When enrolment with a primary care provider is voluntary, who gets enrolled? Cross-sectional analysis of population-based data in two Canadian provinces

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Abstract

Background: Quebec and British Columbia encouraged patient enrolment with a primary care provider through a range of voluntary programs, some targeted at seniors or people with chronic conditions, others open to the general population. Equity implications of voluntary enrolment programs warrant attention but have not been thoroughly explored.

Methods: We used linked administrative data to compare the characteristics of people eligible for enrolment programs to the general population. We use logistic regression to compare enrolled people to people eligible but not enrolled with respect to neighbourhood income, rural/urban location of residence, treatment for mental health and substance use, and pre-enrolment health care use, controlling for characteristics linked to program eligibility.

Results: Odds of enrolment were higher in higher income neighbourhoods for general programs (adjusted odds ratios and 95% confidence intervals comparing highest to lowest quintiles: 1.21 (1.20-1.23), 1.67 (1.64-1.69). Odds of enrolment were similar across neighbourhood income quintiles for targeted programs (0.95 (0.94-0.96), 1.03 (1.00-1.07), 1.10 (1.04-1.17)). Odds of enrolment by urban-rural location varied. People who received services for substance use had lower odds of enrolment in all programs (AORs ranged from 0.60 (0.58-0.63) to 0.72 (0.65-0.80)). People enrolled had similar or higher longitudinal continuity and numbers of primary care visits prior to enrollment, compared to people who were eligible but not enrolled.

Interpretation:
Voluntary enrolment programs open to the general population may exacerbate inequities in access. If policies aim to promote equity in primary care access, programs should include criteria that reflect health status or prioritize underserved populations.

Keywords: primary care; enrolment; equity; access, continuity of care

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Introduction

A longitudinal relationship between patients and providers is central to continuity and coordination of primary care (1, 2)**.** Formal enrolment (also called "rostering" or "empanelment") is a feature of high-performing primary care (3). In some systems, especially those with capitated payments, patient enrolment with providers or places of care is unambiguous to patients, providers, and payors/system administrators (4-6). Under fee-for-service payment, the absence of a clear patient panel may make proactive prevention and chronic disease management more challenging, may limit potential for quality improvement and accountability measures (3, 7), and may contribute to people seeking care from walk-in clinics and emergency departments (8). Patient enrolment policies have been implemented in various Canadian provincial health care systems, with implicit goals of improving access to and continuity of primary care.

Enrolment policies also have potential to improve equity in access to primary care, particularly as barriers to primary care have been observed by income (9, 10), rural/urban context (11), and among people with mental illness and substance use (12-14). Ideally, continuous relationships over time allow primary care providers to understand the contexts in which their patients live, and respond more effectively to the needs of people who are economically or socially marginalized (15-17). As risk of developing chronic conditions is associated with socioeconomic status (18, 19), enrolment programs targeting patients with chronic conditions may improve access among people with lower socioeconomic status. On the other hand, enrollment programs without specific criteria may compound preferential access to primary care already observed among people with higher socioeconomic status (20). In the context of a fixed payment per patient, providers have incentives to select healthier patients who will require less time (21, 22). A study of the characteristics of people enrolled through the centralized waiting list for a primary care physician in Quebec found that although payments were higher for enrolling vulnerable patients (based on the presence of various chronic health conditions), most people enrolled through this mechanism were healthy individuals (23, 24). The equity implications of voluntary enrolment policies warrant attention but have not been thoroughly explored.

Quebec (QC) and British Columbia (BC) both have fee-for-service payment systems and have implemented programs that in some way formalize connections between patients and primary care physicians, documented through the billing of specific fee codes to provincial insurers. These "enrolment" programs differ with respect to population(s) eligible (targeted by age/chronic conditions vs general), requirements of enrolment, and payment mechanisms (Table 1), but all are voluntary in that providers choose whether they want to participate in programs and which people they bill codes for. This creates an opportunity to study who is enrolled under different approaches. We used administrative health data to compare the characteristics of enrolled people and people who were eligible but not enrolled, examining differences in enrolment by neighbourhood income, rural/urban location of residence, treatment for mental health and substance use, and pre-enrolment health care use.

[Table 1}

Methods

Data sources

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Administrative databases were accessed and housed separately within provinces, though measures and analysis were the same. We used databases maintained by the QC Ministry of Health and Social Services and the provincial health insurer (provided through the National Institute for Excellence in Health and Social Services) and the BC Ministry of Health (provided through Population Data BC) (25-28). Data were linked within provinces using unique anonymous person-level study identifiers for patients and physicians and cover up to 15 years of service use (2001-2015). In both provinces, data include the demographic and socioeconomic characteristics of people registered for provincial health insurance programs, payments for physician services, and of hospital stays and emergency department visits. Primary care services delivered are captured in claims data, which contain the date of service, amount paid, an ICD code associated with the billing record, and unique identifiers for both the patient and physician.

Population

The study population included people registered for health insurance for >75% of days in the two years before and two years after policy implementation, who were age 40 and older (ages more likely to use primary care regularly), and who met eligibility criteria for each program (based on diagnosis codes in physician and hospital records) in the year prior to implementation of each program (Appendix 1). We excluded people with missing age or sex, with a recorded age over 120 years, or who used services that indicated they were residents of a long-term care facility. For each enrolment program, the intervention (enrolled) population includes people who had a billing record indicating enrolment within the first two years of program implementation, and the comparison (eligible but not enrolled) who were not enrolled within the first two years. More details on criteria specific to each program are included in Table 2.

[Table 2]

Measures

All measures of patient characteristics were captured prior to program implementation and patient enrolment. Patient age and sex are collected at time of registration for provincial insurance programs. The field is labeled “gender” in BC and “sex” in QC. In both cases only binary “male” and “female” options are provided. We used the Elixhauser index to count the number of comorbid conditions. We used the census enumeration area of the patient’s residence to assign neighbourhood income quintile and to classify residence by rurality, using the Statistics Canada SACTYPE metropolitan influences zones (29). We collapsed categories to compare census metropolitan areas (labelled “Metropolitan”), census agglomerations and areas with strong metropolitan influence (labelled “Smaller urban”), and areas with moderate to no metropolitan influence (labelled “Rural/remote”). We identified people who received services for mental health (ICD9 295-302, 306-319, 50B (BC only); ICD-10-CA: F20-F99, excluding F55) or substance use (ICD9: 291, 292, 303-305, 980; ICD10: F10-F16, F18-F19 and T51 based on service use in the year prior to program implementation (one hospitalization or two physician claims for mental health, one hospitalization or physician claim for substance use).

We counted the number of ambulatory physician visits with a primary care physician in the year prior to program implementation as well as emergency department visits. Ambulatory visits were based on unique physician/patient/date combinations with a claim specialty of primary care, that occurred in an office, home or other ambulatory location (excluding hospital, ED, long-term care) and excluding laboratory claims and diagnostics. We measured longitudinal

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continuity of care as the proportion of primary care visits from the physician seen most often (usual provider continuity, UPC).

Statistical analysis

We present descriptive statistics and associated standardized differences comparing age, sex, chronic health conditions, income, urban-rural residence, service use for mental health and substance use. We compare patients eligible for the programs to the entire provincial population (age 40+) to understand equity implications of how the programs are targeted. We also compare people enrolled and people who were eligible but not enrolled to understand equity implications in access to the programs.

We constructed logistic regression models for each enrolment program separately estimating odds of enrolment by variables unrelated to program eligibility: income, rurality, service use for mental health and substance use, and previous health care use. We present bivariable (unadjusted) and multivariable odds ratios adjusted for patient age, sex, and number of comorbidities.

Ethics approval: Our project was reviewed and approved by the research ethics boards at McGill University (IRB study number A05-B33-17B), the University of British Columbia/ Simon Fraser University (harmonized board, REB number H17-01497) and Sherbrooke University (N/Réf. 2017-1655/Strumpf).

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Results

Comparison of people eligible for enrolment programs with the general population

Targeted programs (Vulnerable enrolment in QC, Chronic disease incentive and Complex care incentive in BC) require that people enrolled have specific health conditions. As expected, people eligible for targeted programs were older, had a higher average number of comorbidities, and lived in lower income neighbourhoods compared to the general population (Tables 3 and 4). They also had more primary care and ED visits and higher longitudinal continuity prior to enrolment than the general population (Tables 3 and 4). Slightly higher percentages of people living outside of metropolitan areas were eligible for targeted programs.

In Quebec, the population eligible for general enrolment in 2009 did not include people previously eligible under the targeted program. As a result, the eligible population is somewhat younger and has fewer comorbidities. Analysis of "A GP for Me" in BC was based on patients virtually rostered to each physician as usual provider of care. We limited this analysis to people with three or more primary care visits for more reliable assignment. The study population is therefore older and has more comorbidities than the general population, though all physicians were eligible to enrol in "A GP for Me" (Table 4).

[Tables 3 and 4]

Comparison of enrolled people with people who were eligible but not enrolled

Neighbourhood income quintile and income assistance

Differences in enrollment across income quintiles were small in targeted programs (standardized differences <=|0.03|) and larger in general enrolment programs (standardized differences 0.074 in QC, 0.20 in BC) (Tables 3 and 4). After adjustment for factors that directly

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determined eligibility, Figure 1 shows that income gradients in enrolment are observed, with people living in higher income neighbourhoods generally more likely to be enrolled. However, the magnitude of differences across income quintiles was more pronounced for general than targeted programs. The exception is the Quebec "vulnerable" (targeted) enrolment program, where odds of enrollment among people who lived in the highest income neighbourhoods were somewhat lower than those in the lowest (Adjusted Odds Ration (AOR): 0.95, 95% CI: 0.94-0.96) (Table 5, Figure 1).

Within BC we were also able to identify people whose prescription coverage indicates they are on income assistance (which suggests lower income) and others. Within targeted programs there was no difference in adjusted odds of enrollment between people whose prescription coverage indicates they are on income assistance and others. In the general enrolment program people whose prescription coverage indicates they are on social assistance (which suggests lower income) had lower odds of enrollment (AOR 0.76, 95% CI: 0.75-0.78).

[Table 5 and Figure 1]

Urban-rural residence

There was no consistent pattern of enrolment by rurality of residence. In the Quebec targeted enrolment program odds of enrolment were higher among people outside metropolitan areas, while the reverse was true for the general program. In the BC targeted programs people who live in smaller urban areas were more likely to be enrolled than people who live in metropolitan centres, while people in rural/remote areas had lower odds of enrolment. In the BC general program people in both smaller urban and rural/remote areas had higher odds of having a primary care provider who participated in the attachment initiative.

Mental health and substance use

Odds of enrolment among people who received services for mental health were somewhat lower than those who did not (AOR 0.87-0.98). The exception was BC's general enrolment program (AOR 1.14, 95% CI: 1.13-1.16). People who received services for substance use had consistently and markedly lower odds of enrolment, across all programs (AOR 0.60-0.73).

Health care use in the year prior to enrolment programs

In Quebec people with more primary care visits in the year before program introduction were more likely to be enrolled (AOR 1.03-1.06) (Table 6). In BC odds of enrolment did not differ by primary care visits in the year prior to enrolment. For the Quebec "vulnerable" enrolment program, people with more emergency department (ED) visits in the year before program introduction were more likely to be enrolled (AOR 1.04, 95% CI: 1.04, 1.04). In all other programs, ED visits in the prior year were not associated with odds of enrolment. In both provinces people with higher longitudinal continuity in the year before program introduction had somewhat higher odds of being enrolled (AOR 1.02-1.13 per 10% change in continuity).

[Table 6]

Interpretation

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Compared to the general population, we find that people eligible for targeted enrolment programs tend to live in lower income neighbourhoods, which was expected as income and chronic illness are correlated (18, 19). We do not observe differences in enrolment by income within targeted programs. In general programs, people who live in higher income neighbourhoods are significantly more likely to be enrolled. Odds of enrolment by urban-rural location varied. People who received services for mental health and substance use generally had lower odds of enrolment. People enrolled had similar or higher levels of primary care visits and longitudinal continuity prior to enrollment, compared to patients who were eligible but not enrolled.

Our findings with respect to neighbourhood income are similar to those reported by Olah et al. (2013) indicating that primary care physicians prefer to enrol patients who report higher socioeconomic status, even when financial status does not impact physician payment (30). That people who have been treated for mental health and substance use were less likely to be enrolled is consistent with literature documenting barriers to accessing primary care (12-14). We also observe that people enrolled tended to have similar or higher numbers of primary care visits and longitudinal continuity of care in the year prior to enrolment. This suggests that enrolment programs may formalize existing care relationships between patients and providers, and/or that presenting at a practice more often may increase the chance of enrollment.(31)

Differences in odds of enrollment between metropolitan and other areas are apparent across programs, though patterns vary. In BC, more physicians practice in walk-in clinics in metropolitan areas, perhaps shaping the observation of higher odds of participation in the attachment initiative outside of metropolitan areas. Other literature has also found higher use of primary care physician services in smaller urban areas, compared to both metropolitan and rural/remote settings. (11)

Our analysis is limited in several ways. First, to ensure a consistent time period across programs we examined people enrolled within the first two years following implementation. People enrolled in early years of program operation may differ from those enrolled later on. While we could measure neighbourhood income quintile in both provinces, in BC we could also observe if people received a prescription paid for by programs targeting people on social assistance. This provided an individual-level indicator of low-income status but is limited in that people need to have filled a prescription for us to observe this. We examined service use for mental health and/or substance use in the year prior to the policy. By using measures of treatment for mental health and substance use we are missing people who did not seek care and who may have the greatest need for primary care enrolment. Similarly, analysis of general enrolment in BC is limited to people with 3 or more visits, and who are therefore already accessing services. This was necessary to define the study population, and both the intervention and comparison population are consistent in this restriction. All of the programs examined involve the billing of a fee code, but patients may not have been aware of the programs. Our objective was not to evaluate the effect of enrolment programs on access or quality of care nor the relationship with accountability and patient management. These effects will be examined separately.

Policymakers should be aware that voluntary enrolment programs open to the general population may exacerbate inequities in access. We conclude that if policies aim to promote equity in primary care access, programs should include criteria that reflect health status or prioritize underserved populations.

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Table 1. Description of enrolment programs in

	Quebec		British Columbia		
Program	Vulnerable Enrolment (2003)(32)	General Enrolment (2009)(33)	Chronic disease incentive (2003)(28)	Complex care incentive (2007)(34)	A GP for Me/Attachment initiative (2013)(35)
Physician responsibilities for enrolled patients	Formal enrolment between patient and physician through a signed contract. Physician agrees to take on the patient and ensure follow up of health problems on an ongoing basis.		Physician bills code accepting responsibility for chronic disease management for one year		Physician bills code indicating willingness to provide "full-service family practice" and confirm relationship with patient through a "standardized conversation"
Population(s) eligible	Vulnerable patients (elderly or chronically ill – included conditions change over time)	General population – Anyone who did not meet the vulnerable criteria	Patients with diabetes or CHF (at time of implementation in 2003, list of eligible conditions subsequently expanded)	Patients with 2+ eligible conditions	All primary care physicians and their patients
Annual payment amount per patient	$14-21, increases to $35-75 in more recent years(36) (can be billed annually, varies based on practice setting), also enabled billing of additional fee codes.	$7-11 (can be billed annually, varies based on practice setting), also enabled billing of additional fee codes	$75	$315	$0 opt in, but enabled billing of additional fee codes

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Table 2. Intervention/comparison populations used in analysis

	Quebec		British Columbia		
Program	Vulnerable Enrolment (2003)	General Enrolment (2009)	Chronic disease incentive (2003)	Complex care incentive (2007)	A GP for Me/Attachment initiative (2013)
Intervention population	Patients for whom relevant billing codes were submitted within the first two years of program implementation		Patients with qualifying chronic conditions in the year prior to the policy change for whom the relevant code was billed within the first two years of implementation		Patients who received the majority of their care from physicians who opted into the program. We restricted analysis to patients with 3+ visits so we could more clearly identify
Comparison population	Patients who were eligible but were not enrolled within the first two years of implementation		Patients with qualifying chronic conditions in the year prior to the policy change with no code billed within the first two years of implementation		Patients with 3 or more visits who received the majority of their care from a physician who did not opt in

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Table 3. Comparison of the general population, patients enrolled, and patients eligible but not enrolled in the year prior to program implementation **(**Quebec)

Variable	**QC population (age 40+) 2007**	**Vulnerable enrolment (targeted) 2003**			**General enrolment 2009**		
		Enrolled	Not enrolled	Standardized difference	Enrolled	Not enrolled	Standardized difference
Total - N	4,043,955	505,869	1,063,141		352,380	2,042,543	
Demographics, comorbidities, and location of residence							
Age group - N (%)							
40-49 years old	1,399,458 (34.6)	33,699 (6.7)	253,701 (23.9)	-0.853	143,111 (40.6)	946,807 (46.4)	-0.118
50-59 years old	1,177,884 (29.2)	68,075 (13.5)	303,729 (28.6)		138,721 (39.4)	740,845 (36.3)	
60-69 years old	785,691 (19.5)	107,541 (21.3)	259,932 (24.5)		70,552 (20)	354,827 (17.4)	
70-79 years old	457,215 (11.3)	218,163 (43.1)	174,997 (16.5)		n/a	n/a	
80+ years old	220,113 (5.5)	78,391 (15.5)	70,774 (6.7)		n/a	n/a	
Sex - N (%)							
Female	2,079,367 (51.5)	281,512 (55.7)	603,040 (56.7)	-0.022	195,164 (55.4)	957,321 (46.9)	-0.171
Comorbidity: # of Elixhauser categories - Mean (SD)	0.57 (0.87)	1.26 (1.18)	0.80 (1.00)	0.424	0.29 (0.52)	0.22 (0.48)	0.143
Neighbourhood Income Quintile - N (%)				-0.022			-0.074
Lowest income quintile	802,422 (20.4)	108,911 (21.5)	223,954 (21.1)		59,713 (17)	407,162 (19.9)	
2nd income quintile	786,080 (20)	103,836 (20.5)	210,634 (19.8)		65,660 (18.6)	381,600 (18.7)	
Middle income quintile	781,599 (19.9)	95,395 (18.9)	196,445 (18.5)		72,634 (20.6)	384,663 (18.8)	
4th income quintile	763,762 (19.4)	93,118 (18.4)	192,452 (18.1)		73,162 (20.8)	392,944 (19.2)	
Highest income quintile	778,603 (19.8)	88,794 (17.6)	192,457 (18.1)		77,909 (22.1)	392,706 (19.2)	
Missing		3.13%	4.44%		0.94%	0.94%	

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Urban-rural residence - N (%)				-0.124			-0.077
Metropolitan	2,655,942 (67.2)	298,494 (59.0)	685,284 (64.5)		252,526 (71.7)	1,361,442 (66.7)	
Smaller urban	703,685 (17.9)	112,305 (22.2)	180,674 (17)		51,286 (14.6)	341,448 (16.7)	
Rural	584,843 (14.9)	86,929 (17.2)	165,944 (15.6)		46,765 (13.3)	269,430 (13.3)	
Missing		1.45%	2.71%		0.48%	3.37%	
Health care use in year prior to enrolment program							
Service use for mental health - N (%)	52,357 (1.3)	10,667 (2.1)	33,934 (3.2)	-0.067	N/A	N/A	
Service use for substance use - N (%)	19,909 (0.5)	3,352 (0.7)	12,366 (1.2)	-0.053	N/A	N/A	
Primary care visits – mean (SD)	3.26 (5.48)	6.65 (7.46)	4.28 (5.85)	0.353	2.47 (2.65)	1.80 (2.73)	2.56
ED visits – mean (SD)	0.53 (1.69)	0.86 (2.14)	0.68 (1.99)	0.085	0.26 (0.84)	0.25 (0.87)	0.005
Continuity (proportion of visits with usual provider of care) – mean (SD)	0.59 (0.43)	0.59 (40.28)	0.38 (41.92)	0.522	0.44 (0.45)	0.25 (0.40)	0.443

We consider a standardized difference =0.2 be considered a 'small' effect size, 0.5 represents a 'medium' effect size and 0.8 a 'large' effect size.

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Table 4. Comparison of the general population, patients enrolled, and patients eligible but not enrolled (British Columbia)

Variable	BC population (age 40+, 2007)	Chronic disease incentive (targeted) 2003			Complex care incentive (targeted) 2007			A GP for Me/Attachment initiative (general) 2013		
		Enrolled	Not enrolled	Standardized difference	Enrolled	Not enrolled	Standardized difference	Enrolled	Not enrolled	Standardized difference
Demographics, comorbidities, and location of residence										
Total - N (%)	1,953,390 (100.0)	60,764 (45.5)	72,825 (54.5)		28,273 (59.4)	19,346 (40.6)		1,066,714 (79.0)	282,714 (21.0)	
Age group - N (%)				0.11			0.40			0.16
40-49 years old	636,535 (32.6)	6,693 (11.0)	9,037 (12.4)		790 (2.8)	1,477 (7.6)		221,202 (20.7)	72,390 (25.6)	
50-59 years old	584,379 (29.9)	14,342 (23.6)	17,356 (23.8)		3,222 (11.4)	3,584 (18.5)		290,914 (27.3)	82,109 (29.0)	
60-69 years old	376,210 (19.3)	17,488 (28.8)	19,244 (26.4)		7,089 (25.1)	5,409 (28.0)		276,542 (25.9)	68,406 (24.2)	
70-79 years old	235,635 (12.1)	16,023 (26.4)	18,116 (24.9)		10,160 (35.9)	5,745 (29.7)		179,607 (16.8)	40,170 (14.2)	
80+ years old	120,631 (6.2)	6,218 (10.2)	9,072 (12.5)		7,012 (24.8)	3,131 (16.2)		98,449 (9.2)	19,639 (6.9)	
Sex - N(%)										
Female	1,011,075 (51.8)	27,454 (45.2)	33,362 (45.8)	-0.01	11,455 (40.5)	8,393 (43.4)	-0.06	613,937 (57.6)	152,978 (54.1)	0.07
Comorbidity: # of Elixhauser categories - Mean (SD)	0.88 (1.08)	2.13 (1.25)	2.15 (1.38)	-0.02	3.25 (1.66)	2.89 (1.62)	0.22	1.39 (1.26)	1.27 (1.21)	0.09
Neighbourhood Income Quintile - N(%)				0.03			0.03			0.20
Lowest income quintile	368,926 (19.2)	13,952 (23.7)	17,393 (24.8)		6,793 (24.3)	4,850 (25.4)		195,711 (18.5)	65,901 (23.5)	
2nd income quintile	374,503 (19.5)	12,654 (21.5)	15,257 (21.7)		6,193 (22.1)	4,293 (22.5)		205,854 (19.5)	63,655 (22.7)	
Middle income quintile	387,101 (20.1)	11,788 (20.1)	13,716 (19.6)		5,488 (19.6)	3,749 (19.6)		212,035 (20.0)	54,539 (19.5)	
4th income quintile	391,346 (20.3)	10,632 (18.1)	12,109 (17.3)		4,977 (17.8)	3,352 (17.6)		219,252 (20.7)	49,942 (17.8)	
Highest income quintile	402,447 (20.9)	9,732 (16.6)	11,674 (16.6)		4,553 (16.3)	2,848 (14.9)		224,937 (21.3)	46,028 (16.4)	

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Prescription drug coverage indicates income Assistance N (%)	66,911 (3.4)	4,054 (6.7)	4,873 (6.7)	0.00	2,038 (7.2)	1,707 (8.8)	-0.06	52,147 (4.9)	18,278 (6.5)	-0.07
Urban-rural residence – N (%)				0.12			0.19			0.42
Metropolitan area	1,275,866 (65.5)	37,301 (61.5)	45,415 (62.5)		17,807 (63.0)	12,285 (63.5)		670,582 (62.9)	228,827 (81.0)	
Smaller urban	449,767 (23.1)	17,308 (28.5)	18,109 (24.9)		7,830 (27.7)	4,196 (21.7)		278,942 (26.2)	33,312 (11.8)	
Rural/remote	221,884 (11.4)	6,049 (10.0)	9,161 (12.6)		2,630 (9.3)	2,858 (14.8)		116,952 (11.0)	20,501 (7.3)	
Health care use in year prior to enrolment program										
Service use for mental health - N (%)	179,352 (9.2)	5,846 (9.6)	7,382 (10.1)	-0.02	3,379 (12.0)	2,588 (13.4)	-0.04	143,376 (13.4)	33,874 (12.0)	0.04
Service use for substance use - N (%)	23,538 (1.2)	582 (1.0)	1,029 (1.5)	-0.04	551 (1.9)	597 (3.1)	-0.07	18,671 (1.8)	8,077 (2.9)	-0.07
Primary care visits – mean (SD)	5.58 (7.02)	10.09 (7.91)	9.97 (8.58)	0.01	14.34 (10.17)	12.69 (10.40)	0.16	7.45 (6.48)	7.78 (8.11)	-0.06
ED visits – mean (SD)	0.28 (1.06)	0.43 (1.30)	0.52 (1.34)	-0.07	1.26 (2.32)	1.33 (2.59)	-0.03	0.48 (1.36)	0.46 (1.43)	0.02
Continuity (proportion of visits with usual provider of care) – mean (SD)	0.80 (0.22)	0.84 (0.18)	0.83 (0.19)	0.05	0.82 (0.18)	0.80 (0.20)	0.10	0.80 (0.22)	0.78 (0.24)	0.09

We consider a standardized difference =0.2 be considered a 'small' effect size, 0.5 represents a 'medium' effect size and 0.8 a 'large' effect size.

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Table 5. Crude and adjusted* odds of enrolment (95% CI) by income, rurality, and previous treatment for mental health or substance use

	Quebec				British Columbia					
	Vulnerable enrolment (targeted) 2003		**General enrolment 2009**		**Chronic disease incentive (targeted) 2003**		**Complex care incentive (targeted) 2007**		**A GP for Me/Attachment initiative (general) 2013**	
	Crude	Adjusted	Crude	Adjusted	Crude	Adjusted	Crude	Adjusted	Crude	Adjusted
Neighbourhood income quintile (reference: lowest income quintile)										
2nd lowest income quintile	1.01 (1.00, 1.03)	1.03 (1.02, 1.04)	1.11 (1.10, 1.12)	1.10 (1.09, 1.11)	1.03 (1.00, 1.07)	1.03 (0.99, 1.06)	1.03 (0.98, 1.09)	1.02 (0.97, 1.08)	1.09 (1.08, 1.10)	1.09 (1.08, 1.11)
Middle income quintile	1.00 (0.99, 1.01)	1.04 (1.03, 1.05)	1.19 (1.18, 1.21)	1.18 (1.16, 1.19)	1.07 (1.04, 1.11)	1.06 (1.03, 1.10)	1.05 (0.99, 1.10)	1.05 (0.99, 1.11)	1.31 (1.29, 1.33)	1.33 (1.31, 1.34)
2nd highest income quintile	1.00 (0.98, 1.01)	1.04 (1.03, 1.06)	1.20 (1.19, 1.21)	1.18 (1.17, 1.20)	1.09 (1.06, 1.13)	1.09 (1.05, 1.12)	1.06 (1.00, 1.12)	1.06 (1.00, 1.13)	1.48 (1.46, 1.50)	1.50 (1.48, 1.52)
Highest income quintile	0.95 (0.94, 0.96)	0.95 (0.94, 0.96)	1.23 (1.22, 1.24)	1.21 (1.20, 1.23)	1.04 (1.00, 1.08)	1.03 (1.00, 1.07)	1.14 (1.08, 1.21)	1.10 (1.04, 1.17)	1.65 (1.62, 1.67)	1.67 (1.64, 1.69)
Prescription drug coverage indicates income assistance	NA	NA	NA	NA	1.00 (0.95, 1.04)	1.01 (0.97, 1.05)	0.80 (0.75, 0.86)	1.02 (0.95, 1.09)	0.74 (0.73, 0.76)	0.76 (0.75, 0.78)
Urban-rural residence (reference is metropolitan areas)										
Smaller urban	1.43 (1.42, 1.44)	1.62 (1.60, 1.63)	0.81 (0.80, 0.82)	0.76 (0.79, 0.80)	1.16 (1.14 , 1.19)	1.17 (1.14 , 1.19)	1.29 (1.23 , 1.35)	1.27 (1.22 , 1.33)	2.86 (2.82 , 2.89)	2.82 (2.78 , 2.85)
Rural/remote	1.20 (1.19, 1.21)	1.37 (1.36, 1.39)	0.94 (0.93, 0.95)	0.93 (0.92, 0.94)	0.80 (0.78 , 0.83)	0.80 (0.78 , 0.83)	0.63 (0.60 , 0.67)	0.62 (0.58 , 0.66)	1.95 (1.92 , 1.98)	1.92 (1.89 , 1.95)
Treatment for mental health/substance use										
Mental health	0.65 (0.64, 0.69)	0.94 (0.92, 0.96)	N/A	N/A	0.94 (0.91, 0.98)	0.98 (0.94, 1.02)	0.88 (0.83, 0.93)	0.87 (0.82, 0.93)	1.14 (1.13, 1.16)	1.14 (1.13, 1.16)
Substance use	0.57 (0.55, 0.59)	0.60 (0.58, 0.63)	N/A	N/A	0.67 (0.61, 0.75)	0.72 (0.65, 0.80)	0.62 (0.56, 0.70)	0.64 (0.56, 0.72)	0.61 (0.59, 0.62)	0.61 (0.59, 0.63)

*Multivariable models used to generate adjusted odds ratios include age, sex, and Elixhauser comorbidity index

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Table 6. Odds of enrolment (95% CI) by health care use in the year prior to enrolment program

	Quebec				British Columbia					
	Vulnerable enrolment (targeted) 2003		**General enrolment 2009**		**Chronic disease incentive (targeted) 2003**		**Complex care incentive (targeted) 2007**		**A GP for Me/Attachment initiative (general) 2013**	
	Crude	Adjusted			Crude	Adjusted	Crude	Adjusted	Crude	Adjusted
Number of primary care visits	1.05 (1.05, 1.05)	1.03 (1.03, 1.03)	1.08 (1.08, 1.08)	1.06 (1.06, 1.06)	1.00 (1.00, 1.00)	1.00 (1.00, 1.01)	1.02 (1.02, 1.02)	1.01 (1.01, 1.01)	0.99 (0.99, 0.99)	0.98 (0.98, 0.98)
Number of ED visits	1.04 (1.04, 1.040	1.04 (1.04, 1.04)	1.005 (1.001, 1.009)	0.99 (0.99, 0.99)	0.95 (0.94, 0.95)	0.96 (0.95, 0.97)	0.99 (0.98, 1.00)	0.98 (0.97, 0.98)	1.01 (1.01, 1.01)	1.00 (1.00, 1.00)
Continuity (proportion of visits with usual provider of care)	1.13 (1.13, 1.14)	1.13 (1.13, 1.13)	1.12 (1.12, 1.12)	1.11 (1.11, 1.11)	1.03 (1.02, 1.03)	1.02 (1.02, 1.03)	1.06 (1.05, 1.07)	1.04 (1.03, 1.05)	1.04 (1.04, 1.04)	1.03 (1.03, 1.04)

* Multivariable models used to generate adjusted odds ratios include age, sex, and Elixhauser comorbidity index

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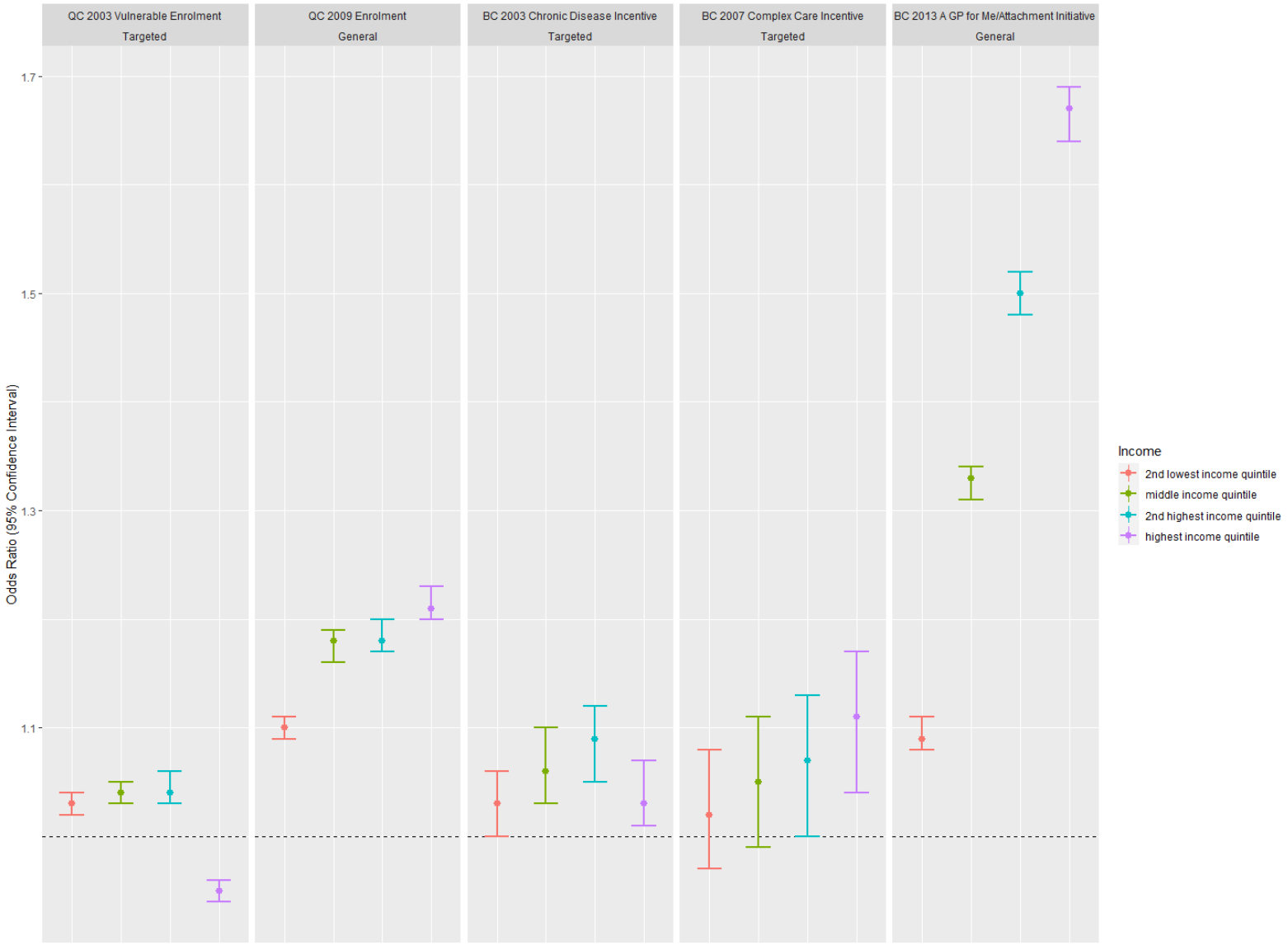

Figure 1. Odds of enrolment by program and neighbourhood income quintile. Adjusted for age, sex, and Elixhauser comorbidity index.

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