

Table S1. Data sources and variables

Data source	Description	Variables
<p>BORN Ontario birth registry www.bornontario.ca</p>	<p>The birth registry captures information on all Ontario births ≥20 weeks' gestation (all hospital births and the ~2.8% of home births with a midwife¹) from over 250 hospitals, birth centers, midwifery practice groups, and prenatal screening labs.² Prenatal and maternity care are publicly funded in the province.</p> <p>Records for pregnant individuals who undergo prenatal screening (about 70% in Ontario³) are uploaded weekly to the registry from hospital- and community-based labs and ultrasound clinics. Thus, screened pregnancies are identifiable in the registry as early as 10 weeks' gestation; 97% of prenatal screening records are linked with other health care encounters pertaining to birth. Unscreened pregnancies typically become identifiable in the BIS only at the time of the birth.</p> <p>When a pregnant individual presents to care around the time of birth, the registry generates a “Labor and birth encounter” that captures information about labor and birth through to the first hour postpartum, regardless of birth setting (hospital, home, or birth center). A separate “Birth-child encounter” documents information about each newborn (live births and stillbirths) through to the first hour postpartum. Postpartum encounters capture clinical information about the mother and newborn(s) from the immediate postpartum period until discharge from hospital/birth center. Unique identifiers (mother and newborn), assigned upon first record entry into the registry, are used by the system to deterministically link all encounters through a robust automated algorithm. A system-generated signal indicates when each encounter record is complete. Submitting sites are required to perform monthly automated data validation checks that flag records with missing encounters or data errors so that corrections can be made; every month, each site must report that it has reviewed and resolved flagged errors.²</p>	<ul style="list-style-type: none"> • Estimated date of birth • Date of birth • Unique health card number • Postal code ^a • Public health unit region of residence ^b • Maternal age at birth (years) • Pre-pregnancy body mass index (kilograms/metre² [kg/m²]) • Self-reported smoking during pregnancy • Self-reported substance use during pregnancy (cannabis, opioid or alcohol use during pregnancy) • Public health unit region • Pre-existing maternal health conditions (asthma, chronic hypertension, diabetes, heart disease, thyroid disease) • Parity • Multiple birth • Labor and birth complications (gestational hypertension, preeclampsia/eclampsia, gestational diabetes, pulmonary embolism) • Newborn feeding from birth to discharge from hospital or birth center (exclusive breastfeeding vs. other feeding [breast milk substitute (formula only), breastmilk substitute (other), combination of breastmilk and breastmilk substitute, and unknown feeding practices]) • Healthcare provider who caught/delivered baby (midwife

		<p>[aboriginal midwife, midwife at birth center, midwife at home, midwife at hospital, midwifery student, registered midwife], registered nurse or clinical nurse specialist/nurse practitioner, family physician, obstetrician, other [other healthcare provider, resident, surgeon], unattended)</p> <ul style="list-style-type: none"> • First prenatal care visit in the first trimester
COVaxON	<p>COVaxON, Ontario’s COVID-19 immunization database, contains records for all COVID-19 vaccines administered in the province. Data are reported into COVaxON at the time of immunization, regardless of type of provider or delivery location (mass immunization clinic, pharmacy, etc.). Information includes vaccine product, dose number, and date(s) of vaccination. We linked the study population to the COVaxON database based on maternal unique health care number.</p>	<ul style="list-style-type: none"> • Number of doses • Date(s) of vaccination • Vaccine product received for each dose
Canadian Census	<p>To obtain information on rural/urban residence and neighborhood income quintile, we linked the study population to Statistics Canada’s 2016 Census based on maternal postal code.</p>	<ul style="list-style-type: none"> • Rural/urban residence • Neighborhood income quintile
Ontario Marginalization Index	<p>We linked the study population to the Ontario Marginalization (ON-Marg) Index based on maternal postal code. Data from Statistics Canada’s Census are used to derive the ON-Marg Index.⁴ The index quantifies the level of marginalization across the province and consists of four dimensions: residential instability, material deprivation, dependency, and ethnic concentration. Area-based quintile scores are available for each dimension, with quintile one representing the least marginalized areas, and quintile five, the most marginalized.</p> <p>Residential instability identifies areas with high rates of family or housing instability. This dimension is closely connected to neighborhood quality and is derived using seven Census indicators: 1) percentage of population living alone; 2) percentage of population who are not youth aged 5-15 years; 3) average number of persons per dwelling; 4) percentage of dwellings that are in apartment buildings; 5) percentage of population who are single/divorced/widowed; 6) percentage of dwellings that are not owned; and 7) percentage of population who moved during the past five years.</p>	<ul style="list-style-type: none"> • Residential instability • Material deprivation • Dependency • Ethnic concentration

	<p>Material deprivation identifies individuals and communities unable to access and attain basic material needs. This dimension is closely connected to poverty and is derived from six Census indicators of income, housing quality, educational attainment, and familial structure: 1) percentage of population ≥ 20 years without a secondary diploma; 2) percentage of lone-parent families; 3) percentage of total income received from government transfer payments for population aged ≥ 15 years; 4) percentage of population aged ≥ 15 years who are unemployed; 5) percentage of population considered low-income; and 6) percentage of household dwellings in need of major repair.</p> <p>Dependency identifies areas with high concentrations of residents who do not receive employment income and are compensated for their work. The Census indicators used to derive dependency are: 1) percentage of population who are aged ≥ 65 years; 2) dependency ratio (total population aged 0-14 years and ≥ 65 years / total population aged 15 to 64 years); and 3) percentage of population aged ≥ 15 years not participating in labor force.</p> <p>Ethnic concentration identifies areas with high concentrations of recent immigrants and/or “visible minorities” (defined by Statistics Canada as “persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color”). This dimension is derived from two Census indicators: 1) percentage of population who are recent immigrants (arrived in past five years); and 2) percentage of population who self-identify as a visible minority (Census respondents can indicate more than one race/ethnicity from a list, or can specify a group not listed on the Census questionnaire).</p>	
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^a Residential postal codes on all records from the birth registry were used to link the study population to area-based socioeconomic information from Statistics Canada’s 2016 Census and the Ontario Marginalization Index.

^b South West: Chatham-Kent Health Unit; Grey Bruce Health Unit; Huron County Health Unit; Perth District Health Unit; Lambton Health Unit; Middlesex-London Health Unit; Windsor-Essex County Health Unit; Oxford Elgin St. Thomas Health Unit. Central West: Brant County Health Unit; City of Hamilton Health Unit; Haldimand-Norfolk Health Unit; Halton Regional Health Unit; Niagara Regional Area Health Unit; Waterloo Health Unit; Wellington-Dufferin-Guelph Health Unit. Central East: Durham Regional Health Unit; Haliburton, Kawartha, Pine Ridge District Health Unit; Peel Regional Health Unit; Peterborough County–City Health Unit; Simcoe Muskoka District Health Unit; York Regional Health Unit. Greater Toronto Area: City of Toronto Health Unit. Eastern: The Eastern Ontario Health Unit; Hastings and Prince Edward Counties Health Unit; Kingston, Frontenac and Lennox and Addington Health Unit; Leeds, Grenville and Lanark District Health Unit; City of Ottawa Health Unit; Renfrew County and District Health Unit. North West: Northwestern Health Unit; Thunder Bay

District Health Unit. North East: The District of Algoma Health Unit; North Bay Parry Sound District Health Unit; Porcupine Health Unit; Sudbury and District Health Unit; Timiskaming Health Unit.

Table S2. Crude and imputed frequencies of baseline characteristics for variables with missing information from January 1 to December 31, 2021

Characteristic	Non-imputed dataset n=87,376		Imputation dataset #1 n=87,376		Imputation dataset #2 n=87,376		Imputation dataset #3 n=87,376		Imputation dataset #4 n=87,376		Imputation dataset #5 n=87,376	
	No.	% ^a	No.	% ^a	No.	% ^a	No.	% ^a	No.	% ^a	No.	% ^a
Parity												
0 (nulliparous)	37,049	42.4	37,189	42.6	37,201	42.6	37,194	42.6	37,164	42.5	37,194	42.6
1 (primiparous)	29,422	33.7	29,536	33.8	29,539	33.8	29,532	33.8	29,544	33.8	29,525	33.8
≥2 (multiparous)	20,560	23.5	20,651	23.6	20,636	23.6	20,650	23.6	20,668	23.7	20,657	23.6
Missing	345	0.4	-	-	-	-	-	-	-	-	-	-
Exclusive breastfeeding at discharge^b												
No	35,804	41.0	42,318	48.4	42,377	48.5	42,342	48.5	42,330	48.5	42,263	48.4
Yes	37,904	43.4	45,058	51.6	44,999	51.5	45,034	51.5	45,046	51.6	45,113	51.6
Missing	13,668	15.6	-	-	-	-	-	-	-	-	-	-
Healthcare provider who caught/delivered baby												
Midwife	10,608	12.1	10,714	12.3	10,701	12.3	10,702	12.3	10,707	12.3	10,707	12.3
Registered Nurse or CNS/NP	657	0.8	658	0.8	664	0.8	660	0.8	665	0.8	664	0.8
Family Physician	4,967	5.7	5,021	5.8	5,014	5.7	5,021	5.8	5,020	5.8	5,019	5.7
Obstetrician	62,927	72.0	63,438	72.6	63,457	72.6	63,455	72.6	63,449	72.6	63,454	72.6
Other	7,145	8.2	7,212	8.3	7,202	8.2	7,206	8.3	7,202	8.2	7,197	8.2
Unattended (None)	332	0.4	333	0.4	338	0.4	332	0.4	333	0.4	335	0.4
Missing	740	0.9	-	-	-	-	-	-	-	-	-	-
Smoked during pregnancy												
No	78,981	90.4	80,449	92.1	80,437	92.1	80,449	92.1	80,432	92.1	80,424	92.0
Yes	6,720	7.7	6,927	7.9	6,939	7.9	6,927	7.9	6,944	8.0	6,952	8.0
Missing	1,675	1.9	-	-	-	-	-	-	-	-	-	-
Substance use during pregnancy^c												
No	78,456	89.8	82,104	94.0	82,097	94.0	82,095	94.0	82,082	93.9	82,073	93.9
Yes	4,935	5.7	5,272	6.0	5,279	6.0	5,281	6.0	5,294	6.1	5,303	6.1

Missing	3,985	4.6	-	-	-	-	-	-	-	-	-	-
Maternal body mass index (kg/m²)												
≥30.0 (obese)	61,544	70.4	69,203	79.2	69,299	79.3	69,221	79.2	69,187	79.2	69,291	79.3
<30.0	16,158	18.5	18,173	20.8	18,077	20.7	18,155	20.8	18,189	20.8	18,085	20.7
Missing	9,674	11.1	-	-	-	-	-	-	-	-	-	-
Neighborhood median family income quintiles												
1 (Lowest)	19,323	22.1	19,569	22.4	19,547	22.4	19,554	22.4	19,576	22.4	19,550	22.4
2	17,949	20.5	18,171	20.8	18,193	20.8	18,174	20.8	18,178	20.8	18,185	20.8
3	18,501	21.2	18,717	21.4	18,698	21.4	18,716	21.4	18,706	21.4	18,713	21.4
4	17,344	19.9	17,524	20.1	17,532	20.1	17,532	20.1	17,510	20.0	17,535	20.1
5 (Highest)	13,264	15.2	13,395	15.3	13,406	15.3	13,400	15.3	13,406	15.3	13,393	15.3
Missing	995	1.1	-	-	-	-	-	-	-	-	-	-
Rural residence												
No	73,573	84.2	73,947	84.6	73,939	84.6	73,949	84.6	73,949	84.6	73,955	84.6
Yes	13,361	15.3	13,429	15.4	13,437	15.4	13,427	15.4	13,427	15.4	13,421	15.4
Missing	442	0.5	-	-	-	-	-	-	-	-	-	-
Public health unit region of residence												
South West	11,560	13.2	11,695	13.4	11,691	13.4	11,707	13.4	11,692	13.4	11,686	13.4
Central West	18,188	20.8	18,422	21.1	18,423	21.1	18,387	21.0	18,429	21.1	18,420	21.1
Central East	25,612	29.3	25,919	29.7	25,905	29.7	25,906	29.7	25,918	29.7	25,907	29.7
Greater Toronto Area	15,601	17.9	15,766	18.0	15,771	18.1	15,787	18.1	15,776	18.1	15,771	18.1
Eastern	10,646	12.2	10,753	12.3	10,760	12.3	10,756	12.3	10,748	12.3	10,767	12.3
North West	1,560	1.8	1,576	1.8	1,575	1.8	1,579	1.8	1,569	1.8	1,580	1.8
North East	3,214	3.7	3,245	3.7	3,251	3.7	3,254	3.7	3,244	3.7	3,245	3.7
Missing	995	1.1	-	-	-	-	-	-	-	-	-	-
Marginalization indices												
Residential instability quintile												
1 (least unstable)	17,407	19.9	17,701	20.3	17,685	20.2	17,710	20.3	17,677	20.2	17,695	20.3
2	16,327	18.7	16,607	19.0	16,607	19.0	16,593	19.0	16,584	19.0	16,615	19.0
3	16,263	18.6	16,555	19.0	16,588	19.0	16,561	19.0	16,604	19.0	16,578	19.0
4	16,005	18.3	16,382	18.8	16,391	18.8	16,396	18.8	16,383	18.8	16,364	18.7
5 (most unstable)	19,551	22.4	20,131	23.0	20,105	23.0	20,116	23.0	20,128	23.0	20,124	23.0

Missing	1,823	2.1	-	-	-	-	-	-	-	-	-	-
Material deprivation quintile												
1 (least deprived)	17,369	19.9	17,610	20.2	17,625	20.2	17,613	20.2	17,626	20.2	17,609	20.2
2	16,652	19.1	16,924	19.4	16,903	19.4	16,915	19.4	16,925	19.4	16,904	19.4
3	16,158	18.5	16,393	18.8	16,424	18.8	16,434	18.8	16,417	18.8	16,446	18.8
4	16,266	18.6	16,588	19.0	16,592	19.0	16,576	19.0	16,569	19.0	16,566	19.0
5 (most deprived)	19,108	21.9	19,861	22.7	19,832	22.7	19,838	22.7	19,839	22.7	19,851	22.7
Missing	1,823	2.1	-	-	-	-	-	-	-	-	-	-
Dependency quintile												
1 (least dependent)	27,516	31.5	27,931	32.0	27,937	32.0	27,983	32.0	27,928	32.0	27,944	32.0
2	17,944	20.5	18,271	20.9	18,304	21.0	18,293	20.9	18,318	21.0	18,315	21.0
3	14,517	16.6	14,848	17.0	14,817	17.0	14,825	17.0	14,838	17.0	14,844	17.0
4	13,473	15.4	13,846	15.9	13,831	15.8	13,829	15.8	13,812	15.8	13,813	15.8
5 (most dependent)	12,103	13.9	12,480	14.3	12,487	14.3	12,446	14.2	12,480	14.3	12,460	14.3
Missing	1,823	2.1	-	-	-	-	-	-	-	-	-	-
Ethnic concentration quintile												
1 (lowest concentration)	12,521	14.3	13,069	15.0	13,077	15.0	13,051	14.9	13,057	14.9	13,042	14.9
2	13,661	15.6	14,016	16.0	14,014	16.0	14,011	16.0	14,009	16.0	14,018	16.0
3	14,672	16.8	14,972	17.1	14,966	17.1	14,976	17.1	14,988	17.2	14,982	17.2
4	17,894	20.5	18,194	20.8	18,198	20.8	18,190	20.8	18,201	20.8	18,202	20.8
5 (highest concentration)	26,805	30.7	27,125	31.0	27,121	31.0	27,148	31.1	27,121	31.0	27,132	31.1
Missing	1,823	2.1	-	-	-	-	-	-	-	-	-	-

Abbreviations: BMI, body mass index; IQR, inter-quartile range.

^a Column percentages.

^b Exclusive breastfeeding was compared against a composite of newborn feeding from birth to discharge from hospital/birth center containing responses for: breast milk substitute (formula only), breast milk substitute (other), combination of breastmilk and breastmilk substitute, and unknown feeding practices.

^c Self-reported cannabis, opioid or alcohol use during pregnancy.

Table S3. Source population and study population by month of delivery

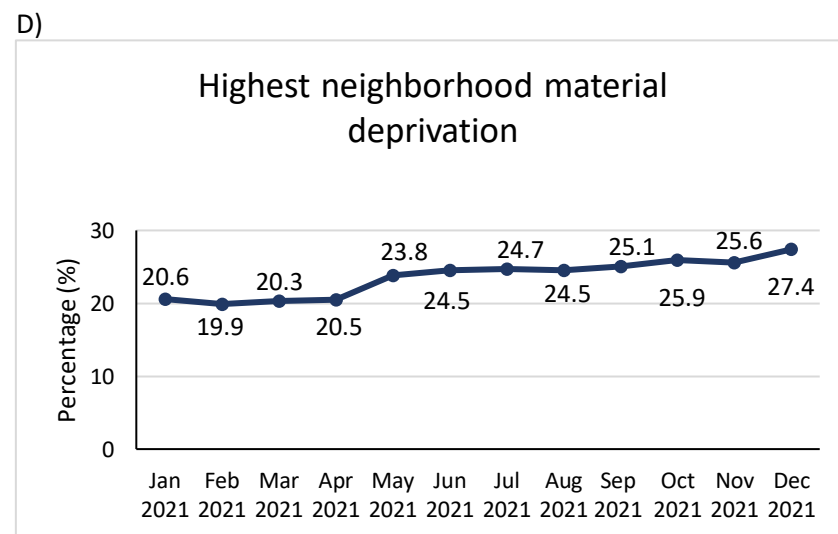
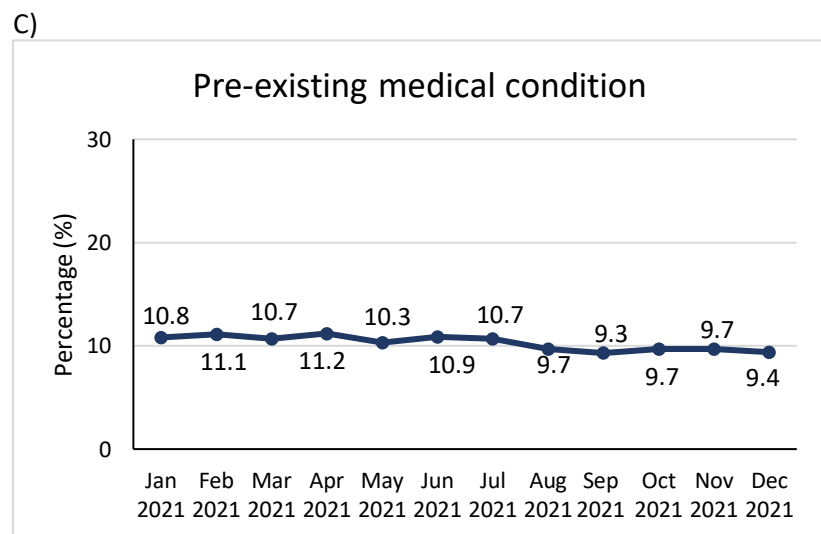
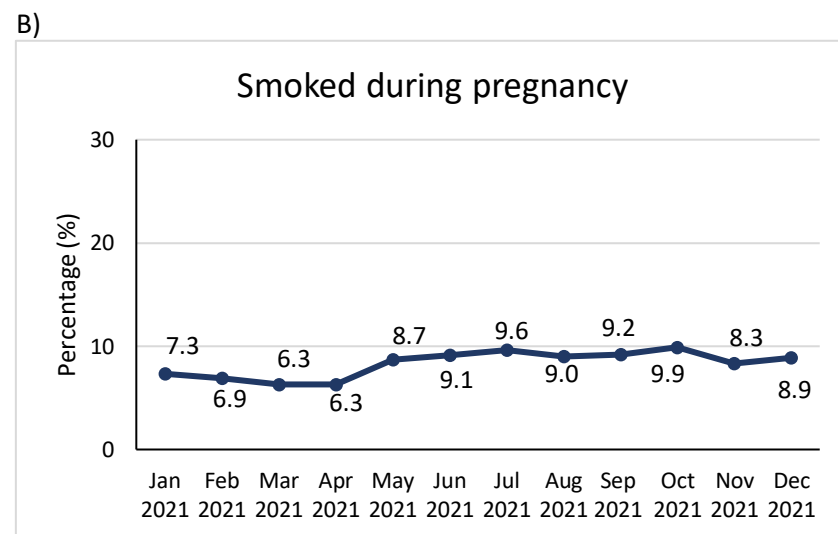
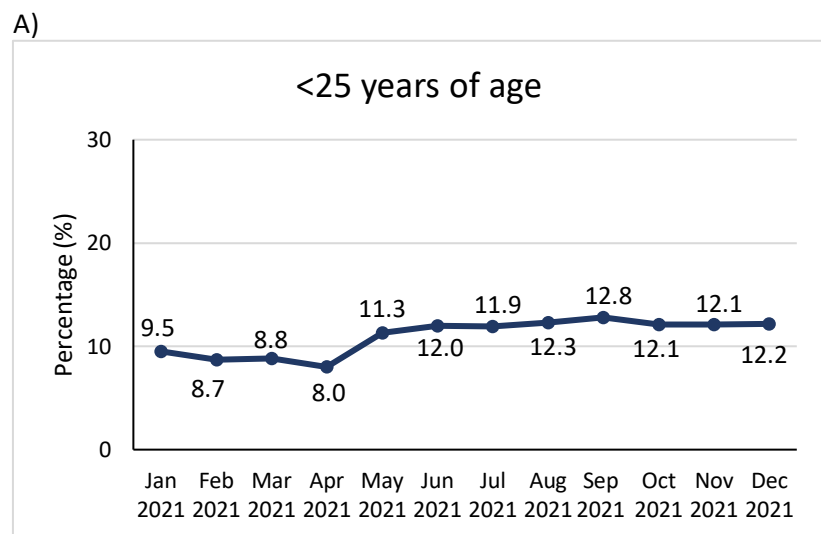
Month of delivery	Source population			Study population	
	Total number of individuals who gave birth ^a	Received ≥ 1 dose of COVID-19 vaccine by end of pregnancy ^b		Remained unvaccinated by end of pregnancy ^c	
		Number	%	Number	%
January 2021	10,091	10	0.1	10,081	99.9
February 2021	10,187	33	0.3	10,154	99.7
March 2021	11,889	178	1.5	11,711	98.5
April 2021	11,080	636	5.7	10,444	94.3
May 2021	11,727	4,288	36.6	7,439	63.4
June 2021	12,389	5,691	45.9	6,698	54.1
July 2021	12,575	6,240	49.6	6,335	50.4
August 2021	12,368	6,251	50.5	6,117	49.5
September 2021	11,946	6,450	54.0	5,496	46.0
October 2021	11,569	6,652	57.5	4,917	42.5
November 2021	10,873	6,680	61.4	4,193	38.6
December 2021	10,504	6,713	63.9	3,791	36.1
OVERALL	137,198	49,822	36.3	87,376	63.7

^a Total number of deliveries, by month, after exclusion criteria were applied (see Figure 1 for study flow diagram).

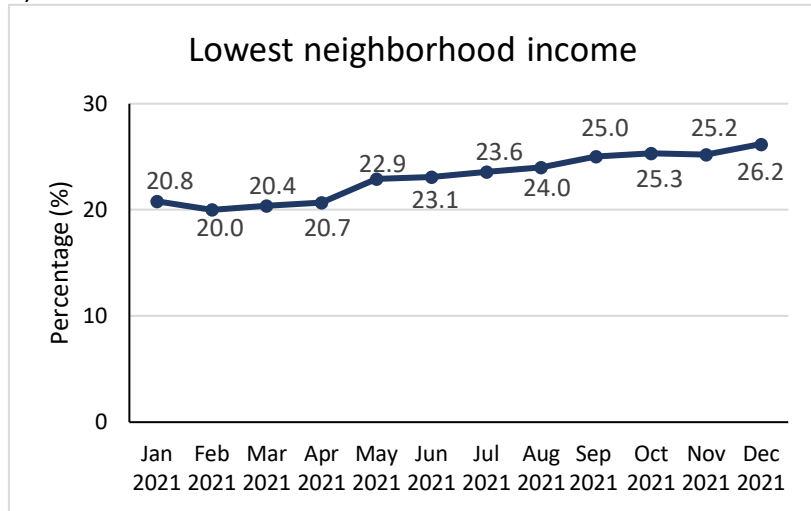
^b Number and proportion of individuals who had received ≥ 1 dose of COVID-19 vaccine (before or during pregnancy) by the time of delivery, by month.

^c Number and proportion of individuals who had not received any doses of COVID-19 vaccine by the time of delivery (before or during pregnancy, including the date of delivery), by month. This is the study population.

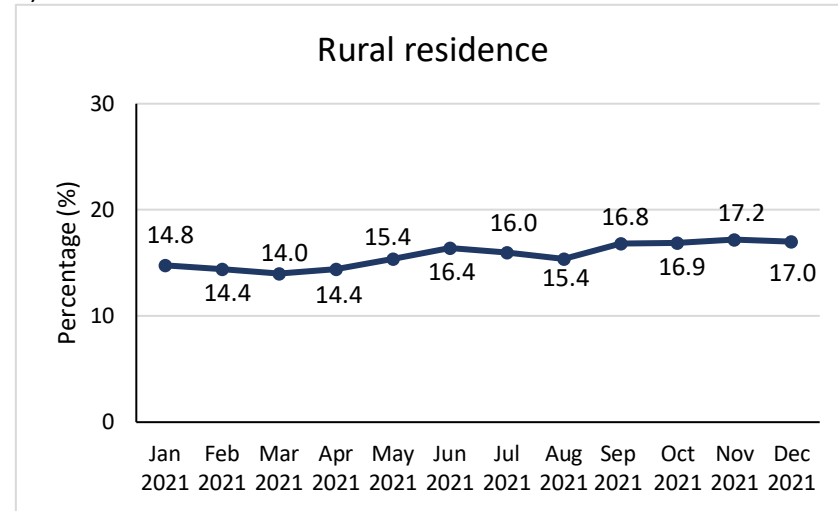
Figure S1. Change in selected characteristics of the study population by month of delivery



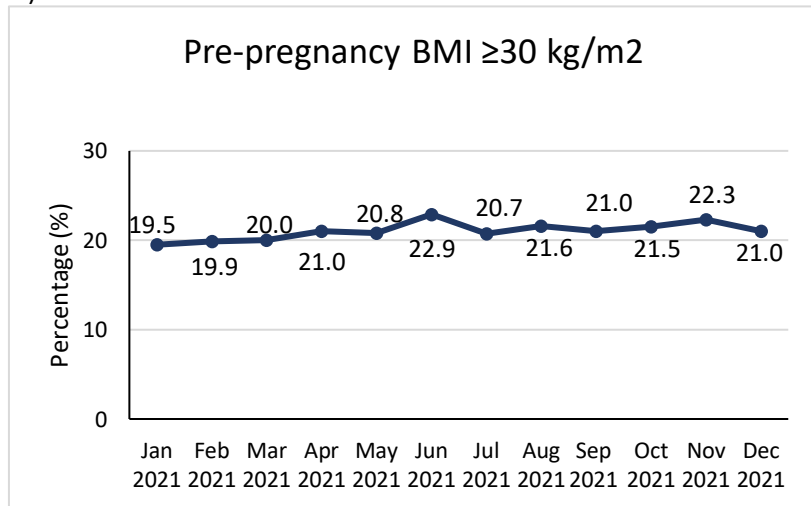
E)



F)



G)



H)

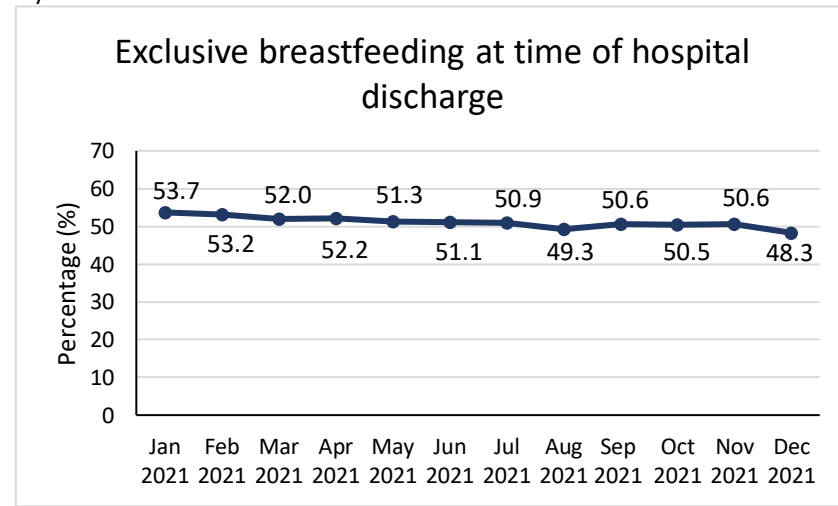


Figure S2. Cumulative incidence plots of time-to-COVID-19 vaccine series initiation after pregnancy, by calendar month of delivery and maternal age group

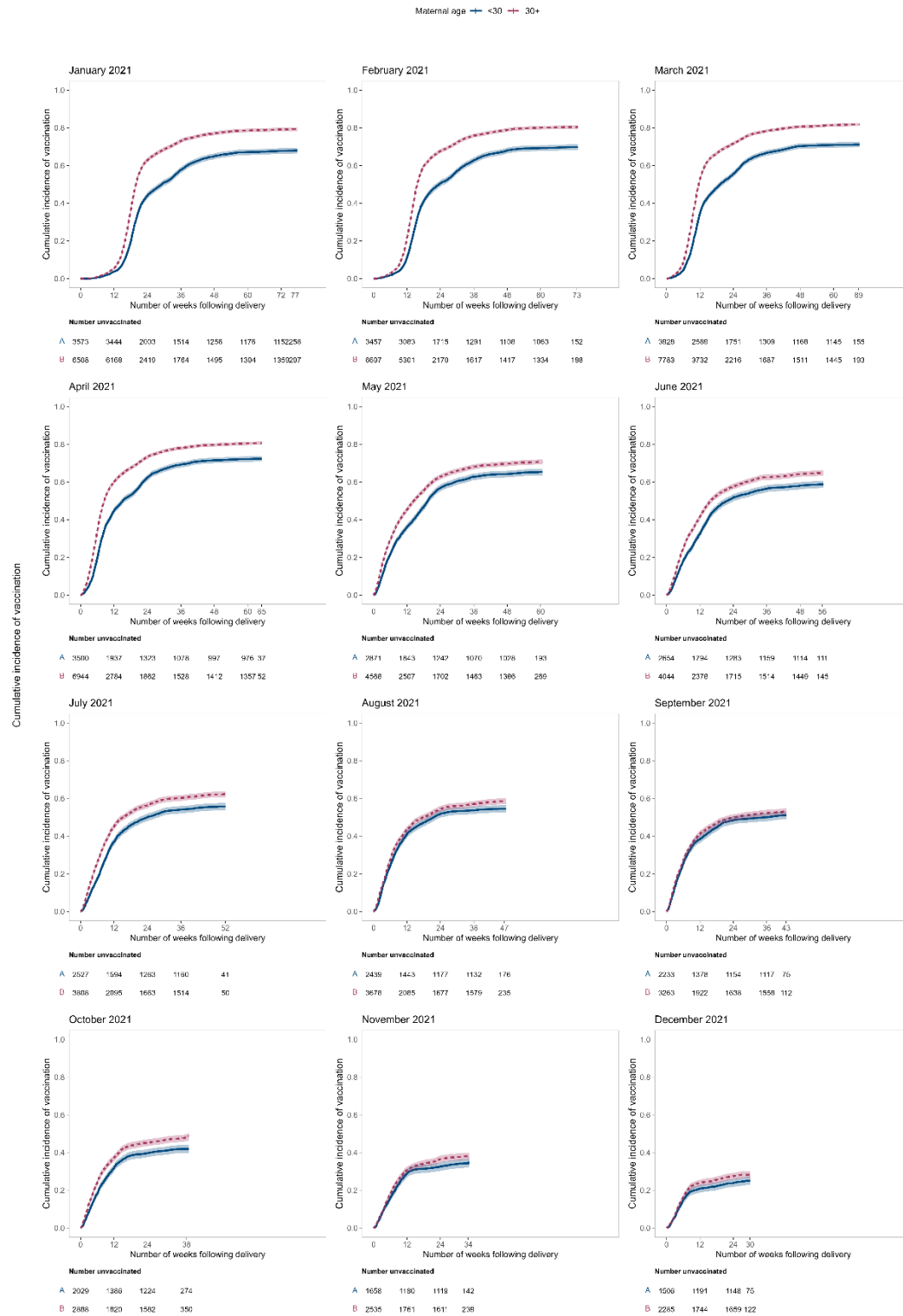


Table S4. Cumulative incidence of COVID-19 vaccine series initiation by 6 months (24 weeks) after pregnancy, by 12 months (48 weeks) after pregnancy, and by end of follow-up (June 30, 2022), stratified by calendar month of delivery

Month of delivery	Cumulative incidence (%) of COVID-19 vaccine series initiation by 6 months (24 weeks) after pregnancy	Cumulative incidence (%) of COVID-19 vaccine series initiation by 12 months (48 weeks) after pregnancy ^a	Cumulative incidence (%) of COVID-19 vaccine series initiation by the end of follow-up (June 30, 2022) ^b
January 2021	56.3	72.8	75.2
February 2021	61.8	75.2	76.8
March 2021	66.3	77.1	78.1
April 2021	69.6	76.9	77.8
May 2021	60.5	67.6	68.5
June 2021	55.3	61.8	62.3
July 2021	53.9	59.5	59.5
August 2021	53.4	---	56.8
September 2021	49.2	---	52.0
October 2021	43.0	---	45.3
November 2021	35.0	---	36.4
December 2021	26.0	---	26.8
OVERALL	56.3	---	65.0

^a July to December 2021 not shown, as individuals who have birth in these calendar months had less than 12 months of follow-up time.

^b Follow-up time ranged from 6 to 18 months according to calendar month of delivery.

Table S5. Cumulative incidence of COVID-19 vaccine series initiation by 6 months (24 weeks) after pregnancy, stratified by calendar month of delivery, maternal age group, and newborn feeding status from birth to discharge from hospital or birth center ^a

Month of delivery	Overall	Maternal age group		Newborn feeding status from birth to discharge from hospital or birth center ^b	
		<30 years	≥30 years	Exclusive breastfeeding	Other methods of newborn feeding
January 2021	56.3	44.1	63.0	55.8	56.7
February 2021	61.8	50.5	67.7	61.4	62.2
March 2021	66.3	55.7	71.7	66.0	66.5
April 2021	69.6	62.4	73.3	69.5	69.7
May 2021	60.5	56.8	62.9	58.8	61.9
June 2021	55.3	51.8	57.6	53.3	56.9
July 2021	53.9	50.1	56.4	50.5	56.5
August 2021	53.4	51.8	54.5	51.3	54.9
September 2021	49.2	48.4	49.8	46.8	51.1
October 2021	43.0	39.7	45.3	39.7	45.4
November 2021	35.0	32.6	36.5	32.4	36.9
December 2021	26.0	23.9	27.4	24.4	27.1
OVERALL	56.3	49.5	60.2	55.1	57.2

^a Follow-up time limited to 6 months (24 weeks) after delivery.

^b Exclusive breastfeeding vs. other methods of newborn feeding from birth to discharge from hospital/birth center. Other methods of feeding comprised: breast milk substitute (formula only), breast milk substitute (other), combination of breastmilk and breastmilk substitute, and unknown feeding practices.

Figure S3. Cumulative incidence plots of time-to-COVID-19 vaccine series initiation after pregnancy, by calendar month of delivery and newborn feeding status at discharge from hospital/birth center

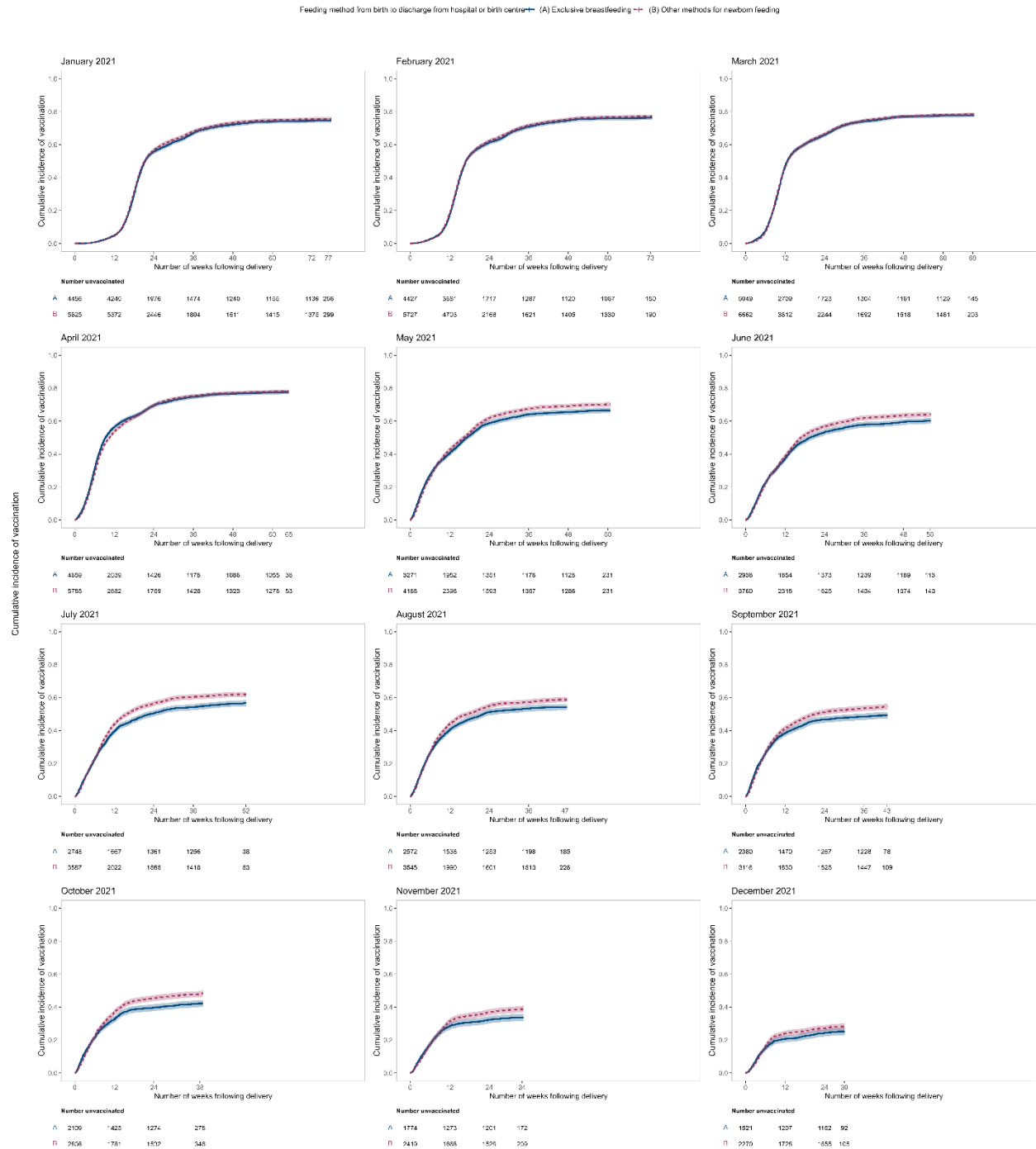


Table S6. COVID-19 vaccine series initiation after pregnancy among individuals who gave birth between May 1 and December 31, 2021 and had not yet been vaccinated by the end of pregnancy, stratified by timing of delivery

Characteristic	Adjusted Hazard Ratio (95% CI)	
	Births between May 1, 2021 - August 31, 2021	Births between September 1, 2021 - December 31, 2021
Maternal age (years)		
<25	0.72 (0.68, 0.76)	0.75 (0.69, 0.81)
25-29	0.91 (0.88, 0.95)	0.94 (0.89, 1.00)
30-34	1.00	1.00
35-39	0.98 (0.94, 1.02)	0.93 (0.88, 0.99)
≥40	0.84 (0.78, 0.91)	0.69 (0.62, 0.78)
Parity		
0 (Nulliparous)	1.05 (1.02, 1.09)	1.09 (1.04, 1.15)
1 (Primiparous)	1.00	1.00
≥2 (Multiparous)	0.73 (0.70, 0.76)	0.69 (0.65, 0.73)
Multiple birth		
Yes	0.99 (0.87, 1.12)	1.06 (0.88, 1.26)
Any pre-existing maternal medical condition		
Yes	1.06 (1.01, 1.11)	1.13 (1.05, 1.22)
Exclusive breastfeeding at discharge		
Yes	0.82 (0.79, 0.84)	0.79 (0.75, 0.83)
Healthcare provider who caught/delivered baby		
Midwife	0.70 (0.67, 0.74)	0.63 (0.58, 0.68)
Registered Nurse or CNS/NP	0.85 (0.72, 1.01)	0.93 (0.72, 1.19)
Family Physician	0.83 (0.77, 0.89)	0.94 (0.85, 1.04)
Obstetrician	1.00	1.00
Other	0.98 (0.93, 1.04)	1.00 (0.92, 1.09)
Unattended (None)	0.51 (0.38, 0.69)	0.50 (0.31, 0.80)
Smoked during pregnancy		
Yes	0.69 (0.64, 0.73)	0.65 (0.60, 0.72)
Substance use during pregnancy		
Yes	0.67 (0.63, 0.72)	0.65 (0.58, 0.72)
Pregnancy complications		
Yes	1.12 (1.08, 1.15)	1.11 (1.06, 1.16)
Preterm birth		
Yes (<37 Weeks)	0.92 (0.87, 0.98)	0.90 (0.82, 0.99)
Maternal BMI (kg/m²)		
≥30.0 (Obese)	1.03 (0.99, 1.07)	1.04 (0.98, 1.11)
Neighbourhood median family income quintile		
1 (Lowest)	0.79 (0.75, 0.84)	0.81 (0.75, 0.88)
2	0.88 (0.83, 0.92)	0.90 (0.83, 0.97)
3	0.95 (0.90, 1.00)	0.95 (0.87, 1.02)
4	1.00 (0.95, 1.05)	0.99 (0.91, 1.07)
5 (Highest)	1.00	1.00
Rural residence		
Yes	0.73 (0.69, 0.76)	0.71 (0.66, 0.76)

Table S6. COVID-19 vaccine series initiation after pregnancy among individuals who gave birth between May 1 and December 31, 2021 and had not yet been vaccinated by the end of pregnancy, stratified by timing of delivery (continued)

Characteristic	Adjusted Hazard Ratio (95% CI)	
	Births between May 1, 2021 - August 31, 2021	Births between September 1, 2021 - December 31, 2021
PHU region of residence		
South West	1.00 (0.94, 1.06)	0.91 (0.83, 1.00)
Central West	1.01 (0.96, 1.07)	1.03 (0.96, 1.11)
Central East	1.06 (1.01, 1.11)	1.09 (1.02, 1.17)
Greater Toronto Area	1.00	1.00
Eastern	1.00 (0.94, 1.06)	1.09 (1.00, 1.19)
North West	1.24 (1.10, 1.39)	1.23 (1.03, 1.47)
North East	1.01 (0.92, 1.11)	1.04 (0.91, 1.18)
Marginalization Indices		
Residential instability quintile		
1 (Least unstable)	1.00	1.00
2	1.02 (0.97, 1.07)	1.06 (0.98, 1.14)
3	0.98 (0.94, 1.03)	0.98 (0.91, 1.06)
4	0.99 (0.93, 1.05)	0.93 (0.85, 1.01)
5 (Most unstable)	1.03 (0.96, 1.09)	1.00 (0.92, 1.10)
Material deprivation quintile		
1 (Least deprived)	1.00	1.00
2	0.93 (0.88, 0.97)	0.89 (0.83, 0.96)
3	0.89 (0.84, 0.94)	0.86 (0.79, 0.93)
4	0.84 (0.79, 0.90)	0.79 (0.72, 0.87)
5 (Most deprived)	0.77 (0.72, 0.83)	0.70 (0.63, 0.77)
Dependency quintile		
1 (Least dependent)	1.00	1.00
2	0.95 (0.91, 0.99)	0.91 (0.86, 0.98)
3	0.89 (0.85, 0.94)	0.89 (0.83, 0.96)
4	0.94 (0.90, 0.99)	0.90 (0.83, 0.96)
5 (Most dependent)	0.91 (0.86, 0.96)	0.84 (0.78, 0.91)
Ethnic concentration quintile		
1 (Lowest concentration)	1.00	1.00
2	0.98 (0.93, 1.04)	1.13 (1.04, 1.24)
3	1.03 (0.96, 1.09)	1.16 (1.05, 1.27)
4	1.07 (1.00, 1.13)	1.20 (1.09, 1.32)
5 (Highest concentration)	1.22 (1.14, 1.29)	1.47 (1.34, 1.62)

Table S7. COVID-19 vaccine series initiation after pregnancy among individuals who gave birth between May 1 and December 31, 2021 and had not yet been vaccinated by the end of pregnancy, limiting the follow-up period to 6 months (24 weeks)

Characteristic	Received ≥ 1 dose of COVID-19 vaccine within 180 days following delivery ^a	
	Unadjusted hazard ratio (95% CI)	Adjusted hazard ratio ^d (95% CI)
Maternal age (years)		
<25	0.69 (0.65 to 0.72)	0.72 (0.69 to 0.76)
25-29	0.89 (0.86 to 0.92)	0.91 (0.89 to 0.95)
30-34	1.00	1.00
35-39	0.95 (0.92 to 0.99)	0.95 (0.91 to 0.98)
≥ 40	0.78 (0.73 to 0.83)	0.77 (0.72 to 0.83)
Month of delivery		
May 2021	1.00	1.00
June 2021	0.87 (0.83 to 0.90)	0.87 (0.83 to 0.91)
July 2021	0.86 (0.82 to 0.90)	0.87 (0.83 to 0.90)
August 2021	0.86 (0.83 to 0.90)	0.87 (0.83 to 0.91)
September 2021	0.78 (0.75 to 0.82)	0.79 (0.76 to 0.83)
October 2021	0.65 (0.61 to 0.68)	0.65 (0.62 to 0.69)
November 2021	0.49 (0.47 to 0.52)	0.50 (0.47 to 0.53)
December 2021	0.35 (0.33 to 0.38)	0.35 (0.33 to 0.38)
Parity		
0 (nulliparous)	1.04 (1.01 to 1.07)	1.07 (1.04 to 1.10)
1 (primiparous)	1.00	1.00
≥ 2 (multiparous)	0.71 (0.68 to 0.73)	0.70 (0.68 to 0.73)
Multiple birth		
No	1.00	1.00
Yes	1.01 (0.91 to 1.13)	1.01 (0.90 to 1.12)
Any pre-existing maternal medical condition ^e		
No	1.00	1.00
Yes	1.11 (1.07 to 1.16)	1.09 (1.05 to 1.14)
Exclusive breastfeeding from birth to discharge from hospital or birth center ^f		
No	1.00	1.00
Yes	0.81 (0.79 to 0.83)	0.81 (0.79 to 0.84)
Healthcare provider who caught/delivered baby		
Midwife	0.65 (0.63 to 0.68)	0.68 (0.65 to 0.71)
Registered Nurse or CNS/NP	0.84 (0.73 to 0.98)	0.87 (0.76 to 1.01)
Family Physician	0.84 (0.79 to 0.89)	0.88 (0.83 to 0.94)
Obstetrician	1.00	1.00
Other	0.95 (0.91 to 1.00)	0.99 (0.94 to 1.04)

Unattended (None)	0.44 (0.34 to 0.58)	0.47 (0.36 to 0.62)
Smoked during pregnancy		
No	1.00	1.00
Yes	0.64 (0.60 to 0.67)	0.67 (0.63 to 0.70)
Substance use during pregnancy ^g		
No	1.00	1.00
Yes	0.63 (0.59 to 0.67)	0.66 (0.62 to 0.70)
Pregnancy complications ^h		
No	1.00	1.00
Yes	1.20 (1.16 to 1.24)	1.18 (1.14 to 1.23)
Preterm birth		
No (≥ 37 weeks)	1.00	1.00
Yes (<37 Weeks)	0.93 (0.88 to 0.98)	0.93 (0.88 to 0.98)
Maternal BMI (kg/m ²)		
≥ 30.0	1.02 (0.99 to 1.05)	1.04 (1.00 to 1.07)
<30.0	1.00	1.00
Neighborhood median family income quintiles		
1 (Lowest)	0.80 (0.76 to 0.84)	0.78 (0.75 to 0.82)
2	0.88 (0.85 to 0.93)	0.87 (0.84 to 0.91)
3	0.95 (0.91 to 0.99)	0.93 (0.89 to 0.98)
4	1.00 (0.95 to 1.04)	0.99 (0.94 to 1.03)
5 (Highest)	1.00	1.00
Rural residence		
No	1.00	1.00
Yes	0.74 (0.71 to 0.77)	0.72 (0.69 to 0.75)
PHU region of residence		
South West	0.93 (0.89 to 0.98)	1.00 (0.95 to 1.05)
Central West	1.04 (1.00 to 1.08)	1.04 (1.00 to 1.09)
Central East	1.14 (1.10 to 1.19)	1.10 (1.05 to 1.14)
Greater Toronto Area	1.00	1.00
Eastern	1.01 (0.96 to 1.06)	1.05 (1.00 to 1.11)
North West	1.11 (1.01 to 1.23)	1.24 (1.12 to 1.38)
North East	0.94 (0.87 to 1.01)	1.06 (0.98 to 1.14)
Marginalization indices ⁱ		
Residential instability quintile		
1 (least unstable)	1.00	1.00
2	0.98 (0.94 to 1.03)	1.02 (0.98 to 1.06)
3	0.92 (0.88 to 0.96)	0.97 (0.93 to 1.01)
4	0.88 (0.84 to 0.92)	0.96 (0.92 to 1.01)
5 (most unstable)	0.89 (0.85 to 0.92)	1.02 (0.96 to 1.07)
Material deprivation quintile		
1 (least deprived)	1.00	1.00
2	0.91 (0.87 to 0.95)	0.91 (0.87 to 0.95)
3	0.87 (0.84 to 0.91)	0.88 (0.84 to 0.92)
4	0.81 (0.78 to 0.85)	0.82 (0.77 to 0.86)

5 (most deprived)	0.72 (0.69 to 0.75)	0.73 (0.69 to 0.78)
Dependency quintile		
1 (least dependent)	1.00	1.00
2	0.90 (0.86 to 0.93)	0.94 (0.91 to 0.98)
3	0.85 (0.81 to 0.88)	0.90 (0.86 to 0.93)
4	0.87 (0.83 to 0.90)	0.93 (0.89 to 0.97)
5 (most dependent)	0.82 (0.78 to 0.85)	0.90 (0.86 to 0.94)
Ethnic concentration quintile		
1 (lowest concentration)	1.00	1.00
2	1.10 (1.05 to 1.16)	1.04 (0.99 to 1.09)
3	1.17 (1.11 to 1.23)	1.07 (1.01 to 1.13)
4	1.22 (1.16 to 1.28)	1.10 (1.04 to 1.16)
5 (highest concentration)	1.32 (1.27 to 1.38)	1.28 (1.21 to 1.35)

Abbreviations: BMI, body mass index; PHU, public health unit

^a Follow-up period extended from the day of delivery until June 30, 2022.

^b Column percentages.

^c Row percentages.

^d Models were adjusted for maternal age at delivery, neighborhood income quintile, rural residence, and public health unit region.

^e Composite of: asthma, chronic hypertension, diabetes, heart disease, thyroid disease.

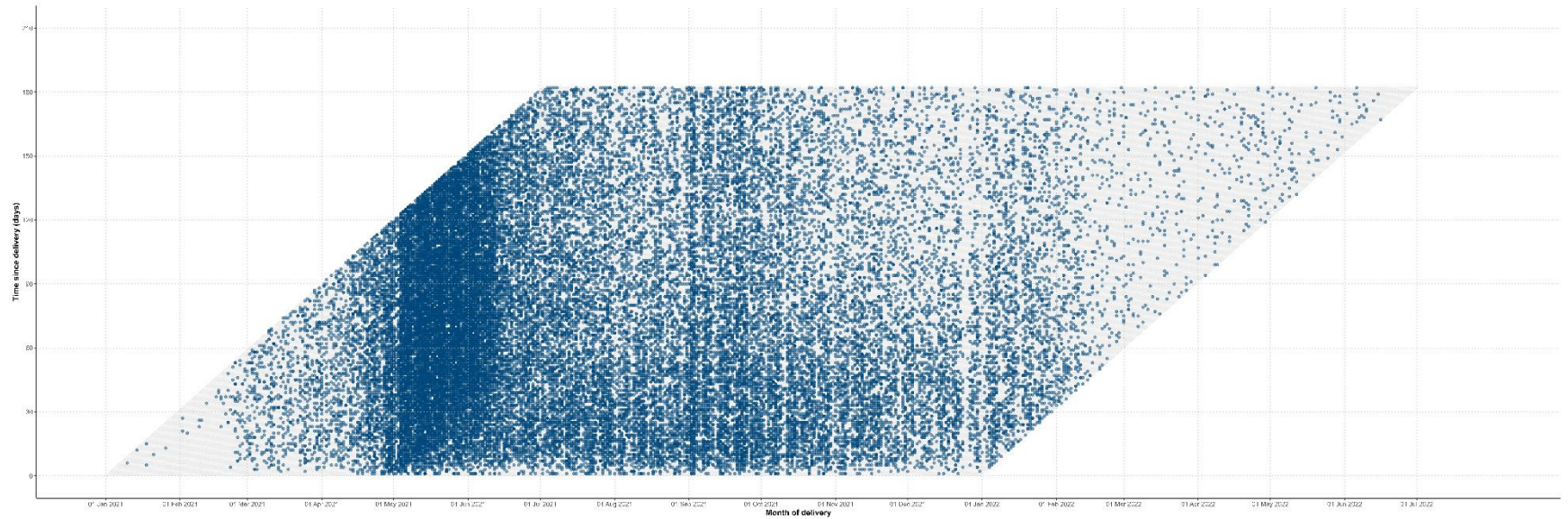
^f Exclusive breastfeeding vs. other methods of newborn feeding from birth to discharge from hospital or birth center. Other methods of feeding comprised: breast milk substitute (formula only), breast milk substitute (other), combination of breastmilk and breastmilk substitute, and unknown feeding practices.

^g Self-reported cannabis, opioid or alcohol use during pregnancy.

^h Composite of: gestational hypertension, eclampsia, pre-eclampsia, gestational diabetes, and pulmonary embolism.

ⁱ Ontario Marginalization Index included neighborhood-level quintiles for residential instability (family or housing instability), material deprivation (inability to attain basic material needs), dependency (receipt of income support), and ethnic concentration (geographic areas with high concentrations of recent immigrants and/or 'visible minorities'; see Table S1 for details.

Figure S4. Lexis diagram showing first COVID-19 vaccine dose administered within the first 6 months (24 weeks) after pregnancy, by calendar month of delivery (x-axis) and time since delivery in days (y-axis) ^a



^a Among the full study population of deliveries from January 1 to December 31, 2021.

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