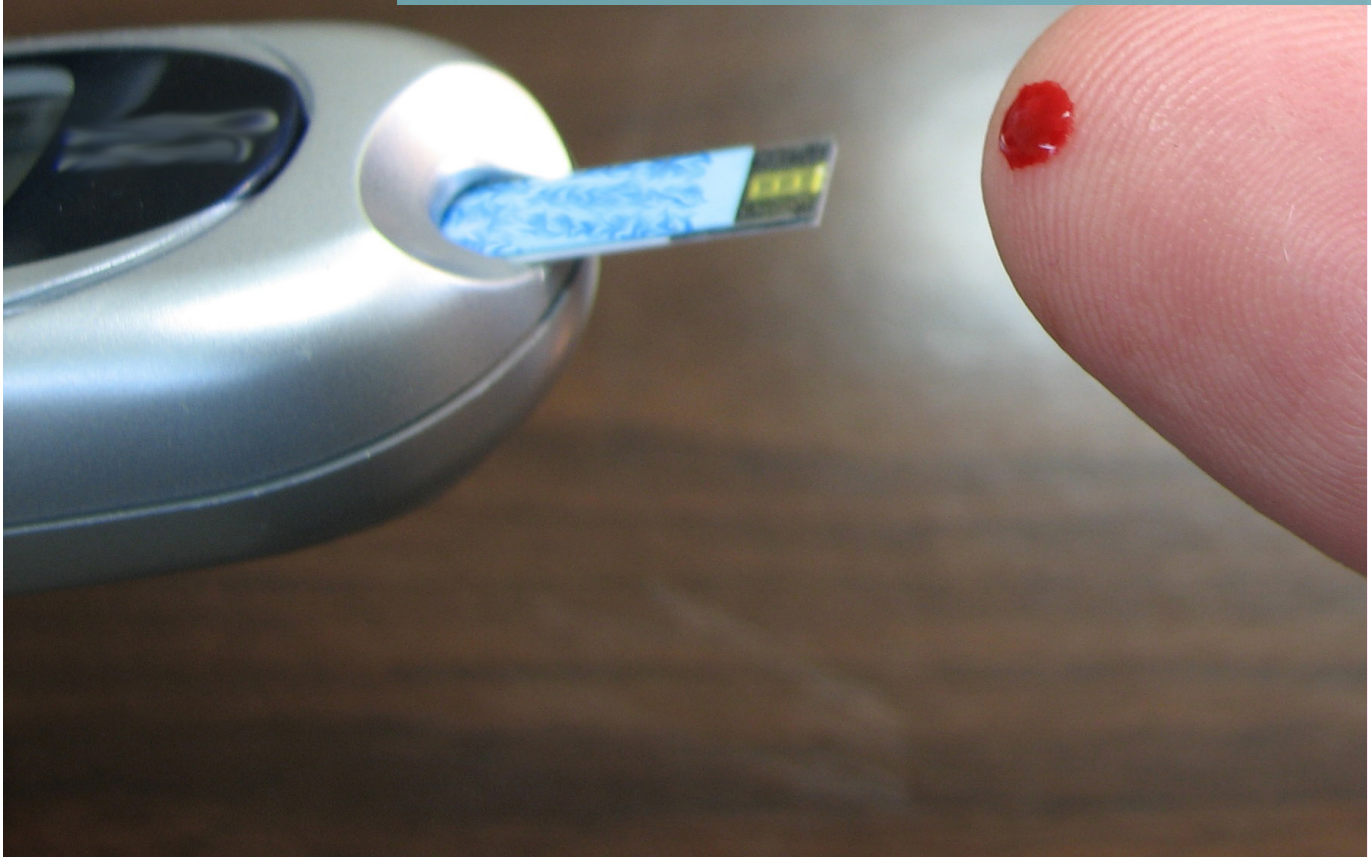


Manitoba Centre for Health Policy

Appendix 1: Selected Additional Indicators for *People with Type 2 Diabetes in Manitoba*

Autumn 2020



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FIRST NATIONS HEALTH AND SOCIAL
SECRETARIAT OF MANITOBA



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Health Sciences

Chapter 3

Appendix Table 1.1: Incidence of Any Diabetes Among Adult Manitobans by Age Group

Crude rate per 1,000 person-years at risk using NDSS definition of diabetes, age 18+, 1985/86-1986/87 to 2015/16-2016/17

Fiscal Year	Age Group						
	18-29*	30-39*	40-49*	50-59*	60-69*	70-79*	80+
1985/86-1986/87	0.57	1.49	3.54	6.19	8.40	9.51	9.30
1987/88-1988/89	0.64	1.42	3.41	6.46	8.27	9.16	8.85
1989/90-1990/91	0.57	1.37	3.33	5.89	7.73	8.58	8.29
1991/92-1992/93	0.68	1.42	3.65	6.54	8.09	8.88	7.48
1993/94-1994/95	0.72	1.62	3.67	6.16	8.51	7.97	7.92
1995/96-1996/97	0.80	1.62	3.36	6.29	8.26	8.41	7.11
1997/98-1998/99	0.94	1.90	3.99	6.88	9.73	9.26	7.73
1999/00-2000/01	0.88	2.09	4.27	8.15	10.61	10.39	9.01
2001/02-2002/03	1.04	2.49	4.73	8.65	10.84	11.40	9.49
2003/04-2004/05	0.98	2.51	4.60	8.50	11.89	11.30	9.86
2005/06-2006/07	1.04	2.71	4.94	8.23	11.92	11.86	9.46
2007/08-2008/09	1.00	2.72	4.78	7.73	10.21	9.50	8.29
2009/10-2010/11	1.04	2.90	5.18	7.92	9.65	10.11	8.09
2011/12-2012/13	1.03	3.15	6.11	8.68	11.35	10.80	8.44
2013/14-2014/15	1.09	3.24	6.37	8.92	10.99	11.66	8.85
2015/16-2016/17	1.27	3.39	6.65	8.50	10.29	9.45	7.72

* Indicates a statistically significant increase in incidence over time for that age group ($p < .05$)

Appendix Table 1.2 Estimates of Annual Change in Diabetes Incidence Among Adult Manitobans by Age Group

Crude 2-year incidence rate per 100 person-years at risk using NDSS definition of diabetes, age 18+, 1985/86-1986/87 - 2015/16-2016/17

Age Group	Rate Ratio	95% Confidence Interval
Age 18-24	1.02	1.02-1.03
Age 25-29	1.03	1.02-1.03
Age 30-34	1.03	1.03-1.04
Age 35-39	1.03	1.03-1.04
Age 40-44	1.03	1.03-1.03
Age 45-49	1.02	1.02-1.02
Age 50-54	1.01	1.01-1.02
Age 55-59	1.01	1.01-1.01
Age 60-64	1.01	1.01-1.01
Age 60-69	1.01	1.01-1.01
Age 70-74	1.01	1.01-1.01
Age 75-79	1.01	1.01-1.01
Age 80-84	1.00	1.00-1.00
Age 85-89	1.00	1.00-1.01
Age 90+	1.00	0.99-1.01

Bolded values indicate a statistically significant change over time ($p < .05$)

Appendix Table 1.3: Adjusted Relative Risk of Incident Type 2 Diabetes For Health Region Among First Nation Manitobans Compared to All Other Manitobans

Age- & sex-adjusted relative risk, age 7+, 2015/16-2016/17

Regional Health Authority	Relative Risk	95% Confidence Interval
	(REF = All Other Manitobans)	
Southern Health-Santé Sud	2.64	1.91-3.64
Winnipeg RHA	2.01	1.51-2.68
Prairie Mountain Health	1.89	1.39-2.57
Interlake-Eastern RHA	1.88	1.41-2.52
Northern Health Region	1.61	1.20-2.17
Manitoba	1.97	1.51-2.56

Bolded values indicate a statistically significant difference (p<.05)**Appendix Table 1.4: Estimate of Annual Change in Diabetes Prevalence Among First Nation Manitobans and All Other Manitobans by Health Region**

Age- and sex-adjusted 2-year prevalence, age 7+, 2011/12-2012/13 to 2015/16-2016

Regional Health Authority	First Nation Manitobans		All Other Manitobans	
	Rate Ratio	95% Confidence Interval	Rate Ratio	95% Confidence Interval
Interlake-Eastern RHA	1.00	0.86-1.18	1.06	0.91-1.24
Northern Health Region	1.02	0.88-1.17	1.05	0.91-1.22
Southern Health-Santé Sud	1.02	0.87-1.19	1.05	0.90-1.22
Prairie Mountain Health	1.03	0.89-1.20	1.08	0.94-1.25
Winnipeg RHA	1.03	0.88-1.20	1.07	0.92-1.25
Manitoba	1.02	0.87-1.19	1.07	0.91-1.25

Chapter 4

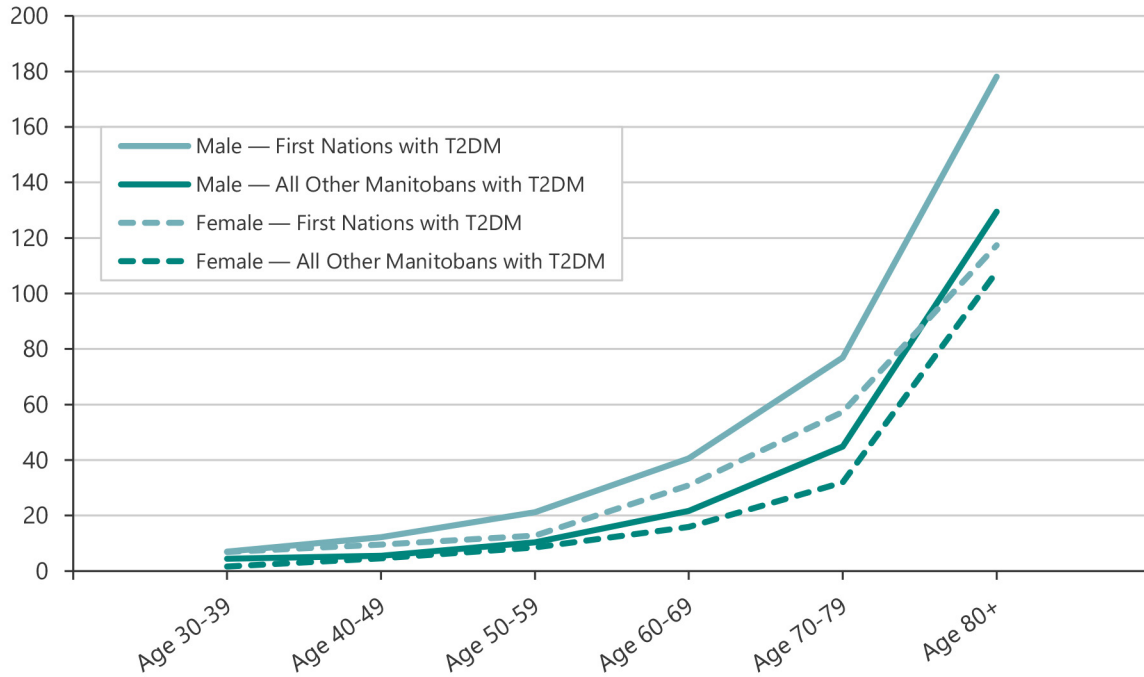
Appendix Table 1.5: Health Zone Distribution of First Nation Manitobans and All Other Manitobans with Type 2 Diabetes, 2015/16-2016/17

Health Zone	Count	Percent	Count	Percent
	First Nation Manitobans		All Other Manitobans	
Southern Health-Santé Sud	1,250	7.4%	10,610	11.5%
East Zone	39	0.2%	3,708	4.0%
Mid Zone	159	0.9%	1,806	2.0%
West Zone	87	0.5%	2,543	2.8%
North Zone	965	5.7%	2,553	2.8%
Winnipeg RHA	2,834	16.7%	55,213	60.0%
Fort Garry & River Heights	245	1.4%	8,855	9.6%
St. Boniface & St. Vital	188	1.1%	9,647	10.5%
St. James & Assiniboine South	159	0.9%	7,394	8.0%
River East & Transcona	386	2.3%	10,324	11.2%
Inkster & Seven Oaks	384	2.3%	9,930	10.8%
Downtown & Point Douglas	1,421	8.4%	9,012	9.8%
Prairie Mountain Health	1,958	11.6%	13,865	15.1%
South Zone	596	3.5%	6,152	6.7%
Brandon Zone	219	1.3%	4,174	4.5%
North Zone	1,143	6.7%	3,539	3.8%
Interlake-Eastern RHA	3,671	21.7%	4,343	10.5%
South Zone	235	1.4%	4,343	4.7%
East Zone	60	0.4%	1,916	2.1%
West Zone	60	0.4%	1,453	1.6%
Selkirk Zone	147	0.9%	1,023	1.1%
North Zone	2,356	13.9%	865	0.9%
Northern Remote Zone	813	4.8%	20	0.0%
Northern Health Region	7,157	42.2%	2,242	2.4%
Direct Service Zone	1,475	8.7%	2,100	2.3%
Non-Direct Service Zone	3,763	22.2%	121	0.1%
Island Lake Zone	1,919	11.3%	21	0.0%
Manitoba Overall	16,870	99.5%	91,550	99.5%

Note: Churchill residents and public trustees have been excluded from this table due to small numbers.

Appendix Figure 1.1: Total Mortality Rate among First Nation Adult Manitobans and All Other Adult Manitobans with Type 2 Diabetes by Age Group and Sex

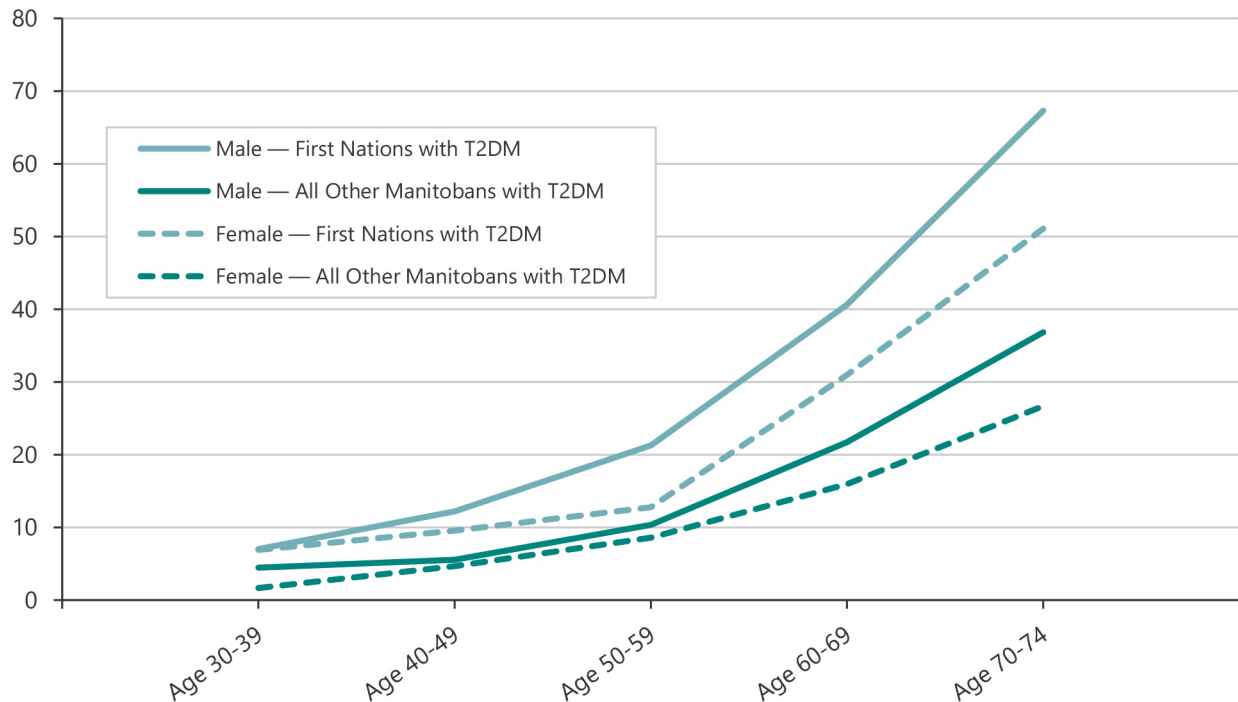
Crude rate per 1,000 person-years, age 30+, 2013/14-2016/17



Note: Ages <30 suppressed due to small numbers

Appendix Figure 1.1: Total Mortality Rate among First Nation Adult Manitobans and All Other Adult Manitobans with Type 2 Diabetes by Age Group and Sex

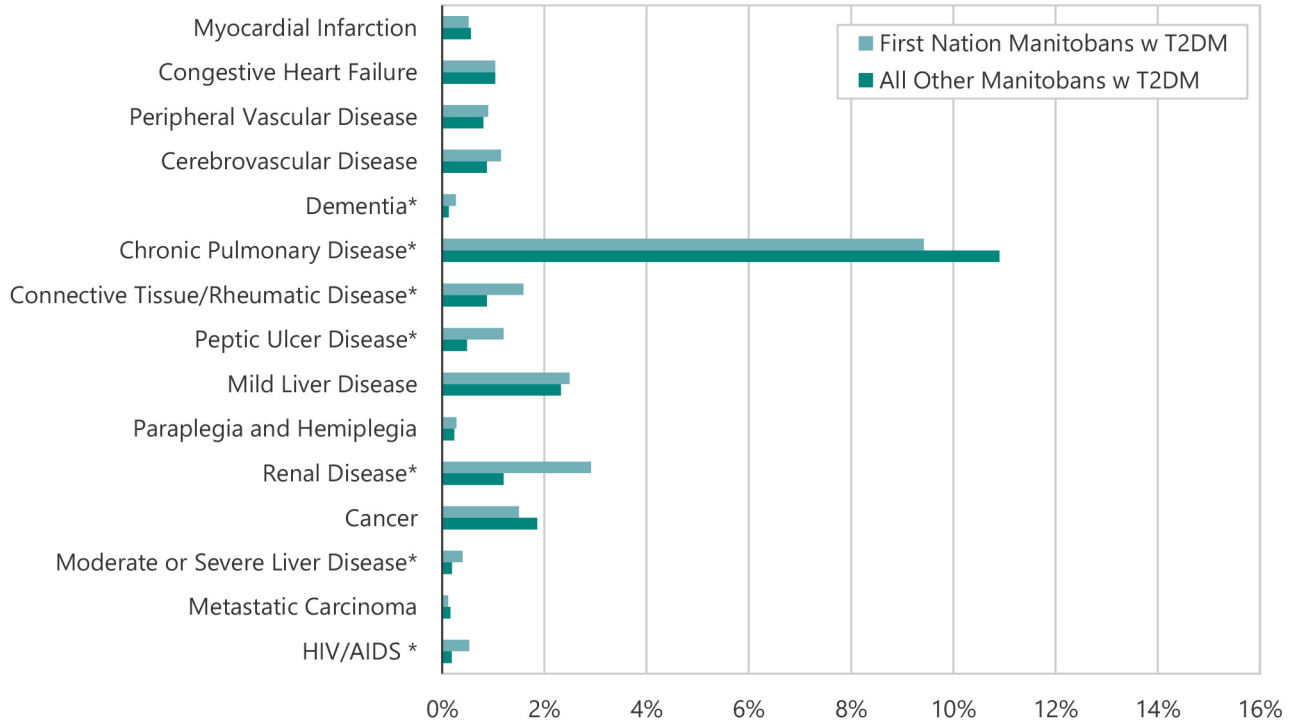
Crude rate per 1,000 person-years, age 30+, 2013/14-2016/17



Note: Ages <30 suppressed due to small numbers

Appendix Figure 1.3: Charlson Comorbidity Diagnosis Groups Among First Nation Manitobans and All Other Manitobans with Type 2 Diabetes, Age 30-49

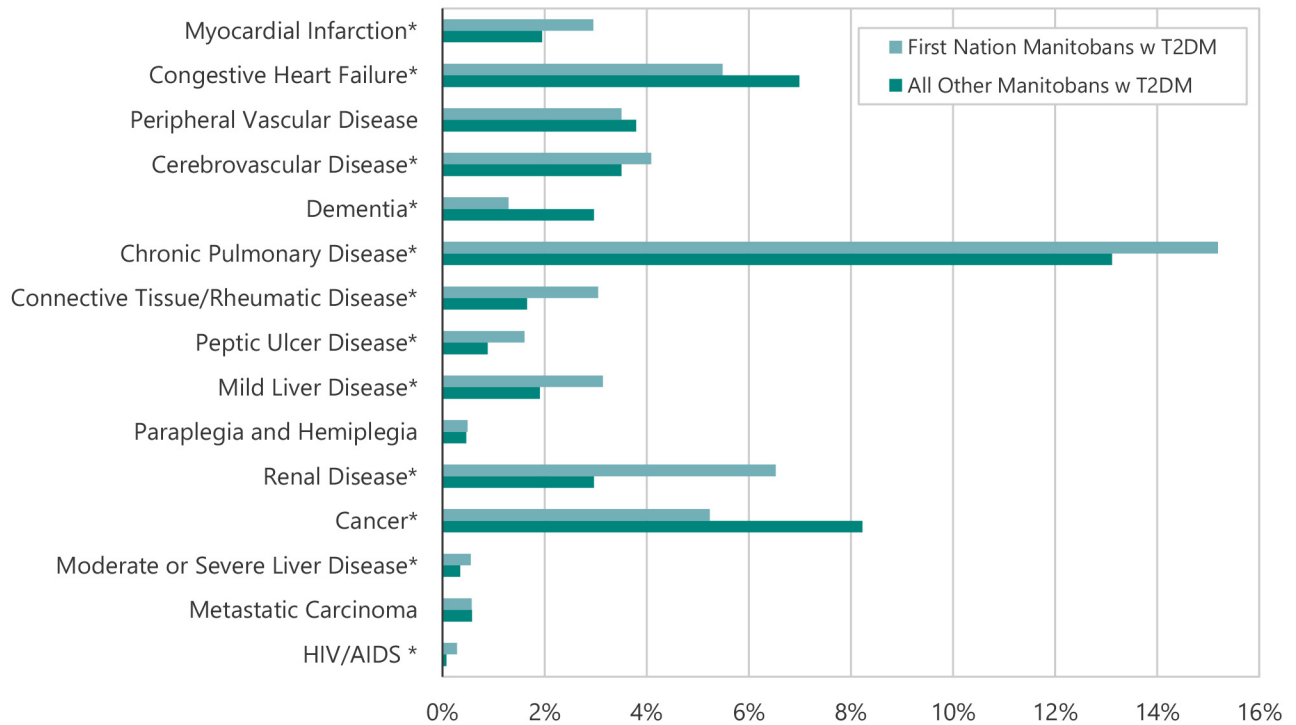
Crude percent, 2015/16-2016/17



* indicates a statistically significant difference between the First Nation Manitobans and All Other Manitobans rates (p < .05)

Appendix Figure 1.4: Charlson Comorbidity Diagnosis Groups Among First Nation Manitobans and All Other Manitobans with Type 2 Diabetes, Age 50+

Crude percent, 2015/16-2016/17



* indicates a statistically significant difference between the First Nation Manitobans and All Other Manitobans rates (p < .05)

Appendix Table 1.6: Most Common Diagnosis Groups in the Charlson Index Score Among Adults with Type 2 Diabetes

Percent, age 18+, 2011/12-2016/17

Diagnosis Groups	Type 2 Diabetes Cases (%)	Diabetes-Free Matches (%)	Chi-Square Statistic	p-value
Charlson Index 06: Chronic Pulmonary Disease	10.99	7.55	79181.56	<.0001
Charlson Index 14: Cancer	6.29	5.25	921.01	<.0001
Charlson Index 11: Diabetes with Complications	4.72	0.00	129.50	<.0001
Charlson Index 02: Congestive Heart Failure	4.44	1.58	6340.66	<.0001
Charlson Index 04: Cerebrovascular Disease	2.94	1.59	1825.71	<.0001
Charlson Index 13: Renal Disease	2.60	0.64	542.27	<.0001
Charlson Index 03: Peripheral Vascular Disease	2.31	1.08	1579.69	<.0001
Charlson Index 05: Dementia	2.21	1.64	593.94	<.0001
Charlson Index 01: Myocardial Infarction	1.93	0.66	110.93	<.0001
Charlson Index 09: Mild Liver Disease	1.74	0.84	832.27	<.0001
Charlson Index 07: Connective Tissue Disease-Rheumatic Disease	1.63	1.47	420.66	<.0001
Charlson Index 08: Peptic Ulcer Disease	0.84	0.52	10.79	0.001
Charlson Index 16: Metastatic Carcinoma	0.49	0.31	97.15	<.0001
Charlson Index 12: Paraplegia and Hemiplegia	0.48	0.30	53.97	<.0001
Charlson Index 15: Moderate or Severe Liver Disease	0.29	0.13	53.68	<.0001
Charlson Index 17: HIV/AIDS	0.10	0.07	83.14	<.0001

Appendix Table 1.7: Most Common Diagnosis Groups in the Charlson Index Score Among First Nation Adult Manitobans with Type 2 Diabetes

Percent, age 18+, 2011/12-2016/17

Diagnosis Groups	Type 2 Diabetes Cases (%)	Diabetes-Free Matches (%)	Chi-Square Statistic	p-value
Charlson Index 06: Chronic Pulmonary Disease	11.16	7.64	8821.79	<.0001
Charlson Index 11: Diabetes with Complications	4.11	0.00	109.41	<.0001
Charlson Index 13: Renal Disease	2.88	0.45	629.94	<.0001
Charlson Index 09: Mild Liver Disease	2.29	1.40	272.45	<.0001
Charlson Index 14: Cancer	2.19	1.43	33.02	<.0001
Charlson Index 07: Connective Tissue Disease-Rheumatic Disease	2.16	2.10	24.33	<.0001
Charlson Index 02: Congestive Heart Failure	1.96	0.49	0.13	0.7189
Charlson Index 04: Cerebrovascular Disease	1.79	0.67	134.01	<.0001
Charlson Index 01: Myocardial Infarction	1.49	0.37	78.36	<.0001
Charlson Index 08: Peptic Ulcer Disease	1.28	0.81	103.33	<.0001
Charlson Index 03: Peripheral Vascular Disease	1.19	0.25	16.28	<.0001
Charlson Index 12: Paraplegia and Hemiplegia	0.56	0.23	92.28	<.0001
Charlson Index 05: Dementia	0.53	0.23	21.27	<.0001
Charlson Index 15: Moderate or Severe Liver Disease	0.39	0.21	17.68	<.0001
Charlson Index 17: HIV/AIDS	0.33	0.29	8.04	0.005
Charlson Index 16: Metastatic Carcinoma	0.25	0.20	0.38	0.535

Appendix Table 1.8: Most Common Diagnosis Groups in the Charlson Index Score Among All Other Adult Manitobans with Type 2 Diabetes

Percent, age 18+, 2011/12-2016/17

Diagnosis Groups	Type 2 Diabetes Cases (%)	Diabetes-Free Matches (%)	Chi-Square Statistic	p-value
Charlson Index 06: Chronic Pulmonary Disease	10.97	7.54	811.24	<.0001
Charlson Index 14: Cancer	6.82	5.75	113.35	<.0001
Charlson Index 11: Diabetes with Complications	4.80	0.00	5711.06	<.0001
Charlson Index 02: Congestive Heart Failure	4.76	1.73	1699.55	<.0001
Charlson Index 04: Cerebrovascular Disease	3.09	1.71	473.93	<.0001
Charlson Index 13: Renal Disease	2.56	0.67	1316.62	<.0001
Charlson Index 03: Peripheral Vascular Disease	2.45	1.19	519.98	<.0001
Charlson Index 05: Dementia	2.42	1.82	100.35	<.0001
Charlson Index 01: Myocardial Infarction	1.99	0.70	732.92	<.0001
Charlson Index 09: Mild Liver Disease	1.67	0.76	395.49	<.0001
Charlson Index 07: Connective Tissue Disease-Rheumatic Disease	1.56	1.39	11.71	0.00
Charlson Index 08: Peptic Ulcer Disease	0.78	0.49	80.90	<.0001
Charlson Index 16: Metastatic Carcinoma	0.52	0.32	53.90	<.0001
Charlson Index 12: Paraplegia and Hemiplegia	0.47	0.31	37.52	<.0001
Charlson Index 15: Moderate or Severe Liver Disease	0.28	0.12	76.01	<.0001
Charlson Index 17: HIV/AIDS	0.07	0.04	6.23	0.013

Chapter 5

Hospitalization rates before and after diagnosis of type 2 diabetes in a matched cohort

This analysis was undertaken in the cohort of adults with type 2 diabetes who were matched to diabetes-free controls by First Nation/All Other Manitobans, year of birth, sex, and region of residence. For further details see Chapter 10 of the report.

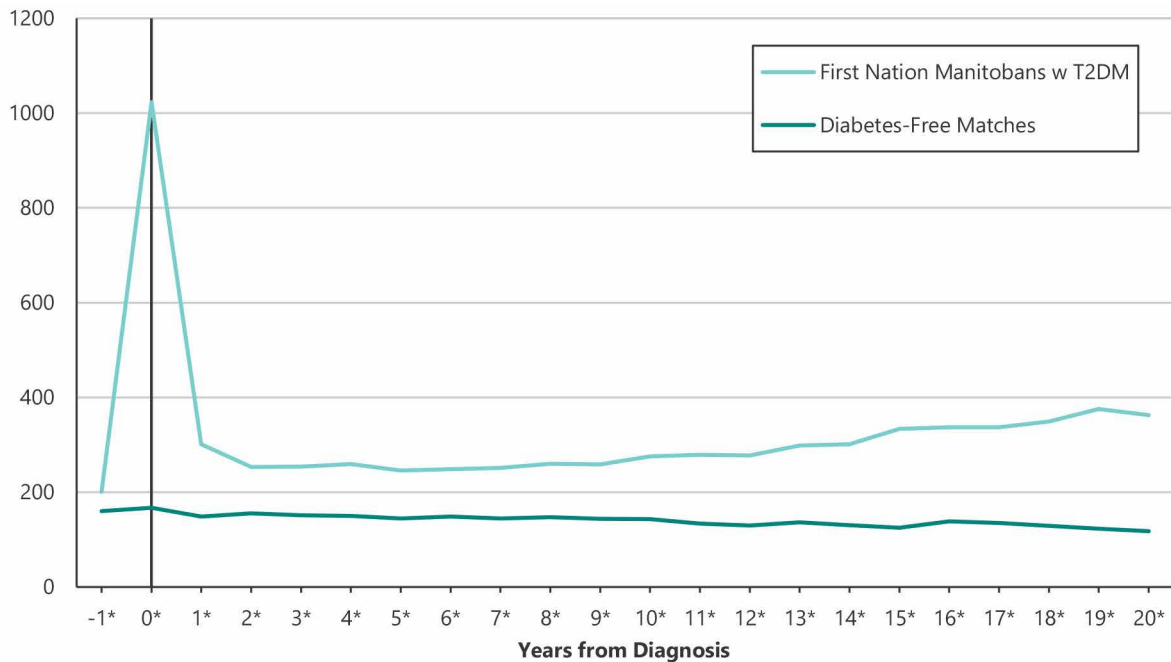
The hospitalizations were divided into the year before diagnosis, the diagnostic period (+/- 30 days from diagnosis), and then for up to 20 years afterwards.

Key Findings (Appendix Figures 1.5 – 1.7):

- Hospitalizations in the year prior to and following diagnosis were slightly higher in those with type 2 diabetes
- The rates slowly increased in all groups over time, as expected as the cohort ages
- The difference between the groups widens over time as the rate of hospitalization in those with type 2 diabetes rises faster

Appendix Figure 1.5: Inpatient Hospitalization Rate Among First Nation Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches Before and After Diagnosis

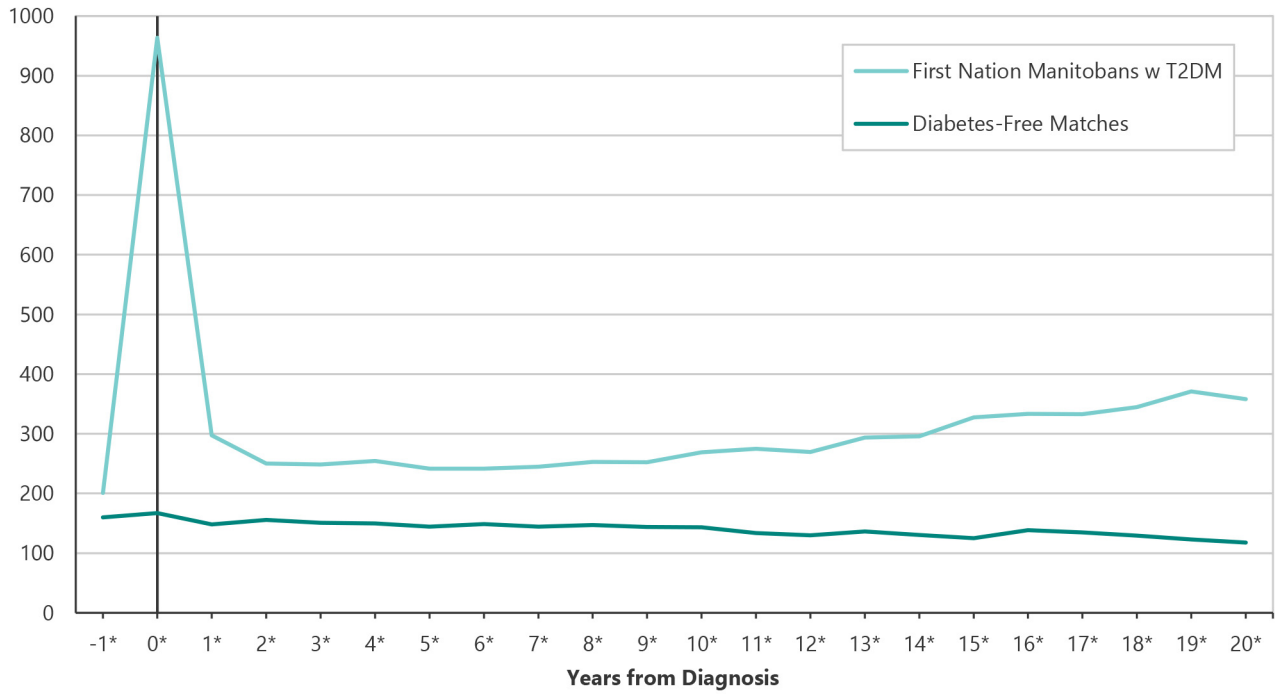
Crude rate per 1,000 person-years, 1984-2017



* indicates a statistically significant difference between the First Nation Manitobans with T2DM and their diabetes-free matches rates ($p < .05$)

Appendix Figure 1.6: Inpatient Hospitalization Rate Among First Nation Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches Before and After Diagnosis, Excluding DKA**

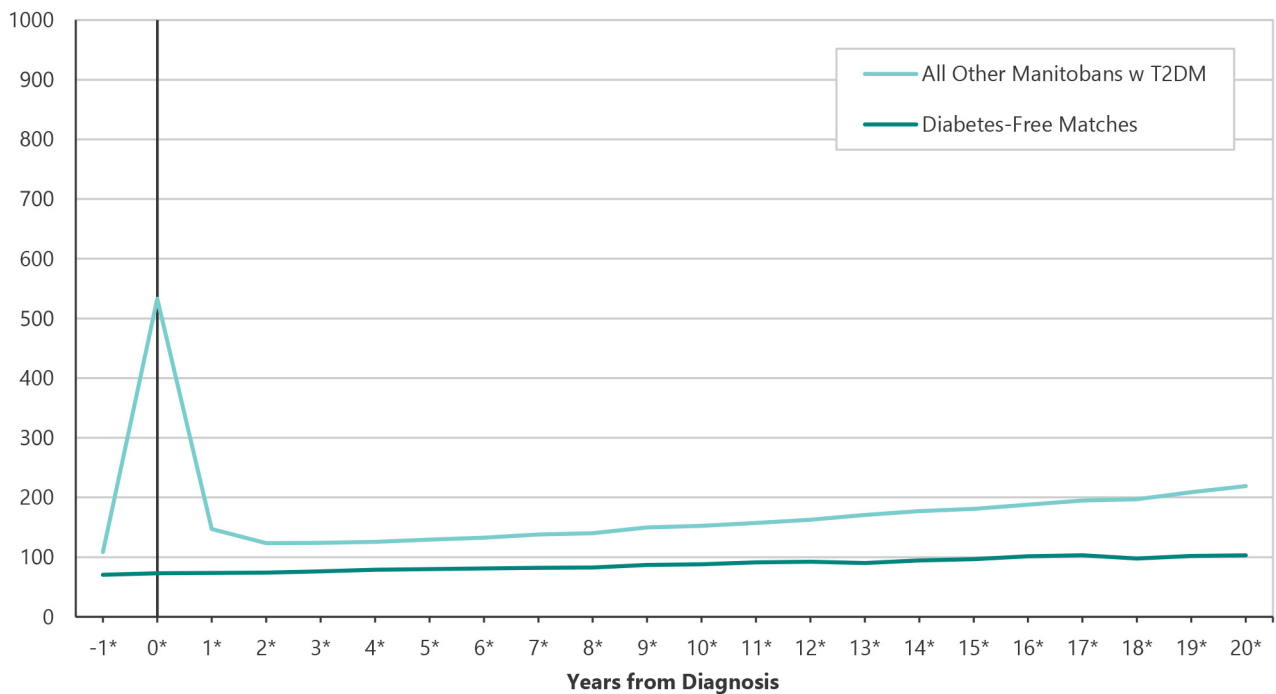
Crude rate per 1,000 person-years, 1984-2017



* indicates a statistically significant difference between the First Nation Manitobans with T2DM and their diabetes-free matches rates ($p < .05$)
 ** DKA = Diabetic Ketoacidosis

Appendix Figure 1.7: Inpatient Hospitalization Rate Among All Other Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches Before and After Diagnosis, Excluding DKA**

Crude rate per 1,000 person-years, 1984-2017



* indicates a statistically significant difference between the All Other Manitobans with T2DM and their diabetes-free matches rates ($p < .05$)
 ** DKA = Diabetic Ketoacidosis

Appendix Table 1.9 shows the relative risks in selected time periods from the graphs. Top reasons for hospitalization in the year leading up to diagnosis and following diagnosis are in Appendix Tables 1.10-1.15.

Appendix Table 1.9: Inpatient Hospitalization Rate Among Adult Manitobans with Type 2 Diabetes

Crude Rate per 1,000 person-years, age 18+

Years from Diagnosis	First Nation Manitobans		All Other Manitobans	
	Relative Risk	95% Confidence Interval	Relative Risk	95% Confidence Interval
1 Year Prior	1.28	1.19-1.38	1.53	1.48-1.59
1 Year After	2.08	1.94-2.23	2.07	2.00-2.15
5 Years After	1.75	1.61-1.89	1.70	1.63-1.76
10 Years After	1.97	1.79-2.17	1.81	1.73-1.89
20 Years After	3.07	2.63-3.59	2.16	2.02-2.30

Appendix Table 1.10: Most Common Causes of Hospitalization in the Year Prior to Diagnosis Among Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Circulatory System	16.76%	Pregnancy & Birth	13.24%
Digestive System	13.41%	Digestive System	12.68%
Pregnancy & Birth	9.26%	Circulatory System	12.24%
Respiratory System	8.23%	Injury & Poisoning	9.93%
Injury & Poisoning	7.72%	Musculoskeletal System	7.67%
Genitourinary System	6.49%	Factors Influencing Health Status & Contact	7.12%
Factors Influencing Health Status & Contact	6.35%	Genitourinary System	6.82%
Mental Illnesses	6.27%	Cancer	6.15%
Symptoms, Signs & Ill-Defined Conditions	6.23%	Respiratory System	5.99%
Musculoskeletal System	6.22%	Mental Illnesses	5.90%
Cancer	5.99%	Symptoms, Signs & Ill-Defined Conditions	5.77%
Nervous System	2.20%	Nervous System	2.38%
Disorders of Skin	1.66%	Infectious and Parasitic Diseases	1.42%
Infectious and Parasitic Diseases	1.48%	Disorders of Skin	1.17%
Endocrine & Metabolic Diseases	0.95%	Endocrine & Metabolic Diseases	0.89%
Disorders of Blood	0.61%	Disorders of Blood	0.51%
All Others	0.18%	Congenital Anomalies	0.14%

Appendix Table 1.11: Most Common Causes of Hospitalization in the Year After Diagnosis Among Manitobans with Type 2 Diabetes and Their Diabetes-Free Match

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Circulatory System	14.68%	Circulatory System	12.43%
Pregnancy & Birth	13.08%	Digestive System	12.04%
Digestive System	12.62%	Pregnancy & Birth	11.59%
Injury & Poisoning	7.25%	Injury & Poisoning	10.19%
Factors Influencing Health Status & Contact	7.15%	Factors Influencing Health Status & Contact	8.09%
Respiratory System	7.14%	Musculoskeletal System	8.02%
Symptoms, Signs & Ill-Defined Conditions	6.15%	Genitourinary System	6.47%
Genitourinary System	5.74%	Respiratory System	6.41%
Musculoskeletal System	5.57%	Cancer	6.15%
Cancer	5.46%	Symptoms, Signs & Ill-Defined Conditions	6.05%
Mental Illnesses	5.23%	Mental Illnesses	5.53%
Endocrine & Metabolic Diseases	3.87%	Nervous System	2.52%
Nervous System	1.97%	Infectious and Parasitic Diseases	1.51%
Infectious and Parasitic Diseases	1.73%	Disorders of Skin	1.30%
Disorders of Skin	1.69%	Endocrine & Metabolic Diseases	0.92%
Disorders of Blood	0.52%	Disorders of Blood	0.59%
All Others	0.15%	All Others	0.20%

Appendix Table 1.12: Most Common Causes of Hospitalization in the Year Prior to Diagnosis Among First Nation Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Pregnancy & Birth	26.19%	Pregnancy & Birth	33.07%
Digestive System	14.29%	Injury & Poisoning	13.77%
Injury & Poisoning	11.06%	Digestive System	10.01%
Respiratory System	7.73%	Mental Illnesses	7.43%
Symptoms, Signs & Ill-Defined Conditions	6.91%	Factors Influencing Health Status & Contact	7.14%
Mental Illnesses	6.88%	Symptoms, Signs & Ill-Defined Conditions	6.55%
Circulatory System	6.56%	Genitourinary System	5.11%
Factors Influencing Health Status & Contact	5.12%	Circulatory System	4.10%
Genitourinary System	4.70%	Respiratory System	3.93%
Musculoskeletal System	2.74%	Musculoskeletal System	2.24%
Disorders of Skin	2.05%	Infectious and Parasitic Diseases	1.86%
Cancer	1.83%	Nervous System	1.69%
Infectious and Parasitic Diseases	1.70%	Cancer	1.14%
Nervous System	1.47%	Disorders of Skin	1.01%
Endocrine & Metabolic Diseases	0.59%	Endocrine & Metabolic Diseases	0.59%
All Others	0.20%	All Others	0.38%

Appendix Table 1.13: Most Common Causes of Hospitalization in the Year After Diagnosis Among First Nation Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Pregnancy & Birth	33.24%	Pregnancy & Birth	30.73%
Digestive System	11.76%	Injury & Poisoning	14.16%
Injury & Poisoning	9.15%	Digestive System	9.40%
Respiratory System	6.41%	Factors Influencing Health Status & Contact	8.90%
Circulatory System	6.30%	Mental Illnesses	7.31%
Symptoms, Signs & Ill-Defined Conditions	6.17%	Symptoms, Signs & Ill-Defined Conditions	6.85%
Factors Influencing Health Status & Contact	4.65%	Respiratory System	4.72%
Mental Illnesses	4.48%	Genitourinary System	4.31%
Endocrine & Metabolic Diseases	4.20%	Circulatory System	3.13%
Genitourinary System	4.04%	Musculoskeletal System	2.68%
Musculoskeletal System	2.54%	Infectious and Parasitic Diseases	1.86%
Cancer	1.83%	Cancer	1.77%
Disorders of Skin	1.76%	Disorders of Skin	1.59%
Infectious and Parasitic Diseases	1.46%	Nervous System	1.41%
Nervous System	1.46%	Disorders of Blood	0.54%
Disorders of Blood	0.37%	All Others	0.64%
Congenital Anomalies	0.17%		

Appendix Table 1.14: Most Common Causes of Hospitalization in the Year Prior to Diagnosis Among All Other Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Circulatory System	19.32%	Circulatory System	14.69%
Digestive System	13.19%	Digestive System	13.48%
Respiratory System	8.36%	Musculoskeletal System	9.30%
Musculoskeletal System	7.09%	Injury & Poisoning	8.77%
Cancer	7.03%	Cancer	7.66%
Genitourinary System	6.94%	Genitourinary System	7.34%
Injury & Poisoning	6.88%	Pregnancy & Birth	7.25%
Factors Influencing Health Status & Contact	6.65%	Factors Influencing Health Status & Contact	7.11%
Mental Illnesses	6.12%	Respiratory System	6.61%
Symptoms, Signs & Ill-Defined Conditions	6.06%	Symptoms, Signs & Ill-Defined Conditions	5.53%
Pregnancy & Birth	5.02%	Mental Illnesses	5.44%
Nervous System	2.38%	Nervous System	2.59%
Disorders of Skin	1.57%	Infectious and Parasitic Diseases	1.29%
Infectious and Parasitic Diseases	1.43%	Disorders of Skin	1.22%
Endocrine & Metabolic Diseases	1.04%	Endocrine & Metabolic Diseases	0.98%
Disorders of Blood	0.72%	Disorders of Blood	0.59%
		Congenital Anomalies	0.14%

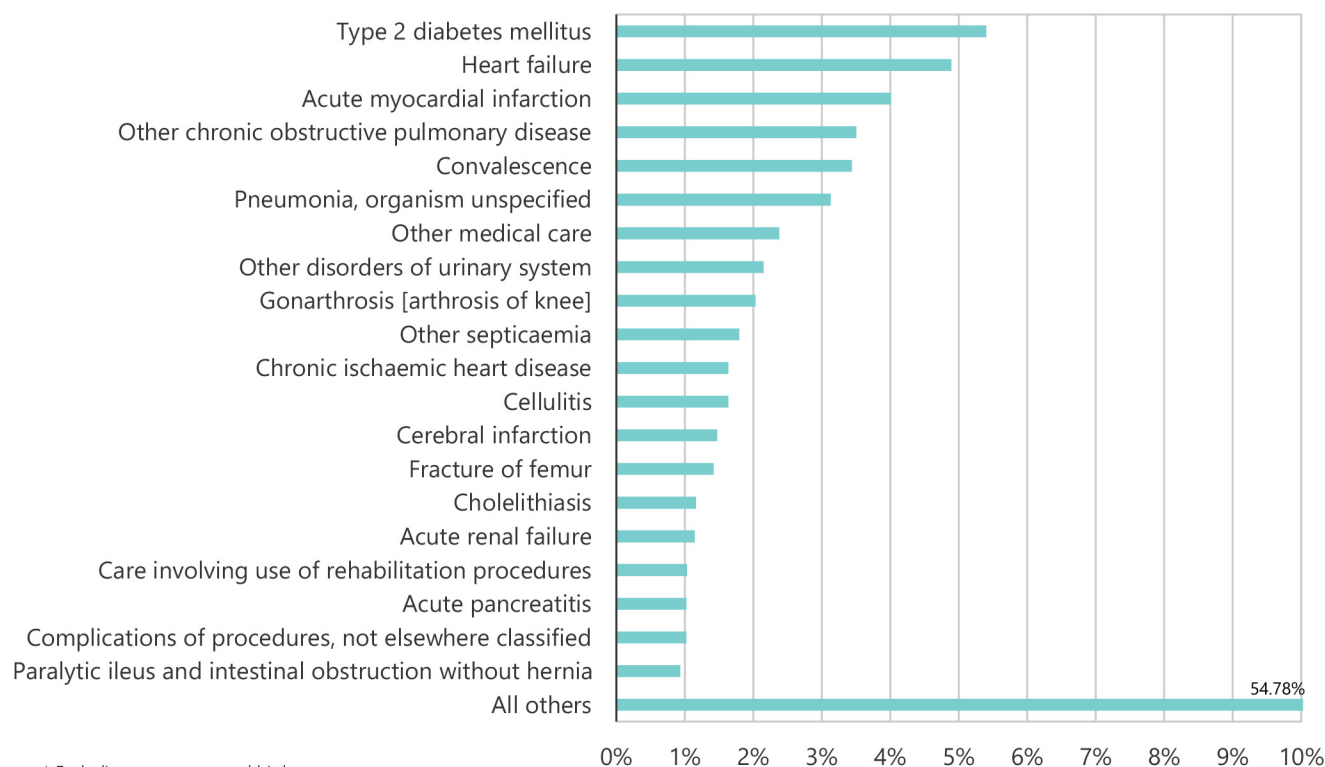
Appendix Table 1.15: Most Common Causes of Hospitalization in the Year After Diagnosis Among All Other Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Percent of hospitalizations

Type 2 Diabetes Cohort		Diabetes-Free Matches	
Cause	Percent	Cause	Percent
Circulatory System	16.92%	Circulatory System	14.91%
Digestive System	12.85%	Digestive System	12.75%
Factors Influencing Health Status & Contact	7.81%	Musculoskeletal System	9.44%
Pregnancy & Birth	7.71%	Injury & Poisoning	9.14%
Respiratory System	7.33%	Factors Influencing Health Status & Contact	7.87%
Injury & Poisoning	6.75%	Cancer	7.32%
Cancer	6.43%	Genitourinary System	7.05%
Musculoskeletal System	6.38%	Respiratory System	6.86%
Genitourinary System	6.19%	Pregnancy & Birth	6.49%
Symptoms, Signs & Ill-Defined Conditions	6.14%	Symptoms, Signs & Ill-Defined Conditions	5.83%
Mental Illnesses	5.43%	Mental Illnesses	5.06%
Endocrine & Metabolic Diseases	3.78%	Nervous System	2.81%
Nervous System	2.11%	Infectious and Parasitic Diseases	1.41%
Infectious and Parasitic Diseases	1.80%	Disorders of Skin	1.22%
Disorders of Skin	1.67%	Endocrine & Metabolic Diseases	1.03%
Disorders of Blood	0.56%	Disorders of Blood	0.60%
All Others	0.14%	All Others	0.22%

Appendix Figure 1.8: Most Common Causes of Hospitalization in Manitoba*

Percent of Hospitalizations, age 18-74, 2013/14-2016/17



* Excluding pregnancy and birth

Appendix Table 1.16: Relative Risk of Inpatient Hospitalization Among Adult Manitobans with Type 2 Diabetes by Demographic Factors and Health Region

Per 1,000 person-years, age 18+, 2013/14-2016/17

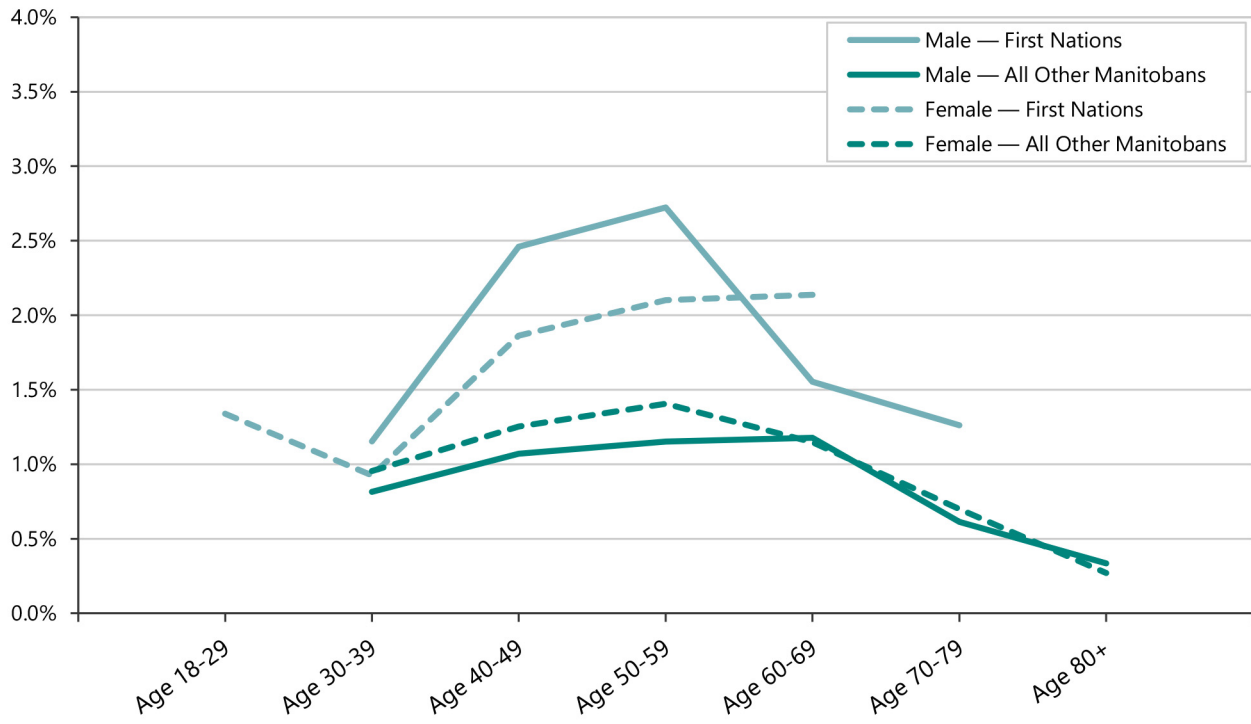
Indicator	Relative Risk	95% Confidence Interval
First Nation Identity (REF=First Nation)	0.60	0.59-0.61
Sex (REF=Female)	1.06	1.05-1.08
Majority of Care (REF=No majority of care)	1.12	1.07-1.18
RHA (REF=Manitoba)		
Interlake-Eastern RHA	0.95	0.93-0.97
Northern Health Region	0.99	0.97-1.02
Public Trustee	1.53	1.41-1.66
Southern Health-Santé Sud	1.13	1.11-1.15
Prairie Mountain Health	1.35	1.32-1.37
Winnipeg RHA	0.88	0.87-0.89

Bolded values indicate a statistically significant difference (p<.05)

Chapter 6

Appendix Figure 1.9: Percent of First Nation Adult Manitobans and All Other Adult Manitobans with Type 2 Diabetes who were Treated for Retinopathy by Age Group and Sex

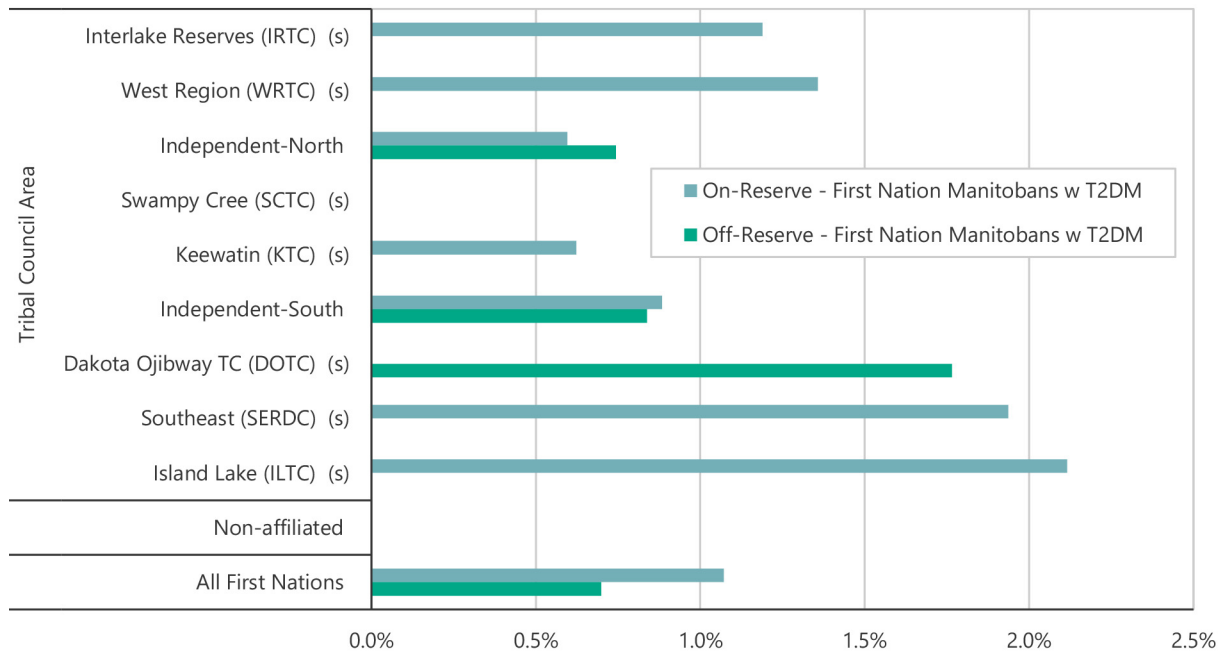
Crude percent of people who ever had 1+ retinopathy treatments, age 18+, 2015/16-2016/17



Note: Missing values indicate suppression due to small numbers

Appendix Figure 1.10: Incident Dialysis Treatment for First Nation Adult Manitobans with Type 2 Diabetes by Tribal Council Area

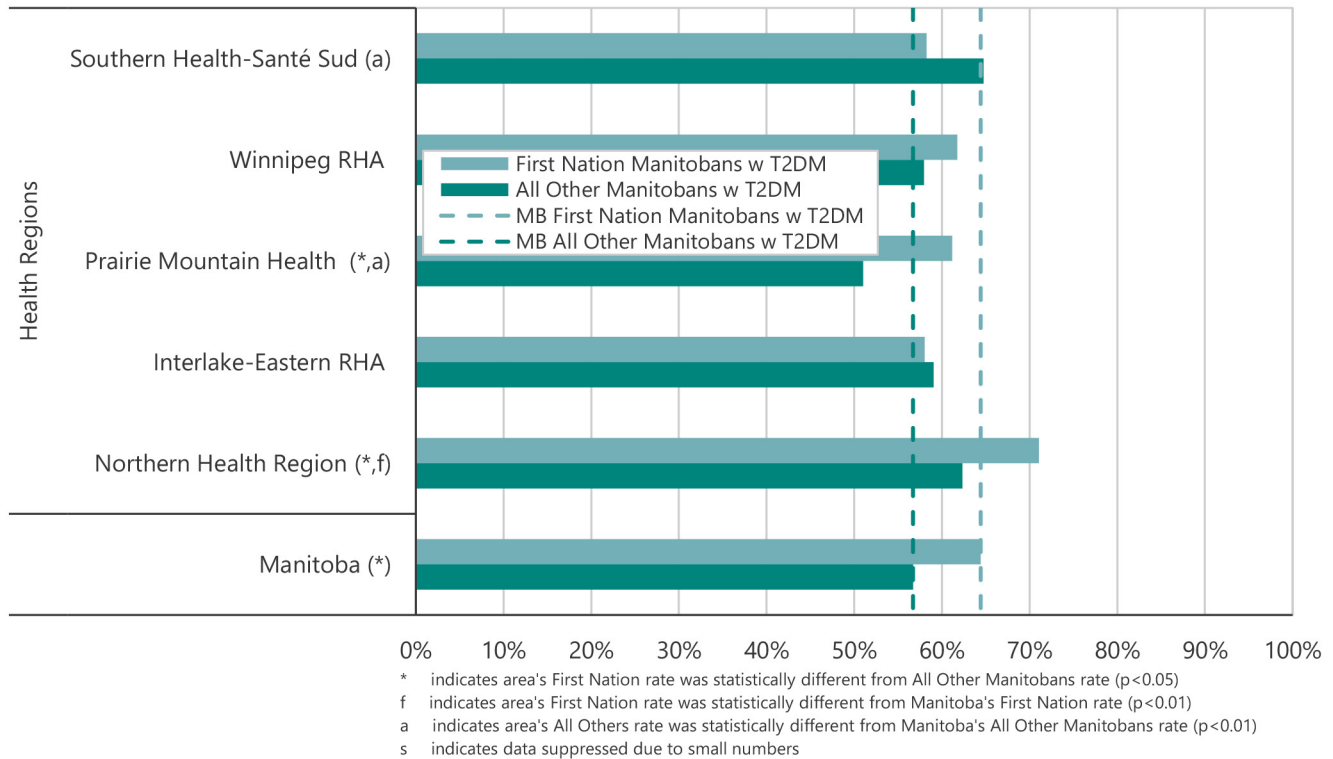
Crude percent, age 18+, 2015/16-2016/17; excludes people with kidney transplant and previous dialysis



s indicates suppression due to small numbers

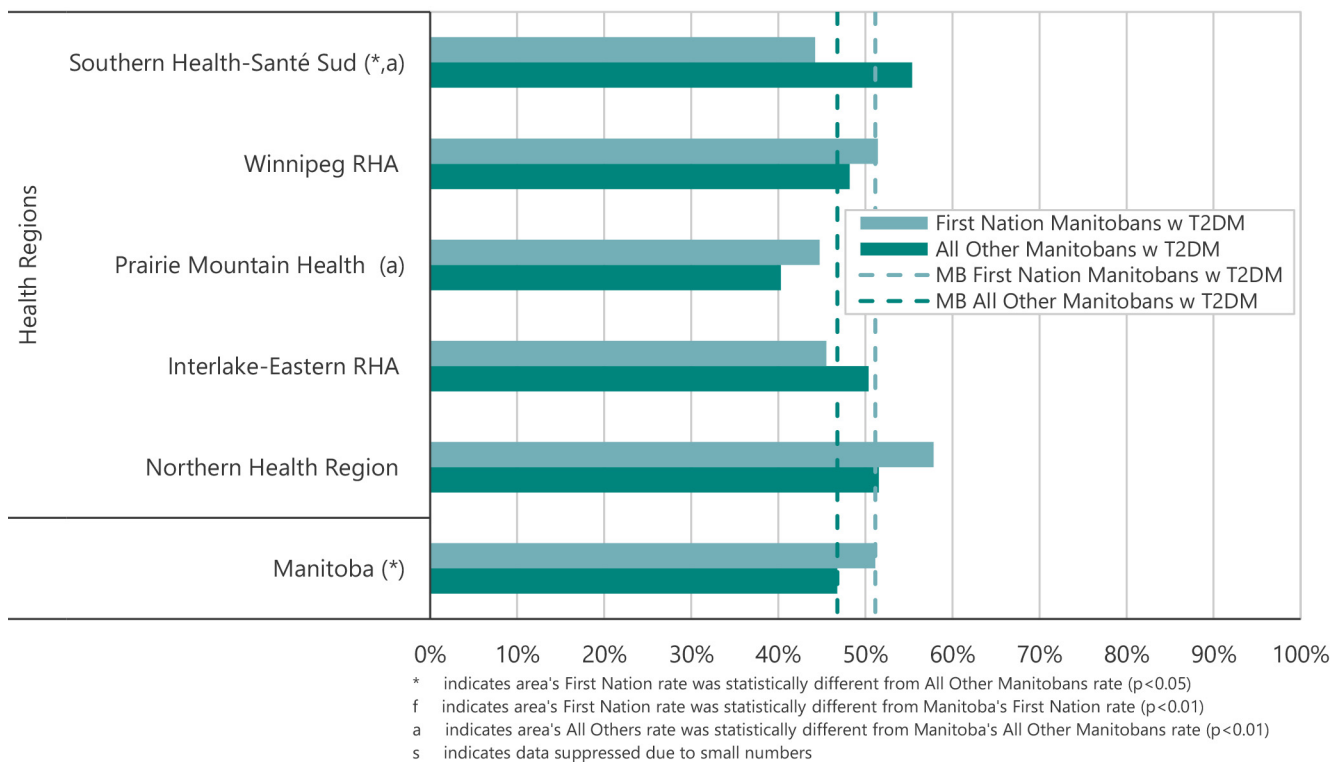
Appendix Figure 1.11: Percent of First Nation Manitobans and All Other Manitobans with Type 2 Diabetes taking ACE Inhibitors or ARBs with 1+ Urine ACR Screens in One Year by Health Region

Age- and sex-adjusted percent, 2015/16



Appendix Figure 1.12: Percent of First Nation Manitobans and All Other Manitobans with Type 2 Diabetes not taking ACE Inhibitors or ARBs with 1+ Urine ACR Screens in One Year by Health Region

Age- and sex-adjusted percent, 2015/16



Appendix Table 1.17: Percent of Manitobans with Type 2 Diabetes with Zero HbA1c Tests by Health Region Authority Zone
2013/14-2016/17

Regional Health Authority Zone	N	%
RHA Zone as of 2013		
Interlake-Eastern Selkirk Zone	906	7.95
Interlake-Eastern South Zone	3,555	25.88
Interlake-Eastern East Zone	1,570	11.21
Interlake-Eastern West Zone	1,273	11.70
Interlake-Eastern North Zone	2,782	12.58
Interlake-Eastern Northern Remote Zone	729	7.82
Northern Direct Service Zone	2,858	3.60
Northern Non-Direct Service Zone	3,224	2.76
Northern Island Lake Zone	1,632	3.86
Public Trustee	441	39.46
Southern North Zone	2,783	12.94
Southern Mid Zone	1,558	19.70
Southern West Zone	2,196	39.94
Southern East Zone	2,930	36.72
St. James & Assiniboine South	6,278	73.73
Fort Garry & River Heights	7,101	71.99
St. Boniface & St. Vital	7,654	73.94
River East & Transcona	8,571	65.65
Inkster & Seven Oaks	8,079	70.74
Downtown & Point Douglas	8,185	58.85
Churchill	91	3.30
Prairie Mountain Health North Zone	3,950	4.46
Prairie Mountain Health Brandon Zone	3,445	3.11
Prairie Mountain Health South Zone	5,690	4.31

Additional outcomes for which type 2 diabetes is a risk factor

Hip Fractures

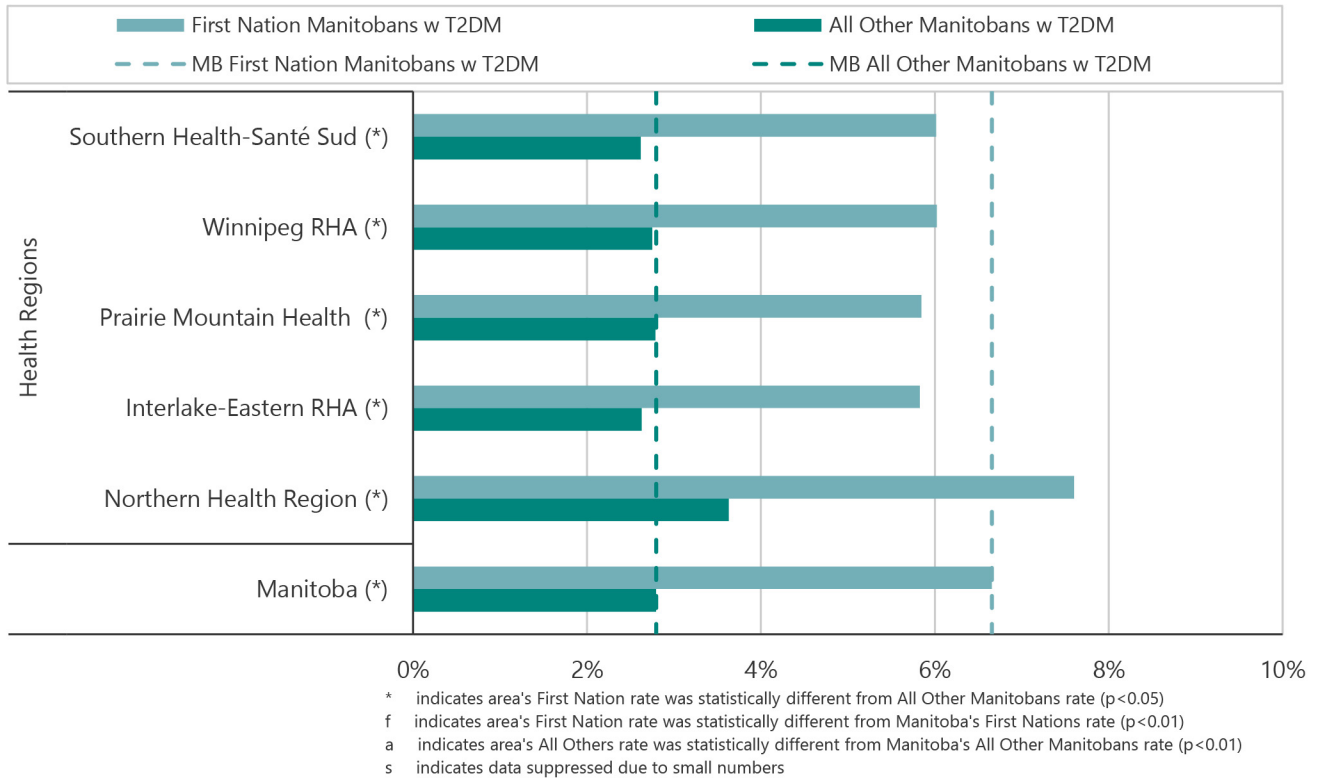
Current literature supports an association between type 2 diabetes and increased risk of osteoporotic fractures [1,2]. Reported here are overall risk and rates of hip fracture for the cohort. Rates in the overall Manitoba community dwelling senior population are less than 2 per 1,000 person-years for those between the ages of 65 and 74, five per 1,000 person-years for those between the ages of 75 and 84, and 15 per 1,000 person-years for those age 85+ [3].

Key Findings (Appendix Figures 1.13 – 1.14).

- By health region
 - There were no differences between health regions
 - Rates were higher for First Nation than for All Other Manitobans in all health regions

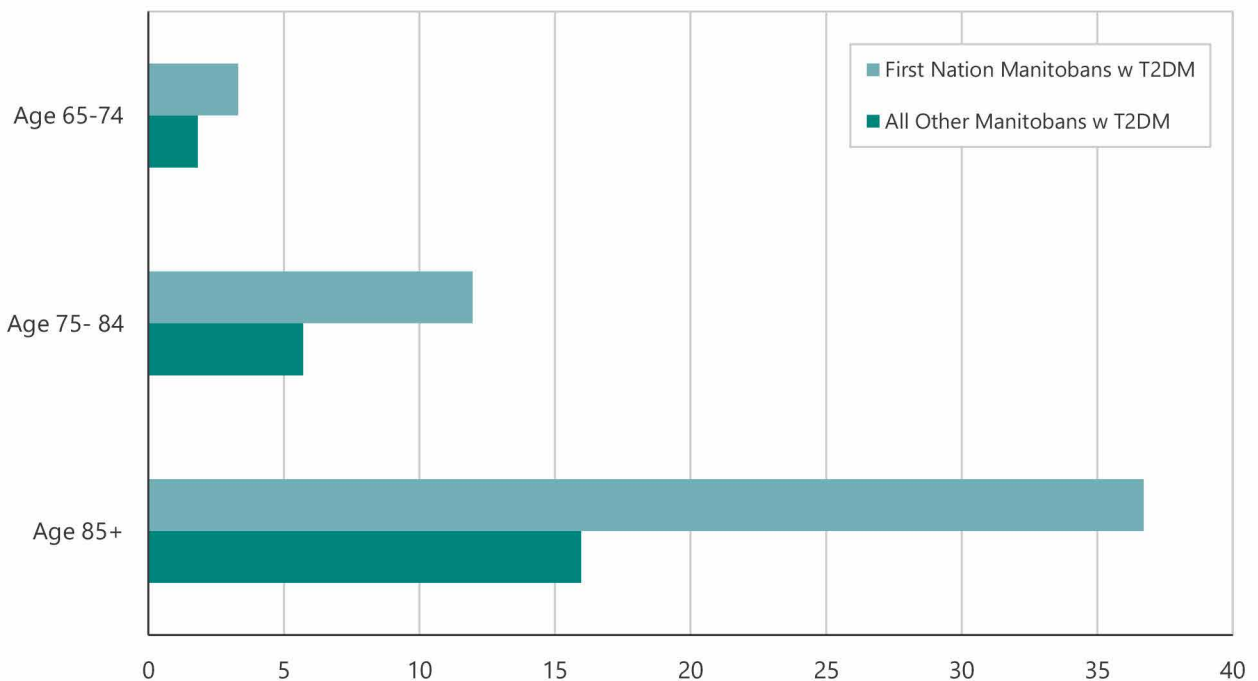
Appendix Figure 1.13: Percent of First Nation Manitobans and All Other Manitobans with Type 2 Diabetes Who Have Ever Had a Hip Fracture by Health Region

Age- and sex-adjusted percent of people with type 2 diabetes who ever had a hip fracture, 1979-2017



Appendix Figure 1.14: Hip Fracture Rate for First Nation Older Adult Manitobans All Other Older Adult Manitobans with Type 2 Diabetes by Age

Crude rate per 1,000 person-years at risk, age 65+, 2011/12-2014/15



Facial Palsy

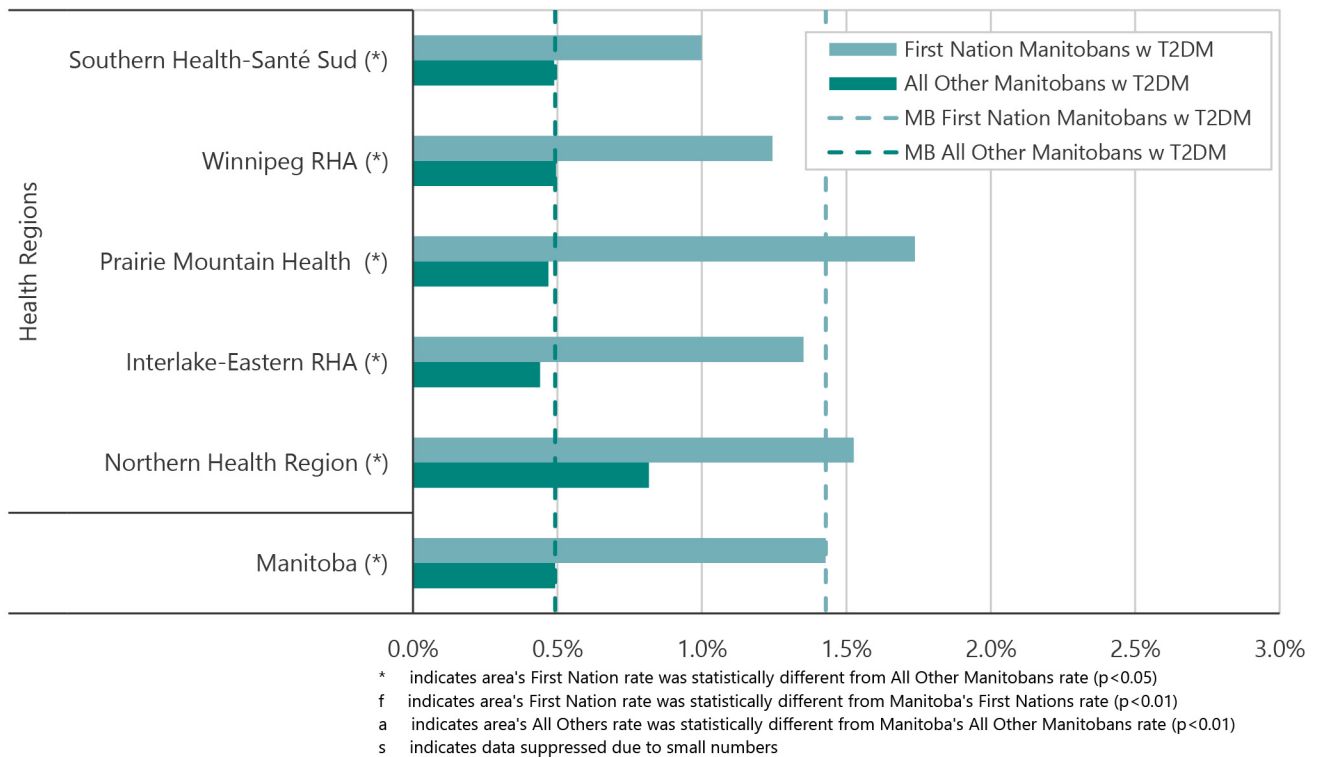
Facial palsy is a temporary paralysis of one side of the face. The reason it happens is not completely understood but it may follow a viral infection. The risk is higher for those with type 2 diabetes than the general population. In the cohort of people with type 2 diabetes 9.9% of First Nation and 3.9% of All Other Manitobans have had at least one episode.

Key Findings (Appendix Figure 1.15):

- By health region
 - No significant differences by health region
 - Higher rates for First Nation individuals

Appendix Figure 1.15: Prevalence of Facial Palsy among First Nation Manitobans and All Other Manitobans with Type 2 Diabetes by Health Region

Age- and sex-adjusted percent, age 7+, 2013/14-2016/17



Tuberculosis

Rates of tuberculosis are higher for First Nation people and for those with type 2 diabetes [4]. While there are geographic and demographic areas of high risk in Manitoba, the numbers are relatively low and thus reported only for all of Manitoba. Rates in the general Manitoba population are 10.5 per 100,00 [5].

Appendix Table 1.18: Rate of Active and Latent Tuberculosis among First Nation Manitobans and All Other Manitobans with Type 2 Diabetes by Sex

Crude rate per 100,000 person-years, 2013/14-2014/15

Indicator	Tuberculosis Status	
	Active	Latent
First Nation Manitobans		
Male	1.41	2.08
Female	1.26	2.17
All Other Manitobans		
Male	0.21	0.33
Female	0.11	0.32

Chapter 8

Appendix Table 1.19: Hospitalization Rate Ratio Among Children in the Year Prior to Month of Diagnosis, Including DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	0.61	0.27-1.37	1.44	0.2295
Type 2 vs. Controls	2.83	1.77-4.53	18.81	<.0001
Type 2 vs. Type 1	10.08	4.46-22.75	30.89	<.0001
Control Groups (Type 2 vs. Type 1)	2.16	1.35-3.43	10.45	0.0012

* DKA=Diabetic ketoacidosis

Appendix Table 1.20: Hospitalization Rate Ratio Among Children in the Year Following the Month of Diagnosis, Including DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	3.49	1.94-6.28	17.48	<.0001
Type 2 vs. Controls	3.19	2.08-4.89	28.40	<.0001
Type 2 vs. Type 1	3.53	1.96-6.35	17.69	<.0001
Control Groups (Type 2 vs. Type 1)	3.86	2.54-5.88	39.67	<.0001

* DKA=Diabetic ketoacidosis

Appendix Table 1.21: Hospitalization Rate Ratio Among Children in the Year Prior to Month of Diagnosis, Excluding DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	0.56	0.25-1.28	1.87	0.1715
Type 2 vs. Controls	2.72	1.70-4.34	17.54	<.0001
Type 2 vs. Type 1	10.38	4.52-23.85	30.41	<.0001
Control Groups (Type 2 vs. Type 1)	2.16	1.37-3.40	10.91	0.0010

* DKA=Diabetic ketoacidosis

Appendix Table 1.22: Hospitalization Rate Ratio Among Children in the Year Following the Month of Diagnosis, Excluding DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	3.17	1.74-5.77	14.30	0.0002
Type 2 vs. Controls	3.12	2.03-4.78	26.98	<.0001
Type 2 vs. Type 1	3.77	2.05-6.92	18.33	<.0001
Control Groups (Type 2 vs. Type 1)	3.84	2.53-5.84	39.71	<.0001

* DKA=Diabetic ketoacidosis

Table 1.23: Hospitalization Rate Ratio Among Children in the Five Years Following the Month of Diagnosis, Including DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	8.02	3.93-16.34	32.82	<.0001
Type 2 vs. Controls	2.43	1.40-4.25	9.83	0.0017
Type 2 vs. Type 1	1.42	0.76-2.66	1.21	0.2722
Control Groups (Type 2 vs. Type 1)	4.68	2.42-9.07	20.90	<.0001

* DKA=Diabetic ketoacidosis

Appendix Table 1.24: Hospitalization Rate Ratio Among Children in the Five Years Following the Month of Diagnosis, Excluding DKA*

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	3.23	1.43-7.34	7.88	0.0050
Type 2 vs. Controls	2.26	1.30-3.95	8.25	0.0041
Type 2 vs. Type 1	3.46	1.61-7.45	10.10	0.0015
Control Groups (Type 2 vs. Type 1)	4.95	2.61-9.39	23.93	<.0001

* DKA=Diabetic ketoacidosis

Appendix Table 1.25: Mood and Anxiety Disorder Rate Ratio Among Children After Diagnosis

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	1.92	1.50-2.44	27.27	<.0001
Type 2 vs. Controls	1.81	1.45-2.27	26.97	<.0001
Type 2 vs. Type 1	2.37	1.84-3.06	44.21	<.0001
Control Groups (Type 2 vs. Type 1)	2.51	2.00-3.14	64.07	<.0001

Appendix Table 1.26: Substance Use Disorder Rate Ratio Among Children After Diagnosis

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	1.80	0.96-3.36	3.40	0.0654
Type 2 vs. Controls	1.10	0.72-1.69	0.19	0.6654
Type 2 vs. Type 1	2.70	1.46-4.99	10.09	0.0015
Control Groups (Type 2 vs. Type 1)	4.42	2.81-6.98	40.93	<.0001

Appendix Table 1.27: Atypical Antipsychotic Use Rate Ratio Among Children After Diagnosis

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	1.19	0.64-2.21	0.31	0.5801
Type 2 vs. Controls	1.76	1.23-2.52	9.63	0.0019
Type 2 vs. Type 1	5.60	3.08-10.17	31.99	<.0001
Control Groups (Type 2 vs. Type 1)	3.78	2.41-5.93	33.57	<.0001

Appendix Table 1.28: Relative Rate of 8+ Grade 9 Credits Passed

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	0.99	0.94-1.03	0.31	0.5756
Type 2 vs. Controls	0.79	0.67-0.93	7.65	0.0057
Type 2 vs. Type 1	0.43	0.37-0.50	118.53	<.0001
Control Groups (Type 2 vs. Type 1)	0.54	0.49-0.59	202.11	<.0001

Appendix Table 1.29: Relative Rate of High School Graduation

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	0.99	0.95-1.03	0.29	0.5913
Type 2 vs. Controls	0.89	0.78-1.02	2.91	0.0879
Type 2 vs. Type 1	0.52	0.46-0.59	105.10	<.0001
Control Groups (Type 2 vs. Type 1)	0.58	0.54-0.62	197.57	<.0001

Appendix Table 1.30: Relative Rate of Any Interaction with Child and Family Services Among Children

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	0.99	0.85-1.15	0.02	0.8783
Type 2 vs. Controls	1.02	0.93-1.12	0.18	0.6692
Type 2 vs. Type 1	2.45	2.08-2.87	119.29	<.0001
Control Groups (Type 2 vs. Type 1)	2.37	2.13-2.63	261.83	<.0001

Appendix Table 1.31: Relative Rate of Being Taken into Care by Child and Family Services Among Children

Comparison Groups	Rate Ratio	95% CI	Chi-Square	P-value
Type 1 vs. Controls	1.17	0.86-1.61	1.00	0.3178
Type 2 vs. Controls	1.07	0.90-1.26	0.59	0.4420
Type 2 vs. Type 1	4.59	3.32-6.36	84.37	<.0001
Control Groups (Type 2 vs. Type 1)	5.05	4.02-6.35	193.70	<.0001

Chapter 9

Appendix Table 1.32: Relative Risk of Outcomes Under Study for First Nation Manitobans and All Other Manitobans with Type 2 Diabetes and Their Diabetes-Free Matches

Perinatal Outcomes	First Nation With T2DM vs Diabetes-Free Matches		All Other Manitobans With T2DM vs Diabetes-Free Matches		First Nations vs All Other Manitobans (with T2DM)		First Nations vs All Other Manitobans (without T2DM)	
	Relative Risk	95% Confidence Interval	Relative Risk	95% Confidence Interval	Relative Risk	95% Confidence Interval	Relative Risk	95% Confidence Interval
Prenatal Care								
First Trimester Initiation	1.19	1.14-1.25	1.03	1.00-1.06	0.86	0.82-0.90	0.74	0.71-0.77
Appropriate	1.25	1.21-1.30	1.03	1.01-1.04	0.92	0.90-0.94	0.75	0.73-0.77
Maternal Outcomes								
Caesarean	2.34	2.07-2.65	1.77	1.58-1.97	0.89	0.79-1.00	0.67	0.59-0.75
Operative Vaginal Delivery	1.40	1.00-1.95	0.90	0.66-1.23	0.86	0.59-1.27	0.56	0.43-0.71
Induction	1.97	1.80-2.16	2.09	1.86-2.35	1.22	1.10-1.35	1.30	1.17-1.44
Mortality/Morbidity	0.83	0.36-1.93	1.18	0.59-2.35	0.54	0.21-1.38	0.76	0.44-1.32
Maternal Readmission	2.27	1.51-3.41	3.32	2.01-5.49	1.13	0.72-1.79	1.65	1.04-2.62
Neonatal Outcomes								
Appropriate for GA	0.65	0.61-0.70	0.82	0.78-0.87	0.74	0.68-0.81	0.94	0.91-0.97
Large for GA	2.90	2.58-3.27	2.42	2.03-2.88	1.79	1.55-2.07	1.49	1.28-1.74
Small for GA	0.41	0.28-0.60	0.85	0.63-1.15	0.46	0.30-0.73	0.97	0.80-1.18
Neonatal Readmission	1.60	1.12-2.29	0.88	0.53-1.49	2.11	1.24-3.62	1.17	0.84-1.63
NICU Admisison	3.93	3.32-4.65	3.42	2.82-4.15	1.23	1.05-1.44	1.07	0.88-1.31
Congenital Anomalies	3.61	2.55-5.12	2.72	1.67-4.43	1.97	1.30-2.99	1.49	0.97-2.29
Birth Trauma	6.25	2.58-15.15	5.24	2.21-12.45	0.97	0.48-1.97	0.81	0.29-2.23

GA = Gestational Age

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