A COMPARISON OF MODELS OF PRIMARY CARE DELIVERY IN WINNIPEG

Authors: Alan Katz, MBChB, MSc, CCFP, FCFP
Jeff Valdivia, MNRM, CAPM
Dan Chateau, PhD
Carole Taylor, MSc
Randy Walld, BSc, Bcomm (Hons)
Scott McCulloch, MA
Christian Becker, P.Eng., MBA
Joshua Ginter, MA

Spring 2016

Manitoba Centre for Health Policy
College of Medicine
Faculty of Health Sciences
University of Manitoba

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Manitoba Centre for Health Policy
Faculty of Health Sciences
College of Medicine, University of Manitoba
4th Floor, Room 408
727 McDermot Avenue
Winnipeg, Manitoba, Canada
R3E 3P5

Email: reports@cpe.umanitoba.ca
Phone: (204) 789-3819
Fax: (204) 789-3910

How to cite this report:
Katz A, Valdivia J, Chateau C, Taylor C, Walld R, McCulloch S, Becker C, Ginter J. *A Comparison of Models of Primary Care Delivery in Winnipeg*. Winnipeg, MB. Manitoba Centre for Health Policy, Spring 2016.

Legal Deposit:
Manitoba Legislative Library
National Library of Canada

ISBN 978-1-896489-83-4

1st printing (Spring 2016)

This report was prepared at the request of Manitoba Health, Healthy Living and Seniors (MHHLS) as part of the contract between the University of Manitoba and MHHLS. It was supported through funding provided by the Department of Health of the Province of Manitoba to the University of Manitoba (HIPC 2013/2014-29). The results and conclusions are those of the authors and no official endorsement by MHHLS was intended or should be inferred. Data used in this study are from the Population Health Research Data Repository housed at the Manitoba Centre for Health Policy, University of Manitoba and were derived from data provided by MHHLS, as well as the Winnipeg Regional Health Authority, CancerCare Manitoba, Manitoba Family Services, Manitoba Housing and Community Development, Manitoba Jobs and the Economy, Manitoba Justice, and the Vital Statistics Agency. Strict policies and procedures were followed in producing this report to protect the privacy and security of the Repository data.

ABOUT THE MANITOBA CENTRE FOR HEALTH POLICY

The Manitoba Centre for Health Policy (MCHP) is located within the Department of Community Health Sciences, College of Medicine, Faculty of Health Sciences, University of Manitoba. The mission of MCHP is to provide accurate and timely information to healthcare decision–makers, analysts and providers, so they can offer services which are effective and efficient in maintaining and improving the health of Manitobans. Our researchers rely upon the unique Population Health Research Data Repository (Repository) to describe and explain patterns of care and profiles of illness and to explore other factors that influence health, including income, education, employment, and social status. This Repository is unique in terms of its comprehensiveness, degree of integration, and orientation around an anonymized population registry.

Members of MCHP consult extensively with government officials, healthcare administrators, and clinicians to develop a research agenda that is topical and relevant. This strength, along with its rigorous academic standards, enables MCHP to contribute to the health policy process. MCHP undertakes several major research projects, such as this one, every year under contract to Manitoba Health, Healthy Living & Seniors. In addition, our researchers secure external funding by competing for research grants. We are widely published and internationally recognized. Further, our researchers collaborate with a number of highly respected scientists from Canada, the United States, Europe, and Australia.

We thank the University of Manitoba, Faculty of Health Sciences, College of Medicine, Health Research Ethics Board for their review of this project. MCHP complies with all legislative acts and regulations governing the protection and use of sensitive information. We implement strict policies and procedures to protect the privacy and security of anonymized data used to produce this report and we keep the provincial Health Information Privacy Committee informed of all work undertaken for Manitoba Health, Healthy Living & Seniors.

Faculty of Health Sciences | University of Manitoba

ACKNOWLEDGEMENTS

The authors wish to acknowledge the contributions of many individuals whose efforts and expertise made this report possible. We thank the following and apologize in advance to anyone we may have overlooked.

Colleagues at MCHP for their valuable input: Mariette Chartier and Marni Brownell (Senior Readers). Editing of the final report: Jennifer Enns. Support in the preparation of graphs, tables, and literature: Jessica Jarmasz, Iresha Ratnayake, and Alexandra Decker.

The Advisory Group for their input, expertise, and contributions to this research:

- Marta Crawford (Manitoba Health, Healthy Living and Seniors)
- Tom Fogg (Manitoba Health, Healthy Living and Seniors)
- Jeanette Edwards (Winnipeg Regional Health Authority)
- Dr. José François (Winnipeg Regional Health Authority)
- Dr. Cynthia Sawatzky (Winnipeg Regional Health Authority)
- Dr. Paul Sawchuck (Winnipeg Regional Health Authority)
- Dr. Kevin Coates (St. Boniface Clinic)
- Dr. Carole Scurfield (Women's Health Clinic)

We are very grateful for the thoughtful feedback from our external academic reviewers: Dr. Michael Green and Dr. Simone Dahrouge.

We acknowledge the University of Manitoba Health Research Ethics Board for their review of the proposed research project. The Health Information Privacy Committee (HIPC) is kept informed of all MCHP deliverables. The HIPC number for this project is 2013/2014-29. We also acknowledge Manitoba Health, Healthy Living and Seniors, as well as the Winnipeg Regional Health Authority, CancerCare Manitoba, Manitoba Family Services, Manitoba Housing and Community Development, Manitoba Jobs and the Economy, Manitoba Justice, and the Vital Statistics Agency for the use of their data.

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ACRONYMS

ACE	Angiotensin-Converting Enzyme
ACEI	Angiotensin-Converting Enzyme Inhibitor
ACG®	Johns Hopkins Adjusted Clinical Group®
ARB	Angiotensin II Receptor Blocker
ACSC	Ambulatory Care Sensitive Conditions
CFS	Child and Family Services
CHF	Congestive Heart Failure
CIHI	Canadian Institute for Health Information
COC	Continuity of Care
COCI	Continuity of Care Index
COPD	Chronic Obstructive Pulmonary Disease
CT	Computed Tomography
CTAS	Canadian Emergency Department Triage and Acuity Scale
DA	Dissemination Area
DPIN	Drug Program Information Network
ED	Emergency Department
EDIS	Emergency Department Information System
EMG	Electromyography
EMR	Electronic Medical Record
FFS	Fee-for-Service
FOBT	Fecal Occult Blood Test
FTE	National Full-time Equivalent
MCHP	Manitoba Centre for Health Policy
MHHLS	Manitoba Health, Healthy Living and Seniors
MI	Myocardial Infarction
MIMS	Manitoba Immunization Monitory System
MRI	Magnetic Resonance Imaging
PAP	Papanicolaou
PIN	Physician Integrated Network

PRISM	Prosecution Information and Scheduling Management
QBIF	Quality-Based Incentive Funding
RUB	Resource Utilization Band
SAMIN	Social Assistance Management Information Network
TRM	Total Respiratory Morbidity
WRHA	Winnipeg Regional Health Authority

EXECUTIVE SUMMARY

Introduction

Primary healthcare service delivery in Winnipeg is provided by physicians and nurse practitioners through five different organizational and funding models. Little is known about the relative advantages and disadvantages of each of these models. The models evolved over more than 40 years to address specific goals, such as providing comprehensive care to specific atrisk populations or to improve the quality of prevention and chronic disease management. As primary care reform has been implemented across Canada over the past 15 years, research has increasingly described the impact of these reforms on different aspects of care, such as access to care and the quality of care provided. To assess these impacts, researchers at the Manitoba Centre for Health Policy (MCHP) have developed a growing number of indicators that are measurable using administrative data. This study describes care provided in Winnipeg from 2010/2011 to 2012/2013 using 29 primary care quality indicators.

The goal of the study was to compare the different models of primary healthcare service delivery. We explored access to care, type of patients served (socio-economic status, presence of chronic disease, presence of social factors impacting health, and age/sex distribution), strength of affinity to the clinic (continuity of care), and quality of care provided across the models of care. Because of contextual differences among the various clinics in Winnipeg, it can be difficult to make direct comparisons across clinics. The analyses in this study addressed this issue by controlling for patient and primary care provider characteristics. However, it is important to recognize the limitations of this approach. While we controlled for as many patient and provider variables as possible, we recognize that there are factors that we were unable to control for in this study.

The primary care quality indicators measure prevention and screening (Chapter 4), chronic disease management (Chapter 5), medical care (Chapter 6), and health services use and delivery (Chapter 7). Chapter 8 explores the validity of shadow billing as well as the factors that influence the panel size (the number of patients who are receiving care by a primary care provider) assigned to each provider.

Models of Primary Care

This study examines the five models of primary care delivery that exist in Winnipeg. Two of the models are fee-for-service (non-PIN FFS and PIN FFS) and the remaining three models include interdisciplinary salary- or alternative funding-based care (WRHA Primary Care, Community Health Clinic, and Teaching Clinic). Below is a brief description of each of these models; the names of the models as they appear in this report are bolded.

Non-PIN FFS: The dominant model of primary healthcare in Winnipeg is the fee-for-service (FFS) model, in which primary care providers submit claims for each service provided to an eligible Manitoba resident according to a predetermined fee schedule.

PIN FFS: The Physician Integrated Network (PIN) is a reform model that was offered to FFS primary care providers working in group clinics. Thirteen clinics in Manitoba received quality-based incentive funding to support high quality prevention and chronic disease management care.

WRHA Primary Care: The Winnipeg Regional Health Authority (WRHA) developed these clinics over the past decade to address the primary care needs of specific underserved populations. The human resources in these integrated care centres are also intended to match the local needs.

Community Health Clinic: These clinics (also called 'Community Health Agency Centres') were established well over 40 years ago in response to a national movement that promoted interdisciplinary team-based care focused on specific target groups. The staffing of each of these clinics has evolved over the years as different programs that are run out of these centres have been developed. The staff and funding are presumed to be based on the needs of the population served.

Teaching Clinic: The fifth model included in our analyses comprises the three interdisciplinary clinics in Winnipeg whose initial mandate was to provide a site for the education and training of family physicians. Much of the clinical care provided at these sites is provided by these trainees under the supervision of their preceptors, who include family physicians, nurse practitioners, and an interdisciplinary team of nurses, social workers, pharmacists, and nutritionists.

Table E.1 describes broad characteristics of each model of primary care in this study. The term 'alternative-funded' – as distinct from 'fee-for-service' – refers to the payment of primary care providers via a salary or contract. 'Funding for multidisciplinary staff' refers to whether financial support is available to hire additional staff, such as nurses, nutritionists, and social workers. 'IT support' refers to financial support provided for implementation and support of electronic medical records (EMR).

Table E.1: Characteristics of Primary Care Models

	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic	Non-PIN FFS
Primary Method of Provider Payment	FFS	Alternative-funded*	Alternative-funded*	Alternative-funded*	FFS
Quality-Based Incentive Funding (for Provider vs. Clinic)	Yes – Clinic	No	No	No	No
Funding for Multidisciplinary Staff	No	Yes	Yes	Yes	No
IT Support	One-time cost of purchase off set (Infoway)	Full Support	Full Support	Full Support	One-time cost of purchase off set (Infoway)

*Alternative Funded: Primary care providers sign contracts to fulfill a certain number of hours of work.

Methods

The analyses in this report use the Population Health Research Data Repository (hereafter 'Repository') housed at MCHP. While data in the Repository can be linked across each of its 70 datasets at the individual level, the data are de-identified to protect the privacy and confidentiality of the Manitobans whose data are included. We linked 16 different datasets to identify and describe our cohort in the study period from April 1, 2010 to March 31, 2013. The study cohort included all Manitobans with at least three visits to primary care providers in Winnipeg during the study period; each of these patients was then allocated to the primary care provider who administered most of their care. Each primary care provider was then allocated to a model of care, creating a cohort of patients who were each assigned to one model of care.

Crude rates for the 29 primary care quality indicators were measured and statistical models were used to control for various factors known to impact primary care. We developed 11 new explanatory variables for this study, which we have called "social complexities". These include indicators such as involvement with the justice system, being a newcomer to Manitoba, involvement with the child welfare system, and living in social housing (see Chapter 2 for details). Administering comprehensive, high-quality medical care to those with social complexities was postulated to be more challenging.

Results

Demographics

During our study period, 714,939 Manitobans visited a primary care provider at a clinic in Winnipeg at least once. Of this total, there were 88,315 (12.4%) Manitobans who had only one or two visits to primary care clinics in Winnipeg; therefore, these people were excluded from this study. Our final study cohort included 626,624 Manitobans, of whom 546,334 (87.2%) people were Winnipeg residents. The breakdown of the patient distribution by model of primary care is as follows: 81.7% in non-PIN FFS; 12.2% in PIN FFS; 2.6% in WRHA Primary Care; 1.9% in Community Health Clinic; and 1.5% in Teaching Clinic. The greatest differences in the patient populations assigned to the different models of care were in the income quintiles and social complexities. The Community Health Clinic model had the highest percent of patients in the lowest income group (Q1) and the smallest percent of patients in the highest income quintile (Q5). The WRHA Primary Care and Community Health Clinic models generally had a higher percent of each social complexity than the other models of primary care, while the PIN FFS model had the lowest percent for every complexity except one.

Primary Care Quality Indicators

Prevention and Screening

The overall observation is that the prevention and screening indicator rates for the PIN FFS model are generally higher (i.e., better) than the other models of primary care. Social complexities had a significant relationship with the indicators. For more than half of the indicators, social complexities were associated with a decrease in the rate of the indicator (i.e., the social complexities were associated with a negative outcome).

Chronic Disease Management

There was very little difference among the models of primary care for the indicator results. This is to some extent due to the small numbers of patients eligible for each indicator within each model. The impact of the social complexities was similarly limited.

Medical Care

The indicator rates among the models of primary care did not vary much and there was only one significantly different adjusted odds ratio when compared to the non-PIN FFS model. It is likely that the small eligible populations for these indicators were the reason for a lack of statistical differences among the rates of the models of primary care, and had an impact on whether the social complexities were associated with the indicator results.

Health Services Use

For some of these indicators, higher rates are better (e.g., continuity of care). For other indicators, lower rates are preferable (e.g., hospitalizations for Ambulatory Care Sensitive Conditions [ACSCs]; X-rays for lower back pain; emergency department visits classified as Canadian Emergency Department Triage and Acuity Scale [CTAS] 4 or 5; and ambulatory visits with a call to Health Links - Info Santé within two days of visit to primary care). When comparing across the models, no single model of care stood out as having better outcomes across most or all of the indicators.

Data Validation and Panel Size

To confirm that fee-for-service (FFS) and alternative-funded primary care providers submit comparable proportions of potential medical claims, we examined the proportion of billing claims preceding (by a maximum of 30 days) the dispensation of a specified list of newly prescribed drugs in the Repository. We assumed that these prescriptions would have required a visit to a primary care provider, resulting in a billing claim, and that this would be a good proxy for overall rates of billing submission. Using this method, we found that the Repository captures billing claims for FFS and alternative-funded primary care providers equally for our cohort, which allowed us to use the Full-Time Equivalent (FTE) National Algorithm to assign an FTE to each provider, regardless of their funding mechanism. The FTE for each primary care provider was used to calculate each provider's panel size.

Generally, 'panel size' refers to the number of patients that receive most of their primary care from one provider. However, comparing the number of allocated patients of one provider to another is complicated by the fact that providers do not all see patients for the same number of hours per day. Therefore, to calculate panel size we divided the total number of allocated patients by FTE for each primary care provider. Because the panel size calculation took each provider's FTE into account, the panel sizes of all providers are comparable, regardless of the number of hours per day spent seeing patients. The results of this analysis showed that FFS providers have panel sizes nearly double those of alternative-funded providers.

We then modelled the relationship between patient and primary care provider characteristics, social complexities and panel size. One primary care provider characteristic – male sex – increased panel size by 210 patients. The next largest impact on panel size was the percent of visits from non-allocated patients, which decreased panel size by 10 patients.

Summary

The striking finding from this study is the difference in the distribution of the social complexities among the primary care delivery models. Patients attending the alternative-funded clinics were found to be more socially complex. This had an association with many of the primary care quality indicators and the frequency of visits to primary care providers. Just as patients who are more medically complex visit their primary care providers more often, so too do more socially complex patients. For many of the indicators, social complexity is also associated with poorer quality of care results across the models of care. This study did not compare the economic costs of the different models; however, it would appear that the alternative-funded interdisciplinary clinics are providing enhanced services to patients with specialized needs. This is consistent with the intent of this model of care.

The overall impression is that there is room for improvement in the quality of care provided at all the models of care. While no single model provides better care than any other, in general, the PIN FFS clinics do stand out for higher rates of the screening and prevention indicators. Many of the indicators have been reported previously by MCHP and it is concerning that there has been little or no discernable improvement in these measures over time.

CHAPTER 1: INTRODUCTION

Background

This report builds on two previous studies done by the Manitoba Centre for Health Policy (MCHP) focusing on primary care delivery in Winnipeg, Manitoba, Canada. The previous two reports (Katz et al., 2014; Katz, Bogdanovic, & Soodeen, 2010) focused on the implementation and early operation of the Physician Integrated Network (PIN), an incentive-based program aiming to increase participating clinics' performance on a of range indicators, called Primary Care Quality Indicators. This third study expands the scope of research to clinics outside PIN clinics, including Winnipeg Regional Health Authority (WRHA) Primary Care clinics, Community Health Agency clinics, teaching clinics, and non-PIN fee-for-service (FFS) clinics.

Primary care reform has been on the national healthcare agenda for over a decade. There is much debate in today's healthcare system concerning the most effective primary care model with regard to activity, efficiency, reaching a targeted patient population, and quality of care. Because healthcare service delivery is a provincial responsibility, each province or territory has addressed this issue differently. There have been no studies that have evaluated all the different models of care delivery across Canada; research has only described the different models of care in specific jurisdictions (Hutchison, 2008; Hutchison, Levesque, Strumpf, & Coyle, 2011). In addition, researchers in Ontario (Glazier, Klein-Geltink, Kopp, & Sibley, 2009; Glazier & Redelmeier, 2010; Glazier, Zagorski, & Rayner, 2012) and Quebec (Haggerty et al., 2007; Haggerty et al., 2008) have evaluated aspects of jurisdiction-specific reforms. The key reforms initiated have been focused on a small number of the key components of primary care service delivery:

- Improved access to care;
- Improved quality of care;
- Support for continuity of care; and
- Improved integration of care.

In general, the delivery of primary care services in Manitoba, and specifically in Winnipeg, has evolved considerably over the last decade. While some of the innovations have been individually evaluated and continue to be evaluated (e.g., PIN), others have not been assessed.

The present study has two main objectives:

- Compare and evaluate primary care quality indicators for the five models of primary care delivery in Winnipeg; and
- Describe the impact of social complexity on primary care quality indicators and primary care provider panel size.

In this study, we analyze a wide range of indicators across the five models of primary care delivery. Several of the indicators in this study were not examined in the two previous studies. The findings primarily concern the differences in quality of care among the five models of primary care delivery. The primary care quality indicators were assessed through the analysis of the data held at MCHP in the Repository. Previous research at MCHP (Katz et al., 2014) has demonstrated the capacity of the data in the Repository to measure relevant primary care quality indicators.

Models of Primary Care Delivery in Winnipeg

The five models of primary care delivery in Winnipeg, Manitoba, are described below.

Non-PIN FFS Clinics

Over 80% of primary care services within Winnipeg are provided by independent FFS primary care providers. This is the traditional model of primary care service delivery and remains the dominant model in Winnipeg. This model includes clinics providing full service family practice as well as walk-in clinics. While some FFS clinics participate in the PIN initiative, most do not. For our analyses, all FFS clinics that are not included in PIN are in this category. It should be noted that certain financial incentives for management of specific chronic diseases were available to all FFS clinicians during the third year of the study period. It was not possible to determine the impact of this funding on clinical practice in this study.

Throughout this report, this model of primary care is referred to as 'non-PIN FFS'.

PIN FFS Clinics

The Physician Integrated Network (PIN) is a model of primary care developed by Manitoba Health, Healthy Living and Seniors based on guidance from an advisory committee with representation from the University of Manitoba, the Colleges of Registered Nurses and Physicians & Surgeons of Manitoba, the Manitoba Medical Association, the Winnipeg and former Assiniboine Regional Health Authorities, and other primary care stakeholders. One mechanism for engaging primary care providers in PIN is Quality-Based Incentive Funding (QBIF): pay-for-performance funding that is provided to clinics meeting quality targets on certain primary care indicators. These indicators were established by the Canadian Institutes for Health Information (CIHI) and modified by a committee of relevant stakeholders. The funding provided to clinics meeting these quality targets is in addition to the usual FFS funding mechanism.

The main objectives of PIN are to improve the public's access to primary care, the primary care providers' access to and use of information, the work life of all primary care providers, and to strive for high-quality primary care, with a focus on chronic disease.

All five clinics of this type in Winnipeg were included in this study:

- Assiniboine Medical Centre;
- Clinique St. Boniface Clinic;
- Concordia Health Associates;
- Prairie Trail Medical Clinic; and
- Tuxedo Family Medical Centre.

Throughout this report, this model of primary care is referred to as 'PIN FFS'.

WRHA Primary Care Clinics

These clinics provide health and social services that are unique to the communities in which they are located. Services include frontline healthcare from physicians or nurse practitioners to assist with mental health, home care, employment, and income assistance programs. Primary care providers at these clinics receive alternative funding or are funded on a sessional basis. There are six such centres in Winnipeg, of which five were included in this study (Access Winnipeg West was excluded because it was not fully operational during the study period):

- Access Downtown Primary Care Clinic (formerly Health Action Centre);
- Corydon Community Health Centre;
- Aikins Community Health Centre;
- Access River East Primary Care Clinic; and
- Access Transcona Primary Care Clinic.

Access Downtown, Access River East, and Access Transcona also provide services beyond primary care; in this study, we only examined the primary care clinics at these locations. Throughout this report, this model of primary care is referred to as 'WRHA Primary Care'.

Community Health Agency Clinics

These clinics are located throughout the city and provide a variety of health and social services; some clinics focus on particular practice areas or population groups (e.g., Francophones, women), while others provide general care. They are operated by Community Boards. Primary care providers at these clinics receive alternative funding or are funded on a sessional basis. All seven primary care clinics of this type were included in this study:

- Aboriginal Health and Wellness Centre;
- Centre de Santé Saint Boniface;
- Hope Centre Health Care Inc.;
- Klinic Community Health Centre;
- Mount Carmel Clinic;
- Nor'West Co-op Community Health Centre; and
- Women's Health Clinic.

Throughout this report, this model of primary care is referred to as 'Community Health Clinic'.

Teaching Clinics

There are three Winnipeg clinics whose primary responsibility is the training of family medicine residents. These clinics are funded through different mechanisms due to their mandate for education, with the supervising primary care providers being funded through a mechanism similar to the Community Health Agency clinics and WRHA Primary Care clinics. The vast majority of care at these sites is provided by family physicians-in-training under the supervision of their preceptors. There are three such sites in Winnipeg:

- Family Medical Centre;
- Kildonan Medical Centre; and
- Northern Connection Medical Centre.

Throughout this report, this model of primary care is referred to as 'Teaching Clinic'.

Characteristics of the Primary Care Models

Table 1.1 describes broad characteristics of each model of primary care in this study. The term 'alternative-funded' – as distinct from 'fee-for-service' – refers to the payment of primary care providers via a salary or contract. 'Funding for multidisciplinary staff' refers to whether financial support is given to hire additional staff, such as nurses, physiotherapists, and social workers. 'IT support' refers to financial support provided for implementation and support of electronic medical records (EMR).

Table 1.1: Characteristics of Primary Care Models

	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic	Non-PIN FFS
Primary Method of Provider Payment	FFS	Alternative-funded*	Alternative-funded*	Alternative-funded*	FFS
Quality-Based Incentive Funding (for Provider vs. Clinic)	Yes – Clinic	No	No	No	No
Funding for Multidisciplinary Staff	No	Yes	Yes	Yes	No
IT Support	One-time cost of purchase off set (Infoway)	Full Support	Full Support	Full Support	One-time cost of purchase off set (Infoway)

*Alternative Funded: Primary care providers sign contracts to fulfill a certain number of hours of work.

Purpose and Objectives of this Study

This report describes characteristics of the patients and primary care providers (also referred to simply as 'providers') assigned to each model of primary care. The results of the primary care quality indicators are then compared among the models of primary care after controlling for these patient and provider characteristics (described in detail in Chapter 2).

We analyze a wide range of primary care quality indicators, several of which were not examined in the previous two studies on primary care delivery. The findings primarily describe the differences in quality of care among the five models of primary care delivery. However, the non-PIN FFS model is sometimes used as a reference model against which all other models are compared, because it is the dominant model of primary care in Winnipeg.

We hypothesized that salaried physicians and nurse practitioners at alternative-funded clinics do not have the same motivation to submit their billing claims (shadow billings) as their FFS counterparts, who are paid only as a result of submitting their billing claims. Therefore, we validated shadow billing claims using data in the Repository.

Finally, taking into account patient and provider characteristics in each primary care model, we determined the impact of these characteristics on panel size.

The present study has two main objectives:

- Compare and evaluate primary care quality indicators for the five models of primary care delivery in Winnipeg; and
- Describe the impact of social complexity on primary care quality indicator results and primary care provider panel size.

The outcomes of the indicators were determined through the analysis of the data held in the Repository at MCHP. Previous research at MCHP (Katz et al., 2014) has demonstrated the capacity of the data in the Repository to measure relevant quality indicators.

Primary Care Indicators

This study conducted analyses on four categories of primary care indicators:

- Prevention and screening;
- Chronic disease management;
- Medical care; and
- Health services use and delivery.

Some of the indicators had been developed previously at MCHP and elsewhere, and others were developed specifically for this study.

Structure of the Report

This report includes nine chapters and six appendices. Chapter 2 presents the methods we used, including data sources, exclusions, patient allocation, a description of social complexities, and statistical analyses. Chapter 3 describes the patient cohort and primary care provider characteristics. Chapters 4-7 present the results for the four categories of primary care quality indicators mentioned above. Chapter 8 describes how we validated the shadow billing and examined the impact of patient and provider characteristics on panel size. Chapter 9 provides a summary and conclusions. Appendix 1 (Primary Care Quality Indicator Definitions), Appendix 2 (Sum of Social Complexities by Clinic), and Appendix 3 (Factor Analysis) follow Chapter 9. Online Appendix 1 (Social Complexities by Clinic), Online Appendix 2 (Primary Care Quality Indicator Crude Rates by Clinic), and Online Appendix 3 (Model Results) are available online at MCHP's website: http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html.

CHAPTER 2: METHODS

This study used data from a variety of sources that are available in the Repository housed at MCHP. Most of these data are derived from administrative data that are collected by Manitoba Health, Healthy Living and Seniors (MHHLS) through administration of the universal healthcare system within Manitoba, such as contacts with primary care providers and hospitals, pharmaceutical dispensation, and use of personal care homes (nursing homes).

The Repository data are person-level data, meaning that they are available for each individual. They are 'de-identified', so that names and other identifying information are not visible. However, unique encrypted identifiers are used to allow linkage across files and follow-up over time. Data in the Repository have been extensively documented and validated for this kind of research (Katz, De Coster, Bogdanovic, Soodeen, & Chateau, 2004).

Data Sources

The analyses in this study used databases from the following sources:

- Canada Census;
- Child and Family Services (CFS) Applications and Intake;
- Drug Program Information Network (DPIN);
- Emergency Department Information System (EDIS);
- Health Links - Info Santé;
- Hospital Abstracts;
- Manitoba Cancer Registry;
- Manitoba Colorectal Cancer Screening Program;
- Manitoba Immunization Monitoring System (MIMS);
- Long Term Care Utilization;
- Manitoba Health Insurance Registry;
- Medical Services;
- Provider Registry;
- Prosecution Information and Scheduling Management (PRISM);
- Social Allowance Management Information Network (SAMIN); and
- Tenant Management System.

Detailed descriptions of these databases can be found on MCHP's Repository Data List webpage: http://umanitoba.ca/faculties/health_sciences/medicine/units/community_health_sciences/departmental_units/mchp/resources/repository/datalist.html.

Development of Cohort

To develop our cohort, we first identified all Manitoba residents who had at least three ambulatory visits to a family physician or nurse practitioner (hereafter, 'primary care provider' or simply 'provider') during our study period (April 1, 2010 – March 31, 2013). These residents were then allocated to a primary care provider in Manitoba based on an allocation algorithm. The algorithm allocates patients to a primary care provider based on the following rules:

1. The patient is allocated to the primary care provider with whom the patient has had the most visits (579,607 patients allocated in this step); in the event of a tie for the most visits, the providers with fewer visits with that patient are eliminated from this process and step two is performed with the remaining providers;
2. The patient is allocated to the primary care provider with the highest total billings (27,553 patients allocated in this step); in the event of a tie for the highest total billings, providers with lower total billings with that patient are eliminated from this process and step three is performed with the remaining providers;
3. The patient is allocated to one of the remaining primary care providers at random (19,104 patients allocated in this step).

Next, we identified the clinic at which each primary care provider worked using the Electronic User Site Location in the Repository. Patients allocated to a primary care provider working in a clinic outside of Winnipeg (i.e., outside the scope of this study) were removed. Finally, patients with non-Manitoba postal codes or no Manitoba Health coverage at the beginning of the study period were removed; patients in personal care homes at the beginning of the study period were also removed.

Non-PIN FFS primary care providers were not allocated to specific clinics due to data limitations. The Repository does not include specific information about site of practice for these individuals. While it is possible to determine the origin of a billing submission, there is overlap among FFS clinics due to some clinics providing the service of submitting the claims of other clinics to MHHLS. As a result, the Repository data is not reliable for determining the non-PIN FFS clinic at which primary care providers work, although this was not an issue for the other models of primary care. We were therefore unable to perform clinic-based analyses for the non-PIN FFS model of care.

Measuring the Outcome of the Primary Care Quality Indicators

The 29 primary care quality indicators selected for this study fall into four categories: prevention and screening, chronic disease management, medical care, and health services use and delivery. By including a wide array of indicators, we hoped to capture differences in primary care delivery quality among the five models of primary care studied. For the technical definitions of the primary care quality indicators used in this report, please see Appendix 1. Table 2.1 lists the indicators examined in this report.

Table 2.1: Study Indicators

Prevention and screening
Breast cancer screening for women aged 50-74
Cervical cancer screening for women aged 21-69
Colorectal cancer screening for adults aged 50-74
Completed vaccinations at age two
Annual influenza vaccination, adults aged 65 and older
Annual influenza vaccination, people with total respiratory morbidity
Pneumococcal vaccination, adults aged 65 and older
Chronic disease management
Diabetes management: eye examination
Congestive heart failure management: initiation of ACE inhibitor drug treatment
Congestive heart failure management: persistence of ACE inhibitor drug treatment
Post-myocardial infarction management: initiation of beta-blocker drug treatment
Post-myocardial infarction management: persistence of beta-blocker drug treatment
Post-myocardial infarction management: initiation of cholesterol-lowering drug treatment
Post-myocardial infarction management: persistence of cholesterol-lowering drug treatment
Asthma management: medication use
Medical care
Benzodiazepine prescribing in community dwelling adults aged 75 and older
Beers drug prescribing in community dwelling adults aged 65 and older
Depression care, prescription follow-up
Health services use and delivery
Continuity of care of assigned primary care provider
Clinic-based continuity of care
Referral Rates
Hospitalizations for ambulatory care sensitive conditions: adults aged 74 and younger
X-ray for lower back pain: adults aged 20 and older
Hospital episodes with a readmission within 30 days
Emergency department visit rate for patients with CTAS 4 or 5
Ambulatory visits to primary care
Ambulatory visits to primary care for patients with RUB 3, 4 or 5
Ambulatory visits to primary care for patients with three or more social complexities
Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit

This report includes new indicators not previously used in other MCHP studies. In past studies we have used indicators developed at MCHP as well as other indicators that have supported descriptions of the quality of care provided. Other investigators have also developed measures appropriate to primary care analysis. The following indicators are new to MCHP studies:

- Colorectal cancer screening for adults aged 50-74;
- X-ray for lower back pain: adults aged 20 and older;
- Emergency department visit rate for patients with CTAS 4 or 5; and
- Ambulatory visit with a call to Health Links – Info Santé within two days of visit.

The following is presented for each indicator in chapters 4, 5, 6, and 7:

- Eligible population number and percent of prevention and screening indicators by model of primary care;
- Comparison of the 'basic' adjusted indicator results among the models of primary care, adjusting for patient characteristics (i.e., age, sex, income quintile, and resource utilization band [RUB]) and primary care provider characteristics (i.e., age, sex, years in practice, and country of graduation);
- Comparison of the 'full' adjusted indicator results among the models of primary care, adjusting for social complexities, in addition to patient and primary care provider characteristics;
- The relationship between each social complexity and the indicator outcome; and
- The relationship between the number of social complexities (compared to zero social complexities) and the indicator outcome, as well as a linear trend test; when the linear trend test result is significant, this means that the indicator result either decreases or increases as the number of social complexities increases.

Only statistically significant comparisons between the different models are described in the text. Wherever a difference between two models is mentioned, this difference has been shown to be statistically different using a 0.01 level of significance due to multiple comparisons being performed. The relationship between the social complexities and the indicator results is statistically significant at the 0.05 level of significance.

Crude indicator rates are provided for each model of primary care in the report and for each clinic (except for clinics in the non-PIN FFS model) in Online Appendix 2.

Patient Complexity

In some cases, patients present with an interconnected and diverse set of needs. While some of these needs may be adequately dealt with by the healthcare system, other needs fall outside of its purview. When the treatment of health-related needs is confounded by the kinds of needs the healthcare system cannot address, patients are left dissatisfied with their experience and, ultimately, inadequately treated. Patients with these kinds of needs are often called 'complex' (Johnson, 2013; Schaink et al., 2012).

A scoping review conducted by Schaink et al. (2012) identified three dimensions of patient complexity: multimorbidity, resource utilization, and psychosocial (Schaink et al., 2012). The 'multimorbidity' dimension to patient complexity includes multiple diagnoses (multimorbidity), polypharmacy (multiple prescription medications), loss of physical functioning, and limited application of clinical practice guidelines. The 'resource utilization' dimension to patient complexity includes heavy utilization of healthcare resources, costly care, self-management challenges, poor quality of life, and difficultly with healthcare system navigation. The 'psychosocial' dimension to patient complexity includes poor mental health, low socio-economic status, poor social support, negatively affected relationships, caregiver strain and burnout, and demographic factors, such as age and sex (Schaink et al., 2012).

Social Complexity

Primary care providers at alternative-funded clinics in Manitoba have consistently claimed that there are systematic differences between the patients seen at their clinics and those seen in FFS clinics. In particular, they believe that their patients' needs are greater than other patients', on average, due to social conditions known to influence health, such as unstable housing and poverty. In this study we examined 11 such social conditions that we call '*social complexities*'. The social complexities examined in this study are similar in kind to the psychosocial dimension to patient complexity that Schaink et al. (2012) presented (Schaink et al., 2012).

The percent of each social complexity is presented by model of primary care in Chapter 3 and by clinic (except for non-PIN FFS clinics) in Online Appendix 1. The percent of the sum of social complexities are presented by model of primary care in Chapter 3 and by clinic (except for Non-PIN FFS clinics) in Appendix 2.

In subsequent chapters, we present the associations among social complexities, the sum of social complexities, and our primary care quality indicator outcomes.

The following sections define and describe each of the 11 social complexities used in this report.

High residential mobility

Patients with high residential mobility are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including physiological and psychological responses to the stress of change, disrupting social ties and support networks, a decrease in social capital, and, for children, changing schools (Brown et al., 2012; Exeter, Sabel, Hanham, Lee, & Wells, 2015; Jelleyman & Spencer, 2008).

In this report, we defined high residential mobility patients as patients who moved residences three or more times within 10 person-years (data from January 2000 to June 2013).

Low Income Quintile

Patients in the lowest income quintile are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including poor prenatal and early childhood care, chronic stress, low household resources, family turmoil, violence, separation from families, instability, and less social support (Hanson et al., 2013; Spencer & Strazdins, 2015).

Income quintile is a measure of neighbourhood socio-economic status that divides the population into five income groups (from lowest income to highest income) so that approximately 20% of the population is in each group. In this report, we identified patients in the lowest income quintile as the population in the lowest 20%.

Social Housing Resident

Social housing residents are at a greater risk of being in a poorer state of health than the rest of the population due to a variety of factors, including poorer education outcomes, social isolation, poor sanitation, poor access to grocery stores and recreation centres, and exposure to second-hand smoke (Arku, Adamkiewicz, Vallarino, Spengler, & Levy, 2015; Chibber et al., 2014; Hayward et al., 2015). Smith et al. (2013) demonstrated that for many of the health and social outcomes experienced by social housing residents, area-level socio-economic status played a greater role than living in social housing (Smith et al., 2013).

In this report, we defined social housing residents as follows: patients having ever lived in social housing that is owned and directly managed by Manitoba Housing and Community Development (data from 1995 to March 31, 2013).

Income Assistance

Patients in families receiving income assistance are at a greater risk of being in a poor state of health than the rest of the population due to the health and social reasons that make them eligible for income assistance. As a result, there is evidence to suggest that being on income assistance is associated with negative health and social outcomes, including obesity, mental health problems, apprehensions by police, and increased emergency department visits. For children, higher rates of all-cause mortality, suicide attempts, alcohol and drug misuse, low education, and social assistance (Brownell et al., 2006; Brownell et al., 2010; Leung & Villamor, 2011; Pickett, Stenstrom, & bu-Laban, 2015; Ringback, Hjern, Batljan, & Vinnerljung, 2008; Roos et al., 2006).

In this report, we identified patients on income assistance as follows: a patient who has ever received income assistance (data from 1995 to March 31, 2013).

Major Mental Health Diagnosis

Patients with a major mental health diagnosis are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including higher rates of tobacco use, inadequate nutrition, excessive alcohol use, illicit drug and substance abuse, physical inactivity, poor housing, homelessness, and side-effects from psychiatric medications (Bartlem et al., 2015; Chwastiak, Vanderlip, & Katon, 2014; Seminog & Goldacre, 2013). Brown et al. (2010) found that people diagnosed with schizophrenia had rates of circulatory and respiratory disease 2.6 and 4.9 times higher than the general population, respectively (Bartlem et al., 2015; Brown, Kim, Mitchell, & Inskip, 2010).

In this report, we defined patients with a major mental health diagnosis as follows: a patient identified as ever having a psychotic disorder (data from 1995 to March 31, 2013).

Newcomer

Patients who are newcomers to Canada are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including less social support, social isolation and loneliness, stress, language and cultural differences and barriers, experiencing racism, less use of the healthcare system, low socio-economic status, and poverty (Ladin & Reinhold, 2013; Papic, Malak, & Rosenberg, 2012; Sword, Watt, & Krueger, 2006; Vatcharavongvan, Hepworth, Lim, & Marley, 2014).

In this report, we defined 'newcomer' using the following approach. First, we identified all patients who were new to Manitoba within the last five years. Second, using the 2011 Canada Census, we calculated the proportion of immigrants in each Dissemination Area (DA) in Manitoba who moved from another country. Finally, each patient identified as new to Manitoba was given a probability of being a 'newcomer' based on the proportion of immigrants in the DA in which he or she resided.

Child of a Newcomer

Children of newcomers are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including parental unemployment, inadequate housing, poverty, psychological and social acculturation, difficulties establishing an identity and sense of belonging, perceptions of discrimination, and prejudice causing bicultural stress (Hilario, Vo, Johnson, & Saewyc, 2014; Romero, Carvajal, Valle, & Orduña, 2007; Schwartz et al., 2015).

In this report, we identified patients as 'child of a newcomer' as follows: a patient identified as a child of somebody who meets the definition of a newcomer as above (data from May 10, 2006 to 2011).

Teen Mom

Teen mothers are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including poorer education outcomes, underemployment, lower socio-economic status, stresses of childrearing at a young age, fewer resources to invest in their own physical health, coming from a household with either a single biological parent or no biological parent, and social exclusion (Assini-Meytin & Green, 2015; Patel & Sen, 2012; Webb, Marshall, & Abel, 2011). Webb et al. (2011) found a significantly higher risk of death by suicide, lung cancer, and cervical cancer in women who became mothers as teens compared to women who became mothers after the age of 19 (Webb et al., 2011).

In this report, we identified teen mothers as female patients of any age who first gave birth at the age of 19 or younger (data from 1970 to March 31, 2013).

Child of a Teen Mom

Children of teen moms are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including being less likely to have been breastfed, having a mother less prepared for pregnancy, childbirth, and childcare, with lower levels of education, and at a greater risk for mental health problems (Branson, Ardington, & Leibbrandt, 2015; Lipman, Georgiades, & Boyle, 2011; Morinis, Carson, & Quigley, 2013).

In this report, we identified children of teen moms as follows: the child of a female patient of any age who first gave birth at the age of 19 or younger (data from 1970 to March 31, 2013).

Child in Care

Children and youths in the child welfare system are more likely to be in a poor state of health than the rest of the population due to exposure to a variety of factors, including poverty, poor prenatal care, prenatal maternal substance exposure, low birth weight, parental mental illness, inadequate routine preventive healthcare, neglect, and abuse (Brownell et al., 2015; Foster Family-based Treatment Association, 2013; Ringeisen, Casanueva, Urato, & Cross, 2008; Simms, Dubowitz, & Szilagyi, 2000). According to Ringeisen et al. (2008), caregivers reported that 50.3% of children in care had one or more special healthcare need(s), meaning that these children are at increased risk of developing chronic physical, developmental, behavioural, or emotional conditions that would require significant health and social services (Ringeisen et al., 2008). Other studies have estimated that more than 80% of children and youths in the child welfare system have these kinds of health problems (Halfon, as cited in Ringeisen et al., 2008; Leslie, as cited in Ringeisen et al., 2008).

In this report, children in care were identified as follows: patients aged 0-18 years on March 31, 2013 who were identified as having been removed from his or her family of origin and placed in the care of another adult due to concerns about proper provision of care in the family of origin (data from 1992 to March 31, 2013).

Involvement with the Justice System

Patients who have involvement with the justice system are at a greater risk of being in a poor state of health than the rest of the population due to a variety of factors, including experiences of sexual victimization, risky sexual behaviour, family violence, past traumatic experience, emotional, physical, and sexual abuse, self-devaluation, smoking, conflict with family and school (Espinosa, Sorensen, & Lopez, 2013; Kinner et al., 2014; Valera et al., 2015).

In this report, we defined involvement with the justice system as follows: a patient who has had contact with the justice system as a witness, victim, or accused (data from 2005 to March 31, 2013).

Statistical Analyses

The results of the statistical analyses of the primary care quality indicators are presented in chapters 4, 5, 6 and 7. Only statistically significant results are shown. In some cases, where no or very few statistically significant results occurred, tables or graphs are not shown; this is indicated within the text.

Comparisons between models of primary care were made using generalized linear mixed models and calculated at a type 1 error rate (i.e., alpha) of 0.01 due to multiple comparisons being performed. These statistical models allow for comparisons among the results for the models of primary care for each primary care quality indicator, while accounting for clustering of patients within primary care providers and clinics. Odds ratios and relative rates were calculated using logistic and Poisson regression, respectively. The Continuity of Care Index is a continuous outcome; therefore, a multilevel linear regression was used for the comparisons between models of primary care. Statistical model results are presented in Online Appendix 3.

In this study, we use a linear trend test to examine whether there is an association between the indicator results and a consistent pattern (i.e., an increasing or decreasing trend) in the relationship between the number of social complexities and the indicator. A significant linear trend would indicate that as the number of social complexities increases, the likelihood of the indicator also increases (or decreases).

All data management, programming, and analyses were performed using SAS® statistical analysis software, version 9.3.

The Johns Hopkins Adjusted Clinical Group® (ACG®) Case-Mix System version 10 was used to create the RUBs. The RUBs are a simplified ranking system of each person's overall sickness level from 0 to 5, taking into account all the diagnoses attributed to them during medical visits and hospitalizations during the preceding year.

Data Validation

There is evidence to suggest that some visits to clinics where primary care providers receive alternative funding (i.e., clinics in the WRHA Primary Care, Community Health Clinic, and Teaching Clinic models) are not captured in the data in the Repository (Katz et al., 2014). A possible reason for this discrepancy is that alternative-funded primary care providers do not have the same motivation as FFS primary care providers to submit claims to MHHLS because they are paid whether they submit a claim or not. On the other hand, FFS primary care providers are only paid for claims that they submit. As a result, one of the objectives of this study is to determine whether the proportion of medical claims found in the Repository is comparable between the FFS and alternative-funded providers in our study.

To validate the assumption that the proportion of billing claims found in the Repository is comparable between the FFS and alternative-funded primary care providers in our study, we looked at the proportion of billing claims preceding (by a maximum of 30 days) the dispensation of a specified list of newly prescribed drugs in the Drug Program Information Network (DPIN). Every prescription that is filled in Manitoba is entered into the DPIN database, and new, dispensed prescriptions for most drugs would be expected to be the result of a face-to-face visit with a primary care provider. New prescriptions were defined as drugs that had not been previously prescribed within the last two years of their dispensation date. Therefore, if a prescription for a particular drug not previously prescribed to a patient did not have a corresponding visit to a primary care provider, we assumed that this information was missing from the data in the Repository.

Primary Care Provider Panel Size

Panel size was compared among primary care providers in the different models of primary care delivery. This analysis was conducted to determine whether there is a difference between the panel sizes of FFS and alternative-funded providers.

Generally, 'panel size' refers to the number of patients that receive most of their primary care from one provider. However, comparing the panel sizes among the primary care providers in our study is complicated by the fact that providers do not all see patients for the same number of hours per day. Therefore, to meaningfully compare panel sizes, we needed to ensure that the Repository captured billing claims for both FFS and alternative-funded primary care providers equally for our cohort (see Data Validation section above); this would allow us to use the national algorithm developed by Health Canada (see (Watson et al., 2004)) Full-Time Equivalent (FTE) National Algorithm to assign an FTE to each provider, regardless of their funding mechanism. We required an estimate of the FTE of each primary care provider to calculate each provider's panel size.

In this study, primary care provider panel size was calculated by dividing the number of patients allocated to a primary care provider by that provider's FTE. Only primary care providers who reported at least one claim in each of the four quarters of the first year they appear in our study period were included in the FTE calculation.

Every primary care provider's FTE is calculated according to one of the following scenarios:

- If the primary care provider's annual total billings fall between the 40th and 60th percentile (inclusive) of all providers' annual billings, the FTE is assigned a value of 1; this defines the typical full-time primary care provider.
- If the primary care provider's annual total billings fall below the 40th percentile, the FTE is the proportion of total billings divided by the 40th percentile; the FTE ranges from 0 to 1 (exclusive).
- If the primary care provider's annual total billings are above the 60th percentile, the FTE is equal to 1 plus the natural logarithm of the proportion of total billings divided by the 60th percentile; the logarithmic relation prevents high income providers from having a very large FTE: for instance, a provider earning four times the 60th percentile will have an FTE of 2.4 instead of an FTE of 4 (Watson et al., 2004).

We performed statistical modelling to determine whether there is a relationship between panel size and characteristics of primary care providers and patients.

For a more detailed description of the FTE calculation, please see the MCHP Concept and Glossary Dictionary webpage: http://mchp-appserv.cpe.umanitoba.ca/viewConcept.php?conceptID=1026.

CHAPTER 3: STUDY POPULATION

This chapter includes information on the demographics of the patients and primary care providers included in the study. Demographic information concerning social complexities is also presented.

Patient Demographics

During our study period, 714,939 Manitobans visited a primary care provider at a clinic in Winnipeg at least once. Of this total, there were 88,315 (12.4%) Manitobans who had only one or two visits to primary care clinics in Winnipeg; therefore, these people were excluded from this study. Our final study cohort included 626,624 Manitobans, of whom 546,334 (87.2%) were Winnipeg residents. The patient cohort was of 53.1% female and 46.9% male. The patients fell into the following age-groups: 7.9% were 0-5 years; 13.6% were 6-18 years; 36.9% were 19-44 years; 28.3% were 45-64 years; 7.1% were 65-74 years; and 6.3% were 75 and older.

Each patient in the cohort was allocated to a primary care provider who was determined to be their principal source of primary care. The providers were then allocated to one of the five models of primary care. The patients were all thereby assigned, indirectly, to a model of primary care. The breakdown of the patient distribution by model of primary care is as follows: 81.7% in non-PIN FFS; 12.2% in PIN FFS; 2.6% in WRHA Primary Care; 1.9% in Community Health Clinic; and 1.5% in Teaching Clinic.

Table 3.1 presents detailed demographics of the study cohort.

Table 3.1: Study Cohort Characteristics

2010/11 – 2012/13

		PIN FFS (N=76,261)		WRHA Primary Care (N=16,536)		Community Health Clinic (N=12,178)		Teaching Clinic (N=9,526)		Non-PIN FFS (N=511,763)	
		Eligible Population	Percent	Eligible Population	Percent	Eligible Population	Percent	Eligible Population	Percent	Eligible Population	Percent
Sex	Male	32,762	43.0	6,518	39.4	3,672	30.2	3,955	41.5	246,815	48.2
	Female	43,499	57.0	10,018	60.6	8,506	69.8	5,571	58.5	264,948	51.8
Age (Years)	0-5	3,219	4.2	1,244	7.5	987	8.1	952	10.0	43,040	8.4
	6-18	7,909	10.4	2,145	13.0	2,754	22.6	939	9.9	71,226	13.9
	19-44	24,030	31.5	5,356	32.4	4,813	39.5	3,012	31.6	193,885	37.9
	45-64	25,555	33.5	4,977	30.1	2,523	20.7	3,051	32.0	141,070	27.6
	65-74	8,102	10.6	1,270	7.7	593	4.9	771	8.1	33,537	6.6
	75+	7,446	9.8	1,544	9.3	508	4.2	801	8.4	29,005	5.7
Income Quintile	Q1 (Lowest)	8,193	10.7	3,921	23.7	4,288	35.2	1,324	13.9	109,912	21.5
	Q2	13,049	17.1	3,505	21.2	2,999	24.6	1,850	19.4	100,188	19.6
	Q3	15,504	20.3	3,300	20.0	1,950	16.0	1,909	20.0	97,190	19.0
	Q4	17,948	23.5	3,151	19.1	1,677	13.8	2,204	23.1	102,515	20.0
	Q5 (Highest)	20,852	27.3	2,440	14.8	1,025	8.4	2,163	22.7	96,251	18.8
	Income Unknown	715	0.9	219	1.3	239	2.0	76	0.8	5,707	1.1
RUB (Morbidity)	0-1	14,726	19.3	4,317	26.1	3,751	30.8	2,527	26.5	128,159	25.0
	2	23,369	30.6	4,656	28.2	3,581	29.4	2,910	30.5	170,029	33.2
	3	33,392	43.8	6,536	39.5	4,242	34.8	3,616	38.0	188,230	36.8
	4-5	4,774	6.3	1,027	6.2	604	5.0	473	5.0	25,345	5.0

Figure 3.1 and Figure 3.2 present the patient cohort by model of primary care by sex and age-group, respectively. For the WRHA Primary Care and Community Health Clinic models, there was a large difference between the proportion of the allocated patients that are male and female: nearly 70% of the patients allocated to primary care providers in the Community Health Clinic model were female. This may be partly explained by the impact of the Women's Health Clinic, which is one of clinics operating in the Community Health Clinic model. In terms of age-groups, the Community Health Clinic model had a higher proportion of patients aged 0-18 and a lower proportion of patients aged 65 and older than the other models of primary care.

Figure 3.1: Study Cohort Sex Distribution, by Model of Primary Care
2010/11 – 2012/13

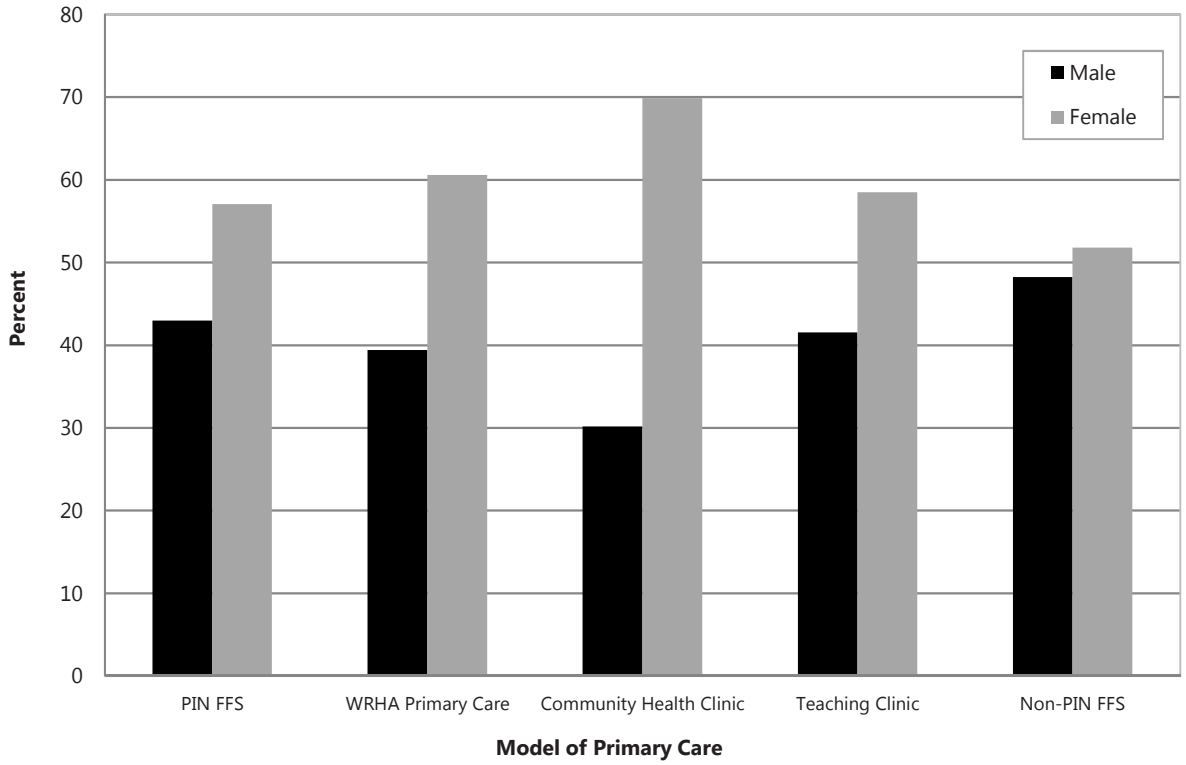
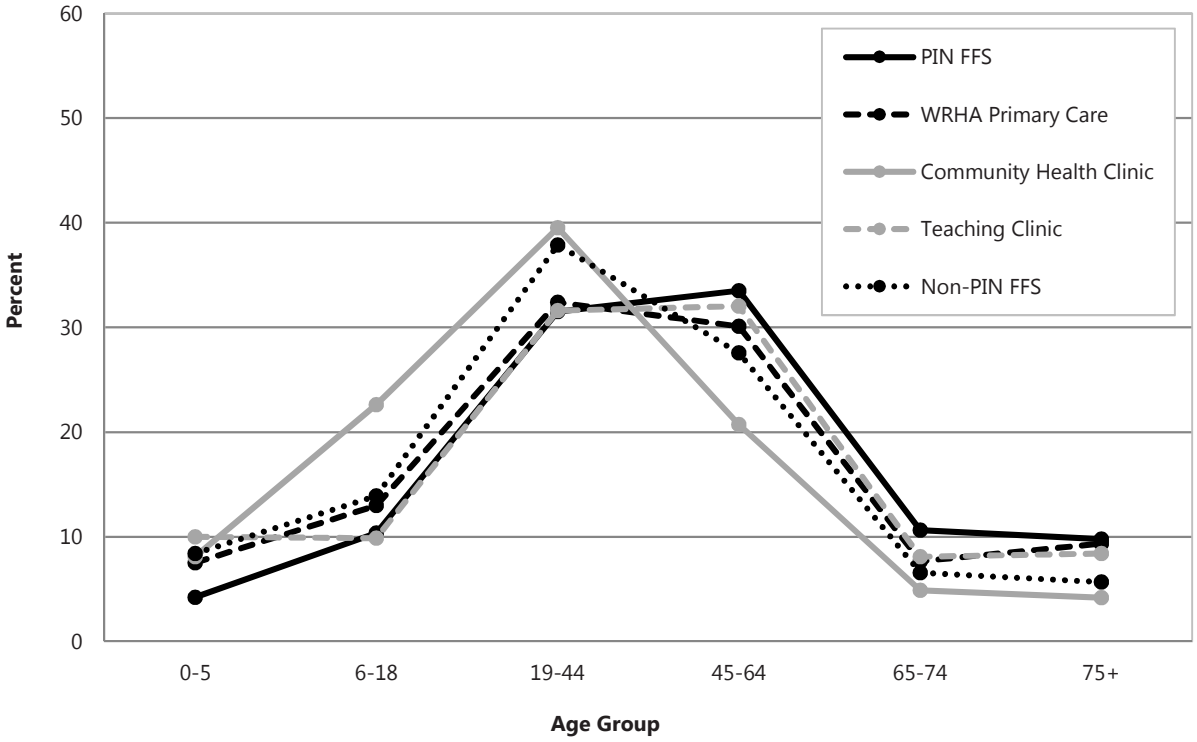


Figure 3.2: Study Cohort Age-Group Distribution, by Model of Primary Care
2010/11 – 2012/13



Figures 3.3 and 3.4 present the patient cohort in each model of primary care by income quintile and RUB, respectively. The Community Health Clinic model had the highest proportion of patients in the lowest income bracket (Q1) and the lowest proportion of patients in the highest income bracket (Q5). Resource Utilization Bands (RUBs) classify patients according to their "sickness level" or morbidity based on their previous use of the healthcare system; the higher the RUB, the greater the morbidity. Patient RUB was fairly evenly distributed among the models of primary care. The PIN FFS model had the highest proportion of patients with an RUB of 3-5, and the lowest proportion of patients with an RUB of 0-2, which may be explained by this model having a low proportion of younger patients and a high proportion of older patients.

Figure 3.3: Study Cohort Income Distribution, by Model of Primary Care
2010/11 – 2012/13

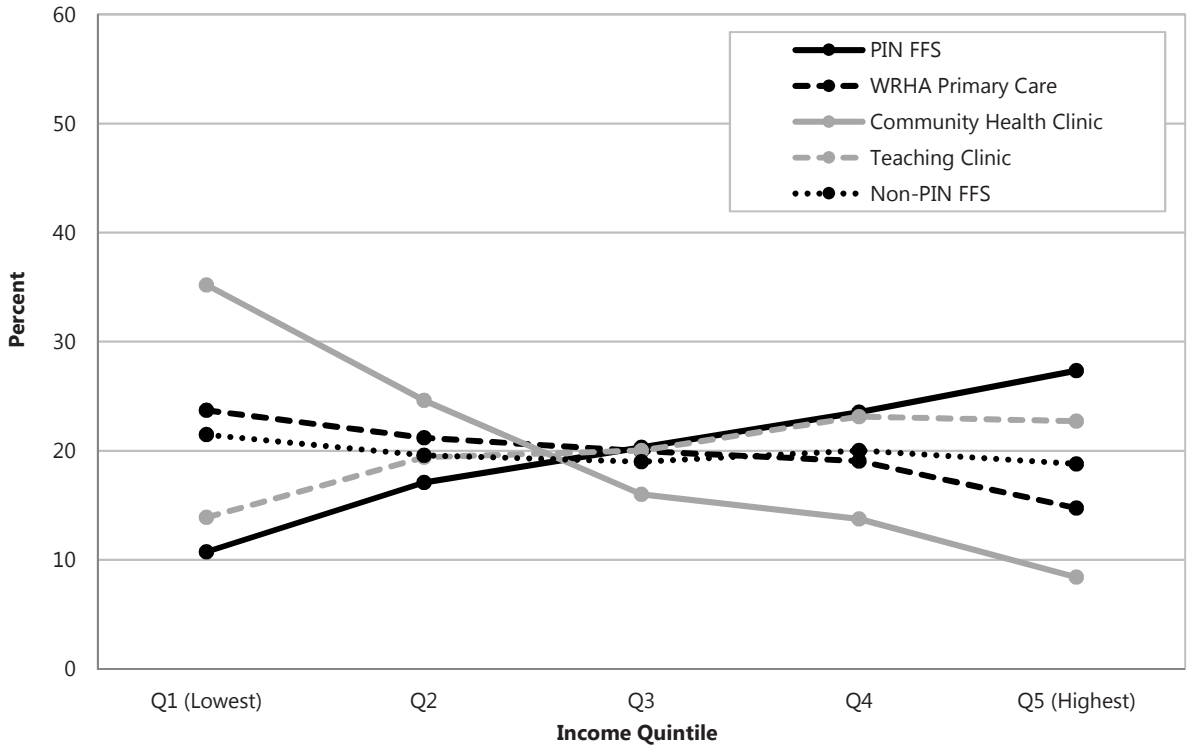
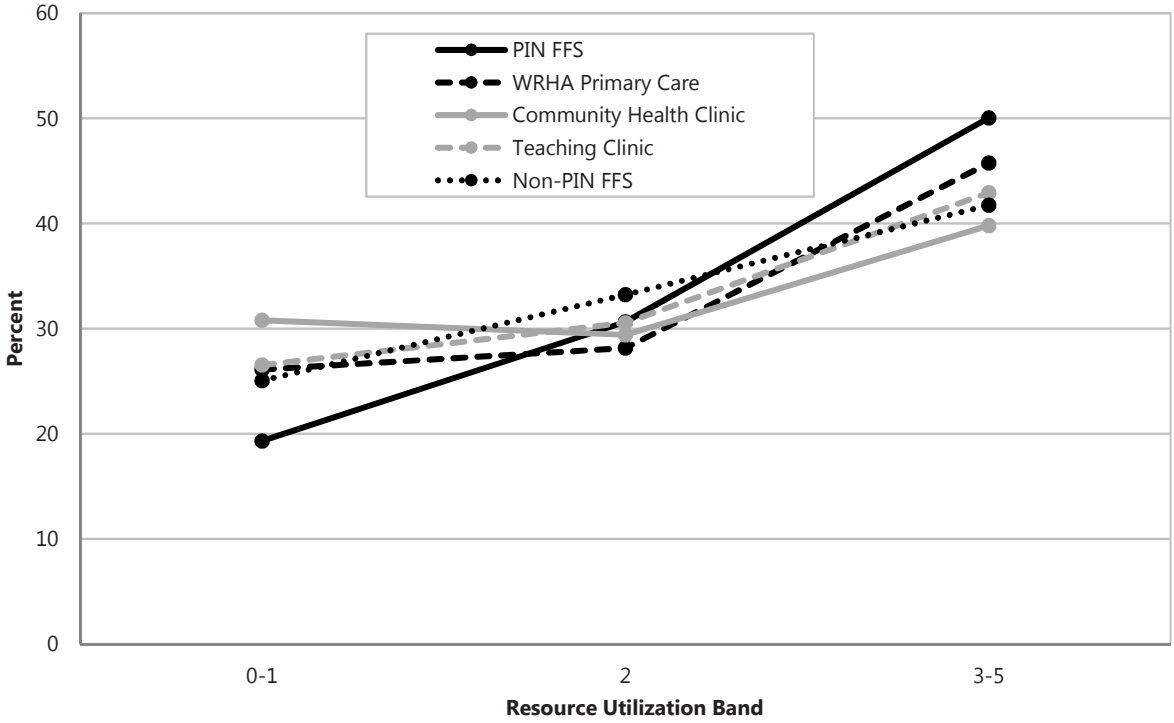


Figure 3.4: Study Cohort Morbidity Level (Resource Utilization Band) Distribution, by Model of Primary Care
2010/11 – 2012/13



Social Complexities by Model of Primary Care

Table 3.2 presents the eligible population and crude rate for each social complexity by model of primary care. Three social complexities have different eligible populations than the others: the eligible populations and crude rates for those social complexities are presented at the bottom of Table 3.2.

Figure 3.5 presents crude rates for each social complexity by model of primary care. The WRHA Primary Care and Community Health Clinic models tend to have higher crude rates of each social complexity than the other models of primary care. On the other hand, the PIN FFS model has the lowest rate for every social complexity except one (major mental health diagnosis). The non-PIN FFS model has rates of social complexities that often fall in the middle of the range, except for newcomer, where these clinics have the highest rate. The study team hypothesizes that this is because some non-PIN FFS clinics specifically cater to certain immigrant populations.

See Online Appendix 1 for the crude rates of social complexities by clinic (except for clinics in the non-PIN FFS model). It should be noted that while our analyses are at the model level, the clinics in the models have differing rates of social complexities.

Table 3.2: Crude Rates of Patient Social Complexities, by Model of Primary Care
2010/11 – 2012/13

Social Complexity	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic	Non-PIN FFS
	Crude Rate (%)				
	(N=76,261)	(N=16,536)	(N=12,178)	(N=9,526)	(N=511,763)
High Residential Mobility	12.1	20.9	31.6	13.1	17.9
Low Income Quintile (Q1 vs. Q5)	10.7	23.7	35.2	13.9	21.5
Social Housing Resident	2.6	11.4	20.3	4.2	7.0
Income Assistance	7.1	26.3	42.4	12.6	17.3
Major Mental Health Diagnosis	9.1	12.1	11.9	8.8	7.8
Newcomer	1.7	2.7	6.0	1.8	8.5
Child of a Teen Mom	6.8	14.3	21.5	10.1	11.8
Involvement with the Justice System	11.5	17.5	25.2	12.7	15.6
Child of a Newcomer	(N=10,161)	(N=3,106)	(N=3,344)	(N=1,786)	(N=107,227)
	3.1	5.9	7.4	4.9	13.2
Teen Mom	(N=43,499)	(N=10,018)	(N=8,506)	(N=5,571)	(N=264,948)
	5.6	11.1	15.5	7.5	8.2
Child in Care	(N=11,128)	(N=3,389)	(N=3,741)	(N=1,891)	(N=114,266)
	1.9	8.3	14.4	3.2	6.2

Note: Child of a Newcomer, Teen Mom, and Child in Care have different population values.

Figure 3.5: Crude Rates of Patient Social Complexities, by Model of Primary Care
2010/11 – 2012/13

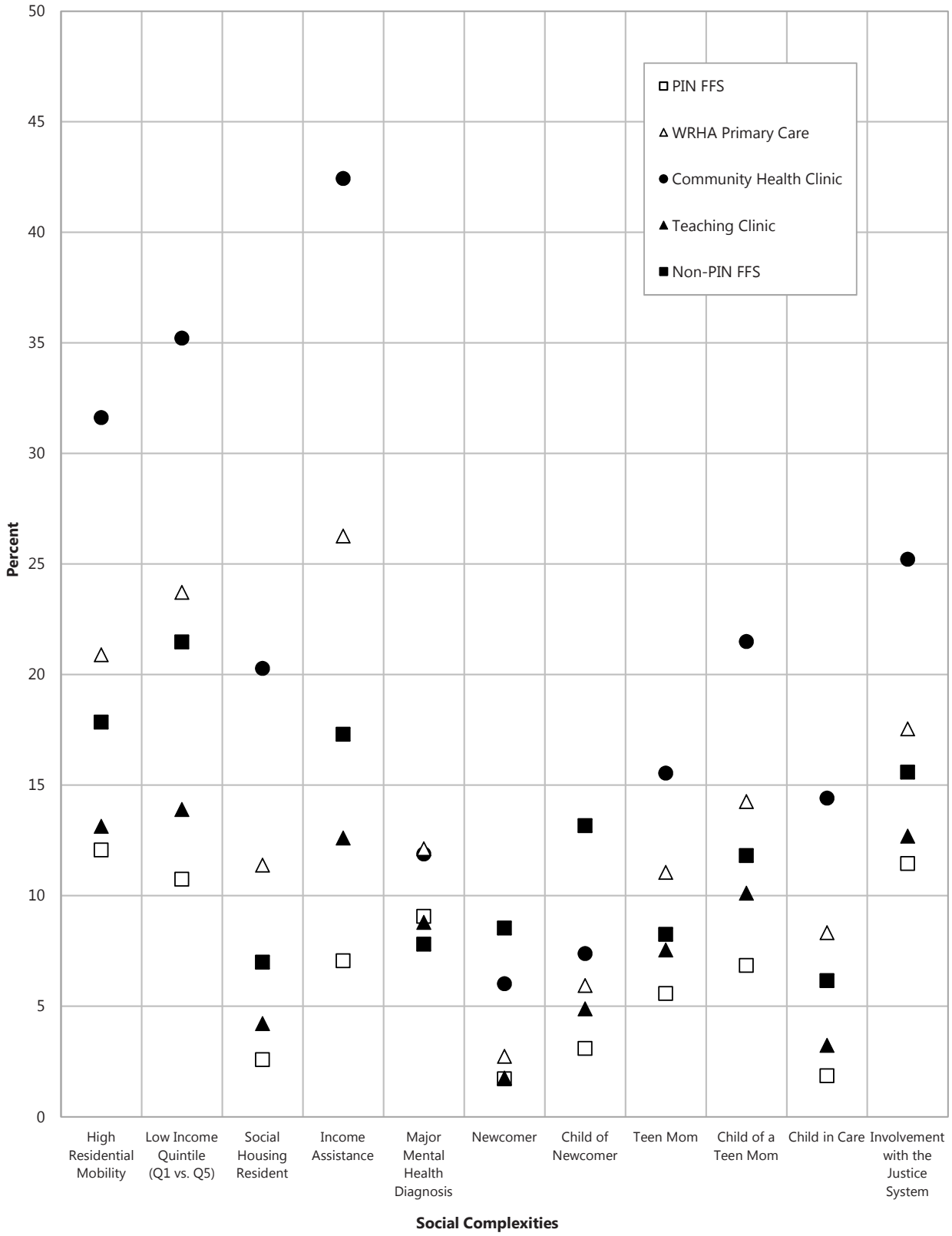
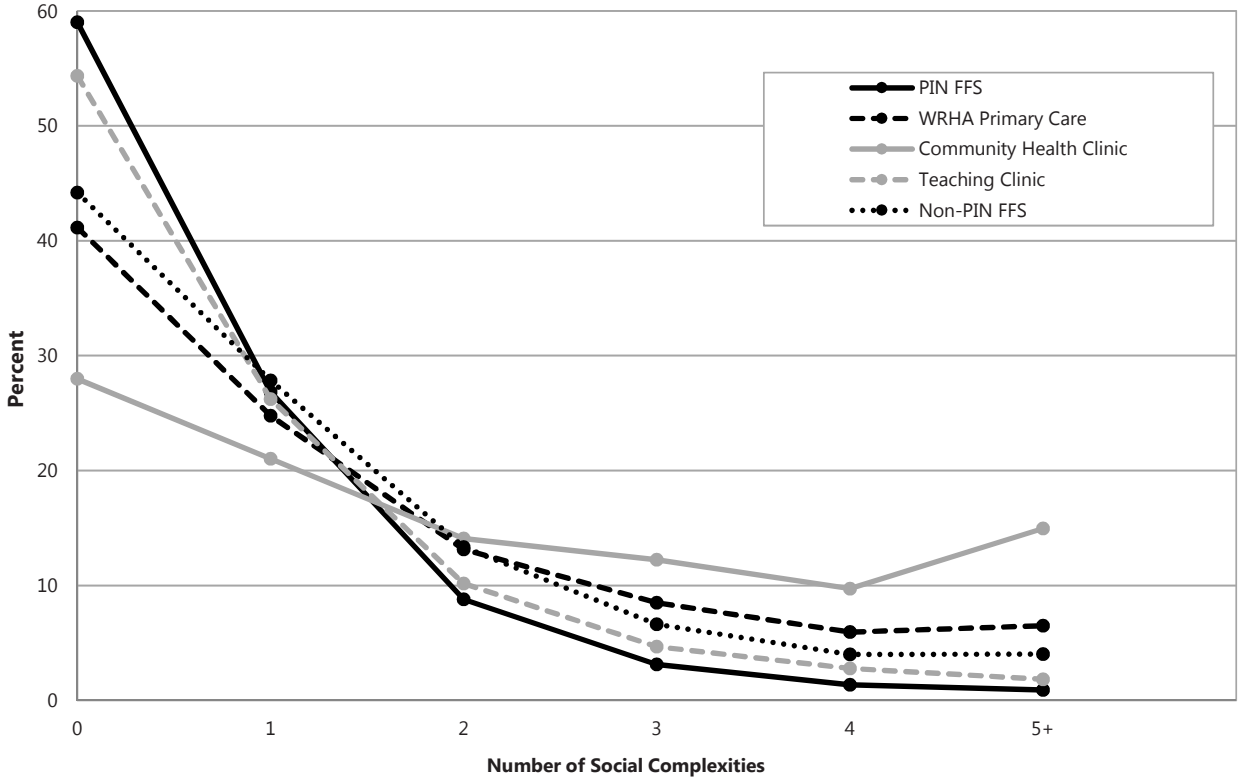


Figure 3.6 presents the proportion of patients in each model of primary care by number of social complexities. PIN FFS and Teaching Clinic models have the highest proportion of patients with no social complexities and the lowest proportion of patients with two, three, four, or five or more social complexities. On the other hand, WRHA Primary Care and Community Health Clinic models have the lowest proportion of patients with no social complexities or one social complexity and have the highest proportion of patients with two, three, four, or five or more social complexities. In fact, 24.7% of the patients allocated to the Community Health Clinic model have four or more complexities; meanwhile, only 12.4% and 8.0% of patients allocated to WRHA Primary Care and non-PIN FFS clinics, respectively, have four or more social complexities.

See Appendix 2 for the crude rates of the number of social complexities of patients by clinic (except for clinics in the non-PIN FFS model).

Figure 3.6: Crude Rates of the Number of Patient Social Complexities, by Model of Primary Care



Primary Care Provider Characteristics

The primary care provider cohort consisted of 690 individuals, 43 of whom were nurse practitioners. Twenty-eight primary care providers had billing claims originating from clinics in two or more models of primary care; in this report, these providers appear as unique individuals in each model of primary care in which they had billing claims. The proportion of the total number of primary care providers (regardless of FTE) in each model of primary care, from greatest to least, was as follows: Non-PIN FFS, 64.9%; PIN FFS, 12.0%; WRHA Primary Care, 8.4%; Community Health Clinic, 9.3%; and Teaching Clinic, 5.4%.

Table 3.3 presents primary care provider characteristics by model of primary care. 'Panel size' was calculated for each primary care provider by dividing the total number of patients allocated to that provider by that provider's FTE. Therefore, the panel sizes presented below for each model of primary care are directly comparable. The FTE was determined by using the Full-Time Equivalent National Algorithm.

Table 3.3: Primary Care Provider Characteristics, by Model of Primary Care
2010/11 – 2012/13

Provider Characterisitcs		PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic	Non-PIN FFS
Number of Providers	Count	83	58	64	37	448
International Medical Graduate (Physicians Only)	Percent	23.2	18.2	10.9	22.9	50.3
Female	Percent	43.4	72.4	73.4	40.5	35.9
Physicians	Percent	100.0	70.7	70.3	94.6	98.9
Nurse Practitioner	Percent	0.0	29.3	29.7	5.4	1.1
Provider Age	Median	44.0	41.0	38.0	48.0	50.0
Years of Practice	Median	5.8	3.7	3.3	4.7	10.4
Percentage of Non-Allocated Patient Visits	Median	8.0	10.3	13.0	14.9	13.5
Full-Time Equivalent	Median	1.0	0.3	0.3	0.5	1.0

CHAPTER 4: PREVENTION AND SCREENING INDICATOR RESULTS

This chapter presents comparisons between the models of care for seven primary care quality indicators related to prevention and screening. Higher odds ratios of prevention and screening are desirable and signify better quality of care. The seven prevention and screening indicators in this chapter are:

- Breast cancer screening for women aged 50-74;
- Cervical cancer screening for women aged 21-69;
- Colorectal cancer screening for adults aged 50-74;
- Completed vaccinations at age two;
- Annual influenza vaccination, adults aged 65 and older;
- Annual influenza vaccination, people with total respiratory morbidity; and
- Pneumococcal vaccination, adults aged 65 and older.

See Online Appendix 2 for indicator crude rates and eligible populations by clinic, and Online Appendix 3 for detailed model results by indicator.

Breast Cancer Screening for Women aged 50-74

Breast cancer screening (i.e., mammography) is provided for eligible women by a provincial screening program operated by CancerCare Manitoba. It is recommended that all women between the ages of 50 and 74 receive a mammogram every two years.

The indicator 'breast cancer screening' was defined as the proportion of women aged 50-74 who received at least one mammogram in a two-year period (fiscal years 2011/2012 to 2012/2013). Women with a history of breast cancer were excluded from this analysis because this indicator was designed to measure a 'preventive' procedure.

Table 4.1 shows the eligible population and crude rate of breast cancer screening for each of the five models of primary care and overall. The average crude rate of breast cancer screening was 63%. The PIN FFS model had the highest crude rate of breast cancer screening of all the models of primary care, with a crude rate 10% higher than the average. This may be explained by the primary care providers in the PIN FFS model having a financial incentive through the PIN program to encourage their patients to attend for breast cancer screenings. The Community Health Clinic model had the lowest crude rate of breast cancer screening.

The published Canadian rate of breast cancer screening from 2004-2006 was 63.1% (Doyle et al., 2011).

Table 4.1: Eligible Population and Crude Rate of Breast Cancer Screening
Women Aged 50–74, 2011/12–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	14,454	73.1
WRHA Primary Care	2,514	64.7
Community Health Clinic	1,380	56.4
Teaching Clinic	1,600	66.6
Non-PIN FFS	65,694	60.7
Overall	85,642	62.9

Table 4.2 shows comparisons between the models of primary care for adjusted odds ratios of breast cancer screening for women aged 50-74. With the 'basic' adjustment (adjusted for patient and primary care provider characteristics), the odds ratio of breast cancer screening in the PIN FFS model was higher than the WRHA Primary Care, Community Health Clinic, and non-PIN FFS models. Also, the Teaching Clinic model had a higher odds ratio than the non-PIN FFS model with the 'basic' adjustment. With the 'full' adjustment (additionally taking social complexities into account), the odds ratio in the PIN FFS model remained higher than the Community Health Clinic and non-PIN FFS models. Also, the odds ratio for the WRHA Primary Care model was higher than the odds ratio for the non-PIN FFS model with the 'full' adjustment.

Table 4.2: Comparisons between Models of Primary Care: Breast Cancer Screening
Women Aged 50–74, 2011/12–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=14,454 patients)	⇧		**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=2,514 patients)	⇩		**PIN FFS**
			Community Health Clinic
			Teaching Clinic
		⇧	**Non-PIN FFS**
Community Health Clinic (N=1,380 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=1,600 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇧		**Non-PIN FFS**
Non-PIN FFS (N=65,694 patients)	⇩	⇩	**PIN FFS**
		⇩	**WRHA Primary Care**
			Community Health Clinic
	⇩		**Teaching Clinic**

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.3 shows the relationship between each social complexity and the odds ratio of breast cancer screening. Most of the social complexities were associated with a lower odds ratio of breast cancer screening compared to patients without those social complexities.

Table 4.3: Relationship between Social Complexities and Breast Cancer Screening
Women Aged 50–74, 2011/12–2012/13

Social Complexity	Effect	p–value
High Residential Mobility	⇩	<0.001
Low Income Quintile (Q1 vs. Q5)	⇩	<0.001
Social Housing Resident		0.303
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis	⇩	<0.001
Newcomer	⇩	<0.001
Child of a Newcomer	—	
Teen Mom	⇩	<0.001
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	<0.001

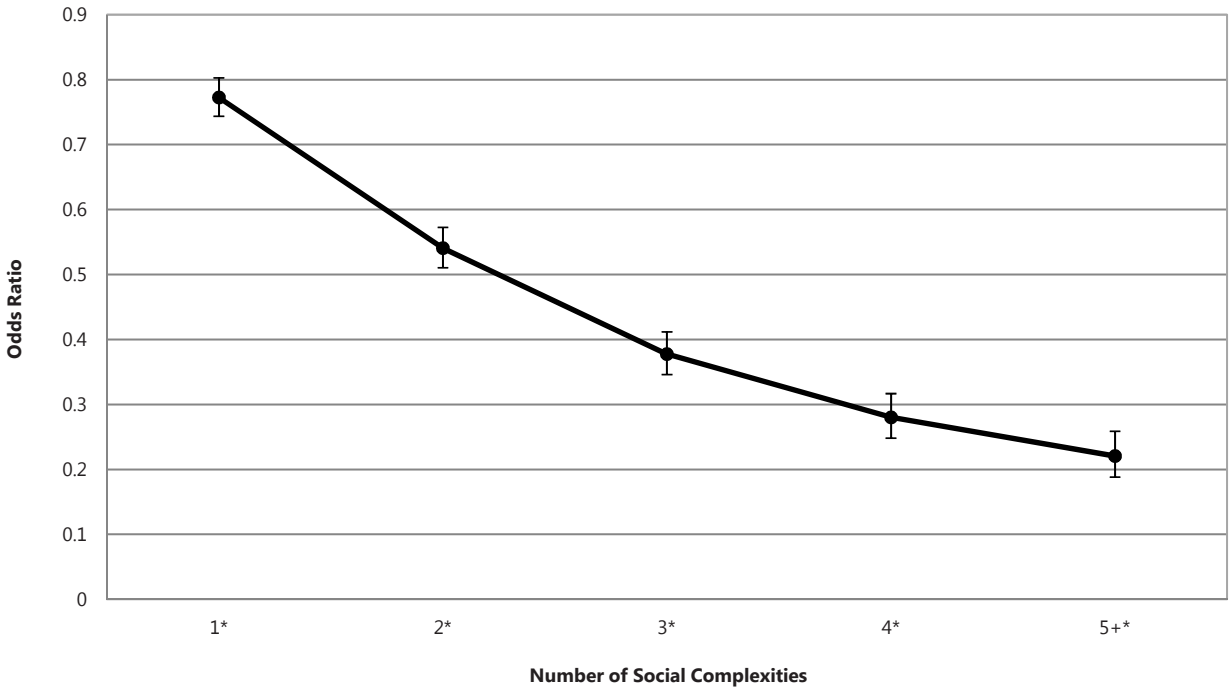
⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Figure 4.1 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of breast cancer screening. There was a statistically significant trend among the number of social complexities, meaning that the breast cancer screening odds ratio decreased as the number of social complexities increased.

Figure 4.1: Relationship between the Number of Social Complexities and Breast Cancer Screening
Women Aged 50–74, 2011/12–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Cervical Cancer Screening for Women aged 21-69

The Manitoba Cervical Cancer Screening Program is managed by CancerCare Manitoba. It is recommended that women who have ever been sexually active receive a Papanicolaou (Pap) test once every three years starting at age 21.

The indicator 'cervical cancer screening' was defined as the proportion of women aged 21-69 who received at least one Pap test in a three-year period (fiscal years 2010/2011 to 2012/2013). Women who had a hysterectomy were excluded from this analysis.

Table 4.4 shows the eligible population and crude rate of cervical cancer screening for women aged 21-69 for each of the five models of primary care and overall. The average crude rate of cervical cancer screening was 71%. The PIN FFS model had the highest crude rate of cervical cancer screening of all the models of primary care, with a crude rate about 11% higher than the average. As with breast cancer screening, this may be explained by the primary care providers in the PIN FFS model having a financial incentive through the PIN program to perform cervical cancer screening. The other models of primary care had nearly identical rates.

The reported cervical cancer screening rate for other provinces in Canada ranges from 64.6% to 74.4% (Canadian Partnership Against Cancer, 2013).

Table 4.4: Eligible Population and Crude Rate of Cervical Cancer Screening
Women Aged 21–69, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	27,014	81.9
WRHA Primary Care	6,028	70.7
Community Health Clinic	4,989	70.0
Teaching Clinic	3,448	68.9
Non-PIN FFS	154,139	69.0
Overall	195,618	70.9

Table 4.5 shows comparisons between the models of primary care for adjusted odds ratios of cervical cancer screening for women aged 21-69. With both the 'basic' and 'full' adjustments, the odds ratio of cervical cancer screening in the PIN FFS model was higher than all the other models of primary care.

Table 4.5: Comparison between Models of Primary Care: Cervical Cancer Screening
Women Aged 21–69, 2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=27,014 patients)	⇧	⇧	**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=6,028 patients)	⇩	⇩	**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=4,989 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=3,448 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=154,139 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.6 shows the relationship between each social complexity and the odds ratio of cervical cancer screening. Three social complexities were associated with a lower odds ratio and three were associated with a higher odds ratio of cervical cancer screening, compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of cervical cancer screening (data not shown).

Table 4.6: Relationship between Social Complexities and Cervical Cancer Screening
Women Aged 21–69, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇩	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis	⇩	0.014
Newcomer		0.647
Child of a Newcomer	–	
Teen Mom		0.347
Child of a Teen Mom	–	
Child in Care	–	
Involvement with the Justice System	⇧	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Colorectal Cancer Screening for Adults aged 50-74

ColonCheck was established in Manitoba in 2007. This population-based program encourages individuals aged 50-74 to be screened with a fecal occult blood test (FOBT) (CancerCare Manitoba, 2016). The analyses included FOBT records from the ColonCheck and Medical Claims databases. Tests for non-screening purposes were excluded.

The indicator 'colorectal cancer screening' was defined as the proportion of patients aged 50-74 who had at least one FOBT in a two-year period (fiscal years 2011/2012 to 2012/2013).

Table 4.7 shows the eligible population and crude rate of colorectal cancer screening for adults aged 50-74 for each of the five models of primary care and overall. The average crude rate of colorectal cancer screening was 46%. The PIN FFS model had the highest crude rate of colorectal cancer screening of all the models, with a crude rate about 8 % higher than the average. As with the cervical and breast cancer screening indicators, this may be explained by the primary care providers in the PIN FFS model having a financial incentive through the PIN program to perform colorectal cancer screenings. The Community Health Clinic model had the lowest rate of colorectal cancer screening.

In Canada, 30.1% of the eligible population (aged 50-74) received a colorectal cancer screen in the form of an FOBT, based on the Canadian Community Health Survey data for 2012 (Singh, Bernstein, Samadder, & Ahmed, 2015).

Table 4.7: Eligible Population and Crude Rate of Colorectal Cancer Screening
Patients Aged 50–74, 2011/12–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	26,374	53.8
WRHA Primary Care	4,824	36.3
Community Health Clinic	2,281	31.0
Teaching Clinic	2,948	38.8
Non-PIN FFS	130,881	44.9
Overall	167,308	45.7

Table 4.8 shows comparisons between the models of primary care for adjusted odds ratios of colorectal cancer screening for adults aged 50-74. With the 'basic' adjustment, the odds ratio of colorectal cancer screening in the PIN FFS model was higher than all other models of primary care; the WRHA Primary Care, Teaching Clinic, and non-PIN FFS models also had higher odds ratios of screening than the Community Health Clinic model. With the 'full' adjustment, the odds ratio in the PIN FFS model was higher than all other models of primary care, excluding WRHA Primary Care; the odds ratios in the WRHA Primary Care and non-PIN FFS models were higher than odds ratio in the Community Health Clinic model.

Table 4.8: Comparison between Models of Primary Care: Colorectal Cancer Screening
Patients Aged 50–74, 2011/12–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=26,374 patients)	⇧		**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=4,824 patients)	⇩		**PIN FFS**
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=2,281 patients)	⇩	⇩	**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
	⇩		**Teaching Clinic**
	⇩	⇩	**Non-PIN FFS**
Teaching Clinic (N=2,948 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
	⇧		**Community Health Clinic**
			Non-PIN FFS
Non-PIN FFS (N=130,881 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.9 shows the relationship between each social complexity and the odds ratio of colorectal cancer screening. Most of the social complexities were associated with a lower odds ratio of colorectal cancer screening compared to patients with no social complexities.

Table 4.9: Relationship between Social Complexities and Colorectal Cancer Screening
Patients Aged 50–74, 2011/12–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇩	<0.001
Low Income Quintile (Q1 vs. Q5)	⇩	<0.001
Social Housing Resident		0.422
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis	⇩	<0.001
Newcomer	⇧	0.006
Child of a Newcomer	—	
Teen Mom	⇩	<0.001
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	<0.001

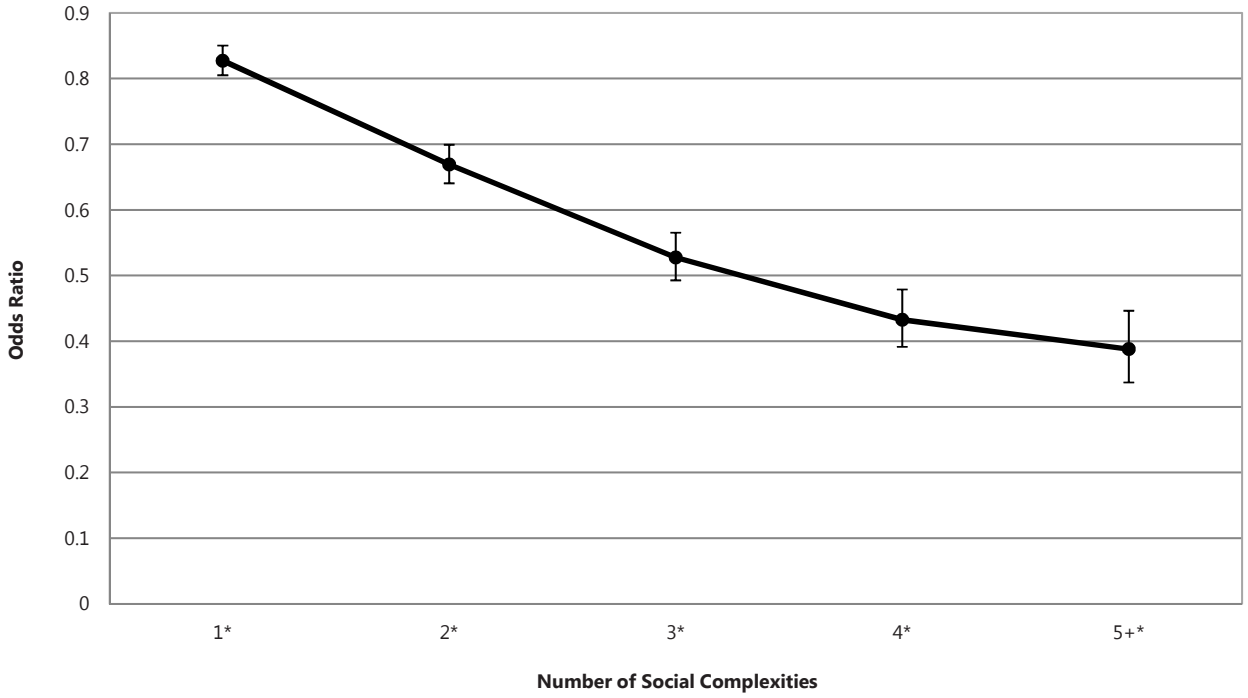
⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Figure 4.2 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of colorectal cancer screening. There was a statistically significant trend among the number of social complexities, meaning that the colorectal cancer screening odds ratio decreased as the number of social complexities increased.

Figure 4.2: Relationship between the Number of Social Complexities and Colorectal Cancer Screening
Patients Aged 50–74, 2011/12–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Completed Vaccinations at Age Two

The Manitoba Immunization Monitoring System (MIMS) records all vaccinations of provincial registrants as reported through multiple mechanisms, including primary care provider billings.

The indicator 'completed vaccinations at age two' was defined as the percent of two-year old children who received all of the vaccinations recommended in the provincial vaccination schedule (Manitoba Health, 2016). The Manitoba vaccination schedule changed during the study period, and this change was taken into consideration in this analysis. Children who were not covered by Manitoba Health from birth to their second birthday were excluded from this analysis.

Table 4.10 shows the eligible population and crude rate of completed vaccinations at age two for each of the five models of primary care and overall. The average crude rate of completed vaccinations at age two is 63%. The PIN FFS and non-PIN FFS models had the highest crude rates of completed vaccinations at age two among the models of primary care, by 10% or more. As with the screening indicators, the higher rate in the PIN FFS model may be explained by the primary care providers in that model having a financial incentive through the PIN program to provide vaccinations to children. It is unclear why the non-PIN FFS model would have a similar rate to the PIN FFS model. The WRHA Primary Care and Teaching Clinic models of primary care had much lower crude rates compared to the average. These models both use shadow billing as the mechanism to populate the MIMS registry. The possibility that this has resulted in incomplete reporting of vaccinations administered at these clinics was confirmed for one teaching clinic via chart audit, where almost 50% of vaccinations recorded in the clinical chart were not included in the shadow billing information.

According to the Canadian National Report on Immunization Canada in 2006, 61% of two-year old children had received the vaccinations recommended by the National Advisory Committee on Immunization (Public Health Agency of Canada, 2006).

Table 4.10: Eligible Population and Crude Rate of Completed Vaccinations at Age Two
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	1,056	65.4
WRHA Primary Care	505	38.0
Community Health Clinic	356	54.5
Teaching Clinic	316	43.7
Non-PIN FFS	13,490	64.5
Overall	15,723	63.0

Table 4.11 shows comparisons between the models of primary care for adjusted odds ratios of completed vaccinations at age two. With both the 'basic' and 'full' adjustments, the odds ratios of completed vaccinations in the PIN FFS and non-PIN FFS models are higher than the odds ratios in the WRHA Primary Care and Teaching Clinic models. With the 'full' adjusted, the odds ratio of completed vaccinations at age two in the Community Health Clinic model was higher than the odds ratio in the WRHA Primary Care and Teaching Clinic models.

Table 4.11: Comparison between Models of Primary Care: Completed Vaccinations at Age Two
2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=1,056 patients)	⇧	⇧	**WRHA Primary Care**
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**
			Non-PIN FFS
WRHA Primary Care (N=505 patients)	⇩	⇩	**PIN FFS**
	⇩	⇩	**Community Health Clinic**
			Teaching Clinic
	⇩	⇩	**Non-PIN FFS**
Community Health Clinic (N=356 patients)			**PIN FFS**
	⇧	⇧	**WRHA Primary Care**
		⇧	**Teaching Clinic**
			Non-PIN FFS
Teaching Clinic (N=316 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
		⇩	**Community Health Clinic**
	⇩	⇩	**Non-PIN FFS**
Non-PIN FFS (N=13,490 patients)			**PIN FFS**
	⇧	⇧	**WRHA Primary Care**
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.12 shows the relationship between each social complexity and the adjusted odds ratio of completed vaccinations at age two. Several social complexities were associated with lower odds ratios of completed vaccinations at age two compared to patients with no social complexities.

Table 4.12: Relationship between Social Complexities and Completed Vaccinations at Age Two
2010/11–2012/13

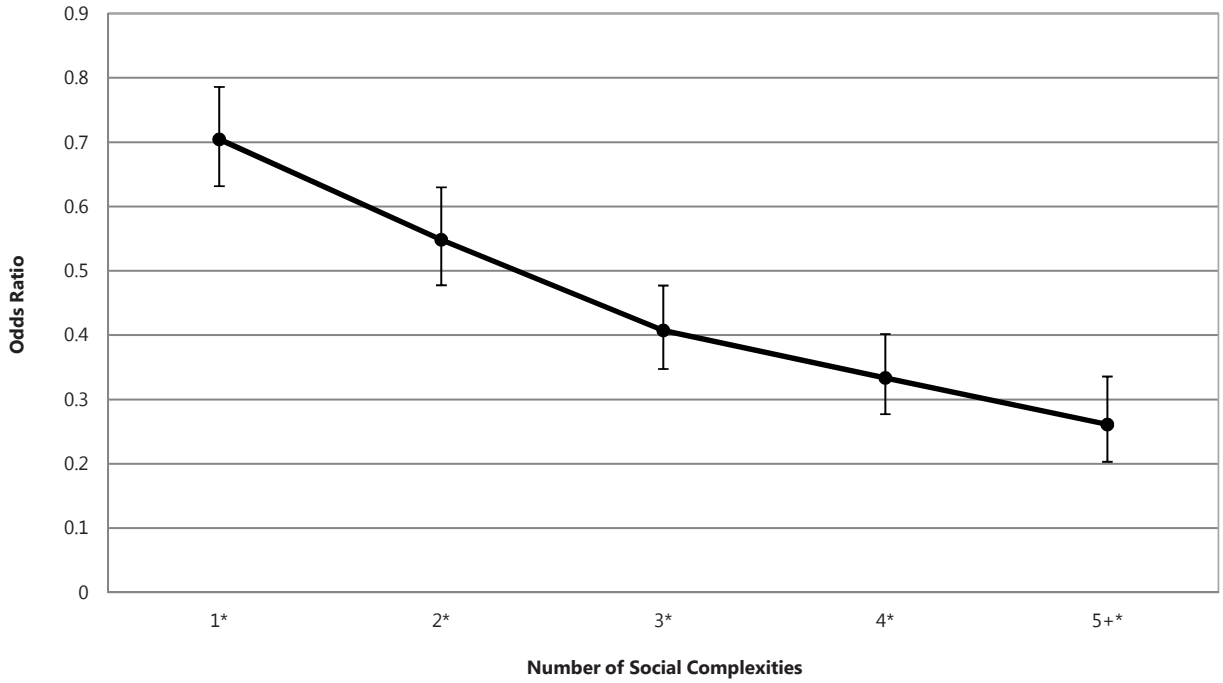
Social Complexity	Effect	p-value
High Residential Mobility	⇩	0.007
Low Income Quintile (Q1 vs. Q5)	⇩	0.003
Social Housing Resident		0.070
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis	–	
Newcomer	–	
Child of a Newcomer	⇧	0.046
Teen Mom	–	
Child of a Teen Mom	⇩	<0.001
Child in Care		0.434
Involvement with the Justice System		0.502

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Figure 4.3 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of completed vaccinations at age two. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of completed vaccinations at age two decreased as the number of social complexities increased.

Figure 4.3: Relationship between the Number of Social Complexities and Completed Vaccinations at Age Two

2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Annual Influenza Vaccination, Adults Aged 65 and Older

Annual influenza vaccination is recommended for all adults aged 65 and older. As of the 2010/2011 flu season, the influenza vaccine is available free of charge to all Manitobans.

The indicator 'annual influenza vaccination for adults aged 65 or older' was defined as the proportion of patients aged 65 and older who received the influenza vaccine in each year of the study period in which they were eligible for inclusion in the indicator age span.

Table 4.13 shows the eligible population and crude rate of annual influenza vaccination for adults aged 65 and older for each of the five models of primary care and overall. The average crude rate of influenza vaccination was 47%. The PIN FFS model had the highest crude rate of influenza vaccination among the models of primary care. The higher rate in the PIN FFS model may be explained by the primary care providers in that model having a financial incentive through the PIN program to provide annual influenza vaccinations to adults aged 65 and older. As with childhood vaccinations, the low rates of influenza vaccinations for the WRHA Primary Care and Teaching Clinic models may be a result of incomplete reporting to MIMS.

Canadian influenza vaccination rates for those 65 and older in the 2012/2013 influenza season were reported as 64.9% by the Public Health Agency of Canada (Public Health Agency of Canada, 2014).

Table 4.13: Eligible Population and Crude Rate of Annual Influenza Vaccination, Adults Aged 65 and Older
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	15,985	52.3
WRHA Primary Care	2,806	38.4
Community Health Clinic	1,070	41.8
Teaching Clinic	1,627	31.8
Non-PIN FFS	64,835	46.1
Overall	86,323	46.7

Table 4.14 shows comparisons between the models of primary care for adjusted odds ratios of annual influenza vaccination for adults aged 65 and older. With the 'basic' and 'full' adjustments, the odds ratio of influenza vaccination in the PIN FFS model was higher than the odds ratios for the WRHA Primary Care, Teaching Clinic, and non-PIN FFS models. The non-PIN FFS model has a higher odds ratio than the Teaching Clinic model with both the 'basic' and 'full' adjustments.

Table 4.14: Comparison between Models of Primary Care: Annual Influenza Vaccination, Adults Aged 65 and Older
2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=15,985 patients)	⇧	⇧	**WRHA Primary Care**
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=2,806 patients)	⇩	⇩	**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=1,070 patients)			**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=1,627 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇩	⇩	**Non-PIN FFS**
Non-PIN FFS (N=64,835 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.15 shows the relationship between each social complexity and the adjusted off ratio of annual influenza vaccination for adults aged 65 and older. Most of the social complexities were associated with a lower odds ratio of annual influenza vaccination for adults aged 65 and older compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of annual influenza vaccination (data not shown).

Table 4.15: Relationship between Social Complexities and Annual Influenza Vaccination, Adults Aged 65 and Older
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.060
Low Income Quintile (Q1 vs. Q5)	⇩	0.005
Social Housing Resident		0.441
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis	⇩	0.010
Newcomer	⇩	<0.001
Child of a Newcomer	—	
Teen Mom		0.200
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Annual Influenza Vaccination, People with Total Respiratory Morbidity

Total Respiratory Morbidity (TRM) is a measure of the burden on the population of certain respiratory illnesses: asthma, chronic or acute bronchitis, emphysema, chronic airway obstruction, or chronic obstructive pulmonary disease (COPD). Combining these illnesses into the designation 'TRM' ensures that primary care providers do not use different diagnosis codes for the same underlying illness (e.g., asthma versus chronic bronchitis). It is recommended that a person diagnosed with any of the above respiratory illnesses receive an annual influenza vaccination.

The indicator 'annual influenza vaccination for people with TRM' was defined as the proportion of patients diagnosed with an illness included in TRM who received the influenza vaccination in each year of the study period. Total Respiratory Morbidity was defined as at least one hospitalization in one year or at least one primary care provider visit in one year with a diagnosis of one of the illnesses included in TRM.

Table 4.16 shows the eligible population and crude rate of annual influenza vaccination for people with TRM for each of the five models of primary care and overall. The average crude rate of influenza vaccinations for people with TRM was 36%. The PIN FFS model had the highest crude rate of influenza vaccinations for people with TRM among the models of primary care. The Community Health Clinic model had the lowest crude rate of influenza vaccinations for people with TRM.

There are no comparative data for this indicator because the definition of TRM is unique to MCHP.

Table 4.16: Eligible Population and Crude Rate of Annual Influenza Vaccination, Total Respiratory Morbidity
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	15,512	43.0
WRHA Primary Care	3,077	36.5
Community Health Clinic	2,169	29.4
Teaching Clinic	1,264	36.9
Non-PIN FFS	111,571	35.0
Overall	133,593	35.9

There was only one statistically significant difference between the models of primary care for adjusted odds ratios of annual influenza vaccinations for people with TRM: with the 'basic' adjustment, the odds ratio of influenza vaccination for people with TRM was higher for the non-PIN FFS model than the Community Health Clinic model (data not shown).

Table 4.17 shows the relationship between each social complexity and annual influenza vaccination for people with TRM. Many of the social complexities were associated with either a lower or higher adjusted odds ratio of annual influenza vaccinations for people with TRM compared to patients with no social complexities.

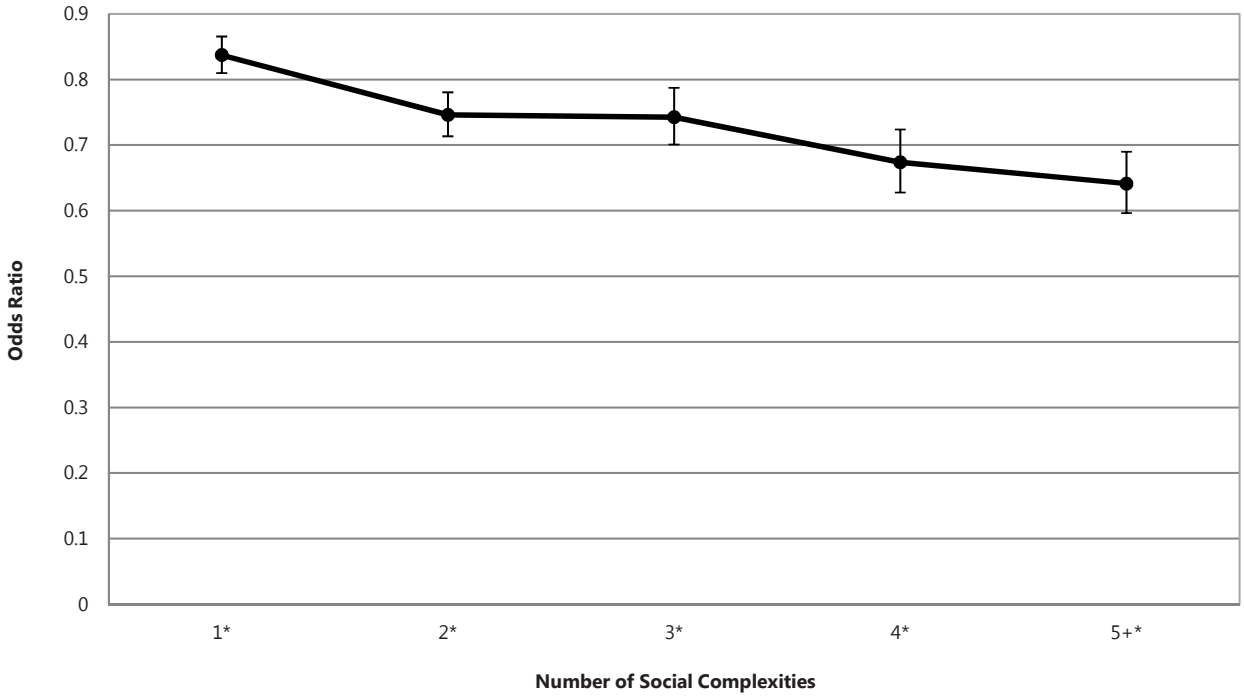
Table 4.17: Relationship between Social Complexities and Annual Influenza Vaccination, Total Respiratory Morbidity
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇩	<0.001
Low Income Quintile (Q1 vs. Q5)		0.240
Social Housing Resident		0.923
Income Assistance	⇩	0.001
Major Mental Health Diagnosis	⇧	0.012
Newcomer		0.573
Child of a Newcomer	⇧	<0.001
Teen Mom	⇩	0.002
Child of a Teen Mom	⇩	<0.001
Child in Care	⇧	<0.001
Involvement with the Justice System	⇩	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

Figure 4.4 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of annual influenza vaccination for people with TRM. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of annual influenza vaccinations for people with TRM decreased as the number of social complexities increased.

Figure 4.4: Relationship between the Number of Social Complexities and Annual Influenza Vaccination, Total Respiratory Morbidity
2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Pneumococcal Vaccination, Adults Aged 65 and Older

It is recommended that all adults aged 65 and older receive a pneumococcal vaccination once in their lifetime (Public Health Agency of Canada, 2015).

The indicator 'pneumococcal vaccination for adults aged 65 or older' was defined as the proportion of patients aged 65 and older at the beginning of the study period (April 1, 2010) who had ever received a pneumococcal vaccination. This vaccination was introduced in Manitoba in 2001.

Table 4.18 shows the eligible population and crude rate of pneumococcal vaccination for adults aged 65 and older for each of the five models of primary care and overall. The average crude rate of pneumococcal vaccinations was 69%. The PIN FFS model had the highest crude rate of pneumococcal vaccination among the models of primary care. The crude rate in the PIN FFS model was potentially impacted by the financial incentive through the PIN program. The Community Health Clinic model had the lowest crude rate of pneumococcal vaccination.

In 2012, 38% of Canadian adults aged 65 and older had received a pneumococcal vaccination (Public Health Agency of Canada, 2014).

Table 4.18: Eligible Population and Crude Rate of Pneumococcal Vaccination Aged 65 and Older
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	15,985	75.7
WRHA Primary Care	2,806	70.6
Community Health Clinic	1,070	63.7
Teaching Clinic	1,627	68.7
Non-PIN FFS	64,835	66.7
Overall	86,323	68.5

Table 4.19 shows comparisons between the models of primary care for adjusted odds ratios of pneumococcal vaccination for adults aged 65 and older. With the 'basic' and 'full' adjustments, the odds ratio of pneumococcal vaccination for the PIN FFS model was higher than the Community Health Clinic and non-PIN FFS models.

Table 4.19: Comparison between Models of Primary Care: Pneumococcal Vaccination Aged 65 and Older
2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=15,985 patients)			**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=2,806 patients)			**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=1,070 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=1,627 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=64,835 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 4.20 shows the relationship between each social complexity and the odds ratio of pneumococcal vaccination for adults aged 65 and older. Several of the social complexities were associated with either a lower or higher odds ratio of pneumococcal vaccination for adults aged 65 and older compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of pneumococcal vaccination (data not shown).

Table 4.20: Relationship between Social Complexities and Pneumococcal Vaccination Aged 65 and Older
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.362
Low Income Quintile (Q1 vs. Q5)		0.253
Social Housing Resident	⇧	0.003
Income Assistance	⇩	0.002
Major Mental Health Diagnosis	⇧	0.044
Newcomer	⇩	<0.001
Child of a Newcomer	—	
Teen Mom		0.337
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Summary

This chapter has demonstrated differences in the prevention and screening quality indicators among the models of primary care, and has shown the impact of the social complexities on these indictors. While no single model outperformed others for all the indicators after controlling for confounding variables, the PIN FFS model did perform better or the same as the other models, and never performed worse. As highlighted throughout this chapter, this result may be explained by the financial incentive offered to primary care providers in the PIN FFS model through the PIN program, which may have encouraged them to achieve higher rates of these indicators. This research has also identified a limitation of the MIMS data in identifying all vaccinations at teaching clinics, as the providers in these clinics do not appear to be reporting vaccinations consistently.

The crude rates for of all vaccinations are lower than expected. The target for population herd immunity is over 80% complete for all immunizations. The rate of Winnipeg childhood vaccinations and adult influenza vaccination reflect significant room for improvement. The rates of colorectal cancer, while lower than in some jurisdictions, have increased over time possibly as a result of the population based program instituted in Manitoba.

In four out of the seven prevention and screening indicators, the presence of social complexities was associated with a decrease in the rates of the indicators. For the remaining indicators, the social complexities were associated with both an increase and decrease in the indicator results. When looking at the relationship between the number of social complexities and the indicator results, there were very different patterns across indicators. For breast cancer screening, colorectal cancer screening, and influenza vaccinations (TRM), there was a statistically significant pattern of decreasing rates as the number of social complexities increased.

CHAPTER 5: CHRONIC DISEASE MANAGEMENT INDICATOR RESULTS

This chapter presents eight indicators related to chronic disease management. Higher rates for the chronic disease management indicators are desirable and signify better quality of care. The eight indicators in this chapter are as follows:

- Diabetes management: eye examination;
- Congestive heart failure management: initiation of ACE inhibitor drug treatment;
- Congestive heart failure management: persistence of ACE inhibitor drug treatment;
- Post-myocardial infarction management: initiation of beta-blocker drug treatment;
- Post-myocardial infarction management: persistence of beta-blocker drug treatment;
- Post-myocardial infarction management: initiation of cholesterol-lowering drug treatment;
- Post-myocardial infarction management: persistence of cholesterol-lowering drug treatment; and
- Asthma management: medication use.

See Online Appendix 2 for crude rates of indicators and eligible populations by clinic, and Online Appendix 3 for detailed model results by indicator.

It should be noted that new "Chronic Disease Management" tariffs were introduced for fee-for-service physicians in 2012. These tariffs provided all FFS physicians with an incentive meet many of the indicators in this chapter.

Diabetes Management: Eye Examination

Individuals with diabetes are at a greater risk of developing diabetic retinopathy (non-inflammatory damage to the retina) than the general population. Therefore, regular eye examinations are recommended for patients with a diabetes diagnosis.

The indicator 'diabetes management: eye examination' is defined as the percentage of patients aged 20-79 who had one eye examination by an ophthalmologist or optometrist for each year that they were diagnosed with diabetes.

Table 5.1 shows the eligible population and crude rate of eye examinations for people with a diabetes diagnosis for each of the five models of primary care and overall. The average crude rate of eye examinations was 35%. The PIN FFS model had the highest crude rate of eye examinations of all the models of primary care; with a crude rate about 6% higher than the average. This may be explained by the primary care providers in the PIN FFS model having a financial incentive through the PIN program to encourage their patients to receive eye examinations if they have a diabetes diagnosis. The Community Clinic model had the lowest crude rate of eye examinations at 30%.

In 2007, 23% of adults in Alberta aged 20 and older with diagnosed diabetes received an eye examination by an ophthalmologist (Rudnisky, Tennant, Johnson, & Balko, 2009).

Table 5.1: Eligible Population and Crude Rate of Diabetes Management, Eye Examination
Patients Aged 20–79, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	5,475	41.5
WRHA Primary Care	1,403	38.2
Community Health Clinic	914	30.1
Teaching Clinic	730	36.7
Non-PIN FFS	34,384	33.4
Overall	42,906	34.6

Table 5.2 shows comparisons between the models of primary care for adjusted odds ratios of eye examinations for people with a diabetes diagnosis. With the 'basic' adjustment, the odds ratio of eye examinations in the PIN FFS model was higher than the Community Health Clinic and non-PIN FFS models. However, after adjusting for the social complexities in the 'full' adjustment, the odds ratio in the PIN FFS model was only higher than the non-PIN FFS model.

Table 5.2: Comparison between Models of Primary Care: Diabetes Management, Eye Examination
Patients Aged 20–79, 2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=5,475 patients)			**WRHA Primary Care**
	⇧		**Community Health Clinic**
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
WRHA Primary Care (N=1,403 patients)			**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=914 patients)	⇩		**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=730 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=34,384 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 5.3 shows the relationship between each social complexity and the odds ratio of eye examinations for people with a diabetes diagnosis. Four social complexities were associated with a lower odds ratio of eye examinations for people with a diabetes diagnosis compared to patients with no social complexities.

Table 5.3: Relationship between Social Complexities and Diabetes Management, Eye Examination
Patients Aged 20–79, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.127
Low Income Quintile (Q1 vs. Q5)	⇩	<0.001
Social Housing Resident		0.074
Income Assistance	⇩	<0.001
Major Mental Health Diagnosis		0.248
Newcomer		0.134
Child of a Newcomer	—	
Teen Mom	⇩	0.001
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

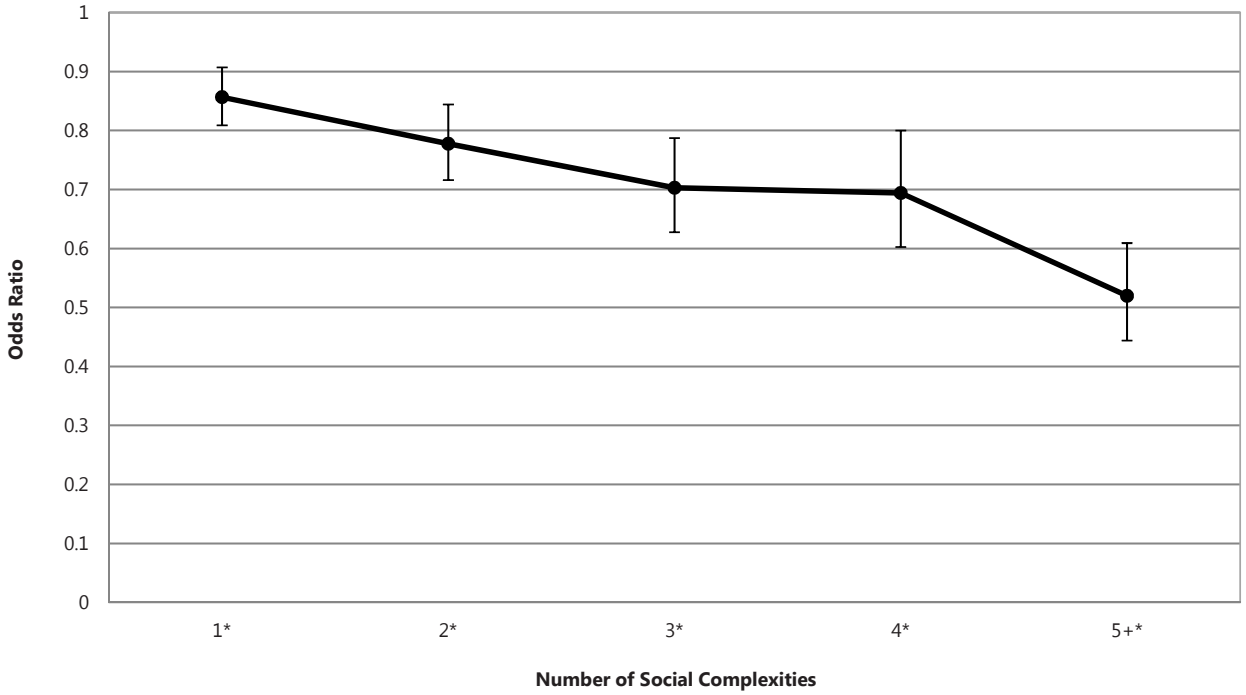
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Figure 5.1 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of eye examinations for people with a diabetes diagnosis. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of eye examinations for people with a diabetes diagnosis decreased as the number of social complexities increased.

Figure 5.1: Relationship between the Number of Social Complexities and Diabetes Management, Eye Examination

Patients Aged 20–79, 2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Congestive Heart Failure Management

Congestive Heart Failure (CHF) is a chronic condition that is often referred to as heart failure or congestive cardiac failure. Treatment with two drugs, beta-blockers and angiotensin-converting enzyme (ACE) inhibitors, has been demonstrated to reduce the mortality and morbidity associated with CHF (Flather et al., 2000; Fonarow et al., 2008; Gruszczynski, Schuster, Regier, & Jensen, 2010). Current guidelines for the management of CHF include treatment with an ACE inhibitor or an Angiotensin II Receptor Blocker (ARB) as first line treatment. These two drug classes are considered to be interchangeable in their therapeutic effects.

Two indicators related to CHF management are presented below. The first indicator examines the proportion of newly diagnosed CHF patients (i.e. diagnosed for the first time during the study period) aged 20 and older who filled a prescription for either an ACE inhibitor or an ARB within three months of diagnosis (*Initiation of ACE Inhibitor Drug Treatment*). The second indicator examines the proportion of these same patients who had a prescription filled for 80% of the days between CHF diagnosis and end of the study period (*Persistence of ACE Inhibitor Drug Treatment*).

Congestive Heart Failure Management: Initiation of ACE Inhibitor Drug Treatment

Table 5.4 shows the eligible population and crude rate for the initiation of ACE inhibitors in people with CHF for each of the five models of primary care and overall. The average crude rate of the initiation of ACE inhibitors was 56%. The Community Health Clinic model had the highest crude rate of ACE inhibitor initiation of all the models of primary care, with a crude rate about 14% higher than the average. Despite the financial incentive offered to primary care providers in the PIN FFS model, , the rate for ACE inhibitor initiation in this model was slightly lower than the average. The WRHA Primary Care model had the lowest crude rate.

A study that looked at CHF prescriptions in Alberta, British Columbia, Nova Scotia, Ontario, and Quebec found that 54.9% of patients received an ACE inhibitor prescription within 30 days following hospital discharge (Cox et al., 2006).

Table 5.4: Eligible Population and Crude Rate of Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	874	54.6
WRHA Primary Care	166	53.6
Community Health Clinic	74	70.3
Teaching Clinic	96	57.3
Non-PIN FFS	3,495	56.4
Overall	4,705	56.2

Table 5.5 shows comparisons between the models of primary care for adjusted odds ratios of the initiation of ACE inhibitors for people with CHF. With the 'basic' and 'full' adjustments, the odds ratio of ACE inhibitor initiation in the Community Health Clinic model was higher than the PIN FFS, Teaching Clinic, and non-PIN FFS models.

Table 5.5: Comparison between Models of Primary Care: Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=874 patients)			**WRHA Primary Care**
	⇩	⇩	**Community Health Clinic**
			Teaching Clinic
			Non-PIN FFS
WRHA Primary Care (N=166 patients)			**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=74 patients)	⇧	⇧	**PIN FFS**
			WRHA Primary Care
	⇧	⇧	**Teaching Clinic**
	⇧	⇧	**Non-PIN FFS**
Teaching Clinic (N=96 patients)			**PIN FFS**
			WRHA Primary Care
	⇩	⇩	**Community Health Clinic**
			Non-PIN FFS
Non-PIN FFS (N=3,495 patients)			**PIN FFS**
			WRHA Primary Care
	⇩	⇩	**Community Health Clinic**
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 5.6 shows the relationship between each social complexity and the odds ratio of the initiation of ACE inhibitors for people with CHF. Three social complexities were associated with a lower odds ratio of ACE inhibitor initiation for people with CHF compared to patients with no social complexities.

Table 5.6: Relationship between Social Complexities and Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

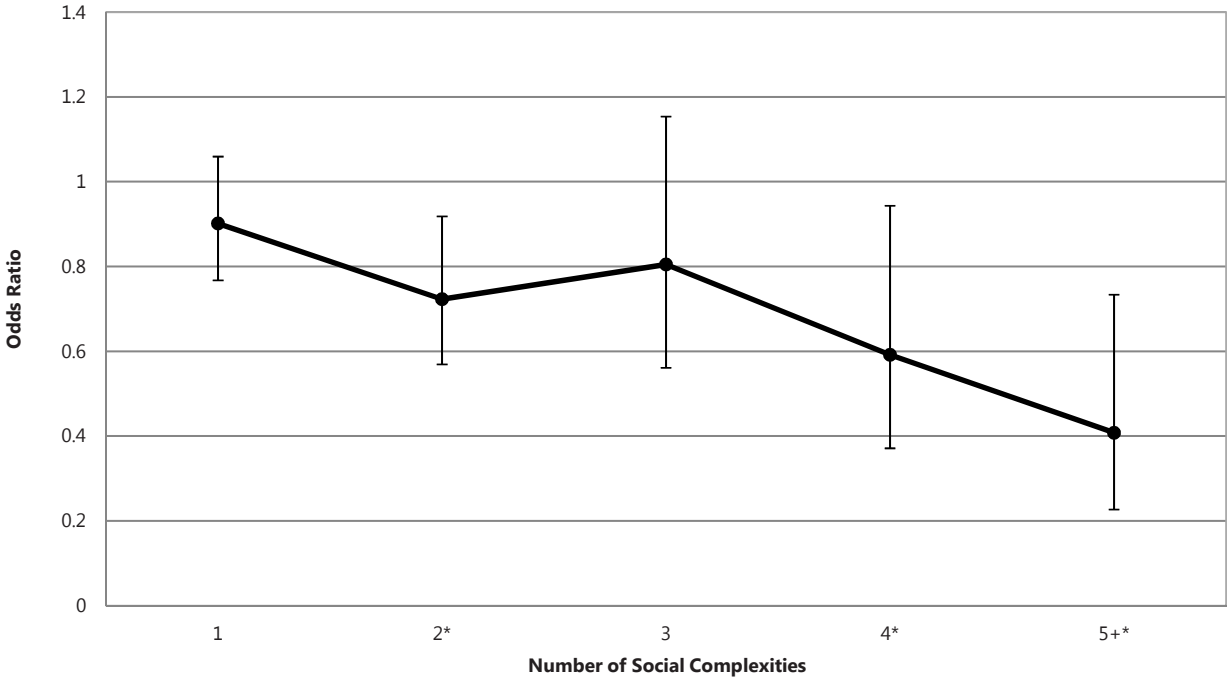
Social Complexity	Effect	p-value
High Residential Mobility		0.324
Low Income Quintile (Q1 vs. Q5)		0.062
Social Housing Resident		0.087
Income Assistance	⇩	0.009
Major Mental Health Diagnosis	⇩	<0.001
Newcomer	⇩	0.011
Child of a Newcomer	—	
Teen Mom		0.924
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System		0.160

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Figure 5.2 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of the initiation of ACE inhibitors for people with CHF. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of ACE inhibitor initiation for people with CHF decreased as the number of social complexities increased.

Figure 5.2: Relationship between the Number of Social Complexities and Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment

Patients Aged 20 and Older, 2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Congestive Heart Failure Management: Persistence of ACE Inhibitor Drug Treatment

Table 5.7 shows the eligible population and crude rate for ACE inhibitor persistence for people with CHF for each of the five models of primary care and overall. The average crude rate of ACE inhibitor persistence was 42%. The Community Health Clinic model had the highest crude rate of all the models of primary care, with a crude rate about 8% higher than the average. Similar to the initiation of ACE inhibitors, the rate for PIN FFS was lower than the average for persistence. The WRHA Primary Care model had the lowest crude rate.

A study conducted in British Columbia found that 69.3%, 59.0%, and 52.6% of patients persisted in using ACE inhibitors for one year, two years, and three years, respectively (Pataky, 2009).

Table 5.7: Eligible Population and Crude Rate of Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	874	41.6
WRHA Primary Care	166	38.0
Community Health Clinic	74	50.0
Teaching Clinic	96	43.8
Non-PIN FFS	3,495	42.5
Overall	4,705	42.3

Analyses with both the 'basic' and 'full' adjustments demonstrated no statistically significant differences among the models of primary care for this indicator (data not shown).

Table 5.8 shows the relationship between each social complexity and the adjusted odds ratio of ACE inhibitor persistence for people with CHF. Four social complexities were associated with a lower odds ratio of ACE inhibitor persistence for people with CHF compared to patients with no social complexities.

Table 5.8: Relationship between Social Complexities and Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.924
Low Income Quintile (Q1 vs. Q5)		0.849
Social Housing Resident		0.162
Income Assistance	⇩	0.021
Major Mental Health Diagnosis	⇩	<0.001
Newcomer	⇩	0.014
Child of a Newcomer	—	
Teen Mom		0.897
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	0.049

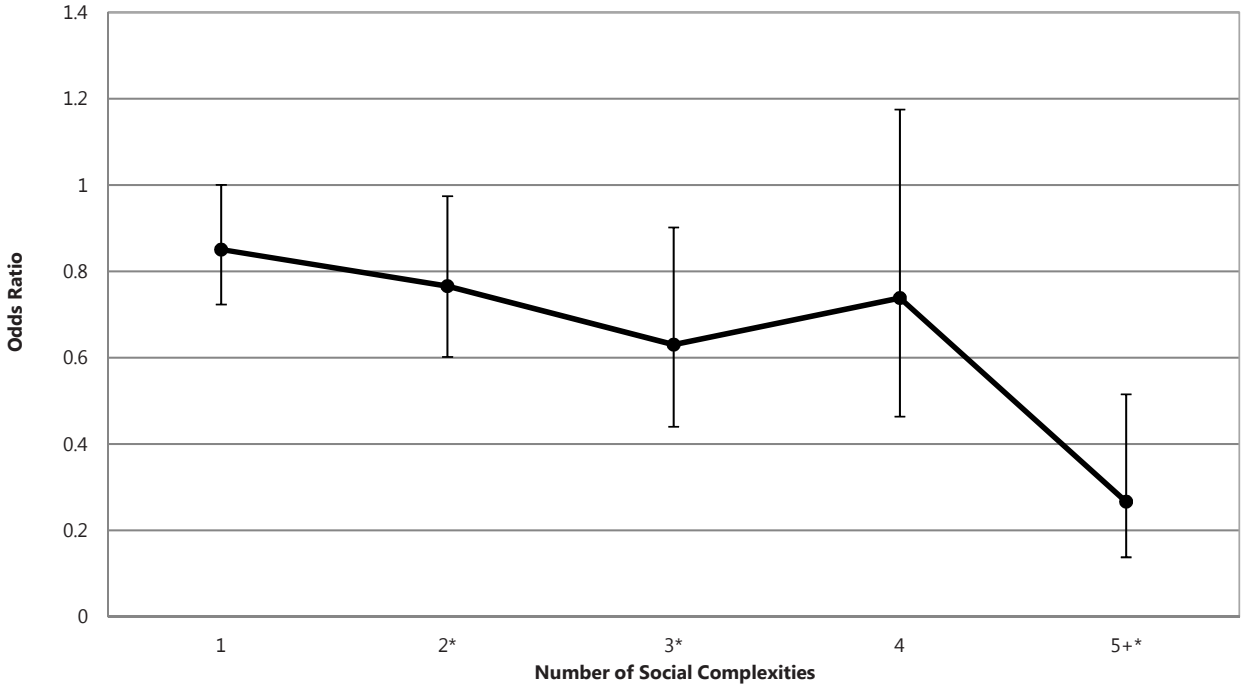
⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Figure 5.3 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of ACE inhibitor persistence for people with CHF. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of ACE inhibitor persistence for people with CHF decreased as the number of social complexities increased.

Figure 5.3: Relationship between the Number of Social Complexities and Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Post-Myocardial Infarction Management

Also known as a heart attack, a myocardial infarction (MI) occurs when the heart muscle (the myocardium) experiences sudden deprivation of circulating blood, causing muscle damage.

After the initial treatment of an MI, clinical practice guidelines recommend both medication and life-style changes to prevent recurrence. Beta-blockers have been shown to lower the risk of subsequent MIs among people who have suffered an MI. Guidelines also recommend the prescription of cholesterol-lowering drugs for all patients after an MI regardless of cholesterol levels.

Two sets of indicators are presented in this section. The first set of indicators examines the initiation and persistence of beta-blocker drugs treatments. The second set of indicators examines the initiation and persistence of cholesterol-lowering drug treatments.

Post-Myocardial Infarction Management: Initiation and Persistence of Beta-Blocker Drug Treatment

The first indicator examines the odds ratio of newly diagnosed MI patients who filled at least one beta-blocker prescription within four months of the hospital discharge at the time of the MI (*Initiation of Beta-Blocker Treatment*). The second indicator examines the odds ratio of patients who had a beta-blocker prescription filled for 80% of the days between MI diagnosis and end of the study period (*Persistence of Beta-Blocker Treatment*). For both indicators, patients who had been diagnosed within the past three years with asthma, COPD, or peripheral vascular disease were excluded because these conditions are contraindications for the use of these drugs.

Post-Myocardial Infarction Management: Initiation of Beta-Blocker Drug Treatment

Table 5.9 shows the eligible population and crude rate for the initiation of beta-blockers post-MI for each of the five models of primary care and overall. The average crude rate of the initiation of beta-blockers was 86%. The WRHA Primary Care model had the highest crude rate of all the models of primary care, with a crude rate about 3% higher than the average. Despite the financial incentive offered to primary care providers in the PIN FFS model, the beta-blocker initiation rate for this model was lower than the average. The Community Health Clinic model had the lowest crude rate.

A study conducted in British Columbia found that 70.0% of patients initiated beta-blocker treatment within 30 days of hospital discharge (Pataky, 2009).

Table 5.9: Eligible Population and Crude Rate of Post-Myocardial Infarction Management, Initiation of Beta-Blocker Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	399	85.2
WRHA Primary Care	72	88.9
Community Health Clinic	35	80.0
Teaching Clinic	48	83.3
Non-PIN FFS	1,838	85.6
Overall	2,392	85.5

With both the 'basic' and 'full' adjustments, there were no statistically significant differences between the models of primary care (data not shown). It should be noted that the eligible populations for this indicator were small, which contributed to the lack of statistical difference between the results.

Table 5.10 shows the relationship between each social complexity and the adjusted odds ratio of the initiation of beta-blocker treatment post-MI. One social complexity, major mental health diagnosis, was associated with a lower odds ratio of beta-blocker initiation post-MI compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of the initiation of beta-blocker treatment post-MI (data not shown).

Table 5.10: Relationship between Social Complexities and Post-Myocardial Infarction Management, Initiation of Beta-Blocker Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.280
Low Income Quintile (Q1 vs. Q5)		0.515
Social Housing Resident		0.414
Income Assistance		0.269
Major Mental Health Diagnosis	⇩	0.032
Newcomer		0.318
Child of a Newcomer	—	
Teen Mom		0.641
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System		0.173

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Post-Myocardial Infarction Management: Persistence of Beta-Blocker Drug Treatment

Table 5.11 shows the eligible population and crude rate for the persistence of beta-blocker treatment post-MI for each of the five models of primary care and overall. The average crude rate of beta-blocker persistence was 64%. The Community Health Clinic model had the highest crude rate of all the models of primary care, with a crude rate about 5% higher than the average. Primary care providers in the PIN FFS model had a financial incentive through the PIN program to encourage beta-blocker persistence post-MI; this model had a crude rate slightly above the average. The WRHA Primary Care and non-PIN FFS models had the lowest crude rates.

A study of the population of British Columbia found that 73.3%, 61.4%, and 54.4% of patients persisted using beta-blockers for one year, two years, and three years, respectively (Pataky, 2009).

Table 5.11: Eligible Population and Crude Rate of Post-Myocardial Infarction Management, Persistence of Beta-Blocker Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	399	66.2
WRHA Primary Care	72	62.5
Community Health Clinic	35	68.6
Teaching Clinic	48	66.7
Non-PIN FFS	1,838	62.8
Overall	2,392	63.5

With both the 'basic' and 'full' adjustments, there were no statistically significant differences between the models of primary care (data not shown). It should be noted that the eligible populations for this indicator were small, which contributed to the lack of statistical difference.

Table 5.12 shows the relationship between each social complexity and the odds ratio of beta-blocker persistence post-MI. One social complexity, involvement with the justice system, was associated with a lower odds ratio of beta-blocker persistence post-MI compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of beta-blocker persistence post-MI (data not shown).

Table 5.12: Relationship between Social Complexities and Post-Myocardial Infarction Management, Persistence of Beta-Blocker Drug Treatment

Patients Aged 20 and Older, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.792
Low Income Quintile (Q1 vs. Q5)		0.941
Social Housing Resident		0.574
Income Assistance		0.901
Major Mental Health Diagnosis		0.800
Newcomer		0.494
Child of a Newcomer	—	
Teen Mom		0.783
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System	⇩	0.009

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Post-Myocardial Infarction Management: Initiation and Persistence of Cholesterol-Lowering Drug Treatment

Current clinical practice guidelines recommend that all patients initiate a cholesterol-modifying agent after experiencing an MI.

The first indicator examines the odds ratio of newly diagnosed MI patients aged 20 and older who filled at least one cholesterol-lowering prescription within four months of hospital discharge following the MI (*Initiation of Cholesterol-Lowering Drug Treatment*). The second indicator examines the odds ratio of MI patients who had a prescription filled for 80% of the days between MI diagnosis and end of the study period (*Persistence of Cholesterol-Lowering Drug Treatment*).

Post-Myocardial Infarction Management: Initiation of Cholesterol-Lowering Drug Treatment

Table 5.13 shows the eligible population and crude rate for the initiation of cholesterol-lowering drug treatment post-MI for each of the five models of primary care and overall. The average crude rate was 57%. The non-PIN FFS model had the highest crude rate of all the models of primary care. The Community Health Clinic model had the lowest crude rate.

In British Columbia, one study found that 61.6% of patients initiated the use of statins (cholesterol-lowering drugs) within 30 days of discharge (Pataky, 2009).

Table 5.13: Eligible Population and Crude Rate of Post-Myocardial Infarction Management, Initiation of Cholesterol-Lowering Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	412	56.1
WRHA Primary Care	75	56.0
Community Health Clinic	37	40.5
Teaching Clinic	49	55.1
Non-PIN FFS	1,888	58.1
Overall	2,461	57.4

With both the 'basic' and 'full' adjustments, there were no statistically significant differences between the models of primary care (no data shown). It should be noted that the eligible populations for this indicator were small, which contributed to the lack of statistical difference between the odds ratios.

Table 5.14 shows the relationship between each social complexity and the odds ratio of the initiation of cholesterol-lowering drug treatment post-MI. One social complexity, major mental health diagnosis, was associated with a lower odds ratio of the initiation of cholesterol-lowering drug treatment post-MI compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of initiation of cholesterol-lowering drug treatment post-MI (data not shown).

Table 5.14: Relationship between Social Complexities and Post-Myocardial Infarction Management, Initiation of Cholesterol-Lowering Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.499
Low Income Quintile (Q1 vs. Q5)		0.145
Social Housing Resident		0.200
Income Assistance		0.889
Major Mental Health Diagnosis	⇩	0.023
Newcomer		0.190
Child of a Newcomer	—	
Teen Mom		0.109
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System		0.361

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Post-Myocardial Infarction Management: Persistence of Cholesterol-Lowering Drug Treatment
Table 5.15 shows the eligible population and crude rate for the persistence of cholesterol-lowering drug treatment post-MI for each of the five models of primary care and overall. The average crude rate was 44%. The WRHA Primary Care model had the highest crude rate of all the models of primary care. The Community Health Clinic model had the lowest crude rate.

A study of the population of British Columbia found that rates of cholesterol-lowering drug treatment persistence were 78.3%, 67.0%, and 60.0% for one year, two years, and three years, respectively (Pataky, 2009).

With both the 'basic' and 'full' adjustments, there were no statistically significant differences between the models of primary care (data not shown). It should be noted that the eligible populations for this indicator were small, which contributed to the lack of statistical difference.

The social complexities were not associated with a higher or lower odds ratio of persistence of cholesterol-lowering drug treatment post-MI (data not shown).

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of persistence of cholesterol-lowering drug treatment post-MI (data not shown).

Table 5.15: Eligible Population and Crude Rate of Post-Myocardial Infarction Management, Persistence of Cholesterol-Lowering Drug Treatment
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	412	43.2
WRHA Primary Care	75	46.7
Community Health Clinic	37	32.4
Teaching Clinic	49	44.9
Non-PIN FFS	1,888	44.2
Overall	2,461	43.9

Asthma Management: Medication Use

Asthma is a disease in which inflammation of the airways causes restricted airflow into and out of the lungs. It is characterized by periodic attacks of wheezing, shortness of breath, chest tightness, and coughing.

There are two kinds of medications available to treat asthma: relievers (acute treatment medications) and controllers (also called preventers, which reduce inflammation in the airways when taken regularly). Asthma treatment guidelines recommend that all patients requiring the use of relievers (e.g., beta2-agonists) more than twice a week should also be treated with long-acting anti-inflammatory medications (i.e., controllers) for long-term control.

The indicator 'asthma management' looks at the proportion of patients aged 20 and older with two or more prescriptions for beta2-agonists (relievers) within 12 months of the study period who filled a prescription for a medication recommended for long-term control of asthma. Long-term asthma medications (controllers) include inhaled corticosteroids and leukotriene antagonists. This analysis excluded patients with COPD, which was defined as having filled one or more prescriptions of ipratropium bromide.

Table 5.16 shows the eligible population and crude rate of controller medication prescriptions for people with evidence of needing a controller for each of the five models of primary care and overall. The average crude rate of controller medication prescriptions was 63%. The Community Health Clinic model had the highest crude rate of all the models of primary care, with a crude rate nearly 7% higher than the average. The non-PIN FFS model had the lowest crude rate.

Table 5.16: Eligible Population and Crude Rate of Asthma Management, Medication Use
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	3,562	66.6
WRHA Primary Care	988	64.9
Community Health Clinic	663	69.5
Teaching Clinic	481	65.9
Non-PIN FFS	22,129	61.5
Overall	27,823	62.6

With both the 'basic' and 'full' adjustments, there were no statistically significant differences among the models of primary care (no data shown).

Table 5.17 shows the relationship between each social complexity and the odds ratio of controller medication prescriptions for people who demonstrated the need for a controller. Three social complexities were associated with a lower odds ratio of controller medication prescriptions for people with evidence of needing a controller compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of controller medication prescriptions for people who demonstrated the need for a controller (data not shown).

Table 5.17: Relationship between Social Complexities and Asthma Management, Medication Use
Patients Aged 20 and Older, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.097
Low Income Quintile (Q1 vs. Q5)	⇩	0.036
Social Housing Resident		0.073
Income Assistance		0.141
Major Mental Health Diagnosis		0.980
Newcomer	⇩	0.030
Child of a Newcomer	–	
Teen Mom		0.388
Child of a Teen Mom	–	
Child in Care	–	
Involvement with the Justice System	⇩	0.013

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).
⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).
"–" indicates that the social complexity is not applicable to this indicator.

Summary

The eligible populations for many of the chronic disease management indicators in this chapter were small, which resulted in a lower likelihood of finding significant differences between the results. Where there were differences, there was no consistent pattern. Whenever there was a relationship between a social complexity and the indicator outcome, the social complexity was associated with a decrease in the rate of the indicator outcomes. For most of the indicators, the rates of the outcomes do not change as the number of complexities increases.

There are many factors that influence the outcomes of the indicators in this chapter. While reporting these indicators at the population or model of care level provides some insight into the current overall quality of care provided it is of very limited use as a tool for policy analysis. Quality improvement initiatives at the clinic and physician levels however can be expected to have an impact on these results, should they be implemented.

CHAPTER 6: MEDICAL CARE INDICATOR RESULTS

This chapter presents three indicators related to drug prescriptions for general medical care. Whether a higher or lower rate signifies a better outcome is dependent on the indicator; lower rates are desirable for the first two indicators and a higher rate is more desirable for the third. The three indicators in this category are as follows:

- Benzodiazepine prescribing in community dwelling adults aged 75 and older;
- Beers drug prescribing in community dwelling adults aged 65 and older; and
- Depression care, prescription follow-up.

See Online Appendix 2 for crude rates of indicators and eligible populations by clinic, and Online Appendix 3 for detailed model results by indicator.

Benzodiazepine Prescribing in Community Dwelling Adults aged 75 and older

Long-term use of benzodiazepines is not recommended for older adults because prolonged use can cause confusion, night wandering, amnesia, and loss of balance. The use of high daily doses by older adults has also been associated with an increased risk of hip fractures and accidental falls (Egan, Wolfson, Moride, & Monette, 2001). In addition, tolerance and physical and psychological dependence may occur with prolonged use. Lower rates of benzodiazepine prescription are therefore desirable (Katz et al., 2014).

The indicator 'benzodiazepine prescribing' measures the percentage of patients aged 75 and older who had at least two prescriptions for benzodiazepines or at least one prescription for benzodiazepines with a greater than 30-day supply, measured annually for three fiscal years.

Table 6.1 shows the eligible population and crude rate of benzodiazepine prescribing in community dwelling adults aged 75 and older for each of the five models of primary care and overall. The average crude rate was 24%. The WRHA Primary Care model had the highest crude rate of all the models of primary care. The Teaching Clinic model had the lowest crude rate.

Table 6.1: Eligible Population and Crude Rate of Benzodiazepine Prescribing in Community Dwelling Adults Aged 75 and Older
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	7,231	26.2
WRHA Primary Care	1,351	26.8
Community Health Clinic	440	26.1
Teaching Clinic	735	20.0
Non-PIN FFS	27,312	23.8
Overall	37,069	24.3

Table 6.2 shows comparisons between the models of primary care for adjusted odds ratios of benzodiazepine prescribing in community dwelling adults aged 75 and older. With the 'basic' adjustment, the odds ratio of benzodiazepine prescribing in the WRHA Primary Care model was higher than the Teaching Clinic and non-PIN FFS models. With the 'full' adjustment, the odds ratio in the WRHA Primary Care model was only higher than the Teaching Clinic model.

Table 6.2: Comparison between Models of Primary Care: Benzodiazepine Prescribing in Community Dwelling Adults Aged 75 and Older
2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=7,231 patients)			**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
WRHA Primary Care (N=1,351 patients)			**PIN FFS**
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**
	⇧		**Non-PIN FFS**
Community Health Clinic (N=440 patients)			**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=735 patients)			**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=27,312 patients)			**PIN FFS**
	⇩		**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 6.3 shows the relationship between each social complexity and the odds ratio of benzodiazepine prescribing in community dwelling adults aged 75 and older. Three social complexities were associated with a higher odds ratio of benzodiazepine prescribing in community dwelling adults aged 75 and older compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of benzodiazepine prescribing in community dwelling adults aged 75 and older (data not shown).

Table 6.3: Relationship between Social Complexities and Benzodiazepine Prescribing in Community Dwelling Adults Aged 75 and Older
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇧	0.002
Low Income Quintile (Q1 vs. Q5)		0.936
Social Housing Resident		0.875
Income Assistance	⇧	0.007
Major Mental Health Diagnosis	⇧	<0.001
Newcomer		0.443
Child of a Newcomer	—	
Teen Mom	—	
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System		0.591

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Beers Drug Prescribing in Community Dwelling Adults aged 65 and Older

Beers Criteria are a set of guidelines compiled and updated by expert review panels, used to identify drugs that should not be prescribed to older adults. These drugs, often referred to as 'Beers drugs', are generally thought to be ineffective or to place older adults at an unnecessarily high risk of experiencing adverse events. Beers drugs typically have strong anticholinergic and sedating properties, or place older adults at an increased risk of drug addiction and falls.

The indicator 'Beers drug prescribing' is calculated as the percentage of community-dwelling patients aged 65 and older who filled at least one prescription for a drug which the Beers Criteria suggest should be avoided. The list of drugs used in this analysis is found in Appendix 1.

Table 6.4 shows the eligible population and crude rate of one or more Beers drug prescriptions for community dwelling adults aged 65 and older for each of the five models of primary care and overall. The average crude rate was 29%. The Community Health Clinic model had the highest crude rate of all the models of primary care. The Teaching Clinic model had the lowest crude rate.

In 2012, 38.9% of adults aged 65 and older in public drug programs (in all provinces except Quebec and Newfoundland) had at least one claim for a drug from the Beers list (Canadian Institute for Health Information, 2014).

Table 6.4: Eligible Population and Crude Rate of Beers Drug Prescribing in Community Dwelling Adults Aged 65 and Older
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	15,542	28.8
WRHA Primary Care	2,669	29.7
Community Health Clinic	1,013	30.3
Teaching Clinic	1,581	27.0
Non-PIN FFS	63,097	29.5
Overall	83,902	29.3

There were no statistically significant differences between the models with the 'basic' or 'full' adjustments (data not shown).

Table 6.5 shows the relationship between each social complexity and the odds ratio of one or more Beers drug prescriptions for community dwelling adults aged 65 and older. Most of the social complexities were associated with a higher odds ratio of one or more Beers drug prescriptions for community dwelling adults aged 65 and older compared to patients with no social complexities.

Figure 6.1 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of one or more Beers drug prescriptions for community dwelling adults aged 65 and older. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of one or more Beers drug prescriptions for community dwelling adults aged 65 and older increased as the number of social complexities increased.

Table 6.5: Relationship between Social Complexities and Beers Drug Prescribing in Community Dwelling Adults Aged 65 and Older

2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	0.036
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇩	0.002
Child of a Newcomer	—	
Teen Mom	—	
Child of a Teen Mom	—	
Child in Care	—	
Involvement with the Justice System		0.083

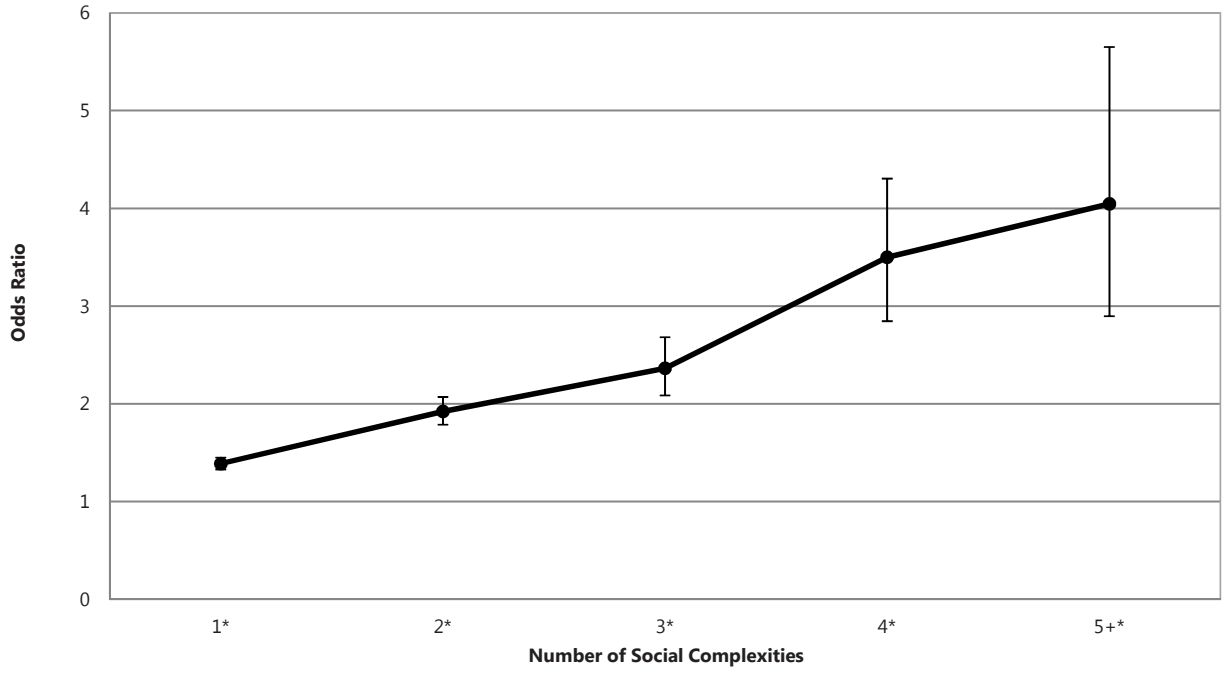
⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that the social complexity is not applicable to this indicator.

Figure 6.1: Relationship between the Number of Social Complexities and Beers Drug Prescribing in Community Dwelling Adults Aged 65 and Older

2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Depression Care, Prescription Follow-up

Approximately 8% of Canadians will experience a major depression in their lifetime, with 4-5% of Canadians being depressed at any point in time (Mood Disorders Society of Canada, 2009). Depression can be treated with medication or other non-drug-based treatments. Mild depression is generally not treated with medication initially. Clinical guidelines recommend routine follow-up of patients to whom antidepressants have been prescribed both to monitor side-effects of the medication and to monitor the patient's mood (Hauser, 2016).

The indicator 'depression care' was calculated as the percent of patients diagnosed with depression who filled a prescription for an antidepressant medication within two weeks of the diagnosis and made three subsequent ambulatory visits within four months of the prescription being filled (any diagnosis, any primary care provider). Patients with a prescription for antidepressants or a diagnosis of depression within the two years prior to the first diagnosis in the study period were excluded from this analysis. A higher rate of this indicator is considered a better outcome.

Table 6.6 shows the eligible population and crude rate of three follow-up visits for depression care for each of the five models of primary care and overall. The average crude rate for follow-up visits was 55%. The non-PIN FFS model had the highest crude rate of all the models of primary care. The WRHA Primary Care model had the lowest crude rate.

In the United States, one study of 4,102 patients found that only 31% received three or more follow-up visits after being newly diagnosed with major depressive disorder and initiating antidepressant medication (Chen et al., 2010).

Table 6.6: Eligible Population and Crude Rate of Depression Care, Prescription Followup
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	1,146	55.8
WRHA Primary Care	222	40.5
Community Health Clinic	199	45.7
Teaching Clinic	123	48.0
Non-PIN FFS	5,744	56.2
Overall	7,434	55.2

There were no statistically significant differences between the models with the 'basic' adjustment. With the 'full' adjustment, the only significant result was that the odds ratio in the non-PIN FFS model was higher than the WRHA Primary Care model (data not shown).

Table 6.7 shows the relationship between each social complexity and the adjusted odds ratio of three follow-up visits for depression care. One social complexity, major mental health diagnosis, was associated with a higher odds ratio and one social complexity, newcomer, was associated with a lower odds ratio of three follow-up visits for depression care compared to patients with no social complexities.

There was no clinically relevant relationship between the number of social complexities (compared to no social complexities) and the odds ratio of three follow-up visits for depression care (data not shown).

Table 6.7: Relationship between Social Complexities and Depression Care, Prescription Follow-up
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.425
Low Income Quintile (Q1 vs. Q5)		0.251
Social Housing Resident		0.226
Income Assistance		0.131
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇩	0.050
Child of a Newcomer		0.726
Teen Mom		0.867
Child of a Teen Mom		0.287
Child in Care		0.138
Involvement with the Justice System		0.114

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

Summary

There are very few differences in drug prescribing and follow up care among the models of care. The individual social complexities were more frequently associated with one or more Beers drug prescriptions for community dwelling adults aged 65 and older compared to the other two medical care indicators.

The rates of prescriptions for drugs that fall within the Beers criteria are consistent with those reported in other jurisdictions; however, they do present an opportunity for improvement in the quality of care provided across all the models of care.

The rates of benzodiazepine prescribing in the elderly have not changed since they were first described in previous MCHP studies (Katz et al., 2004).

CHAPTER 7: HEALTH SERVICES DELIVERY AND USE INDICATOR RESULTS

This chapter presents twelve health services delivery and use indicators related to primary care delivery and use. Some of the indicators in this chapter reflect the style of practice of the practitioner (which is likely influenced by the clinical environment), others are more likely to be patient dependent (which would be influenced by the patient provider interaction and relationship) and others may be perceived as being dependent on the outcomes of the care provided by the primary care provider.

Whether a higher or lower rate signifies a better outcome is dependent on the indicator. The eleven health services delivery and use indicators in this chapter are as follows:

- Continuity of care of assigned primary care provider;
- Clinic-based continuity of care;
- Referral rates;
- Hospitalizations for ambulatory care sensitive conditions: adults aged 74 and younger;
- X-ray for lower back pain: adults aged 20 and older;
- Hospital episodes with a readmission within 30 days;
- Emergency department visit rate for patients with CTAS 4 or 5;
- Ambulatory visits to primary care;
- Ambulatory visits to primary care for patients with RUB 3, 4, or 5;
- Ambulatory visits to primary care for patients with three or more social complexities; and
- Ambulatory visit with a call to Health Links – Info Santé within two days of visit.

See Online Appendix 2 for crude rates of indicators and eligible populations by clinic, and Online Appendix 3 for detailed model results by indicator.

Continuity of Care, Assigned Primary Care Provider

Continuity of Care (COC) measures the extent to which an individual patient sees their assigned primary care provider over a specified period of time. This indicator uses an index that weights both the frequency of ambulatory visits to each primary care provider and the dispersion of ambulatory visits among primary care providers. It is measured by the Continuity of Care Index (COCI). Possible values on the COCI range from zero to one. For example, if a patient received all primary care from one primary care provider during the study period, the patient is allocated a value of 1; if a patient received primary care from three or more primary care providers and did not see any of those providers more than once, the patient is allocated a value of 0. To be included in this analysis, a patient must have been present in Winnipeg for the full three-year study period and have had at least three ambulatory visits during this period. A higher COCI is considered a better outcome.

Table 7.1 shows the eligible population and crude COCI of assigned primary care providers for each of the five models of primary care and overall. The average crude COCI was 0.56. The PIN FFS model had the highest COCI of all the models of primary care. The Teaching Clinic model had the lowest crude COCI. The low index for COC of assigned primary care providers in the Teaching Clinic model is due to residents seeing patients on behalf of the attending primary care provider. Our data is based on the shadow billings by the supervising primary care provider, not the resident providing the care at the visit. Because residents are not always supervised by the same attending primary care provider, poor continuity of care is recorded. Even if a patient is seen by the same resident multiple times, it is the supervising attending physician who is the primary care provider of record.

Table 7.1: Eligible Population and Crude Continuity of Care Index, Assigned Primary Care Provider

2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Index
PIN FFS	63,754	0.59
WRHA Primary Care	11,892	0.43
Community Health Clinic	8,562	0.44
Teaching Clinic	7,148	0.24
Non-PIN FFS	375,929	0.57
Overall	467,285	0.56

Table 7.2 shows comparisons between the models of primary care for adjusted COCI of assigned primary care providers. With the 'basic' adjustment, the COCI in the PIN FFS model was higher than the Community Health Clinic and Teaching Clinic models. With both the 'basic' and 'full' adjustments, the Teaching Clinic model had a lower COCI than all the other models.

Table 7.2: Comparison between Models of Primary Care: Continuity of Care Index, Assigned Primary Care Provider

2010/11–2012/13

Model of Primary Care	Adjusted Index		Comparison Model
	Basic*	Full**	
PIN FFS (N=63,754 patients)			**WRHA Primary Care**
	⇧		**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**
			Non-PIN FFS
WRHA Primary Care (N=11,892 patients)			**PIN FFS**
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**
			Non-PIN FFS
Community Health Clinic (N=8,562 patients)	⇩		**PIN FFS**
			WRHA Primary Care
	⇧	⇧	**Teaching Clinic**
			Non-PIN FFS
Teaching Clinic (N=7,148 patients)	⇩	⇩	**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
	⇩	⇩	**Community Health Clinic**
	⇩	⇩	**Non-PIN FFS**
Non-PIN FFS (N=375,929 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇧	⇧	**Teaching Clinic**

⇧ indicates that the model's adjusted index is statistically significantly higher than the comparison model's adjusted index ($p<0.01$).

⇩ indicates that the model's adjusted index is statistically significantly lower than the comparison model's adjusted index ($p<0.01$).

Blank cell indicates that the model's adjusted index is not statistically significantly different from the comparison model's adjusted index.

*Basic Adjusted Index: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Index: Basic adjustment with the addition of social complexities.

Table 7.3 shows the relationship between each social complexity and the COCI of assigned primary care providers. Many of the social complexities were associated with either a lower or higher COCI of assigned primary care providers compared to patients with no social complexities.

Table 7.3: Relationship between Social Complexities and Continuity of Care Index, Assigned Primary Care Provider
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇩	<0.001
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇩	<0.001
Income Assistance		0.055
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇧	<0.001
Child of a Newcomer	⇧	<0.001
Teen Mom	⇩	0.015
Child of a Teen Mom	⇩	<0.001
Child in Care	⇩	0.004
Involvement with the Justice System	⇩	<0.001

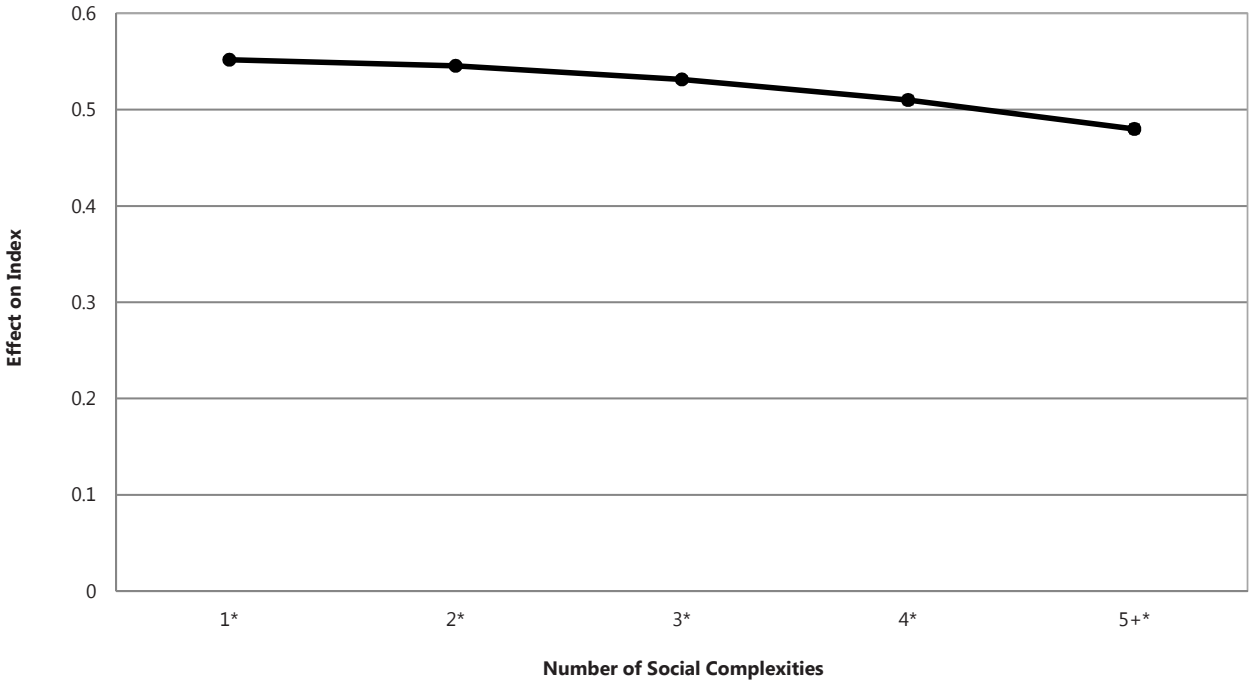
⇧ indicates that the social complexity is associated with a significantly higher adjusted index of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted index of the outcome ($p<0.05$).

Figure 7.1 shows the relationship between the number of social complexities (compared to no social complexities) and the COCI of assigned primary care providers. There was a statistically significant trend among the number of social complexities, meaning that the COCI of assigned primary care providers decreased as the number of social complexities increased.

The presence of social complexities has a statistically significant negative association with the COCI. Even a single social complexity is associated with a lower COCI, although the average difference of 0.01 is quite small and perhaps not clinically meaningful. With five or more social complexities, COCI is, on average, 0.08 lower compared to those with no social complexities. Even comparing the best case scenario (no complexities) to the worst (5 or more complexities), the association of social complexities amounts to a decrease in COCI of only about one-quarter of a standard deviation.

Figure 7.1: Relationship between the Number of Social Complexities and Continuity of Care Index, Assigned Primary Care Provider
2010/11–2012/13



* indicates that the adjusted index is significantly different from the adjusted index of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Clinic-Based Continuity of Care

Clinic-based continuity of care measures the extent to which an individual patient sees any primary care provider in a particular clinic compared to providers in other clinics. This indicator is measured within each clinic (clinic-based), as opposed to by individual primary care provider (provider-based). The calculation is the same as for the primary care provider-based measure, except for the inclusion of all the providers in the clinic. The possible values of the clinic-based Continuity of Care Index (COCI) range from zero to one. For example, if one clinic provided all of a patient's care during the study period, a value of 1 is allocated to that patient; if the patient had five total visits to primary care providers and each visit was to a different clinic, the patient is allocated a score of 0. To be included in this analysis, a patient must have had at least three ambulatory visits in the three-year study period. A higher COCI is considered a better outcome.

The non-PIN FFS model was removed from this analysis because we could not reliably assign primary care providers to individual non-PIN FFS clinics. This is because non-PIN FFS primary care providers often work at multiple non-PIN FFS clinics, and larger clinics sometimes provide billing services for primary care providers working at smaller clinics, thereby calling into question the accuracy of primary care provider billing addresses in administrative data. Table 7.4 shows the eligible population and crude clinic-based COCI for each of the other four models of primary care.

The Teaching Clinic model had the highest crude COCI of all the models of primary care. This result for the Teaching Clinic model is in stark contrast to this model's result for continuity of care of assigned primary care providers, which is consistent with the rationale previously explained. The Community Health Clinic model had the lowest crude COCI.

Table 7.4: Eligible Population and Crude Continuity of Care Index, Clinic-Based

2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Index
PIN FFS	63,754	0.69
WRHA Primary Care	11,889	0.69
Community Health Clinic	8,559	0.60
Teaching Clinic	7,147	0.74

Table 7.5 shows comparisons between the models of primary care for adjusted clinic-based COCI. With the 'basic' and 'full' adjustments, the clinic-based COCI in the WRHA Primary Care model was higher than the Community Health Clinic model.

Table 7.5: Comparison between Models of Primary Care: Continuity of Care Index, Clinic-Based

2010/11–2012/13

Model of Primary Care	Adjusted Index		Comparison Model
	Basic*	Full**	
PIN FFS (N=63,754 patients)			**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic
WRHA Primary Care (N=11,889 patients)			**PIN FFS**
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic
Community Health Clinic (N=8,559 patients)			**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
			Teaching Clinic
Teaching Clinic (N=7,147 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic

⇧ indicates that the model's adjusted index is statistically significantly higher than the comparison model's adjusted index ($p<0.01$).

⇩ indicates that the model's adjusted index is statistically significantly lower than the comparison model's adjusted index ($p<0.01$).

Blank cell indicates that the model's adjusted index is not statistically significantly different from the comparison model's adjusted index.

*Basic Adjusted Index: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Index: Basic adjustment with the addition of social complexities.

Note: Non-PIN FFS is not included in this table.

Table 7.6 shows the relationship between each social complexity and clinic-based COCI. Four social complexities were associated with a lower clinic-based COCI compared to patients with no social complexities.

Table 7.6: Relationship between Social Complexities and Continuity of Care Index, Clinic-Based
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇩	<0.001
Low Income Quintile (Q1 vs. Q5)		0.116
Social Housing Resident	⇩	<0.001
Income Assistance	⇧	0.002
Major Mental Health Diagnosis		0.234
Newcomer		0.354
Child of a Newcomer		0.140
Teen Mom		0.588
Child of a Teen Mom	⇩	<0.001
Child in Care		0.535
Involvement with the Justice System	⇩	<0.001

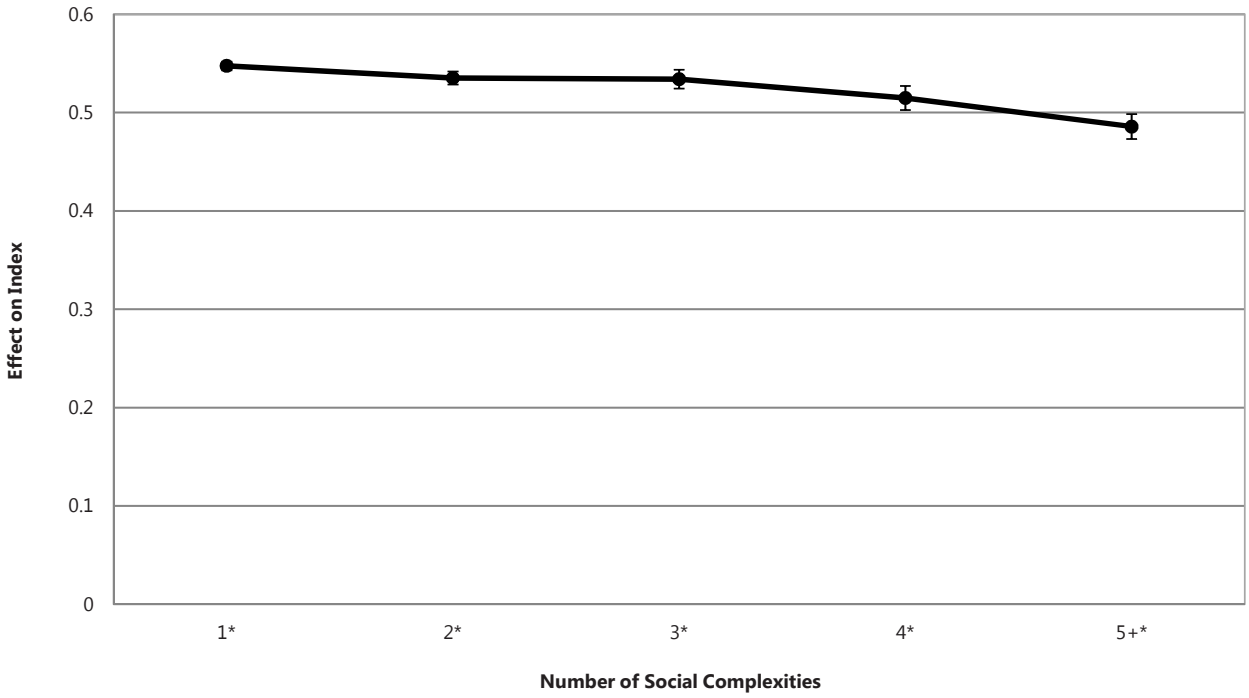
⇧ indicates that the social complexity is associated with a significantly higher adjusted index of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted index of the outcome ($p<0.05$).

Figure 7.2 shows the relationship between the number of social complexities (compared to no social complexities) and clinic-based COCI. There was a statistically significant trend among the number of social complexities, meaning that the clinic-based COCI decreased as the number of social complexities increased.

The presence of social complexities had a statistically significant negative association with the COCI. Even a single social complexity was associated with a lower COCI, although the average difference of 0.01 is quite small and perhaps not clinically meaningful. With five or more social complexities, COCI is, on average, 0.07 lower compared to those with no social complexities. Even comparing the best case scenario (no complexities) to the worst (five or more complexities), the association between the social complexities and the COCI only decreases by about one-quarter of a standard deviation.

Figure 7.2: Relationship between the Number of Social Complexities and Continuity of Care Index, Clinic-Based
2010/11–2012/13



* indicates that the adjusted index is significantly different from the adjusted index of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Referral Rates

Referrals from primary care providers to specialists are a routine part of primary care. The decision to refer a patient is based on a number of factors and has a number of consequences for the patient and the healthcare system. While analysis of administrative data does not allow evaluation of the appropriateness of any one specific referral, practice-based analysis does suggest a pattern of clinical behavior. Previous research has demonstrated significant differences in referrals that are extremely unlikely to be a reflection of individual patient need (Liddy et al., 2014). For example, FFS primary care providers have been shown to have lower referral rates than primary care providers funded through other mechanisms. Previous research has suggested that patients tend to be referred to specialists more often by primary care providers who do not have an ongoing therapeutic relationship with the patient (Forrest, Shadmi, Nutting, & Starfield, 2007).

Total referral rate was calculated as follows:

- The rate of referrals per patient made by any primary care provider (i.e., referrals made by assigned and unassigned providers).

Several exclusions were made when calculating *total referral rate*:

- Referrals to pathology, radiology, and other primary care providers;
- Referral to obstetricians, for uncomplicated pregnancy care; and
- Any subsequent referral from the same primary care provider to the same specialist within six months of the first referral.

We also compared the proportion of all referrals that come from the assigned provider to the number of referrals that come from other providers, across models of care. We are assuming that the assigned provider has a therapeutic relationship with the patient and has access to the patient's relevant medical and social history. Other providers working at the same site will also have access to the notes in the EMR. This suggests that referrals made from another site are more likely to represent poor functioning of the system. Referrals from another site are likely to be based on one of the following:

1. Lack of patient access to the primary site, resulting in care seeking from a provider who does not have access to the relevant medical history; or
2. The patient purposefully choosing to seek care from an alternative site specifically for the purpose of requesting the referral to the specialist.

Table 7.7 shows the eligible population and crude rate of total referrals per patient from any primary care provider, as well as the percent of referrals originating from the assigned provider, from the assigned clinic (i.e., the clinic at which the assigned provider works), and from an unassigned clinic (i.e., any clinic other than the clinic at which the assigned provider works) for each of the five models of primary care and overall. The average crude rate of total referrals was 0.36 referrals per patient. The PIN FFS and WRHA Primary Care models had the highest crude rates of referrals per patient of all the models of primary care. The non-PIN FFS model had the lowest crude rate of referrals per patient.

Table 7.7 shows that the PIN FFS model had the highest (best) percent of referrals from the assigned provider and from that provider's clinic. In contrast, the Community Health Clinic model had the lowest (worst) rates. Clinic-based rates are not availbale for the Non-PIN FFS model because we could not reliably identify the clinics at which these providers worked. It is noteworthy that almost one-third of referrals for patients in the PIN FFS model came from providers working at other clinics.

Table 7.7: Referral Rates by Primary Care Model

Model of Primary Care	Eligible Population	Total Referral Rate	Percent of Referrals from Assigned Provider	Percent of Referrals from Assigned Clinic	Percent of Referrals from Unassigned Clinic
PIN FFS	70,498	0.45	65.1	68.2	31.8
WRHA Primary Care	14,969	0.45	40.1	56.2	43.8
Community Health Clinic	10,676	0.36	37.3	51.0	49.0
Teaching Clinic	8,407	0.35	39.5	60.9	39.1
Non-PIN FFS	442,293	0.34	56.6	N/A	N/A
Overall	546,843	0.36	56.8	N/A	N/A

While the impact of individual social complexities on referral rates is inconsistent, the social complexities do, in general, have a significant impact on referral rates. Table 7.8

Table 7.8: Relationship between Social Complexities and Total Referral Rate
2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇩	<0.001
Social Housing Resident		0.789
Income Assistance		0.149
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇧	<0.001
Child of a Newcomer	⇩	<0.001
Teen Mom	⇧	<0.001
Child of a Teen Mom	⇩	<0.001
Child in Care	⇩	<0.001
Involvement with the Justice System	⇧	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted rate of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted rate of the outcome ($p<0.05$).

Hospitalizations for Ambulatory Care Sensitive Conditions

Ambulatory care sensitive conditions (ACSCs) are a set of 28 medical conditions and diagnoses "for which timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition, or managing a chronic disease or condition" (Billings et al., 1993). This indicator measures the proportion of patients aged 0-74 who were hospitalized for a select group of the ACSCs. The idea behind this measure is that if people receive an adequate level of good quality primary care, they should not need to be hospitalized for these ACSCs. We have not included all 28 conditions in this analysis, because many of the conditions originally identified are now treated in the ambulatory care setting and no longer lead to hospitalization unless there are other significant comorbidities. We included chronic obstructive pulmonary disease (COPD), asthma, congestive heart failure (CHF), and diabetes in our analyses. A lower rate of this indicator is considered a better outcome.

Table 7.9 shows the eligible population and crude rate of hospitalizations for ACSCs for each of the five models of primary care and overall. The average crude rate was 2.21 hospitalizations per 1,000 person-years. The WRHA Primary Care model had the highest crude rate of hospitalizations of all the models of primary care. The PIN FFS model had the lowest crude rate.

Table 7.9: Eligible Population and Crude Rate of Hospitalizations for Ambulatory Care Sensitive Conditions
Patients Aged 74 and Younger, per 1,000 person-years, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate
PIN FFS	64,598	2.06
WRHA Primary Care	13,866	4.11
Community Health Clinic	10,408	3.46
Teaching Clinic	7,849	2.17
Non-PIN FFS	422,837	2.14
Overall	519,558	2.21

Table 7.10 shows comparisons between the models of primary care for odds ratios of hospitalizations for ACSCs. With the 'basic' adjustment, the odds ratio of hospitalizations for ACSCs in the Teaching Clinic model was higher than the PIN FFS model. With the 'basic' and 'full' adjustment, the odds ratio of hospitalizations for ACSCs in the WRHA Primary Care model was higher than in the PIN FFS and non-PIN FFS models.

Table 7.10: Comparison between Models of Primary Care: Hospitalizations for Ambulatory Care Sensitive Conditions

Patients Aged 74 and Younger, 2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=64,598 patients)	⇩	⇩	**WRHA Primary Care**
			Community Health Clinic
	⇩		**Teaching Clinic**
			Non-PIN FFS
WRHA Primary Care (N=13,866 patients)	⇧	⇧	**PIN FFS**
			Community Health Clinic
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
Community Health Clinic (N=10,408 patients)			**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=7,849 patients)	⇧		**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=422,837 patients)			**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 7.11 shows the relationship between each social complexity and the odds ratio of hospitalizations for ACSCs. Six of the social complexities were associated with a higher odds ratio of hospitalizations for ACSCs compared to patients with no social complexities.

Table 7.11: Relationship between Social Complexities and Hospitalizations for Ambulatory Care Sensitive Conditions
Patients Aged 74 and Younger, 2010/11–2012/13

Social Complexity	Effect	p-value
High Residential Mobility		0.063
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇩	<0.001
Child of a Newcomer	⇧	0.025
Teen Mom		0.236
Child of a Teen Mom	⇩	<0.001
Child in Care	⇧	<0.001
Involvement with the Justice System		0.503

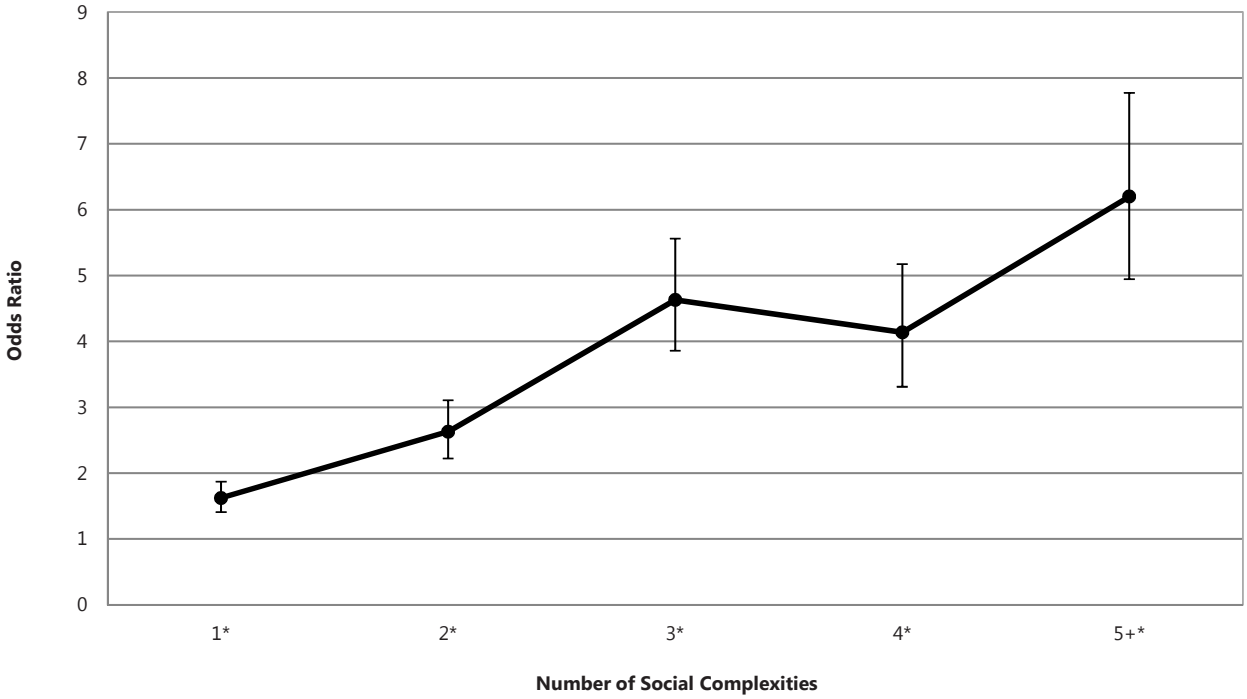
⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

Figure 7.3 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of hospitalizations for ACSCs. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of hospitalizations for ACSCs increased as the number of social complexities increased.

Figure 7.3: Relationship between the Number of Social Complexities and Hospitalizations for Ambulatory Care Sensitive Conditions

Patients Aged 74 and Younger, 2010/11–2012/13



* indicates that the adjusted odds ration is significantly different from the adjusted odds ratio of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

X-Ray for Lower Back Pain: Adults aged 20 and older

There is increasing awareness of the need to limit the use of diagnostic tests to clinical circumstances where they are clearly necessary. Lower back X-rays have been identified in the literature as being an over-ordered imaging study (Choosing Wisely Canada, 2014). Clinical practice guidelines suggest that lower back X-rays should only be ordered under restricted clinical conditions.

The indicator 'X-ray for lower back pain' looks at patients aged 20 and older who had at least one lower back pain diagnosis over the three-year study period. The numerator includes those who had a lower back X-ray within 6 weeks of the lower back pain diagnosis. We excluded patients with a history of neoplasms, nervous system diagnoses, arthritis, congenital anomalies, fractures, neurosurgery visits, orthopedic surgery visits, previous spine X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI), electromyography (EMG), and spine operations. A lower result for this indicator is considered a better outcome.

Table 7.12 shows the eligible population and crude rate of X-rays for lower back pain for each of the five models of primary care and overall. The average crude rate of X-rays for lower back pain was 25%. The PIN FFS model had the highest crude rate of X-rays of all the models of primary care. The Community Health Clinic model had the lowest crude rate.

In Ontario, about 20% of patients aged 20 and older with lower back pain received an X-ray over the course of one year (January 1 to December 31, 2000) (Iron, Jaakkimainen, Ping, & Laupacis, 2004).

Table 7.12: Eligible Population and Crude Rate of X-Ray for Lower Back Pain
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	622	28.6
WRHA Primary Care	113	22.1
Community Health Clinic	80	8.8
Teaching Clinic	76	25.0
Non-PIN FFS	4,481	25.0
Overall	5,372	25.1

Table 7.13 shows comparisons between the models of primary care for adjusted odds ratios of X-rays for lower back pain. With the 'basic' and 'full' adjustments, the odds ratios of X-rays for lower back pain in the PIN FFS and non-PIN FFS models were greater than the odds ratio in the Community Health Clinic model.

There were no relationships between any of the social complexities and the odds ratio of X-rays for lower back pain; as well, there was no relationship between the number of social complexities and the odds ratio of X-rays for lower back pain (data not shown).

Table 7.13: Comparison between Models of Primary Care: X-Ray for Lower Back Pain
Patients Aged 20 and Older, 2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=622 patients)			**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic
			Non-PIN FFS
WRHA Primary Care (N=113 patients)			**PIN FFS**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
Community Health Clinic (N=80 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
	⇩	⇩	**Non-PIN FFS**
Teaching Clinic (N=76 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=4,481 patients)			**PIN FFS**
			WRHA Primary Care
	⇧	⇧	**Community Health Clinic**
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Hospital Episodes with a Readmission within 30 Days

This indicator is defined as an unplanned, inpatient readmission to an acute care facility (the same or different hospital) within 30 days following discharge from the original hospital episode. This indicator is potentially influenced by care within the hospital sector (the patient may have been discharged too soon from hospital), communication between the hospital and ambulatory care sectors (the patient may not have continued with recommended care after discharge from hospital), and/or care provided by the primary care provider in the community. Hospitalizations within 24 hours of each other are considered part of the same episode and, as such, are not counted as readmissions. Only inpatient hospitalizations are included; newborn separations are also included. A lower rate of this indicator is considered a better outcome.

Table 7.14 shows the eligible population and crude rate of hospital episodes with a readmission within 30 days for each of the five models of primary care and overall. The average crude rate of readmissions was 6.0%. The WRHA Primary Care model had the highest crude rate of all the models of primary care. The PIN FFS model had the lowest crude rate.

Table 7.14: Eligible Population and Crude Rate of Hospital Episodes with a Readmission within 30 Days
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate (%)
PIN FFS	14,506	5.4
WRHA Primary Care	4,366	7.7
Community Health Clinic	3,188	7.1
Teaching Clinic	2,150	7.3
Non-PIN FFS	84,553	6.1
Overall	108,763	6.1

Table 7.15 shows comparisons between the models of primary care for adjusted odds ratios of hospital episodes with a readmission within 30 days. With the 'basic' adjustment, the odds ratio of readmissions in the WRHA Primary Care model was higher than the PIN FFS and non-PIN FFS models. With the 'full' adjustment, the odds ratio of readmissions in the WRHA Primary Care model was higher than the PIN FFS model.

Table 7.15: Comparison between Models of Primary Care: Hospital Episodes with a Readmission within 30 Days
2010/11–2012/13

Model of Primary Care	Adjusted Odds Ratio		Comparison Model
	Basic*	Full**	
PIN FFS (N=14,506 patients)	⇩	⇩	**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic
			Non-PIN FFS
WRHA Primary Care (N=4,366 patients)	⇧	⇧	**PIN FFS**
			Community Health Clinic
			Teaching Clinic
	⇧		**Non-PIN FFS**
Community Health Clinic (N=3,188 patients)			**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
			Non-PIN FFS
Teaching Clinic (N=2,150 patients)			**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
			Non-PIN FFS
Non-PIN FFS (N=84,553 patients)			**PIN FFS**
	⇩		**WRHA Primary Care**
			Community Health Clinic
			Teaching Clinic

⇧ indicates that the model's adjusted odds ratio is statistically significantly higher than the comparison model's adjusted odds ratio ($p<0.01$).

⇩ indicates that the model's adjusted odds ratio is statistically significantly lower than the comparison model's adjusted odds ratio ($p<0.01$).

Blank cell indicates that the model's adjusted odds ratio is not statistically significantly different from the comparison model's adjusted odds ratio.

*Basic Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Odds Ratio: Basic adjustment with the addition of social complexities.

Table 7.16 shows the relationship between each social complexity and the adjusted odds ratio of hospital episodes with a readmission within 30 days. Five social complexities were associated with a higher odds ratio of hospital episodes with a readmission within 30 days compared to patients with no social complexities.

Table 7.16: Relationship between Social Complexities and Hospital Episodes with a Readmission within 30 Days
2010/11–2012/13

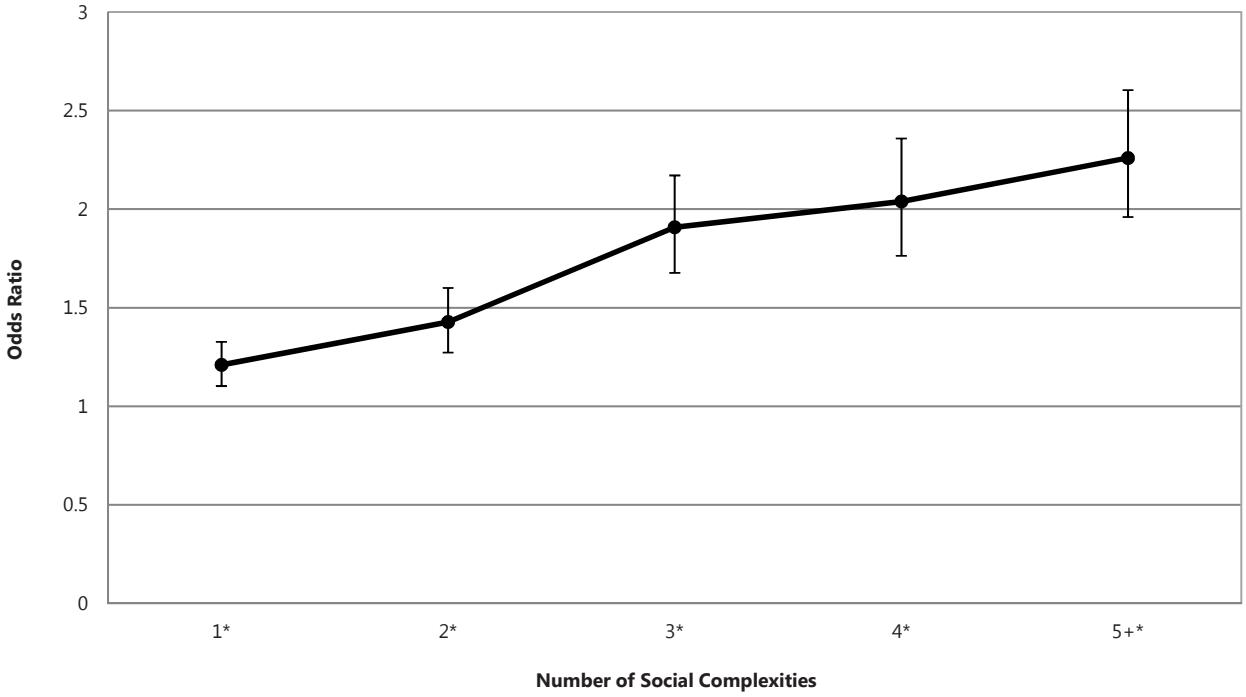
Social Complexity	Effect	p-value
High Residential Mobility		0.132
Low Income Quintile (Q1 vs. Q5)	⇧	0.004
Social Housing Resident	⇧	0.007
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer		0.104
Child of a Newcomer	⇧	0.001
Teen Mom		0.685
Child of a Teen Mom	⇩	0.015
Child in Care		0.241
Involvement with the Justice System		0.432

⇧ indicates that the social complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

Figure 7.4 shows the relationship between the number of social complexities (compared to no social complexities) and the odds ratio of hospital episodes with a readmission within 30 days. There was a statistically significant trend among the number of social complexities, meaning that the odds ratio of hospital episodes with a readmission within 30 days increased as the number of social complexities increased.

Figure 7.4: Relationship between the Number of Social Complexities and Hospital Episodes with a Readmission within 30 Days
2010/11–2012/13



* indicates that the adjusted odds ratio is significantly different from the adjusted odds ratio rate of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Emergency Department Visit Rate for Patients with CTAS 4 or 5

The Canadian Emergency Department Triage and Acuity Scale (CTAS) is a five-level system used within an emergency department (ED) or urgent care facility to assess patients according to the urgency of their condition. Patients are classified as Resuscitation (Level 1), Emergent (Level 2), Urgent (Level 3), Less Urgent (Level 4), or Non-Urgent (Level 5). This indicator measures the proportion of patients coming to an ED during the three-year study period for conditions that are defined as 'less urgent' (CTAS 4) or 'non-urgent' (CTAS 5): that is, this indicator measures the potentially inappropriate use of EDs. This indicator is included in this report because it is assumed that inappropriate ED use is a reflection of poor primary care access or dissatisfaction of the primary care received by the patient. A lower rate of this indicator is considered a better outcome.

Table 7.17 shows the eligible population and crude rate of ED visits for patients with CTAS 4 or 5 for each of the five models of primary care and overall. The average crude rate was 151 visits per 1,000 person-years. The Community Health Clinic model had the highest crude rate of all the models of primary care. The PIN FFS model had the lowest crude rate.

Table 7.17: Eligible Population and Crude Rate of Emergency Department Visit Rate for Patients with CTAS 4 or 5
Per 1,000 person-years, 2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate
PIN FFS	70,879	114.62
WRHA Primary Care	15,144	209.32
Community Health Clinic	10,808	231.87
Teaching Clinic	8,506	138.96
Non-PIN FFS	446,867	152.55
Overall	552,204	150.58

Table 7.18 shows comparisons between the models of primary care for adjusted rates of ED visits for patients with CTAS 4 or 5. With the 'basic' adjustment, the adjusted rate of visits in the WRHA Primary Care and Community Health Clinic models was higher than the PIN FFS, Teaching Clinic, and non-PIN FFS models; also, the non-PIN FFS model had a higher adjusted rate than the PIN FFS model. With the 'full' adjustment, the adjusted rate of visits in the WRHA Primary Care model was higher than all the other models.

Table 7.18: Comparison between Models of Primary Care: Emergency Department Visit Rate for Patients with CTAS 4 or 5
2010/11–2012/13

Model of Primary Care	Adjusted Rate		Comparison Model
	Basic*	Full**	
PIN FFS (N=70,879 patients)	⇩	⇩	**WRHA Primary Care**
	⇩		**Community Health Clinic**
			Teaching Clinic
	⇩		**Non-PIN FFS**
WRHA Primary Care (N=15,144 patients)	⇧	⇧	**PIN FFS**
		⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**
	⇧	⇧	**Non-PIN FFS**
Community Health Clinic (N=10,808 patients)	⇧		**PIN FFS**
		⇩	**WRHA Primary Care**
	⇧		**Teaching Clinic**
	⇧		**Non-PIN FFS**
Teaching Clinic (N=8,506 patients)			**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
	⇩		**Community Health Clinic**
			Non-PIN FFS
Non-PIN FFS (N=446,867 patients)	⇧		**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
	⇩		**Community Health Clinic**
			Teaching Clinic

⇧ indicates that the model's adjusted rate is statistically significantly higher than the comparison model's adjusted rate ($p<0.01$).
⇩ indicates that the model's adjusted rate is statistically significantly lower than the comparison model's adjusted rate ($p<0.01$).
Blank cell indicates that the model's adjusted rate is not statistically significantly different from the comparison model's adjusted rate.
*Basic Adjusted Rate: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).
**Full Adjusted Rate: Basic adjustment with the addition of social complexities.

Table 7.19 shows the relationship between each social complexity and the adjusted rate of ED visits for patients with CTAS 4 or 5. Nearly all of the social complexities were associated with a higher adjusted rate of ED visits for patients with CTAS 4 or 5 compared to patients with no social complexities.

Table 7.19: Relationship between Social Complexities and Emergency Department Visit Rate for Patients with CTAS 4 or 5
2010/11–2012/13

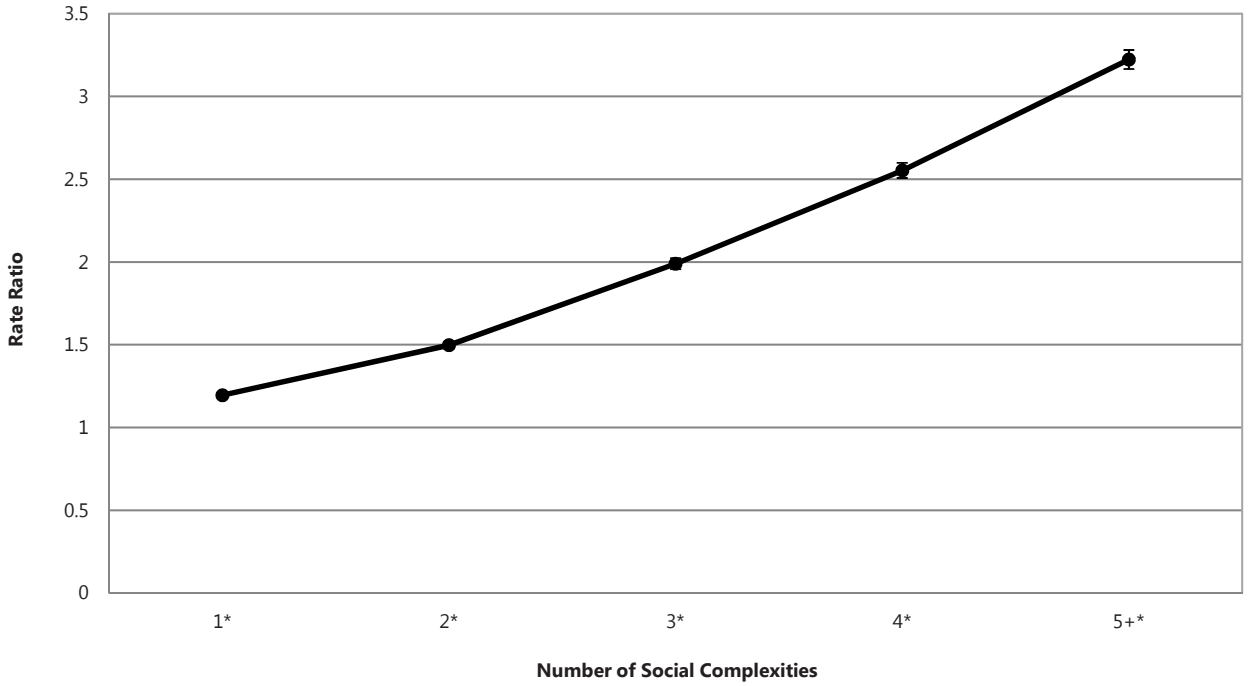
Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇩	<0.001
Child of a Newcomer	⇧	<0.001
Teen Mom		0.083
Child of a Teen Mom	⇧	0.005
Child in Care	⇧	0.026
Involvement with the Justice System	⇧	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted rate of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted rate of the outcome ($p<0.05$).

Figure 7.5 shows the relationship between the number of social complexities (compared to no social complexities) and the adjusted rate ratio of ED visits for patients with CTAS 4 or 5. There was a statistically significant trend among the number of social complexities, meaning that the adjusted rate ratio of ED visits for patients with CTAS 4 or 5 increased as the number of social complexities increased.

Figure 7.5: Relationship between the Number of Social Complexities and Emergency Department Visit Rate for Patients with CTAS 4 or 5
2010/11–2012/13



* indicates that the adjusted rate is significantly different from the adjusted rate of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Ambulatory Visits to Primary Care

The vast majority of care provided within primary care is classified as an ambulatory visit. This includes all care provided outside of a hospital. These visits can be initiated by the patient or the provider. It has been suggested in the literature that FFS providers may manipulate their billings by increasing the number of visits patients are encouraged to make (Contandriopoulos, 2013). Particularly for chronic disease management, there are significant differences in the frequency with which clinicians provide follow-up visits to similar patients. Clinicians who provide fewer such visits would have the potential to provide care to more patients and would provide more economical care to their patients.

The indicator 'ambulatory visits to primary care' is defined as the number of visits to a licensed primary care provider in an outpatient setting in Winnipeg per patient, annualized over the three-year study period. All visits the patients made to primary care were counted, regardless of the model of primary care they received or participated in.

Table 7.20 shows the eligible population and crude rate of ambulatory visits to primary care for each of the five models of primary care and overall. The average crude rate was 4.5 visits per patient per year. The non-PIN FFS model had the highest crude rate of all the models of primary care. The WRHA Primary Care and Teaching Clinic models had the lowest crude rates. It should be noted that both of these models of care include nurses and other professionals in their clinics. Visits to these providers are not included in these rates which may explain the lower rates.

Table 7.20: Eligible Population and Crude Rate of Ambulatory Visits to Primary Care

2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate
PIN FFS	186,177	4.39
WRHA Primary Care	35,900	3.72
Community Health Clinic	25,661	4.10
Teaching Clinic	21,111	3.84
Non-PIN FFS	1,107,071	4.58
Overall	1,375,920	4.51

Table 7.21 shows comparisons between the models of primary care for adjusted rates of ambulatory visits to primary care. With the 'full' adjustment, the adjusted rate of visits in the non-PIN FFS model was higher than the adjusted rates in the WRHA Primary Care, Community Health Clinic, and Teaching Clinic models; the adjusted rate of visits per patient per year in the PIN FFS model was higher than the adjusted rate in the WRHA Primary Care model.

Table 7.21: Comparison between Models of Primary Care: Ambulatory Visits to Primary Care

2010/11–2012/13

Model of Primary Care	Adjusted Rate		Comparison Model
	Basic*	Full**	
PIN FFS (N=186,177 patients)	⇧	⇧	**WRHA Primary Care**
			Community Health Clinic
	⇧		**Teaching Clinic**
	⇩		**Non-PIN FFS**
WRHA Primary Care (N=35,900 patients)	⇩	⇩	**PIN FFS**
	⇩		**Community Health Clinic**
	⇩		**Teaching Clinic**
	⇩	⇩	**Non-PIN FFS**
Community Health Clinic (N=25,661 patients)			**PIN FFS**
	⇧		**WRHA Primary Care**
	⇧		**Teaching Clinic**
	⇩	⇩	**Non-PIN FFS**
Teaching Clinic (N=21,111 patients)	⇩		**PIN FFS**
	⇧		**WRHA Primary Care**
	⇩		**Community Health Clinic**
	⇩	⇩	**Non-PIN FFS**
Non-PIN FFS (N=1,107,071 patients)	⇧		**PIN FFS**
	⇧	⇧	**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**

⇧ indicates that the model's adjusted rate is statistically significantly higher than the comparison model's adjusted rate ($p<0.01$).
⇩ indicates that the model's adjusted rate is statistically significantly lower than the comparison model's adjusted rate ($p<0.01$).
Blank cell indicates that the model's adjusted rate is not statistically significantly different from the comparison model's adjusted rate.
*Basic Adjusted Rate: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).
**Full Adjusted Rate: Basic adjustment with the addition of social complexities.

Table 7.22 shows the relationship between each social complexity and the adjusted rate of ambulatory visits to primary care. Most of the social complexities were associated with a higher adjusted rate of ambulatory visits to primary care compared to patients with no social complexities.

Table 7.22: Relationship between Social Complexities and Ambulatory Visits to Primary Care
2010/11–2012/13

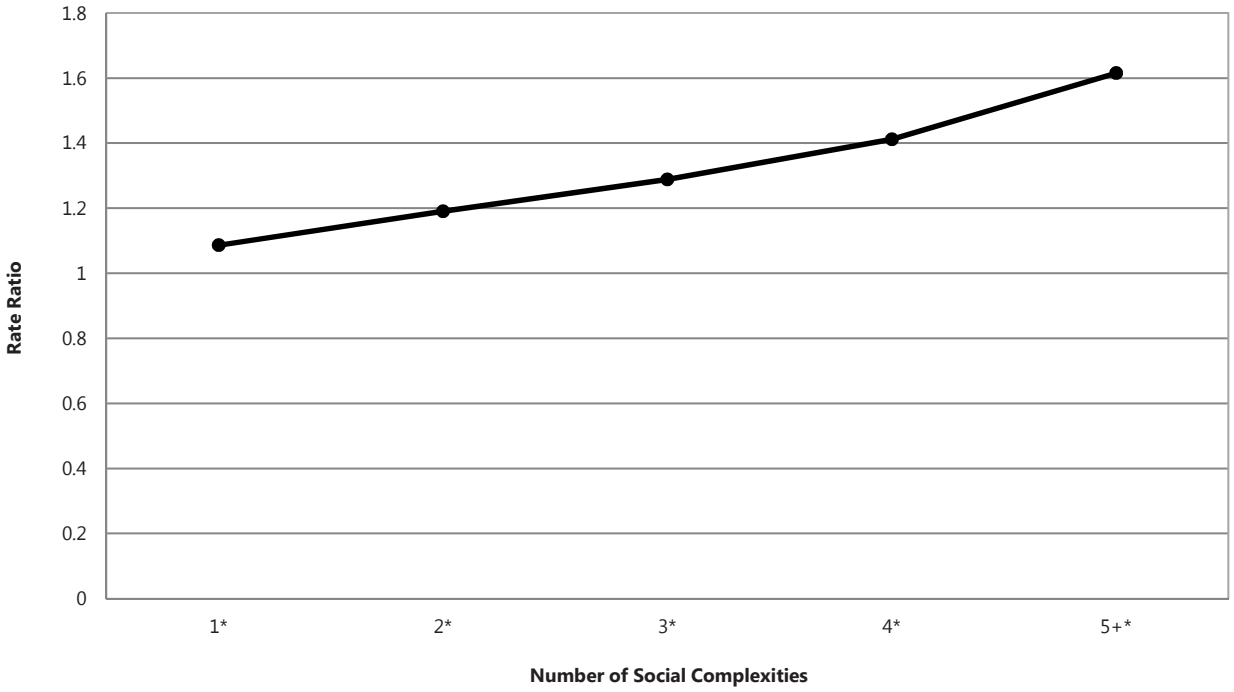
Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇧	<0.001
Child of a Newcomer	⇩	<0.001
Teen Mom	⇧	<0.001
Child of a Teen Mom	⇧	0.014
Child in Care	⇩	<0.001
Involvement with the Justice System	⇧	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted rate of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted rate of the outcome ($p<0.05$).

Figure 7.6 shows the relationship between the number of social complexities (compared to no social complexities) and the adjusted rate ratio of ambulatory visits to primary care. There was a statistically significant trend among the number of social complexities, meaning that the adjusted rate ratio of ambulatory visits to primary care increased as the number of social complexities increased.

Figure 7.6: Relationship between the Number of Social Complexities and Ambulatory Visits to Primary Care
2010/11–2012/13



* indicates that the adjusted rate is significantly different from the adjusted rate of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Ambulatory Visits to Primary Care for Patients with RUB 3, 4, or 5

Resource Utilization Bands (RUBs) classify patients according to their "sickness level" or morbidity based on their previous use of the healthcare system. This indicator measures the rate of ambulatory visits to primary care for patients with a 'moderate' (3), 'high' (4), or 'very high' (5) morbidity. It is expected that sicker patients would be seen more frequently in primary care.

This indicator is defined as the number of visits to a licensed primary care provider in an outpatient setting in Winnipeg per patient, annualized over the three-year study period. Only patients with an RUB of 3, 4, or 5 are considered in this analysis.

Table 7.23 shows the eligible population and crude rate of ambulatory visits to primary care for patients with an RUB of 3, 4, or 5 for each of the five models of primary care and overall. The average crude rate was 5.8 visits per patient per year. The non-PIN FFS model had the highest crude rate of all the models of primary care. The WRHA Primary Care and Teaching Clinic models had the lowest crude rates.

Table 7.23: Eligible Population and Crude Rate of Ambulatory Visits to Primary Care for Patients with RUB 3, 4 or 5
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate
PIN FFS	102,696	5.45
WRHA Primary Care	18,894	4.72
Community Health Clinic	12,331	5.44
Teaching Clinic	10,583	4.88
Non-PIN FFS	555,704	5.97
Overall	700,208	5.84

Table 7.24 shows comparisons between the models of primary care for adjusted rates of ambulatory visits to primary care for patients with RUB 3, 4, or 5. With the 'basic' adjustment, the adjusted rate of visits per patient per year in the non-PIN FFS model was higher than all the other models; the adjusted rate of visits in the PIN FFS model was higher than the adjusted rate in the Teaching Clinic model. With the 'full' adjustment, the adjusted rate of visits per patient per year in the non-PIN FFS model was higher than all the other models; also, the adjusted rate of visits per year in the PIN FFS model was higher than the adjusted rate in the WRHA Primary Care, Community Health Clinic, and Teaching Clinic models, all of which have inter-professional practice where return visits may not always be provided by primary care providers.

Table 7.24: Comparison between Models of Primary Care: Ambulatory Visits to Primary Care for Patients with RUB 3, 4 or 5

2010/11–2012/13

Model of Primary Care	Adjusted Rate		Comparison Model
	Basic*	Full**	
PIN FFS (N=102,696 patients)		⇧	**WRHA Primary Care**
		⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**
	⇩	⇩	**Non-PIN FFS**
WRHA Primary Care (N=18,894 patients)		⇩	**PIN FFS**
			Community Health Clinic
			Teaching Clinic
	⇩	⇩	**Non-PIN FFS**
Community Health Clinic (N=12,331 patients)		⇩	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
	⇩	⇩	**Non-PIN FFS**
Teaching Clinic (N=10,583 patients)	⇩	⇩	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇩	⇩	**Non-PIN FFS**
Non-PIN FFS (N=555,704 patients)	⇧	⇧	**PIN FFS**
	⇧	⇧	**WRHA Primary Care**
	⇧	⇧	**Community Health Clinic**
	⇧	⇧	**Teaching Clinic**

⇧ indicates that the model's adjusted rate is statistically significantly higher than the comparison model's adjusted rate ($p<0.01$).

⇩ indicates that the model's adjusted rate is statistically significantly lower than the comparison model's adjusted rate ($p<0.01$).

Blank cell indicates that the model's adjusted rate is not statistically significantly different from the comparison model's adjusted rate.

*Basic Adjusted Rate: Adjusted for patient income quintile, sex, and age; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Rate: Basic adjustment with the addition of social complexities.

Table 7.25 shows the relationship between each social complexity and the adjusted rate of ambulatory visits to primary care for patients with an RUB of 3, 4, or 5. Most of the social complexities were associated with a higher adjusted rate of ambulatory visits to primary care for patients with an RUB of 3, 4, or 5 compared to patients with no social complexities.

Figure 7.7 shows the relationship between the number of social complexities (compared to no social complexities) and the adjusted rate of ambulatory visits to primary care for patients with an RUB of 3, 4, or 5. There was a statistically significant trend among the number of social complexities, meaning that the adjusted rate of ambulatory visits to primary care for patients with an RUB of 3, 4, or 5 increased as the number of social complexities increased.

Table 7.25: Relationship between Social Complexities and Ambulatory Visits to Primary Care for Patients with RUB 3, 4 or 5

2010/11–2012/13

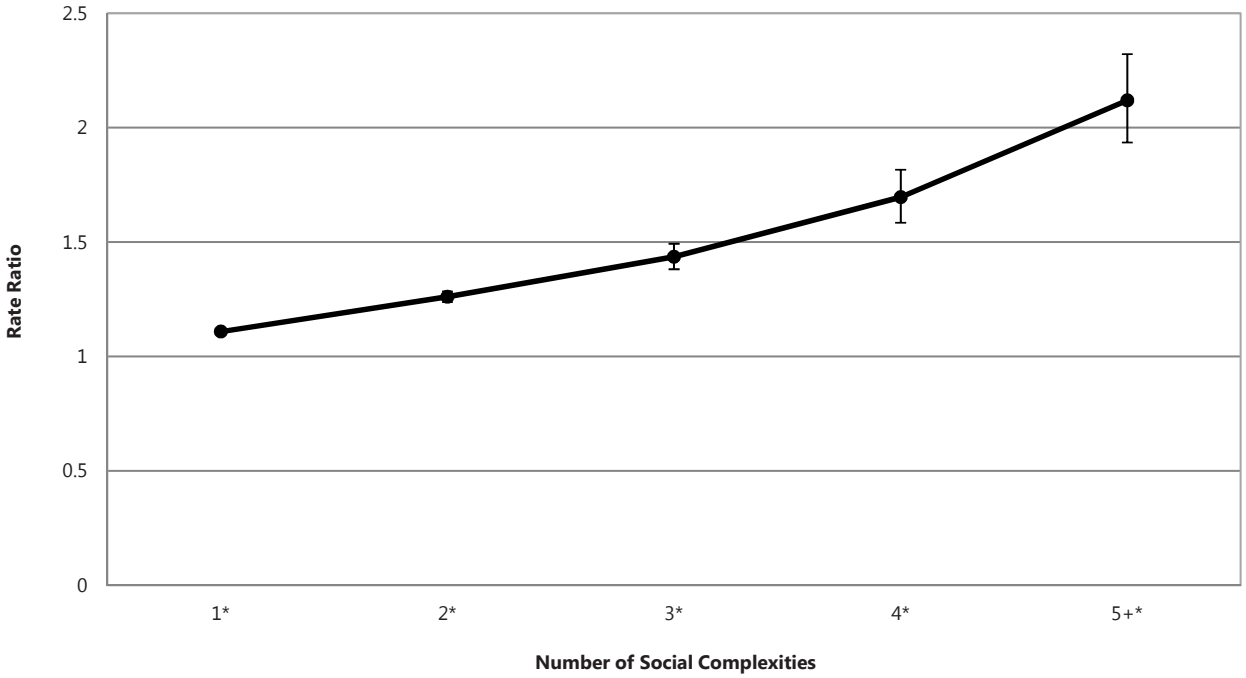
Social Complexity	Effect	p-value
High Residential Mobility	⇧	<0.001
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer		0.649
Child of a Newcomer	⇩	0.003
Teen Mom	⇧	<0.001
Child of a Teen Mom	⇧	<0.001
Child in Care	⇩	<0.001
Involvement with the Justice System	⇧	<0.001

⇧ indicates that the social complexity is associated with a significantly higher adjusted rate of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted rate of the outcome ($p<0.05$).

Figure 7.7: Relationship between the Number of Social Complexities and Ambulatory Visits to Primary Care for Patients with RUB 3, 4 or 5

2010/11–2012/13



* indicates that the adjusted rate is significantly different from the adjusted rate of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Ambulatory Visits to Primary Care for Patients with Three or More Social Complexities

Just as sickness level (measured by RUB) can influence the number of ambulatory visits, so too can social complexities. This indicator builds on the newly defined concept of social complexities to explain primary care ambulatory visit rates.

The indicator 'ambulatory visits to primary care for patients with three or more social complexities' is defined as the number of visits to a licensed primary care provider in an outpatient setting in Winnipeg per patient, annualized over the three-year study period. Only patients with three or more social complexities are considered in this analysis.

Table 7.26 shows the eligible population and crude rate of ambulatory visits to primary care for patients with three or more social complexities for each of the five models of primary care and overall. The average crude rate was 5.5 visits per patient per year. The non-PIN FFS model had the highest crude rate of all the models of primary care. The WRHA Primary Care model had the lowest crude rate.

Table 7.26: Eligible Population and Crude Rate of Ambulatory Visits to Primary Care for Patients with Three or more Complexities
2010/11–2012/13

Model of Primary Care	Eligible Population	Crude Rate
PIN FFS	10,014	5.26
WRHA Primary Care	7,742	4.49
Community Health Clinic	10,028	4.84
Teaching Clinic	2,036	4.91
Non-PIN FFS	164,468	5.63
Overall	194,288	5.52

Table 7.27 shows comparisons between the models of primary care for adjusted rates of ambulatory visits to primary care for patients with three or more social complexities. With the 'basic' adjustment, the adjusted rate of visits per year in the non-PIN FFS model is higher than the PIN FFS, WRHA Primary Care, and Teaching Clinic models. This indicator does not include a 'full' adjustment (i.e., an adjustment for social complexities) because social complexities are part of the indicator definition.

Table 7.27: Comparison between Models of Primary Care: Ambulatory Visits to Primary Care for Patients with Three or more Complexities
2010/11–2012/13

Model of Primary Care	*Basic Adjusted Rate	Comparison Model
PIN FFS (N=10,014 patients)		**WRHA Primary Care**
		Community Health Clinic
		Teaching Clinic
	⇩	**Non-PIN FFS**
WRHA Primary Care (N=7,742 patients)		**PIN FFS**
		Community Health Clinic
		Teaching Clinic
	⇩	**Non-PIN FFS**
Community Health Clinic (N=10,028 patients)		**PIN FFS**
		WRHA Primary Care
		Teaching Clinic
	⇩	**Non-PIN FFS**
Teaching Clinic (N=2,036 patients)		**PIN FFS**
		WRHA Primary Care
		Community Health Clinic
		Non-PIN FFS
Non-PIN FFS (N=164,468 patients)	⇧	**PIN FFS**
	⇧	**WRHA Primary Care**
	⇧	**Community Health Clinic**
		Teaching Clinic

⇧ indicates that the model's adjusted rate is statistically significantly higher than the comparison model's adjusted rate ($p<0.01$).
⇩ indicates that the model's adjusted rate is statistically significantly lower than the comparison model's adjusted rate ($p<0.01$).
Blank cell indicates that the model's adjusted rate is not statistically significantly different from the comparison model's adjusted rate.

*Basic Adjusted Rate: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit

Health Links - Info Santé is a provincial nurse-managed telephone service that operates 24 hours per day, seven days per week providing health information to the public. Callers are asked for their personal health information numbers during the call. Patients who call for information within 48 hours of a primary care visit are presumed to have questions about that visit that were not adequately addressed during the visit.

This indicator measures the rate of ambulatory visits to primary care over the study period with at least one associated call made to Health Links - Info Santé within a 48-hour period after the ambulatory visit. The rate presented is per 1,000 ambulatory visits. A lower rate of this indicator is considered a better outcome.

Table 7.28 shows the eligible population number and crude rate of ambulatory visits with at least one call to Health Links - Info Santé within two days of the visit for each of the five models of primary care and overall. The average crude rate was about seven calls per 1,000 visits. The WRHA Primary Care model had the highest crude rate of all the models of primary care. The PIN FFS model had the lowest crude rate. One clinic from the WRHA Primary Care model and one clinic from the Teaching Clinic model were removed from the results presented in this table because their rates were dramatically different from the other clinics in their models, thus distorting the model results.

Table 7.28: Eligible Population and Crude Rate of Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit

Per 1,000 visits, 2010/11–2012/13

Model of Primary Care	Number of Visits	Crude Rate
PIN FFS	867,082	3.83
WRHA Primary Care	110,977	7.10
Community Health Clinic	114,205	9.86
Teaching Clinic	82,853	6.06
Non-PIN FFS	5,525,318	4.37
Overall	6,700,435	4.46

Table 7.29 shows comparisons between the models of primary care for adjusted rates of an ambulatory visit with a call to Health Links – Info Santé within 48 hours of the visit. With the 'basic' adjustment and 'full' adjustment, the Teaching Clinic model had higher adjusted rates than all the other models; the WRHA Primary Care model had a higher adjusted rate than the PIN FFS, Community Health Clinic, and non-PIN FFS models; and the Community Health Clinic model had a higher adjusted rate than the PIN FFS and non-PIN FFS models.

Table 7.29: Comparison between Models of Primary Care: Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit

2010/11–2012/13

Model of Primary Care	Adjusted Rate		Comparison Model
	Basic*	Full**	
PIN FFS (N=867,082 patients)	⇩		**WRHA Primary Care**
	⇩	⇩	**Community Health Clinic**
	⇩	⇩	**Teaching Clinic**
			Non-PIN FFS
WRHA Primary Care (N=110,977 patients)	⇧		**PIN FFS**
			Community Health Clinic
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
Community Health Clinic (N=114,205 patients)	⇧	⇧	**PIN FFS**
			WRHA Primary Care
			Teaching Clinic
	⇧	⇧	**Non-PIN FFS**
Teaching Clinic (N=82,853 patients)	⇧	⇧	**PIN FFS**
			WRHA Primary Care
			Community Health Clinic
	⇧	⇧	**Non-PIN FFS**
Non-PIN FFS (N=5,525,318 patients)			**PIN FFS**
	⇩	⇩	**WRHA Primary Care**
	⇩	⇩	**Community Health Clinic**
	⇩	⇩	**Teaching Clinic**

⇧ indicates that the model's adjusted rate is statistically significantly higher than the comparison model's adjusted rate ($p<0.01$).

⇩ indicates that the model's adjusted rate is statistically significantly lower than the comparison model's adjusted rate ($p<0.01$).

Blank cell indicates that the model's adjusted rate is not statistically significantly different from the comparison model's adjusted rate.

*Basic Adjusted Rate: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, and country of graduation (Canada or other).

**Full Adjusted Rate: Basic adjustment with the addition of social complexities.

Table 7.30 shows the relationship between each social complexity and the adjusted rate of ambulatory visits with at least one call to Health Links - Info Santé within two days of the visit. Many of the social complexities were associated with either a lower or higher adjusted rate of ambulatory visits with at least one call to Health Links - Info Santé within two days of the visit compared to patients with no social complexities.

Table 7.30: Relationship between Social Complexities and Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit
2010/11–2012/13

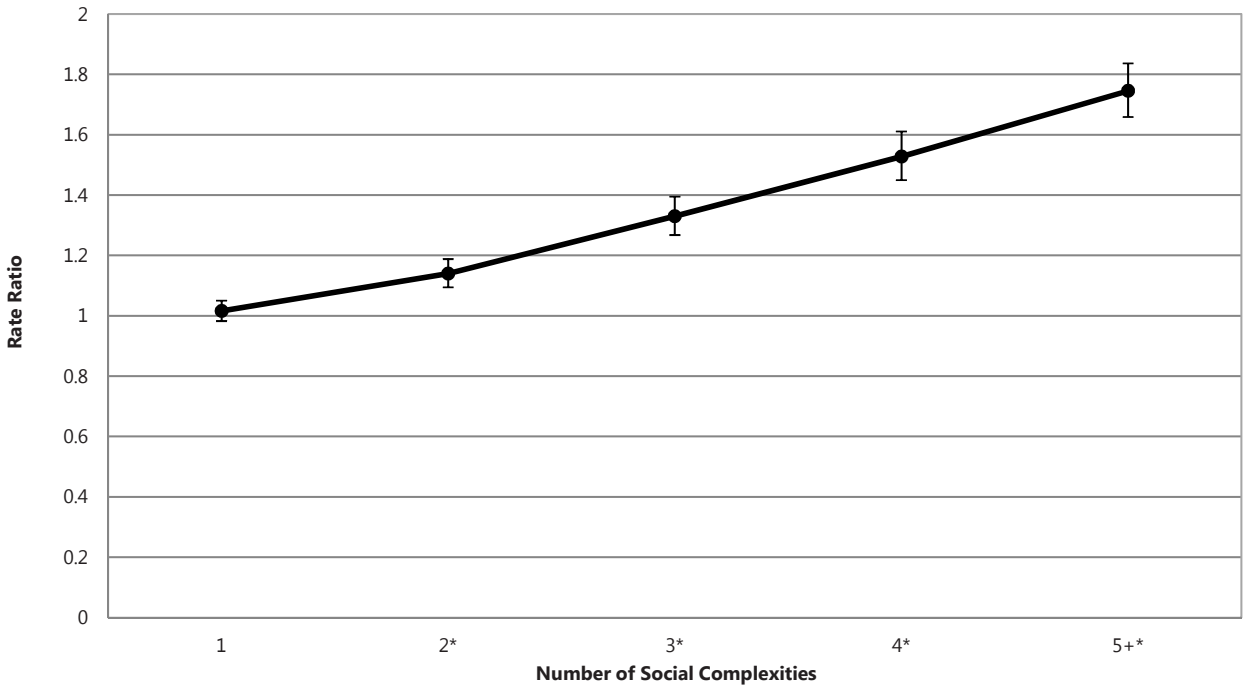
Social Complexity	Effect	p-value
High Residential Mobility	⇧	0.013
Low Income Quintile (Q1 vs. Q5)	⇧	<0.001
Social Housing Resident	⇧	<0.001
Income Assistance	⇧	<0.001
Major Mental Health Diagnosis	⇧	<0.001
Newcomer	⇩	<0.001
Child of a Newcomer	⇩	<0.001
Teen Mom	⇧	<0.001
Child of a Teen Mom	⇩	<0.001
Child in Care	⇩	<0.001
Involvement with the Justice System		0.057

⇧ indicates that the social complexity is associated with a significantly higher adjusted rate of the outcome ($p<0.05$).

⇩ indicates that the social complexity is associated with a significantly lower adjusted rate of the outcome ($p<0.05$).

Figure 7.8 shows the relationship between the number of social complexities (compared to no social complexities) and the adjusted rate ratio of ambulatory visits with at least one call to Health Links - Info Santé within two days of the visit. There was a statistically significant trend among the number of social complexities, meaning that the adjusted rate ratio of ambulatory visits with at least one call to Health Links - Info Santé within two days of the visit increased as the number of social complexities increased.

Figure 7.8: Relationship between the Number of Social Complexities and Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit
2010/11–2012/13



* indicates that the adjusted rate is significantly different from the adjusted rate of zero social complexities ($p<0.05$).
Note: Linear Trend Test statistically significant ($p<0.05$).

Summary

The health services delivery and use indicator results in this chapter extend the pattern developed by previous indicators, demonstrating that no single model is consistently achieving better outcomes than the others. The variability across the indicators is often small. Rates of emergency department visits and contacts with Health Links – Info Santé show the greatest variability, suggesting that patients feel the need to obtain more information or greater care beyond what is already being provided in certain models (in particular, WRHA Primary Care, Community Health Clinic, and Teaching Clinic models).

The continuity of care indices were lower than expected across all models. The assigned provider continuity of care indices were particularly noteworthy for the alternative-funded models, which may be explained by the high proportion of part-time providers in those models. However, it is evident that when a patient's assigned provider is not available, patients are often seen by another provider at the same clinic, which explains the increase in these models' indices for clinic-based continuity of care.

The high percentage of referrals to specialists that originate in clinics other than the one where the assigned physician works is concerning for all models.

The Community Health Clinic model had lower rates of lower back X-rays. The WHRA Primary Care model had higher adjusted rates of potentially avoidable hospital admissions, as well as higher adjusted rates of hospital readmission and emergency department visits for CTAS 4 or 5 patients, even after adjusting for social complexities.

Medical complexity (as measured by RUB) and social complexity were associated with an increased number of ambulatory visits to a similar extent. The PIN FFS and non-PIN FFS models tended to have higher visit rates than the alternative-funded models for the three ambulatory visit-related indicators. In contrast, the PIN FFS and non-PIN FFS clinics had lower adjusted rates of contact with Health Links – Info Santé.

The relationship between the social complexities and the healthcare delivery and use indicator outcomes varied considerably.

CHAPTER 8: SHADOW BILLING VALIDATION AND PANEL SIZE

This chapter describes the method we used to validate *shadow billings*, which are the billing claims made by alternative-funded primary care providers. Unlike the payment structure in the FFS model, payment to alternative-funded providers is not dependent on the submission of a claim for a particular visit. As a result, there is some uncertainty as to whether the data in the Repository captures the same proportion of patient visits to alternative-funded providers as it does to FFS providers. Ensuring that the Repository captures shadow billings at a similar rate to FFS billing claims is important to this study because many of the comparisons made are between shadow billing and FFS billing claims data.

This study is based on a fundamental assumption that the vast majority of visits to primary care providers working in Winnipeg are represented (as billing claims) in the Repository. If this assumption were incorrect, the requirement that each patient in the study cohort have at least three visits to primary care during the study period would have incorrectly excluded some patients from our study. More importantly, a systematic bias would have been introduced if there was a difference among the models of primary care in terms of the representation of visits in the Repository. If, for example, alternative-funded primary care providers were less likely to submit their billing claims than FFS providers, patients could have been allocated to the wrong provider and model due to those missing billing claims.

This chapter also presents the results of an analysis on panel size. Presented below are the associations between primary care provider and patient characteristics and panel size.

Shadow Billing Validation

New prescriptions for drugs are usually preceded by a primary care provider visit. To determine whether alternative-funded primary care providers shadow bill for their office visits, we identified new incident prescriptions for specific drugs in the fiscal year 2011/2012 in the DPIN database. We then searched for a corresponding primary care provider visit to the prescribing provider in the Medical Services data (i.e., billing claims) in the 30 days prior to the prescription dispensation date. We compared the proportion of visits to primary care providers working in alternative-funded clinic models to those working in FFS models. Only primary care providers with 100 or more allocated patients were included in this analysis because they are more likely to be full-time providers.

Our analyses found corresponding visits for 92.3% of the prescriptions from alternative-funded primary care providers compared to the 91.7% of the prescriptions from FFS primary care providers. We are thus confident that there is no meaningful difference in the submission rate of visit billing claims between the alternative-funded and FFS primary care providers included in our study.

This finding validates our patient allocation algorithm and justifies the use of the National Algorithm to calculate full-time equivalent values for all primary care providers, which was integral to the panel size analysis (see Chapter 2 for more details).

These validation results are expected for two reasons. First, all of the alternative-funded clinics included in this study have dedicated staff whose responsibility includes ensuring that shadow billings are submitted. This was not the case for many of the primary care providers included in our previous analyses. Second, the introduction of EMRs has resulted in automated processes that remind staff at alternative-funded clinics to submit billings for visits in the EMR that do not yet have billings associated with them.

Primary Care Provider Panel Size

'Panel size' refers to the number of patients who receive care from a single primary care provider.. In order to calculate provider panel size it is necessary to allocate each patient to one primary care provider. The process of allocation depends on how the healthcare system is organized. In some jurisdictions (e.g., Ontario), a process called 'rostering' allocates the majority of patients to providers. Rostering results in the primary care provider having a 'roster' of patients with whom they have a formal agreement to provide ongoing care. This roster of patients constitutes the primary care provider's 'panel'. A panel that is too large may result in challenges in access to care (e.g., long wait times to get an appointment). An alternative-funded provider panel that is too small may result in less cost-effective care. In an FFS environment, a primary care provider may encourage more frequent visits to ensure adequate income; in an alternative-funded environment, primary care providers would be paid the same whether they care for many patients or for fewer patients, thus potentially increasing the cost per patient. In addition to the direct cost impacts of different panel sizes, primary care provider resource planning also requires an understanding of the average panel size and the factors that influence that number.

The determination of panel size in our study is based on our allocation algorithm. All patients were allocated to a provider panel based on the provider from whom they received the majority of their care. This approach was the same for FFS and alternative-funded providers. A further consideration in the calculation of panel size is the amount of time a clinician spends in patient care. Fee-for-service primary care providers can choose to work less than full-time and alternative-funded primary care providers often have other responsibilities, such as administration, research, and teaching, which can significantly limit their clinical time. The data in the Repository do not specify the number of clinical hours worked. We used the National Algorithm (described in Chapter 2), which classifies the full-time equivalent (FTE) of clinical work based on the relationship between a provider's billings and the average billings. We are thus able to assign an FTE to all primary care providers.

There are many factors that may influence the optimal panel size for any one primary care provider. Traditionally, patient characteristics, such as age, sex, and morbidity, have been included in this calculation. We have added social complexities to this analysis based on our understanding that these complexities make patient care more challenging, and time-consuming. Our results show that patients with five or more social complexities have 20% more visits to their primary care provider (see Chapter 7). We have not proposed a theoretical weighting of the impact of individual complexities on panel size, but our analyses indicated that it was not feasible to simply include all the social complexities in a regression model to determine the individual effects of each complexity after controlling for the other relevant factors. This is due to co-linearity among the social complexities. We therefore performed a statistical technique called factor analysis, which created a Social Complexity Index. For a more details, please see Appendix 3.

Table 8.1 presents the results of the univariate analysis. The bold variables with a positive estimate value are associated with an increase in panel size and those with a negative value are associated with a decrease in panel size. For example, for every unit increase in provider age, 'years in practice' the panel size increased by 12.7 patients; for every increase of 1% in the proportion of patients who are male, the panel size decreased by 2.6 patients.

Table 8.1: Association between Patient and Provider Characteristics and Panel Size Unadjusted Values

Characteristic	Estimate (95% Confidence Interval)	p-value
Provider Sex	64.14 (-8.71 – 136.99)	0.084
Provider Age	**5.64 (2.65 – 8.63)**	**<0.001**
International Medical Graduate	33.26 (-42.86 – 109.37)	0.392
Years of Practice	**12.67 (8.84 – 16.49)**	**<0.001**
Percent of Visits from Non-Allocated Patients	**-11.63 (-13.77 – -9.49)**	**<0.001**
Percent of Patients aged 75 or older	**9.02 (3.60 – 14.43)**	**0.001**
Percent of Male Patients	**-2.62 (-4.51 – -0.74)**	**0.006**
Percent of Patients who are RUB 4 or 5	**29.35 (19.00 – 39.69)**	**<0.001**
Percent of Patients who are Children of Teen Moms	**-6.36 (-9.55 – -3.17)**	**<0.001**
Percent of Children with a History of Being in Care	**-11.72 (-20.33 – -3.12)**	**0.008**
Percent of Patients who are Children of Newcomers	**-25.06 (-43.64 – -6.49)**	**0.008**
Percent of Patients with 3+ Moves in 10 years	**-3.09 (-5.91 – -0.28)**	**0.031**
Percent of Patients in Social Housing	**-4.44 (-8.06 – -0.82)**	**0.016**
Percent of Patients on Income Assistance	**-3.51 (-5.48 – -1.55)**	**<0.001**
Percent of Q1 Patients	**-3.55 (-6.23 – -0.87)**	**0.009**
Percent of Patients with Justice System Involvement	**-4.13 (-7.39 – -0.88)**	**0.013**
Percent of Patients with a Major Mental Health Diagnosis	**7.20 (2.01 – 12.39)**	**0.007**
Percent of Patients who are Newcomers	-6.23 (-14.25 – 1.78)	0.127
Percent of Patients who are Teen Moms	-0.71 (-6.35 – 4.93)	0.806
Social Complexity Index	**-50.94 (-86.98 – -14.89)**	**0.006**

Values in bold type indicate statistically significantly values (p<0.05).

Table 8.2 presents the results of the regression model with the inclusion of the Social Complexity Index. Only those variables bolded have a statistically significant influence on panel size. Some variables increase the panel size: for example, male primary care providers have an average of 210 more patients than female primary care providers; and the association between panel size and having more male patients is doubled to 5.23 compared to -2.62 (see Table 8.1) after controlling for all the variables in the model. The social complexity 'child of a newcomer' was removed from the regression model because it was highly correlated with the 'newcomer' social complexity.

Table 8.2: Association between Patient and Provider Characteristics and Panel Size Regression Model Results

Characteristic	Estimate (95% Confidence Interval)	p-value
Baseline	**881.19 (833.93 – 928.44)**	**<0.001**
Male Provider	**210.21 (109.09 – 311.33)**	**<0.001**
Provider Age	2.13 (-1.81 – 6.07)	0.290
Provider Age (Quadractic Term)	**-0.36 (-0.60 – -0.13)**	**0.002**
International Medical Graduate	73.93 (-3.43 – 151.29)	0.061
Years of Practice	3.86 (-1.04 – 8.76)	0.123
Percent of Patients aged 75 or older	1.84 (-6.28 – 9.96)	0.657
Percent of Male Patients	**-5.23 (-7.90 – -2.55)**	**<0.001**
Percent of Patients who are RUB 4 or 5	-4.05 (-17.32 – 9.22)	0.550
Percent of Visits from Non-Allocated Patients	**-9.97 (-12.57 – -7.38)**	**<0.001**
Social Complexity Index	-37.17 (-76.65 – 2.30)	0.065
Percent of Patients who are Newcomers	6.28 (-1.84 – 14.41)	0.130
Percent of Patients with a Major Mental Health Diagnosis	3.68 (-2.08 – 9.43)	0.211

Values in bold type indicate statistically significantly values ($p<0.05$).

Table 8.3 shows actual and expected panel sizes based on the statistical models we developed. The expected panel sizes for each model take into account the characteristics of the patients allocated to those models and provider characteristics of the providers working in those models. The most striking differences between the actual panel size and the expected panel size were for the Teaching Clinic model, where the actual panel size was about two-thirds of the expected panel size, and the Community Health Clinic model, where the panel size was about three-quarters of the expected panel size. In the case of the Teaching Clinic model, this is not surprising because the mandate of these clinics includes the training of learners: this means that each visit takes longer and that provider time is also allocated to non-clinical teaching. The PIN FFS model panel size was about 20% larger than predicted by the statistical model, which may reflect the added capacity to provide care through the re-investment of the quality-based incentive funding in the clinics in that model of care. The Community Health Clinic model had the most socially complex patients (Figures 3.5 and 3.6). The statistical model may underestimate the impact of multiple social complexities on panel size, thus resulting in the lower than expected actual panel size for this model of care.

Table 8.3: Clinical Model Panel Size

	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic	Non-PIN FFS
Acutal Panel Size	1,095.1	766.0	588.0	560.7	902.8
Expected Panel Size	908.9	779.0	792.4	834.5	895.7

Conclusion

The analyses in this chapter provide reassurance that our fundamental assumption about the completeness of billing claims is valid. Further analyses provide objective information on the factors that influence panel size in Winnipeg and by how much. While our model predicts the panel size of the non-PIN FFS and WRHA models of care extremely well, the differences between the actual and predicted panel sizes for the other models is explained above. These results can be used by system planners and managers to determine the expected number of patients for whom any one provider should be responsible based on provider and patient characteristics. Prior to this report, there has not been a method to determine how to set practice panel size targets for planning and management purposes.

CHAPTER 9: SUMMARY OF RESULTS AND DISCUSSION

This study compared five models of primary care delivery in Winnipeg, Manitoba: two FFS models and three alternative-funded models. The models of primary care delivery were compared using 29 primary care indicators. The goals of this study were to characterize the patients served (socio-economic status, presence of chronic disease, presence of social factors impacting health, and age/sex distribution), to explore patients' affinity to a single clinic (continuity of care), and to assess the quality of care across the models of care as described by these 29 indicators. Contextual differences among the various clinics in Winnipeg can make it difficult to make direct comparisons across clinics. The analyses in this study addressed this issue by controlling for patient and primary care provider characteristics. However, it is important to recognize the limitation of this approach. While we controlled for as many patient and provider variables as possible, we recognize that there are factors (such as patient treatment choices) that we were unable to control for in this study which may influence the indicator results. For example, patients may choose not to follow their provider's advice.

We also calculated panel size for primary care providers in each type of funding model (FFS vs alternative-funded). We adjusted these panel sizes based on patient complexities to determine the effect of social complexities on panel size.

Chapters 4, 5, 6, and 7 present our findings on the different categories of primary care quality indicators, and Chapter 8 addresses panel size. The current chapter provides a summary of these results with relevant discussion.

Primary Care Quality Indicator Results

This section presents a discussion of the primary care quality indicators and social complexity results by chapter. Summary tables of the indicator results are presented, comparing indicator results for each model of primary care to the non-PIN FFS model (the most common model of primary care in Winnipeg). Summary tables of the relationships between social complexities and the indicators are also presented.

Overall Results by Model of Primary Care Delivery

Prevention and Screening

The overall observation is that prevention and screening indicator rates for the PIN FFS model were generally higher than the other models of primary care. In contrast to this, some of the indicator rates for the Teaching Clinic model were significantly lower than the other models of primary care. However, for the Teaching Clinic model, poor reporting appears to account for the lower rates of vaccinations (Dr. Alex Singer, Electronic Communication, September 2014, Director at MaPCREN). The PIN FFS model performed better than the non-PIN FFS model in five of the seven prevention and screening indicators; the WRHA Primary Care, and Community Health Clinic models had similar indicator results to the non-PIN FFS model.

Two observations put these results into perspective: first, the PIN FFS model included financial incentives to clinics for achieving targets in prevention and screening; and second, despite this finding, previous research has failed to show significantly higher rates for the PIN FFS model when comparisons include analyses of the rates before and after the implementation of the model (Katz et al., 2014). This suggests that the incentives that the PIN clinics received may not be associated with the higher screening and prevention rates, as these may instead be related to provider characteristics.

In more than half of the indicators studied, having one or more social complexities was associated with poorer prevention and screening rates.

How do the different models of care compare across the prevention and screening indicators?

Table 9.1 presents a summary of the results of the prevention and screening indicators. The results of the 'full' statistical model for each indicator are presented by model of primary care compared to the non-PIN FFS model, which is the model serving the majority of the Winnipeg population.

Teaching clinics appeared worse on vaccinations, but there is a specific problem with tracking vaccinations given by trainees at these clinics. Trainees have been found to not routinely include vaccinations in their Manitoba Health billing submissions even when the vaccinations are recorded in the electronic medical record.

Table 9.1: Summary of Indicator Results by Model of Primary Care Compared to Non-PIN FFS: Prevention and Screening

Indicator	Model of Primary Care*			
	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic
Breast Cancer Screening, Aged 50-74	⇧	⇧		
Cervical Cancer Screening, Aged 21-69	⇧			
Colorectal Cancer Screening, Aged 50-74	⇧		⇩	
Completed Vaccinations at Age Two		⇩		⇩
Annual Influenza Vaccination, Aged 65 and Older	⇧			⇩
Annual Influenza Vaccination, Total Respiratory Morbidity				
Pneumococcal Vaccination, Aged 65 and Older	⇧			

⇧ indicates that the model of care odds ratio is statistically significantly higher than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

⇩ indicates that the model of care odds ratio is statistically significantly lower than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

A blank cell represents no significant difference between the two models of primary care.

*Full Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, country of graduation (Canada or other); and social complexities.

What is the impact of the social complexities on the prevention and screening indicator outcomes?

Table 9.2 presents the relationship between the social complexities and the prevention and screening indicators. The table presents the indicators in the first column and the relationship with each social complexity in subsequent columns. The table summarizes the findings by indicator (looking across the rows) and by social complexity (looking down each column).

Some indicators, such as breast cancer screening, were consistently influenced by all or most of the social complexities. Other indicators, like the adult vaccination indicators, showed less consistent patterns. The impact of the social complexities was more consistent for the complexities in Table 9.2 (high residential mobility, low income quintile, social housing resident, income assistance, major mental health diagnosis) than those presented in Table 9.2 continued (newcomer, child of a newcomer, teen mom, child in care, involvement with the justice system).

Table 9.2: Summary of the Relationship between Social Complexities and Indicator Outcomes: Prevention and Screening

Indicator	Social Complexity				
	High Residential Mobility	Low Income Quintile (Q1 vs. Q5)	Social Housing Resident	Income Assistance	Major Mental Health Diagnosis
Breast Cancer Screening, Aged 50-74	⇩	⇩		⇩	⇩
Cervical Cancer Screening, Aged 21-69	⇧	⇩	⇧	⇩	⇩
Colorectal Cancer Screening, Aged 50-74	⇩	⇩		⇩	⇩
Completed Vaccinations at Age Two	⇩	⇩		⇩	–
Annual Influenza Vaccination, Aged 65 and Older		⇩		⇩	⇩
Annual Influenza Vaccination, Total Respiratory Morbidity	⇩			⇩	⇧
Pneumococcal Vaccination, Aged 65 and Older			⇧	⇩	⇧

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Table 9.2: Continued

Indicator	Social Complexity					
	Newcomer	Child of a Newcomer	Teen Mom	Child of a Teen Mom	Child in Care	Involvement with the Justice System
Breast Cancer Screening, Aged 50-74	⇩	–	⇩	–	–	⇩
Cervical Cancer Screening, Aged 21-69		–		–	–	⇧
Colorectal Cancer Screening, Aged 50-74	⇧	–	⇩	–	–	⇩
Completed Vaccinations at Age Two	–	⇧	–	⇩		
Annual Influenza Vaccination, Aged 65 and Older	⇩	–		–	–	⇩
Annual Influenza Vaccination, Total Respiratory Morbidity		⇧	⇩	⇩	⇧	⇩
Pneumococcal Vaccination, Aged 65 and Older	⇩	–		–	–	⇩

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Chronic Disease Management

There was very little difference among the models of primary care for the indicators related to chronic disease management. This is partly due to the fact that there were few patients in each clinic who are eligible for each indicator, resulting in small sample sizes. As a result, the social complexities had less association with the indicators than those in the previous section.

How do the different models of care compare across the chronic disease management indicators?

As discussed above, many of the chronic disease management indicators lacked sufficient population numbers to demonstrate statistical differences between the primary care models. Table 9.3 shows the results of the 'full' statistical model for each indicator, which is presented by model of primary care compared to the non-PIN FFS model.

Table 9.3: Summary of Indicator Results by Model of Primary Care Compared to Non-PIN FFS: Chronic Disease Management

Indicator	Model of Primary Care*			
	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic
Diabetes Management, Eye Examination	⇧			
Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment			⇧	
Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment				
Post-Myocardial Infarction Management, Initiation of Beta-Blocker Drug Treatment				
Post-Myocardial Infarction Management, Persistence of Beta-Blocker Drug Treatment				
Post-Myocardial Infarction Management, Initiation of Cholesterol-Lowering Drug Treatment				
Post-Myocardial Infarction Management, Persistence of Cholesterol-Lowering Drug Treatment				
Asthma Management, Medication Use				

⇧ indicates that the model of care odds ratio is statistically significantly higher than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

⇩ indicates that the model of care odds ratio is statistically significantly lower than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

A blank cell represents no significant difference between the two models of primary care.

*Full Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, country of graduation (Canada or other); and social complexities.

What is the relationship between the social complexities and the chronic disease management indicator outcomes?

In the few instances where relationships between the social complexities and the chronic disease management indicators existed, they were uniformly negative, but overall there were few relationships with the outcomes at all. The 'major mental health diagnosis' (Table 9.4) and 'involvement with the justice system' social complexities (Table 9.4 continued) had the most associations with the indicators, with negative associations with four indicators. In previous research, patients with mental health diagnoses have been shown to have poorer outcomes for multiple medical conditions (Martens et al., 2004). These patients tend to be on medications for their mental health conditions, which may divert the attention of both patient and provider towards mental health and away from other chronic health concerns.

Table 9.4: Summary of the Relationship between Social Complexities and Indicator Outcomes: Chronic Disease Management

Indicator	Social Complexity				
	High Residential Mobility	**Low Income Quintile (Q1 vs. Q5)**	**Social Housing Resident**	**Income Assistance**	**Major Mental Health Diagnosis**
Diabetes Management, Eye Examination		⇩		⇩	
Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment				⇩	⇩
Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment				⇩	⇩
Post-Myocardial Infarction Management, Initiation of Beta Blocker Drug Treatment					⇩
Post-Myocardial Infarction Management, Persistence of Beta-Blocker Drug Treatment					
Post-Myocardial Infarction Management, Initiation of Cholesterol-Lowering Drug Treatment					⇩
Post-Myocardial Infarction Management, Persistence of Cholesterol-Lowering Drug Treatment					
Asthma Mangaement, Medication Use		⇩			

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Table 9.4: Continued

Indicator	Social Complexity					
	Newcomer	Child of a Newcomer	Teen Mom	Child of a Teen Mom	Child in Care	Involvement with the Justice System
Diabetes Management, Eye Examination		–	⇩	–	–	⇩
Congestive Heart Failure Management, Initiation of ACE Inhibitor Drug Treatment	⇩	–		–	–	
Congestive Heart Failure Management, Persistence of ACE Inhibitor Drug Treatment	⇩	–		–	–	⇩
Post-Myocardial Infarction Management, Initiation of Beta-Blocker Drug Treatment		–		–	–	
Post-Myocardial Infarction Management, Persistence of Beta-Blocker Drug Treatment		–		–	–	⇩
Post-Myocardial Infarction Management, Initiation of Cholesterol-Lowering Drug Treatment		–		–	–	
Post-Myocardial Infarction Management, Persistence of Cholesterol-Lowering Drug Treatment		–		–	–	
Asthma Management, Medication Use	⇩	–		–	–	⇩

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Medical Care

These analyses revealed few differences between the models of primary care. The rates of inappropriate prescribing of benzodiazepines and other non-recommended drugs for seniors are already generally low, so there would need to be extreme differences between models of care to achieve statistical significance between them.

Table 9.5: Summary of Indicator Results by Model of Primary Care Compared to Non-PIN FFS: Medical Care

Indicator	Model of Primary Care*			
	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic
Benzodiazepine Prescribing in Community Dwelling Adults, Aged 75 and Older				
Depression Care, Prescription Follow-up		⇩		
Beers Drug Prescribing in Community Dwelling, Aged 65 and older				

⇧ indicates that the model of care odss ratio is statistically significantly higher than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

⇩ indicates that the model of care odds ratio is statistically significantly lower than the odds ratio for Non-PIN FFS model of care ($p<0.01$).

A blank cell represents no significant difference between the two models of primary care.

*Full Adjusted Odds Ratio: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, country of graduation (Canada or other); and social complexities.

Effect of Social Complexities on Medical Care Indicator Summary Results

All of the social complexities in Table 9.6 were associated with an increase in prescribing for the elderly except 'involvement with the justice system'. In terms of specific social complexities, 'major mental health diagnosis' was associated with an increase in the rate of all three indicators; 'high residential mobility' and 'income assistance' were associated with an increase in the rates of two indicators; and 'newcomer' was associated with a decrease in the rates of two indicators. There may be some overlap in the prescribing to treat the social complexities (i.e., major mental illness) and the prescriptions included in the indicators, which would explain that association.

Table 9.6: Summary of the Relationship between Social Complexities and Indicator Outcomes: Medical Care

Indicator	Social Complexity				
	High Residential Mobility	Low Income Quintile (Q1 vs. Q5)	Social Housing Resident	Income Assistance	Major Mental Health Diagnosis
Benzodiazepine Prescribing in Community Dwelling Adults, Aged 75 and Older	⇧			⇧	⇧
Depression Care, Prescription Follow-up					⇧
Beers Drug Prescribing in Community Dwelling, Aged 65 and older	⇧	⇧	⇧	⇧	⇧

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Table 9.6: Continued

Indicator	Social Complexity					
	Newcomer	Child of a Newcomer	Teen Mom	Child of a Teen Mom	Child in Care	Involvement with the Justice System
Benzodiazepine Prescribing in Community Dwelling Adults, Aged 75 and Older		–	–	–	–	
Depression Care, Prescription Follow-up	⇩					
Beers Drug Prescribing in Community Dwelling, Aged 65 and older	⇩	–	–	–	–	

⇧ indicates that the complexity is associated with a significantly higher adjusted odds ratio of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted odds ratio of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Health Services Use and Delivery

Health Services Use and Delivery Indicator Summary Results

For some of the health services use and delivery indicators, higher rates are better (continuity of care); for others, lower rates are preferable (hospitalizations for ACSCs, X-ray for lower back pain, emergency department visit rate for patients with CTAS 4 or 5, and ambulatory visits with a call to Health Links-Info Santé with two days of visit). As Table 9.7 demonstrates, when comparing the health services use and delivery indicators across the models, there is no one single model of care that stands out as having a better rate across multiple indicators.

Patients attending the FFS clinics have higher visit rates; however, we cannot tell definitively if these visits are indicated based on true patient need or not. In addition, it is quite likely that patients attending alternative-funded clinics are being seen in follow-up by other healthcare professionals, such as nurses, who do not submit billings claims; as such, these visits would not be represented in this study.

Table 9.7: Summary of Indicator Results by Model of Primary Care Compared to Non-PIN FFS: Health Services Use and Delivery

Indicator	Model of Primary Care*			
	PIN FFS	WRHA Primary Care	Community Health Clinic	Teaching Clinic
Continuity of Care, Assigned Primary Care Provider				⇩
Hospitalizations for Ambulatory Care Sensitive Conditions, Aged 74 and Younger		⇧		
X-Ray for Lower Back Pain, Aged 20 and Older			⇩	
Hospital Episodes with a Readmission within 30 Days				
Emergency Department Visit Rate, Patients with CTAS 4 or 5		⇧		
Ambulatory Visits to Primary Care		⇩	⇩	⇩
Ambulatory Visits to Primary Care, Patients with RUB 3, 4 or 5	⇩	⇩	⇩	⇩
Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit		⇧	⇧	⇧

⇧ indicates that the model of care rate/odds ratio/index is statistically significantly higher than the rate/odds ratio/index for Non-PIN FFS model of care ($p<0.01$).

⇩ indicates that the model of care rate/odds ratio/index is statistically significantly lower than the rate/odds ratio/index for Non-PIN FFS model of care ($p<0.01$).

A blank cell represents no significant difference between the two models of primary care.

*Full Adjusted Rate/Odds Ratio/Index: Adjusted for patient income quintile, sex, age, and RUB; and provider age, sex, years of practice, country of graduation (Canada or other); and social complexities.

Relationship between the Social Complexities and the Health Services Use and Delivery Indicator Summary Results

The relationship between the social complexities and the Health Services Use and Delivery outcomes is presented in Table 9.8. Social complexities had mixed associations with both continuity of care indicators and referral rates. There was a consistent association between social complexities and increased hospitalizations (ACSCs and readmission rates), CTAS 4 or 5 emergency department visits, ambulatory care visits, and ambulatory visit with a call to Health Links – Info Santé within two days of the visit. As suggested above, the factors contributing to these indicators are complex; however, the association between social complexities and medical outcomes was very strong.

Table 9.8: Summary of the Relationship between Social Complexities and Indicator Outcomes: Health Services Use and Delivery

Indicator	Social Complexity				
	High Residential Mobility	Low Income Quintile (Q1 vs. Q5)	Social Housing Resident	Income Assistance	Major Mental Health Diagnosis
Continuity of Care, Assigned Primary Care Provider	⇩	⇧	⇩		⇧
Continuity of Care, Clinic-Based	⇩		⇩	⇧	
Referral Rates	⇧	⇩			⇧
Hospitalizations for Ambulatory Care Sensitive Conditions, Aged 74 and Younger		⇧	⇧	⇧	⇧
X-Ray for Lower Back Pain, Aged 20 and Older					
Hospital Episodes with a Readmission within 30 Days		⇧	⇧	⇧	⇧
Emergency Department Visit Rate, Patients with CTAS 4 or 5	⇧	⇧	⇧	⇧	⇧
Ambulatory Visits to Primary Care	⇧	⇧	⇧	⇧	⇧
Ambulatory Visits to Primary Care, Patients with RUB 3, 4 or 5	⇧	⇧	⇧	⇧	⇧
Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit	⇧	⇧	⇧	⇧	⇧

⇧ indicates that the complexity is associated with a significantly higher adjusted rate/odds ratio/index of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted rate/odds ratio/index of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Table 9.8: Continued

Indicator	Social Complexity					
	Newcomer	Child of a Newcomer	Teen Mom	Child of a Teen Mom	Child in Care	Involvement with the Justice System
Continuity of Care, Assigned Primary Care Provider	⇧	⇧	⇩	⇩	⇩	⇩
Continuity of Care, Clinic-Based				⇩		⇩
Referral Rates	⇧	⇩	⇧	⇩	⇩	⇧
Hospitalizations for Ambulatory Care Sensitive Conditions, Aged 74 and Younger	⇩	⇧		⇩	⇧	
X-Ray for Lower Back Pain, Aged 20 and Older		–		–	–	
Hospital Episodes with a Readmission within 30 Days		⇧		⇩		
Emergency Department Visit Rate, Patients with CTAS 4 or 5	⇩	⇧		⇧	⇧	⇧
Ambulatory Visits to Primary Care	⇧	⇩	⇧	⇧	⇩	⇧
Ambulatory Visits to Primary Care, Patients with RUB 3, 4 or 5		⇩	⇧	⇧	⇩	⇧
Ambulatory Visit with a Call to Health Links – Info Santé within Two Days of Visit	⇩	⇩	⇧	⇩	⇩	

⇧ indicates that the complexity is associated with a significantly higher adjusted rate/odds ratio/index of the outcome ($p<0.05$).

⇩ indicates that the complexity is associated with a significantly lower adjusted rate/odds ratio/index of the outcome ($p<0.05$).

"–" indicates that complexity is not applicable for the indicator.

Blank cell indicates no statistically significant difference.

Validation of Shadow Billing

We addressed the concern that the administrative data in the Repository provide an incomplete picture of the work performed by alternative-funded primary care providers.

Prescription-based validation of shadow billing

Previous work at MCHP suggested that up to one third of all visits for alternative-funded primary care providers may not have billings in the Repository. This was based on an analysis of the presence of visit billing in the Repository associated with a new drug dispensation from a pharmacy where the generation of a new prescription for that drug was thought to be very unlikely without a face-to-face visit with the prescriber. Those analyses included rural alternative-funded primary care providers working as single providers with little administrative support, in addition to most of the clinics included in this study.

The current study found that there was no difference in the rate of billing between alternative-funded and FFS primary care providers. These results are both reassuring and unsurprising. A finding suggestive of significant missing data would have placed many of our results in doubt as most of our analyses are dependent on being able to make valid assignments of patients to the different clinic types. A significant rate of missing billings from certain models of care would have resulted in the misallocation of patients between models of care.

These results are expected for two reasons. First, all of the clinics included in this study have dedicated staff whose responsibilities include ensuring that shadow billings are submitted. This was not the case for many of the primary care providers included in our previous analyses. Second, the introduction of EMRs has resulted in automated processes that remind clinics to submit billings for visits in the EMR that do not yet have billings associated with them.

Primary Care Provider Panel Size

Our analyses have identified primary care provider and patient demographics, and social complexities that impact panel size. This is the first time social complexities have been shown to influence panel size. Our statistical models have provided new insight into predicted panel sizes for different models based on the characteristics of the patients and providers associated with these models of care.

Summary

In summary, there is no best model that stands out from our analyses. As with previous primary care quality analyses, we have demonstrated the need for a systematic quality improvement initiative in Winnipeg because the results for many indicators are below expectation. It is also worth noting that the more detailed analyses performed by clinic for the alternative-funded clinics demonstrate obvious differences among clinics that are included in the same model of care. For example, two clinics in the WRHA Primary Care model have higher rates of social complexities than the other WRHA sites. The analyses in this report provide new information about the clinicians and patients across five different models of primary healthcare delivery in Winnipeg and their interactions with the healthcare system. While no single model of care is clearly superior, it does appear that the current system provides the framework for patient needs to be met. This report provides unique information about the patients attending Winnipeg clinics in terms of their social complexity, which will be useful for those responsible for managing the system. In particular there is an opportunity to provide additional targeted support to the small group of FFS physicians that provide care to newcomers to Canada.

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APPENDIX 1 – PRIMARY CARE QUALITY INDICATOR DEFINITIONS

Appendix Table 1.1: Definitions and Codes of Primary Care Quality Indicators Used in This Deliverable

PREVENTION AND SCREENING	
Indicator	**Definition**
Breast cancer screening for women aged 50-74	Women aged 50-74 who had at least one mammogram in a two-year period during our study period. • Mammogram tariff codes: 7098, 7099, 7104, 7110 or 7111 Women with a history of breast cancer were excluded (data from CancerCare Manitoba).
Cervical cancer screening for women aged 21-69	Women aged 21-69 who had a least one Papanicolaou (Pap) test in 3 years (fiscal years 2010/11-2012/13). Women who have had a hysterectomy were excluded. Pap test tariff codes: 8470, 8495, 8496, 8498, 9470, 9795
Colorectal cancer screening for adults aged 50-74	Patients aged 50-74 who had at least one Fecal Occult Blood Test (FOBT) in a two-year period (fiscal years 2011/12-2012/13). Patients with a history of colorectal cancer were excluded (data from CancerCare Manitoba) FOBT tariff code: 9374 Exclusions: 1. FOBTs done in hospital; 2. FOBTs done within 6 months of a GI complaint; 3. FOBTs done within 6 months of a colonoscopy, barium enema, or flexible sigmoidoscopy; and 4. FOBTs done within 1 year of a previous FOBT.

Appendix Table 1.1: Continued

Completed vaccinations at age two	Two-year-olds covered in Manitoba from birth to their 2nd birthday who received complete immunizations as per the schedule at the time (data from Manitoba Immunization Monitoring System): • Children born prior to October 1, 2004 require 4 shots of DTP, 3 shots of polio, 4 shots of HiB, 1 shot of MMR • Children born between October 1, 2004 and December 31, 2004 require 4 shots of DTP, 3 shots of polio, 4 shots of HiB, 1 shot of MMR, 3 shots of PCV, 1 shot of Varicella • Children born in 2005 to 2008 require 4 shots of DTP, 3 shots of polio, 4 shots of HiB, 1 shot of MMR, 4 shots of PCV, 1 shot of Varicella • Children born in 2009 up to Jul 1, 2010 require 4 shots of DTP, 3 shots of polio, 4 shots of HiB, 1 shot of MMR, 4 shots of PCV, 1 shot of Varicella, 1 shot of Men-C • Children born after Jul 1, 2010 require 4 shots of DTP, 3 shots of polio, 4 shots of HiB, 1 shot of MMR, 3 shots of PCV, 1 shot of Varicella, 1 shot of Men C Tariff codes for vaccinations: • DTP: 8601, 8602, 8603, 8609, 8641, 8642, 8643, 8649, 8651, 8781, 8782, 8783, 8789, 8798, 8802, 8804, 8805, 8806, 8807, 8921, 8922, 8923, 8924, 8929; • Polio: 8611, 8612, 8613, 8619, 8798, 8802, 8804, 8805, 8806, 8807, 8924, 8931, 8932, 8933, 8939; • HiB: 8781, 8782, 8783, 8789, 8802, 8804, 8806, 8807, 8901, 8902, 8903, 8909; • MMR: 8621, 8670; • Varicella: 8672, 8674; • PCV7/13: 8681, 8682, 8683, 8684, 8962, 8896 • Men-C: 8685, 8686, 8687, 8925 Acronyms: • DTP: Diphtheria, Tetanus, Pertusis • HiB: Haemophilus influenza type b • MMR: Measles, Mumps, Rubella • PCV: Pneumococcal Conjugate 13 valent • Men-C: Meningococcal C Conjugate Note: there was a schedule change in July 2012 so that PCV now requires 3 shots instead of 4. Also, the Men-C vaccine was added to the schedule in 2011.

Appendix Table 1.1: Continued

Annual influenza vaccinations: 1) Adults aged 65 and older 2) People with total respiratory morbidity	Influenza Immunization Tariffs: 8791, 8792, 8799 – defined using MIMS data Influenza Immunization Rates were calculated for two groups: 1. Adults aged 65 and older The percentage of patients aged 65 and older who received a vaccine for influenza in the study period. Manitoba Health, Healthy Living and Senior's recommendation is to get the vaccine for influenza annually at that age: so, if a patient is eligible in all three years of the study period, they need three shots (one in each year) to appear in the numerator; and if the patient is only eligible for one year of the study period, the patient only needs one shot (in the year the patient is eligible) to appear in the numerator. 2. People with total respiratory morbidity (TRM) TRM includes acute bronchitis, chronic bronchitis, bronchitis not specified as acute or chronic, emphysema, asthma, and chronic airway obstruction. Note that all the above, except for acute bronchitis, make up COPD. Once a patient has been diagnosed with an illness included in TRM, it is recommended for that patient to receive the vaccine for influenza every year. This indicator represents the proportion of patients with TRM that have followed this vaccination recommendation. Definition of TRM: 1. One or more hospitalizations in 1 year; or 2. One or more primary care provider visit in 1 year. TRM Diagnosis Codes: 1. ICD-9-CM: 466, 490, 491, 492, 493, 496 2. ICD-10-CA: J20, J21, J40-J45
Pneumococcal vaccinations, adults aged 65 and older	The percentage of patients aged 65 and older at the beginning of the study period (April 1, 2010) who ever received a pneumococcal vaccination. This vaccination was introduced in 2001 and is defined using MIMS data. Manitoba Health, Healthy Living and Seniors recommends that all people aged 65 and older receive one pneumococcal vaccination. Tariff codes: 8681, 8682, 8683, 8684, 8961

Appendix Table 1.1: Continued

CHRONIC DISEASE MANAGEMENT	
Indicator	**Definition**
People with a diabetes diagnosis who had an eye examination	The percentage of persons with diabetes aged 20-79 who had at least one eye examination by an ophthalmologist or optometrist. Note that if a patient had a diabetes diagnosis in all three years of the study period then the patient needs three eye exams to be counted in the numerator. Definition of Diabetes is as follows: 1. One or more inpatient hospitalizations in 3 years; 2. Two or more primary care provider visits in 3 years; or 3. One or more prescriptions in 3 years. Diabetes diagnosis codes: • ICD-9-CM: 250 • ICD-10-CA: E10-E14 Drugs to treat diabetes are defined by ATC code A10.
Congestive heart failure management 1. Initiation of ACE inhibitor drug treatment 2. Persistence of ACE inhibitor drug treatment	Congestive heart failure (CHF) management is calculated for two groups of patients aged 20 and older: 1. Patients newly diagnosed with CHF who filled a prescription for either angiotensin-converting enzyme inhibitors (ACEI) or angiotensin II receptor blocker (ARB) within 3 months of diagnosis; and 2. Patients with CHF who were persistent users of either ACEI or ARB, as defined by their prescriptions being filled for 80% of the days between CHF diagnosis and the end of study period. CHF patients are defined by: 1. One or more inpatient hospitalizations in 1 year; or 2. Two or more primary care provider visits in 1 year. CHF diagnosis codes: 1. ICD9-CA: 428 2. ICD10-CA: I50 Exclusions: 1. Patients with a CHF diagnosis within one year prior to the CHF diagnosis in the study period. ACEI are defined by ATC codes C09A, C09B ARB are defined as CO9C, C09D

Appendix Table 1.1: Continued

Post-myocardial infarction management 1. Initiation of beta-blocker drug treatment 2. Persistence of beta-blocker drug treatment	Post-myocardial infarction (MI) management, with respect to beta-blocker drug treatment, is calculated for two groups of patients aged 20 and older: 1. Patients newly diagnosed with MI who filled at least one beta-blocker prescription within 4 months of hospital discharge; and 2. Patients diagnosed with MI who are persistent users of beta-blockers as defined by having filled prescriptions for 80% of the days between MI hospital separation date and the end of the study period. MI patients are defined by an inpatient hospital separation with a most responsible diagnosis of AMI: 1. ICD-9-CM code 410; or 2. ICD-10-CA code I21 Beta-blockers are defined by ATC codes C07AA, C07AB. Exclusions include those hospitalized in the three years prior to the MI hospitalization with diagnoses of: 1. MI (ICD-9-CM code 410 or ICD-10-CA codes I21 and I22); 2. Asthma (ICD-9-CM code 493 or ICD-10-CA code J45); 3. COPD (ICD-9-CM codes 491 and 492 or ICD-10-CA codes J41-J44); or 4. Peripheral Vascular Disease (ICD-9-CM codes 443 and 459 or ICD-10-CA codes I73, I79.2, I87).
Post-myocardial infarction (MI) management 1. Initiation of cholesterol-lowering drug treatment 2. Persistence of cholesterol-lowering drug treatment	Post-myocardial infarction (MI) management, with respect to cholesterol-lowering drug treatment, is calculated for two groups of patients aged 20 and older: 1. Patients diagnosed with MI who filled at least one cholesterol-lowering prescription within 4 months of hospital discharge; and 2. Patients diagnosed with MI who were persistent users of cholesterol-lowering drugs as defined by having filled prescriptions for 80% of the days between MI hospital separation date and the end of the study period. MI patients are defined by an inpatient hospital separation with a most responsible diagnosis of MI: 1. ICD-9-CM code 410; or 2. ICD-10-CA code I21 Cholesterol Lowering Drugs are defined by ATC codes C10. Exclusions: 1. Those hospitalized in the 3 years prior to the MI hospitalization with diagnoses of MI (ICD-9-CM code 410 or ICD-10-CA codes I21 and I22); and 2. Prescriptions of cholesterol-lowering drugs that occur up to 1 year prior the MI.

Appendix Table 1.1: Continued

Asthma care: medication use	The percentage of patients diagnosed with asthma aged 20 and older who had at least one prescription for a long-term control of asthma in the study period. Patients diagnosed with asthma are defined as individuals with a repeat prescription (i.e., 2+ prescriptions) for: 1. Beta 2-agonists: ATC codes R03AA, R03AB or R03AC. Long-term asthma control medications are defined as the following: 1. Inhaled corticosteroids (ATC code R03BA); 2. Leukotriene modifiers (ATC code R03DC); or 3. Adrenergics and other drugs for obstructive airway diseases (ATC code R03AK). Exclusions: 1. COPD patients, as defined by one or more prescriptions for Ipratropium Bromide (ATC codes R01AX03, R03AK04, R03BB01).

Appendix Table 1.1: Continued

MEDICAL CARE	
Indicator	**Definition**
Benzodiazepine prescribing in community dwelling adults aged 75 and older	The proportion of community dwelling adults aged 75 and older who filled at least 2 prescriptions, or at least 1 prescription for more than a 30-day supply, of Benzodiazepines. Benzodiazepines are defined by the following ATC codes: 1. N05BA; 2. N05CD; 3. N05CF; and 4. N03AE01 (clonazepam is categorized as an antiepileptic drug, not an anxiolytic, but it is a benzodiazepine derivative and is now included in this definition).
Beers drug prescribing in community dwelling older adults	The proportion of community dwelling adults aged 65 and older who filled at least 1 prescription for any drug on the Beers list that should be avoided in older adults. We used the following drugs: 1. **Antiarrythmic**: DISOPYRAMIDE; ATC: C01BA03 2. **Antidepressant**: IMIPRAMINE HCL, CLOMIPRAMINE HCL, TRIMIPRAMINE, AMITRIPTYLINE, AMITRIPTYLINE/PERPHENAZINE; ATCs: N06AA02, N06AA04, N06AA06, N06AA09, N06CA01 3. **Antihistamines**: DEXBROMPHENIRAMINE MALEATE, PROMETHAZINE HCL, HYDROXYZINE HCL, CHLORPHENIRAMINE/PSEUOEPHEDRIN, BROMPHENIRAMINE/PHENYLEPHRINE, BROMPHENIRAMINE MALEATE, CHLORPHENIRAMINE, BROMPHENIRAMINE MALEATE, PROMETHAZINE HCL/CODEINE, DIPHENHYDRAMINE HYDROCHLORIDE, CLEMASTINE HYDROGEN FUMARATE, DOXYLAMINE SUCCINATE, DOXYLAMINE/PYRIDOXINE, BROMPHENIRAMINE MALEATE, DEXCHLORPHENIRAMINE MALEATE, CHLORPHENIRAMINE MALEATE, PROMETHAZINE HCL, CYPROHEPTADINE HYDROCHLORIDE, CHLORPHENIRAMINE MALEATE; ATCs: R06AB56, D04AA10, N05BB01, R01BA52, R01BA53, R05DA20, R05DA20, R05FA02, R05FA02, R06AA02, R06AA04, R06AA09, R06AA59, R06AB01, R06AB02, R06AB04, R06AD02, R06AX02, S05DA20; 4. **Antihypertensives**: GUANFACINE, NIFEDIPINE; ATCs: C02AC02, C08CA05;

Appendix Table 1.1: Continued

	5. **Antiparkinson**: TRIHEXYPHENIDYL HYDROCHLORIDE, BENZTROPINE MESYLATE, BENZTROPINE METHANESULFONATE; ATCs: N04AA01, N04AC01, N04AC01; 6. **Antipsychotics**: THIORIDAZINE HYDROCHLORIDE, MESORIDAZINE BESYLATE; ATCs: N05AC02, N05AC03; 7. **Benzodiazepine**: CHLORDIAZEPOXIDE/CLIDINIUM, CLONAZEPAM, DIAZEPAM, CHLORDIAZEPOXIDE, CLORAZEPATE DIPOTASSIUM, FLURAZEPAM HCL, NITRAZEPAM; ATCs: A03CA02, N03AE01, N05BA01, N05BA02, N05BA05, N05CD01, N05CD02; 8. **Endocrine**: ESTRADIOL, CONJUGATED ESTROGEN, THYROID; ATCs: G03CA03, G03CA57, H03AA05 9. **Gastrointestinal**: MINERAL OIL ((AS HEAVY)), PETROLATUM; ATCs: A06AA01, A06AA01 10. **Muscle relaxant**: CHLORZOXAZONE ACETAMINOPHEN, CARISOPRODOL, METHOCARBAMOL, ORPHENADRINE CITRATE, CYCLOBENZAPRINE, ORPHENADRINE HYDROCHLORIDE; ATCs: M03BB03, M03BA02, M03BA03, M03BC01, M03BX08, N04AB02 11. **NSAIDs**: INDOMETHACIN SOD TRIHYDRATE, INDOMETHACIN, KETOROLAC TROMETHAMINE, INDOMETHACIN, KETOROLAC TROMETHAMINE; ATCs: C01EB03, M01AB01, M01AB15, S01BC01, S01BC05 12. **Narcotics**: PENTAZOCINE; ATC: N02AD01 13. **Oral hypoglycemics**: GLYBURIDE, CHLORPROPAMIDE; ATCs: A10BB01, A10BB02 14. **Other Beers criteria**: DIGOXIN, ZOPICLONE, ZALEPLON; ATCs: C01AA05, N05CF01, N05CF03 15. **Platelet Inhibitors**: TICLOPIDINE HCL, DIPYRIDAMOLE; ATCs: B01AC05, B01AC07; and 16. **Sedatives/Hypnotics**: METHOHEXITAL SODIUM, PHENOBARBITAL, PHENOBARBITAL SODIUM, MEPROBAMATE, PENTOBARBITAL SODIUM, AMOBARBITAL SODIUM, BUTABARBITAL SODIUM, SECOBARBITAL SODIUM, AMOBARBITAL SODIUM & SECOBARB, CHLORAL HYDRATE; ATCs: N01AF01, N03AA02, N03AA02, N05BC01, N05CA01, N05CA02, N05CA03, N05CA06, N05CB01, N05CC01.

Appendix Table 1.1: Continued

Depression care: prescription follow-up	The percentage of patients with a new diagnosis of depression who had three follow-up ambulatory visits within four months of filling a prescription for an antidepressant. Patients with depression are defined by an ambulatory visit to primary care with a diagnosis of depression and a prescription for antidepressants within two weeks of each other (it is assumed that the prescription date comes after the ambulatory visit to primary care). Depression diagnoses include ICD-9-CM codes 296 and 311. Antidepressants are defined by ATC code N06A. Exclusions: 1. Depression diagnosis within the two years prior to the depression diagnosis in the study period; or 2. Antidepressant prescription within the two years prior to the depression diagnosis in the study period.

Appendix Table 1.1: Continued

HEALTH SERVICES DELIVERY AND USE	
Indicators	**Definitions**
Continuity of Care Index (COCI) 1. Assigned primary care provider 2. Clinic-based	The COCI weights both the frequency of ambulatory visits to each primary care provider and the dispersion of visits among providers. The COCI values range from 0 (each visit made to a different primary care provider) to 1 (all visits made to a single primary care provider). The COCI is calculated in two ways: 1. The COCI for the assigned primary care provider; and 2. The COCI for the clinic in which the assigned primary care provider works.
Referral Rates	This indicator represents the average number of referrals per patient. All referrals (i.e., referrals made by assigned and unassigned providers) to specialists were counted. Exclusions: 1. Referrals to pathology, radiology, anesthetists, and primary care providers; 2. Referrals to obstetricians due to normal pregnancy; and 3. Referrals from the same provider to the same specialist within six months of the first referral.

Appendix Table 1.1: Continued

Hospitalizations for ambulatory care sensitive conditions (ACSCs)	This indicator measures the rate at which patients aged 0-74 were hospitalized for a select group of the ACSCs per 1,000 patients. Separations were counted here, not episodes. This indicator used most responsible diagnosis only. Four ambulatory care sensitive conditions are looked at: 1. COPD a. ICD-9-CM: 491, 492, 494, 496 b. ICD-10-CA: J41, J42, J43, J44, J47 2. Asthma a. ICD-9-CM: 493 b. ICD-10-CA: J45 3. Congestive Heart Failure a. ICD-9-CM: 402.01, 402.11, 402.91, 428, 518.4 b. ICD-10-CA: I50, J81 c. Some Cardiac Interventions are excluded 4. Diabetes a. ICD-9-CM: 250 b. ICD-10-CA: E10-E14 Exclusions/Inclusions: 1. Individuals aged 75 and older are excluded from this analysis; 2. Individuals who died in hospital are excluded from the numerator; 3. Individuals in Personal Care Homes, Long-term Care facilities and Nursing Stations are excluded; 4. Only inpatient separations are included; and 5. Newborn separations are included.
X-ray for lower back pain: adults aged 20 and older	The percentage of patients 20 years and older who had at least 1 lower back pain X-ray and a lower back pain diagnosis over the 3 year study period (fiscal years 2010/11 – 2012/13) Index Back Pain tariff code: ICD-9-CM 724. Lower back X-ray is defined by any of the following tariff codes: 7034, 7035, 7036, 7037, 7038, 7039, 7041, 7054, 7061, 7193. Exclusions: 1. Patients with a history of neoplasms, nervous system diagnoses, arthritis, congenital anomalies, fractures, neurosurgery visits, orthopedic surgery visits, previous spine x-ray tariffs, computed tomography (CT) scans, MRIs, EMGs, spine operations.

Appendix Table 1.1: Continued

Hospital episodes with a readmission within 30 days	The percentage of hospital episodes with a readmission within 30 days of discharge. For the index hospitalization, discharge date at the end of the hospital episode is used, and separations from March 1, 2010 to March 1, 2013 are included. For readmissions, inpatient separations (not episodes) are used, from March 1, 2010 to March 31, 2013. Exclusions: 1. Hospitalizations within 24 hours of each other are considered part of the same episode and are not counted as readmissions; 2. Non-Manitoban hospital inpatient hospitalizations; and 3. Patients in Personal Care Homes, Long-term Care facilities, and Nursing Stations. Newborn separations are included.
Emergency department visit rate for patients with CTAS 4 and 5	The number of Emergency Department visits coded as CTAS 4 or 5 per 1,000 person-years during the study period (fiscal years 2010/11-2012/13).
Ambulatory Visits to Primary Care 1. All patients 2. For patients with RUB 3, 4, or 5 3. For patients with 3 or more social complexities	The average number of visits to a primary care provider in an outpatient setting in Winnipeg per patient, annualized over the study period (fiscal years 2010/11-2012/13). Outpatient surgeries, diagnostic tests, and procedures are also not considered ambulatory visits. This indicator was calculated for three groups of patients: 1. All patients; 2. Patients with an RUB of 3, 4, or 5; and 3. Patient with three or more social complexities.
Ambulatory Visits with a Call to Health Links – Info Santé within Two Days of Visit to Primary Care	The average number of visits to a primary care provider in an outpatient setting in Winnipeg in the study period (fiscal years 2010/11-2012/13) that were followed within two days by at least one call to Health Links – Info Santé. This indicator is expressed as the number of calls per 1,000 visits, where no more than one call is counted per visit.

APPENDIX 2 – SUM OF SOCIAL COMPLEXITIES BY CLINIC

Appendix Table 2.1: Percentage of Patients with Social Complexities

Model of Primary Care	Clinic	Number of Social Complexities Crude Rate (%)					
		0	1	2	3	4	5+
PIN FFS	Assiniboine Medical Clinic	62.4	25.5	7.6	2.7	1.1	0.7
	Concordia Health Associates	53.4	28.3	10.0	4.4	2.4	1.6
	Prairie Trail Medical Clinic	60.0	27.0	8.6	2.8	0.9	0.7
	Clinique St. Boniface Clinic	50.7	30.4	11.6	4.1	1.8	1.4
	Tuxedo Family Medical Centre	67.7	23.2	6.6	1.7	0.6	0.3
WRHA Primary Care	Access River East	44.0	28.0	12.6	7.1	4.0	4.3
	Access Transcona	47.0	25.8	13.0	6.9	3.1	4.2
	Aikins Street Community Health Centre	23.4	21.5	16.4	14.3	11.0	13.4
	Access Downtown	25.0	19.6	15.8	13.7	12.2	13.7
	Corydon/River Heights Primary Care Clinic	54.0	25.6	10.2	4.6	3.4	2.2
Community Health Clinic	Aboriginal Health and Wellness Centre	3.7	11.7	11.4	20.3	19.6	33.2
	Centre de Santé Saint Boniface	53.4	27.9	10.7	4.3	2.4	1.3
	Hope Centre Health Care Inc	1.6	9.1	12.8	18.9	19.2	38.4
	Klinic Community Health Centre	26.1	20.4	16.6	14.7	9.8	12.4
	Mount Carmel Clinic	7.8	13.4	14.4	18.1	16.5	29.8
	Nor'West Co-op Community Health Centre	25.6	24.7	16.2	11.1	9.4	13.0
	Women's Health Clinic	29.2	24.4	15.8	11.2	7.6	11.7
Teaching Clinic	Family Medical Centre	55.9	25.0	10.1	4.5	2.8	1.8
	Kildonan Medical Centre	55.4	27.4	9.6	4.0	2.3	1.5
	Northern Connection Medical Centre	38.3	26.6	14.5	10.0	6.2	4.4

APPENDIX 3 – SOCIAL COMPLEXITY INDEX

Factor Analysis

The theory behind factor analysis is that two (or more) indicators are correlated because of an underlying 'factor' causing the performance of the two indicators to be related. The factor cannot be measured directly, but is only seen in the indicators (i.e., rates) that can be measured. If the results of the analysis indicate that there is one underlying factor, then a single factor score could be used to describe the entire set of indicators. Because this factor influences all rates, a model's rate for one indicator can tell you something about their rates on the other related indicators.

The output of a factor analysis provides a mathematical combination of the indicators that is similar to a regression formula, where a certain portion of each indicator contributes to an overall factor score. The degree to which each indicator contributes to the composite index depends on the degree of commonality within the entire set of indicators. The contribution of an indicator to a factor is known as a factor loading, and can theoretically range from -1 to +1. The larger the absolute size, the greater the variance of the indicator explained by the factor.

Factor loadings indicate whether or not an index can be reasonably or validly constructed. The rule we used to decide if an indicator was associated with (or part of) the factor is a factor loading with an absolute value of at least 0.40.

Social Complexity Index

Due to co-linearity among the social complexities, it was not feasible to include all the social complexities in a regression model. We therefore performed factor analysis on the social complexities to obtain a Social Complexity Index. The following social complexities resulted in factor loading scores of at least 0.40 and are therefore included in the Social Complexity Index:

- High residential mobility;
- Low income quintile;
- Social housing resident;
- Income assistance;
- Teen mom;
- Child of a teen mom;
- Child in care; and
- Involvement with the justice system.

Appendix Table 3.1 describes the factor loading of each social complexity making up the Social Complexity Index.

Appendix Table 3.1: Factor Loadings for Social Complexity Composite Index

Social Complexity	Factor Loading
High Residential Mobility	0.91
Low Income Quintile (Q1 vs. Q5)	0.78
Social Housing Resident	0.93
Income Assistance	0.95
Teen Mom	0.72
Child of a Teen Mom	0.85
Child in Care	0.74
Involvement with the Justice System	0.79

Appendix Table 3.2 presents the Social Complexity Index scores for each of the models of primary care, as well as the clinics in all the models, except for Non-PIN FFS. A higher index score means more social complexity, while a lower score means less. The scores not only varied by model of primary care, but they also varied among the clinics within each model. The Community Health Clinic model had an index score of 0.7, suggesting that, on average, patients of the providers at those clinics had the highest social complexity among all the models of primary care.

Appendix Table 3.2: Social Complexity Index Score by Model of Primary Care and Clinic

Model of Primary Care and Clinic	Median
PIN FFS	-0.72
Assiniboine Medical Clinic	-0.92
Concordia Health Associates	-0.49
Prairie Trail Medical Clinic	-0.75
Clinique St. Boniface Clinic	-0.60
Tuxedo Family Medical Centre	-1.04
WRHA Primary Care	0.07
Access River East	0.05
Access Transcona	-0.31
Aikins Street Community Health Centre	0.86
Access Downtown	1.81
Corydon/River Heights Primary Care Clinic	-0.37
Community Health Clinic	0.71
Aboriginal Health and Wellness Centre	2.82
Centre de Santé Saint Boniface	-0.36
Hope Centre Health Care Inc	2.57
Klinic Community Health Centre	0.87
Mount Carmel Clinic	2.13
Nor'West Co-op Community Health Centre	0.66
Women's Health Clinic	0.09
Teaching Clinic	-0.59
Family Medical Centre	-0.61
Kildonan Medical Centre	-0.65
Northern Connection Medical Centre	0.92
Non-PIN FFS	-0.20

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Manitoba Centre for Health Policy
University of Manitoba, College of Medicine
Faculty of Health Sciences
408-727 McDermot Avenue
Winnipeg, Manitoba R3E 3P5
Tel: (204) 789-3819
Fax: (204) 789-3910
Email: reports@cpe.umanitoba.ca
Web: umanitoba.ca/medicine/units/mchp

ONLINE APPENDIX 1 – SOCIAL COMPLEXITIES BY CLINIC

Online Appendix Table 1.1: High Residential Mobility, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	3,687	11.7
	Concordia Health Associates	1,434	13.9
	Prairie Trail Medical Clinic	1,429	13.5
	Clinique St. Boniface Clinic	1,860	12.0
	Tuxedo Family Medical Centre	789	9.5
WRHA Primary Care	Access River East	826	18.1
	Access Transcona	676	19.8
	Aikins Street Community Health Centre	601	32.2
	Access Downtown	843	28.5
	Corydon/River Heights Primary Care Clinic	509	13.6
Community Health Clinic	Aboriginal Health and Wellness Centre	250	58.4
	Centre de Santé Saint Boniface	517	15.7
	Hope Centre Health Care Inc	213	56.8
	Klinic Community Health Centre	802	30.0
	Mount Carmel Clinic	1,367	48.6
	Nor'West Co-op Community Health Centre	314	22.5
	Women's Health Clinic	388	32.3
Teaching Clinic	Family Medical Centre	623	14.0
	Kildonan Medical Centre	506	11.5
	Northern Connection Medical Centre	122	17.5

Online Appendix Table 1.2: Low Income Quintile, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	8.9
	Concordia Health Associates	10,300	15.4
	Prairie Trail Medical Clinic	10,600	10.2
	Clinique St. Boniface Clinic	15,521	13.7
	Tuxedo Family Medical Centre	8,323	6.8
WRHA Primary Care	Access River East	4,566	21.4
	Access Transcona	3,412	11.5
	Aikins Street Community Health Centre	1,865	36.5
	Access Downtown	2,961	41.9
	Corydon/River Heights Primary Care Clinic	3,732	16.9
Community Health Clinic	Aboriginal Health and Wellness Centre	428	50.0
	Centre de Santé Saint Boniface	3,291	16.7
	Hope Centre Health Care Inc	375	62.7
	Klinic Community Health Centre	2,675	37.0
	Mount Carmel Clinic	2,813	55.4
	Nor'West Co-op Community Health Centre	1,395	31.1
	Women's Health Clinic	1,201	25.6
Teaching Clinic	Family Medical Centre	4,443	13.5
	Kildonan Medical Centre	4,385	12.8
	Northern Connection Medical Centre	698	23.5

Online Appendix Table 1.3: Social Housing Resident, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	2.4
	Concordia Health Associates	10,300	4.6
	Prairie Trail Medical Clinic	10,600	1.8
	Clinique St. Boniface Clinic	15,521	2.9
	Tuxedo Family Medical Centre	8,323	1.2
WRHA Primary Care	Access River East	4,566	8.2
	Access Transcona	3,412	8.2
	Aikins Street Community Health Centre	1,865	17.2
	Access Downtown	2,961	23.3
	Corydon/River Heights Primary Care Clinic	3,732	5.8
Community Health Clinic	Aboriginal Health and Wellness Centre	428	40.7
	Centre de Santé Saint Boniface	3,291	5.3
	Hope Centre Health Care Inc	375	39.2
	Klinic Community Health Centre	2,675	16.5
	Mount Carmel Clinic	2,813	36.4
	Nor'West Co-op Community Health Centre	1,395	21.9
	Women's Health Clinic	1,201	16.8
Teaching Clinic	Family Medical Centre	4,443	4.4
	Kildonan Medical Centre	4,385	3.4
	Northern Connection Medical Centre	698	8.6

Online Appendix Table 1.4: Income Assistance, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	6.7
	Concordia Health Associates	10,300	10.5
	Prairie Trail Medical Clinic	10,600	5.8
	Clinique St. Boniface Clinic	15,521	8.3
	Tuxedo Family Medical Centre	8,323	3.5
WRHA Primary Care	Access River East	4,566	20.3
	Access Transcona	3,412	19.6
	Aikins Street Community Health Centre	1,865	46.5
	Access Downtown	2,961	45.3
	Corydon/River Heights Primary Care Clinic	3,732	14.4
Community Health Clinic	Aboriginal Health and Wellness Centre	428	79.7
	Centre de Santé Saint Boniface	3,291	10.8
	Hope Centre Health Care Inc	375	87.2
	Klinic Community Health Centre	2,675	44.4
	Mount Carmel Clinic	2,813	71.3
	Nor'West Co-op Community Health Centre	1,395	38.6
	Women's Health Clinic	1,201	34.3
Teaching Clinic	Family Medical Centre	4,443	12.3
	Kildonan Medical Centre	4,385	10.8
	Northern Connection Medical Centre	698	25.6

Online Appendix Table 1.5: Major Mental Health Diagnosis, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	5.5
	Concordia Health Associates	10,300	6.1
	Prairie Trail Medical Clinic	10,600	7.7
	Clinique St. Boniface Clinic	15,521	20.1
	Tuxedo Family Medical Centre	8,323	7.3
WRHA Primary Care	Access River East	4,566	10.7
	Access Transcona	3,412	8.5
	Aikins Street Community Health Centre	1,865	11.7
	Access Downtown	2,961	20.3
	Corydon/River Heights Primary Care Clinic	3,732	10.9
Community Health Clinic	Aboriginal Health and Wellness Centre	428	18.0
	Centre de Santé Saint Boniface	3,291	9.2
	Hope Centre Health Care Inc	375	15.2
	Klinic Community Health Centre	2,675	16.9
	Mount Carmel Clinic	2,813	12.8
	Nor'West Co-op Community Health Centre	1,395	7.7
	Women's Health Clinic	1,201	7.7
Teaching Clinic	Family Medical Centre	4,443	8.3
	Kildonan Medical Centre	4,385	8.9
	Northern Connection Medical Centre	698	11.3

Online Appendix Table 1.6: Newcomer, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	1.7
	Concordia Health Associates	10,300	1.5
	Prairie Trail Medical Clinic	10,600	3.2
	Clinique St. Boniface Clinic	15,521	1.6
	Tuxedo Family Medical Centre	8,323	0.7
WRHA Primary Care	Access River East	4,566	2.6
	Access Transcona	3,412	3.7
	Aikins Street Community Health Centre	1,865	2.5
	Access Downtown	2,961	4.0
	Corydon/River Heights Primary Care Clinic	3,732	1.1
Community Health Clinic	Aboriginal Health and Wellness Centre	428	2.6
	Centre de Santé Saint Boniface	3,291	2.9
	Hope Centre Health Care Inc	375	s
	Klinic Community Health Centre	2,675	12.2
	Mount Carmel Clinic	2,813	2.7
	Nor'West Co-op Community Health Centre	1,395	11.0
	Women's Health Clinic	1,201	5.8
Teaching Clinic	Family Medical Centre	4,443	1.3
	Kildonan Medical Centre	4,385	0.8
	Northern Connection Medical Centre	698	10.2

s indicates data suppressed due to small numbers.

Online Appendix Table 1.7: Child of a Newcomer, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	3,348	3.0
	Concordia Health Associates	2,150	3.0
	Prairie Trail Medical Clinic	1,700	5.4
	Clinique St. Boniface Clinic	1,607	2.9
	Tuxedo Family Medical Centre	1,356	0.6
WRHA Primary Care	Access River East	908	5.6
	Access Transcona	990	4.8
	Aikins Street Community Health Centre	537	3.4
	Access Downtown	318	19.0
	Corydon/River Heights Primary Care Clinic	353	2.0
Community Health Clinic	Aboriginal Health and Wellness Centre	58	s
	Centre de Santé Saint Boniface	732	5.5
	Hope Centre Health Care Inc	93	0.0
	Klinic Community Health Centre	814	12.1
	Mount Carmel Clinic	855	3.5
	Nor'West Co-op Community Health Centre	489	12.9
	Women's Health Clinic	303	4.2
Teaching Clinic	Family Medical Centre	947	3.3
	Kildonan Medical Centre	638	3.9
	Northern Connection Medical Centre	201	15.5

s indicates data suppressed due to small numbers.

Online Appendix Table 1.8: Teen Mom, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	16,874	5.9
	Concordia Health Associates	5,439	7.1
	Prairie Trail Medical Clinic	5,899	3.8
	Clinique St. Boniface Clinic	8,688	7.0
	Tuxedo Family Medical Centre	6,599	3.3
WRHA Primary Care	Access River East	3,020	8.1
	Access Transcona	2,029	9.8
	Aikins Street Community Health Centre	1,317	18.6
	Access Downtown	1,575	18.7
	Corydon/River Heights Primary Care Clinic	2,077	6.0
Community Health Clinic	Aboriginal Health and Wellness Centre	257	33.1
	Centre de Santé Saint Boniface	2,065	4.7
	Hope Centre Health Care Inc	263	41.4
	Klinic Community Health Centre	1,780	10.5
	Mount Carmel Clinic	2,008	28.1
	Nor'West Co-op Community Health Centre	953	16.8
	Women's Health Clinic	1,180	10.0
Teaching Clinic	Family Medical Centre	2,535	6.9
	Kildonan Medical Centre	2,621	8.1
	Northern Connection Medical Centre	415	8.0

Online Appendix Table 1.9: Child of a Teen Mom, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	6.6
	Concordia Health Associates	10,300	10.0
	Prairie Trail Medical Clinic	10,600	5.8
	Clinique St. Boniface Clinic	15,521	6.9
	Tuxedo Family Medical Centre	8,323	4.9
WRHA Primary Care	Access River East	4,566	12.0
	Access Transcona	3,412	16.1
	Aikins Street Community Health Centre	1,865	28.6
	Access Downtown	2,961	16.4
	Corydon/River Heights Primary Care Clinic	3,732	6.4
Community Health Clinic	Aboriginal Health and Wellness Centre	428	38.1
	Centre de Santé Saint Boniface	3,291	6.0
	Hope Centre Health Care Inc	375	44.8
	Klinic Community Health Centre	2,675	16.6
	Mount Carmel Clinic	2,813	36.7
	Nor'West Co-op Community Health Centre	1,395	26.1
	Women's Health Clinic	1,201	20.8
Teaching Clinic	Family Medical Centre	4,443	10.1
	Kildonan Medical Centre	4,385	8.8
	Northern Connection Medical Centre	698	18.1

Online Appendix Table 1.10: Child in Care, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	3,715	1.6
	Concordia Health Associates	2,304	2.5
	Prairie Trail Medical Clinic	1,850	1.8
	Clinique St. Boniface Clinic	1,779	2.4
	Tuxedo Family Medical Centre	1,480	0.8
WRHA Primary Care	Access River East	995	5.0
	Access Transcona	1,086	5.4
	Aikins Street Community Health Centre	567	16.6
	Access Downtown	342	14.9
	Corydon/River Heights Primary Care Clinic	399	7.0
Community Health Clinic	Aboriginal Health and Wellness Centre	62	30.6
	Centre de Santé Saint Boniface	763	0.9
	Hope Centre Health Care Inc	101	39.6
	Klinic Community Health Centre	921	12.7
	Mount Carmel Clinic	937	25.0
	Nor'West Co-op Community Health Centre	567	13.8
	Women's Health Clinic	390	11.3
Teaching Clinic	Family Medical Centre	994	3.1
	Kildonan Medical Centre	684	1.9
	Northern Connection Medical Centre	213	8.0

Online Appendix Table 1.11: Involvement with the Justice System, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	31,517	11.2
	Concordia Health Associates	10,300	13.5
	Prairie Trail Medical Clinic	10,600	11.3
	Clinique St. Boniface Clinic	15,521	11.8
	Tuxedo Family Medical Centre	8,323	9.4
WRHA Primary Care	Access River East	4,566	15.3
	Access Transcona	3,412	15.9
	Aikins Street Community Health Centre	1,865	23.2
	Access Downtown	2,961	25.2
	Corydon/River Heights Primary Care Clinic	3,732	12.9
Community Health Clinic	Aboriginal Health and Wellness Centre	428	46.7
	Centre de Santé Saint Boniface	3,291	10.5
	Hope Centre Health Care Inc	375	45.1
	Klinic Community Health Centre	2,675	21.6
	Mount Carmel Clinic	2,813	39.7
	Nor'West Co-op Community Health Centre	1,395	21.9
	Women's Health Clinic	1,201	29.7
Teaching Clinic	Family Medical Centre	4,443	11.7
	Kildonan Medical Centre	4,385	13.0
	Northern Connection Medical Centre	698	16.9

ONLINE APPENDIX 2 – PRIMARY CARE QUALITY INDICATOR CRUDE RATES BY CLINIC

Online Appendix Table 2.1: Breast Cancer Screening: Women Aged 50-74, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	5,701	73.2
	Concordia Health Associates	1,508	62.7
	Prairie Trail Medical Clinic	1,644	73.3
	Clinique St. Boniface Clinic	3,227	72.7
	Tuxedo Family Medical Centre	2,374	79.7
WRHA Primary Care	Access River East	674	59.6
	Access Transcona	317	69.1
	Aikins Street Community Health Centre	273	56.4
	Access Downtown	532	68.8
	Corydon/River Heights Primary Care Clinic	718	67.5
Community Health Clinic	Aboriginal Health and Wellness Centre	53	32.1
	Centre de Santé Saint Boniface	528	70.5
	Hope Centre Health Care Inc	69	36.2
	Klinic Community Health Centre	192	52.1
	Mount Carmel Clinic	280	43.6
	Nor'West Co-op Community Health Centre	150	53.3
	Women's Health Clinic	108	58.3
Teaching Clinic	Family Medical Centre	679	65.7
	Kildonan Medical Centre	849	68.0
	Northern Connection Medical Centre	72	59.7

Online Appendix Table 2.2: Cervical Cancer Screening: Women Aged 21-69, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	10,103	82.6
	Concordia Health Associates	3,172	71.8
	Prairie Trail Medical Clinic	3,909	80.4
	Clinique St. Boniface Clinic	5,350	81.9
	Tuxedo Family Medical Centre	4,480	88.8
WRHA Primary Care	Access River East	1,755	58.6
	Access Transcona	1,145	77.3
	Aikins Street Community Health Centre	804	81.2
	Access Downtown	1,036	64.9
	Corydon/River Heights Primary Care Clinic	1,288	79.6
Community Health Clinic	Aboriginal Health and Wellness Centre	193	44.0
	Centre de Santé Saint Boniface	1,205	85.1
	Hope Centre Health Care Inc	172	55.8
	Klinic Community Health Centre	976	71.5
	Mount Carmel Clinic	1,183	69.1
	Nor'West Co-op Community Health Centre	495	54.7
	Women's Health Clinic	765	65.2
Teaching Clinic	Family Medical Centre	1,584	73.5
	Kildonan Medical Centre	1,652	65.0
	Northern Connection Medical Centre	212	64.2

Online Appendix Table 2.3: Colorectal Cancer Screening: Adults Aged 50-74, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	11,531	56.4
	Concordia Health Associates	2,884	40.6
	Prairie Trail Medical Clinic	3,078	52.2
	Clinique St. Boniface Clinic	5,920	54.1
	Tuxedo Family Medical Centre	2,961	57.4
WRHA Primary Care	Access River East	1,111	34.6
	Access Transcona	606	55.0
	Aikins Street Community Health Centre	392	34.4
	Access Downtown	1,178	22.6
	Corydon/River Heights Primary Care Clinic	1,537	41.1
Community Health Clinic	Aboriginal Health and Wellness Centre	98	13.3
	Centre de Santé Saint Boniface	882	48.8
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	380	26.6
	Mount Carmel Clinic	483	9.9
	Nor'West Co-op Community Health Centre	229	19.7
	Women's Health Clinic	111	57.7
Teaching Clinic	Family Medical Centre	1,311	45.8
	Kildonan Medical Centre	1,524	33.7
	Northern Connection Medical Centre	113	25.7

s indicates data suppressed due to small numbers.

Online Appendix Table 2.4: Completed Vaccinations at Age Two, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	252	68.3
	Concordia Health Associates	249	69.1
	Prairie Trail Medical Clinic	212	69.3
	Clinique St. Boniface Clinic	187	57.2
	Tuxedo Family Medical Centre	156	59.6
WRHA Primary Care	Access River East	144	47.9
	Access Transcona	153	27.5
	Aikins Street Community Health Centre	119	45.4
	Access Downtown	64	34.4
	Corydon/River Heights Primary Care Clinic	s	s
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	158	74.1
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	68	32.4
	Mount Carmel Clinic	60	55.0
	Nor'West Co-op Community Health Centre	38	44.7
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	183	39.3
	Kildonan Medical Centre	112	47.3
	Northern Connection Medical Centre	21	61.9

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.5: Annual Influenza Vaccination: Adults Aged 65 and Older, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	7,669	52.3
	Concordia Health Associates	1,650	43.0
	Prairie Trail Medical Clinic	1,513	46.9
	Clinique St. Boniface Clinic	3,677	54.9
	Tuxedo Family Medical Centre	1,476	62.1
WRHA Primary Care	Access River East	851	30.9
	Access Transcona	337	37.4
	Aikins Street Community Health Centre	164	40.2
	Access Downtown	588	50.7
	Corydon/River Heights Primary Care Clinic	866	37.5
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	591	44.5
	Hope Centre Health Care Inc	24	29.2
	Klinic Community Health Centre	105	41.9
	Mount Carmel Clinic	192	36.5
	Nor'West Co-op Community Health Centre	120	44.2
	Women's Health Clinic	22	36.4
Teaching Clinic	Family Medical Centre	756	33.7
	Kildonan Medical Centre	829	30.2
	Northern Connection Medical Centre	42	31.0

s indicates data suppressed due to small numbers.

Online Appendix Table 2.6: Annual Influenza Vaccinations: People with Total Respiratory Morbidity, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	7,483	43.5
	Concordia Health Associates	1,660	35.5
	Prairie Trail Medical Clinic	1,768	37.1
	Clinique St. Boniface Clinic	3,026	45.9
	Tuxedo Family Medical Centre	1,575	50.0
WRHA Primary Care	Access River East	738	29.4
	Access Transcona	593	25.0
	Aikins Street Community Health Centre	355	46.8
	Access Downtown	657	48.4
	Corydon/River Heights Primary Care Clinic	734	37.3
Community Health Clinic	Aboriginal Health and Wellness Centre	145	22.1
	Centre de Santé Saint Boniface	499	34.1
	Hope Centre Health Care Inc	108	29.6
	Klinic Community Health Centre	412	34.2
	Mount Carmel Clinic	629	28.3
	Nor'West Co-op Community Health Centre	221	29.0
	Women's Health Clinic	155	13.5
Teaching Clinic	Family Medical Centre	565	38.1
	Kildonan Medical Centre	621	36.7
	Northern Connection Medical Centre	78	30.8

Online Appendix Table 2.7: Pneumococcal Vaccination: Adults Aged 65 and Older, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	7,669	78.5
	Concordia Health Associates	1,650	67.8
	Prairie Trail Medical Clinic	1,513	69.0
	Clinique St. Boniface Clinic	3,677	76.7
	Tuxedo Family Medical Centre	1,476	74.9
WRHA Primary Care	Access River East	851	72.6
	Access Transcona	337	67.7
	Aikins Street Community Health Centre	164	67.1
	Access Downtown	588	73.1
	Corydon/River Heights Primary Care Clinic	866	68.7
Community Health Clinic	Aboriginal Health and Wellness Centre	16	75.0
	Centre de Santé Saint Boniface	591	66.0
	Hope Centre Health Care Inc	24	70.8
	Klinic Community Health Centre	105	48.6
	Mount Carmel Clinic	192	63.0
	Nor'West Co-op Community Health Centre	120	67.5
	Women's Health Clinic	22	45.5
Teaching Clinic	Family Medical Centre	756	67.9
	Kildonan Medical Centre	829	69.6
	Northern Connection Medical Centre	42	64.3

Online Appendix Table 2.8: Diabetes Management: Eye Examination, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	2,419	39.2
	Concordia Health Associates	627	46.9
	Prairie Trail Medical Clinic	627	45.3
	Clinique St. Boniface Clinic	1,395	40.1
	Tuxedo Family Medical Centre	407	45.5
WRHA Primary Care	Access River East	304	38.5
	Access Transcona	187	30.5
	Aikins Street Community Health Centre	161	37.9
	Access Downtown	449	38.8
	Corydon/River Heights Primary Care Clinic	302	42.1
Community Health Clinic	Aboriginal Health and Wellness Centre	78	28.2
	Centre de Santé Saint Boniface	200	41.5
	Hope Centre Health Care Inc	69	21.7
	Klinic Community Health Centre	151	25.8
	Mount Carmel Clinic	293	24.6
	Nor'West Co-op Community Health Centre	97	37.1
	Women's Health Clinic	26	30.8
Teaching Clinic	Family Medical Centre	240	40.0
	Kildonan Medical Centre	437	35.7
	Northern Connection Medical Centre	53	30.2

Online Appendix Table 2.9: Congestive Heart Failure Management: Initiation of ACE Inhibitor Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	398	55.0
	Concordia Health Associates	106	54.7
	Prairie Trail Medical Clinic	73	52.1
	Clinique St. Boniface Clinic	247	54.7
	Tuxedo Family Medical Centre	50	54.0
WRHA Primary Care	Access River East	57	52.6
	Access Transcona	21	57.1
	Aikins Street Community Health Centre	9	77.8
	Access Downtown	37	54.1
	Corydon/River Heights Primary Care Clinic	42	47.6
Community Health Clinic	Aboriginal Health and Wellness Centre	N/A	N/A
	Centre de Santé Saint Boniface	27	66.7
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	29	89.7
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	40	52.5
	Kildonan Medical Centre	50	62.0
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.10: Congestive Heart Failure Management: Persistence of ACE Inhibitor Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	398	40.5
	Concordia Health Associates	106	42.5
	Prairie Trail Medical Clinic	73	42.5
	Clinique St. Boniface Clinic	247	42.1
	Tuxedo Family Medical Centre	50	46.0
WRHA Primary Care	Access River East	57	38.6
	Access Transcona	21	33.3
	Aikins Street Community Health Centre	s	s
	Access Downtown	37	45.9
	Corydon/River Heights Primary Care Clinic	42	28.6
Community Health Clinic	Aboriginal Health and Wellness Centre	N/A	N/A
	Centre de Santé Saint Boniface	27	48.1
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	29	65.5
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	40	42.5
	Kildonan Medical Centre	50	48.0
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.11: Post-Myocardial Infarction Management: Initiation of Beta-Blocker Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	201	86.1
	Concordia Health Associates	42	78.6
	Prairie Trail Medical Clinic	47	91.5
	Clinique St. Boniface Clinic	81	81.5
	Tuxedo Family Medical Centre	28	89.3
WRHA Primary Care	Access River East	20	100.0
	Access Transcona	8	87.5
	Aikins Street Community Health Centre	s	s
	Access Downtown	21	76.2
	Corydon/River Heights Primary Care Clinic	20	95.0
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	11	81.8
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	13	84.6
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	19	68.4
	Kildonan Medical Centre	28	96.4
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.12: Post-Myocardial Infarction Management: Persistence of Beta-Blocker Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	201	67.2
	Concordia Health Associates	42	64.3
	Prairie Trail Medical Clinic	47	70.2
	Clinique St. Boniface Clinic	81	65.4
	Tuxedo Family Medical Centre	28	57.1
WRHA Primary Care	Access River East	20	90.0
	Access Transcona	s	s
	Aikins Street Community Health Centre	s	s
	Access Downtown	21	42.9
	Corydon/River Heights Primary Care Clinic	20	65.0
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	11	54.5
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	13	76.9
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	19	57.9
	Kildonan Medical Centre	28	75.0
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.13: Post-Myocardial Infarction Management: Initiation of Cholesterol-Lowering Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	208	57.7
	Concordia Health Associates	44	45.5
	Prairie Trail Medical Clinic	49	49.0
	Clinique St. Boniface Clinic	83	59.0
	Tuxedo Family Medical Centre	28	64.3
WRHA Primary Care	Access River East	21	57.1
	Access Transcona	9	66.7
	Aikins Street Community Health Centre	s	s
	Access Downtown	22	50.0
	Corydon/River Heights Primary Care Clinic	20	60.0
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	12	50.0
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	s	s
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	19	52.6
	Kildonan Medical Centre	29	58.6
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.14: Post-Myocardial Infarction Management: Persistence of Cholesterol-Lowering Drug Treatment, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	208	43.8
	Concordia Health Associates	44	36.4
	Prairie Trail Medical Clinic	49	34.7
	Clinique St. Boniface Clinic	83	47.0
	Tuxedo Family Medical Centre	28	53.6
WRHA Primary Care	Access River East	21	42.9
	Access Transcona	9	66.7
	Aikins Street Community Health Centre	s	s
	Access Downtown	22	36.4
	Corydon/River Heights Primary Care Clinic	20	55.0
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	s	s
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	s	s
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	N/A	N/A
Teaching Clinic	Family Medical Centre	19	47.4
	Kildonan Medical Centre	29	44.8
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

N/A indicates that no patient at this clinic is eligible for this indicator.

Online Appendix Table 2.15: Asthma Management: Medication Use, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	1,449	67.7
	Concordia Health Associates	398	64.6
	Prairie Trail Medical Clinic	432	69.7
	Clinique St. Boniface Clinic	804	60.6
	Tuxedo Family Medical Centre	479	72.7
WRHA Primary Care	Access River East	252	69.4
	Access Transcona	125	64.8
	Aikins Street Community Health Centre	119	62.2
	Access Downtown	263	58.6
	Corydon/River Heights Primary Care Clinic	229	68.6
Community Health Clinic	Aboriginal Health and Wellness Centre	44	68.2
	Centre de Santé Saint Boniface	153	66.0
	Hope Centre Health Care Inc	68	86.8
	Klinic Community Health Centre	138	76.8
	Mount Carmel Clinic	176	68.2
	Nor'West Co-op Community Health Centre	51	52.9
	Women's Health Clinic	33	54.5
Teaching Clinic	Family Medical Centre	194	62.4
	Kildonan Medical Centre	263	68.8
	Northern Connection Medical Centre	24	62.5

Online Appendix Table 2.16: Benzodiazepine Prescribing in Community Dwelling Adults Aged 75 and Older, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	3,565	23.9
	Concordia Health Associates	787	25.7
	Prairie Trail Medical Clinic	603	26.0
	Clinique St. Boniface Clinic	1,673	31.0
	Tuxedo Family Medical Centre	603	27.2
WRHA Primary Care	Access River East	471	28.9
	Access Transcona	161	29.2
	Aikins Street Community Health Centre	73	27.4
	Access Downtown	222	28.4
	Corydon/River Heights Primary Care Clinic	424	22.6
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	262	32.8
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	41	14.6
	Mount Carmel Clinic	75	16.0
	Nor'West Co-op Community Health Centre	51	17.6
	Women's Health Clinic	s	s
Teaching Clinic	Family Medical Centre	310	18.1
	Kildonan Medical Centre	410	22.0
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

Online Appendix Table 2.17: Beers Drug Prescribing in Community Dwelling Adults Aged 65 and Older, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	7,467	29.6
	Concordia Health Associates	1,609	27.3
	Prairie Trail Medical Clinic	1,465	26.6
	Clinique St. Boniface Clinic	3,559	29.5
	Tuxedo Family Medical Centre	1,442	26.9
WRHA Primary Care	Access River East	799	27.0
	Access Transcona	319	32.3
	Aikins Street Community Health Centre	157	33.8
	Access Downtown	558	34.9
	Corydon/River Heights Primary Care Clinic	836	27.0
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	560	29.5
	Hope Centre Health Care Inc	22	36.4
	Klinic Community Health Centre	100	32.0
	Mount Carmel Clinic	180	36.1
	Nor'West Co-op Community Health Centre	114	25.4
	Women's Health Clinic	s	s
Teaching Clinic	Family Medical Centre	741	21.2
	Kildonan Medical Centre	801	32.3
	Northern Connection Medical Centre	39	28.2

s indicates data suppressed due to small numbers.

Online Appendix Table 2.18: Depression Care, Prescription Follow-up, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	483	53.2
	Concordia Health Associates	171	46.8
	Prairie Trail Medical Clinic	132	67.4
	Clinique St. Boniface Clinic	249	57.4
	Tuxedo Family Medical Centre	111	63.1
WRHA Primary Care	Access River East	49	30.6
	Access Transcona	70	25.7
	Aikins Street Community Health Centre	34	58.8
	Access Downtown	20	60.0
	Corydon/River Heights Primary Care Clinic	49	51.0
Community Health Clinic	Aboriginal Health and Wellness Centre	11	63.6
	Centre de Santé Saint Boniface	16	50.0
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	50	36.0
	Mount Carmel Clinic	84	52.4
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	18	33.3
Teaching Clinic	Family Medical Centre	52	53.8
	Kildonan Medical Centre	64	42.2
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

Online Appendix Table 2.19: Continuity of Care of Assigned Primary Care Provider, Population and Crude Index

Model of Primary Care	Clinic	Population	Crude Index
PIN FFS	Assiniboine Medical Clinic	26,720	0.59
	Concordia Health Associates	7,738	0.59
	Prairie Trail Medical Clinic	8,806	0.48
	Clinique St. Boniface Clinic	13,271	0.62
	Tuxedo Family Medical Centre	7,219	0.61
WRHA Primary Care	Access River East	3,151	0.44
	Access Transcona	2,329	0.33
	Aikins Street Community Health Centre	1,302	0.49
	Access Downtown	2,344	0.55
	Corydon/River Heights Primary Care Clinic	2,766	0.36
Community Health Clinic	Aboriginal Health and Wellness Centre	360	0.44
	Centre de Santé Saint Boniface	2,427	0.47
	Hope Centre Health Care Inc	297	0.45
	Klinic Community Health Centre	1,633	0.50
	Mount Carmel Clinic	2,144	0.45
	Nor'West Co-op Community Health Centre	797	0.44
	Women's Health Clinic	904	0.24
Teaching Clinic	Family Medical Centre	3,242	0.15
	Kildonan Medical Centre	3,527	0.33
	Northern Connection Medical Centre	379	0.20

Online Appendix Table 2.20: Clinic-Based Continuity of Care, Population and Crude Index

Model of Primary Care	Clinic	Population	Crude Index
PIN FFS	Assiniboine Medical Clinic	26,720	0.69
	Concordia Health Associates	7,738	0.77
	Prairie Trail Medical Clinic	8,806	0.70
	Clinique St. Boniface Clinic	13,271	0.66
	Tuxedo Family Medical Centre	7,219	0.68
WRHA Primary Care	Access River East	3,151	0.72
	Access Transcona	2,329	0.64
	Aikins Street Community Health Centre	1,302	0.63
	Access Downtown	2,343	0.74
	Corydon/River Heights Primary Care Clinic	2,764	0.69
Community Health Clinic	Aboriginal Health and Wellness Centre	360	0.47
	Centre de Santé Saint Boniface	2,426	0.74
	Hope Centre Health Care Inc	297	0.62
	Klinic Community Health Centre	1,633	0.59
	Mount Carmel Clinic	2,144	0.60
	Nor'West Co-op Community Health Centre	797	0.53
	Women's Health Clinic	902	0.38
Teaching Clinic	Family Medical Centre	3,242	0.74
	Kildonan Medical Centre	3,527	0.76
	Northern Connection Medical Centre	378	0.50

Online Appendix Table 2.21: Referral Rates, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	29,097	0.47
	Concordia Health Associates	9,492	0.38
	Prairie Trail Medical Clinic	9,641	0.38
	Clinique St. Boniface Clinic	14,430	0.50
	Tuxedo Family Medical Centre	7,838	0.45
WRHA Primary Care	Access River East	4,152	0.39
	Access Transcona	3,093	0.41
	Aikins Street Community Health Centre	1,610	0.42
	Access Downtown	2,627	0.54
	Corydon/River Heights Primary Care Clinic	3,487	0.49
Community Health Clinic	Aboriginal Health and Wellness Centre	385	0.52
	Centre de Santé Saint Boniface	2,937	0.43
	Hope Centre Health Care Inc	325	0.46
	Klinic Community Health Centre	2,290	0.33
	Mount Carmel Clinic	2,478	0.37
	Nor'West Co-op Community Health Centre	1,180	0.26
	Women's Health Clinic	1,081	0.26
Teaching Clinic	Family Medical Centre	3,916	0.30
	Kildonan Medical Centre	4,014	0.40
	Northern Connection Medical Centre	477	0.37

Online Appendix Table 2.22: Hospitalizations for Ambulatory Care Sensitive Conditions: Adults Aged 74 and Younger, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	26,098	2.45
	Concordia Health Associates	8,897	2.02
	Prairie Trail Medical Clinic	9,195	1.31
	Clinique St. Boniface Clinic	13,054	2.37
	Tuxedo Family Medical Centre	7,354	1.09
WRHA Primary Care	Access River East	3,744	2.94
	Access Transcona	2,987	2.01
	Aikins Street Community Health Centre	s	s
	Access Downtown	2,443	11.87
	Corydon/River Heights Primary Care Clinic	3,108	2.57
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	2,734	2.93
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	2,283	3.50
	Mount Carmel Clinic	2,443	4.50
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	1,080	0.00
Teaching Clinic	Family Medical Centre	s	s
	Kildonan Medical Centre	3,680	1.63
	Northern Connection Medical Centre	471	12.74

s indicates data suppressed due to small numbers.

Online Appendix Table 2.23: X-Ray for Lower Back Pain: Adults Aged 20 and Older, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	263	34.6
	Concordia Health Associates	95	27.4
	Prairie Trail Medical Clinic	113	15.9
	Clinique St. Boniface Clinic	116	30.2
	Tuxedo Family Medical Centre	35	22.9
WRHA Primary Care	Access River East	31	22.6
	Access Transcona	23	26.1
	Aikins Street Community Health Centre	s	s
	Access Downtown	s	s
	Corydon/River Heights Primary Care Clinic	30	23.3
Community Health Clinic	Aboriginal Health and Wellness Centre	s	s
	Centre de Santé Saint Boniface	s	s
	Hope Centre Health Care Inc	s	s
	Klinic Community Health Centre	s	s
	Mount Carmel Clinic	23	0.0
	Nor'West Co-op Community Health Centre	s	s
	Women's Health Clinic	8	0.0
Teaching Clinic	Family Medical Centre	s	s
	Kildonan Medical Centre	31	41.9
	Northern Connection Medical Centre	s	s

s indicates data suppressed due to small numbers.

Online Appendix Table 2.24: Hospital Episodes with a Readmission within 30 Days, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate (%)
PIN FFS	Assiniboine Medical Clinic	5,897	4.9
	Concordia Health Associates	1,865	6.1
	Prairie Trail Medical Clinic	1,848	5.8
	Clinique St. Boniface Clinic	3,527	6.2
	Tuxedo Family Medical Centre	1,369	4.4
WRHA Primary Care	Access River East	1,192	8.4
	Access Transcona	707	5.5
	Aikins Street Community Health Centre	551	6.9
	Access Downtown	1,104	9.3
	Corydon/River Heights Primary Care Clinic	812	6.8
Community Health Clinic	Aboriginal Health and Wellness Centre	182	6.6
	Centre de Santé Saint Boniface	668	4.9
	Hope Centre Health Care Inc	165	8.5
	Klinic Community Health Centre	641	11.1
	Mount Carmel Clinic	1,050	6.9
	Nor'West Co-op Community Health Centre	290	5.2
	Women's Health Clinic	192	4.2
Teaching Clinic	Family Medical Centre	939	5.3
	Kildonan Medical Centre	1,036	7.5
	Northern Connection Medical Centre	175	17.1

Online Appendix Table 2.25: Emergency Department Visit Rate for Patients with CTAS 4 or 5, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	29,205	117.96
	Concordia Health Associates	9,581	149.57
	Prairie Trail Medical Clinic	9,718	98.27
	Clinique St. Boniface Clinic	14,493	115.23
	Tuxedo Family Medical Centre	7,882	78.79
WRHA Primary Care	Access River East	4,208	214.59
	Access Transcona	3,147	190.66
	Aikins Street Community Health Centre	1,647	290.83
	Access Downtown	2,644	292.74
	Corydon/River Heights Primary Care Clinic	3,498	118.35
Community Health Clinic	Aboriginal Health and Wellness Centre	391	445.01
	Centre de Santé Saint Boniface	2,987	110.14
	Hope Centre Health Care Inc	332	433.73
	Klinic Community Health Centre	2,317	242.99
	Mount Carmel Clinic	2,504	325.48
	Nor'West Co-op Community Health Centre	1,196	269.23
	Women's Health Clinic	1,081	147.09
Teaching Clinic	Family Medical Centre	3,974	118.02
	Kildonan Medical Centre	4,048	148.22
	Northern Connection Medical Centre	484	233.47

Online Appendix Table 2.26: Ambulatory Visits to Primary Care, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	77,576	4.43
	Concordia Health Associates	23,364	3.86
	Prairie Trail Medical Clinic	25,207	4.77
	Clinique St. Boniface Clinic	38,868	4.51
	Tuxedo Family Medical Centre	21,162	4.19
WRHA Primary Care	Access River East	9,690	3.56
	Access Transcona	7,051	3.34
	Aikins Street Community Health Centre	3,917	4.14
	Access Downtown	6,894	4.48
	Corydon/River Heights Primary Care Clinic	8,348	3.40
Community Health Clinic	Aboriginal Health and Wellness Centre	1,028	6.88
	Centre de Santé Saint Boniface	7,322	3.99
	Hope Centre Health Care Inc	881	5.40
	Klinic Community Health Centre	5,008	3.76
	Mount Carmel Clinic	6,353	4.58
	Nor'West Co-op Community Health Centre	2,483	3.09
	Women's Health Clinic	2,586	3.25
Teaching Clinic	Family Medical Centre	9,655	3.63
	Kildonan Medical Centre	10,343	3.98
	Northern Connection Medical Centre	1,113	4.38

Online Appendix Table 2.27: Ambulatory Visits to Primary Care for Patients with RUB 3, 4, or 5, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	44,262	5.40
	Concordia Health Associates	11,549	5.01
	Prairie Trail Medical Clinic	13,985	5.92
	Clinique St. Boniface Clinic	22,107	5.60
	Tuxedo Family Medical Centre	10,793	5.21
WRHA Primary Care	Access River East	4,839	4.59
	Access Transcona	3,134	4.50
	Aikins Street Community Health Centre	2,175	5.24
	Access Downtown	4,452	5.23
	Corydon/River Heights Primary Care Clinic	4,294	4.23
Community Health Clinic	Aboriginal Health and Wellness Centre	663	8.43
	Centre de Santé Saint Boniface	3,645	5.31
	Hope Centre Health Care Inc	628	6.30
	Klinic Community Health Centre	2,281	5.12
	Mount Carmel Clinic	3,387	5.67
	Nor'West Co-op Community Health Centre	914	4.15
	Women's Health Clinic	813	4.36
Teaching Clinic	Family Medical Centre	4,534	4.61
	Kildonan Medical Centre	5,545	5.00
	Northern Connection Medical Centre	504	5.89

Online Appendix Table 2.28: Ambulatory Visits to Primary Care for Patients with Three or More Complexities, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate
PIN FFS	Assiniboine Medical Clinic	3,510	5.02
	Concordia Health Associates	1,940	4.50
	Prairie Trail Medical Clinic	1,139	6.15
	Clinique St. Boniface Clinic	2,853	5.77
	Tuxedo Family Medical Centre	572	5.09
WRHA Primary Care	Access River East	1,608	4.30
	Access Transcona	1,096	3.75
	Aikins Street Community Health Centre	1,515	4.39
	Access Downtown	2,668	5.09
	Corydon/River Heights Primary Care Clinic	855	4.08
Community Health Clinic	Aboriginal Health and Wellness Centre	764	7.25
	Centre de Santé Saint Boniface	591	4.91
	Hope Centre Health Care Inc	689	5.74
	Klinic Community Health Centre	2,059	4.83
	Mount Carmel Clinic	4,232	4.78
	Nor'West Co-op Community Health Centre	871	3.45
	Women's Health Clinic	822	3.62
Teaching Clinic	Family Medical Centre	969	4.75
	Kildonan Medical Centre	817	5.14
	Northern Connection Medical Centre	250	4.76

Online Appendix Table 2.29: Contact with Health Links – Info Santé within Two Days of an Ambulatory Visit to Primary Care, Population and Crude Rate

Model of Primary Care	Clinic	Population	Crude Rate*
PIN FFS	Assiniboine Medical Clinic	364,295	3.75
	Concordia Health Associates	96,026	4.34
	Prairie Trail Medical Clinic	128,292	3.95
	Clinique St. Boniface Clinic	185,589	3.33
	Tuxedo Family Medical Centre	92,880	4.46
WRHA Primary Care	Access River East	37,272	8.16
	Access Transcona	25,743	7.03
	Aikins Street Community Health Centre	17,837	8.19
	Access Downtown	0	0.00
	Corydon/River Heights Primary Care Clinic	30,125	5.21
Community Health Clinic	Aboriginal Health and Wellness Centre	7,532	6.90
	Centre de Santé Saint Boniface	31,448	9.92
	Hope Centre Health Care Inc	5,303	6.98
	Klinic Community Health Centre	20,705	12.70
	Mount Carmel Clinic	31,714	9.08
	Nor'West Co-op Community Health Centre	8,517	10.80
	Women's Health Clinic	8,986	9.13
Teaching Clinic	Family Medical Centre	38,688	8.92
	Kildonan Medical Centre	44,165	3.55
	Northern Connection Medical Centre	0	0.00

*per 1,000 visits

ONLINE APPENDIX 3 – MODEL RESULTS

Online Appendix Table 3.1: Statistical Model Output for Breast Cancer Screening: Women Aged 50-74

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.21 (0.96 – 1.53)	0.114
	PIN FFS vs. Community Health Clinic	**1.48 (1.13 – 1.94)**	**0.005**
	PIN FFS vs. Teaching Clinic	1.21 (0.94 – 1.55)	0.146
	PIN FFS vs. Non-PIN FFS	**1.62 (1.41 – 1.85)**	**<0.001**
	WRHA Primary Care vs. Community Health Clinic	1.22 (0.90 – 1.67)	0.206
	WRHA Primary Care vs. Teaching Clinic	1.00 (0.74 – 1.35)	0.982
	WRHA Primary Care vs. Non-PIN FFS	**1.34 (1.08 – 1.66)**	**0.009**
	Community Health Clinic vs. Teaching Clinic	0.81 (0.59 – 1.13)	0.222
	Community Health Clinic vs. Non-PIN FFS	1.09 (0.85 – 1.41)	0.493
	Teaching Clinic vs. Non-PIN FFS	1.34 (1.07 – 1.69)	0.013
Characteristics	**Patient Age**	**0.98 (0.98 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.68 (0.63 – 0.74)**	**<0.001**
	RUB 2 vs. 4-5	**0.75 (0.71 – 0.81)**	**<0.001**
	RUB 3 vs. 4-5	1.05 (0.99 – 1.12)	0.128
	Q1 vs. Q5	**0.70 (0.66 – 0.74)**	**<0.001**
	Q2 vs. Q5	**0.77 (0.73 – 0.81)**	**<0.001**
	Q3 vs. Q5	**0.83 (0.79 – 0.87)**	**<0.001**
	Q4 vs. Q5	**0.93 (0.88 – 0.97)**	**0.001**
	Patient Sex (Male vs. Female)	N/A	–
	International Medical Graduate	**0.89 (0.80 – 0.99)**	**0.027**
	Provider Age	**0.99 (0.99 – 1.00)**	**0.002**
	Years of Practice	**1.02 (1.01 – 1.02)**	**<0.001**
	Provider Sex (Male vs. Female)	**0.66 (0.60 – 0.73)**	**<0.001**
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	**0.76 (0.72 – 0.80)**	**<0.001**
	Social Housing Resident	0.95 (0.86 – 1.05)	0.303
	Income Assistance	**0.45 (0.42 – 0.48)**	**<0.001**
	Major Mental Health Diagnosis	**0.78 (0.74 – 0.82)**	**<0.001**
	Newcomer	**0.71 (0.63 – 0.81)**	**<0.001**
	Teen Mom	**0.90 (0.85 – 0.94)**	**<0.001**
	Involvement with the Justice System	**0.77 (0.73 – 0.81)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.2: Statistical Model Output for Cervical Cancer Screening: Women Aged 21-69

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**1.79 (1.32 – 2.43)**	**<0.001**
	PIN FFS vs. Community Health Clinic	**2.33 (1.71 – 3.18)**	**<0.001**
	PIN FFS vs. Teaching Clinic	**1.63 (1.19 – 2.24)**	**0.003**
	PIN FFS vs. Non-PIN FFS	**1.79 (1.49 – 2.16)**	**<0.001**
	WRHA Primary Care vs. Community Health Clinic	1.30 (0.91 – 1.86)	0.156
	WRHA Primary Care vs. Teaching Clinic	0.91 (0.63 – 1.32)	0.620
	WRHA Primary Care vs. Non-PIN FFS	1.00 (0.76 – 1.31)	0.998
	Community Health Clinic vs. Teaching Clinic	0.70 (0.48 – 1.02)	0.066
	Community Health Clinic vs. Non-PIN FFS	0.77 (0.58 – 1.02)	0.067
	Teaching Clinic vs. Non-PIN FFS	1.10 (0.83 – 1.46)	0.513
Characteristics	**Patient Age**	**0.99 (0.99 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.89 (0.83 – 0.94)**	**<0.001**
	RUB 2 vs. 4-5	**0.90 (0.85 – 0.95)**	**<0.001**
	RUB 3 vs. 4-5	**1.23 (1.16 – 1.30)**	**<0.001**
	Q1 vs. Q5	**0.82 (0.79 – 0.85)**	**<0.001**
	Q2 vs. Q5	**0.87 (0.83 – 0.90)**	**<0.001**
	Q3 vs. Q5	**0.91 (0.88 – 0.94)**	**<0.001**
	Q4 vs. Q5	**0.95 (0.91 – 0.98)**	**0.003**
	International Medical Graduate	0.89 (0.78 – 1.02)	0.100
	Provider Age	**0.99 (0.98 – 0.99)**	**<0.001**
	Years of Practice	**1.03 (1.02 – 1.04)**	**<0.001**
	Provider Sex (Male vs. Female)	**0.46 (0.41 – 0.53)**	**<0.001**
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	**1.39 (1.34 – 1.43)**	**<0.001**
	Social Housing Resident	**1.10 (1.05 – 1.15)**	**<0.001**
	Income Assistance	**0.59 (0.57 – 0.61)**	**<0.001**
	Major Mental Health Diagnosis	**0.95 (0.92 – 0.99)**	**0.014**
	Newcomer	1.01 (0.96 – 1.07)	0.647
	Teen Mom	1.02 (0.98 – 1.06)	0.347
	Involvement with the Justice System	**1.12 (1.08 – 1.15)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.3: Statistical Model Output for Colorectal Cancer Screening: Adults Aged 50-74

Effect		Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.40 (1.04 – 1.88)	0.026
	PIN FFS vs. Community Health Clinic	**2.56 (1.83 – 3.59)**	**<0.001**
	PIN FFS vs. Teaching Clinic	**1.57 (1.15 – 2.14)**	**0.005**
	PIN FFS vs. Non-PIN FFS	**1.34 (1.13 – 1.60)**	**0.001**
	WRHA Primary Care vs. Community Health Clinic	**1.83 (1.25 – 2.69)**	**0.002**
	WRHA Primary Care vs. Teaching Clinic	1.12 (0.78 – 1.62)	0.544
	WRHA Primary Care vs. Non-PIN FFS	0.96 (0.74 – 1.25)	0.765
	Community Health Clinic vs. Teaching Clinic	0.61 (0.41 – 0.92)	0.017
	Community Health Clinic vs. Non-PIN FFS	**0.52 (0.38 – 0.72)**	**<0.001**
	Teaching Clinic vs. Non-PIN FFS	0.86 (0.65 – 1.14)	0.283
Characteristics	**Patient Age**	**1.04 (1.04 – 1.04)**	**<0.001**
	RUB 0-1 vs. 4-5	1.05 (1.00 – 1.11)	0.072
	RUB 2 vs. 4-5	**1.06 (1.01 – 1.11)**	**0.010**
	RUB 3 vs. 4-5	**1.16 (1.11 – 1.21)**	**<0.001**
	Q1 vs. Q5	**0.83 (0.80 – 0.86)**	**<0.001**
	Q2 vs. Q5	**0.88 (0.85 – 0.91)**	**<0.001**
	Q3 vs. Q5	**0.94 (0.91 – 0.97)**	**<0.001**
	Q4 vs. Q5	0.98 (0.95 – 1.01)	0.288
	Patient Sex (Male vs. Female)	1.01 (0.99 – 1.04)	0.390
	International Medical Graduate	**1.16 (1.02 – 1.33)**	**0.027**
	Provider Age	**0.99 (0.98 – 1.00)**	**0.016**
	Years of Practice	1.01 (1.00 – 1.01)	0.081
	Provider Sex (Male vs. Female)	**0.73 (0.64 – 0.82)**	**<0.001**
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	**0.85 (0.82 – 0.89)**	**<0.001**
	Social Housing Resident	0.97 (0.90 – 1.05)	0.422
	Income Assistance	**0.63 (0.59 – 0.66)**	**<0.001**
	Major Mental Health Diagnosis	**0.84 (0.81 – 0.87)**	**<0.001**
	Newcomer	**1.14 (1.04 – 1.25)**	**0.006**
	Teen Mom	**0.88 (0.84 – 0.92)**	**<0.001**
	Involvement with the Justice System	**0.83 (0.80 – 0.86)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.4: Statistical Model Output for Completed Vaccinations at Age Two

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**2.42 (1.61 – 3.63)**	**<0.001**
	PIN FFS vs. Community Health Clinic	0.79 (0.49 – 1.29)	0.350
	PIN FFS vs. Teaching Clinic	**1.98 (1.31 – 3.00)**	**0.001**
	PIN FFS vs. Non-PIN FFS	0.95 (0.74 – 1.21)	0.665
	WRHA Primary Care vs. Community Health Clinic	**0.33 (0.19 – 0.57)**	**<0.001**
	WRHA Primary Care vs. Teaching Clinic	0.82 (0.50 – 1.35)	0.434
	WRHA Primary Care vs. Non-PIN FFS	**0.39 (0.27 – 0.57)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	**2.50 (1.42 – 4.41)**	**0.002**
	Community Health Clinic vs. Non-PIN FFS	1.20 (0.76 – 1.89)	0.437
	Teaching Clinic vs. Non-PIN FFS	**0.48 (0.33 – 0.69)**	**<0.001**
Characteristics	Patient Age	N/A	–
	RUB 0-1 vs. 4-5	0.99 (0.76 – 1.29)	0.942
	RUB 2 vs. 4-5	1.04 (0.79 – 1.36)	0.787
	RUB 3 vs. 4-5	1.22 (0.93 – 1.61)	0.156
	Q1 vs. Q5	**0.83 (0.73 – 0.94)**	**0.003**
	Q2 vs. Q5	0.90 (0.80 – 1.01)	0.085
	Q3 vs. Q5	**0.87 (0.77 – 0.98)**	**0.022**
	Q4 vs. Q5	0.94 (0.83 – 1.06)	0.288
	Patient Sex (Male vs. Female)	1.03 (0.96 – 1.10)	0.482
	International Medical Graduate	1.11 (0.93 – 1.32)	0.246
	Provider Age	1.00 (0.99 – 1.00)	0.317
	Years of Practice	0.99 (0.98 – 1.00)	0.080
	Provider Sex (Male vs. Female)	1.08 (0.92 – 1.27)	0.329
Social Complexity	Child in Care	0.93 (0.79 – 1.11)	0.434
	Child of a Newcomer	**1.17 (1.00 – 1.38)**	**0.046**
	Child of a Teen Mom	**0.67 (0.61 – 0.75)**	**<0.001**
	High Residential Mobility	**0.81 (0.70 – 0.95)**	**0.007**
	Social Housing Resident	0.88 (0.77 – 1.01)	0.070
	Income Assistance	**0.68 (0.60 – 0.76)**	**<0.001**
	Major Mental Health Diagnosis	N/A	–
	Newcomer	N/A	–
	Teen Mom	N/A	–
	Involvement with the Justice System	0.88 (0.60 – 1.29)	0.502

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.5: Statistical Model Output for Annual Influenza Vaccination: Adults Aged 65 and Older

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**1.49 (1.17 – 1.89)**	**0.001**
	PIN FFS vs. Community Health Clinic	1.22 (0.92 – 1.62)	0.170
	PIN FFS vs. Teaching Clinic	**1.92 (1.48 – 2.49)**	**<0.001**
	PIN FFS vs. Non-PIN FFS	**1.21 (1.06 – 1.39)**	**0.005**
	WRHA Primary Care vs. Community Health Clinic	0.82 (0.59 – 1.13)	0.227
	WRHA Primary Care vs. Teaching Clinic	1.29 (0.94 – 1.76)	0.111
	WRHA Primary Care vs. Non-PIN FFS	0.81 (0.65 – 1.02)	0.069
	Community Health Clinic vs. Teaching Clinic	1.58 (1.11 – 2.23)	0.010
	Community Health Clinic vs. Non-PIN FFS	1.00 (0.76 – 1.30)	0.974
	Teaching Clinic vs. Non-PIN FFS	**0.63 (0.50 – 0.80)**	**<0.001**
Characteristics	Patient Age	1.00 (1.00 – 1.00)	0.710
	RUB 0-1 vs. 4-5	**0.37 (0.34 – 0.40)**	**<0.001**
	RUB 2 vs. 4-5	**0.54 (0.51 – 0.57)**	**<0.001**
	RUB 3 vs. 4-5	**0.86 (0.82 – 0.90)**	**<0.001**
	Q1 vs. Q5	**0.93 (0.88 – 0.98)**	**0.005**
	Q2 vs. Q5	**0.94 (0.89 – 0.98)**	**0.006**
	Q3 vs. Q5	0.95 (0.91 – 1.00)	0.052
	Q4 vs. Q5	0.98 (0.94 – 1.02)	0.368
	Patient Sex (Male vs. Female)	1.02 (0.99 – 1.06)	0.157
	International Medical Graduate	**0.76 (0.68 – 0.85)**	**<0.001**
	Provider Age	0.99 (0.99 – 1.00)	0.061
	Years of Practice	**1.02 (1.01 – 1.02)**	**<0.001**
	Provider Sex (Male vs. Female)	0.94 (0.85 – 1.03)	0.183
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.94 (0.88 – 1.00)	0.060
	Social Housing Resident	0.95 (0.84 – 1.08)	0.441
	Income Assistance	**0.79 (0.72 – 0.86)**	**<0.001**
	Major Mental Health Diagnosis	**0.93 (0.89 – 0.98)**	**0.010**
	Newcomer	**0.59 (0.48 – 0.72)**	**<0.001**
	Teen Mom	1.05 (0.97 – 1.13)	0.200
	Involvement with the Justice System	**0.74 (0.69 – 0.79)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.6: Statistical Model Output for Annual Influenza Vaccination, People with Total Respiratory Morbidity

Effect		Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.07 (0.86 – 1.33)	0.523
	PIN FFS vs. Community Health Clinic	1.24 (0.97 – 1.58)	0.081
	PIN FFS vs. Teaching Clinic	1.07 (0.84 – 1.37)	0.592
	PIN FFS vs. Non-PIN FFS	0.96 (0.85 – 1.08)	0.511
	WRHA Primary Care vs. Community Health Clinic	1.16 (0.87 – 1.53)	0.314
	WRHA Primary Care vs. Teaching Clinic	1.00 (0.74 – 1.34)	0.984
	WRHA Primary Care vs. Non-PIN FFS	0.89 (0.73 – 1.09)	0.270
	Community Health Clinic vs. Teaching Clinic	0.86 (0.63 – 1.18)	0.351
	Community Health Clinic vs. Non-PIN FFS	0.77 (0.62 – 0.97)	0.025
	Teaching Clinic vs. Non-PIN FFS	0.90 (0.71 – 1.13)	0.354
Characteristics	**Patient Age**	**1.03 (1.03 – 1.03)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.44 (0.42 – 0.47)**	**<0.001**
	RUB 2 vs. 4-5	**0.52 (0.50 – 0.55)**	**<0.001**
	RUB 3 vs. 4-5	**0.72 (0.69 – 0.76)**	**<0.001**
	Q1 vs. Q5	0.97 (0.93 – 1.02)	0.240
	Q2 vs. Q5	**0.95 (0.91 – 1.00)**	**0.034**
	Q3 vs. Q5	**0.93 (0.89 – 0.97)**	**<0.001**
	Q4 vs. Q5	0.98 (0.94 – 1.02)	0.375
	Patient Sex (Male vs. Female)	**0.89 (0.87 – 0.92)**	**<0.001**
	International Medical Graduate	**0.81 (0.74 – 0.89)**	**<0.001**
	Provider Age	1.00 (0.99 – 1.00)	0.136
	Years of Practice	**1.01 (1.00 – 1.01)**	**0.012**
	Provider Sex (Male vs. Female)	0.93 (0.86 – 1.01)	0.098
Social Complexity	**Child in Care**	**1.92 (1.71 – 2.16)**	**<0.001**
	Child of a Newcomer	**4.05 (3.54 – 4.63)**	**<0.001**
	Child of a Teen Mom	**0.90 (0.86 – 0.94)**	**<0.001**
	High Residential Mobility	**0.91 (0.88 – 0.95)**	**<0.001**
	Social Housing Resident	1.00 (0.95 – 1.06)	0.923
	Income Assistance	**0.93 (0.89 – 0.97)**	**0.001**
	Major Mental Health Diagnosis	**1.06 (1.01 – 1.10)**	**0.012**
	Newcomer	0.97 (0.89 – 1.07)	0.573
	Teen Mom	**0.91 (0.87 – 0.97)**	**0.002**
	Involvement with the Justice System	**0.70 (0.68 – 0.73)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.7: Statistical Model Output for Pneumococcal Vaccinations: Adults Aged 65 and Older

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.25 (1.00 – 1.56)	0.052
	PIN FFS vs. Community Health Clinic	**1.52 (1.16 – 1.98)**	**0.002**
	PIN FFS vs. Teaching Clinic	1.20 (0.95 – 1.52)	0.135
	PIN FFS vs. Non-PIN FFS	**1.38 (1.22 – 1.56)**	**<0.001**
	WRHA Primary Care vs. Community Health Clinic	1.22 (0.89 – 1.65)	0.216
	WRHA Primary Care vs. Teaching Clinic	0.96 (0.72 – 1.28)	0.788
	WRHA Primary Care vs. Non-PIN FFS	1.10 (0.90 – 1.36)	0.350
	Community Health Clinic vs. Teaching Clinic	0.79 (0.57 – 1.09)	0.157
	Community Health Clinic vs. Non-PIN FFS	0.91 (0.70 – 1.17)	0.456
	Teaching Clinic vs. Non-PIN FFS	1.15 (0.92 – 1.43)	0.220
Characteristics	**Patient Age**	**1.07 (1.06 – 1.07)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.35 (0.32 – 0.38)**	**<0.001**
	RUB 2 vs. 4-5	**0.48 (0.45 – 0.51)**	**<0.001**
	RUB 3 vs. 4-5	**0.78 (0.74 – 0.82)**	**<0.001**
	Q1 vs. Q5	0.97 (0.91 – 1.02)	0.253
	Q2 vs. Q5	1.01 (0.96 – 1.07)	0.601
	Q3 vs. Q5	**1.06 (1.00 – 1.11)**	**0.036**
	Q4 vs. Q5	1.03 (0.98 – 1.08)	0.243
	Patient Sex (Male vs. Female)	**1.06 (1.02 – 1.10)**	**0.001**
	International Medical Graduate	**0.83 (0.75 – 0.92)**	**<0.001**
	Provider Age	**0.99 (0.99 – 1.00)**	**0.032**
	Years of Practice	**1.01 (1.01 – 1.02)**	**<0.001**
	Provider Sex (Male vs. Female)	0.93 (0.85 – 1.02)	0.120
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.97 (0.90 – 1.04)	0.362
	Social Housing Resident	**1.21 (1.06 – 1.37)**	**0.003**
	Income Assistance	**0.87 (0.79 – 0.95)**	**0.002**
	Major Mental Health Diagnosis	**1.06 (1.00 – 1.13)**	**0.044**
	Newcomer	**0.17 (0.14 – 0.21)**	**<0.001**
	Teen Mom	1.04 (0.96 – 1.13)	0.337
	Involvement with the Justice System	**0.76 (0.71 – 0.82)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.8: Statistical Model Output for Diabetes Management: Eye Examination

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.03 (0.85 – 1.25)	0.760
	PIN FFS vs. Community Health Clinic	1.31 (1.04 – 1.65)	0.025
	PIN FFS vs. Teaching Clinic	1.18 (0.95 – 1.45)	0.131
	PIN FFS vs. Non-PIN FFS	**1.17 (1.06 – 1.29)**	**0.002**
	WRHA Primary Care vs. Community Health Clinic	1.27 (0.97 – 1.67)	0.086
	WRHA Primary Care vs. Teaching Clinic	1.14 (0.88 – 1.48)	0.314
	WRHA Primary Care vs. Non-PIN FFS	1.14 (0.95 – 1.36)	0.163
	Community Health Clinic vs. Teaching Clinic	0.90 (0.67 – 1.20)	0.476
	Community Health Clinic vs. Non-PIN FFS	0.89 (0.72 – 1.12)	0.330
	Teaching Clinic vs. Non-PIN FFS	1.00 (0.82 – 1.21)	0.961
Characteristics	**Patient Age**	**1.04 (1.04 – 1.04)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.52 (0.45 – 0.60)**	**<0.001**
	RUB 2 vs. 4-5	**0.45 (0.42 – 0.49)**	**<0.001**
	RUB 3 vs. 4-5	**0.78 (0.73 – 0.83)**	**<0.001**
	Q1 vs. Q5	**0.82 (0.76 – 0.89)**	**<0.001**
	Q2 vs. Q5	**0.87 (0.81 – 0.94)**	**<0.001**
	Q3 vs. Q5	**0.92 (0.86 – 0.99)**	**0.034**
	Q4 vs. Q5	0.94 (0.87 – 1.01)	0.097
	Patient Sex (Male vs. Female)	**0.80 (0.77 – 0.85)**	**<0.001**
	International Medical Graduate	0.96 (0.89 – 1.04)	0.342
	Provider Age	**0.99 (0.99 – 1.00)**	**0.002**
	Years of Practice	1.00 (1.00 – 1.01)	0.668
	Provider Sex (Male vs. Female)	**0.86 (0.80 – 0.93)**	**<0.001**
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.95 (0.88 – 1.02)	0.127
	Social Housing Resident	0.91 (0.81 – 1.01)	0.074
	Income Assistance	**0.83 (0.77 – 0.90)**	**<0.001**
	Major Mental Health Diagnosis	0.96 (0.89 – 1.03)	0.248
	Newcomer	0.88 (0.74 – 1.04)	0.134
	Teen Mom	**0.85 (0.78 – 0.94)**	**0.001**
	Involvement with the Justice System	**0.86 (0.80 – 0.92)**	**<0.001**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.9: Statistical Model Output for Congestive Heart Failure Management: Initiation of ACE Inhibitor Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.85 (0.54 – 1.32)	0.465
	PIN FFS vs. Community Health Clinic	**0.31 (0.16 – 0.61)**	**<0.001**
	PIN FFS vs. Teaching Clinic	0.95 (0.60 – 1.50)	0.821
	PIN FFS vs. Non-PIN FFS	0.97 (0.81 – 1.18)	0.780
	WRHA Primary Care vs. Community Health Clinic	0.37 (0.17 – 0.79)	0.011
	WRHA Primary Care vs. Teaching Clinic	1.12 (0.62 – 2.04)	0.710
	WRHA Primary Care vs. Non-PIN FFS	1.15 (0.74 – 1.78)	0.528
	Community Health Clinic vs. Teaching Clinic	**3.02 (1.39 – 6.57)**	**0.006**
	Community Health Clinic vs. Non-PIN FFS	**3.10 (1.61 – 5.97)**	**<0.001**
	Teaching Clinic vs. Non-PIN FFS	1.03 (0.66 – 1.60)	0.908
Characteristics	**Patient Age**	**0.99 (0.98 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	1.26 (0.81 – 1.96)	0.310
	RUB 2 vs. 4-5	**1.45 (1.14 – 1.85)**	**0.003**
	RUB 3 vs. 4-5	1.08 (0.94 – 1.24)	0.288
	Q1 vs. Q5	1.23 (0.99 – 1.53)	0.062
	Q2 vs. Q5	1.17 (0.95 – 1.44)	0.149
	Q3 vs. Q5	1.17 (0.94 – 1.44)	0.158
	Q4 vs. Q5	0.94 (0.75 – 1.16)	0.552
	Patient Sex (Male vs. Female)	**1.19 (1.04 – 1.36)**	**0.013**
	International Medical Graduate	0.93 (0.79 – 1.09)	0.354
	Provider Age	1.01 (1.00 – 1.02)	0.187
	Years of Practice	1.00 (0.99 – 1.01)	0.607
	Provider Sex (Male vs. Female)	1.11 (0.94 – 1.31)	0.204
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	1.11 (0.90 – 1.37)	0.324
	Social Housing Resident	1.35 (0.96 – 1.91)	0.087
	Income Assistance	**0.71 (0.54 – 0.92)**	**0.009**
	Major Mental Health Diagnosis	**0.69 (0.58 – 0.81)**	**<0.001**
	Newcomer	**0.39 (0.19 – 0.80)**	**0.011**
	Teen Mom	0.98 (0.70 – 1.38)	0.924
	Involvement with the Justice System	0.84 (0.65 – 1.07)	0.160

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.10: Statistical Model Output for Congestive Heart Failure Management: Persistence of ACE Inhibitor Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.92 (0.59 – 1.43)	0.701
	PIN FFS vs. Community Health Clinic	0.48 (0.27 – 0.86)	0.014
	PIN FFS vs. Teaching Clinic	0.98 (0.62 – 1.55)	0.927
	PIN FFS vs. Non-PIN FFS	1.01 (0.84 – 1.21)	0.940
	WRHA Primary Care vs. Community Health Clinic	0.53 (0.27 – 1.04)	0.066
	WRHA Primary Care vs. Teaching Clinic	1.07 (0.59 – 1.94)	0.827
	WRHA Primary Care vs. Non-PIN FFS	1.10 (0.71 – 1.70)	0.669
	Community Health Clinic vs. Teaching Clinic	2.08 (1.19 – 3.66)	0.011
	Community Health Clinic vs. Non-PIN FFS	2.02 (1.00 – 4.08)	0.049
	Teaching Clinic vs. Non-PIN FFS	1.03 (0.66 – 1.60)	0.900
Characteristics	**Patient Age**	**0.99 (0.98 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	1.16 (0.76 – 1.77)	0.499
	RUB 2 vs. 4-5	**1.58 (1.25 – 2.00)**	**<0.001**
	RUB 3 vs. 4-5	1.13 (0.98 – 1.30)	0.092
	Q1 vs. Q5	1.02 (0.82 – 1.27)	0.849
	Q2 vs. Q5	1.03 (0.84 – 1.27)	0.774
	Q3 vs. Q5	1.10 (0.89 – 1.36)	0.363
	Q4 vs. Q5	0.88 (0.71 – 1.10)	0.251
	Patient Sex (Male vs. Female)	1.11 (0.97 – 1.27)	0.135
	International Medical Graduate	0.90 (0.76 – 1.06)	0.203
	Provider Age	1.00 (0.99 – 1.01)	0.435
	Years of Practice	1.00 (0.99 – 1.01)	0.907
	Provider Sex (Male vs. Female)	1.04 (0.88 – 1.23)	0.610
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	1.01 (0.82 – 1.24)	0.924
	Social Housing Resident	1.27 (0.91 – 1.78)	0.162
	Income Assistance	**0.73 (0.56 – 0.95)**	**0.021**
	Major Mental Health Diagnosis	**0.69 (0.58 – 0.82)**	**<0.001**
	Newcomer	**0.37 (0.17 – 0.82)**	**0.014**
	Teen Mom	0.98 (0.70 – 1.37)	0.897
	Involvement with the Justice System	**0.78 (0.61 – 1.00)**	**0.049**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.11: Statistical Model Output for Post-Myocardial Infarction Management: Initiation of Beta-Blocker Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.59 (0.20 – 1.77)	0.350
	PIN FFS vs. Community Health Clinic	1.31 (0.46 – 3.73)	0.619
	PIN FFS vs. Teaching Clinic	0.97 (0.41 – 2.29)	0.941
	PIN FFS vs. Non-PIN FFS	0.95 (0.67 – 1.34)	0.772
	WRHA Primary Care vs. Community Health Clinic	2.20 (0.53 – 9.16)	0.280
	WRHA Primary Care vs. Teaching Clinic	1.63 (0.43 – 6.12)	0.470
	WRHA Primary Care vs. Non-PIN FFS	1.60 (0.55 – 4.67)	0.391
	Community Health Clinic vs. Teaching Clinic	0.74 (0.20 – 2.70)	0.650
	Community Health Clinic vs. Non-PIN FFS	0.73 (0.26 – 2.03)	0.544
	Teaching Clinic vs. Non-PIN FFS	0.98 (0.43 – 2.25)	0.965
Characteristics	Age	0.99 (0.98 – 1.00)	0.205
	RUB 0-1 vs. 4-5	0.74 (0.42 – 1.30)	0.293
	RUB 2 vs. 4-5	1.01 (0.67 – 1.51)	0.976
	RUB 3 vs. 4-5	0.93 (0.68 – 1.28)	0.661
	Q1 vs. Q5	0.87 (0.58 – 1.31)	0.515
	Q2 vs. Q5	1.05 (0.70 – 1.58)	0.822
	Q3 vs. Q5	0.84 (0.57 – 1.23)	0.365
	Q4 vs. Q5	0.98 (0.65 – 1.46)	0.910
	Sex (Male vs. Female)	1.10 (0.82 – 1.47)	0.527
	International Medical Graduate	1.05 (0.78 – 1.41)	0.761
	Provider Age	0.99 (0.97 – 1.01)	0.223
	Years of Practice	1.00 (0.98 – 1.02)	0.958
	Provider Sex (Male vs. Female)	1.05 (0.77 – 1.44)	0.744
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.81 (0.55 – 1.19)	0.280
	Social Housing Resident	0.77 (0.42 – 1.43)	0.414
	Income Assistance	1.33 (0.80 – 2.19)	0.269
	Major Mental Health Diagnosis	**0.67 (0.47 – 0.97)**	**0.032**
	Newcomer	0.58 (0.20 – 1.68)	0.318
	Teen Mom	0.86 (0.46 – 1.62)	0.641
	Involvement with the Justice System	0.77 (0.54 – 1.12)	0.173

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.12: Statistical Model Output for Post-Myocardial Infarction Management: Persistence of Beta-Blocker Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.03 (0.51 – 2.06)	0.943
	PIN FFS vs. Community Health Clinic	0.94 (0.39 – 2.22)	0.879
	PIN FFS vs. Teaching Clinic	1.00 (0.51 – 1.94)	0.990
	PIN FFS vs. Non-PIN FFS	1.13 (0.87 – 1.47)	0.360
	WRHA Primary Care vs. Community Health Clinic	0.91 (0.32 – 2.57)	0.861
	WRHA Primary Care vs. Teaching Clinic	0.97 (0.39 – 2.41)	0.949
	WRHA Primary Care vs. Non-PIN FFS	1.10 (0.56 – 2.17)	0.778
	Community Health Clinic vs. Teaching Clinic	1.06 (0.38 – 3.02)	0.906
	Community Health Clinic vs. Non-PIN FFS	1.21 (0.52 – 2.81)	0.659
	Teaching Clinic vs. Non-PIN FFS	1.14 (0.60 – 2.16)	0.698
Characteristics	**Patient Age**	**1.01 (1.00 – 1.02)**	**0.013**
	RUB 0-1 vs. 4-5	1.09 (0.71 – 1.66)	0.696
	RUB 2 vs. 4-5	1.31 (0.98 – 1.75)	0.065
	RUB 3 vs. 4-5	1.17 (0.93 – 1.47)	0.174
	Q1 vs. Q5	1.01 (0.75 – 1.36)	0.941
	Q2 vs. Q5	1.15 (0.86 – 1.54)	0.348
	Q3 vs. Q5	1.14 (0.86 – 1.52)	0.363
	Q4 vs. Q5	1.10 (0.83 – 1.47)	0.498
	Patient Sex (Male vs. Female)	0.98 (0.79 – 1.22)	0.873
	International Medical Graduate	1.09 (0.88 – 1.37)	0.427
	Provider Age	0.99 (0.98 – 1.01)	0.423
	Years of Practice	1.00 (0.99 – 1.02)	0.529
	Provider Sex (Male vs. Female)	1.00 (0.79 – 1.26)	0.994
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.96 (0.72 – 1.29)	0.792
	Social Housing Resident	1.15 (0.71 – 1.87)	0.574
	Income Assistance	0.98 (0.69 – 1.38)	0.901
	Major Mental Health Diagnosis	1.04 (0.78 – 1.39)	0.800
	Newcomer	0.75 (0.32 – 1.73)	0.494
	Teen Mom	0.93 (0.57 – 1.52)	0.783
	Involvement with the Justice System	**0.70 (0.53 – 0.91)**	**0.009**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.13: Statistical Model Output for Post-Myocardial Infarction Management: Initiation of Cholesterol-Lowering Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.07 (0.54 – 2.12)	0.857
	PIN FFS vs. Community Health Clinic	2.46 (1.05 – 5.79)	0.040
	PIN FFS vs. Teaching Clinic	0.99 (0.52 – 1.89)	0.973
	PIN FFS vs. Non-PIN FFS	1.00 (0.78 – 1.30)	0.976
	WRHA Primary Care vs. Community Health Clinic	2.31 (0.83 – 6.47)	0.112
	WRHA Primary Care vs. Teaching Clinic	0.93 (0.38 – 2.26)	0.870
	WRHA Primary Care vs. Non-PIN FFS	0.94 (0.48 – 1.84)	0.862
	Community Health Clinic vs. Teaching Clinic	0.40 (0.14 – 1.12)	0.082
	Community Health Clinic vs. Non-PIN FFS	0.41 (0.18 – 0.94)	0.036
	Teaching Clinic vs. Non-PIN FFS	1.02 (0.54 – 1.89)	0.962
Characteristics	**Patient Age**	**0.97 (0.96 – 0.98)**	**<0.001**
	RUB 0-1 vs. 4-5	**3.58 (2.02 – 6.34)**	**<0.001**
	RUB 2 vs. 4-5	1.12 (0.84 – 1.49)	0.453
	RUB 3 vs. 4-5	**0.79 (0.63 – 0.99)**	**0.038**
	Q1 vs. Q5	1.25 (0.93 – 1.68)	0.145
	Q2 vs. Q5	1.06 (0.80 – 1.42)	0.669
	Q3 vs. Q5	1.22 (0.92 – 1.62)	0.164
	Q4 vs. Q5	1.10 (0.83 – 1.47)	0.498
	Patient Sex (Male vs. Female)	0.95 (0.77 – 1.18)	0.643
	International Medical Graduate	0.88 (0.70 – 1.09)	0.242
	Provider Age	1.00 (0.99 – 1.01)	0.848
	Years of Practice	1.00 (0.98 – 1.01)	0.530
	Provider Sex (Male vs. Female)	1.02 (0.81 – 1.29)	0.862
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.90 (0.67 – 1.21)	0.499
	Social Housing Resident	0.73 (0.46 – 1.18)	0.200
	Income Assistance	0.98 (0.69 – 1.38)	0.889
	Major Mental Health Diagnosis	**0.72 (0.55 – 0.96)**	**0.023**
	Newcomer	0.56 (0.24 – 1.33)	0.190
	Teen Mom	0.68 (0.42 – 1.09)	0.109
	Involvement with the Justice System	1.14 (0.86 – 1.52)	0.361

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.14: Statistical Model Output for Post-Myocardial Infarction Management: Persistence of Cholesterol-Lowering Drug Treatment

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.97 (0.49 – 1.91)	0.931
	PIN FFS vs. Community Health Clinic	2.24 (0.89 – 5.62)	0.086
	PIN FFS vs. Teaching Clinic	0.92 (0.49 – 1.74)	0.803
	PIN FFS vs. Non-PIN FFS	0.98 (0.76 – 1.26)	0.865
	WRHA Primary Care vs. Community Health Clinic	2.31 (0.79 – 6.78)	0.128
	WRHA Primary Care vs. Teaching Clinic	0.95 (0.40 – 2.27)	0.909
	WRHA Primary Care vs. Non-PIN FFS	1.01 (0.52 – 1.94)	0.982
	Community Health Clinic vs. Teaching Clinic	0.41 (0.14 – 1.20)	0.105
	Community Health Clinic vs. Non-PIN FFS	0.44 (0.18 – 1.08)	0.072
	Teaching Clinic vs. Non-PIN FFS	1.06 (0.58 – 1.95)	0.851
Characteristics	**Patient Age**	**0.97 (0.97 – 0.98)**	**<0.001**
	RUB 0-1 vs. 4-5	**2.50 (1.60 – 3.91)**	**<0.001**
	RUB 2 vs. 4-5	1.22 (0.93 – 1.61)	0.158
	RUB 3 vs. 4-5	0.85 (0.68 – 1.06)	0.150
	Q1 vs. Q5	1.13 (0.84 – 1.51)	0.427
	Q2 vs. Q5	1.03 (0.78 – 1.37)	0.831
	Q3 vs. Q5	1.17 (0.89 – 1.55)	0.263
	Q4 vs. Q5	0.95 (0.71 – 1.25)	0.696
	Patient Sex (Male vs. Female)	0.97 (0.78 – 1.19)	0.744
	International Medical Graduate	0.81 (0.65 – 1.01)	0.057
	Provider Age	1.00 (0.99 – 1.01)	0.913
	Years of Practice	1.00 (0.98 – 1.01)	0.793
	Provider Sex (Male vs. Female)	0.96 (0.76 – 1.20)	0.722
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.82 (0.61 – 1.09)	0.170
	Social Housing Resident	1.17 (0.73 – 1.86)	0.512
	Income Assistance	0.84 (0.60 – 1.18)	0.313
	Major Mental Health Diagnosis	0.79 (0.60 – 1.05)	0.101
	Newcomer	0.62 (0.27 – 1.43)	0.260
	Teen Mom	0.73 (0.45 – 1.17)	0.189
	Involvement with the Justice System	0.85 (0.65 – 1.12)	0.256

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.15: Statistical Model Output for Asthma Mangement: Medication Use

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.10 (0.86 – 1.41)	0.429
	PIN FFS vs. Community Health Clinic	1.24 (0.92 – 1.67)	0.156
	PIN FFS vs. Teaching Clinic	1.04 (0.79 – 1.37)	0.771
	PIN FFS vs. Non-PIN FFS	1.17 (1.02 – 1.33)	0.022
	WRHA Primary Care vs. Community Health Clinic	1.12 (0.80 – 1.58)	0.501
	WRHA Primary Care vs. Teaching Clinic	0.94 (0.68 – 1.31)	0.733
	WRHA Primary Care vs. Non-PIN FFS	1.06 (0.85 – 1.32)	0.627
	Community Health Clinic vs. Teaching Clinic	0.84 (0.58 – 1.22)	0.356
	Community Health Clinic vs. Non-PIN FFS	0.94 (0.71 – 1.24)	0.666
	Teaching Clinic vs. Non-PIN FFS	1.12 (0.87 – 1.45)	0.389
Characteristics	Patient Age	1.00 (1.00 – 1.00)	0.101
	RUB 0-1 vs. 4-5	**0.48 (0.42 – 0.54)**	**<0.001**
	RUB 2 vs. 4-5	**0.63 (0.57 – 0.70)**	**<0.001**
	RUB 3 vs. 4-5	**0.86 (0.79 – 0.94)**	**0.001**
	Q1 vs. Q5	**0.91 (0.83 – 0.99)**	**0.036**
	Q2 vs. Q5	**0.85 (0.78 – 0.93)**	**<0.001**
	Q3 vs. Q5	**0.88 (0.80 – 0.96)**	**0.004**
	Q4 vs. Q5	0.95 (0.87 – 1.04)	0.255
	Patient Sex (Male vs. Female)	**0.93 (0.88 – 0.99)**	**0.024**
	International Medical Graduate	**0.85 (0.77 – 0.93)**	**<0.001**
	Provider Age	1.00 (0.99 – 1.00)	0.508
	Years of Practice	1.01 (1.00 – 1.01)	0.072
	Provider Sex (Male vs. Female)	0.92 (0.84 – 1.01)	0.086
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	0.94 (0.88 – 1.01)	0.097
	Social Housing Resident	1.09 (0.99 – 1.21)	0.073
	Income Assistance	0.94 (0.87 – 1.02)	0.141
	Major Mental Health Diagnosis	1.00 (0.93 – 1.08)	0.980
	Newcomer	**0.78 (0.62 – 0.98)**	**0.030**
	Teen Mom	0.96 (0.87 – 1.05)	0.388
	Involvement with the Justice System	**0.92 (0.86 – 0.98)**	**0.013**

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.16: Statistical Model Output for Benzodiazepine Prescribing in Community Dwelling Adults Aged 75 and Older

	Effect	Relative Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.82 (0.65 – 1.04)	0.101
	PIN FFS vs. Community Health Clinic	1.14 (0.83 – 1.57)	0.424
	PIN FFS vs. Teaching Clinic	1.35 (1.04 – 1.77)	0.027
	PIN FFS vs. Non-PIN FFS	1.10 (0.98 – 1.24)	0.122
	WRHA Primary Care vs. Community Health Clinic	1.39 (0.96 – 1.99)	0.078
	WRHA Primary Care vs. Teaching Clinic	**1.65 (1.19 – 2.28)**	**0.003**
	WRHA Primary Care vs. Non-PIN FFS	1.34 (1.07 – 1.67)	0.010
	Community Health Clinic vs. Teaching Clinic	1.19 (0.80 – 1.76)	0.386
	Community Health Clinic vs. Non-PIN FFS	0.97 (0.71 – 1.32)	0.827
	Teaching Clinic vs. Non-PIN FFS	0.81 (0.63 – 1.05)	0.113
Characteristics	Patient Age	1.00 (1.00 – 1.01)	0.683
	RUB 0-1 vs. 4-5	**0.18 (0.14 – 0.23)**	**<0.001**
	RUB 2 vs. 4-5	**0.32 (0.29 – 0.36)**	**<0.001**
	RUB 3 vs. 4-5	**0.69 (0.65 – 0.74)**	**<0.001**
	Q1 vs. Q5	1.00 (0.92 – 1.10)	0.936
	Q2 vs. Q5	1.01 (0.93 – 1.10)	0.794
	Q3 vs. Q5	0.93 (0.85 – 1.01)	0.090
	Q4 vs. Q5	0.92 (0.85 – 1.01)	0.068
	Patient Sex (Male vs. Female)	**0.56 (0.53 – 0.60)**	**<0.001**
	International Medical Graduate	1.03 (0.92 – 1.14)	0.635
	Provider Age	1.00 (0.99 – 1.00)	0.283
	Years of Practice	1.00 (1.00 – 1.01)	0.556
	Provider Sex (Male vs. Female)	**0.87 (0.79 – 0.95)**	**0.003**
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	**1.22 (1.08 – 1.39)**	**0.002**
	Social Housing Resident	1.02 (0.80 – 1.29)	0.875
	Income Assistance	**1.33 (1.08 – 1.65)**	**0.007**
	Major Mental Health Diagnosis	**2.21 (2.04 – 2.40)**	**<0.001**
	Newcomer	0.85 (0.57 – 1.28)	0.443
	Teen Mom	N/A	–
	Involvement with the Justice System	1.04 (0.89 – 1.23)	0.591

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.17: Statistical Model Output for Beers Drug Prescribing in Community Dwelling Adults Aged 65 and Older

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.88 (0.73 – 1.04)	0.141
	PIN FFS vs. Community Health Clinic	0.95 (0.76 – 1.19)	0.664
	PIN FFS vs. Teaching Clinic	0.99 (0.82 – 1.20)	0.931
	PIN FFS vs. Non-PIN FFS	0.97 (0.89 – 1.07)	0.587
	WRHA Primary Care vs. Community Health Clinic	1.09 (0.84 – 1.41)	0.526
	WRHA Primary Care vs. Teaching Clinic	1.13 (0.90 – 1.43)	0.295
	WRHA Primary Care vs. Non-PIN FFS	1.11 (0.94 – 1.31)	0.205
	Community Health Clinic vs. Teaching Clinic	1.04 (0.80 – 1.36)	0.766
	Community Health Clinic vs. Non-PIN FFS	1.02 (0.83 – 1.27)	0.828
	Teaching Clinic vs. Non-PIN FFS	0.98 (0.82 – 1.17)	0.848
Characteristics	**Patient Age**	**0.99 (0.99 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.22 (0.20 – 0.24)**	**<0.001**
	RUB 2 vs. 4-5	**0.40 (0.38 – 0.42)**	**<0.001**
	RUB 3 vs. 4-5	**0.69 (0.66 – 0.72)**	**<0.001**
	Q1 vs. Q5	**1.12 (1.06 – 1.19)**	**<0.001**
	Q2 vs. Q5	**1.08 (1.03 – 1.14)**	**0.004**
	Q3 vs. Q5	**1.06 (1.01 – 1.12)**	**0.018**
	Q4 vs. Q5	0.99 (0.94 – 1.04)	0.740
	Patient Sex (Male vs. Female)	**0.82 (0.79 – 0.85)**	**<0.001**
	International Medical Graduate	**1.12 (1.04 – 1.21)**	**0.003**
	Provider Age	1.00 (1.00 – 1.00)	0.861
	Years of Practice	1.00 (1.00 – 1.01)	0.275
	Provider Sex (Male vs. Female)	1.01 (0.94 – 1.08)	0.822
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	**1.23 (1.14 – 1.32)**	**<0.001**
	Social Housing Resident	**1.14 (1.01 – 1.29)**	**0.036**
	Income Assistance	**1.53 (1.40 – 1.68)**	**<0.001**
	Major Mental Health Diagnosis	**1.84 (1.75 – 1.95)**	**<0.001**
	Newcomer	**0.71 (0.57 – 0.88)**	**0.002**
	Teen Mom	N/A	–
	Involvement with the Justice System	1.07 (0.99 – 1.15)	0.083

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.18: Statistical Model Output for Depression Care, Prescription Follow-up

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.67 (1.09 – 2.56)	0.018
	PIN FFS vs. Community Health Clinic	1.02 (0.62 – 1.70)	0.927
	PIN FFS vs. Teaching Clinic	1.42 (0.89 – 2.26)	0.140
	PIN FFS vs. Non-PIN FFS	0.96 (0.78 – 1.17)	0.652
	WRHA Primary Care vs. Community Health Clinic	0.61 (0.33 – 1.12)	0.112
	WRHA Primary Care vs. Teaching Clinic	0.85 (0.47 – 1.52)	0.582
	WRHA Primary Care vs. Non-PIN FFS	**0.57 (0.38 – 0.85)**	**0.006**
	Community Health Clinic vs. Teaching Clinic	1.39 (0.73 – 2.64)	0.320
	Community Health Clinic vs. Non-PIN FFS	0.93 (0.58 – 1.51)	0.778
	Teaching Clinic vs. Non-PIN FFS	0.67 (0.43 – 1.05)	0.080
Characteristics	**Patient Age**	**1.01 (1.01 – 1.02)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.32 (0.24 – 0.43)**	**<0.001**
	RUB 2 vs. 4-5	**0.37 (0.28 – 0.48)**	**<0.001**
	RUB 3 vs. 4-5	**0.49 (0.38 – 0.62)**	**<0.001**
	Q1 vs. Q5	1.11 (0.93 – 1.32)	0.251
	Q2 vs. Q5	1.01 (0.85 – 1.19)	0.941
	Q3 vs. Q5	0.98 (0.83 – 1.15)	0.773
	Q4 vs. Q5	1.03 (0.88 – 1.22)	0.682
	Patient Sex (Male vs. Female)	0.91 (0.81 – 1.02)	0.097
	International Medical Graduate	0.93 (0.79 – 1.10)	0.406
	Provider Age	1.00 (0.99 – 1.01)	0.413
	Years of Practice	**0.99 (0.98 – 1.00)**	**0.044**
	Provider Sex (Male vs. Female)	0.88 (0.76 – 1.02)	0.096
Social Complexity	Child in Care	1.36 (0.91 – 2.02)	0.138
	Child of a Newcomer	1.29 (0.31 – 5.43)	0.726
	Child of a Teen Mom	1.08 (0.94 – 1.25)	0.287
	High Residential Mobility	1.05 (0.93 – 1.19)	0.425
	Social Housing Resident	0.89 (0.74 – 1.08)	0.226
	Income Assistance	1.12 (0.97 – 1.31)	0.131
	Major Mental Health Diagnosis	**1.51 (1.33 – 1.72)**	**<0.001**
	Newcomer	**0.65 (0.42 – 1.00)**	**0.050**
	Teen Mom	0.98 (0.82 – 1.19)	0.867
	Involvement with the Justice System	0.90 (0.80 – 1.02)	0.114

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.19: Statistical Model Output for Continuity of Care of Assigned Primary Care Provider

	Effect	Estimate (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.068 (0.006 – 0.129)	0.032
	PIN FFS vs. Community Health Clinic	0.070 (0.010 – 0.130)	0.023
	PIN FFS vs. Teaching Clinic	**0.284 (0.222 – 0.346)**	**<0.001**
	PIN FFS vs. Non-PIN FFS	0.030 (-0.008 – 0.068)	0.127
	WRHA Primary Care vs. Community Health Clinic	0.002 (-0.068 – 0.072)	0.952
	WRHA Primary Care vs. Teaching Clinic	**0.216 (0.143 – 0.290)**	**<0.001**
	WRHA Primary Care vs. Non-PIN FFS	-0.038 (-0.093 – 0.017)	0.174
	Community Health Clinic vs. Teaching Clinic	**0.214 (0.143 – 0.286)**	**<0.001**
	Community Health Clinic vs. Non-PIN FFS	-0.040 (-0.093 – 0.012)	0.135
	Teaching Clinic vs. Non-PIN FFS	**-0.254 (-0.309 – -0.200)**	**<0.001**
Characteristics	**Patient Age**	**0.004 (0.004 – 0.004)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.015 (0.011 – 0.019)**	**<0.001**
	RUB 2 vs. 4-5	**0.022 (0.018 – 0.026)**	**<0.001**
	RUB 3 vs. 4-5	**0.011 (0.007 – 0.014)**	**<0.001**
	Q1 vs. Q5	**0.006 (0.003 – 0.009)**	**<0.001**
	Q2 vs. Q5	**0.010 (0.007 – 0.012)**	**<0.001**
	Q3 vs. Q5	**0.006 (0.003 – 0.009)**	**<0.001**
	Q4 vs. Q5	**0.004 (0.001 – 0.006)**	**0.003**
	Patient Sex (Male vs. Female)	**0.017 (0.015 – 0.018)**	**<0.001**
	International Medical Graduate	-0.003 (-0.030 – 0.025)	0.843
	Provider Age	-0.001 (-0.003 – 0.000)	0.068
	Years of Practice	**0.009 (0.008 – 0.011)**	**<0.001**
	Provider Sex (Male vs. Female)	**-0.028 (-0.053 – -0.002)**	**0.033**
Social Complexity	**Child in Care**	**-0.011 (-0.019 – -0.004)**	**0.004**
	Child of a Newcomer	**0.057 (0.048 – 0.066)**	**<0.001**
	Child of a Teen Mom	**-0.009 (-0.011 – -0.006)**	**<0.001**
	High Residential Mobility	**-0.026 (-0.028 – -0.024)**	**<0.001**
	Social Housing Resident	**-0.020 (-0.023 – -0.016)**	**<0.001**
	Income Assistance	-0.003 (-0.006 – 0.000)	0.055
	Major Mental Health Diagnosis	**0.010 (0.007 – 0.013)**	**<0.001**
	Newcomer	**0.026 (0.021 – 0.031)**	**<0.001**
	Teen Mom	**-0.005 (-0.009 – -0.001)**	**0.015**
	Involvement with the Justice System	**-0.027 (-0.029 – -0.024)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.20: Statistical Model Output for Clinic-Based Continuity of Care

	Effect	Estimate (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	-0.059 (-0.105 – -0.013)	0.013
	PIN FFS vs. Community Health Clinic	0.022 (-0.023 – 0.066)	0.348
	PIN FFS vs. Teaching Clinic	-0.040 (-0.085 – 0.005)	0.082
	WRHA Primary Care vs. Community Health Clinic	**0.080 (0.029 – 0.131)**	**0.002**
	WRHA Primary Care vs. Teaching Clinic	0.019 (-0.036 – 0.073)	0.502
	Community Health Clinic vs. Teaching Clinic	-0.062 (-0.115 – -0.008)	0.025
Characteristics	**Patient Age**	**0.003 (0.003 – 0.003)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.015 (0.006 – 0.024)**	**<0.001**
	RUB 2 vs. 4-5	**0.023 (0.015 – 0.031)**	**<0.001**
	RUB 3 vs. 4-5	**0.012 (0.005 – 0.020)**	**0.002**
	Q1 vs. Q5	0.005 (-0.001 – 0.012)	0.116
	Q2 vs. Q5	**0.007 (0.001 – 0.012)**	**0.024**
	Q3 vs. Q5	0.002 (-0.003 – 0.008)	0.420
	Q4 vs. Q5	0.002 (-0.003 – 0.008)	0.346
	Patient Sex (Male vs. Female)	**0.009 (0.005 – 0.013)**	**<0.001**
	International Medical Graduate	-0.013 (-0.056 – 0.029)	0.536
	Provider Age	-0.002 (-0.004 – 0.001)	0.141
	Years of Practice	**0.004 (0.001 – 0.006)**	**0.008**
	Provider Sex (Male vs. Female)	0.010 (-0.024 – 0.044)	0.574
Social Complexity	Child in Care	-0.007 (-0.030 – 0.016)	0.535
	Child of a Newcomer	0.034 (-0.011 – 0.079)	0.140
	Child of a Teen Mom	**-0.015 (-0.022 – -0.008)**	**<0.001**
	High Residential Mobility	**-0.029 (-0.034 – -0.024)**	**<0.001**
	Social Housing Resident	**-0.022 (-0.032 – -0.012)**	**<0.001**
	Income Assistance	**0.012 (0.004 – 0.019)**	**0.002**
	Major Mental Health Diagnosis	0.004 (-0.002 – 0.010)	0.234
	Newcomer	0.010 (-0.011 – 0.031)	0.354
	Teen Mom	-0.002 (-0.011 – 0.006)	0.588
	Involvement with the Justice System	**-0.026 (-0.032 – -0.021)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.21: Statistical Model Output for Referral Rates

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.98 (0.88 – 1.10)	0.778
	PIN FFS vs. Community Health Clinic	1.07 (0.95 – 1.19)	0.270
	PIN FFS vs. Teaching Clinic	**1.19 (1.06 – 1.34)**	**0.004**
	PIN FFS vs. Non-PIN FFS	**1.13 (1.06 – 1.21)**	**<0.001**
	WRHA Primary Care vs. Community Health Clinic	1.08 (0.95 – 1.23)	0.236
	WRHA Primary Care vs. Teaching Clinic	**1.21 (1.05 – 1.39)**	**0.007**
	WRHA Primary Care vs. Non-PIN FFS	**1.15 (1.04 – 1.27)**	**0.007**
	Community Health Clinic vs. Teaching Clinic	1.12 (0.97 – 1.28)	0.121
	Community Health Clinic vs. Non-PIN FFS	1.06 (0.96 – 1.17)	0.259
	Teaching Clinic vs. Non-PIN FFS	0.95 (0.86 – 1.05)	0.337
Characteristics	**Patient Age**	**1.01 (1.01 – 1.01)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.27 (0.26 – 0.27)**	**<0.001**
	RUB 2 vs. 4-5	**0.39 (0.39 – 0.39)**	**<0.001**
	RUB 3 vs. 4-5	**0.67 (0.66 – 0.67)**	**<0.001**
	Q1 vs. Q5	**0.92 (0.92 – 0.93)**	**<0.001**
	Q2 vs. Q5	**0.96 (0.95 – 0.97)**	**<0.001**
	Q3 vs. Q5	**0.96 (0.96 – 0.97)**	**<0.001**
	Q4 vs. Q5	**0.98 (0.97 – 0.99)**	**<0.001**
	Patient Sex (Male vs. Female)	**0.89 (0.88 – 0.89)**	**<0.001**
	International Medical Graduate	**0.92 (0.88 – 0.97)**	**0.002**
	Provider Age	**1.00 (0.99 – 1.00)**	**<0.001**
	Years of Practice	**1.01 (1.00 – 1.01)**	**<0.001**
	Provider Sex (Male vs. Female)	**0.90 (0.86 – 0.94)**	**<0.001**
Social Complexity	**Child in Care**	**0.86 (0.82 – 0.89)**	**<0.001**
	Child of a Newcomer	**0.67 (0.64 – 0.70)**	**<0.001**
	Child of a Teen Mom	**0.97 (0.96 – 0.98)**	**<0.001**
	High Residential Mobility	**1.07 (1.06 – 1.08)**	**<0.001**
	Social Housing Resident	1.00 (0.99 – 1.02)	0.789
	Income Assistance	1.01 (1.00 – 1.02)	0.149
	Major Mental Health Diagnosis	**1.16 (1.15 – 1.17)**	**<0.001**
	Newcomer	**1.08 (1.06 – 1.10)**	**<0.001**
	Teen Mom	**1.09 (1.08 – 1.10)**	**<0.001**
	Involvement with the Justice System	**1.04 (1.03 – 1.05)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.22: Statistical Model Output for Hospitalizations for Ambulatory Care Sensitive Conditions: Adults Aged 74 and Younger

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**0.47 (0.31 – 0.70)**	**<0.001**
	PIN FFS vs. Community Health Clinic	0.83 (0.50 – 1.37)	0.459
	PIN FFS vs. Teaching Clinic	0.59 (0.37 – 0.96)	0.034
	PIN FFS vs. Non-PIN FFS	0.93 (0.73 – 1.18)	0.540
	WRHA Primary Care vs. Community Health Clinic	1.77 (1.02 – 3.07)	0.044
	WRHA Primary Care vs. Teaching Clinic	1.26 (0.73 – 2.19)	0.402
	WRHA Primary Care vs. Non-PIN FFS	**1.98 (1.38 – 2.83)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	0.72 (0.38 – 1.34)	0.297
	Community Health Clinic vs. Non-PIN FFS	1.12 (0.70 – 1.79)	0.633
	Teaching Clinic vs. Non-PIN FFS	1.56 (1.00 – 2.45)	0.050
Characteristics	**Patient Age**	**1.05 (1.04 – 1.05)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.04 (0.03 – 0.05)**	**<0.001**
	RUB 2 vs. 4-5	**0.08 (0.07 – 0.10)**	**<0.001**
	RUB 3 vs. 4-5	**0.21 (0.19 – 0.23)**	**<0.001**
	Q1 vs. Q5	**2.29 (1.89 – 2.77)**	**<0.001**
	Q2 vs. Q5	**1.94 (1.61 – 2.35)**	**<0.001**
	Q3 vs. Q5	**1.90 (1.57 – 2.30)**	**<0.001**
	Q4 vs. Q5	**1.29 (1.05 – 1.58)**	**0.014**
	Patient Sex (Male vs. Female)	**1.39 (1.25 – 1.55)**	**<0.001**
	International Medical Graduate	**1.22 (1.02 – 1.46)**	**0.031**
	Provider Age	**0.98 (0.97 – 0.99)**	**<0.001**
	Years of Practice	1.01 (1.00 – 1.02)	0.067
	Provider Sex (Male vs. Female)	**1.36 (1.14 – 1.62)**	**<0.001**
Social Complexity	**Child in Care**	**4.77 (3.36 – 6.77)**	**<0.001**
	Child of a Newcomer	**3.81 (1.18 – 12.33)**	**0.025**
	Child of a Teen Mom	**0.73 (0.60 – 0.87)**	**<0.001**
	High Residential Mobility	1.13 (0.99 – 1.28)	0.063
	Social Housing Resident	**1.47 (1.26 – 1.70)**	**<0.001**
	Income Assistance	**2.68 (2.33 – 3.07)**	**<0.001**
	Major Mental Health Diagnosis	**1.33 (1.17 – 1.50)**	**<0.001**
	Newcomer	**0.29 (0.16 – 0.53)**	**<0.001**
	Teen Mom	1.11 (0.93 – 1.33)	0.236
	Involvement with the Justice System	1.04 (0.92 – 1.18)	0.503

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.23: Statistical Model Output for X-Ray for Lower Back Pain: Adults Aged 20 and Older

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.30 (0.69 – 2.45)	0.423
	PIN FFS vs. Community Health Clinic	**8.28 (1.90 – 36.10)**	**0.005**
	PIN FFS vs. Teaching Clinic	1.18 (0.62 – 2.25)	0.617
	PIN FFS vs. Non-PIN FFS	1.13 (0.86 – 1.48)	0.390
	WRHA Primary Care vs. Community Health Clinic	6.38 (1.34 – 30.41)	0.020
	WRHA Primary Care vs. Teaching Clinic	0.91 (0.39 – 2.11)	0.824
	WRHA Primary Care vs. Non-PIN FFS	0.87 (0.47 – 1.59)	0.648
	Community Health Clinic vs. Teaching Clinic	0.14 (0.03 – 0.69)	0.016
	Community Health Clinic vs. Non-PIN FFS	**0.14 (0.03 – 0.59)**	**0.008**
	Teaching Clinic vs. Non-PIN FFS	0.96 (0.52 – 1.77)	0.885
Characteristics	**Patient Age**	**1.02 (1.01 – 1.02)**	**<0.001**
	RUB 0-1 vs. 4-5	0.89 (0.55 – 1.46)	0.646
	RUB 2 vs. 4-5	0.97 (0.60 – 1.55)	0.891
	RUB 3 vs. 4-5	0.95 (0.59 – 1.52)	0.820
	Q1 vs. Q5	1.16 (0.93 – 1.45)	0.193
	Q2 vs. Q5	1.06 (0.85 – 1.32)	0.621
	Q3 vs. Q5	1.15 (0.92 – 1.44)	0.220
	Q4 vs. Q5	1.07 (0.86 – 1.33)	0.550
	Patient Sex (Male vs. Female)	0.94 (0.81 – 1.09)	0.438
	International Medical Graduate	1.00 (0.81 – 1.23)	0.994
	Provider Age	1.00 (0.98 – 1.01)	0.471
	Years of Practice	1.01 (1.00 – 1.03)	0.056
	Provider Sex (Male vs. Female)	1.01 (0.83 – 1.23)	0.894
Social Complexity	Child in Care	N/A	–
	Child of a Newcomer	N/A	–
	Child of a Teen Mom	N/A	–
	High Residential Mobility	1.04 (0.87 – 1.24)	0.647
	Social Housing Resident	0.95 (0.70 – 1.29)	0.749
	Income Assistance	1.01 (0.80 – 1.26)	0.960
	Major Mental Health Diagnosis	1.04 (0.81 – 1.32)	0.779
	Newcomer	1.10 (0.83 – 1.46)	0.505
	Teen Mom	0.88 (0.64 – 1.22)	0.454
	Involvement with the Justice System	0.99 (0.83 – 1.18)	0.913

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.24: Statistical Model Output for Hospital Episodes with a Readmission within 30 Days

	Effect	Odds Ratio (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**0.74 (0.60 – 0.92)**	**0.007**
	PIN FFS vs. Community Health Clinic	0.97 (0.73 – 1.30)	0.858
	PIN FFS vs. Teaching Clinic	0.85 (0.65 – 1.11)	0.225
	PIN FFS vs. Non-PIN FFS	0.93 (0.82 – 1.05)	0.252
	WRHA Primary Care vs. Community Health Clinic	1.31 (0.96 – 1.80)	0.089
	WRHA Primary Care vs. Teaching Clinic	1.14 (0.84 – 1.56)	0.395
	WRHA Primary Care vs. Non-PIN FFS	1.25 (1.03 – 1.53)	0.025
	Community Health Clinic vs. Teaching Clinic	0.87 (0.61 – 1.25)	0.446
	Community Health Clinic vs. Non-PIN FFS	0.95 (0.73 – 1.25)	0.731
	Teaching Clinic vs. Non-PIN FFS	1.10 (0.85 – 1.41)	0.470
Characteristics	**Patient Age**	**1.01 (1.00 – 1.01)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.45 (0.38 – 0.53)**	**<0.001**
	RUB 2 vs. 4-5	**0.46 (0.41 – 0.52)**	**<0.001**
	RUB 3 vs. 4-5	**0.60 (0.56 – 0.65)**	**<0.001**
	Q1 vs. Q5	**1.18 (1.05 – 1.33)**	**0.004**
	Q2 vs. Q5	**1.15 (1.02 – 1.29)**	**0.019**
	Q3 vs. Q5	**1.14 (1.02 – 1.28)**	**0.026**
	Q4 vs. Q5	1.11 (0.99 – 1.25)	0.079
	Patient Sex (Male vs. Female)	1.04 (0.97 – 1.12)	0.244
	International Medical Graduate	0.96 (0.88 – 1.06)	0.440
	Provider Age	1.00 (1.00 – 1.01)	0.188
	Years of Practice	1.00 (0.99 – 1.00)	0.139
	Provider Sex (Male vs. Female)	**1.10 (1.00 – 1.20)**	**0.041**
Social Complexity	Child in Care	1.16 (0.91 – 1.47)	0.241
	Child of a Newcomer	**2.27 (1.39 – 3.69)**	**0.001**
	Child of a Teen Mom	**0.87 (0.78 – 0.97)**	**0.015**
	High Residential Mobility	1.07 (0.98 – 1.16)	0.132
	Social Housing Resident	**1.16 (1.04 – 1.29)**	**0.007**
	Income Assistance	**1.38 (1.25 – 1.53)**	**<0.001**
	Major Mental Health Diagnosis	**1.52 (1.41 – 1.64)**	**<0.001**
	Newcomer	1.20 (0.96 – 1.49)	0.104
	Teen Mom	1.02 (0.91 – 1.15)	0.685
	Involvement with the Justice System	1.04 (0.95 – 1.13)	0.432

N/A indicates that the social complexity is not applicable to this indicator.

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.25: Statistical Model Output for Emergency Department Visit Rate for Patients with CTAS 4 or 5

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**0.70 (0.61 – 0.80)**	**<0.001**
	PIN FFS vs. Community Health Clinic	0.87 (0.76 – 0.99)	0.037
	PIN FFS vs. Teaching Clinic	0.92 (0.80 – 1.05)	0.217
	PIN FFS vs. Non-PIN FFS	0.94 (0.87 – 1.02)	0.137
	WRHA Primary Care vs. Community Health Clinic	**1.25 (1.07 – 1.45)**	**0.005**
	WRHA Primary Care vs. Teaching Clinic	**1.31 (1.12 – 1.54)**	**<0.001**
	WRHA Primary Care vs. Non-PIN FFS	**1.35 (1.20 – 1.51)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	1.05 (0.90 – 1.24)	0.512
	Community Health Clinic vs. Non-PIN FFS	1.08 (0.96 – 1.22)	0.182
	Teaching Clinic vs. Non-PIN FFS	1.03 (0.91 – 1.16)	0.677
Characteristics	**Patient Age**	**0.99 (0.99 – 0.99)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.29 (0.28 – 0.29)**	**<0.001**
	RUB 2 vs. 4-5	**0.34 (0.33 – 0.34)**	**<0.001**
	RUB 3 vs. 4-5	**0.49 (0.48 – 0.49)**	**<0.001**
	Q1 vs. Q5	**1.31 (1.29 – 1.33)**	**<0.001**
	Q2 vs. Q5	**1.25 (1.23 – 1.27)**	**<0.001**
	Q3 vs. Q5	**1.22 (1.20 – 1.24)**	**<0.001**
	Q4 vs. Q5	**1.12 (1.11 – 1.14)**	**<0.001**
	Patient Sex (Male vs. Female)	**1.01 (1.00 – 1.02)**	**0.010**
	International Medical Graduate	1.01 (0.95 – 1.07)	0.841
	Provider Age	1.00 (1.00 – 1.00)	0.561
	Years of Practice	**1.00 (0.99 – 1.00)**	**0.012**
	Provider Sex (Male vs. Female)	**1.13 (1.07 – 1.20)**	**<0.001**
Social Complexity	**Child in Care**	**1.03 (1.00 – 1.05)**	**0.026**
	Child of a Newcomer	**1.55 (1.49 – 1.62)**	**<0.001**
	Child of a Teen Mom	**1.02 (1.01 – 1.03)**	**0.005**
	High Residential Mobility	**1.16 (1.15 – 1.17)**	**<0.001**
	Social Housing Resident	**1.11 (1.10 – 1.13)**	**<0.001**
	Income Assistance	**1.62 (1.60 – 1.64)**	**<0.001**
	Major Mental Health Diagnosis	**1.51 (1.49 – 1.52)**	**<0.001**
	Newcomer	**0.74 (0.72 – 0.76)**	**<0.001**
	Teen Mom	0.99 (0.97 – 1.00)	0.083
	Involvement with the Justice System	**1.29 (1.28 – 1.30)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.26: Statistical Model Output for Ambulatory Visits to Primary Care

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**1.19 (1.07 – 1.33)**	**0.002**
	PIN FFS vs. Community Health Clinic	1.10 (0.99 – 1.23)	0.067
	PIN FFS vs. Teaching Clinic	1.10 (0.98 – 1.23)	0.101
	PIN FFS vs. Non-PIN FFS	0.94 (0.88 – 1.01)	0.073
	WRHA Primary Care vs. Community Health Clinic	0.93 (0.82 – 1.05)	0.229
	WRHA Primary Care vs. Teaching Clinic	0.92 (0.81 – 1.05)	0.216
	WRHA Primary Care vs. Non-PIN FFS	**0.79 (0.71 – 0.87)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	0.99 (0.88 – 1.13)	0.924
	Community Health Clinic vs. Non-PIN FFS	**0.85 (0.78 – 0.93)**	**<0.001**
	Teaching Clinic vs. Non-PIN FFS	**0.86 (0.78 – 0.94)**	**0.002**
Characteristics	**Patient Age**	**1.01 (1.01 – 1.01)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.45 (0.44 – 0.45)**	**<0.001**
	RUB 2 vs. 4-5	**0.54 (0.54 – 0.54)**	**<0.001**
	RUB 3 vs. 4-5	**0.75 (0.75 – 0.75)**	**<0.001**
	Q1 vs. Q5	**1.03 (1.03 – 1.04)**	**<0.001**
	Q2 vs. Q5	**1.03 (1.03 – 1.04)**	**<0.001**
	Q3 vs. Q5	**1.03 (1.03 – 1.03)**	**<0.001**
	Q4 vs. Q5	**1.02 (1.01 – 1.02)**	**<0.001**
	Patient Sex (Male vs. Female)	**0.89 (0.89 – 0.89)**	**<0.001**
	International Medical Graduate	**1.05 (1.00 – 1.11)**	**0.041**
	Provider Age	**0.99 (0.99 – 1.00)**	**<0.001**
	Years of Practice	**1.01 (1.01 – 1.01)**	**<0.001**
	Provider Sex (Male vs. Female)	1.02 (0.97 – 1.07)	0.416
Social Complexity	**Child in Care**	**0.87 (0.86 – 0.88)**	**<0.001**
	Child of a Newcomer	**0.94 (0.93 – 0.96)**	**<0.001**
	Child of a Teen Mom	**1.00 (1.00 – 1.01)**	**0.014**
	High Residential Mobility	**1.08 (1.08 – 1.09)**	**<0.001**
	Social Housing Resident	**1.06 (1.06 – 1.06)**	**<0.001**
	Income Assistance	**1.15 (1.14 – 1.15)**	**<0.001**
	Major Mental Health Diagnosis	**1.20 (1.20 – 1.20)**	**<0.001**
	Newcomer	**1.03 (1.02 – 1.03)**	**<0.001**
	Teen Mom	**1.07 (1.06 – 1.07)**	**<0.001**
	Involvement with the Justice System	**1.09 (1.09 – 1.09)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.27: Statistical Model Output for Ambulatory Visits to Primary Care for Patients with RUB 3, 4 or 5

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	**PIN FFS vs. WRHA Primary Care**	**1.21 (1.13 – 1.30)**	**<0.001**
	PIN FFS vs. Community Health Clinic	**1.13 (1.05 – 1.21)**	**<0.001**
	PIN FFS vs. Teaching Clinic	**1.11 (1.05 – 1.18)**	**<0.001**
	PIN FFS vs. Non-PIN FFS	**0.92 (0.88 – 0.97)**	**0.001**
	WRHA Primary Care vs. Community Health Clinic	0.93 (0.86 – 1.01)	0.078
	WRHA Primary Care vs. Teaching Clinic	0.92 (0.85 – 0.99)	0.024
	WRHA Primary Care vs. Non-PIN FFS	**0.76 (0.71 – 0.82)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	0.98 (0.91 – 1.06)	0.698
	Community Health Clinic vs. Non-PIN FFS	**0.82 (0.76 – 0.88)**	**<0.001**
	Teaching Clinic vs. Non-PIN FFS	**0.83 (0.78 – 0.88)**	**<0.001**
Characteristics	**Patient Age**	**1.01 (1.01 – 1.01)**	**<0.001**
	Q1 vs. Q5	**1.05 (1.03 – 1.08)**	**<0.001**
	Q2 vs. Q5	**1.04 (1.03 – 1.05)**	**<0.001**
	Q3 vs. Q5	**1.03 (1.02 – 1.05)**	**<0.001**
	Q4 vs. Q5	**1.02 (1.01 – 1.03)**	**<0.001**
	Patient Sex (Male vs. Female)	**0.90 (0.89 – 0.92)**	**<0.001**
	International Medical Graduate	**1.07 (1.01 – 1.13)**	**0.031**
	Provider Age	1.00 (1.00 – 1.00)	0.134
	Years of Practice	1.00 (0.99 – 1.00)	0.079
	Provider Sex (Male vs. Female)	**1.04 (1.00 – 1.09)**	**0.036**
Social Complexity	**Child in Care**	**0.81 (0.75 – 0.87)**	**<0.001**
	Child of a Newcomer	**0.90 (0.84 – 0.97)**	**0.003**
	Child of a Teen Mom	**1.04 (1.02 – 1.06)**	**<0.001**
	High Residential Mobility	**1.12 (1.10 – 1.15)**	**<0.001**
	Social Housing Resident	**1.11 (1.09 – 1.12)**	**<0.001**
	Income Assistance	**1.25 (1.21 – 1.30)**	**<0.001**
	Major Mental Health Diagnosis	**1.19 (1.17 – 1.22)**	**<0.001**
	Newcomer	0.99 (0.94 – 1.04)	0.649
	Teen Mom	**1.09 (1.07 – 1.11)**	**<0.001**
	Involvement with the Justice System	**1.15 (1.11 – 1.19)**	**<0.001**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.28: Statistical Model Output for Ambulatory Visits to Primary Care with Three or More Social Complexities

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	1.05 (0.95 – 1.16)	0.314
	PIN FFS vs. Community Health Clinic	0.98 (0.87 – 1.09)	0.682
	PIN FFS vs. Teaching Clinic	0.94 (0.86 – 1.04)	0.235
	PIN FFS vs. Non-PIN FFS	**0.82 (0.73 – 0.92)**	**<0.001**
	WRHA Primary Care vs. Community Health Clinic	0.93 (0.83 – 1.04)	0.188
	WRHA Primary Care vs. Teaching Clinic	0.90 (0.80 – 1.01)	0.063
	WRHA Primary Care vs. Non-PIN FFS	**0.78 (0.69 – 0.87)**	**<0.001**
	Community Health Clinic vs. Teaching Clinic	0.97 (0.85 – 1.10)	0.599
	Community Health Clinic vs. Non-PIN FFS	**0.84 (0.75 – 0.93)**	**0.001**
	Teaching Clinic vs. Non-PIN FFS	0.87 (0.77 – 0.98)	0.023
Characteristics	**Patient Age**	**1.01 (1.01 – 1.01)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.31 (0.29 – 0.34)**	**<0.001**
	RUB 2 vs. 4-5	**0.40 (0.37 – 0.42)**	**<0.001**
	RUB 3 vs. 4-5	**0.65 (0.63 – 0.68)**	**<0.001**
	Q1 vs. Q5	1.00 (0.95 – 1.06)	0.932
	Q2 vs. Q5	1.04 (1.00 – 1.10)	0.074
	Q3 vs. Q5	1.01 (0.97 – 1.05)	0.573
	Q4 vs. Q5	1.01 (0.97 – 1.04)	0.676
	Patient Sex (Male vs. Female)	**0.85 (0.83 – 0.88)**	**<0.001**
	International Medical Graduate	0.96 (0.83 – 1.10)	0.536
	Provider Age	1.00 (0.99 – 1.00)	0.237
	Years of Practice	0.99 (0.99 – 1.00)	0.071
	Provider Sex (Male vs. Female)	**1.14 (1.04 – 1.25)**	**0.007**

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).

Online Appendix Table 3.29: Statistical Model Output for a Call to Health Links – Info Santé within Two Days of an Ambulatory Visit

	Effect	Relative Rate (95% Confidence Limits)	p-value
Model Comparisons	PIN FFS vs. WRHA Primary Care	0.77 (0.61 – 0.96)	0.019
	PIN FFS vs. Community Health Clinic	**0.68 (0.55 – 0.83)**	**<0.001**
	PIN FFS vs. Teaching Clinic	**0.72 (0.57 – 0.91)**	**0.006**
	PIN FFS vs. Non-PIN FFS	1.01 (0.89 – 1.13)	0.919
	WRHA Primary Care vs. Community Health Clinic	0.88 (0.68 – 1.15)	0.356
	WRHA Primary Care vs. Teaching Clinic	0.94 (0.70 – 1.25)	0.665
	WRHA Primary Care vs. Non-PIN FFS	**1.31 (1.07 – 1.61)**	**0.009**
	Community Health Clinic vs. Teaching Clinic	1.06 (0.81 – 1.40)	0.673
	Community Health Clinic vs. Non-PIN FFS	**1.48 (1.23 – 1.79)**	**<0.001**
	Teaching Clinic vs. Non-PIN FFS	**1.40 (1.13 – 1.74)**	**0.002**
Characteristics	**Patient Age**	**0.98 (0.98 – 0.98)**	**<0.001**
	RUB 0-1 vs. 4-5	**0.68 (0.64 – 0.71)**	**<0.001**
	RUB 2 vs. 4-5	**0.55 (0.52 – 0.57)**	**<0.001**
	RUB 3 vs. 4-5	**0.68 (0.66 – 0.71)**	**<0.001**
	Q1 vs. Q5	**1.08 (1.04 – 1.13)**	**<0.001**
	Q2 vs. Q5	**1.13 (1.08 – 1.17)**	**<0.001**
	Q3 vs. Q5	**1.05 (1.01 – 1.09)**	**0.026**
	Q4 vs. Q5	**1.07 (1.03 – 1.11)**	**0.001**
	Patient Sex (Male vs. Female)	**0.68 (0.67 – 0.70)**	**<0.001**
	International Medical Graduate	0.94 (0.86 – 1.03)	0.167
	Provider Age	1.00 (0.99 – 1.00)	0.171
	Years of Practice	**0.99 (0.99 – 1.00)**	**0.002**
	Provider Sex (Male vs. Female)	1.05 (0.97 – 1.14)	0.254
Social Complexity	**Child in Care**	**0.61 (0.55 – 0.67)**	**<0.001**
	Child of a Newcomer	**0.54 (0.48 – 0.62)**	**<0.001**
	Child of a Teen Mom	**0.87 (0.84 – 0.90)**	**<0.001**
	High Residential Mobility	**1.04 (1.01 – 1.07)**	**0.013**
	Social Housing Resident	**1.17 (1.12 – 1.22)**	**<0.001**
	Income Assistance	**1.31 (1.27 – 1.36)**	**<0.001**
	Major Mental Health Diagnosis	**1.40 (1.35 – 1.44)**	**<0.001**
	Newcomer	**0.50 (0.46 – 0.55)**	**<0.001**
	Teen Mom	**1.10 (1.05 – 1.15)**	**<0.001**
	Involvement with the Justice System	1.03 (1.00 – 1.06)	0.057

Values in bold type indicate statistically significant values: Model Comparisons ($p<0.01$); Characteristics and Social Complexity ($p<0.05$).