [Uncertainty]	Clade Ib MPXV estimate [Uncertainty]
What is the likelihood of at least one traveller infected with clade Ia or Ib MPXV entering Canada in the next three months?	**Low** [High]	**High** [Moderate]
What would be the impact on an individual infected with clade Ia or Ib MPXV (including impact on mental health, disease morbidity/mortality, and/or welfare)?	• Children/infants, pregnant individuals, and immunocompromised individuals: **Major** [Moderate] • Individual without known risk factors: **Moderate** [Moderate]	• Children/infants, pregnant individuals, and immunocompromised individuals: **Major** [High] • Individual without known risk factors: **Minor** [High]

Source: Public Health Agency of Canada. Rapid risk assessment: clades 1a and 1b mpox virus (MPXV) multi-country outbreaks – public health implications for Canada [Internet]. Ottawa, ON: Government of Canada; 2024 [modified 2024 Sep 13; cited 2024 Sep 16]. Available from: https://www.canada.ca/en/public-health/services/emergency-preparedness-response/rapid-risk-assessments-public-health-professionals/rapid-risk-assessment-clades-1a-1b-mpox-virus-multi-country-outbreaks-public-health-implications-2024.html

Public Health Agency of Canada Clade Ia and Ib MPXV Risk Assessment

As of September 4, 2024

Question	Response
What is the most likely spread scenario should an infectious traveller enter Canada with clade Ia or Ib MPXV?	• Transmission through households and non-household close contacts, including sexual contacts • Potential for domestic amplification through high-contact sexual networks, including among sex workers and gay, bisexual, and men who have sex with men (gbMSM)
What would be the population health impact on the affected and the general populations?	• Households and non-household close contacts, including sexual contacts: **Moderate** [Moderate] • Individuals in high-contact sexual networks, including gbMSM and sex workers and their close contacts: **Moderate** [Moderate] • General population: **Minor** [Low]

Source: Public Health Agency of Canada. Rapid risk assessment: clades 1a and 1b mpox virus (MPXV) multi-country outbreaks – public health implications for Canada [Internet]. Ottawa, ON: Government of Canada; 2024 [modified 2024 Sep 13; cited 2024 Sep 16]. Available from: https://www.canada.ca/en/public-health/services/emergency-preparedness-response/rapid-risk-assessments-public-health-professionals/rapid-risk-assessment-clades-1a-1b-mpox-virus-multi-country-outbreaks-public-health-implications-2024.html

MPXV Testing at Public Health Ontario

PHO MPXV Testing Process

- MPXV Polymerase Chain Reaction (PCR) diagnostic testing is performed on appropriate specimen types (e.g., lesion swabs)
- MPXV PCR detects two viral targets:
  1. Generic target - identifies **both** clade I and II (“pan-Monkeypox”)
  2. Specific target - identifies **only** clade II
- PHO’s laboratory is working with the National Microbiology Laboratory (NML) to develop an assay that can detect and distinguish subclade Ib
- If a specimen only has the generic target detected this will be flagged for suspicion of clade I. The specimen will undergo whole genome sequencing to distinguish clade Ia vs. Ib and will be sent to NML for confirmation

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Monkeypox virus testing information [Internet]. Toronto, ON: King’s Printer for Ontario; 2024 [modified 2024 Aug 20; cited 2024 Sep 6]. Available from: https://www.publichealthontario.ca/en/Laboratory-Services/Test-Information-Index/Monkeypox-Virus

Specimen Collection

Specimen type	Collection notes
Lesion fluid, crust material, or scab	• Submit sterile tube/container or virus culture collection kit (order #390081)
Swab of lesion	• Submit sterile tube/container or virus culture collection kit • Anal/rectal swabs recommended in patients with appropriate symptoms (e.g., rectal lesion/pain) • Detection sensitivity from individual skin specimens is higher (approximately 90%) than NP/throat swab and blood
Nasopharyngeal (NP) and/or throat swab	• Submit sterile tube/container, virus culture collection kit, or respiratory collection kit (order #390082) • Generally not recommended in patients with skin lesions that can be swabbed • Also submit a blood sample for patients presenting during the prodromal stage

Other collection notes:

- De-roofing vesicles or using sharps to collect specimens is not necessary
- Swab samples can be collected as a dry swab or added to a minimum volume of viral transport media (e.g., 1ml) to avoid excessive dilution of the sample

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Monkeypox virus testing information sheet [Internet]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Sep 10]. Available from: https://www.publichealthontario.ca/en/Laboratory-Services/Test-Information-Index/Monkeypox-Virus

Specimen Storage and Transport

- Label specimen with patient's full name, date of collection and one other unique identifier (e.g., date of birth or Health Card Number)
- Place the specimen container in a biohazard bag and seal the bag; insert the completed General Test Requisition in the pocket on the outside of the sealed biohazard bag
- Clinical MPXV specimens have been temporarily reclassified as UN3373 Biological Substance, Category B for land and air transport. The outer packaging must be marked, on a contrasting background, with "Temporary Certificate – TU 0886" or "TU 0886"
- Specimens should be stored at 2-8°C following collection and shipped to Public Health Ontario on ice packs

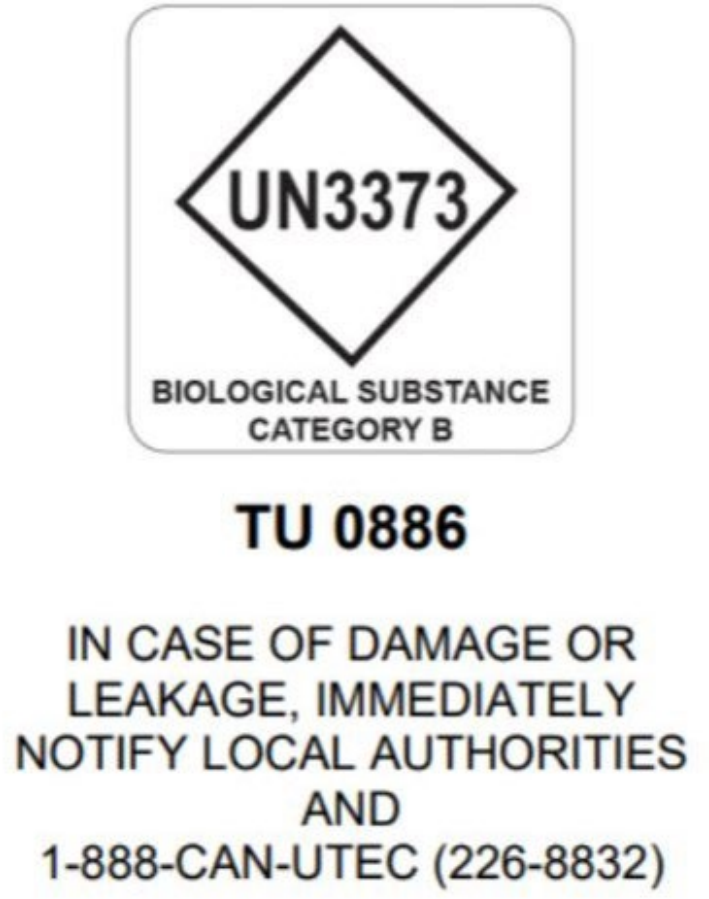
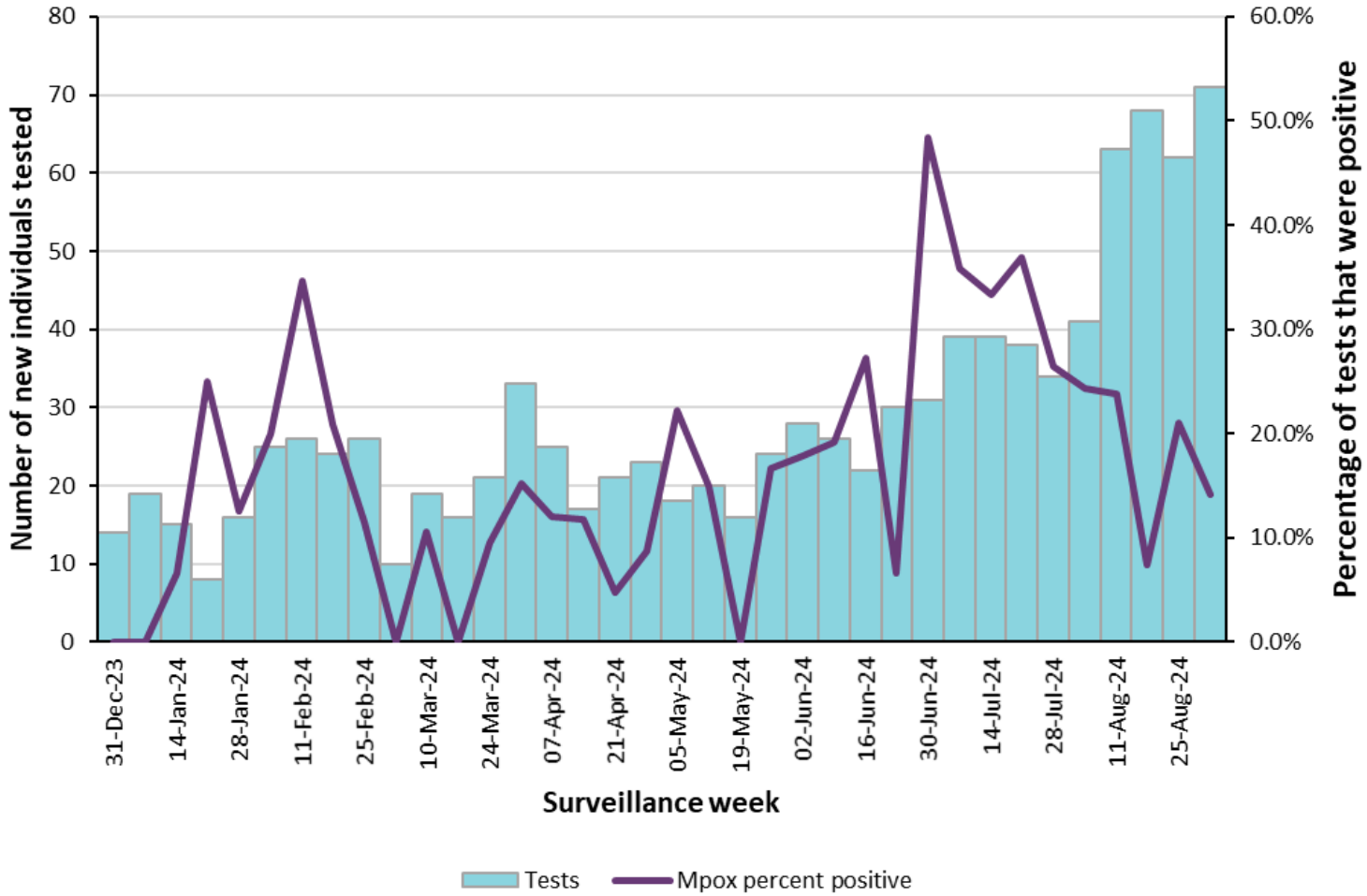


Image source: Ottawa Public Health. Health care professionals: mpox (formerly Monkeypox) virus. Ottawa, ON: Ottawa Public Health; 2024 [cited 2024 Sep 10]. Available from: https://www.ottawapublichealth.ca/en/professionals-and-partners/monkeypox-virus-mpxv.aspx

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Monkeypox virus testing information sheet [Internet]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2025 Sep 10]. Available from: https://www.publichealthontario.ca/en/Laboratory-Services/Test-Information-Index/Monkeypox-Virus

Number of New Individuals Tested for Mpox and Percent Positivity



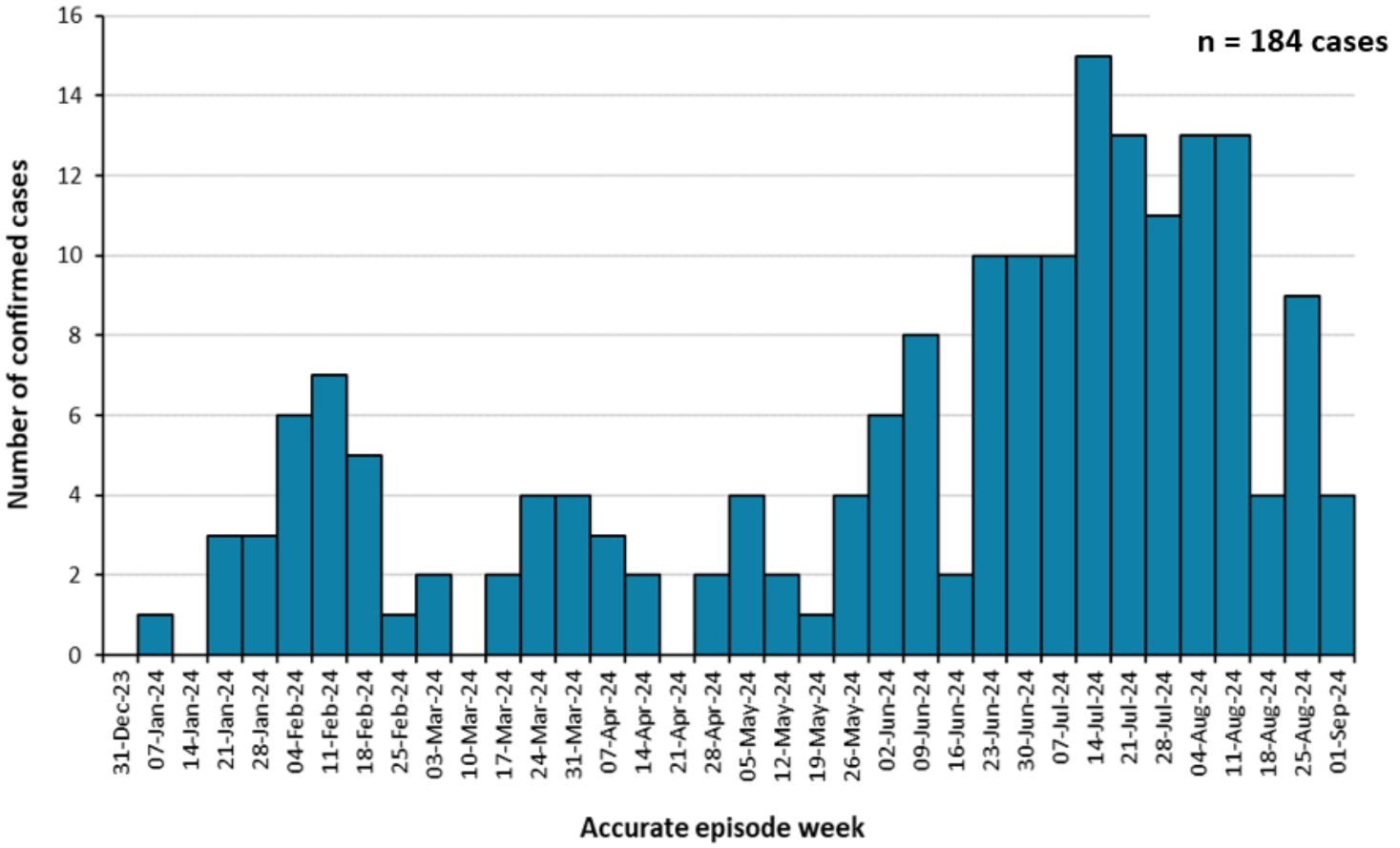
In 2022, Ontario used a weekly percent positivity threshold of < 5% to indicate low levels of mpox activity

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Laboratory information management system [database]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Aug 14]. Unpublished.

Mpox Epidemiology in Ontario

Confirmed Mpox Cases by Episode Week

January 1 to September 7, 2024



- The increase in mpox in Ontario began in late January 2024 with a greater increase in June and July
- All mpox cases in Ontario are Clade IIb
- There have been no cases of the new mpox Clade Ib detected in Ontario

Source: Ontario. Ministry of Health. integrated Public Health Information System (iPHIS) [database]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Sep 9]. Unpublished.

Key Highlights

January 1 to September 7, 2024

- **Sex**
  - 177/184 (96.2%) cases are male
  - 4/184 (2.2%) cases are female
  - 3/184 (1.6%) cases are unknown gender
- **Age**
  - Median age of cases is 35.5 years
- **Location of cases**
  - 11 public health units have reported at least one case in 2024
  - 92.4% of cases (170/184) have occurred in the Greater Toronto Area

Source: Ontario. Ministry of Health. integrated Public Health Information System (iPHIS) [database]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Aug 28]. Unpublished.

Key Highlights Continued

January 1 to September 7, 2024

- **Severity of disease**
  - 2/184 (1.1%) cases were hospitalized
  - No deaths have been reported
- **Most frequently reported risk factors**
  - Engaging in sexual or intimate contact with a partner of the same sex (138/156; 88.5%)
  - Having a new and/or more than one sexual partner (126/156; 80.8%)
  - Having an anonymous sexual partner (96/156; 61.5%)
- **Travel history**
  - Nearly 85% (132/156) of cases reported no travel during the time they could have gotten their infection. This suggests most cases acquired their infection in Ontario

Source: Ontario. Ministry of Health. integrated Public Health Information System (iPHIS) [database]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Aug 28]. Unpublished.

Mpox Vaccine Status of Cases

January 1 to August 24, 2024

Vaccine status	Number (%)
Unvaccinated	99 (59.6%)
1 dose of vaccine	41 (24.7%)
2 doses of vaccine	26 (15.7%)
Total	**166 (100%)**

Nearly 85% of cases in 2024 are unvaccinated or only received 1 dose of an mpox vaccine

Sources:

- Ontario. Ministry of Health. integrated Public Health Information System (iPHIS) [datatbase]. Toronto, ON: King's Printer for Ontario; 2024 [extracted 2024 Aug 28]. Unpublished.
- Ontario Health. Digital Health Immunization Repository (DHIR). Toronto, ON: eHealth Ontario 2024 [extracted 2024 Aug 30]. Unpublished.

Mpox Vaccine: Eligibility and Effectiveness

Mpox Vaccine

Modified Vaccinia Ankara-Bavarian Nordic (MVA-BN)

- Earlier generations of smallpox vaccines are prepared from live, replicating vaccinia virus
- Modified Vaccinia Ankara-Bavarian Nordic (MVA-BN) contains live-attenuated, non-replicating vaccinia virus
  - Also known as SMV; trade names Imvamune®, Imvanex®, Jynneos®
  - Two doses administered subcutaneously (0.5 mL) at a 28-day minimum interval
- Health Canada authorizations
  - 2013: for use in an emergency situation for active immunization against smallpox infection for adults
  - 2020: for active immunization against smallpox, mpox and related Orthopoxvirus infections and disease in adults at high risk for exposure

Source: Public Health Agency of Canada. Smallpox and mpox vaccines: Canadian Immunization Guide for health professionals [Internet]. Ottawa, ON: Government of Ontario; 2024 [updated 2024 Sep 3; cited 2024 Sep 11]. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-21-smallpox-vaccine.html

Ontario Guidance for Pre-exposure Vaccination for High-risk Individuals

As of June 26, 2024

A. Two-spirit, non-binary, transgender, cisgender, intersex, or gender-queer individuals who self-identify or have sexual partners who self-identify as belonging to the gay, bisexual, pansexual and other men who have sex with men (gbMSM) community **and** at least one of the following:
   - Have more than one partner
   - Are in a relationship where at least on of the partners has other sexual partners
   - Have had a confirmed sexually transmitted infection (STI) within the last year
   - Have attended venues for sexual contact (such as bathhouses, sex clubs)
   - Have had anonymous sex recently (such as using hookup apps)

B. Sexual partners of individuals who meet the criteria above

C. Sex worker (regardless of gender, sex assigned at birth, or sexual orientation) or who are a sexual contact of an individual who engages in sex work

D. Staff or volunteers in sex-on-premise venues where workers may have contact with surfaces or objects that may be contaminated with mpox

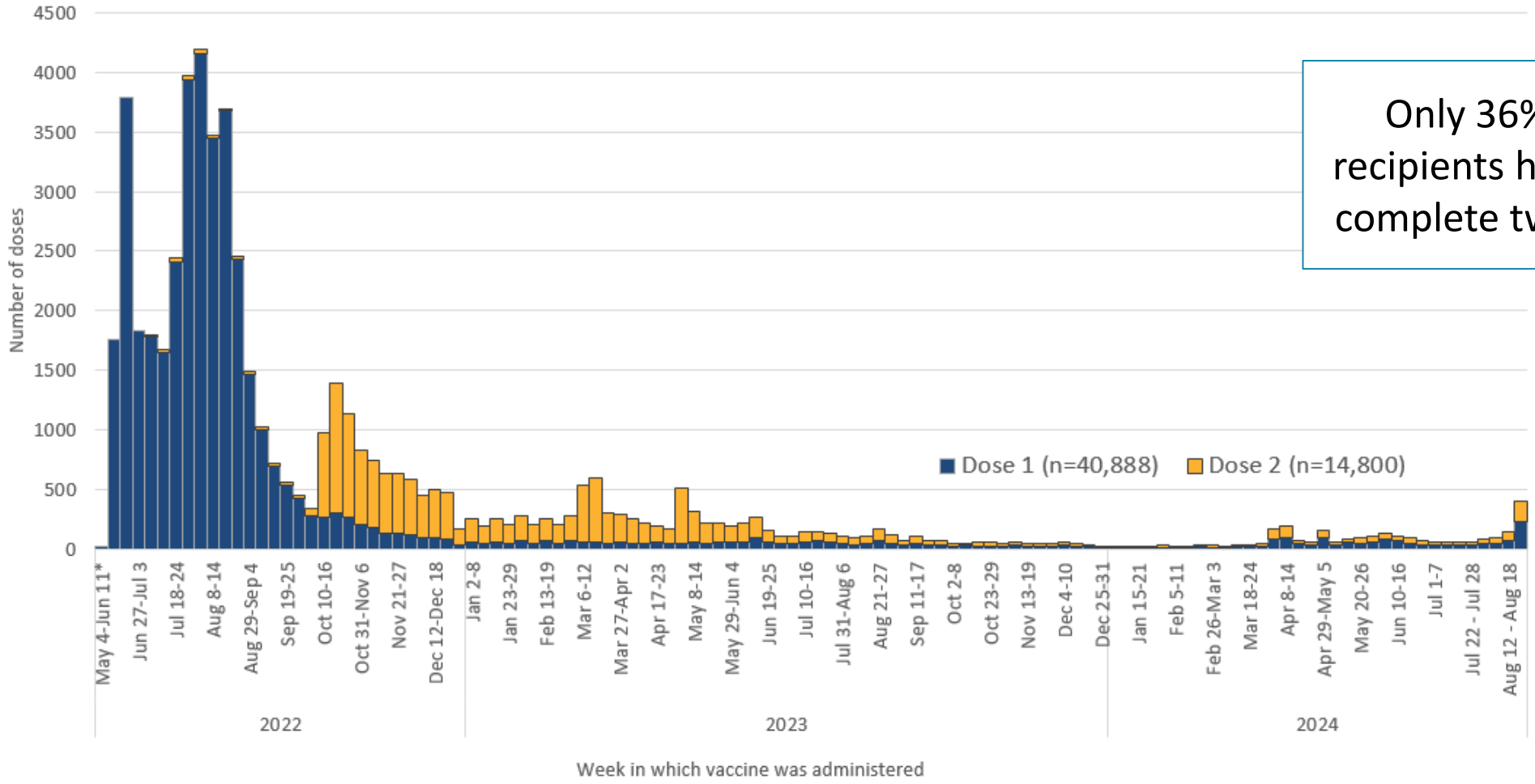
E. Individuals who engage in sex tourism (regardless of gender, sex assigned at birth, or sexual orientation)

F. Individuals who anticipate experiencing any of the above scenarios

- Household and/or sexual contacts of those identified in parts A or B **AND** who are moderately to severely immunocompromised or pregnant who may be at higher risk for severe illness from mpox infection, in consultation with their health care provider.
- Research laboratory employees working directly with replicating orthopoxviruses if there is an ongoing risk of exposure.

Source: Ontario. Ministry of Health. Mpox vaccine (Imvamune®) guidance for health care providers: version 5.0 – June 26, 2024 [Internet]. Toronto, ON: King's Printer for Ontario; 2024 [cited 2024 Sep 11]. Available from: https://www.ontario.ca/files/2024-06/moh-mpox-vaccine-guidance-hcp-v5-0-en-2024-06-28.pdf

Number of Mpox Vaccine Doses Administered in Ontario

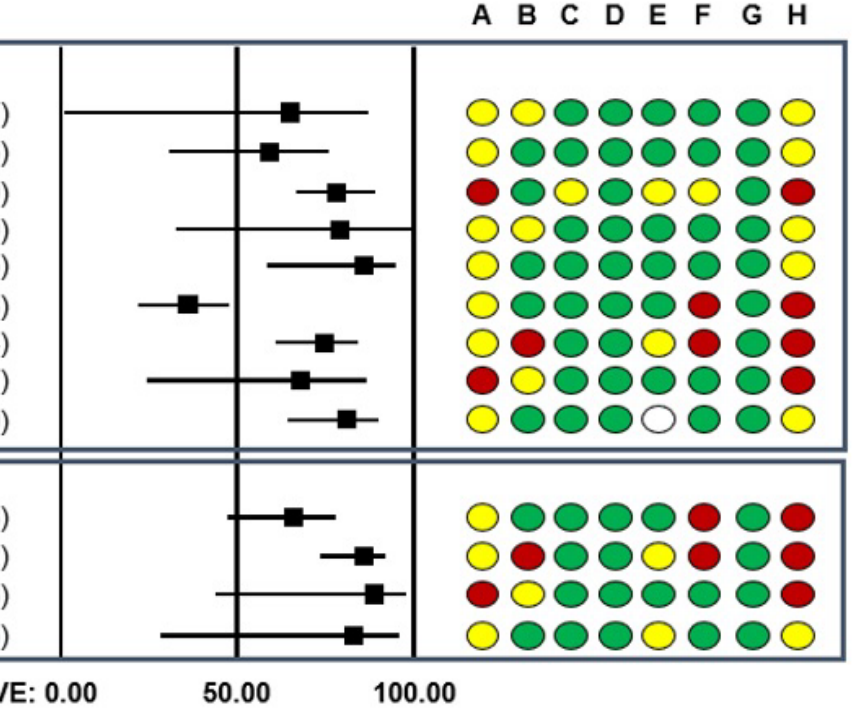


Only 36% of vaccine recipients have received a complete two-dose series

Source: Ontario Health. Digital Health Immunization Repository (DHIR). Toronto, ON: eHealth Ontario 2024 [extracted 2024 Sep 6]. Unpublished.

Vaccine Effectiveness of Mpox Vaccines

Study name	Study design	n, cases[1]	n, controls[1]	VE and 95% CI
1 dose studies				
Brousseau, et al. (Canada)	Case-control	231	301	65% (1 to 87)
Navarro, et al. (Canada)	Cohort study	3204	3204	59% (31 to 76)
Bertran, et al. (UK)	Case-coverage	362	N/A	78% (54 to 89)
Fontan-Vela, et al. (Spain)	Cohort study	5660	5660	79% (33 to 100)
Sagy, et al. (Israel)	Cohort study	1037	1017	86% (59 to 95)
Deputy, et al. (USA)	Case-control	2193	8319	36% (22 to 48)
Dalton, et al. (USA)	Case-control	309	608	75% (61 to 84)
Rosenberg, et al. (USA)	Case-control	252	255	68% (25 to 87)
Ramchandani, et al (USA)	Cohort study	685	2393	81% (64 to 90)
2 dose studies				
Deputy, et al. (USA)	Case-control	2193	8319	66% (47 to 78)
Dalton, et al. (USA)	Case-control	309	608	86% (74 to 92)
Rosenberg, et al. (USA)	Case-control	252	255	89% (44 to 98)
Ramchandani, et al (USA)	Cohort study	1152	2393	83% (28 to 96)



[1] Cohort studies are shown as n, vaccinated and n, unvaccinated.

Studies are stratified by the number of doses administered to participants. A pooled meta-analysis was not performed due to the significant heterogeneity observed across studies. The **forest plot** depicts estimated vaccine effectiveness (VE) and 95% confidence interval (CI) of individual studies. **Risk of bias legend:** A) bias due to confounding; B) bias in selection of participants into the study; C) bias in classification of interventions; D) bias due to deviation from intended interventions; E) bias due to missing data; F) bias in measurement of outcomes; G) bias due to selection of reported result; H) overall risk of bias. Green represents a low risk of bias, yellow a moderate risk of bias, red a serious risk of bias, and white represents no information.

Source: National Advisory Committee on Immunization (NACI). Interim guidance on the use of Imvamune® in the context of a routine immunization program. Ottawa, ON: His Majesty the King in Right of Canada, as represented by the Minister of Health; 2024 [cited 2024 Sep 11]. Available from: https://www.canada.ca/en/public-health/services/publications/vaccines-immunization/national-advisory-committee-immunization-interim-guidance-imvamune-routine-immunization-program.html

Canadian Immunization Guide

Mpox Vaccines (September 3, 2024)

- Individuals at high risk of mpox should receive two doses of mpox vaccine administered at least 28 days apart
- Catch-up: Those who have started a primary series, in whom more than 28 days have passed without receipt of the second dose, should receive the second dose regardless of time since the first dose
- Mpox vaccine can be given concurrently or at any time before or after other live- or non-live vaccines
- At this time, there are no recommendations for additional doses of mpox vaccine (i.e., more than 2) for individuals at high risk in community settings, including immunocompromised populations

Source: Public Health Agency of Canada. Smallpox and mpox vaccines: Canadian Immunization Guide for health professionals [Internet]. Ottawa, ON: Government of Canada; 2024 [updated 2024 Sep 3]. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-21-smallpox-vaccine.html

Mpox Case Management Guidance

Notification of an atypical mpox case

- In order to monitor for changes in mpox transmission dynamics in Ontario, Public Health Units should notify Public Health Ontario and the Ministry of Health in the following situations:

1. Suspicion that a case may be infected with clade I MPXV (e.g. based on travel history, risk factors, laboratory results)
   - Proceed with case and contact management as usual

2. Any case that does not identify as part of the key population affected or does not have an identified common risk factor such as individuals who:
   - Identify as male and report sex with opposite sex
   - Identify as female
   - Are less than 18 years of age (excluding adolescents with an identified risk factor)

Case Management Goals

- Aim of the new guidance is to balance risk of MPXV transmission to others while taking into consideration health, social, financial, and other harms associated with a prolonged isolation period
- As there is a wide variability in clinical presentation of mpox, the new guidance provides the ability for Public Health Units to tailor their case management approach to the case's clinical symptoms/progression and their ability to apply risk mitigation measures

Self-isolation and Risk Mitigation Measures

- Self-isolation is generally **not required** if cases can adhere to risk mitigation measures including:
  - Performing frequent hand hygiene
  - Covering skin lesions with bandages or clothing
  - Wearing a medical mask if there are oropharyngeal lesions or respiratory symptoms
  - Avoiding interactions where prolonged close, direct skin-to-skin contact may occur (including sexual contact)
  - Avoiding direct contact with individuals at higher risk of severe disease (i.e., children < 12 years old, pregnant individuals, and those who are immunocompromised)
  - Avoiding congregate settings if possible
- Self isolation is **required** if cases have skin lesions that cannot be covered and/or have systemic symptoms that make adherence to risk mitigation measures difficult
  - Example: case has oropharyngeal lesions and cough but is unable to wear a medical mask
- Cases who initially present with mild symptoms but develop symptoms that make adherence to risk mitigation measures difficult should enter self-isolation (e.g., numerous skin lesions that cannot be covered)

Recommendations for Animal/Pet Precautions

- **Symptomatic mpox cases:** avoid close and/or prolonged unprotected contact (e.g., not wearing clothing or bandages covering lesions) with pets while infectious (e.g., petting, snuggling, kissing, sleeping with pets)
- **Asymptomatic exposed animals:** if possible, ask someone else in the home who is not sick to care for the pet, especially for rodents, rabbits, and non-human primates. For dogs that go outside, keep them on leash and kept away from other animals
- **Symptomatic exposed animals:** consult a veterinarian to seek advice on MPXV testing and keep the animal away from individuals at higher risk of severe mpox infection

Mpox Contact Management Guidance

Considerations for Exposure Risk Assessment

- Case symptoms at time of interaction such as:
  - Location and extent of skin lesions (e.g., single genital lesion vs. disseminated rash)
  - If skin lesions were appropriately and consistently covered
  - Presence of respiratory symptoms and use of a well-fitting mask by case
- Contact characteristics such as being at higher risk of severe mpox illness (i.e., immunocompromised, pregnant, less than 12 years old)
- Duration and nature of the interaction between the case and contact (e.g., direct contact vs. sharing of potentially contaminated items)

Extending the Contact Tracing Period

- Recent evidence suggests that some cases may be infectious up to 4 days before the onset of symptoms
- It is currently unknown what proportion of mpox cases transmit the virus pre-symptomatically, and if the likelihood of pre-symptomatic transmission varies by route of transmission
- PHUs may consider extending contact tracing to high-risk contacts who were exposed to the case up to 4 days before their symptom onset (especially if employing a more rigorous contact management approach and if the necessary resources are available)

Risk of Exposure Assessment for Contacts in Community Settings*

Risk	Description	Examples
High	• Direct prolonged contact between the individual's skin/mucus membranes and a case's lesion(s)/scab(s), mucus membranes, respiratory secretions, and/or body/biological fluids	• Intimate or sexual contact • Touching a case's skin lesion(s)/scab(s) without wearing gloves
Intermediate	Does not meet high-risk criteria, but interaction may result in direct contact with infectious materials such as: • Prolonged close face-to-face contact (within 2 metres) with case who has respiratory symptoms • Direct contact with surfaces or objects contaminated by a case's skin lesion(s)/scab(s) or body/biological fluids	• Unprotected prolonged face-to-face interaction with a case who has oral lesions and was not wearing a medical mask for source control • Unprotected contact with a case's contaminated bedding/linens, towels, clothing, lesion dressings, sex toys, etc.
Low**	A limited exposure deemed not meeting criteria for other risk categories	• Individuals in same room as a case but no close proximity (e.g., co-workers in nearby cubicles)

* At the discretion of the PHU, an exposure may be re-classified to a different risk level due to context-specific factors.
** For low risk contacts, public health follow-up/monitoring is not required.

Contact Management

- Quarantine is not indicated, asymptomatic contacts should generally be able to continue their activities
- Monitor for signs and symptoms for 21 days from last exposure including for new skin rash/lesions, fever, chills, headache, myalgia, lymphadenopathy, pharyngitis (sore throat), and proctitis (rectal inflammation/pain)
  - If symptoms develop the individual should notify the public health unit and seek a clinical assessment by a health care provider
  - Contacts should be made aware of their potential to still develop mpox infection (including mild symptoms) even if they have received 1 or 2 doses of vaccine
  - Infant and young children should be monitored by their caregivers
- Offer post-exposure prophylaxis vaccine if indicated

Post-exposure Prophylaxis (PEP) Vaccination

- **High-risk contact:** PEP vaccination should be offered ideally within 4 days (up to 14 days) from the date of the last exposure
- **Intermediate-risk contact:** PEP vaccination is not routinely indicated but it may be considered on a case-by-case basis based on the PHU's exposure risk assessment
  - PHUs may consider having a lower threshold to offer post-exposure vaccination more broadly to intermediate risk contacts in situations where the exposure risk assessment is challenging and/or not feasible (e.g., case(s) and/or contact(s) are not able to provide a reliable exposure history)

Mpox in Educational and Congregate Settings

Mpox Exposures in Educational and Congregate Settings

- Educational and congregate settings (e.g., long-term care home, shelter, correctional facility), should follow sector specific legislation and guidelines for when a child/client or staff member becomes ill while at the setting
- PHUs should work with the case and/or educational/congregate setting to complete an exposure risk assessment, identify close contacts, and offer post-exposure prophylaxis where appropriate
- Given the potential for an outbreak/increased severity of disease, if a high-risk exposure to an mpox case in an educational/congregate setting occurs, the health unit should consult with Public Health Ontario and the Ministry of Health to assist with the risk assessment and investigation

Mpox Outbreak in an Educational or Congregate Setting

- **Declaring the start of an outbreak**
  - Suspect outbreak: a single probable case of mpox acquired in the facility
  - Confirmed outbreak: a single confirmed case of mpox acquired in the facility

- **Declaring an outbreak over**
  - An outbreak may be declared over when there are no new cases in residents or staff linked to exposures in the setting after 21 days (one maximum incubation period has passed) from the last date that others were potentially exposed to an infectious mpox case

Infection Prevention and Control in Community Settings

IPAC Recommendations for an Mpox Case

- Clean hands often with an alcohol-based hand rub or soap and water
- Use dedicated clothing, bed linens, and towels
- Cover shared furniture with a launderable coversheet/blanket
- Clean and disinfect shared items/common surfaces after use
- Use a separate bathroom if available
  - Clean and disinfect shared bathroom after each use

IPAC Recommendations for Caregivers of an Mpox Case

- Perform hand hygiene regularly including before putting on gloves, after removing gloves, after touching lesions or contaminated materials (e.g., dressings, clothing, linens)
- Wear a medical mask and disposable gloves if in direct contact with skin lesions
- Wear a medical mask if in a case's isolation space
- Wear disposable gloves and gown/long-sleeved clothing if handling contaminated materials (e.g., laundry)

Other IPAC Advice

- **Laundry**
  - Do not shake soiled laundry to prevent dispersion of infectious particles
  - Do not hold soiled laundry against self
  - Wash laundry in a standard washing machine with hot water and detergent
- **Cleaning**
  - Clean and disinfect MPXV contaminated surfaces
  - Usual household cleaning and disinfecting products are sufficient
- **Waste**
  - Discard contaminated items (e.g., bandages, gauze) directly into a dedicated waste container
  - Perform regular hand hygiene, including after removing gloves used to handle waste
  - Double bag waste using strong bags and ensure they are securely tied

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Public Health Ontario Resources

- Ontario Agency of Health Protection and Promotion (Public Health Ontario). Enhanced epidemiological summary: Mpox in Ontario: January 1 to August 24, 2024 [Internet]. Toronto, ON: King's Printer for Ontario; 2024 [cited 2024 Sep 11]. Available from: https://www.publichealthontario.ca/-/media/Documents/M/24/mpox-ontario-enhanced-episummary.pdf?rev=c1de3496d1aa4dfea556146cc9ea2c8c&sc_lang=en
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