ORIGINAL RESEARCH

Relational Continuity, Physician Payment, and Team-Based Primary Care in the Canadian Health Care System

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Purpose: **Continuity is a core component of primary care and known to differ by patient characteristics. It is unclear how primary care physician payment and organization are associated with continuity.**

Methods: **We analyzed administrative data from 7,110,036 individuals aged 16+ in Ontario, Canada who were enrolled to a physician and made at least 2 visits between October 1, 2017 and September 30, 2019. Continuity with physician and practice group was quantified using the usual provider of care index. We used log-binomial regression to assess the relationship between enrollment model and continuity adjusting for patient characteristics.**

Results: **Mean physician and group continuity were 67.3% and 73.8%, respectively, for patients enrolled in enhanced fee-for-service, 70.7% and 76.2% for nonteam capitation, and 70.6% and 78.7% for team-based capitation. These differences were attenuated in regression models for physician-level continuity and group-level continuity. Older age was the most notable factor associated with continuity. Compared with those 16 to 34, those 80 and older had 1.45 times higher continuity with their physician.**

Conclusion: **Our results suggest that continuity does not differ substantially by physician payment or organizational model among primary care patients who are formally enrolled with a physician in a setting with universal health insurance. (J Am Board Fam Med 2022;00:000–000.)**

Keywords: **Canada, Continuity of Patient Care, Patient Care Team, Primary Health Care**

Introduction

The ongoing relationship between a family physician and a patient developed over time is one of the central tenets of primary care.[1] Relational continuity with a single provider is highly valued by both patients and providers[2–6] and has also been consistently associated with better outcomes.[7–9] High relational continuity has been associated with improved preventive care,[10] better chronic disease management,[11–13] fewer emergency department visits,[14–17] fewer hospitalizations,[14,18–20] and even lower mortality[21,22] and costs.[19,23,24]

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Given its strong association with better population health, it is important that health system leaders understand factors influencing relational continuity in primary care. Studies to date have highlighted relevant patient and physician factors. Research from a range of jurisdictions has found that continuity is higher for people who are older in age and have more chronic conditions.[14,25–28] Physicians with larger panel sizes, who are newer to practice, and who provided fewer hours on-call had lower continuity.[27,29–31] However, little research has been done to understand how physician payment and team-based care influence continuity—2 types of reform gaining more traction and that are under the influence of health system leaders.[32]

We sought to understand factors influencing continuity in a large jurisdiction where visits to a primary care provider are fully insured and free at the point of care. We hypothesized that patients of physicians paid primarily through blended capitation would have higher levels of continuity than those paid largely through fee-for-service and that team-based care may lead to reduced physician-level continuity but better group-level continuity.

Methods

Context

In Canada, health care is publicly administered and funded through tax revenue. Ontario is Canada's most populated province, with approximately 14.7 million residents in 2020. All permanent residents are eligible to receive medically necessary hospital and physician services free at the point of care through the Ontario Health Insurance Plan (OHIP). Most physicians bill the government for patients seen or cared for; the type and amount of remuneration varies based on the practice model. In the early 2000s, most primary care physicians were paid fee-for-service, worked in their own office, and did not have the support of a team. By 2011, approximately 84% of comprehensive primary care physicians in Ontario practiced in a patient enrollment model where physicians work in an administrative group with joint responsibility for after-hours care, formally enroll patients, receive blended payments, and are eligible for financial incentives from government for specific chronic disease and preventative care services.[33,34] Patient enrollment models differ based on the proportion of payments that are by capitation versus fee-for-service and by whether they include funding for an interprofessional team. Patients are enrolled to a physician who in turn belongs to a group. Joining a patient enrollment model was voluntary for both physicians and patients, so their distribution across geographic regions of Ontario is variable; for example, there is a higher proportion of team-based models in rural areas.[35]

Study Design and Patient Population

We conducted a cross-sectional analysis using administrative health data to evaluate the association between continuity of care and primary care model and patient characteristics for Ontario residents, aged 16 years or older, over the 2-year period from October 1, 2017 to September 30, 2019. We included residents with a valid OHIP number who were alive on September 30, 2019 and attached to a general practitioner or family physician who practiced in an office location. We excluded physicians who had a focused practice designation. Our analysis only included patients who were enrolled to the physician and had at least 2 primary care visits between October 1, 2017 and September 30, 2019. Other studies of continuity in primary care have also limited analysis to patients with 2 or more visits over 2 years.[15,18] We excluded patients admitted to long-term care; those who attended a community health center, a salaried model serving less than 2% of Ontario's population; and those enrolled to a number of small nonstandard enrollment models.

We limited our analysis to patients who were formally enrolled because we wanted to measure continuity to the enrolled physician or group rather than to the most frequent provider. Enrollment denotes formal responsibility for patient care and is a core component of Ontario's new models incorporating teams and capitation. Our study was not designed to understand continuity for patients who were not enrolled to a physician and who we know have more gaps in care.[36]

sources; no endorsement is intended or should be inferred. TK and RHG are supported as Clinician Scientists by the Department of Family and Community Medicine at the University of Toronto and at St. Michael's Hospital. TK is the Fidani Chair of Improvement and Innovation in Family Medicine at the University of Toronto. MEG is supported by the Brian Hennen Chair in Family Medicine at Queen's University.

Conflict of interest: None.

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Data Sources

We analyzed data held at ICES, which houses administrative health service records for the population of Ontario. All datasets were linked using unique encoded identifiers and analyzed at ICES. We assigned patients to primary care physicians, and physicians to groups, using the enrollment database that is maintained by the Ministry of Health and Long-term Care to pay physicians. Physician billings were used to assess the number of outpatient visits and calculate continuity. We used the database for all residents registered with OHIP to examine patient age, sex, and postal code. We used postal code to derive neighborhood income quintile using a conversion file provided by Statistics Canada that uses 2016 census data (quintile 1: poorest to quintile 5: wealthiest).[37] We used postal code and the Rurality Index for Ontario to determine whether patients resided in a rural area (40+), small town (10 to 39), or urban area (<10).[38] We examined whether patients registered for the first time with OHIP in the last 10 years, a common proxy for immigration. The Johns Hopkins Adjusted Clinical Group (ACG) method[39–41] was used to measure comorbidity and morbidity (ACG System Version 10). Comorbidity was assessed using the ACG System Aggregated Diagnosis Groups (ADGs) categorized as 0 to 4 (no or low comorbidity), 5 to 9 (moderate comorbidity), and 10+ (high comorbidity). Morbidity was measured using the ACG System Resource Utilization Bands (RUBs) categorized as 0 to 1 (nonuser/healthy user), 2 (low morbidity), 3 (moderate morbidity), and 4+ (high morbidity).

Measures of Continuity of Care

Our primary analysis included 2 measures of continuity: continuity to the enrolled physician and continuity to the enrolled group. We assessed group continuity because physicians in the same group are supposed to share responsibility for after-hours care, and many have systems to support informational continuity and daytime cross-coverage between physicians.

We quantified continuity of care using a modified usual provider of care (UPC) index,[42] defined as the fraction of a patient's visits to the primary care physician or group out of all outpatient visits; we were only able to include in-person visits to physicians as phone calls and visits to other health professionals were not captured by administrative billing data at the time. Essentially, the UPC measures the extent to which visits are concentrated with a single physician or group of physicians. Typically, the UPC measures the concentration of visits to the most frequently seen physician or group; in our study, we measured the concentration of visits to the enrolling physician or enrolling group. The UPC index was calculated for the 2-year period from October 1, 2017 to September 30, 2019 for both visits to the physician and practice group:

$$\mathrm{UPC} = \frac{\textit{total number of visits to enrolling physician (or enrolling group)}}{\textit{total number of outpatient visits to all general or family practitioners}}.$$

The index ranges from 0 to 100% with 0 indicating no visits to the enrolling physician or group and 100 indicating highest continuity with all visits made to the same enrolling physician or group. The denominator included all outpatient visits made in an office location to any general practitioner or family physician who was not designated as focused practice (eg, because they are exclusively practicing sports medicine, addiction medicine, palliative care, or psychotherapy).

Patient Enrollment Models

We categorized patient enrollment models into 3 categories based on the predominant type of payment and whether there was government funding for nonphysician team members.[34,43] In *enhanced fee-for-service* (Comprehensive Care Model, Family Health Group), physicians receive approximately 80% of remuneration through fee-for-service billings, 15% from capitation payments per enrolled patient adjusted for age and sex, and 5% from financial incentives and bonuses with no additional funding to hire nonphysician health professionals. In *nonteam capitation* (Family Health Network, Family Health Organization), 70% of funding is from capitation, 20% from fee-for-service billings, and 10% from incentives and bonuses with no additional funding to hire nonphysician health professionals. In *team-based capitation*, the type of payment is the same as nonteam capitation, but physicians are part of a group that receives funding to hire health professionals such as nurses, nurse practitioners, social workers, pharmacists, and dietitians. Patients were assigned to the physician and group they were enrolled to on September 30, 2019.

Statistical Analysis

For descriptive statistics we calculated the mean value of UPC index for physician continuity and group continuity across sociodemographic groups and patient enrollment models. To measure the association between patient enrollment model and the continuity index, as risk ratios, we used log-binomial regression with continuity entered in the model as a proportion. The risk ratios (RRs) and 95% CIs were adjusted for age, sex, rurality, income quintile, recent immigration, comorbidity (ADG), and morbidity (RUB). A significance level of 0.05 was used in all analyses. Analyses were conducted in SAS Enterprise Guide v9.4 (SAS Institute, Cary, North Carolina).

Additional Analyses

Health care utilization patterns and the distribution of enrollment models are known to vary by sex and by urban-rural location. We conducted additional sensitivity analyses where we stratified patients by (1) rurality and (2) sex and then measured the association between the continuity index and the enrollment model within each stratum.

Ethics

This project has been approved by the Research Ethics Board at Sunnybrook Health Sciences Centre, Toronto, Canada.

Results

We analyzed data for 7,110,036 Ontarians enrolled with a physician who made 2 or more visits to their provider in the period between October 1, 2017 and September 30, 2019 (Figure 1). Patient demographic characteristics varied by enrollment model (Table 1). A higher percentage of patients in an

Figure 1. Patient population included in analysis. Abbreviation: GP, general practitioner.

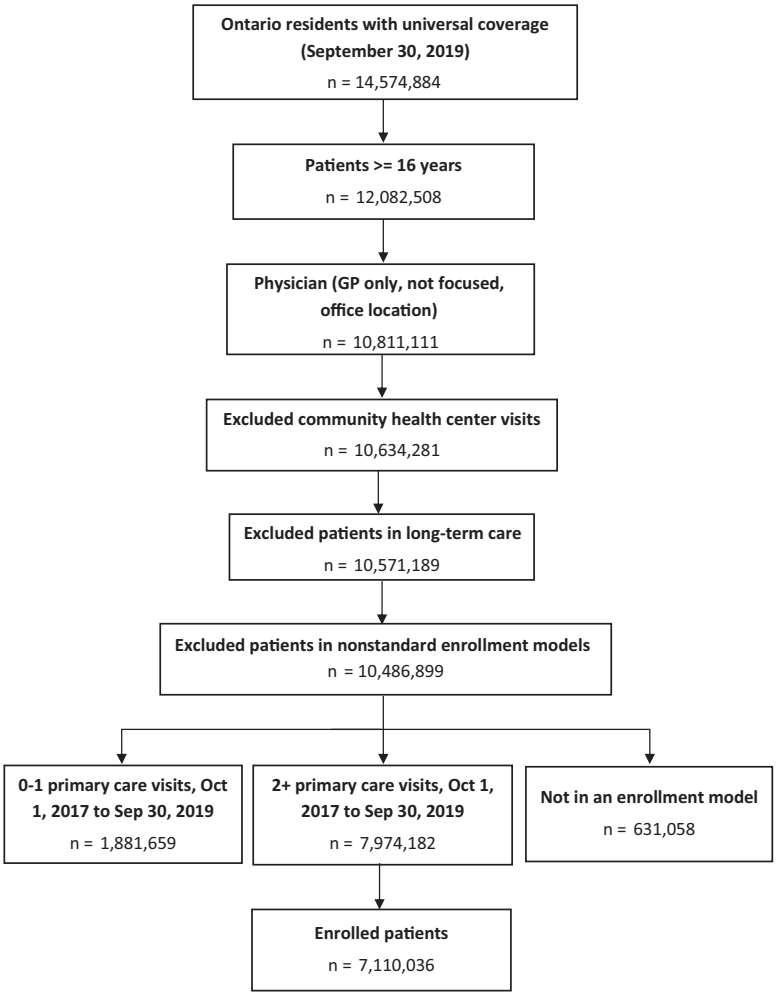


Table 1. Demographic Characteristics for Enrolled Patients with 2 or More Primary Care Visits Between October 1, 2017 and September 30, 2019, Stratified by Patient Enrollment Model

	Patient Enrollment Model							
	Enhanced Fee-for-Service		Nonteam Capitation		Team-Based Capitation		Total	
Characteristic	n	%	n	%	n	%	n	%
Overall	2,617,415	100.0	2,520,998	100.0	1,971,623	100.0	7,110,036	100.0
Age group								
16–34	696,614	26.6	563,986	22.4	440,491	22.3	1,701,091	23.9
35–49	673,824	25.7	553,155	21.9	409,415	20.8	1,636,394	23.0
50–64	702,216	26.8	713,931	28.3	540,275	27.4	1,956,422	27.5
65–79	417,025	15.9	518,891	20.6	435,816	22.1	1,371,732	19.3
80+ years	127,736	4.9	171,035	6.8	145,626	7.4	444,397	6.3
Sex								
Male	1,171,246	44.7	1,090,688	43.3	834,352	42.3	3,096,286	43.5
Female	1,446,169	55.3	1,430,310	56.7	1,137,271	57.7	4,013,750	56.5
Rurality index (RIO score)								
Urban (0 to 9)	2,332,217	89.1	1,935,125	76.8	1,075,389	54.5	5,342,731	75.1
Small town (10 to 39)	234,186	8.9	476,717	18.9	611,200	31.0	1,322,103	18.6
Rural (40+)	43,133	1.6	99,840	4.0	266,513	13.5	409,486	5.8
Missing	7,879	0.3	9,316	0.4	18,521	0.9	35,716	0.5
Number of visits over the 2-year period (October 1, 2017 to September 30, 2019)								
Mean (± SD)	2,617,415	10.2 (± 8.6)	2,520,998	7.2 (± 5.7)	1,971,623	6.6 (± 5.3)	7,110,036	8.1 (± 7.0)
Median (IQR)	2,617,415	8 (5, 13)	2,520,998	6 (3, 9)	1,971,623	5 (3, 8)	7,110,036	6 (4, 10)
2 to 4	638,985	24.4	955,647	37.9	852,053	43.2	2,446,685	34.4
5 to 7	581,805	22.2	682,795	27.1	525,161	26.6	1,789,761	25.2
8 to 11	573,876	21.9	497,287	19.7	347,834	17.6	1,418,997	20.0
12+	822,749	31.4	385,269	15.3	246,575	12.5	1,454,593	20.5
Comorbidity (ADG)*								
No/low comorbidity (0 to 4)	858,997	32.8	952,197	37.8	747,213	37.9	2,558,407	36.0
Moderate comorbidity (5 to 9)	1,288,707	49.2	1,197,334	47.5	923,890	46.9	3,409,931	48.0
High comorbidity (10+)	469,711	17.9	371,467	14.7	300,520	15.2	1,141,698	16.1
Morbidity (RUB)†								
Nonuser/healthy user (0 to 1)	48,480	1.9	58,553	2.3	44,857	2.3	151,890	2.1
Low morbidity (2)	314,417	12.0	344,800	13.7	263,735	13.4	922,952	13.0
Moderate morbidity (3)	1,539,271	58.8	1,465,091	58.1	1,105,677	56.1	4,110,039	57.8
High morbidity (4+)	715,247	27.3	652,554	25.9	557,354	28.3	1,925,155	27.1
Income quintile								
Low (1)	500,005	19.1	406,988	16.1	344,446	17.5	1,251,439	17.6
2	530,913	20.3	470,210	18.7	381,707	19.4	1,382,830	19.4
3	561,096	21.4	501,437	19.9	399,243	20.2	1,461,776	20.6
4	544,486	20.8	540,400	21.4	405,774	20.6	1,490,660	21.0
High (5)	476,908	18.2	598,482	23.7	437,860	22.2	1,513,250	21.3
Missing	4007	0.2	3,481	0.1	2,593	0.1	10,081	0.1
Long-term resident								
Yes	2,250,895	86.0	2,376,543	94.3	1,897,786	96.3	6,525,224	91.8
No	366,520	14.0	144,455	5.7	73,837	3.7	584,812	8.2

Abbreviations: IQR, interquartile range; RIO, Rurality Index for Ontario.
*Johns Hopkins Aggregated Diagnosis Group.
†Johns Hopkins Resource Utilization Band.

enhanced fee-for-service model were younger, were recent registrants, lived in urban areas, and lived in a neighborhood in the lowest income quintile. Patients in an enhanced fee-for-service model had a higher mean number of primary care visits in the last 2 years.

Mean continuity was 69.4% and 76.0% to the enrolling physician and group, respectively (Table 2). In unadjusted analyses, continuity varied by patient characteristics, with higher levels of physician and group continuity among older age groups, among patients living in rural areas and those who were long-term residents. Patients in enhanced fee-for-service models had the lowest levels of physician and group continuity (67.3% and 73.8%, respectively), whereas patients in team-based capitation models had the highest levels of group continuity (78.7%).

Figure 2 shows the percentage of patients by decile of continuity, stratified by rurality and enrollment model. The level of continuity was not normally distributed; between one third and one half of patients had continuity levels of 90% to 100%, and around one tenth or fewer patients had continuity levels of under 10%.

Table 3 presents results of the regression analysis. After adjustment for patient characteristics, there were only small differences by enrollment model for physician continuity (enhanced fee-for-service 67.3%; nonteam capitation 70.7% aRR 1.003, 95% CI, 1.003-1.003; team-based capitation 70.6% aRR 0.980, 95% CI, 0.979-0.980) or group continuity (enhanced fee-for-service 73.8%; nonteam capitation 76.2% aRR 0.994, 95% CI, 0.994-0.995; team-based capitation 78.7% aRR 1.003, 95% CI, 1.002-1.003). The most notable persistent association was between age and continuity. Compared with patients 16 to 34 years of age, those 80 years and older had 1.45 times higher continuity with their physician (57.0% vs 79.6%, RR: 1.447, 95% CI, 1.446-1.448) and 1.34 times higher continuity with their group (64.8% vs 84.7%, aRR: 1.337, 95% CI, 1.336-1.338). Patients living in rural areas and those with higher morbidity also had higher levels of continuity.

Sensitivity Analyses

We found no major differences in the association between continuity and enrollment model when regression analyses were stratified by (1) rurality and (2) patient sex (Appendix Table 1).

Discussion

Continuity is a crucial component of high-quality primary care, and it has been unclear how it is influenced by physician payment and organization. We conducted a population-based study of more than 7 million adults who were enrolled to a primary care physician and made at least 2 visits over a 2-year period. We found that there was little difference in continuity between patients of doctors paid by fee-for-service or capitation and between doctors who did and did not work in a team both before and after we accounted for differences in patient characteristics. The biggest differences in continuity were related to patient characteristics themselves, specifically age, with continuity increasing substantially with older age.

Our findings related to the association between continuity and patient characteristics are consistent with other studies. Studies from many jurisdictions have found that older age and higher morbidity are both factors related to higher continuity. However, only a handful of studies have assessed the association between physician payment, team-based care, and continuity, and findings have been mixed. For example, Hickson and colleagues[44] found that salaried payment was associated with lower continuity. In contrast, Kristjansson and colleagues[27] found that a capitation model, now being phased out, had higher levels of continuity probably because of physician financial penalties when patients saw another physician from outside the group. Physicians in capitation models included in our study also faced similar financial penalties,[45] but this did not seem to influence overall levels of relational continuity.

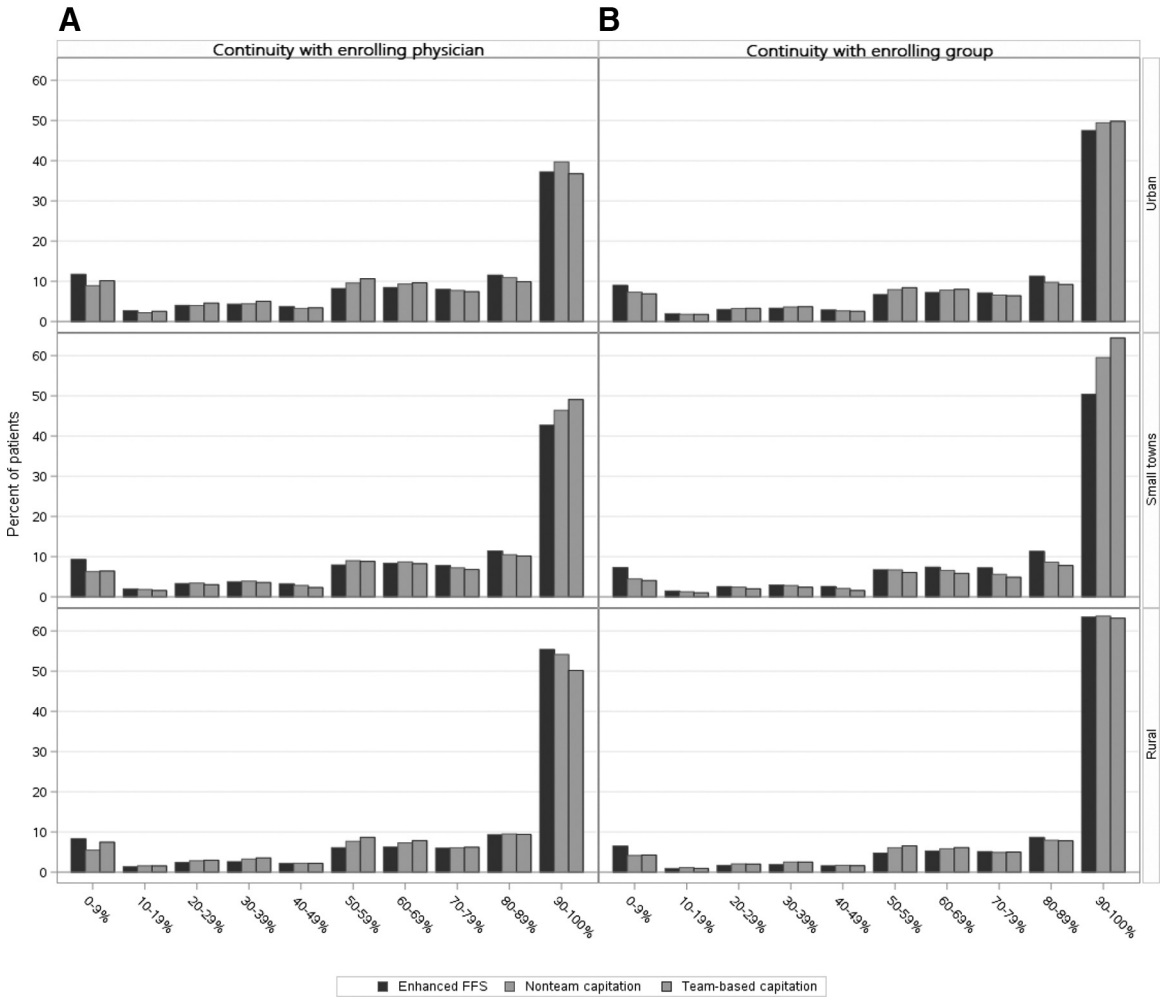
Overall levels of continuity in our study were relatively high and likely relate to health system factors that influence primary care delivery broadly. We limited our analysis to patients attached to family doctors, and, in our setting, visits to family physicians and nurse practitioners are fully insured for permanent residents and free at the point of care. There may also be cultural factors that influence care-seeking behaviors, with most patients understanding the role of primary care providers as the first point of contact in the health care system. In theory, patients in Ontario can choose to see any family physician, even those different from their enrolling physician or group; however, physicians act as gatekeepers and usually only walk-in clinics

Table 2. Mean Continuity to the Enrolling Physician and Group by Patient Enrollment Model and Selected Demographic Characteristics for All Patients with 2 or More Primary Care Visits, October 1, 2017–September 30, 2019, Ontario, Canada

	Enrolling Physician			Enrolling Group		
Characteristic	n	Mean	SD	n	Mean	SD
Overall	7,110,036	69.4	33.2	7,110,036	76.0	31.3
Enrollment model						
Enhanced fee-for-service	2,617,415	67.3	34.2	2,617,415	73.8	32.4
Nonteam capitation	2,520,998	70.7	32.3	2,520,998	76.2	31.1
Team-based capitation	1,971,623	70.6	32.8	1,971,623	78.7	30.0
Age group						
16–34	1,701,091	57.0	35.5	1,701,091	64.8	35.2
35–49	1,636,394	66.0	33.6	1,636,394	73.3	32.1
50–64	1,956,422	74.0	31.1	1,956,422	80.2	28.7
65–79	1,371,732	79.0	28.3	1,371,732	84.4	25.6
80+ years	444,397	79.6	28.2	444,397	84.7	25.7
Sex						
Male	3,096,286	69.9	34.0	3,096,286	76.2	32.1
Female	4,013,750	69.0	32.5	4,013,750	75.8	30.7
Rurality index (RIO score)						
Urban (0 to 9)	5,342,731	67.7	33.6	5,342,731	74.2	32.1
Small town (10 to 39)	1,322,103	74.2	31.2	1,322,103	81.2	28.5
Rural (40+)	409,486	76.0	31.4	409,486	82.7	27.8
Missing	35,716	71.6	33.9	35,716	78.7	31.1
Number of visits over the 2-year period (October 1, 2017 to September 30, 2019)						
2 to 4	2,446,685	69.4	36.1	2,446,685	76.1	33.9
5 to 7	1,789,761	69.8	31.9	1,789,761	76.4	30.2
8 to 11	1,418,997	70.1	30.9	1,418,997	76.6	29.2
12+	1,454,593	68.2	31.6	1,454,593	74.9	30.2
Comorbidity (ADG)*						
No/low comorbidity (0 to 4)	2,558,407	70.1	35.5	2,558,407	76.5	33.4
Moderate comorbidity (5 to 9)	3,409,931	69.1	32.1	3,409,931	75.8	30.4
High comorbidity (10+)	1,141,698	68.8	30.8	1,141,698	75.6	29.3
Morbidity (RUB)†						
Nonuser/healthy user (0 to 1)	151,890	59.4	40.0	151,890	67.3	39.0
Low morbidity (2)	922,952	66.8	36.8	922,952	73.7	35.0
Moderate morbidity (3)	4,110,039	70.0	32.8	4,110,039	76.5	30.9
High morbidity (4+)	1,925,155	70.2	31.3	1,925,155	76.8	29.5
Income quintile						
Low (1)	1,251,439	68.7	34.2	1,251,439	75.0	32.5
2	1,382,830	69.6	33.4	1,382,830	76.2	31.6
3	1,461,776	69.4	33.1	1,461,776	76.1	31.3
4	1,490,660	69.2	32.8	1,490,660	76.0	31.0
High (5)	1,513,250	70.0	32.4	1,513,250	76.8	30.5
Missing	10,081	64.3	35.1	10,081	70.5	34.1
Long-term resident						
Yes	6,525,224	69.7	33.2	6,525,224	76.2	31.3
No	584,812	66.5	33.2	584,812	73.6	31.6

Abbreviations: RIO, Rurality Index for Ontario; SD, standard deviation.
*Johns Hopkins Aggregated Diagnosis Group.
†Johns Hopkins Resource Utilization Band.

Figure 2. Mean continuity with the enrolling physician (A) and group (B) stratified by patient enrollment model and rurality. Continuity was calculated for all enrolled patients with 2 or more visits between October 1, 2017 and September 30, 2019. Abbreviation: FFS, fee-for-service.



or covering physicians agree to see a patient that is not part of their existing panel. It is heartening that we found minimal differences in continuity of care by neighborhood income quintile or between new and long-term registrants, a proxy for immigration. These findings suggest that patients who are attached to a family physician in a setting where primary care services are fully insured have high levels of continuity regardless of socioeconomic position or physician payment and organization.

Strengths and Limitations

Major strengths of our study include that it was population based, analyzing data for all enrolled patients in a jurisdiction, and that we included sensitivity analyses using stratifications for rurality and patient gender. There were also limitations. First, we assessed relational continuity based on office visits to physicians captured using billing data and were unable to capture visits to nurse practitioners or visits involving phone, video, or secure messaging; however, these other visit types were in the minority in our setting during the time of study. Second, there is heterogeneity between physicians and groups who share the same practice model, and our study was not designed to understand this variation or related context. Finally, we intentionally limited our analysis to patients formally enrolled to a primary care physician but are planning future analysis to understand differences in continuity between those who are and are not enrolled. Other work we have done has highlighted that those left behind from enrollment models experience more gaps in care.[36]

Table 3. Risk Ratios and 95% CIs for Regression Models Examining the Associations Between Patient Enrollment Model and Continuity to the Enrolling Physician or Group After Adjustment for Patient Characteristics. Continuity Was Calculated for All Patients with 2 or More Primary Care Visits Between October 1, 2017 and September 30, 2019

	Enrolling Physician				Enrolling Group			
Characteristic	Risk Ratio	Lower 95% CI	Upper 95% CI	*P* Value	Risk Ratio	Lower 95% CI	Upper 95% CI	*P* Value
Enrollment Model								
Enhanced fee-for-service	1.000				1.000			
Nonteam capitation	1.003	1.003	1.003	<0.001	0.994	0.994	0.995	<0.001
Team-based capitation	0.980	0.979	0.980	<0.001	1.003	1.002	1.003	<0.001
Age group								
16–34	1.000				1.000			
35–49	1.164	1.163	1.165	<0.001	1.134	1.134	1.135	<0.001
50–64	1.312	1.311	1.313	<0.001	1.243	1.242	1.244	<0.001
65–79	1.413	1.412	1.414	<0.001	1.316	1.315	1.316	<0.001
80+ years	1.447	1.446	1.448	<0.001	1.337	1.336	1.338	<0.001
Sex								
Male	1.000				1.000			
Female	0.994	0.994	0.995	<0.001	1.001	1.001	1.002	<0.001
Rurality index (RIO score)								
Urban (0 to 9)	1.000				1.000			
Small town (10 to 39)	1.071	1.070	1.071	<0.001	1.066	1.065	1.066	<0.001
Rural (40+)	1.084	1.083	1.084	<0.001	1.070	1.069	1.070	<0.001
Comorbidity (ADG)*								
No/low comorbidity (0 to 4)	1.145	1.144	1.146	<0.001	1.108	1.107	1.109	<0.001
Moderate comorbidity (5 to 9)	1.071	1.071	1.072	<0.001	1.056	1.056	1.057	<0.001
High comorbidity (10+)	1.000				1.000			
Morbidity (RUB)†								
Nonuser/healthy user (0 to 1)	0.888	0.886	0.890	<0.001	0.918	0.916	0.920	<0.001
Low morbidity (2)	0.974	0.973	0.974	<0.001	0.982	0.981	0.983	<0.001
Moderate morbidity (3)	0.988	0.988	0.988	<0.001	0.991	0.990	0.991	<0.001
High morbidity (4+)	1.000				1.000			
Income quintile								
Low (1)	1.000				1.000			
2	1.000	1.000	1.001	0.899	0.991	0.991	0.992	<0.001
3	1.007	1.006	1.007	<0.001	1.003	1.002	1.003	<0.001
4	1.001	1.000	1.001	0.001	0.999	0.999	0.999	<0.001
High (5)	0.995	0.994	0.995	<0.001	0.994	0.993	0.994	<0.001
Long-term resident								
Yes	1.000				1.000			
No	1.012	1.012	1.013	<0.001	1.020	1.019	1.020	<0.001

Abbreviations: CI, confidence interval; RIO, Rurality Index for Ontario.
*Johns Hopkins Aggregated Diagnosis Group.
†Johns Hopkins Resource Utilization Band.

Conclusion

Overall, our results suggest that among patients who have a primary care provider and insurance coverage for physician visits, the primary care practice model does not have a major impact on relational continuity.

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Appendix Table 1. Risk Ratios and 95% CIs for the Associations Between Patient Enrollment Model and Continuity Stratified by Rurality (Urban, Small Town, Rural) and Sex (Male, Female) for Patients with 2 or More Primary Care Visits, October 1, 2017–September 30, 2019, Ontario, Canada

	Continuity Measure					
	Enrolling Physician			Enrolling Group		
Enrollment Model	Risk Ratio	Lower 95% CI	Upper 95% CI	Risk Ratio	Lower 95% CI	Upper 95% CI
Overall						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	1.003	1.003	1.003	0.994	0.994	0.995
Team-based capitation	0.980	0.979	0.980	1.003	1.002	1.003
Urban						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	1.004	1.003	1.004	0.988	0.988	0.988
Team-based capitation	0.963	0.962	0.964	0.988	0.988	0.989
Small town						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	1.008	1.007	1.009	1.031	1.030	1.032
Team-based capitation	1.022	1.021	1.023	1.054	1.054	1.055
Rural						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	0.989	0.987	0.991	0.989	0.987	0.991
Team-based capitation	0.951	0.949	0.953	0.984	0.982	0.985
Male						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	1.002	1.001	1.003	0.992	0.992	0.993
Team-based capitation	0.981	0.981	0.982	0.999	0.999	1.000
Female						
Enhanced fee-for-service	1.000			1.000		
Nonteam capitation	1.003	1.003	1.004	0.996	0.995	0.996
Team-based capitation	0.979	0.978	0.979	1.005	1.005	1.006

Abbreviation: CI, confidence interval.