

## Supplementary Appendix

*Methodological details for:* Changes in family medicine visits after the onset of the COVID-19 pandemic in Ontario: a retrospective cohort study (Stephenson et al. 2021)

### Data Source

The 2020 Q2 data extract from the University of Toronto Practice-Based Research Network (UTOPIAN) Data Safe Haven was the data source used in the current study. This is the most recent data extract currently available. The cut-off date for inclusion in this data extract was June 30, 2020. The UTOPIAN Data Safe Haven includes electronic medical records collected from 88 family medicine clinics in the Greater Toronto Area and other parts of Ontario, Canada. Eligibility for inclusion in the data analysis was based on the following criteria.

**Physician level:** Family physicians were eligible to contribute to the research cohort if their EMR data met the following criteria:

1. The percentage of rostered patients<sup>1</sup> with a billing record in the year prior to the cut-off date (i.e., June 30, 2020) was greater than or equal to 20%.
2. The percentage of rostered adult patients with a '*selected*' lab test in the year prior to the cut-off date (i.e., June 30, 2020) was greater than or equal to 20%.
3. The percentage of rostered adult patients with a medication record in the year prior to the cut-off date (i.e., June 30, 2020) was greater than or equal to 20%.
4. The physician had at least 200 rostered patients.
5. The earliest date on which the physician had least 10 family physician visits<sup>2</sup> recorded in the EMR (i.e., the EMR start date) was January 1, 2019 or earlier.

**Patient level:** EMR data from patients who met all of the following criteria were included.

1. The patient had their sex and a valid month and year of birth recorded in the EMR.
2. The patient's EMR start date<sup>3</sup> must be at least 18 months prior to the cut-off date for data extraction (June 30, 2020), unless age <1.5 years at the cut-off date. If age < 1.5 years, then the patient must be rostered or have at least 1 Ontario Health Insurance Plan (OHIP) billing service code that is classified as a family physician office visit.<sup>2</sup>
3. The patient must:
  - a. Be rostered to a participating physician  
**OR**
  - b. Have documentation of a periodic health exam (OHIP billing service code K017, K130, K131, K132) in the past 3 years  
**OR**
  - c. Have had at least two encounters in the past 3 years in which an OHIP service code was billed for a family physician office visit  
**OR**
  - d. Have had at least two encounters in the past 3 years in which an OHIP service code was billed for a special or focused practice office visit, hospital visit (including hospital palliative care visit), emergency room visit, home visit, or long-term care visit AND have a populated cumulative patient profile.

*Notes:*

1. **Rostered patients:** Patient rostering is a process by which patients register with a family practice, family physician, or team. Patient rostering defines a population for which the primary care organization or provider is responsible and facilitates an ongoing relationship between the patient and provider. Patients are formally enrolled and enrolment records are updated through the submission of the Per Patient Rostering Fee (PPRF) Codes: Q200A or Q202A. Patients can be formally de-rostered if physicians submit one of the following PPDR Q codes: Q401A (De-Roster – Member Deceased); Q402A (De-Roster – Ended by Provider); Q403A (De-Roster – Patient Left Province). These Q codes were used to identify the number of rostered patients per physician.
2. **Family physician services: OHIP billing service codes** with a frequency of 50 or more were classified into family physician office visits, special or focused practice office visits, specialist visits, hospital visits, hospital or office prenatal or obstetrical care visits, hospital or home palliative care visits, emergency room visits, home visits, long term care visits, telephone consultations, nurse practitioner visits, add on/premium codes, tracking codes and miscellaneous billing codes.
3. **Patient EMR Start Date:** EMR start date for each patient is defined as the earliest date of a:
  - a. of a family physician office visit

**OR**

  - b. a special or focused practice office visit, hospital visit (including hospital palliative care visit), emergency room visit, home visit or long-term care visit with a populated cumulative patient profile in the EMR AND a family physician office visit less than 1 year prior to the cut-off date for data extraction.

## Measures

### Family physician visits

OHIP service codes billed between January 1, 2019 and June 30, 2020 were used to select family physician visits that occurred via telephone, video, or in-person. Billing records for eligible patients containing any of the following service codes were counted as family physician visits.

“Visitors” were patients for whom any of these codes were billed between January 1, 2019 and June 30, 2020; “Non-visitors” were patients for whom none of these codes were billed between January 1, 2019 and June 30, 2020.

Code	Description	Code	Description
A001	minor assessment	K017	periodic health visit-child aft. 2nd birthday
A002	enhanced 18-month well baby visit	K022	hiv prim care individ care 1/2 hr or major part
A003	major assessment	K028	sexually transmitted disease (std) counseling
A004	general re-assessment	K030	diabetic management fee
A007	intermediate assessment	K032	gp-specific neurocognitive assessment
A008	mini assessment	K033	counselling - 1 pt/yr/unit
A071	complex medical specific re-assessment	K039	smoking cessation follow-up visit
A131	complex medical specific re-assessment	K130	periodic health visit - adolescent
A134	medical specific re-assessment	K131	periodic health visit - adult aged 18 to 64 inclusive
A624	medical specific re-assessment	K132	periodic health visit - adult 65 years of age and older
A888	partial assessment	K680	substance abuse - extended assessment
A903	pre-op assessment	P003	obs.-prenatal care-gen.assess-major prenatal visit
A920	medical management of early pregnancy, initial visit	P004	obs.-prenatal care-minor prenatal assess.-subseq.prenat.vis.
K005	primary mental health	P005	antenatal health screen
K007	ind. psychotherapy per half hour - gp	P008	obs.-post-natal care in office
K013	counselling-one or more people-per 1/2hr	K037	fibromyalgia/chronic fatigue syndrome care

Appendix 1, as supplied by the authors. Appendix to: Stephenson E, O’Neill B, Gronsbell J, et al. Changes in family medicine visits across sociodemographic groups after the onset of the COVID-19 pandemic in Ontario: a retrospective cohort study. *CMAJ Open* 2021. DOI:10.9778/cmajo.20210005. Copyright © 2021 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at [cmajgroup@cmaj.ca](mailto:cmajgroup@cmaj.ca).

K080	Minor assessment of patient by telephone or video	K081	Intermediate assessment including psychotherapy by telephone or video
K082	Psychotherapy, psychiatric or mental health counselling by telephone or video	K087	Minor assessment of an uninsured by telephone or video
K088	Intermediate assessment of an uninsured patient including psychotherapy by telephone or video	K089	Psychotherapy, psychiatric or mental health counselling of an uninsured patient by telephone or video

### Visit format

Two visit formats were defined: *virtual* (i.e., telephone or video) and *in-person*.

Virtual visits were defined based on the use of virtual visit billing codes introduced specifically in response to the COVID-19 pandemic or based on the use of codes for billing services to the Ontario Telehealth Network (a virtual care service that was implemented prior to the COVID-19 pandemic).

A *virtual visit* was counted for any date on which any of the following conditions were met:

- 1) A service code for a family physician visit was billed (as defined above) and an applicable Virtual Care Program (OTN) service code was billed (B099, B101, B102, B103, B201, B202, B203).
- 2) Any of the OHIP codes for family physician visits by telephone or video were billed: K080, K081, K082, K087, K088, K089.

An *in-person visit* was counted for any date on which any of the following criteria were met:

- 1) A service code for a family physician visit was billed (as defined above excluding visits by telephone or video -- K080, K081, K082, K087, K088, K089) AND no Virtual Care Program (OTN) service code was billed (B099, B101, B102, B103, B201, B202, B203).
- 2) A Virtual Care Program (OTN) service code and 2 or more service codes for a family physician visit (as defined above excluding visits by telephone or video -- K080, K081, K082, K087, K088, K089) were billed on the same date.

**Patient sex.** Sex is extracted from the EMR.

**Patient age.** Year and month of birth are extracted from the EMR. Each patient's age is calculated as of the cut-off date for data extraction (i.e., June 30, 2020), using the middle of the birth month as the day of birth.

**Income quintile.** Statistics Canada’s Postal Code<sup>OM</sup> Conversion File Plus (PCCF+) tool was used to assign an income quintile to each participant based on their postal address. The PCCF+ tool assigns postal codes to standard census geographic areas that have corresponding area-level equity stratifiers such as income quintiles and geographic location (urban and rural/remote). The Neighbourhood Income Quintile (CMA/CA) Before Tax (QABTIPPE) was used in the current study. This variable is constructed by using the distribution of incomes within census metropolitan areas (CMAs), census agglomerations (CAs) and provincial residual areas within a province to categorize these areas into income quintiles. Missing data on this variable could occur if no postal code was available in the EMR or is the corresponding income quintile was unknown/undefined.

**Material deprivation quintile.** The material deprivation dimension of the Ontario Marginalization Index uses 6 indicators that come from Statistics Canada and are extracted by the Ontario Agency for Health Protection and Promotion. Quintiles defined for each census dissemination area (DA) are available through Public Health Ontario and were used in the current study (i.e., variable “deprivation\_q\_DA16”). Statistics Canada’s Postal Code<sup>OM</sup> Conversion File Plus (PCCF+) tool was used to identify the appropriate dissemination area to each patient based their postal code.

**Ethnic concentration quintile.** The ethnic concentration dimension of the Ontario Marginalization Index uses 2 indicators that come from Statistics Canada and are extracted by the Ontario Agency for Health Protection and Promotion. Quintiles defined for each census dissemination area (DA) are available through Public Health Ontario and were used in the current study (i.e., variable “ethniccon\_q\_DA16”). Statistics Canada’s Postal Code<sup>OM</sup> Conversion File Plus (PCCF+) tool was used to identify the appropriate dissemination area to each patient based their postal code.

**Table S1. Year-over-year change in visitor rate and visit volume from 2019 to 2020, during the pre-pandemic period from Jan 1-March 30.**

		Visitor rate				Visit volume			
		Visitor Rate in 2019	Visitor Rate in 2020	Year over year difference (95% CI)	Percent Change	Visit Rate in 2019	Visit Rate in 2020	Year over year difference (95% CI)	Percent Change
<b>All patients</b>		292	291	-1 (-2, 1)	-0.2	413	417	3 (0, 6)	0.8
<b>By patient sex</b>	Female	317	315	-2 (-4, 1)	-0.6	456	458	2 (-7, 2)	0.5
	Male	261	262	1 (-2, 4)	0.4	361	366	5 (-9, 0)	1.3
<b>By patient age</b>	18 years and under	233	238	5 (1, 9)	2.1	316	332	16 (-23, -9)	5.1
	19-34 years	230	227	-3 (-7, 1)	-1.4	327	323	-5 (-2, 12)	-1.5
	34-49 years	273	270	-2 (-6, 2)	-0.8	391	386	-5 (-2, 12)	-1.3
	50-64 years	328	328	0 (-4, 4)	0.1	462	463	1 (-7, 6)	0.2
	65 years and over	384	381	-3 (-7, 2)	-0.7	555	566	11 (-19, -4)	2.0
<b>By income quintile</b>	1 = lowest income	307	305	-2 (-6, 2)	-0.5	458	457	-1 (-6, 9)	-0.2
	2	300	299	0 (-5, 4)	-0.1	430	435	5 (-13, 2)	1.3
	3	295	294	-1 (-5, 3)	-0.3	415	417	2 (-9, 6)	0.4
	4	287	289	3 (-2, 7)	0.9	400	406	6 (-13, 1)	1.5
	5 = highest income	283	282	-1 (-4, 3)	-0.3	388	393	5 (-10, 1)	1.2
	Missing	240	226	-14 (-24, 3)	-5.8	350	344	-6 (-13, 25)	-1.7

		Visitor rate				Visit volume			
		Visitor Rate in 2019	Visitor Rate in 2020	Year over year difference (95% CI)	Percent Change	Visit Rate in 2019	Visit Rate in 2020	Year over year difference (95% CI)	Percent Change
<b>By material deprivation quintile</b>	1 = least deprived	291	288	-3 (-7, 1)	-1.0	406	408	2 (-4,8)	0.6
	2	285	287	2 (-2, 6)	0.8	396	404	7 (1,14)	1.9
	3	292	294	2 (-2, 6)	0.6	408	415	7 (0,14)	1.8
	4	301	302	1 (-4, 5)	0.2	435	435	0 (-8,8)	0.0
	5 = most deprived	302	299	-3 (-8, 1)	-1.0	449	448	-1 (-9,8)	-0.1
	Missing	241	228	-13 (-23, -3)	-5.3	359	349	-10 (-20,0)	-2.8
<b>By ethnic concentration quintile</b>	1 = least ethnic diversity	287	287	1 (-5, 6)	0.2	398	408	10 (0, 20)	2.5
	2	286	288	2 (-3, 7)	0.7	402	409	7 (1,16)	1.8
	3	288	289	1 (-4, 5)	0.2	401	405	5 (-2,12)	1.2
	4	294	295	2 (-2, 5)	0.6	412	420	8 (2, 14)	2.0
	5 = most ethnic diversity	301	297	-4 (-7, -1)	-1.3	437	433	-4 (-10, 1)	-1.0
	Missing	241	228	-13 (-23, -3)	-5.3	359	349	-10 (-20,0)	-2.8