The association of physician payment and team-based care with timely access in primary care: a population-based cross sectional study

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Word count: 2912
Number of Tables: 2
Number of Figures: 4

Funding statement

This study was supported by ICES, which is funded by an annual grant from the Ontario Ministry of Health and Long-Term Care (MOHLTC) and also by the Toronto Central Local Health Integration Network (LHIN). As well, this study was supported by the INSPIRE Primary Health Care Research Program which is funded through the Health Systems Research Program of the Ontario Ministry of Health and Long Term Care. The opinions, results and conclusions reported in this paper are those of the authors and are independent from the funding sources. No endorsement by ICES, Toronto Central LHIN or the Ontario MOHLTC is intended or should be inferred.

Drs. Kiran and Glazier are supported as Clinician Scientists by the Department of Family and Community Medicine at the University of Toronto and at St. Michael's Hospital. Dr. Kiran is the Fidani Chair in Improvement and Innovation at the University of Toronto. She is also supported by the Canadian Institutes of Health Research and Health Quality Ontario as an Embedded Clinician Researcher. Dr. Green is supported by the Brian Hennen Chair in Family Medicine at Queen's University.

Conflicts of interest
The authors declare no conflicts of interest.

Author contributions
TK and RG conceived of the study. TK, MG, YD, SS, AK, NY, HW, and RG designed the study. YD and SK conducted the analysis. All authors interpreted the data. TK drafted the manuscript and all authors critically reviewed it. All authors read and approved the final manuscript

Abstract

Background: North Americans report challenges with timely access to primary care. It is unclear how patient-reported access differs by physician payment and participation in team-based care.

Methods: We conducted a cross-sectional analysis of adult Ontarians responding to a provincial survey between January 2013 and September 2015 who reported having a primary care provider and had responses linked to administrative health data (n=24,682). Access measures included the proportion of patients reporting i) same/next day access when sick; ii) satisfaction with time to appointment when sick; iii) telephone access and iv) knowledge of an after-hours clinic. We tested the association between practice model and measures of access using logistic regression after stratifying for rurality.

Results: In big cities, patients in team and non-team capitation models were less likely to report same/next day access when sick compared to patients in enhanced fee-for-service models (team-capitation: 43%, aOR 0.88(0.79-0.98); non-team capitation: 39%, aOR 0.78(0.70-0.87); enhanced fee-for-service 46%, reference). In contrast, patients in team and non-team capitation models were more likely to report that their provider had an after-hours clinic (team-capitation: 59%, aOR 2.59(2.39-2.81); non-team capitation: 51% 1.90(1.76-2.04); enhanced fee-for service: 34%, reference). Patterns were similar for patients

in small towns. There was minimal to no difference by model for satisfaction with time to appointment or telephone access.

Conclusions: In our setting, there was an association between some types of access and physician payment and team-based care but the direction was not consistent. Different measures of timely access are needed to understand health system performance.

INTRODUCTION

Health systems with strong primary care have better health outcomes, lower costs, and fewer inequities(1). First contact access is one of the pillars of primary care(2) yet in both Canada and the United States, timely access to primary care continues to be a challenge. Only 43% of patients in Canada and 51% in the US report being able to get an appointment the same or next day when sick compared to 77% in the Netherlands(3). Similarly, only 34% in Canada and 42% in the US say it was easy or very easy to get medical care in the evening, weekends or holidays without going to the emergency department compared to 72% in the Netherlands(3). Both Canada and the US also have among the highest rates of emergency department use with many patients reporting they went to the emergency department for a condition that could have been managed in primary care(3).

Jurisdictions in both Canada and the United States have made investments to strengthen the primary care system by supporting practices to transition to medical homes(4, 5). Medical homes typically incorporate blended payment for physicians, a focus on quality and safety, and mechanisms for enhanced access(6, 7). In Ontario, reforms have included options for physicians to transition from fee-for-service to blended capitation and also apply for funding for non-physician health professionals to join their team(8). Capitation theoretically supports the care of patients with multiple chronic conditions incentivizing proactive follow-up, non-visit based care, and addressing multiple issues at one appointment. However, capitation provides little incentive to see a high volume of patients and reduced access is a known concern(9). In

contrast, sharing the care with non-physician health professionals is a known strategy to improve access(10-12).

Our study aimed to understand the association between timely and after-hours access and physician payment and participation in team-based care. We also sought to assess how access varied by patient characteristics. Little research to date has evaluated the association between access and physician payment and organization. We hope that lessons from our setting can inform other jurisdictions contemplating similar reforms.

METHODS

Setting and Context

Ontario is Canada's largest province with a population of 14.3 million in 2018. Primary care physician services are fully insured for all permanent residents through the Ontario Health Insurance Plan (OHIP) with no co-payments or deductibles. Primary care physician payment and organization has shifted over the last fifteen years. In 2002, most physicians worked independently and billed fee-for-service. Now, most physicians are organized in groups, with formal patient enrolment, some degree of blended payments, and mandated after-hours coverage(8). There are three dominant practice models: enhanced fee-for-service (85% fee-for-service, 15% capitation and bonuses, no funding for non-physician health professionals); non-team capitation (20% fee-for-service, 80% capitation and bonuses, no funding for non-physician health professionals), and team capitation (20% fee-for-service, 80% capitation and bonuses,

and funding for non-physician health professionals). Approximately one in six Ontarians are not formally enrolled to a physician practicing in a new model(13). Ontario includes some densely populated urban areas, smaller towns and cities, and also some rural and remote regions with unique health service challenges. For example, in rural and remote areas, primary care physicians often staff the emergency room, provide inpatient care, deliver babies, and provide other services in addition to maintaining an office practice. New practice models are unevenly distributed across the province(14).

Study Design and Population

We conducted a cross-sectional analysis of Ontario residents to understand the determinants of timely access to primary care including patient characteristics, type of physician practice model, and rurality. We included Ontarians age 16 and over who responded to the provincial Health Care Experience Survey (HCES) between January 1, 2013 and September 30, 2015, agreed to link their responses with administrative health data, reported having a primary care provider, had valid provincial health insurance, and had contact with the health system in the last 7-9 years. We did not have billing data for Community Health Centres in the province so excluded patients who visited a Community Health Centre in the last two years. These datasets were linked using unique encoded identifiers and analyzed at the Institute for Clinical Evaluative Sciences (ICES). The use of data in this project was authorized under section 45 of Ontario's Personal Health Information Protection Act, which does not require review by a Research Ethics Board.

Measures of timely access

The HCES is a voluntary telephone survey introduced by Ontario's Ministry of Health and Long-Term Care in 2012 to understand the public's experience with various aspects of the health care system including primary care. The survey is conducted by the Institute for Social Research at York University. The public is sampled using the Registered Persons Database (RPDB) which contains personal and demographic data for all current and previous OHIP registrants. Approximately 11,200 15-minute interviews are conducted annually using a sampling frame that accounts for geography. The survey runs continuously with data provided to government in three-month waves. Our study includes data from Wave 2 (first wave with full survey implemented) to Wave 16 (most recent data linked to administrative databases).

Our primary analysis included four HCES questions related to timely primary care access: i) percentage responding they saw their provider "same day" or "next day" when sick; ii) percentage responding that, when sick, the time between making the appointment and the actual visit was "about right" (question included in wave 15 and 16 only); iii) percentage responding their provider or someone in their office "always" or "often" spoke to them or got back to them the same day they called, and iv) percentage responding "yes" to whether their provider has an after-hours clinic where patients can be seen by or talk to a doctor or nurse when the provider's office is closed (Figure 1). For our main analyses, we did not include the question "the last time when you needed medical care in the evening, on a weekend, or on a public holiday, how easy or difficult was it to get care without going to the emergency

department?" because we felt it related to health system factors that were beyond the control of a primary care practice, such as the availability of walk-in clinics. We analyzed responses related to email use and online booking descriptively given the small number of affirmative responses. For each question, we excluded missing and "don't know/refused" responses from the denominator with the exception of after-hours awareness where "don't know/refused" was coded together with no.

Other variables

We obtained the following demographic variables from the HCES survey: self-rated health (excellent, very good, good, fair, poor), level of education (some or less than high school, high school graduate or equivalent, some college or university, completed community college, completed bachelor's degree, graduate or professional degree), financial situation (very comfortable, comfortable, tight/very tight/poor), and language most spoken at home (English, other). We obtained other demographic variables from administrative data. We determined age, sex, and postal code from the RPDB. We used postal code to derive neighbourhood income quintile (an area-based proxy for poverty used only when comparing demographics of survey respondents to the general population). We calculated rurality using the Rurality Index of Ontario (RIO 0-9 Urban; RIO 10-39 Small towns, RIO 40+ Rural)(15). We used OHIP registration within the last ten years as a proxy for immigration. We used the Johns Hopkins Adjusted Clinical Groups software to measure co-morbidity using Aggregated Diagnosis Groups (ADGs) and morbidity using Resource Utilization Bands (RUBs) assigned based on similar healthcare

use, each calculated using data from a two-year period. Survey respondents were assigned to a physician practice model based on enrolment tables and for our main analysis they were categorized as enrolled to a physician in enhanced fee-for-service (Family Health Group or Comprehensive Care Model), non-team capitation (Family Health Organization or Family Health Network), or team capitation (Family Health Team) or as not enrolled.

Analysis

We compared demographic characteristics of HCES survey respondents with the general population of Ontario. We conducted bivariate analysis to examine the relationship between timely access and both patient demographics and practice model. We stratified bivariate analyses by rurality because we hypothesized *a priori* that the relationship between practice model and access may differ by rurality. We used multivariable logistic regression to understand the relationship between practice model and timely access after controlling for patient demographics. We included variables that we hypothesized as potential confounders a priori (age, sex, education, tight financial situation, self-rated health, co-morbidity and recent registration). We did not include RUB as it was significantly correlated with ADG and likewise excluded language as it was significantly correlated with recent OHIP registration. We initially included rurality in the model as well as an interaction term for rurality and practice model. There was a significant interaction between rurality and practice model so we ran separate logistic regression models for big cities, small towns, and rural areas.

RESULTS

39,665 Ontarians responded to the health care experience survey between January 2013 and September 2015 with 36,792 agreeing to link their responses to health administrative data. Compared to the general population, survey respondents were older, had more co-morbidities and were more likely to reside in a rural area, live in a higher income neighbourhood, and be a long-term resident of Ontario (Appendix, Exhibit 1). We analyzed data for 33,810 individuals who met our inclusion criteria (Figure 1).

Forty percent of patients reported getting a same or next day appointment when sick, 70% rated the length of the time they waited for an appointment when sick as just right, 78% reported their provider always or often responded to a telephone call about a medical concern the same day, and 41% said their physician had an after-hours clinic. Patients living in rural areas as well as those with fair health and a tight financial situation generally reported poorer access in all categories (Table 1). New residents of Ontario and those speaking a language other than English at home reported higher same/next day access when sick but poorer access via telephone, no after-hours clinics, and lower satisfaction with the time to appointment. Less than 4% of Ontarians reported emailing with their physician in the last 12 months and 11% reported being able to book an appointment on-line or via email. The percentage responding it was easy or very easy to get care without going to the emergency department ranged from 53% in urban areas to 25% in rural areas.

Only 14% percent of respondents from wave 15 and 16 reported good access for all four questions (Figure 2). The percentage reporting good access for all questions was lowest in rural areas (6%) and Family Health Teams (13%). Figure 3 illustrates the overlap in responses for access to care when sick and satisfaction with time to booked appointment. Of patients who reported a same or next day visit when sick, 91% were also satisfied with the time to visit. In contrast, 50% of people who reported being satisfied with the time to visit reported having a same or next day visit.

Table 2 summarizes the crude responses to the access questions by physician practice model after stratifying by rurality. Patients in rural areas reported poorer access generally, especially access to care when sick and satisfaction with time to appointment. There was variation in access by physician practice model, even within rural strata.

Figure 3 presents the unadjusted and adjusted odds of patients reporting favourable access by practice model, stratified by rurality. In big cities, patients in team and non-team capitation models were less likely to report same/next day access when sick compared to patients in enhanced fee-for-service models even after adjustment for patient demographics (team-capitation: 43%, adjusted odds ratio (aOR) 0.88 (0.79-0.98); non-team capitation: 39%, aOR 0.78 (0.70-0.87); enhanced fee-for-service 46%, reference). In contrast, patients in team and non-team capitation models were more likely to report that their provider had an after-hours clinic (team-capitation: 59%, aOR 2.59 (2.39-2.81); non-team capitation: 51% 1.90 (1.76-2.04); enhanced fee-for service: 34%, reference). In small towns, the relationships

between model and same/next day access and after-hours awareness was similar to the relationships noted in big cities. For telephone access, patients in team-capitation reported more favourable access in big cities and less favourable access in small towns relative to patients in enhanced fee-for-service but there were no other differences by model. There were no significant differences by model for satisfaction for time to an appointment. There were also no significant differences in access by model for patients in rural areas. Full parameter estimates are presented in the Appendix.

DISCUSSION

We found that, compared to patients enrolled to physicians paid primarily by fee-for-service, patients enrolled to physicians paid mostly via capitation were significantly less likely to report having a same or next day visit when sick but significantly more likely to report that their provider had an after-hours clinic. Compared to patients in non-team capitation practice, patients in team-based capitation practices reported somewhat better same or next day access and were more likely to report their provider had an after-hours clinic. These differences existed in both big cities and small towns even after adjustment for patient factors. Reported telephone access and satisfaction with time to visit were moderate to high overall with few consistent differences by practice model. Access was strongly influenced by rurality with patients in rural areas consistently reporting much poorer access, with no significant differences in access by model in rural settings.

Our results highlight the importance of measuring timely access in primary care in multiple ways. Our finding of low reported same or next day visits when sick echo other reports (3). However, in our study, one-third of respondents said they were satisfied with the time to visit even though the visit was not on the same or next day. This discrepancy highlights the limitations of evaluating access or targeting related improvements using a measure of same or next day visit – a measure favoured by news media and politicians(16, 17). Even so, it is concerning that patients enrolled to capitation practices report lower same or next day access given the goals of reforms and the higher relative income of physicians paid by capitation(8, 18). The finding is not surprising, though, given that reduction in service is a known risk of capitation(19). In contrast, our finding of relatively poor same or next day access for patients enrolled to team-based models compared to enhanced fee-for-service was contrary to our expectation. Others have reported how enhanced roles for non-physician health professionals can improve access(11, 12, 20) suggesting team-based care can be further optimized in Ontario.

Ontarians reported very low rates of emailing with their provider or using email or online booking to make appointments – two newer dimensions of access worthy of attention. Our own engagement of patients in our practice confirmed the importance of e-communication for patients(21, 22). New contracts with team-based practices in Ontario ask practices to provide patients with the option of email communication(23). All physicians in new practice models currently have a contractual obligation to provide shared after-hours care yet we found higher awareness of after-hours clinics in capitation practices. The higher awareness may relate to

capitation practices receiving administration grants that can be used to fund personnel to support effective organization and advertisement of after-hours clinics.

Crude reported access differed by patient characteristics. Those with fair health and a tight financial situation generally reported poorer access in all categories. New residents of Ontario and those not speaking English had higher same or next day visits but poorer access in other categories. These findings suggest some newcomers may be seeing physicians practicing walk-in style but may also be having difficulties navigating the health care system due to language and cultural barriers. In our setting, the strongest determinant of access was rurality. Poorer reported access in rural areas is not surprising given challenges with physician supply and the necessity of rural primary care physicians to play multiple different roles both in and outside of hospital.

Ours is one of the first studies to report on the association between timely access and physician payment and organization. We used responses from a routinely administered provincial survey that were linked to administrative data and assessed timely access using a variety of measures. However, our study has two notable limitations. First, survey respondents underrepresented some patient groups including those living in lower income neighbourhoods and newcomers to Canada. We suspect survey response bias may have led to more favourable reporting of timely access overall. Second, our study is cross-sectional. We found some differences in reported access by practice model but it is unclear if these differences pre-dated physicians joining new models.

In summary, we found that patients enrolled to physicians paid mostly by capitation were less likely to report a same or next day visit when sick but more likely to report that their provider had an after-hours clinic. Within capitation practices, same or next day access was somewhat better and after-hours awareness much better for physicians who received funding for non-physician health professionals compared to those that did not. Our findings highlight the importance of health care administrators and clinicians measuring access in multiple ways to better understand areas of weakness and strength. Team-based practices likely need to strengthen efforts on having non-physician health professionals share the care to improve access(12). Policy-makers should carefully consider how to incentivize timely visits for capitation practices given the financial disincentive to provide timely access inherent in capitation payment. Changes to physician payment and organization should be prospectively evaluated to understand their impact on access.

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Table 1. Association between respondent demographics and self-report of favourable access to primary care as measured by four questions on the provincial Health Care Experience Survey

	Same/next day access when sick (N=16,602) N (%)	P-value	**Satisfaction with time to visit when sick** (N=2,364) N (%)	P-value	**Telephone Access** (N=18,179) N (%)	P-value	**Awareness of after-hours clinic** (N=33,660) N (%)	P-value
All respondents	6684 (40.3%)		1652 (69.9%)		14223 (78.2%)		13858 (41.2%)	
Sex		0.909		0.101		0.281		<.001
Female	4,135 (40.3%)		980 (68.6%)		9,021 (78.0%)		8,731 (44.7%)	
Male	2,549 (40.2%)		672 (71.8%)		5,202 (78.7%)		5,127 (36.3%)	
Age		<.001		<.001		<.001		<.001
16-49	2,867 (39.5%)		615 (65.6%)		5,924 (76.5%)		5,644 (39.5%)	
50-64	2,068 (38.4%)		533 (68.2%)		4,596 (77.4%)		4,500 (43.2%)	
65-79	1,426 (43.7%)		414 (77.5%)		3,072 (83.1%)		3,028 (42.5%)	
80+	323 (46.9%)		90 (80.4%)		631 (78.7%)		686 (37.4%)	
Rurality		<.001		0.057		0.022		<.001
Big cities	4,417 (43.1%)		1,027 (71.3%)		8,123 (78.8%)		8,889 (44.9%)	
Small towns	1,685 (38.8%)		440 (69.6%)		4,255 (78.2%)		3,868 (41.8%)	
Rural	505 (28.9%)		162 (63.8%)		1,624 (76.2%)		974 (24.3%)	
Missing	77 (28.4%)		23 (60.5%)		221 (74.2%)		127 (22.0%)	
Recent registrant		<.001		0.03		0.004		<.001
No	6,427 (40.0%)							
Yes	257 (49.0%)		42 (58.3%)		311 (72.5%)		281 (26.6%)	
Aggregated diagnosis groups		<.001		0.261		0.075		<.001
0 (lowest)	98 (37.5%)		25 (69.4%)		312 (80.2%)		483 (34.3%)	
1-5	2,219 (38.2%)		564 (70.4%)		5,467 (79.0%)		5,753 (40.2%)	
6-9	3,305 (40.5%)		806 (68.4%)		6,592 (77.4%)		6,056 (42.4%)	
10+ (highest)	1,062 (44.8%)		257 (73.9%)		1,852 (78.6%)		1,566 (42.8%)	

Resource Utilization Bands		0.041		0.17		0.168		<.001
0 (lowest)	96 (37.5%)		24 (70.6%)		304 (80.0%)		477 (34.4%)	
1	196 (41.4%)		40 (66.7%)		499 (81.7%)		546 (37.8%)	
2	770 (39.1%)		199 (69.3%)		1,856 (78.4%)		2,010 (39.2%)	
3	3,788 (39.6%)		934 (69.2%)		7,827 (77.7%)		7,616 (42.0%)	
4	1,305 (42.1%)		296 (68.8%)		2,693 (78.4%)		2,320 (42.3%)	
5	529 (42.8%)		159 (78.3%)		1,044 (79.5%)		889 (42.5%)	
Self-reported health		<.001		<.001		<.001		<.001
Excellent	1,134 (43.7%)		228 (74.3%)		2,557 (81.3%)		2,628 (42.1%)	
Very good	2,465 (40.9%)		598 (72.3%)		5,392 (80.5%)		5,383 (42.8%)	
Good	1,934 (39.2%)		521 (69.4%)		3,942 (76.5%)		3,789 (39.7%)	
Fair	778 (36.6%)		209 (61.1%)		1,673 (74.5%)		1,487 (39.3%)	
Poor	351 (40.6%)		88 (68.2%)		617 (70.7%)		528 (38.2%)	
Missing	22 (40.7%)		8 (100.0%)		42 (68.9%)		43 (35.2%)	
Education		0.544		0.003		0.005		<.001
Less than high School	666 (40.9%)		143 (67.8%)		1,223 (76.8%)		1,362 (35.0%)	
High School	1,336 (40.9%)		346 (73.0%)		2,880 (80.4%)		2,798 (39.3%)	
Some college or university	622 (41.2%)		175 (81.0%)		1,331 (80.0%)		1,266 (41.6%)	
College or Trade	1,719 (39.9%)		385 (68.0%)		3,788 (77.5%)		3,666 (43.6%)	
Bachelor's degree	1,525 (39.6%)		396 (67.2%)		3,306 (77.7%)		3,117 (42.4%)	
Graduate or professional degree	762 (39.6%)		189 (66.8%)		1,604 (77.0%)		1,555 (43.3%)	
Missing	54 (47.4%)		18 (72.0%)		91 (77.8%)		94 (38.1%)	
Financial situation		0.001		<.001		<.001		<.001
Very comfortable	1,077 (43.3%)		266 (75.8%)		2,365 (81.8%)		2,230 (43.1%)	
Comfortable	3,978 (40.1%)		1,005 (71.2%)		8,620 (79.0%)		8,590 (41.9%)	
Tight	1,444 (38.4%)		339 (63.0%)		2,897 (73.6%)		2,686 (37.9%)	
Missing	185 (42.2%)		42 (66.7%)		341 (77.1%)		352 (39.9%)	
Language		0.026		0.041		<.001		<.001
English	5,890 (39.9%)		1,494 (70.6%)		13,153 (78.7%)		12,794 (42.6%)	
Other	780 (43.0%)		156 (64.2%)		1,054 (72.9%)		1,051 (29.4%)	
Missing	14 (48.3%)		<=5 (40.0%)		16 (80.0%)		13 (22.8%)	

Table 2. Crude number and proportion of survey respondents reporting favourable access stratified by physician practice model and rurality

		All respondents N (%)	Team-capitation N (%)	Non-team capitation N (%)	Enhanced fee-for-service N (%)	Not rostered N (%)	P-value
Same/next day access when sick	**Overall**	6493 (40.9%)	2147 (38.5%)	1711 (38.8%)	1868 (45.1%)	767 (43.4%)	<0.0001
	Big cities	4406 (43.2%)	1074 (42.5%)	1249 (39.8%)	1505 (45.7%)	578 (46.1%)	<0.0001
	Small towns	1605 (40%)	795 (40.1%)	377 (36.9%)	310 (44.9%)	123 (39%)	<0.0001
	Rural	482 (28.8%)	278 (26.2%)	85 (33.5%)	53 (33.1%)	66 (33.3%)	0.04
Satisfaction with time to visit when sick	**Overall**	1576 (70.1%)	554 (69.9%)	470 (69.4%)	372 (70.1%)	180 (72.9%)	0.87
	Big cities	1023 (71.2%)	270 (73.8%)	331 (69.5%)	296 (69.8%)	126 (74.1%)	0.33
	Small towns	400 (69.8%)	194 (69.8%)	110 (67.9%)	63 (74.1%)	33 (68.8%)	0.88
	Rural	153 (64%)	90 (60.4%)	29 (74.4%)	13 (59.1%)	21 (72.4%)	0.42
Telephone Access	**Overall**	13571 (78.5%)	5239 (78.5%)	4004 (79.4%)	2964 (78.3%)	1364 (76.5%)	0.0001
	Big cities	8100 (78.8%)	2283 (80.8%)	2730 (79.2%)	2201 (77.3%)	886 (76.2%)	0.003
	Small towns	3919 (79%)	1982 (78.2%)	997 (79.6%)	627 (81.9%)	313 (76.9%)	<0.0001
	Rural	1552 (76.2%)	974 (74.2%)	277 (81.2%)	136 (79.5%)	165 (77.5%)	0.07
Awareness of after-hours clinic	**Overall**	13528 (42.2%)	5492 (48.1%)	4213 (47.4%)	2710 (34.3%)	1113 (29.1%)	<0.0001
	Big cities	8880 (44.9%)	2832 (58.7%)	3146 (51%)	2125 (34.4%)	777 (30%)	<0.0001
	Small towns	3701 (43.8%)	2061 (49.5%)	900 (42.5%)	507 (36.6%)	233 (29.8%)	<0.0001
	Rural	947 (24.7%)	599 (24.6%)	167 (27.9%)	78 (22.9%)	103 (22.3%)	0.008

*Table excludes respondents with rurality variable missing

Figure 1: Survey respondents included in study

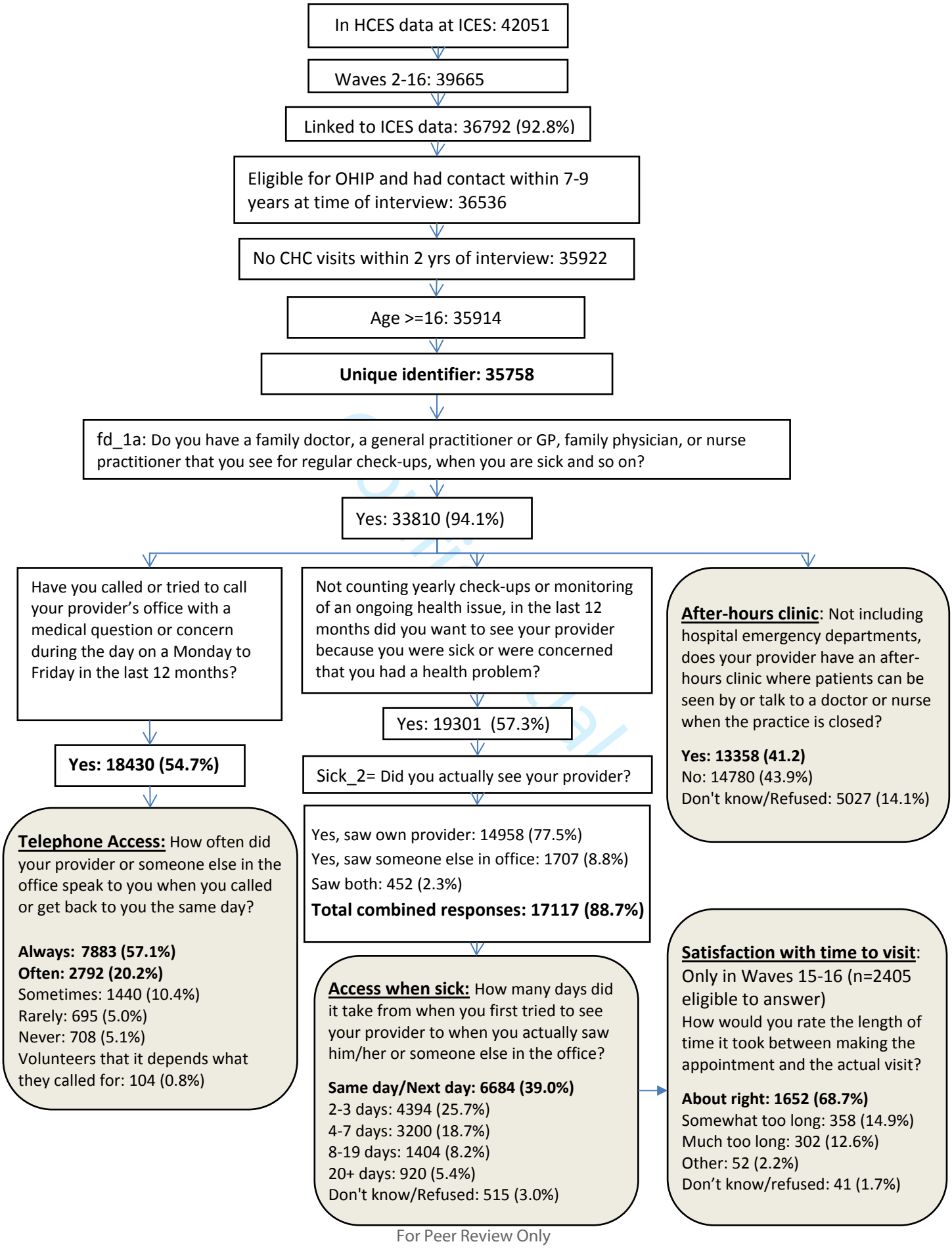
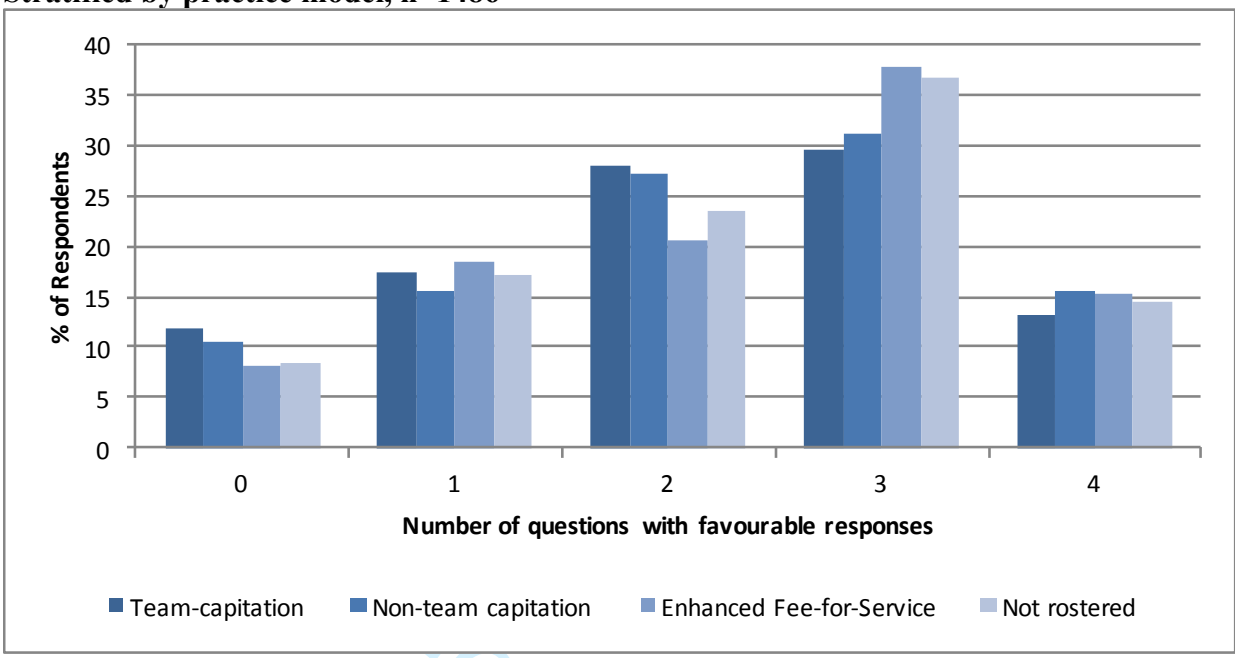


Figure 2. Percentage of respondents in wave 15-16 reporting favourable access for all four questions

a. Stratified by practice model, n=1486



b. Stratified by rurality, n=1540

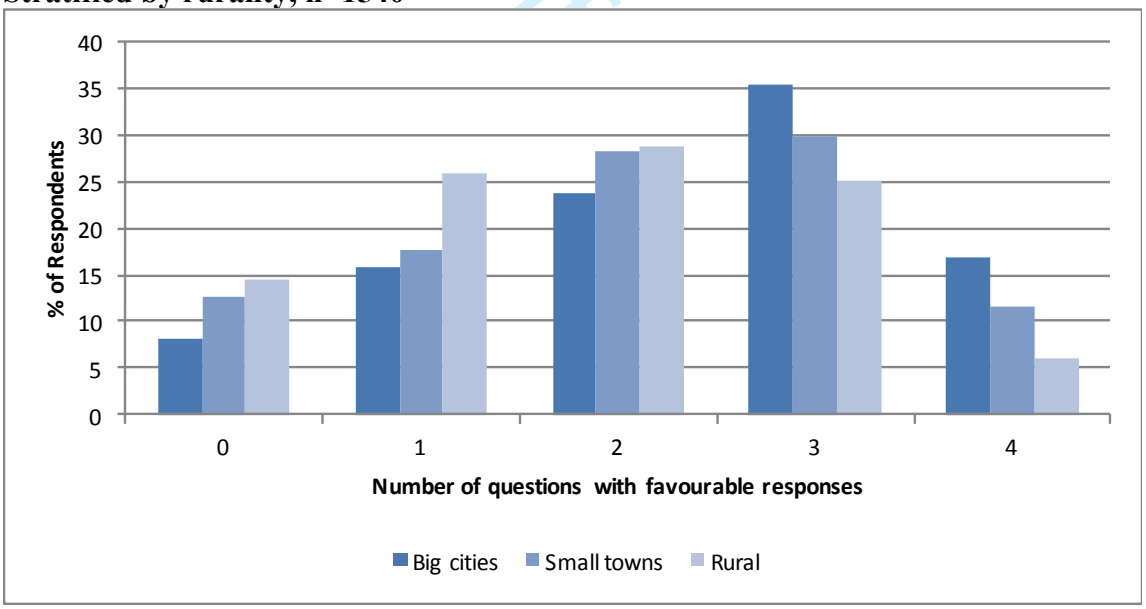


Figure 3. Relationship between same/next day visit and satisfaction with time to visit when sick (N=2294)

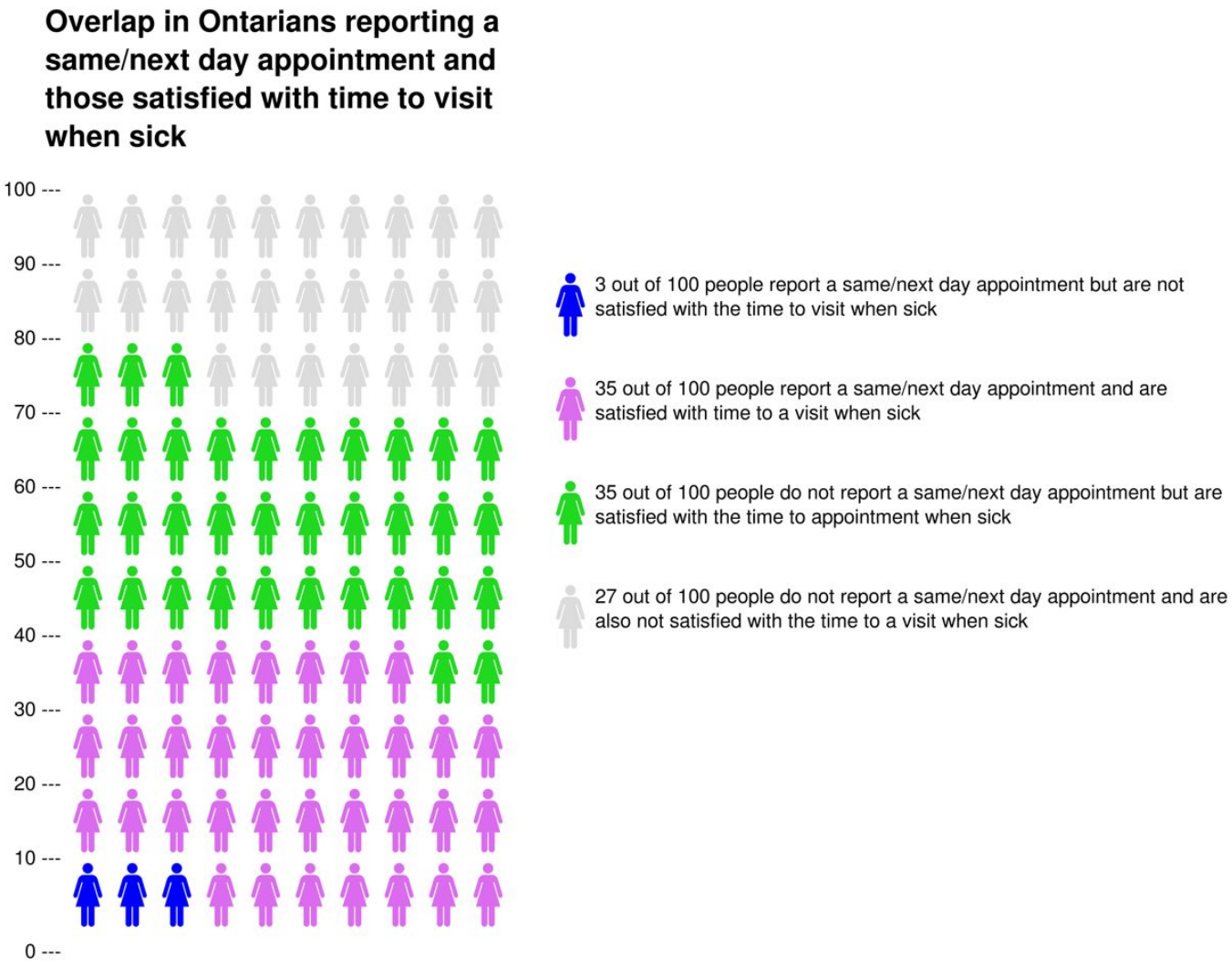
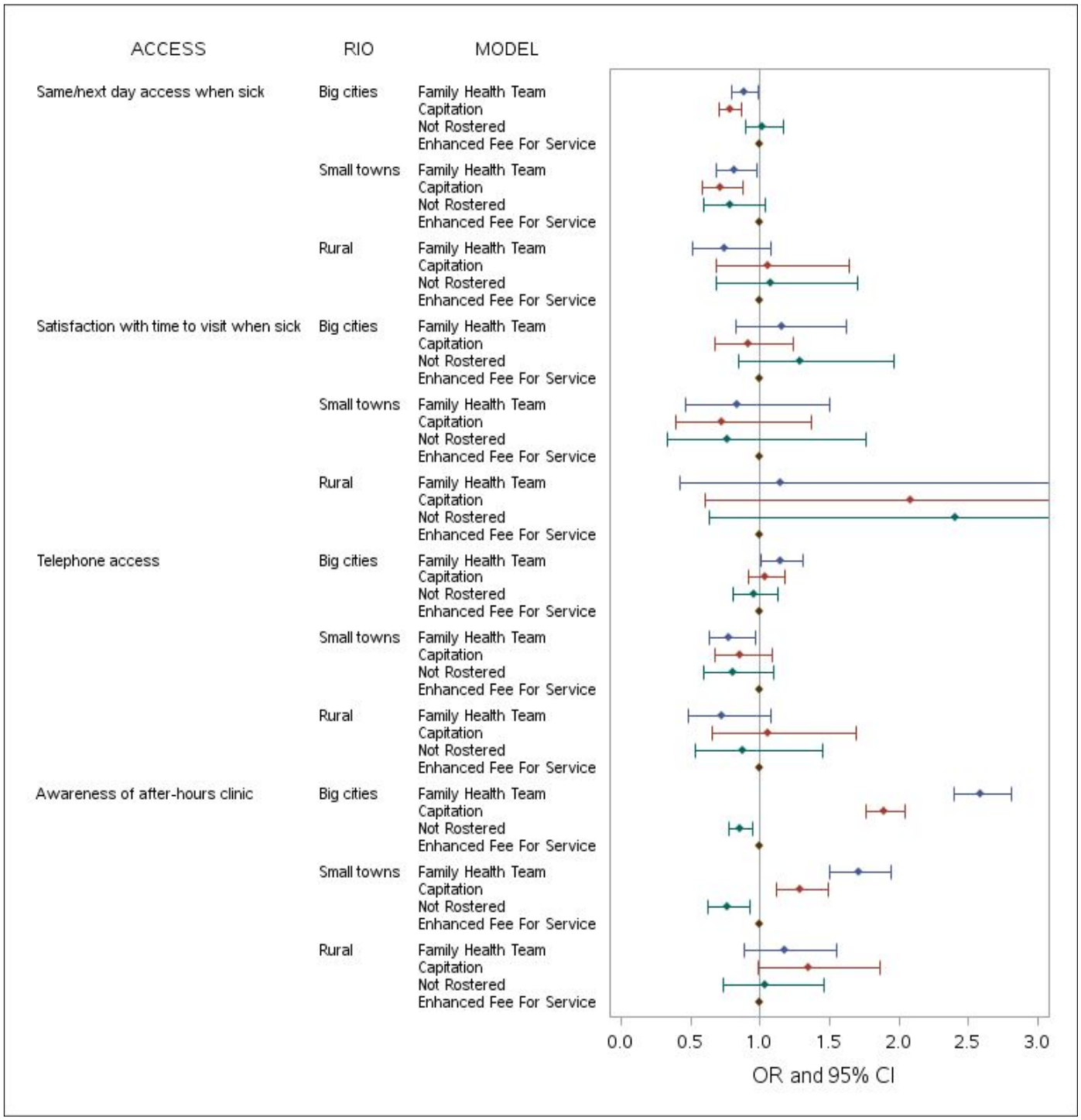


Fig 4. Adjusted* odds of patients in different practice models reporting favourable access, stratified by rurality



*all models adjusted for age, sex, education, tight financial situation, self-rated health, co-morbidity and recent registration. Full parameter estimates presented in the appendix

Supplementary material

eExhibit1. Demographic characteristics of survey respondents compared to Ontario's general population

eExhibit2. Full parameter estimates for regression models

eExhibit 1. Demographic characteristics of survey respondents and the general Ontario population

		Ontario population* not included as Health Care Experience Survey respondents in administrative database (N= 13,567,530)	Ontario population* who responded to the Health Care Experience Survey and agreed to link responses to health administrative databases (N= 36,792)	P-VALUE
Number of Aggregated Diagnosis Groups	0	1,369,910 (10.1%)	1,938 (5.3%)	<.001
	1-5	6,425,531 (47.4%)	15,928 (43.8%)	
	6-9	4,751,400 (35.0%)	14,890 (40.9%)	
	10+	1,020,689 (7.5%)	3,635 (10.0%)	
Resource Utilization Band	0 (low)	1,367,315 (10.1%)	1,921 (5.3%)	<.001
	1	921,199 (6.8%)	1,708 (4.7%)	
	2	2,844,739 (21.0%)	5,902 (16.2%)	
	3	6,289,381 (46.4%)	19,131 (52.6%)	
	4	1,609,006 (11.9%)	5,697 (15.7%)	
	5 (high)	535,890 (3.9%)	2,032 (5.6%)	
Age	Mean (95% CI)	39.9 (39.9, 39.9)	51.5 (51.3, 51.7)	<.001
	Median (IQR)	40 (21-57)	52 (39-64)	<.001
Neighbourhood income quintile	1 (low)	2,550,378 (18.9%)	6,068 (16.7%)	<.001
	2	2,618,355 (19.4%)	6,812 (18.8%)	
	3	2,709,490 (20.1%)	7,279 (20.1%)	
	4	2,892,611 (21.4%)	7,938 (21.9%)	
	5 (high)	2,741,411 (20.3%)	8,147 (22.5%)	
Recent registrant	No	10,722,933 (89.8%)	34,219 (94.0%)	<.001
	Yes	1,215,977 (10.2%)	2,171 (6.0%)	
Rurality	Urban	9,883,419 (73.5%)	21,394 (59.9%)	<.001
	Small town	2,588,048 (19.2%)	9,822 (27.5%)	
	Rural	984,250 (7.3%)	4,515 (12.6%)	
Sex from RPDB	F	6,919,094 (51.0%)	20,826 (57.2%)	<.001
	M	6,648,436 (49.0%)	15,565 (42.8%)	

*Ontario population includes all Ontario residents with a valid the Ontario Health Insurance Plan, who were alive at the index date, and had contacts with the healthcare system in the last 7 to 9 years.

eExhibit 2. Full Parameter Estimates for Regression Models

a. Same/next day access when sick

Variables	Labels	Odds Ratio (95% CI)		
		Big cities	Small towns	Rural
Age	Years	1.01 (1.003, 1.008)	1.00 (1.000, 1.009)	1.00 (0.995, 1.010)
Aggregated diagnosis groups (ADG)	Medium (6-9)	1.07 (0.980, 1.177)	1.06 (0.918, 1.226)	1.03 (0.812, 1.315)
	High (10+)	1.26 (1.102, 1.438)	1.17 (0.943, 1.460)	1.45 (0.992, 2.114)
	Low (0-5) - **ref**	1.00	1.00	1.00
Education	Less than high School	1.30 (1.082, 1.559)	1.35 (0.993, 1.838)	1.37 (0.787, 2.402)
	High School	1.27 (1.095, 1.465)	1.18 (0.892, 1.551)	1.38 (0.815, 2.349)
	Some college or university	1.27 (1.065, 1.505)	1.25 (0.905, 1.717)	1.28 (0.709, 2.293)
	College or Trade	1.18 (1.027, 1.348)	1.14 (0.872, 1.490)	1.37 (0.809, 2.305)
	Bachelor's degree	1.06 (0.932, 1.212)	1.03 (0.776, 1.369)	1.07 (0.616, 1.865)
	Graduate/professional – **ref**	1.00	1.00	1.00
Financial situation	Very comfortable	1.22 (1.059, 1.400)	1.17 (0.935, 1.458)	1.28 (0.871, 1.889)
	Comfortable	1.02 (0.923, 1.132)	1.11 (0.938, 1.308)	1.33 (1.001, 1.762)
	Tight - **ref**	1.00	1.00	1.00
Recent immigrant	No	0.70 (0.581, 0.852)	0.94 (0.379, 2.327)	1.09 (0.108, 10.905)
	Yes - **ref**	1.00	1.00	1.00
Models of care	Family Health Team	0.88 (0.791, 0.983)	0.82 (0.681, 0.976)	0.74 (0.514, 1.078)
	Capitation	0.78 (0.704, 0.865)	0.71 (0.581, 0.871)	1.06 (0.688, 1.637)
	Not Rostered	1.02 (0.893, 1.168)	0.78 (0.592, 1.032)	1.08 (0.683, 1.706)
	Enhanced Fee For Services - **ref**	1.00	1.00	1.00
Self-reported health	Very good	0.94 (0.834, 1.059)	0.79 (0.651, 0.960)	0.76 (0.538, 1.071)
	Good	0.81 (0.716, 0.924)	0.77 (0.626, 0.950)	0.82 (0.574, 1.172)
	Fair	0.69 (0.586, 0.808)	0.72 (0.556, 0.924)	0.72 (0.469, 1.113)
	Poor	0.81 (0.649, 1.005)	0.64 (0.454, 0.902)	0.84 (0.477, 1.482)
	Excellent - **ref**	1.00	1.00	1.00
Sex	Female	1.02 (0.937, 1.107)	0.96 (0.836, 1.097)	0.88 (0.705, 1.104)
	Male - **ref**	1.00	1.00	1.00

b. Satisfaction with time to visit when sick

Variables	Labels	Odds Ratio (95% CI)		
		Big cities	Small towns	Rural
Age	Years	1.01 (1.003, 1.019)	1.02 (1.003, 1.029)	1.01 (0.984, 1.027)
Aggregated diagnosis groups (ADG)	Medium (6-9)	0.76 (0.578, 1.008)	1.22 (0.796, 1.860)	0.84 (0.428, 1.638)
	High (10+)	1.08 (0.718, 1.634)	1.66 (0.852, 3.217)	1.55 (0.528, 4.542)
	Low (0-5) - **ref**	1.00	1.00	1.00
Education	Less than high School	1.59 (0.873, 2.898)	2.01 (0.833, 4.833)	0.32 (0.066, 1.527)
	High School	1.71 (1.100, 2.647)	2.11 (0.987, 4.518)	0.80 (0.174, 3.658)
	Some college or university	2.31 (1.318, 4.045)	3.53 (1.357, 9.164)	1.39 (0.233, 8.347)
	College or Trade	1.18 (0.794, 1.768)	1.99 (0.942, 4.209)	0.31 (0.071, 1.328)
	Bachelor's degree	0.99 (0.682, 1.439)	1.71 (0.789, 3.696)	0.31 (0.069, 1.356)
	Graduate/professional – **ref**	1.00	1.00	1.00
Financial situation	Very comfortable	2.29 (1.480, 3.548)	0.89 (0.454, 1.733)	2.65 (0.890, 7.901)
	Comfortable	1.43 (1.064, 1.926)	1.27 (0.802, 2.025)	1.89 (0.902, 3.949)
	Tight - **ref**	1.00	1.00	1.00
Recent immigrant	No	1.49 (0.858, 2.601)	0.00 (--, --)	1.15 (0.419, 3.161)
	Yes - **ref**	1.00	1.00	1.00
Models of care	Family Health Team	1.16 (0.825, 1.620)	0.84 (0.468, 1.500)	2.08 (0.605, 7.179)
	Capitation	0.91 (0.672, 1.239)	0.73 (0.388, 1.368)	2.40 (0.637, 9.080)
	Not Rostered	1.28 (0.841, 1.960)	0.77 (0.336, 1.766)	0.47 (0.165, 1.346)
	Enhanced Fee For Services - **ref**	1.00	1.00	1.00
Self-reported health	Very good	1.02 (0.682, 1.518)	0.79 (0.419, 1.471)	0.77 (0.253, 2.343)
	Good	0.82 (0.545, 1.232)	0.70 (0.363, 1.367)	0.48 (0.129, 1.756)
	Fair	0.51 (0.314, 0.824)	0.34 (0.164, 0.722)	0.18 (0.034, 0.930)
	Poor	1.26 (0.614, 2.604)	0.52 (0.196, 1.393)	1.07 (0.583, 1.976)
	Excellent - **ref**	1.00	1.00	1.00
Sex	Female	0.86 (0.665, 1.100)	0.87 (0.589, 1.293)	1.01 (0.984, 1.027)
	Male - **ref**	1.00	1.00	1.00

c. Telephone Access

Variables	Labels	Odds Ratio (95% CI)		
		Big cities	Small towns	Rural
Age	Years	1.01 (1.006, 1.013)	1.01 (1.007, 1.016)	1.00 (0.994, 1.008)
Aggregated diagnosis groups (ADG)	Medium (6-9)	0.87 (0.779, 0.971)	1.08 (0.926, 1.264)	0.86 (0.686, 1.084)
	High (10+)	1.01 (0.854, 1.190)	1.06 (0.829, 1.357)	0.97 (0.654, 1.441)
	Low (0-5) - **ref**	1.00	1.00	1.00
Education	Less than high School	1.03 (0.816, 1.293)	1.40 (1.004, 1.957)	1.45 (0.895, 2.358)
	High School	1.34 (1.119, 1.606)	1.52 (1.142, 2.025)	1.73 (1.109, 2.714)
	Some college or university	1.49 (1.194, 1.861)	1.29 (0.929, 1.798)	1.60 (0.951, 2.690)
	College or Trade	1.06 (0.899, 1.242)	1.36 (1.037, 1.791)	1.37 (0.889, 2.119)
	Bachelor's degree	1.00 (0.852, 1.163)	1.33 (0.993, 1.771)	1.44 (0.906, 2.276)
	Graduate/professional – **ref**	1.00	1.00	1.00
Financial situation	Very comfortable	1.47 (1.237, 1.747)	1.37 (1.077, 1.742)	1.34 (0.924, 1.947)
	Comfortable	1.20 (1.064, 1.355)	1.39 (1.167, 1.647)	1.06 (0.816, 1.374)
	Tight - **ref**	1.00	1.00	1.00
Recent immigrant	No	1.18 (0.931, 1.498)	1.67 (0.667, 4.170)	0.91 (0.100, 8.267)
	Yes - **ref**	1.00	1.00	1.00
Models of care	Family Health Team	1.15 (1.002, 1.309)	0.78 (0.630, 0.965)	0.72 (0.481, 1.076)
	Capitation	1.04 (0.915, 1.175)	0.85 (0.674, 1.083)	1.05 (0.658, 1.689)
	Not Rostered	0.95 (0.806, 1.125)	0.81 (0.597, 1.094)	0.88 (0.532, 1.454)
	Enhanced Fee For Services - **ref**	1.00	1.00	1.00
Self-reported health	Very good	0.96 (0.829, 1.112)	0.96 (0.777, 1.192)	0.83 (0.591, 1.179)
	Good	0.75 (0.639, 0.873)	0.68 (0.544, 0.854)	0.63 (0.445, 0.906)
	Fair	0.67 (0.550, 0.805)	0.50 (0.381, 0.653)	0.69 (0.455, 1.060)
	Poor	0.62 (0.477, 0.804)	0.51 (0.354, 0.722)	0.49 (0.278, 0.855)
	Excellent - **ref**	1.00	1.00	1.00
Sex	Female	1.05 (0.943, 1.158)	0.97 (0.831, 1.123)	0.80 (0.640, 1.002)
	Male - **ref**	1.00	1.00	1.00

d. Awareness of after-hours clinic

Variables	Labels	Odds Ratio (95% CI)		
		Big cities	Small towns	Rural
Age	Years	1.01 (1.006, 1.009)	1.00 (0.996, 1.002)	1.00 (0.995, 1.005)
Aggregated diagnosis groups (ADG)	Medium (6-9)	1.00 (0.932, 1.063)	1.21 (1.101, 1.339)	1.19 (1.007, 1.400)
	High (10+)	1.04 (0.942, 1.159)	1.13 (0.963, 1.338)	1.36 (1.009, 1.822)
	Low (0-5) - **ref**	1.00	1.00	1.00
Education	Less than high School	0.75 (0.655, 0.852)	0.82 (0.667, 1.013)	0.77 (0.539, 1.112)
	High School	0.92 (0.827, 1.025)	0.91 (0.749, 1.097)	0.76 (0.539, 1.073)
	Some college or university	1.02 (0.899, 1.165)	0.99 (0.792, 1.232)	0.83 (0.558, 1.223)
	College or Trade	1.11 (1.003, 1.231)	0.98 (0.814, 1.184)	0.96 (0.686, 1.353)
	Bachelor's degree	1.00 (0.902, 1.099)	1.01 (0.826, 1.226)	0.87 (0.608, 1.253)
	Graduate/professional – **ref**	1.00	1.00	1.00
Financial situation	Very comfortable	1.19 (1.073, 1.320)	1.10 (0.944, 1.287)	0.89 (0.686, 1.165)
	Comfortable	1.12 (1.035, 1.207)	1.08 (0.965, 1.216)	1.02 (0.842, 1.237)
	Tight - **ref**	1.00	1.00	1.00
Recent immigrant	No	1.67 (1.431, 1.947)	1.22 (0.643, 2.312)	0.85 (0.265, 2.754)
	Yes - **ref**	1.00	1.00	1.00
Models of care	Family Health Team	2.59 (2.391, 2.810)	1.71 (1.503, 1.944)	1.17 (0.890, 1.550)
	Capitation	1.90 (1.758, 2.044)	1.29 (1.118, 1.488)	1.35 (0.985, 1.862)
	Not Rostered	0.86 (0.772, 0.948)	0.76 (0.629, 0.925)	1.03 (0.734, 1.458)
	Enhanced Fee For Services - **ref**	1.00	1.00	1.00
Self-reported health	Very good	1.10 (1.007, 1.191)	1.01 (0.888, 1.141)	0.81 (0.653, 1.003)
	Good	0.96 (0.881, 1.057)	0.93 (0.807, 1.063)	0.80 (0.637, 1.007)
	Fair	0.98 (0.866, 1.098)	0.93 (0.776, 1.107)	0.61 (0.452, 0.828)
	Poor	0.88 (0.738, 1.045)	0.94 (0.731, 1.211)	0.71 (0.465, 1.089)
	Excellent - **ref**	1.00	1.00	1.00
Sex	Female	1.41 (1.330, 1.503)	1.34 (1.227, 1.474)	1.14 (0.976, 1.327)
	Male - **ref**	1.00	1.00	1.00