



Manitoba Centre for Health Policy

Revisiting Primary Care Provider Projection Models

Summer 2020

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How to cite this report:

Katz A, Chateau D, Taylor C, Koseva I. Revisiting Primary Care Provider Projection Models. Manitoba Centre for Health Policy. Summer 2020.

Legal Deposit:

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ISBN 978-1-987924-00-8

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1st printing (Summer 2020)

This report was prepared at the request of Manitoba Health, Seniors and Active Living (MHSAL), a department within the Government of Manitoba, as part of the contract between the University of Manitoba and MHSAL. It was supported through funding provided by MHSAL to the University of Manitoba (HIPC 2019/2020-29). The results and conclusions are those of the authors and no official endorsement by MHSAL was intended or should be inferred. Data used in this study are from the Manitoba Population Research Data Repository housed at the Manitoba Centre for Health Policy, University of Manitoba, and were derived from data provided by MHSAL. 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, Max Rady College of Medicine, Rady 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 Manitoba Population 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, Seniors and Active Living. 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 Research Ethics Board on the Bannatyne Campus at the University of Manitoba, 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, Seniors and Active Living.

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Acknowledgements

The authors wish to acknowledge the contributions of the many individuals whose efforts and expertise made this report possible. We apologize in advance to anyone whom we have inadvertently neglected to mention.

We thank Okechukwu Ekuma and Dr. Marcelo Urquia from MCHP for their contributions to this report; Dr. Morgan Price (University of British Columbia) for his external review and insightful comments; Dr. Jennifer Enns (MCHP) for editing the report and writing the lay summary; Jennifer Pepneck for the infographics; and Ruth-Ann Soodeen and Dale Stevenson for contributing to the final report preparation and production.

We acknowledge the contributions of the advisory group in guiding our analyses and interpretation:

- Jeanette Edwards, Barbara Wasilewski, Dr. Jose Francois, Jide Babalola, Sean Brygidyr, Joyce Owusu-Muhanuka, Kara Gray, Rachel McPherson and Dr. Alex Singer

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 2019/2020-29. We also acknowledge the support of Manitoba Health, Seniors and Active Living for the analyses and use of data held in the Manitoba Population Research Data Repository

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Abbreviations

ESM	Equivalent Services Measure
FP	Family Physician
FTE	Full-time Equivalent
HHR	Health Human Resource
MCHP	Manitoba Centre for Health Policy
MHSAL	Manitoba Health, Seniors and Active Living
MyHT	My Health Team
NP	Nurse Practitioner
RHA	Regional Health Authority



Executive Summary

This report revisits the 2009 Manitoba Centre for Health Policy (MCHP) report titled “Physician Resource Projection Models” [1] with a focus on one of the projections reported in that report: primary care providers. Revisiting the previous report provides the opportunity to validate the various components of the process undertaken to make those projections and to update the findings and projections.

The projection models are based on past system use, population projections, and an understanding that both population characteristics and provider characteristics influence the number of providers needed to provide services to the population. The current report provides several refinements of the 2009 report. In addition to validating the projections with current data, we have provided projections for service needs at the local level rather than just at the provincial level. In addition, the models presented include all services provided by primary care providers (family physicians and nurse practitioners), including those provided within institutions such as hospital emergency rooms, inpatient care and personal care homes. These are important refinements that are designed to meet the needs of system planners and managers.

This report does not address whether the projections are for the optimum number of services or providers; it is based on the past patterns of care rather than future service needs, which are unknown.

Population Projections

The population has grown a little faster than projected in the 2009 report. The 2018 Manitoba population is very similar to what was previously projected for 2020 (Figure 2.1). We compare the provider projections for 2020 to the 2018 reality to match the service needs to the population growth.

Service (Equivalent Services Measure) and Provider Projections

The projected Equivalent Services Measure (ESM) values for Manitoba are within 2% of the real values for 2018, with the difference even less when nurse practitioner services are included in the model (Table 2.2). This is true despite the dramatic changes in provider characteristics presented in Tables 2.4 and 2.5. These findings supported the use of the model from the 2009 report to project the number of providers needed to supply the projected services, taking into account current provider characteristics.

The current services provided (ESM) and current provider characteristics were calculated for each of the My Health Team (MyHT) geographic areas, and were used to create a baseline for projections into the future. These are presented in two different ways: based on where people live and where they receive services (as was shown to be important in previous research at MCHP [2]).

Finally, we present ESM projections from 2019 to 2025. Provider projections require the inclusion of provider characteristics. This report follows the same approach taken in 2009 where we created a tool to calculate the number of providers needed based on the most up-to-date provider characteristics, rather than making projections that rely on unknown characteristics.



Chapter 1: Introduction

There is considerable interest in health human resource (HHR) planning at the local, provincial, national and international levels. To a large extent, this interest is based on the widespread perception that there are shortages of physicians, nurses and other healthcare professionals that may result in negative impacts on the health of the population. It has also been suggested that the challenge is a misdistribution of physician services rather than an absolute lack of providers. In response to the perceived shortage of physicians in Manitoba over the past 15 years, the number of training positions for medical students at the University of Manitoba has increased from 85 positions to 110 positions, and there has been a corresponding increase in the absolute number of family physicians practicing in the province. In addition, the system has evolved to include nurse practitioners and the team-based care model.¹

In 2009, the Manitoba Centre for Health Policy (MCHP) released a report entitled “Physician Resource Projection Models” [1]. The focus of that report was to provide information to help medical education planners decide how to distribute the available training (residency) positions among the various medical specialties. The projections for the growth of service requirements in the specialties were intended to actively manage the training of different specialists and family physicians who would provide medical services to the population of Manitoba.

The 2009 report was based on a novel approach to HHR needs planning that at the time had not yet been validated. The projections for service requirements were based on the historical trends in service provision over the previous 23 years and the future population projections developed by Statistics Canada with the Manitoba Bureau of Statistics [1]. The report presented a novel approach to describing the services used by patients: the Equivalent Services Measure (ESM). The ESM is derived from the billing tariffs used by clinicians and as such it represents clinical activity that is comparable over time. The numerical value of the ESM reflects the intensity of the clinical activity. There was no claim that any of the projected service levels represented the “correct” number of services needed. In fact, there is evidence to suggest that there has historically been a continual shortage of services in many areas of medical practice and that modeling our projections on this state of shortage would perpetuate the physician shortage [1]. The purpose of the 2009 study, however, was to use the evidence available to project service requirements based on the projected population changes, not to speculate on an optimal service provision level.

¹ This report addresses care provided by family physicians and nurse practitioners, but does not address other primary care providers such as nurses or allied health providers.

The current report adds two important dimensions to the previous analysis. Firstly, we validate the previous approach and the projection models developed using service use in the ensuing years. Secondly, this report addresses the needs of system planners rather than medical education planners. We do this by analyzing the local requirements for primary care HHRs based on population needs at the local level as well as at the provincial level. We based this approach on the work of the former Primary Care Branch of Manitoba Health, Seniors and Active Living. Their internal annual reports have identified areas of perceived HHR shortages, recognizing that services are provided in multiple settings (offices, hospitals, emergency departments and personal care homes). In addition, the primary care system is now organized into My Health Teams (MyHTs), which provide inter-disciplinary care [2]. As with the 2009 report, we do not claim to provide information on optimal levels of care in this updated report. Our models are based on past levels of care.

The objectives of this report are to:

1. Validate the primary care provider predictive models from the 2009 report [1]
2. Improve the primary care provider prediction models (if they performed poorly in the validation)
3. Inform future primary care planning
 - Provide results by health region and MyHT (see MCHP's report about the My Health Team Initiative [2])
 - Provide a tool to calculate the number of providers needed to meet the demand for services based on current provider characteristics and past use patterns

Chapter 2:

Validation of Previous Projections

We compared the results for each component of the projections up to 2020 made in the 2009 report [1] with the current reality (as of 2018). The components were: the population projections, which should influence service use; the measure of service use (ESM) based on physician claims data² (adjusted for changes in the MHSAL tariff schedule over time); and finally, the provider service delivery, which determines the number of providers required to meet the projected service provision needs. We followed the methods developed for each of these steps as described in the 2009 report [1].

Population Projections

Table 2.1 presents the population projections from 2010 to 2020 reported in 2009 [1] compared to the observed population of Manitoba as of 2018/19³. The 2018 actual population was remarkably similar to the projected population for 2020. This indicates that the population grew slightly faster than projected.

Table 2.1: Validation of Population Projections for Manitoba, 2010-2020

Fiscal Year	Population		
	2009 Report Projected	Actual	Difference
	N	N	
2010	1,233,274	1,242,426	0.74%
2015	1,284,514	1,331,325	3.64%
2018	1,313,577	1,369,850	4.28%
2020	1,332,539	n/a	n/a

n/a: Not applicable

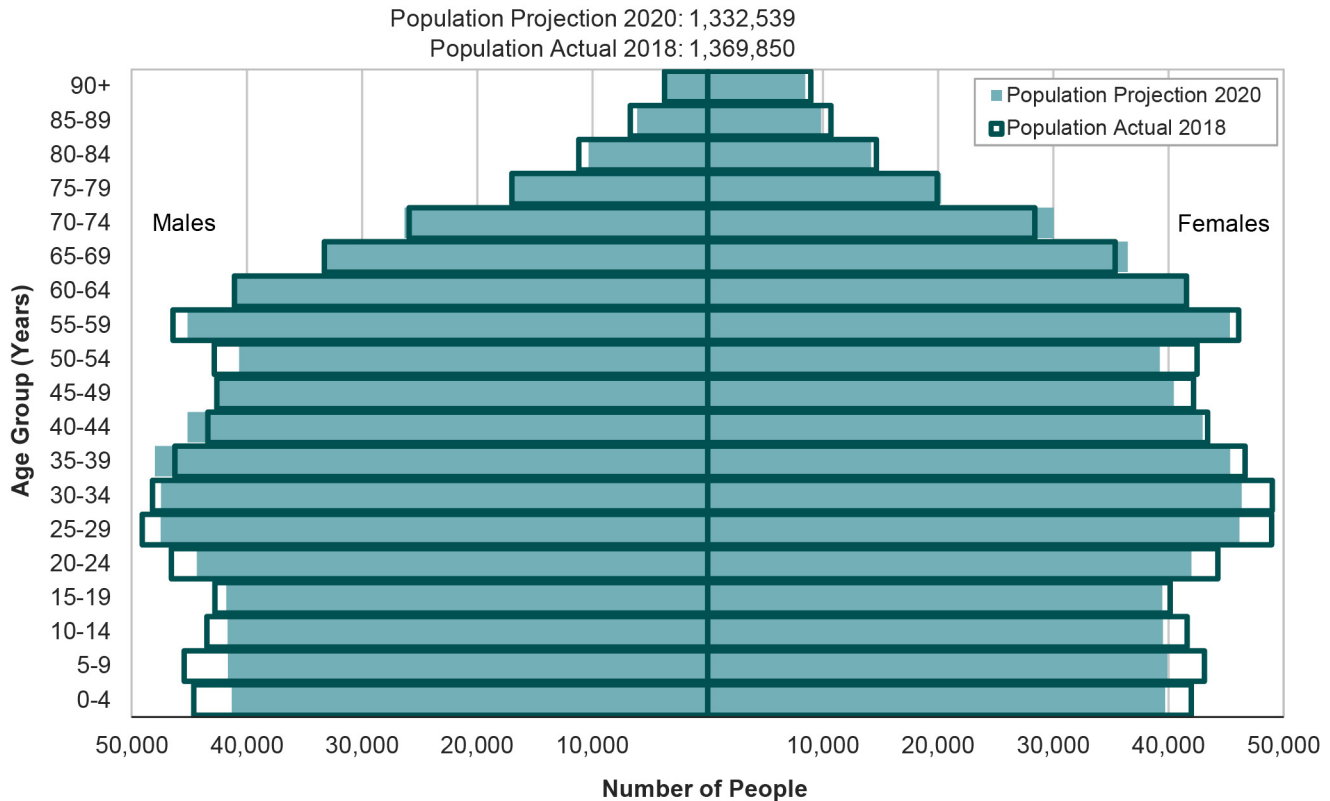
² This report used administrative health data from the Manitoba Population Research Data Repository housed at MCHP. A full list of the data used throughout this report is available in Appendix 1 of the online supplement for this report at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>. Detailed information about these data is available on the MCHP website at http://umanitoba.ca/faculties/health_sciences/medicine/units/chs/departamental_units/mchp/resources/repository/descriptions.html.

³ All analyses in this report were carried out using SAS® version 9.4.

In Figure 2.1, we present the age- and sex-specific projections for 2020 compared to the 2018 reality, based on the Manitoba Health Insurance Registry. The projections

were remarkably accurate. The minor differences were that there were more children and women of child-bearing age in 2018/19 than were projected for 2020.

Figure 2.1: Validation of 2020 Population Projections in Manitoba (Age- and Sex-Specific Profiles)



Equivalent Services Measure (ESM) Projections

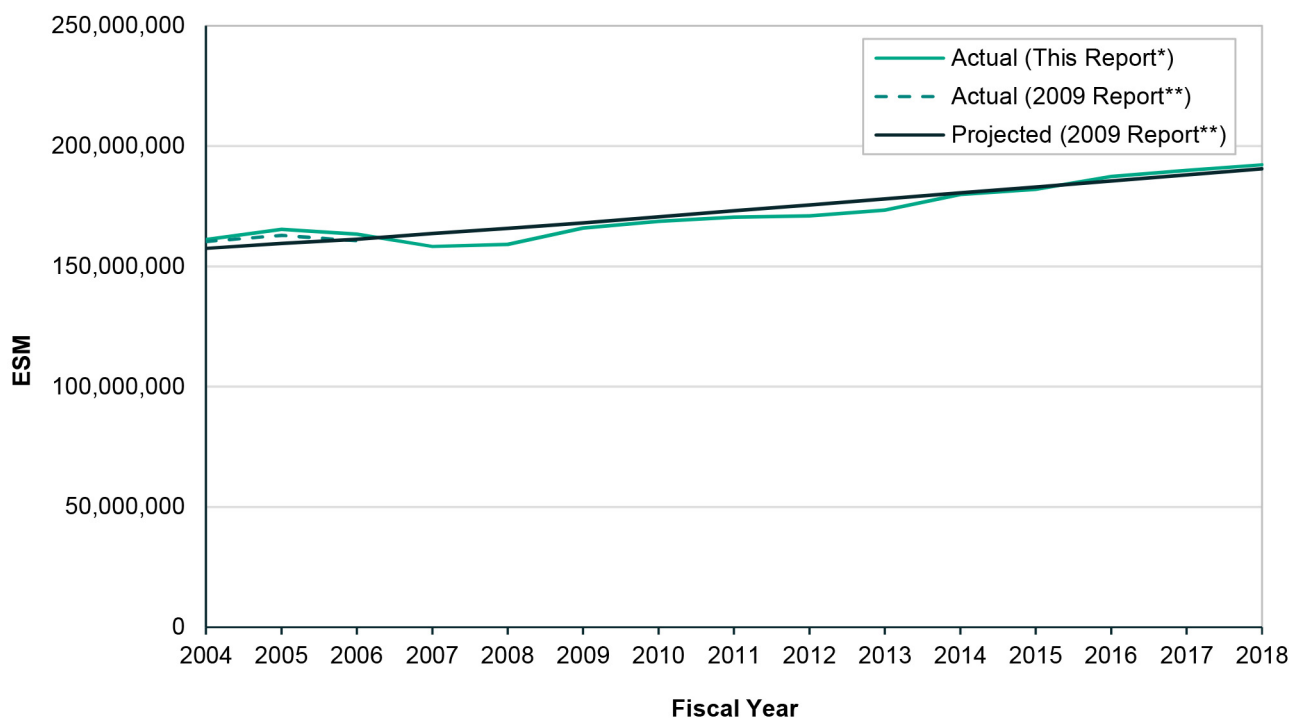
Mathematical models describe the behaviour of a system based on theory and historical data. In the 2009 study, we built models describing the total ESM provided by each of the physician specialties that we studied and for each year of data available [1]. The models included the age and sex of the patients who were recipients of the services. The models were then used to project the ESM (amount of physician services) that would be supplied if the trend of service delivery described in the model was continued. The trend was based on the projected population composition (by age and sex) provided to us by the Manitoba Bureau of Statistics. Thus, the models used past service delivery patterns to project future service need based on projected population changes.

We used the same approach to develop the comparisons of primary care services below.⁴ In the current report, our definition of primary care providers includes both family physicians (FPs) and nurse practitioners (NPs) because NPs are now well-integrated into care provision. This new definition reflects the current team-based care model.

Figure 2.2 and Table 2.2 present the real ESM for 2010, 2015 and 2018 compared to the ESM projections for these years from the 2009 report [1]. The projections for primary care provider ESM from the 2009 report were remarkably accurate (within 2% of the real values), and the difference was even less when NP services were included in the model. It should be noted that the calculation of ESM used in this report is slightly different to that used in the 2009 report. This is due to changes over time in the data system and a refinement of the model. The ESM in the current models includes all services of primary care providers, including hospital, emergency room and personal care home services, rather than community-based services only.

⁴ A full list of tariffs used to calculate ESM in this report is provided in Appendix 1 of the online supplement at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>.

Figure 2.2: Actual and Projected Total Equivalent Services Measure (ESM) for Primary Care Providers in Manitoba, 2004/05-2018/19



* Includes family physicians and nurse practitioners

** Includes family physicians

Table 2.2: Validation of Total Primary Care Equivalent Services Measure (ESM) for Manitoba, 2010-2020

Fiscal Year	Total Equivalent Services Measure by Provider Type				
	2009 Report Projected	Actual			
	Family Physicians	Family Physicians		Family Physicians and Nurse Practitioners	
	N	N	Difference	N	Difference
2010	170,577,301	167,356,803	-1.89%	168,678,711	-1.11%
2015	182,971,356	179,360,545	-1.97%	182,086,383	-0.48%
2018	190,551,261	187,538,153	-1.58%	192,250,864	0.89%
2020	195,713,551	n/a	n/a	n/a	n/a

n/a: Not applicable

Primary Care Provider Projections

Planners need to be able to project the number of providers (family physicians and nurse practitioners) needed in addition to the amount of services required by the population. In the 2009 report, we developed a tool to transform our service needs projections into projections for the number of primary care providers required to meet those projected needs [1]. The tool (see Appendix 2 in the online supplement) uses calculations based on several key factors influencing provider service delivery over the past 20 years, such as provider sex and length of time they have been practicing.

Table 2.3 compares real numbers of providers for 2015-2018 to projections of the number of providers needed, based on population and service use projections from the 2009 report, the provider projection model from the 2009 report, and observations of past service use and provider characteristics. The accuracy of the projections varied over the years. However, our 7-year projections (using 2011 data to project number of providers needed to meet 2018 service delivery) were as good as our 2-year projections (using 2016 data to project 2018), even though we made the assumption that provider characteristics would remain unchanged. The findings suggest that a 7-year prediction window would have a small enough margin of error to be useful for planning purposes. Based on these findings, we used 2018 provider characteristics to predict the number of providers needed all the way up to 2025 (7-year window) in Chapter 4.

Table 2.3: Validation of Primary Care Provider Projections for Manitoba, 2015-2018

Actual and projected number of providers needed to meet projected equivalent service measure

Fiscal Year	Primary Care Providers				
	Actual	2-Year Projection		7-Year Projection	
	N	N	Difference	N	Difference
2015	1,671	1,759	5.29%	1,708	2.19%
2016	1,678	1,686	0.48%	1,636	-2.52%
2017	1,763	1,758	-0.29%	1,791	1.61%
2018	1,800	1,736	-3.55%	1,733	-3.74%

The next step was based on recognizing the impact of changes in practice patterns (team-based care), introduction of other providers (NPs) and changes in provider demographics (years in practice and sex) (Tables 2.4-2.6). Tables 2.5-2.6 demonstrate the dramatic increase in the proportion of ESM contributed by female providers during the study period due to an increase in the number of female providers. The annual average amount of ESM per provider did not change significantly over the study period, as demonstrated in Figure 2.3.⁵ The trend analysis by provider practice years, location and sex is presented in Appendix 3 of the online supplement.

Table 2.4: Total Equivalent Services Measure (ESM) for Primary Care Providers in Manitoba by Practice Years, 2005/06 and 2018/19
Percent of overall ESM

Years in Practice	Percent of Total ESM by Practice Years	
	2005/06* (%)	2018/19** (%)
1-5	27.00	26.57
6-10	14.00	23.32
11-15	15.00	12.12
16-20	15.00	10.30
21+	29.00	27.68

* Includes family physicians

** Includes family physicians and nurse practitioners

Table 2.5: Total Equivalent Services Measure (ESM) Contributed by Female Primary Care Providers in Manitoba by Practice Years, 2005/06 and 2018/19

Percent of ESM for each category of practice years

Years in Practice	Percent of Total ESM for Female Providers by Practice Years	
	2005/06* (%)	2018/19** (%)
1-5	25.00	47.16
6-10	29.00	42.83
11-15	27.00	40.32
16-20	18.00	22.37
21+	13.00	24.05

* Includes family physicians

** Includes family physicians and nurse practitioners

Table 2.6: Average Equivalent Services Measure (ESM) for Primary Care Providers in Manitoba by Provider Sex and Practice Years, 2005/06 and 2018/19

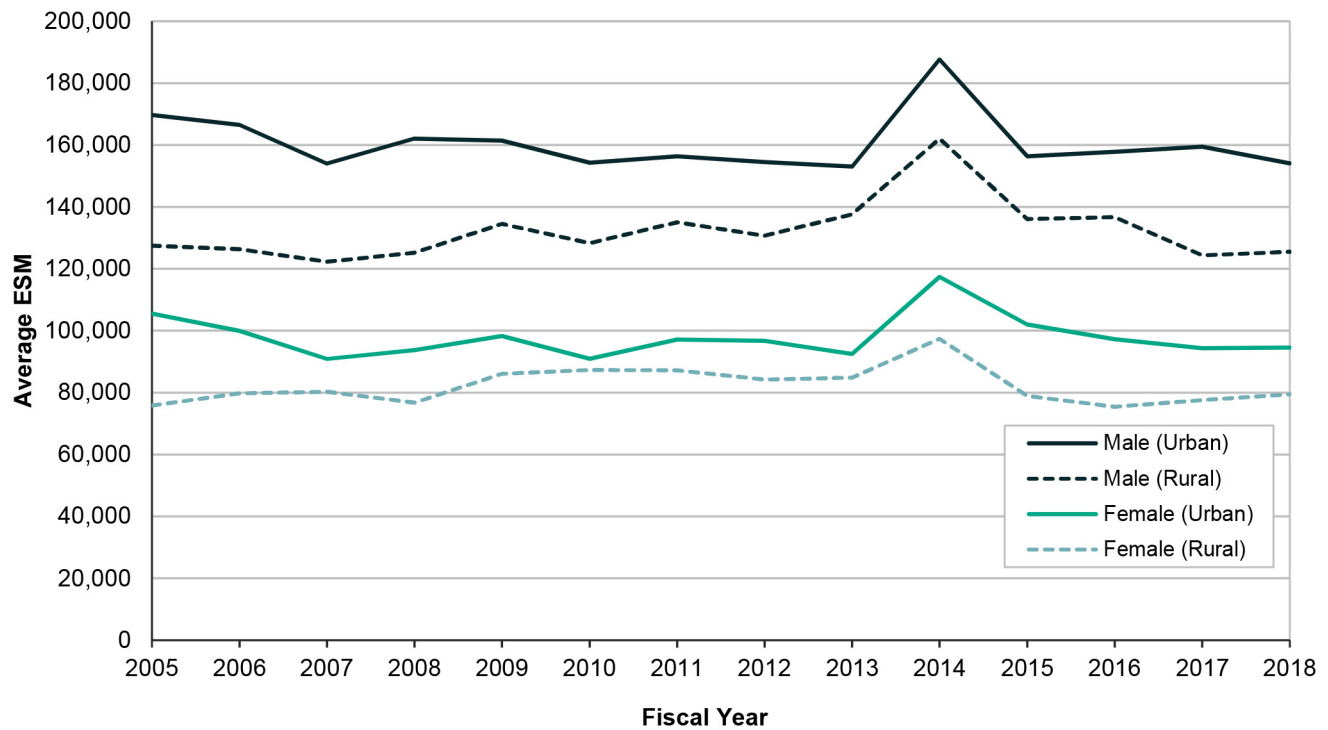
Years in Practice	Average ESM per Provider			
	Female Providers		Male Providers	
	2005/06*	2018/19**	2005/06*	2018/19**
1-5	98,727	69,507	149,619	97,061
6-10	128,697	113,431	159,942	184,344
11-15	127,534	92,321	180,100	166,265
16-20	124,034	72,100	191,509	162,349
21+	130,415	112,372	194,237	152,507

* Includes family physicians

** Includes family physicians and nurse practitioners

Figure 2.3: Annual Average Equivalent Services Measure (ESM) for Primary Care Providers in Manitoba, 2005/06-2018/19

ESM by Provider



Chapter 3:

Current Primary Care Service Provision

Table 3.1 presents primary care service provision by provider characteristics in Manitoba in 2018/19. The variability in ESM provision (average per provider) reflects differences in practice style and, to a greater extent, differences in hours of patient care across providers. These differences contribute to the HHR need projections. The detailed information in this table (by practice years) is presented for the province overall to protect the privacy of individual providers.

The findings in the rest of Chapter 3 and in Chapter 4 focus on primary care providers who could be allocated to My Health Teams based on provider location and patient residence. Billing numbers that are used by multiple providers (e.g., one billing number in a clinic) could not be allocated. This resulted in 1,641 providers being allocated (Table 3.1) out of the 1,800 providers in 2018/19 (Table 2.3).

Table 3.1: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in Manitoba by Years of Practice and Sex, 2018/19

Years of Practice	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
1-5	344	55.48	276	44.52	69,508	97,062
6-10	168	54.90	138	45.10	113,431	184,345
11-15	101	54.89	83	45.11	92,322	166,265
16-20	61	39.35	94	60.65	72,101	162,349
21+	113	30.05	263	69.95	112,372	152,508
Total	787	47.96	854	52.04	88,168	142,153

Provision of Services within My Health Teams (MyHTs)

In 2014, the provincial government initiated a series of primary care networks to support the work of family physicians. The geographically-based networks, known as “My Health Teams” (MyHTs), are composed of various healthcare professionals and may include nurses, nurse practitioners, midwives, dietitians, mental-health professionals, pharmacists and others [3].

Tables 3.2-3.6 present the average ESM provided by MyHTs in each health region in 2018/19. Data for MyHTs in Churchill and no-zone areas are not shown in order to

protect the privacy and confidentiality of the providers (i.e., due to small numbers).

The amount of ESM provided in the Northern Health Region presented in Table 3.6 is dramatically different to that provided in other health regions. This likely reflects the fact that the providers in this region do not work full time in patient care. In addition, many services in First Nation communities are provided by nurses who are employed by federal agencies and do not submit claims to MHSAL. This patient care is therefore not reflected in our data. The service provision included in this report for the Northern Health Region is therefore an underestimation of the population’s service use.

Table 3.2: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in My Health Teams in Southern Health-Santé Sud, 2018/19

My Health Teams	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
East	26	43.33	34	56.67	63,444	129,956
Mid	12	60.00	8	40.00	60,439	103,887
West	32	39.02	50	60.98	86,412	112,692
North	10	30.30	23	69.70	86,113	134,545
Mon Équipe Santé*	11	52.38	10	47.62	57,398	118,753

* This My Health Team is defined by patients who regularly receive care in French.

Table 3.3: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in My Health Teams in Winnipeg RHA, 2018/19

My Health Teams	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
River East/Transcona	63	47.37	70	52.63	116,873	164,173
St. Vital/St. Boniface	73	43.71	94	56.29	108,719	161,260
Fort Garry/River Heights	116	55.24	94	44.76	105,673	128,667
St. James/Assiniboine South	55	48.25	59	51.75	82,628	155,079
Seven Oaks/Inkster	57	51.82	53	48.18	130,960	221,788
Downtown/Point Douglas	110	55.00	90	45.00	65,820	155,330

Table 3.4: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in My Health Teams in Prairie Mountain Health, 2018/19

My Health Teams	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
South	20	46.51	23	53.49	86,080	124,985
Brandon	30	42.86	40	57.14	112,485	221,159
Mid	20	51.28	19	48.72	71,247	169,248
North	33	50.77	32	49.23	102,507	120,988

Table 3.5: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in My Health Teams in Interlake-Eastern RHA, 2018/19

My Health Teams	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
East	12	32.43	25	67.57	105,952	145,503
South	19	52.78	17	47.22	71,269	157,495
Mid	12	37.50	20	62.50	51,085	121,155
West	9	34.62	17	65.38	71,085	161,807
North	s	75.00	s	25.00	15,446	12,914

s Indicates data suppressed due to small numbers.

Table 3.6: Equivalent Services Measure (ESM) Provided by Family Physicians and Nurse Practitioners in My Health Teams in Northern Health Region, 2018/19

My Health Teams	Primary Care Providers				Average ESM	
	Female		Male		Female	Male
	N	%	N	%		
Southeast	38	49.35	39	50.65	32,706	30,270
Southwest	18	40.91	26	59.09	40,210	36,913
North	s	45.45	s	54.55	17,726	16,570

s Indicates data suppressed due to small numbers.

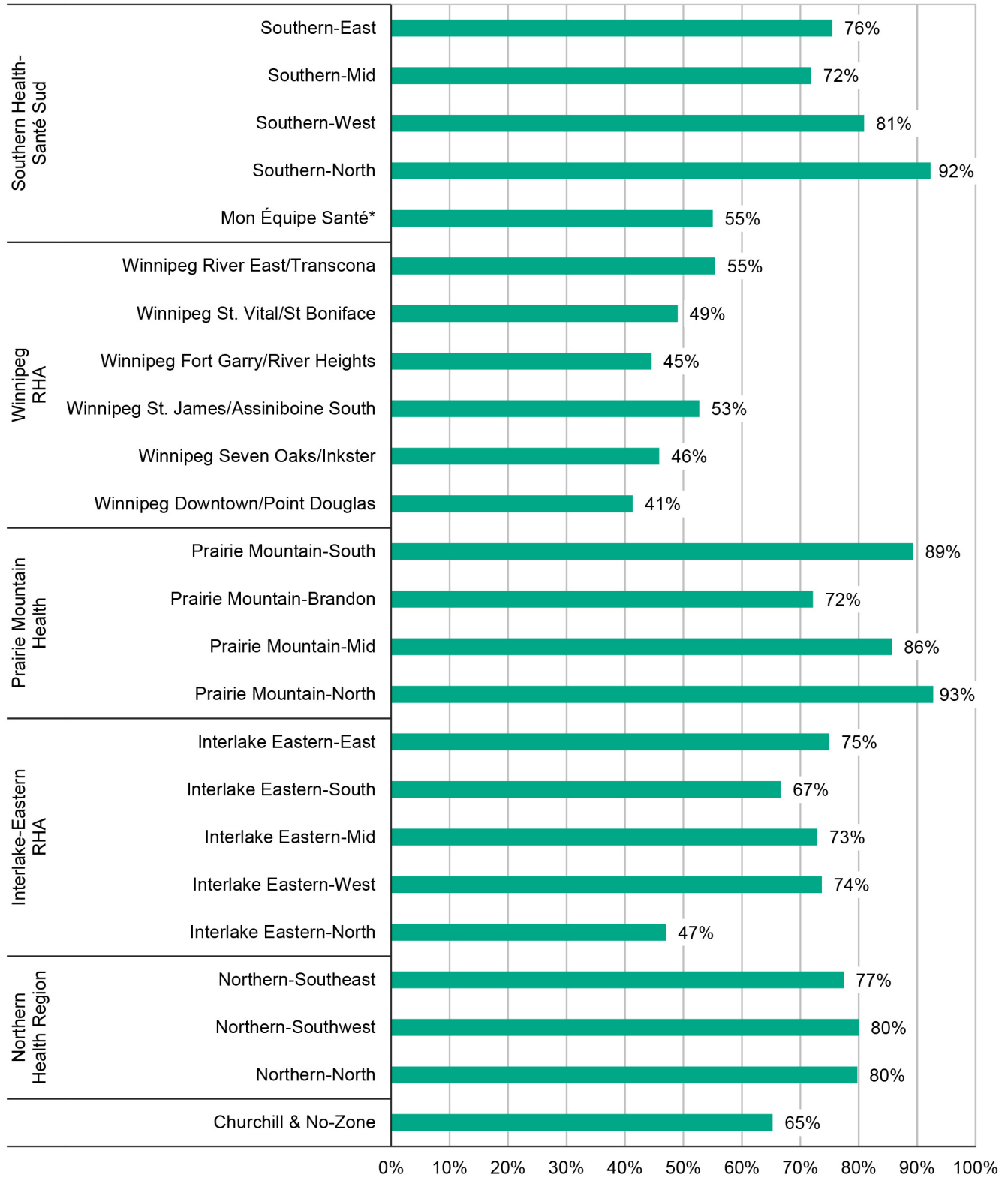
Provision of Services Based on Provider Location or Patient Residence

Provider needs planning should take into account both the distribution and characteristics of the providers and the population's characteristics and geographical distribution. Our previous research demonstrated that patients do not necessarily access care within the geographical catchment area in which they live [2]. The current pattern of patient care-seeking behaviour is not fully understood. There are many factors that may influence patients to seek primary care outside of their MyHT catchment area [4–6]. These include seeking care nearer to their place of work, having a long-term relationship with a provider who moves to a different area, lack of access to care in their area of residence, and other reasons. Changes to any of these factors may impact the need for HHRs over time.

Figure 3.1 shows that 41-55% of primary care services provided by FPs and NPs in the Winnipeg Regional Health Authority are received by residents of this region. In contrast, 72-93% of the services provided in Prairie Mountain Health are received by its residents. Figure 3.2 shows that residents of specific MyHTs across Regional Health Authorities (RHAs) in Manitoba (Southern-Mid, Interlake Eastern-South, Interlake Eastern-North, and Northern-North) seek most of their care in areas outside of their area of residence.

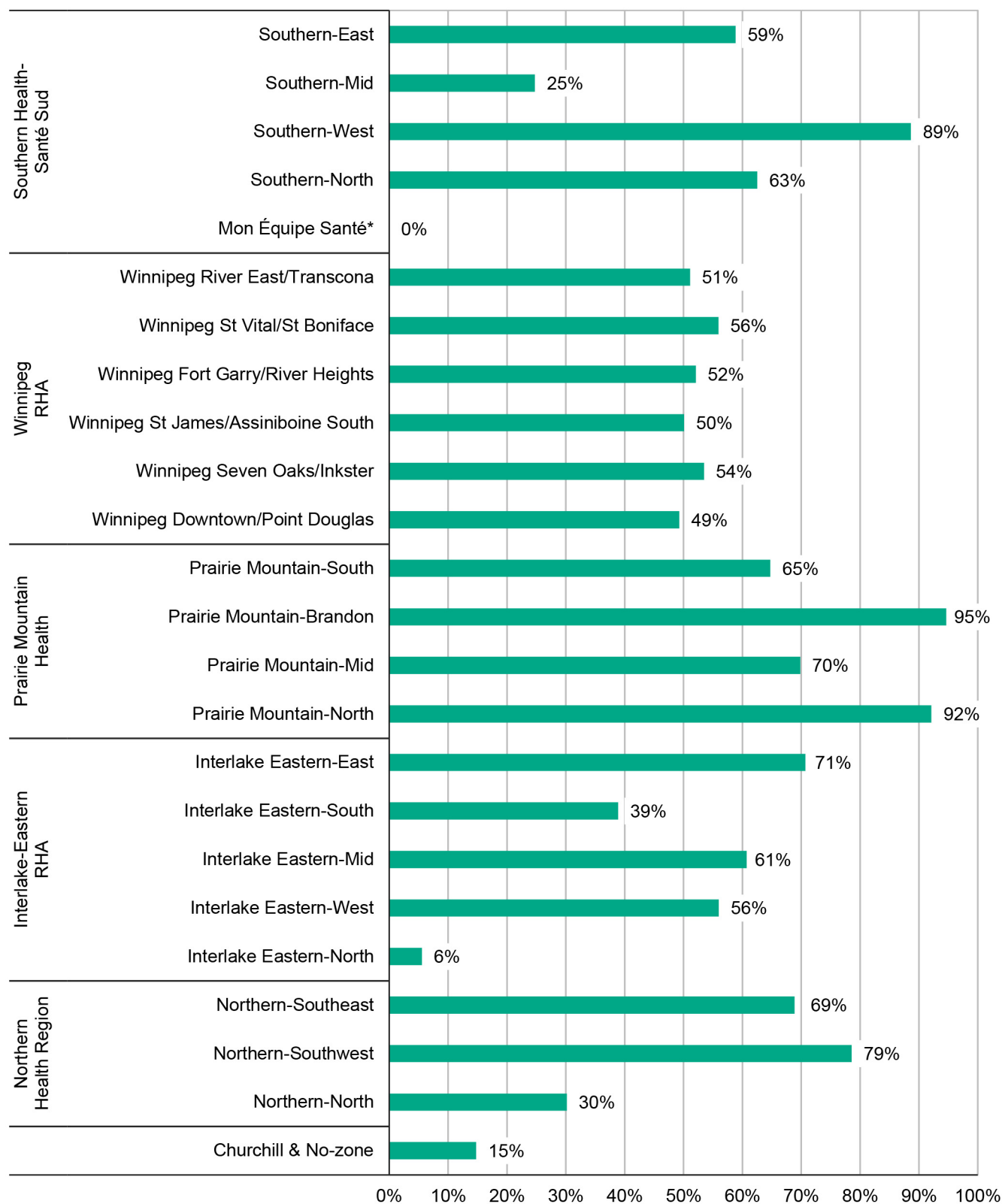
We have therefore chosen to present our results in Chapter 4 using two different approaches: where people get their care (provider-based) and where people live (residence-based).

Figure 3.1: Provider-Based Percent of Primary Care Services Provided in a Region that are Received by Residents of that Region, 2018



* This My Health Team is defined by patients who regularly receive care in French.

Figure 3.2: Residence-Based Percent of Primary Care Services Received by Residents of a Region that are Provided in their Region, 2018



* Residence-based results are not available for this My Health Team because it is not based on geographic boundaries. This My Health Team is defined by patients who regularly receive care in French.



Chapter 4:

Projections up to 2025

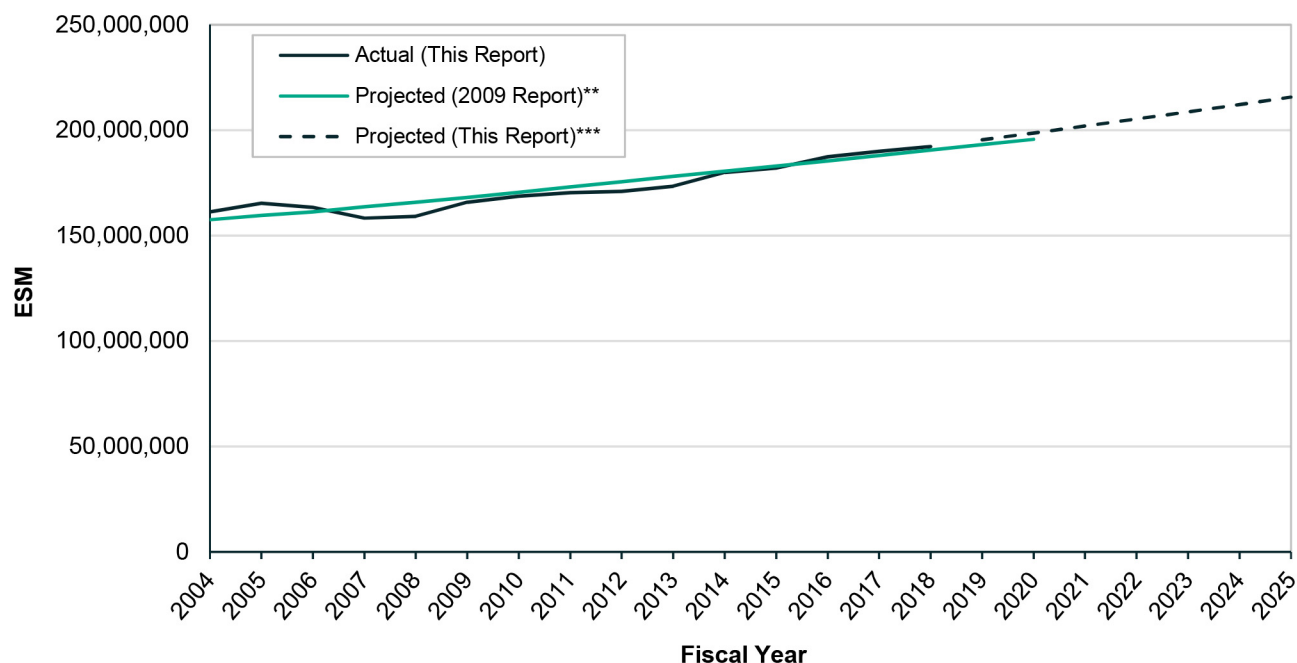
Once we validated the population estimates, ESM and provider projection models in Chapter 2, we used the same methodology to project ESM and the number of providers needed to meet service use from 2019 to 2025. These new projections include the projected service use of the population based on past patterns of primary care service use and the population's age and sex.

Equivalent Services Measure (ESM) Projections

The ESM projections from 2018/19 to 2025/26 are based on the pattern of actual ESM increase from 2009/10 to 2018/19. We modeled the ESM for each RHA (see Appendix 4 in the online supplement) and used the percent distribution of total ESM by MyHT within each region in 2018/19 to estimate projected ESM by MyHT for the following years. These projections require assumptions of continued population growth, as well as constant geographical population distribution and service delivery models. Figure 4.1 presents ESM projections for Manitoba.

Figure 4.1: Actual and Projected Equivalent Services Measure (ESM)* for Primary Care Providers in Manitoba from 2004/05 to 2025/26

Family physicians** and nurse practitioners***



* ESM is a measure of service provision based on billing tariffs standardized over time.

** Projected values from the 2009 Report (Katz et al. 2009) are based on observed ESM for family physicians from 1984/85 to 2004/05.

*** Projected values from this report are based on the observed annual increase in ESM for family physicians and nurse practitioners from 2009/10 to 2018/19.

Projections by Health Region

The ESM projections for each RHA are available in Appendix 4 of the online supplement. Each RHA-specific projection is calculated in two different ways: one is based on the percent of the population who receive care in the catchment area (provider-based), and the second is based on the population projected to be living in the catchment area (residence-based).

As expected, the projected ESM for most regions rose with population growth. However, the projected ESM for the Northern Health Region declined over time, in contrast to the other regions. This is consistent with the findings in the

recently released report “The Health Status of and Access to Healthcare by Registered First Nation Peoples in Manitoba”, which indicated an increase in the percent of First Nations living in the Northern Health Region who received primary care in Winnipeg from 1998/99 to 2016/17 [7].

Projections by My Health Teams

Provider-based and residence-based ESM projections by MyHT are presented in Appendix 4 of the online supplement. In each table, we present two projections for the Northern Health Region: one based on the models with decreasing service provision and a second based on the models with stable (constant) service provision.

Primary Care Provider Projections

We used the projected ESM for 2019/20-2025/26 and the current (2018/19) provider characteristics and service delivery patterns to project the number of providers needed to meet the projected service need¹ for each MyHT in 2019/20-2025/26. Note that these projections are based on the characteristics (including years in practice and sex) of providers in each MyHT in 2018/19. Changes in the

¹ We provide a tool for calculating the number of primary care providers needed to meet projected service needs in Appendix 2 of the online supplement.

provider characteristics could impact these projections. In addition, system changes, such as more team-based care, and changes to community and emergency services can be expected to impact the projections.

Provider-Based Projections

Table 4.1 presents the projected number of primary care providers for each MyHT based on where patients have accessed care in the past. Consistent with projected population growth, the projected number of providers grew steadily in Southern Health-Santé Sud and Winnipeg, was stable in Prairie Mountain Health and Interlake-Eastern RHA, and declined in the Northern Health Region.

Table 4.1: Actual and Projected Number of Providers Based on Provider Location by Health Region and My Health Team, 2018/19-2025/26

Health Region and My Health Team	Number of Primary Care Providers by Fiscal Year							
	Actual	Projected						
	2018	2019	2020	2021	2022	2023	2024	2025
Southern Health-Santé Sud								
East	60	61	63	64	66	67	69	70
Mid	20	20	21	21	22	22	23	23
West	82	84	85	87	90	92	94	96
North	33	34	34	35	36	37	38	39
Mon Équipe Santé*	21	21	22	22	23	23	24	25
Winnipeg RHA								
River East/Transcona	133	137	140	144	147	151	154	158
St Vital/St Boniface	167	172	176	180	185	189	193	198
Fort Garry/River Heights	210	216	222	227	232	238	243	249
St James/Assiniboine South	114	118	120	123	126	129	132	135
Seven Oaks/Inkster	110	113	116	119	122	124	127	130
Downtown/Point Douglas	200	206	211	216	221	226	232	237
Prairie Mountain Health								
South	43	43	43	43	43	44	44	44
Brandon	70	70	70	71	71	71	71	71
Mid	39	39	39	39	39	40	40	40
North	65	65	65	65	66	66	66	66
Interlake-Eastern RHA								
East	37	37	38	38	39	40	40	41
South	36	36	37	37	38	39	39	40
Mid	32	32	33	33	34	34	35	35
West	26	26	27	27	27	28	28	29
North	s	s	s	s	s	s	s	s
Northern Health Region**								
Southeast	77	77	75	74	73	71	70	69
Southwest	44	44	43	42	42	41	40	39
North	11	11	11	11	10	10	10	10
Churchill & No-zone	s	s	s	s	s	s	s	s
Overall***	1,641	1,681	1,709	1,737	1,766	1,795	1,825	1,855

s Data suppressed due to small numbers.

* This My Health Team is defined by patients who regularly receive care in French.

** Based on projected decline in service needs in Northern Health Region during 2019/20-2025/26. A conservative approach of no change in service needs assumes that the number of providers does not change after 2018/19.

*** Differences from the total for My Health Teams are due to rounding errors in the calculation of average Equivalent Services Measure for each My Health Team.

Residence-Based Projections

The alternative approach to exploring the service needs of the population is based on where they live, as presented in Table 4.2. The residence-based approach resulted in a reduction in the number of Winnipeg-based providers projected (with some variability) compared to the

provider-based projections. There was an increase in the projected number of providers needed in Southern Health-Santé Sud, Interlake-Eastern RHA and the Northern Health Region compared to the provider-based projections. The number of providers needed in Prairie Mountain Health was projected to remain stable.

Table 4.2: Actual and Projected Number of Primary Care Providers Based on Patient Residence by Health Region and My Health Team, 2018/19-2025/26

Health Region and My Health Team	Number of Primary Care Providers							
	Actual	Projected						
	2018	2019	2020	2021	2022	2023	2024	2025
Southern Health-Sant� Sud								
East	76	79	81	82	84	86	88	91
Mid	59	59	61	62	64	65	67	68
West	76	77	78	80	82	84	86	88
North	48	50	51	52	53	55	56	57
Mon �quipe Sant�*	-	-	-	-	-	-	-	-
Winnipeg RHA								
River East/Transcona	143	148	152	156	160	163	167	172
St Vital/St Boniface	148	151	154	158	162	166	170	174
Fort Garry/River Heights	179	185	189	194	199	204	209	214
St James/Assiniboine South	119	124	127	130	133	136	139	143
Seven Oaks/Inkster	96	97	99	102	104	107	110	112
Downtown/Point Douglas	167	173	177	181	186	190	195	200
Prairie Mountain Health								
South	60	60	60	60	60	60	60	61
Brandon	54	54	54	54	54	54	54	55
Mid	48	48	48	48	48	49	49	49
North	65	66	66	67	67	67	67	67
Interlake-Eastern RHA								
East	38	40	41	41	42	43	44	45
South	63	63	64	65	66	67	69	70
Mid	38	39	40	40	41	42	43	44
West	34	35	35	36	37	37	38	39
North	32	34	35	36	36	37	38	38
Northern Health Region**								
Southeast	85	86	85	83	82	80	79	77
Southwest	44	45	44	43	42	41	41	40
North	30	29	28	28	27	27	26	26
Churchill & No-zone	21	50	54	57	61	65	69	74
Overall***	1,723	1,790	1,823	1,857	1,892	1,928	1,965	2,003

* Residence-based results are not available for Mon Équipe Santé because this MyHT is not based on geographic location.

** Based on projected decline in service needs in Northern Health Region during 2019/20-2025/26. A conservative approach of no change in service needs assumes that the number of providers does not change after 2018/19.

*** Based on the current average Equivalent Services Measure for providers working in the geographical area of each My Health Team.



Chapter 5: Conclusions

This report provides updated MyHT-specific projections of primary care HHR needs for the next five years based on validated projection models.

Key Findings

The models developed for the 2009 report [1] proved to be a valid approach to projecting service needs. The only adaptation these models required was to ensure that all primary care providers (family physicians and nurse practitioners) and all services (including those delivered in community, hospital and personal care home settings) were included. The population of Manitoba has grown faster than previously predicted, which resulted in the 2018 population closely matching the projected population for 2020.

Our results demonstrate a profound shift in the characteristics of the primary care provider workforce since 2005. An increase in the proportion of female providers and sex-specific differences in patterns of service delivery have had an impact on our HHR projections.

This report provides detailed MyHT-specific projections for primary care HHR requirements based on past patterns of service use in each region. HHR planning has progressed in Manitoba to the extent where it is no longer appropriate to describe provincial resource needs. Recruitment efforts can be planned at the local level based on these projections.

Strengths

The models used to develop the projections are based on both population characteristics, which influence illness and patterns of service use, and provider characteristics, which influence service delivery patterns. Population-based service projections require the high quality population-based data housed in the Repository. This report adds value to the previous report by including regional- and MyHT-based projections.

Other studies have used “full time equivalents” (FTEs) to calculate provider needs. An approach using FTEs is less useful than using ESM, because the method of calculating FTEs does not provide as much detail about the amount of services that the providers are providing.

Limitations

Population projections were not available for the MyHT geographical areas, which limited our ability to project ESM by MyHT. We therefore used regional trends in total ESM growth from 2004/05 to 2018/19 and the proportional distribution of total ESM across MyHTs within the larger health regions to estimate ESM projections for 2019/20-2025/26 by MyHT.

The HHR projections do not take into account potential changes in the characteristics of individual providers over time, which would likely impact the services provided by individuals.

System changes, including incentives to promote continuity of care, may influence where patients receive their care. The report does not provide evidence on why patients seek care outside their region of residence. This may be due to poor access or it may be due to other factors such as convenience. The patterns in the Northern Health Region are different to other regions. The analyses do not provide evidence to explain these differences.

The projections of ESM and number of providers needed to meet future service needs are based on past patterns of service use. This approach assumes that the past patterns of care have been meeting the needs of the population.

This report makes no endorsement of the appropriateness of the services accessed by Manitobans.

Changes in service delivery models, such as increasing the use of virtual care (telehealth), are likely to influence HHR planning but the impact is not predictable based on the data available.

Future Directions

Manitoba is in the midst of a health system transformation, which is likely to lead to changes in how services are provided and potentially by which providers. The Manitoba Quality and Learning framework may also influence the type of services provided [8]. Repeating the analyses with updated data as they become available is recommended to ensure that planning is based on the best possible information.

A future study could explore the changes in patient complexity, which has been shown to be important in a previous MCHP report [6], across the regions over time. The current report was based on the assumption that the distribution of patient complexity (which influences service use) has remained stable and will remain stable for the timeline of the projections. This assumption should be tested in a future study.

References

1. Katz A, Bogdanovic B, Ekuma O, Soodeen R-A, Chateau D, & Burnett C. *Physician Resource Projection Models*. Winnipeg: Manitoba Centre for Health Policy; 2009. http://mchp-appserv.cpe.umanitoba.ca/reference/Physmod_Full_report_2.pdf
2. Chateau D, Katz A, Metge C, Taylor C, McDougall C, & McCulloch S. *Describing Patient Populations for the My Health Team Initiative*. Winnipeg; 2017. http://mchp-appserv.cpe.umanitoba.ca/reference//hiusers_Report_web.pdf.
3. Manitoba Health Seniors and Active Living. My Health Teams and Team-Based Care. <https://www.gov.mb.ca/health/primarycare/myhts/teams.html>. Accessed March 30, 2020.
4. Katz A, Bogdanovic B, & Soodeen R-A. *Physician Integrated Network Baseline Evaluation: Linking Electronic Medical Records and Administrative Data*. Winnipeg: Manitoba Centre for Health Policy; 2010. http://mchp-appserv.cpe.umanitoba.ca/reference/PIN_full_report.pdf.
5. Katz A, Chateau D, Bogdanovic B, Taylor C, McGowan K-L, Rajotte L, & Dziadek J. *Physician Integrated Network: A Second Look*. Winnipeg: Manitoba Centre to Health Policy; 2014. http://mchp-appserv.cpe.umanitoba.ca/reference/PIN2_web_final.pdf.
6. Katz A, Valdivia J, Chateau D, Taylor C, Walld R, McCulloch S, Becker C, & Ginter J. *A Comparison of Models of Primary Care Delivery in Winnipeg*. Winnipeg: Manitoba Centre for Health Policy; 2016. http://mchp-appserv.cpe.umanitoba.ca/reference/Models of Primary Care_Web_final.pdf.
7. Katz A, Kinew KA, Star L, Taylor C, Koseva I, Lavoie J, Burchill C, Urquia ML, Basham A, Rajotte L, et al. *The Health Status of and Access to Healthcare by Registered First Nation Peoples in Manitoba*. Winnipeg; 2019. http://mchp-appserv.cpe.umanitoba.ca/reference/FN_Report_web.pdf.
8. Shared Health Manitoba. Quality and Learning Framework. <https://sharedhealthmb.ca/about/quality-patient-safety-learning/framework>. Accessed January 13, 2020.



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