



Manitoba Centre for Health Policy

# Appendices for: Revisiting Primary Care Provider Projection Models

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## Appendix 1: List of Data Used in this Report and Technical Definition of Equivalent Services Measure (ESM)

### Data Used in This Report

- Manitoba Health Insurance Registry (2004/05-2018/19)
- Medical Claims (2004/05-2018/19)
- Provider Registry (2004/05-2018/19)

Additional information about these data is available on the Manitoba Centre for Health Policy website at [http://umanitoba.ca/faculties/health\\_sciences/medicine/units/chs/departmental\\_units/mchp/resources/repository/descriptions.html](http://umanitoba.ca/faculties/health_sciences/medicine/units/chs/departmental_units/mchp/resources/repository/descriptions.html).

### Equivalent Services Measure (ESM) Definition

A standardized measure of service provision that enables researchers to use tariff codes over time regardless of any changes in the fee associated with them. Tariff codes are specific codes used to identify each service provided by a physician or a nurse practitioner as defined in the Physician Tariff Manual. In this report, the numerical value of ESM is standardized based on the dollar value of tariffs in 2005 (see list below). The ESM accounts for the effects of inflation and reflects the intensity of the service.

### Tariffs Included in This Report:

5556, 5557;

7900, 7904, 7908, 7918, 7919, 7920, 7923, 7928, 7930, 7944;

8009, 8110, 8141, 8300, 8301, 8303, 8304, 8305, 8306, 8307, 8308, 8309, 8310, 8315, 8316, 8400, 8401, 8402, 8403, 8405, 8406, 8407, 8409, 8412, 8413, 8416, 8440, 8450, 8451, 8460, 8461, 8466, 8470, 8471, 8487, 8498, 8499, 8500, 8502, 8503, 8504, 8505, 8508, 8509, 8510, 8511, 8513, 8514, 8515, 8516, 8520, 8524, 8529, 8530, 8540, 8543, 8544, 8550, 8552, 8553, 8555, 8556, 8557, 8558, 8559, 8560, 8561, 8562, 8563, 8564, 8566, 8567, 8571, 8572, 8573, 8574, 8575, 8576, 8577, 8578, 8579, 8580, 8581, 8582, 8584, 8585, 8589, 8594, 8595, 8597, 8598, 8599, 8617, 8630, 8632, 8635, 8636, 8645, 8646, 8650, 8651, 8670, 8671, 8672, 8674, 8685, 8690, 8732, 8734, 8735, 8751, 8761, 8768, 8778, 8791, 8800, 8802, 8805, 8810, 8811, 8812, 8813, 8814, 8815, 8816, 8818, 8820, 8821, 8830, 8831, 8850, 8851, 8863, 8865, 8872, 8893, 8894, 8896, 8897, 8899, 8901, 8904, 8907, 8910, 8913, 8916, 8920, 8924, 8926, 8928, 8931, 8942, 8943, 8950, 8951, 8952, 8953, 8954, 8955, 8956, 8957, 8958, 8961, 8964, 8969, 8970, 8971, 8981, 8990, 8991;

9724, 9726, 9727, 9728, 9729, 9730, 9740, 9741, 9743, 9745, 9749, 9770, 9771, 9772, 9786, 9790, 9791, 9792, 9795, 9796, 9817, 9818, 9830, 9831, 9832, 9834, 9836, 9837, 9838, 9841, 9847, 9849, 9851, 9853, 9854, 9856, 9857, 9858, 9862, 9864, 9865, 9870, 9878, 9881, 9882, 9889, 9890, 9891, 9897, 9958.

## Appendix 2: How to Use the Primary Care Provider Projection Calculator in Healthcare Planning

### What is the primary care provider projection calculator?

This appendix will help planners put the report to use. The online supplement includes an Excel-based calculator<sup>1</sup> with the necessary formulae embedded in the file.

Service delivery as defined by the Equivalent Services Measure (ESM) calculation is based on the population characteristics. The calculator provides a mechanism to adjust the number of providers required to provide the projected future service needs of the population that incorporates the provider characteristics in the calculation. For example, a provider pool that includes more providers with higher levels of ESM provision will need fewer providers than one which has more providers with lower ESM delivery.

Appendix Table 2.1: Functional Primary Care Provider Service Calculator with Example Data

Years of Provider Practice	Inputs				Outputs	
	Practice Characteristics (Reference Year = 2018/19)*				Overall Characteristics (Target Year = 2025/26)**	Practice Volume (Target Year = 2025/26)
	Total ESM for All Providers	Total ESM for Female Providers	Average ESM per Female Provider	Average ESM per Male Provider	Projected Total ESM for All Providers	Number of Providers Required for Projected Service Needs
	(A)	(B)	(C)	(D)	(E)	(F)
1-5	50,699,774	23,910,719	69,507	97,061	215,696,408	701
6-10	44,496,037	19,056,488	113,431	184,344	215,696,408	346
11-15	23,124,503	9,324,475	92,321	166,265	215,696,408	208
16-20	19,659,003	4,398,152	72,100	162,349	215,696,408	175
21+	52,807,577	12,698,060	112,372	152,507	215,696,408	425
<b>Overall</b>	<b>190,786,900</b>	<b>69,387,894</b>	<b>88,168</b>	<b>142,153</b>	<b>215,696,408</b>	<b>1,855</b>

Note: Calculations exclude entities (i.e., billing numbers that are used by multiple physicians) and include only well-established physicians (i.e., those who are active one year prior and one year after the study year).

\* The reference year is the most current year for which provider characteristics are available. In this example, this is 2018/19.

\*\* The target year is the year for which total ESM is projected. In this example, the target year is 2025/26.

$$F = \left[ \frac{\left( \frac{A_i}{\text{Sum}(A_i)} \right) \times \left( \frac{B_i}{A_i} \right)}{C} + \frac{\left( \frac{A_i}{\text{Sum}(A_i)} \right) \times \left( 1 - \frac{B_i}{A_i} \right)}{D} \right] \times E$$

### How can this calculator be used in HHR planning?

1. Start with the current (baseline) total ESM and average ESM (per provider) for each category (years in practice and sex).
2. Calculate the projected total ESM required in a future year (target year) based on the population characteristics.
3. Insert this information into the calculator to estimate the number of providers in each category necessary to provide the projected ESM.
4. The calculator supports adjusting any of the input data, resulting in changes to the HHR output.
5. The calculator assumes no major changes in patterns of service delivery (ESM), such as new types of providers or new roles for current providers.
6. The calculator is based on the current (baseline) distribution of providers across the years in practice and sex categories.

<sup>1</sup> [http://www.umanitoba.ca/faculties/health\\_sciences/medicine/units/chs/departamental\\_units/mchp/projects/media/physmod2\\_calculator\\_functional.xlsx](http://www.umanitoba.ca/faculties/health_sciences/medicine/units/chs/departamental_units/mchp/projects/media/physmod2_calculator_functional.xlsx)

## Appendix 3: Changes in Average Equivalent Services Measure (ESM) in Manitoba by Provider Practice Years, Location, and Sex

Appendix Table 3.1: Annual Average Equivalent Services Measure for Primary Care Providers in Manitoba from 2005/06 to 2018/19

Years in Practice and Fiscal Year	Average ESM by Provider			
	Urban		Rural	
	Female	Male	Female	Male
<b>1-5 Years</b>				
2005/06	65,237	127,089	70,666	97,640
2006/07	60,544	111,842	65,159	87,167
2007/08	45,196	99,500	63,371	77,619
2008/09	54,179	112,351	58,596	81,071
2009/10	63,533	112,194	68,893	101,260
2010/11	57,324	103,108	77,978	90,298
2011/12	73,094	118,934	74,392	103,534
2012/13	77,718	111,817	73,525	104,176
2013/14	72,068	112,387	72,612	101,482
2014/15	94,525	122,843	83,948	113,125
2015/16	79,865	100,964	64,897	85,644
2016/17	74,436	118,463	65,640	90,111
2017/18	72,086	113,367	71,218	80,791
2018/19	70,920	114,859	67,611	77,896
p-values*	0.0144	0.9277	0.4666	0.8057
<b>6-10 Years</b>				
2005/06	114,016	155,949	97,607	107,543
2006/07	97,065	155,944	101,980	114,812
2007/08	91,248	162,627	104,276	126,053
2008/09	84,640	180,227	106,212	134,772
2009/10	100,532	175,896	117,446	145,729
2010/11	89,973	172,462	118,697	164,842
2011/12	88,207	166,997	113,728	150,209
2012/13	82,119	168,205	83,389	140,735
2013/14	82,362	164,136	92,670	158,157
2014/15	115,859	230,116	101,402	193,701
2015/16	113,830	202,563	85,402	163,697
2016/17	117,610	199,125	68,169	168,495
2017/18	119,925	202,295	73,093	155,895
2018/19	124,096	185,603	91,494	145,589
p-values*	0.0565	<b>0.0057</b>	0.0164	<b>0.0047</b>

\* **Bolded** p-values indicate a statistically significant change over time ( $p < 0.01$ ).

Appendix Table 3.1: Continued

Years in Practice and Fiscal Year	Average ESM by Provider			
	Urban		Rural	
	Female	Male	Female	Male
<b>11-15 Years</b>				
2005/06	137,014	176,944	69,121	171,928
2006/07	136,767	177,766	112,553	146,373
2007/08	146,176	163,629	108,747	164,858
2008/09	125,976	174,275	103,680	151,899
2009/10	112,413	173,669	125,760	137,493
2010/11	112,850	172,129	103,341	137,159
2011/12	106,904	174,676	106,898	141,524
2012/13	104,873	184,565	122,433	133,414
2013/14	98,529	187,265	116,812	148,647
2014/15	119,782	219,456	132,280	196,810
2015/16	95,309	169,650	99,321	160,826
2016/17	97,905	157,197	124,072	172,200
2017/18	95,750	183,327	84,127	195,041
2018/19	94,246	180,986	91,853	200,136
p-values*	<.0001	0.4990	0.7476	0.0469
<b>16-20 Years</b>				
2005/06	125,054	182,019	92,764	190,834
2006/07	110,248	191,696	66,116	188,669
2007/08	114,455	186,450	76,241	162,302
2008/09	140,293	176,745	71,669	168,757
2009/10	135,923	210,494	96,216	169,360
2010/11	137,121	187,864	67,062	165,334
2011/12	143,074	180,095	94,463	159,465
2012/13	137,035	173,380	115,558	146,572
2013/14	119,687	156,592	114,545	139,041
2014/15	129,519	208,999	128,542	169,798
2015/16	109,353	181,520	138,968	155,003
2016/17	96,221	184,486	126,859	151,166
2017/18	96,446	171,354	107,702	149,633
2018/19	88,833	187,290	101,265	163,328
p-values*	0.0383	0.5766	<b>0.0046</b>	<b>0.0084</b>

\* **Bolded** p-values indicate a statistically significant change over time ( $p < 0.01$ ).

Appendix Table 3.1: Continued

Years in Practice and Fiscal Year	Average ESM by Provider			
	Urban		Rural	
	Female	Male	Female	Male
<b>20+ Years</b>				
2005/06	102,334	189,623	52,676	152,793
2006/07	130,184	189,966	103,171	181,544
2007/08	127,930	174,404	98,135	179,896
2008/09	129,580	178,689	100,473	178,742
2009/10	135,588	173,039	90,455	176,775
2010/11	123,769	174,174	96,561	169,447
2011/12	124,249	167,009	78,432	170,833
2012/13	122,589	163,887	78,518	163,528
2013/14	125,926	162,497	80,162	173,188
2014/15	152,633	202,437	110,100	201,850
2015/16	126,719	164,512	88,497	167,162
2016/17	120,449	155,206	69,429	157,702
2017/18	113,411	160,838	98,992	138,494
2018/19	113,347	150,494	91,830	146,518
<b>p-values*</b>	0.9172	0.0156	0.7275	0.1537

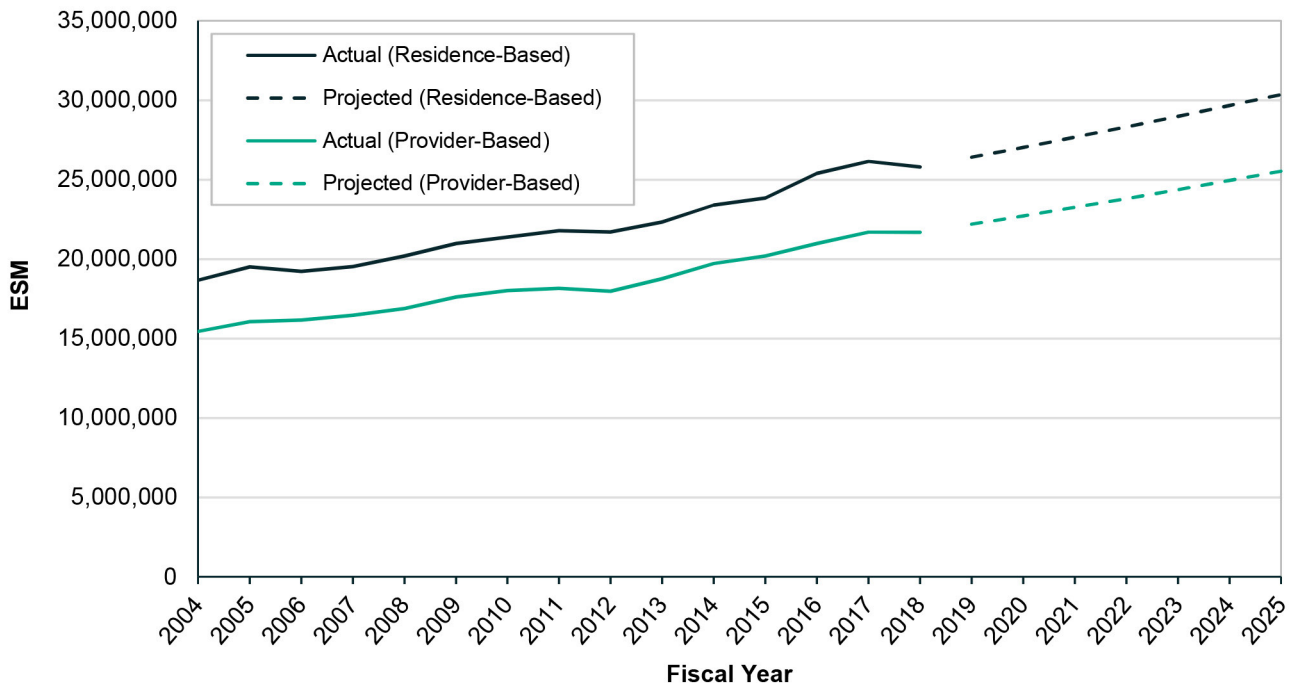
\* **Bolded** p-values indicate a statistically significant change over time (p<0.01).

# Appendix 4: Equivalent Services Measure (ESM) Projections by Health Region and My Health Team

## Health Region

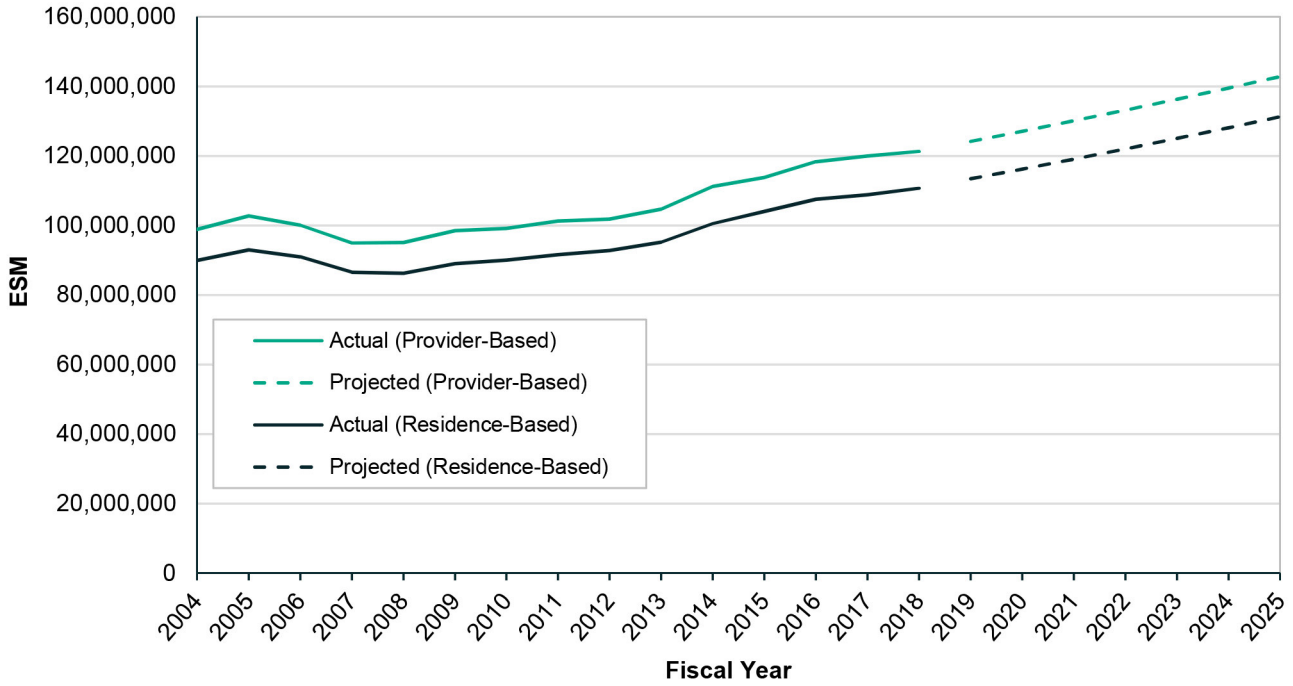
**Appendix Table 4.1: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Southern Health-Santé Sud from 2004/05 to 2025/26**

Family physicians and nurse practitioners



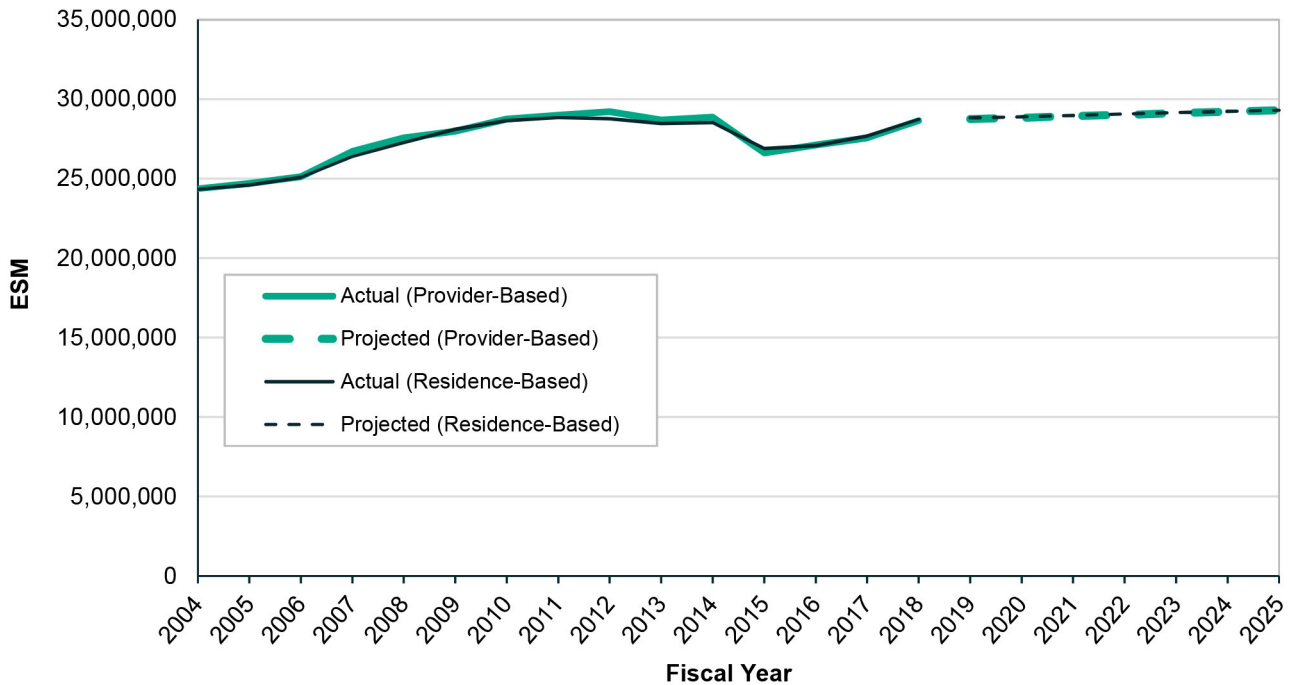
**Appendix Table 4.2: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Winnipeg RHA from 2004/05 to 2025/26**

Family physicians and nurse practitioners



**Appendix Table 4.3: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Prairie Mountain Health from 2004/05 to 2025/26**

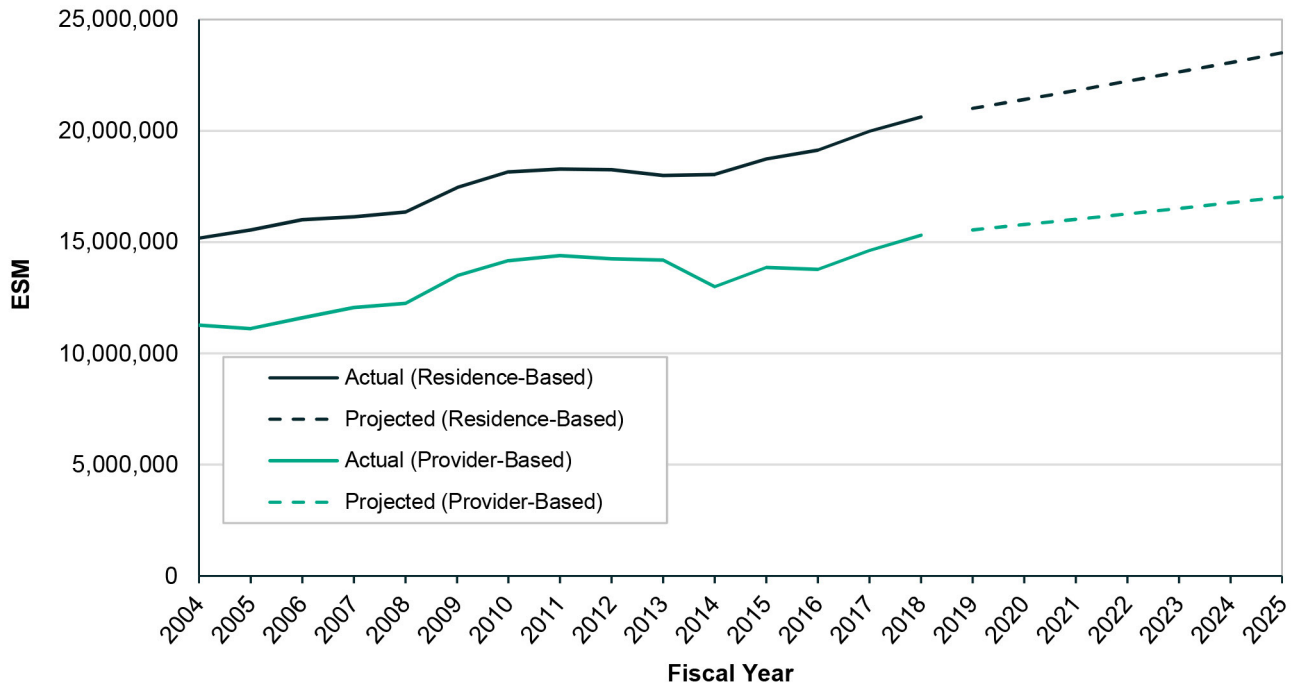
Family physicians and nurse practitioners





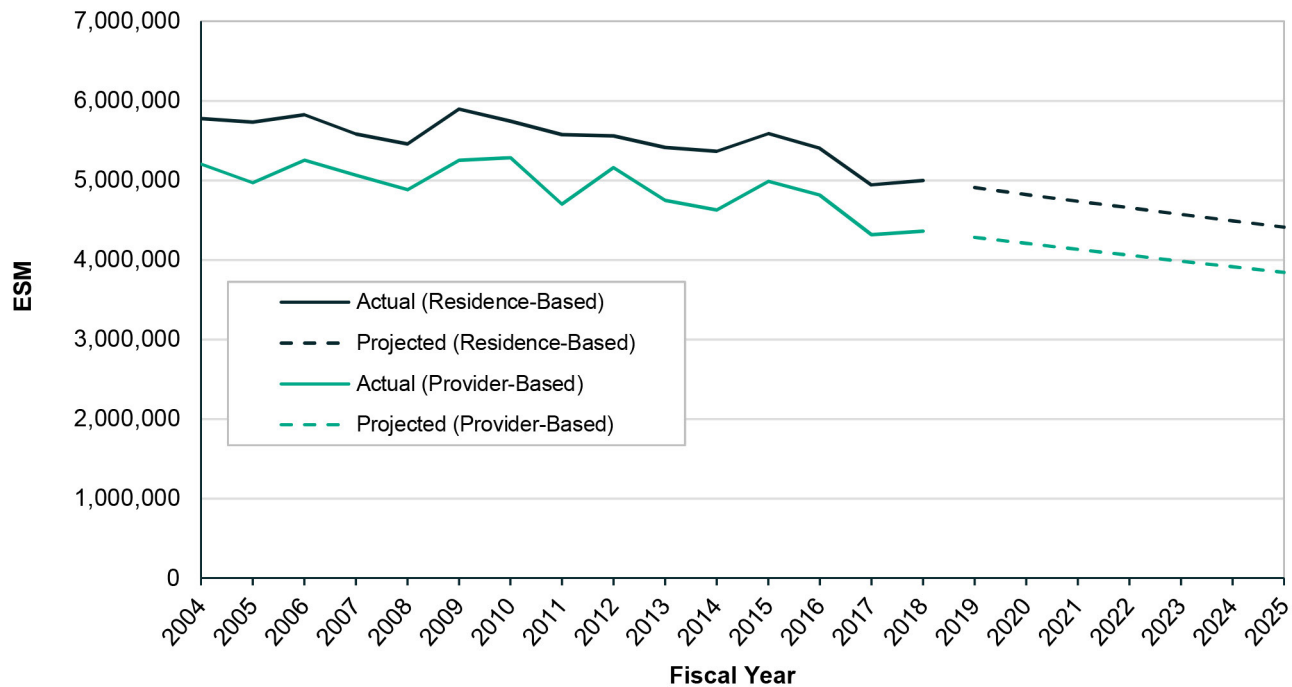
**Appendix Table 4.4: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Interlake-Eastern RHA from 2004/05 to 2025/26**

Family physicians and nurse practitioners



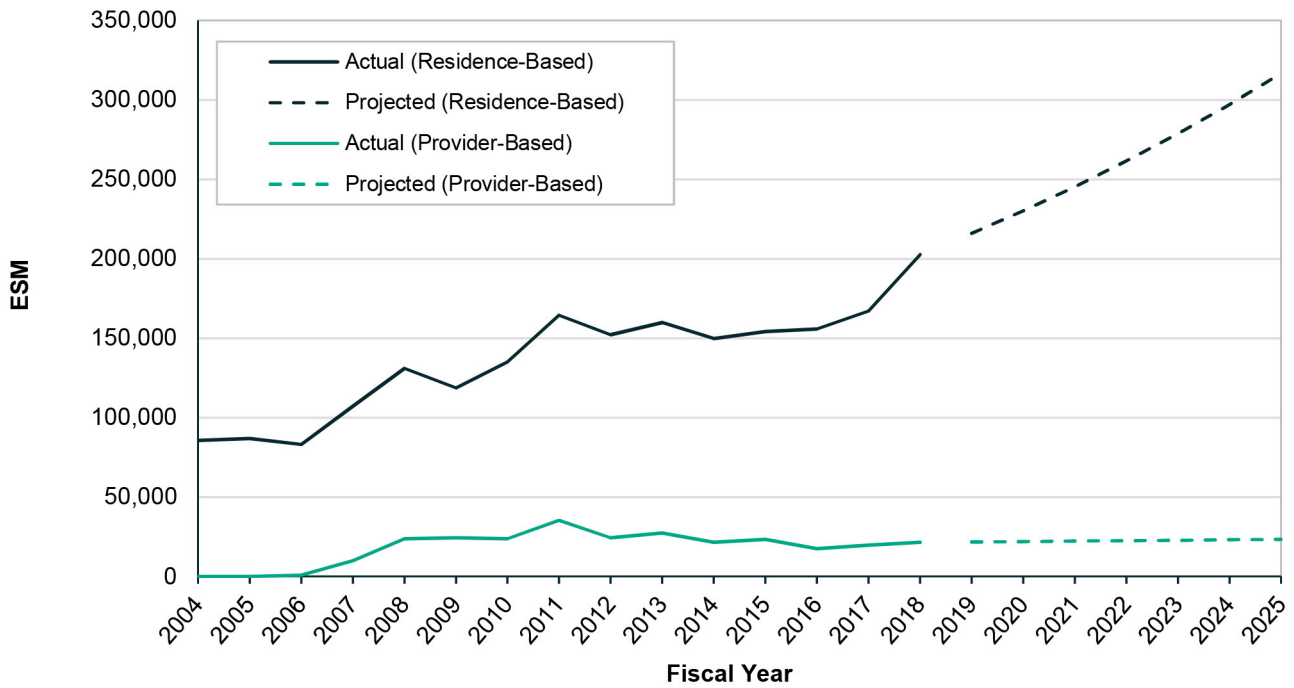
**Appendix Table 4.5: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Northern Health Region from 2004/05 to 2025/26**

Family physicians and nurse practitioners



**Appendix Table 4.6: Actual and Projected Equivalent Services Measure (ESM) for Primary Care Provision in Churchill and No-Zone My Health Teams from 2004/05 to 2025/26**

Family physicians and nurse practitioners



# My Health Team Provider-Based

Appendix Table 4.1: Actual and Projected Primary Care Equivalent Services Measure Based on Provider Location by Health Region and My Health Team, 2018/19-2025/26

Health Region and My Health Team	Equivalent Services Measure									
	Actual	Projected								
	2018	2019	2020	2021	2022	2023	2024	2025		
<b>Southern Health-Santé Sud</b>										
East	6,068,045	6,179,115	6,325,022	6,474,375	6,627,255	6,783,745	6,943,930	7,107,897		
Mid	1,556,368	1,584,856	1,622,279	1,660,586	1,699,798	1,739,935	1,781,020	1,823,076		
West	8,399,822	8,553,573	8,755,548	8,962,293	9,173,921	9,390,545	9,612,285	9,839,260		
North	3,955,662	4,028,067	4,123,181	4,220,542	4,320,202	4,422,215	4,526,638	4,633,525		
Mon Équipe Santé	1,818,916	1,852,209	1,895,946	1,940,715	1,986,541	2,033,449	2,081,465	2,130,615		
<b>Winnipeg RHA</b>										
River East/Transcona	18,855,106	19,437,376	19,895,760	20,364,954	20,845,213	21,336,797	21,839,975	22,355,018		
St Vital/St Boniface	23,094,899	23,808,100	24,369,557	24,944,254	25,532,505	26,134,628	26,750,950	27,381,808		
Fort Garry/River Heights	24,352,792	25,104,838	25,696,876	26,302,875	26,923,165	27,558,083	28,207,975	28,873,192		
St James/Assiniboine South	13,694,174	14,117,068	14,449,985	14,790,754	15,139,558	15,496,588	15,862,038	16,236,106		
Seven Oaks/Inkster	19,219,471	19,812,993	20,280,235	20,758,496	21,248,036	21,749,120	22,262,021	22,787,017		
Downtown/Point Douglas	21,219,877	21,875,175	22,391,048	22,919,087	23,459,579	24,012,817	24,579,102	25,158,741		
<b>Prairie Mountain Health</b>										
South	4,596,254	4,601,638	4,616,254	4,630,916	4,645,624	4,660,379	4,675,182	4,690,031		
Brandon	12,220,899	12,235,215	12,274,076	12,313,060	12,352,168	12,391,401	12,430,758	12,470,240		
Mid	4,640,661	4,646,097	4,660,854	4,675,657	4,690,508	4,705,406	4,720,351	4,735,344		
North	7,254,337	7,262,835	7,285,903	7,309,044	7,332,259	7,355,547	7,378,909	7,402,346		
<b>Interlake-Eastern RHA</b>										
East	4,908,999	4,948,212	5,023,725	5,100,390	5,178,225	5,257,248	5,337,476	5,418,930		
South	4,031,532	4,063,736	4,125,751	4,188,713	4,252,635	4,317,533	4,383,421	4,450,314		
Mid	3,036,117	3,060,370	3,107,073	3,154,489	3,202,628	3,251,502	3,301,122	3,351,499		
West	3,390,482	3,417,565	3,469,719	3,522,669	3,576,427	3,631,006	3,686,417	3,742,674		
North	59,253	59,726	60,638	61,563	62,503	63,456	64,425	65,408		
<b>Northern Health Region*</b>										
Southeast	2,423,352	2,417,165	2,373,780	2,331,173	2,289,332	2,248,242	2,207,889	2,168,260		
Southwest	1,683,527	1,679,229	1,649,089	1,619,490	1,590,422	1,561,876	1,533,842	1,506,312		
North	188,053	187,573	184,206	180,900	177,653	174,464	171,333	168,258		
Churchill & No-zone	21,394	21,667	21,936	22,208	22,484	22,763	23,046	23,332		
<b>Manitoba**</b>	<b>192,250,864</b>	<b>195,437,334</b>	<b>198,676,619</b>	<b>201,969,593</b>	<b>205,317,147</b>	<b>208,720,185</b>	<b>212,179,627</b>	<b>215,696,408</b>		

\* 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**

Appendix Table 4.2: Actual and Projected Primary Care Equivalent Services Measure Provided in the Patient's Area of Residence by Health Region and My Health Team, 2018/19-2025/26

Health Region and My Health Team	Equivalent Services Measure									
	Actual	Projected								
	2018	2019	2020	2021	2022	2023	2024	2025		
<b>Southern Health-Santé Sud</b>										
East	7,782,037	7,963,696	8,150,854	8,342,410	8,538,468	8,739,134	8,944,515	9,154,723		
Mid	4,520,168	4,625,684	4,734,394	4,845,659	4,959,538	5,076,094	5,195,389	5,317,488		
West	7,668,457	7,847,465	8,031,891	8,220,651	8,413,848	8,611,585	8,813,969	9,021,109		
North	5,837,895	5,974,171	6,114,572	6,258,273	6,405,351	6,555,886	6,709,958	6,867,651		
Mon Équipe Santé*	-	-	-	-	-	-	-	-		
<b>Winnipeg RHA</b>										
River East/Transcona	20,417,533	21,022,132	21,539,902	22,070,424	22,614,012	23,170,989	23,741,684	24,326,435		
St Vital/St Boniface	20,251,298	20,850,975	21,364,529	21,890,731	22,429,894	22,982,336	23,548,385	24,128,375		
Fort Garry/River Heights	20,817,861	21,434,315	21,962,236	22,503,160	23,057,407	23,625,304	24,207,189	24,803,405		
St James/Assiniboine South	14,409,978	14,836,683	15,202,106	15,576,530	15,960,176	16,353,271	16,756,047	17,168,744		
Seven Oaks/Inkster	16,472,249	16,960,022	17,377,742	17,805,751	18,244,302	18,693,654	19,154,074	19,625,833		
Downtown/Point Douglas	17,796,977	18,323,977	18,775,292	19,237,722	19,711,542	20,197,032	20,694,479	21,204,178		
<b>Prairie Mountain Health</b>										
South	6,338,814	6,362,924	6,380,750	6,398,625	6,416,551	6,434,527	6,452,554	6,470,631		
Brandon	9,321,923	9,357,379	9,383,594	9,409,882	9,436,244	9,462,680	9,489,190	9,515,774		
Mid	5,691,540	5,713,188	5,729,193	5,745,244	5,761,339	5,777,480	5,793,666	5,809,897		
North	7,359,893	7,387,886	7,408,584	7,429,339	7,450,153	7,471,024	7,491,955	7,512,943		
<b>Interlake-Eastern RHA</b>										
East	5,204,270	5,278,660	5,378,378	5,479,980	5,583,501	5,688,978	5,796,447	5,905,946		
South	6,905,717	7,004,427	7,136,747	7,271,565	7,408,931	7,548,891	7,691,496	7,836,794		
Mid	3,642,821	3,694,892	3,764,691	3,835,809	3,908,270	3,982,101	4,057,326	4,133,972		
West	4,461,036	4,524,802	4,610,279	4,697,371	4,786,108	4,876,521	4,968,643	5,062,504		
North	502,445	509,627	519,254	529,063	539,058	549,241	559,617	570,188		
<b>Northern Health Region**</b>										
Southeast	2,725,398	2,710,977	2,663,077	2,616,022	2,569,800	2,524,394	2,479,790	2,435,974		
Southwest	1,714,092	1,705,022	1,674,896	1,645,302	1,616,231	1,587,674	1,559,621	1,532,064		
North	496,651	494,023	485,294	476,719	468,296	460,022	451,894	443,909		
<b>Churchill &amp; No-zone</b>	<b>94,590</b>	<b>215,998</b>	<b>230,231</b>	<b>245,401</b>	<b>261,571</b>	<b>278,807</b>	<b>297,178</b>	<b>316,760</b>		
<b>Manitoba***</b>	<b>192,250,864</b>	<b>195,437,334</b>	<b>198,676,619</b>	<b>201,969,593</b>	<b>205,317,147</b>	<b>208,720,185</b>	<b>212,179,627</b>	<b>215,696,408</b>		

\* 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 Equivalent Services Measure for providers working in the geographical area of each My Health Team.