

## QUICK EPIDEMIOLOGICAL SUMMARY

# Mpox Immunization and Post-immunization Cases in Ontario

1<sup>st</sup> Revision: April 2023

## Purpose

This report provides a summary of monkeypox (Mpox) vaccine uptake in Ontario as of October 24, 2022. It also provides a comparison of confirmed cases of Mpox by immunization status, including those who were immunized prior to symptom onset (post-immunization cases) and those who did not receive any vaccine (unimmunized).

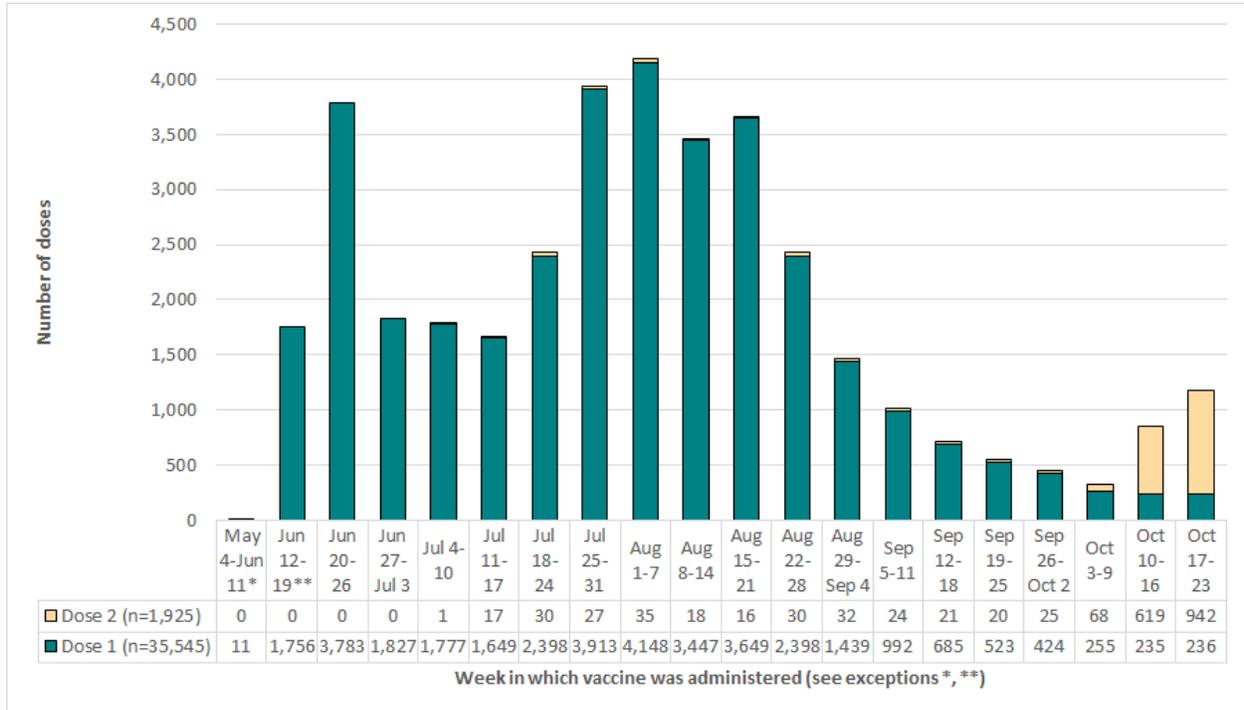
## Summary

- A total of 37,470 doses of Imvamune<sup>®</sup> have been administered in Ontario among 35,545 people between May 4 and October 24, 2022 (source: Digital Health Immunization Repository (Panorama)).
  - The weekly number of doses administered is shown in Figure 1. A small percentage of doses (5.1%, n=1,925 doses) were administered as second doses.
  - Almost all doses were administered for pre-exposure prophylaxis (97.2%), while a small proportion were administered for post-exposure prophylaxis (1.2%); reason for administration was unknown for 1.6% of all doses.
  - 92.0% of immunized individuals were male; 5.4% were female. The highest number of doses were administered among 30-39 year olds (33.4%), followed by 18-29 year olds (22.1%) and 40-49 year olds (18.2%).
- To characterise Mpox cases that occurred following immunization, immunization histories of confirmed cases were determined through a review of data entered in the integrated Public Health Information System (iPHIS) and by linking case data in iPHIS with immunization records in the Digital Health Immunization Repository through the use of health card number, name and date of birth.
  - As of October 24, 2022, there were 687 confirmed cases of Mpox.
  - While 31.3% (n=215 cases) of Mpox cases received at least one dose of Imvamune<sup>®</sup> vaccine, they represented just 0.6% of all individuals who were immunized.
  - Among cases who received a dose, 143 (66.5%) were immunized prior to onset of illness (post-immunization cases), while 72 (33.5%) received at least one dose on the same day as or after onset. There were 472 cases (68.7%) who had no record of ever receiving a dose (unimmunized cases). (Table 1)

- Among the 143 cases who were immunized before onset (i.e. post-immunization cases), 3 cases (2.1%) were immunized for PEP and 132 cases (92.3%) were administered for PrEP; the reason was unknown for 4 cases (2.8%).
- Figure 2 shows the distribution in days between dose administration and onset of illness among cases who received at least one dose of vaccine. Most post-immunization cases occurred between one and 13 days after immunization (n=65, 45.5%). (Figure 3) This time period from vaccination does not provide sufficient time to develop an immune response to the first dose.
- All post-immunization cases were male (n=143) and were slightly older compared to unimmunized cases (median age 36.6 versus 35.2 years, respectively); the age distribution is shown in Figure 4.
- Compared to unimmunized cases, post-immunization cases were less likely to report a hospital and/or ICU admission (3.8% versus 0.7%, respectively) or any symptoms (90.9% versus 79.0%, respectively). (Table 2)

# Results

**Figure 1. Number of Mpox vaccine doses administered in Ontario by dose number and date of administration, May 4 – October 24, 2022 (n=37,470 doses)**



\* Prior to mass immunization clinic events.

\*\* Period extended to 8 days to incorporate a mass immunization clinic on June 12.

**Note:**

1. A minimum interval of 24 days between the first and subsequent dose was applied to count valid second doses. Individuals who received a second dose less than 24 days after their first dose were considered to have received one dose.

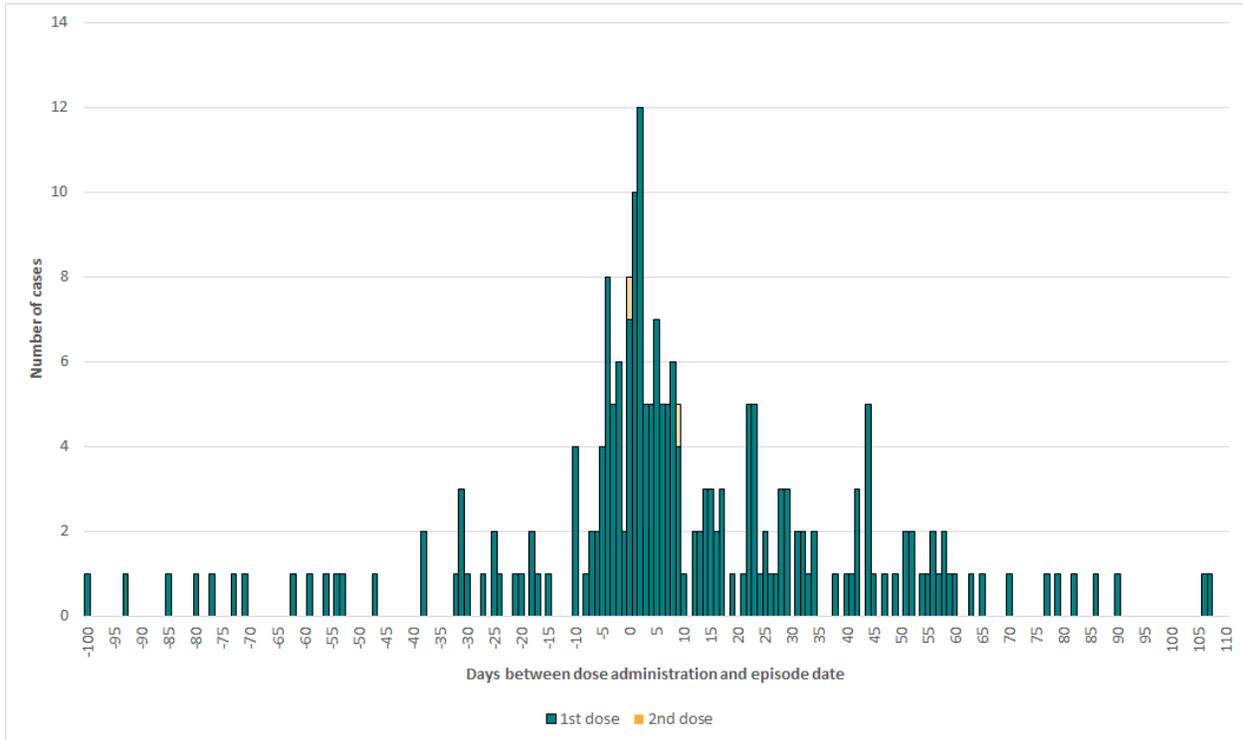
**Table 1. Summary of immunizations received among confirmed cases of Mpox in Ontario as of October 24, 2022**

Immunization status	Number of cases	Percent (%)
<b>Total number of cases</b>	<b>687</b>	<b>100.0</b>
<b>Received at least one dose of Imvamune® vaccine</b>	<b>215</b>	<b>31.3</b>
Immunized before onset (post-immunization cases)	143	66.5
Onset 1 to 13 days after immunization	65	45.5
Onset 14 to 20 days after immunization	12	8.4
Onset 21 to 27 days after immunization	16	11.2
Onset at least 28 days after immunization	50	35.0
Immunized on the same day as onset	8	3.7
Immunized after onset	64	29.8
<b>Did not receive any Imvamune® vaccine (unimmunized cases)</b>	<b>472</b>	<b>68.7</b>

**Note:**

1. Onset date may refer to the symptom onset date, laboratory specimen collection date or when the case was reported to the public health unit.

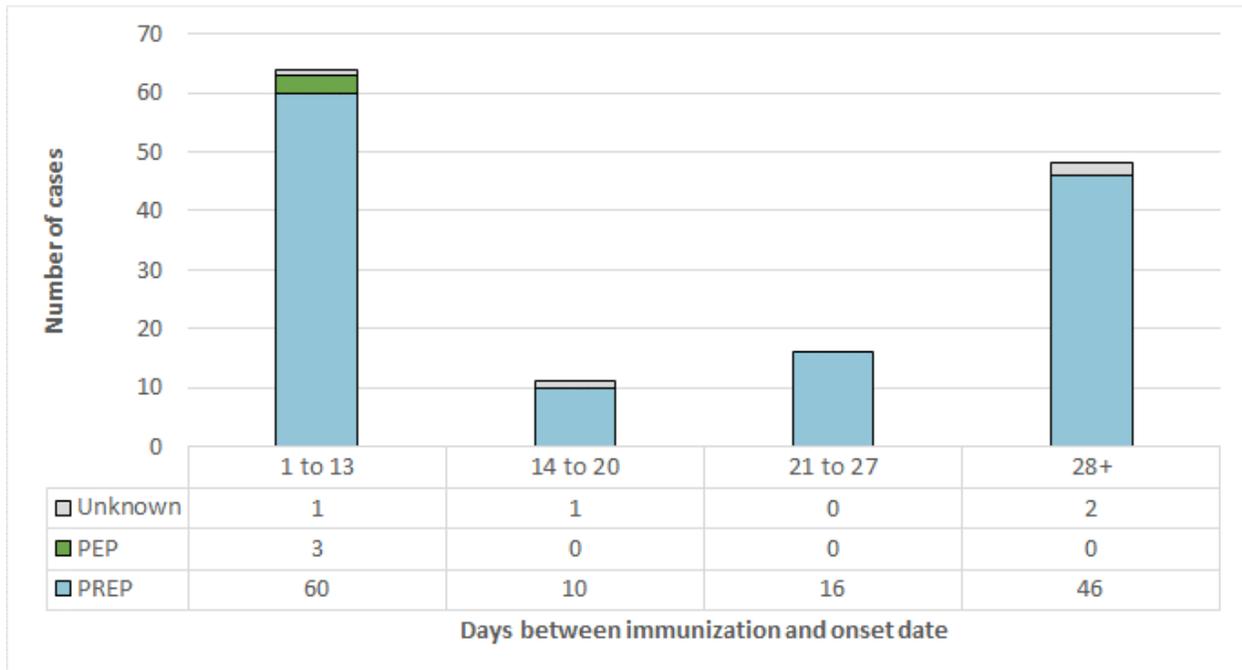
**Figure 2. Days between dose administration and episode date among individuals who received at least one dose of Mpxv vaccine by dose number (n=215 cases)**



**Note:**

1. The interval is calculated as the number of days between the most recent dose and the episode date; in the event illness occurred between the first and second dose, the interval is calculated from the first dose (n=14). A negative value indicates immunization was received after the onset date.
2. Episode date may refer to the symptom onset date, laboratory specimen collection date or when the case was reported to the public health unit.

**Figure 3. Post-immunization Mpox cases by interval between dose administration and episode date and reason for administration (n=143 cases)**



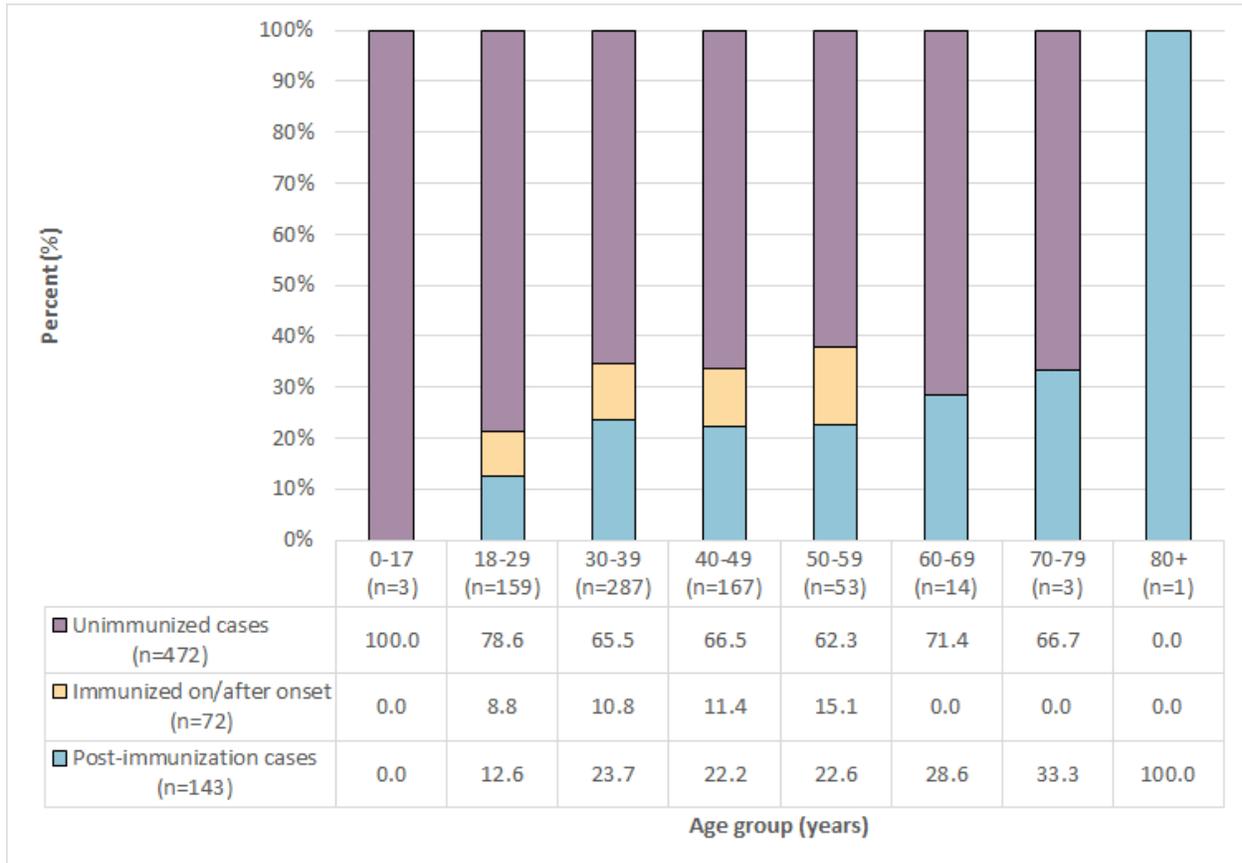
\* PEP: post-exposure prophylaxis

\* PrEP: pre-exposure prophylaxis

**Note:**

1. Episode date may refer to the symptom onset date, laboratory specimen collection date or when the case was reported to the public health unit.

**Figure 4. Age distribution Mpox cases by immunization status (n=687 cases)**



**Table 2. Severity of illness among all confirmed cases by category of immunization**

Severity of illness	All Cases (n=687) n (%)	Cases immunized on or after onset (n=72)	Post- Immunization cases (n=143)	Unimmunized cases (n=472)
		n (%)	n (%)	n (%)
<b>Hospitalization or ICU</b>	20 (2.9)	1 (1.4)	1 (0.7)	18 (3.8)
Hospitalized	20 (2.9)	1 (1.4)	1 (0.7)	18 (3.8)
ICU	2 (0.3)	0 (0.0)	0 (0.0)	2 (0.4)
<b>Any symptom</b>	605 (88.1)	63 (87.5)	113 (79)	429 (90.9)
Any rash	530 (77.1)	54 (75)	98 (68.5)	378 (80.1)
Macular	135 (19.7)	15 (20.8)	23 (16.1)	97 (20.6)
Papular	195 (28.4)	19 (26.4)	37 (25.9)	139 (29.4)
Vesicular	222 (32.3)	18 (25)	41 (28.7)	163 (34.5)
Pustular	133 (19.4)	12 (16.7)	19 (13.3)	102 (21.6)
Crusted	9 (1.3)	0 (0.0)	2 (1.4)	7 (1.5)
Oral/genital lesions	425 (61.9)	37 (51.4)	84 (58.7)	304 (64.4)
Fever	331 (48.2)	36 (50)	41 (28.7)	254 (53.8)
Fatigue	304 (44.3)	31 (43.1)	37 (25.9)	236 (50)
Lymph node	300 (43.7)	28 (40.0)	56 (39.2)	218 (46.2)
Chills	288 (41.9)	27 (37.5)	34 (23.8)	227 (48.1)
Myalgia	216 (31.4)	18 (25)	26 (18.2)	172 (36.4)
Headache	223 (32.5)	20 (27.8)	26 (18.2)	177 (37.5)
Sweating	184 (26.8)	15 (20.8)	24 (16.8)	145 (30.7)
Sore throat	166 (24.2)	21 (29.2)	25 (17.5)	120 (25.4)
Prostration	120 (17.5)	10 (13.9)	17 (11.9)	93 (19.7)

## Data Source and Caveats

- Immunization data for this report were obtained from the Digital Health Immunization Repository (Panorama) and extracted using the Panorama Enhanced Analytical Reporting (PEAR) tool. Case data were extracted from the integrated Public Health Information System (iPHIS) using the Cognos reporting tool on October 24, 2022.
- Data were compiled and analyzed using the statistical software program SAS® version 9.4.
- Due to delays in data entry and reporting, data in Panorama may be incomplete. Further, while most doses were administered by public health units, doses administered by an external healthcare provider outside of a public health unit may not be reported, and thus would not be included in this analysis.
- Linkage between case data in iPHIS and immunization records in Panorama was conducted on the basis of healthcard number, name and date of birth; some cases may have been vaccinated but were classified as unimmunized due to the inability to be linked.
- Imvamune® is licensed to be given at a 28-day interval, but a 4-day grace period was used to determine valid second doses; individuals who received a second dose less than 24 days after their first dose were considered to have received one dose.
- Mpox cases are reported based on the Episode Date, which is an estimate of the onset date of disease for a case. In order to determine this date, the following hierarchy exists in iPHIS: Onset Date > Specimen Collection Date > Lab Test Date > Reported Date.
- Reason for administration was derived from free-text and drop-down fields in Panorama and iPHIS. Further details may be found here:

Ontario. Ministry of Health. Monkeypox vaccine (Imvamune®) guidance for health care providers [Internet]. Version 3.0. Toronto, ON: King's Printer for Ontario; 2022 [cited 2022 Oct 27].

Available from:

[https://www.health.gov.on.ca/en/pro/programs/emb/docs/Monkeypox\\_Imvamune®\\_Guidance\\_HCP.pdf](https://www.health.gov.on.ca/en/pro/programs/emb/docs/Monkeypox_Imvamune®_Guidance_HCP.pdf)

- Immunization data were sourced from Panorama and iPHIS where available; in the event of discrepant immunization information between Panorama and iPHIS, information in Panorama was prioritised.

## Summary of Revisions

New material in this revision is summarized in the table below.

Revision number	Description of Major Changes	Implementation Date
1	Monkeypox acronym changed from MPX to Mpx throughout the document.	April 2023

## Citation

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