

SURVEILLANCE REPORT

COVID-19 Vaccine Uptake in Ontario: December 14, 2020 to September 10, 2023

This report describes vaccine uptake using data extracted from the Ontario Ministry of Health's COVaxON application. Data in this report includes the most current information extracted from COVaxON as of September 11, 2023 at approximately 7:00 a.m., and describes vaccinations reported up to September 10, 2023. Population data used for denominators in coverage estimates have been updated. As a result, coverage estimates are not comparable to previous reports.

Please visit the interactive [Ontario Respiratory Virus Tool](#) to explore COVID-19 vaccination uptake data by public health unit, age group and trends over time.

This report is updated **every four weeks**.

Background

The COVID-19 vaccination program began in Ontario on December 14, 2020. Currently, all individuals in the province 6 months of age and older are eligible for a complete series of a Health Canada (HC) authorized COVID-19 vaccine, and all individuals 5 years of age and older are eligible for at least one booster dose.¹ Bivalent COVID-19 vaccine products are currently recommended as either a primary series for individuals 6 months of age and older, or as a booster dose at a 6 month interval for individuals 5 years of age and older who have not yet received a booster dose (monovalent or bivalent).¹ Between April 6 and July 6, 2023 high-risk individuals were further recommended to receive an additional booster dose of a bivalent COVID-19 vaccine product as part of Ontario's spring booster program.¹ However, effective July 7, 2023 individuals 5 years of age and older should consider delaying receipt of additional booster doses until fall 2023 (unless otherwise advised by a health care provider).¹

Definition of Terms

As vaccine program eligibility varies by age, the following definitions are used to describe vaccine uptake among individuals **5 years of age and older** (eligible for a bivalent booster):

- **Completed primary series and any booster dose over 12 months ago** refers to individuals that have completed their primary series and have received any number of booster doses (e.g. first booster, second booster) of HC-authorized COVID-19 vaccine over 12 months ago.
- **Completed primary series and any booster dose 6 to less than 12 months ago** refers to individuals that have completed their primary series and have received any number of booster doses (e.g. first booster, second booster) of HC-authorized COVID-19 vaccine 6 to less than 12 months ago.
- **Completed primary series and any booster dose within the previous 6 months** refers to individuals that have completed their primary series and have received any number of booster doses (e.g. first booster, second booster) of HC-authorized COVID-19 vaccine within the previous 6 months.

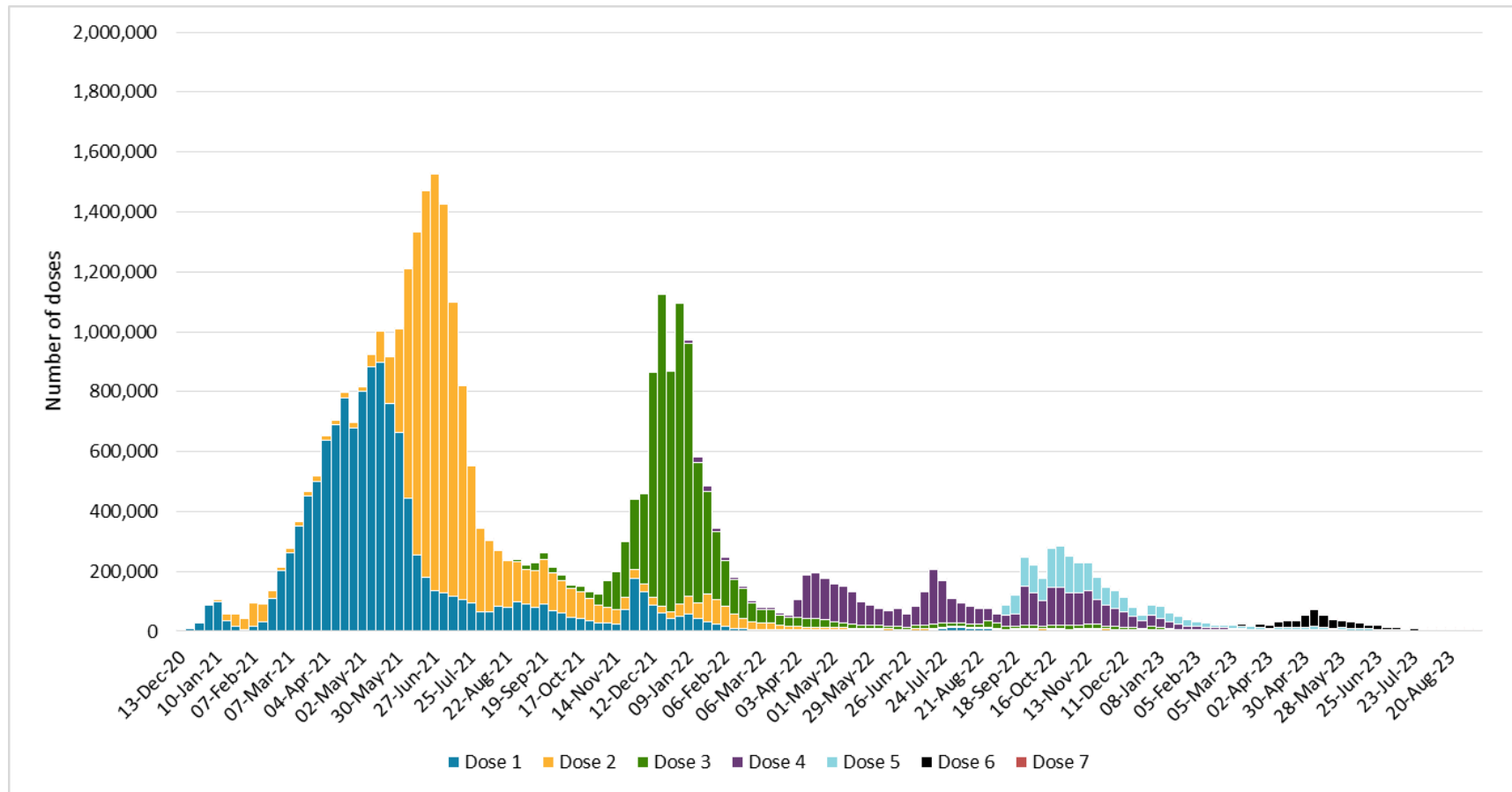
The definitions used to describe vaccine uptake among individuals **under 5 years of age** are described in the Technical Notes.

Highlights

- To date, 3,681,464 bivalent COVID-19 vaccine doses have been administered in Ontario (Table 1).
 - Since July 7th, 2023, 2,817 bivalent COVID-19 vaccine doses have been administered in Ontario as an initiation of a bivalent primary series (Table 1).
- 4.1% of individuals 5 years of age and older who completed their primary series have received any booster dose in the previous 6 months (Figure 3, Table 2).
 - The proportion of individuals that completed their primary series and received any booster dose in the previous 6 months increases with age. Over 16% of adults 70 years of age and older received any booster dose in the previous 6 months (Figure 3, Table 2).
 - 17.6% of individuals 5 years of age and older who completed their primary series received any booster dose 6 to less than 12 months ago, 31.0% of individuals 5 years of age and older received any booster dose over 12 months ago, and 30.4% of individuals 5 years of age and older completed their primary series but have received no booster doses (Figure 3, Table 2).
- To date, 5.0% of children under 5 years of age have completed their primary series (Figure 4, Table 3).

Doses Administered Over Time

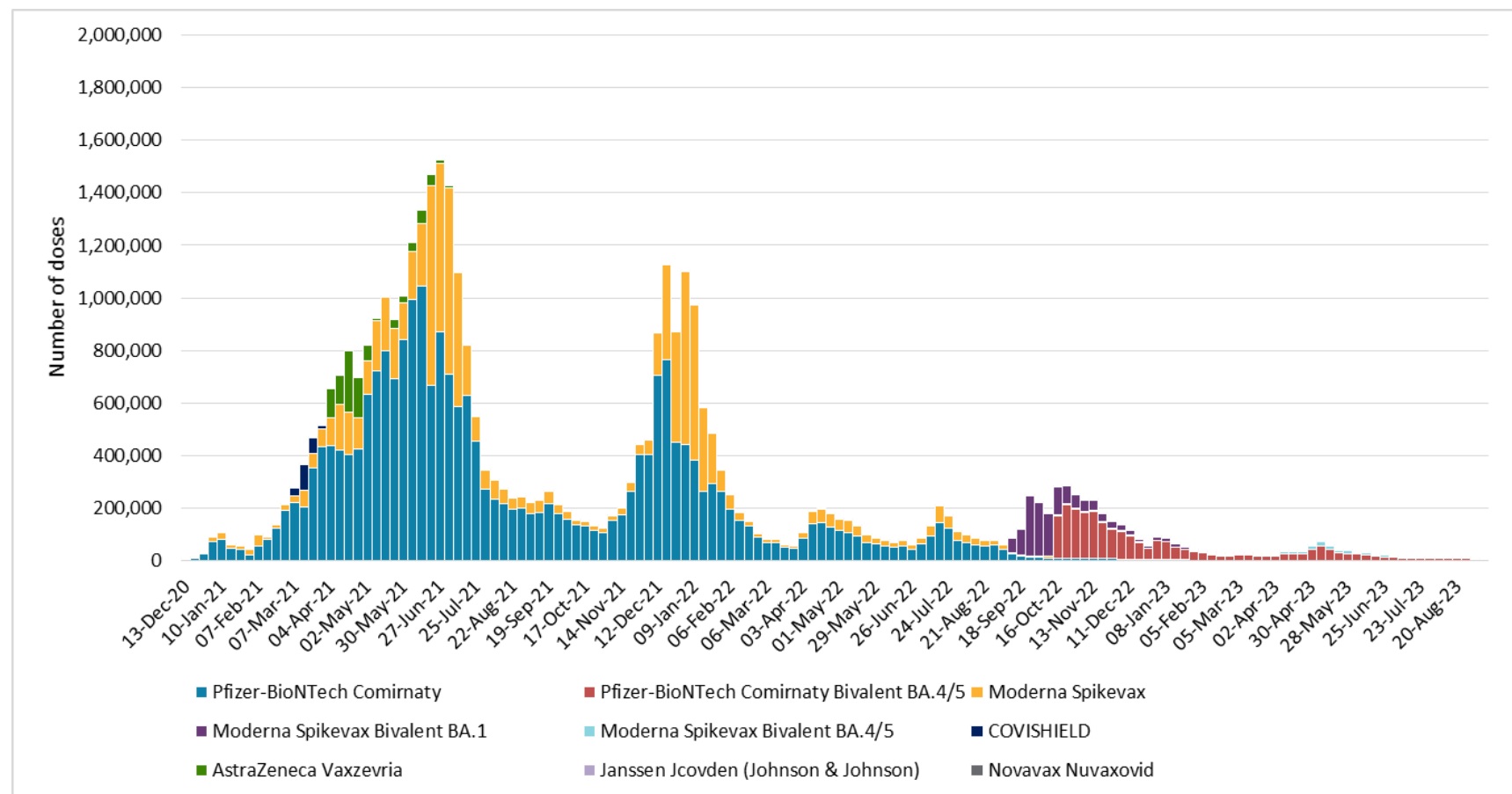
Figure 1. Number of COVID-19 vaccine doses administered by dose number and week of dose administration: Ontario



Note:

1. Individuals with seventh doses include immunocompromised individuals who have received an extended 3-dose primary series and a fourth booster (i.e. dose 7).

Figure 2. Number of COVID-19 vaccine doses administered by vaccine product and week of dose administration: Ontario



Note:

1. AstraZeneca Vaxzevria/COVISHIELD, Janssen Jcovden, and Moderna Spikevax Bivalent BA.1 COVID-19 vaccine products have now been fully phased out in Ontario.

Table 1. Number of bivalent COVID-19 vaccine doses administered by dose number and product: Ontario, September 12, 2022 to September 10, 2023

Bivalent COVID-19 vaccine product	Age (years)	Dose 1 (Number administered since July 7, 2023)	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6	Dose 7	Total
Pfizer-BioNTech Comirnaty Bivalent BA.4/5	5-11	453 (231)	399	17,641	5,442	154	2	0	24,091
	12-17	886 (110)	408	25,862	50,831	1,978	65	1	80,031
	18-29	6,435 (390)	1,757	22,606	100,224	25,509	1,641	62	158,234
	30-39	4,528 (299)	1,281	16,565	115,479	41,309	3,244	123	182,529
	40-49	2,556 (173)	768	12,184	127,778	47,828	4,439	223	195,776
	50-59	2,785 (145)	786	12,549	191,672	89,961	8,800	346	306,899
	60-69	3,074 (169)	1,081	10,867	156,960	286,837	74,380	1,210	534,409
	70-79	1,880 (132)	738	5,612	85,860	293,953	141,012	1,662	530,717
	80+	720 (47)	365	2,677	41,299	153,820	80,233	761	279,875
	Total: 5+	23,317 (1,696)	7,583	126,563	875,545	941,349	313,816	4,388	2,292,561
Moderna Spikevax Bivalent BA.4/5	6 months - 5	874 (870)	788	182	1	0	0	0	1,845
	6-11	7 (7)	4	28	19	5	0	0	63
	12-17	1 (0)	0	17	24	27	0	0	69

Bivalent COVID-19 vaccine product	Age (years)	Dose 1 (Number administered since July 7, 2023)	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6	Dose 7	Total
	18-29	132 (48)	39	485	522	683	200	6	2,067
	30-39	149 (56)	43	354	1,132	2,109	849	40	4,676
	40-49	93 (41)	30	207	889	2,293	1,102	72	4,686
	50-59	74 (27)	41	218	1,233	3,819	2,255	83	7,723
	60-69	106 (34)	57	262	1,507	7,078	20,165	318	29,493
	70-79	68 (22)	52	201	1,265	7,029	35,523	434	44,572
	80+	56 (10)	66	259	1,355	6,434	30,647	221	39,038
	Total: 6 months+	1,560 (1,115)	1,120	2,213	7,947	29,477	90,741	1,174	134,232
Moderna Spikevax Bivalent BA.1	6-11	0 (0)	1	22	2	2	0	0	27
	12-17	31 (0)	9	198	360	26	0	0	624
	18-29	1,717 (2)	457	6,733	43,376	3,296	48	3	55,630
	30-39	1,571 (3)	449	6,699	81,866	10,864	195	3	101,647
	40-49	840 (0)	280	5,110	94,839	13,175	274	12	114,530
	50-59	882 (0)	288	5,961	147,174	27,411	519	20	182,255
	60-69	1,229 (1)	406	6,356	117,600	168,636	3,112	64	297,403

Bivalent COVID-19 vaccine product	Age (years)	Dose 1 (Number administered since July 7, 2023)	Dose 2	Dose 3	Dose 4	Dose 5	Dose 6	Dose 7	Total
	70-79	854 (0)	364	4,210	69,646	220,114	4,659	49	299,896
	80+	392 (0)	251	2,467	36,324	160,421	2,790	14	202,659
	Total: 6+	7,516 (6)	2,505	37,756	591,187	603,945	11,597	165	1,254,671

Notes:

1. Individuals 5 to 11 years of age are recommended to receive the pediatric formulation of Pfizer-BioNTech Comirnaty Bivalent BA.4/5 COVID-19 vaccine; individuals 6 months to 11 years of age are recommended to receive the infant/pediatric doses of Moderna Spikevax Bivalent BA.4/5 COVID-19 vaccine; and individuals 6 to 11 years of age were recommended to receive the pediatric dose of Moderna Spikevax Bivalent BA.1 COVID-19 vaccine as a booster dose, however this product has now been fully phased out in Ontario.¹
2. Dose 1 counts in brackets represent the subset of bivalent COVID-19 vaccine doses administered on or after July 7, 2023, which correspond to an initiation of a bivalent primary series. Prior to July 7, 2023 bivalent products were not typically expected to be administered as a primary series, and those doses may represent data errors or missing/incomplete data.

Vaccination coverage

Individuals 5 years of age and older (i.e., eligible for bivalent booster)

Figure 3. Provincial coverage estimates among individuals 5 years of age and older by age group: Ontario, December 14, 2020 to September 10, 2023

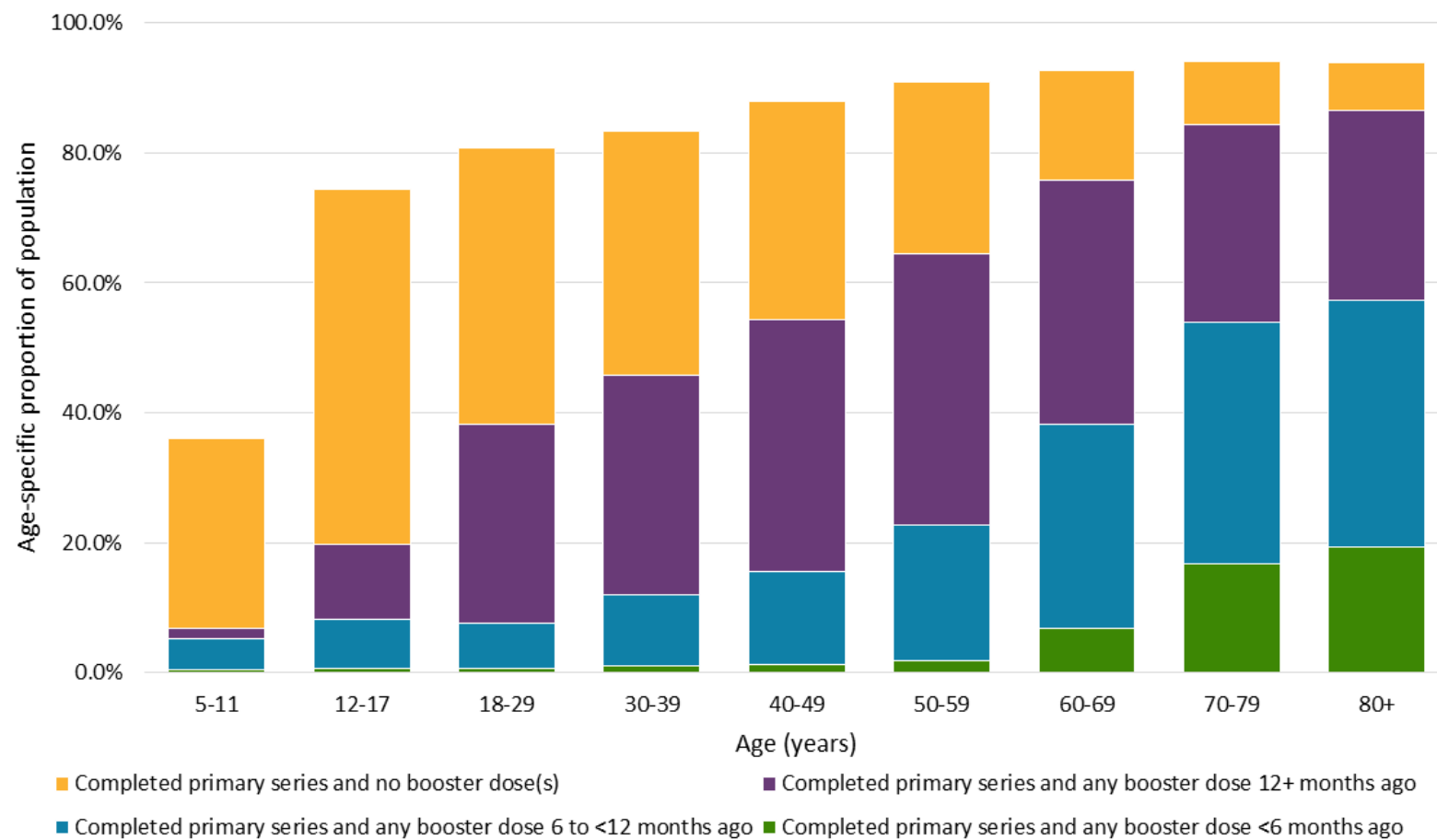
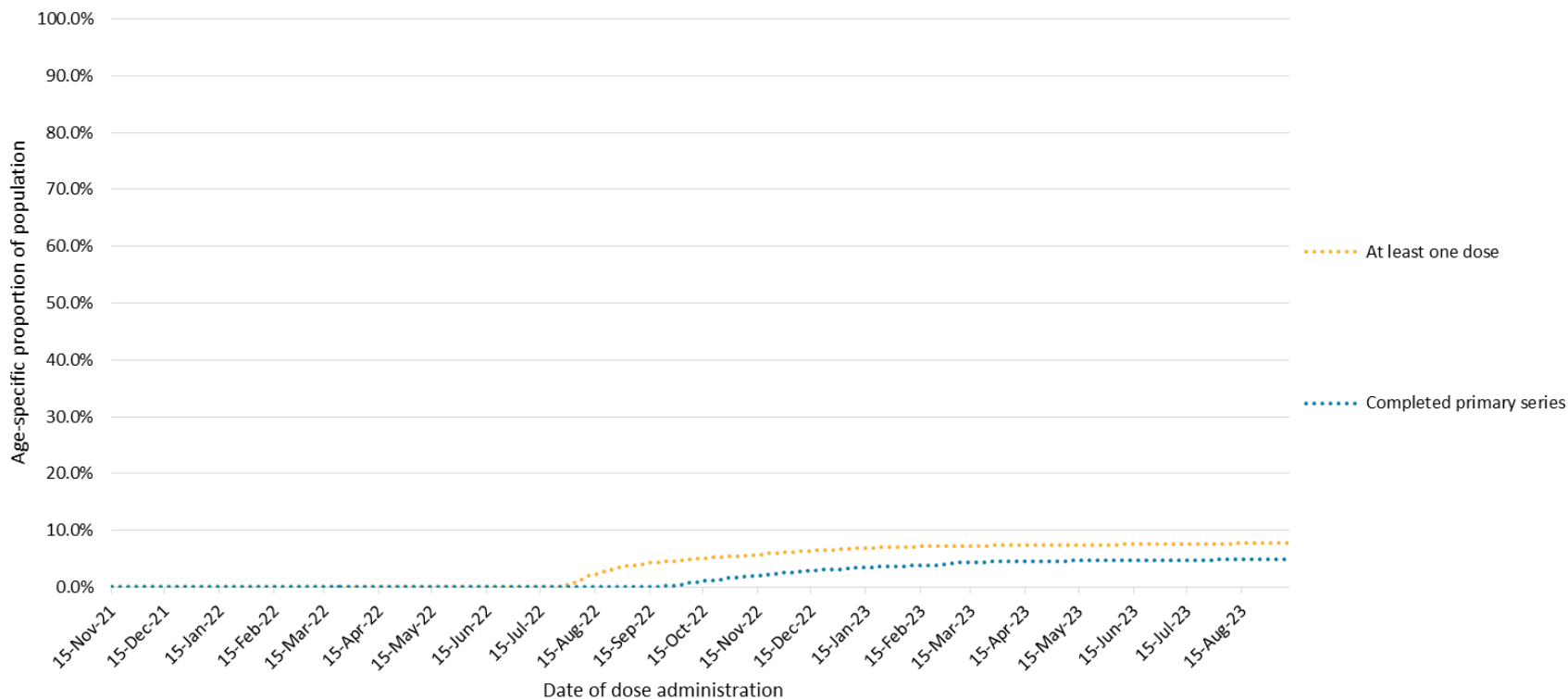


Table 2. Number of individuals 5 years of age and older who completed their primary COVID-19 vaccine series and coverage estimates by booster dose status and age group: Ontario, December 14, 2020 to September 10, 2023

Age (years)	Number of individuals: No booster dose(s)	Number of individuals: Any booster dose 12+ months ago	Number of individuals: Any booster dose 6 to <12 months ago	Number of individuals: Any booster dose <6 months ago	Coverage (%): No booster dose(s)	Coverage (%): Any booster dose 12+ months ago	Coverage (%): Any booster dose 6 to <12 months ago	Coverage (%): Any booster dose <6 months ago
5-11	316,709	17,275	51,341	4,966	29.2	1.6	4.7	0.5
12-17	537,307	115,441	73,643	5,993	54.6	11.7	7.5	0.6
18-29	1,103,263	794,597	178,124	18,376	42.5	30.6	6.9	0.7
30-39	833,715	746,879	244,857	22,758	37.6	33.7	11.0	1.0
40-49	638,012	740,364	272,930	23,112	33.5	38.9	14.3	1.2
50-59	520,563	813,612	408,939	37,363	26.6	41.6	20.9	1.9
60-69	325,454	715,522	602,055	129,569	17.0	37.5	31.5	6.8
70-79	125,125	385,153	470,984	213,368	9.9	30.4	37.1	16.8
80+	54,312	210,115	272,620	139,384	7.5	29.2	37.9	19.4
Total: 5+	4,454,460	4,538,958	2,575,493	594,889	30.4	31.0	17.6	4.1

Individuals under 5 years of age

Figure 4. Provincial COVID-19 vaccine coverage estimates among individuals under 5 years of age: Ontario



Note:

1. Children 0-6 months of age are included in denominators used to calculate coverage estimates, but are not eligible for COVID-19 vaccination.

Table 3. Number of individuals who received a COVID-19 vaccine and coverage estimates among individuals under 5 years of age: Ontario, December 14, 2020 to September 10, 2023

Age (years)	Number of individuals: Initiated primary series	Number of individuals: Completed primary series	Coverage (%): At least one dose	Coverage (%): Completed primary series
<5	20,430	36,829	7.8	5.0

Note:

1. Children 0-6 months of age are included in denominators used for calculate coverage estimates, but are not eligible for COVID-19 vaccination.

Technical Notes

Definition of Terms

Vaccine series refers to the number of vaccine doses that are needed to complete a primary series. COVID-19 vaccine products currently approved by Health Canada (HC) and the World Health Organization (WHO) Emergency Use Listing have a two-dose (i.e. Moderna Spikevax, Pfizer-BioNTech Comirnaty, AstraZeneca Vaxzevria/COVISHIELD, Novavax Nuvaxovid, Covaxin, Sinopharm, CoronaVac, Skycovione) or one-dose (i.e. Janssen Jcovden, Convidecia) schedule. For children under 5 years of age, Health Canada has also approved a Pfizer-BioNTech Comirnaty three-dose schedule.

Interval refers to the period of time (e.g. number of days) between doses. For all available COVID-19 vaccines, there is a recommended minimum number of days that an individual must wait between doses of a primary series or between booster dose(s).

Initiated primary series refers to individuals that have received only one dose of a two-dose COVID-19 vaccine series, whether it is HC/WHO-authorized or not, or two doses of a non-HC/non-WHO authorized vaccine. For some children under 5 years of age, this refers to individuals that have received only one or two doses of a three-dose Pfizer-BioNTech Comirnaty vaccine series.

Completed primary series refers to individuals that have received:

- One dose of a one-dose HC/WHO-authorized vaccine (i.e. dose one of one),
- Both doses of a two-dose HC/WHO-authorized vaccine series (i.e. dose two of two) including series with mixed HC/WHO-authorized vaccine products,
- One dose of non-HC/non-WHO authorized vaccine and one dose of HC/WHO-authorized vaccine,
- Three doses of any other combination of HC/WHO-authorized vaccines and non-HC/non-WHO authorized vaccines,
- For some children under 5 years of age, this refers to individuals that have received three doses of a three-dose Pfizer-BioNTech Comirnaty vaccine series.

Completed primary series and one booster dose refers to individuals that have completed their primary series (as per the definition above) and have received a booster dose of a HC-authorized vaccine. Note: a dose of WHO-authorized or non-HC/non-WHO authorized vaccine is not considered a booster dose.

Coverage estimate (at least one dose) refers to the proportion of the population that has received at least one dose of any COVID-19 vaccine, whether it is HC/WHO-authorized or not.

Coverage estimate (completed primary series) refers to the proportion of the population that has completed their primary series, as per the definition above.

Coverage estimate (completed primary series and one booster dose) refers to the proportion of the population that has completed their primary series (as per the above definition) and received a booster dose of a HC-authorized vaccine.

Data Sources

- COVID-19 vaccination data were based on information successfully extracted from the Ontario Ministry of Health's COVaxON application as of **September 11, 2023 at approximately 7:00 a.m.**
- Ontario population estimate data were sourced from the Ministry of Finance.²

Data Caveats

- Data presented may differ from other sources for various reasons, including differing extract times and methodologies for processing COVaxON data.
- COVaxON is a dynamic reporting system, which allows ongoing updates to data previously entered. As a result, data extracted from COVaxON represents a snapshot at the time of extraction and may differ from previous or subsequent reports.
- The data represent vaccination information reported in COVaxON. As a result, all counts may be subject to varying degrees of underreporting due to a variety of factors.
- Due to the expanding vaccine program, which now includes single-dose primary series and booster dose options, vaccine terminology has been updated (e.g. "fully vaccinated" has been updated to "completed primary series") and may not align with other sources. For certain populations (e.g. immunocompromised individuals) three doses are recommended to complete the primary series. Due to challenges in identifying these individuals in the COVaxON data, it was not possible to account for some three-dose primary series in the analysis, and these individuals are classified as per the definitions above.
 - Individuals with seventh doses are likely immunocompromised individuals that received an extended 3-dose primary series and a fourth booster (i.e. a seventh dose)
- Counts reported for doses administered will not align with the number of individuals vaccinated for the following reasons:
 - Counts for the number of doses administered in Ontario exclude doses administered out of province and from non-Ontario stock. However, individuals that received a vaccination out of province or from non-Ontario stock are included in coverage estimates
 - Counts for the number of individuals vaccinated and coverage estimates exclude individuals reported as deceased. However, doses administered to individuals later reported as deceased are included in dose counts.
 - Methods for calculating age differ when reporting on doses administered in the province and vaccinated individuals/coverage estimates. For doses administered, the date of dose administration is used to calculate age and age is interpreted as the age at the time of each dose administration. For individuals vaccinated and coverage estimates the date of data extraction is used to calculate age and age is interpreted as the individual's current age.
- Coverage estimates shown as 100% may represent estimates of 100% or more. Coverage estimates may be over 100% due to limitations in the vaccination data (numerator) or Ontario population estimates (denominator).

- Children 0-6 months of age are included in denominators used to calculate coverage estimates for the <5 age group. However, children 0-6 months of age not eligible for COVID-19 vaccination and therefore are not included in the numerator.

Vaccination Data Processing

- Data includes clients with a dose administration record recorded in COVaxON, which captures a small number of client records with a residential postal code outside of Ontario who may be eligible for vaccination on the basis of working in a high-risk setting (e.g. long-term care home) in Ontario.
- Non-valid dose records are excluded. Non-valid records include doses where the status is reported as 'entered in error', 'invalid', or other similar variations, as well as doses where the status is valid (e.g. 'administered') but that are identified as non-valid client records (e.g. client first and last name were reported as 'test', 'do not use', 'error', 'ignore', or other similar variations).
- For missing dose administration dates and dose administration dates prior to December 14, 2020, the date the administration record was created is used as a proxy.
- Duplicate dose administration records (i.e. clients with multiple dose administration records with the same date) are identified and excluded using personal identifiers, such as health card number, name, date of birth, and postal code, where available, as well as dose administration date.
- After removing duplicate dose administration records, dose number is assigned based on the dose administration dates reported. Dose administration date is also used to determine the dose interval.
 - For clients with multiple doses reported with different administration dates, the first chronological dose is considered the first dose.
 - To determine a date for the second dose, the first subsequent dose administered on or after the product-specific recommended minimum interval of the first dose product, with a 4-day grace period, is used. Doses administered prior to the product-specific recommended minimum interval, with a 4-day grace period, are not considered valid. For example, if there are two subsequent doses that were 7 days and 21 days from a Moderna Spikevax COVID-19 vaccine first dose, respectively, then the dose that is 21 days from the first dose is used as the second dose. Similarly, if there are two subsequent doses that are 10 days and 12 days from the first dose, respectively, then neither dose is used and the individual is not assigned a second dose. The recommended product specific minimum intervals, with a 4-day grace period, as outlined by the National Advisory Committee on Immunization (NACI) are as follows (there is currently no maximum interval for second doses, i.e., no recommendation to restart a vaccine series regardless of the length of delay of the second dose):
 - Pfizer-BioNTech Comirnaty COVID-19 vaccine: 15 days (19 days with a 4-day grace period).³
 - Moderna Spikevax COVID-19 vaccine: 17 days (21 days with a 4-day grace period).³
 - AstraZeneca Vaxzevria/COVISHIELD COVID-19 vaccine: 24 days (28 days with a 4-day grace period).³
 - Novavax Nuvaxovid COVID-19 vaccine: 17 days (21 days with a 4-day grace period).³

- Janssen Jcovden, Moderna Spikevax Bivalent BA.1, Moderna Spikevax Bivalent BA.4/5, Pfizer-BioNTech Comirnaty Bivalent BA.4/5, WHO-authorized, non-HC/non-WHO authorized COVID-19 vaccine products or unspecified/missing products: 17 days (21 days with a 4-day grace period).
- To determine a date for the third dose, the first subsequent dose administered 28 days or more after the second dose is used, regardless of the HC-authorized vaccine product administered for the second dose (i.e. the dose 3 interval is not product-specific). If multiple doses 28 days or more after the second dose are reported, then the first chronological dose after the second dose is used.
- To determine dates for the fourth to seventh doses, the first subsequent date 56 days or more after the date of the previous dose is used, regardless of the HC-authorized vaccine product administered for the previous dose (i.e. the minimum interval is not product-specific). If multiple doses 56 days or more after the previous dose are reported, then the first chronological dose after the previous dose is used.
- A maximum of seven doses are assigned for an individual.
- Only HC-authorized vaccine products are considered for booster doses.
- Clients reporting a gender of 'Non-binary/third gender' and 'Other' are combined into an 'Other' category. 'Unknown' gender included clients where gender is reported as 'Prefer not to say', 'Unknown', or where gender was missing.
- Age at the time of dose administration and age at the time of data extraction are calculated using the client date of birth and the date of dose administration or date of data extraction, respectively. Table A1 below shows the authorized ages for each of the COVID-19 vaccine products administered in Ontario.¹ Individuals whose age was reported as below the minimum authorized age noted in Table A1, ≥ 120 years, or missing date of birth were considered to have unknown age.

Table A1. Authorized ages for COVID-19 vaccine products administered in Ontario

COVID-19 vaccine product	Authorized age	Notes
Pfizer-BioNTech Comirnaty	6 months and older	- Individuals 6 months to 4 years of age are recommended to receive the infant formulation - Individuals 5 to 11 years of age are recommended to receive the pediatric formulation
Moderna Spikevax	6 months and older	- Individuals 6 months to 5 years of age are recommended to receive the infant dose - Individuals 6 to 11 years of age are recommended to receive the pediatric dose
Moderna Spikevax Bivalent BA.4/5	6 months and older	- Individuals 6 months to 5 years of age are recommended to receive the infant dose - Individuals 6 to 11 years of age are recommended to receive the pediatric dose
Pfizer-BioNTech Comirnaty Bivalent BA.4/5	5 years and older	Individuals 5 to 11 years of age are recommended to receive the pediatric formulation
Moderna Spikevax Bivalent BA.1	6 years and older	Previously authorized as a booster dose but no longer in use in Ontario
Novavax Nuvaxovid	12 years and older	
AstraZeneca Vaxzevria/COVISHIELD	18 years and older	No longer in use in Ontario
Janssen Jcovden	18 years and older	No longer in use in Ontario

Vaccination Data Analysis and Reporting

- Out of province dose administration records well as doses administered from non-Ontario stock (e.g. doses from federal stock for populations such as the Armed Forces) are included in coverage estimates. However, out of province and non-Ontario stock dose administration records are not included in dose counts.
- Dose numbers are maintained in doses administered counts. For example, if an individual received doses 1 and 2 out of province and a third dose in Ontario, the third dose is counted as a dose 3 administered in Ontario and the first two doses are not counted as they were administered out of province.
- Clients reported as deceased are excluded when describing the number of individuals vaccinated and in coverage estimates, but are included when describing doses administered in the province.
- Age at the time of dose administration (e.g. age at dose 1, age at dose 2, etc.) is used when describing doses administered in Ontario.
- Age at the time of data extraction is used when describing the number of individuals vaccinated and in coverage estimates.
- Clients with unknown age/gender are excluded for age/gender specific analyses, but are included in provincial totals.
- Dose records where the product is reported as other/unknown/missing are excluded from product-specific analysis, but are included in provincial totals.
- Pfizer-BioNTech Comirnaty, Moderna Spikevax, and Moderna Spikevax Bivalent BA.4/5 vaccine product counts include infant (<5 years of age), pediatric (5-11 years of age), and 12+ years of age doses. Pfizer-BioNTech Comirnaty Bivalent BA.4/5 vaccine product counts include pediatric and 12+ years of age doses. Moderna Spikevax Bivalent BA.1 vaccine product counts include pediatric and 12+ years of age doses.
- 180 days is used as the 6-month interval and 360 days is used as the 12-month interval for booster dose status.
- Data are shown using the date of dose one administration for coverage estimates for at least one dose; the date the primary series was completed for completed primary series counts and coverage estimates; and the date the first booster dose was received for completed primary series and one booster counts and coverage estimates.

References

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Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 vaccine uptake in Ontario: December 14, 2020 to September 10, 2023. Toronto, ON: King's Printer for Ontario; 2023.

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