

# The Impact of Incorporating Virtual Prenatal Care Visits on In-Person Healthcare Utilization in Alberta, Canada

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## 1 Background

- Fee codes for virtual care visits were introduced in response to the COVID-19 pandemic, and they have subsequently been integrated into routine prenatal care.
- Virtual visits improve access to prenatal services, yet concerns have been raised about potential inequities in accessing virtual care due to technological or resource availability.<sup>1,2</sup>
- The utilization of virtual prenatal care and its impact on the total number of prenatal care visits has yet to be described within Alberta.

### This study aimed to:

1. Examine if the incorporation of virtual prenatal care visits impacted the total number of prenatal visits.
2. Determine what proportion of virtual visits required a subsequent follow-up in-person prenatal care visit, emergency department visit, or hospitalization.

## 2 Methods

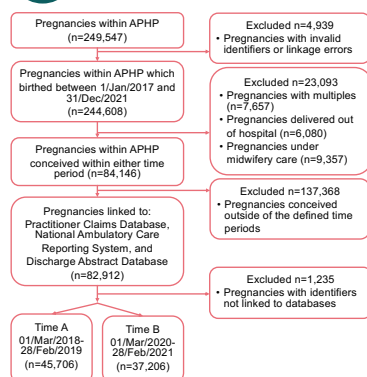


Figure 1: Sample selection and data linkage

- Sample selection for this observational study included pregnancies conceived within Time A (01/Mar/2018-28/Feb/2019) and Time B (01/Mar/2020-28/Feb/2021), which is described in Figure 1.
- Prenatal care visits were identified using the Practitioner Claims database's pregnancy-specific diagnostic and procedural codes.
- Sample characteristics were described and compared between time periods and the distribution of prenatal care visits was examined graphically.
- The percentage of virtual visits followed by in-person prenatal care visits, emergency department visits, or hospital admission was estimated at the population level.
- The crude, adjusted, and stratified estimated change in the total number of prenatal care visits between Time A and B was modelled using negative binomial regression, with gestational age at delivery as an offset.
- Within Time B, negative binomial regression modelling estimated the crude, adjusted, and stratified change in the number of in-person prenatal care visits per virtual visit, again including gestational age at delivery as an offset.

## 3 Results

Table 1: Sample characteristics

Variables		Full sample (n=82,912)	Time A (01/Mar/2018-28/Feb/2019) (n=45,706)	Time B (01/Mar/2020-28/Feb/2021) (n=37,206)
		n(%) or mean (SD)		
Maternal age at delivery	Years	30.8 (5.1)	30.7 (5.2)	31.0 (5.1)
Parity	Nulliparous	32,691 (39.5%)	17,741 (38.9%)	14,950 (40.3%)
	Multiparous	50,113 (60.5%)	27,863 (61.1%)	22,150 (59.7%)
Antenatal risk score	Low	46,284 (56.3%)	25,500 (56.2%)	20,784 (56.4%)
	Moderate	29,172 (35.5%)	16,092 (35.5%)	13,080 (35.5%)
	High	6,743 (8.2%)	3,760 (8.3%)	2,983 (8.1%)
Antenatal care provider	General practitioner	33,263 (40.1%)	18,513 (40.5%)	14,750 (39.7%)
	Obstetrics	47,186 (56.9%)	25,773 (56.4%)	21,413 (57.6%)
Provincial health zone	South	6,334 (7.6%)	3,294 (7.2%)	3,040 (8.2%)
	Calgary	31,994 (38.6%)	16,446 (36.0%)	15,548 (41.8%)
	Central	8,233 (9.9%)	4,612 (10.1%)	3,621 (9.7%)
	Edmonton	26,524 (32.0%)	15,298 (33.5%)	11,226 (30.2%)
Residential area	Urban	71,736 (86.5%)	39,155 (85.7%)	32,581 (87.6%)
	Rural	11,176 (13.5%)	6,551 (14.3%)	4,625 (12.4%)
Canadian Index of Multiple Deprivation quintiles	1-Least	15,781 (19.0%)	8,204 (17.9%)	7,577 (20.4%)
	2	15,765 (19.0%)	8,528 (18.7%)	7,237 (19.5%)
	3	17,048 (20.6%)	9,597 (21.0%)	7,451 (20.0%)
	4	19,923 (24.0%)	11,057 (24.2%)	8,866 (23.8%)
	5-Most	14,394 (17.4%)	8,319 (18.2%)	6,075 (16.3%)

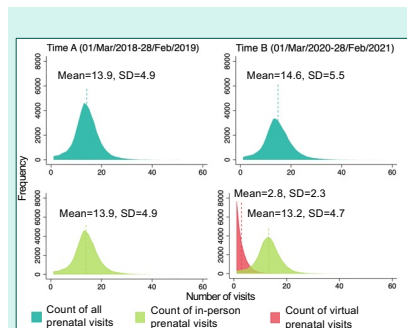


Figure 2: Distribution of prenatal care visits over study time periods

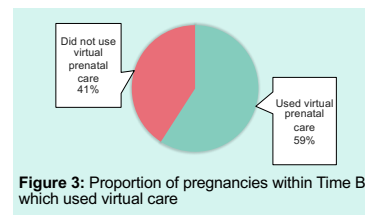


Figure 3: Proportion of pregnancies within Time B which used virtual care

Table 2: Proportion of virtual visits with subsequent in-person follow-up

Visit type	Timing		
	24-hours	48-hours	72-hours
% (95% CI)			
In-person	9.0(8.8-9.2)	12.7(12.4-13.0)	15.7(15.4-16.0)
Emergency department	0.7(0.6-0.8)	0.9(0.9-1.0)	1.1(1.0-1.2)
Hospital admission	0.10(0.07-0.12)	0.11(0.08-0.14)	0.11(0.08-0.14)

Table 3: Incident rate ratios (IRR) of the total number of prenatal care visits between times A and B

Model	IRR [95% CI]
Crude	◆ 1.05 [1.05, 1.06]
Adjusted*	◆ 1.04 [1.04, 1.05]
<b>Stratified by: Maternal Age</b>	
<35 years	◆ 1.04 [1.03, 1.04]
≥35 years	◆ 1.05 [1.04, 1.06]
<b>Stratified by: Parity</b>	
Nulliparous	◆ 1.05 [1.04, 1.05]
Multiparous	◆ 1.04 [1.03, 1.04]
<b>Stratified by: Antenatal risk score</b>	
Low	◆ 1.04 [1.03, 1.05]
Moderate	◆ 1.04 [1.03, 1.05]
High	◆ 1.05 [1.02, 1.07]
<b>Stratified by: Antenatal care provider</b>	
General Practitioner	◆ 1.04 [1.03, 1.04]
Obstetrics	◆ 1.05 [1.04, 1.05]
<b>Stratified by: Provincial health zone</b>	
South	◆ 0.99 [0.97, 1.01]
Calgary	◆ 1.05 [1.04, 1.06]
Central	◆ 0.96 [0.95, 0.97]
Edmonton	◆ 1.07 [1.06, 1.08]
North	◆ 1.04 [1.02, 1.05]
<b>Stratified by: Area of residence</b>	
Urban	◆ 1.04 [1.04, 1.05]
Rural	◆ 1.04 [1.02, 1.05]
<b>Stratified by: Canadian Index of Multiple Deprivation</b>	
1-Least deprived	◆ 1.05 [1.04, 1.06]
2	◆ 1.05 [1.04, 1.06]
3	◆ 1.03 [1.02, 1.04]
4	◆ 1.06 [1.05, 1.07]
5-Most deprived	◆ 0.85 [0.84, 0.86]

\*Adjusted for maternal age, parity, antenatal risk score, antenatal care provider provincial health zone, area of residence, and deprivation index (a measure of socioeconomic status).

Table 4: Incident rate ratios (IRR) of in-person prenatal care visits per virtual visit within time B

Model	IRR [95% CI]
Crude	◆ 1.03 [1.03, 1.04]
Adjusted*	◆ 1.03 [1.03, 1.03]
<b>Stratified by: Maternal Age</b>	
<35 years	◆ 1.03 [1.03, 1.03]
≥35 years	◆ 1.03 [1.02, 1.03]
<b>Stratified by: Parity</b>	
Nulliparous	◆ 1.03 [1.02, 1.03]
Multiparous	◆ 1.03 [1.03, 1.03]
<b>Stratified by: Antenatal risk score</b>	
Low	◆ 1.02 [1.02, 1.02]
Moderate	◆ 1.03 [1.03, 1.03]
High	◆ 1.04 [1.04, 1.05]
<b>Stratified by: Antenatal care provider</b>	
General Practitioner	◆ 1.02 [1.02, 1.02]
Obstetrics	◆ 1.03 [1.03, 1.03]
<b>Stratified by: Provincial health zone</b>	
South	◆ 1.02 [1.01, 1.04]
Calgary	◆ 1.03 [1.03, 1.03]
Central	◆ 1.03 [1.02, 1.04]
Edmonton	◆ 1.03 [1.02, 1.03]
North	◆ 1.04 [1.03, 1.04]
<b>Stratified by: Area of residence</b>	
Urban	◆ 1.03 [1.03, 1.03]
Rural	◆ 1.03 [1.02, 1.04]
<b>Stratified by: Canadian Index of Multiple Deprivation</b>	
1-Least deprived	◆ 1.02 [1.02, 1.03]
2	◆ 1.03 [1.03, 1.03]
3	◆ 1.03 [1.03, 1.03]
4	◆ 1.03 [1.02, 1.03]
5-Most deprived	◆ 1.03 [1.02, 1.03]

\*Adjusted for maternal age, parity, antenatal risk score, antenatal care provider provincial health zone, area of residence, and deprivation index (a measure of socioeconomic status).

## 4 Conclusions

- 59% of pregnancies used virtual prenatal care once the option was introduced.
- Virtual visits were more frequently followed by in-person prenatal care visits than emergency department visits or hospitalizations.
- The introduction of virtual prenatal care led to a small increase in the total number of prenatal care visits within the first year.
- However, the stratified analysis shows this differed by provincial health zone and socio-economic status (SES).
- Pregnant persons within the lowest SES quintile experienced fewer total prenatal visits within time B, yet the rate of in-person visits per virtual visit did not differ by SES.
- Continued surveillance is warranted to assess how virtual visits have been incorporated into the prenatal care pathway post-pandemic, specifically for persons with lower SES.

### Funding and Support:



## References:

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