THE 2013 RHA INDICATORS ATLAS

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ABOUT THE MANITOBA CENTRE FOR HEALTH POLICY

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

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

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

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Dedication

This report is dedicated to the late Catherine Hynes, former Regional Manager of Decision Support for the Northern Regional Health Authority. Catherine was a dedicated member of *The Need to Know Team*, and an avid user of data to inform health program and policy decisions.

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ACRONYMS

ACG®	Adjusted Clinical Group®
ACS	Ambulatory Care Sensitive
ADG®	Aggregated Diagnostic Group™
AMI	Acute Myocardial Infarction
ATC	Anatomic, Therapeutic, Chemical
CA	Community Area
CCDSS	Canadian Chronic Disease Surveillance System
CCI	Canadian Classification of Interventions
CHAN	Community Health Assessment Network
CHF	Congestive Heart Failure
CI	Confidence Interval
CIHR	Canadian Institute of Health Research
CMG™	Case Mix Group
COPD	Chronic Obstructive Pulmonary Disease
CT	Computed Tomography
DA	Dissemination Area
DPIN	Drug Program Information Network
ELOS	Expected Length of Stay
ER	Emergency
FP	Family Practitioner
GLM	Generalized Linear Model
GP	General Practitioner
ICD	International Classification of Diseases
IHD	Ischemic Heart Disease
MCC	Major Clinical Categories
MCHP	Manitoba Centre for Health Policy
MIMS	Manitoba Immunization Monitoring System
MRI	Magnetic Resonance Imaging
NC	Neighbourhood Cluster
NTK	Need To Know

OOH	Out-of-Province
OR	Odds Ratio
PCH	Personal Care Home
PCI	Percutaneous Coronary Interventions
PHAC	Public Health Agency of Canada
PHIN	Personal Health Identification Number
PMR	Premature Mortality Rate
PYLL	Potential Years of Life Lost
RHA	Regional Health Authority
RUB	Resource Utilization Band
SEFI	Socioeconomic Factor Index
TRM	Total Respiratory Morbidity
WHO	World Health Organization

EXECUTIVE SUMMARY

Major Findings and Implications

Health Status is Improving

The results in this report show clearly that the health of Manitobans has improved significantly over time, despite the aging of the population. Life expectancy increased, and death rates decreased. Potential years of life lost and premature mortality rates (PMR) also decreased, indicating that fewer people died before the age of 75 years. These results are summarized in Table E.1.

Table E.1: Changes in Indicators of Mortality*

Indicators†	2007	2011
Getting Better		
Total Mortality (per 1,000 residents)	**8.43**	**7.88**
Premature Mortality Rate (PMR) (per 1,000 residents)	**3.38**	**3.12**
Male Life Expectancy (Years)	**76.5**	**77.5**
Female Life Expectancy (Years)	**81.5**	**82.2**
Potential Years of Life Lost (PYLL) (per 1,000 residents)	**55.0**	**51.5**
No Significant Change		
Suicide (per 1,000 residents aged 10+)	0.16	0.17

* calendar years for suicide rates; fiscal years for all others
† bolded values indicate that change over time was statistically significant at $p<0.05$

The total mortality rate indicates how many people die each year per 1,000 residents. These rates have been declining for years because life expectancy is increasing. That is, as people live longer lives, fewer die each year. Premature mortality indicates how many people died before reaching the age of 75 years. It is considered the best single indicator of population health status and need for healthcare, and it shows considerably larger differences between regions and income groups. Comparing the results from these two indicators suggests that about 40% of all deaths were premature. Life expectancy is perhaps the most commonly used indicator of population health status—especially in international comparisons. Changes in life expectancy values often seem insignificant, but even small changes in this indicator reflect important changes in population health status. Potential years of life lost adds to these indicators (for those dying before age 75) because it measures how many years before 75 each person died—so the death of a young person adds many more years to this indicator than the death of an older person.

The results also show that the diagnosed prevalence of many diseases and health conditions decreased, including respiratory diseases, ischemic heart disease, osteoporosis, and congestive heart failure. Heart attack and stroke rates also decreased, as did the percent of residents with diabetes who had lower limb amputations. Conversely, the prevalence of diabetes increased over time, as did the prevalence of hypertension (high blood pressure) though only slightly. While this seems like bad news, it may not be: recent research shows that since the mid–1990s, the mortality associated with diabetes has dropped significantly (Lind et al., 2013). This implies that people with diabetes are living longer, which would increase the prevalence value. These increases are likely related to earlier detection and to improvements in healthcare and self–care for people with diabetes. In addition, the rate at which new cases of diabetes and hypertension were being diagnosed (the incidence rates) decreased over time. If these lower incidence rates are sustained or fall even more, then the prevalence values for these diseases will also eventually decrease. Arthritis, the second most prevalent disease after hypertension, was unchanged over time. There was also no substantial change in the diagnosed prevalence of a number of common mental health conditions in the population. These results are summarized in Table E.2.

Table E.2: Changes in Indicators of Diseases and Health Conditions*

Indicators†	2007	2011
Getting Better		
Total Respiratory Morbidity (TRM) Prevalence (all residents)	**10.8%**	**9.54%**
Ischemic Heart Disease (IHD) Prevalence (residents aged 19+)	**8.80%**	**7.92%**
Osteoporosis Prevalence (residents aged 50+)	**12.4%**	**10.4%**
Congestive Heart Failure (CHF) Prevalence (residents aged 40+)	**1.83%**	**1.64%**
Hypertension Incidence (per 100 person–years, aged 19+)	**3.40**	**3.09**
Diabetes Incidence (per 100 person–years, aged 19+)	**0.91**	**0.85**
Ischemic Heart Disease (IHD) Incidence (per 100 person–years, aged 19+)	**0.77**	**0.67**
Acute Myocardial Infarction (AMI) Rate (per 1,000 residents aged 40+)	**4.36**	**4.09**
Stroke Rate (per 1,000 residents aged 40+)	**2.93**	**2.66**
Lower Limb Amputations Among Diabetics (residents aged 19+)	**1.64%**	**1.27%**
No Significant Change		
Mood and Anxiety Disorders Prevalence (residents aged 10+)	23.5%	23.3%
Arthritis Prevalence (residents aged 19+)	21.0%	20.9%
Substance Abuse Prevalence (residents aged 10+)	5.05%	5.04%
Dementia Prevalence (residents aged 55+)	10.6%	10.6%
Getting Worse		
Hypertension Prevalence (residents aged 19+)	**24.8%**	**25.6%**
Diabetes Prevalence (residents aged 19+)	**8.99%**	**10.0%**

* calendar years for AMI and stroke rates; fiscal years for all others

† bolded values indicate that change over time was statistically significant at $p<0.05$

Previous MCHP Atlas reports (Fransoo, Martens, Burland, *The Need To Know* Team, Prior & Burchill, 2009; Martens, Fransoo, *The Need To Know* Team, Burland, Jebamani, Burchill, Black, Dik, MacWilliam, Derksen, Walld, Steinbach & Dahl, 2003) did not show this trend of significant improvement over so many indicators, suggesting that something may have changed. However, the data used in this report cannot identify what the cause(s) of such a change might be; it can only document the trends and raise questions for future research projects.

The Gap Keeps Widening

While most Manitobans got healthier, not all did. The health status of northern residents and those in Winnipeg's inner city did not improve like that of others. Fortunately, their health status did not actually decline, as was seen in MCHP's 2009 Atlas report (Fransoo et al., 2009).

There has always been a strong connection between health and wealth, and the results in this report confirm that this relationship continues. Residents of lower income areas have significantly higher mortality rates and higher prevalence of physical and mental illness. Their results are either not improving over time or are improving at a slower rate than for residents of higher income areas. As a result, the health gap is getting even wider.

The System is Working

In the face of these widening gaps, it is reassuring to know that many parts of the healthcare system seem to be responding to that need. In particular, hospital care is strongly related to health status, as might have been expected given the nature of Canada's healthcare system. So while it remains unfortunate that some groups are in poorer health than others, it is good that they are receiving more healthcare.

Manitobans are Using Less of Some Kinds of Healthcare and More of Others

The findings in this report show decreases in the percent of the population visiting a physician in a given year, in the number of annual visits to physicians, and in all indicators of hospital use except for "day surgery", which continues to increase over time. Rates of use of Personal Care Homes (PCH) also decreased. All of these decreases in health service use may be the result of the improvements in population health status described above, but may also be affected by other factors.

Conversely, there were increases in rates of consultations with specialist physicians, cardiac catheterization, angioplasty with stent insertion, and hip and knee joint replacements. The rate of Magnetic Resonance Imaging (MRI) scans doubled over the five-year period, as they had over the previous five years, indicating a four–fold increase in MRI scan rates in just over a decade.

There is Still Room for Improvement

The rates of use of some services were not strongly related to health status, as might have been expected. Consultations with specialist physicians, adult immunizations, and MRI scan rates were all lower among residents of lower income areas. Similar findings were shown in MCHP's 2009 Atlas report (Fransoo et al., 2009), suggesting that there remains room for improvement in the system in terms of matching services with need. This may require extra efforts to ensure effective service delivery to high–need groups.

What is Missing

The most obvious missing piece in this report, compared to previous reports of this kind, is an analysis of the use of Home Care. The program has expanded over time and provides care to thousands of Manitobans. However, new data systems are being used in the RHAs and individual–level data are not currently reported from all RHAs to Manitoba Health, so they were not available for use in this study. Home care is a key and growing part of the healthcare system, so it is critical that accurate, individual-level information is consistently collected in all RHAs, and reported into a central data system for ongoing management and evaluation of the program.

Conclusions and Recommendations

Manitobans are getting healthier and living longer. Almost every measure of mortality rates decreased, and fewer people are dying before old age. The prevalence of many chronic diseases also decreased, as did the incidence rates of a number of diseases.

Unfortunately, increases were shown in the prevalence of diabetes and hypertension. Increasing prevalence does not always mean only bad news: it can be caused by improvements in care that decrease death rates, and result in more people living with the condition. But no matter how it comes about, higher prevalence means more people in the population with that disease, which can impact the need for healthcare services.

The results also show that not all Manitobans got healthier. Residents of higher income areas showed the largest improvements, while residents of lower income areas had less or no improvement in their health status. As a result, the health gap continues to widen. Stopping or reversing this trend may require new or different approaches, likely involving initiatives outside the healthcare system.

Many healthcare service use rates decreased over time, including physician visits, hospitalizations (except outpatient surgery), and Personal Care Home use —and these decreases may be related to the improvements in population health status discussed above. Conversely, the rates of all high–profile diagnostic and surgical services studied either increased or remained stable over time. Prescription drug use rates also remained stable.

Most indicators in this report show significant variation among and within Manitoba's five RHAs, emphasizing the need to look carefully at the results. This includes an examination of not only the adjusted rates graphed in the body of the report (which make for fair comparisons), but also the crude rates and actual numbers of people and events, which are shown in Appendix 2.

Key Findings by Chapter

Below are the key findings from each chapter in this report (except Chapter 1: Introduction and Methods).

Chapter 2

Manitoba's population increased from 1,180,452 in 2006 to 1,261,261 in 2011, a 6.85% increase. The population also aged: the growth rate among children (0 to 19 years) was 3.61%; among adults (20 to 64) it was 7.74%; and among older adults (65 and older), it was 9.30%. Each region's population structure was also slightly different from the provincial average:

- Southern has a higher percent of children and lower percent of adults and older adults than Manitoba overall.
- Winnipeg has a lower percent of children, a higher percent of adults, and an average percent of older adults.
- Prairie Mountain has slightly lower percent of children and adults and a higher percent of older adults.
- Interlake–Eastern has slightly lower percent of children and adults and a higher percent of older adults.
- Northern has a much higher percent of children, a lower percent of adults, and a much lower percent of older adults than Manitoba overall.

Chapter 3

Mortality rates and population health indicators:

- In Manitoba and most areas within it, total and premature mortality rates (PMR) and potential years of life lost (PYLL) decreased over time, while life expectancy (at birth) increased. These findings imply that the population's health status continues to improve, extending results from the 2009 and 2003 RHA Indicator Atlas reports (Fransoo et al., 2009; Martens et al., 2003).

    - As explained in the text for each indicator, some of these changes were not consistent across regions, age, and sex; therefore the main statistical models showed that some of these changes were not significant. However, alternate models testing just the change in the provincial rate over time confirmed that all of these changes were statistically significant.
- Premature mortality rates were about 40% of total mortality rates, but PMR values had a slightly larger decrease over time. This suggests that the proportion of deaths occurring to residents under age 75 is decreasing over time, which is good news and adds support to other indicators suggesting that overall health status continues to improve in Manitoba.
- However, these results also reveal that the health gap in Manitoba continues to widen over time: most of the improvements in health status were not reflected in the lowest income areas or in the Northern health region. This finding is consistent with and extends the trends found in previous MCHP reports (Brownell, Lix, Ekuma, Derksen, Dehaney, Bond, Fransoo, MacWilliam & Bodnarchuk, 2003; Fransoo et al., 2009; Martens, Brownell, Au, MacWilliam, Prior, Shultz, Guenette, Elliott, Buchan, Anderson, Caetano, Santos & Serwonka, 2010b; Martens et al., 2003). All these reports show that the gap in health status is widening over time, due to improvement in health status among residents in healthy areas and lack of improvement among residents of the least healthy areas.

Causes of death:

- Circulatory diseases (30.2%) and cancer (27.6%) continue to be the most common causes of death for Manitobans, together comprising almost 60% of all deaths.
- However, in terms of premature deaths, cancer (36.4%) was more frequent than circulatory disease (21.9%), meaning that many more premature deaths were attributable to cancer than to circulatory diseases.

Chapter 4

- Overall, the findings reveal that the diagnosed prevalence of most chronic diseases decreased over time. The changes varied in size, and across and within the health regions and income groups.
- The exceptions were hypertension and diabetes, both of which increased in prevalence by about 1% of the population.
    - This represents a large increase for diabetes (from 9.0% to 10.0%), but a relatively small increase for hypertension (from 24.8% to 25.6%).
    - While these increases seem like bad news, they may not be: recent research shows that since the mid–1990s, the mortality associated with diabetes has dropped significantly (Lind et al., 2013). This implies that people with diabetes are living longer, which would increase the prevalence value. These increases are likely related to earlier detection and to improvements in healthcare and self–care for people with diabetes.
    - Interestingly, for both of these conditions, incidence rates decreased over time. If these lower incidence rates are sustained or fall even more, then the prevalence values for these diseases will also eventually decrease.
- These decreases suggest that the health of the population continues to improve over time. Unfortunately, these improvements were not shared by all residents: those living in lower income areas saw less or no improvement in chronic disease indicators.
- The results also show that:
    - the prevalence of arthritis was stable over time at 21%
    - the prevalence of total respiratory morbidity, ischemic heart disease, congestive heart failure, and osteoporosis decreased
    - heart attack and stroke rates also decreased over time, as did lower limb amputations among residents with diabetes
    - the incidence rates for hypertension, diabetes, and heart disease decreased
- All illnesses except osteoporosis were more prevalent among residents of lower income areas, and this pattern held in both urban and rural settings.

  - However, for hypertension, arthritis and osteoporosis, the associations with income were relatively weak in comparison with other diseases.
- Perhaps the most compelling single indicator in this chapter was diabetes incidence (i.e. new cases), which showed much higher rates among residents of the Northern health region and those in the Northern Remote district of Interlake–Eastern. The prevalence of diabetes is already high in these areas, so the results suggest the need for additional attention to address this growing problem. Such efforts may also affect the incidence of hypertension and ischemic heart disease, which were also high in those areas.

Chapter 5

- The findings in this short chapter reveal that the prevalence of mood and anxiety disorders (23.5%), substance abuse (5.3%), and dementia (10.3%) were all stable over time.

Chapter 6

- The proportion of residents visiting a physician at least once in a year decreased slightly, from 80.9% to 79.1%. These values are somewhat lower than those shown in previous reports, partly due to changes in the definition of ambulatory visits.
- The average rate of ambulatory visits (4.43 per person per year) was also slightly lower than in previous reports for this same reason. Moreover, results in this report suggest that visit rates are decreasing slightly over time, though these changes varied by age, sex, and region. Visit rates for Winnipeg and Brandon residents continue to be higher than other areas.
- The age– and sex–specific rates of visits to physicians changed slightly over time, with young children and adults aged 50 and older receiving slightly lower visit rates in 2011/12 than in 2006/07. Rates for other age groups remained stable.
- Ambulatory consultation rates increased, indicating that Manitobans had more access to specialist physicians in 2011/12 than in 2006/07. Winnipeg had the highest rates; this affected the Manitoba average, so rates for most other areas were below average.
- The causes of physician visits remained distributed among many disease categories. The top five causes were the same over time though rankings shifted among them: Respiratory, Circulatory, Musculoskeletal, Mental Illness, and Health Status and Contact.
- There was no change over time in the proportion of Manitobans receiving the majority of their ambulatory care from a single physician.
- The majority of visits to general and family practitioners continue to be provided relatively close to home (i.e., within the person's home district or region), with visits to specialist physicians more often occurring in Winnipeg.
- Rates of physician service use (access, visit rates, consult rates) do not appear to be strongly related to health status at the regional level, though missing data may affect this observation (especially in Northern region).
- There was no consistent relationship between physician service use and area–level income: some services were significantly related to income, but others were not.
- These latter two observations suggest that physician services may not be as responsive to population health status as other services (e.g., hospital use), but the issue of missing data makes it impossible to draw firm conclusions.
- The "completeness" of data for physician services continues to be a concern, particularly among physicians and nurse practitioners working in rural areas; many of them are paid by alternative payment systems (e.g., salary) and may not be completing "shadow billing" claims for all services they provide.
- This issue also affects the prevalence and incidence of diseases, because they also use physician visit data.

Chapter 7

- Most indicators of hospital use rates continue to decrease slowly over time except rates of day surgery, which continue to increase.

- The proportion of area residents admitted to a hospital at least once in a year decreased slightly over time. Rates varied from 5% among Winnipeg residents to 10% for Northern residents. Some portion of this regional difference is likely explained by geographic distances and access to hospitals.
- Most other indicators also showed that hospital use was lower for Winnipeggers than residents of any other region.
- Inpatient hospitalization rates and rates of days used for short and long hospital stays decreased over time, though these changes did not reach statistical significance in the main models. However, this lack of statistical significance was driven by differences in the changes over time by age, sex, and region. Alternate models created for each indicator testing only the change over time at the provincial level confirmed all decreases as statistically significant.
- Most indicators of hospital care were strongly related to population health status, implying that hospital care continues to be responsive to the health needs of local populations. This is reinforced by the consistently strong relationships between hospital use and area–level income.
- Causes of hospitalization were stable over time. The most common groups were digestive disorders, pregnancy and birth, circulatory diseases, health status and contact (including colonoscopies, convalescence and follow–up after surgery, sterilization procedures, and palliative care), and cancer.
  - Childbirth continues to be the most frequent single cause of hospital admission, though the other groupings (e.g., digestive) ranked higher because they comprise many separate diagnoses.
  - The ranking of top causes varied by geographic area (e.g., injuries were more prominent for residents of Northern region).
- Causes of hospital days used showed a distinctly different distribution than hospitalizations because length of stay varies by category. The leading groups were health status and contact (primarily patients awaiting placement in nursing homes, palliative care, and rehabilitation), circulatory diseases (including heart attack and stroke), and mental illness. The rankings were different in the five regions.
- Readmissions to hospital decreased over time from 9.28% to 8.52% of all hospital episodes. The key factors driving readmission rates appeared to be those related to the patient's health status and the setting into which they were discharged (e.g., home, PCH, etc.).
- Patterns of the location of hospitalization for residents of each region were stable over time. For most regions, the majority of hospitalizations of residents were provided within the region.
- Hospital catchment patterns were also stable over time. The majority of hospitalizations provided by each facility were to residents of that region. This included hospitals in Winnipeg, Brandon, and Churchill, though these had different profiles, as these hospitals provide services to residents from other regions and residents from outside Manitoba.

Chapter 8

- Rates of cardiac catheterizations and percutaneous coronary interventions (PCI) increased significantly over time, while coronary artery bypass surgery rates were stable.
- Knee and hip replacement surgery rates continued to increase over time.
- Cataract surgery rates have remained stable, as have rates of dental extraction surgery for young children.
- Computed Tomography (CT) scan rates cannot be compared over time due to incomplete data in previous years. Hopefully, data collection systems can be improved to provide complete individual–level data for all scans performed in Manitoba hospitals.
- The Magnetic Resonance Imaging (MRI) scan rate among adults in Manitoba doubled over the past five years, as it had in the previous Atlas report (Fransoo et al., 2009). This means a quadrupling of rates over the 11–year period. These increases were likely related to the installation of new MRI scanners during those periods.

- For most procedures studied, the results showed that residents of less healthy areas received more healthcare services, though some of these associations were not statistically significant. The exception was MRI scan rates, though the indications for MRI scans may not be correlated with overall health status as measured by PMR.

Chapter 9

- All indicators in this chapter point to a decrease in the rates of use of Personal Care Homes (PCH) in Manitoba, as was also shown in the 2009 Atlas report (Fransoo et al., 2009).
- PCH bed supply per capita was basically stable over time. The exact values decreased slightly (but not significantly) over time because the population 75 years and older increased more than did the number of PCH beds.
- The proportion of the population 75 years and older being admitted to PCH and the proportion living in PCHs both decreased over time. The number of people involved actually increased slightly, but the population 75 and older increased even more, making the rates lower. These decreases may be related to the expansion of Home Care, Supportive Housing and other services.
- Median wait times for admission to PCH directly from hospital increased over time, whereas those for patients being admitted from the community were stable, albeit at higher values.
- There has been a slight increase in the level of care required by patients being admitted to PCH: a higher proportion of residents were admitted at level 3 not requiring close supervision, and a lower proportion at level 2 not requiring close supervision. The proportion of residents admitted at levels 2 and 3 requiring close supervision and level 4 were stable.
- Median lengths of stay (by level of care) in PCH decreased over time, though not for all levels of care.

Chapter 10

- The proportion of Manitobans aged 65 and older receiving pneumococcal immunizations and influenza immunizations decreased over time, though only the latter was a statistically significant decrease. These values suggest that new or additional efforts may be required to get immunization rates increasing again.
- Influenza immunization rates were significantly higher among higher income residents in both urban and rural areas. For pneumococcal immunizations, there was a significant gradient in rural areas, but not in urban areas.
- The two indicators of prescription drug use rates shown in this chapter were both stable over time: pharmaceutical use (the proportion of the population with at least one prescription dispensed) and the number of different types of drugs dispensed per user.
- Pharmaceutical use rates were not significantly related to income, but the number of different types of drugs dispensed was. Residents of lower income areas received more types of drugs, which may be appropriate given their demonstrated higher burden of illness.

Chapter 11

- Results from the quality indicators analyzed provide a mixed picture regarding changes in rates of quality of primary care over time:
  - Good news: A higher proportion of residents with diabetes received an annual eye exam, and a lower proportion of older adults living in PCH received prescriptions for benzodiazepines.
  - Bad news: There was a decrease in antidepressant prescription follow–up care.
  - No change: Rates were stable for asthma care, beta–blocker prescribing after heart attacks, and benzodiazepine use among older adults living in the community.
- Relationships with premature mortality rates and with income were mixed: some indicators showed strong trends, others showed weak trends or no association.
  - For diabetes care and post–AMI care, there were "negative" associations, indicating that residents of lower income areas were less likely to receive quality care.

CHAPTER 1: INTRODUCTION AND METHODS

1.1 Background

This report was produced by the **Manitoba Centre for Health Policy**[1] (**MCHP)** to provide indicators of population health status, healthcare use, and quality of care for all residents of the five recently formed **health regions** in Manitoba. These regions were created in the spring of 2012, through amalgamations of the 11 former **Regional Health Authorities** (**RHAs**). This report includes over 70 indicators covering many aspects of health status and healthcare use. It was intended primarily to assist the regions in preparing their fourth comprehensive Community Health Assessment reports. Other key sources include a number of other MCHP reports, along with data from **Manitoba Health** and **CancerCare Manitoba**.

Many of the indicators in this report update those in previous MCHP reports, most notably the Manitoba RHA Indicators Atlas 2009 (hereinafter referred to as "the 2009 Atlas") (Fransoo et al., 2009). Like that report, this one provides results for two time periods, to allow an assessment of change over time.

The analyses in this kind of report are intended to be primarily descriptive, not explanatory. That is, the report shows *what* the data reveal, not *how* or *why* those results have come about. Answering the latter questions requires information about context, history, and local circumstances, which are not available in **administrative data**.

1.2 The Collaborative Networks Involved

Two collaborative networks were involved in creating this report: ***The Need to Know*** **Team** (**NTK**), and the **Community Health Assessment Network** (**CHAN**). The NTK team was intimately involved in all aspects of this report since its inception, including determining which indicators were included, how they were analyzed and reported, and how they can be used to influence regional health planning and service provision. The NTK team is a collaborative researcher/planner group which includes representatives from all Manitoba health regions, several representatives of Manitoba Health, and staff of MCHP. The NTK team was established in 2001 through a five–year grant from the **Canadian Institutes of Health Research** (**CIHR**) and has continued with support from various sources, including a CIHR–PHAC Applied Public Health Research Chair awarded to Dr. Patricia Martens, Director of the NTK Team and MCHP, and the McDole Professorship awarded to Dr. Randall Fransoo. The team's work is also currently supported by CIHR and Heart and Stroke Foundation funding of the PATHS Equity program of research (PI: P Martens).

The Community Health Assessment Network (CHAN) also includes representation from every health region in Manitoba and from several units within Manitoba Health, along with representatives from other stakeholder groups, including MCHP, CancerCare Manitoba, and others. CHAN confirmed the need for population–based indicators to inform each region's upcoming Community Health Assessment and produced the list of indicators to be included in the CHAN reports (most of the indicators in this report, plus others).

1 Terms in **bold** typeface are defined in the Glossary at the end of this report.

1.3 The Geographical Boundaries Used in This Report

This report provides data at multiple levels. Every indicator provides results for the five new health regions as well as the 11 former Regional Health Authorities (RHAs) in Manitoba, as listed below and shown in Figure 1.3.1. The names used in this report for the new regions are shorthand for their full legal names.

New Region	Former RHAs
Southern	Central and South Eastman
Winnipeg	Winnipeg and Churchill
Prairie Mountain	Assiniboine, Brandon and Parkland
Interlake/Eastern	Interlake and North Eastman
Northern	Burntwood and NOR–MAN

This report also provides information for two levels of geography within each new region. For most indicators, there is a "district–level" graph, showing results for the 70 **districts** into which the rural regions are sub–divided. Each rural region also has a smaller number of planning "**zones**" (groupings of districts), and results for these zones are provided online at MCHP's website as "data extras" of this report: http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html.

Table 1.3.1 lists the districts in each zone of each health region (except Winnipeg, which is shown below). The first letter or two in the label used for each district indicates the zone in which each district belongs. Appendix 1 contains a complete listing of all the towns, municipalities, and **First Nation communities** in each of the districts and zones of the rural regions, plus the **Winnipeg community areas** (**CAs**) and **neighbourhood clusters** (**NCs**). The districts in Northern RHA contain several communities in each, so the district names are highly abbreviated; see Appendix 1 for a full listing.

In most regions, these zones group together adjacent districts into larger planning and management zones. However, in the Northern health region, the zones are used for a different purpose: Zone 1 represents the "Direct Service" communities where the Northern health region is the primary provider of health services to the community. Zone 2 is the "non–direct service" communities, including many First Nation communities where the Northern health region is not the primary provider of health services in the community, although there may be significant utilization of hospital–based services within the region. Zone 3 is comprised of the communities in the Island Lake area—a group of primarily First Nation communities in the south–east corner of the region. Some of the names of the districts in the Northern region are abbreviations for the many communities included in each. See Appendix 1 for a full listing with complete names.

Figure 1.3.1: Map of Manitoba Health Regions and Former Regional Health Authorities

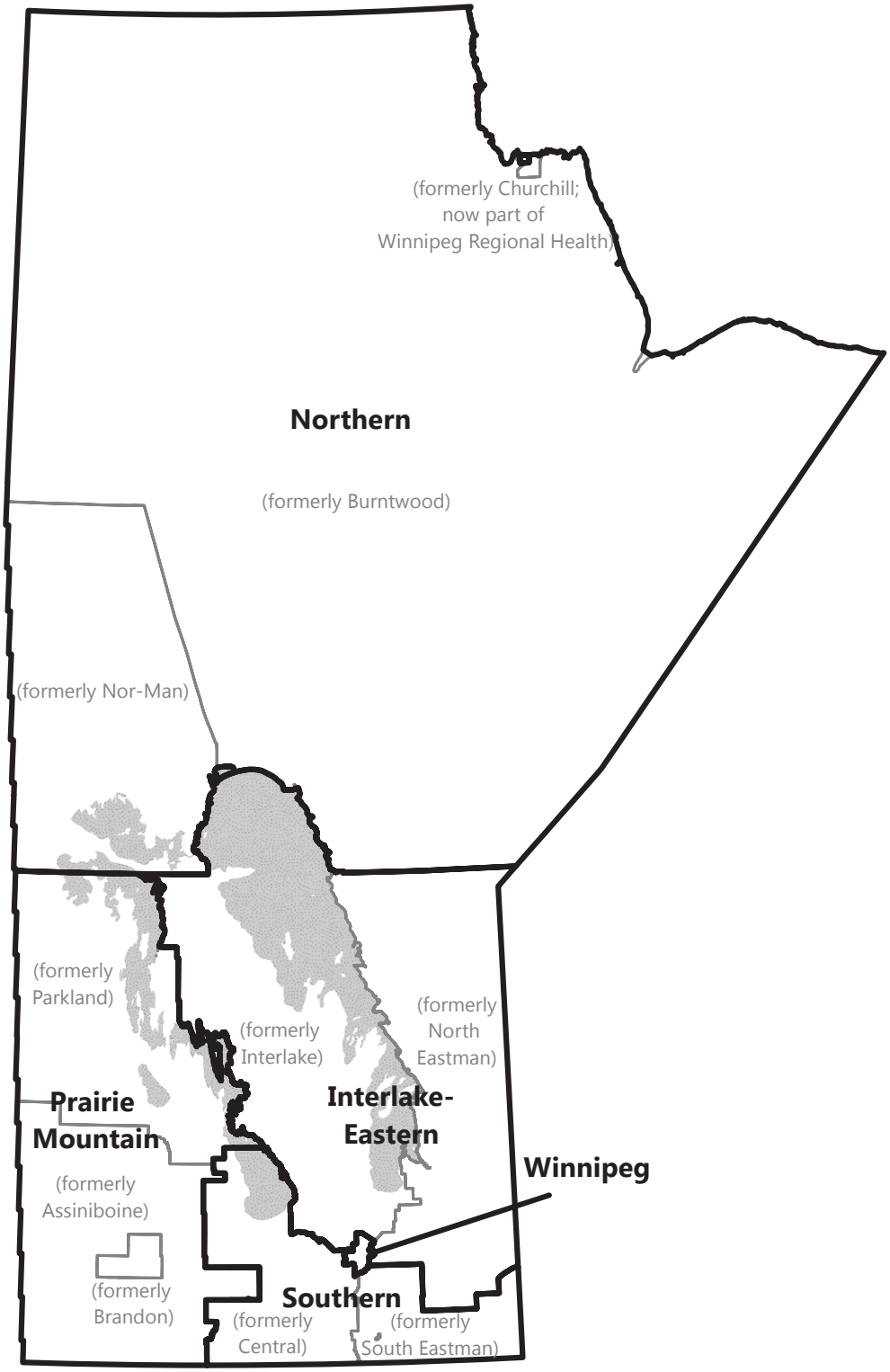


Table 1.3.1: Zones and Districts in Non-Winnipeg Health Regions

Health Region	Zone	District	Graph Label
Southern	North	Seven Regions	N Seven Regions
		MacGregor	N MacGregor
		Rural Portage	N Rural Portage
		Cartier/SFX	N Cartier/SFX
		City of Portage	N City of Portage
	Mid	Notre Dame/St Claude	M Notre Dame/St Claude
		Carman	M Carman
		MacDonald	M MacDonald
		Morris	M Morris
		St. Pierre/DeSalaberry	M St. Pierre/DeSalaberry
		Red River South	M Red River South
	West	Lorne/Louise/Pembina	W Lorne/Louise/Pembina
		Stanley	W Stanley
		Altona	W Altona
		Morden	W Morden
		Winkler	W Winkler
		Roland/Thompson	W Roland/Thompson
	East	Niverville/Richot	E Niverville/Richot
		Tache	E Tache
		Ste Anne/LaBroquerie	E Ste Anne/LaBroquerie
		Steinbach	E Steinbach
		Hanover	E Hanover
		Rural East	E Rural East
Prairie Mountain	North	Duck Mountain	N Duck Mountain
		Porcupine Mountain	N Porcupine Mountain
		Riding Mountain	N Riding Mountain
		Agassiz Mountain	N Agassiz Mountain
		Dauphin	N Dauphin
		Swan River	N Swan River
	Brandon	Bdn West End	Bdn West End
		Bdn North Hill	Bdn North Hill
		Bdn Downtown	Bdn Downtown
		Bdn South End	Bdn South End
		Bdn East End	Bdn East End
	South	South Asessippi	S Asessippi
		Little Saskatchewan	S Little Saskatchewan
		Turtle Mountain	S Turtle Mountain
		Souris River	S Souris River
		Whitemud	S Whitemud
		Spruce Woods	S Spruce Woods
Interlake-Eastern	Selkirk	Selkirk	Selkirk
	South	Stonewall/Teulon	S Stonewall/Teulon
		Wpg Beach/St. Andrews	S Wpg Beach/St. Andrews
		St. Clements	S St. Clements
		Springfield	S Springfield
	East	Beausejour	E Beausejour
		Pinawa/LDB	E Pinawa/LDB
		Whiteshell	E Whiteshell
	West	Gimli	W Gimli
		Arborg/Riverton	W Arborg/Riverton
		St. Laurent	W St. Laurent
	North	Powerview/PF	N Powerview/PF
		Fisher/Peguis	N Fisher/Peguis
		Eriksdale/Ashern	N Eriksdale/Ashern
	Northern Remote	Northern Remote	Northern Remote
Northern	Zone 1	The Pas/OCN,Kels	Z1 The Pas/OCN,Kelsey
		Flin,Snow,Cran,Sher	Z1 Flin,Snow,Cran,Sher
		LL/MC,LR,O-P(SIL),PN(GVL)	Z1 LL/MC,LR,O-P(SIL),PN(GVL)
		Thompson,Myst Lake	Z1 Thompson,Mystery Lake
		Bay Line	Z1 Bay Line
		Gillam,Fox Lake CN	Z1 Gillam,Fox Lake CN
	Zone 2	GR/Mis,ML/Mos,Eas/Che	Z2 GR/Mis,ML/Mos,Eas/Che
		Puk/Mat Col CN	Z2 Puk/MatCol CN
		SayD(TL),Bro/BL,NoL(Lac)	Z2 SayD(TL),Bro/BL,NoL(Lac)
		Nelson House/NCN	Z2 Nelson House/NCN
		Sham,York FN,Tat(SPL)	Z2 Sham,York FN,Tat(SPL)
		Bu(OH),MS(GR),GLN/GLFN	Z2 Bu(OH),MS(GR),GLN/GLFN
		Cross Lake/Pimi CN	Z2 Cross Lake/Pimi CN
		Norway House/NH CN	Z2 Norway House/NHCN
	Zone 3	Island Lake	Z3 Island Lake

Maps of each of the new regions, showing district and zone boundaries, are shown in Figures 1.3.2—1.3.6.

Results for the Winnipeg region are also provided at two levels. Graphs in this report show the 25 Neighbourhood Clusters (NCs), and the data files available online provide results for the 12 Community Areas that the NCs fit into. For both levels, results for Churchill are provided as well, since that former RHA is now an operating division of the Winnipeg region.

Figure 1.3.6 shows the 25 NCs, along with the boundaries (bold lines) of the 12 CAs into which they fit.

The results for all indicators at all levels (i.e., district, zone, and region) are available on the MCHP website, where the data are posted for viewing or downloading in spreadsheet form (Microsoft Office Excel files).

Finally, for most indicators, we also provide results by socioeconomic status. For each indicator, the tables in Appendix 2 include results by area–level income quintile groups, separately calculated for Urban (Winnipeg and Brandon) and Rural (all other) areas. Appendix 2 also includes maps which show these **income quintile** areas. In most cases, the district–level results actually provide more detailed data, so both sets of values should be used when considering variations/inequalities. Comparable income quintile information is not available for residents of **personal care homes** (**PCHs**).

Figure 1.3.2: Map of Southern Health/Santé Sud Region, Showing Zones and Districts

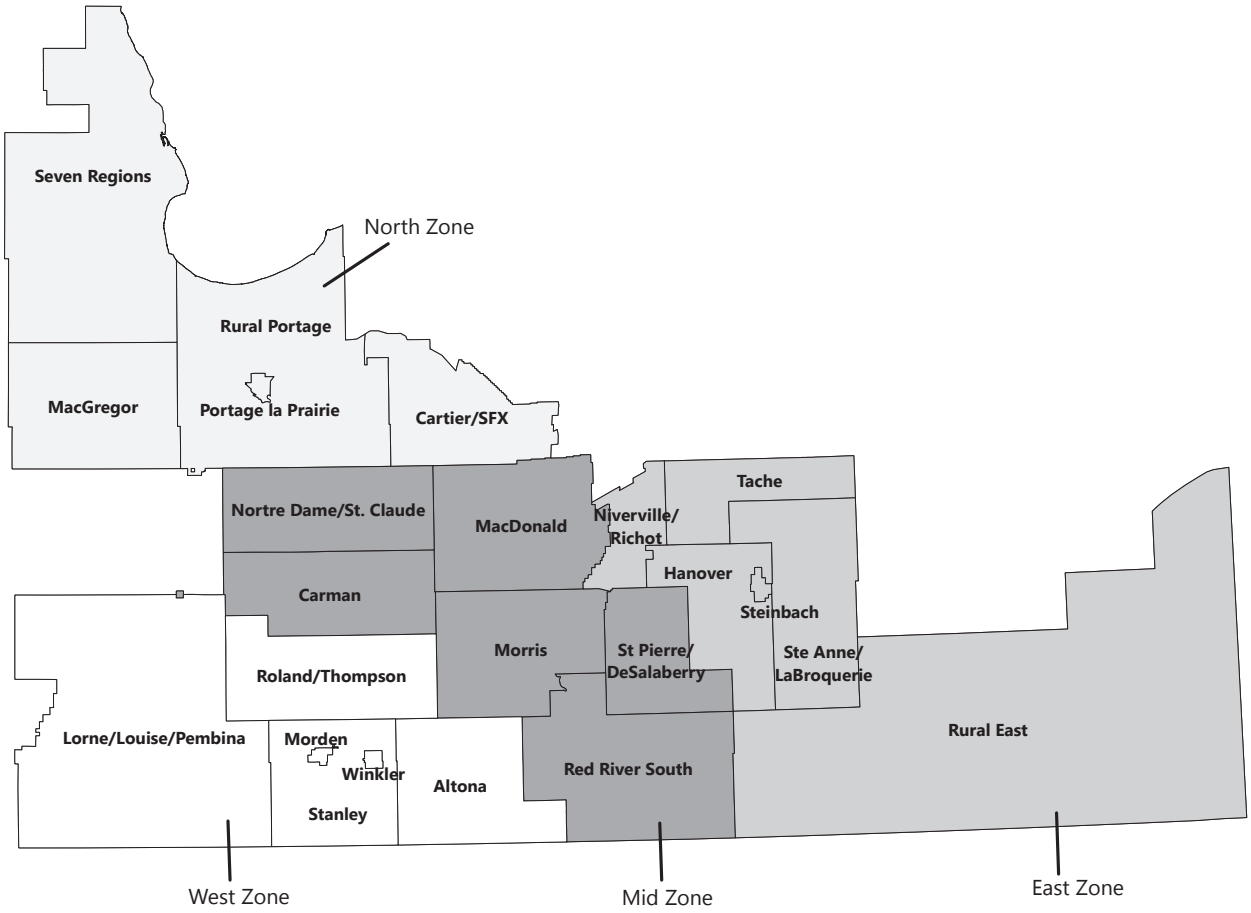


Figure 1.3.3: Map of Prairie Mountain Health Region, Showing Zones and Districts

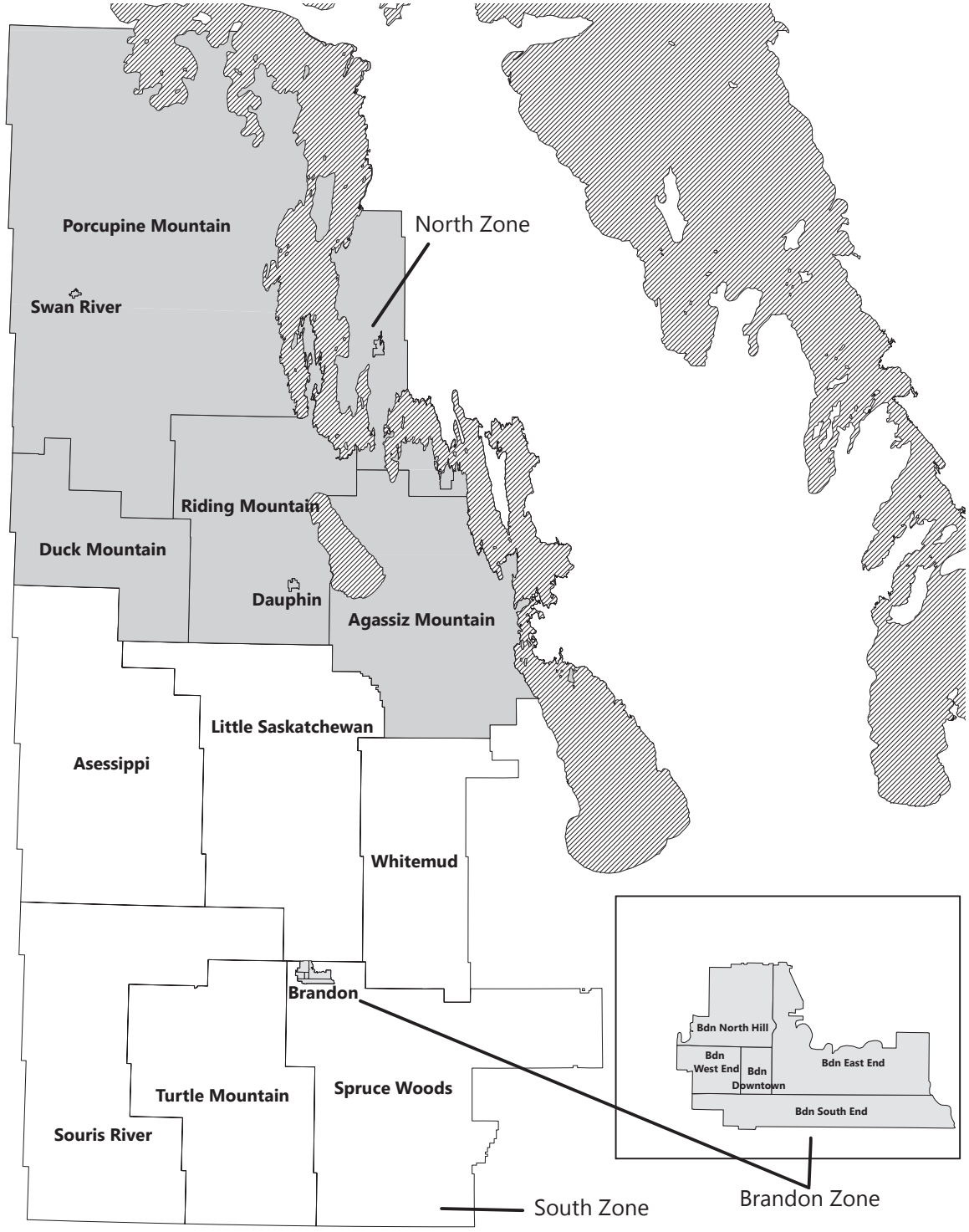


Figure 1.3.4: Map of Interlake-Eastern Health Region, Showing Zones and Districts

Figure 1.3.5: Map of Northern Health Region, Showing Zones and Districts

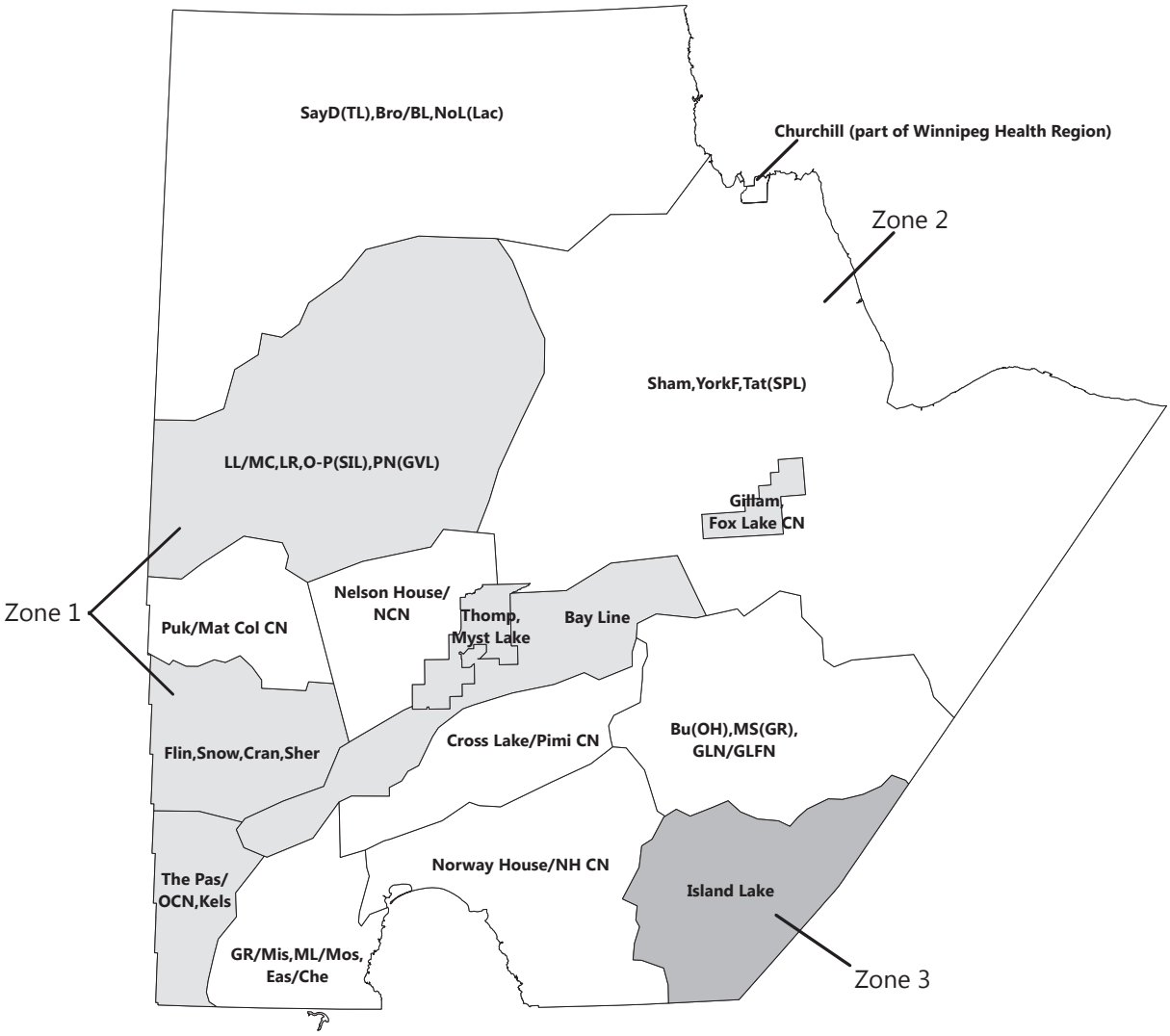
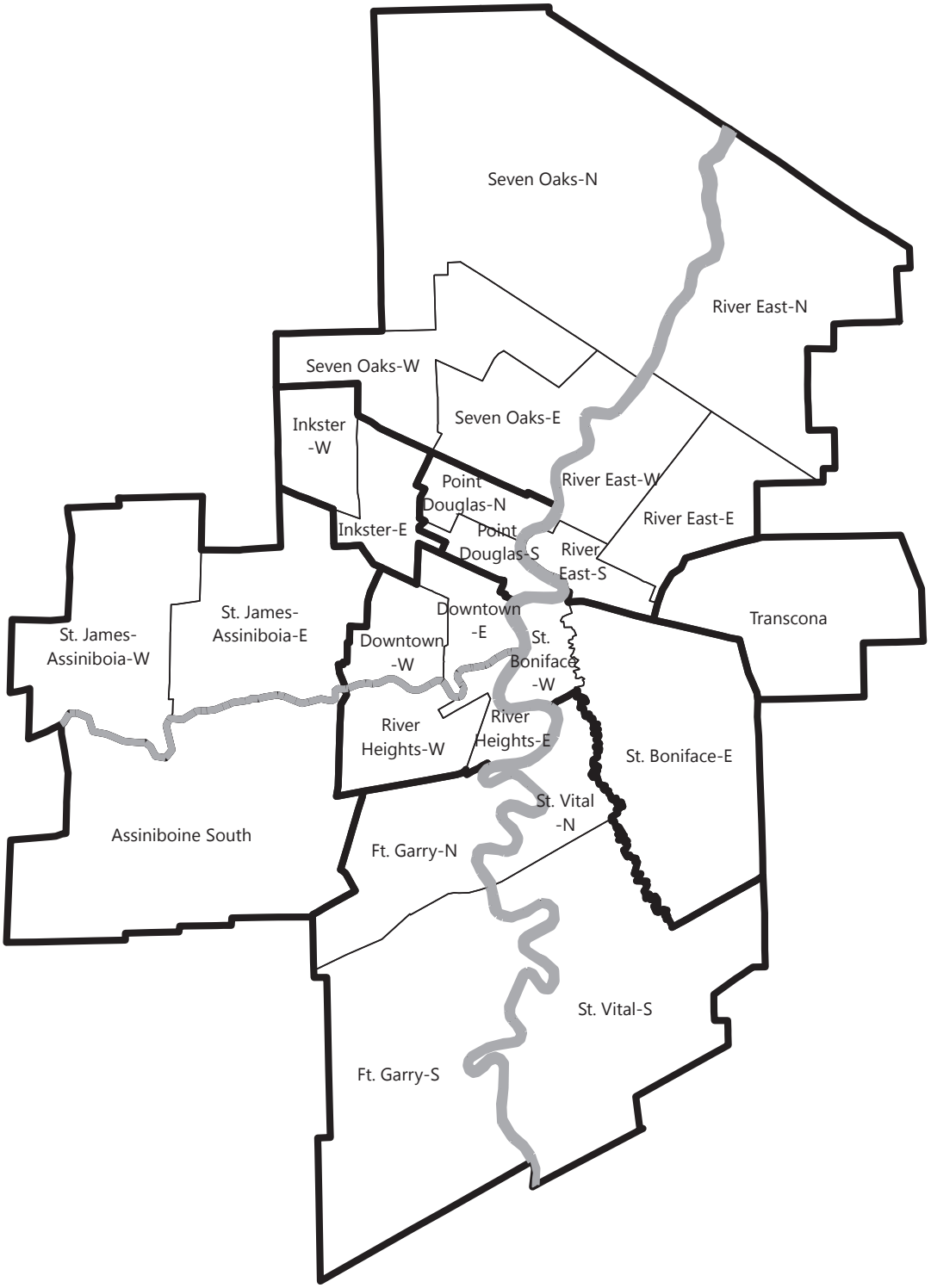


Figure 1.3.6: Map of Winnipeg Health Region* With Community Areas and Neighbourhood Clusters



* Churchill is also part of the Winnipeg Health Region (not shown in this map)

1.4 What's in This Report?

The purpose of this report is to provide data for regional and provincial planners and decision–makers. The following areas are covered:

- Introduction and methods (Chapter 1)
- Demographics (Chapter 2)
- Population health status and mortality (Chapter 3)
- Physical illness (Chapter 4)
- Mental illness (Chapter 5)
- Use of physician services (Chapter 6)
- Use of hospital services (Chapter 7)
- Surgical and diagnostic services (Chapter 8)
- Use of Personal Care Homes (Nursing Homes) (Chapter 9)
- Use of pharmaceutical, preventive, and other services (Chapter 10)
- Quality of primary care (Chapter 11)

1.5 The Indicators—Key Concepts

Most indicators in this report were calculated using a population–based approach. This means that the rates or the **prevalence** shown are based upon virtually every person living in Manitoba.[2] Furthermore, the indicators in this report reflect where people live, not where they received services. For example, a person living in a remote area may be hospitalized in Winnipeg, but the hospitalization is attributed back to the rate for the remote area. Thus, the results offer insight into the complete health and healthcare use patterns of the population living in the area, no matter where they receive their care. Selected indicators also show the distribution of locations of service provision, in order to allow insight regarding patient travel patterns.

Residents of some areas receive some of their health services in **nursing stations** operated by the Federal government or through transfer agreements. Not all of the services provided in these settings are recorded in the provincial data files used in our analyses. Services provided by physicians should be recorded, but those provided by nursing staff are not. The exception is data on Immunizations, which are entered into the **Manitoba Immunization Monitoring System** (**MIMS**). Therefore, service use rates shown in this report may under–estimate the total level of service provision to some residents. This issue is most important in the Northern region, but also affects other regions to some extent.

Since age and sex are often key determinants of health status and health service use, most results shown are **adjusted rates** estimated from statistical models which control for age and sex differences among areas. This allows fair comparison of health status and health service use across areas that have different population compositions (as described in Chapter 2). The actual number of people or events observed, along with corresponding **crude rates** (the number of events divided by the population) are provided in Appendix 2.

2 Excludes persons in Federal penitentiaries, and personnel of the Canadian Armed Forces and Royal Canadian Mounted Police. Together these comprise less than 2% of the population.

1.6 The Graphs: Order of Regions and Sub–Areas

In this report, the health regions and their sub–areas are shown in a particular order, which is consistent throughout the report and similar to other MCHP reports. This order is based on the overall health status of the population of each area as measured by the **premature mortality rate**. A death before the age of 75 years is considered premature, so the premature mortality rate (PMR) reflects how many residents of that area died before reaching the age of 75 (per 1,000 area residents under 75). Because some districts have small populations, ten years of data (2001–2010) were used to ensure reliable estimates. Like most other indicators in this report, the PMR data were adjusted to account for the age and sex composition of each area's population.

The premature mortality rate is considered the best single indicator of the overall health status of a region's population and need for healthcare (Carstairs & Morris, 1991; Eyles & Birch, 1993; Eyles, Birch, Chambers, Hurley, & Hutchison, 1991). PMR is correlated with morbidity and with self–rated health, as well as with socioeconomic indicators (Martens, Frohlich, Carriere, Derksen, & Brownell, 2002a). Populations having a high PMR are presumed to need more healthcare services than healthier populations.

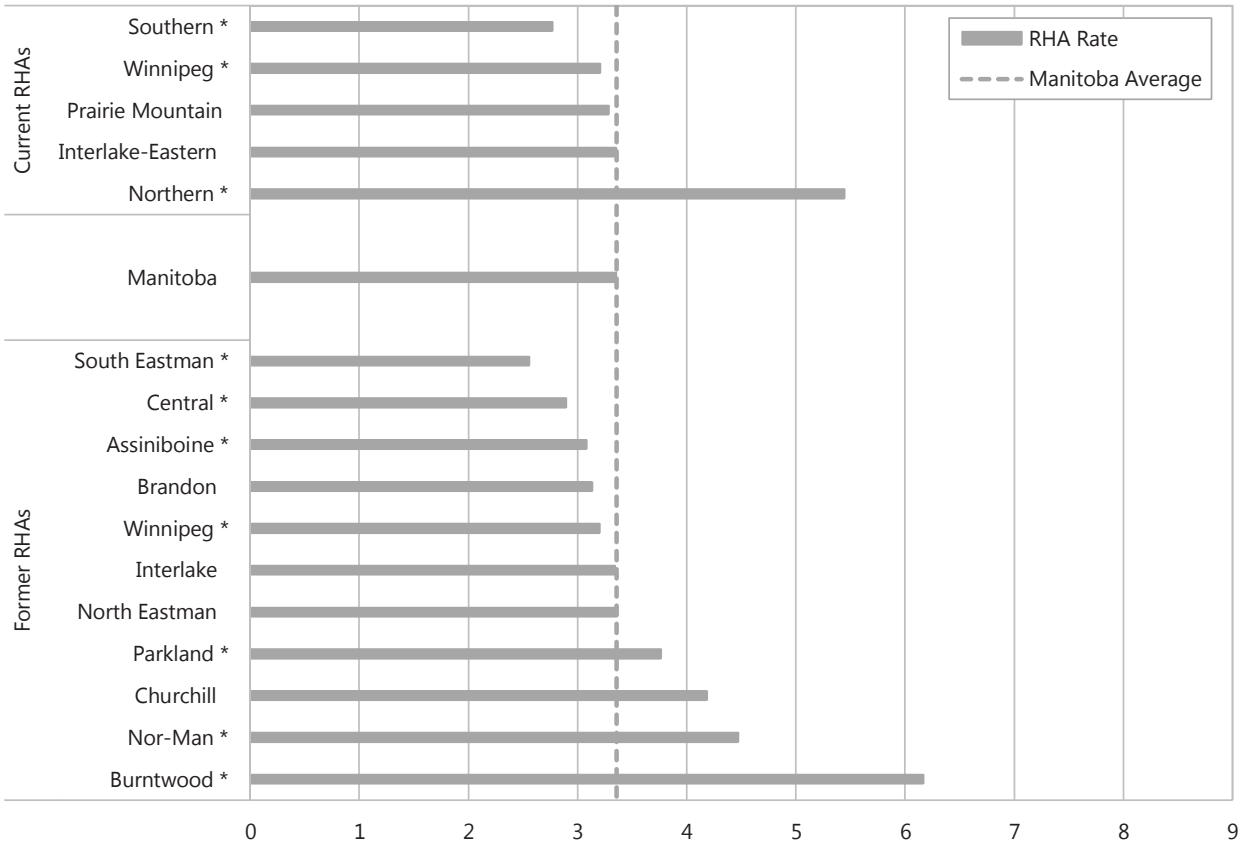
PMR values for the regions are shown in Figure 1.6.1, the districts in Figure 1.6.2, and the Winnipeg NCs in Figure 1.6.3. In Figure 1.6.1, the region with the lowest PMR (that is, the best overall health status) is shown at the top of the graph (Southern), and the other regions follow in order of increasing PMR ending with Northern, which has the highest PMR (poorest overall health status). Below that is the overall average for Manitoba, and dashed lines are drawn vertically to allow easy comparison of the provincial average to each area's rate for each time period. Results for the 11 former RHAs, also ranked by PMR, are shown below the Manitoba average.

In the district–level graphs, the same order of the new regions is maintained, and the districts within each region are ordered according to PMR. That is, within each region, the district with the lowest PMR (the best overall health status) is listed first, with the others listed below it in order of increasing PMR. Results for the zones within each region are provided in the Excel files available on the MCHP website.

For the Winnipeg sub–areas, a similar process was used: the 25 NCs are ranked by PMR within their CAs, as shown in Figure 1.6.3.

Figure 1.6.1: Premature Mortality Rate by RHA, 2001–2010

Age- and sex-adjusted average annual rate of death before age 75 per 1,000 residents under age 75



* indicates area's rate was statistically different from Manitoba average

s indicates data suppressed due to small numbers

Figure 1.6.2: Premature Mortality Rate by District, 2001–2010

Age- and sex-adjusted average annual rate of death before age 75 per 1,000 residents under age 75

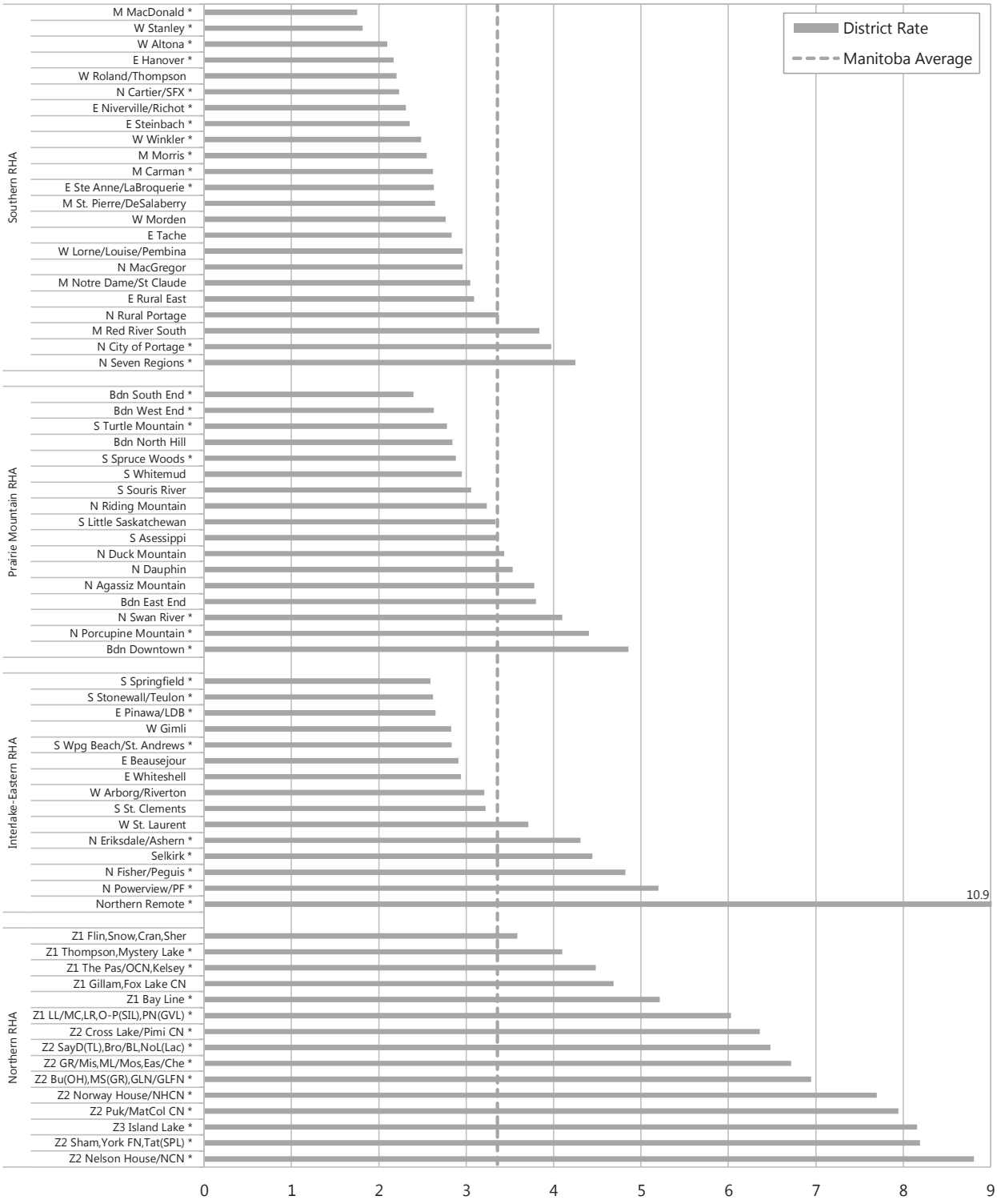
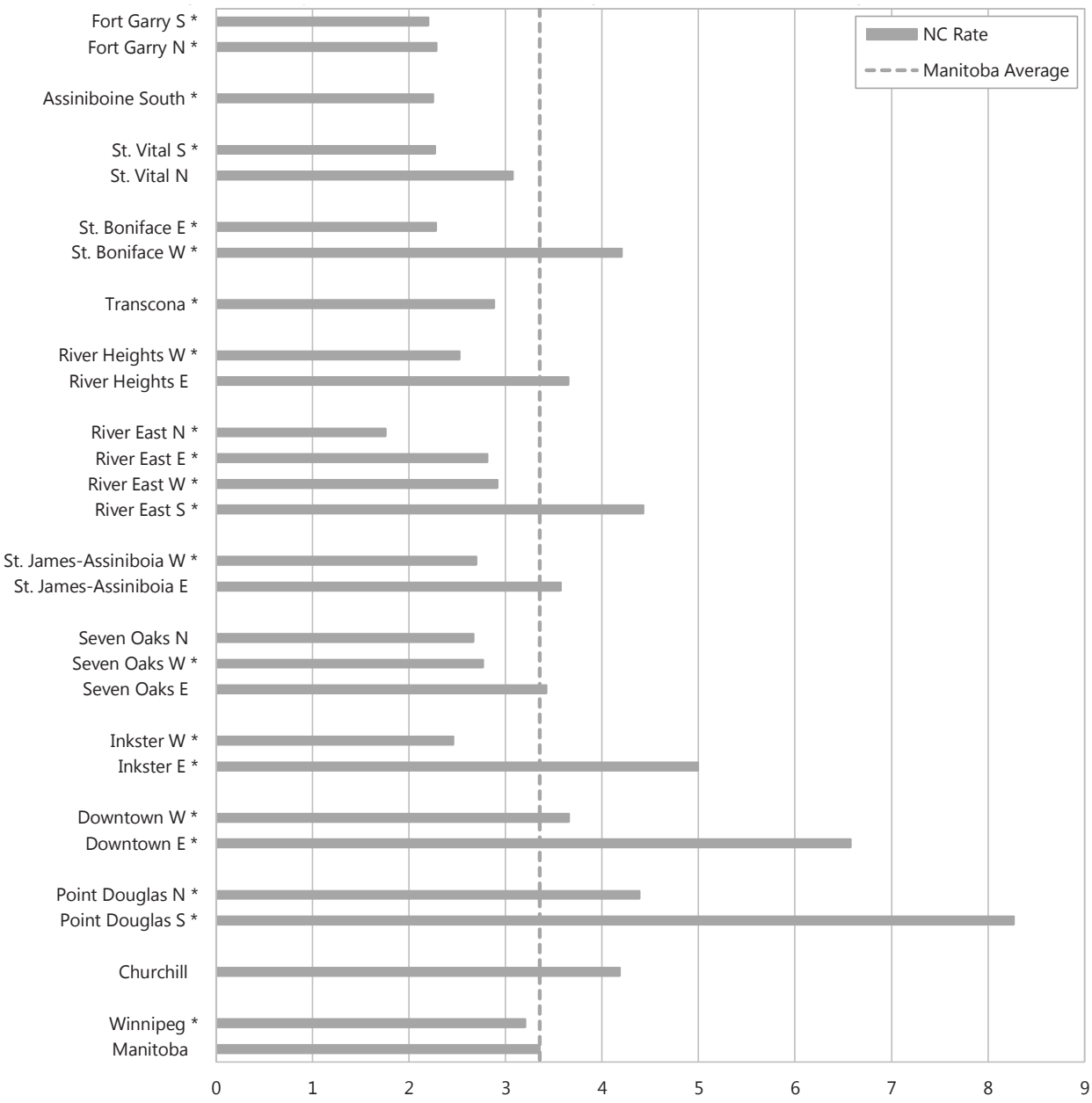


Figure 1.6.3: Premature Mortality Rate by Winnipeg NC, 2001–2010

Age- and sex-adjusted annual rate of death before age 75 per 1,000 residents under age 75



1.7 Data Sources and Years of Data Used

The data used for this report are housed at the Manitoba Centre for Health Policy (MCHP), which maintains the **Population Health Research Data Repository ("the Repository")**. Most of the data in the Repository are derived from administrative records: data which were collected in order to administer health and social services. Data are sent to MCHP from Manitoba Health only after identifying information (names, addresses) have been removed and **personal health information numbers (PHIN)** are scrambled. The Repository includes information of key interest to health planners, such as mortality and birth information, physician and hospital use, pharmaceutical use, and use of personal care homes (nursing homes). As well, area–level information from public–use 2006 Census data[3], like average household income for a geographical area, is used to provide insight into the influence of socioeconomic factors on health and healthcare use. These results are calculated separately for Urban (Winnipeg and Brandon) and Rural (all other) areas and are shown in the tables in Appendix 2.

The following data were used in various analyses for this report:

- Canadian Census
- **Drug Program Information Network (DPIN)**
- **Hospital Discharge Abstracts**
- **Long Term Care Utilization History**
- **Manitoba Health Insurance Registry**
- **Immunization** (collected by Manitoba Immunization Monitoring System (MIMS))
- **Medical Services**
- **Provider Registry**
- **Vital Statistics Mortality Registry**

All indicators in this report using Repository data are provided for two time periods (2006/07 and 2011/12) in order to allow for some assessment of change over time, as was done in previous Atlas reports (Fransoo et al., 2009; Martens et al., 2003). This series of reports thus provides a moving window of observation, each of which incorporates two time periods. For each reporting period, providing the most recent data available were the priority, with additional (prior) years being added as needed to provide statistically reliable results. Therefore, indicators of the most frequent events/outcomes show results for single years, while less common events require between two and five years of data to be aggregated to avoid **data suppression** and provide statistically reliable results.

In the hospital abstract data system, the ICD–10–CA (**International Classification of Diseases**) system was used for coding diseases, and the **Canadian Classification of Interventions** (**CCI**) **system** was used for procedures. Records in the medical claims data (for **physician visits**) remain in the ICD–9–CM system.

1.8 Differences from 2009 RHA Indicators Atlas

Many of the indicators in this report use multiple years of data in each time period, as explained previously. For most, there is a large degree of overlap between the first time period used in this report and the second time period used in the 2009 report (Fransoo et al., 2009). For example, most of the indicators using five years of data in this report included 2002/03–2006/07 as the first time period, while the second five–year period in the 2009 report was 2001/02–2005/06. Because four of the five years are the same, it is reasonable to expect similar results for these periods in the two reports (for indicators that have not had revisions made to their definition/calculation). However, a few larger than expected differences have been found (e.g., **total mortality rates**: the values shown here are slightly higher than those shown in the 2009 Atlas). These differences are the consequence of ongoing data quality improvements at MCHP, through which revisions are continually being made to the data system. As a result, the values shown in this report are more accurate than those in previous reports.

3 Data from the 2011 National Household Survey (which replaced the long–form Census) were not available at the time this report was prepared. However, even if they had been available, they would not have been used because the sample is not representative of the population (due to the sampling methodology no longer being random).

1.9 Rates and Prevalence, Adjusted Rates, and Statistical Analyses

Rates and Prevalence

Prevalence refers to the proportion of the population that has a certain condition over a specified period of time (period prevalence). It is an indication of how common the condition is and, therefore, has implications for the provision of services. Most indicators in this report use the concept of period prevalence, over a one–year, three–year, or five–year period.

In contrast, a rate refers to a change in state over time and is used to express the frequency of events during a given period. Many health–related events can happen to a given person more than once. For example, the physician visit rate shows how often residents visit physicians each year. Where an indicator covers a period longer than one year, the rate is annualized—that is, given as an annual average.

The administrative data used for this report do not directly indicate who "gets" or "has" diseases, but do record who gets "treated" for which diseases (i.e., visits a physician, gets prescribed certain drugs, or is hospitalized and gets the appropriate codes). When we report the prevalence of a disease, we are reporting the proportion of the population who were "treated" for that disease in the period (though different diseases/indicators have different case definitions—see each indicator for its definition). In other reports, including previous MCHP reports, indicators like this are sometimes referred to as "Treatment Prevalence" values because they are derived from records of healthcare treatment.

Many of the indicators in this report use data from physician claims. The majority of these claims are generated by **fee–for–service** physicians, though a growing proportion are "**shadow billing**" claims generated by physicians covered under alternate payment methods (e.g., salary). Shadow billing claims may not be 100% complete, so some indicators may under–report actual values. Furthermore, in some northern and remote areas, residents are served by nurses (e.g., in nursing stations), and these encounters are not included in physician claims data. Also, rates for Churchill can vary substantially over time, some of which is due to irregularity in reporting of physician services, in combination with the small population.

Adjusted Rates

Most of the indicators are labeled as "age–and sex–adjusted" rates because the results have been statistically adjusted to account for the different age and sex composition of the populations living in different areas. This adjustment allows for fair comparisons among areas with different population characteristics (described in Chapter 2). Adjusted rates show what that area's rate would have been if the area's population had the same age and sex composition as the Manitoba population. For example, adjusted rates are almost always higher than the crude rates for residents of Northern because this region has a relatively young population. For most of the analyses, these rates were produced using **generalized linear models** (**GLMs**) (see "Statistical Analyses").

Appendix 2 contains tables listing the crude rates/prevalence values and the actual numbers of events observed for each indicator by region and Winnipeg NC. This type of information is helpful in giving a more practical view of the possible burden on the healthcare system (e.g., actual number of residents diagnosed with a given condition.)

Age Calculations

For most indicators in this report, age is calculated as of December 31 of each study year for both the numerator and the denominator. Exceptions include when there are more years of study in the numerator than in the denominator, such as **diabetes** prevalence, in which case age is calculated as of December 31 of the denominator year. Other exceptions include cohort analyses, where age is calculated as of the start of follow–up or at the time of an event.

Statistical Analyses

Most of the analyses for this report were done using a generalized linear modeling approach, incorporating interaction terms and a quadratic age term. Parameters in the model included age, sex, and area of residence (or income quintile). Because we were modeling rates not events, we used the logarithm of the population as an offset in the model. As noted above, Churchill is included as both a CA and an NC in the analyses, so that its results could be shown along with the other Winnipeg areas.

One model provided rates for the four non–Winnipeg regions and the 13 Winnipeg CAs, a second model provided rates for the 70 non–Winnipeg districts and the 26 Winnipeg NCs, and a third model provided rates for the five new regions. As a result, there are instances in which inconsistencies arise between models; for example, the average rate for the new Winnipeg RHA (which combines Winnipeg and Churchill) is slightly higher or slightly lower than those for both former RHAs (typically by less than 0.05%).

Even though most of the analyses in this report include the entire Manitoba population, we use statistical significance tests to indicate how much confidence to put in the rates. If a difference is "statistically significant" (e.g., **p–value** below 0.05), then this difference is large enough that we are confident it is not just due to chance. So we would expect to see the rate remain different from the provincial average from year to year, unless some change is implemented.

It is important to not over–interpret the importance of small differences, especially those that are not statistically significant. When you see a difference that is not statistically significant (whether the difference is small or large), the rate should be considered similar to the provincial average, since it could fluctuate from year to year. This is usually due to the rate being based on small numbers: either a small number of events, a small underlying population, or both. For RHA– and CA–level comparisons, we used the 99% **confidence interval**; and for district– and NC–level comparisons, we used the 99.5% confidence interval. These were chosen to balance the need for control of **type I errors** (which increase when performing multiple comparisons) without adhering to a strict **Bonferroni method** correction, which would have required differences to be much larger before being labeled as statistically significant.

In most figures, the results from both time periods are shown: the most recent period in black bars, and the previous period in grey bars. Each area's name can be followed by a set of parentheses that can include any combination the indicators "1", "2", "t", or "s", which indicate:

- a "1" indicates that in the first time period, the area's rate was statistically different from the Manitoba average at that time (grey dashed line)
- a "2" indicates that in the second time period, the area's rate was statistically different from the Manitoba average at that time (black dashed line)
- a "t" indicates, for that area, the change in rates from time 1 to time 2 was significant
- an "s" indicates that the results were suppressed to ensure confidentiality

MCHP's confidentiality policy requires that whenever the number of events or persons involved is five or fewer, the results are not shown. However, this excludes a true "0", as the non–occurrence of events can be shown without compromising confidentiality. Therefore, some graphs might seem to be missing a bar, but if there is no "s" beside the area's name, this reflects the fact that zero events occurred.

"Default" Conventions for Analyses

The values provided for most indicators were calculated by generalized linear models, which accounted for the different age and sex distribution of residents of different areas (and sometimes other factors, including the time period and an age–squared term to capture non–linear effects). Therefore, the values can be compared fairly across areas with different population compositions. The reference group for all estimates is the Manitoba population in the first time period. Therefore, in time period 1, each area's rate is age and sex adjusted to the Manitoba population and the provincial averages are the same as the "crude" (i.e., unadjusted) rates. In time period 2, all rates (including the provincial averages) are adjusted to the population in the first time period. As a result, changes in rates over time are not attributable to changes in population characteristics (e.g., aging).

Age was calculated as of December 31 of each year. People were assigned to an area of residence based on the first record in the file being analyzed. People registered with the Office of the **Public Trustee** ("Wards" of the province) were assigned to a separate group because their actual area of residence is not known. Results for this group are provided in the Excel files available online.

Results by Income Quintile

The Appendix 2 tables also show results by rural and urban income quintiles. These results are discussed in the Key Findings section for each indicator in the report. Urban areas are Winnipeg and Brandon, while rural areas are all other parts of Manitoba. Within each, the population was divided into five groups of approximately equal population, according to the average household income of the small area (Dissemination Area) they lived in. Income values were taken from public use files from the 2006 Canadian Census, the most recent data available. These rates are age– and sex–adjusted to account for the different demographic profile of these groups (e.g., residents of the lowest income areas are younger than residents of the highest income areas). For each set of areas, in each time period, the relationship between income and the indicator shown were statistically tested using a linear trend test. The results of these tests are cited directly below the results table by income quintiles, along with a test to determine whether the linear trend changed significantly over time. The results shown are "p" values; those below 0.05 indicate statistically significant relationships and are shown in bold font.

All data management, programming and analyses were performed on MCHP's secure server, using SAS® version 9.3 software.

1.10 Putting Evidence into Action

There is a wealth of information in this report. *The Need to Know* Team hopes that it will be useful to regional and provincial planners and decision–makers in Manitoba, as well as other planners and researchers across Canada and elsewhere. The information can be used in many ways. A region can obtain an overview of the population it is serving, the proportion of the region's population having various diseases or events, the use of healthcare services, and the quality of care being provided.

Regions can "cross–compare" their information with other regions (new and old) and their own districts. Furthermore, regional planners will ask many questions about the context of their profiles: How do the data add to the knowledge that planners have about their region and its services? What factors caused these results to come about? What can or should be done?

We hope that this information will be a useful tool in the effort to improve the health of the entire population of Manitoba. An electronic version of this report and all Excel files for the graphs in this report ("data extras") are available on the website of the Manitoba Centre for Health Policy (website listed below), under Reports.

The MCHP website address for research reports is: http://umanitoba.ca/faculties/medicine/units/community_health_sciences/departmental_units/mchp/research.html

CHAPTER 2: DEMOGRAPHICS

Key Findings in Chapter 2

Manitoba's population increased from 1,180,452 in 2006 to 1,261,261 in 2011, a 6.85% increase. The population also aged: the growth rate among children (0 to 19 years) was 3.61%; among adults (20 to 64) it was 7.74%; and among older adults (65 and older), it was 9.30%. Each region's population structure was also slightly different from the provincial average:

- Southern has a higher percent of children and lower percent of adults and older adults than Manitoba overall.
- Winnipeg has a lower percent of children, a higher percent of adults, and an average percent of older adults.
- Prairie Mountain has slightly lower percent of children and adults and a higher percent of older adults.
- Interlake–Eastern has slightly lower percent of children and adults and a higher percent of older adults.
- Northern has a much higher percent of children, a lower percent of adults, and a much lower percent of older adults than Manitoba overall.

Introduction

This chapter describes the age and sex composition of the population of each health region, along with several indicators of socioeconomic status/deprivation. Because of their nature, the indicators in this chapter were not calculated for the urban and rural income quintiles.

For the demographic information, two **population pyramids** are shown for each region: the first shows a percent distribution, comparing each region to the Manitoba population as of December 31, 2011; and the second shows the change in actual numbers over time in each region (December 31, 2006 versus December 31, 2011). Areas with young populations have a triangular shape, reflecting the presence of many young residents and few elderly, whereas areas with older populations have more rectangular (vertical) shapes.

Manitoba's population grew substantially over time from 1,180,452 on December 31, 2006 to 1,261,261 on December 31, 2011. This increase of 80,809 residents represents a growth of 6.85%, much larger than the 2.03% seen in the previous five years (Fransoo et al., 2009). The population of every region increased, though the growth varied considerably by region: Southern by 10.18%, Winnipeg by 7.47%, Northern by 5.11%, Interlake–Eastern by 4.43%, and Prairie Mountain by 3.48%.

Manitoba's population is also aging. There was more growth among adult age groups than among children from 2006 to 2011: the 0 to 19 year old group grew by 3.61%, the 20 to 64 year old group by 7.74%, and the 65 and older group by 9.30%.

Manitoba's health regions vary widely in terms of demographic profiles. Northern RHA has the youngest population, whereas Prairie Mountain has the oldest population. These differences have important implications for health and health service use, which is why most indicators in this report show age and sex "adjusted" rates (see Chapter 1). This adjustment allows results to be validly compared across areas, ensuring that any differences shown were not determined by differences in age/sex distributions of local populations.

Below is a summary of the demographic profile for each region in 2011, comparing the percent of the population who are children (0 to 19), adults (20 to 64), or adults 65 and older to the corresponding percent for Manitoba overall. These are based on the values shown in Table 2.0 and graphed in Figure 2.0.

- Southern has a higher proportion of children and lower proportions of adults and older adults than Manitoba overall.
- Winnipeg has a lower proportion of children, a higher proportion of adults, and an average proportion of older adults.
- Prairie Mountain has slightly lower proportions of children and adults and a higher proportion of older adults.
- Interlake–Eastern has slightly lower proportions of children and adults and a higher proportion of older adults.
- Northern has a much higher proportion of children, a lower proportion of adults, and a much lower proportion of older adults than Manitoba overall.

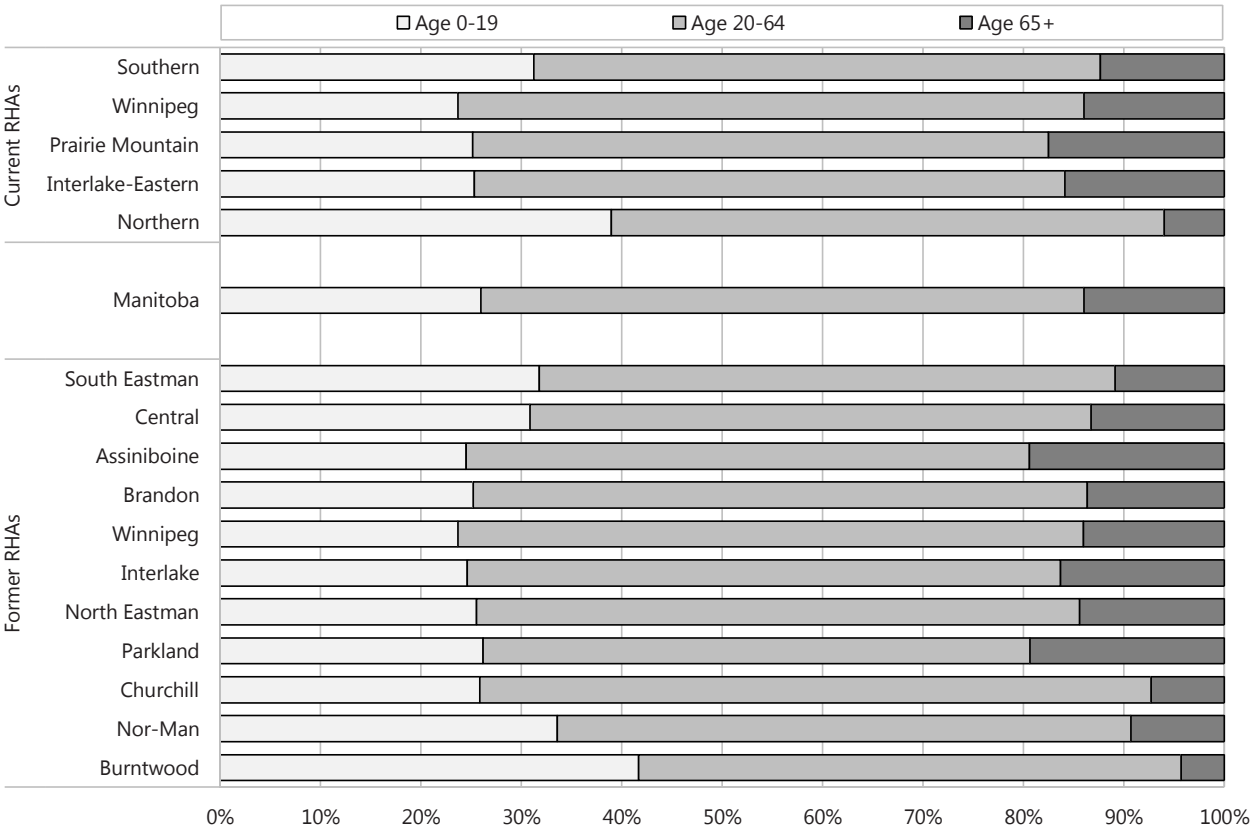
Table 2.0: Demographic Summary by RHA, 2011

Percent of population in each age group

Regional Health Authority	Age 0-19	Age 20-64	Age 65+
Current RHAs			
Southern	31.2%	56.4%	12.3%
Winnipeg	23.7%	62.3%	14.0%
Prairie Mountain	25.2%	57.3%	17.5%
Interlake-Eastern	25.3%	58.8%	15.9%
Northern	39.0%	55.0%	6.01%
Manitoba	26.0%	60.0%	14.0%
Former RHAs			
South Eastman	31.8%	57.3%	10.9%
Central	30.9%	55.8%	13.3%
Assiniboine	24.5%	56.1%	19.4%
Brandon	25.2%	61.2%	13.6%
Winnipeg	23.7%	62.3%	14.0%
Interlake	24.6%	59.1%	16.3%
North Eastman	26.7%	62.7%	15.0%
Parkland	26.2%	54.5%	19.3%
Churchill	25.9%	66.8%	7.31%
Nor-Man	33.6%	57.1%	9.33%
Burntwood	41.7%	54.0%	4.32%

Figure 2.0: Demographic Summary by RHA, 2011

Percent of population in each age group



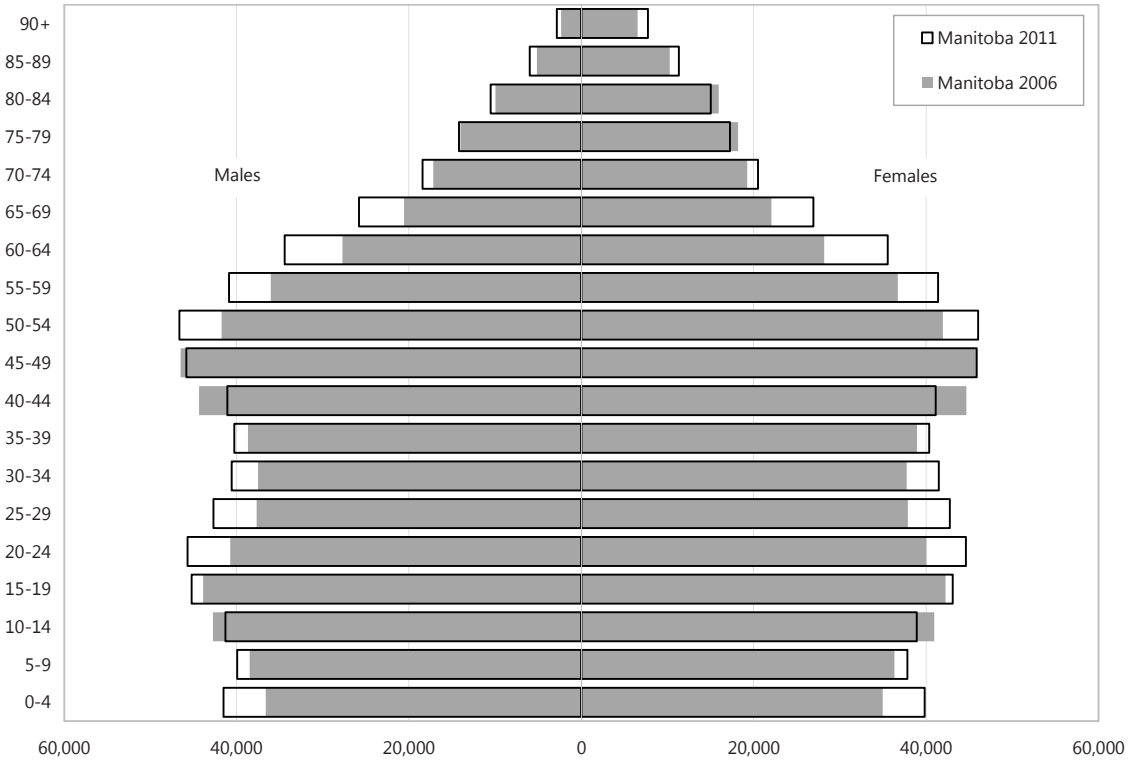
2.1 Population Pyramids

Definition: a population pyramid is a graphic representation of the age and sex composition of a population (all ages). The percent and number of residents within each five–year age group (from 0–4 to 90 and older) are shown for both males and females. Values for each RHA[4] are shown for 2006 and 2011 in two different ways:

a. a pyramid that compares a health region to the Manitoba population on December 31, 2011, showing the percent of males and females in each five–year age category. This allows comparison of the region's demographic profile to that of Manitoba overall.
b. a pyramid that shows how each region has changed over time. The population on December 31, 2006 is compared with that on December 31, 2011, showing the actual number of males and females in each five–year age category. This allows an assessment of how that region's population has changed over time.

Figure 2.1.1: Age Profile of Manitoba, 2006 and 2011

2006 Population: 1,180,452
2011 Population: 1,261,261



4 Data for older adults in Churchill are presented in one age group (75 and older) to avoid suppression.

Figure 2.1.2: Age Profile of Southern vs. Manitoba, 2011

Southern Population: 181,053
Manitoba Population: 1,261,261

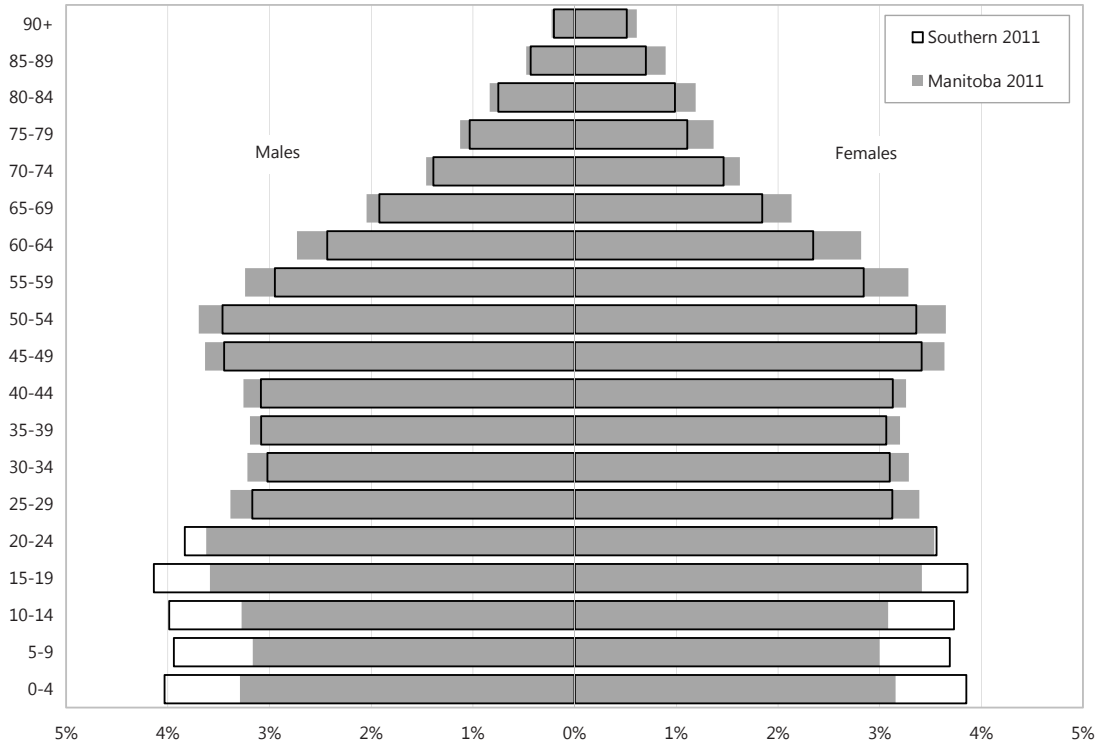


Figure 2.1.3: Age Profile of Southern, 2006 and 2011

2006 Population: 164,321
2011 Population: 181,053

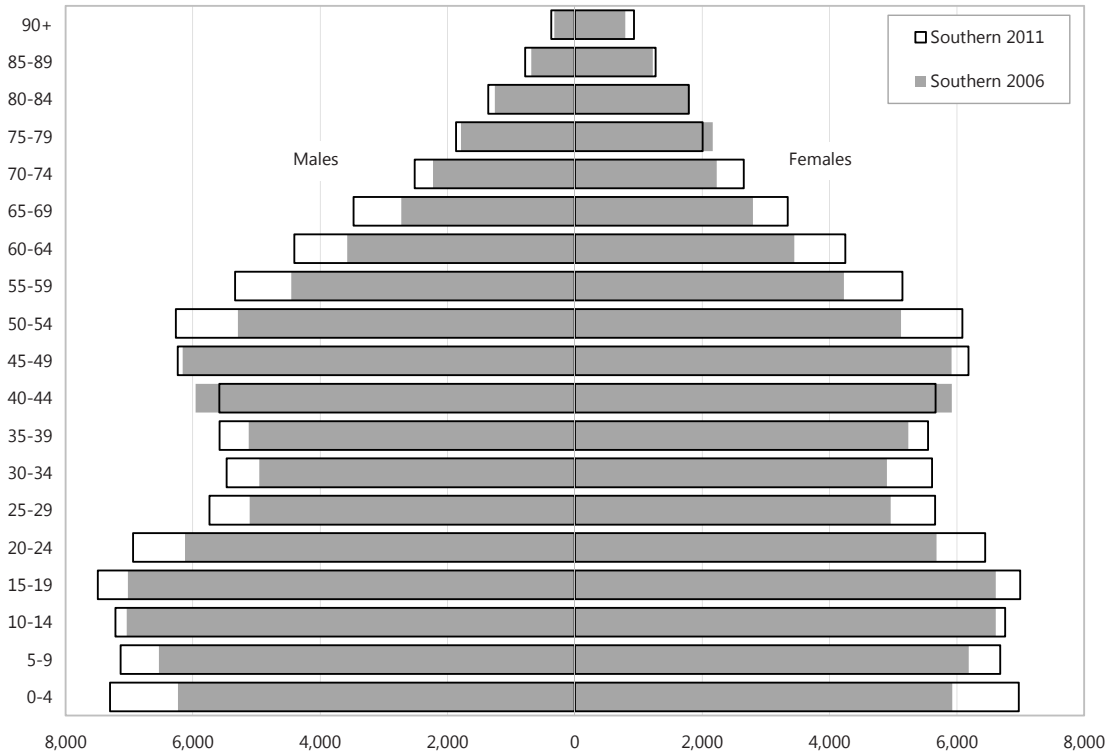


Figure 2.1.4: Age Profile of Winnipeg vs. Manitoba, 2011

Winnipeg Population: 716,094
Manitoba Population: 1,261,261

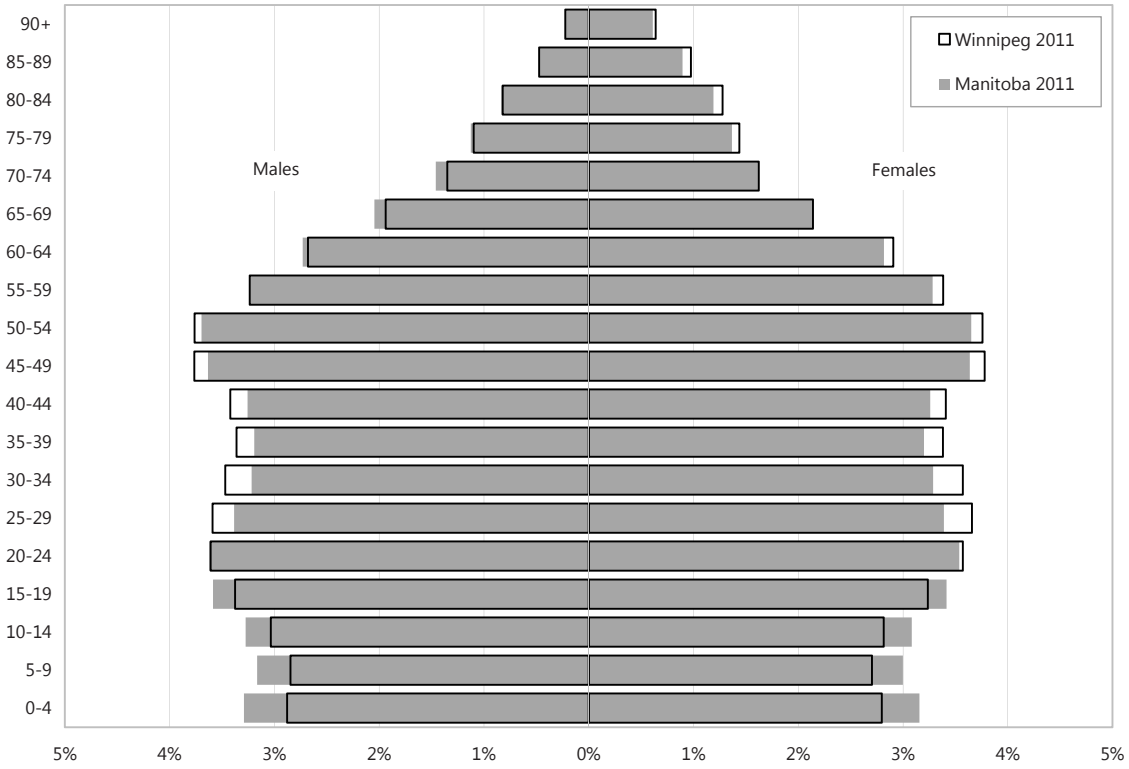


Figure 2.1.5: Age Profile of Winnipeg, 2006 and 2011

2006 Population: 666,335
2011 Population: 716,094

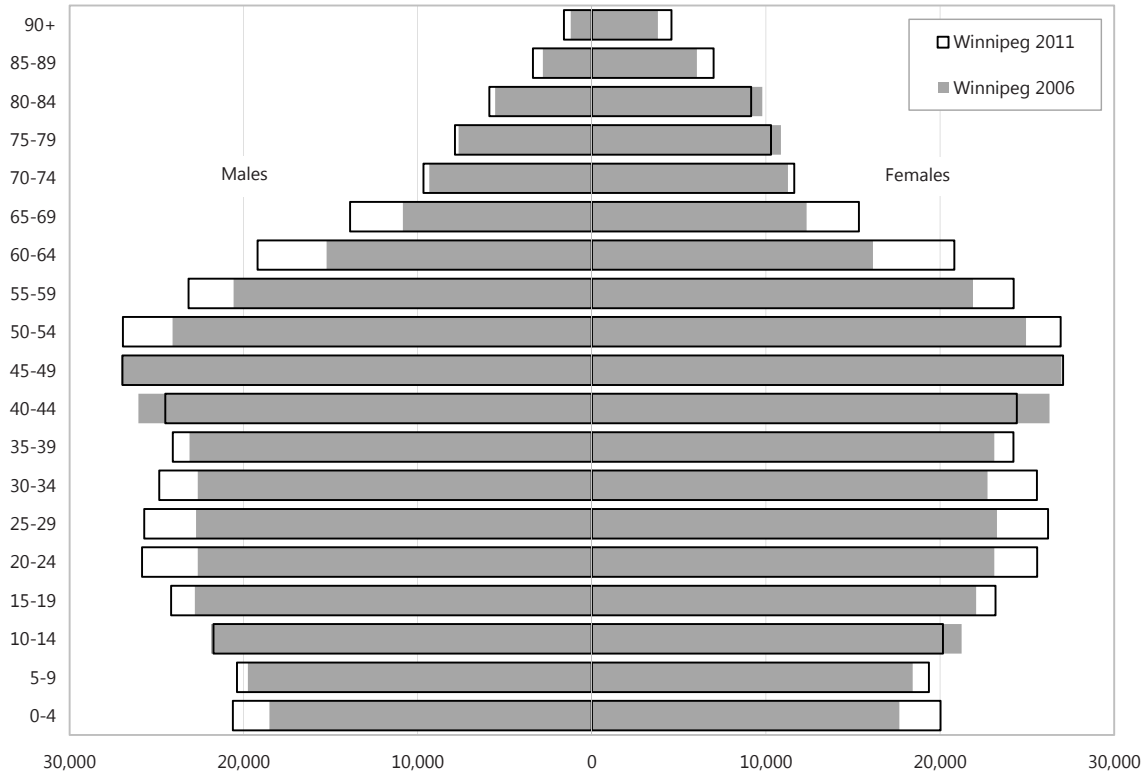


Figure 2.1.6: Age Profile of Prairie Mountain vs. Manitoba, 2011

Prairie Mountain Population: 164,720
Manitoba Population: 1,261,261

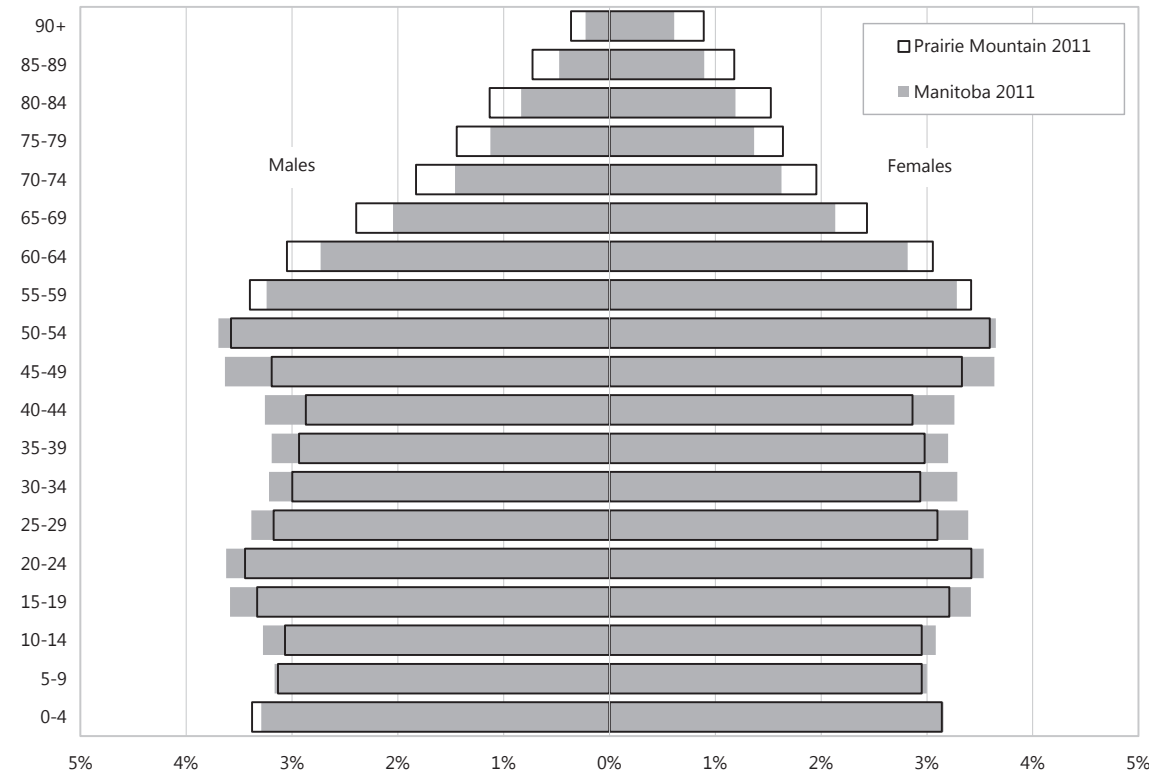


Figure 2.1.7: Age Profile of Prairie Mountain, 2006 and 2011

2006 Population: 159,176
2011 Population: 164,720

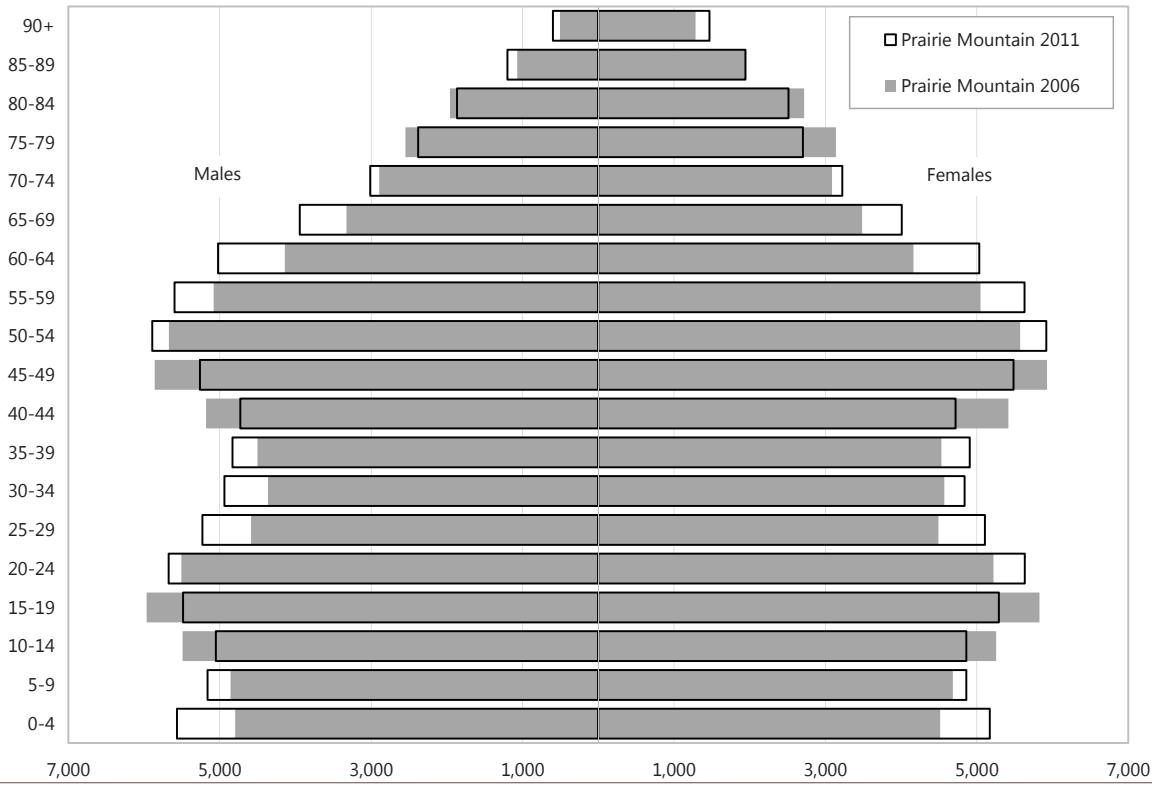


Figure 2.1.8: Age Profile of Interlake-Eastern vs. Manitoba, 2011

Interlake-Eastern Population: 122,258
Manitoba Population: 1,261,261

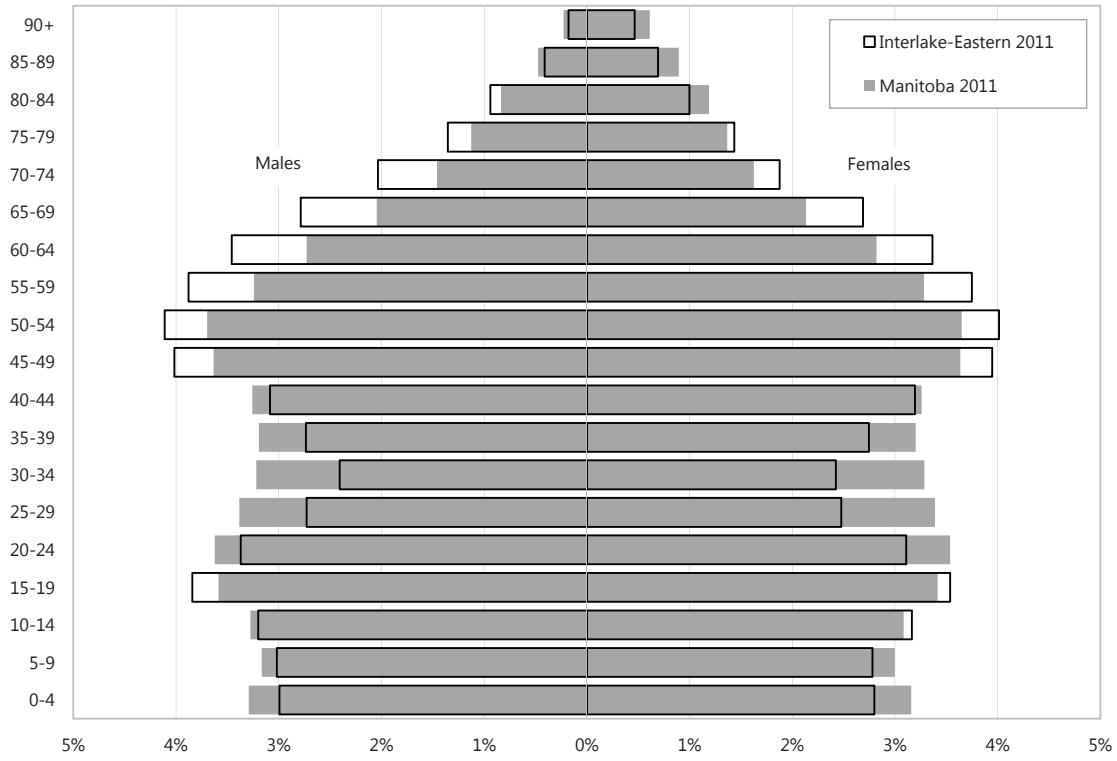


Figure 2.1.9: Age Profile of Interlake-Eastern, 2006 and 2011

2006 Population: 117,077
2011 Population: 122,258

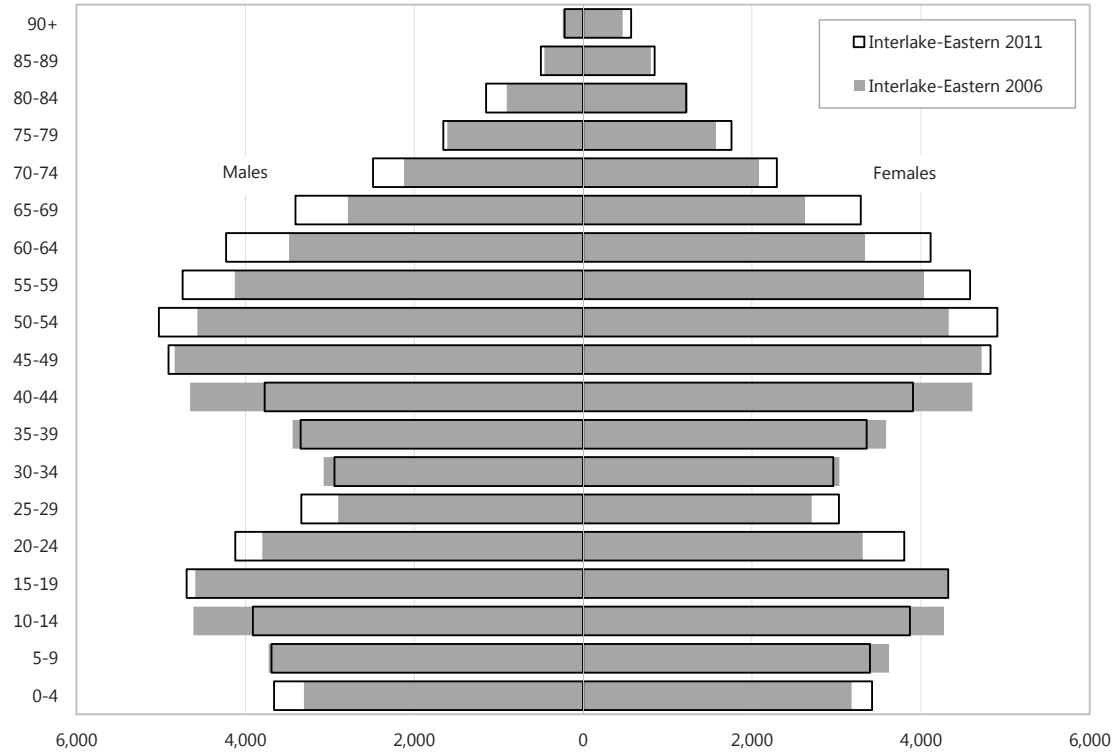


Figure 2.1.10: Age Profile of Northern vs. Manitoba, 2011

Northern Population: 74,317
Manitoba Population: 1,261,261

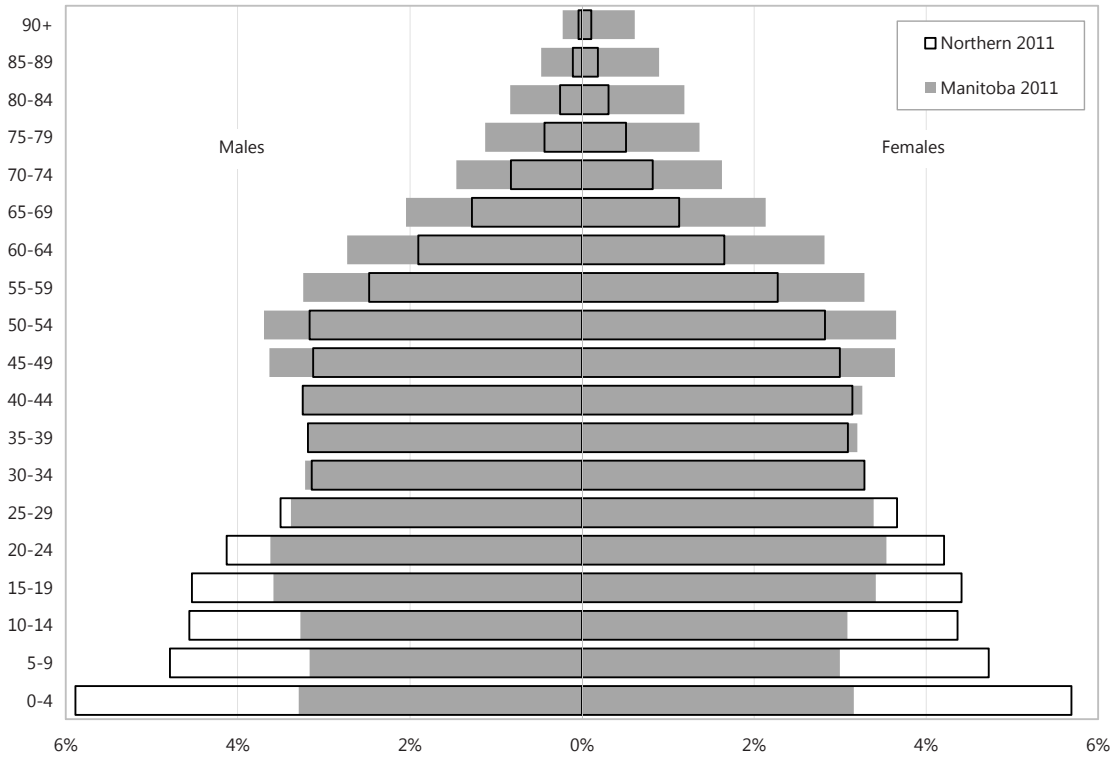
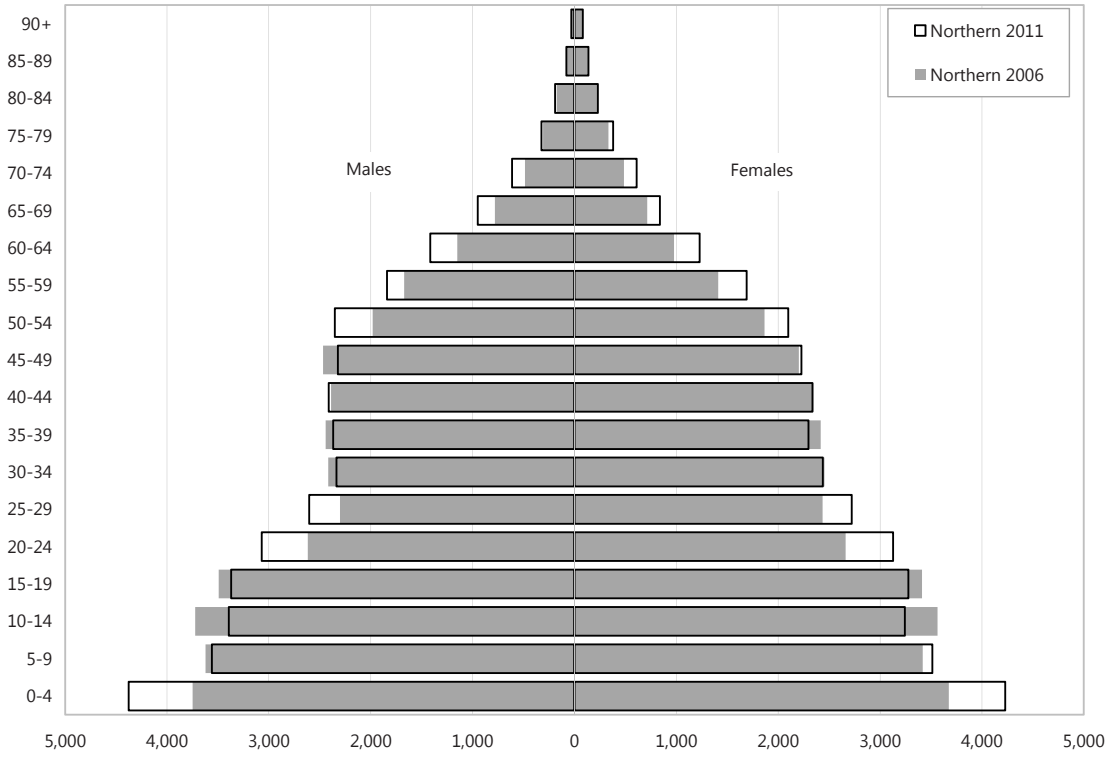


Figure 2.1.11: Age Profile of Northern, 2006 and 2011

2006 Population: 70,702
2011 Population: 74,317



2.2 Socioeconomic Factor Index (SEFI)

Definition: a composite index based on area–level Canadian Census data. The **socioeconomic factor index** (**SEFI**) reflects the social determinants of health using four variables: average household income, proportion of single parent households, unemployment rate for residents aged 15 and older, and proportion of population aged 15 and older without high school graduation. SEFI scores range from approximately –5 to +5, and a value of zero represents the Manitoba average. Lower scores (e.g., below zero) indicate better socioeconomic status (i.e., less deprivation), while scores greater than zero indicate worse status (Chateau, Metge, Prior, & Soodeen, 2012). Population–weighted SEFI scores were calculated for Census years 2001 and 2006[5].

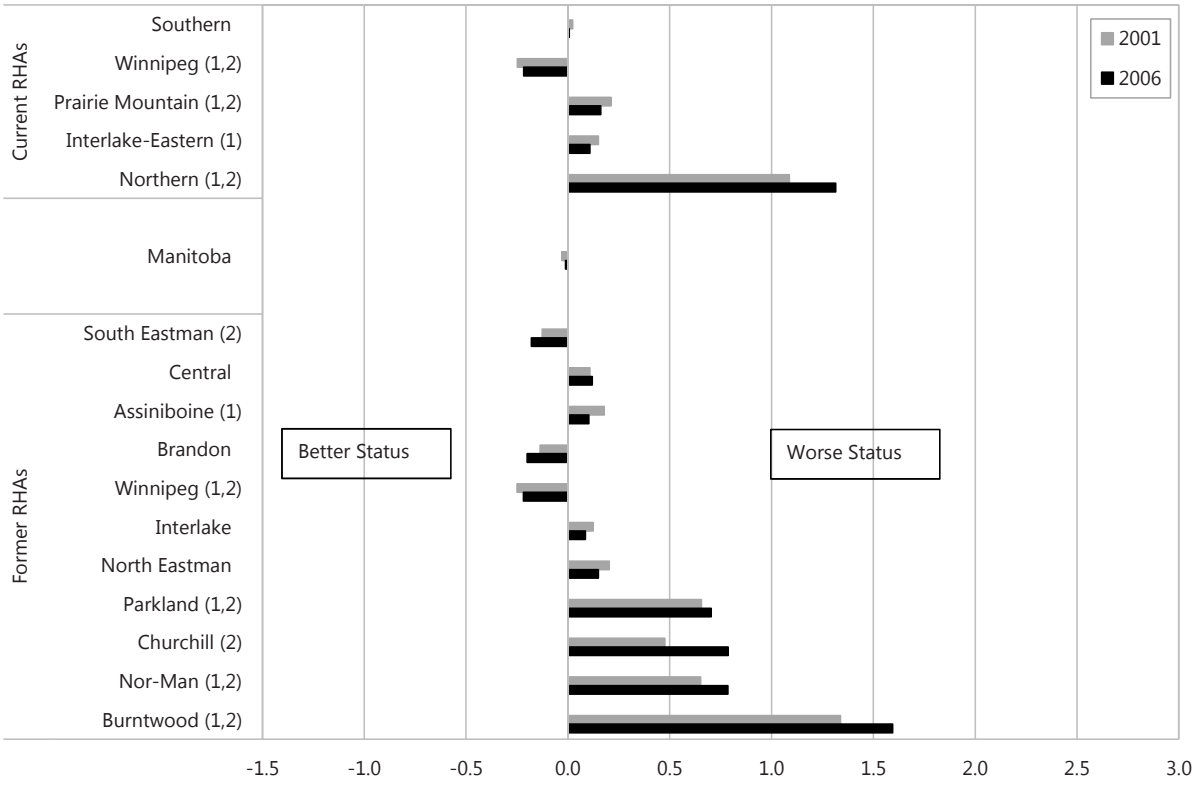
Key Findings

- Note: The actual values for this indicator cannot be compared over time because it is created by a process of "standardization" within each time period. This also means that the Manitoba average will always be zero, even if the province's socioeconomic status changes over time. However, the values across regions can be compared within each time period; and the relative position of each region can be compared over time.
- Lower values are better on this index as they represent less deprivation
- The results show a very similar pattern across regions in both periods:
  - Southern was right at the provincial average
  - Winnipeg was slightly lower than average (better)
  - Prairie Mountain was slightly higher than average (worse)
  - Interlake–Eastern was slightly higher than average, though the difference in 2006 was not statistically significant
  - Northern was well above average (worse) in both periods
- While the values for the two years used cannot be directly compared, the results suggest that socioeconomic inequalities have increased over time, in that the gap between highest and lowest values in 2006 was larger than that for 2001.
- These patterns match those shown by various other socioeconomic indicators and results from previous MCHP reports (Brownell, Chartier, Santos, Ekuma, Au, Sarkar, MacWilliam, Burland, Koseva & Guenette, 2012; Martens, Frohlich, Carriere, Derksen, & Brownell, 2002b; Martens et al., 2003; Metge, Chateau, Prior, Soodeen, DeCoster & Barre, 2009).

5 Data from 2011 were not used because changes to the Census sampling process rendered the results non–representative of the population.

Figure 2.2.1: Socioeconomic Status by RHA, Canadian Census 2001 and 2006

Score on MCHP's Socioeconomic Factor Index (SEFI).



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 2.2.2: Socioeconomic Status by District, Canadian Census 2001 and 2006

Score on MCHP's Socioeconomic Factor Index (SEFI). Lower values indicate better status

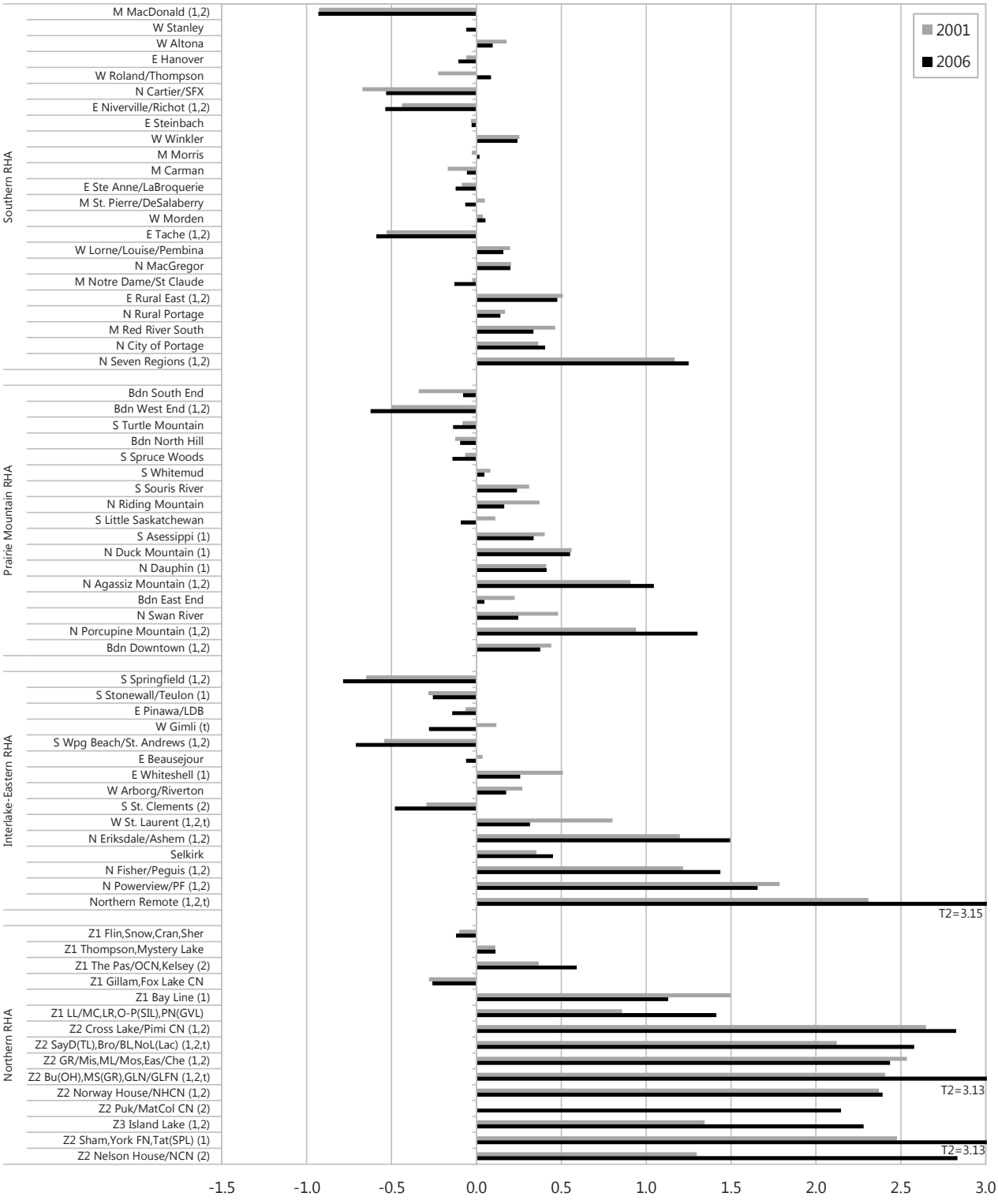
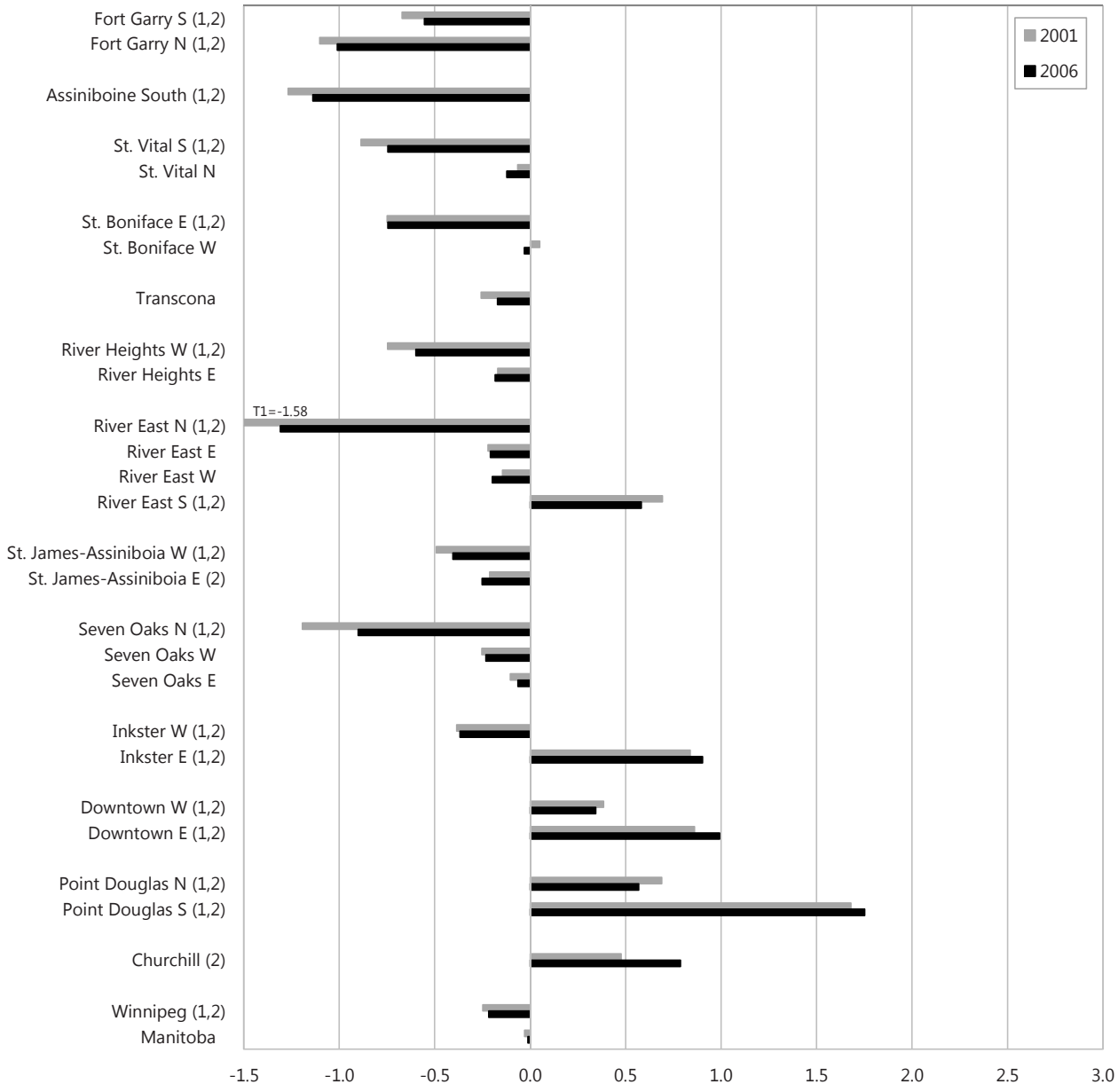


Figure 2.2.3: Socioeconomic Status by Winnipeg NC, Canadian Census 2001 and 2006

Score on MCHP's Socioeconomic Factor Index (SEFI). Lower values indicate better status



2.3 Material and Social Deprivation

Definition: small-area based composite indices calculated from Canadian Census data which reflect the deprivation of wealth, goods and conveniences (material deprivation), and the deprivation of relationships among individuals in the family, the workplace, and the community (social deprivation). The **material deprivation index** includes average household income, the unemployment rate of the population aged 15 and older, and the proportion of the population aged 15 and older without high school graduation. The **social deprivation index** includes the proportion of the population aged 15 and older who are separated, divorced, or widowed, the proportion of the population that lives alone, and the proportion of the population that has moved at least once in the past five years. Scores on these indices range from –5 to +5. Lower scores (e.g., below zero) indicate better status (less deprivation), while scores higher than zero indicate worse status (Pampalon & Raymond, 2000). Population–weighted scores for the social and material deprivation indices were calculated for Census year 2006[6]. See the Glossary for further details.

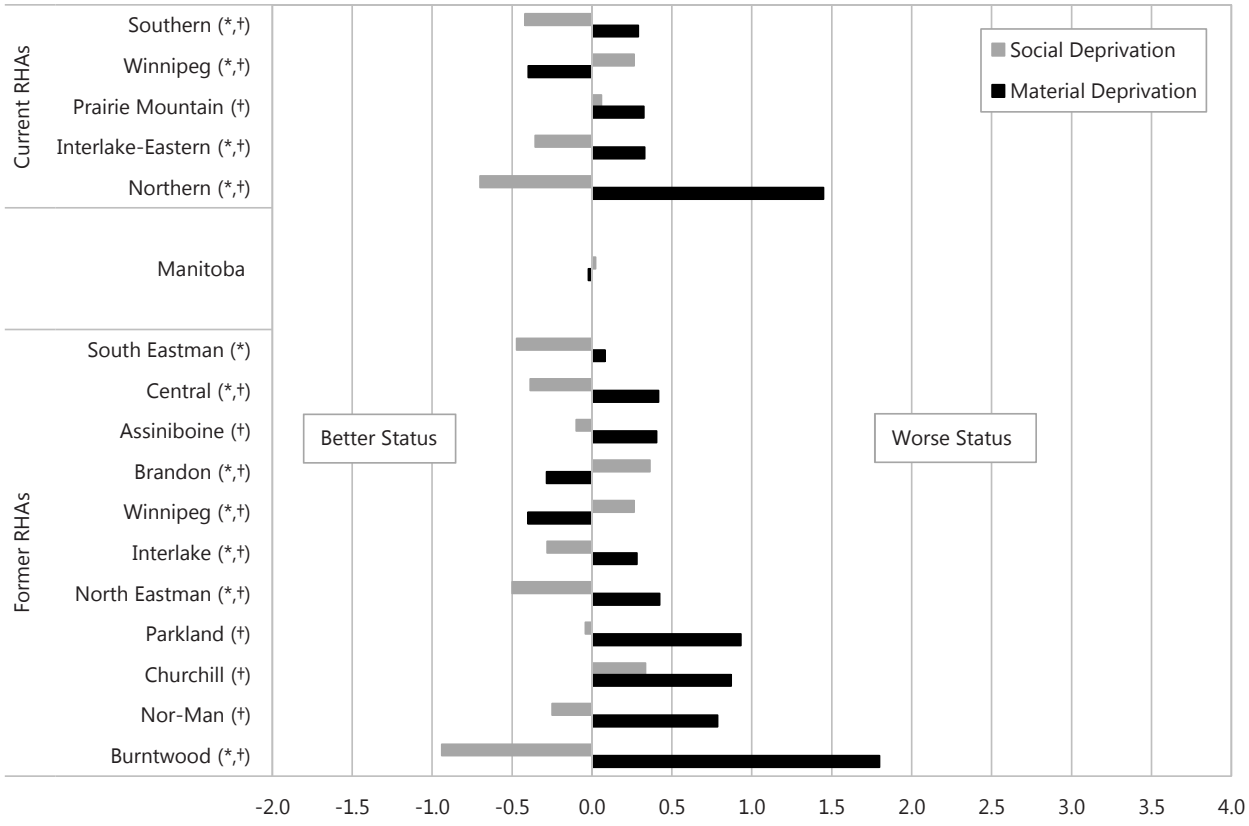
Key Findings

- In most but not all regions, the Material and Social deprivation scores have opposite values from each other. This is caused by the differences in the variables used to create these scores (i.e., there are no "structural" issues that cause the two scores to take opposing values, as demonstrated by those areas where both are either positive or negative).
  - This difference does suggest, however, that there is merit in separately examining these two aspects, as the patterns are not the same.
- The values on the material deprivation scale are very similar to those shown for the SEFI. Winnipeg had the best (lowest) score at –0.4, whereas all other regions were above zero. Northern had the highest score at just under 1.45, whereas the other three rural regions were near 0.3.
- Interestingly, however, Northern had the best (lowest) score on the social deprivation index. These results suggest that while Northern residents face the greatest challenges in terms of income, education, and employment, the social fabric may be stronger in that region with fewer people living alone, fewer people separated/divorced/widowed, and less residential instability[7].
- Neither material nor social deprivation scores were particularly strongly related to PMR.

6 Data from 2011 were not used because changes to the Census sampling process render the results non–representative of the population.

7 Caution is required in interpreting housing results, because many Northern residents face issues of over–crowding and a lack of options for housing. These realities would produce results that look good in terms of not living alone and not moving frequently, but they may not reflect good social circumstances.

Figure 2.3.1: Social and Material Deprivation Values by RHA, Canadian Census 2006



* indicates area's rate for social deprivation was statistically different from Manitoba average
† indicates area's rate for material deprivation was statistically different from Manitoba average

Figure 2.3.2: Social and Material Deprivation Values by District, Canadian Census 2006

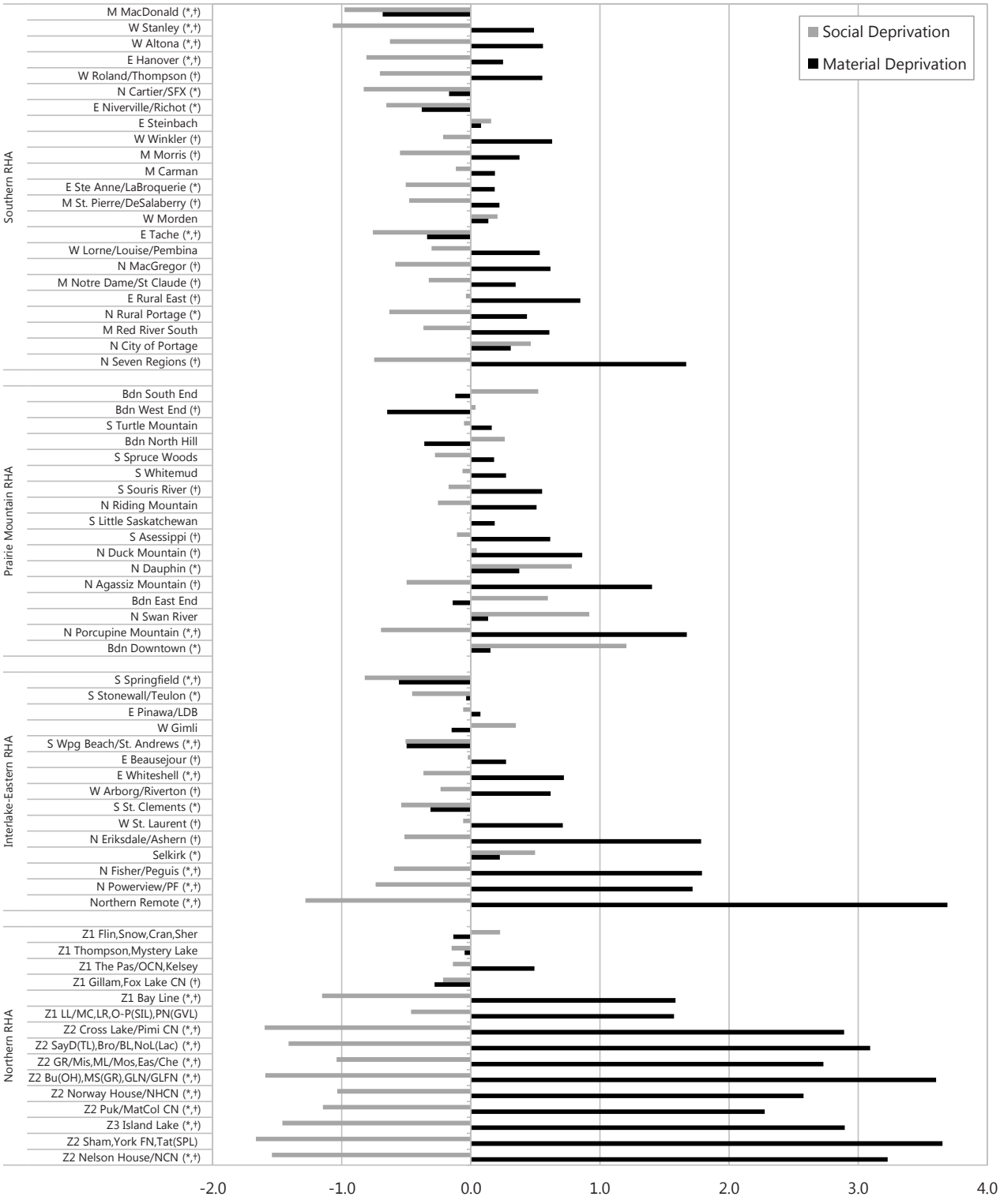
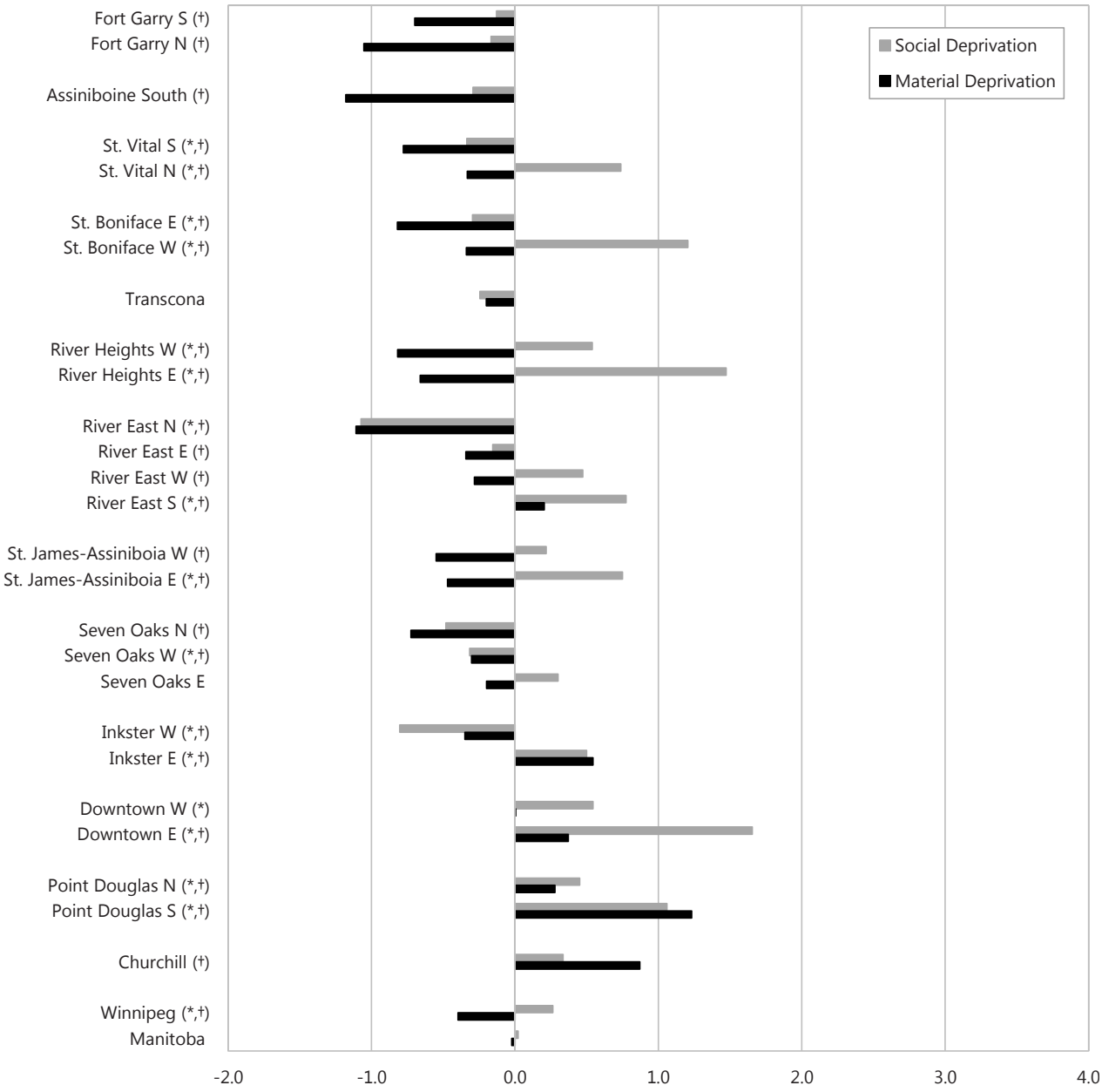


Figure 2.3.3: Social and Material Deprivation Values by Winnipeg NC, Canadian Census 2006



CHAPTER 3: POPULATION HEALTH STATUS AND MORTALITY

Key Findings in Chapter 3

Mortality rates and population health indicators:

- In Manitoba and most areas within it, total and premature mortality rates (PMR) and **potential years of life lost** (**PYLL**) decreased over time, while **life expectancy** (**at birth**) increased. These findings imply that the population's health status continues to improve, extending results from the 2009 and 2003 RHA Indicator Atlas reports (Fransoo et al., 2009; Martens et al., 2003).
    - As explained in the text for each indicator, some of these changes were not consistent across regions, age, and sex; therefore the main statistical models showed that some of these changes were not significant. However, alternate models testing just the change in the provincial rate over time confirmed that all of these changes were statistically significant.
- Premature mortality rates were about 40% of total mortality rates, but PMR values had a slightly larger decrease over time. This suggests that the proportion of deaths occurring to residents under age 75 is decreasing over time, which is good news and adds support to other indicators suggesting that overall health status continues to improve in Manitoba.
- However, these results also reveal that the health gap in Manitoba continues to widen over time: most of the improvements in health status were not reflected in the lowest income areas or in the Northern health region. This finding is consistent with and extends the trends found in previous MCHP reports (Brownell et al., 2003; Fransoo et al., 2009; Martens et al., 2010b; Martens et al., 2003). All these reports show that the gap in health status is widening over time, due to improvement in health status among residents in healthy areas and lack of improvement among residents of the least healthy areas.

Causes of death:

- Circulatory diseases (30.2%) and cancer (27.6%) continue to be the most common causes of death for Manitobans, together comprising almost 60% of all deaths.
- However, in terms of premature deaths, cancer (36.4%) was more frequent than circulatory disease (21.9%), meaning that many more premature deaths were attributable to cancer than to circulatory diseases.

Introduction

This chapter includes a number of indicators of mortality and population health status. Life expectancy is perhaps the most widely used indicator of a population's health status, especially for international comparisons. The total mortality rate is another common indicator of health status, tracking the annual death rate within a population. Like life expectancy, it is based on the mortality experience of the entire population. The premature mortality rate (PMR), by contrast, focuses on the population under 75 years of age. As explained in Chapter 1, it is based on the concept that deaths occurring before age 75 are considered "premature." Potential Years of Life Lost (PYLL) also uses only those under age 75, but further excludes infants (0–1 year) in its calculations. The PYLL is more sensitive to deaths among younger residents because it is a rate determined by the number of years below 75 at which each death occurs. For example, the death of a 50-year-old contributes "25" to the PYLL measure, but only "1" to the premature (and total) mortality rate. So while the PMR is a good indicator of overall health status and need for care, PYLL rates give an indication of whether the premature deaths are occurring among relatively younger or older "under 75" residents. Mortality indicators are routinely calculated for calendar years (not **fiscal years** like most other indicators) because Vital Statistics data are collected and organized by calendar year.

For several of these indicators, relatively small changes in the number of deaths and the age of decedents can cause very high or low rates or what appear to be dramatic changes over time. This is particularly true in areas (districts or NCs) that have small populations. Therefore, caution is required when interpreting some of the results shown. More discussion of this effect is included with each indicator, as appropriate.

3.1 Total Mortality Rates

Definition: the number of deaths per 1,000 residents (all ages) per year. Average annual rates were calculated for two 5–year periods, 2002–2006 and 2007–2011, and were age– and sex–adjusted to the Manitoba population in the first time period.

Key Findings

- The total mortality rate for Manitoba decreased over time from 8.43 to 7.88 deaths per 1,000 residents per year, but this difference did not quite reach statistical significance (p=0.066) in the main model. Most regions appear to have decreasing rates, though only those in Southern and Winnipeg were statistically significant. The exception was Northern where no change over time was seen.
  - This lack of statistical significance despite the substantial decrease in overall rates was caused by the variability across areas. Therefore, an alternate model which did not include "region" was also created. The results of that model showed that the decrease in mortality rates was significant (p<0.0001).
    - The difference between the two models implies that even though the decrease over time was not consistent across all areas, the overall decrease for Manitoba was significant.
  - Note: the actual mortality rates shown in this report are very similar to those in the 2009 Atlas (Fransoo et al., 2009), whereas lower values may have been expected. This discrepancy is related to improvements in the MCHP data system explained in Chapter 1. The values shown here are more accurate.
- There appears to be a strong though non–linear relationship between total mortality rates and PMR at the region, district, and NC levels, as expected.
- Southern was the only region with rates significantly lower than average, and they were lower in both time periods. Northern had higher than average rates.
- These results suggest that inequalities in health status continue to widen in Manitoba: the healthiest regions are getting healthier, while the least healthy regions are not changing.
- There was very large variation among the districts within each region of Manitoba. Rates were particularly high in several districts in Northern and the Northern Remote district of Interlake–Eastern region.

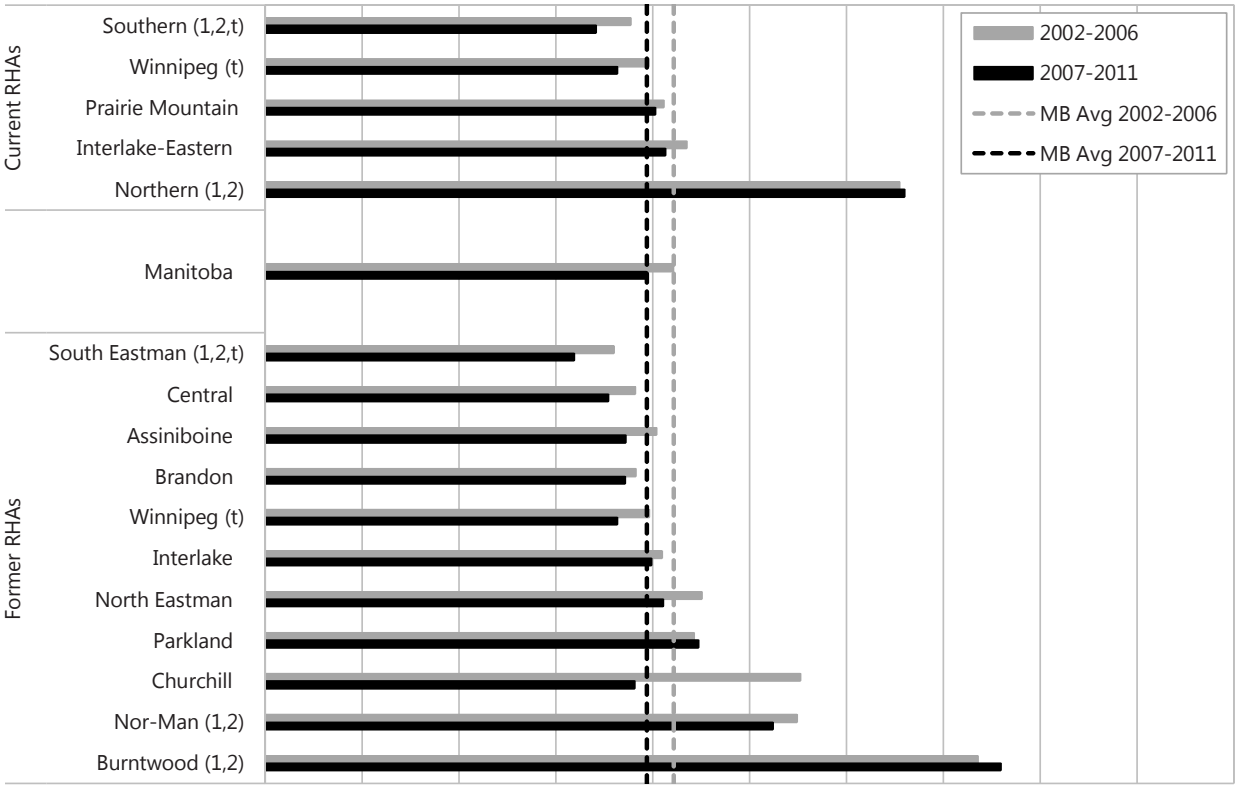
- Within Winnipeg, mortality rates for the small Winnipeg NC of Seven Oaks North were higher than expected, but strongly influenced by the Middlechurch Personal Care Home (PCH) located in that area. Excluding those residents reduced the mortality rates to 6.40 in the first time period (versus 12.0 shown) and 4.97 in the second time period (versus 11.1 shown). These values suggest that Seven Oaks North is among the healthiest areas in Winnipeg region.
  - This influence also affects other indicators in this report (e.g., **dementia**), so care must be taken when interpreting results for Seven Oaks North.
- The decrease over time in Churchill appeared large but was not statistically significant because the population and number of deaths were low.
- There were strong relationships between income and total mortality rates in rural and urban areas in both time periods: mortality rates were higher among residents of lower income areas, particularly the lowest group (Appendix 2).

Comparison to Other Findings

- The modest (but statistically non–significant) decrease in mortality rates over time and the distribution across regions are consistent with and extend the results from the 2009 Atlas, which showed the same pattern (Fransoo et al., 2009).

Figure 3.1.1: Total Mortality Rate by RHA, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death per 1,000 residents per year



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.1.2: Total Mortality Rate by District, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death per 1,000 residents per year

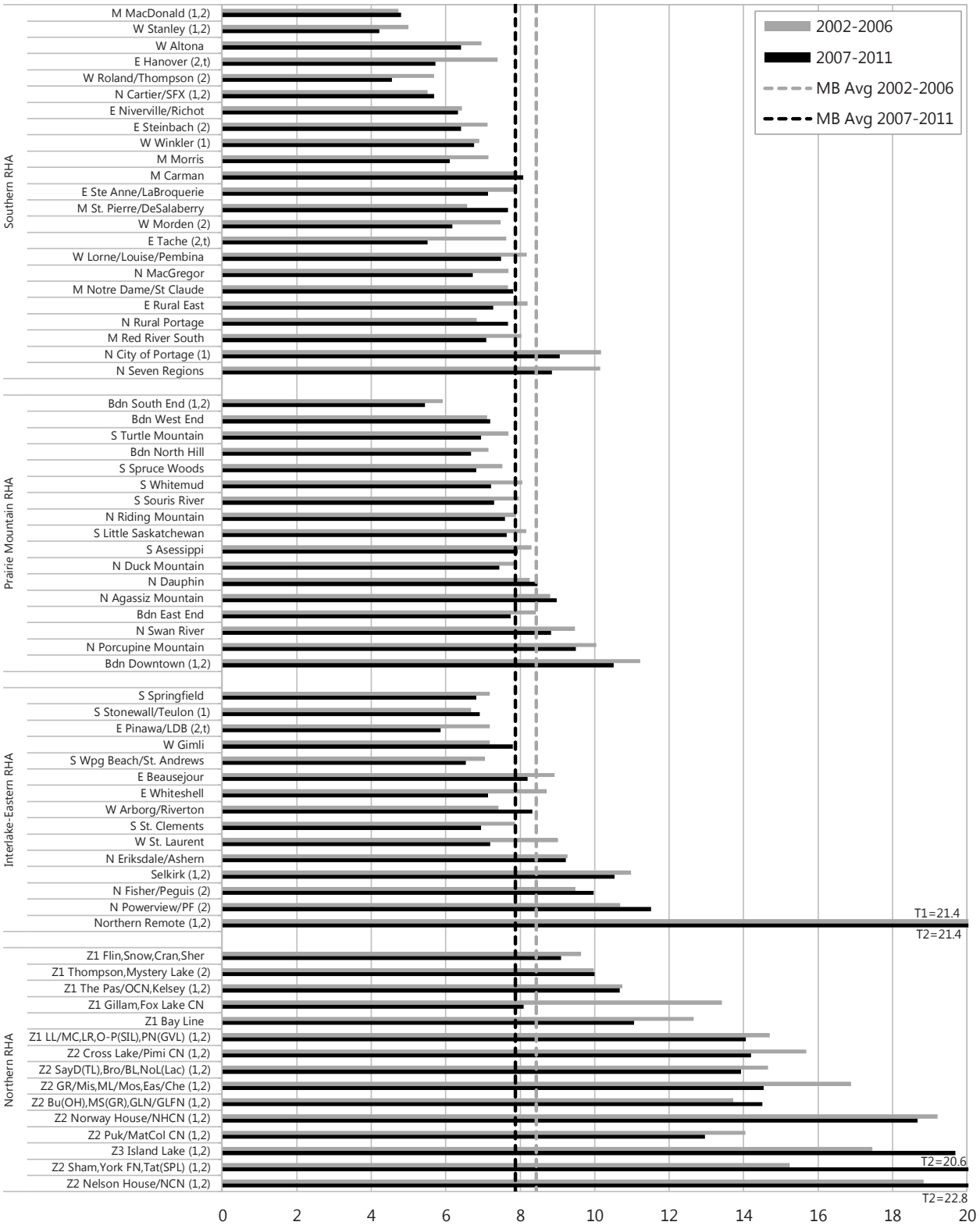
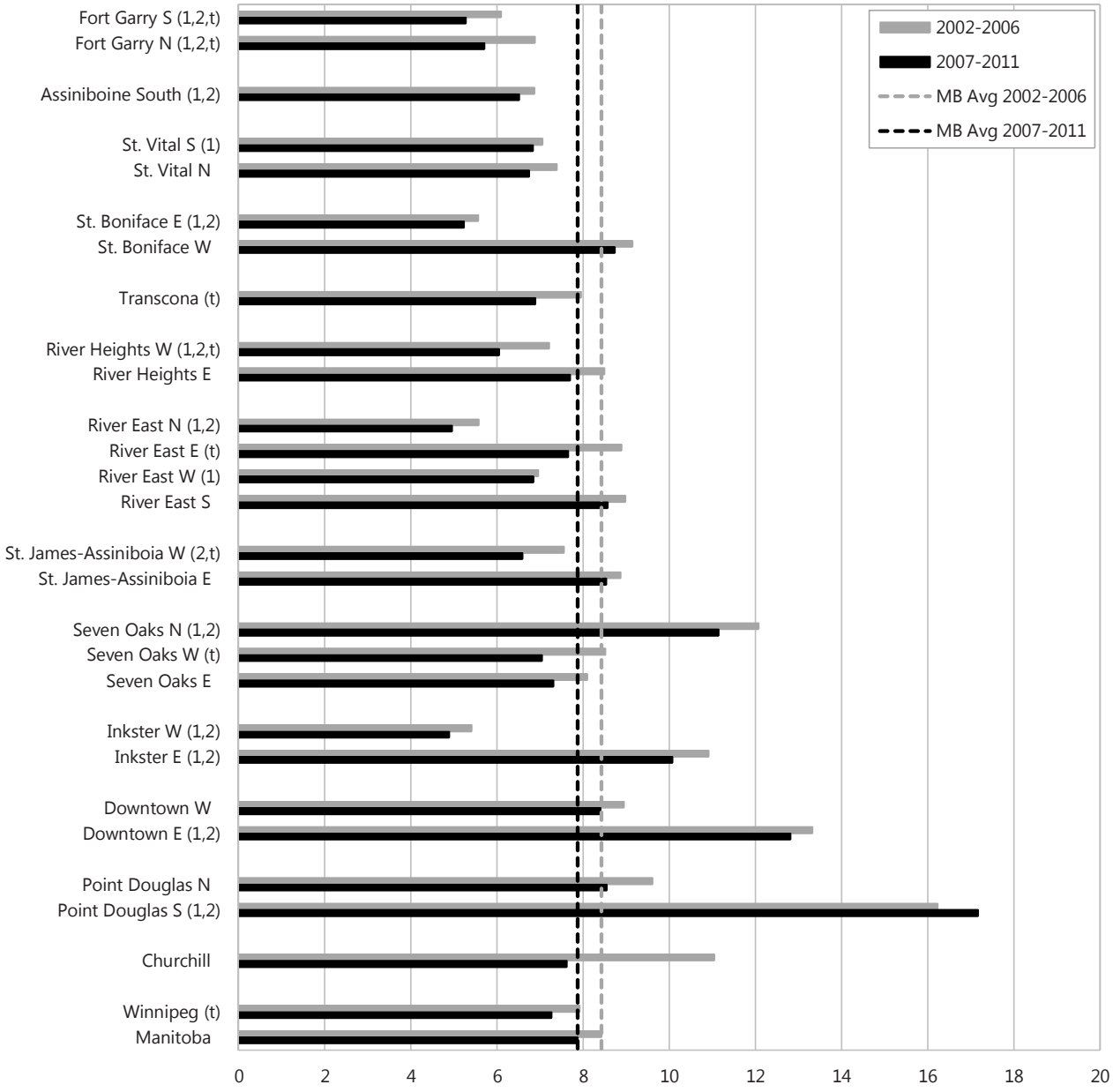


Figure 3.1.3: Total Mortality Rate by Winnipeg NC, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death per 1,000 residents per year



3.2 Causes of Death

Definition: the most frequent **causes of death** for Manitobans are reported for two 5-year time periods: 2000–2004 and 2005–2009. Causes of death from the Vital Statistics death records were grouped by ICD–10 chapter, and the most frequent causes are shown for each RHA and the province overall (shown as average annual crude percent).

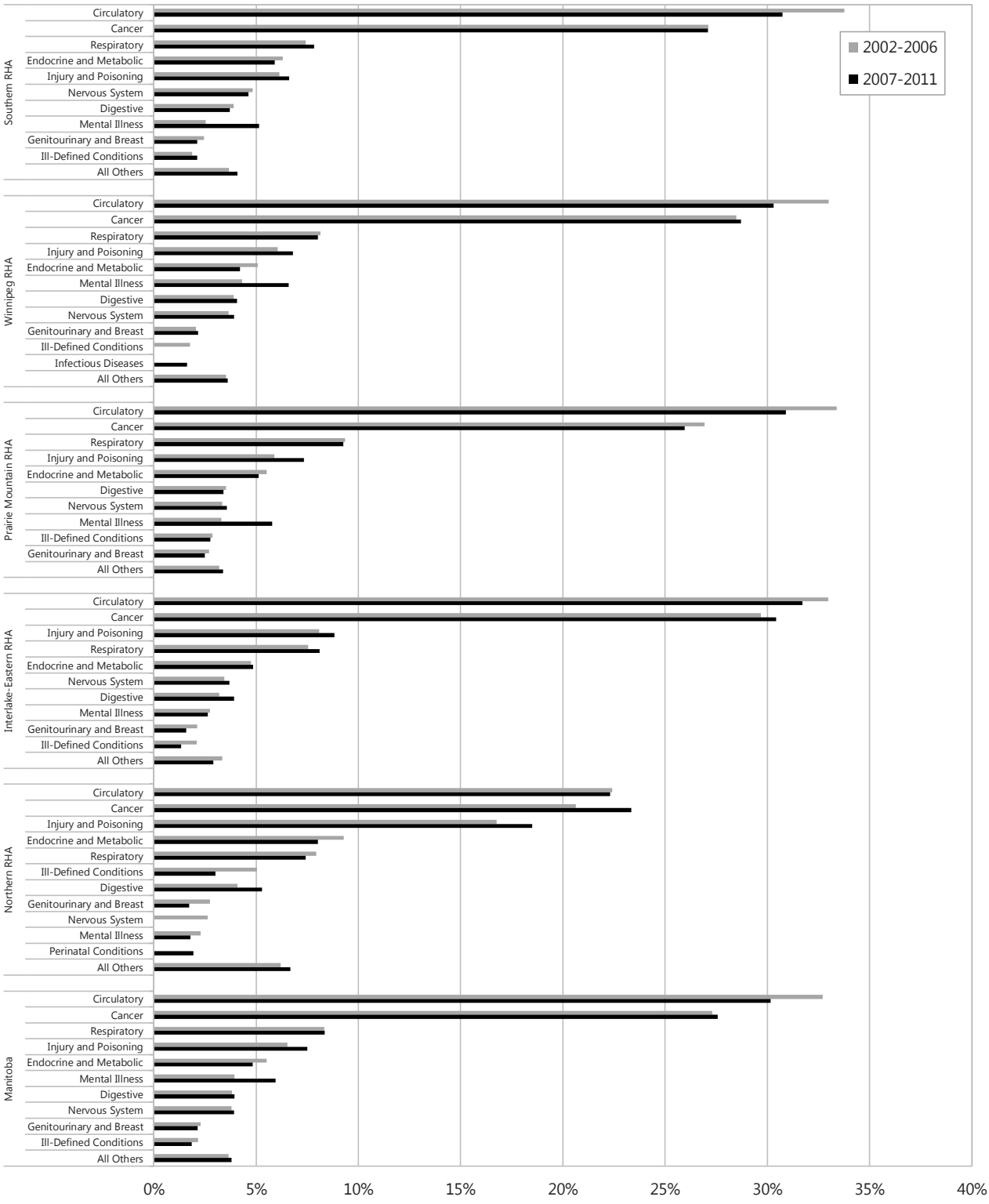
Note: "Circulatory diseases" includes heart attack and stroke.

Key Findings

- In 2007–2011, the top causes of death in Manitoba were circulatory diseases (30.2%) and cancer (27.6%), followed by **respiratory disease**s (8.35%), injury and poisoning (7.50%), endocrine and metabolic diseases (4.84%), and mental illness (5.94%).
  - It is important to note that the two top causes alone (circulatory and cancer) comprise almost 60% of all deaths. This is quite different than rankings of the causes of health service use shown in subsequent chapters.
- The top causes of death in Manitoba were relatively stable over time, though the percent attributable to circulatory disease decreased. This is consistent with previous studies and reflects the ongoing reduction in deaths from heart attack and stroke.
- The rankings varied somewhat by health region, though circulatory diseases and cancer were the top two in all regions.
  - Northern had the most unique profile, with injury and poisoning being considerably more common than in other regions. Also, the percentages attributed to circulatory diseases and cancer were lower. All of these changes are likely related to the relatively young population of the Northern health region.

Figure 3.2.1: Most Frequent Cause of Death by RHA, 2002-2006 and 2007-2011

Average annual crude percent of deaths



3.3 Premature Mortality Rates (PMR)

Definition: the number of deaths among residents under 75 years old per 1,000 residents under 75 years old, per year. Average annual rates were calculated for two 5–year periods: 2002–2006 and 2007–2011, and were age– and sex–adjusted to the Manitoba population under 75 years old in the first time period. (See Chapter 1 for a more thorough discussion of the meaning and interpretation of PMR.)

Key Findings

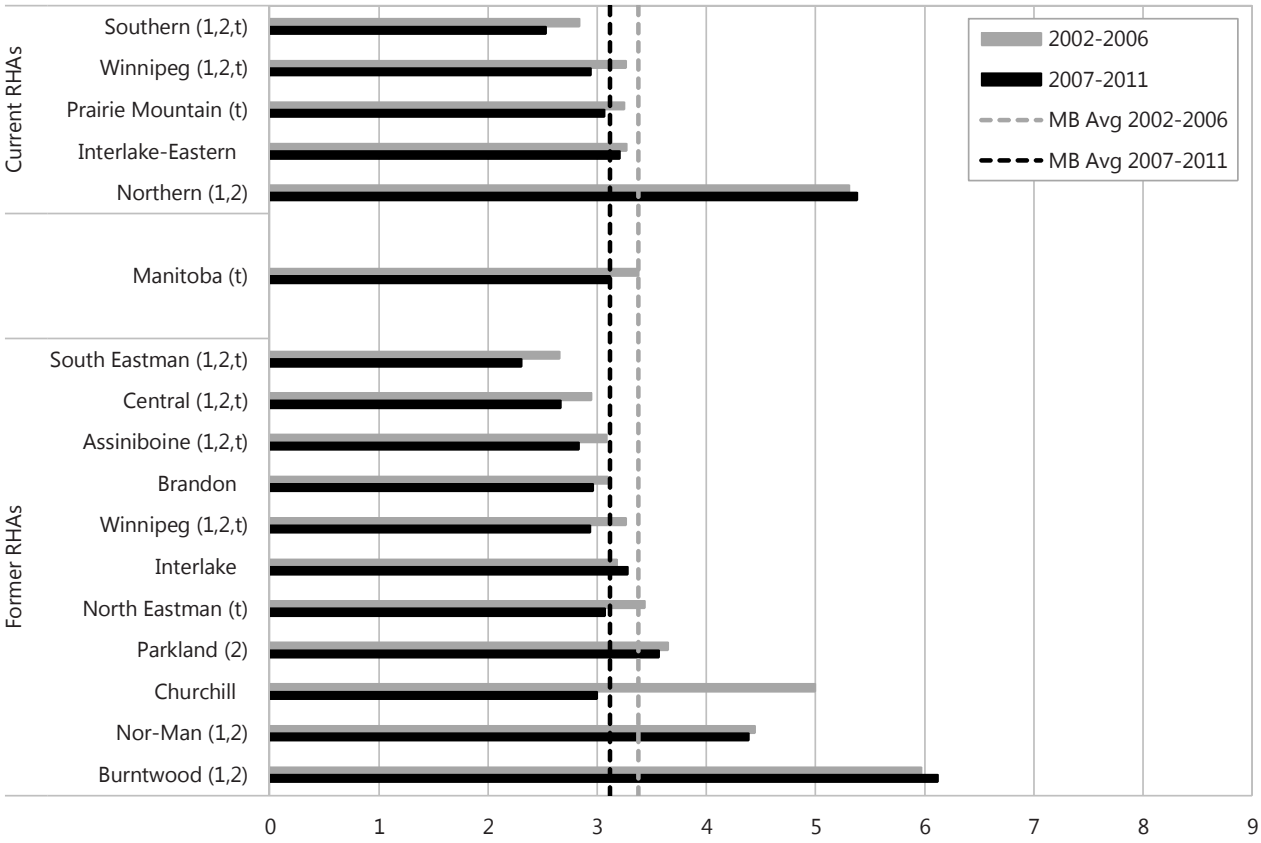
- PMR in Manitoba decreased over time from 3.38 to 3.12 deaths per 1,000 residents aged 0 to 74 per year. This decrease in this sentinel indicator reflects a significant improvement in population health.
- Among regions, the rates for Southern, Winnipeg, and Prairie Mountain decreased significantly, while those for Northern and Interlake–Eastern were stable.
- In both time periods, Southern and Winnipeg had rates below the provincial average, while Northern had higher than average rates.
- As was seen with total mortality rates, these results suggest a widening of the health status gap in Manitoba: PMR decreased in the healthiest regions and did not change in the least healthy regions.
- Among districts, there was more variation in PMR than total morality rates, consistent with the idea that PMR may be a better indicator of population health status than total mortality.
- The Northern Remote district of Interlake–Eastern and several districts in Northern region had particularly high PMR, approximately three times the provincial average. Unlike the provincial average, these rates were not decreasing over time, suggesting that the gap is growing over time.
- There was also large variation across Winnipeg NCs, but a less consistent pattern of change over time. Some of the healthiest areas had further decreases, while others were unchanged. The least healthy NC, Point Douglas South, had a higher rate in the second time period; this increase was not statistically significant. The rate in Churchill decreased; this decrease was not statistically significant because the population and number of deaths involved were small.
- There were strong relationships between income and PMR in urban and rural areas in both time periods: PMR were higher among residents of lower income areas (Appendix 2). There was greater disparity within urban areas than within rural areas, and the gap widened over time for both.

Comparison to Other Findings

- These results are consistent with and extend the trend of decreasing PMR shown in the 2009 and 2003 Atlas reports (Fransoo et al., 2009; Martens et al., 2003), suggesting that the health status of Manitobans overall continues to improve gradually. However, as noted above, there are some areas where rates are not decreasing, so the health gap in Manitoba continues to grow over time.

Figure 3.3.1: Premature Mortality Rate by RHA, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death before age 75 per 1,000 residents under age 75



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.3.2: Premature Mortality Rate by District, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death before age 75 per 1,000 residents under age 75

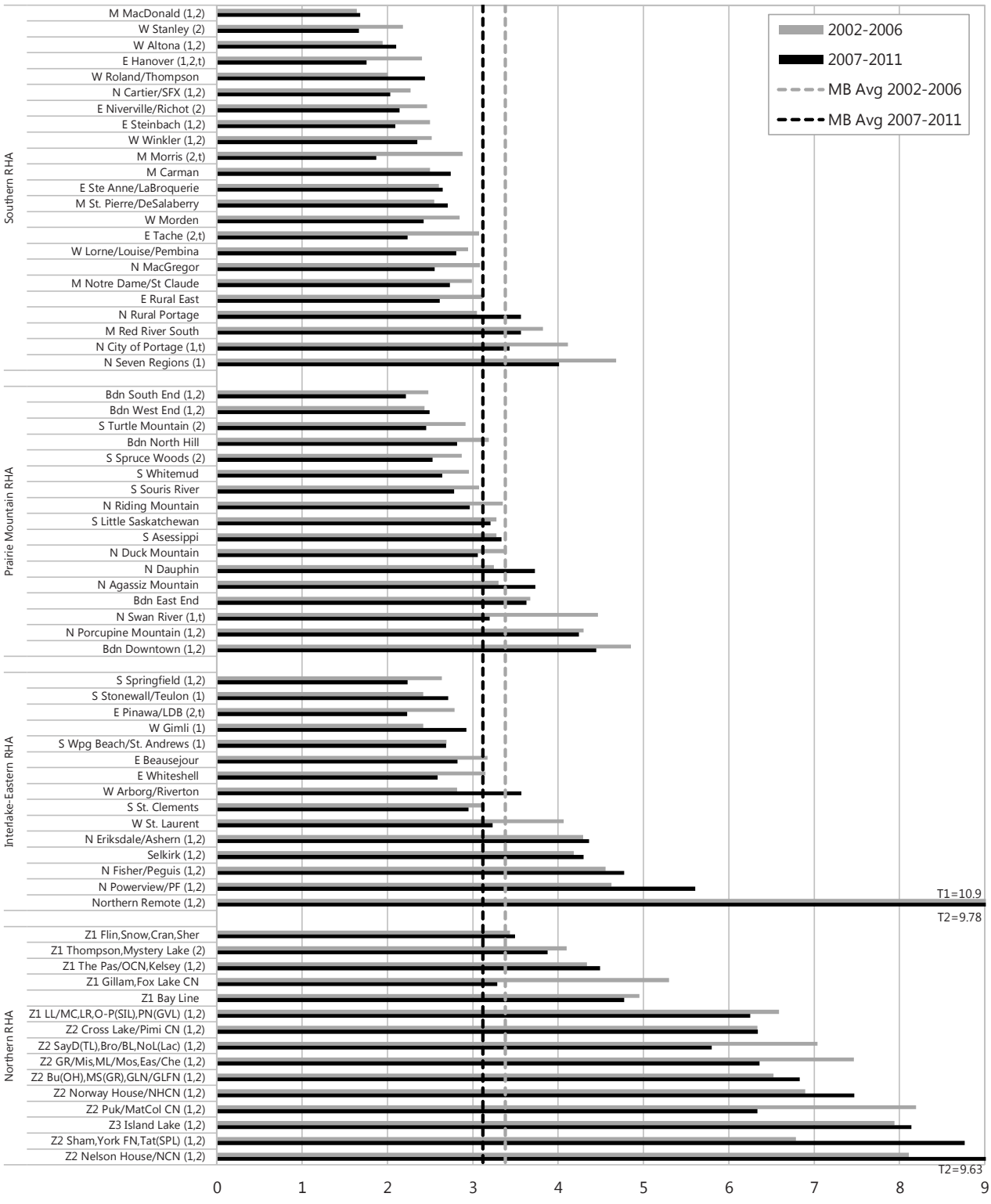
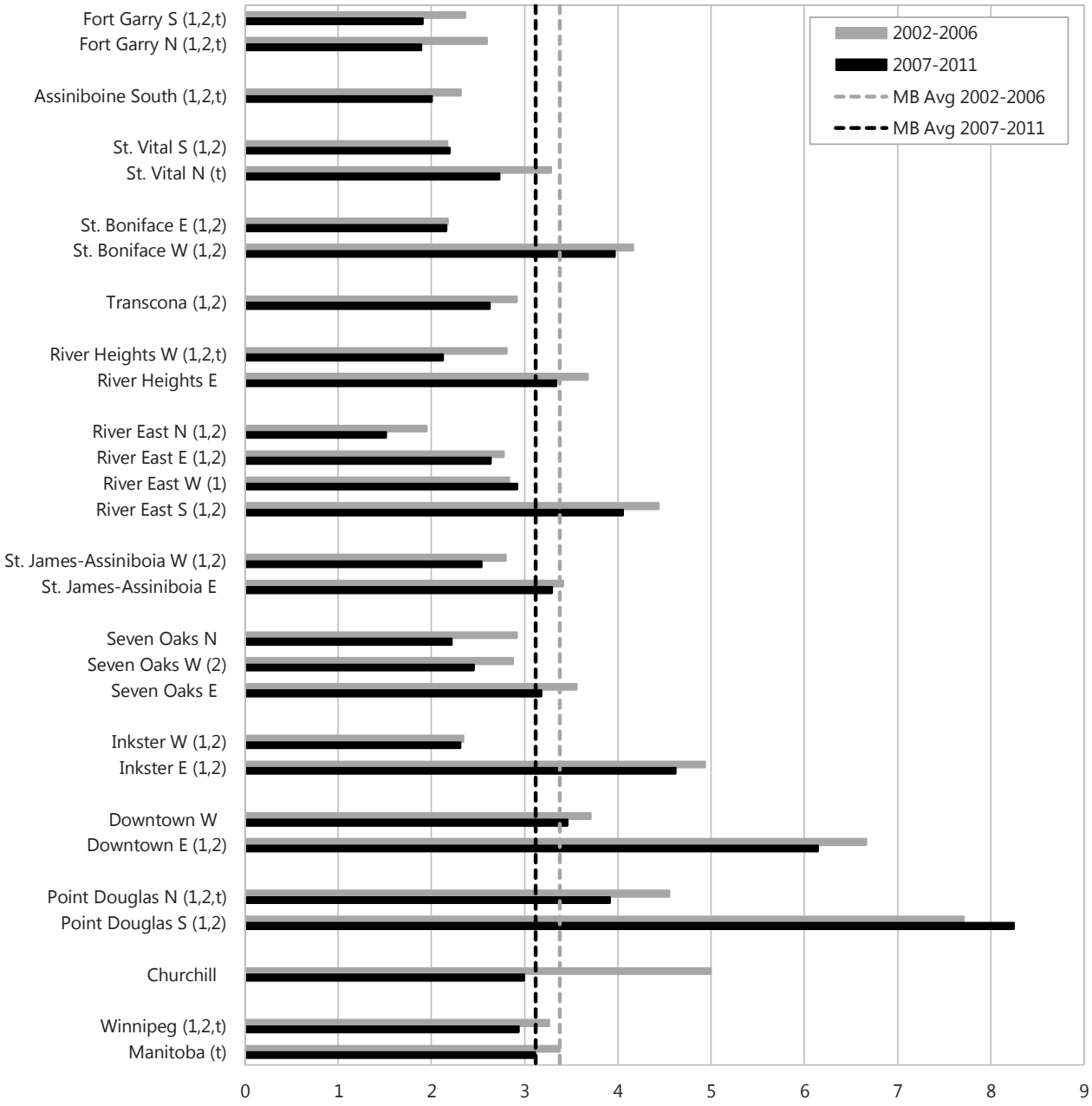


Figure 3.3.3: Premature Mortality Rate by Winnipeg NC, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of death before age 75 per 1,000 residents under age 75



3.4 Causes of Premature Death

Definition: the most frequent **causes of premature death** for Manitobans aged 0 to 74 are reported for two 5–year time periods: 2000–2004 and 2005–2009. Causes of death from the Vital Statistics death records were grouped by ICD–10 chapter, and the most frequent causes are shown for each RHA and the province overall (shown as average annual crude percent).

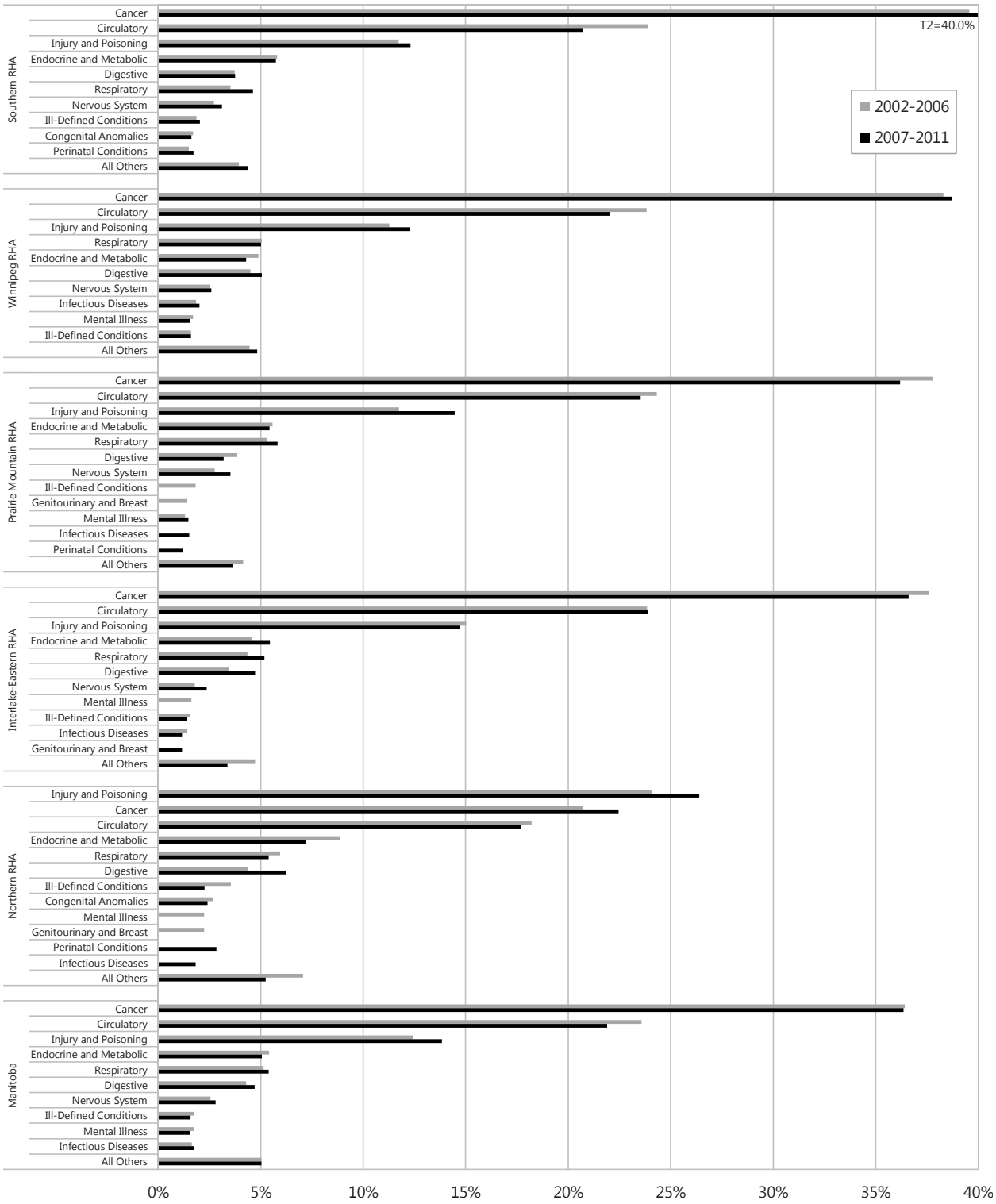
Note: "Circulatory diseases" includes heart attack and stroke.

Key Findings

- In 2007–2011, the top causes of premature death (before age 75) in Manitoba were cancer (36.4%) and circulatory diseases (21.9%), followed by injury and poisoning (13.8%), endocrine and metabolic disorders (5.06%), and respiratory diseases (5.39%).
  - Note that cancer and circulatory diseases are still the top two and claim almost 60% of all premature deaths. However, they have swapped places in these rankings when compared with all deaths (Section 3.2). This means that while both are obviously important and can cause death at any age, cancer is responsible for more deaths of people under the age of 75 than is circulatory disease.
- The top causes of premature death in Manitoba were relatively stable over time, though the percent attributable to circulatory disease decreased slightly.
- The rankings varied somewhat by health region though cancer was the top cause in all regions except Northern, which had the most unique profile.
  - In Northern health region, injury and poisoning was the most frequent cause of premature death (26.4%), followed by cancer (22.5%).

Figure 3.4.1: Most Frequent Cause of Premature Death by RHA, 2002-2006 and 2007-2011

Average annual crude percent of deaths among residents under age 75



3.5 Male Life Expectancy

Definition: the expected length of life (in years) of male residents at birth, based on the patterns of mortality in the population for the preceding five years. Life expectancy was calculated directly from the mortality experience of local residents using the "life table" approach. Crude values are shown for two 5–year periods: 2002–2006 and 2007–2011. Even small differences in life expectancy values imply large differences in health status. It has been estimated that if all cancers could be eradicated, life expectancy for males would increase by approximately 3.8 years (Mackenbach, Kunst, Lautenbach, Oei, & Bijlsma, 1999).

Key Findings

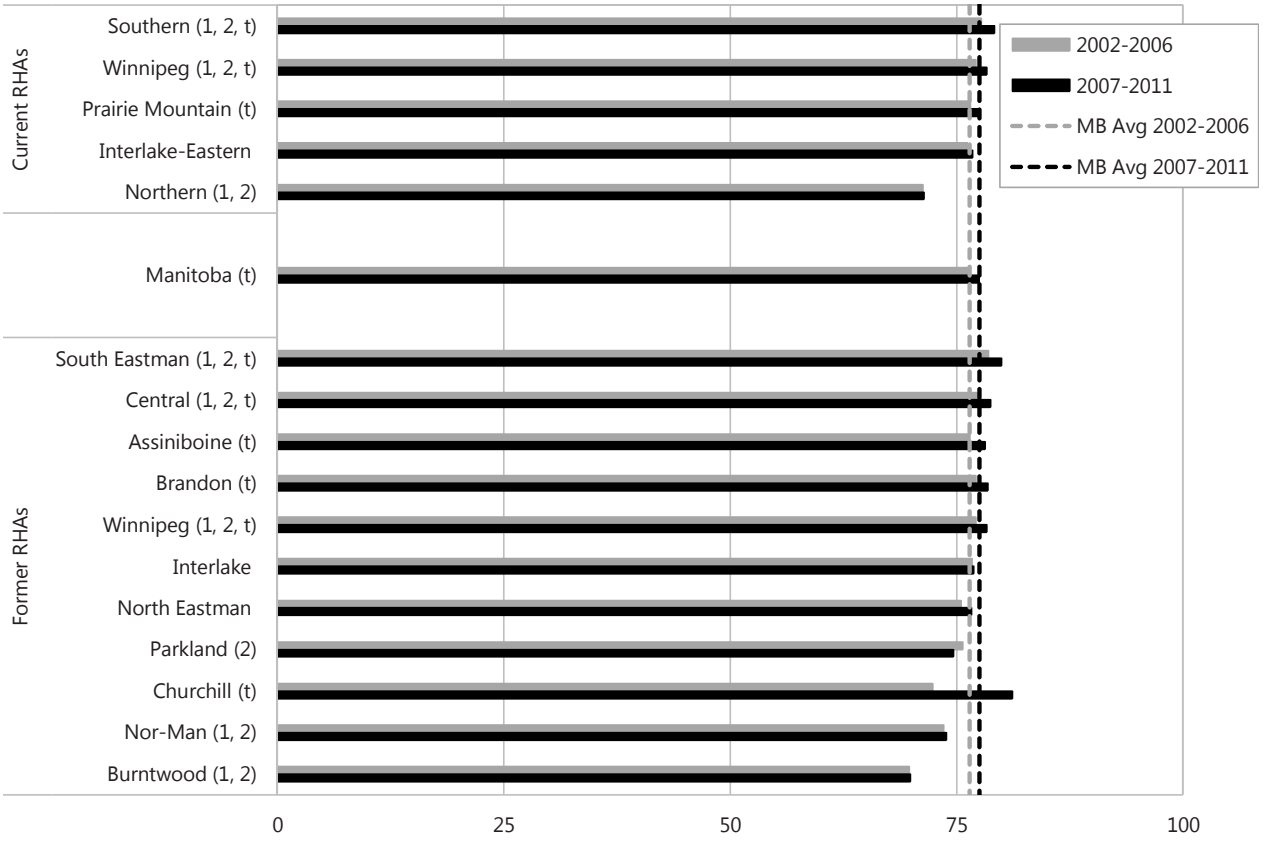
- Life expectancy for males in Manitoba increased from 76.5 to 77.5 years. Significant increases were seen in Southern, Winnipeg, and Prairie Mountain regions with no change among Interlake–Eastern or Northern residents.
- In both time periods, values for Northern were significantly lower than average, while those in Southern and Winnipeg were higher.
- Values were strongly inversely related to PMR at regional and district levels as expected, though life expectancy numbers show less variation across areas.
- The increase over time in the former Churchill RHA is an anomaly. The small population means that relatively small changes in the number of deaths can substantially affect rates. Corresponding decreases in total mortality and PMR were also seen, but neither reached statistical significance.
- Conversely, low life expectancy was seen in the Northern Remote district of Interlake–Eastern and in many districts of Northern region.
- There were strong relationships between income and male life expectancy in urban and rural areas in both time periods: life expectancy was shorter for residents of lower income areas (Appendix 2).
    - Life expectancy was particularly low for residents of the lowest income areas, both urban and rural.

Comparison to Other Findings

- These values are consistent with and extend the findings of the 2009 Atlas, which also showed increases in male life expectancy over time (Fransoo et al., 2009). These also mirror decreases in total mortality, PMR, and potential years of life lost.
- Life Expectancy estimates from **Statistics Canada** (CANSIM Table 102–0511 and 102–0512) for Manitoba males were very similar (Statistics Canada, 2009; Statistics Canada, 2012), but revealed that Manitoba values were slightly below Canadian averages:
    - Manitoba: 76.4 and 77.0 (2002–2006 and 2007–2009, respectively)
    - Canada: 77.8 and 78.8 (2002–2006 and 2007–2009, respectively)

Figure 3.5.1: Male Life Expectancy by RHA, 2002–2006 and 2007–2011

Life expectancy (at birth) in years



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.5.2: Male Life Expectancy by District, 2002–2006 and 2007–2011

Life expectancy (at birth) in years

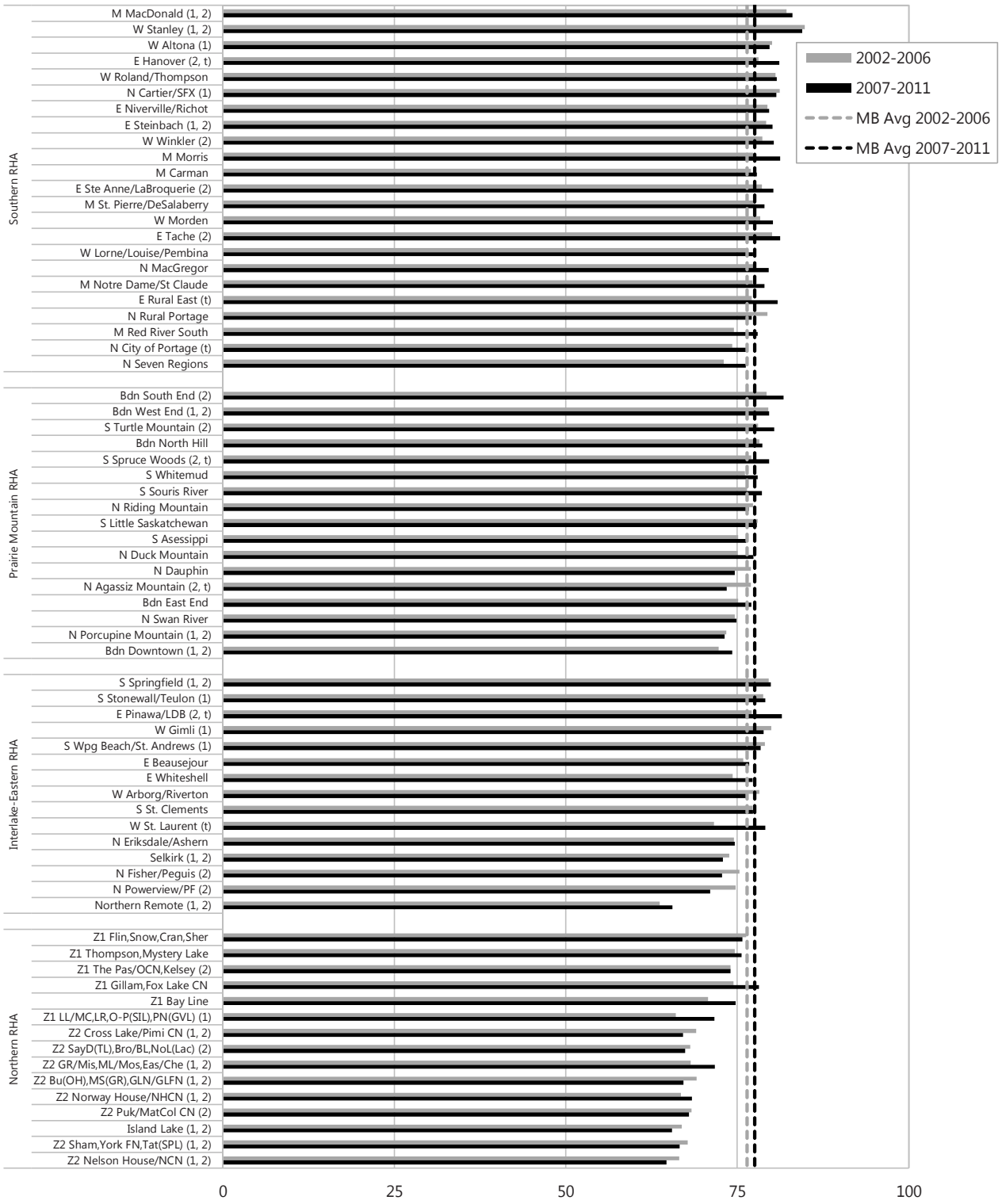
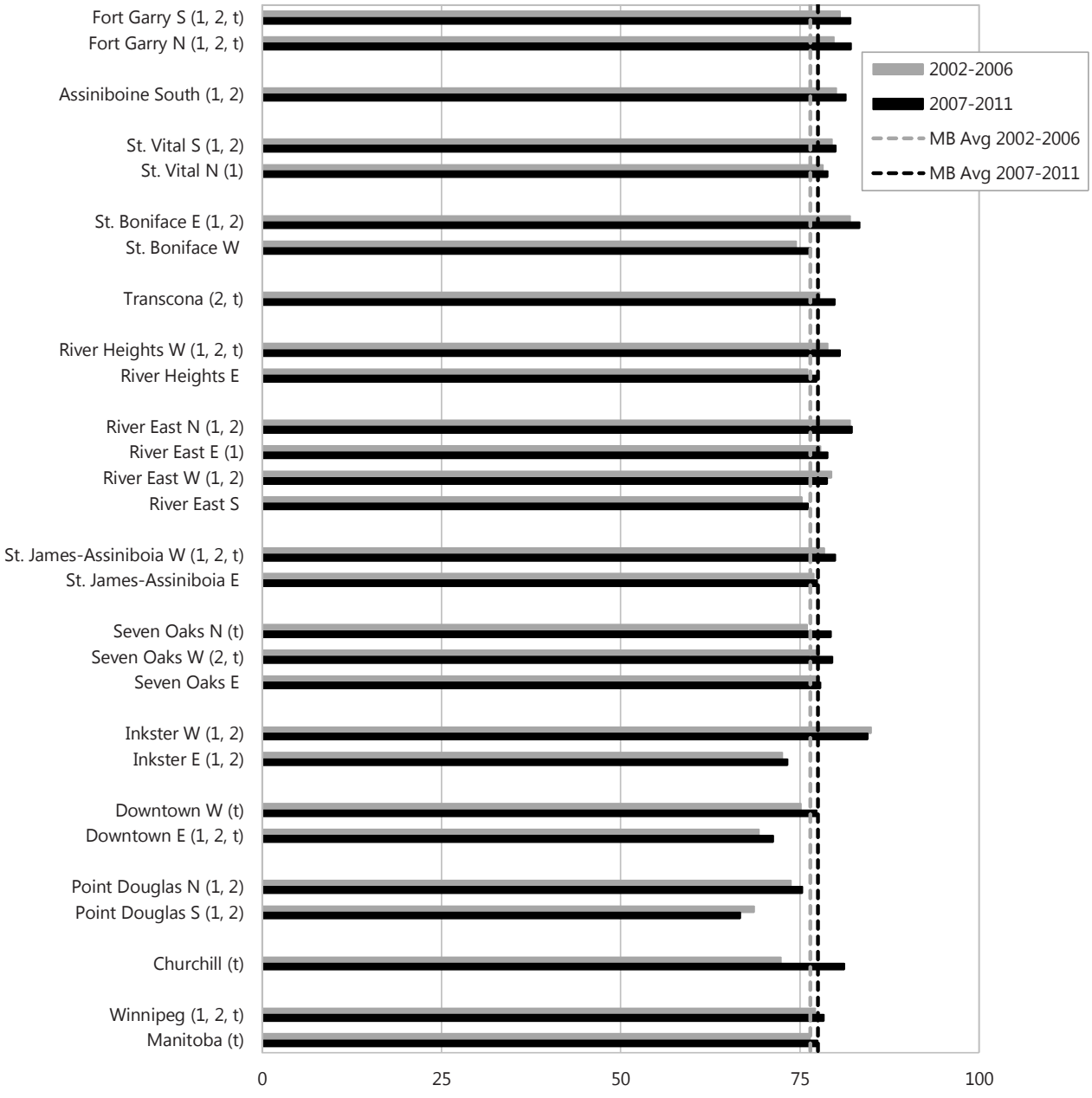


Figure 3.5.3: Male Life Expectancy by Winnipeg NC, 2002–2006 and 2007–2011

Life expectancy (at birth) in years



3.6 Female Life Expectancy

Definition: the expected length of life (in years) of female residents at birth, based on the patterns of mortality in the population for the preceding five years. Life expectancy was calculated directly from the mortality experience of local residents using the "life table" approach. Crude values are shown for two 5–year periods: 2002–2006 and 2007–2011. Even small differences in life expectancy values imply important differences in health status. It has been estimated that if all cancers could be eradicated, life expectancy for females would increase by approximately 3.4 years (Mackenbach et al., 1999).

Key Findings

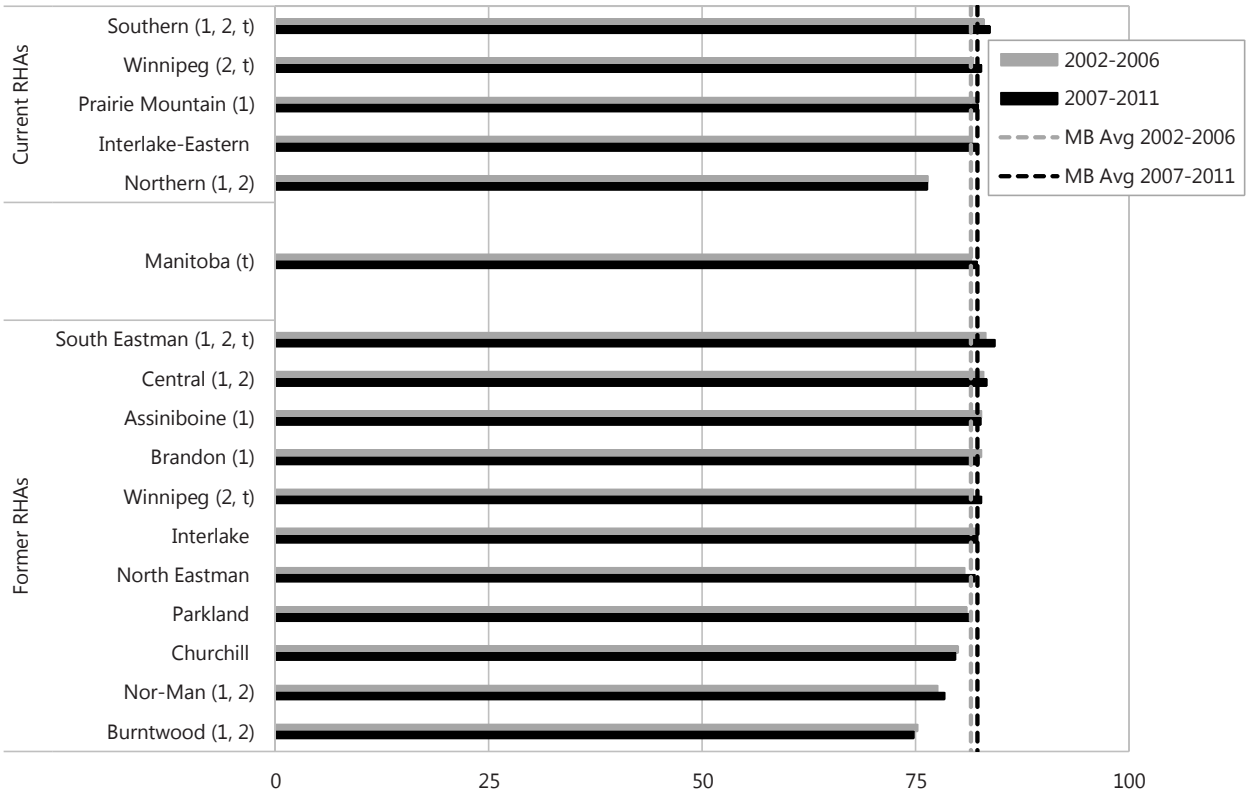
- Life expectancy for females in Manitoba increased from 81.5 to 82.2 years. Significant increases were seen in Southern and Winnipeg regions with no change among residents of the other regions.
- Values are strongly inversely related to PMR at regional and district levels as expected, though life expectancy numbers show less variation across areas.
- Northern region had values consistently lower than the provincial average, while Southern had values consistently higher than average. Winnipeg and Prairie Mountain had higher than average values in one time period, but not the other.
- Several rural districts had particularly high values: Stanley, Roland/Thompson, and Tache in Southern region and Brandon South End in Prairie Mountain.
  - Most of these values were based on relatively small populations and a low number of deaths, so they need to be interpreted with caution. Very long lives lived by a few people could have affected these results.
- Conversely, low life expectancy was seen in the Northern Remote district of Interlake–Eastern and in several districts of Northern region.
- Among rural residents, there were strong relationships between income and female life expectancy in both time periods: life expectancy was shorter for residents of lower income areas (Appendix 2). The relationship for residents of urban areas was weaker, and did not reach significance in the second time period. However, life expectancy for those in the lowest income areas was distinctly lower.

Comparison to Other Findings

- These values are consistent with and extend the findings of the 2009 Atlas, which also showed increases in female life expectancy over time (Fransoo et al., 2009). These also mirror decreases in total mortality, PMR, and potential years of life lost.
- Life Expectancy estimates from Statistics Canada (CANSIM Table 102–0511 and 102–0512) for Manitoba females were very similar (Statistics Canada, 2009; Statistics Canada, 2012), but revealed that Manitoba values were slightly below Canadian averages:
  - Manitoba: 81.4 and 81.9 (in 2002–2006 and 2007–2009, respectively)
  - Canada: 82.6 and 83.3 (in 2002–2006 and 2007–2009, respectively)

Figure 3.6.1: Female Life Expectancy by RHA, 2002–2006 and 2007–2011

Life expectancy (at birth) in years



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.6.2: Female Life Expectancy by District, 2002–2006 and 2007-2011

Life expectancy (at birth) in years

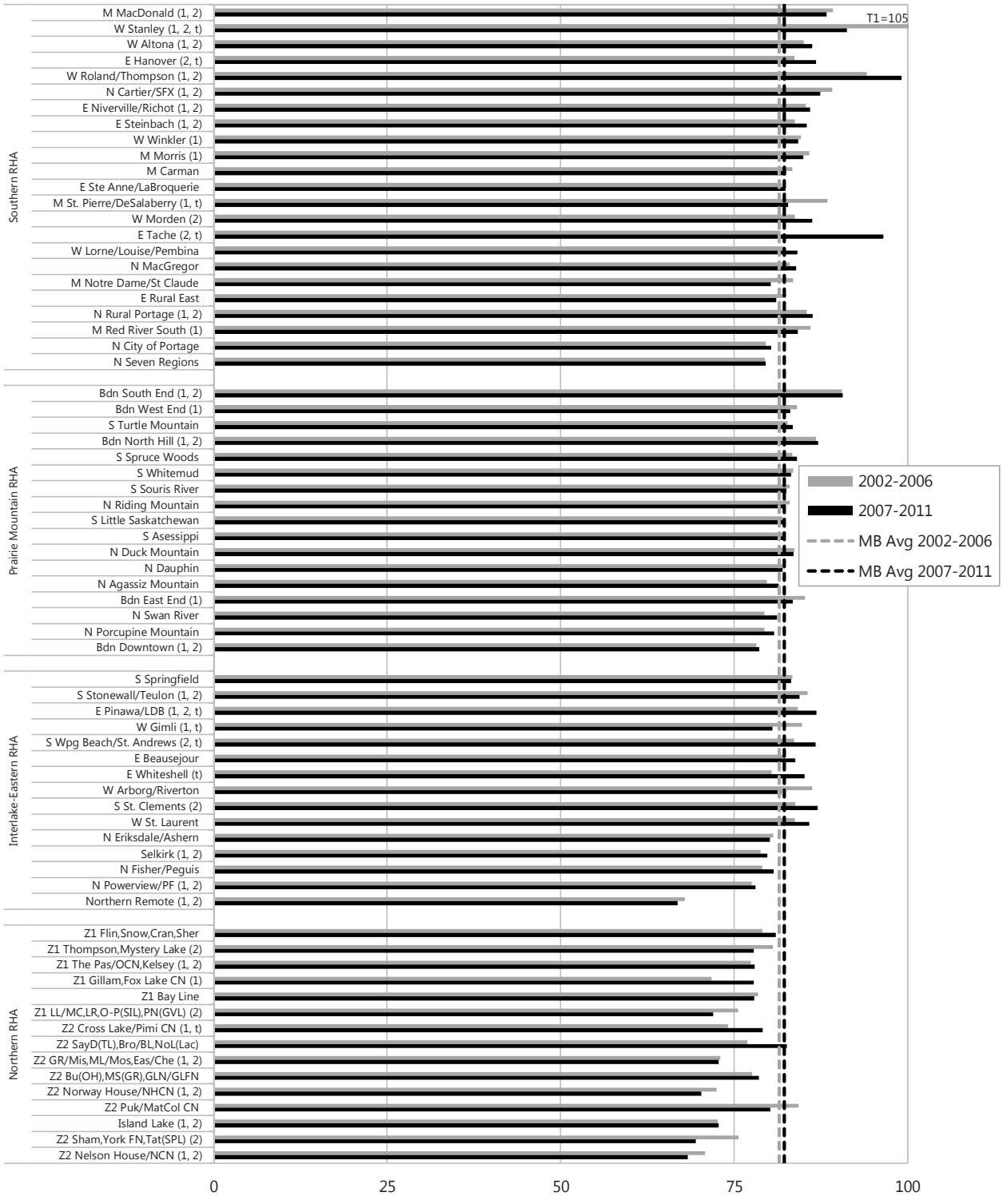
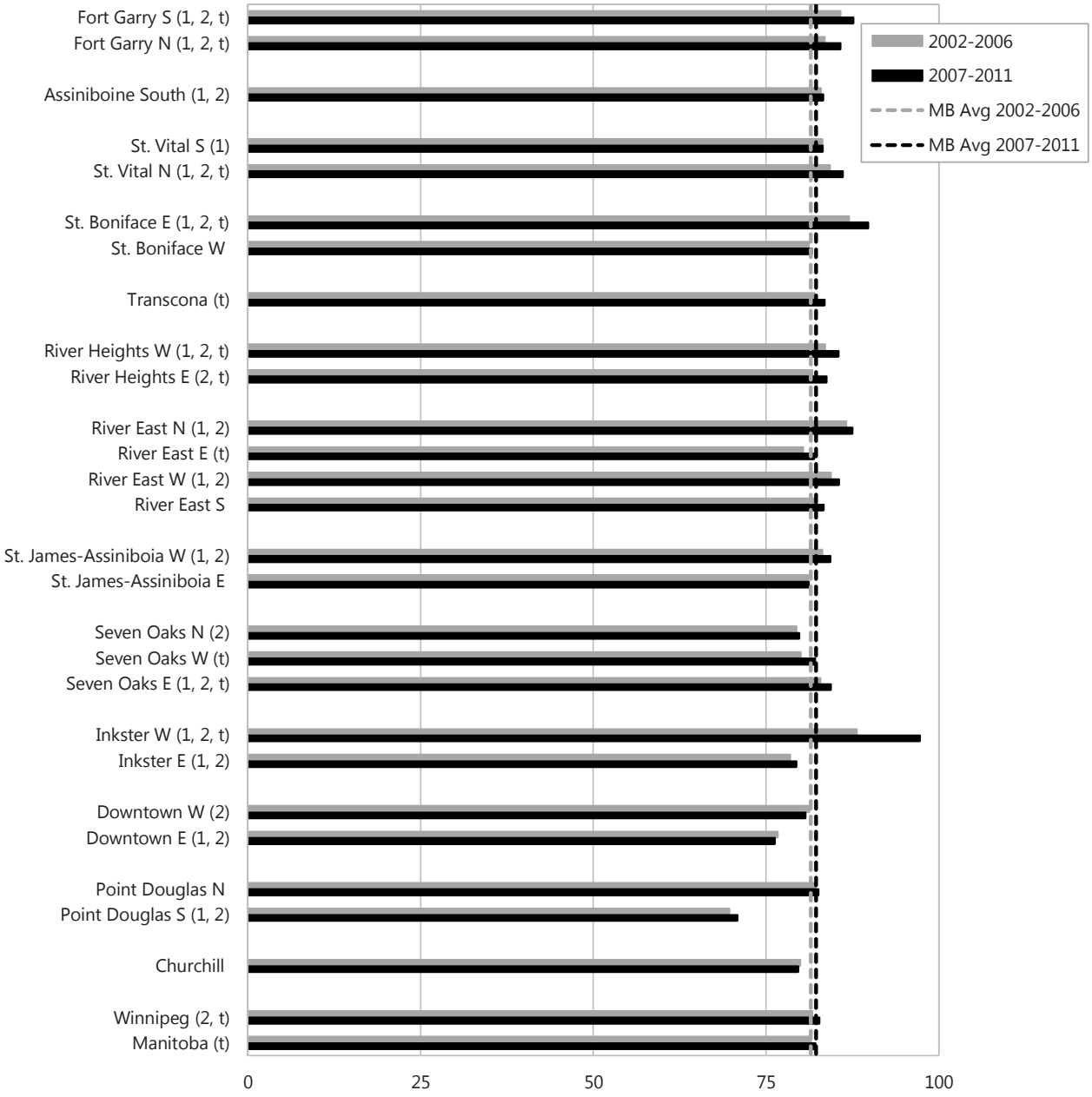


Figure 3.6.3: Female Life Expectancy by Winnipeg NC, 2002–2006 and 2007–2011

Life expectancy (at birth) in years



3.7 Potential Years of Life Lost (PYLL)

Definition: the number of potential years of life lost by residents aged 1 to 74 per 1,000 residents aged 1 to 74. For each death, the PYLL value is calculated as the difference (in years) between age at death and 75 years of age. PYLL is more sensitive to deaths at young ages than other mortality indicators. See Glossary for further details. Average annual rates were calculated for two 5–year periods, 2002–2006 and 2007–2011, and were age– and sex–adjusted to the Manitoba population aged 1 to 74 in the first time period.

Key Findings

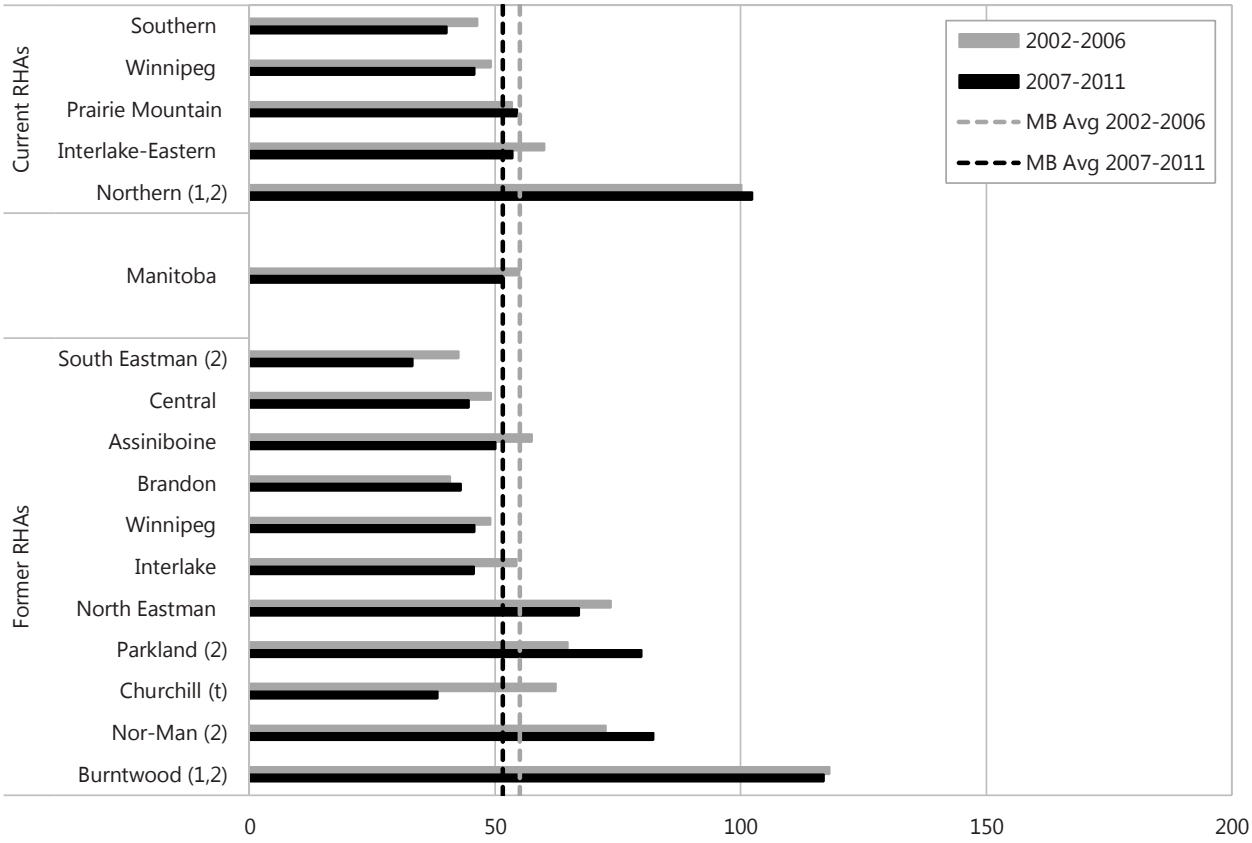
- The rate of potential years of life lost was stable over time; the decrease from 55.0 to 51.5 years per 1,000 Manitobans aged 1 to 74 was not statistically significant.
- Changes over time varied across the regions, though none were statistically significant. Northern and Prairie Mountain had slight increases, while the other regions had slight decreases.
  - This lack of statistical significance despite the substantial decrease in overall rates was caused by the variability across areas, age, and sex. Therefore, an alternate model which did not include region, age or sex was also created. The results of that model showed that the decrease in PYLL rates was significant ($p<0.0001$). The difference between the two models implies that even though the decrease over time was not consistent across all areas within Manitoba, the overall decrease was significant.
- Northern had the highest rates in both time periods, and they were significantly higher than the provincial averages.
- PYLL values appeared to be related to PMR as expected: areas with less healthy populations generally had higher PYLL values.
- Rates were particularly high in the Northern Remote district of Interlake–Eastern, several districts of Northern, and the Point Douglas South area of Winnipeg.
- There were very strong relationships between income and PYLL rates in urban and rural areas in both time periods: PYLL rates were higher for residents of lower income areas (Appendix 2).
  - Rates for the lowest income quintile areas (rural and urban) were particularly high.
  - PYLL values decreased over time in all income quintile areas except the lowest income rural group, where they increased.

Comparison to Other Findings

- The small decrease in rates of potential years of life lost found in this report are consistent with and extend the findings from the 2009 Atlas (Fransoo et al., 2009).

Figure 3.7.1: Potential Years of Life Lost by RHA, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of PYLL per 1,000 residents aged 1-74



1 indicates area's rate was statistically different from Manitoba average in first time period
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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.7.2: Potential Years of Life Lost by District, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of PYLL per 1,000 residents aged 1-74

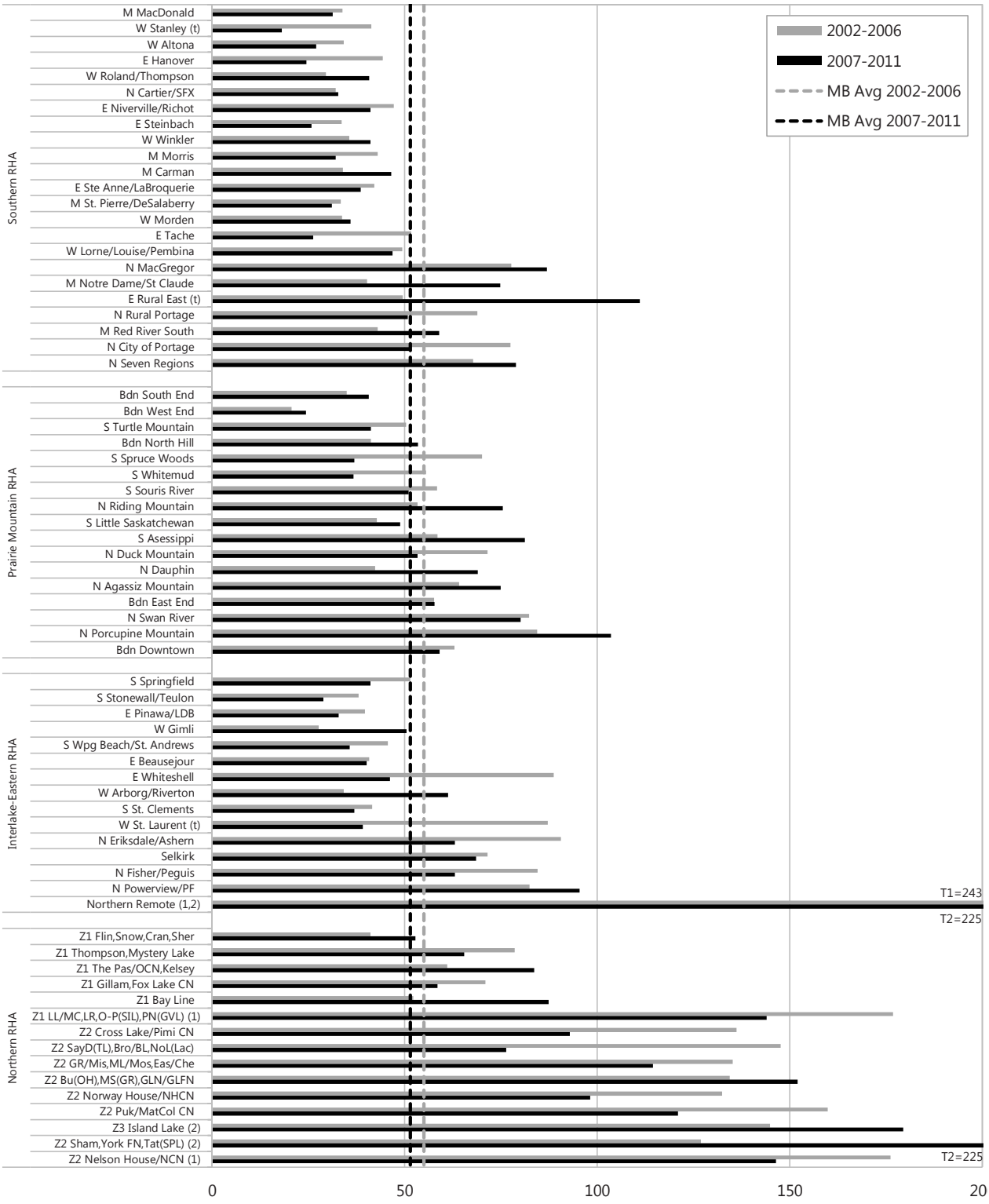
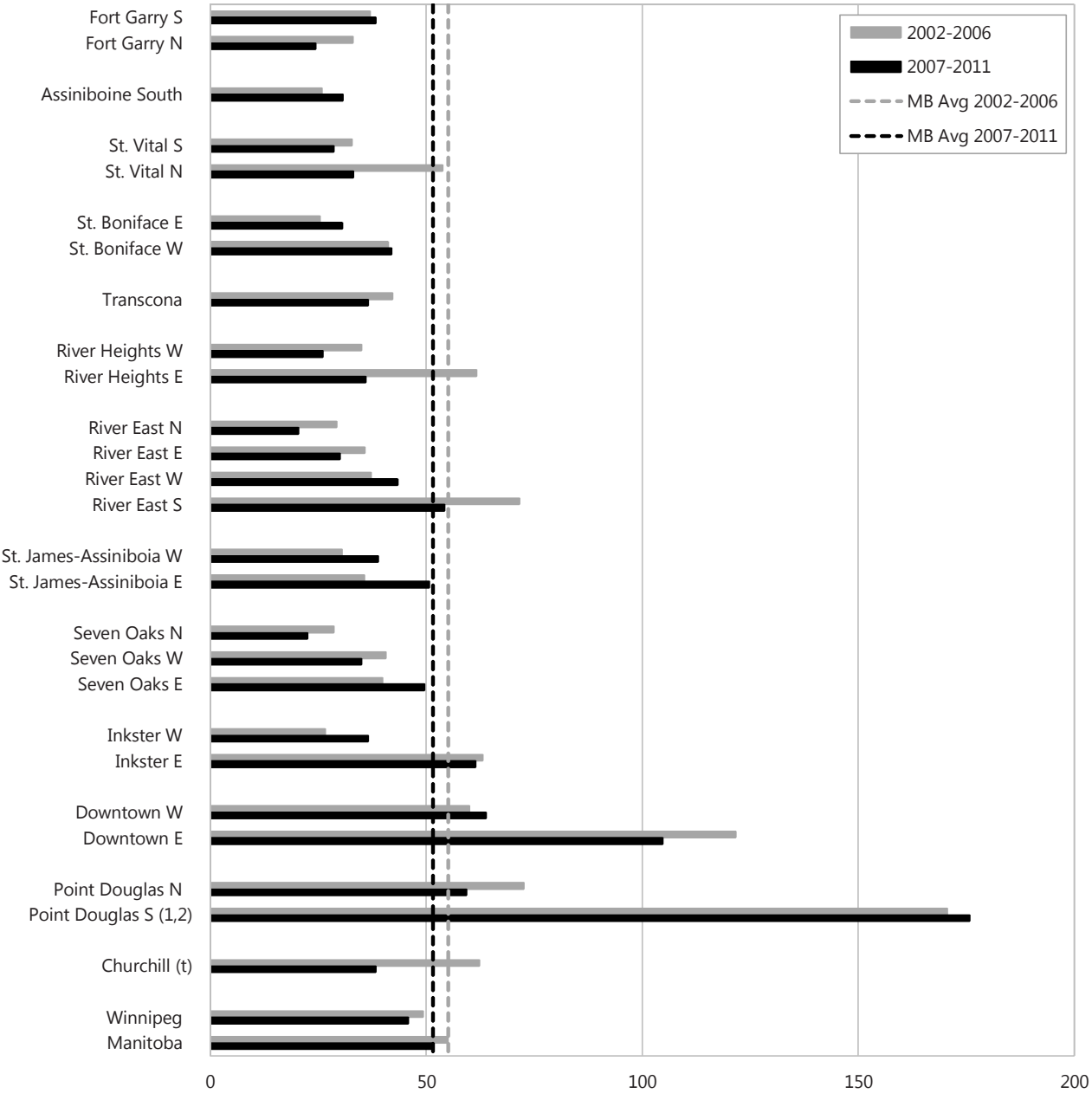


Figure 3.7.3: Potential Years of Life Lost by Winnipeg NC, 2002–2006 and 2007–2011

Age- and sex-adjusted average annual rate of PYLL per 1,000 residents aged 1-74



3.8 Suicide Rates

Definition: the number of deaths due to **suicide** among residents aged 10 and older per 1,000 residents aged 10 and older, per year. Suicide was defined as a death record in Vital Statistics data with any of the following causes:

- Intentional self–harm: ICD–10–CA codes X60–X84
- Late effects of intentional self–harm: ICD–10–CA code Y87.0
- Poisoning of undetermined intent: ICD–10–CA codes Y10–Y19
- Other events of undetermined intent: ICD–10–CA codes Y20–Y34

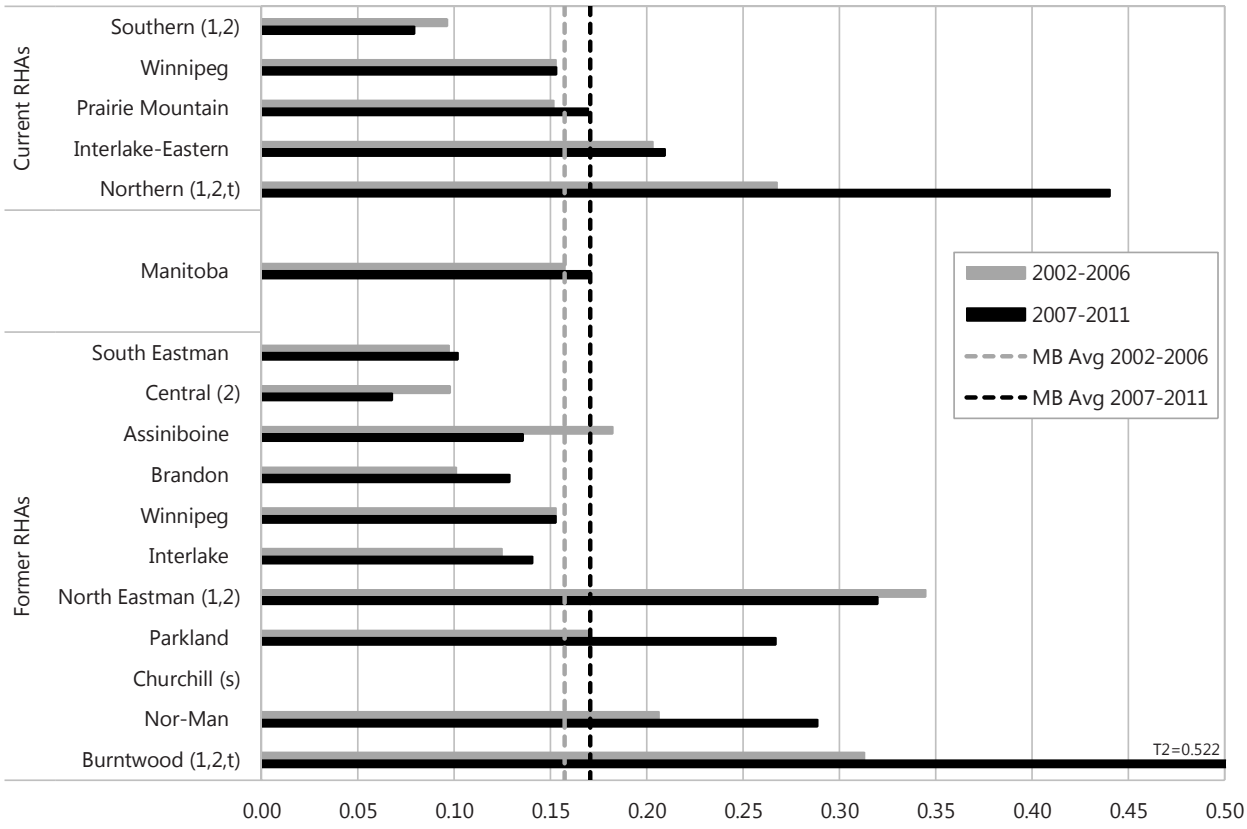
A relatively "inclusive" definition was used in an attempt to overcome suspected under–counting of suicides in administrative data; however, deaths due to accidental poisoning were excluded. Results are shown by RHA and Winnipeg CA but not by District, due to the relatively small number of suicides in smaller areas. Average annual rates were calculated for two 5–year periods, 2002–2006 and 2007–2011, and were age– and sex–adjusted to the Manitoba population aged 10 and older in the first time period.

Key Findings

- The suicide rate in Manitoba was stable over time; the slight increase from 0.157 to 0.171 was not statistically significant.
- This overall stability was reflected in several regions, though Northern had a significant increase over time. The decrease in Southern was not significant.
- Suicide rates were clearly related to PMR, with higher suicide rates among residents of regions with higher PMR. This trend was more consistent among the new regions than the former RHAs. There were also some interesting differences in rates and time trends among former RHAs within the new regions, especially Interlake–Eastern, Prairie Mountain, and Northern (that is, the rates can be quite different between former RHAs that have been amalgamated).
- Suicide rates in Winnipeg CAs were also related to PMR, though not as directly as among regions.
- There were very strong relationships between income and suicide rates in urban and rural areas in both time periods: suicide rates were dramatically higher for residents of lower income areas (Appendix 2).

Figure 3.8.1: Suicide Rate by RHA, 2000-2004 and 2005-2009

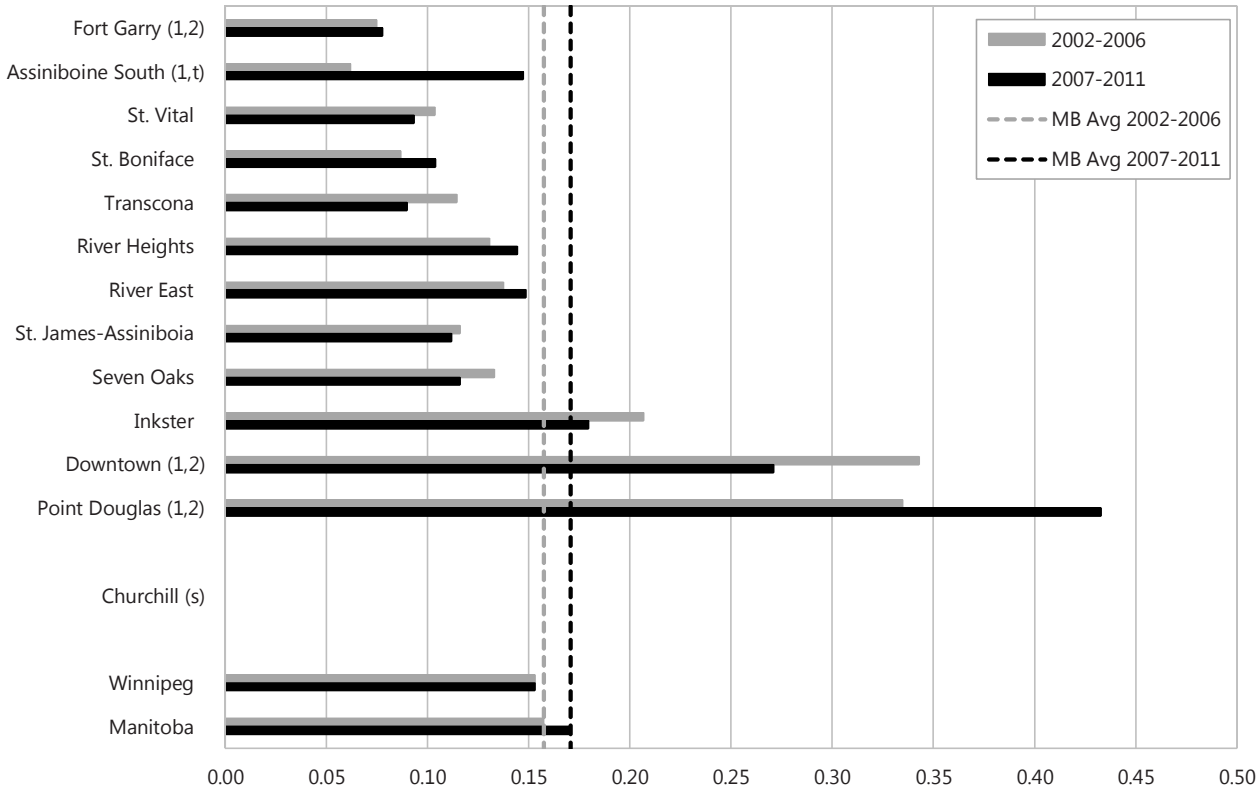
Age- and sex-adjusted average annual rate of suicide per 1,000 residents aged 10+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 3.8.2: Suicide Rate by Winnipeg CA, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of suicide per 1,000 residents aged 10+



CHAPTER 4: PHYSICAL ILLNESS

Key Findings in Chapter 4

- Overall, the findings reveal that the diagnosed prevalence of most **chronic diseases** decreased over time. The changes varied in size, and across and within the health regions and income groups.
- The exceptions were **hypertension** and diabetes, both of which increased in prevalence by about 1% of the population.
  - This represents a large increase for diabetes (from 9.0% to 10.0%), but a relatively small increase for hypertension (from 24.8% to 25.6%).
  - While these increases seem like bad news, they may not be: recent research shows that since the mid–1990s, the mortality associated with diabetes has dropped significantly (Lind et al., 2013). This implies that people with diabetes are living longer, which would increase the prevalence value. These increases are likely related to earlier detection and to improvements in healthcare and self–care for people with diabetes.
  - Interestingly, for both of these conditions, **incidence** rates decreased over time. If these lower incidence rates are sustained or fall even more, then the prevalence values for these diseases will also eventually decrease.
- These decreases suggest that the health of the population continues to improve over time. Unfortunately, these improvements were not shared by all residents: those living in lower income areas saw less or no improvement in chronic disease indicators.
- The results also show that:
  - the prevalence of **arthritis** was stable over time at 21%
  - the prevalence of **total respiratory morbidity** (**TRM**), **ischemic heart disease** (**IHD**), **congestive heart failure** (**CHF**), and **osteoporosis** decreased
  - **heart attack** and **stroke** rates also decreased over time, as did **lower limb amputations among residents with diabetes**
  - the incidence rates for hypertension, diabetes, and heart disease decreased
- All illnesses except osteoporosis were more prevalent among residents of lower income areas, and this pattern held in both urban and rural settings.
  - However, for hypertension, arthritis and osteoporosis, the associations with income were relatively weak in comparison with other diseases.
- Perhaps the most compelling single indicator in this chapter was diabetes incidence (i.e. new cases), which showed much higher rates among residents of the Northern health region and those in the Northern Remote district of Interlake–Eastern. The prevalence of diabetes is already high in these areas, so the results suggest the need for additional attention to address this growing problem. Such efforts may also affect the incidence of hypertension and ischemic heart disease, which were also high in those areas.

Introduction

This chapter is divided into two sections:

- **Section 1** contains prevalence estimates for key chronic diseases, expressed as the percent of the population that "has" the disease during each of two time periods. It should be noted that administrative data do not directly indicate who "has" a given disease, but rather who uses health services for that disease (e.g., physician visits, hospitalization, or prescription drug use). These indicators have been validated against other data sources (e.g., survey data, clinical measures, etc.). The diseases with the highest prevalence are presented first. For selected conditions, estimates of disease incidence (i.e., new cases) are also provided.
- **Section 2** contains indicators of key adverse health events (e.g., heart attacks and strokes), expressed as annual rates because these events could happen to the same person more than once in a given period.

Each indicator starts with a definition which describes the case definition used to identify residents as having the disease or event. Most definitions use a combination of data from physician visits, hospitalizations, and prescription drug use. In Manitoba, these data systems cover the entire population. As of April 1, 2004, hospital claims are coded using the ICD–10–CA system, whereas before that time, and for physician claims during both time periods, the ICD–9–CM system was used. The codes used in each system are listed in the definition for each indicator and in the Glossary entries.

The disease prevalence indicators are based, in part, on data from physician claims (fee–for–service and "shadow" billing claims for salaried physicians). These values likely under–estimate the true prevalence of disease in Northern and Remote areas where a significant amount of care is delivered by nurses.

For hypertension, diabetes, and ischemic heart disease, in addition to the usual indicator of disease prevalence (what proportion of the population already have this condition), we have added indicators of disease incidence—that is, how many people develop the condition in a given year. This is expressed as a rate of new cases per 100 **person–years** and can be thought of as follows: Of 100 people without this disease, how many will develop it over the next year if we assume all 100 people live for the entire year?

Finally, there remains the possibility that a resident with a given chronic disease may not have that diagnosis attributed to them in the time period under study. For example, a resident with diabetes may visit physicians several times for reasons other than their diabetes, so none of those visits would get the diagnosis code for diabetes. In this case, the person would be erroneously classified as not having diabetes in that period. All of the case definitions used in this report have been validated against other data sources (e.g., surveys) and were chosen to provide optimal estimates of population prevalence (Lix, Yogendran, & Mann, 2008; Lix, Yogendran, Burchill, Metge, McKeen, Moore & Bond, 2006).

In the research literature, a number of systems have been developed to measure co–morbidity, to quantify the fact that many people have more than one disease. In the online appendix for this report, we have calculated values for several of these measures, and analyzed their ability to predict one-year mortality or hospital admission. The results show that the performance of these systems are very similar to each other.

Section 1: Chronic Physical Illness

4.1 Hypertension Prevalence

Definition: the percent of residents aged 19 and older with hypertension (high blood pressure) in a one–year period as defined by either:

- at least one hospitalization with an ICD–9–CM code of 401–405 or an ICD–10–CA code of I10–I13, I15, or
- at least one physician visit with an ICD–9–CM code listed above or
- at least two prescriptions for hypertension medication (see Glossary)

Prevalence was calculated for 2006/07 and 2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in 2006/07. See Glossary for further details.

Key Findings

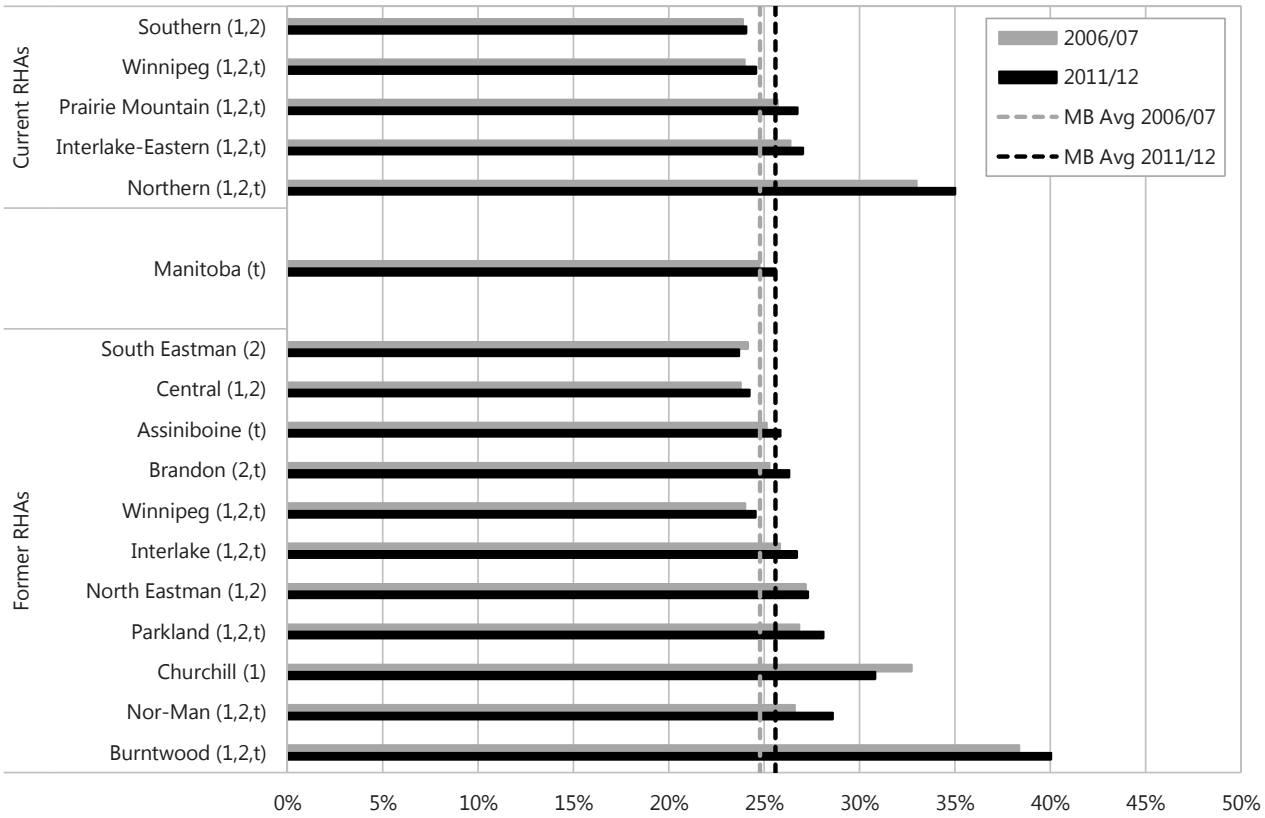
- Hypertension prevalence increased in Manitoba from 24.8% to 25.6% of the population aged 19 and older. Prevalence increased in all regions except Southern.
- Hypertension prevalence was related to PMR at the regional level, with the lowest values in Southern and Winnipeg and the highest in Northern.
  - The crude rates in Northern (Appendix 2) are actually lower than the provincial average, but the high adjusted rates indicate the prevalence is higher than expected for the young population living there.
- Prevalence was particularly high in several districts in Northern and two districts in Interlake–Eastern.
- There was remarkably little variation across NCs within Winnipeg.
- There were significant relationships between income and hypertension prevalence in urban and rural areas in both time periods: prevalence was higher among residents of lower income areas (Appendix 2). In rural areas, this gap widened over time.

Comparison to Other Findings

- These results, along with those from previous Atlas reports, suggest a slow but steady increase in hypertension prevalence over time (Fransoo et al., 2009; Martens et al., 2003).
- However, this trend may soon change, as the incidence rate of hypertension is decreasing (see Hypertension Incidence).

Figure 4.1.1: Prevalence of Hypertension by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent residents aged 19+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.1.2: Prevalence of Hypertension by District, 2006/07 and 2011/12

Age- and sex-adjusted percent residents aged 19+ diagnosed with disorder

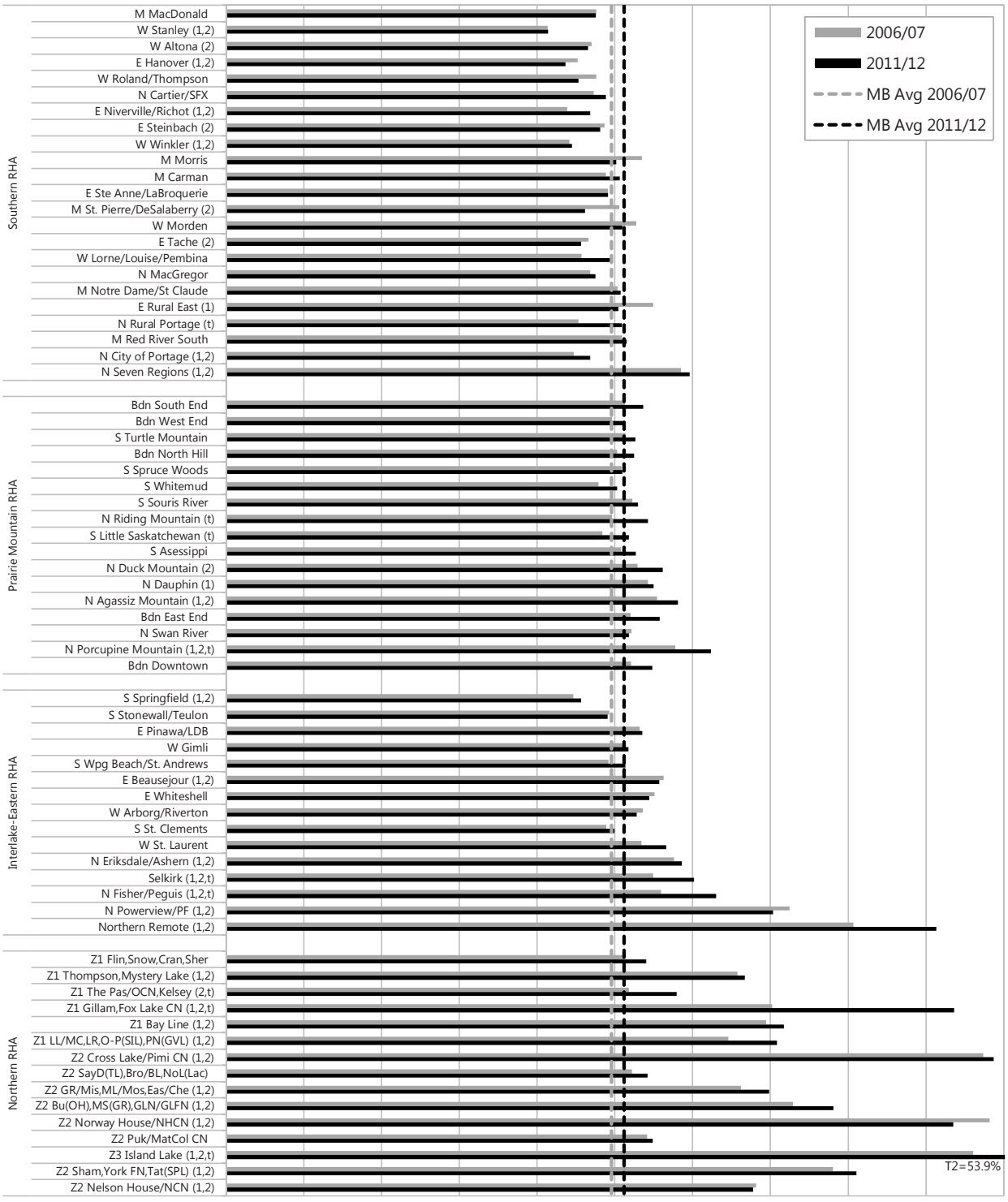
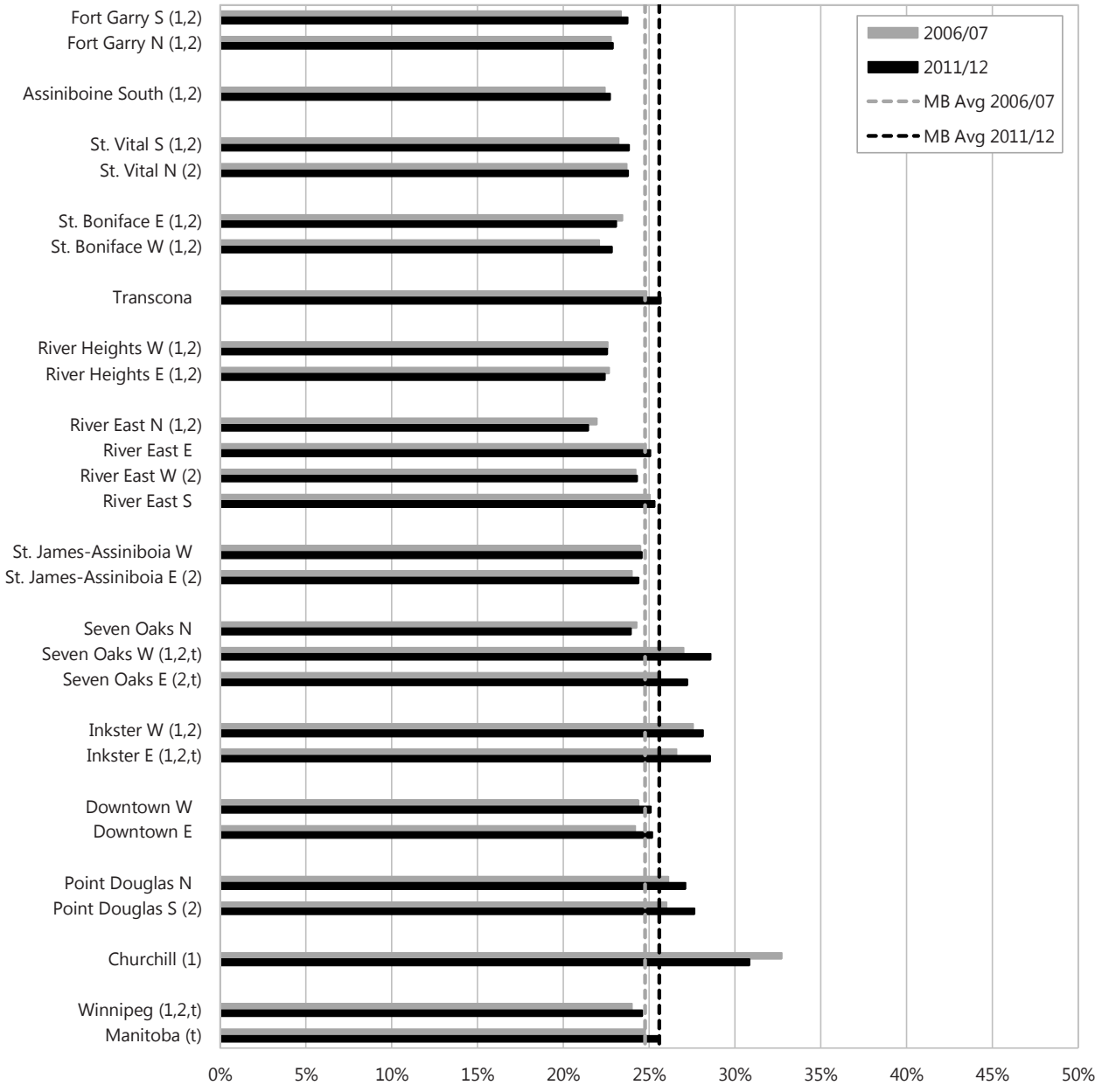


Figure 4.1.3: Prevalence of Hypertension by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



4.2 Hypertension Incidence

Definition: the average number of new cases of residents aged 19 and older with hypertension (high blood pressure) per 100 person–years as defined by either:

- at least one hospitalization with an ICD–9–CM code of 401–405 or an ICD–10–CA code of I10–I13, I15, or
- at least one physician visit with an ICD–9–CM code listed above, or
- at least two prescriptions for hypertension medication (see Glossary)

Incidence of new cases per 100 person–years was calculated for 2006/07 and 2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in 2006/07. See Glossary for further details.

Key Findings

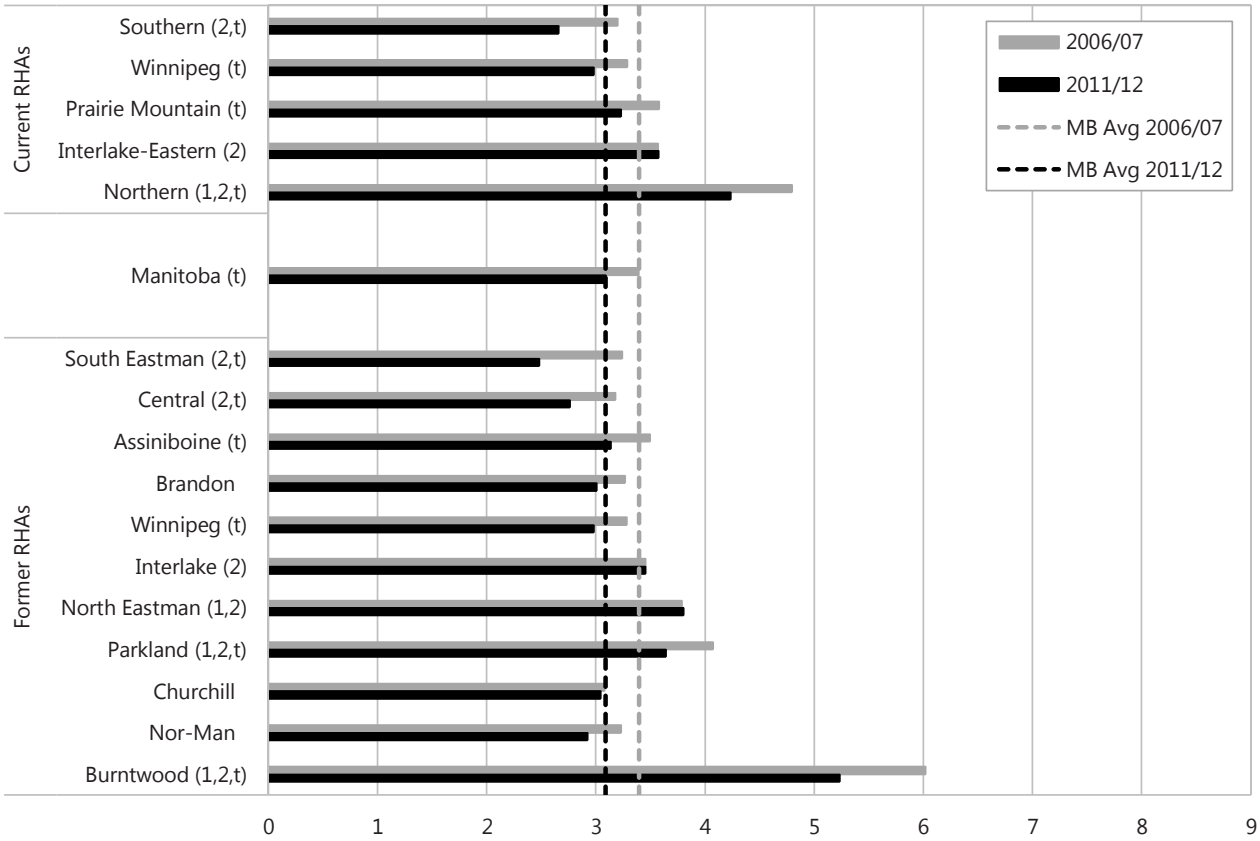
- Hypertension incidence decreased in Manitoba from 3.40 to 3.09 cases per 100 person–years. (As explained above, these values can be interpreted as percent, presuming all residents lived for at least one year). Incidence decreased in all regions except Interlake–Eastern.
- Hypertension incidence rates were related to PMR at the regional level, with the lowest rates in Southern and the highest in Northern. Interestingly, this relationship did not hold as strongly across districts of rural regions or NCs in Winnipeg; at these smaller levels, results were more variable.
- Incidence was particularly high in several districts in Northern and two districts in Interlake–Eastern and particularly low in several districts in Southern (especially in the second time period).
- There was relatively little variation across NCs within Winnipeg.
- There were significant relationships between income and hypertension incidence in urban and rural areas in both time periods: incidence rates were higher among residents of lower income areas (Appendix 2).

Comparison to Other Findings

- This indicator has not been included in MCHP reports before. However, we applied the same definition to earlier time periods. The results revealed that over the last 10 years, hypertension incidence decreased steadily from 3.52 to 3.40 to, most recently, 3.09 new cases per 100 person–years.

Figure 4.2.1: Incidence of Hypertension by RHA, 2006/07 and 2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.2.2: Incidence of Hypertension by District, 2006/07 and 2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+

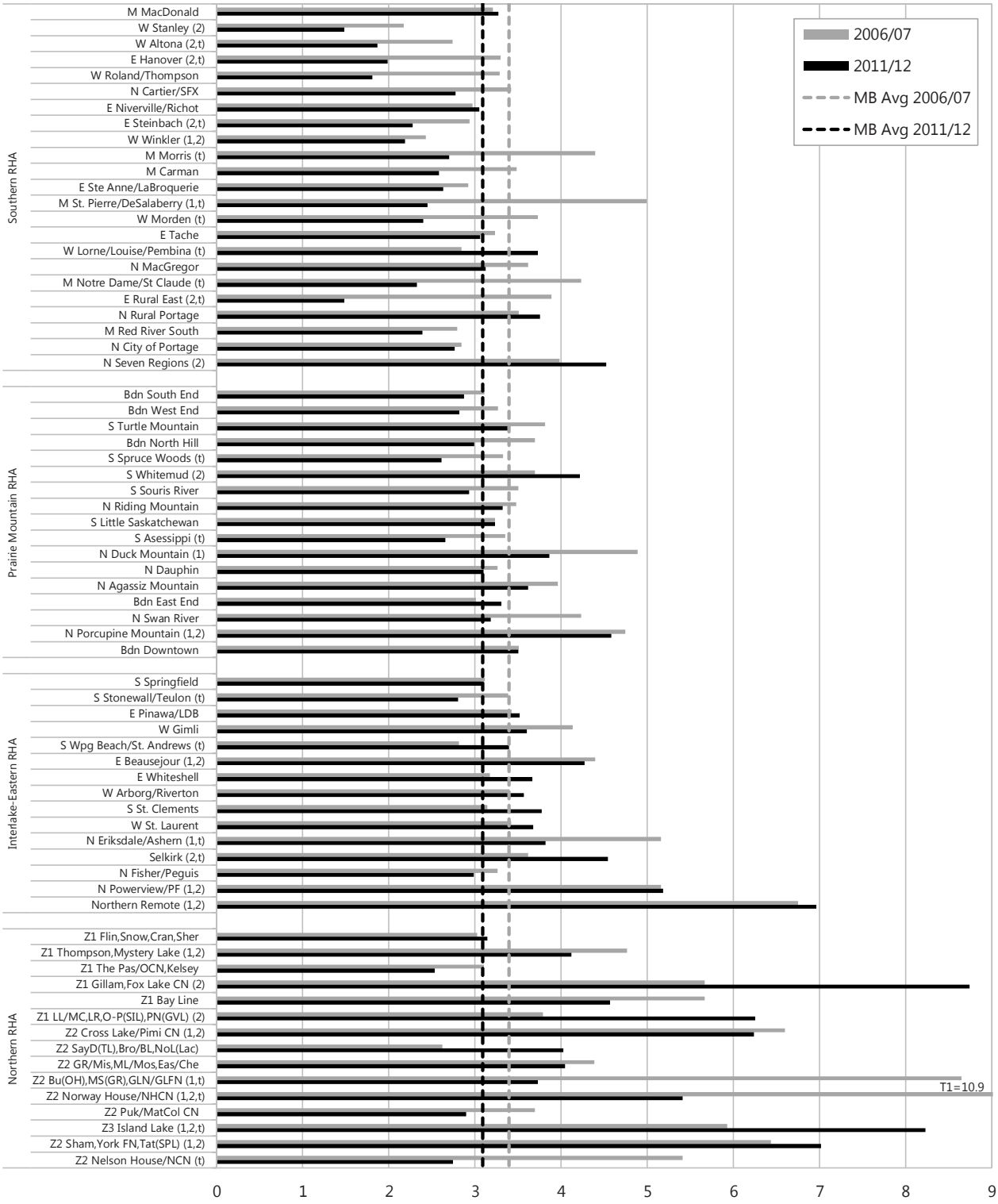
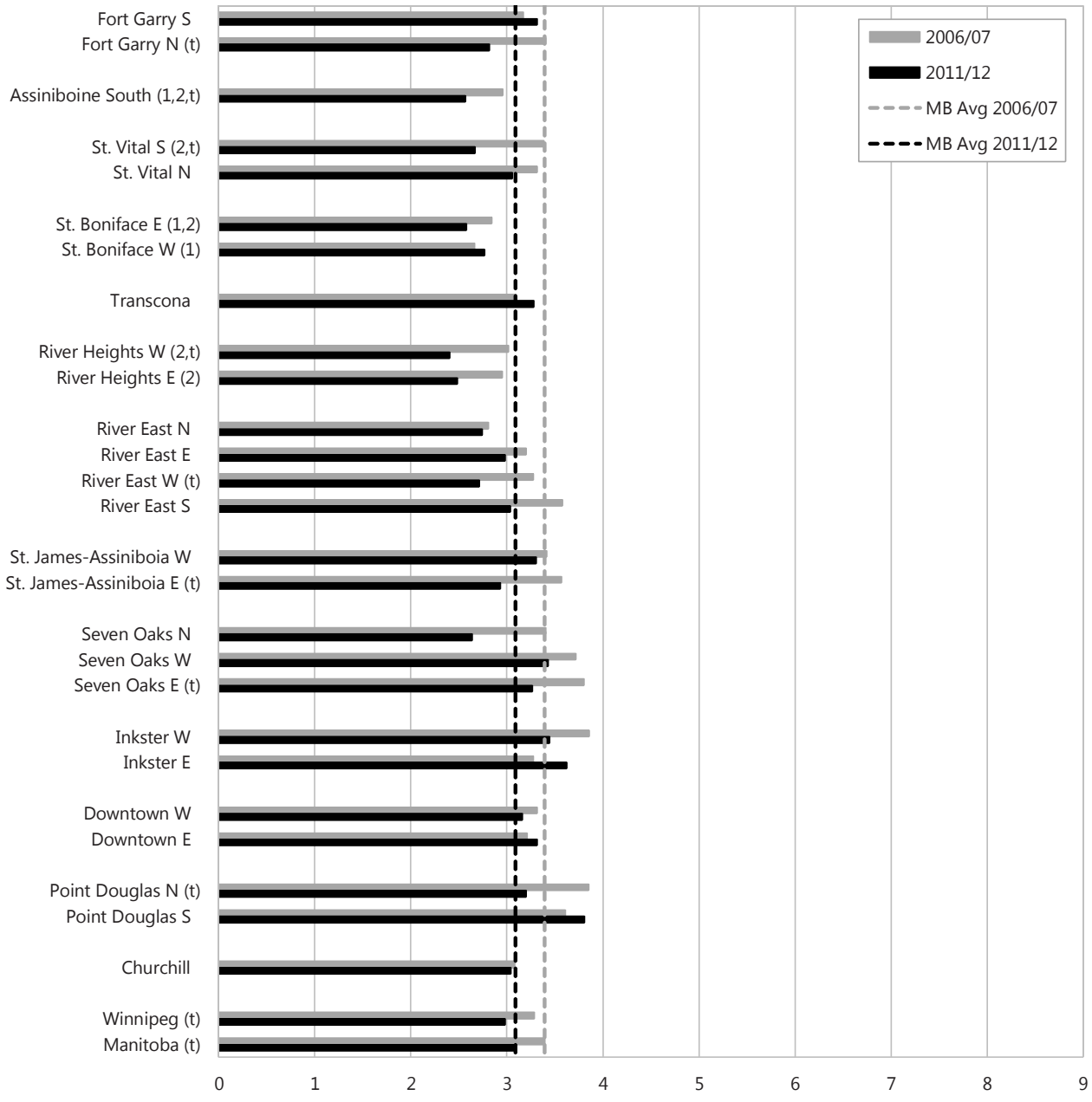


Figure 4.2.3: Incidence of Hypertension by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



4.3 Arthritis Prevalence

Definition: the percent of residents aged 19 and older with arthritis (rheumatoid or osteo–arthritis) in a two–year period as defined by either:

- at least one hospitalization with an ICD–9–CM code of 274, 446, 710–721, 725–729, 739 or an ICD–10–CA code of M00–M03, M05–M07, M10–M25, M30–M36, M65–M79, or
- at least two physician visits with an ICD code listed above, or
- one physician visit with an ICD code listed above and at least two prescriptions for arthritis medications (see Glossary).

Prevalence was calculated for 2005/06–2006/07 and 2010/11–2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in the first time period.

Key Findings

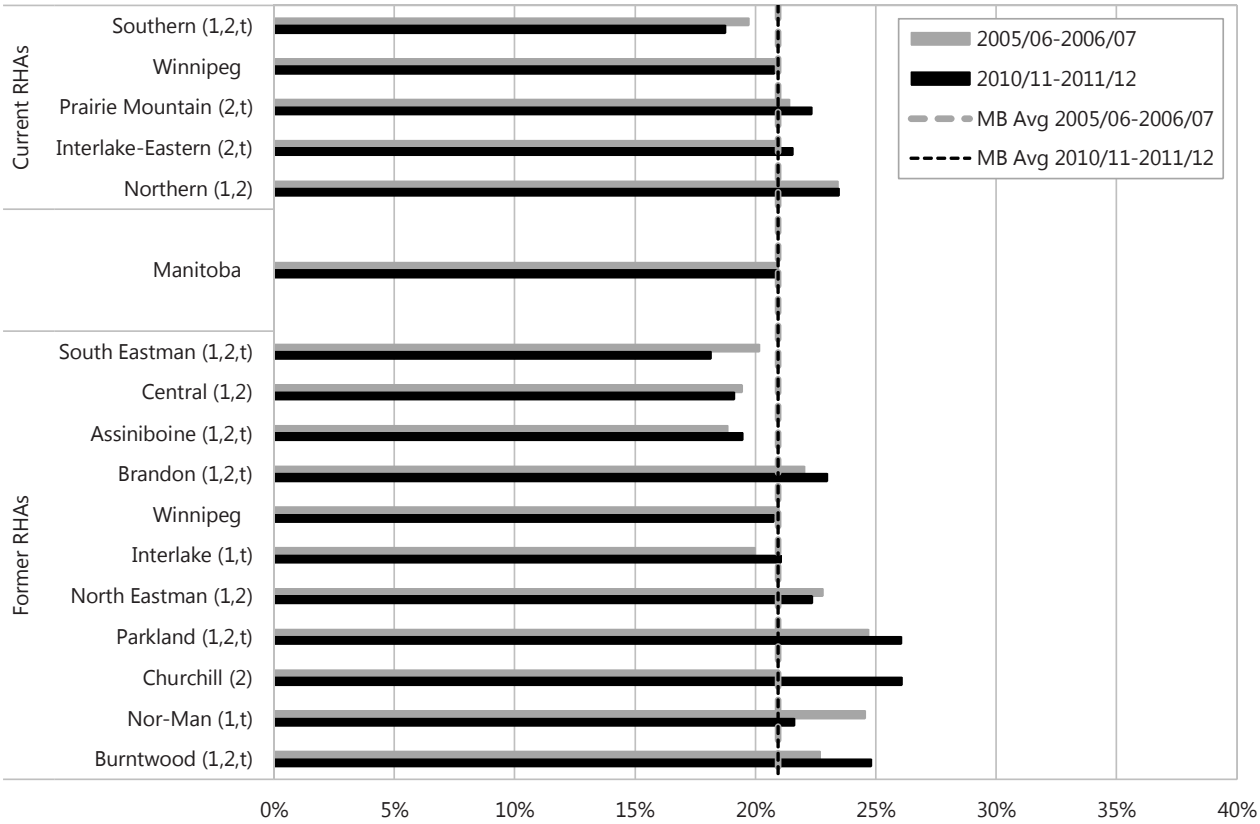
- For Manitoba overall, the prevalence of arthritis did not change over time, remaining at 21%. However, there was a decrease in Southern and increases in Prairie Mountain and Interlake–Eastern.
- Arthritis prevalence appeared to be somewhat related to PMR at the regional level. Prevalence was lowest in Southern and highest in Northern, though the differences were modest and non–linear.
- There was substantial variation in arthritis prevalence across the districts of the rural regions, but relatively little across NCs in Winnipeg.
- There were statistically significant relationships between income and arthritis prevalence in urban and rural areas in both time periods: arthritis prevalence was higher among residents of lower income areas (Appendix 2). The gradient was steeper in urban than rural areas, but got steeper over time in rural areas.

Comparison to Other Findings

- The values reported here are generally similar to the 2009 Atlas (Fransoo et al., 2009) and previous MCHP reports (Finlayson, Ekuma, Yogendran, Burland, & Forget, 2010; Martens et al., 2003; Metge et al., 2009), though there were large differences in some small areas.

Figure 4.3.1: Prevalence of Arthritis by RHA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.3.2: Prevalence of Arthritis by District, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder

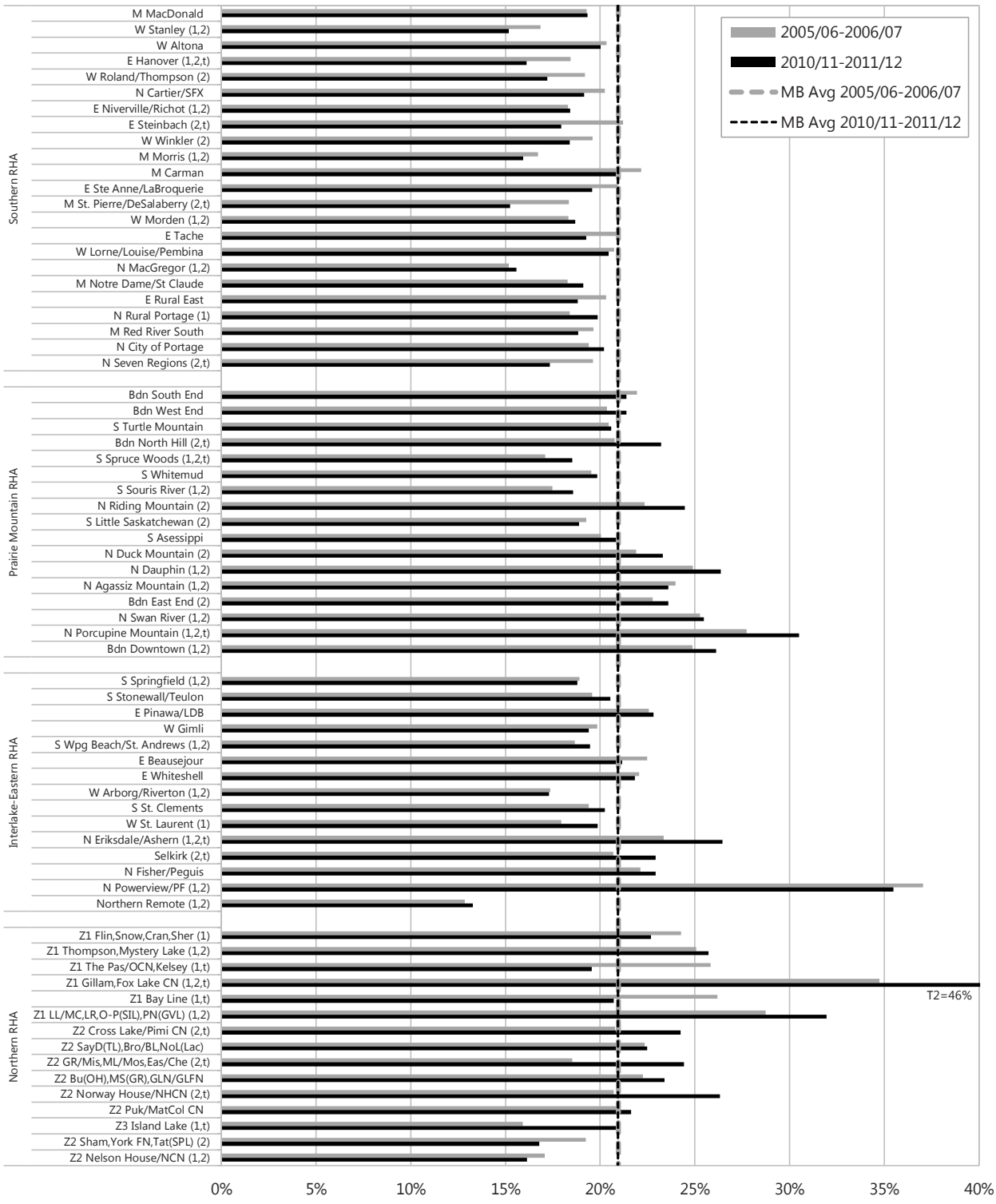
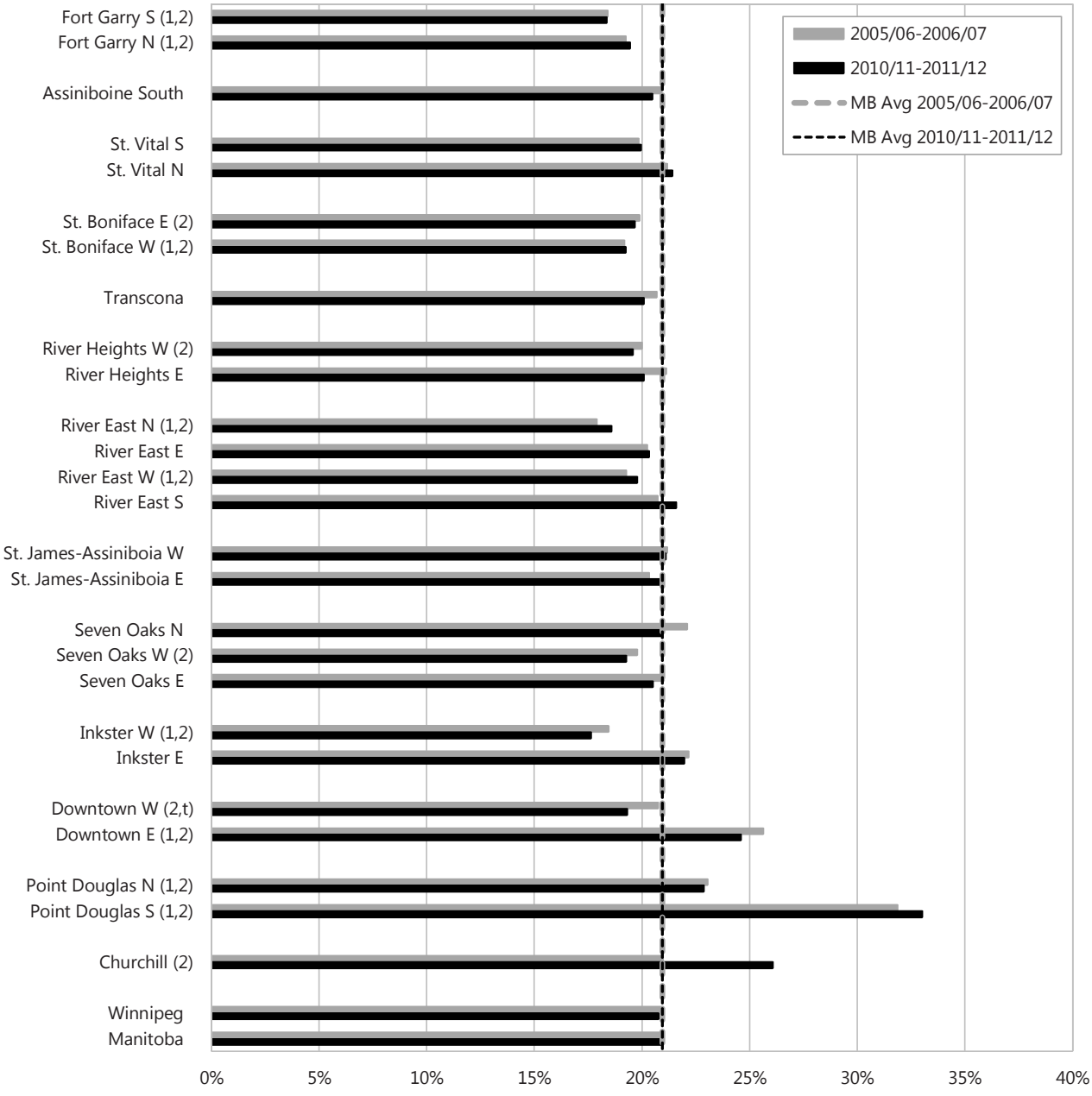


Figure 4.3.3: Prevalence of Arthritis by Winnipeg NC, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



4.4 Total Respiratory Morbidity (TRM) Prevalence

Definition: the percent of residents (all ages) with a respiratory disease (asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction) in a one–year period as defined by either:

- at least one hospitalization with an ICD–9–CM code of 466, 490, 491, 492, 493, 496 or an ICD–10–CA code of J20, J21, J40–J45, or
- at least one physician visit with an ICD–9–CM code listed above

Prevalence was calculated for 2006/07 and 2011/12 and was age– and sex–adjusted to the Manitoba population in 2006/07. See Glossary for further details.

Key Findings

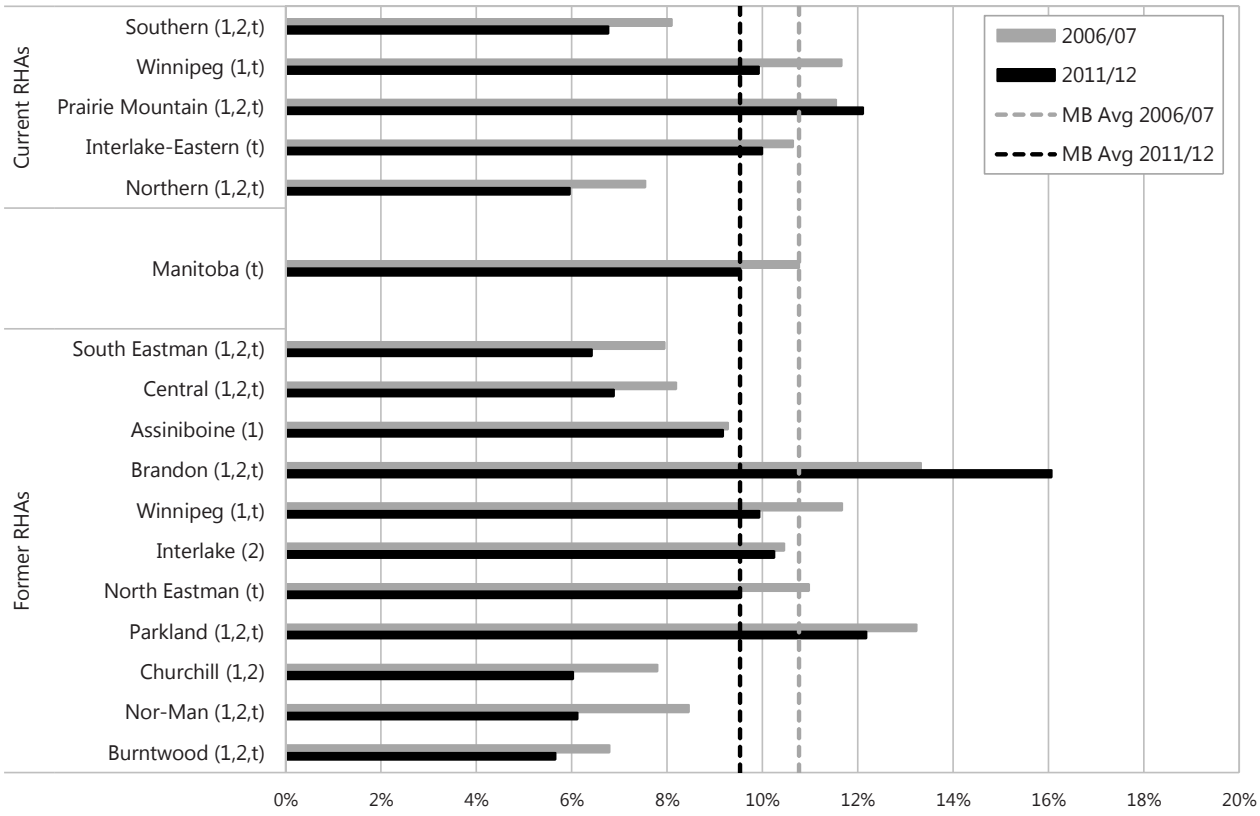
- Total respiratory morbidity prevalence decreased in Manitoba from 10.8% to 9.5% of the population (all ages). The decrease was relatively consistent across most regions and sub–areas. The increase in Prairie Mountain seemed to be largely driven by residents of the former Brandon RHA.
- There was an unusual relationship between TRM prevalence and PMR: values were highest in the "middle" health status regions and lower in both Southern (most healthy) and Northern (least healthy).
- Prevalence values were lowest in the Northern region and within most of its districts, including (paradoxically) the least healthy ones. This may be related to the limitations of the medical claims data in many Northern districts: (1) much of the primary care for residents in some communities is provided by nurses and not coded into medical claims; and (2) medical claims allow for only a single diagnosis to be entered, and to the extent that many of these same residents have other diagnoses attributed to them (e.g., heart disease, diabetes, etc.), they are less likely to receive a TRM diagnosis.
- The variation in TRM prevalence values across the districts of rural regions was dramatic with values ranging from below 4% to almost 20%. This contrasts with results for the Winnipeg NCs, which had much less variation.
- Relationships with income were different among urban and rural residents (Appendix 2).
  - In urban areas, there was a strong, stepwise relationship, with higher prevalence among residents of lower income areas, in both time periods.
  - Among rural residents, prevalence was highest in the lowest income areas and a bit lower but very similar among residents of the other four income quintile groups. The "linear" trend tests were statistically significant, but need to be interpreted with caution given the non–linear pattern.

Comparison to Other Findings

- The values reported here are similar to those shown in the 2009 Atlas (Fransoo et al., 2009) and suggest an ongoing pattern of decreasing TRM prevalence over time since the mid–1990s. The 2009 Atlas contained a longer–term time trend, which was subsequently updated to 2010 in a follow–up analysis (Fransoo et al 2013).

Figure 4.4.1: Prevalence of Total Respiratory Morbidity by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.4.2: Prevalence of Total Respiratory Morbidity by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) diagnosed with disorder

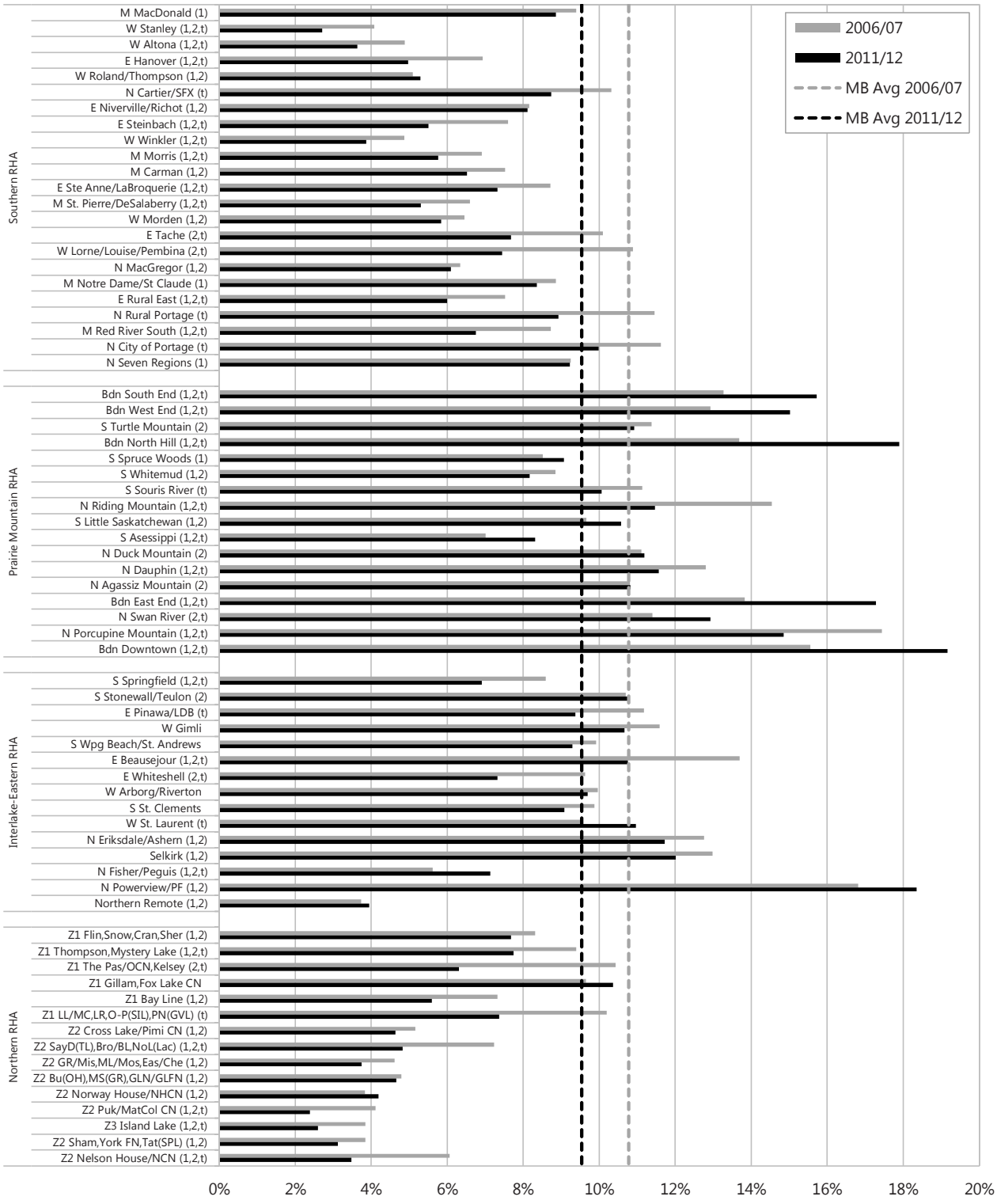
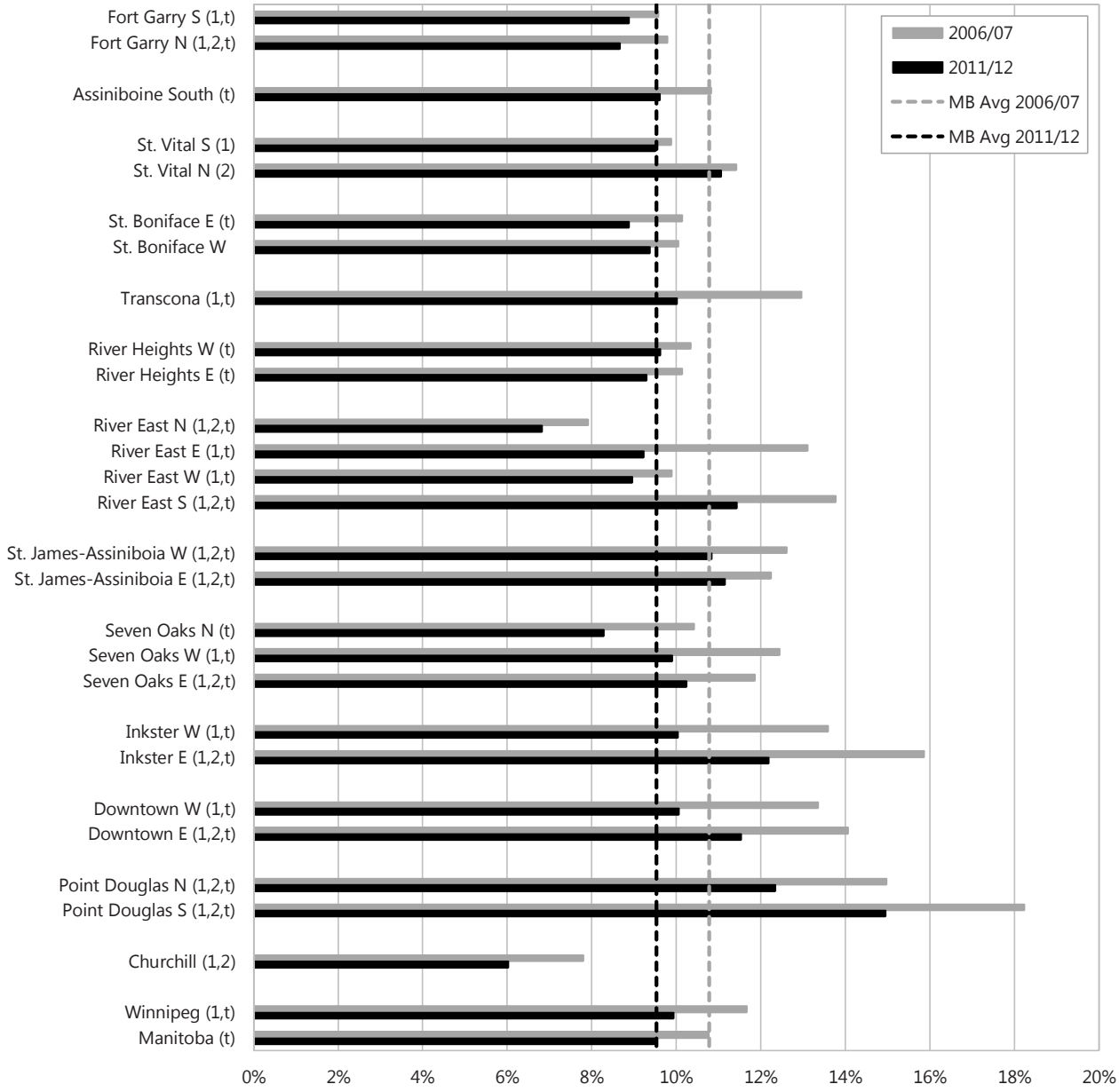


Figure 4.4.3: Prevalence of Total Respiratory Morbidity by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) diagnosed with disorder



4.5 Diabetes Prevalence

Definition: the percent of residents aged 19 and older with diabetes (type 1 or 2) in a three–year period as defined by either:

- at least one hospitalization with a diagnosis with an ICD–9–CM code of 250 or an ICD–10–CA code of E10–E14, or
- at least two physician visits with an ICD–9–CM code listed above, or
- at least one prescription for diabetes medication (**Anatomic**, **Therapeutic**, **Chemical** (**ATC**) code A10; see Glossary)

Prevalence was calculated for 2004/05–2006/07 and 2009/10–2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in the first time period. See Glossary for further details.

Key Findings

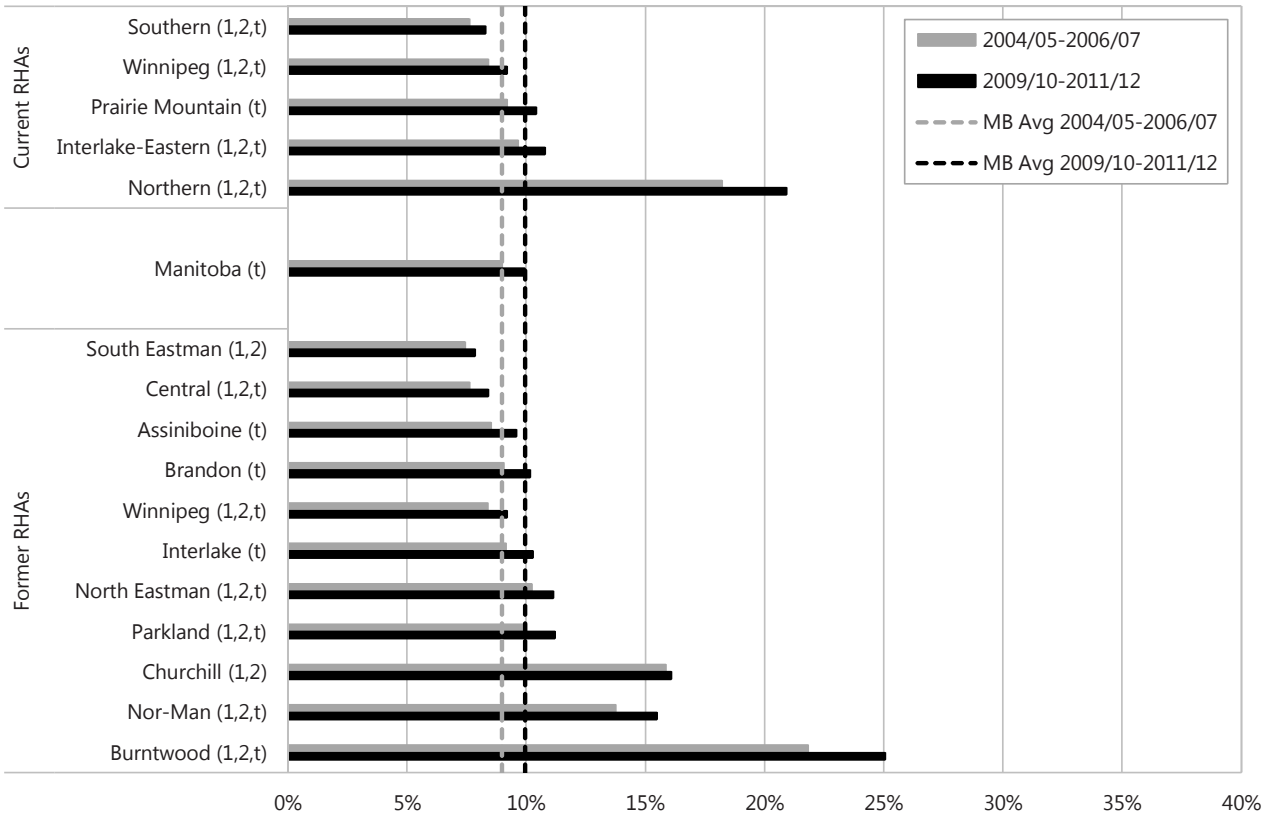
- Diabetes prevalence increased over time in Manitoba from 8.99% to 9.96% of the population aged 19 and older. This increase was reflected in almost all regions, districts, and Winnipeg sub–areas, though in some areas the increase was not statistically significant.
- Diabetes prevalence values were related to PMR, with lower prevalence values in healthier areas and higher prevalence values in less healthy areas. However, this relationship was not linear: the prevalence in Northern was much higher than that in all other regions, in both time periods.
  - Some of this difference is attributable to the higher proportion of Aboriginal peoples living in the Northern health region, as diabetes rates have been shown to be significantly higher among First Nations, Metis, and Inuit residents (Canadian Institute for Health Information, 2009; Martens, Bartlett, Burland, Prior, Burchill, Huq, Romphf, Sanguins, Carter & Bailly, 2010a; Martens, Bond, Jebamani, Burchill, Roos, Derksen, Beaulieu, Steinbach, MacWilliam, Wald, Dik & Sanderson, 2002).
- Among the districts of the rural regions, there was almost ten–fold variation in diabetes prevalence from about 6% to almost 50%.
- There was less variation across NCs within Winnipeg, though some had higher and some had lower than average rates.
- There were strong relationships between income and diabetes prevalence in urban and rural areas in both time periods: diabetes prevalence was higher among residents of lower income areas. Among rural residents, the gap across income groups widened over time (Appendix 2).

Comparison to Other Findings

- These results are consistent with and extend those shown in the 2009 Atlas (Fransoo et al., 2009). Diabetes prevalence continues to increase, though the rate of increase appears to be slowing over time.
- These increases in prevalence are likely related to a combination of two influences: first, longer survival of people with diabetes related to improvements in medical and self–care and second, continuing efforts around awareness and earlier identification of cases.
- The values shown here may be different from those provided by reports using the **Canadian Chronic Disease Surveillance System (CCDSS)** definition (Public Health Agency of Canada, 2008; Public Health Agency of Canada, 2009). CCDSS uses physician visits and hospitalizations to define cases over a two–year period. Our definition similarly used physician visits and hospitalizations, but covers a three–year period, and also includes residents receiving prescription drugs for diabetes (to take advantage of data available in Manitoba; see Glossary). There are also differences regarding the standard population used for adjustment and accumulation of cases over time.

Figure 4.5.1: Diabetes Prevalence by RHA, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
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s indicates data suppressed due to small numbers

Figure 4.5.2: Diabetes Prevalence by District, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder

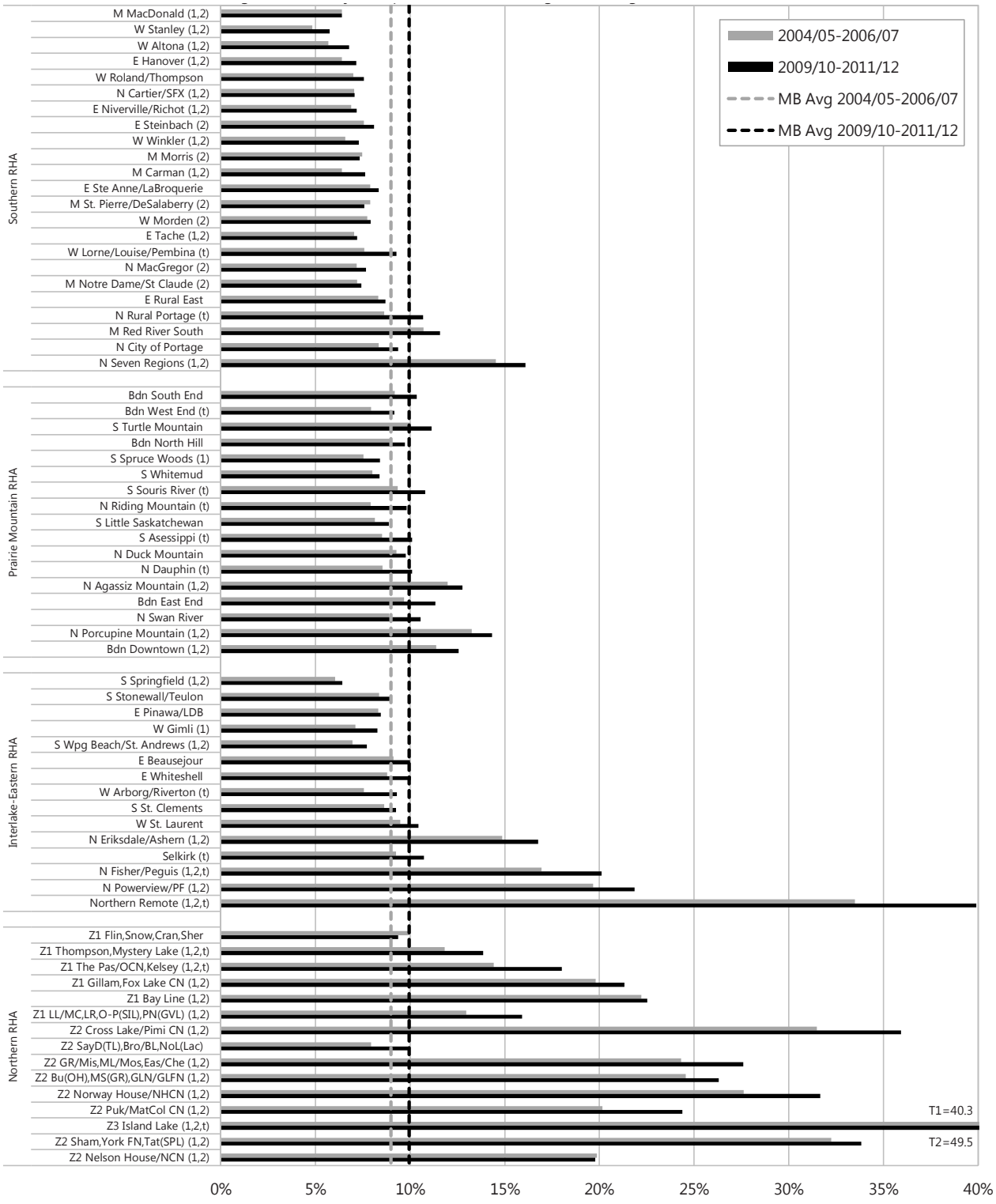
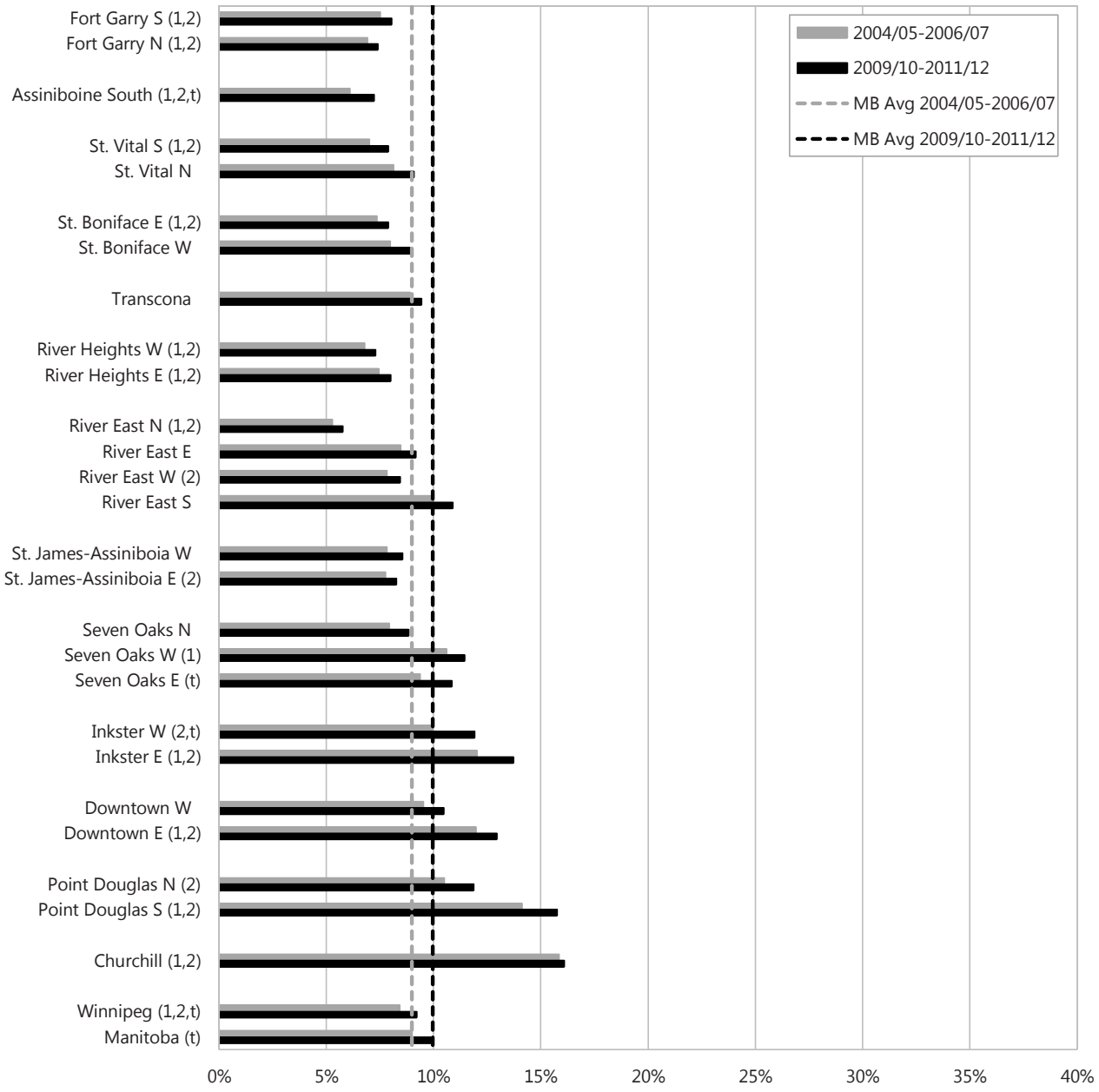


Figure 4.5.3: Diabetes Prevalence by Winnipeg NC, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



4.6 Diabetes Incidence

Definition: the average number of new cases of residents aged 19 and older with diabetes (Type I and II) per 100 person–years as defined by either:

- at least one hospitalization with a diagnosis with an ICD–9–CM code of 250 or an ICD–10–CA code of E10–E14 or
- at least two physician visits with an ICD–9–CM code listed above or
- at least one prescription for diabetes medication (ATC code A10; see Glossary)

Incidence was calculated for 2004/05–2006/07 and 2009/10–2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in the first time period. See Glossary for further details.

Key Findings

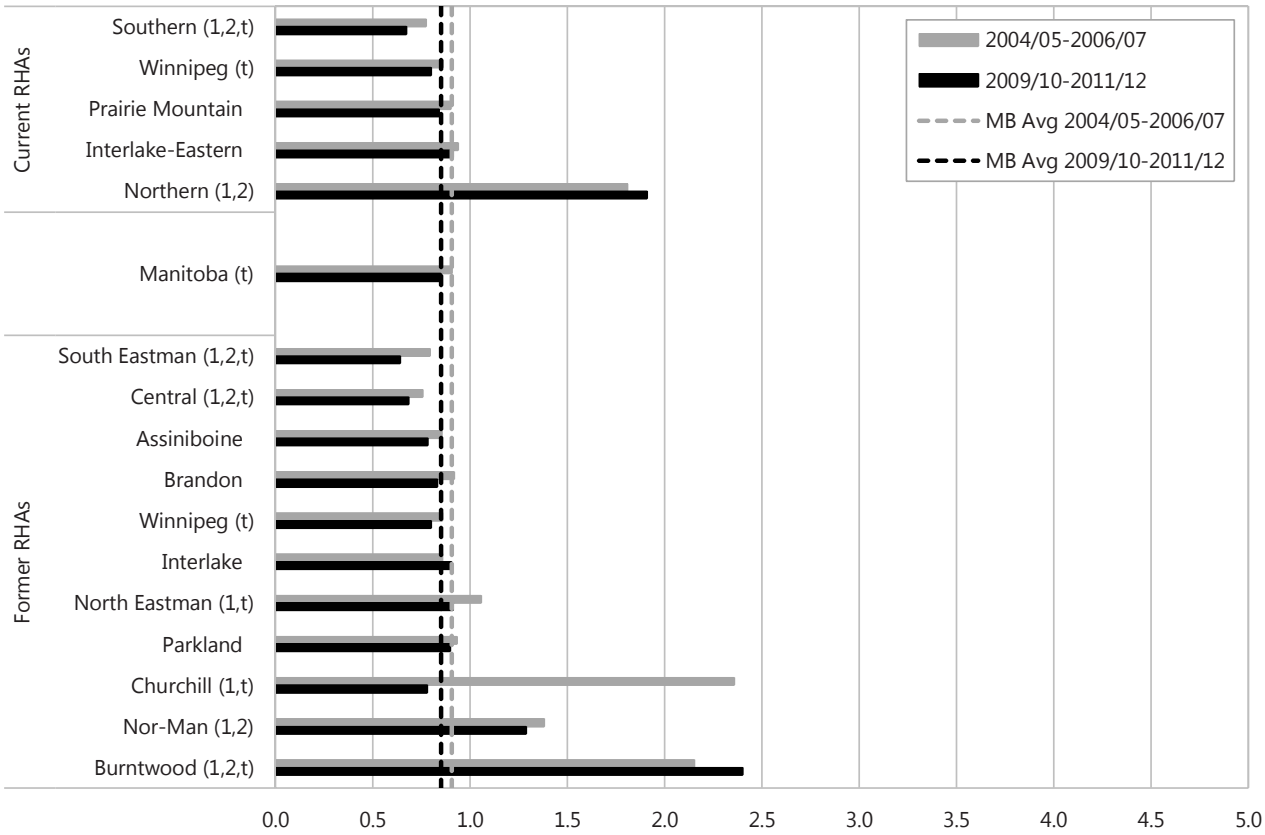
- Diabetes incidence decreased in Manitoba from 0.908 to 0.851 cases per 100 person–years. (As explained above, these values can be interpreted as percent, presuming all residents lived for at least one year). Incidence decreased in all regions except Northern, though only the decreases in Southern and Winnipeg reached statistical significance.
- Diabetes incidence rates were related to PMR at the regional level, with the lowest rates in Southern and the highest in Northern. However, this relationship was not linear: the incidence rate in Northern was double that in all other regions. Incidence was particularly high in the former Burntwood RHA (and increased over time), though the rates for the former NOR–MAN RHA were also above the provincial average.
- Incidence rates varied dramatically across districts in rural regions, ranging from under 0.5 to over 5.0 per 100 person–years. Several districts in Northern and the Northern Remote district of Interlake–Eastern had the highest rates.
- There was less variation across NCs within Winnipeg, though some had higher and some had lower than average rates.
- There were statistically significant relationships between income and diabetes incidence rates in urban and rural areas in both time periods: incidence rates were higher among residents of lower income areas. Among rural residents, the gap across income groups widened over time because the incidence rate among the lowest income group increased slightly, while that in all other income groups decreased (Appendix 2).

Comparison to Other Findings

- This indicator has not been included in MCHP reports before. However, we applied the same definition to earlier time periods. The results revealed that over the last 10 years, diabetes incidence increased from 0.761 to 0.908 and then decreased to 0.851 new cases per 100 person–years.

Figure 4.6.1: Incidence of Diabetes by RHA, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



1 indicates area's rate was statistically different from Manitoba average in first time period
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Figure 4.6.2: Incidence of Diabetes by District, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+

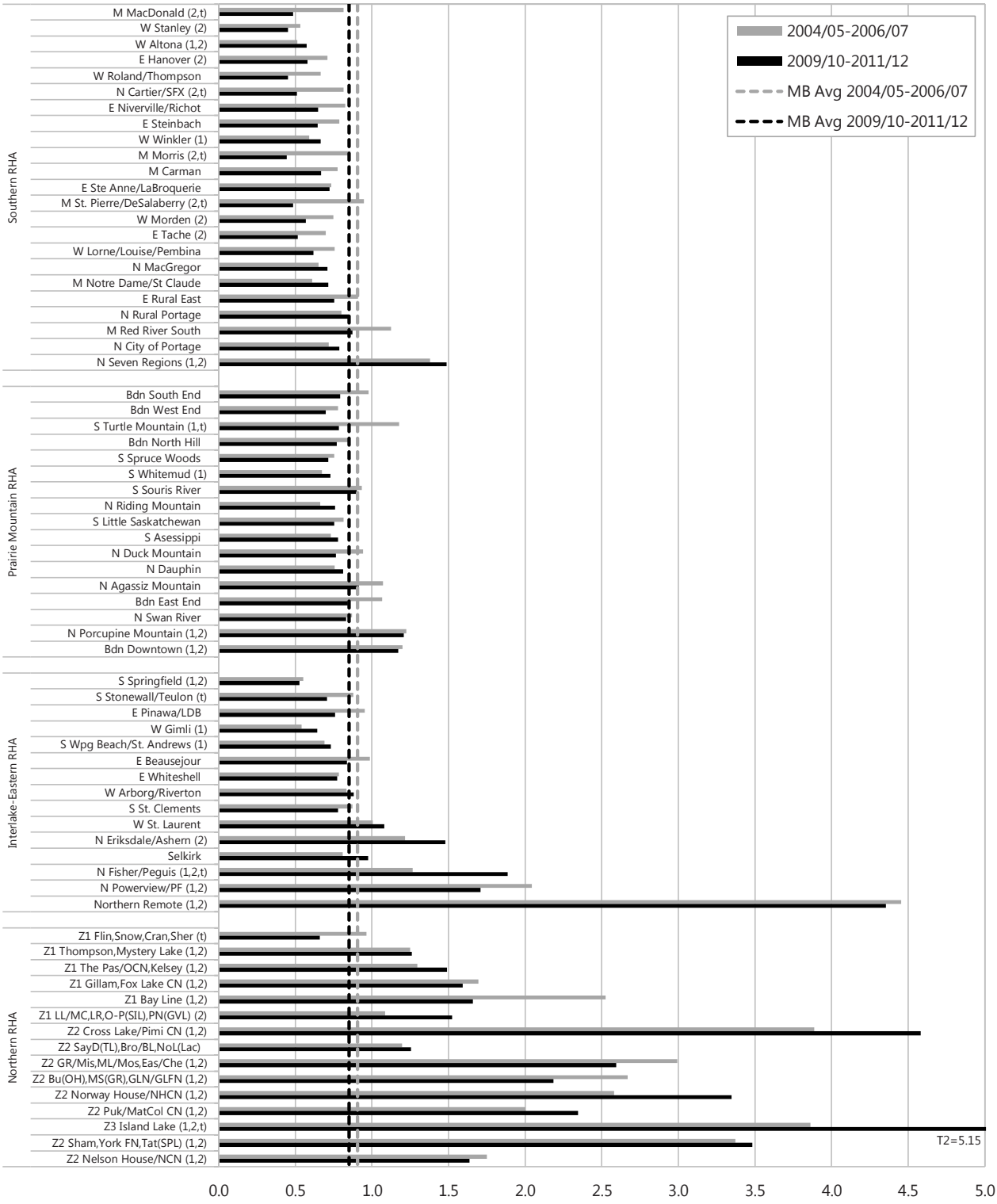
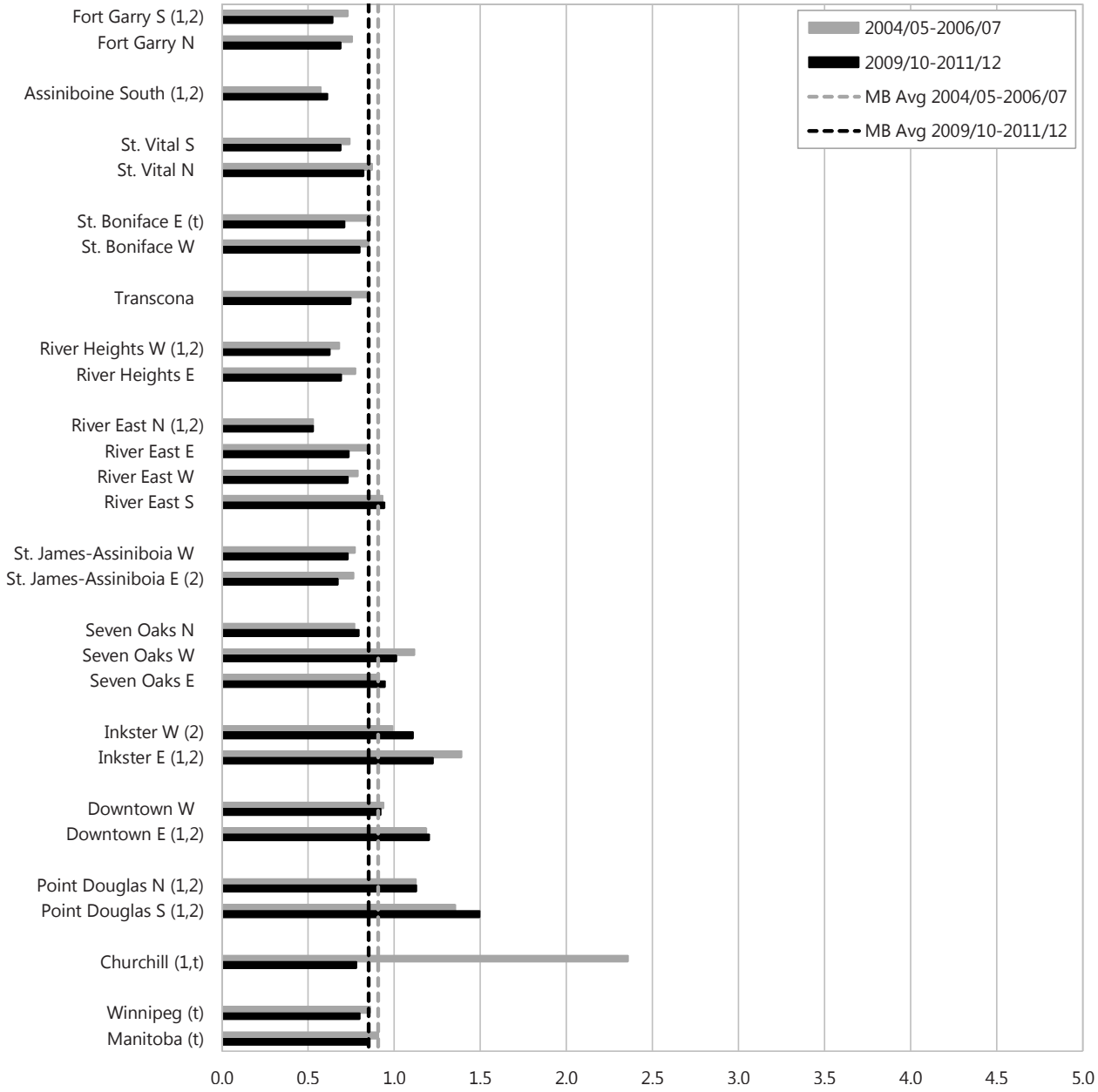


Figure 4.6.3: Incidence of Diabetes by Winnipeg NC, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



4.7 Ischemic Heart Disease (IHD) Prevalence

Definition: the percent of residents aged 19 and older with ischemic heart disease (IHD) in a five–year period as defined by either:

- at least one hospitalization with an ICD–9–CM code of 410–414 or an ICD–10–CA code of I20–I22, I24, or I25, or
- at least two physician visits with an ICD–9–CM code listed above, or
- one physician visit with an ICD–9–CM code listed above and at least two prescriptions IHD medications (see Glossary)

Prevalence was calculated for 2002/03–2006/07 and 2007/08–2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in the first time period. See Glossary for further details.

Key Findings

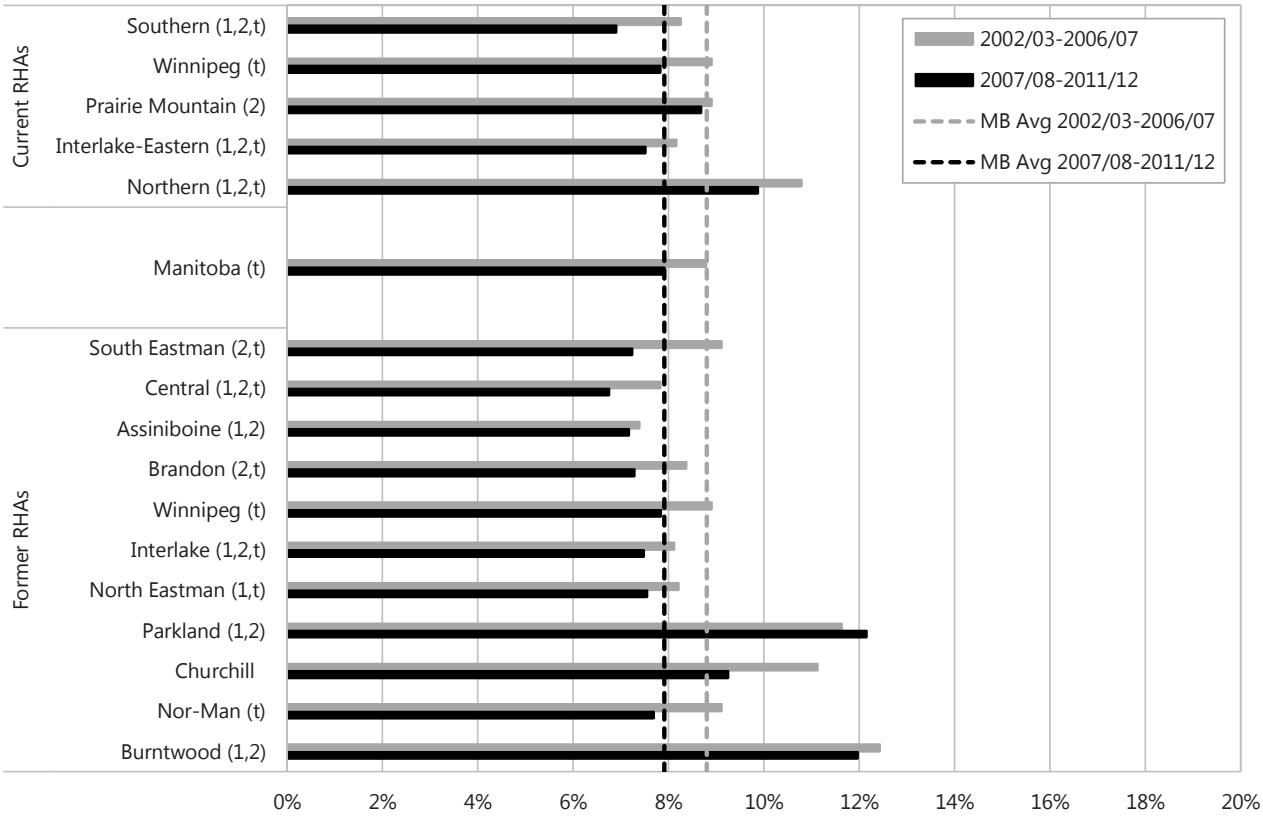
- Ischemic Heart Disease (IHD) prevalence decreased in Manitoba from 8.80% to 7.92% of the population aged 19 and older. This decrease was reflected in all regions except Prairie Mountain, where in its prevalence was higher than average in the second time period.
- IHD prevalence was related to PMR at the regional level: the healthiest region had the lowest rate and the least healthy region had the highest rate, but the regions in the middle did not follow a stepwise gradient.
- There was large variation across districts in rural regions, ranging from under 5% to over 26%. The highest values were in Northern districts, though several districts within Prairie Mountain and Interlake–Eastern had relatively high values.
- There was less variation across NCs within Winnipeg, though some had higher and some had lower than average rates.
- There were strong relationships between income and IHD prevalence in urban and rural areas in both time periods: IHD prevalence was higher among residents of lower income areas. In urban areas, this relationship was strong and linear in both time periods. In rural areas in the first time period, it was dominated by the high prevalence among the lowest income areas. Among rural residents, the gap across income groups widened over time, because the decrease among the lowest income group was very small, whereas all other quintiles decreased more (Appendix 2).

Comparison to Other Findings

- These results are consistent with those from the 2009 and 2003 Atlas reports (Fransoo et al., 2009; Martens et al., 2003) and Section 4.11, which show that rates of **acute myocardial infarction** (**AMI**) (one of the key diagnoses that comprise the IHD group) are decreasing over time in Manitoba.

Figure 4.7.1: Prevalence of Ischemic Heart Disease by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
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Figure 4.7.2: Prevalence of Ischemic Heart Disease by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder

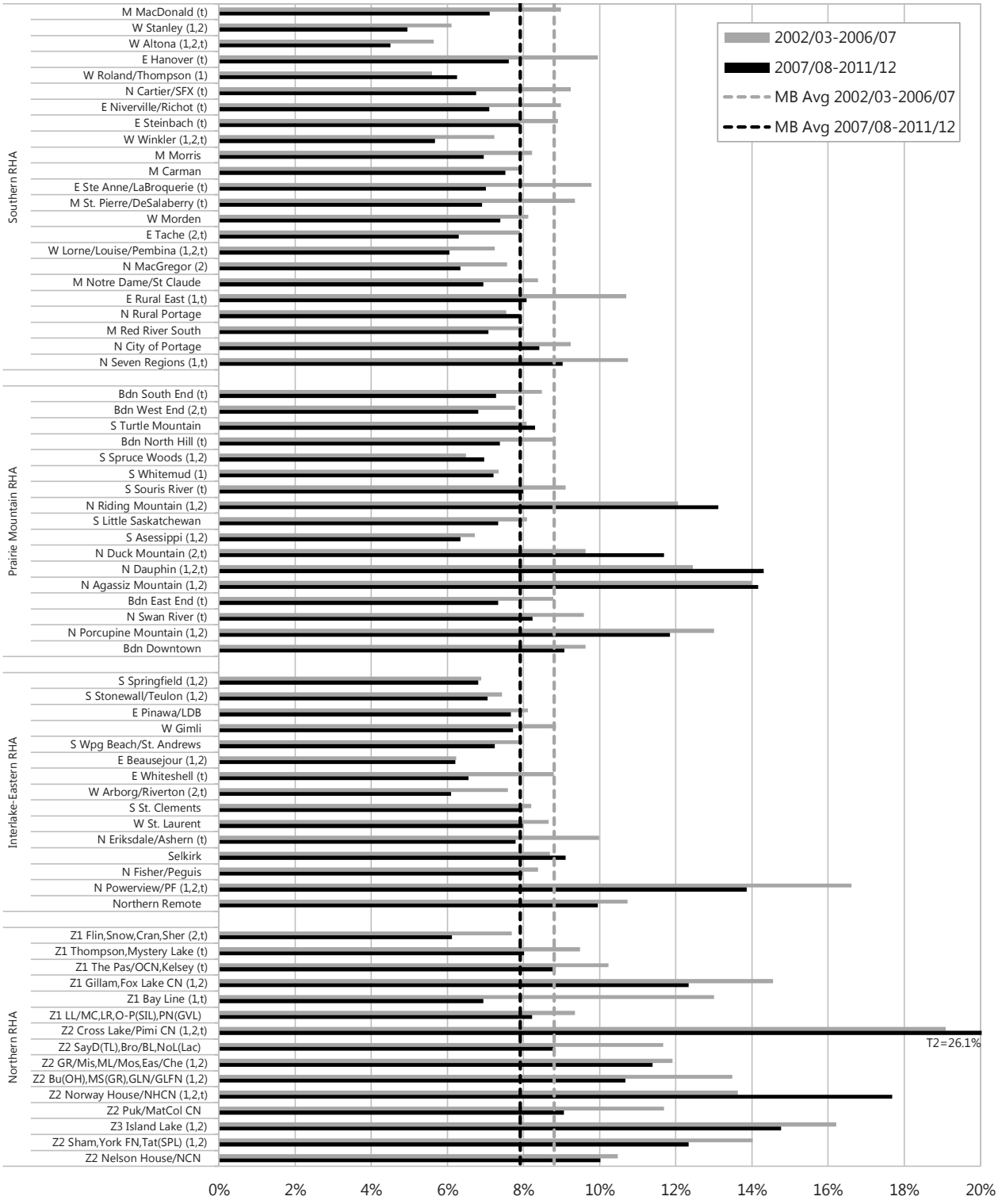
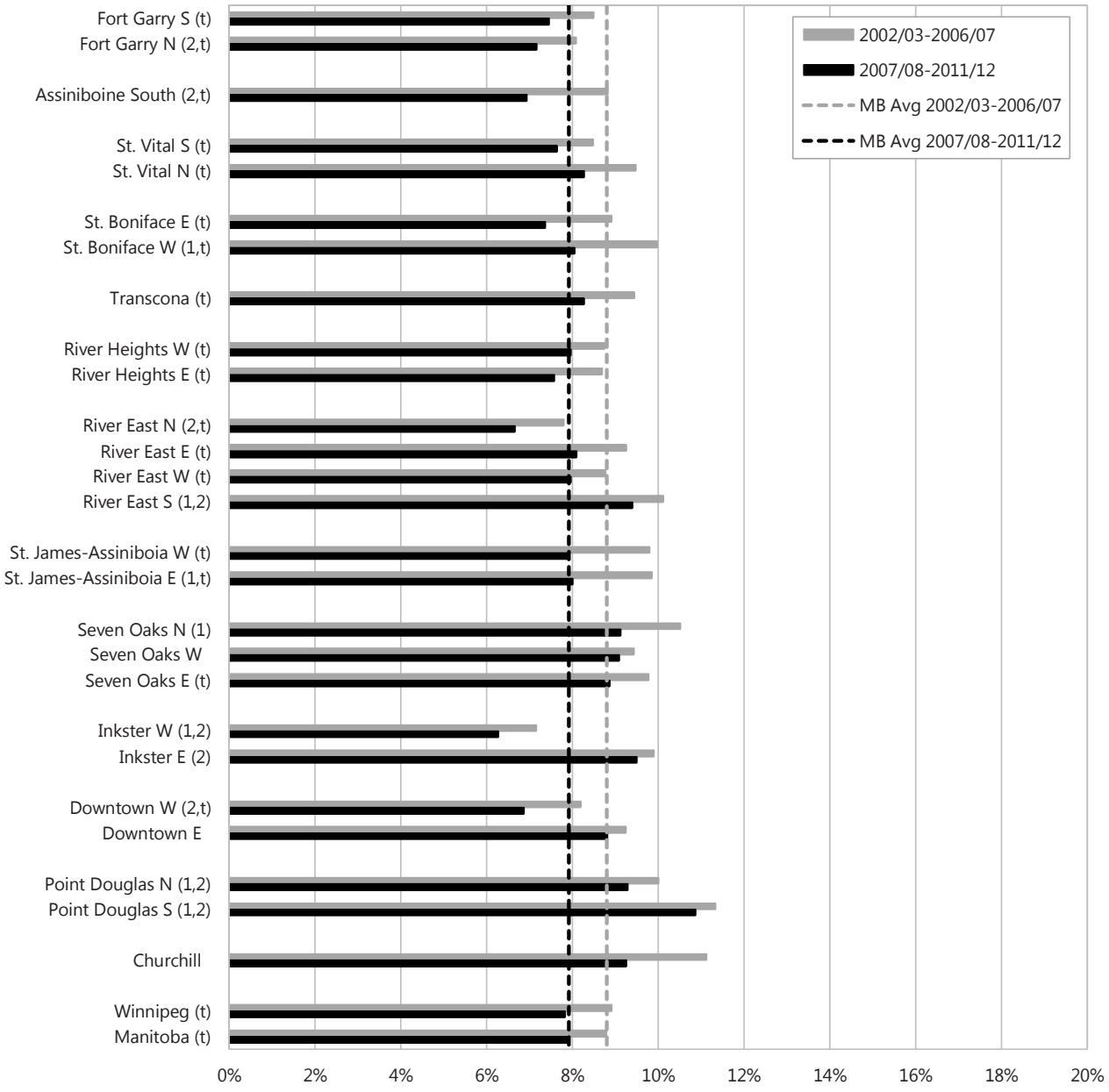


Figure 4.7.3: Prevalence of Ischemic Heart Disease by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 19+ diagnosed with disorder



4.8 Ischemic Heart Disease (IHD) Incidence

Definition: the average number of new cases of residents aged 19 and older with ischemic heart disease (IHD) per 100 person–years as defined by either:

- at least one hospitalization with an ICD–9–CM code of 410–414 or an ICD–10–CA code of I20–I22, I24, or I25 or
- at least two physician visits with an ICD–9–CM code listed above or
- one physician visit with an ICD–9–CM code listed above and at least two prescriptions IHD medications (see Glossary)

Incidence was calculated for 2002/03–2006/07 and 2007/08–2011/12 and was age– and sex–adjusted to the Manitoba population aged 19 and older in the first time period. See Glossary for further details.

Key Findings

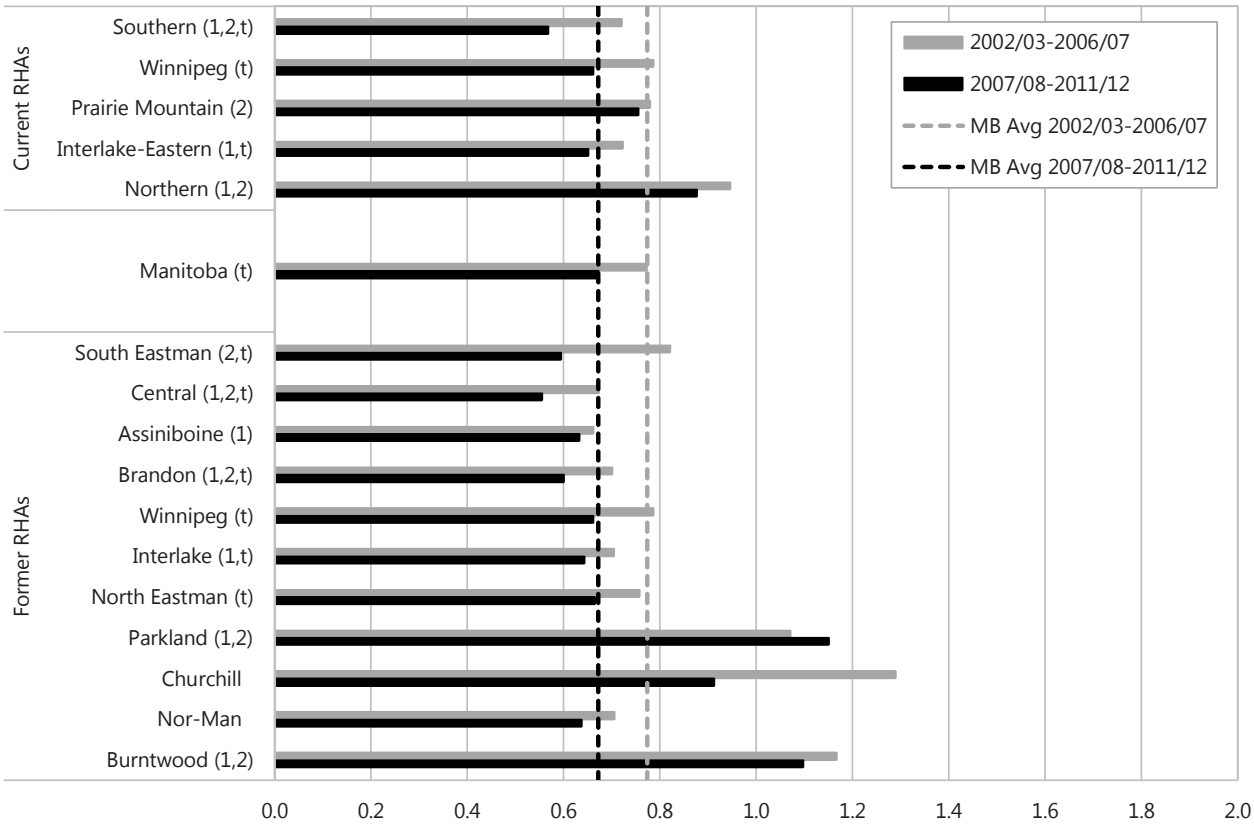
- IHD incidence decreased in Manitoba from 0.774 to 0.673 cases per 100 person–years. (As explained above, these values can be interpreted as percent, presuming all residents lived for at least one year). Incidence decreased in all regions, though only the changes in Southern, Winnipeg, and Interlake-Eastern were statistically significant.
- IHD incidence rates were related to PMR at the regional level, with the lowest rates in Southern and the highest in Northern. However, this relationship was not linear.
- Incidence rates varied widely across districts in rural regions, ranging from just under 0.4 to over 2.0 per 100 person–years. The highest rates were in districts within Northern, though several districts in Prairie Mountain and Interlake–Eastern also had relatively high rates (as was seen with IHD prevalence above).
- There was remarkably little variation across NCs within Winnipeg.
- There were statistically significant relationships between income and IHD incidence rates in urban and rural areas in both time periods: incidence rates were higher among residents of lower income areas. Among rural residents, the gap across income groups widened over time because the decrease among low–income residents was smaller than that for all other income groups (Appendix 2).

Comparison to Other Findings

- This indicator has not been included in MCHP reports before. However, we applied the same definition to earlier time periods. The results revealed that over the last 10 years, IHD incidence decreased steadily from 0.805 to 0.774 to 0.673 new cases per 100 person–years.

Figure 4.8.1: Incidence of Ischemic Heart Disease by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.8.2: Incidence of Ischemic Heart Disease by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+

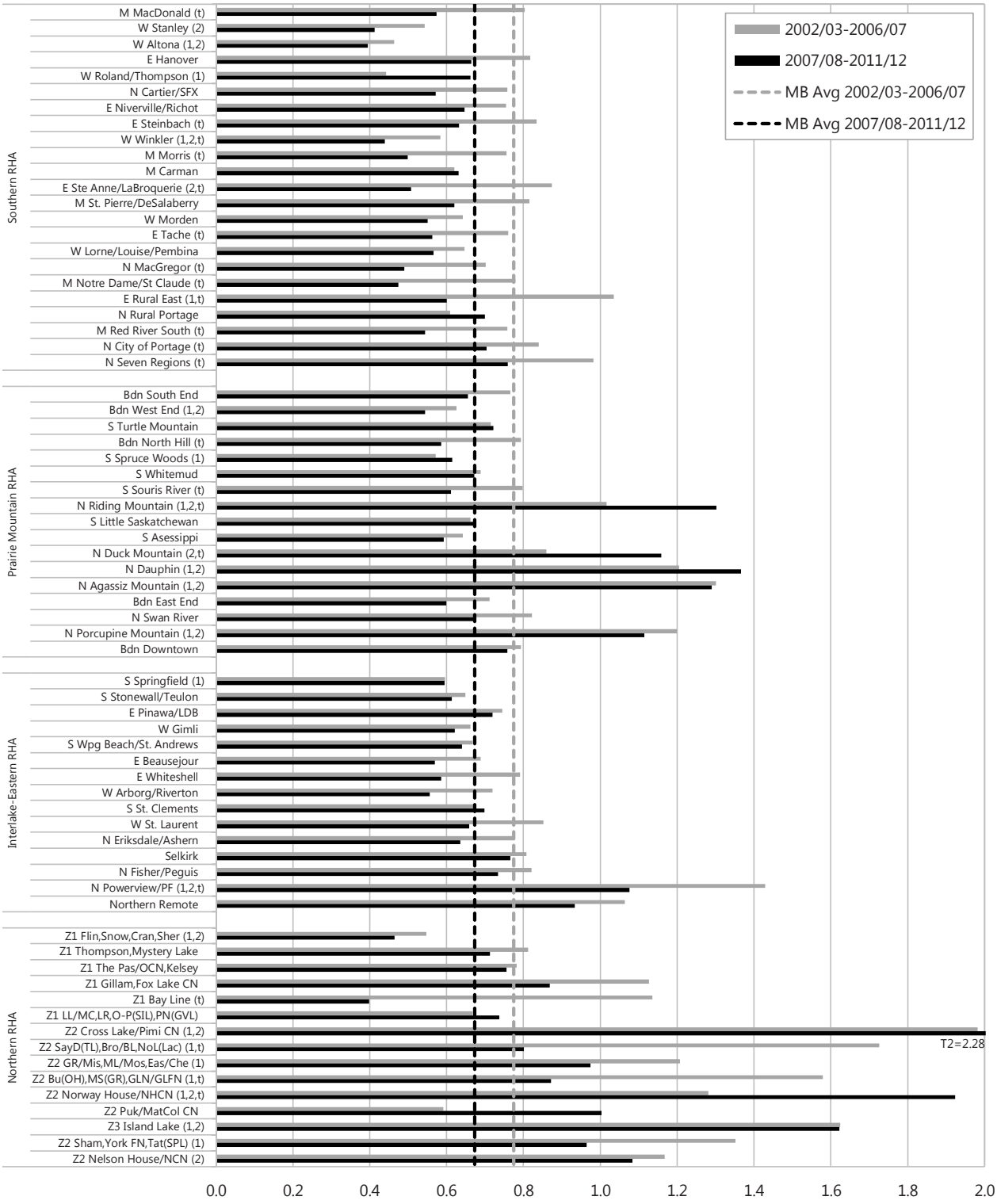
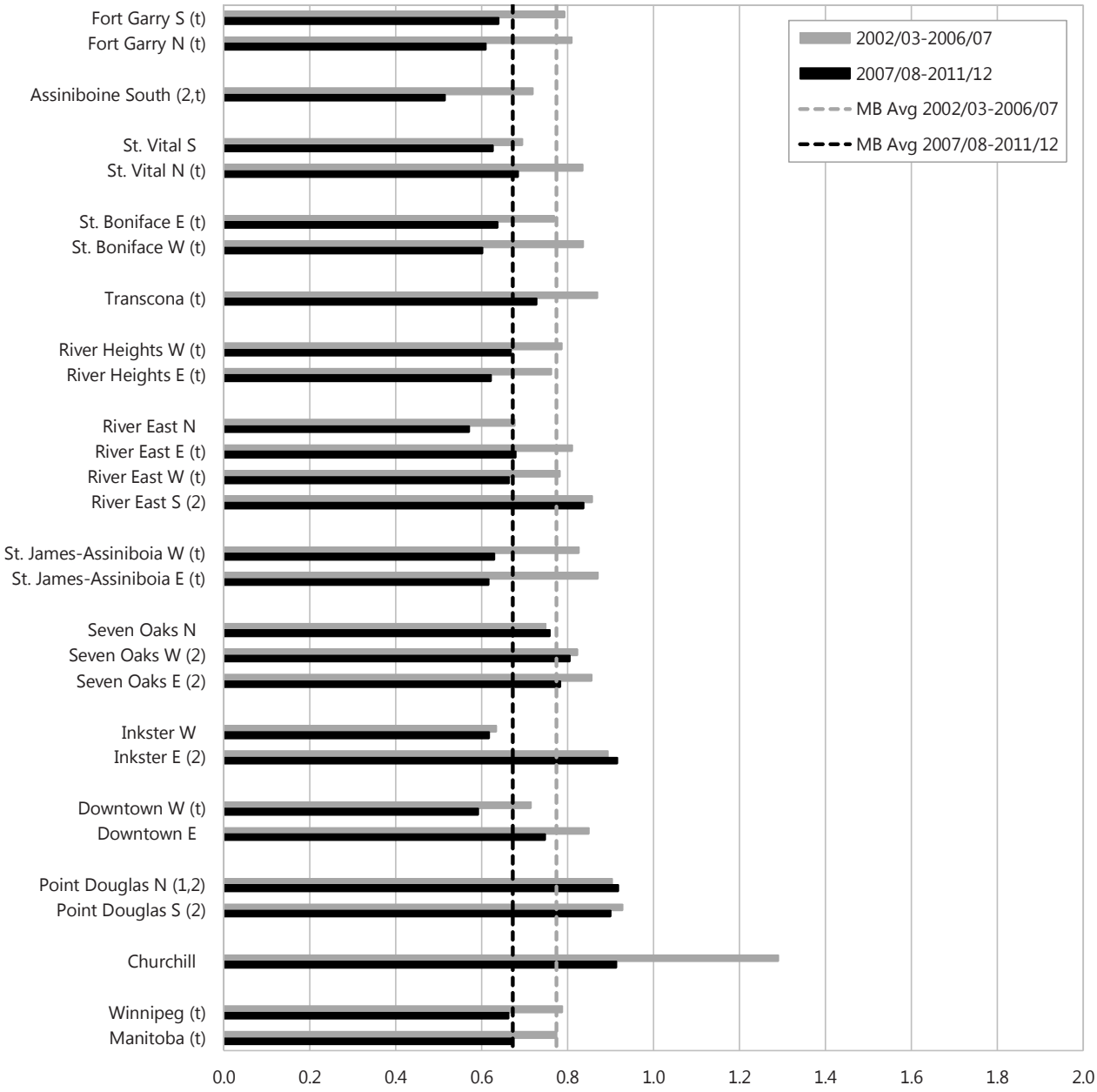


Figure 4.8.3: Incidence of Ischemic Heart Disease by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted incidence rate per 100 person-years for residents aged 19+



4.9 Congestive Heart Failure (CHF) Prevalence

Definition: the percent of residents aged 40 and older with congestive heart failure in a three–year period as defined by either:

- at least one inpatient hospitalization in one year with an ICD–9–CM code of 428 or an ICD–10–CA code of I50 or
- at least two physician visits in one year with an ICD–9–CM code listed above

Average annual prevalence was calculated for 2002/03–2006/07 and 2007/08–2011/12 and was age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period. See Glossary for further details.

Key Findings

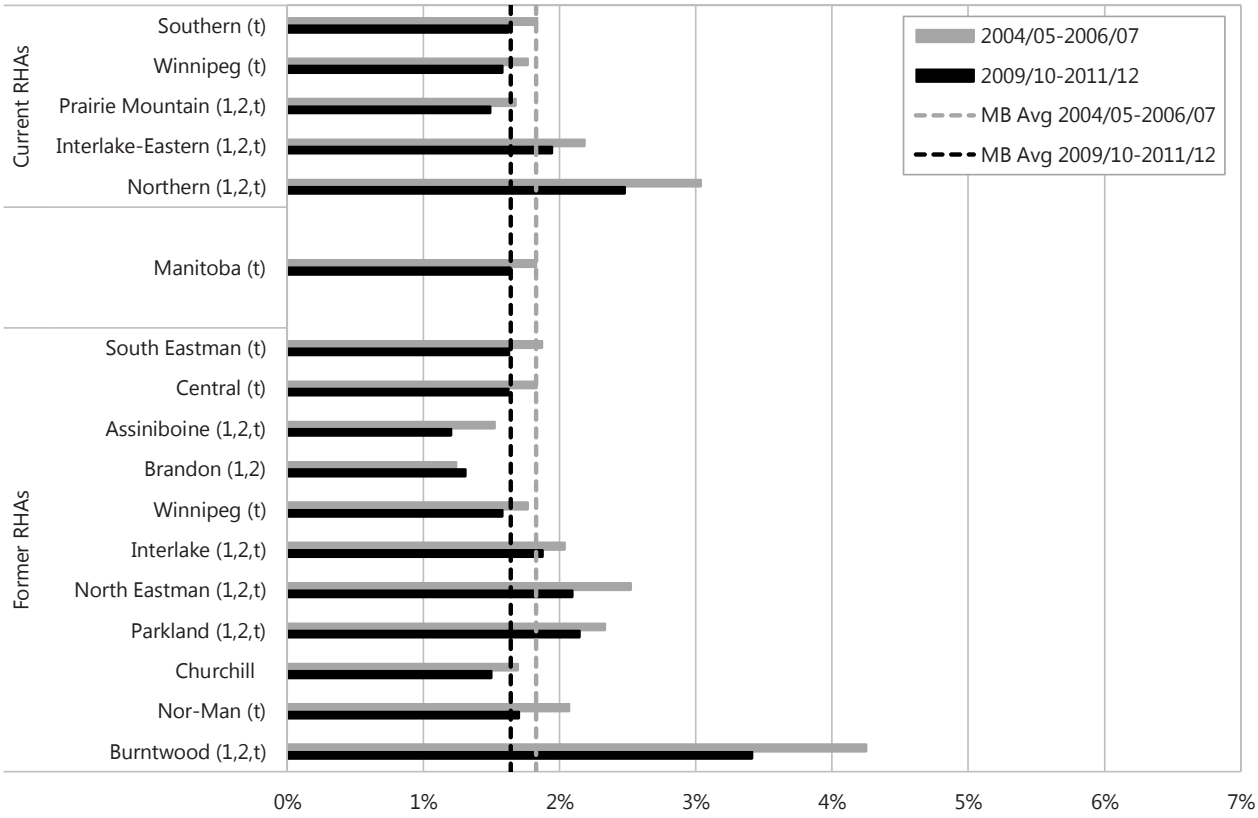
- CHF prevalence decreased in Manitoba from 1.83% to 1.64% of the population aged 40 and older. This decrease was reflected in all regions.
- CHF prevalence was related to PMR at the regional level, with the lowest rates in Southern and the highest in Northern. However, this relationship was not linear. Prairie Mountain region had the lowest prevalence, despite being in the middle of the PMR ranking.
- There was large variation across districts in rural regions, ranging from under 1% to over 7%. The highest values were in Northern districts.
- There was relatively little variation across Winnipeg NCs; except that in both time periods, Point Douglas South had a much higher prevalence than all other NCs.
- There were strong relationships between income and CHF prevalence in urban and rural areas in both time periods: CHF prevalence was higher among residents of lower income areas with a stepwise pattern across the income groups. Among rural residents, the gap across income groups widened over time because the decrease among the lowest income group was smaller than that for all other income groups (Appendix 2).

Comparison to Other Findings

- This indicator was not included in previous RHA Atlas reports by MCHP.

Figure 4.9.1: Prevalence of Congestive Heart Failure by RHA, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual percent of residents aged 40+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.9.2: Prevalence of Congestive Heart Failure by District, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual percent of residents aged 40+ diagnosed with disorder

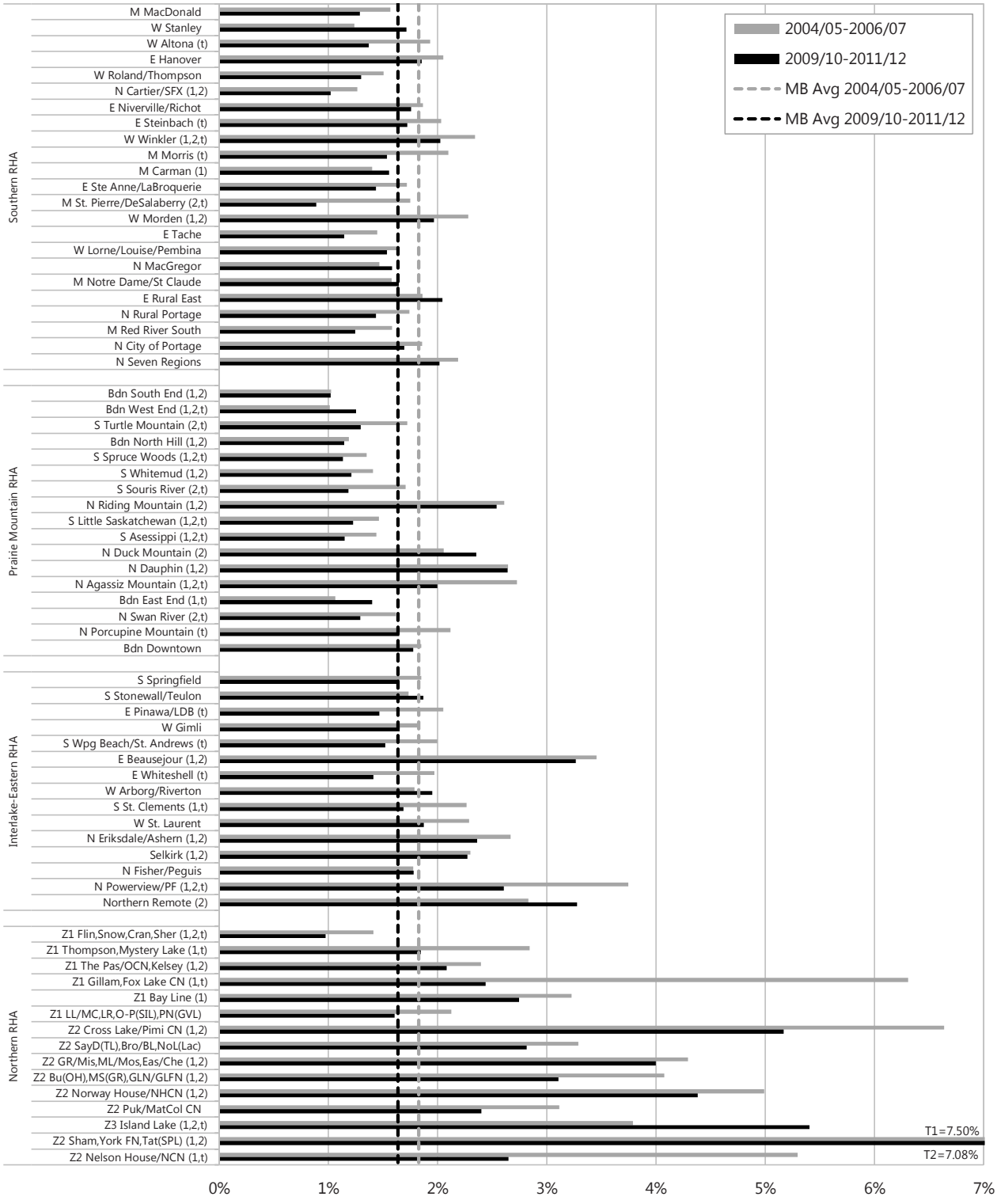
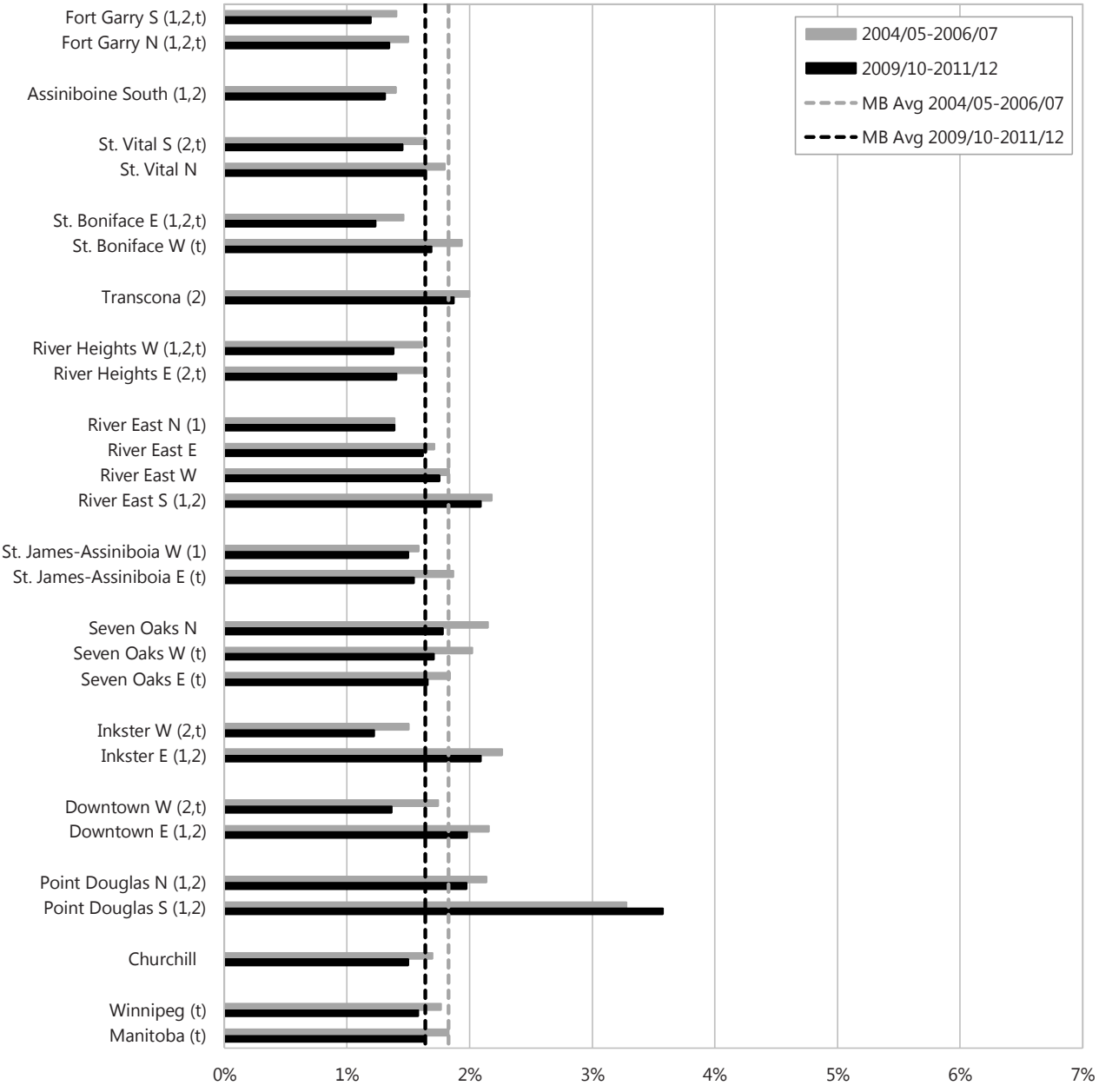


Figure 4.9.3: Prevalence of Congestive Heart Failure by Winnipeg NC, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual percent of residents aged 40+ diagnosed with disorder



4.10 Osteoporosis Prevalence

Definition: the percent of residents aged 50 and older with osteoporosis in a three–year period as defined by either: (see Glossary for list of ICD codes and medications used)

- at least one hospitalization or one physician visit with one of the following diagnoses: osteoporosis, hip fracture, spine fracture, humerus fracture, or wrist fracture or
- at least one prescription for osteoporosis medications

Fractures in hospital associated with a diagnosis code for major trauma are excluded. See Glossary for further details. Prevalence was calculated for 2004/05–2006/07 and 2009/10–2011/12 and was age– and sex–adjusted to the Manitoba population aged 50 and older in the first time period.

Key Findings

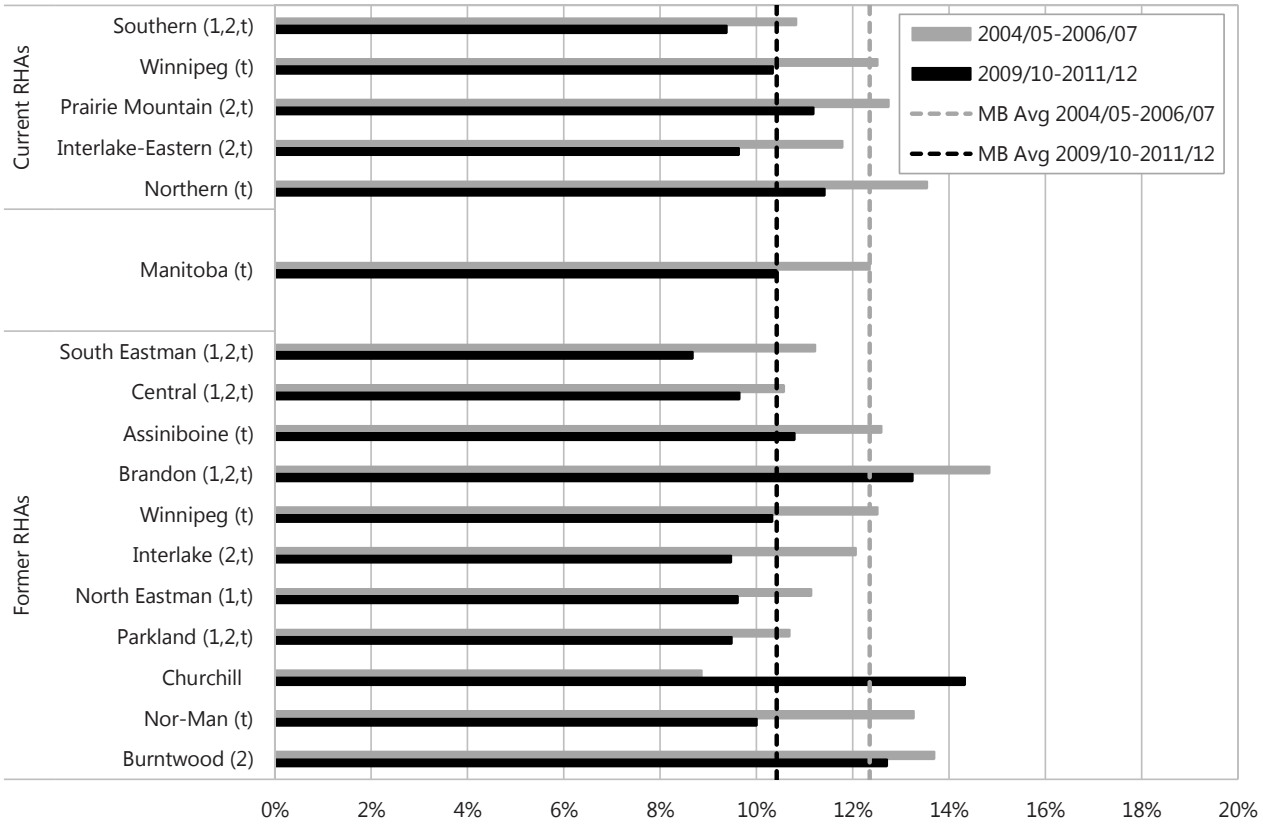
- Osteoporosis prevalence decreased over time in Manitoba from 12.4% to 10.4% of the population aged 50 and older. A significant decrease was seen in every region and in many districts and Winnipeg NCs.
- Osteoporosis prevalence was related to PMR at the regional level, with the lowest rates in Southern and the highest in Northern. However, this relationship was not linear and clearly less consistent among the former RHAs.
- Rates also varied across districts of rural regions and Winnipeg NCs, though were not systematically related to PMR.
- In the first time period, there was no relationship between income and osteoporosis prevalence in urban or rural residents. However, in the second time period, both showed modest but statistically significant gradients, with higher osteoporosis prevalence among residents of lower income areas. This was caused by prevalence values falling faster in higher income areas than in lower income areas (Appendix 2). In rural areas, the gap widened over time.

Comparison to Other Findings

- The results shown here are the exact opposite of what was shown in the 2009 Atlas report (Fransoo et al., 2009): Osteoporosis prevalence had increased from 10.7% in the early 2000s to 12.7% in the mid–2000s. The updated results here show a drop back down to 10.4%.

Figure 4.10.1: Prevalence of Osteoporosis by RHA, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 50+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.10.2: Prevalence of Osteoporosis by District, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 50+ diagnosed with disorder

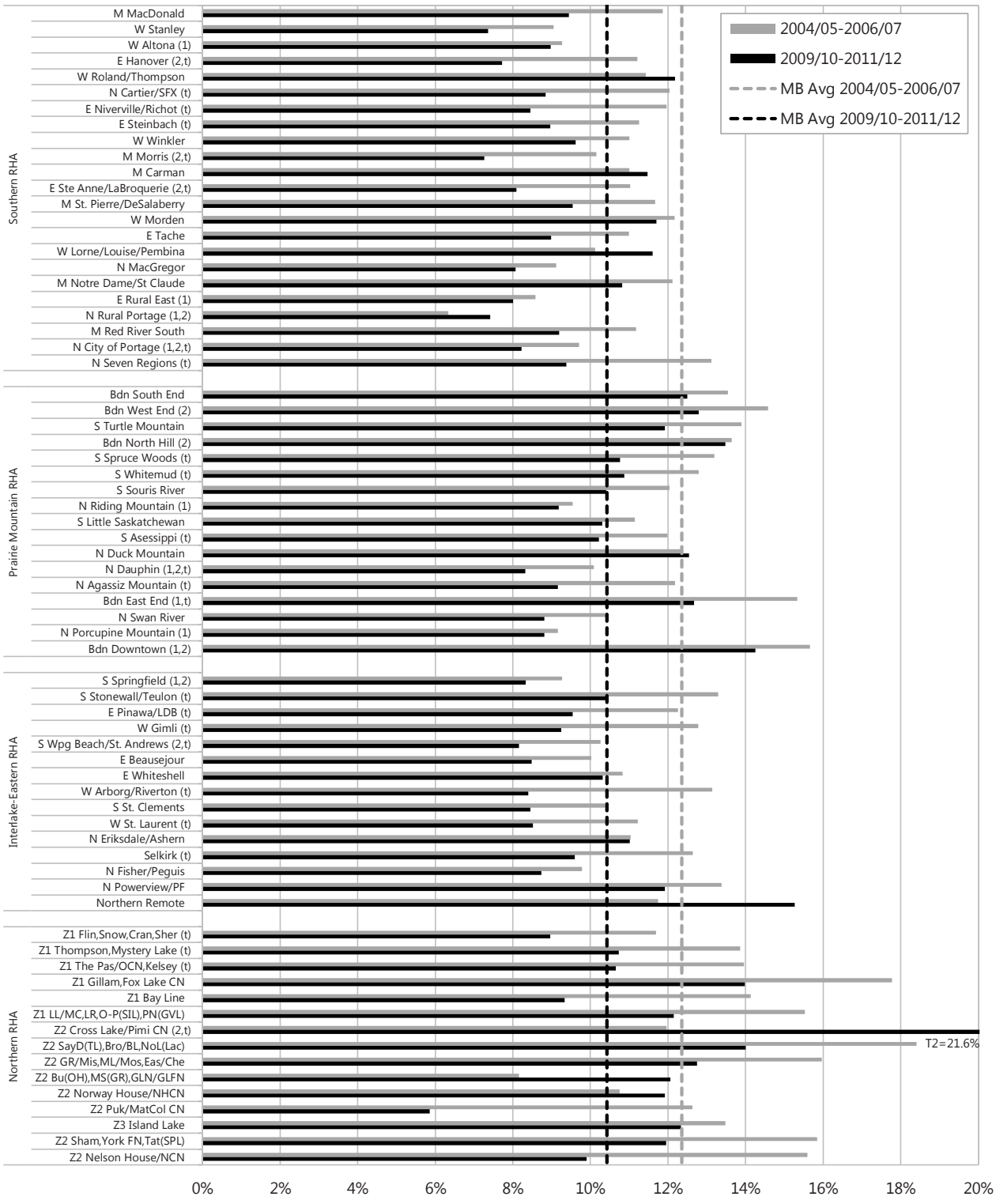
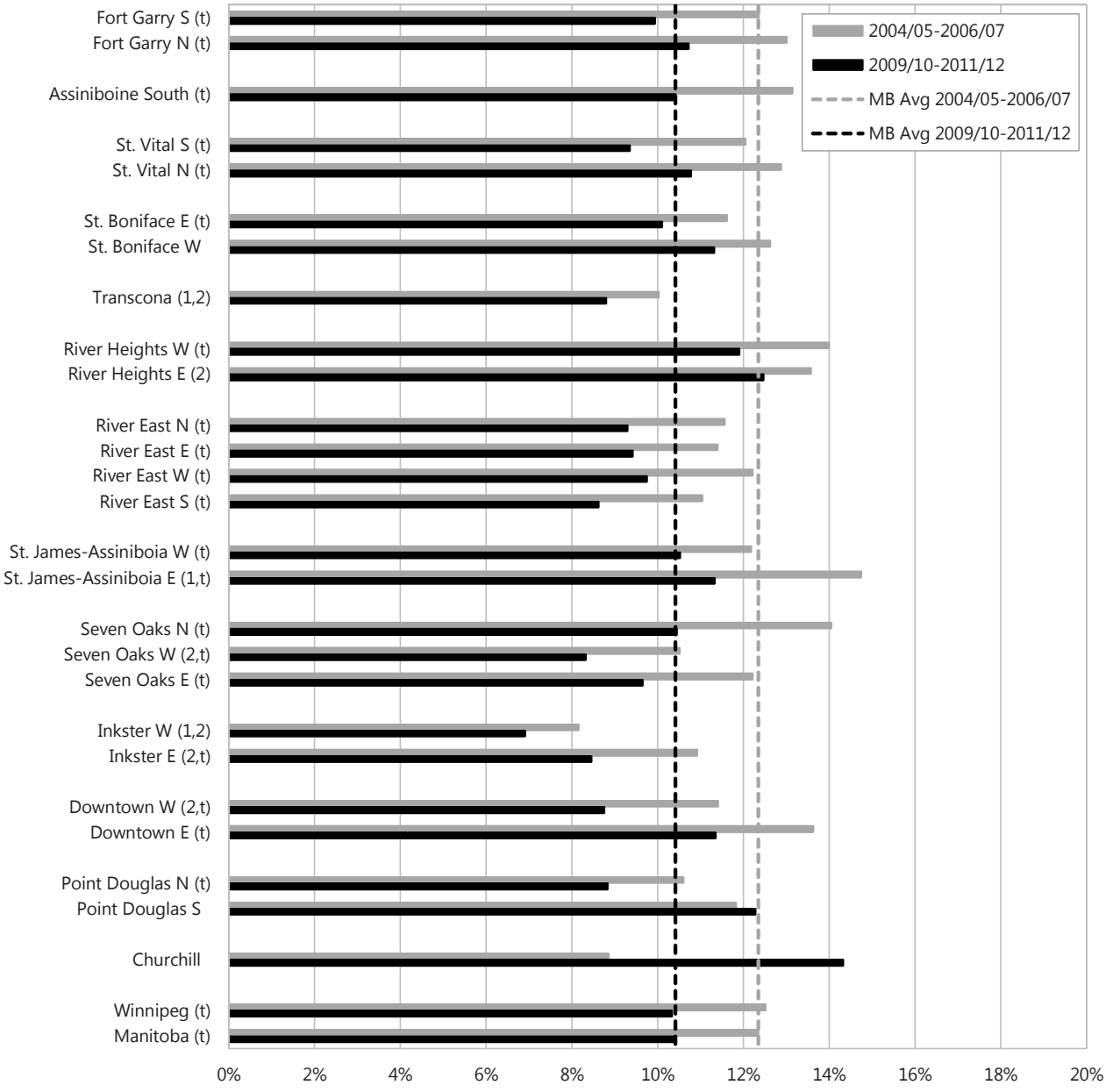


Figure 4.10.3: Prevalence of Osteoporosis by Winnipeg NC, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted percent of residents aged 50+ diagnosed with disorder



Section 2: Adverse Health Event Rates

This section provides average annual rates of key health–related events. They are shown as rates per 1,000 residents per year, not as percent, because these events can happen to the same person more than once.

4.11 Acute Myocardial Infarction (AMI) Rates

Definition: the number of hospitalizations or deaths due to acute myocardial infarction (also known as heart attack) expressed as a rate per 1,000 residents aged 40 and older during two 5–year periods. AMI was defined by either:

- at least one hospitalization with an ICD–9–CM code of 410 or an ICD–10–CA code of I21 and a **length of stay** (**LOS**) of at least three days or
- AMI listed as the cause of death in Vital Statistics files

Average annual rates were calculated for 2000–2004 and 2005–2009 and were age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period. See Glossary for further details.

Key Findings

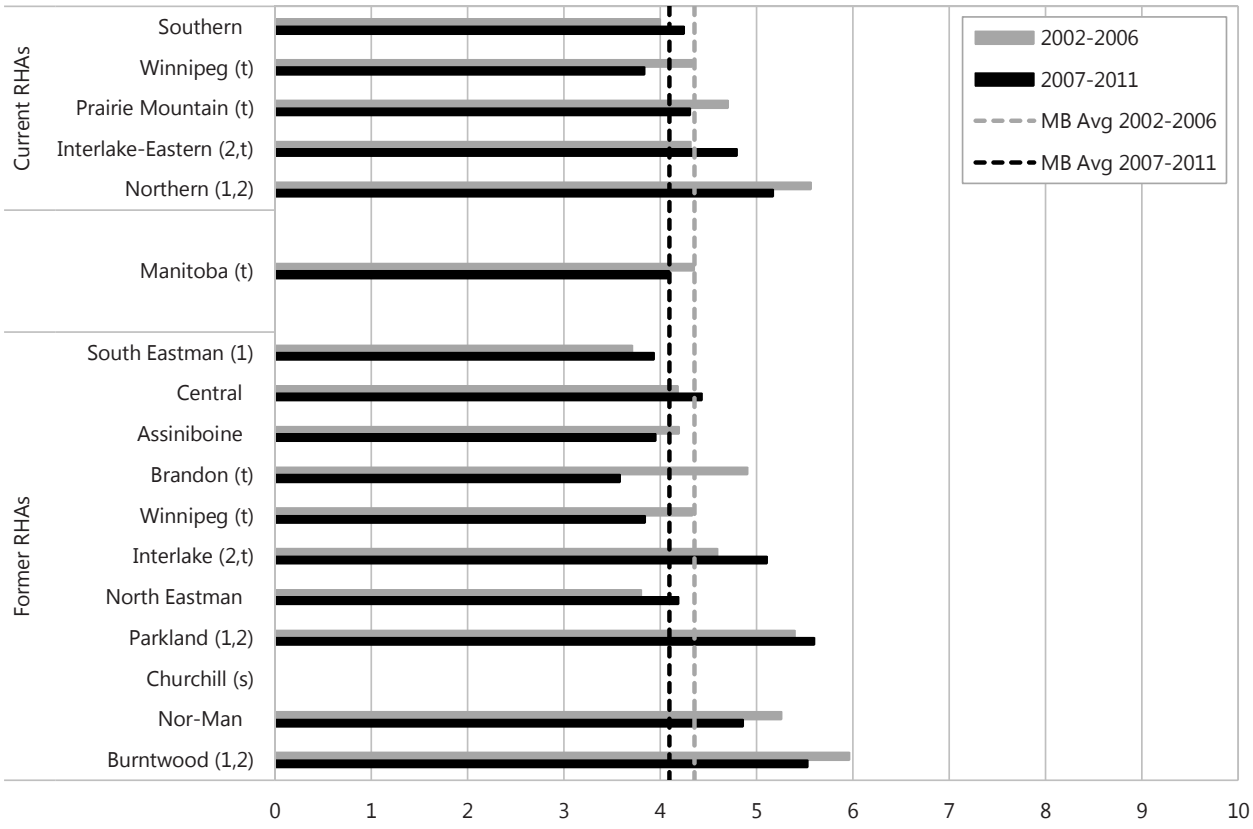
- The AMI rate for Manitobans decreased over time from 4.36 to 4.09 AMIs per 1,000 residents aged 40 and older per year.
- The changes over time varied by region: rates in Winnipeg and Prairie Mountain decreased, while the rate in Interlake–Eastern increased over time. The changes in Southern and Northern were not statistically significant.
- AMI rates were related to premature mortality rates, with higher AMI rates in less healthy areas. This trend was stronger among the new regions than the former RHAs.
- There was large variation in AMI rates among Districts of rural regions and less, but still substantial, variation among the 25 NCs in Winnipeg.
- AMI rates were strongly related to income levels for urban and rural residents in both time periods. Residents in lower income areas had higher AMI rates, though the trends were not linear.

Comparison to Other Findings

- These results are consistent with and extend the results shown in the 2009 and 2003 Atlas reports (Fransoo et al., 2009; Martens et al., 2003), reflecting the ongoing reduction in AMI rates over time. Similar findings have been reported by numerous studies at the national level.

Figure 4.11.1: Heart Attack (AMI) Rate by RHA, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for AMI per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.11.2: Heart Attack (AMI) Rate by District, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for AMI per 1,000 residents aged 40+

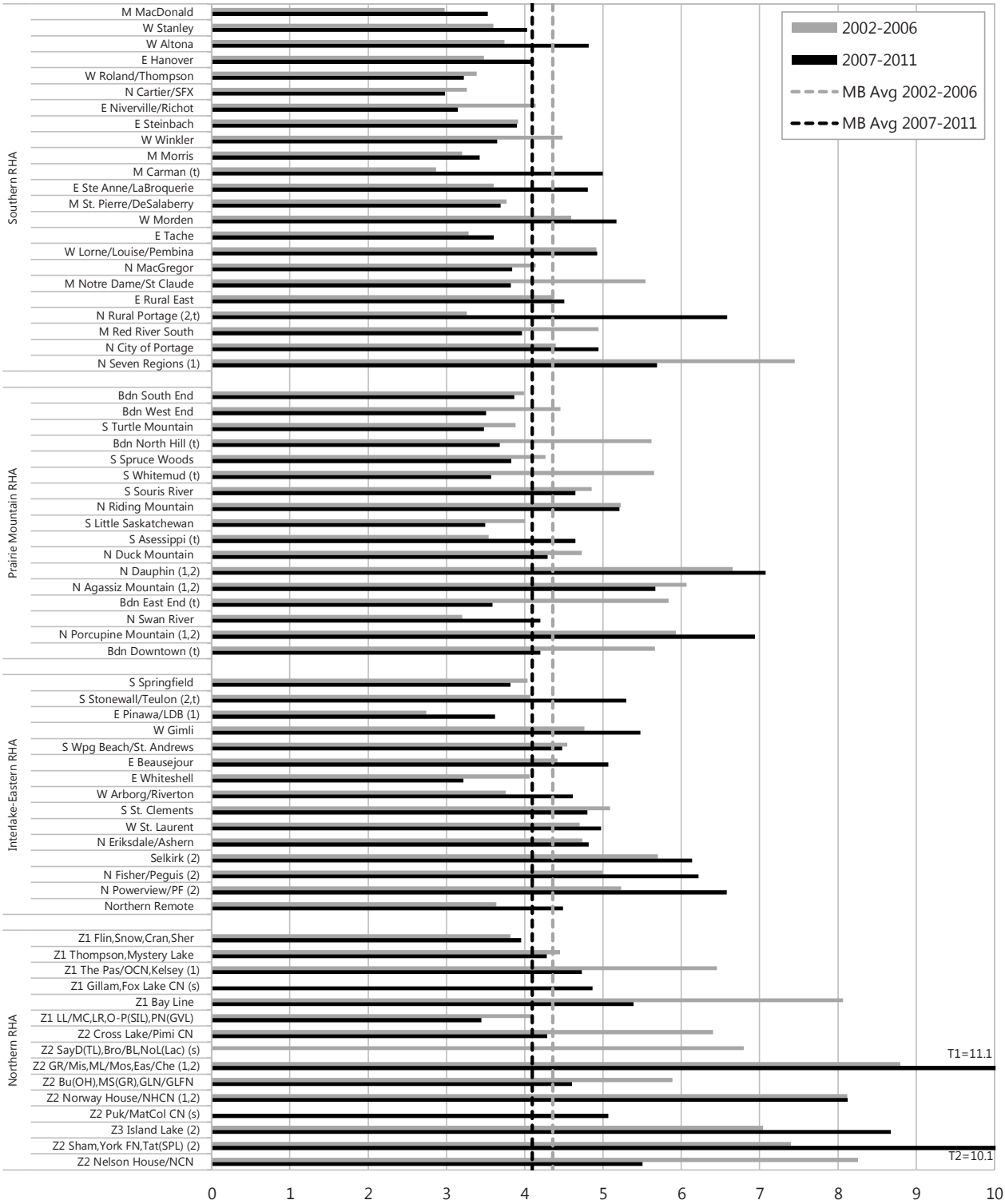
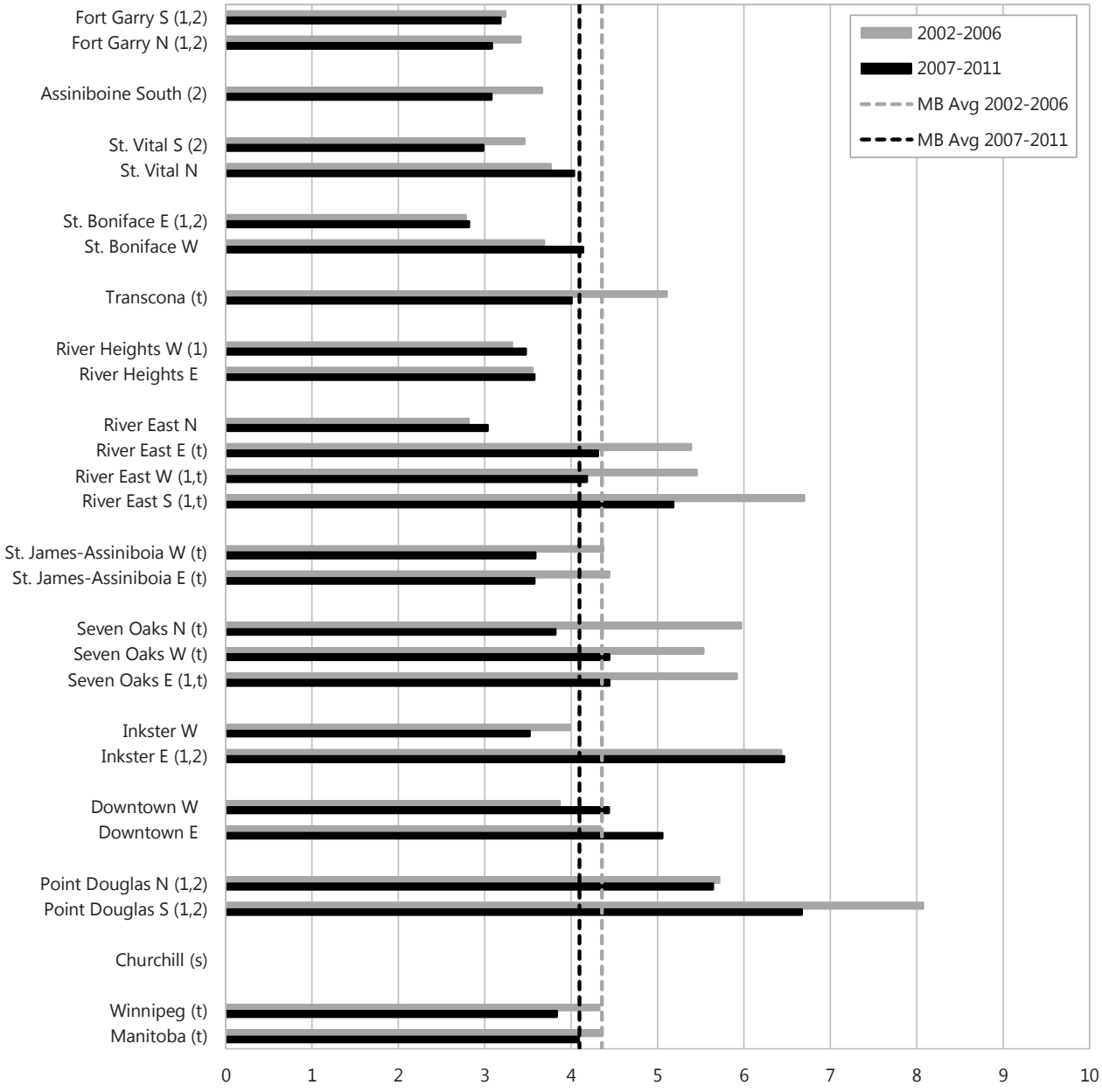


Figure 4.11.3: Heart Attack (AMI) Rate by Winnipeg NC, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for AMI per 1,000 residents aged 40+



4.12 Stroke Rates

Definition: the number of hospitalizations or deaths due to stroke, expressed as a rate per 1,000 residents aged 40 and older during two 5–year periods. Stroke was defined either by:

- at least one hospitalization with an ICD–9–CM code of 431, 434, 436 or an ICD–10–CA code of I61, I63, I64, or
- a cause of death in Vital Statistics files of stroke

Average annual rates were calculated for 2000–2004 and 2005–2009 and were age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period. See Glossary for further details.

Key Findings

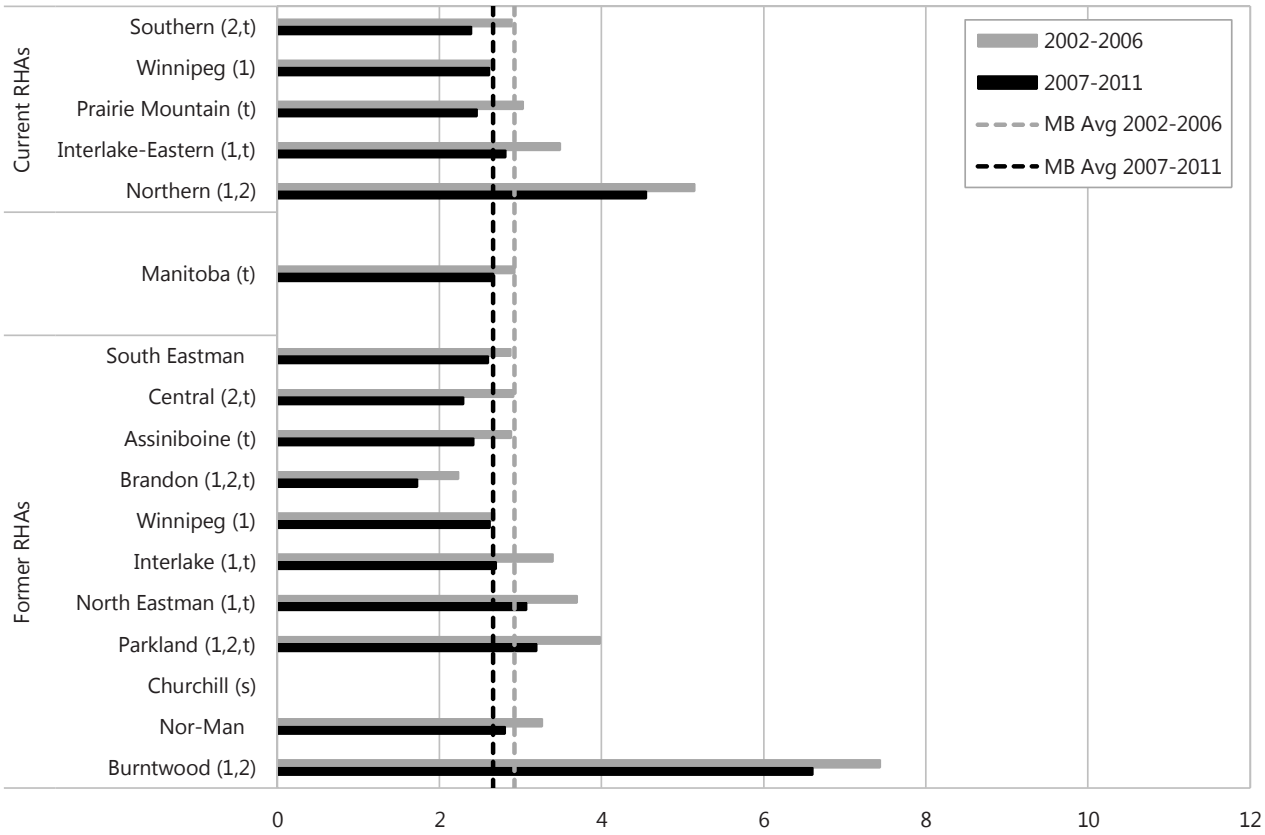
- The stroke rate for Manitobans decreased over time from 2.93 to 2.66 strokes per 1,000 residents aged 40 and older per year.
- Rates decreased in all regions, though only the decreases in Southern, Prairie Mountain, and Interlake-Eastern were statistically significant.
- Stroke rates were related to premature mortality rates, with higher stroke rates in less healthy areas. This trend was stronger among the new regions than the former RHAs.
- Stroke rates in Northern region, notably in the former Burntwood RHA, were considerably higher than in all other regions.
- There was large variation in stroke rates among Districts of rural regions, but relatively little variation among the 25 NCs in Winnipeg.
- Stroke rates were strongly related to income levels for urban and rural residents in both time periods: residents in lower income areas had higher stroke rates.

Comparison to Other Findings

- These results are consistent with and extend the results shown in the 2009 and 2003 Atlas reports (Fransoo et al., 2009; Martens et al., 2003), reflecting the ongoing reduction in stroke rates over time. Similar findings have been reported at the national level.

Figure 4.12.1: Stroke Rate by RHA, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for stroke per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 4.12.2: Stroke Rate by District, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for stroke per 1,000 residents aged 40+

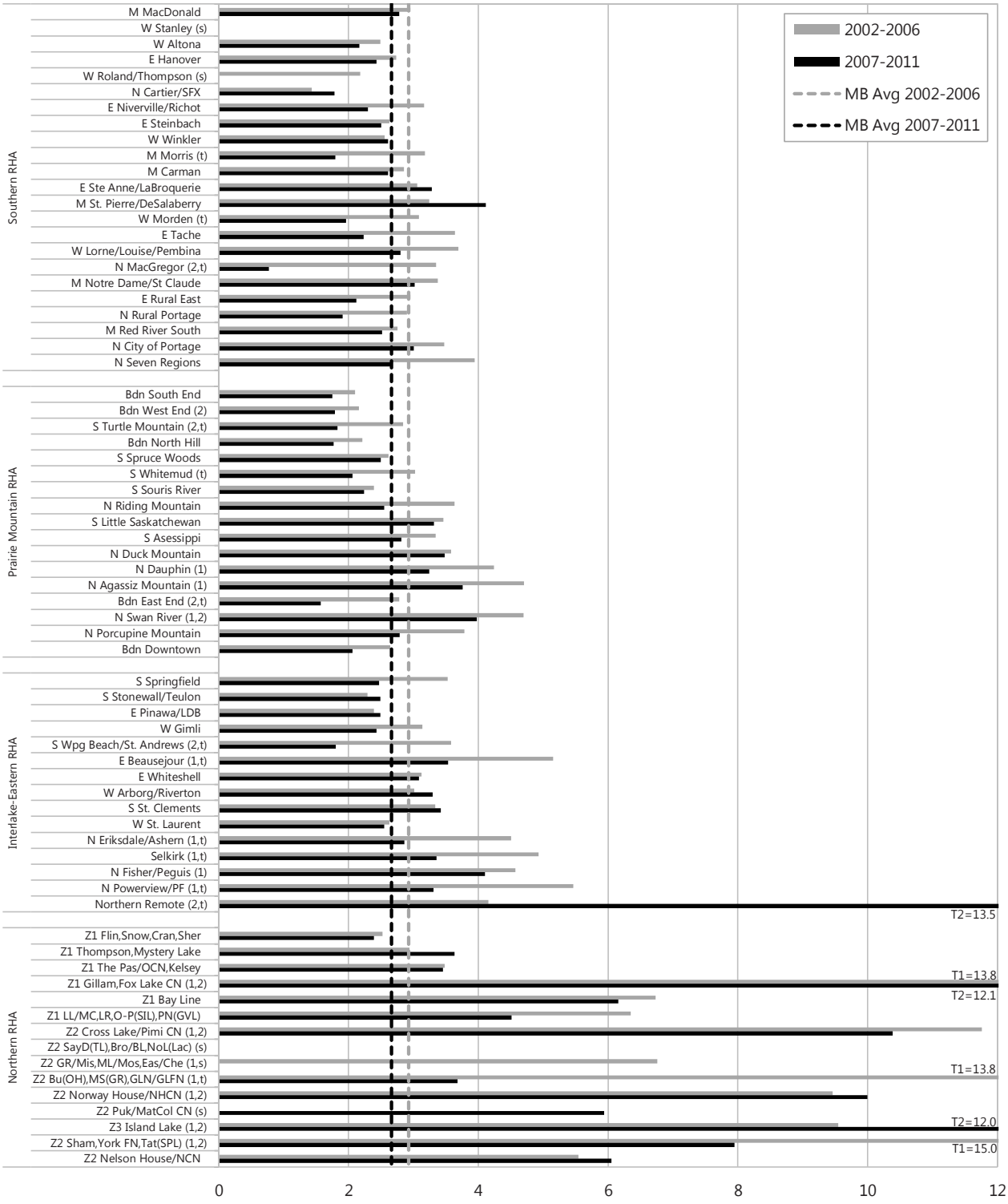
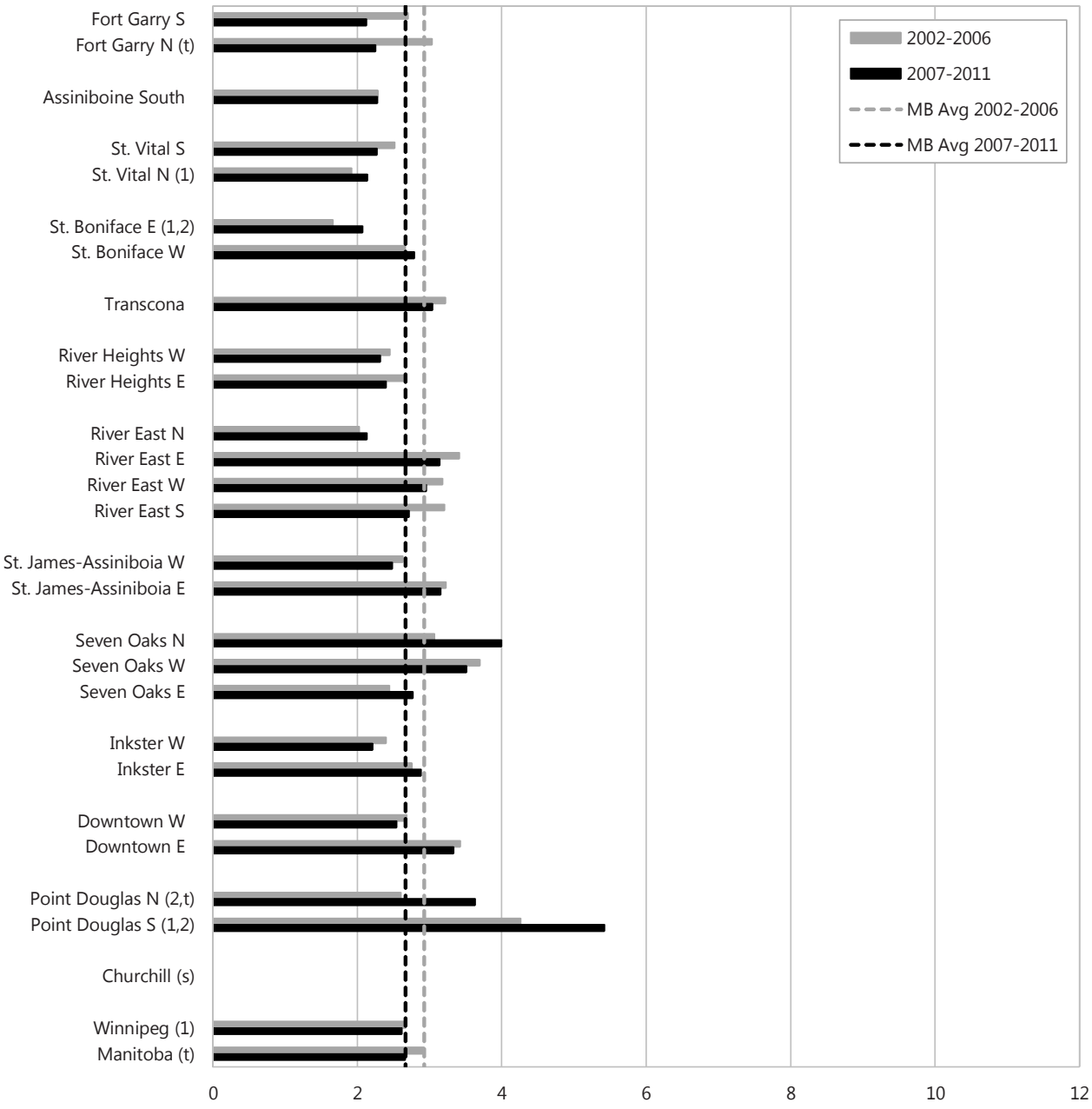


Figure 4.12.3: Stroke Rate by Winnipeg NC, 2002-2006 and 2007-2011

Age- and sex-adjusted average annual rate of death or hospitalization for stroke per 1,000 residents aged 40+



4.13 Lower Limb Amputation Among Residents with Diabetes

Definition: the age– and sex–adjusted percent of residents with diabetes aged 19 and older who had a lower limb amputation (below or including the knee) was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Diabetes was defined in the three fiscal years prior to the five-year study period: 1999/00–2001/02 and 2004/05–2006/07. Amputation was defined by a hospitalization with a surgery for a lower limb amputation, identified by ICD–9–CM procedure codes 84.10–84.17 and CCI codes 1.VC.93, 1.VG.93, 1.VQ.93, 1.WA.93, 1.WE.93, 1.WJ.93, 1.WL.93, and 1.WM.93. This definition does not include all amputations, but only those for which there was an existing condition of diabetes coded with the amputation; therefore the hospital abstract for the amputation must also indicate a diagnosis of diabetes (defined by ICD–9–CM diagnosis code 250 and ICD–10–CA codes E10–E14). Amputations associated with accidental injury were excluded.

Key Findings

- The proportion of people with diabetes who had a lower limb amputation in a five-year period decreased in Manitoba from 1.64% to 1.27%. Decreases were seen in all regions, though not all regions had statistically significant changes.
- The percent of diabetics receiving a lower limb amputation appears to be associated with premature mortality (amputation rates were higher in areas with higher premature mortality), though the relationship is not linear.
- Northern residents had the highest rates in both time periods. The percent of Northern residents receiving an amputation decreased slightly, but this change was not statistically significant.
- Because lower limb amputations are relatively rare, 10 years of data were used to calculate rates for the sub-regional areas (rural districts and Winnipeg NCs) Appendix 2. This results in less suppression of results (though some districts are still suppressed), but also a higher overall rate (just under 3.0%) than for the five–year period shown in the region–level results (1.27%).
    - There was large variation across districts in rural regions from just over 1% in several districts to over 9% in several districts. However, most districts with very low rates were not statistically different from the Manitoba average. There was much less variation among NCs in Winnipeg.
- There were strong relationships between income and amputations in urban and rural areas in both time periods: amputation rates were higher among residents of lower income areas (Appendix 2).

Comparison to Other Findings

- The decrease in amputations shown here is consistent with and extends the similar findings from the 2009 Atlas report (Fransoo et al., 2009).
- Since results for many small areas were suppressed due to small numbers, values were also calculated using a 10–year period (instead of five years). The 10–year results for rural districts and Winnipeg NCs are shown in Appendix 2.

Figure 4.13.1: Lower Limb Amputation Among Residents With Diabetes by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of people with diabetes (aged 19+) who had an amputation in a five-year period

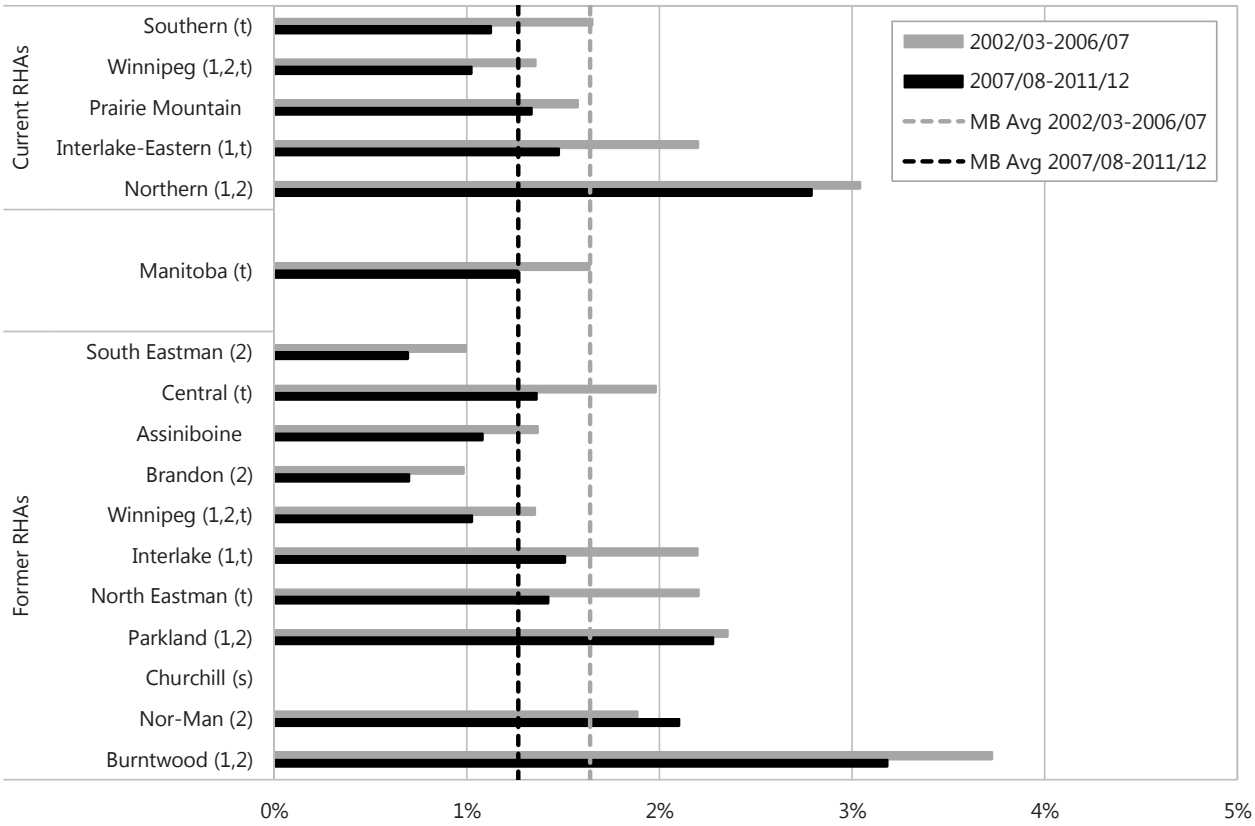


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Figure 4.13.2: Lower Limb Amputation Among Residents With Diabetes by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of people with diabetes (aged 19+) who had an amputation in a five-year period

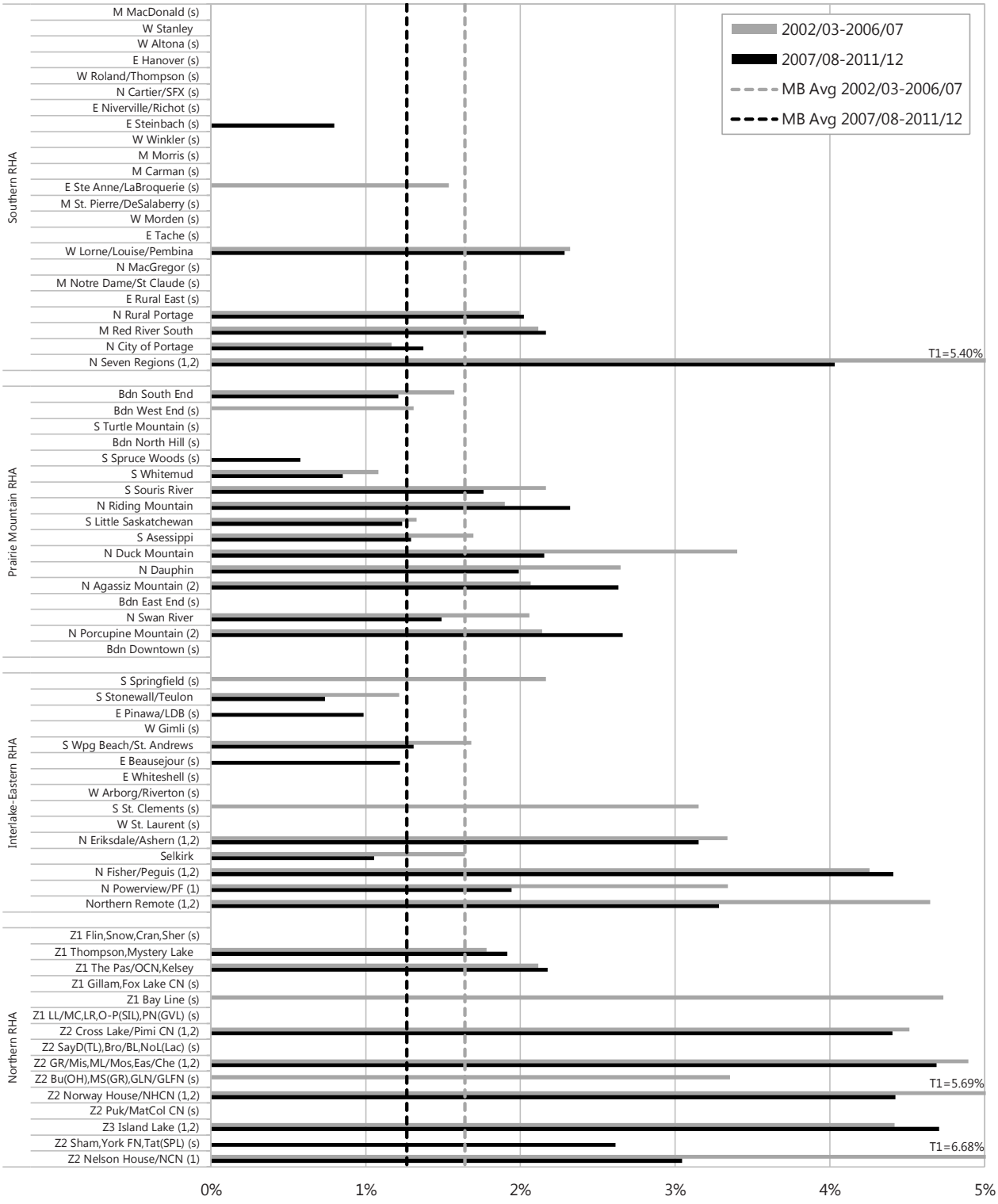
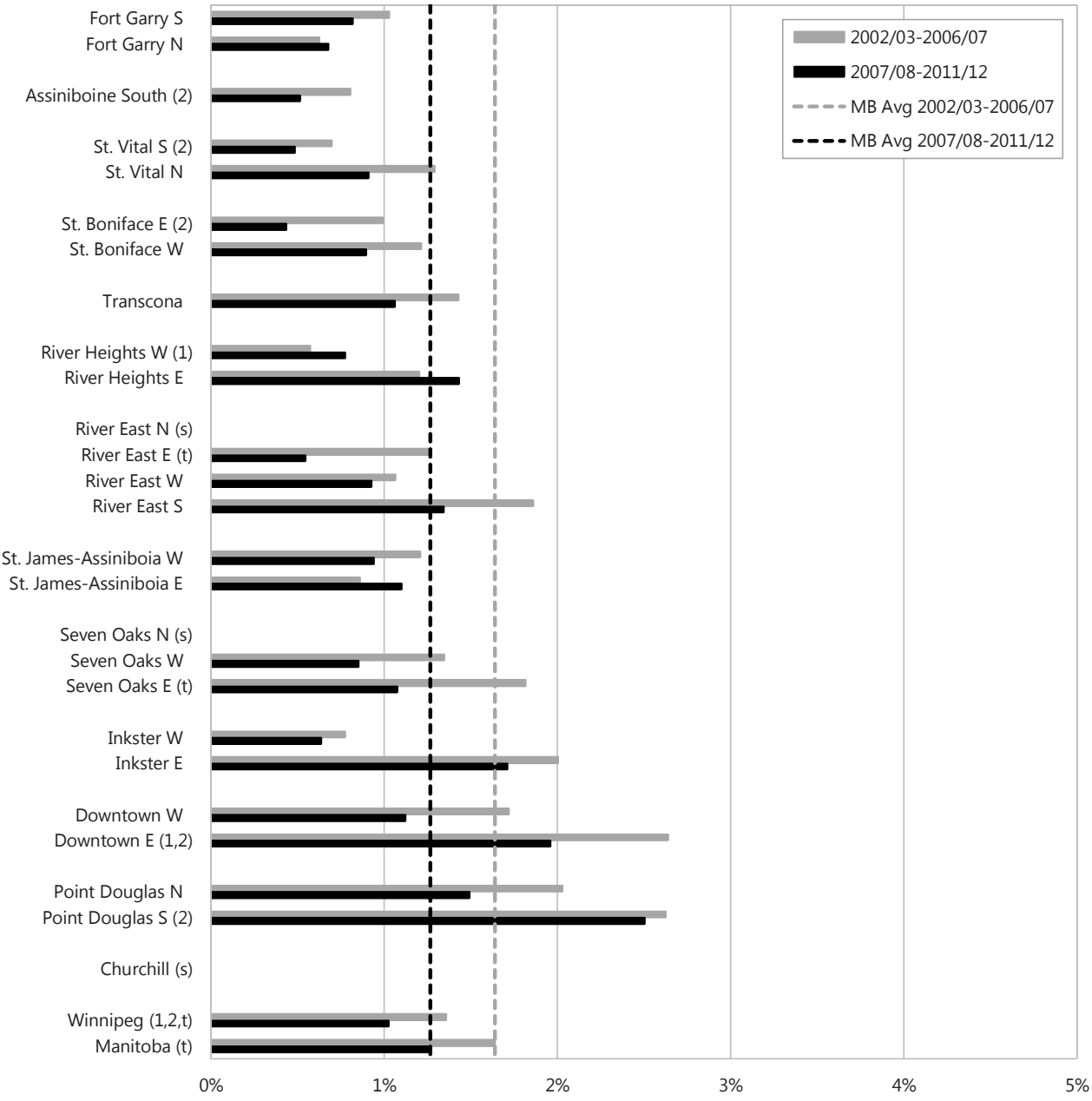


Figure 4.13.3: Lower Limb Amputation Among Residents With Diabetes by WinnipegNC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of people with diabetes (aged 19+) who had an amputation in a five-year period



CHAPTER 5: MENTAL ILLNESS

Key Findings in Chapter 5

- The findings in this short chapter reveal that the prevalence of **mood and anxiety disorders** (23.3%), **substance abuse** (5.04%), and dementia (10.6%) were all stable over time.

Introduction

This chapter contains indicators of the prevalence of selected Mental Disorders. Each indicator starts with a definition which describes the case definition used to identify residents as having the disease or event. Most definitions use a combination of data from physician visits, hospitalizations, and prescription drug use. In Manitoba, these data systems cover the entire population. As of April 1, 2004, hospital claims are coded using the ICD–10–CA system, whereas before that time and for physician claims during both time periods, the ICD–9–CM system was used. The codes used in each system are listed in the definition for each indicator and in the Glossary entries.

The disease prevalence indicators are based, in part, on data from physician claims (fee–for–service and "shadow" billing claims for salaried physicians). The values likely under–estimate the true prevalence of disease in Northern and Remote areas where a significant amount of care is delivered by nurses.

There remains the possibility that a resident with a given disorder may not have that diagnosis attributed to them in the time period under study. For example, a resident with depression may visit physicians several times for reasons other than their depression, and so none of those visits would get the diagnosis code for depression. In this case, the person would be erroneously classified as not having depression in that period. All of the case definitions used in this report have been validated against other data sources (e.g., surveys) and were chosen to provide optimal estimates of population prevalence (Lix et al., 2008; Lix et al., 2006).

5.1 Mood and Anxiety Disorders Prevalence

Definition: the percent of residents aged 10 and older with mood and anxiety disorders in two 5–year periods. Mood and anxiety disorders include depression; episodic mood disorders (bipolar disorder, manic episode); anxiety (anxiety disorders, phobic disorders, obsessive–compulsive disorders); dissociative and somatoform disorders; or adjustment reaction as defined by:

- at least one hospitalization with an ICD–9–CM code of 296.1–296.8, 300.0, 300.2–300.4, 300.7 or an ICD–10–CA code of F31, F32, F33, F34.1, F38.0, F38.1, F40, F41.0–F41.3, F41.8, F41.9, F42, F43.1, F43.2, F43.8, F45.2, F53.0, F93.0 or
- at least one physician visit with an ICD–9–CM code of 296 or 311 or
- at least one hospitalization or physician visit with an ICD–9–CM code of 300 or an ICD–10–CA code of F32, F34.1, F40, F41, F42, F44, F45.0, F45.1, F48, F68.0, F99 and at least one prescription for mood and anxiety medications (ATC codes N05AN01, N05BA, N06A) or
- at least three physician visits with an ICD–9–CM code of 300 or 309

Prevalence was calculated for 2002/03–2006/07 and 2007/08–2011/12 and was age– and sex–adjusted for the Manitoba population aged 10 and older.

Key Findings

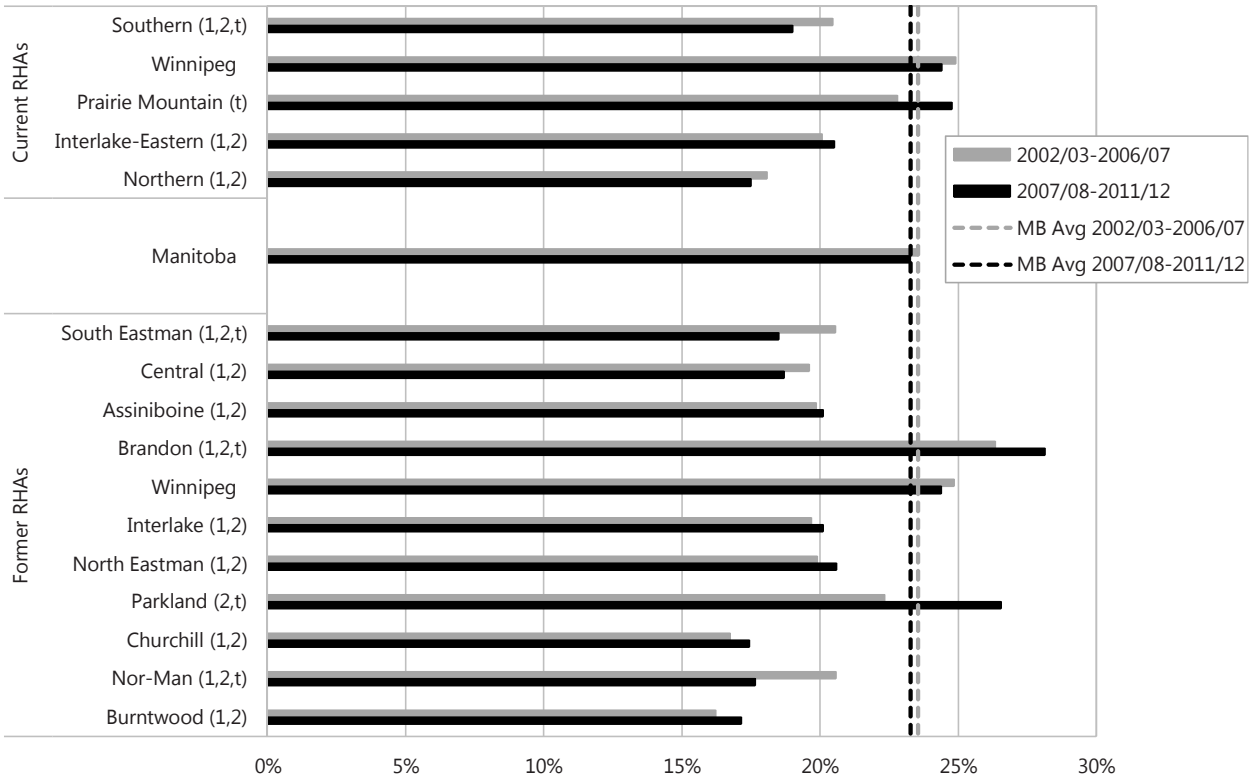
- The prevalence of mood and anxiety disorders was stable over time in Manitoba, with a small but non–significant decrease from 23.5% to 23.3%. This stability was not reflected in all regions however: Southern had a significant decrease over time and Prairie Mountain had a significant increase.
- Mood and anxiety disorders prevalence was not related to PMR at the regional, district, or NC levels.
- Northern region had the lowest prevalence for mood and anxiety disorders, but had high values for substance abuse prevalence (Section 4.15). These may be related in that unidentified mood disorders can sometimes lead to substance abuse problems (Bolton, Cox, Clara, & Sareen, 2006).
  - However, the earlier–noted issues with medical claims data for Northern residents may also play a role in these results. Many of the districts with low prevalence receive primary care services from "non–physician" providers, so medical claims data may under–estimate prevalence in these areas relative to other areas.
- Mood and anxiety disorders prevalence was significantly related to income in urban areas in both time periods, with much higher prevalence among residents of lower income areas. Among rural areas, there was no relationship with income in the first time period and a statistically significant but modest relationship in the second time period (Appendix 2).

Comparison to Other Findings

- This combined "mood and anxiety disorders" indicator is relatively new to MCHP. The 2009 Atlas report provided separate values for depression (approximately 19.1% in the second time period) and for anxiety (7.44%) (Fransoo et al., 2009). Because some patients would have met the criteria for both disorders, one would expect that the new indicator would have a prevalence value lower than the sum of the two separate disorders (26%), which is similar to what was reported in this Atlas report (23%). Therefore, the results appear to be consistent with those in the 2009 Atlas.
  - The notable difference is that in this report, the prevalence appears stable over time, not increasing as was seen for both depression and anxiety in the 2009 Atlas (Fransoo et al., 2009).

Figure 5.1.1: Prevalence of Mood and Anxiety Disorders by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ diagnosed with a disorder



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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 5.1.2: Prevalence of Mood and Anxiety Disorders by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ diagnosed with a disorder

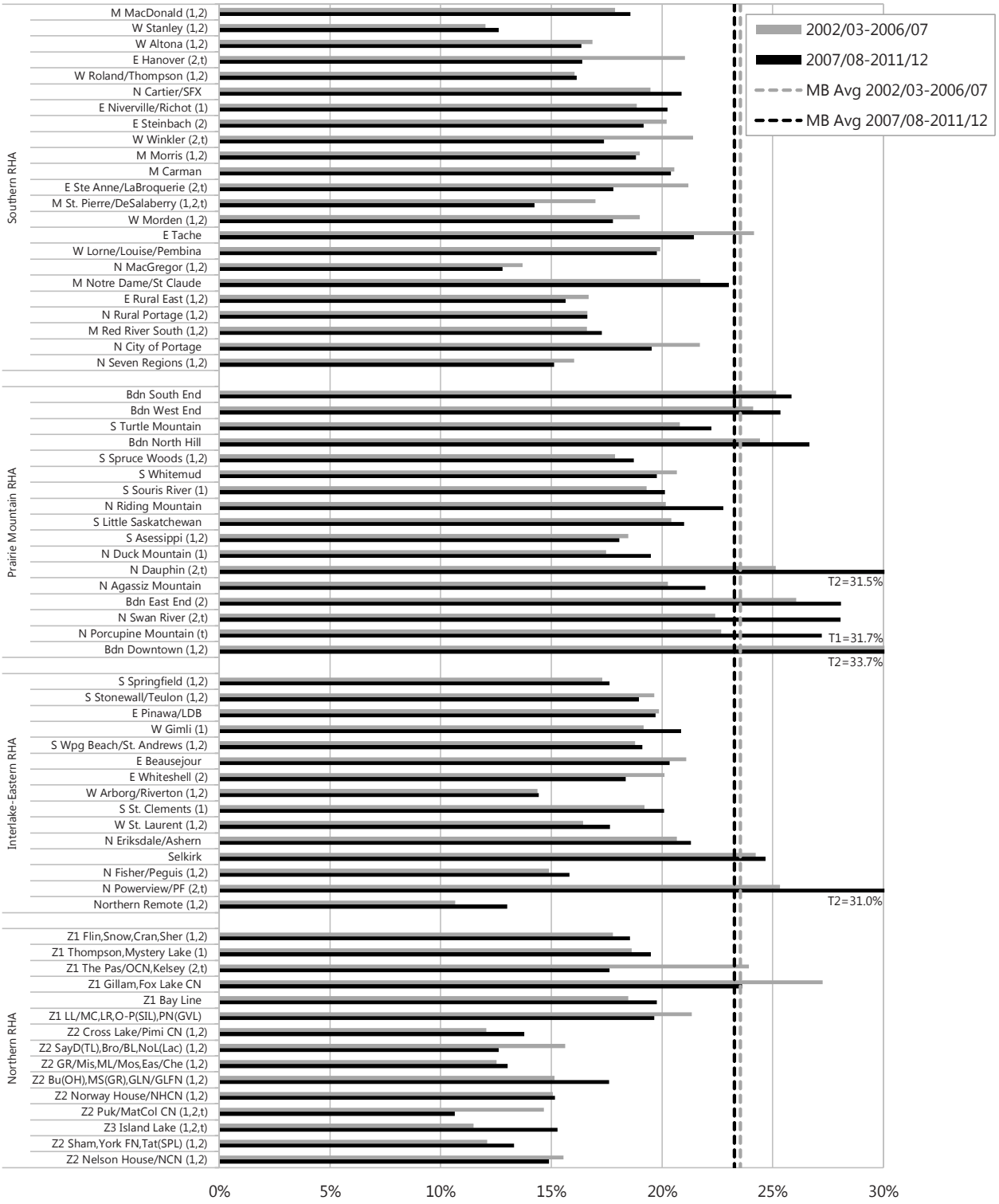
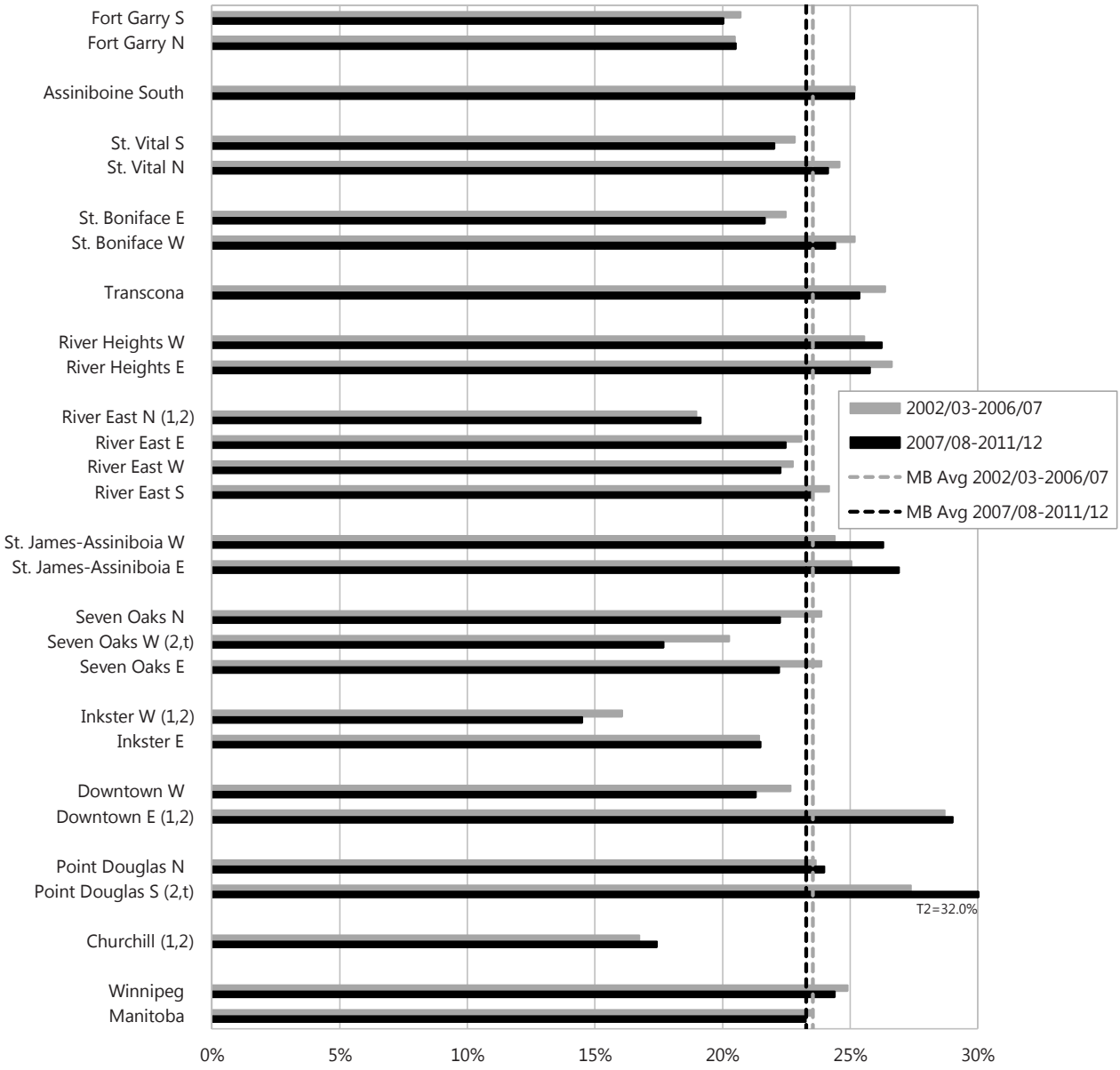


Figure 5.1.3: Prevalence of Mood and Anxiety Disorders by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ with a disorder



5.2 Substance Abuse Prevalence

Definition: the percent of residents aged 10 and older with substance abuse over two 5–year periods. Substance abuse includes alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs as defined by:

- at least one hospitalization with an ICD–9–CM code of 291, 292, 303, 304, 305 or an ICD–10–CA code of F10–F19, F55 or
- at least one physician visit with an ICD–9–CM code listed above

Prevalence was calculated for 2002/03–2006/07 and 2007/08–2011/12 and was age– and sex–adjusted to the Manitoba population aged 10 and older in the first time period.

Key Findings

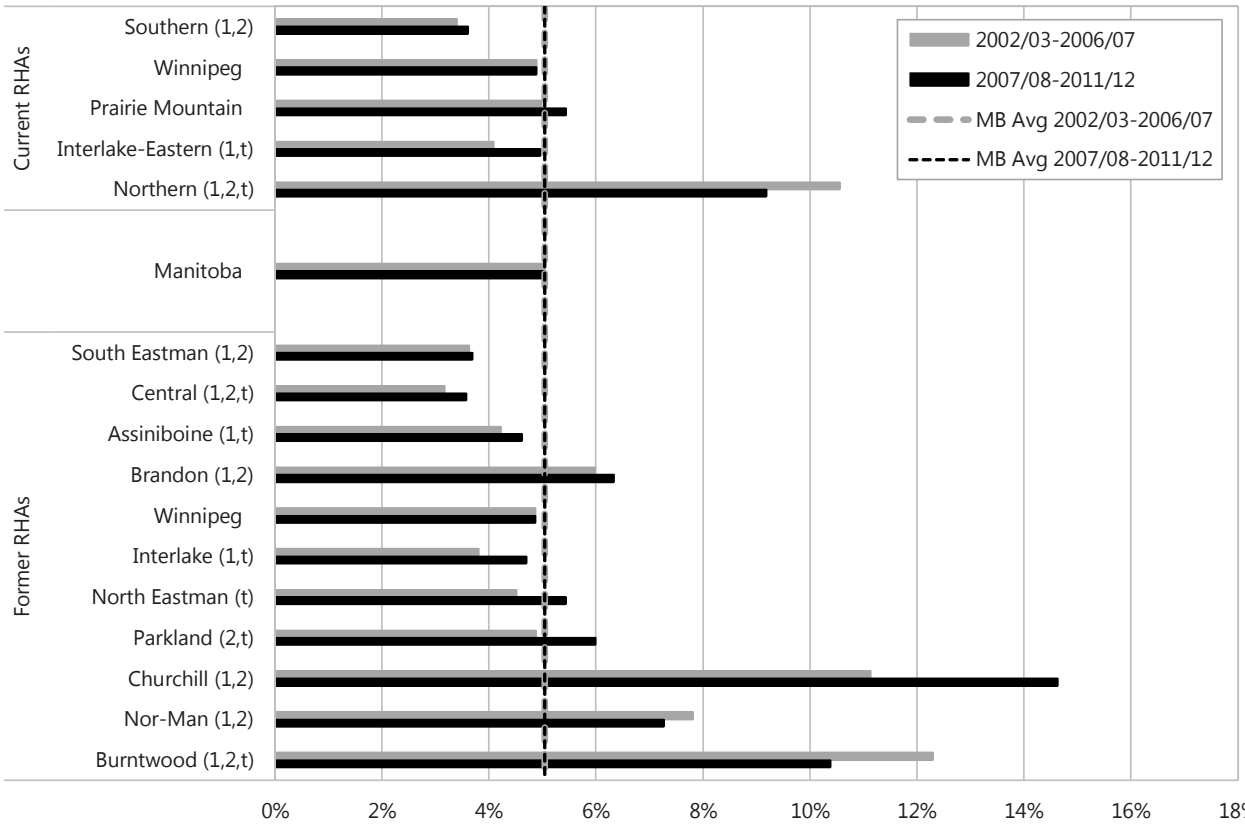
- The prevalence of substance abuse was stable over time in Manitoba at 5% of residents aged 10 and older. However, there were differences across regions:
  - Prevalence was relatively stable in Southern and Winnipeg regions and showed a slight but non–significant increase in Prairie Mountain.
  - Interlake–Eastern had a significant increase, which brought it up to the provincial average.
  - Northern had a significant decrease, which lowered it from 10.6% to 9.2%.
- Substance abuse prevalence was related to PMR at the regional level though not linearly. The lowest value was in Southern, and the highest value was in Northern.
- There was significant variation across the districts of rural regions with some evidence of association with PMR within each region.
- There was large variation across NCs in Winnipeg, from just under 3% to over 14%.
- There were strong relationships between substance abuse prevalence and area–level income in both urban and rural areas in both time periods. Prevalence was higher among residents of lower income areas, though the gradient was considerably steeper in urban than rural areas (Appendix 2). In both rural and urban areas, the lowest income areas had considerably higher rates.

Comparison to Other Findings

- The 2009 Atlas report showed a significant decrease from 5.44% to 4.90% (Fransoo et al., 2009). The updated values in this report suggest the prevalence has stabilized at 5%.

Figure 5.2.1: Prevalence of Substance Abuse by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 5.2.2: Prevalence of Substance Abuse by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ diagnosed with disorder

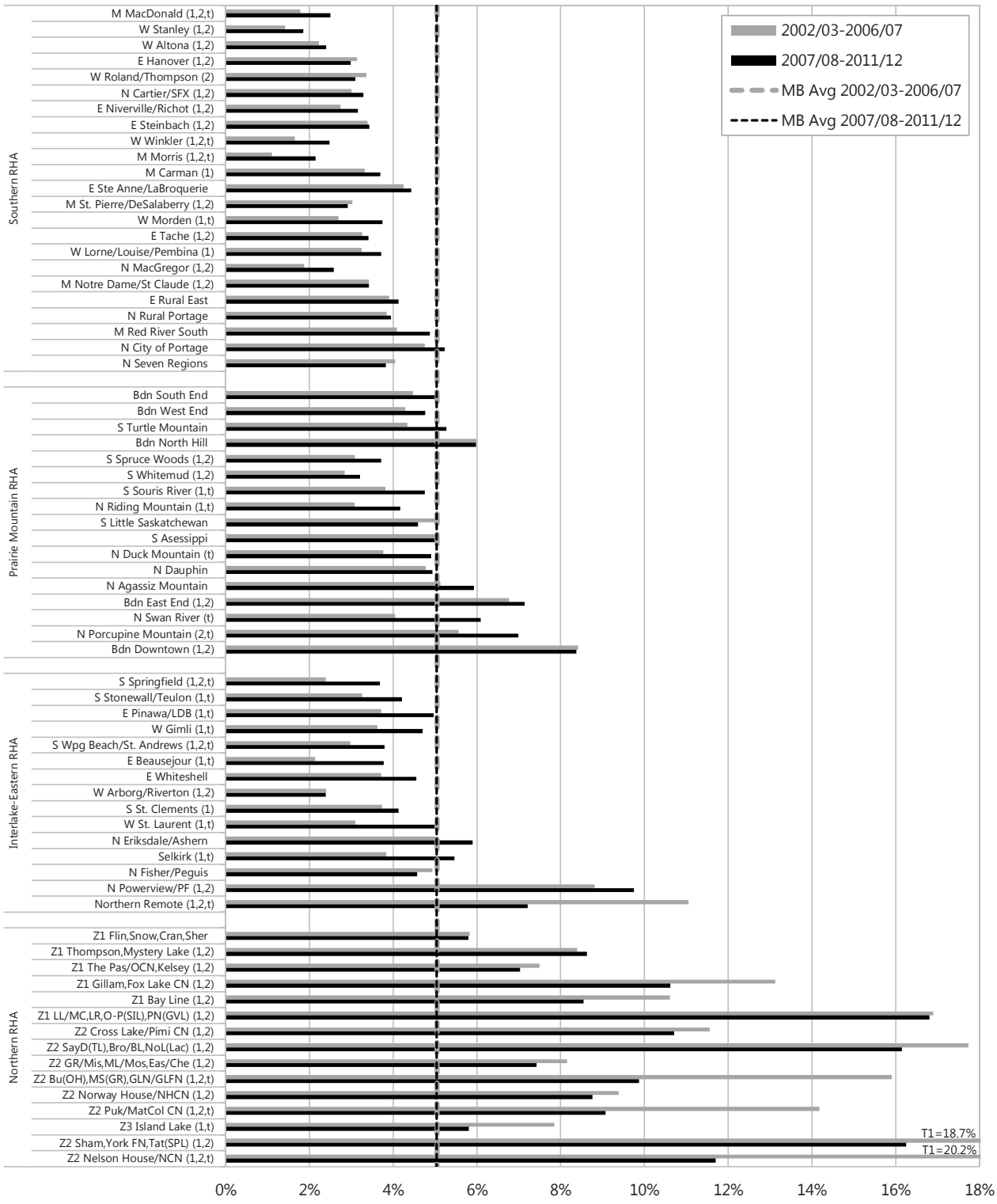
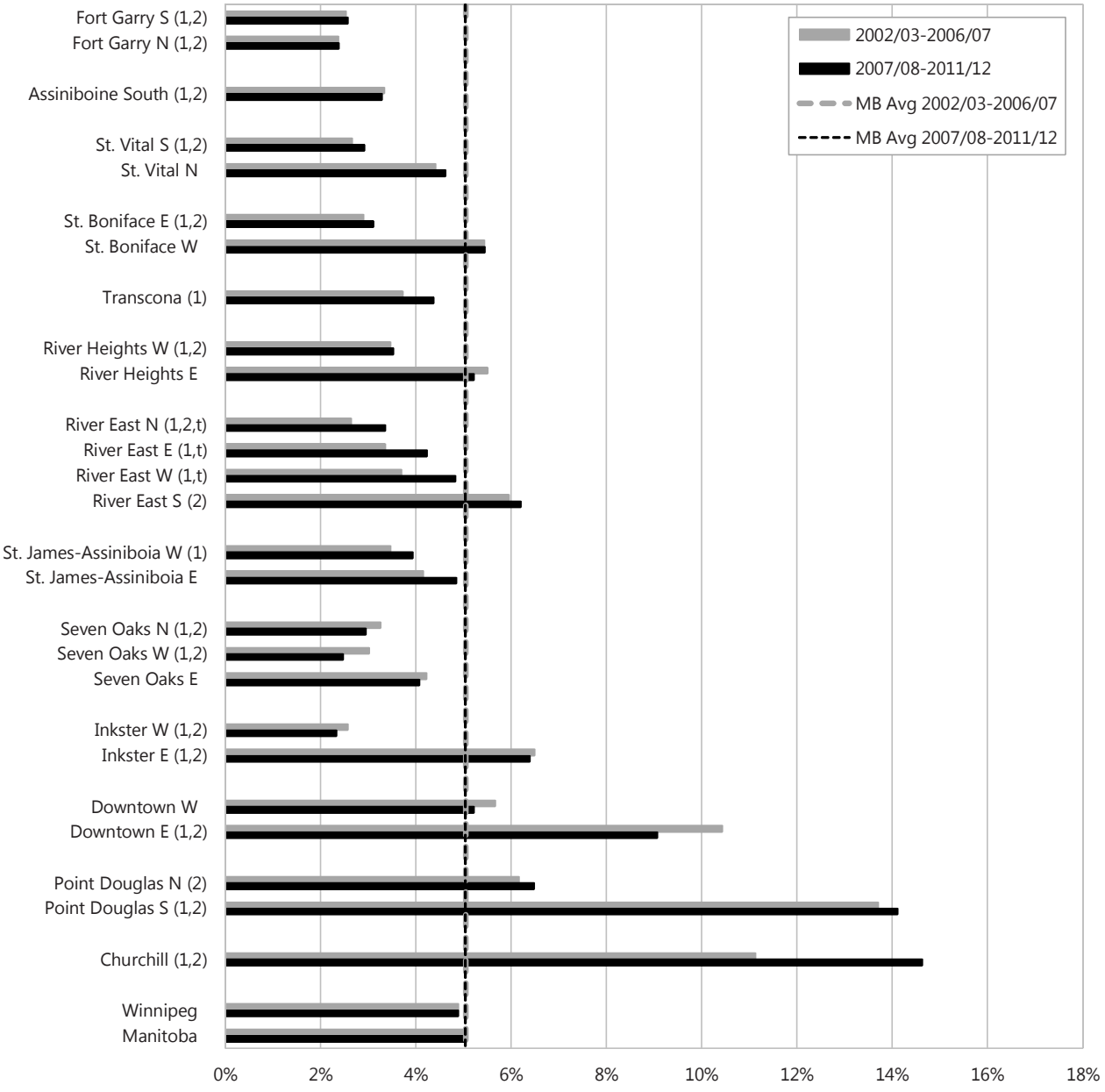


Figure 5.2.3: Prevalence of Substance Abuse by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 10+ diagnosed with disorder



5.3 Dementia Prevalence

Definition: the percent of residents aged 55 and older with dementia, including organic psychotic conditions, cerebral degenerations, and senility, over two 5–year periods. Dementia was defined as:

- at least one hospitalization with an ICD–9–CM code of 290, 291.1, 291.2, 292.82, 294, 331, 797 or an ICD–10–CA code of F00, F01, F02, F03, F04, F05.1, F06.5, F06.6, F06.8, F06.9, F09, F10.7, F11.7, F12.7, F13.7, F14.7, F15.7, F16.7, F17.7, F18.7, F19.7, G30, G31.0, G31.1, G31.9, G32.8, G91, G93.7, G94, R54 or
- at least one physician visit with an ICD–9–CM code of 290, 294, 331, or 797

Values were calculated for 2002/03–2006/07 and 2007/08–2011/12 and were age– and sex–adjusted for the Manitoba population aged 55 and older in the first time period.

Key Findings

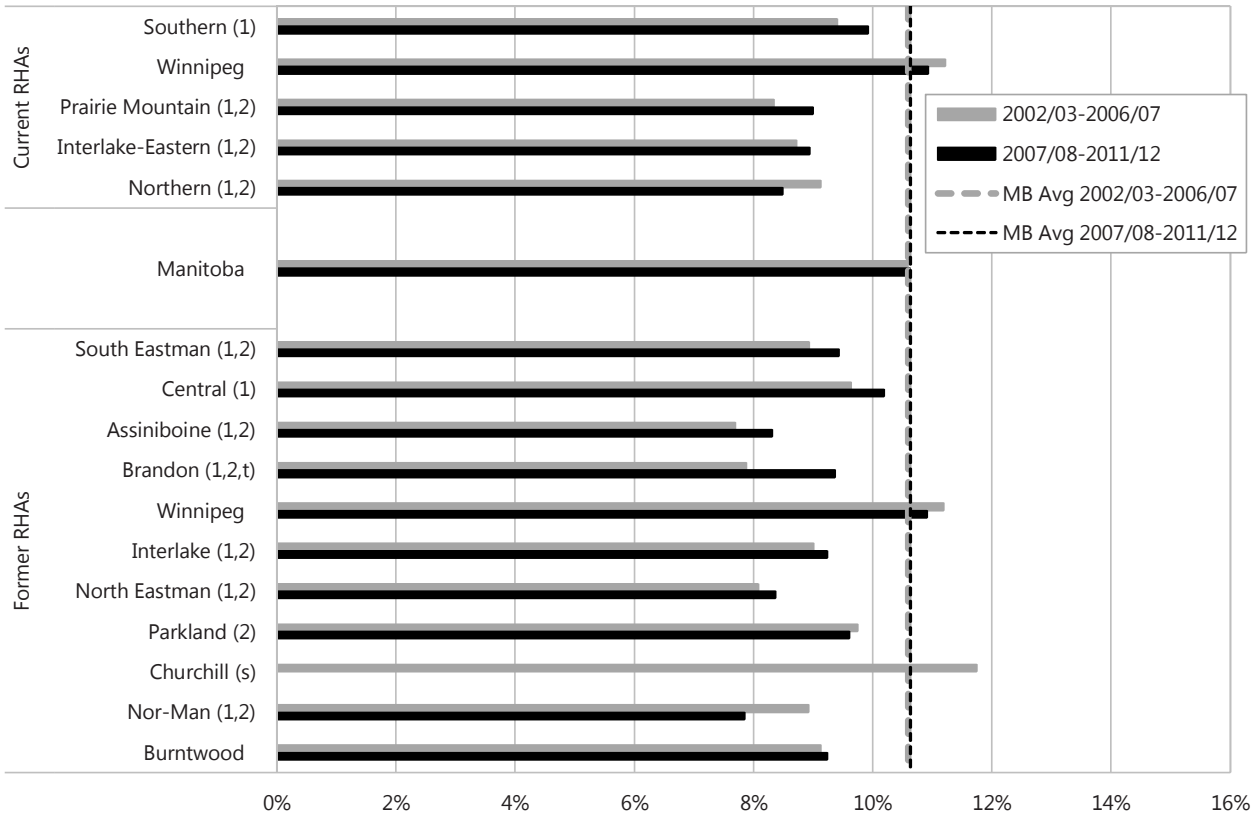
- The prevalence of dementia in Manitoba was stable over time at 10.6% of the population aged 55 and older. Rates in all regions reflected this stability.
- Dementia prevalence was not related to PMR at the regional, district, or NC level.
- Prevalence was higher among Winnipeg residents than Manitoba overall, though this difference did not reach statistical significance. All other regions had values that were significantly lower than average in at least one time period.
- There was substantial variation across the districts of the rural regions from just over 4% to over 20%.
- There was also large variation among Winnipeg NCs from 5% to over 19%.
  - The high prevalence of dementia in Seven Oaks North is strongly affected by the Middlechurch Personal Care Home located in that area. An analysis excluding **Personal Care Home** (**PCH**) **residents** produced much lower values: 8.3% in the first time period (versus 17.0% shown) and 9.7% in the second time period (versus 19.6% shown).
  - This same issue also affects Point Douglas South, but to a lesser degree.
- Dementia prevalence was significantly related to income in urban areas, but not rural areas. Among urban residents, dementia prevalence was significantly higher among residents of lower income areas in both time periods (Appendix 2).

Comparison to Other Findings

- The results shown here suggest that the prevalence of dementia has stabilized over time, at 10.6%. In the 2009 Atlas report, dementia prevalence increased from 10.0% to 10.8% (Fransoo et al., 2009).

Figure 5.3.1: Prevalence of Dementia by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 55+ diagnosed with disorder



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 5.3.2: Prevalence of Dementia by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 55+ diagnosed with disorder

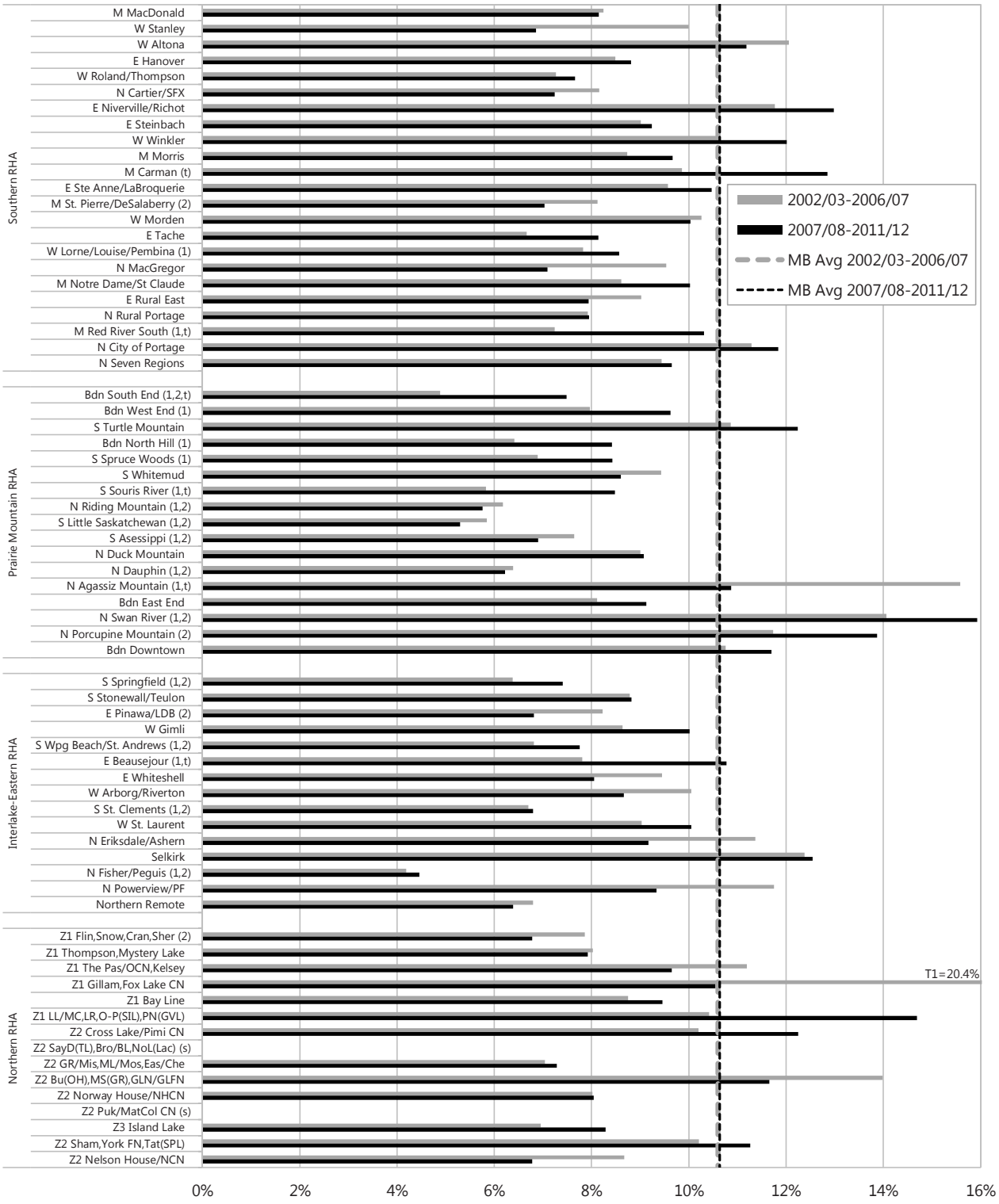
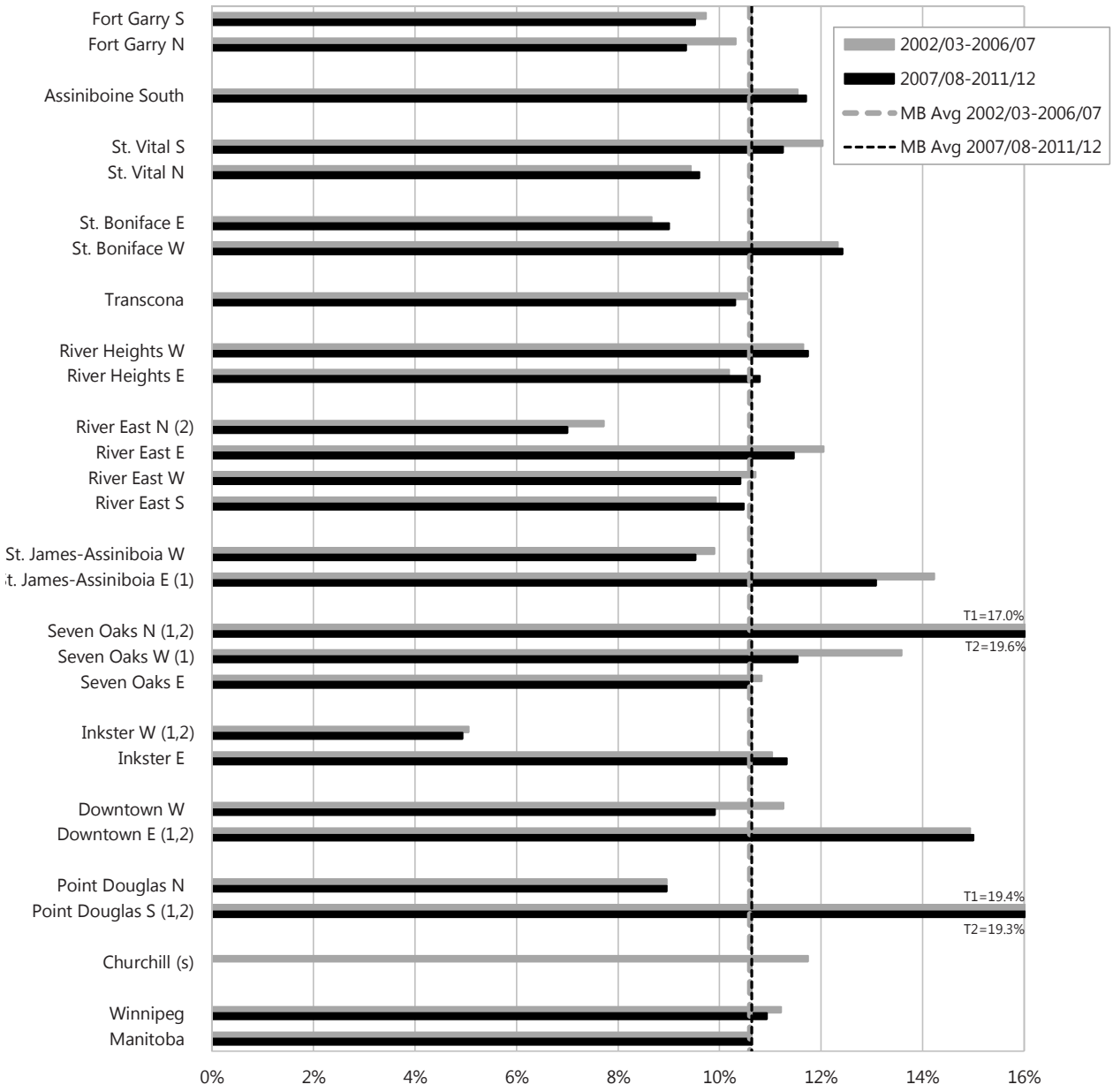


Figure 5.3.3: Prevalence of Dementia by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted percent of residents aged 55+ diagnosed with disorder



CHAPTER 6: PHYSICIAN SERVICES

Key Findings in Chapter 6

- The proportion of residents visiting a physician at least once in a year decreased slightly, from 80.9% to 79.1%. These values are somewhat lower than those shown in previous reports, partly due to changes in the definition of **ambulatory visits**.
- The average rate of ambulatory visits (4.43 per person per year) was also slightly lower than in previous reports for this same reason. Moreover, results in this report suggest that visit rates are decreasing slightly over time, though these changes varied by age, sex, and region. Visit rates for Winnipeg and Brandon residents continue to be higher than other areas.
- The age– and sex–specific rates of visits to physicians changed slightly over time, with young children and adults aged 50 and older receiving slightly lower visit rates in 2011/12 than in 2006/07. Rates for other age groups remained stable.
- **Ambulatory consultation** rates increased, indicating that Manitobans had more access to **specialist physicians** in 2011/12 than in 2006/07. Winnipeg had the highest rates; this affected the Manitoba average, so rates for most other areas were below average.
- The **causes of physician visits** remained distributed among many disease categories. The top five causes were the same over time though rankings shifted among them: Respiratory, Circulatory, Musculoskeletal, Mental Illness, and Health Status and Contact.
- There was no change over time in the proportion of Manitobans receiving the majority of their ambulatory care from a single physician.
- The majority of visits to **general and family practitioners** (**GP/FPs**) continue to be provided relatively close to home (i.e., within the person's home district or region), with visits to specialist physicians more often occurring in Winnipeg.
- Rates of physician service use (access, visit rates, consult rates) do not appear to be strongly related to health status at the regional level, though missing data may affect this observation (especially in Northern region).
- There was no consistent relationship between physician service use and area–level income: some services were significantly related to income, but others were not.
- These latter two observations suggest that physician services may not be as responsive to population health status as other services (e.g., hospital use), but the issue of missing data makes it impossible to draw firm conclusions.
- The "completeness" of data for physician services continues to be a concern, particularly among physicians and nurse practitioners working in rural areas; many of them are paid by alternative payment systems (e.g., salary) and may not be completing "shadow billing" claims for all services they provide.
    - This issue also affects the prevalence and incidence of diseases, because they also use physician visit data.

Introduction

This chapter provides a number of indicators of the use of physician services by residents of Manitoba. Service use is allocated to the area of residence of the patient, regardless of where the service was provided. For example, if a resident of Prairie Mountain region visits a physician in Winnipeg, it would be counted as a visit for a Prairie Mountain resident. Similarly, if a physician based in Winnipeg provides itinerant services in Northern region, these are counted as visits provided to Northern residents.

The primary indicator of physician visits is called "ambulatory visits"; it captures the vast majority of all contacts with physicians. This includes visits to physicians' offices/clinics, plus visits to walk–in clinics, home visits, nursing home visits, and visits provided in outpatient departments of hospitals.

The definition has recently undergone two significant revisions driven by changes in the data being reported to Manitoba Health. Overall, this new definition captures about 1% more visits than the previous definition.

1. The new definition excludes visits to emergency departments, as the majority of such visits are not captured in the data system. This change decreases visit rates by about 4% overall, though the impact is much larger in Northern region (16%).
2. The definition includes prenatal visits because separate claims are now captured for each visit. This change increases visit rates by about 2.5% overall, and the impact was largest in Northern region (4%).

Other minor revisions were also incorporated to address changes in the data system.

"Ambulatory consultations" are a subset of ambulatory visits which occur when one physician refers a patient to another physician (usually a specialist or surgeon) because of "the complexity, obscurity, or seriousness of the condition" or when the patient requests a second opinion. A consultation is the first visit to the specialist, after which the patient usually returns to their general or family practitioner (GP/FP) for **continuing care**. The consultation rate is used as an indicator of access to specialist care.

The indicators in this chapter include visits to all licensed medical doctors for which claims were submitted to Manitoba Health (via the usual fee–for–service claims or "shadow" billing claims). Physicians working under alternative payment schemes (e.g., salary) are encouraged to submit shadow billing claims; but because these data may not be complete, our results may underestimate true visit rates. Analyses in another MCHP report (Katz, Bogdanovic, Ekuma, Soodeen, Chateau & Burnett, 2009) suggest that shadow billings appear to be missing for about one-third of all visits provided by salaried physicians.

Residents of some First Nation communities (primarily in the Northern region) often have lower ambulatory visits rates than expected, but many of these communities have nursing stations that also provide care. Therefore, the ambulatory visit rate is an underestimate of the total amount of care received by these residents. Manitoba also has some **nurse practitioners**, but their services are not included in ambulatory visits.

6.1 Use of Physicians

Definition: the percent of residents (all ages) who received at least one ambulatory visit in a fiscal year. Ambulatory visits include virtually all contacts with physicians, except during inpatient hospitalization and emergency department visits (see Introduction). Values were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

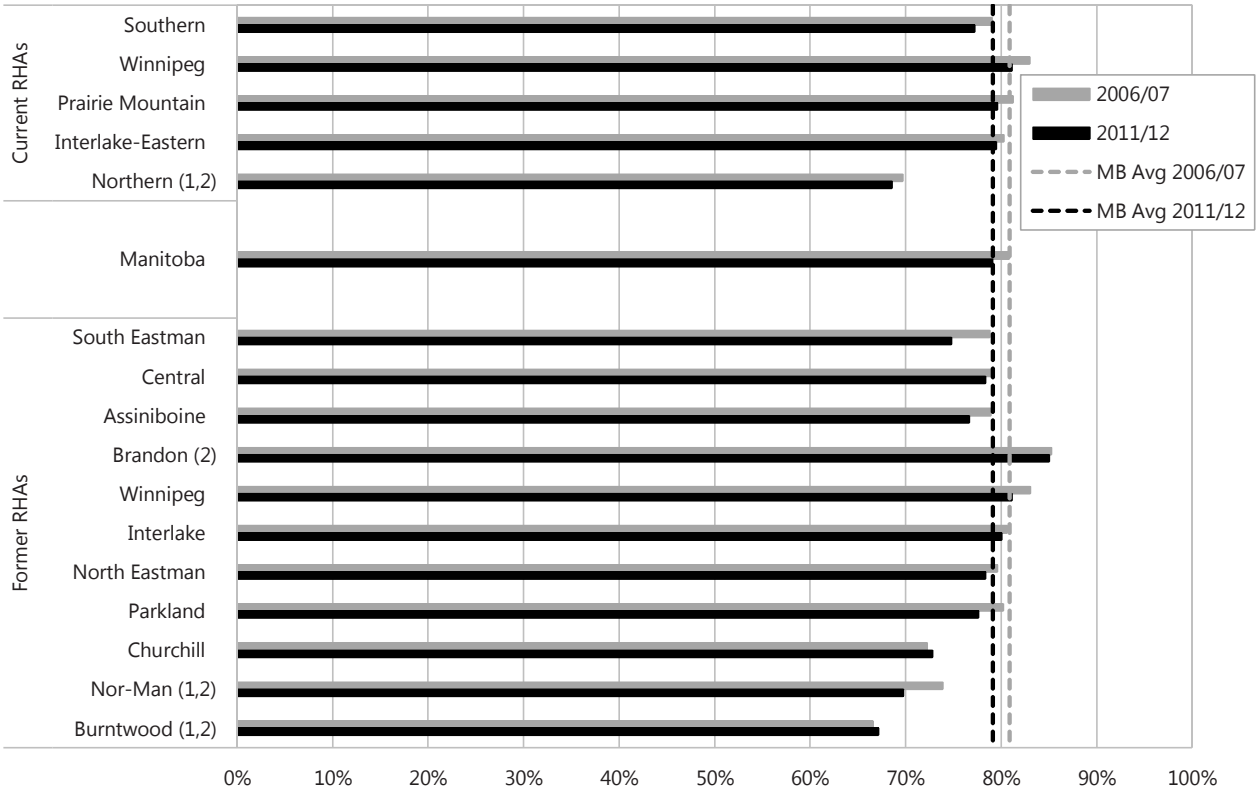
- The proportion of residents with at least one physician visit in a year was stable over time; the slight decrease from 80.9% to 79.1% was not statistically significant in the main model. This finding was reflected in all regions.
  - An alternate model was created to test the time difference for Manitoba overall (i.e., excluding age, sex, and region), and this model showed that the decrease in **use of physicians** was statistically significant ($p<0.0001$).
  - Therefore, the lack of statistical significance despite the decrease in overall rates is likely caused by variability among age and sex groups.
- Physician use rates were not associated with PMR at the regional, district, or NC level.
- Residents of the Northern region had lower physician use rates; and among districts within Northern, there are lower rates among residents of the least healthy districts. However, as described above, this is partly related to the fact that many residents of those districts receive much of their primary care in nursing stations. This care is not captured in the medical claims data system. Therefore, these results must be interpreted with caution.
- There was remarkably little variation in physician use rates across NCs in Winnipeg.
- Use of physicians was significantly related to income in rural areas, but not urban areas. Among rural areas, the proportion of residents with at least one visit was lower for residents of lower income areas (see Appendix 2 tables).

Comparison to Other Findings

- Results in the 2009 Atlas also showed a small but non–significant decrease over time (Fransoo et al., 2009). However, the values shown here have shifted to lower rates likely because of the changes to the definition of ambulatory visits described above. In particular, it is likely that the exclusion of visits to Emergency Departments is responsible for a substantial portion of this drop, as such visits may have been the only physician visit in a year for some residents.

Figure 6.1.1: Use of Physicians by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one ambulatory visit per year (to any physician)



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 6.1.2: Use of Physicians by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one ambulatory visit per year (to any physician)

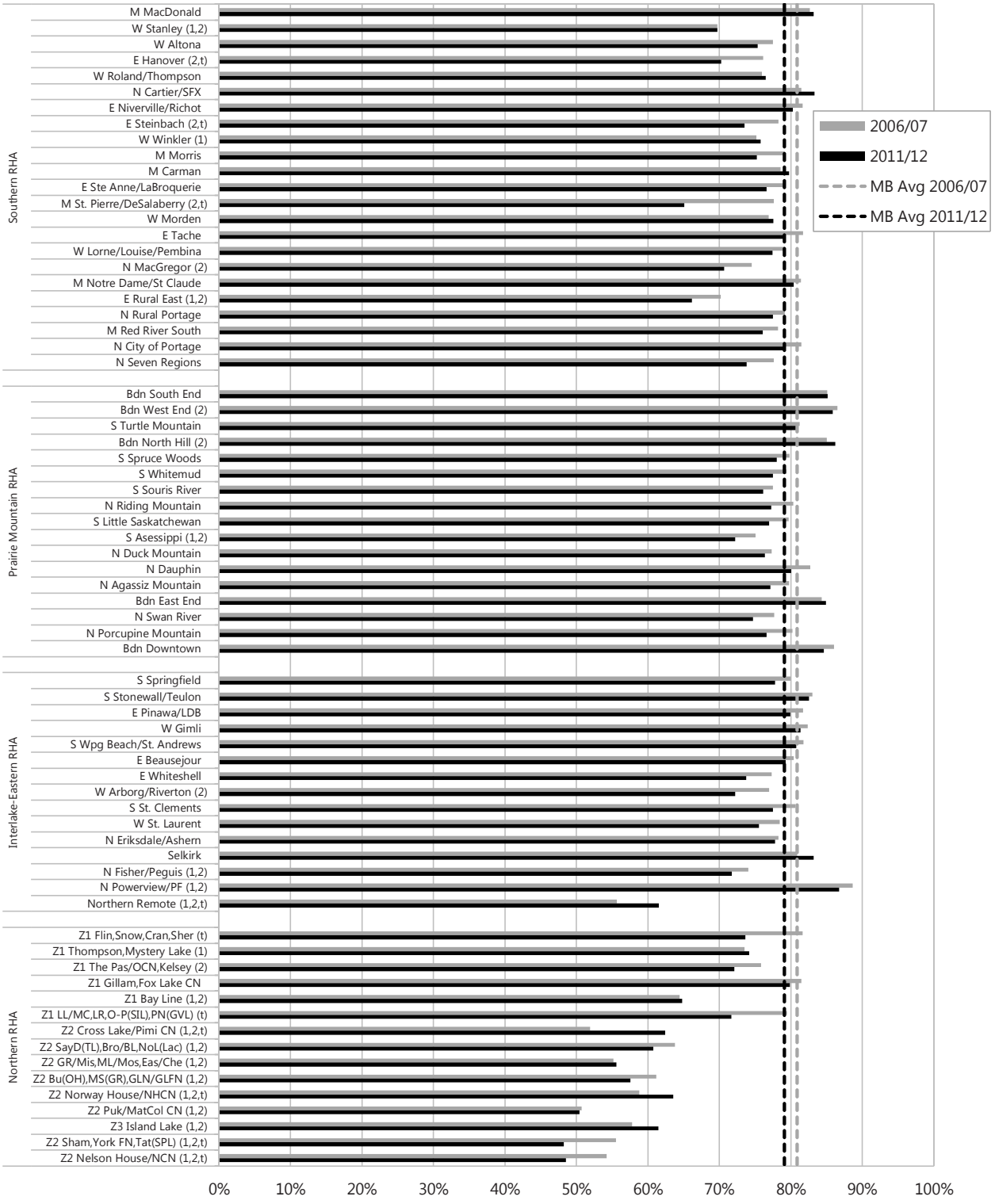
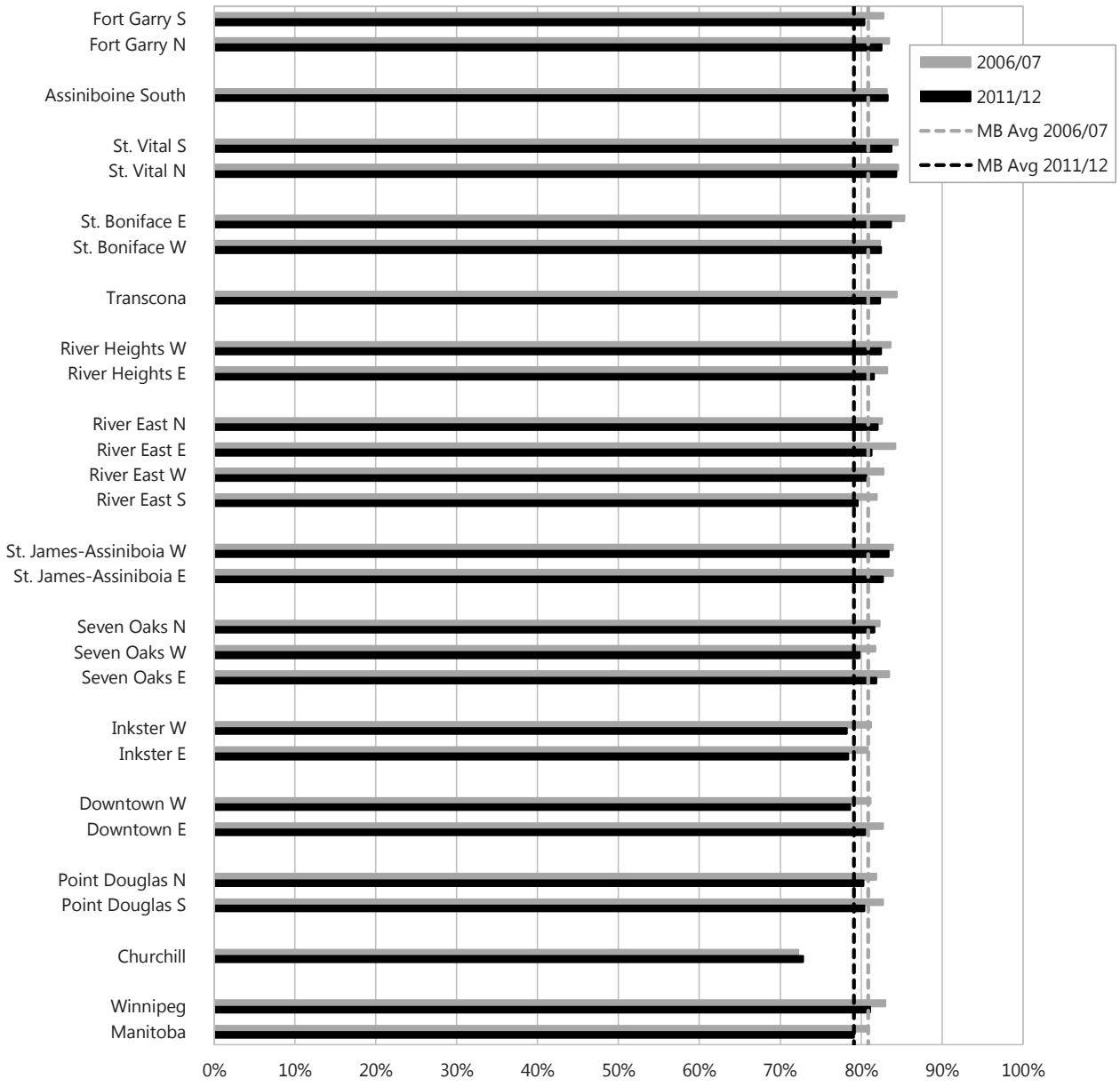


Figure 6.1.3: Use of Physicians by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one ambulatory visit per year (to any physician)



6.2 Ambulatory Visits

Definition: the average number of visits to physicians per resident (all ages) in a given year. Ambulatory visits include almost all contacts with physicians (general practitioners, family practitioners, and specialists): office visits, walk–in clinics, home visits, personal care home (nursing home) visits, and visits to outpatient departments. Due to improved coding practices, prenatal visits are also included. Services provided to patients while admitted to hospital and emergency department visits are excluded. Average annual rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

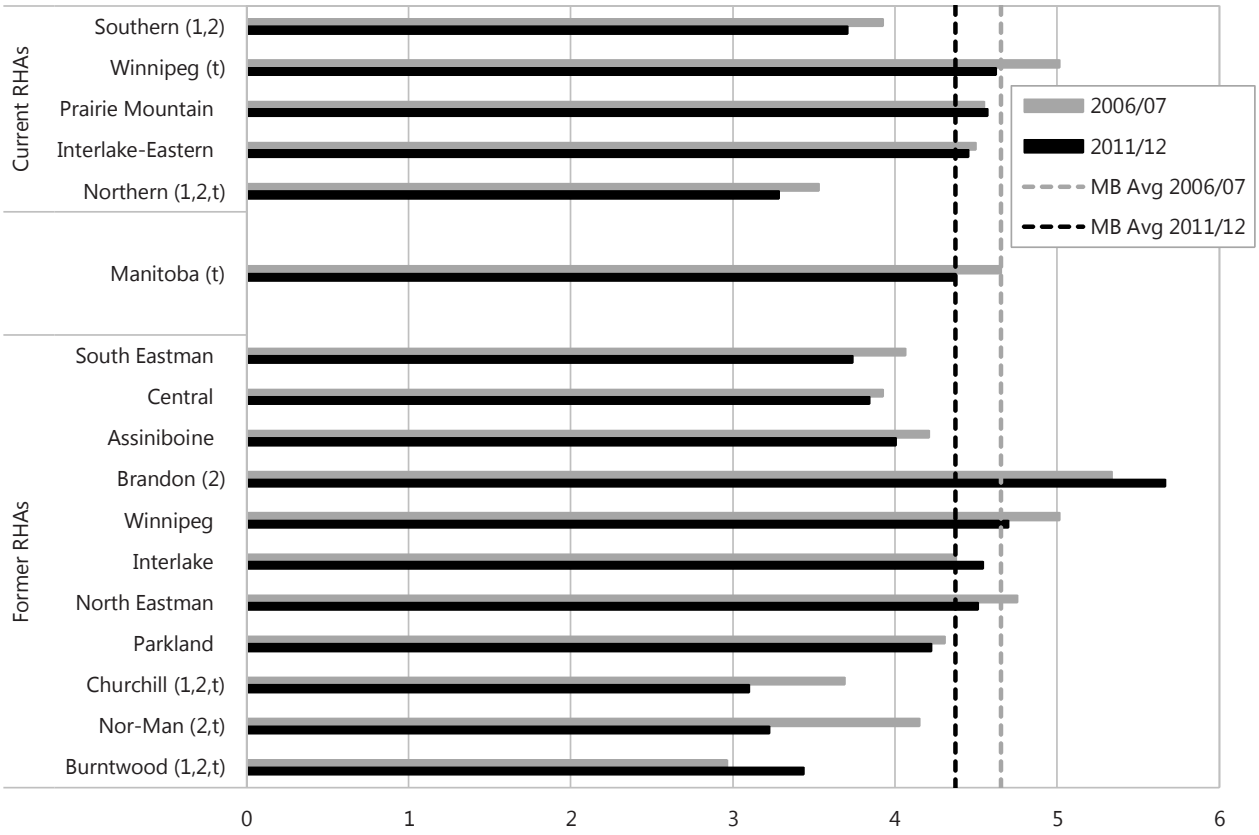
- The rate of ambulatory visits per resident appeared to decrease over time, but did not reach statistical significance in the main model. The changes varied by region. Winnipeg and Northern had the largest decreases (neither reached significance, though Winnipeg was marginal), while other regions showed smaller changes.
  - This lack of statistical significance despite the substantial decrease in overall rates is likely caused by the variability across regions and age/sex groups. In several parts of the province, the visit rate decreased; in others, it remained stable; and in a few, it increased (e.g., former Brandon and Interlake RHAs).
  - An alternate model which tested only the time difference for Manitoba overall (excluded age, sex, and region) was created, and this model showed that the decrease in visit rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the decreases over time (by age, sex, and region) is why the main model did not show a significant decrease over time.
- Visit rates do not appear to be associated with PMR at the regional, district, or NC levels though data issues for residents of Northern (described in the Introduction of this chapter) affect these patterns.
- Residents of the former Brandon RHA and Winnipeg appeared to have higher than average rates. The only statistically significant difference was in Brandon in the second time period.
- There was large variation in visit rates across districts of rural regions from under two to over seven visits per year.
- There was considerably less variation across NCs in Winnipeg.
- The relationships between ambulatory visit rates and income were inconsistent over time and across urban and rural areas (see Appendix 2 tables).
  - In urban areas, residents of lower income areas had higher visit rates than those in higher income areas, though this pattern was only statistically significant in the first time period.
  - In rural areas, the opposite trend was found: residents of higher income areas had higher visit rates in both time periods. A portion of this pattern is attributable to the fact that many of the highest income rural areas are close to Winnipeg or Brandon, where visit rates are higher.

Comparison to Other Findings

- In the 2009 Atlas report, ambulatory visit rates were stable at just under 5.0 visits per resident per year (Fransoo et al., 2009). The results here are a bit lower due to changes in the definition of ambulatory visits. There is also a trend toward visit rates decreasing over time though this varied by age, sex, and region as described above.

Figure 6.2.1: Ambulatory Visit Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of ambulatory visits to all physicians per resident



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 6.2.2: Ambulatory Visit Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of ambulatory visits to all physicians per resident

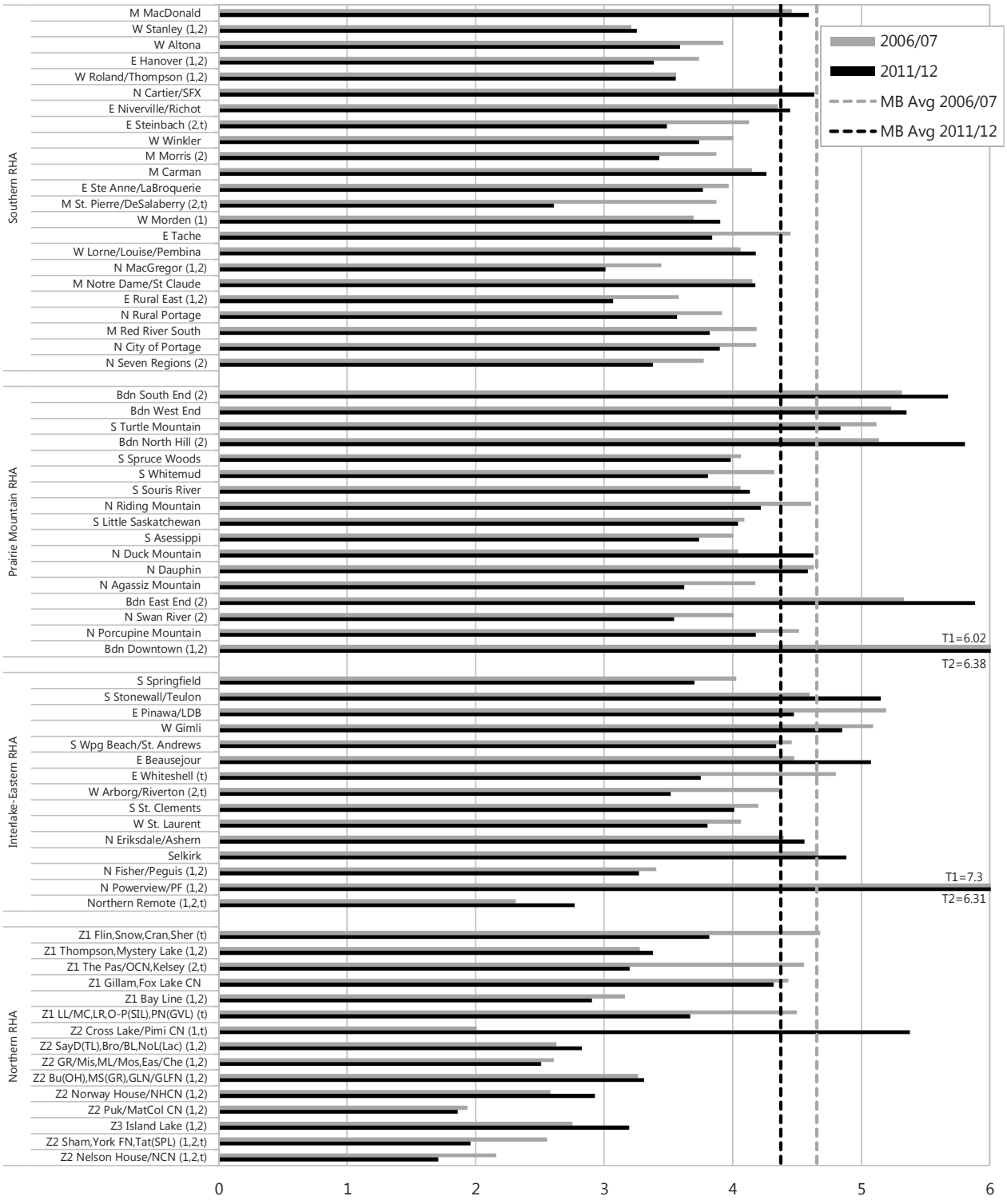
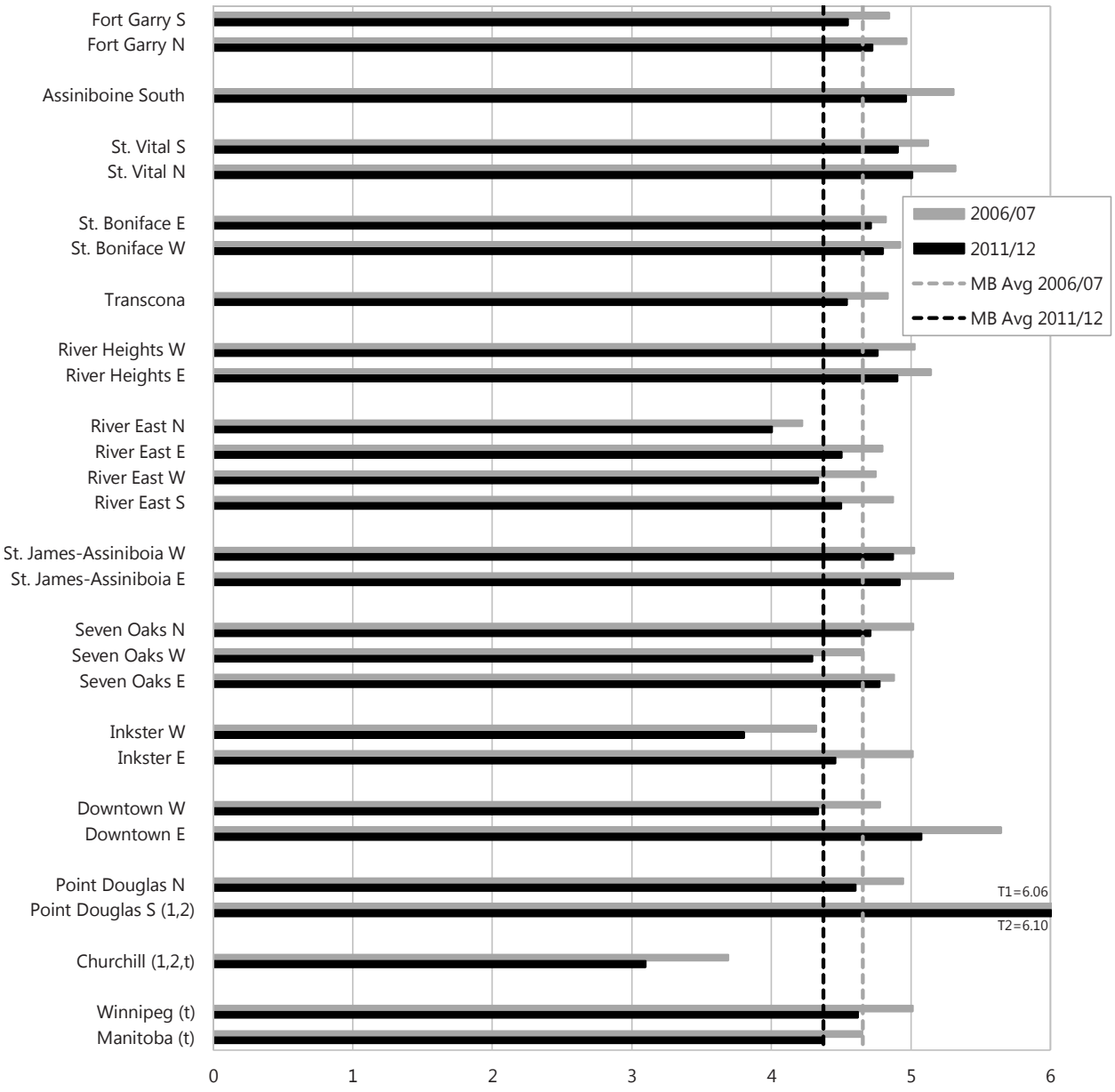


Figure 6.2.3: Ambulatory Visit Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of ambulatory visits to all physicians per resident



6.3 Ambulatory Visit by Age and Sex

Definition: the average number of visits to physicians by resident age and sex in a given year. Crude average annual rates were calculated for 2006/07 and 2011/12. See Glossary for further details.

Key Findings

- For males, visit rates were elevated for young children (0 to 4 years), then decreased into later childhood and young adulthood. From 20 onward, visit rates increased slowly, but steadily, with age, then declined among the oldest age groups.
- For females, rates were elevated among young children, decreased in middle childhood, but then increased sharply in adolescence and into the child–bearing years (related to reproductive health issues). Rates decreased slightly from 30 to 40, then gradually increased with age thereafter.
- From about 70, male and female rates converged.
- For both sexes, the patterns were similar over time.
  - Visit rates for very young children (0 to 4) were lower in 2011/12 than in 2006/07, as were those among adults 50 and older, whereas rates for the other age groups did not change as much.
- There were some regional differences:
  - Southern: the peak in the childbearing years occurred slightly younger than Manitoba and visit rates among older adults were slightly lower
  - Winnipeg: similar to Manitoba pattern but slightly higher rates
  - Prairie Mountain: steeper increase in the childbearing years and higher values for those women
  - Interlake–Eastern: similar to Manitoba
  - Northern: rates lower at all ages, especially in childbearing years; this was expected given issues with medical claims data, as explained above

Comparison to Other Findings

- The results shown here reveal similar overall patterns to those shown in the 2009 Atlas, but the changes over time were different. In the 2009 report, visit rates for young residents decreased, while those for older adults increased (Fransoo et al., 2009). In this report, visit rates for both those groups decreased over time, while those for other age groups remained relatively stable.
- These results are also consistent with findings from another recent MCHP report about "Physician Resource Projection Models", which also found fewer physician visits were for children and more were for adults and older adults (Katz et al., 2009).

Figure 6.3.1: Ambulatory Visit Rates by Age and Sex, Manitoba, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident

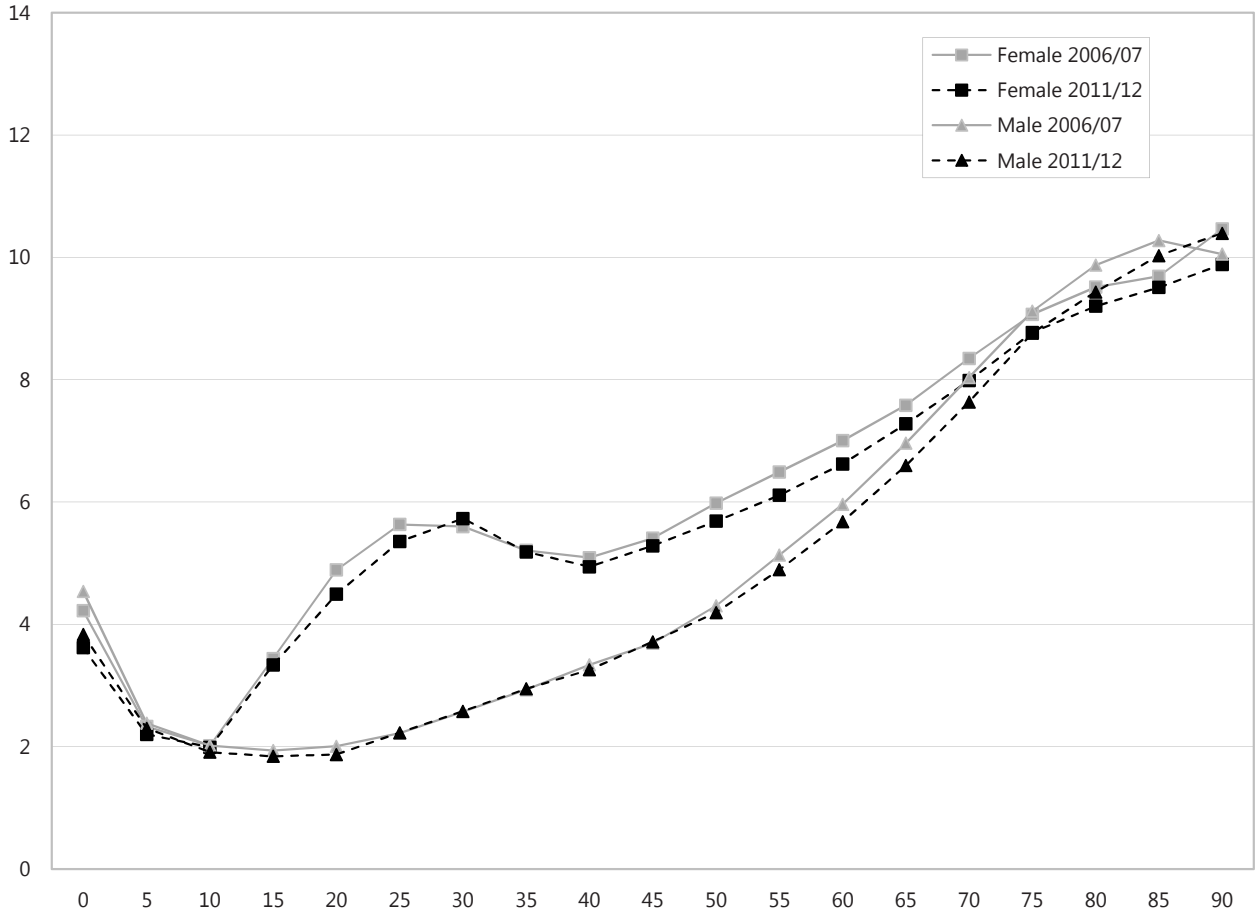


Figure 6.3.2: Ambulatory Visit Rates by Age and Sex, Southern, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident

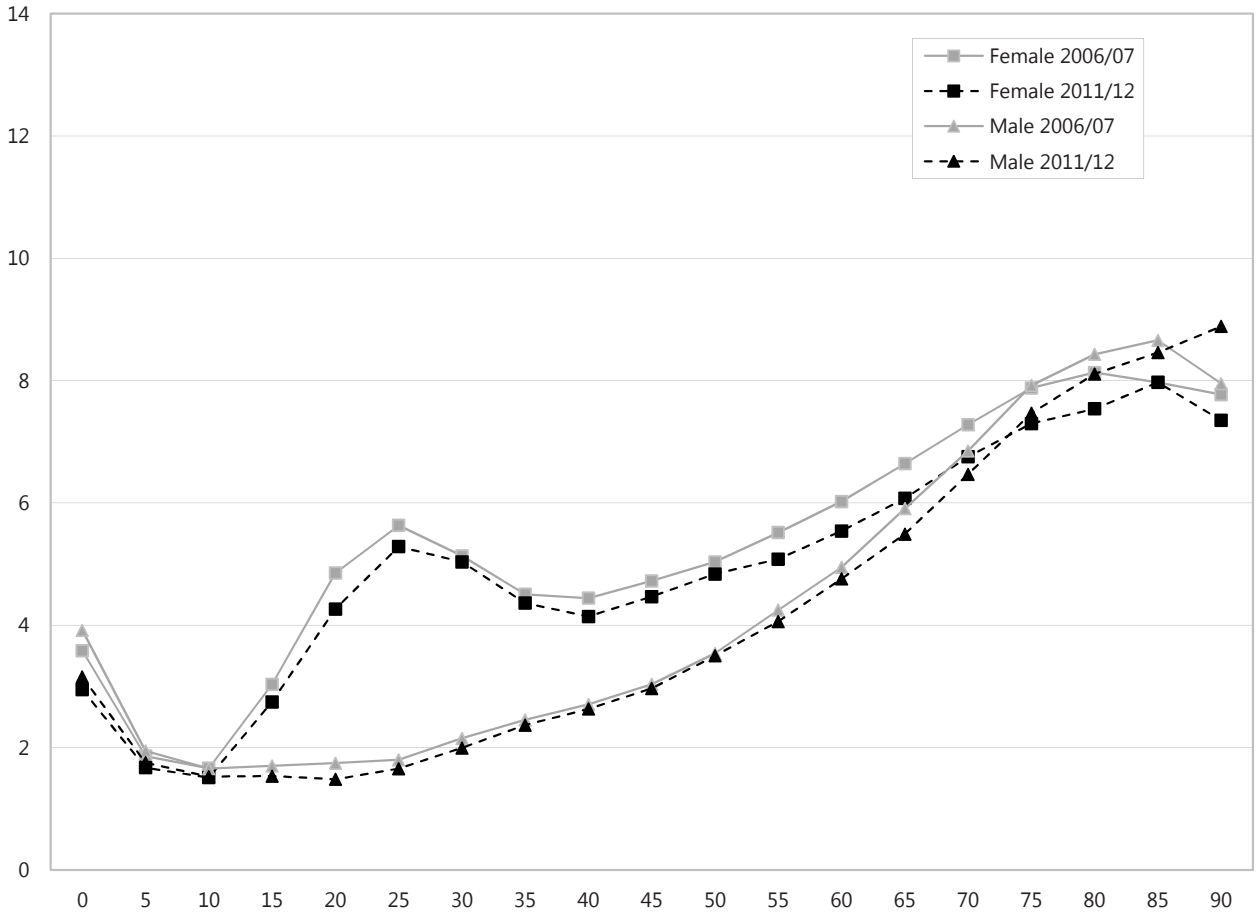


Figure 6.3.3: Ambulatory Visit Rates by Age and Sex, Winnipeg, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident

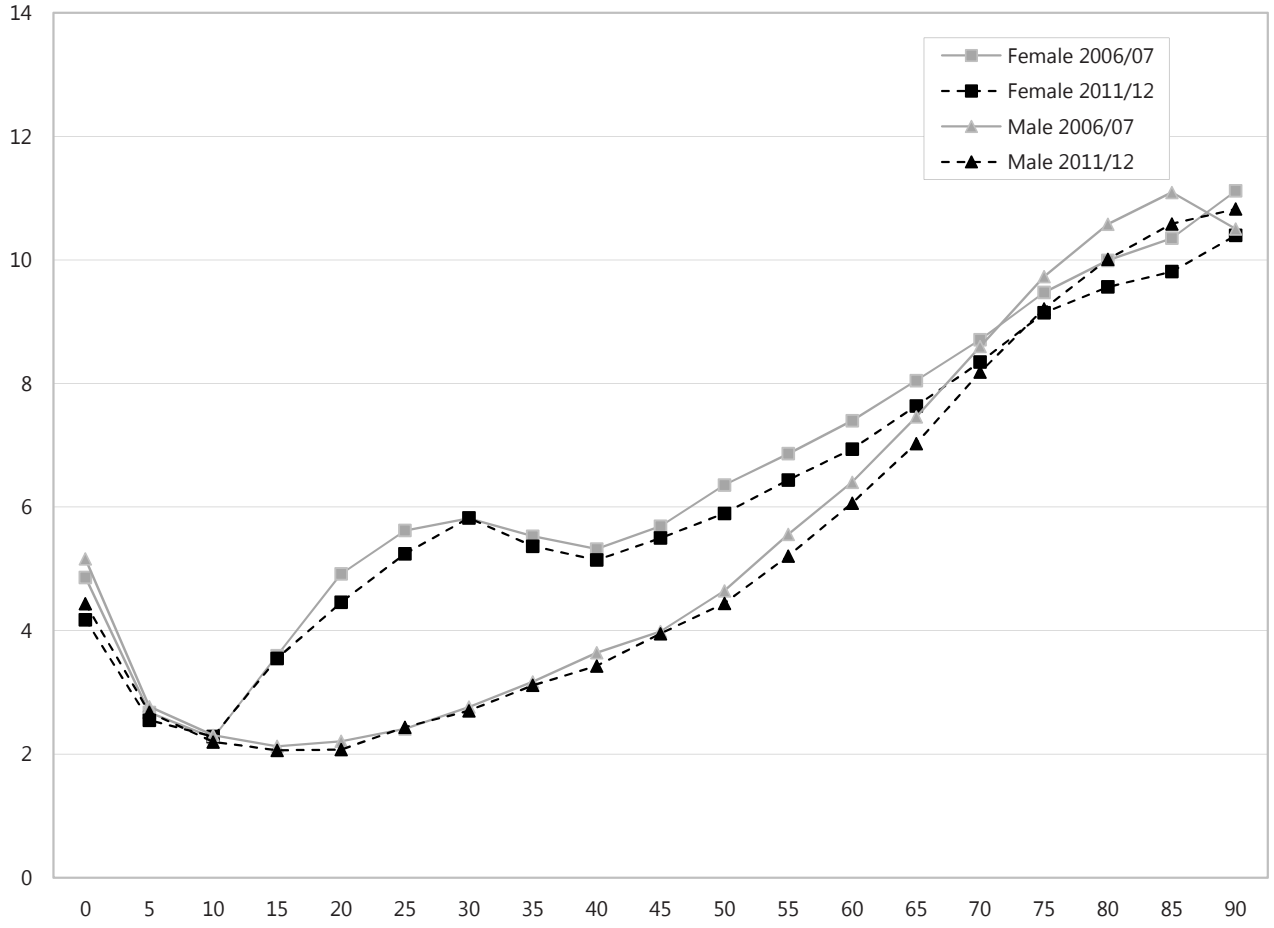


Figure 6.3.4: Ambulatory Visit Rates by Age and Sex, Prairie Mountain, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident

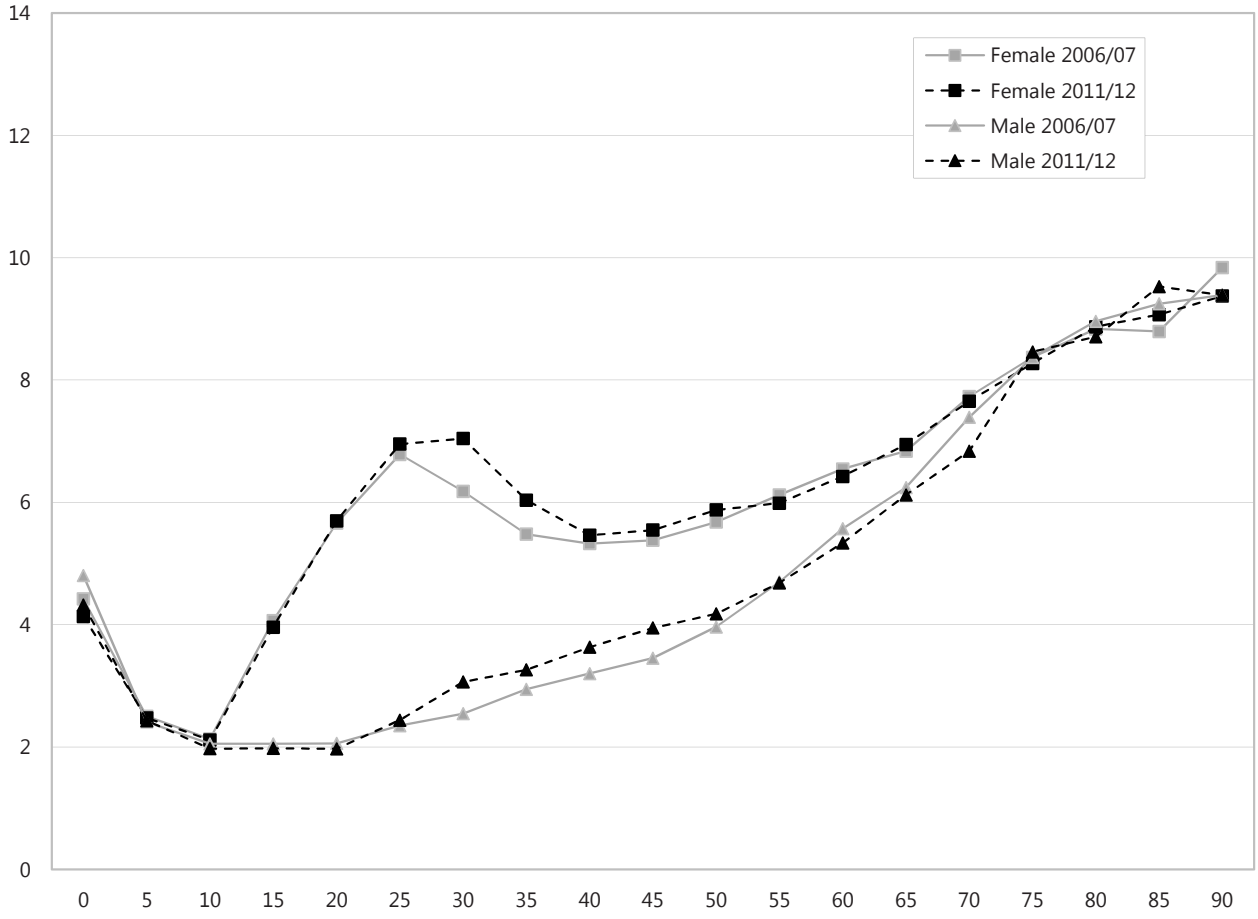


Figure 6.3.5: Ambulatory Visit Rates by Age and Sex, Interlake-Eastern, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident

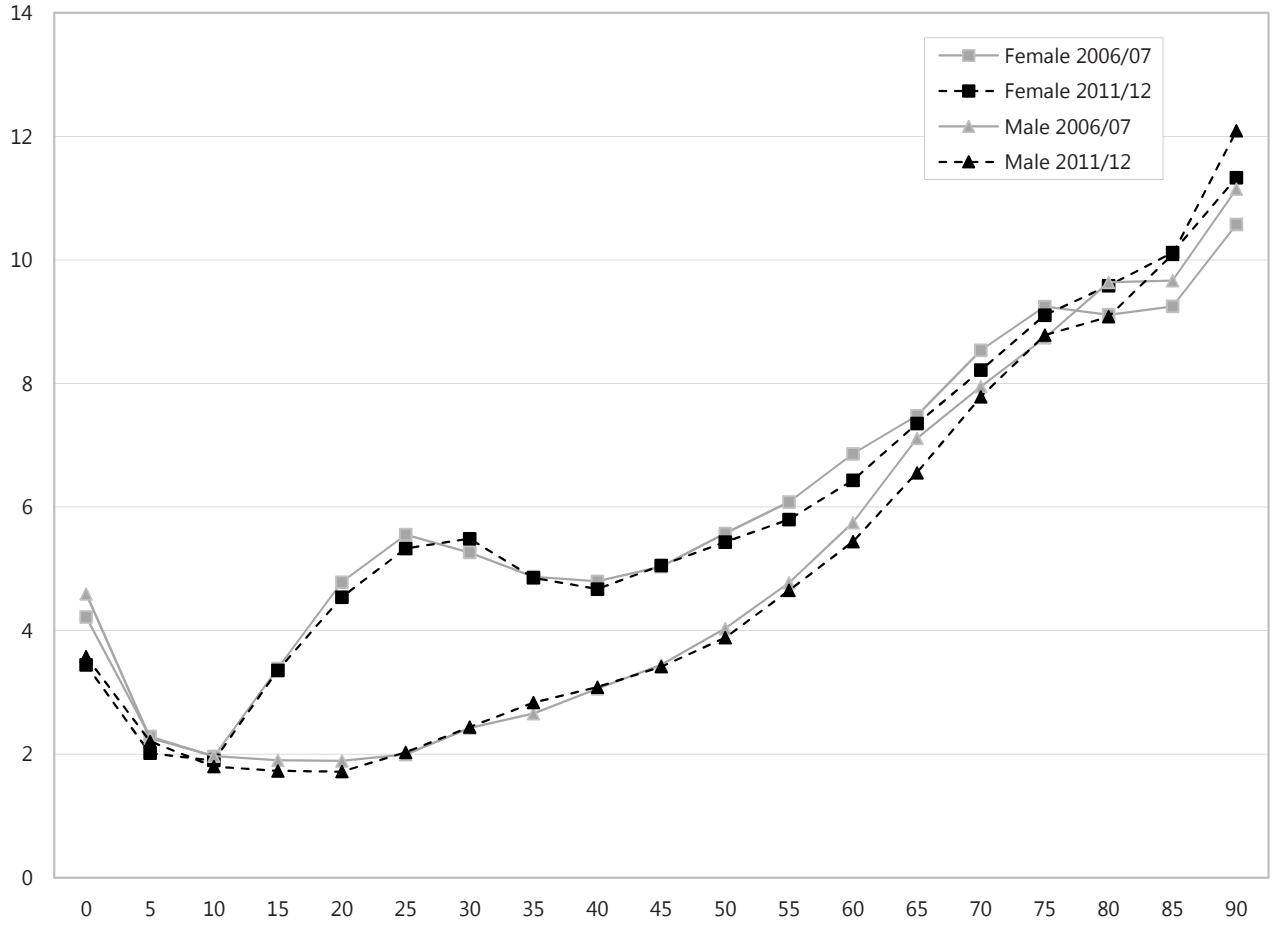
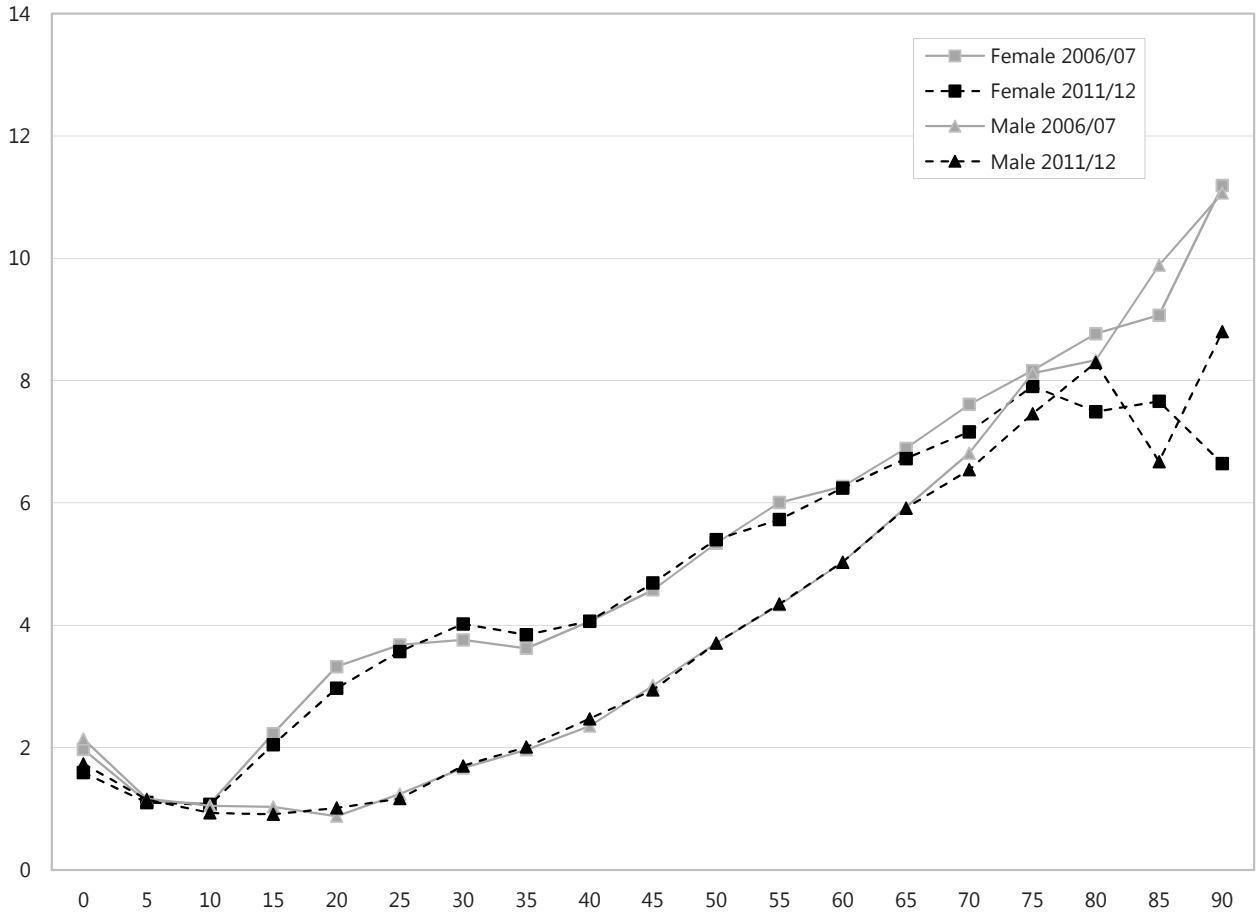


Figure 6.3.6: Ambulatory Visit Rates by Age and Sex, Northern, 2006/07 and 2011/12

Crude average annual rate of ambulatory visits to all physicians, per resident



6.4 Causes of Physician Visits

Definition: the most frequent reasons for ambulatory visits are reported for fiscal years 2006/07 and 2011/12. Each visit has only one diagnosis code recorded as the "reason" for the visit, and these diagnoses were grouped by ICD–9–CM chapter. The most frequent causes are shown for each RHA and the province overall (shown as average annual crude percent).

Note regarding two key categories:

- Health status and contact: the majority of visits in this category are for general medical examinations; but it also includes a number of other issues like well–baby care, contraceptive management, and other examinations. So for these visits, patients usually were not presenting for a specific problem.
- Ill–defined conditions: this group is primarily visits for chest and respiratory symptoms, abdominal and pelvic symptoms, and "general" symptoms. For the majority of these visits, the patient was experiencing a specific problem, but it was not clear to which disease category it should have been assigned.

Key Findings

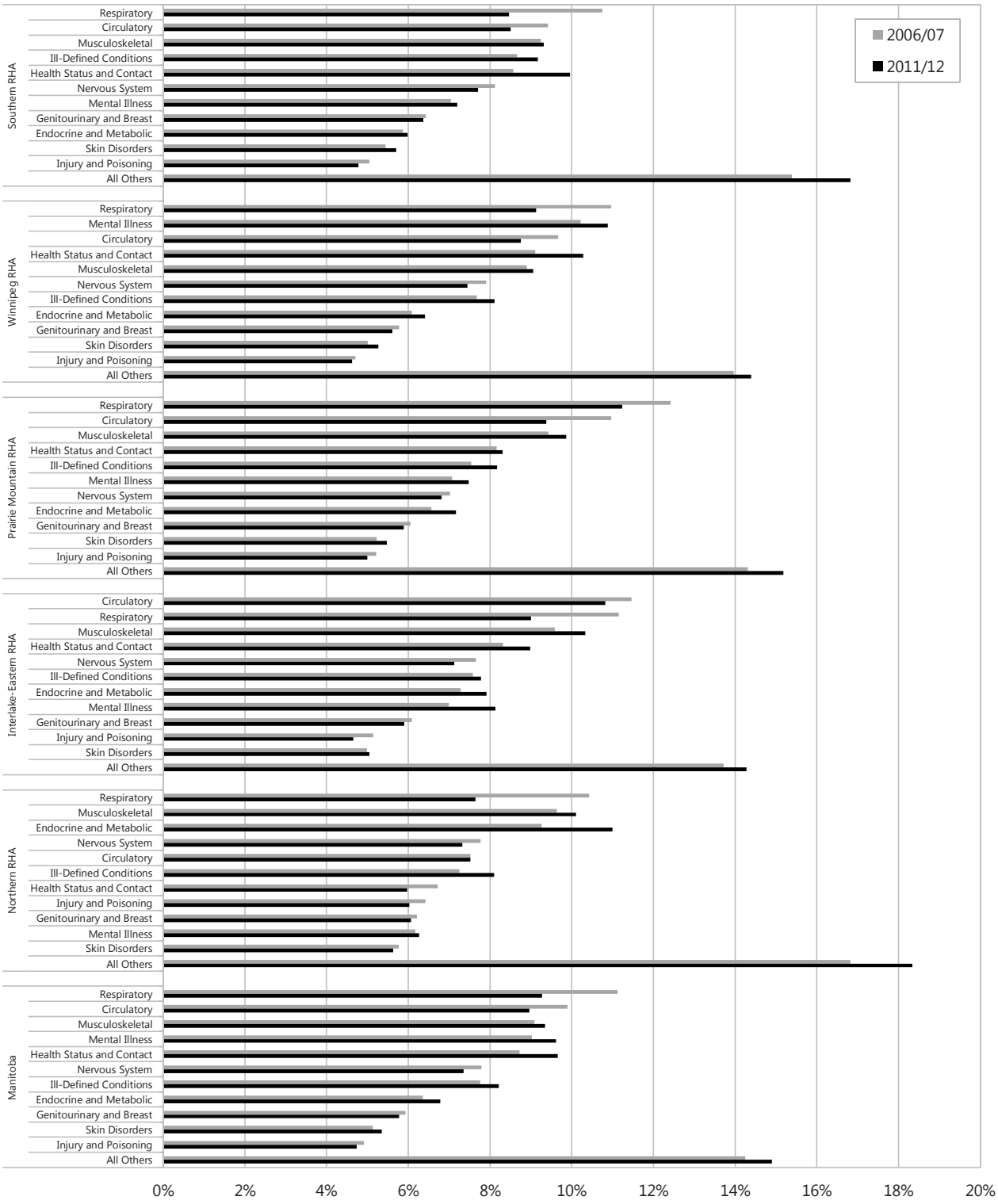
- The diagnoses attributed during physician visits were spread across many diseases, at nearly equal proportions for the top five conditions. Therefore, the rankings appear different across regions and time periods, but few major differences were found.
- The same diseases comprise the top five categories in each time period even though their exact rankings change. These were: respiratory, circulatory, musculoskeletal, mental illness, and health status and contact.
- The most significant change was that respiratory and circulatory diseases used to be the top two causes in almost all regions, whereas now they rank 4 and 5.
  - These changes are consistent with the steadily decreasing prevalence of these conditions over time (see Chapter 4).
- There were some differences for Northern residents:
  - Endocrine and metabolic disorders had higher rankings, which seems logical given that diabetes is in that grouping, and is more prevalent among Northern residents (see Chapter 4).
  - The previously mentioned exclusion of emergency department visits considerably reduced the number of visits for injury and poisoning. Without this change, injury and poisoning would have ranked 3 rather than 8 as shown.
- In both time periods, visits for mental illness were higher ranking in Winnipeg than in any other region. This could be related to the fact that some patients with severe mental illness move to Winnipeg to be close to essential services.

Comparison to Other Findings

- These results are very similar to those in the 2009 Atlas (Fransoo et al., 2009), though with the noted differences related to the change in the definition of ambulatory visits.

Figure 6.4.1: Most Frequent Cause of Physician Visits by RHA, 2006/07 and 2011/12

Average annual crude percent of physician visits



6.5 Ambulatory Consultation Rates

Definition: the average number of ambulatory consultations per resident (all ages) in a given year. "Consultations" are a subset of ambulatory visits: they occur when one physician refers a patient to another physician (usually a specialist or surgeon) because of the complexity, obscurity, or seriousness of the condition or when the patient requests a second opinion. The consult rate is the best indicator of access to specialist care. Consultations both to GP/FPs and specialists are included. See Glossary for further details. Rates are shown for 2006/07 and 2011/12 and are age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

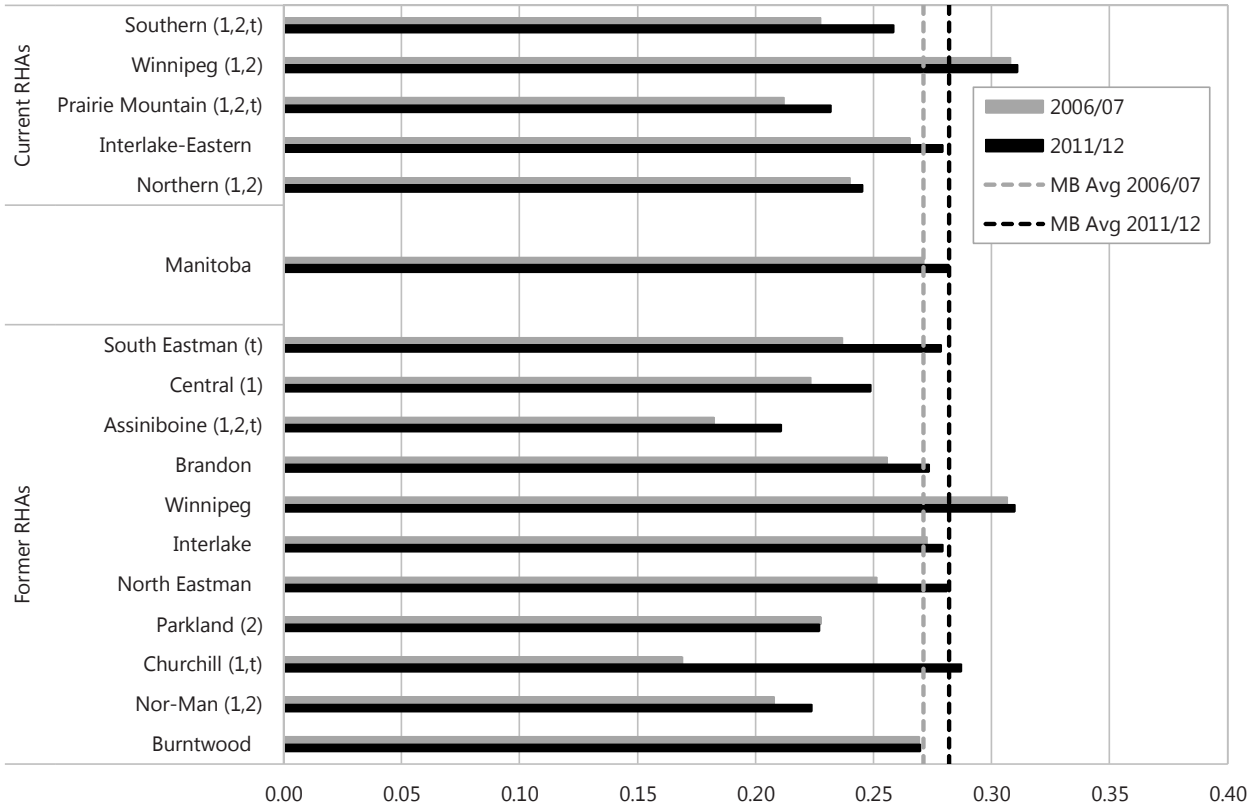
- The average number of consultations per resident per year increased, but the difference did not reach statistical significance in the main model. An increase was seen in most regions, but only the increase in Southern and Prairie Mountain was statistically significant.
  - We also created an alternate model that tested only the time difference for Manitoba overall (excluded age, sex, and region), and this model showed that the increase in consult rates was statistically significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the increases over time (by age, sex, and region) is why the main model did not show a significant change over time.
- In both time periods, consultation rates in Winnipeg were higher than average, while those in all other regions were lower than average, except Interlake–Eastern.
- Consultation rates do not appear to be associated with PMR at the regional, district, or NC levels.
- Within Winnipeg, residents of some of the healthiest areas had higher than average rates.
- In urban and rural areas, in both time periods, the relationships between consult rates and income quintiles were interesting and non–linear. The lower three quintiles had generally lower rates, and the higher two quintiles had higher rates. Still, the linear trend tests indicated significant trends for rural areas, in both time periods, and urban areas, in the first time period (see Appendix 2 tables).

Comparison to Other Findings

- Consultation rates were stable in the 2009 Atlas report (Fransoo et al., 2009), whereas the findings in this report suggest that consult rates are increasing over time. As noted above, this increase was not consistent across all regions.

Figure 6.5.1: Ambulatory Consultation Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of consults per resident (first referral)



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 6.5.2: Ambulatory Consultation Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of consults per resident (first referral)

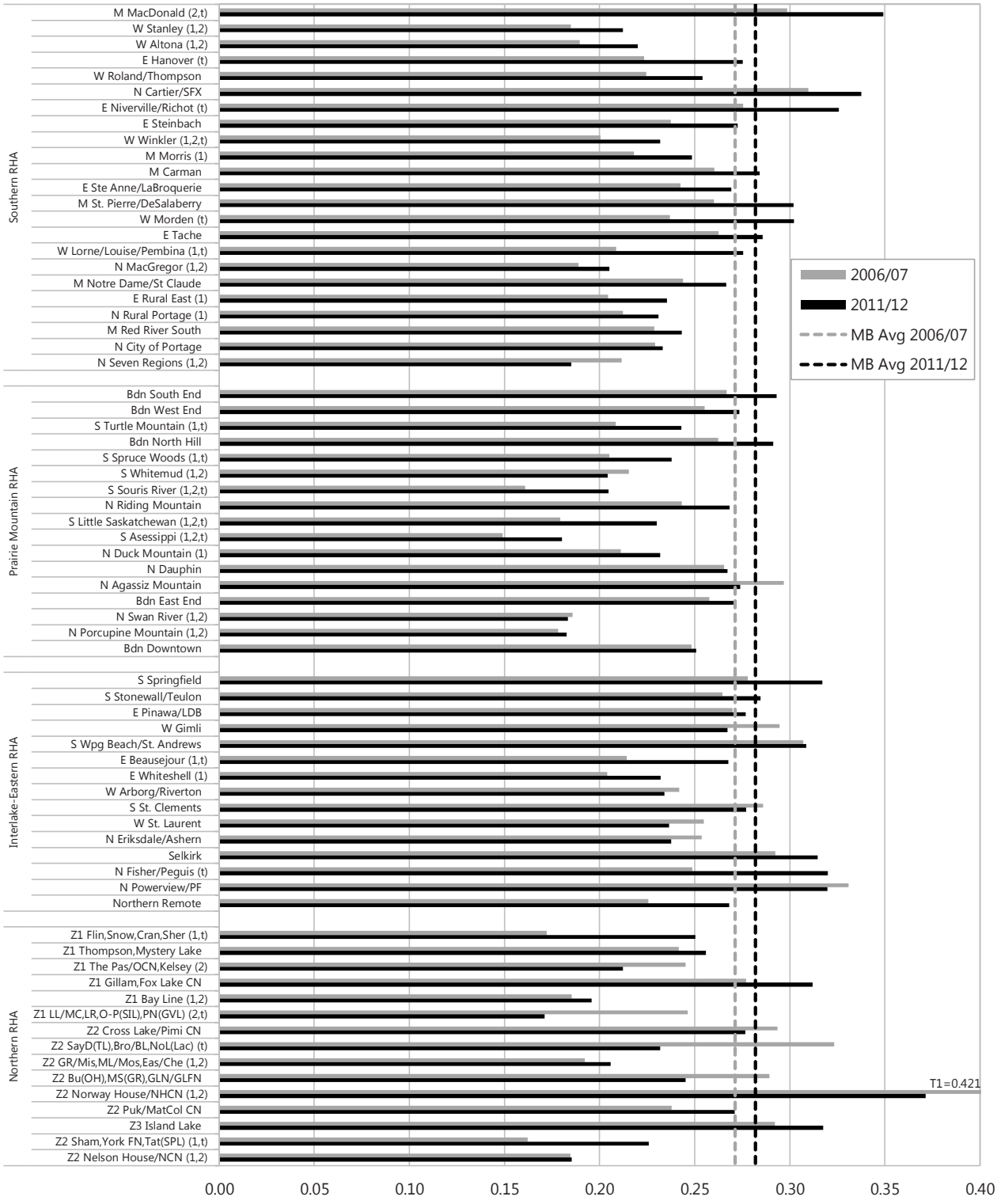
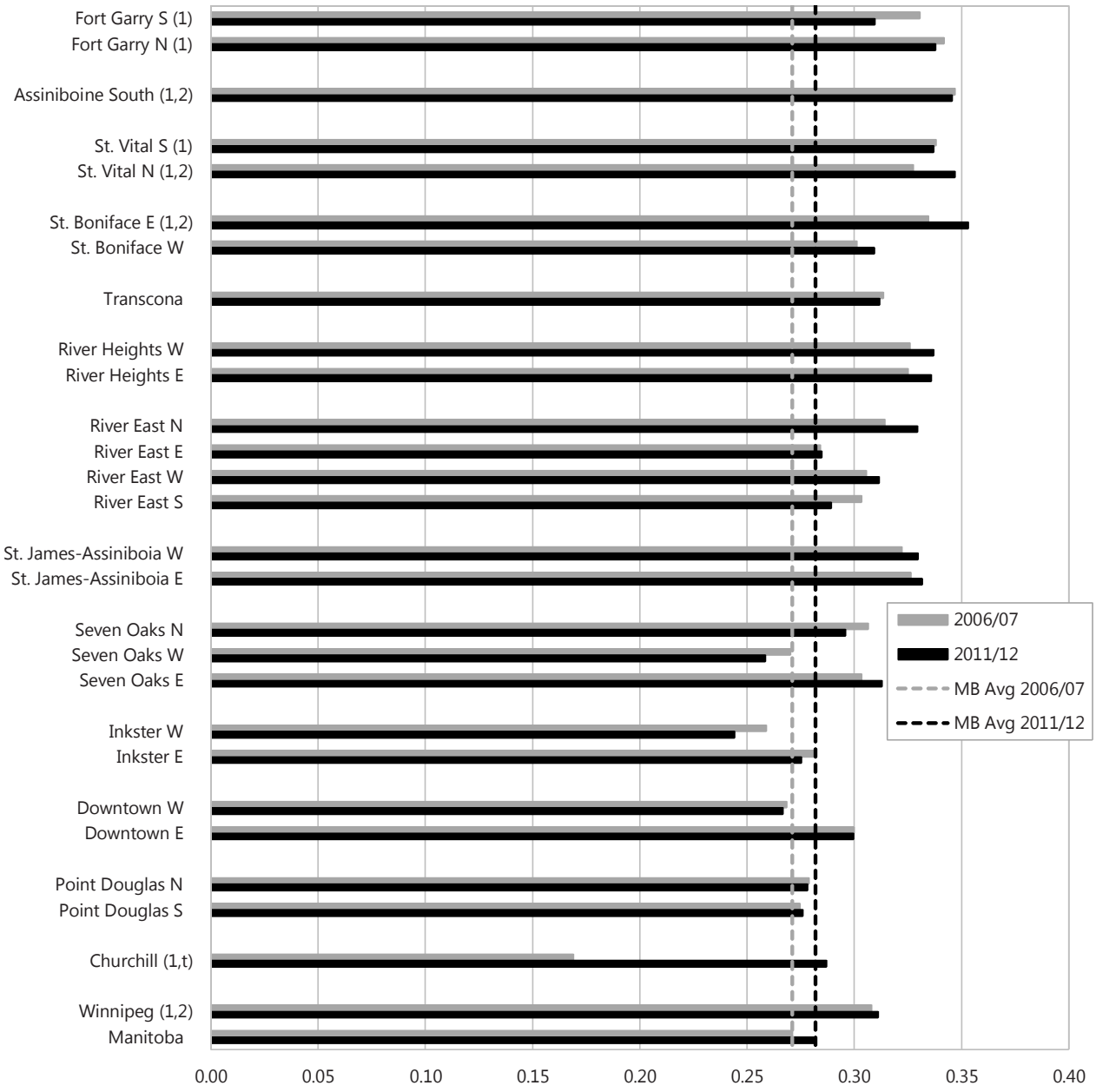


Figure 6.5.3: Ambulatory Consultation Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of consults per resident (first referral)



6.6 Majority of Care

Definition: formerly known as "continuity of care", **majority of care** is measured as the percent of residents (all ages) receiving at least 50% of their ambulatory visits over a two–year period from the same physician. For children aged 0 to 14, the primary physician could be a general practitioner (GP), a family practitioner (FP), or a pediatrician; for residents 15 to 59, only GPs and FPs; for seniors 60 years and older, a GP/FP or an internal medicine specialist. Residents with fewer than three ambulatory visits over the two–year period were excluded. Values were calculated for 2005/06–2006/07 and 2010/11–2011/12 and were age– and sex–adjusted to the Manitoba population in the first time period.

Key Findings

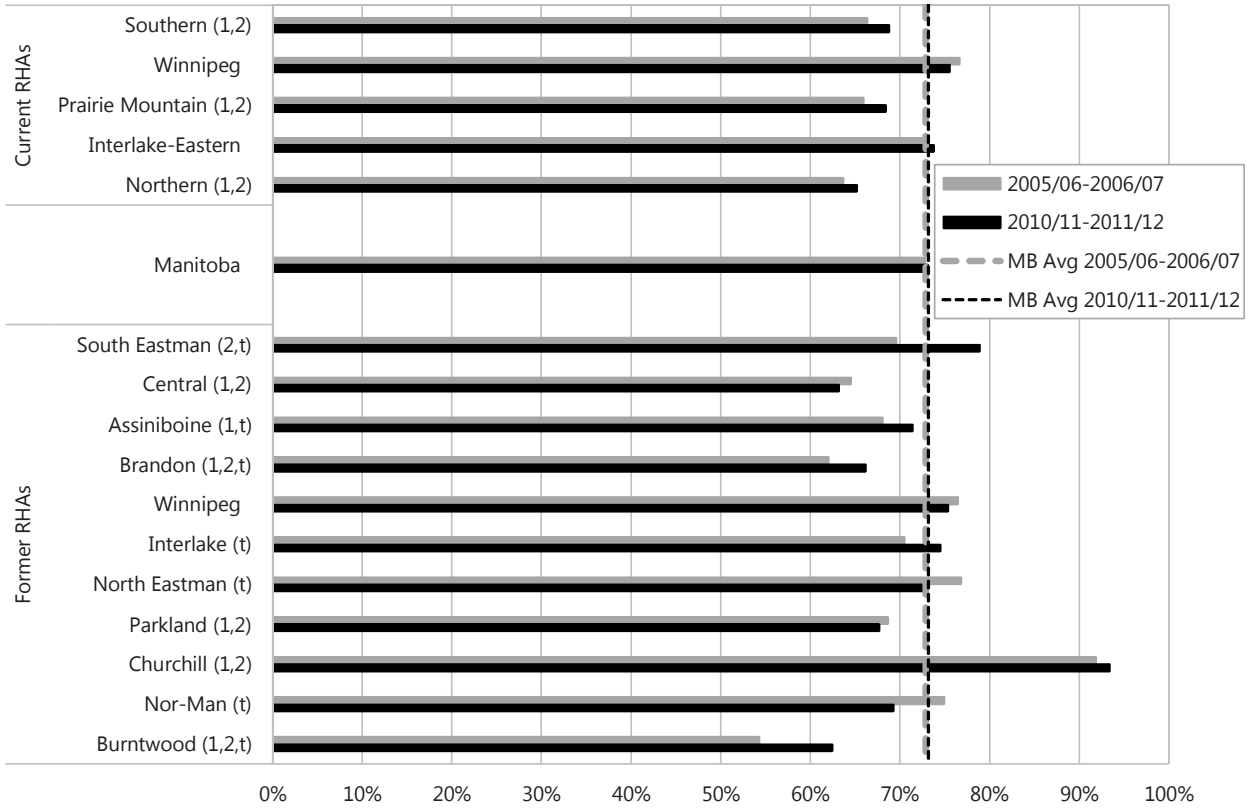
- The proportion of residents receiving more than 50% of their visits from the same physician was stable over time at about 73%. Regional values were relatively stable over time, but varied significantly by region.
- Winnipeg residents had rates slightly but not statistically above average; Interlake–Eastern was average; all other regions were lower than average.
- Rates in the former Churchill RHA (now part of Winnipeg) were particularly high, likely due to the limited number of physicians practicing there.
- Rates varied significantly by district in rural regions from under 30% to over 90%.
- Within Winnipeg, there was little variation across NCs, with the exception that rates in Churchill (as noted above) were particularly high.
- Majority of care rates were not associated with PMR at the regional, district, or NC levels.
- Majority of care rates were significantly related to income in rural areas: residents of lower income areas were less likely to receive a majority of their physician visits from a single provider. A similar trend was noted in urban areas, though there was much less variation by income. The linear trend was significant in the first time period, but not the second.
- Note: Because this indicator can only be calculated for people with three or more visits per year, it excludes those with two or fewer visits. In most regions, this was about 20% of the population; but in Northern, it was 34%.

Comparison to Other Findings

- The values reported here are somewhat higher than those shown in the 2009 Atlas (Fransoo et al., 2009), though the change in the definition of ambulatory visits may have affected the results to some extent. The stability in rates shown here may reflect a leveling off compared to the increase in rates shown in the 2009 Atlas.

Figure 6.6.1: Majority of Care by RHA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents getting more than 50% of their visits from the same physician (among those with 3+ visits)



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 6.6.2: Majority of Care by District, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents getting more than 50% of their visits from the same physician (among those with 3+ visits)

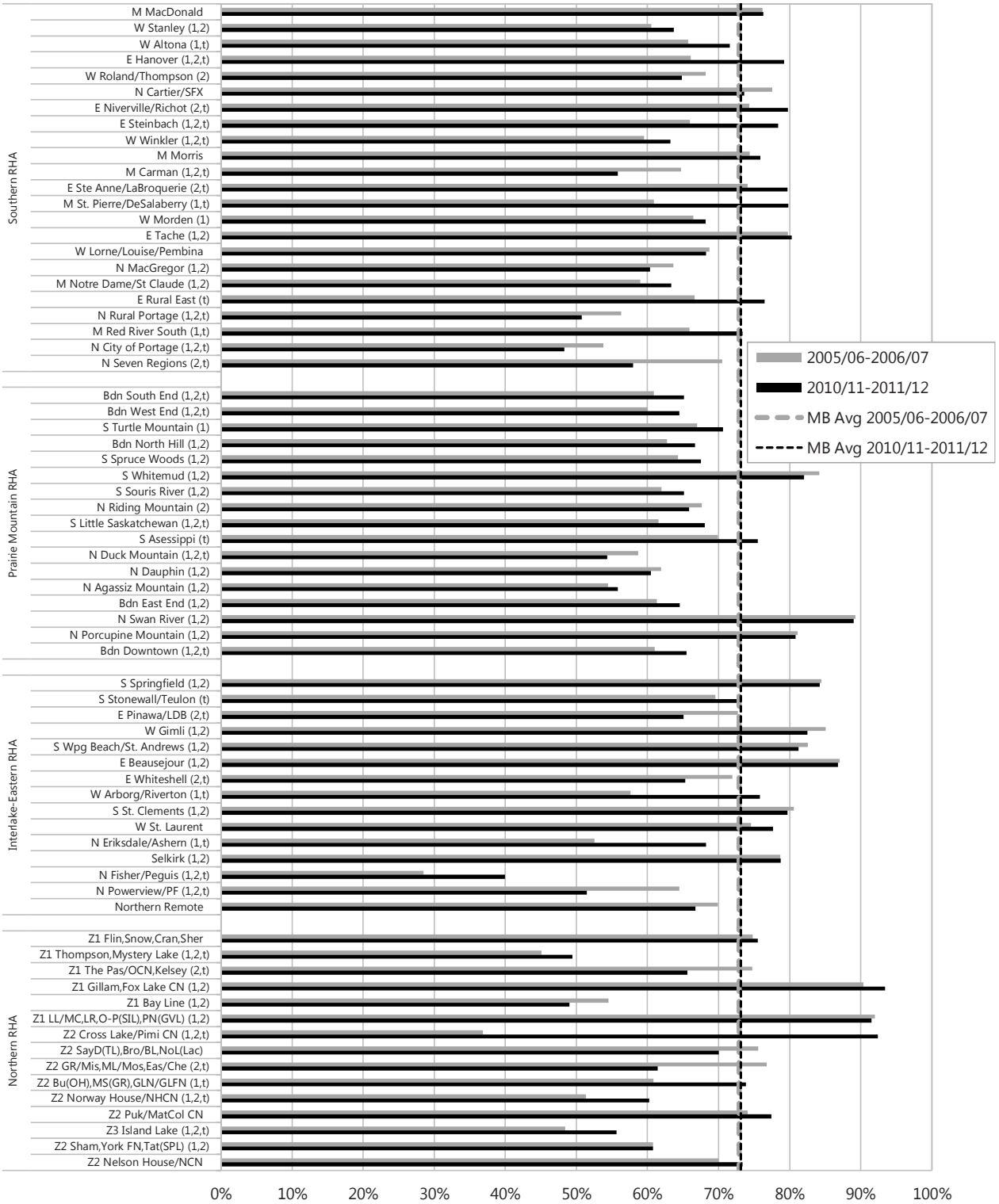
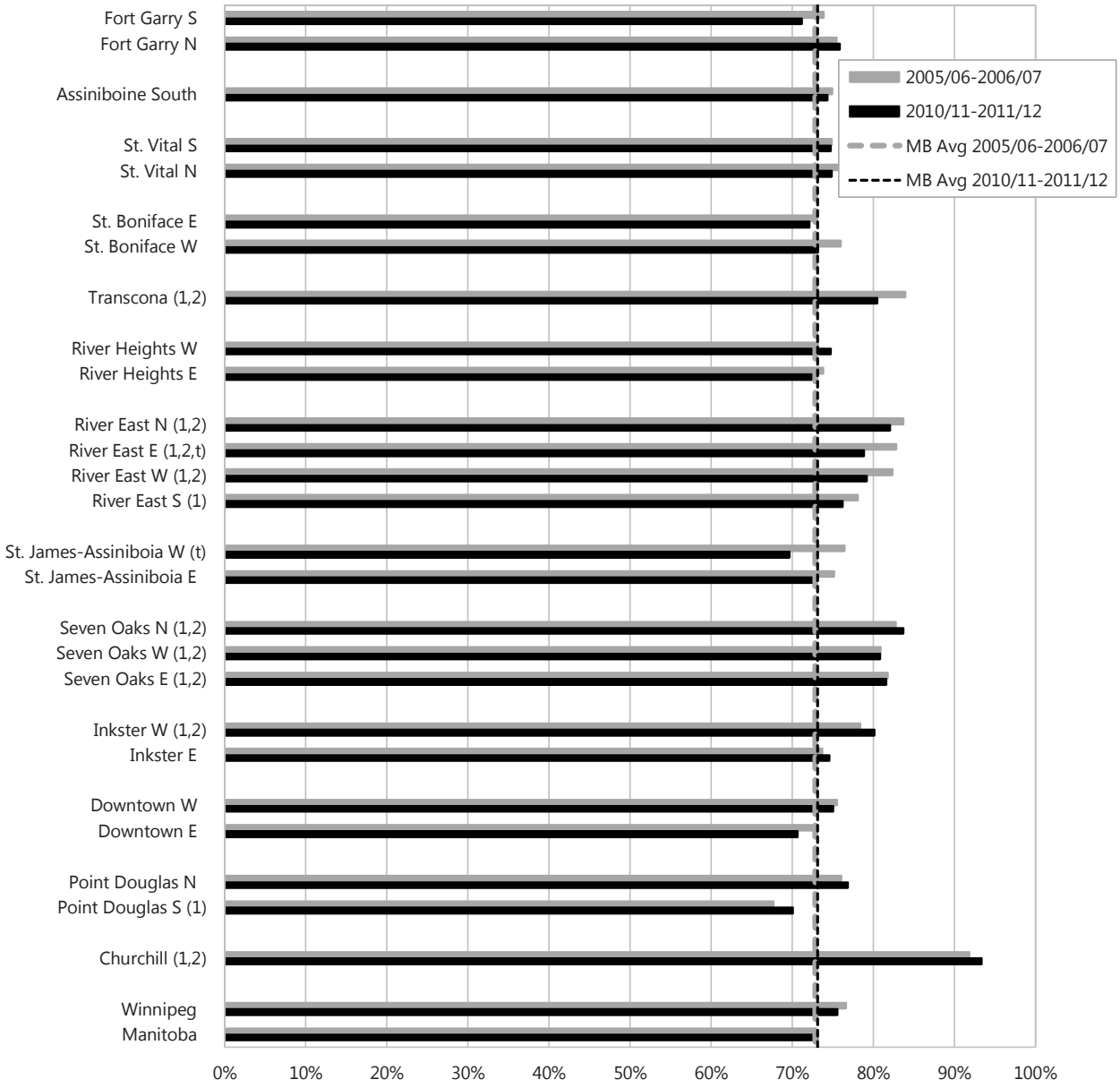


Figure 6.6.3: Majority of Care by Winnipeg NC, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted percent of residents getting more than 50% of their visits from the same physician (among those with 3+ visits)



6.7 Location of Visits to General and Family Practitioners

Definition: the percent of ambulatory visits made by residents of each RHA to GPs and FPs in the patient's (home) RHA district[8], elsewhere in their home RHA, in another RHA, or in Winnipeg. Ambulatory visits to GPs and FPs were defined by "MDBLOC" code 11. For each month, every physician in Manitoba gets assigned to the area in which the majority of their patients lived. If the physician and the patient were in the same area, then the visit was assigned to that area. Otherwise, the visit is assigned to the location where the physician was that month. Winnipeg residents receive virtually all of their visits within the city, and these were called "within district."[9] Only visits for Manitoba residents within Manitoba were included. Crude values are shown for 2006/07 and 2011/12.

Key Findings

- The **location of visits to general and family practitioners** (**GPs/FPs**) was stable over time. For Manitoba, over 80% of all visits to GP/FPs occurred in the district where the patient lived. This was strongly affected by the high values for Winnipeg.
- Results varied dramatically across regions, though there were similarities between Southern and Interlake–Eastern residents and between Prairie Mountain and Northern residents (2011/12 values cited):
  - Southern and Interlake–Eastern residents received just under 50% of their visits within their home district. Winnipeg was a major influence for residents of both regions, likely reflecting the fact that many residents of these regions live close to, work in, or regularly visit the city for care.
    - Southern residents received 30.5% of their visits elsewhere in their home region and most of the remaining visits in Winnipeg (20.3%).
    - Interlake–Eastern residents received 20.7% of their visits elsewhere in their home region and most of the remaining of visits in Winnipeg (27.7%).
  - Residents of Prairie Mountain and Northern regions received over 70% of their visits in their home district, though their patterns diverged for the remaining groups:
    - Prairie Mountain residents received most of the rest of their visits (23.5%) elsewhere in their region and under 2% in other regions and Winnipeg.
    - Northern residents received 11.0% of their visits elsewhere in their region, 4.2% in other regions, and 7.9% in Winnipeg.

8 Only results for the districts of the five new RHAs are shown, as geo-coding has not been updated for the previous RHA districts.

9 Residents of Churchill are now also part of the Winnipeg health region, so they were treated somewhat differently. Visits provided to Churchill residents by physicians in Churchill are called "within district", whereas those provided in Winnipeg were called "elsewhere in RHA".

Figure 6.7.1: Location of Visits to General/Family Practitioners by RHA, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

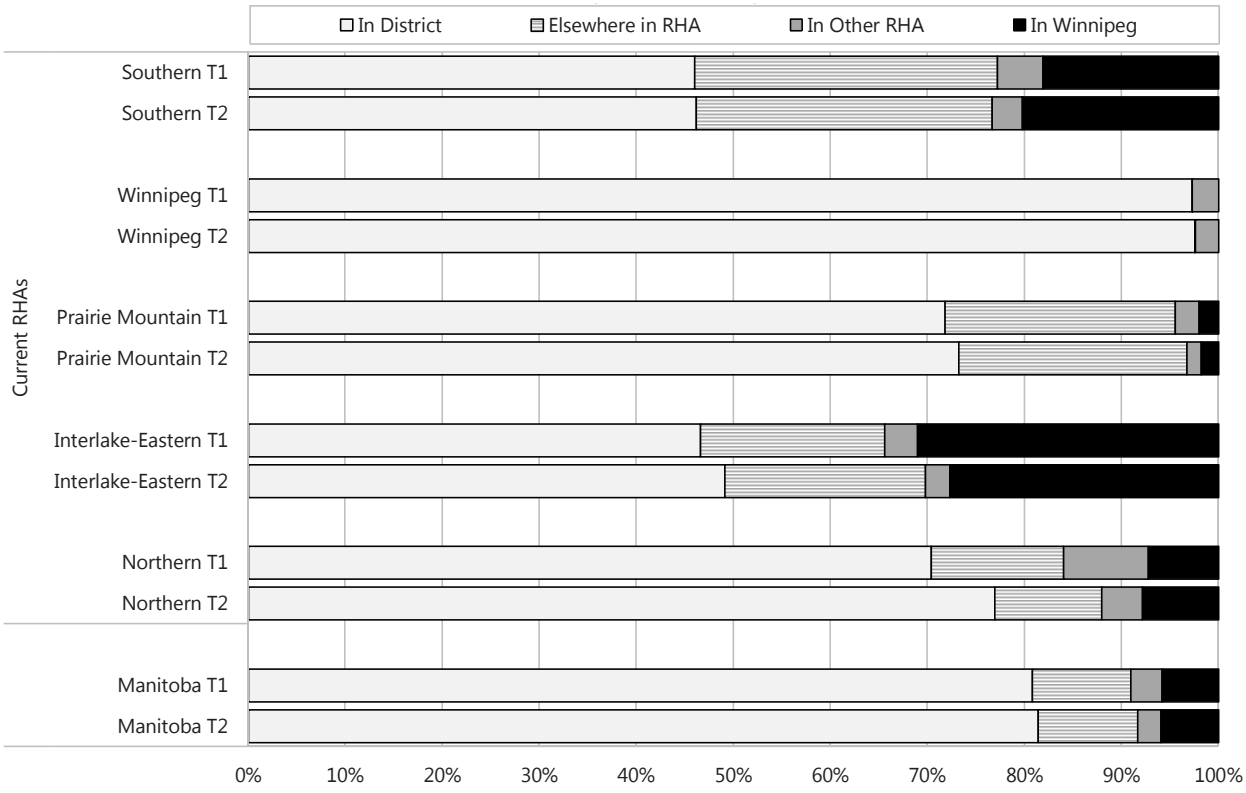


Table 6.7.1: Location of Visits to General/Family Practitioners by RHA, 2006/07 and 2011/12

RHA	Fiscal Year	In District	Elsewhere in RHA	In Other RHA	In Winnipeg
Southern	**2006/07**	46.0%	31.2%	4.7%	18.1%
Southern	**2011/12**	46.2%	30.5%	3.1%	20.3%
Winnipeg	**2006/07**	97.3%	0.01%	2.7%	n/a
Winnipeg	**2011/12**	97.6%	0.01%	2.4%	n/a
Prairie Mountain	**2006/07**	71.8%	23.7%	2.5%	2.0%
Prairie Mountain	**2011/12**	73.2%	23.5%	1.5%	1.8%
Interlake-Eastern	**2006/07**	46.6%	19.0%	3.4%	31.0%
Interlake-Eastern	**2011/12**	49.1%	20.7%	2.5%	27.7%
Northern	**2006/07**	70.4%	13.7%	8.7%	7.2%
Northern	**2011/12**	76.9%	11.0%	4.2%	7.9%
Manitoba	**2006/07**	80.8%	10.1%	3.2%	5.9%
Manitoba	**2011/12**	81.4%	10.3%	2.4%	5.9%

n/a indicates "Not Applicable"

6.8 Location of Visits to Specialists

Definition: the percent of ambulatory visits made by the residents (all ages) of each RHA to specialists in the patient's (home) RHA district[10], elsewhere in the home RHA, in another RHA, or in Winnipeg. Ambulatory visits to specialists, including all medical specialists, pediatricians, psychiatrists, obstetricians and gynecologists and surgeons, were defined by "MDBLOC" codes other than code 11. For each month, every physician in Manitoba gets assigned to the area in which the majority of their patients lived. If the physician and the patient were in the same area, then the visit was assigned to that area. Otherwise, the visit is assigned to the location where the physician was that month. Winnipeg residents receive virtually all of their visits within the city—these were called "within district." Residents of Churchill are now also part of the Winnipeg health region, so they were treated somewhat differently. Visits provided to Churchill residents by physicians in Churchill are called "within district", whereas those provided in Winnipeg were called "elsewhere in RHA". Only visits for Manitoba residents within Manitoba were included. Crude values are shown for 2006/07 and 2011/12.

Key Findings

- The **location of visits to specialists** was stable over time. For Manitoba, over 74% of all visits to specialists occurred in the district where the patient lived, though these values were completely different for residents of Winnipeg versus all other regions. (All visits of Winnipeg residents to providers in Winnipeg were classified as "in district".)
- There were basically three patterns in the results:
  - Residents of Winnipeg got virtually all of their visits to specialists within their home district (i.e., within the city).
  - Residents of Prairie Mountain received 27.0% of their visits to specialists within their home district, another 37.4% elsewhere in the region (most likely Brandon), and about 33.5% in Winnipeg.
  - Residents of the other three regions received the majority of their specialist visits in Winnipeg (over 70%) with small portions within their home district or region. The exact values varied by region and over time.

10 Only results for the districts of the five new RHAs are shown, as geo-coding has not been updated for the previous RHA districts.

Figure 6.8.1: Location of Visits to Specialists by RHA, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

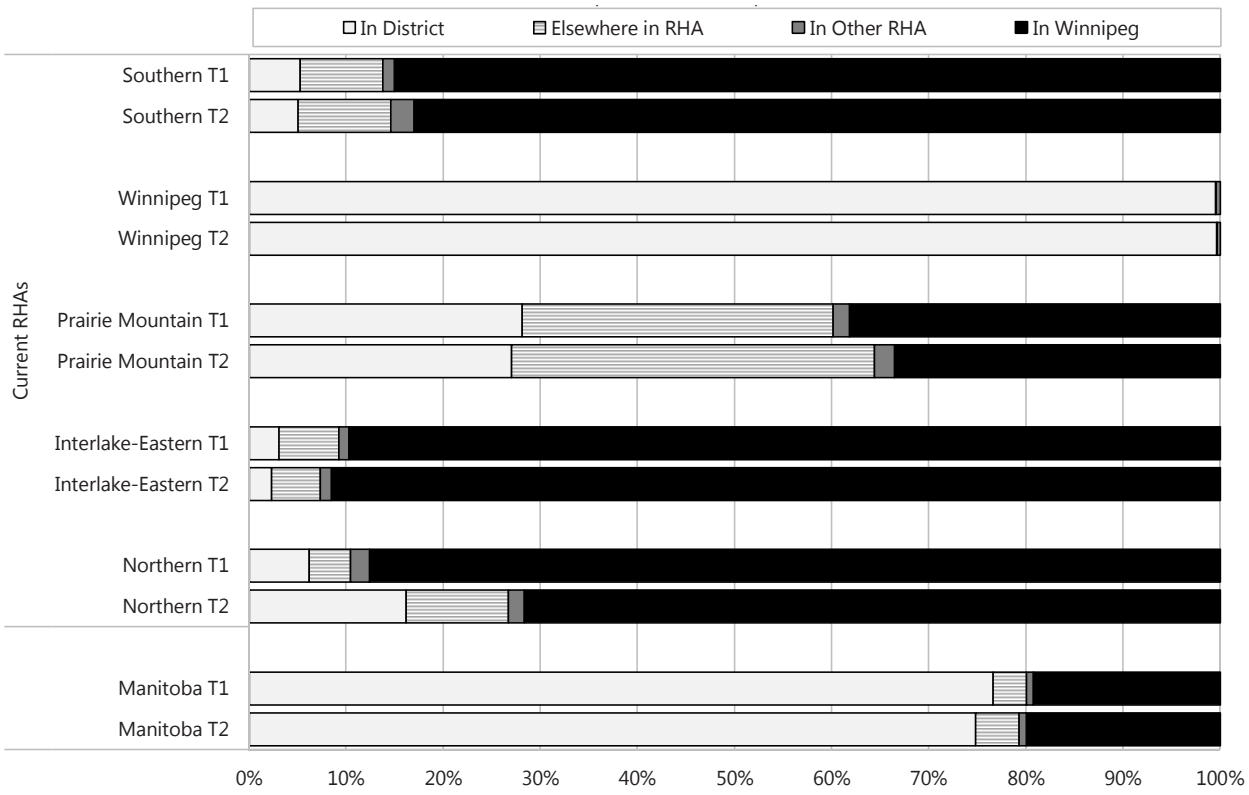


Table 6.8.1: Location of Visits to Specialists by RHA, 2006/07 and 2011/12

RHA	Fiscal Year	In District	Elsewhere in RHA	In Other RHA	In Winnipeg
Southern	**2006/07**	5.3%	8.5%	1.2%	85.0%
Southern	**2011/12**	5.0%	9.6%	2.4%	83.0%
Winnipeg	**2006/07**	99.5%	0.04%	0.5%	n/a
Winnipeg	**2011/12**	99.6%	0.05%	0.3%	n/a
Prairie Mountain	**2006/07**	28.1%	32.0%	1.7%	38.2%
Prairie Mountain	**2011/12**	27.0%	37.4%	2.1%	33.5%
Interlake-Eastern	**2006/07**	3.1%	6.2%	1.0%	89.7%
Interlake-Eastern	**2011/12**	2.3%	5.0%	1.2%	91.5%
Northern	**2006/07**	6.2%	4.3%	2.0%	87.6%
Northern	**2011/12**	16.2%	10.5%	1.7%	71.7%
Manitoba	**2006/07**	76.6%	3.5%	0.7%	19.3%
Manitoba	**2011/12**	74.8%	4.5%	0.7%	20.0%

n/a indicates "not applicable"

CHAPTER 7: HOSPITAL SERVICES

Key Findings in Chapter 7

- Most indicators of hospital use rates continue to decrease slowly over time except rates of **day surgery**, which continue to increase.
- The proportion of area residents admitted to a hospital at least once in a year decreased slightly over time. Rates varied from 5% among Winnipeg residents to 10% for Northern residents. Some portion of this regional difference is likely explained by geographic distances and access to hospitals.
- Most other indicators also showed that **hospital use** was lower for Winnipeggers than residents of any other region.
- **Inpatient hospitalization** rates and rates of days used for short and long hospital stays decreased over time, though these changes did not reach statistical significance in the main models. However, this lack of statistical significance was driven by differences in the changes over time by age, sex, and region. Alternate models created for each indicator testing only the change over time at the provincial level confirmed all decreases as statistically significant.
- Most indicators of hospital care were strongly related to population health status, implying that hospital care continues to be responsive to the health needs of local populations. This is reinforced by the consistently strong relationships between hospital use and area–level income.
- **Causes of hospitalization** were stable over time. The most common groups were digestive disorders, pregnancy and birth, circulatory diseases, health status and contact (including colonoscopies, convalescence and follow–up after surgery, sterilization procedures, and palliative care), and cancer.
  - Childbirth continues to be the most frequent single cause of hospital admission, though the other groupings (e.g., digestive) ranked higher because they comprise many separate diagnoses.
  - The ranking of top causes varied by geographic area (e.g., injuries were more prominent for residents of Northern region).
- **Causes of hospital days used** showed a distinctly different distribution than hospitalizations because length of stay varies by category. The leading groups were health status and contact (primarily patients awaiting placement in nursing homes, palliative care, and rehabilitation), circulatory diseases (including heart attack and stroke), and mental illness. The rankings were different in the five regions.
- Hospital **Readmission** decreased over time from 9.28% to 8.52% of all hospital episodes. The key factors driving readmission rates appeared to be those related to the patient's health status and the setting into which they were discharged (e.g., home, PCH, etc.).

- Patterns of the location of hospitalization for residents of each region were stable over time. For most regions, the majority of hospitalizations of residents were provided within the region.
- **Hospital catchment** patterns were also stable over time. The majority of hospitalizations provided by each facility were to residents of that region. This included hospitals in Winnipeg, Brandon, and Churchill, though these had different profiles, as these hospitals provide services to residents from other regions and residents from outside Manitoba.

Introduction

This chapter provides a number of indicators of the use of hospital services by residents of Manitoba: the number of hospitalizations provided, number of days used, where they were provided, and reasons for hospitalization. Service use is allocated to the area of residence of the patient, regardless of the location of the hospital. For example, if a resident of Southern uses a Winnipeg hospital, it would be counted as a hospitalization for a Southern resident. That said, the results in Sections 6.11 and 6.12 provide detailed results regarding where residents of each region were hospitalized.

Most of the indicators in this chapter are based on information taken from hospital discharge abstracts that are created for each admission to hospital (inpatients) and day surgery procedures (outpatients) coded in Manitoba. The analyses exclude admissions to personal care homes (PCHs) and long term care facilities (e.g., Deer Lodge Centre and Riverview Health Centre in Winnipeg and similar facilities in other regions).

Major Change to Hospitalization Indicators

MCHP's indicator of day surgery has changed substantially as of this report for the following reasons. The hospital abstract data system has always captured the large number of surgeries and procedures performed on an outpatient basis. However, many of these procedures were relatively minor interventions, which used to be informally referred to as "removal of lumps and bumps". Therefore, MCHP developed methods in the 1990s to exclude these and count only relatively major procedures (e.g., things that required an operating room). With recent changes in coding systems and in how healthcare is delivered, it is no longer possible to produce a comparable indicator. Moreover, there was a key coding change in 2001 to exclude many of the minor interventions whose prior inclusion was the key motivator for having developed our indicator of major day surgeries in the first place.

Therefore, our revised indicator of day surgery includes all procedures that are currently coded into Manitoba hospital abstracts. In terms of numbers, this identifies almost twice as many procedures as the previous "major" day surgery indicator. For example, in 2005/06 (the second time period in the 2009 Atlas report (Fransoo et al., 2009)), we reported 44,889 day surgery procedures. When we adopt the new system of counting all coded procedures, this number becomes 83,956. In this report, we show 84,272 cases in 2006/07 and 96,517 in 2011/12. These numbers seems perfectly reasonable, given the long–term trend of increasing numbers of outpatient surgeries over time. This also has the advantage of including a number of important procedures that were excluded before because they are not provided in operating rooms (e.g., scoping procedures; **cardiac catheterizations**).

This change also affects the indicator related to hospitalizations. This indictor used to be called "hospital separations" and included day surgery procedures. These two ideas are now presented in separate indicators: one called "inpatient hospitalizations", which includes only cases in which patients were admitted to acute hospital for at least one night, and the day surgery indicator described above. Note that patients receiving day surgery can also be admitted in which case they would be counted in both indicators.

7.1 Hospital Bed Supply

Definition: the number of beds in acute care hospitals in each RHA divided by the population of the RHA. The bed counts come from the "Setup Beds" data maintained by Manitoba Health for 2006/07 and 2011/12. These values should be interpreted with caution because the actual number of beds in use in each hospital varies throughout the year, and the beds can be used for "non–acute" care. The values shown can provide an overall indication of the relative supply of beds across the province and the change in supply over time. Statistical testing is not done on supply measures.

Key Findings

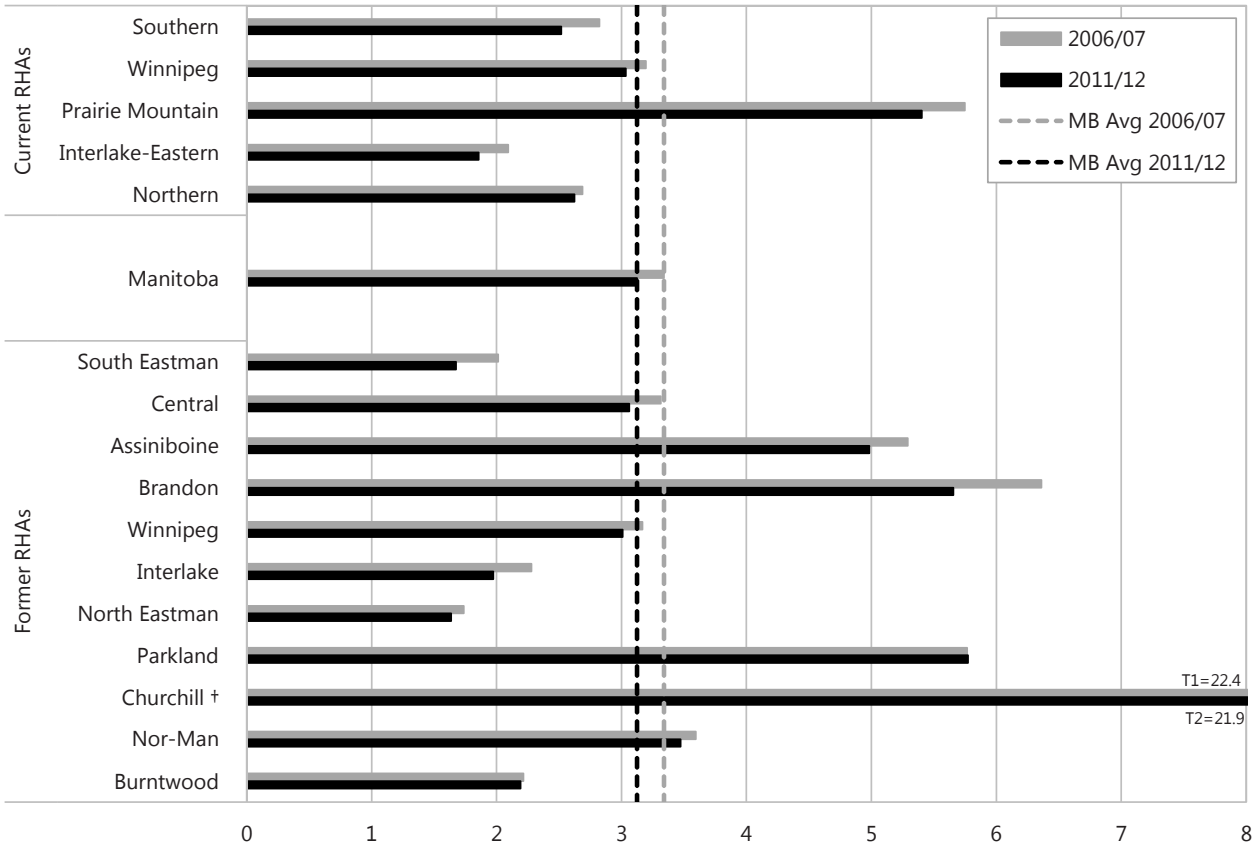
- The provincial supply of hospital beds per capita decreased from 3.35 beds per 1,000 residents to 3.13. Values in most regions reflected this overall decrease, driven by increases in regional populations and relatively stable bed numbers.
- The former Churchill RHA appears to have a much higher **hospital bed supply** than all other areas. However, much of the capacity of the Churchill Regional Health Centre is used by non–Churchill residents, especially residents of Nunavut.
- Prairie Mountain had the highest hospital bed supply followed by Winnipeg, Northern, Southern, and Interlake–Eastern. However, hospitals in Winnipeg often provide services to residents of other regions, so these values must be interpreted with caution.
- Hospital bed supply does not appear to be related to population health status at the regional level.

Comparison to Other Findings

- The values shown here align with and extend those in the 2009 Atlas (Fransoo et al., 2009). Taken together, results from these reports suggest that bed supply per capita continues to decrease due to small reductions in bed numbers and population increases.

Figure 7.1.1: Hospital Bed Supply by RHA, 2006/07 and 2011/12

Number of setup hospital beds* per 1,000 residents



* Bed numbers were copied from Manitoba Health data. Statistical testing is not performed on supply measures.

† The Churchill Health Centre has 28 beds, 7 of which serve as Personal Care Home beds.

7.2 Use of Hospitals

Definition: the percent of residents who were admitted to an acute care hospital at least once in a fiscal year. See Glossary for further details. Values were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

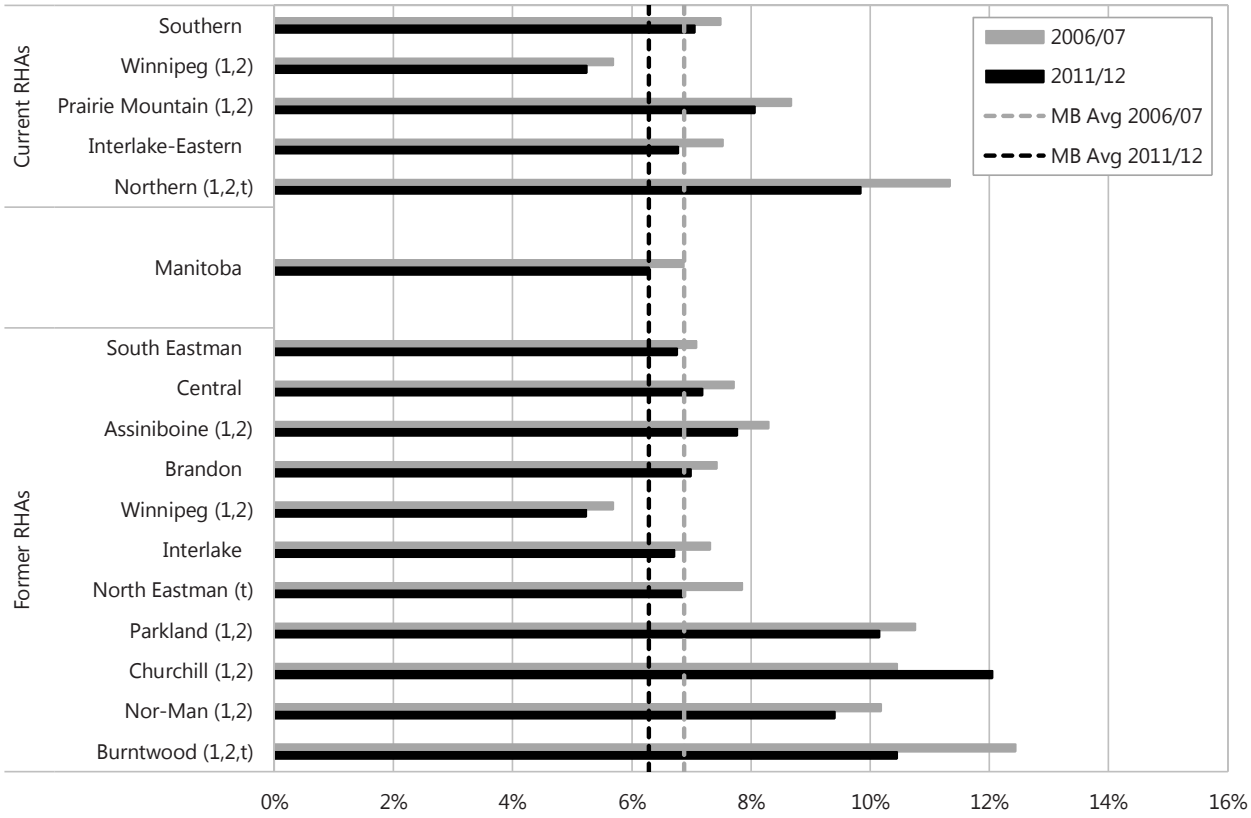
- The proportion of residents hospitalized at least once in a given year decreased from 6.88% to 6.29%, though this decrease did not reach statistical significance in the main model. All regions had decreasing values, but the magnitude of the change varied by region.
  - This lack of statistical significance despite the substantial decrease in overall rates was caused primarily by the variability across regions, though differences among age/sex groups were also a factor.
  - An alternate model that tested only the time difference for Manitoba overall (excluding age, sex, and region) was also created, and this model showed that the decrease in visit rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the decreases over time (by age, sex, and region) is why the main model did not show a significant decrease over time.
- Hospital use rates appear to be related to health status at the regional level though the relationship was not linear, mostly because of Winnipeg.
  - It is likely that geography and transportation systems also play a role: more residents of Northern live in remote areas without ready access to hospitals, so they are more likely to be admitted to (and kept in) hospitals than those with better access to acute care facilities.
  - In addition, a higher proportion of hospitalizations for Winnipeg and former Brandon RHA residents were outpatient services. These residents used the hospital, but were not admitted (for overnight stays) as often.
- There were large differences across RHAs from 5% of Winnipeg residents to just under 10% of Northern residents (in 2011/12).
- In rural regions, rates were particularly low in some districts of Southern and Interlake–Eastern, several of which are relatively close to Winnipeg. Rates were higher in most districts of Northern region.
- There was also substantial variation among NCs in Winnipeg from under 4% to over 12%, though most NCs were below the provincial average.
- Hospital use rates were strongly related to income in urban and rural areas in both time periods: a higher proportion of residents of lower income areas were hospitalized at least once (Appendix 2).

Comparison to Other Findings

- The values shown here are consistent with and extend the findings of the 2009 Atlas (Fransoo et al., 2009). This implies a continuing reduction over time in the proportion of residents admitted to a hospital at least once in a given year.

Figure 7.2.1: Use of Hospitals by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) with at least one inpatient hospital stay per year



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.2.2: Use of Hospitals by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) with at least one inpatient hospital stay per year

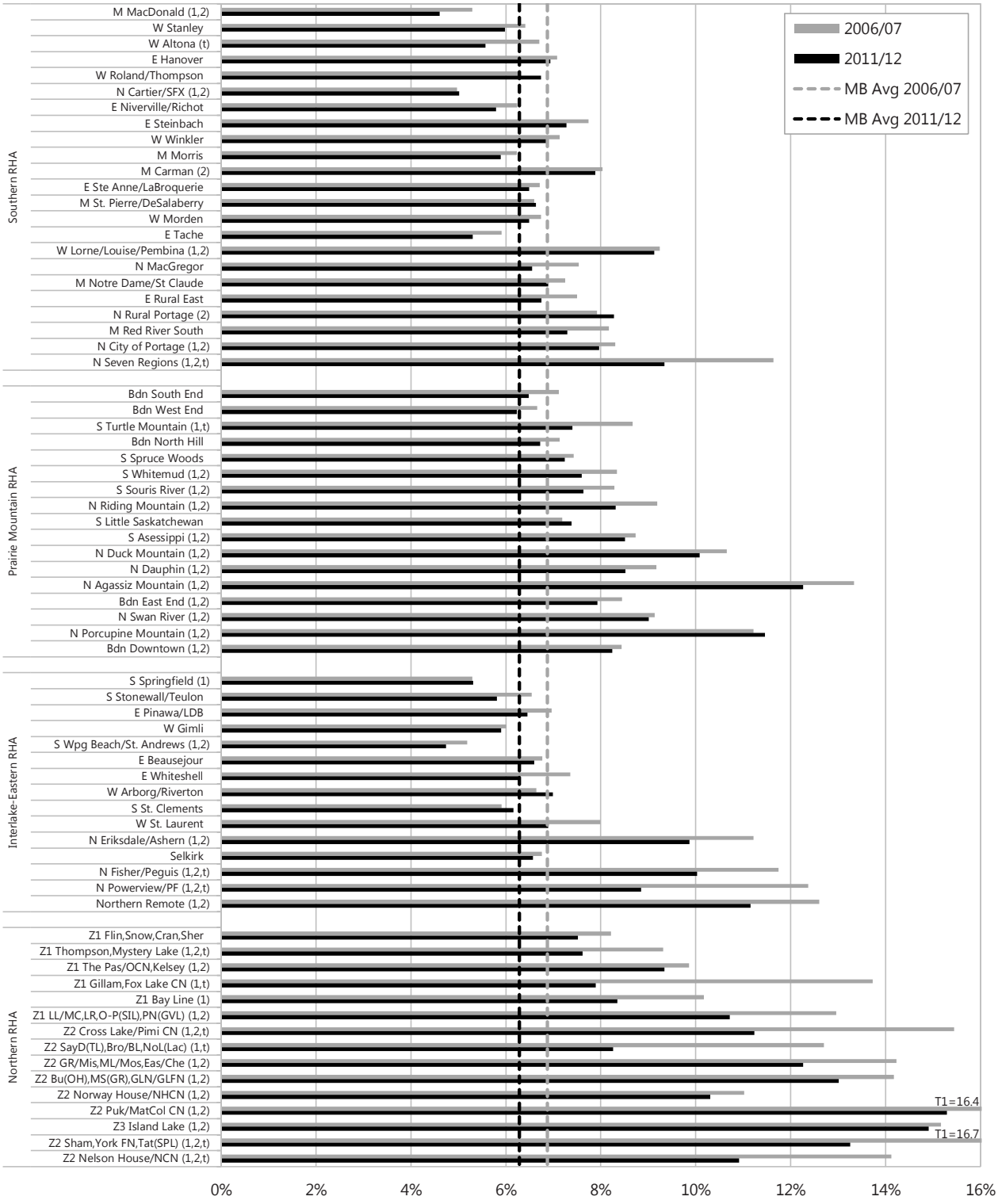
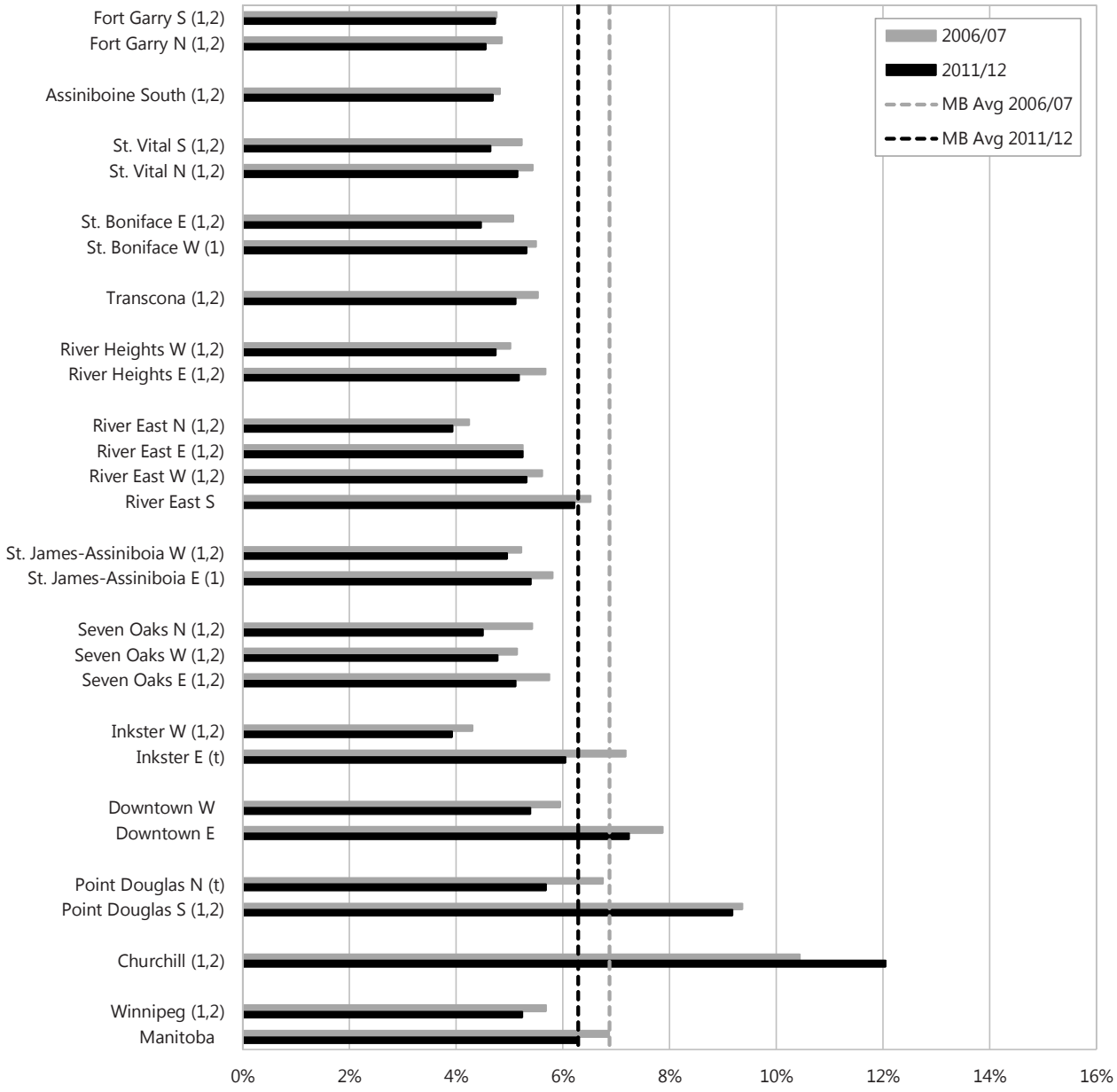


Figure 7.2.3: Use of Hospitals by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents (all ages) with at least one inpatient hospital stay per year



7.3 Inpatient Hospitalization

Definition: the total number of inpatient hospitalizations per 1,000 residents per year. In any given period, a resident could be hospitalized more than once, so this indicator shows the total number of hospitalizations from acute care facilities by all residents of the area. See Glossary for further details. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

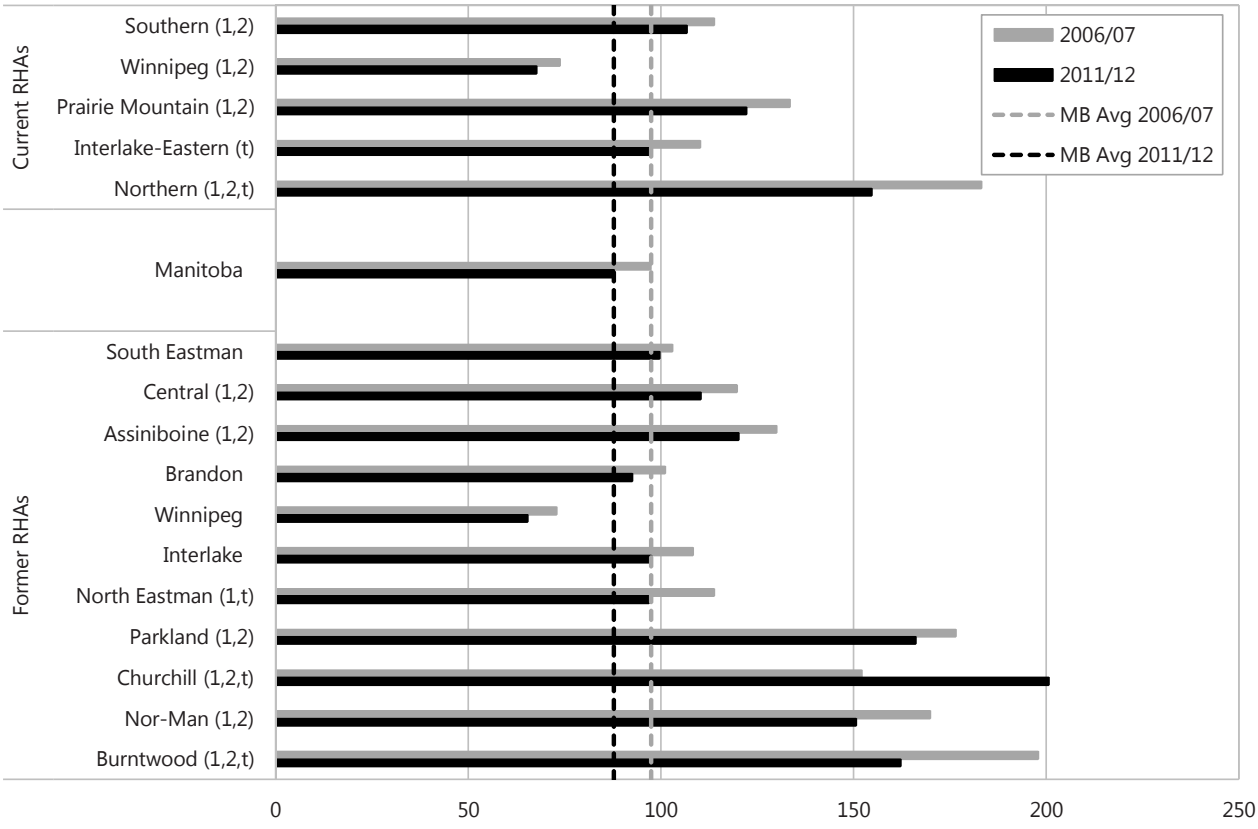
- The overall inpatient hospitalization rate decreased from 97.5 to 86.4 per 1,000 residents per year, though this decrease was not statistically significant in the main model.
  - This lack of significance despite the substantial decrease in overall rates was caused by the variability across regions and age/sex groups.
  - An alternate model that tested only the time difference for Manitoba overall (excluding age, sex, and region) was also created, and this model showed that the decrease in rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the decreases over time (by age, sex, and region) is why the main model did not show a significant decrease over time.
- Hospitalization rates appear to be related to health status at the regional level, though the relationship was not linear mostly because of Winnipeg.
  - It is likely that geography and transportation systems also play a role: more residents of Northern live in remote areas without ready access to hospitals, so they are more likely to be admitted to (and kept in) hospitals more often than those with better access to acute care facilities.
  - In addition, a higher proportion of hospitalizations for Winnipeg and former Brandon RHA residents were outpatient services. These residents used the hospital, but were not admitted (for overnight stays) as often.
- In each rural region, there were at least one or two districts with particularly high rates. In Northern, most districts had high rates.
- Winnipeg residents had substantially lower hospitalization rates than residents of any other region, though rates varied considerably across NCs.
- Inpatient hospitalization rates were very strongly related to income in urban and rural areas in both time periods: residents of lower income areas had hospitalization rates almost double those of higher income areas (Appendix 2).

Comparison to Other Findings

- The patterns shown here are consistent with those in the 2009 Atlas (Fransoo et al., 2009), showing a continuing decrease in inpatient hospitalization rates. However, the values here are all lower because this indicator excludes day surgeries (see next Section).
- A version of this indicator based on episodes rather than hospitalizations was also created, and the results were very similar. See Appendix 2 for details.

Figure 7.3.1: Inpatient Hospitalization Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.3.2: Inpatient Hospitalization Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents

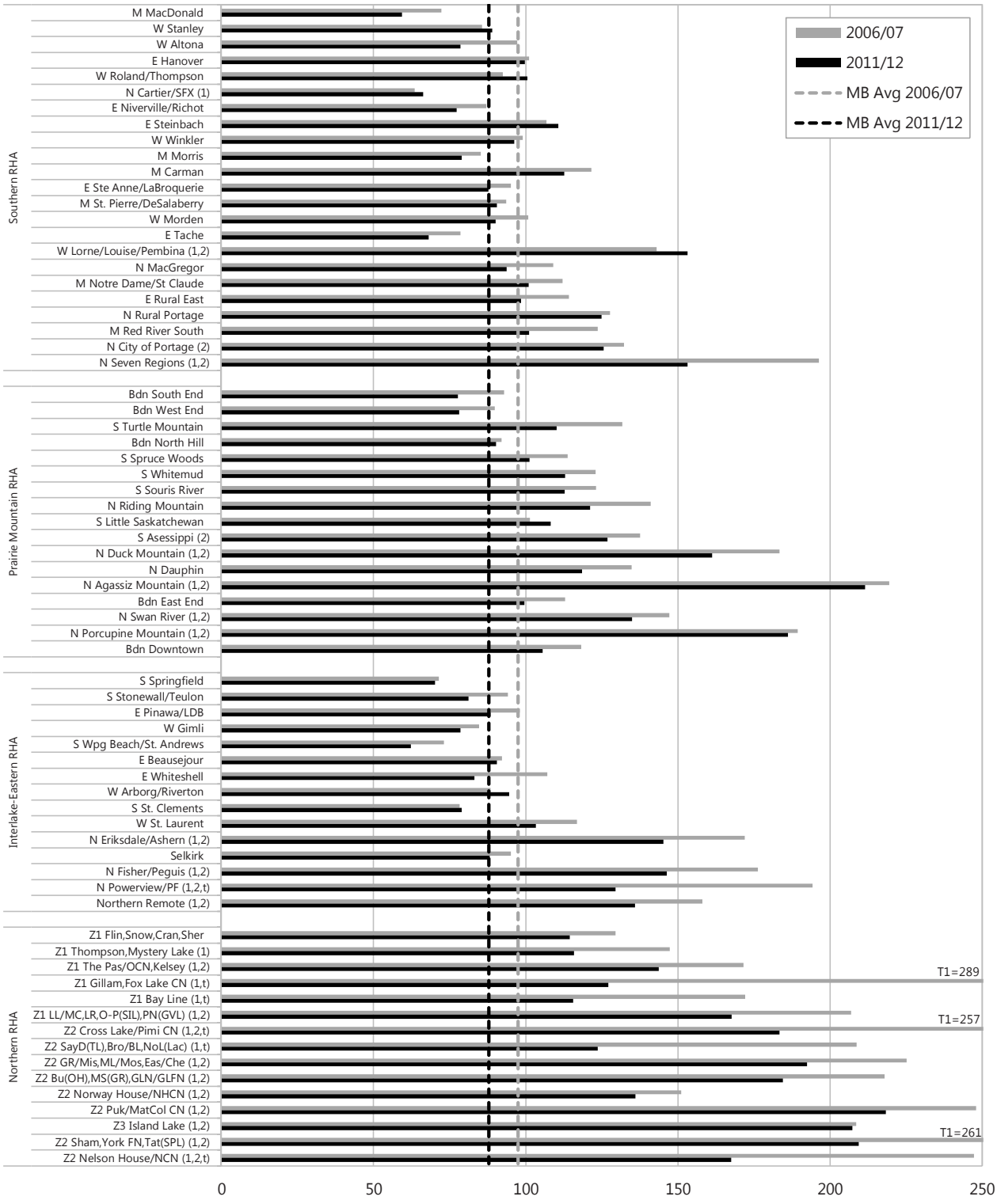
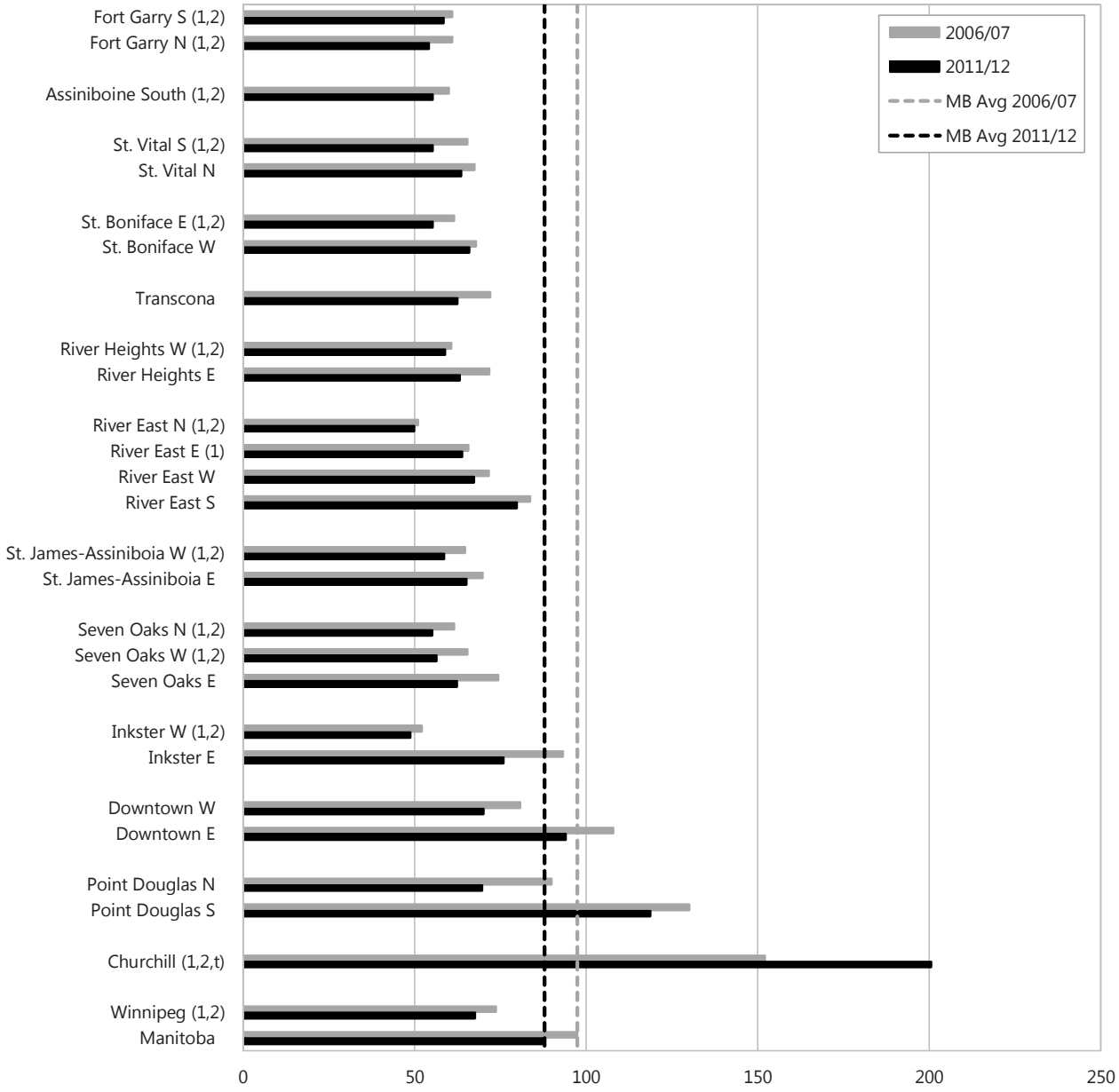


Figure 7.3.3: Inpatient Hospitalization Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents



7.4 Day Surgery

Definition: the number of day surgery hospitalizations per 1,000 residents in a given year. Day surgery was defined as surgical services received on an outpatient basis. Multiple admissions of the same person were counted as separate events. See Glossary for further details. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07. See also the important note in the Introduction of this chapter regarding the major change to the definition of this indicator for this report.

Key Findings

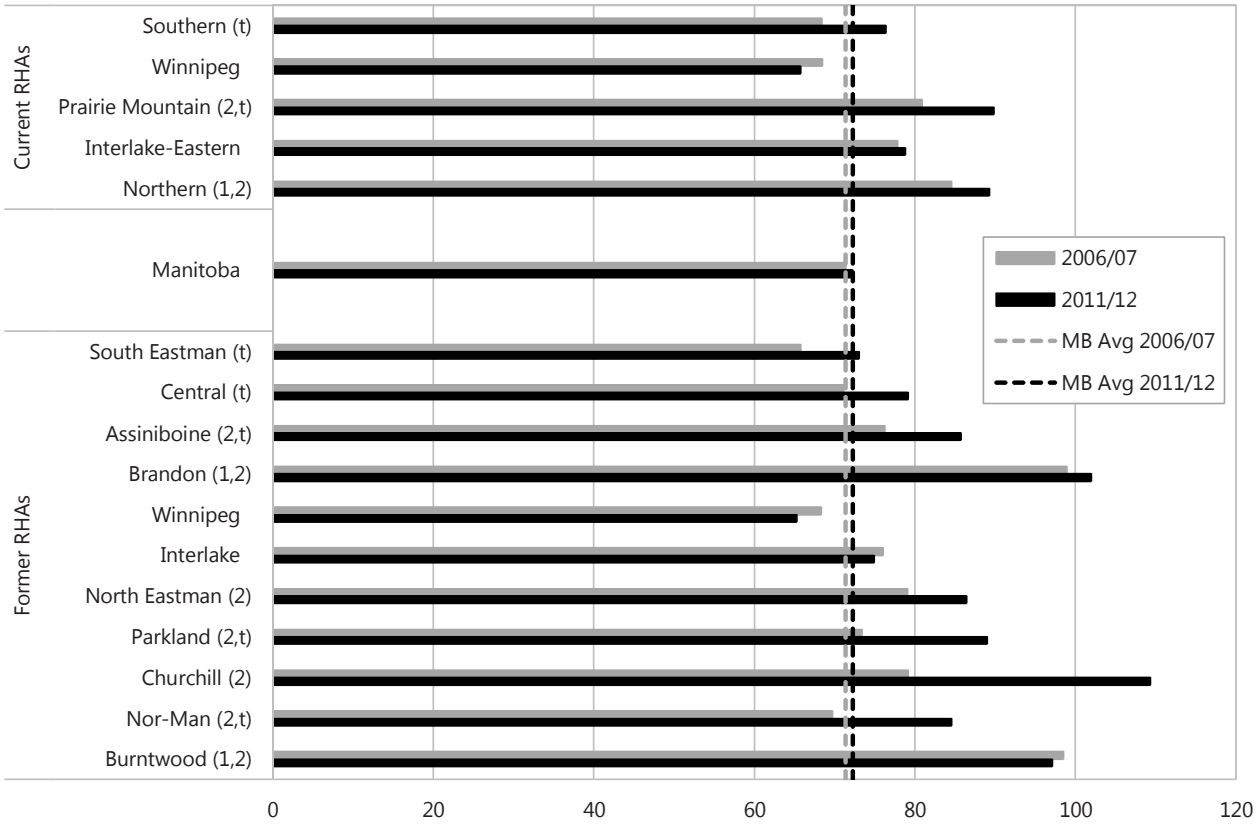
- The rate of day surgery procedures increased slightly, but not significantly, from 71.4 to 72.2 over time. However, the changes varied markedly by region. Winnipeg had a non–significant decrease, while all other regions had increases, even though only those in Southern and Prairie Mountain were significant.
  - An alternate model that tested only the time difference for Manitoba overall (excluding age, sex, and region) was also created, and this model showed that the increase in rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the changes over time (by age, sex, and region) is why the main model did not show a significant increase over time.
- Day surgery rates were related to PMR, but the relationship was not linear. Rates in the former Brandon RHA were particularly high.
- Rates varied across districts in rural regions. Interestingly, the districts with the lowest values in the first time period had higher rates in the second time period, and most of these increases were statistically significant.
- There seems to be an unusual pattern among districts in Prairie Mountain region: the healthiest districts had high rates (several of which increased over time); whereas the less healthy districts had lower rates, which is the reverse of what might have been expected.
- There was considerable variation among NCs in Winnipeg; the values were not related to PMR.
- Day surgery rates were related to income in urban and rural areas in both time periods. Residents of lower income areas had higher rates of day surgery, though the association among urban residents in the second time period did not reach statistical significance.

Comparison to Other Findings

- This indicator was included in the MCHP report on "Sex Differences in Health Status", published in 2005 (Fransoo, Martens, *The Need To Know* Team, Burland, Prior, Buchill, Chateau & Walld, 2005). Results in that report showed rates that are just over half of those shown here because of the major change in the definition, as explained above.

Figure 7.4.1: Day Surgery Hospitalization Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.4.2: Day Surgery Hospitalization Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents

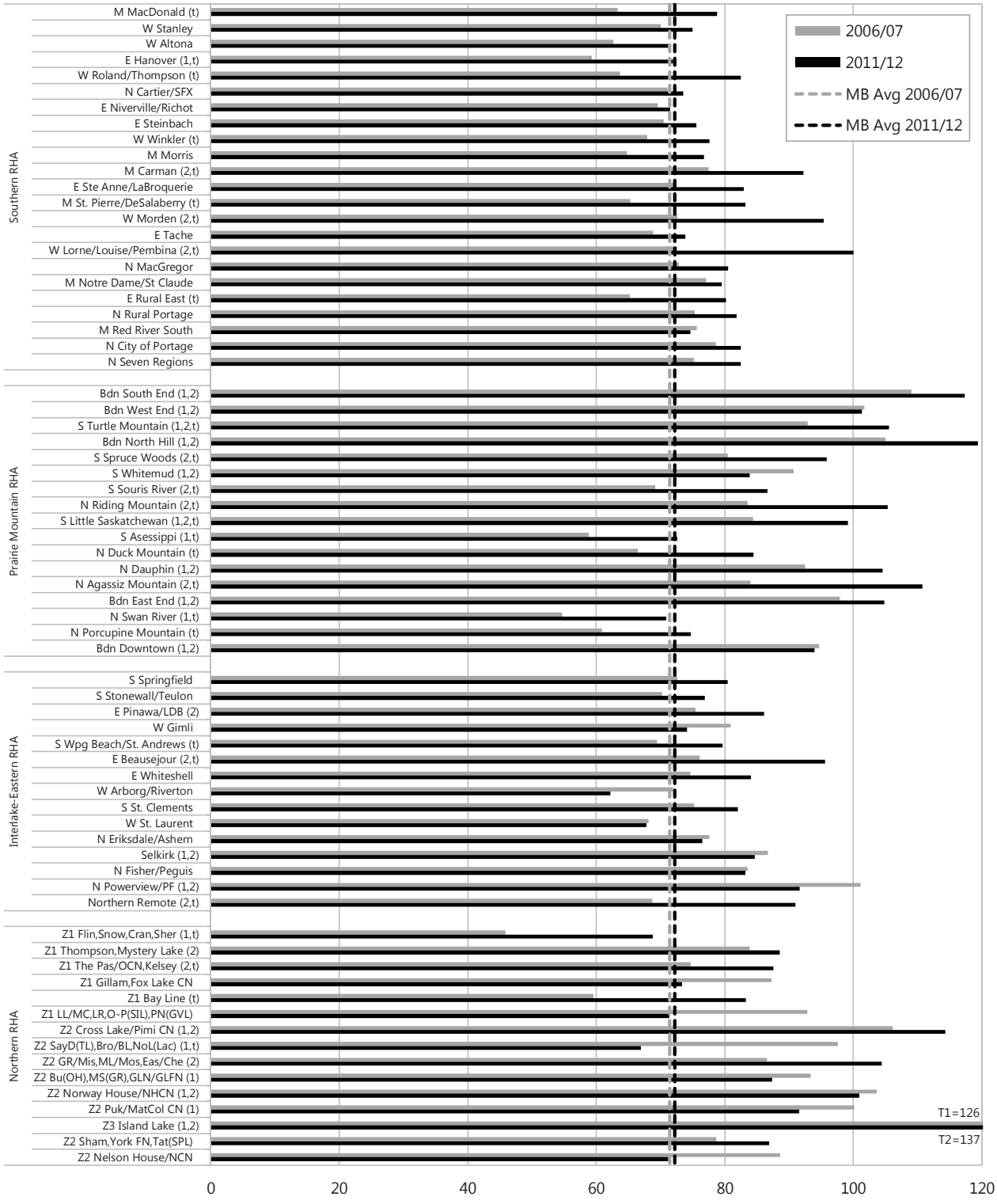
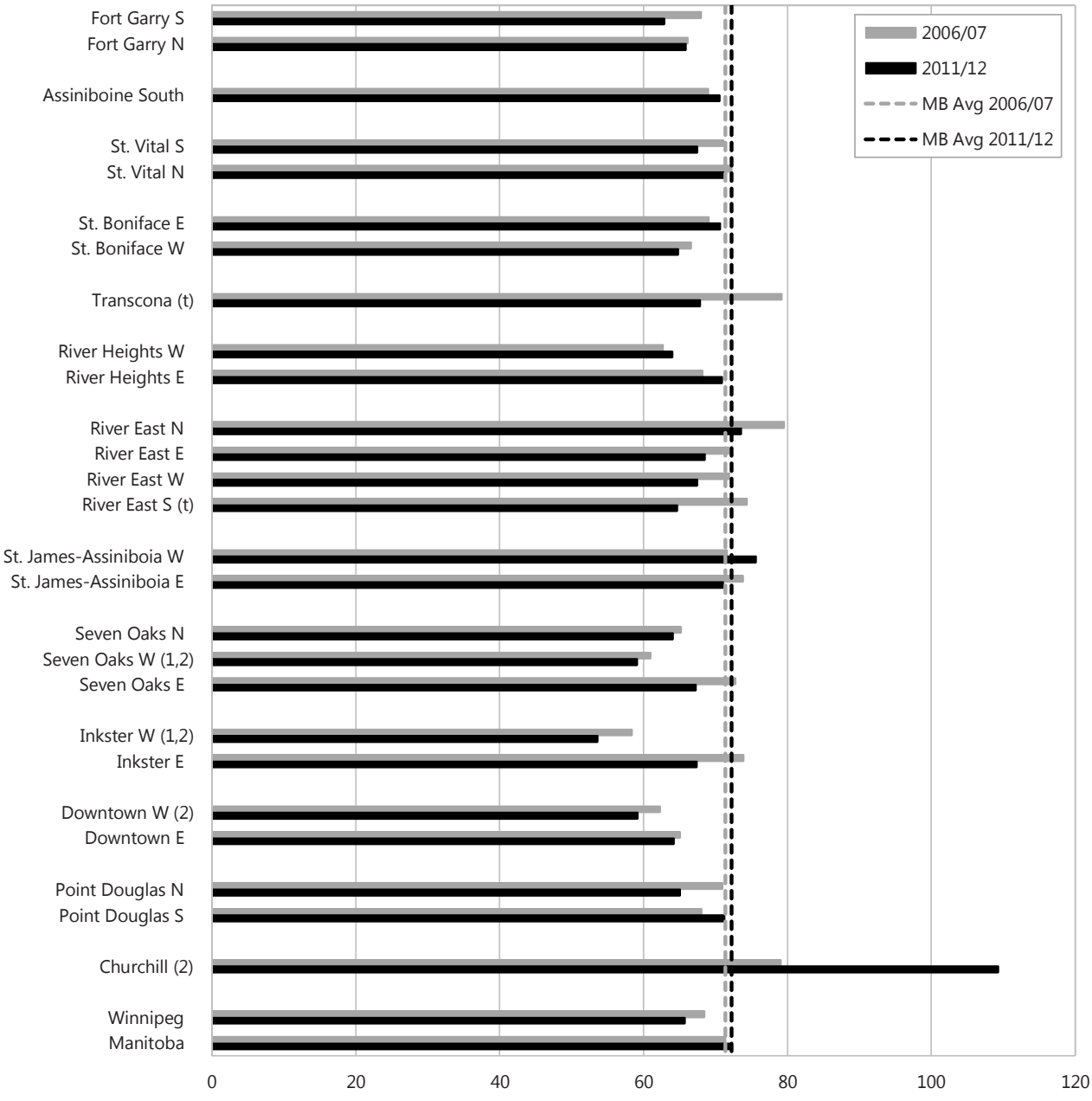


Figure 7.4.3: Day Surgery Hospitalization Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospitalizations per 1,000 residents



7.5 Hospital Days Used in Short Stays

Definition: the number of **hospital days used in short stays** (under 14 days) per 1,000 residents per year. If a resident had more than one short hospitalization in the period, the days used in all short hospitalizations were summed. See Glossary for further details. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

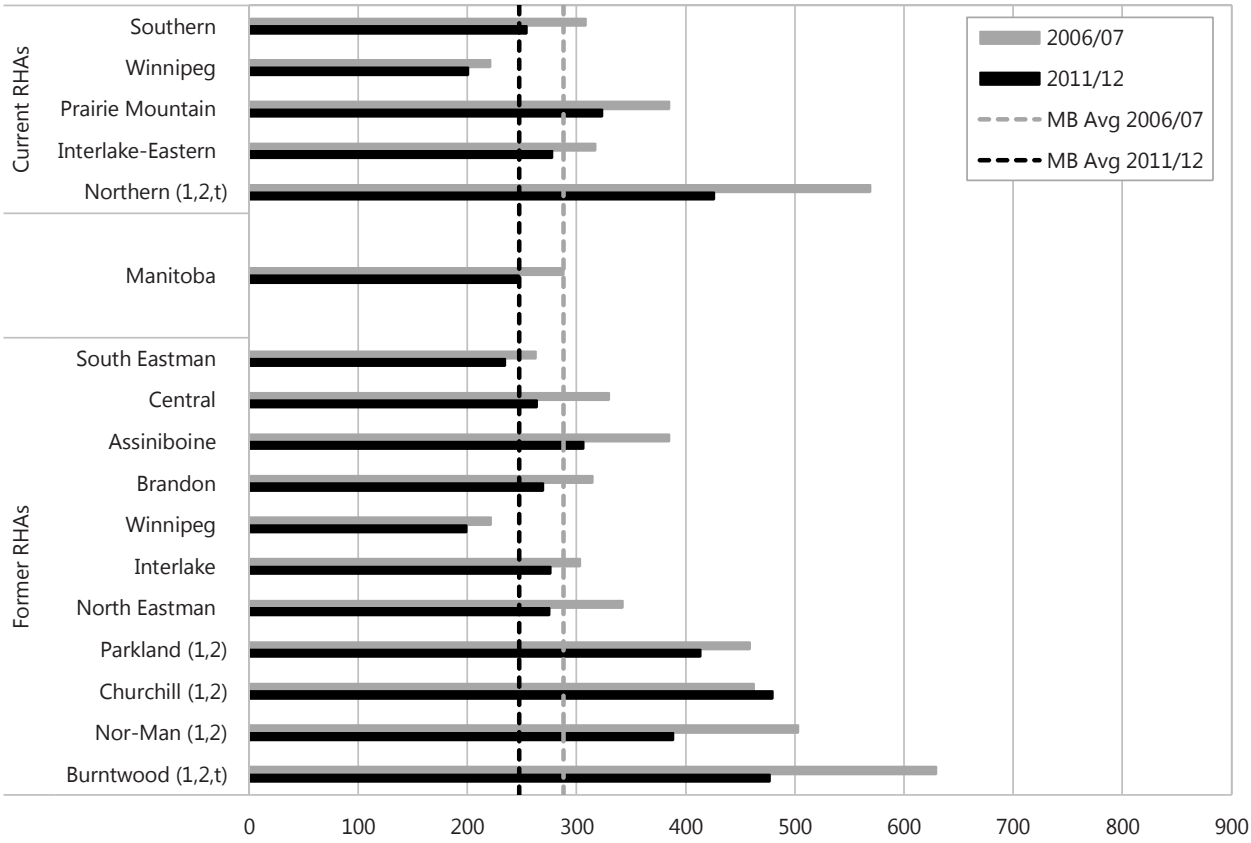
- The number of days used in short stays decreased from 288 to 247 days per 1,000 residents per year, but the difference was not statistically significant in the main model. Rates decreased in all regions, but the magnitude of the decrease varied. Only the decrease in Northern reached statistical significance.
  - An alternate model that tested only the time difference for Manitoba overall (excluding age, sex, and region) was also created, and this model showed that the decrease in rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the changes over time (by age, sex, and region) is why the main model did not show a significant increase over time.
- Days used in short stays were related to PMR at the regional, district, and NC levels, though the relationships were not linear. Winnipeg region had lower than average rates, but this difference was not statistically significant.
- Rates were higher than average in Northern region and all of its districts; this is consistent with the poorer overall health status of Northern residents.
- Days used in short stays were strongly related to income in urban and rural areas in both time periods: short stay days used among residents of lower income areas were almost double those in higher income areas (Appendix 2).

Comparison to Other Findings

- These results are consistent with and extend those in the 2009 Atlas (Fransoo et al., 2009). Hospital days used for short stays (1–13 days) have been steadily decreasing over many years.

Figure 7.5.1: Hospital Days Used in Short Stays by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of less than 14 days per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.5.2: Hospital Days Used in Short Stays by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of less than 14 days per 1,000 residents

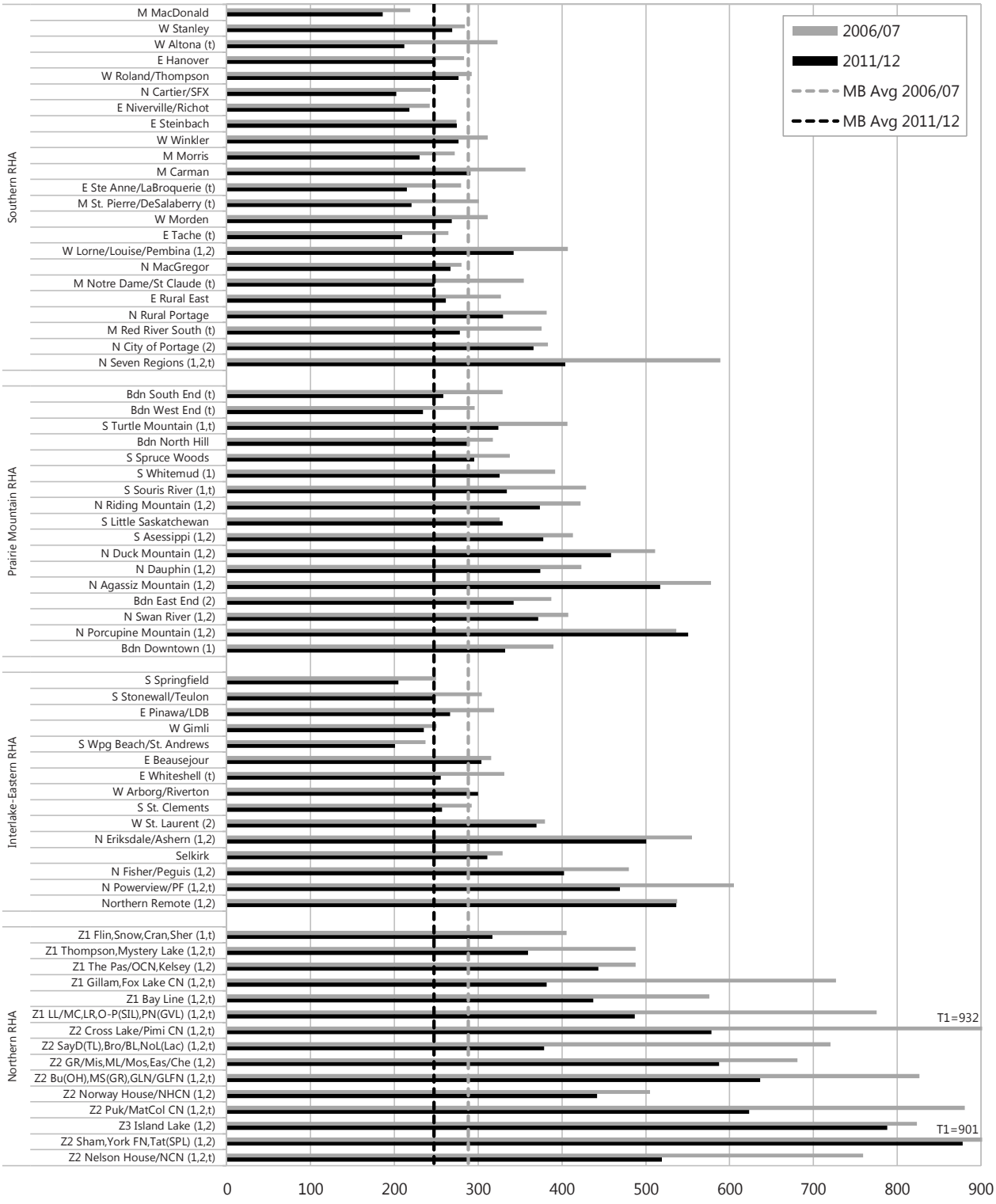
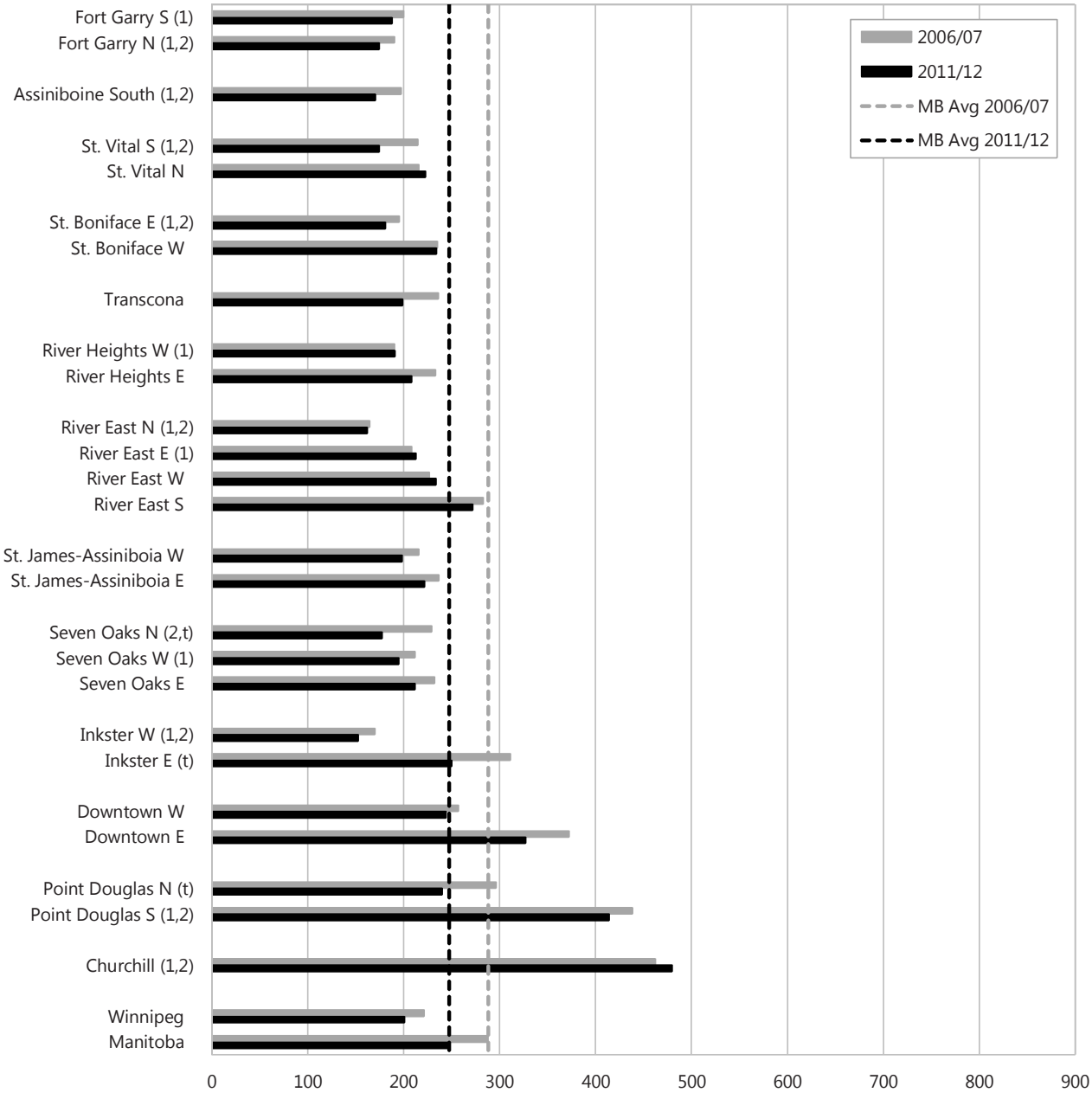


Figure 7.5.3: Hospital Days Used in Short Stays by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of less than 14 days per 1,000 residents



7.6 Hospital Days Used in Long Stays

Definition: the number of **hospital days used in long stays** (14 to 365 days) per 1,000 residents per year. If a resident had more than one long hospitalization in the period, the days used in all long hospitalizations were summed. Each hospitalization was limited to 365 days as the maximum length of stay. See Glossary for further details. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07.

Key Findings

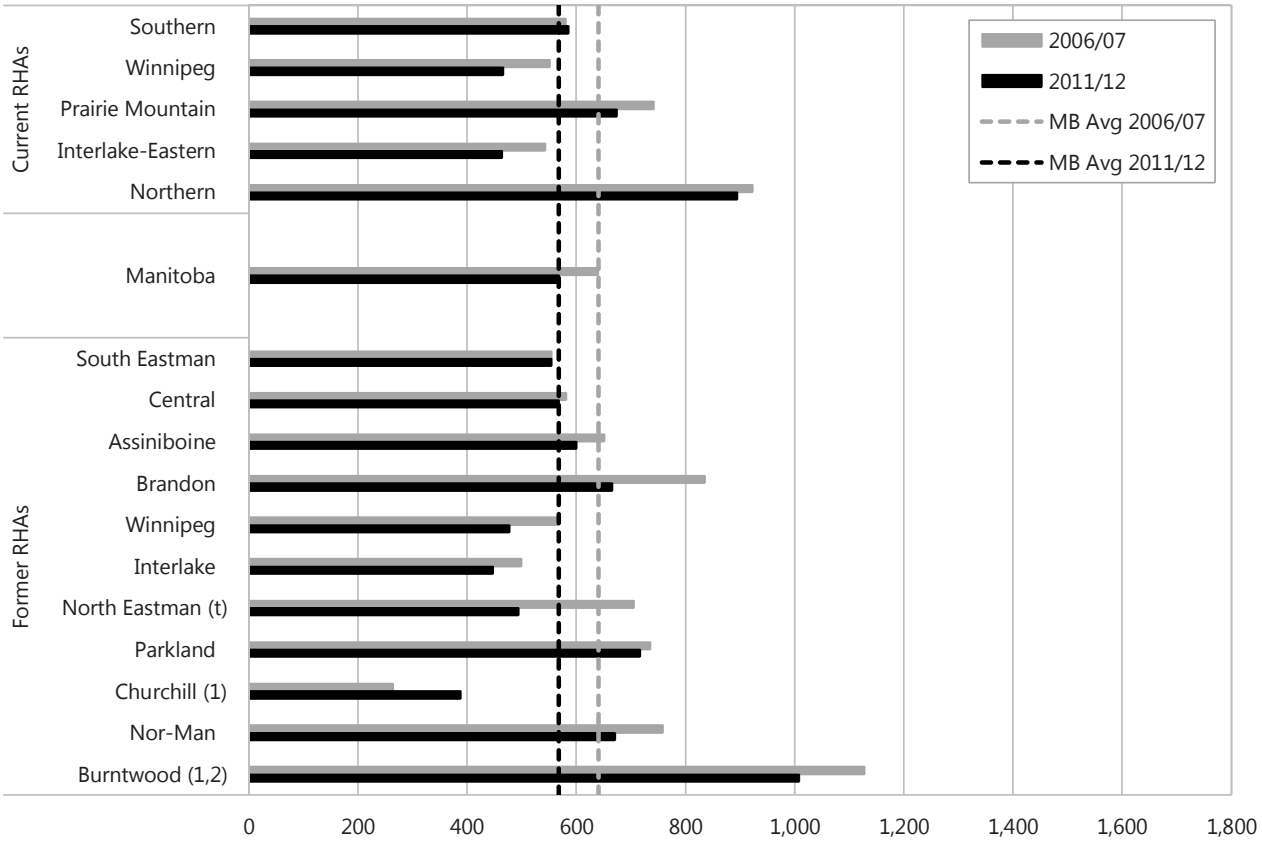
- The number of days used in long stays decreased from 640 to 567 days per 1,000 residents per year, but the difference was not statistically significant in the main model. Most regions had decreases, though none were statistically significant; Southern had a small increase.
  - An alternate model that tested only the time difference for Manitoba overall (excluding age, sex, and region) was also created, and this model showed that the decrease in rates was significant ($p<0.0001$).
  - The difference between the two models implies that the inconsistency of the changes over time (by age, sex, and region) is why the main model did not show a significant decrease over time.
- There does not appear to be a strong association between days used in long stays and population health status, although residents of Northern had the highest rates.
- Rates varied dramatically among districts in the rural regions and across NCs within Winnipeg.
- Days used in long stays were significantly related to income in urban and rural areas in both time periods: residents of lower income areas used more than twice as many days in long stays as residents of higher income areas (Appendix 2).
- Note: Because this indicator counts days used in each fiscal year, the maximum each person could accumulate was 365 days even though some of the people leaving hospital in each year had been there longer than one year. Therefore, we also provide alternative values in Appendix 2, which show results using all days of care provided. The results are slightly higher, but the patterns across regions and over time are very similar to those shown here.

Comparison to Other Findings

- These results are consistent with and extend those in the 2009 Atlas (Fransoo et al., 2009), reflecting the continuing decrease in the number of hospital days used in long stays.

Figure 7.6.1: Hospital Days Used in Long Stays by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of 14-365 days per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.6.2: Hospital Days Used in Long Stays by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of 14-365 days per 1,000 residents

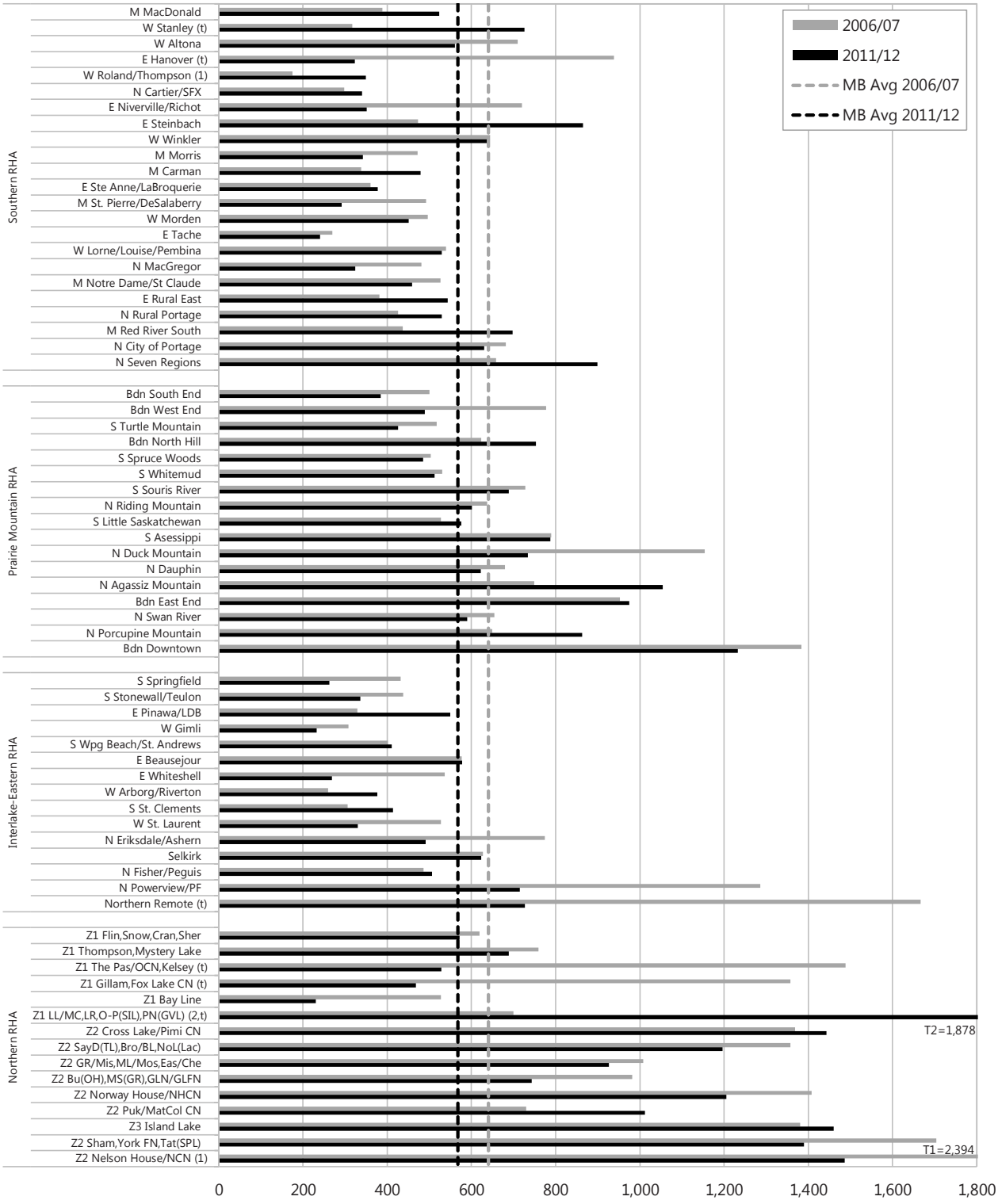
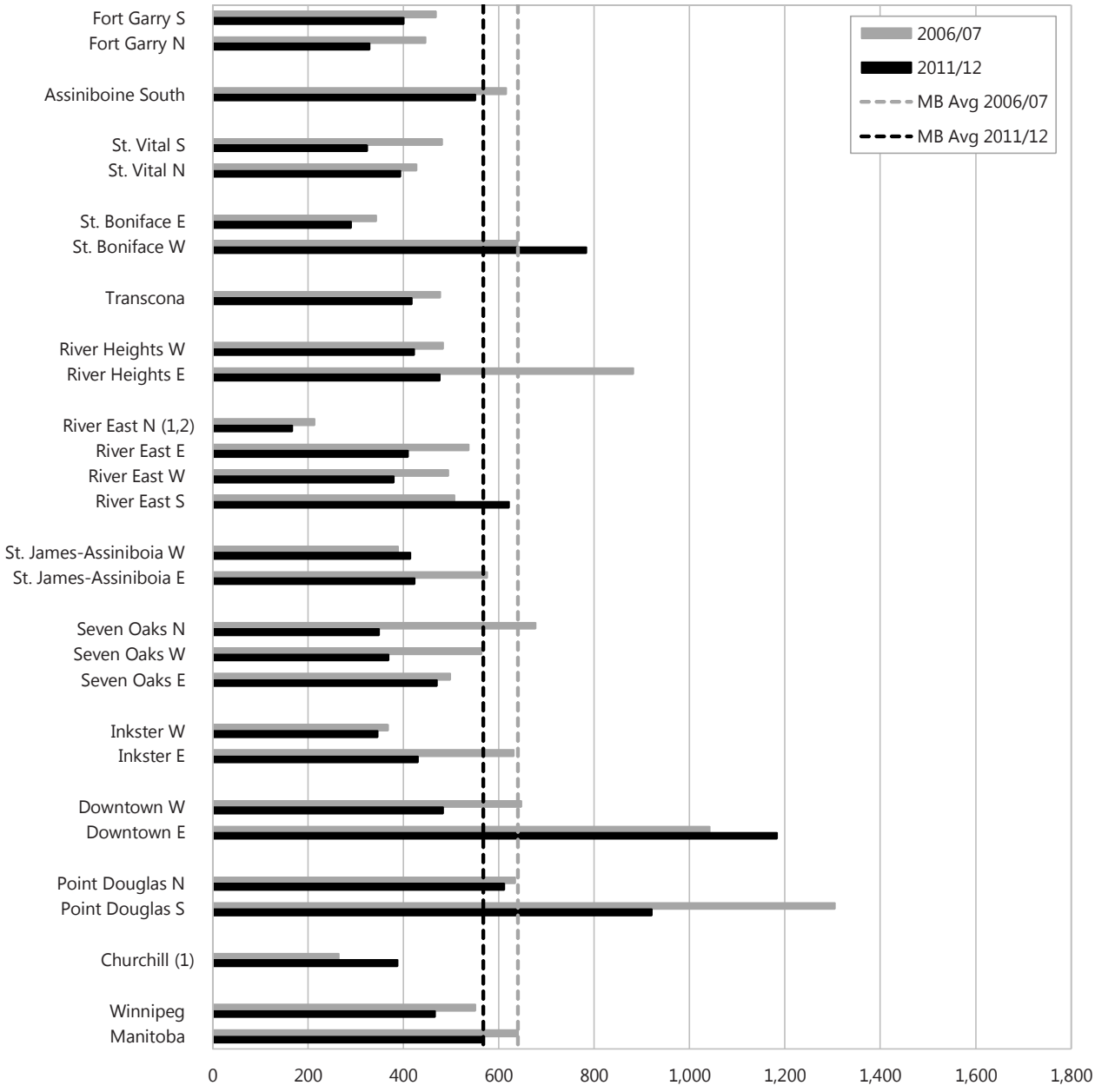


Figure 7.6.3: Hospital Days Used in Long Stays by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of 14-365 days per 1,000 residents



7.7 Causes of Hospitalization

Definition: the most frequent reasons for inpatient hospitalizations and day surgeries are reported for fiscal years 2006/07 and 2011/12. Each hospital abstract has a "most responsible" diagnosis—the diagnosis that describes the most significant condition of a patient which contributed his or her stay in hospital. Most responsible diagnoses were grouped by ICD–10–CA chapter, and the most frequent causes are shown for each RHA and the province overall (as average annual crude percent).

Notes regarding two key groups of causes:

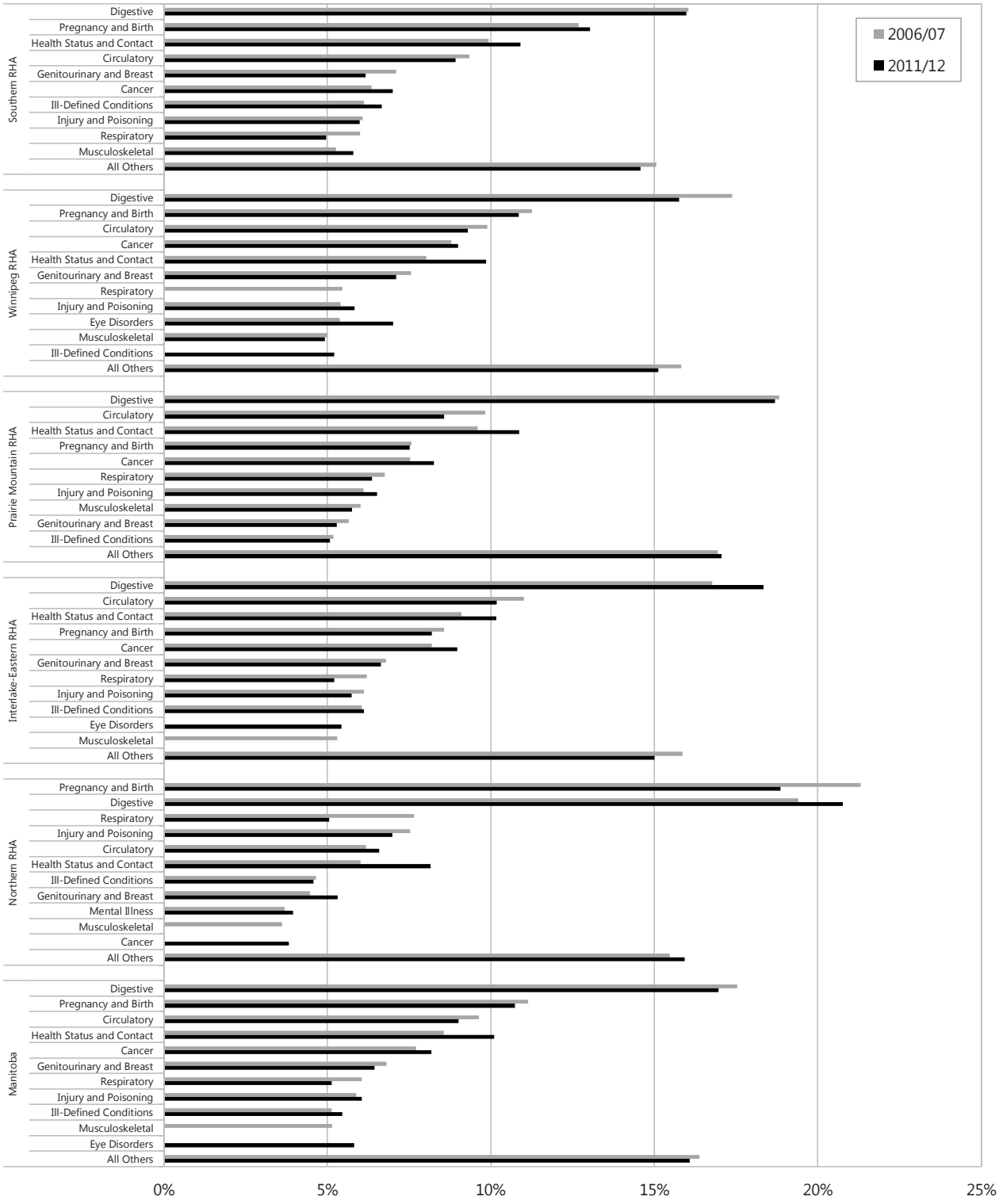
- Health status and contact: hospitalizations in this broad category included a large number of issues not necessarily connected to a specific diagnosis or disease: colonoscopies, convalescence and follow–up after surgery, sterilization procedures, palliative care, and others.
- Ill–defined conditions: hospitalizations in this group were most commonly related to non–specific pain in the abdomen or chest, though a variety of other issues were also coded including malaise and fatigue, fainting, and pain in other areas. For the majority of these cases, the patient was experiencing a specific problem; but it could not be assigned to a specific disease category.

Key Findings

- The results show that the most frequent causes of hospitalization did not change much over time. Digestive diseases were the most common cause, followed by pregnancy and birth, circulatory diseases, health status and contact, and cancer.
- The exact order of causes varied somewhat by region. Results for Northern region were most unique, with all other regions showing patterns that were similar to each other.

Figure 7.7.1: Most Frequent Cause of Hospitalizations by RHA, 2006/07 and 2011/12

Average annual crude percent of hospitalizations



7.8 Causes of Hospital Days Used

Definition: the most frequent reasons for hospital days used during inpatient hospitalizations and day surgeries are reported for fiscal years 2006/07 and 2011/12. Each hospital abstract has a "most responsible" diagnosis—the diagnosis that describes the most significant condition of a patient that contributed to his or her days in hospital. Most responsible diagnoses were grouped by ICD–10–CA chapter, and the most frequent causes are shown for each RHA and the province overall (as average annual crude percent).

Notes regarding two key groups of causes:

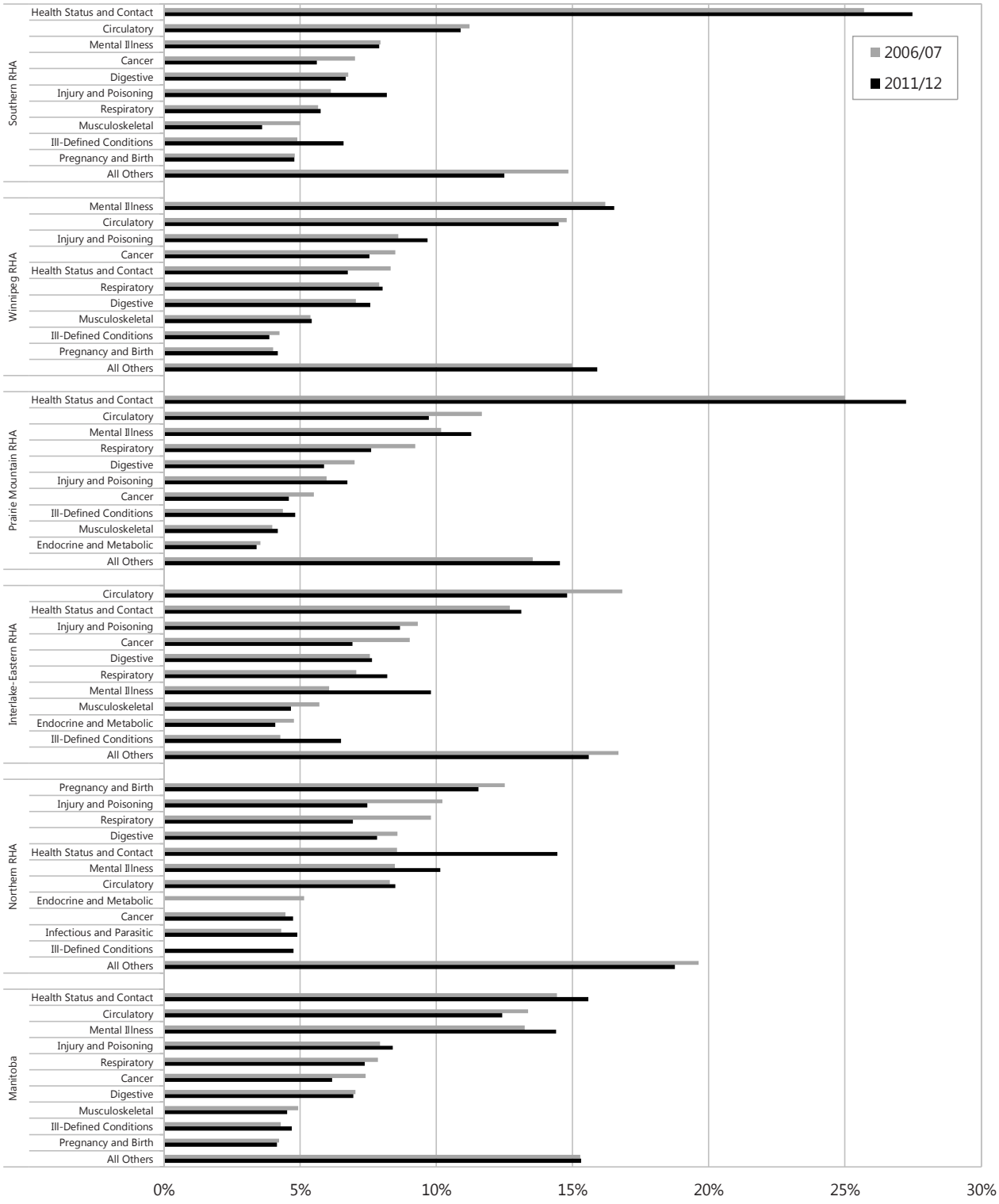
- Health status and contact: hospitalizations in this category included a large number of issues not necessarily connected to a specific diagnosis or disease.
- Ill–defined conditions: for hospitalizations in this category, the patient was experiencing a specific problem; but it could not be assigned to a specific disease category.

Key Findings

- Causes of hospital days used showed a distinctly different distribution than hospitalizations because length of stay varies by category. For example, childbirth is the most frequent reason for hospitalization, but ranks much lower (10) in terms of days used because most stays are quite short.
- The most prominent causes of hospital days used by Manitobans were health status and contact, circulatory diseases (including heart attack and stroke), and mental illness. For Manitoba overall, these rankings did not change much over time; but they varied considerably by region, as shown in Figure 7.8.1.
  - Within health status and contact, the top diagnoses were people awaiting placement in personal care homes, palliative care, and rehabilitation and other services.
  - Within ill–defined conditions, the top diagnoses were malaise and fatigue, tendency to fall, and other unspecified pain.

Figure 7.8.1: Most Frequent Cause of Hospital Days of Care by RHA, 2006/07 and 2011/12

Average annual crude percent of hospital days



7.9 Hospital Readmission

Definition: the percent of **hospital episodes** after which the patient was admitted again to any hospital within one to 30 days of discharge. Hospital episodes combine multiple inpatient admissions of the same person to create a single, continuous stay in the hospital system, linking transfers between hospitals (readmissions less than 24 hours after discharge were considered to be part of the same hospital episode). Only unplanned inpatient readmissions were counted, defined by admission category "U" for urgent/emergent admissions. See Glossary for further details. Values were calculated for 2006/07 and 2011/12 and were age– and sex– adjusted to the Manitoba population in 2006/07.

Key Findings

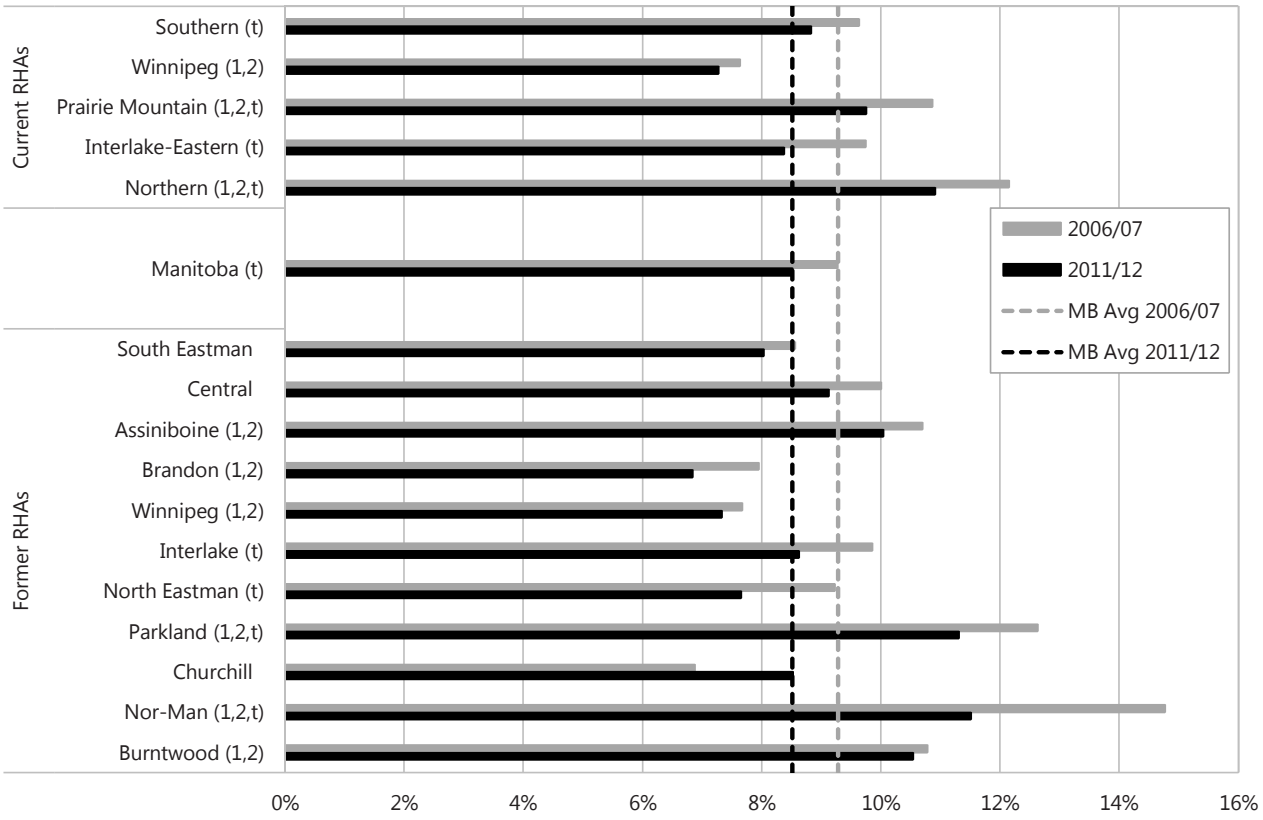
- **Hospital readmissions** (within 30 days) decreased over time from 9.28% to 8.52% of all hospital episodes. Rates decreased in all regions, though the small decrease in Winnipeg was not statistically significant.
- Readmission rates were related to PMR, but the relationship was not linear. Winnipeg residents and residents of the former Brandon RHA had the lowest rates.
- Prairie Mountain and Northern residents had rates that were higher than average in both time periods, though the rates in both regions decreased over time.
- Rates varied markedly across the districts of the rural regions. Within all regions except Northern, rates were generally higher in districts with higher PMR, but the relationships were not linear.
- There was considerable variation among NCs within Winnipeg, but less than that seen across districts of rural regions.
- Readmission rates were strongly related to income in both urban and rural areas in both time periods. However, the relationships were stronger and more consistent across rural income groups. Rates were lower among urban than rural areas.

Comparison with Other Findings

- This indicator was not included in previous RHA Atlas reports from MCHP, but the overall results are similar to those shown for Canada in a report by the **Canadian Institute for Health Information** 2012.

Figure 7.9.1: Hospital Readmission by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of hospital episodes with a readmission within 30 days of discharge



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.9.2: Hospital Readmission by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of hospital episodes with a readmission within 30 days of discharge

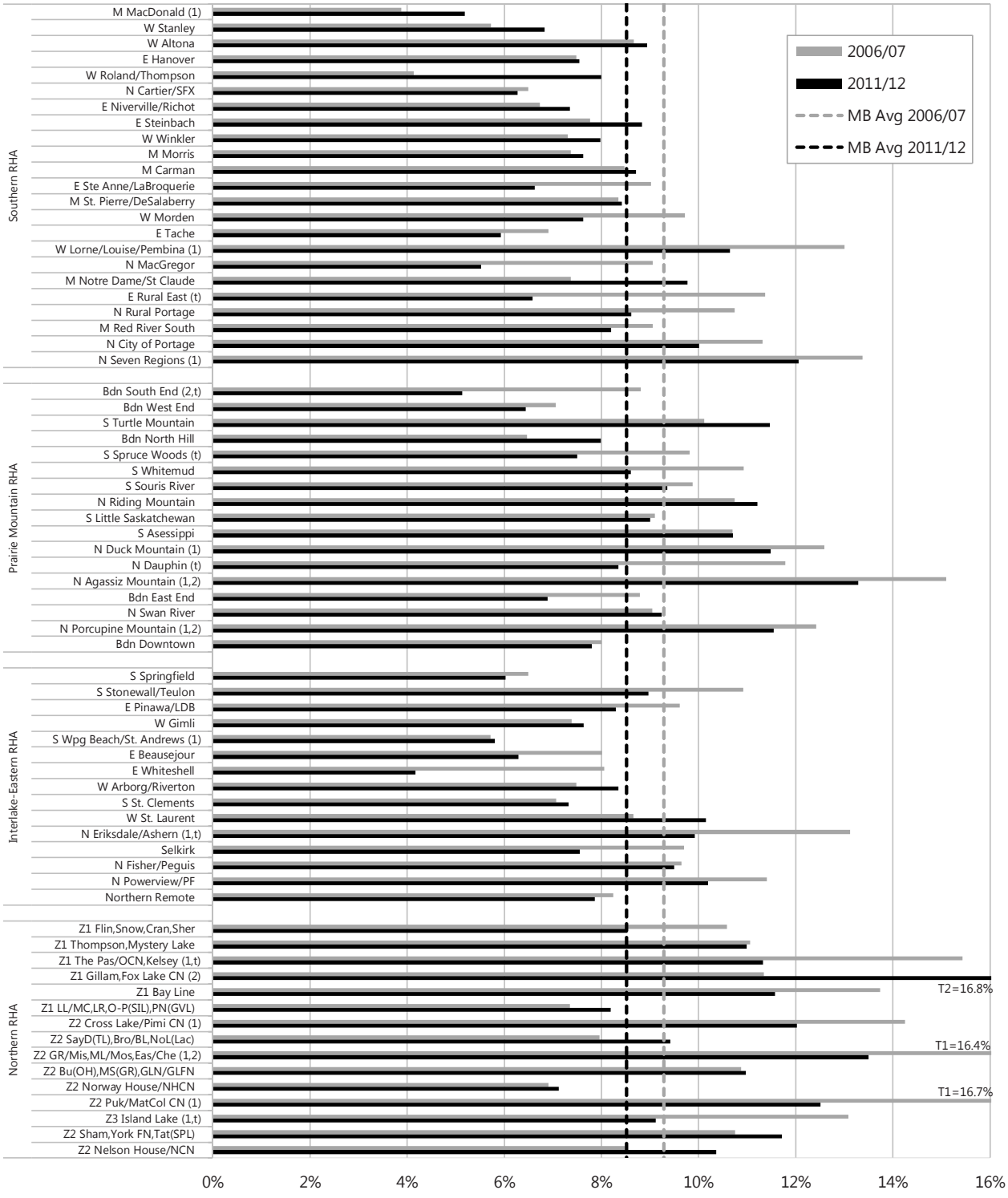
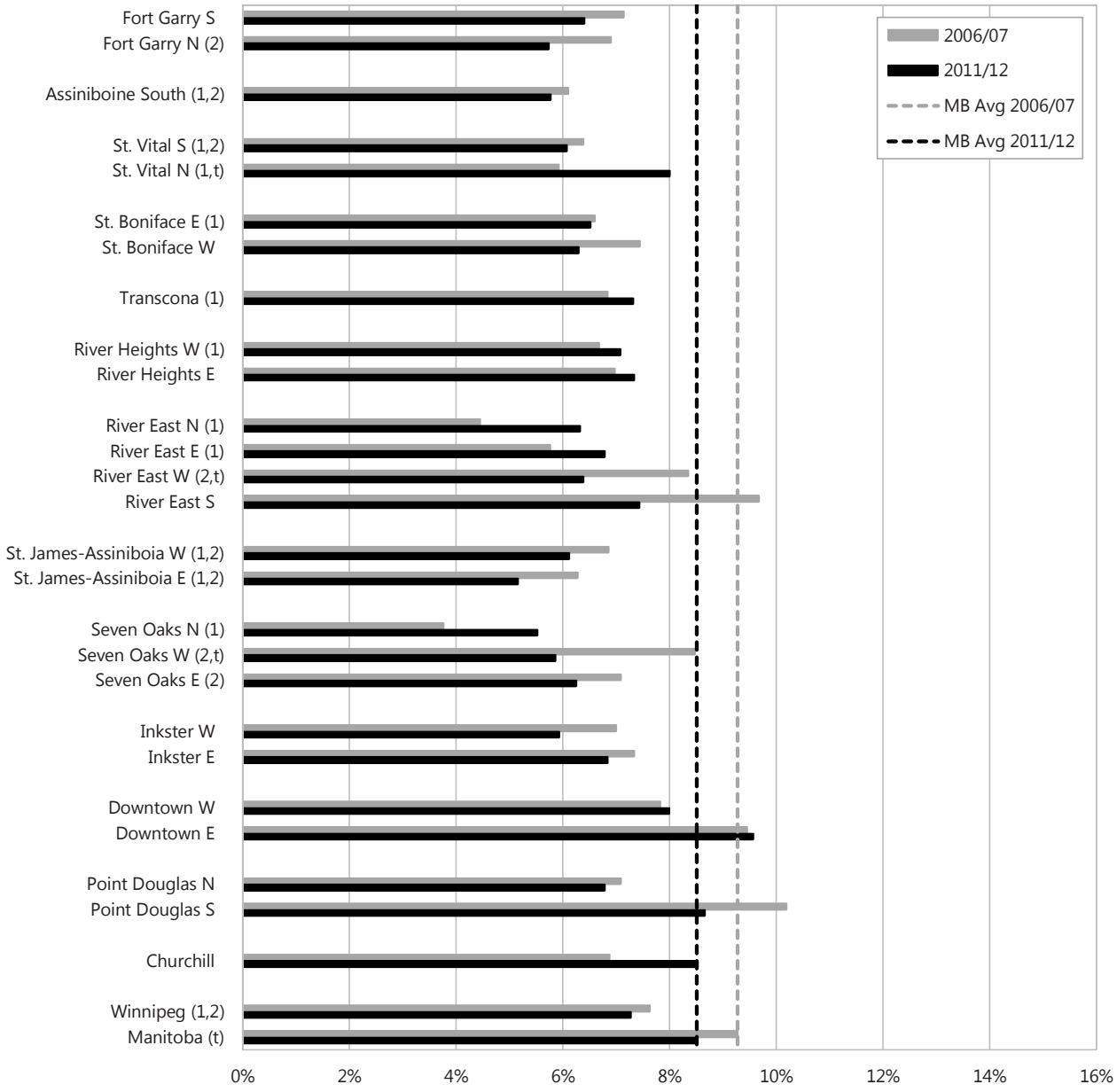


Figure 7.9.3: Hospital Readmission by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of hospital episodes with a readmission within 30 days of discharge



7.10 Factors Associated with Readmission

A series of **logistic regression** analyses were performed to determine which of a number of factors were related to hospital readmission within 30 days, based on the findings of previous studies (Battistella, Torabian, & Siadatan, 1997; Calvillo-King et al., 2013; Hoskins, Walton-Moss, Clark, Schroeder, & Thiel, 1999; Kansagara et al., 2011; Lichtman et al., 2010; Mackie, Ionescu-Ittu, Pilote, Rahme, & Marelli, 2008; Slamowicz, Erbas, Sundararajan, & Dharmage, 2008; Van Walraven & Bell, 2002; Weeks, Lee, Wallace, West, & Bagian, 2009). The variables included were:

- Patient age (in years)
- Patient sex
- Income quintile (urban and rural separately)
- Sickness level (using **resource utilization bands** (**RUB**) groups[11])
- Discharge disposition
- Admission from the emergency department
- Discharged on a Friday
- Hospitalization type[12]
- Difference between actual and **expected length of stay** (**ELOS**) (2 days or more)
- Number of hospitalizations in preceding one year period

Table 7.10.1 shows the results for the "overall" model (i.e., readmission for all patients admitted). Appendix 3 contains results for the separate models run for the following patient groups: medical, surgical, obstetric, and newborn patients, as well as, patients hospitalized for mental illness. While the results show that many variables were statistically significantly related to hospital readmissions, it is important to note that none of the models were particularly strong from a statistical perspective. The highest "**C–statistic**" was 0.734, whereas only values above 0.8 are considered strong. This likely means that other factors not included in the model are also related to hospital readmission rates.

The results in Table 7.10.1 show that many variables were significantly related to readmission rates. As with all logistic regression analyses, the adjusted **odds ratio** (**OR**) indicates whether a given group is statistically more or less likely than the reference group to be related to the outcome. An OR of 1.0 means no relationship; a value below 1.0 means less likely to be readmitted; a value above 1.0 means more likely to be readmitted. All variables that were statistically significant are shown in bold text in the table. The variables are listed in decreasing order of importance—that is strength of relationship with readmissions. The first variable, "number of previous hospitalizations" was by far the strongest predictor of readmission. The OR (1.24) was higher than 1.0, indicating that people hospitalized more often in the previous year were more likely to be readmitted. Sickness level and discharge disposition were second and third strongest, but both were much weaker than "previous hospitalizations." Following these were income quintile, type of hospitalization, length of stay, and "admitted from emergency department" (ER). These were considerably weaker. Patient age and being discharged on a Friday were also statistically significant, but very weak; patient sex was not significant.

11 Resource utilization bands (RUBs) were created using the **Johns Hopkins Adjusted Clinical Group® (ACG®) Case–Mix System** version 10.0.

12 Hospitalizations were grouped into surgical, obstetric, mental disorders, and live birth based on the **case mix groups (CMG™)** and major clinical categories (MCC).

The same general findings were seen for the model of Medical patients only, but other models for other patient groups showed quite different findings, as expected (see Appendix 3 for detailed tables):

- For surgical patients, sickness level was the most important factor, followed by previous hospitalizations, admission from ER, length of stay, and discharge disposition.
- For mental illness hospitalizations, previous hospitalizations was the most important, followed by discharge disposition and admission from ER
- For obstetric hospitalizations, length of stay was most important, followed by previous hospitalizations, admission from ER, and discharge disposition
- The model for live births was particularly weak overall, but identified sickness level and discharge disposition as the most significant predictors.

Table 7.10.1: Logistic Regression: Probability of Readmission per Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.02 (0.02–0.02)**	<0.0001
Number of Previous Hospitalizations in Year Before Index Episode	**1.24 (1.23–1.26)**	<0.0001
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	**1.81 (1.62–2.02)**	<0.0001
RUB 4	**2.46 (2.19–2.77)**	<0.0001
RUB 5	**2.81 (2.49–3.16)**	<0.0001
Discharge Disposition (ref = Discharged Home Without Support Services)		
Discharged Home With Support Services	**1.40 (1.31–1.50)**	<0.0001
Transferred to PCH/Chronic Care/Other Facility	**0.69 (0.63–0.76)**	<0.0001
Signed-Out Against Medical Advice/Did Not Return From A Pass	**1.91 (1.66–2.21)**	<0.0001
Income Quintile (ref = U5)		
R1 (lowest)	**1.52 (1.37–1.69)**	<0.0001
R2	**1.47 (1.32–1.64)**	<0.0001
R3	**1.43 (1.28–1.60)**	<0.0001
R4	**1.30 (1.16–1.46)**	<0.0001
R5 (highest)	**1.36 (1.20–1.54)**	<0.0001
U1 (lowest)	**1.15 (1.03–1.28)**	0.0119
U2	1.09 (0.973–1.23)	0.1324
U3	1.07 (0.948–1.20)	0.2825
U4	1.03 (0.912–1.17)	0.6135
Income Unknown	**1.22 (1.02–1.47)**	0.0331
Type of Hospitalization (ref = Medical)		
Surgical	**0.67 (0.63–0.72)**	<0.0001
Obstetric	0.94 (0.85–1.04)	0.2066
Mental Disorders	**0.84 (0.76–0.92)**	0.0002
Live Births	0.92 (0.79–1.07)	0.2872
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	**1.42 (1.34–1.51)**	<0.0001
LOS 2- Less Than ELOS	**1.42 (1.34–1.51)**	<0.0001
Admitted from the Emergency Department (ref = No)	**1.39 (1.32–1.47)**	<0.0001
Age (Years)	**1.004 (1.003–1.005)**	<0.0001
Discharged on a Friday (ref = No)	**1.06 (1.00–1.12)**	0.0447
Males (vs. Females)	1.03 (0.98–1.08)	0.2233

* model fit statistic: C=0.734

† bolded values indicate that the factor effect is significant at p<0.05

7.11 Hospitalization Rates for Ambulatory Care Sensitive (ACS) Conditions

Definition: the number of inpatient **hospitalizations for ambulatory care sensitive** (**ACS**) **conditions** among residents aged 0 to 74 per 1,000 residents aged 0 to 74 in a given year. ACS conditions are a group of 17 diseases and diagnoses, including asthma, angina, gastroenteritis, and congestive heart failure. These were created by Billings and colleagues (Billings et al., 1993; Billings, Anderson, & Newman, 1996). Low rates of hospitalizations for ACS conditions can be used as indicators of access to good quality primary care. For all ACS conditions except congenital syphilis, the condition must be coded as the most responsible diagnosis. Rates are shown for 2006/07 and 2011/12 and age– and sex–adjusted to the Manitoba population aged 0 to 74.

Key Findings

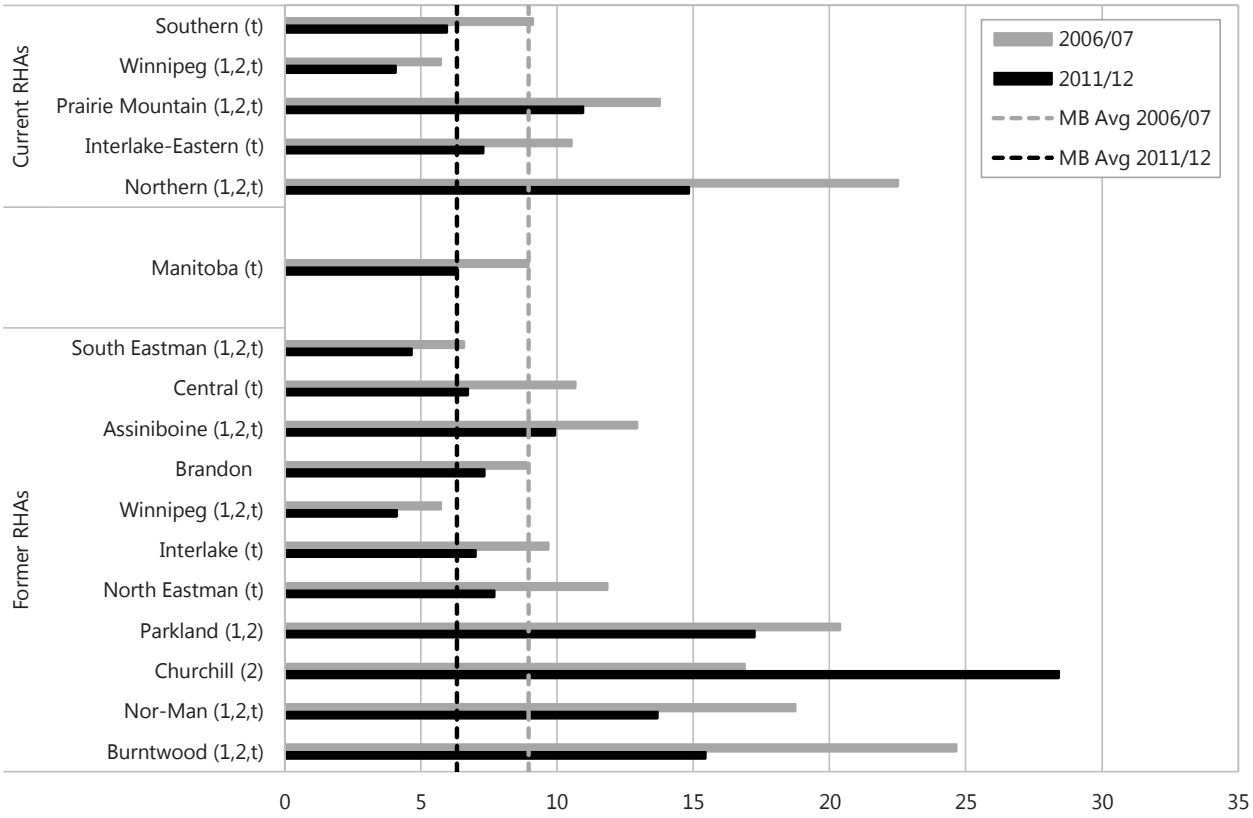
- The rate of hospitalization for ACS conditions decreased over time from 8.96 to 6.33 hospitalizations per 1,000 residents per year. Significant decreases were seen in all regions.
- Rates were strongly related to PMR at the region, district, and NC levels; but the relationships were not linear.
- Residents of Northern region had the highest rates, but they also had the largest decrease over time. Winnipeg residents had the lowest rates.
- Rates varied dramatically across districts of rural regions from one to over 45 ACS hospitalizations per 1,000 residents per year.
- There was also substantial variation across NCs within Winnipeg.
- Rates were very strongly related to income in urban and rural areas in both time periods: rates for residents of lower income areas were more than triple those for residents of higher income areas (Appendix 2).

Comparison to Other Findings

- The results shown in this report are consistent with and extend the findings of the 2009 Atlas (Fransoo et al., 2009), reflecting the continuing decrease in rates of hospitalization for ACS conditions.

Figure 7.11.1: Hospitalization Rate for Ambulatory Care Sensitive Conditions by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 0-74



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 7.11.2: Hospitalization Rate for Ambulatory Care Sensitive Conditions by District, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 0-74

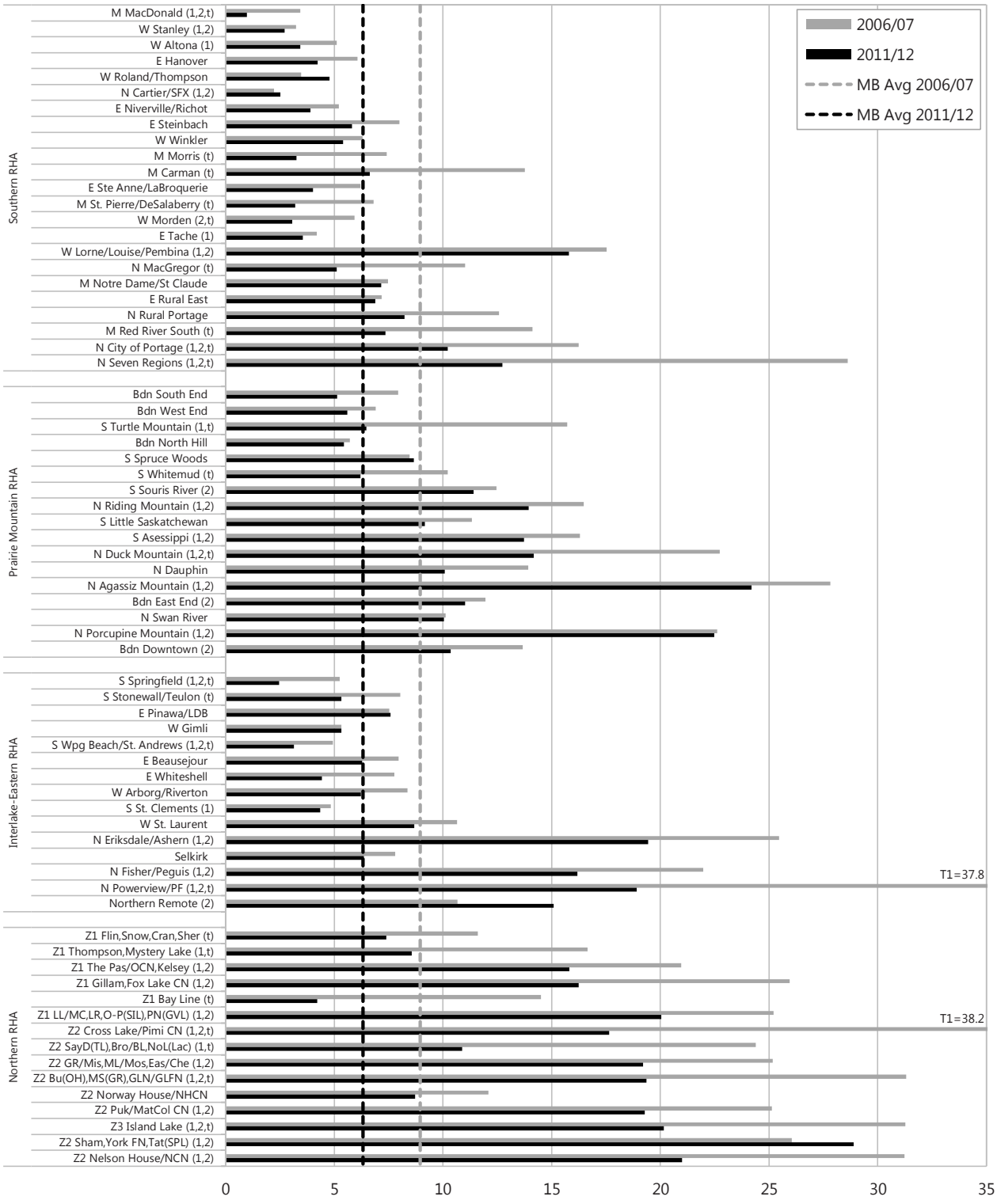
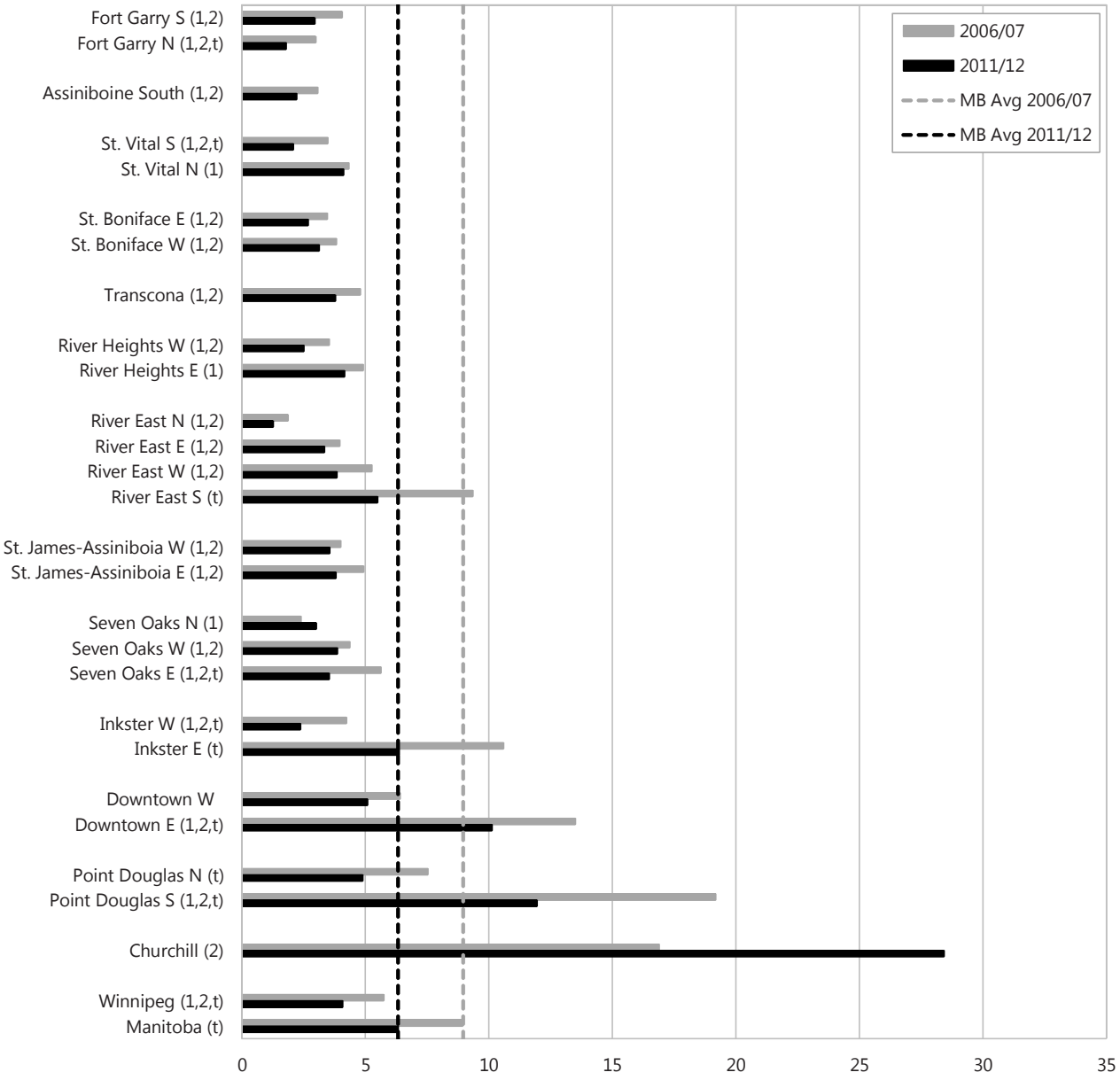


Figure 7.11.3: Hospitalization Rate for Ambulatory Care Sensitive Conditions by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 0-74



7.12 Hospital Location: Where RHA Residents Were Hospitalized Hospitalizations

Definition: the percent of all hospitalizations of the residents of each RHA that occurred in a hospital within their (home) RHA, another RHA, in Winnipeg, or out-of-province. If a patient is transferred between hospitals, each stay is counted as a separate event and is attributed to the appropriate location. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization. See Glossary for further details. Crude values for **hospital location** are shown for 2006/07 and 2011/12.

Key Findings[13]

- The vast majority of hospitalizations of Manitoba residents occurred either in their home region or in Winnipeg, and this has remained stable over time.
- The proportions vary substantially by region (2011/12 values cited):
  - Winnipeg and Prairie Mountain residents had the highest proportion of hospitalizations in their home regions, at 96.9% and 80.8%, respectively.
  - Southern and Northern region residents received just over half of their hospitalizations in their home region and about 40% in Winnipeg.
  - Interlake–Eastern residents received about 37.7% of their hospitalizations in their home region and almost 60% in Winnipeg.
  - These values varied even more widely among the former RHAs.
  - Hospitalizations of Manitoba residents in hospitals out-of-province were uncommon among residents of all regions; the highest value was 2.3% for residents of Prairie Mountain.

Comparison with Other Findings

- These results are similar to those in the 2009 Atlas (Fransoo et al., 2009), except for the differences related to the amalgamation of the 11 former RHAs into the five larger regions. This change caused a higher proportion of hospitalizations to be seen as "in region" because several former "neighbouring RHAs" are now part of the same region. This effect was most prominent in Prairie Mountain, but affected other regions to some degree as well.
- Examination of results for the former RHAs reveals that patient travel patterns are stable over time, as was also reported in the 2009 Atlas (Fransoo et al., 2009).

13 Since residents of Churchill are now part of the Winnipeg health region, our indicators needed to appropriately reflect that sometimes being hospitalized "within region" may still be quite far from home. In this analysis, we used the following steps:
-If a resident who lived in Winnipeg (i.e., the city) was hospitalized in any of the hospitals within the city, this was classified as "home RHA."
-Similarly, if a resident of Churchill was treated in the Churchill hospital, this was also called "home RHA".
-If a Churchill resident was hospitalized in Winnipeg, this was called "Winnipeg hospital" to reflect the great distance travelled, even though they are still within their home region.

Figure 7.12.1: Hospital Location: Where RHA Patients Went for Hospitalizations, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

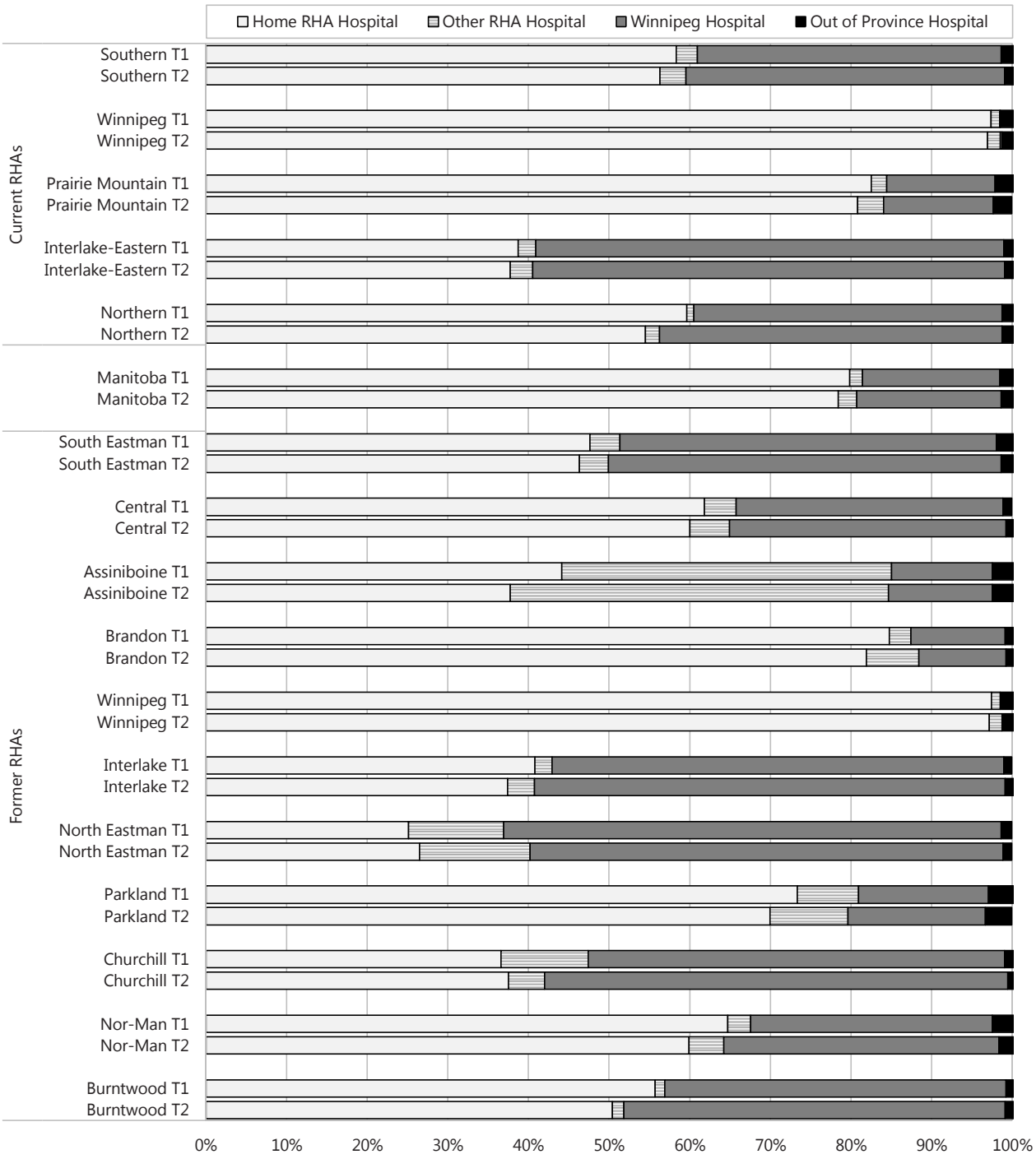


Table 7.12.1: Hospital Location: Where RHA Patients Went for Hospitalizations, 2006/07 and 2011/12

RHA	Fiscal Year	Total Hospitalizations Used by RHA Residents	Home RHA Hospital	Other RHA Hospital	Winnipeg Hospital	Out of Province Hospital
Southern	**2006/07**	28,148	58.3%	2.6%	37.7%	1.4%
Southern	**2011/12**	31,853	56.3%	3.2%	39.5%	1.1%
Winnipeg	**2006/07**	96,028	97.3%	1.1%	0.1% *	1.5%
Winnipeg	**2011/12**	100,668	96.9%	1.6%	0.2% *	1.3%
Prairie Mountain	**2006/07**	37,723	82.5%	1.9%	13.4%	2.3%
Prairie Mountain	**2011/12**	40,119	80.8%	3.2%	13.6%	2.3%
Interlake-Eastern	**2006/07**	21,407	38.7%	2.2%	58.0%	1.1%
Interlake-Eastern	**2011/12**	22,345	37.7%	2.8%	58.5%	1.0%
Northern	**2006/07**	14,538	59.6%	0.9%	38.2%	1.3%
Northern	**2011/12**	14,422	54.5%	1.7%	42.5%	1.3%
Manitoba	**2006/07**	197,844	79.8%	1.6%	17.0%	1.6%
Manitoba	**2011/12**	209,407	78.4%	2.3%	17.9%	1.4%
South Eastman	**2006/07**	9,564	47.6%	3.7%	46.7%	2.0%
South Eastman	**2011/12**	11,422	46.3%	3.6%	48.7%	1.4%
Central	**2006/07**	18,584	61.8%	3.9%	33.1%	1.1%
Central	**2011/12**	20,431	60.0%	4.9%	34.3%	0.9%
Assiniboine	**2006/07**	15,978	44.1%	40.9%	12.5%	2.5%
Assiniboine	**2011/12**	16,734	37.7%	46.9%	12.9%	2.5%
Brandon	**2006/07**	10,018	84.7%	2.7%	11.7%	0.9%
Brandon	**2011/12**	11,044	81.9%	6.5%	10.8%	0.9%
Winnipeg	**2006/07**	95,842	97.4%	1.1%	n/a	1.5%
Winnipeg	**2011/12**	100,377	97.1%	1.6%	n/a	1.3%
Interlake	**2006/07**	14,064	40.8%	2.1%	56.0%	1.0%
Interlake	**2011/12**	14,449	37.4%	3.3%	58.4%	0.9%
North Eastman	**2006/07**	7,343	25.1%	11.8%	61.7%	1.3%
North Eastman	**2011/12**	7,896	26.5%	13.7%	58.6%	1.1%
Parkland	**2006/07**	11,727	73.3%	7.6%	16.1%	3.1%
Parkland	**2011/12**	12,341	69.9%	9.7%	17.0%	3.3%
Churchill	**2006/07**	186	36.6%	10.8%	51.6%	1.1%
Churchill	**2011/12**	291	37.5%	4.5%	57.4%	0.7%
Nor-Man	**2006/07**	4,918	64.7%	2.8%	30.0%	2.5%
Nor-Man	**2011/12**	5,186	59.9%	4.3%	34.1%	1.8%
Burntwood	**2006/07**	9,620	55.7%	1.2%	42.3%	0.8%
Burntwood	**2011/12**	9,236	50.4%	1.4%	47.3%	1.0%

* values represent residents of Churchill staying in hospital in the City of Winnipeg

n/a indicates "not applicable"; "Home RHA Hospital" represents residents of the City of Winnipeg staying in Winnipeg hospitals

7.13 Hospital Location: Where RHA Residents Were Hospitalized —Days

Definition: the percent of all hospital days used by the residents of each RHA that occurred in a hospital within their (home) RHA, another RHA, in Winnipeg, or out-of-province. If a patient is transferred between hospitals, each stay is counted as a separate event and the days spent in each hospital are attributed to that hospital's location. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization. See Glossary for further details. Crude values are shown for 2006/07 and 2011/12.

Key Findings[14]

- The vast majority of hospital days used by Manitoba residents were provided either in their home region or in Winnipeg, and this has remained stable over time.
- The proportions vary substantially by region (2011/12 values cited):
  - Winnipeg and Prairie Mountain residents had the highest proportion of hospital days in their home regions, at 97.6% and 90.0%, respectively.
  - Southern residents received 75.3% of their hospital days in their home region and 21.4% in Winnipeg.
  - Interlake–Eastern and Northern residents received about 60% of their hospitalizations in their home region and under 40% in Winnipeg.
  - These values varied even more widely among the former RHAs.
  - A very low proportion of hospital days used by Manitoba residents were provided in out-of-province hospitals: the maximum was 1.7% among residents of Northern and Prairie Mountain regions.

Comparison with Other Findings

- These results are similar to those in the 2009 Atlas (Fransoo et al., 2009), except for the differences related to the amalgamation of the 11 former RHAs into the five larger regions. This change caused a higher proportion of hospitalizations to be seen as "in region" because former "neighbouring RHAs" are now part of the same region. This effect was most prominent in Prairie Mountain, but affected other regions to some degree as well.
- Examination of results for the former RHAs reveals that the profile of where regional residents received their days of hospital care were stable over time, as was also reported in the 2009 Atlas.

14 Since residents of Churchill are now part of the Winnipeg health region, our indicators needed to appropriately reflect that sometimes being hospitalized "within region" may still be quite far from home. In this analysis, we used the following steps:
-If a resident who lived in Winnipeg (i.e., the city) was hospitalized in any of the hospitals within the city, this was classified as "home RHA."
-Similarly, if a resident of Churchill was treated in the Churchill hospital, this was also called "home RHA".
-If a Churchill resident was hospitalized in Winnipeg, this was called "Winnipeg Hospital" to reflect the great distance travelled, even though they are still within their home region.

Figure 7.13.1: Hospital Location: Where RHA Patients Went for Hospital Days, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

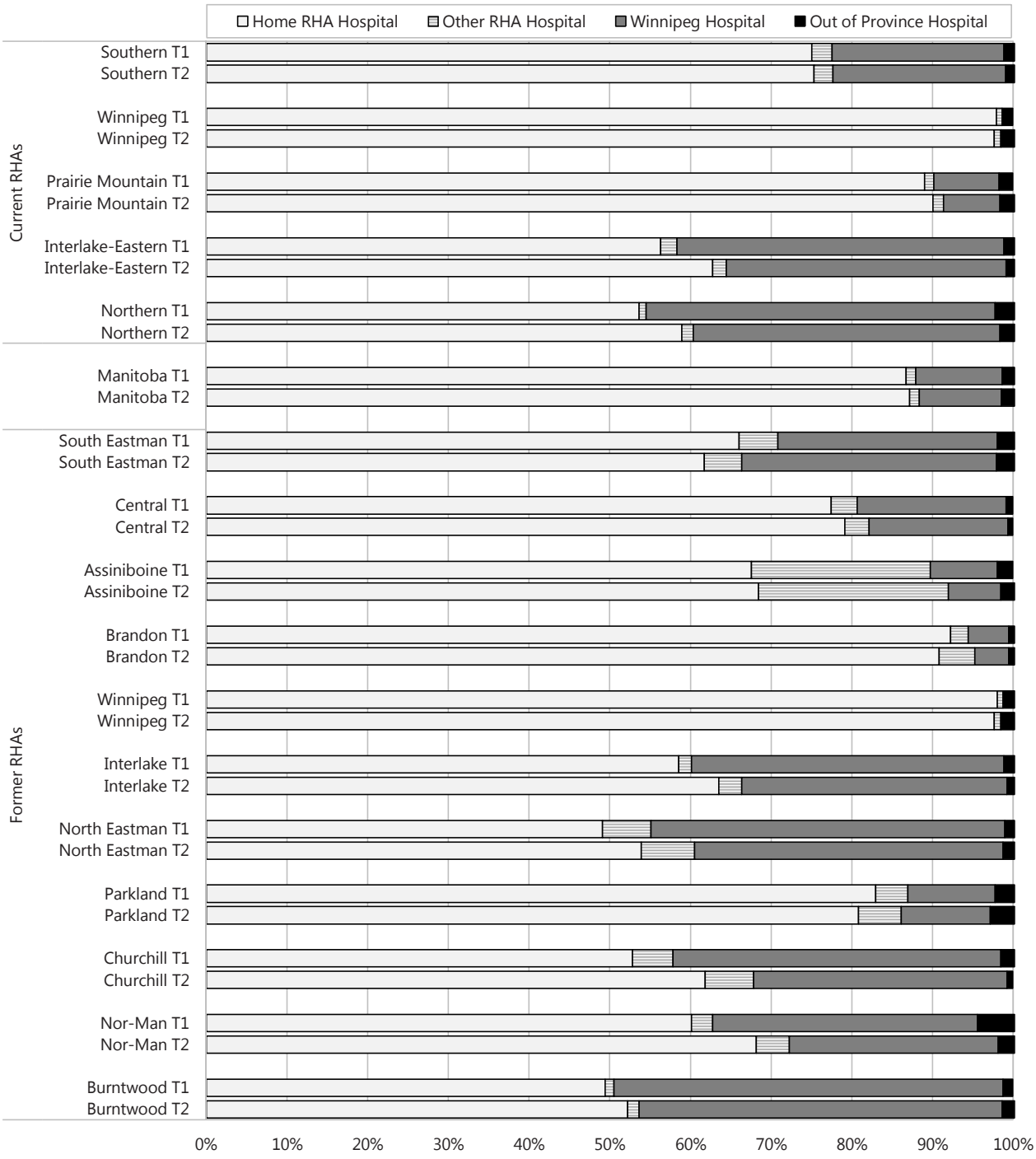


Table 7.13.1: Hospital Location: Where RHA Patients Went for Hospital Days, 2006/07 and 2011/12

RHA	Fiscal Year	Total Days of Care Used by RHA Residents	Home RHA Hospital	Other RHA Hospital	Winnipeg Hospital	Out of Province Hospital
Southern	**2006/07**	149,767	75.0%	2.5%	21.3%	1.2%
Southern	**2011/12**	157,806	75.3%	2.3%	21.4%	1.0%
Winnipeg	**2006/07**	558,127	97.9%	0.7%	0.0%	1.3%
Winnipeg	**2011/12**	507,936	97.6%	0.8%	0.1% *	1.6%
Prairie Mountain	**2006/07**	229,259	89.0%	1.1%	8.1%	1.7%
Prairie Mountain	**2011/12**	234,938	90.0%	1.3%	7.0%	1.7%
Interlake-Eastern	**2006/07**	100,621	56.3%	2.0%	40.5%	1.2%
Interlake-Eastern	**2011/12**	102,330	62.7%	1.7%	34.7%	1.0%
Northern	**2006/07**	59,778	53.6%	0.9%	43.2%	2.3%
Northern	**2011/12**	58,577	58.9%	1.4%	38.0%	1.7%
Manitoba	**2006/07**	1,097,552	86.7%	1.2%	10.7%	1.4%
Manitoba	**2011/12**	1,061,587	87.1%	1.2%	10.2%	1.5%
South Eastman	**2006/07**	48,565	66.0%	4.8%	27.2%	2.0%
South Eastman	**2011/12**	45,514	61.7%	4.6%	31.6%	2.1%
Central	**2006/07**	101,202	77.4%	3.2%	18.5%	0.8%
Central	**2011/12**	112,292	79.1%	3.0%	17.2%	0.6%
Assiniboine	**2006/07**	95,846	67.5%	22.2%	8.3%	1.9%
Assiniboine	**2011/12**	108,915	68.4%	23.5%	6.5%	1.7%
Brandon	**2006/07**	63,978	92.2%	2.2%	5.0%	0.6%
Brandon	**2011/12**	64,157	90.8%	4.4%	4.2%	0.6%
Winnipeg	**2006/07**	557,513	98.0%	0.7%	n/a	1.3%
Winnipeg	**2011/12**	506,812	97.6%	0.8%	n/a	1.6%
Interlake	**2006/07**	63,940	58.5%	1.6%	38.7%	1.2%
Interlake	**2011/12**	68,113	63.5%	2.8%	32.9%	0.9%
North Eastman	**2006/07**	36,681	49.1%	6.0%	43.8%	1.1%
North Eastman	**2011/12**	34,217	53.9%	6.6%	38.2%	1.3%
Parkland	**2006/07**	69,435	82.9%	4.0%	10.8%	2.4%
Parkland	**2011/12**	61,866	80.8%	5.3%	11.0%	2.9%
Churchill	**2006/07**	614	52.8%	5.0%	40.6%	1.6%
Churchill	**2011/12**	1,124	61.8%	6.0%	31.4%	0.7%
Nor-Man	**2006/07**	19,601	60.1%	2.6%	32.8%	4.5%
Nor-Man	**2011/12**	21,505	68.1%	4.1%	25.9%	2.0%
Burntwood	**2006/07**	40,177	49.4%	1.1%	48.2%	1.2%
Burntwood	**2011/12**	37,072	52.2%	1.4%	45.0%	1.5%

* values represent residents of Churchill staying in hospital in the City of Winnipeg

n/a indicates "Not Applicable"; "Home RHA Hospital" represents residents of the City of Winnipeg staying in Winnipeg hospitals

7.14 Hospital Catchment: Where Patients Using RHA Hospitals Came From—Hospitalizations

Definition: the percent of all hospitalizations in the hospitals in each RHA that were provided to residents of the (home) RHA, other RHA, Winnipeg, or out-of-province. If a patient is transferred between hospitals, each stay is counted as a separate event and is attributed to the appropriate catchment. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization. See Glossary for further details. Crude values are shown for 2006/07 and 2011/12.

Key Findings[15]

- In every (new) health region in Manitoba, the vast majority of patients hospitalized in that region's hospitals were residents of that region. This finding has remained stable over time. (The exception is the former Churchill RHA, which serves many residents of Nunavut.)
- Winnipeg has a unique profile. It provides hospital care for residents of all other regions because many services and procedures are only available in Winnipeg hospitals.
- Among rural regions only (2011/12 results cited):
  - Interlake–Eastern provides the highest proportion of hospitalizations to residents of Winnipeg at about 7.7%.
  - Southern provides the highest proportion of hospitalizations to residents from other regions at about 7.8%.
- Manitoba hospitals also provide care to non–Manitoba residents, though this is limited, at 4.8% overall with a maximum of 9.6% for Northern hospitals (with the exception of Churchill, noted previously).

Comparison with Other Findings

- These results are similar to those in the 2009 Atlas (Fransoo et al., 2009), except for the differences related to the amalgamation of the 11 former RHAs into the five larger regions. This change caused a higher proportion of hospital patients served in each region to be seen as regional residents because former "neighbouring RHAs" are now part of the same region. This effect was most prominent in Prairie Mountain, but affected most regions to some degree.
- Examination of results for the former RHAs reveals that the residential location of patients served by Manitoba hospitals remains stable over time, as was also reported in the 2009 Atlas.

15 For this analysis, all the hospitals in each region are analyzed together to describe the regions from which their patients came. Since Churchill is now part of the Winnipeg region, their facilities are combined in the results for the new region. Separate results for the former Winnipeg and Churchill RHAs are also shown in the values below the Manitoba average.

Figure 7.14.1: Hospital Catchment: Where RHA Hospital Patients Came From for Hospitalizations, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

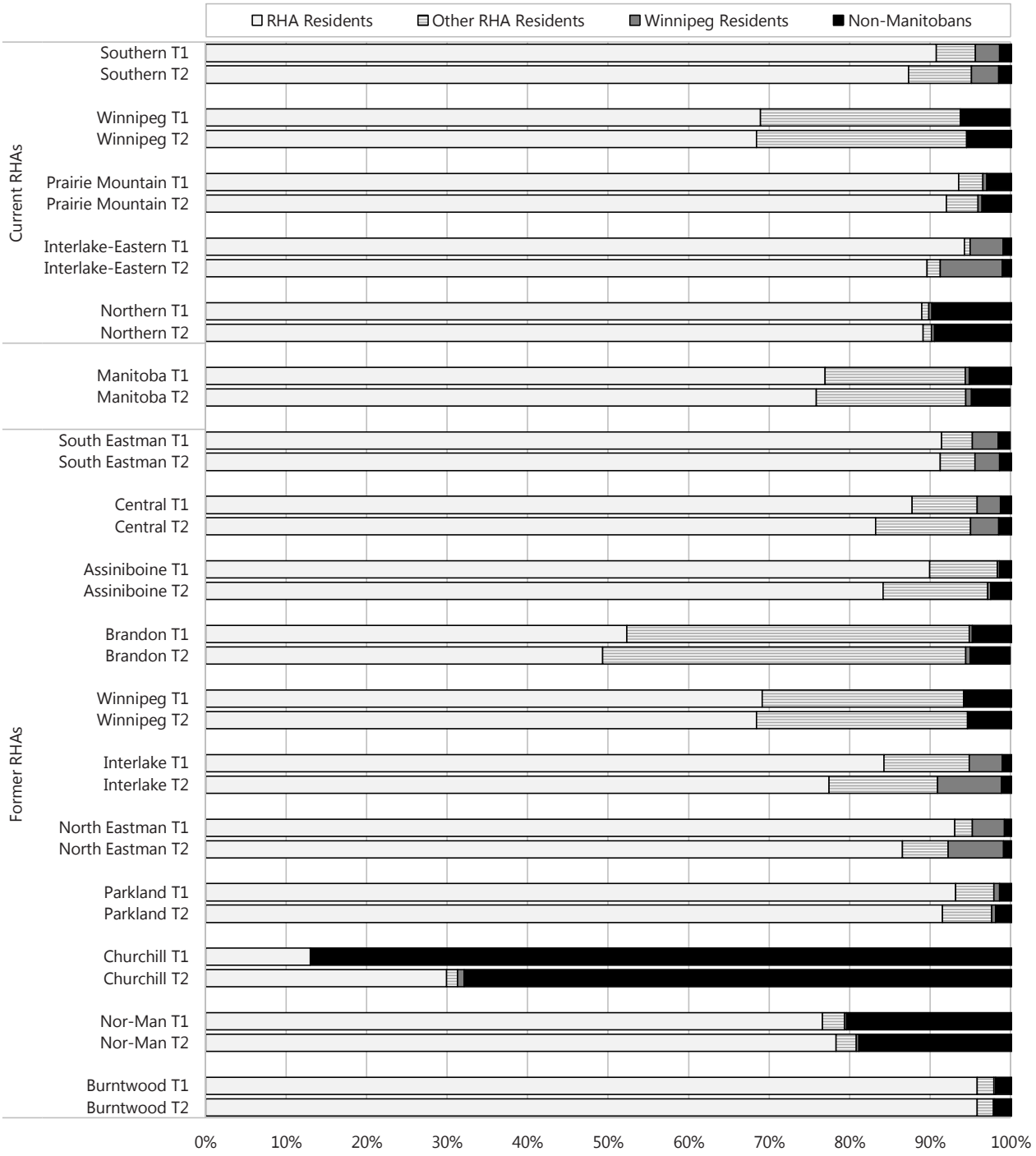


Table 7.14.1: Hospital Catchment: Where RHA Hospital Patients Came From for Hospitalizations, 2006/07 and 2011/12

RHA	Fiscal Year	Total Hospitalizations Provided by RHA Hospitals	RHA Residents	Other RHA Residents	Winnipeg Residents	Non-Manitobans
Southern	**2006/07**	18,085	90.7%	4.9%	3.0%	1.4%
Southern	**2011/12**	20,534	87.3%	7.8%	3.4%	1.5%
Winnipeg	**2006/07**	135,619	68.9%	24.8%	n/a	6.2%
Winnipeg	**2011/12**	142,919	68.4%	26.1%	n/a	5.6%
Prairie Mountain	**2006/07**	33,291	93.5%	3.0%	0.5%	3.1%
Prairie Mountain	**2011/12**	35,271	92.0%	3.9%	0.5%	3.7%
Interlake-Eastern	**2006/07**	8,804	94.2%	0.7%	4.1%	1.0%
Interlake-Eastern	**2011/12**	9,404	89.6%	1.6%	7.7%	1.1%
Northern	**2006/07**	9,751	88.9%	0.9%	0.4%	9.8%
Northern	**2011/12**	8,820	89.1%	1.0%	0.4%	9.6%
Manitoba	**2006/07**	205,550	76.9%	17.4%	0.5%	5.3%
Manitoba	**2011/12**	216,948	75.8%	18.6%	0.7%	4.8%
South Eastman	**2006/07**	4,978	91.4%	3.8%	3.2%	1.5%
South Eastman	**2011/12**	5,807	91.2%	4.3%	3.1%	1.4%
Central	**2006/07**	13,107	87.7%	8.1%	2.9%	1.3%
Central	**2011/12**	14,727	83.2%	11.8%	3.5%	1.5%
Assiniboine	**2006/07**	7,832	89.9%	8.4%	0.3%	1.4%
Assiniboine	**2011/12**	7,497	84.1%	13.0%	0.4%	2.6%
Brandon	**2006/07**	16,233	52.3%	42.5%	0.4%	4.8%
Brandon	**2011/12**	18,338	49.3%	45.1%	0.5%	5.0%
Winnipeg	**2006/07**	135,094	69.1%	25.0%	n/a	5.9%
Winnipeg	**2011/12**	142,554	68.4%	26.2%	n/a	5.4%
Interlake	**2006/07**	6,820	84.2%	10.6%	4.1%	1.1%
Interlake	**2011/12**	6,983	77.4%	13.5%	7.9%	1.2%
North Eastman	**2006/07**	1,984	93.0%	2.2%	4.0%	0.8%
North Eastman	**2011/12**	2,421	86.5%	5.7%	6.9%	1.0%
Parkland	**2006/07**	9,226	93.1%	4.8%	0.7%	1.4%
Parkland	**2011/12**	9,436	91.5%	6.1%	0.5%	1.9%
Churchill	**2006/07**	525	13.0%	0.0%	0.0%	87.0%
Churchill	**2011/12**	365	29.9%	1.4%	0.8%	67.9%
Nor-Man	**2006/07**	4,157	76.6%	2.7%	0.3%	20.4%
Nor-Man	**2011/12**	3,967	78.3%	2.5%	0.3%	18.9%
Burntwood	**2006/07**	5,594	95.8%	2.1%	0.2%	1.9%
Burntwood	**2011/12**	4,853	95.8%	2.0%	0.2%	2.0%

n/a indicates "not applicable". Winnipeg residents in Winnipeg hospitals are in the "RHA Residents" category

7.15 Hospital Catchment: Where Patients Using RHA Hospitals Came From—Days

Definition: the percent of all days of care in the hospitals in each RHA that were provided to residents of their (home) RHA, another RHA, in Winnipeg, or out-of-province. If a patient is transferred between hospitals, each stay is counted as a separate event and the days spent in each hospital are attributed to that hospital's catchment. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization. See Glossary for further details. Crude values are shown for 2006/07 and 2011/12.

Key Findings[16]

- In every health region in Manitoba, the vast majority of hospital days provided by that region's hospitals were provided to residents of that region. (The exception is the former Churchill RHA, which serves many residents of Nunavut.) These findings have remained stable over time.
- Winnipeg has a unique profile. It provides hospital care for residents of all other regions because many services and procedures are only available in Winnipeg hospitals. However, the proportion of days provided to non–Winnipeg residents is lower than the proportion of hospitalizations (Section 6.14).
- Among rural regions only (2011/12 results cited):
  - Interlake–Eastern provides the highest proportion of hospital days to residents of Winnipeg at 2.4%.
  - Southern provides the highest proportion of hospitalizations to residents from other regions at 3.2%.
- Manitoba hospitals also provide some care to non–Manitoba residents, though this is limited, at 3.3% overall, with a maximum of 8.3% for Northern hospitals.

Comparison with Other Findings

- These results are similar to those in the 2009 Atlas (Fransoo et al., 2009), except for the differences related to the amalgamation of the 11 former RHAs into the five larger regions. This change caused a higher proportion of hospital days provided by hospitals in each region to be seen as serving regional residents because former "neighbouring RHAs" are now part of the same region. This effect was most prominent in Prairie Mountain (particularly the former Brandon RHA), but affected most regions to some degree.
- Examination of results for the former RHAs reveals stable patterns over time regarding the residential location of recipients of hospital care days in each region. This stability was also reported in the 2009 Atlas.

16 For this analysis, all the hospitals in each region are analyzed together to describe the regions from which their patients came. Since Churchill is now part of the Winnipeg region, their facilities are combined in the results for the new region. Separate results for the former Winnipeg and Churchill RHAs are also shown in the values below the Manitoba average.

Figure 7.15.1: Hospital Catchment: Where RHA Hospital Patients Came From for Hospital Days, 2006/07 and 2011/12

T1=2006/07 T2=2011/12

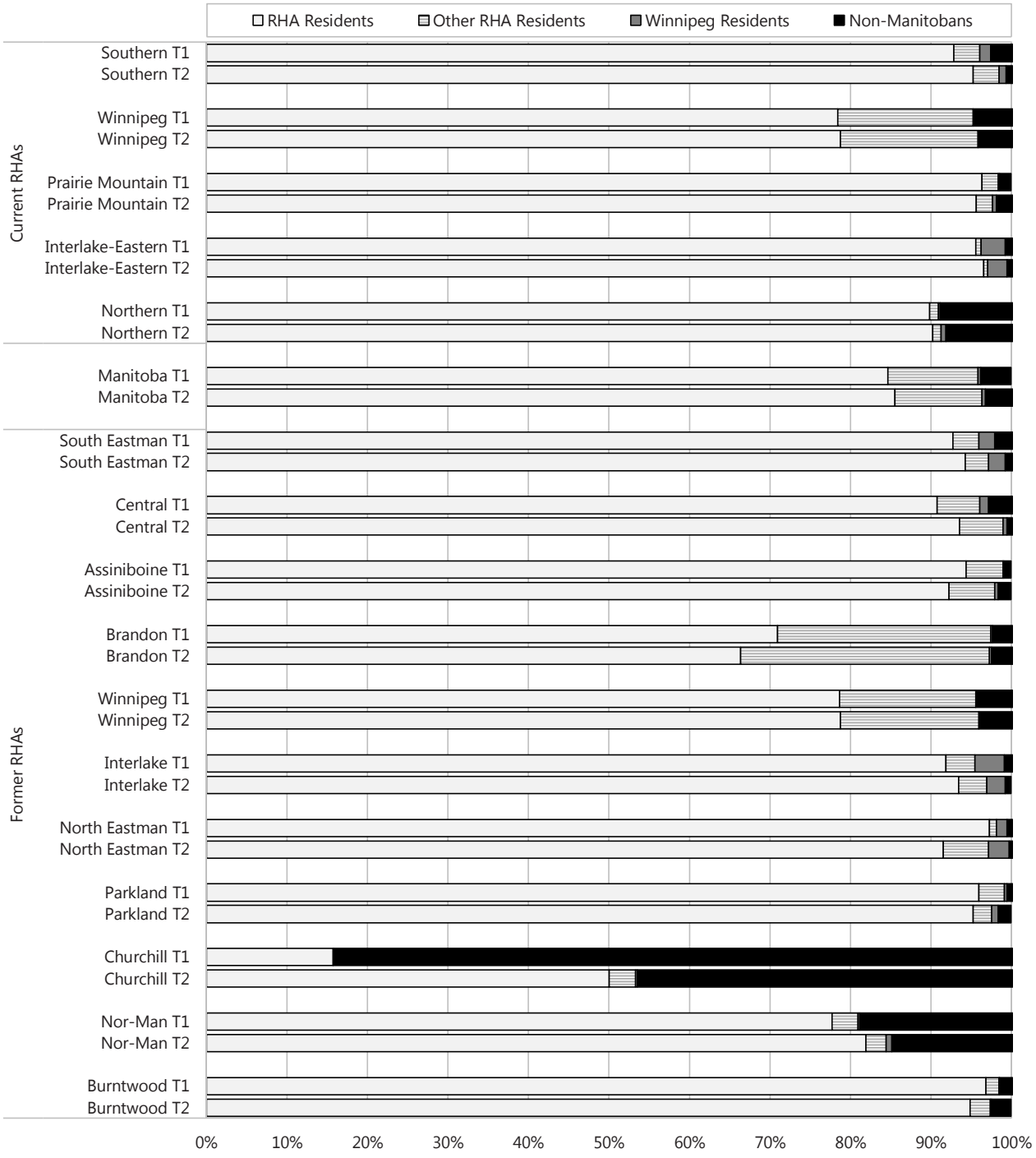


Table 7.15.1: Hospital Catchment: Where RHA Hospital Patients Came From for Hospital Days, 2006/07 and 2011/12

RHA	Fiscal Year	Total Days of Care Provided by RHA Hospitals	RHA Residents	Other RHA Residents	Winnipeg Residents	Non-Manitobans
Southern	**2006/07**	120,983	92.8%	3.2%	1.4%	2.6%
Southern	**2011/12**	124,809	95.2%	3.2%	0.9%	0.7%
Winnipeg	**2006/07**	697,424	78.4%	16.8%	n/a	4.8%
Winnipeg	**2011/12**	630,328	78.7%	17.1%	n/a	4.2%
Prairie Mountain	**2006/07**	211,868	96.3%	2.0%	0.2%	1.4%
Prairie Mountain	**2011/12**	221,231	95.6%	2.0%	0.5%	2.0%
Interlake-Eastern	**2006/07**	59,309	95.5%	0.7%	3.0%	0.8%
Interlake-Eastern	**2011/12**	66,430	96.5%	0.5%	2.4%	0.6%
Northern	**2006/07**	35,696	89.8%	1.1%	0.2%	8.9%
Northern	**2011/12**	38,271	90.2%	1.0%	0.6%	8.3%
Manitoba	**2006/07**	1,125,280	84.6%	11.2%	0.3%	3.8%
Manitoba	**2011/12**	1,081,069	85.5%	10.8%	0.4%	3.3%
South Eastman	**2006/07**	34,578	92.7%	3.2%	2.0%	2.1%
South Eastman	**2011/12**	29,842	94.2%	2.9%	2.1%	0.8%
Central	**2006/07**	86,405	90.7%	5.3%	1.1%	2.9%
Central	**2011/12**	94,967	93.5%	5.4%	0.5%	0.6%
Assiniboine	**2006/07**	68,622	94.3%	4.6%	0.1%	0.9%
Assiniboine	**2011/12**	80,774	92.2%	5.7%	0.4%	1.6%
Brandon	**2006/07**	83,216	70.9%	26.5%	0.2%	2.4%
Brandon	**2011/12**	87,921	66.3%	30.9%	0.3%	2.5%
Winnipeg	**2006/07**	695,356	78.6%	16.9%	n/a	4.6%
Winnipeg	**2011/12**	628,937	78.7%	17.2%	n/a	4.1%
Interlake	**2006/07**	40,763	91.8%	3.6%	3.7%	0.9%
Interlake	**2011/12**	46,253	93.4%	3.5%	2.3%	0.7%
North Eastman	**2006/07**	18,546	97.2%	0.9%	1.3%	0.6%
North Eastman	**2011/12**	20,177	91.5%	5.6%	2.6%	0.3%
Parkland	**2006/07**	60,030	95.9%	3.2%	0.3%	0.7%
Parkland	**2011/12**	52,536	95.2%	2.3%	0.8%	1.6%
Churchill	**2006/07**	2,068	15.7%	0.0%	0.0%	84.3%
Churchill	**2011/12**	1,391	50.0%	3.3%	0.2%	46.5%
Nor-Man	**2006/07**	15,177	77.7%	3.2%	0.2%	19.0%
Nor-Man	**2011/12**	17,872	81.9%	2.5%	0.7%	14.9%
Burntwood	**2006/07**	20,519	96.8%	1.6%	0.1%	1.5%
Burntwood	**2011/12**	20,399	94.8%	2.5%	0.2%	2.4%

n/a indicates "not applicable". Winnipeg residents in Winnipeg hospitals are in the "RHA Residents" category

CHAPTER 8: HIGH PROFILE SURGICAL AND DIAGNOSTIC SERVICES

Key Findings in Chapter 8

- Rates of cardiac catheterizations and **percutaneous coronary interventions** (**PCI**) increased significantly over time, while **coronary artery bypass surgery** rates were stable.
- Knee and hip replacement surgery rates continued to increase over time.
- **Cataract surgery** rates have remained stable, as have rates of **dental extraction** surgery for young children.
- **Computed tomography** (**CT**) **scan** rates cannot be compared over time due to incomplete data in previous years. Hopefully, data collection systems can be improved to provide complete individual–level data for all scans performed in Manitoba hospitals.
- The **magnetic resonance imaging** (**MRI**) **scan** rate among adults in Manitoba doubled over the past five years, as it had in the previous Atlas report (Fransoo et al., 2009). This means a quadrupling of rates over the 11–year period. These increases were likely related to the installation of new MRI scanners during those periods.
- For most procedures studied, the results showed that residents of less healthy areas received more healthcare services, though some of these associations were not statistically significant. The exception was MRI scan rates, though the indications for MRI scans may not be correlated with overall health status as measured by PMR.

Introduction

This chapter includes indicators of a number of surgical and diagnostic procedures for which validated indicators have been developed. These are mostly "high profile" procedures that MCHP has tracked in previous reports (Fransoo et al., 2009; Martens et al., 2003).

Most of the procedures are services that a resident could receive more than once in a given period, so the indicators count each event and reflect the sum of all such services to area residents, regardless of the location of service provision. For example, if a resident of Prairie Mountain receives a service in Brandon or Winnipeg, it is attributed to Prairie Mountain.

Magnetic resonance imaging and CT scans are slightly different because separate records are kept for scans of different body sites, even if the scans are performed during the same scanning session. Therefore, our indicators count the number of "person–visits" to the imaging service each day. So if a resident has an MRI scan of the head and the abdomen on the same day (two services), we count only a single "visit" to the MRI service for that person that day.

Note Regarding Missing Data

MRI and CT scan data are not complete for children, so the indicators include only residents aged 20 and older. Furthermore, individual–level data were not recorded for CT scans performed in hospitals in Southern region. Therefore, rates for those areas have warnings noted on the figures. Some residents of other regions may also receive CT scans in these hospitals, so those rates may also be slightly under–estimated.

8.1 Cardiac Catheterization (Diagnostic Angiogram)

Definition: the number of cardiac catheterizations performed on residents aged 40 and older per 1,000 residents aged 40 and older. This includes CCI code 3.IP.10 in any procedure field in an inpatient hospital abstract. Cardiac catheterizations were only performed at the two tertiary hospitals (Health Sciences Centre and St. Boniface General Hospital) in Manitoba; out–of–hospital interventions were excluded. Average annual rates were calculated for 2004/05–2006/07 and 2009/10–2011/12 and age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period.

Key Findings

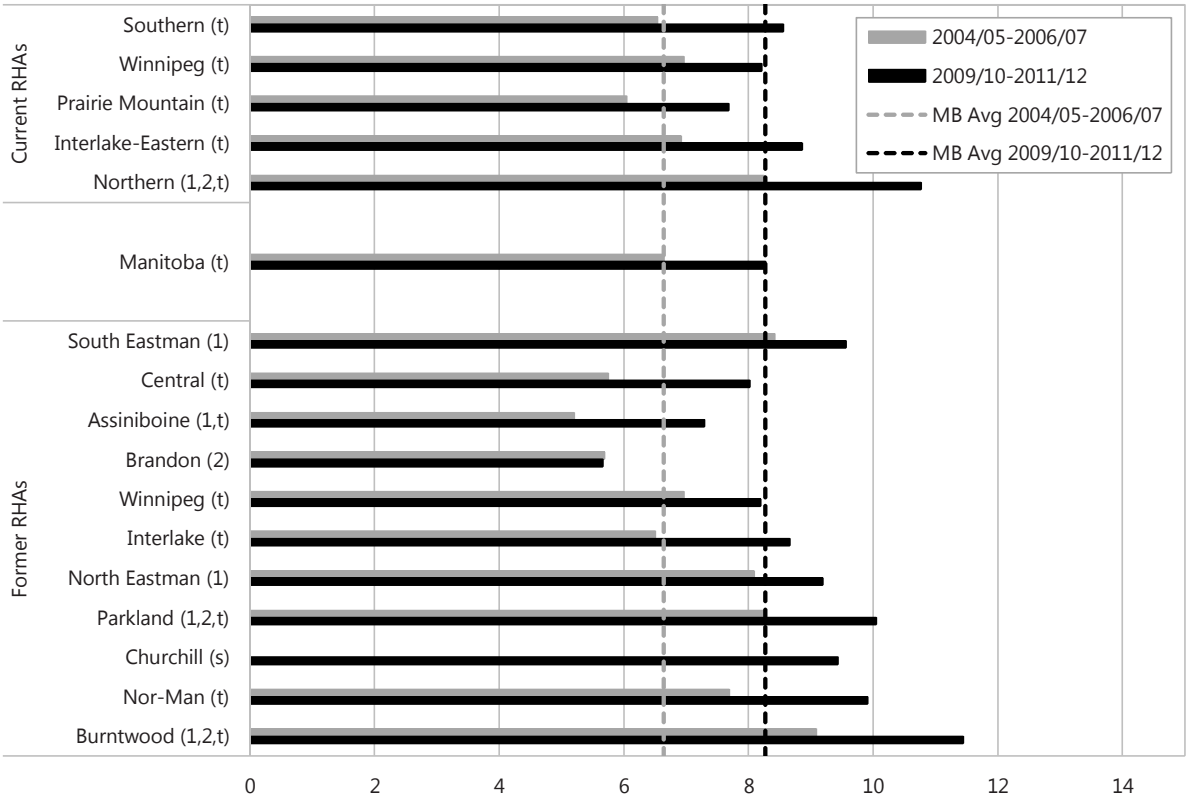
- The rate of cardiac catheterizations increased in Manitoba from 6.64 to 8.27 per 1,000 residents aged 40 and older per year. Rates increased significantly in all regions.
- Cardiac catheterization rates were not related to health status at the regional level, though the highest rate was in Northern.
- There was relatively little variation in rates across regions, even though this procedure is only performed in Winnipeg.
- Residents of Prairie Mountain had the lowest rates; and while this difference was not statistically significant, it is consistent with previous results for this indicator.
    - Residents of Assiniboine and Brandon had the lowest rates among former RHAs in both time periods. Their rates may be increasing over time, although the increases shown here did not reach statistical significance.
- Rates varied dramatically across districts from under five to over 20. There was less variation across NCs in Winnipeg.
- There were significant associations with income in urban and rural areas in both time periods. Residents of lower income areas had higher catheterization rates (Appendix 2).

Comparisons with Other Findings

- In previous MCHP indicator atlas reports, cardiac catheterization rates had increased significantly over time, though the 2009 Atlas showed a stabilization by the mid–2000s (Fransoo et al., 2009). Values in this report reveal that rates are increasing again.

Figure 8.1.1: Cardiac Catheterization Rate by RHA, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.1.2: Cardiac Catheterization Rate by District, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+

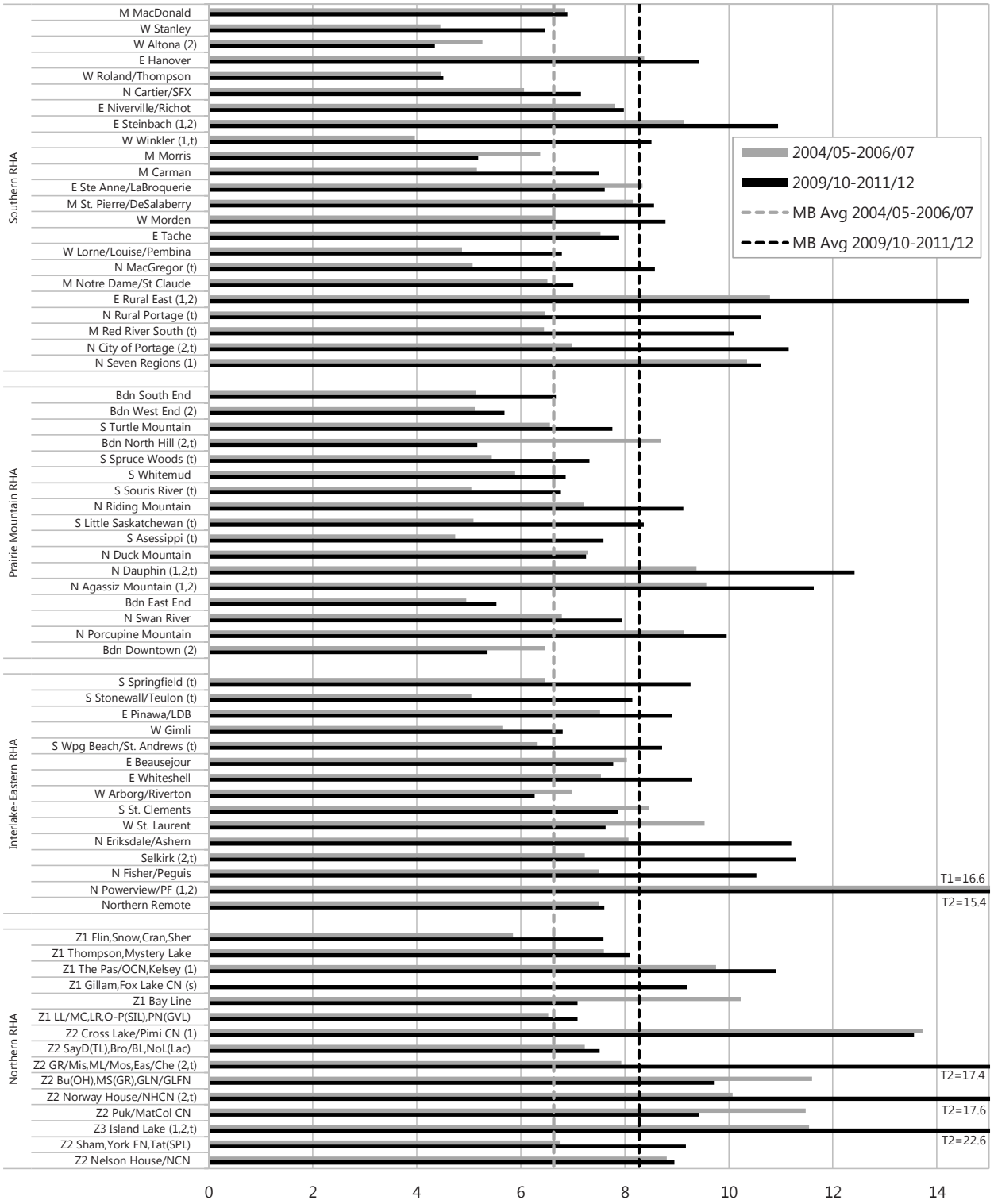
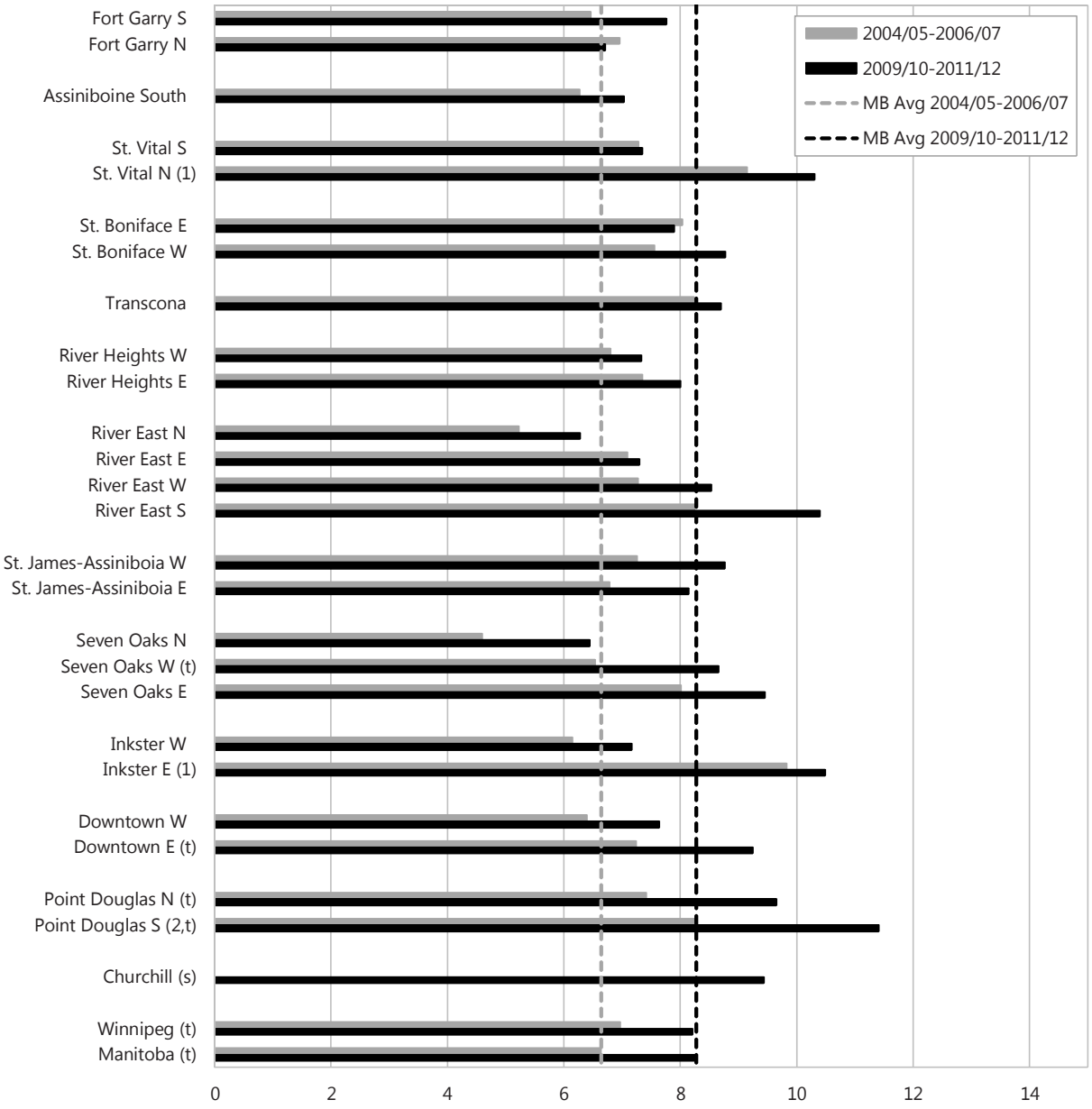


Figure 8.1.3: Cardiac Catheterization Rate by Winnipeg NC, 2004/05-2006/07 and 2009/10-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



8.2 Percutaneous Coronary Interventions (PCI) (Angioplasty and Stent Insertion)

Definition: the number of percutaneous coronary interventions (PCIs) (angioplasty and stent insertion) performed on residents aged 40 and older per 1,000 residents aged 40 and older. This includes ICD–9–CM codes 36.01, 36.02, 36.05, and 36.06 or CCI codes 1.IJ.50 and 1.IJ.57 in any procedure field in an inpatient hospital abstract. PCIs were performed only at the two tertiary hospitals in Manitoba (Health Sciences Centre and St. Boniface General Hospital); out–of–hospital interventions were excluded. Annual average rates were calculated for 2002/03–2006/07 and 2007/08–2011/12 and age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period.

Key Findings

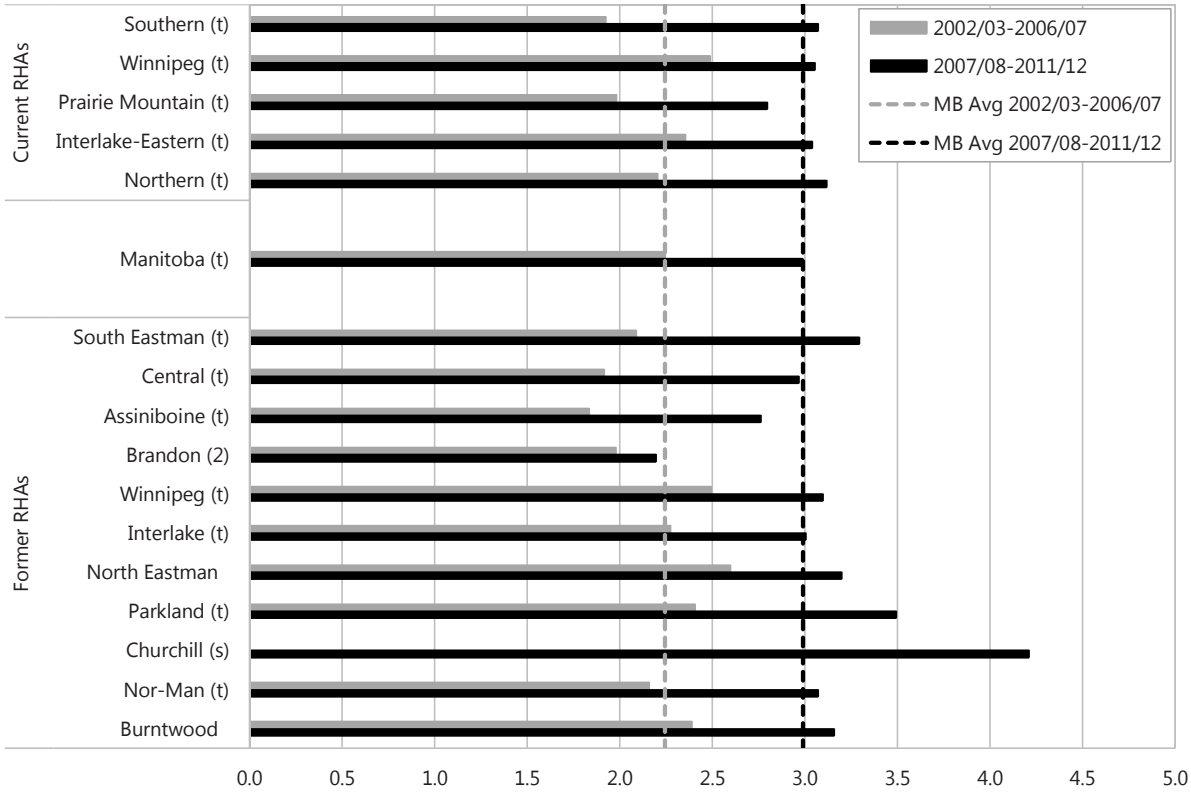
- The PCI rate increased in Manitoba from 2.25 to 3.02 procedures per 1,000 residents aged 40 and older per year. Significant increases were seen in all regions.
  - This is consistent with continuing changes in clinical practice, including the use of PCI as a "primary" treatment for heart attack patients and the use of stents among some patients for whom bypass surgery may have been recommended several years ago.
- There was very little variation in PCI rates across regions and NCs. This small level of variation resulted in no relationship between PCI rates and PMR at the regional, district, or NC levels.
- District–level rates showed more variation, likely related to the smaller population size in some smaller districts.
- Relationships with income were different in urban versus rural areas (Appendix 2).
  - In urban areas, there were strong, stepwise relationships between PCI rates and income levels in both time periods—with higher procedure rates among residents of lower income areas.
  - In rural areas, rates were highest among the lowest income group, but more comparable among residents of all other rural quintiles. The trend in the second time period was significant; but in the first time period, it was not because rates were non–linear.

Comparisons with Other Findings

- These results are consistent with and extend those in the 2009 Atlas (Fransoo et al., 2009), reflecting the continuing increase in PCI rates over time.

Figure 8.2.1: Percutaneous Coronary Intervention Rate by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.2.2: Percutaneous Coronary Intervention Rate by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+

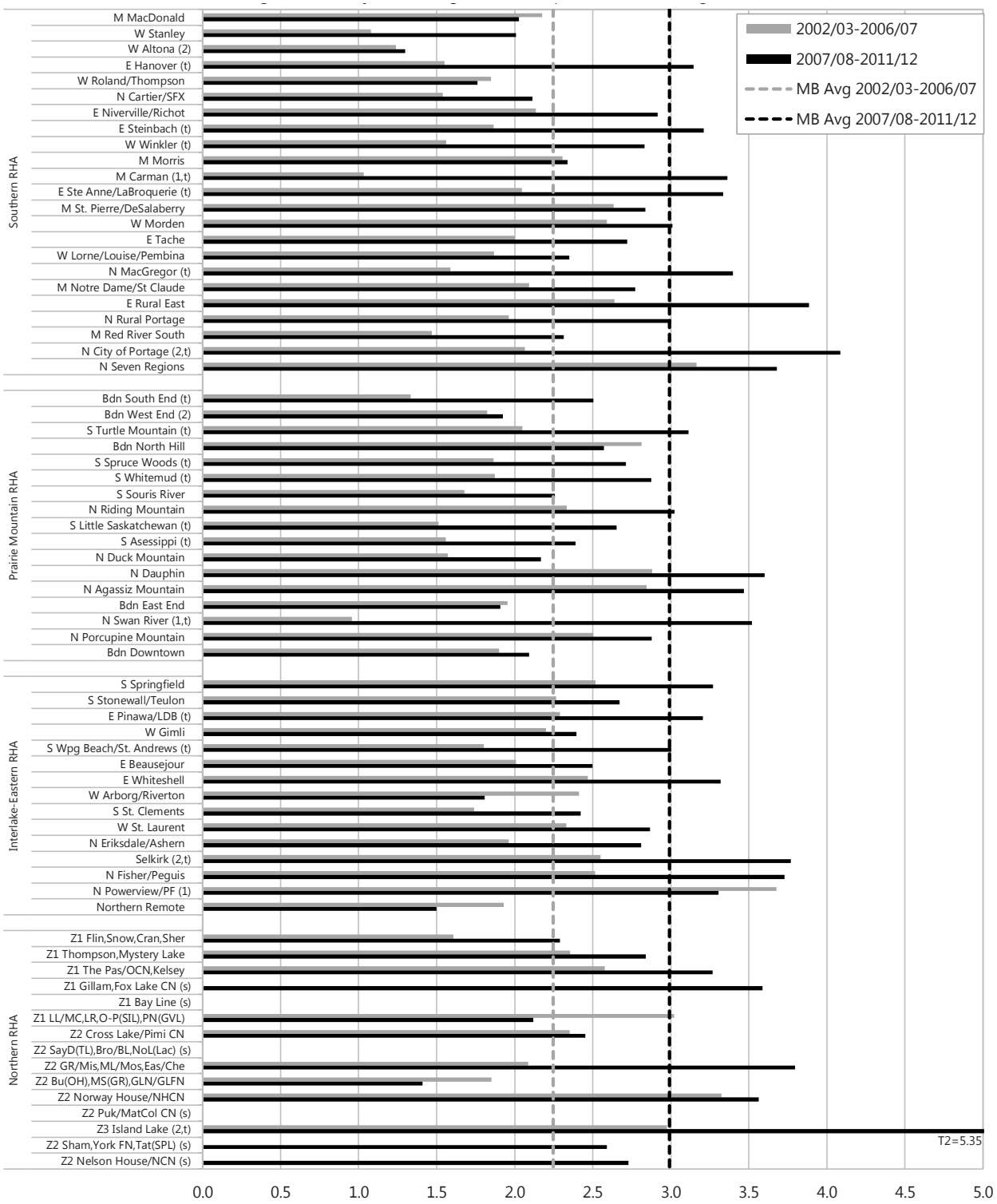
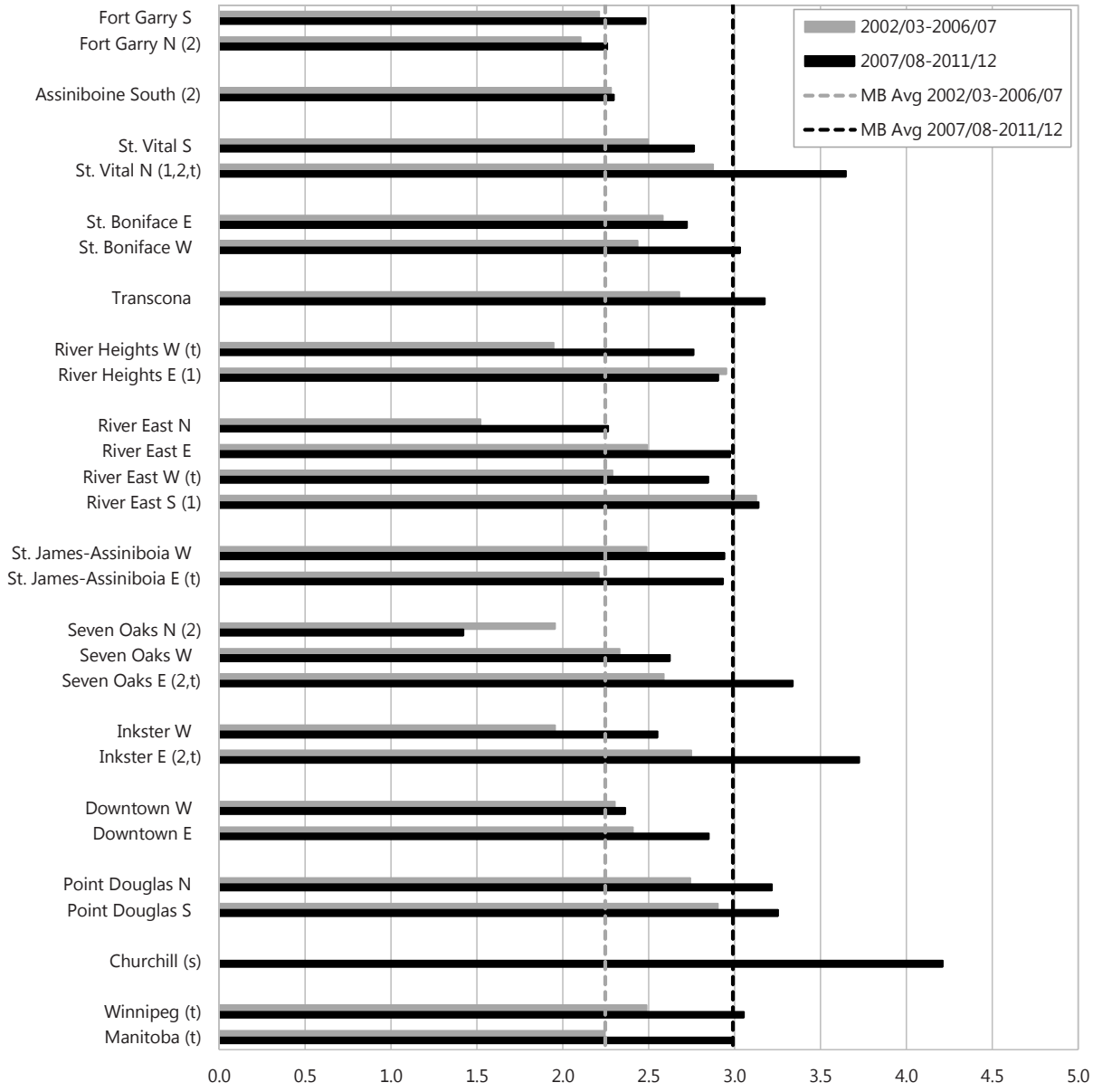


Figure 8.2.3: Percutaneous Coronary Intervention Rate by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



8.3 Coronary Artery Bypass Surgery

Definition: the number of bypass surgeries performed on residents aged 40 and older per 1,000 residents aged 40 and older. Bypass surgery is defined by ICD-–9–CM codes 36.10–36.14 and 36.19 or a CCI code 1.IJ.76 in any procedure field in an inpatient hospital abstract. These procedures were performed only at the two tertiary hospitals (Health Sciences Centre and St. Boniface General Hospital) in Manitoba; out–of–hospital interventions were excluded. Annual average rates were calculated for 2002/03–2006/07 and 2007/08–2011/12 and age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period.

Key Findings

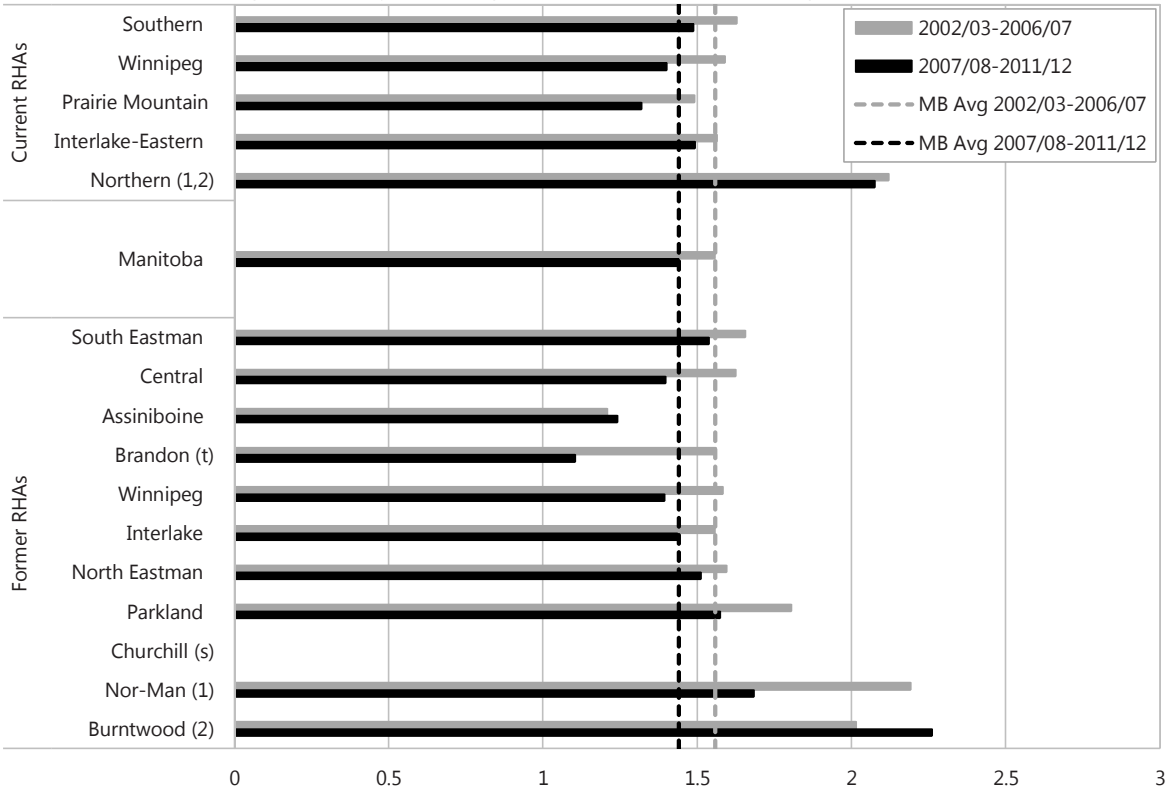
- The rate of coronary artery bypass surgery in Manitoba remained stable: the slight decrease from 1.56 to 1.44 surgeries per 1,000 residents aged 40 and older per year was not statistically significant. This trend was reflected in all regions.
- Bypass surgery rates were not related to PMR, though the highest rates were among residents of Northern region. Within districts of rural regions, there was some relationship with PMR in that residents of less healthy districts generally had higher bypass surgery rates.
- Rates were relatively low in the former Brandon and Assiniboine RHAs, though the differences did not reach significance.
- Among urban residents, in both time periods, those in lower income areas had higher bypass surgery rates. The trend among rural residents was non–linear and did not reach significance (Appendix 2).

Comparisons with Other Findings

- These results are consistent with those shown in the 2009 Atlas, which also showed stable rates near 1.5 per 1,000 residents aged 40 and older (Fransoo et al., 2009).
- This is likely related to the continuing increases in PCI rates (Section 7.2), as some patients are now treated with PCI rather than bypass surgery.

Figure 8.3.1: Coronary Artery Bypass Surgery Rate by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
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Figure 8.3.2: Coronary Artery Bypass Surgery Rate by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+

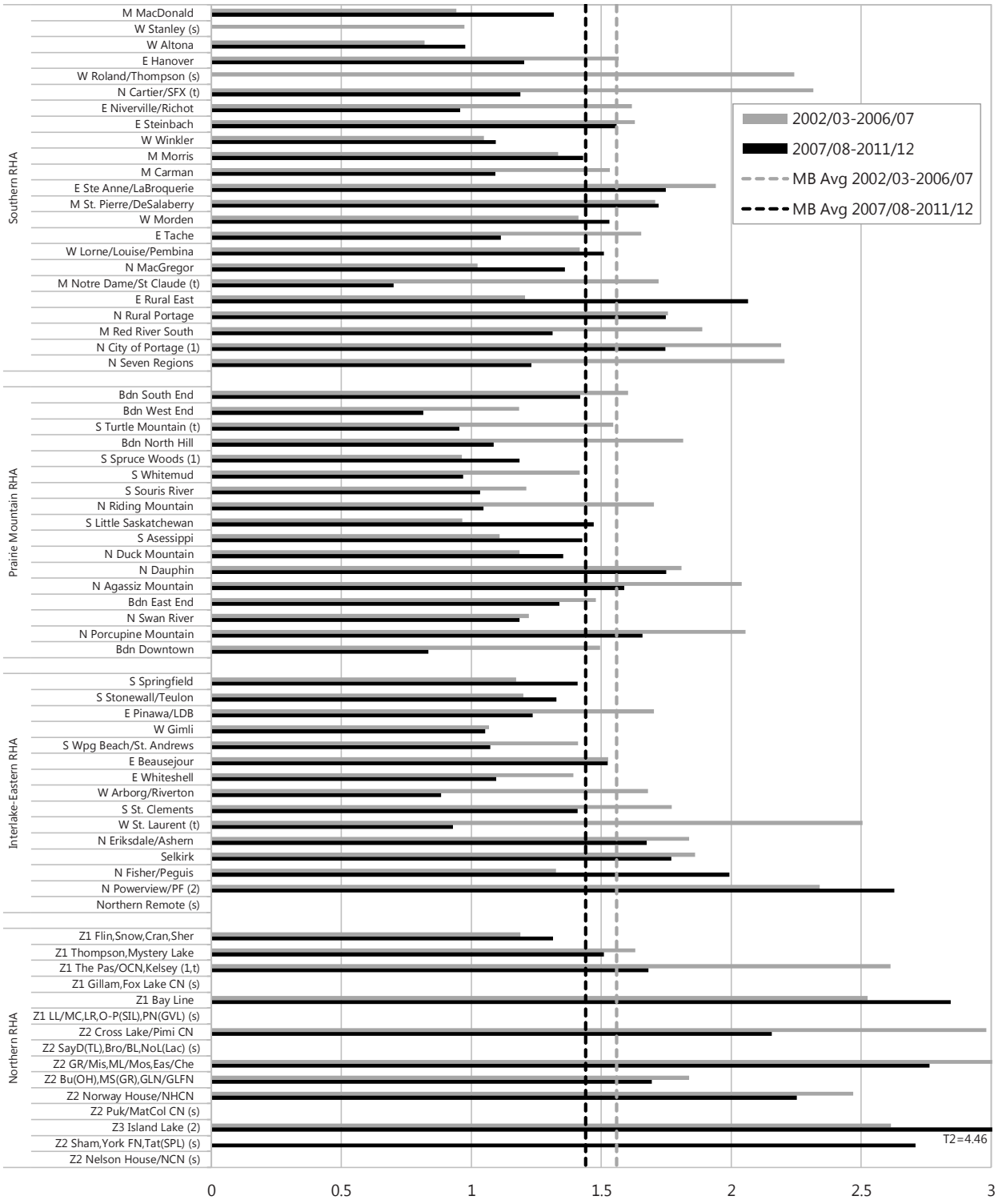
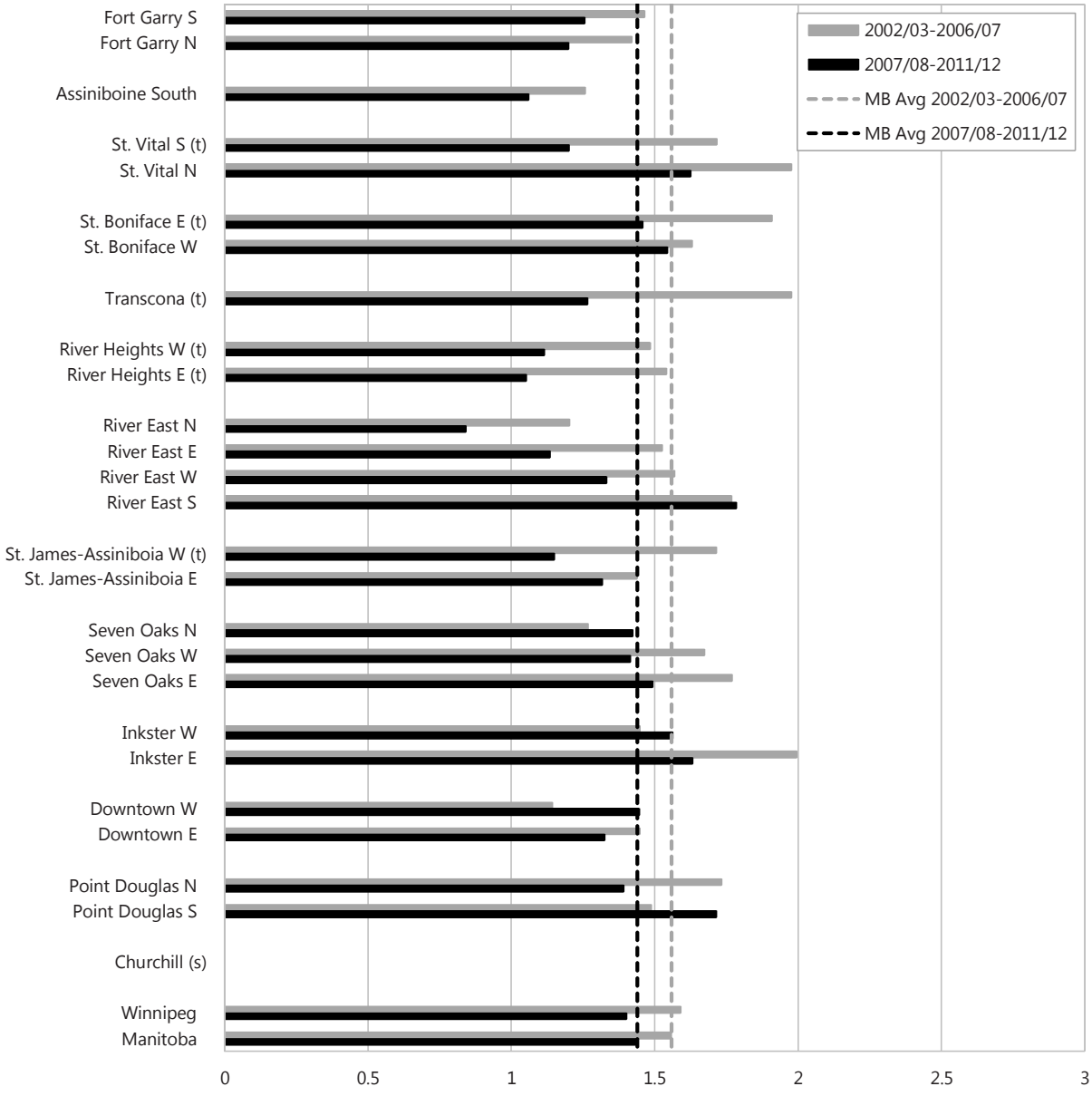


Figure 8.3.3: Coronary Artery Bypass Surgery Rate by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



8.4 Total Hip Replacement

Definition: the number of **total hip replacements** (complete removal and replacement of joint) performed on residents aged 40 and older per 1,000 residents aged 40 and older. Hip replacements were defined by ICD–9–CM codes 81.50, 81.51, and 81.53 or CCI codes 1.VA.53.LA–PN and 1.VA.53.PN–PN in any procedure field in inpatient hospital abstracts. Out–of–hospital procedures were excluded. Average annual rates were calculated for 2002/03–2006/07 and 2007/08–2011/12 and age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period.

Key Findings

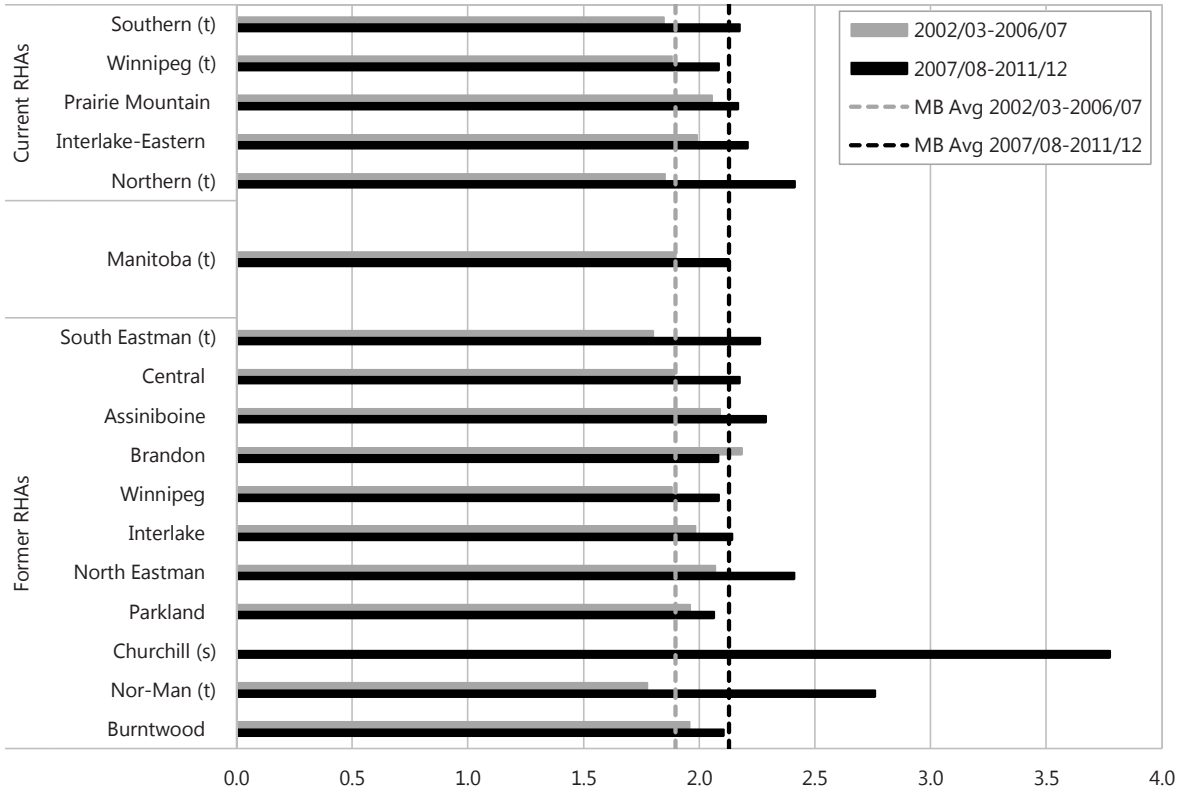
- The rate of total hip replacements increased over time in Manitoba from 1.90 to 2.13 procedures per 1,000 residents aged 40 and older per year. An increase was seen in all regions, though not all regional increases were statistically significant.
- There was remarkably little variation in hip replacement rates across regions. Regional rates were not strongly correlated with PMR in the first time period, but were more so in the second time period.
- District–level results showed more variation in rates, but also had no clear relationship with health status.
- Among Winnipeg NCs, there was considerable variation with some less healthy areas having lower than average rates.
- In urban areas, there were significant relationships with residents of lower income areas having lower rates, though these trends were not linear.
- Among rural residents, the relationships with income were distinctly non–linear, so the trends were not statistically significant (Appendix 2).

Comparison to Other Findings

- These results are consistent with and extend those from the 2009 Atlas (Fransoo et al., 2009), reflecting the continuing increase in hip replacement rates over time.

Figure 8.4.1: Hip Replacement Surgery Rate by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.4.2: Hip Replacement Surgery Rate by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+

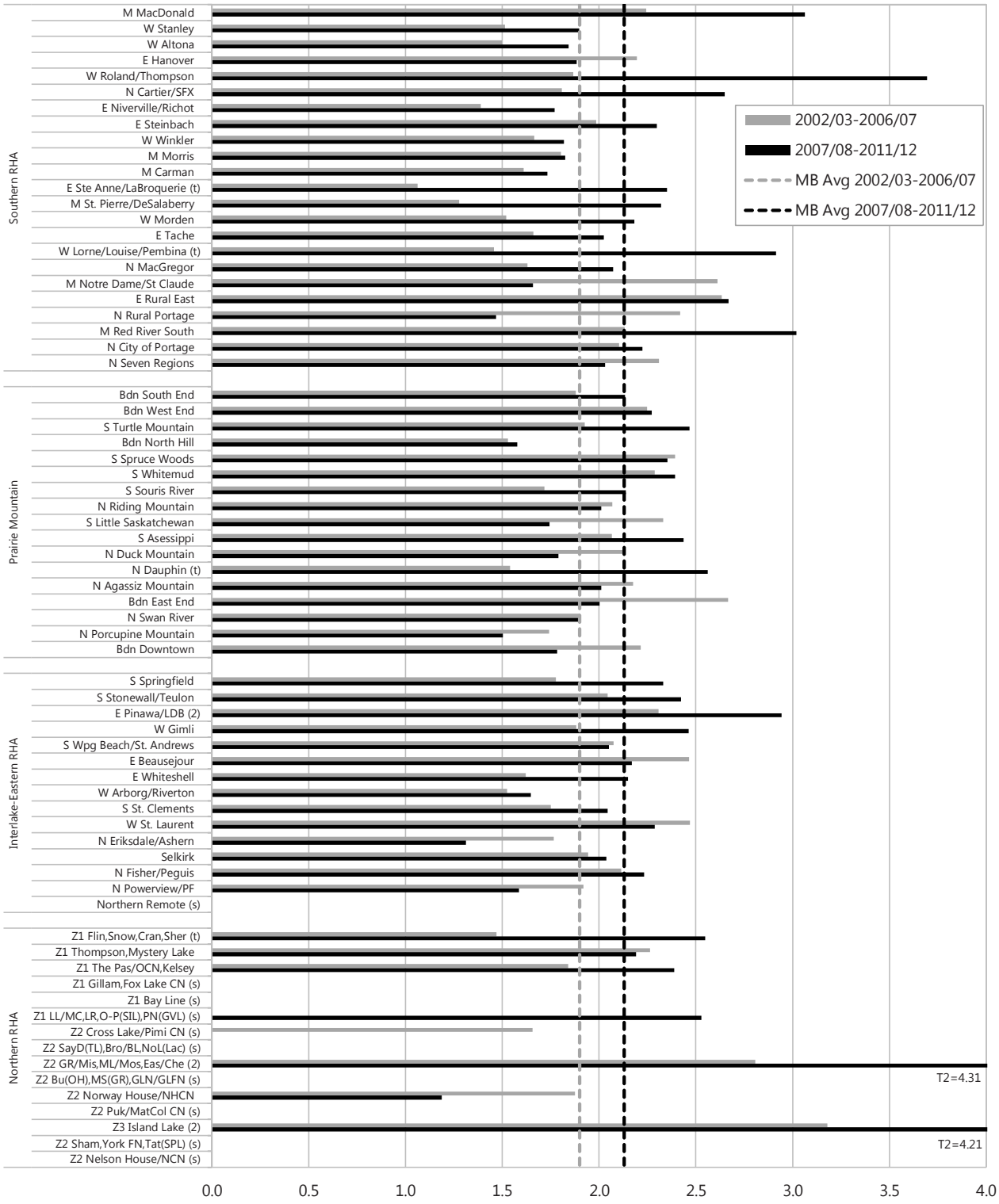
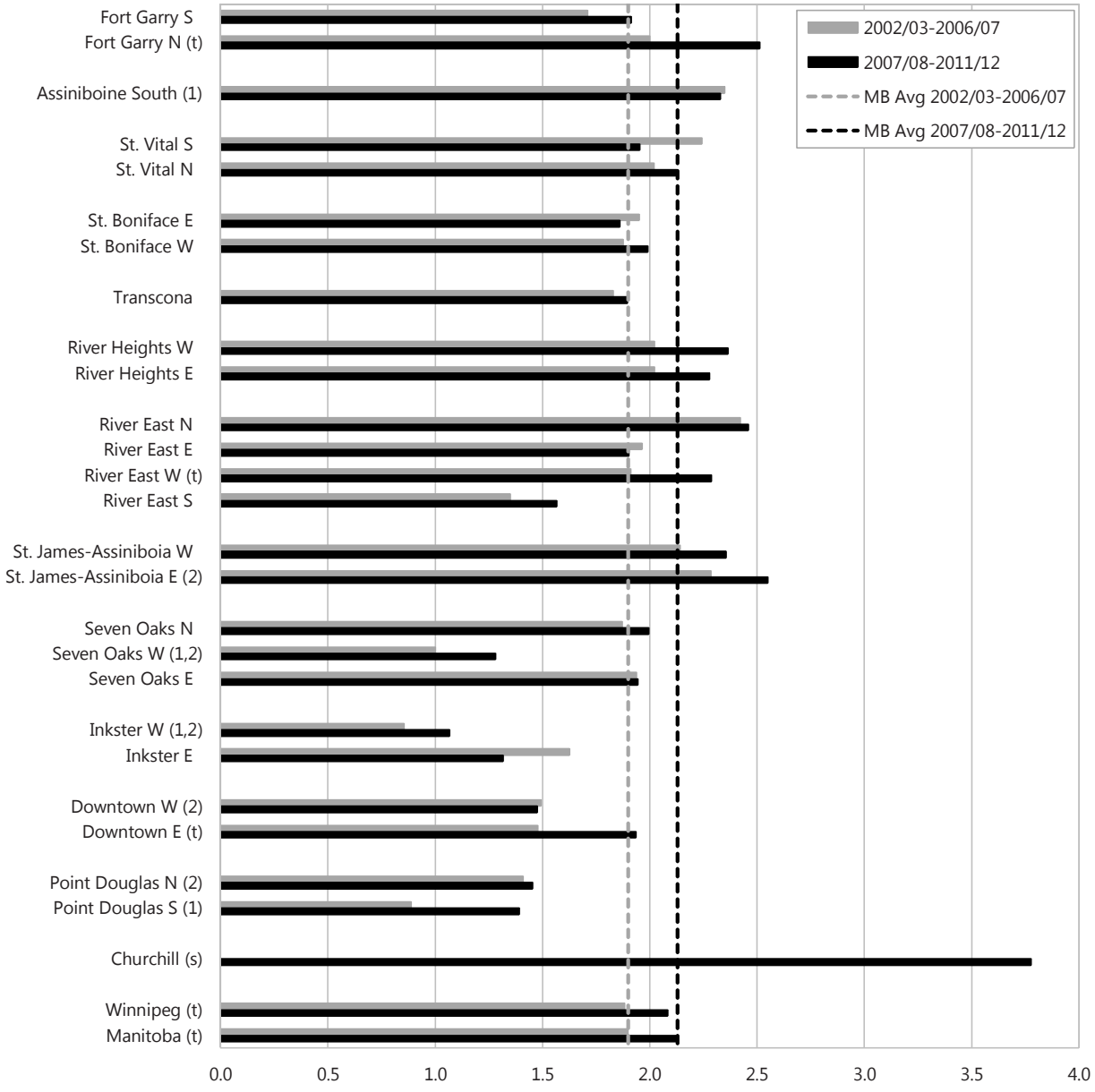


Figure 8.4.3: Hip Replacement Surgery Rate by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



8.5 Total Knee Replacement

Definition: the number of **total knee replacements** (complete removal and replacement of joint) performed on residents aged 40 and older per 1,000 residents aged 40 and older. Knee replacements were defined by ICD–9–CM codes 81.54 and 81.55 or CCI codes 1.VG.53.LA–PN and 1.VG.53.LA–PP in any procedure field in inpatient hospital abstracts. Out–of–hospital procedures were excluded. Average annual rates were calculated for 2002/03–2006/07 and 2007/08–2011/12 and age– and sex–adjusted to the Manitoba population aged 40 and older in the first time period.

Key Findings

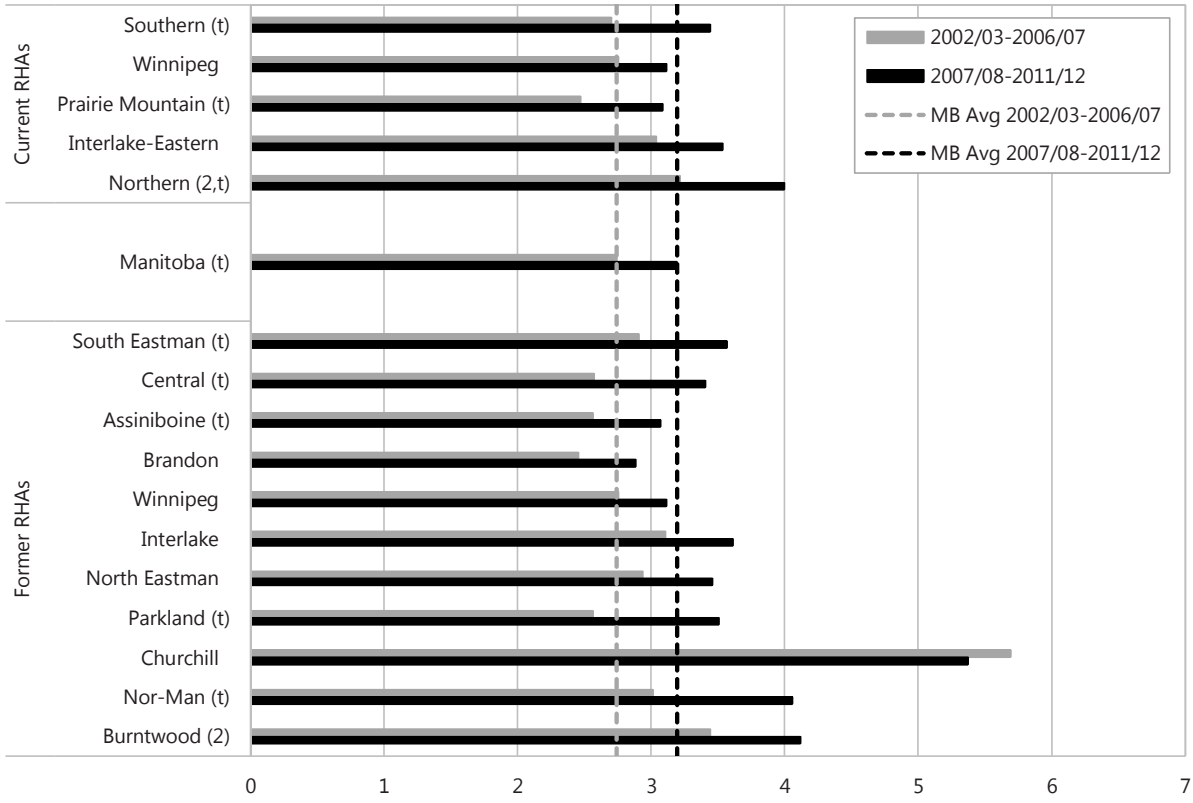
- Total knee replacement rates increased from 2.74 to 3.19 per 1,000 residents aged 40 and older per year. Increases were seen in virtually all areas.
- There appears to be only a modest association between knee replacement rates and health status at the regional level and no relationship at district or NC levels, despite significant variation in rates across areas.
- There was no association between knee replacement rates and income in either time period, among urban or rural residents (Appendix 2). The trends were distinctly non–linear.

Comparison to Other Findings

- These results are consistent with and extend those from the 2009 Atlas (Fransoo et al., 2009), reflecting the continuing increase in knee replacement rates over time.

Figure 8.5.1: Knee Replacement Surgery Rate by RHA, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



1 indicates area's rate was statistically different from Manitoba average in first time period
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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.5.2: Knee Replacement Surgery Rate by District, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+

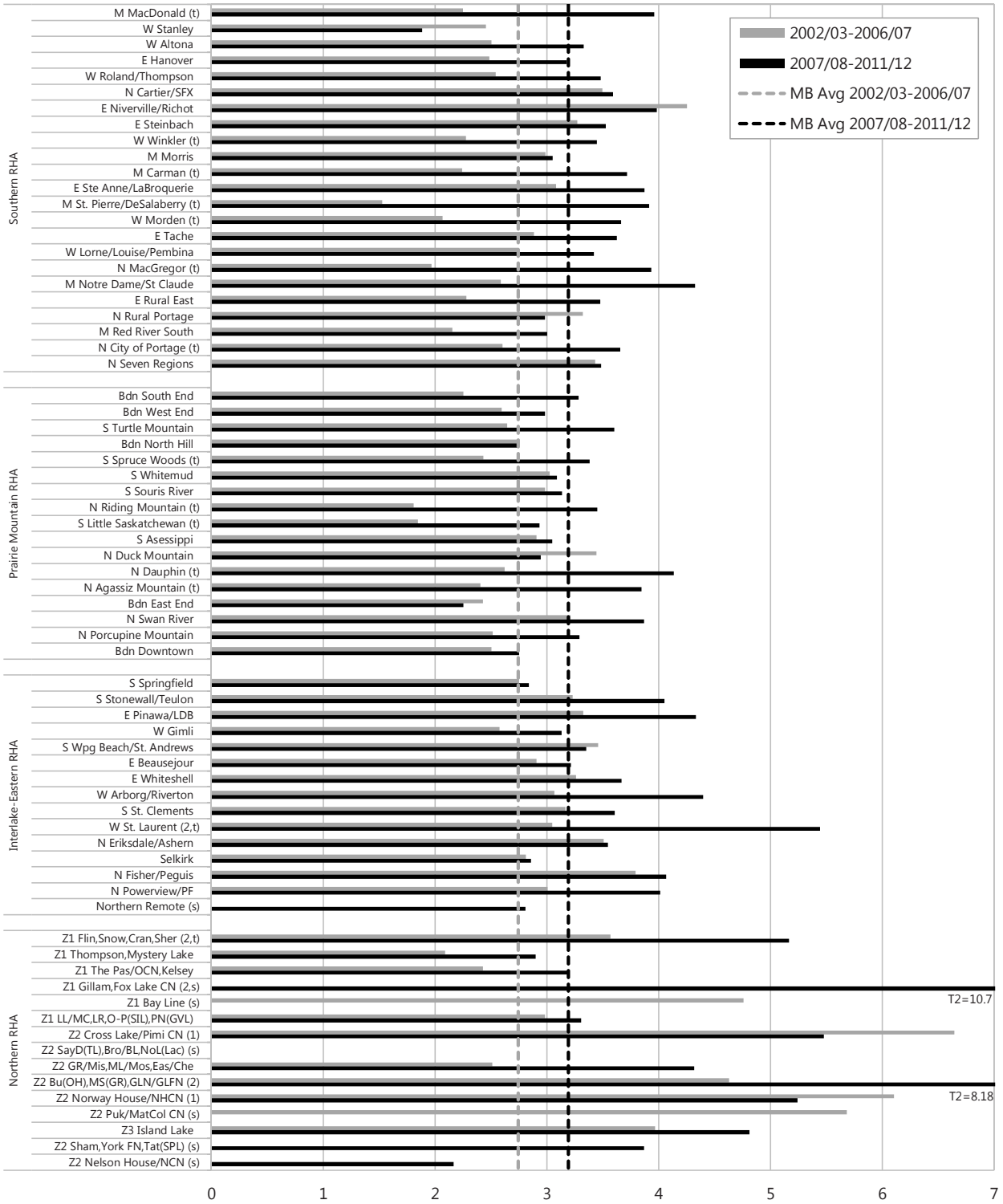
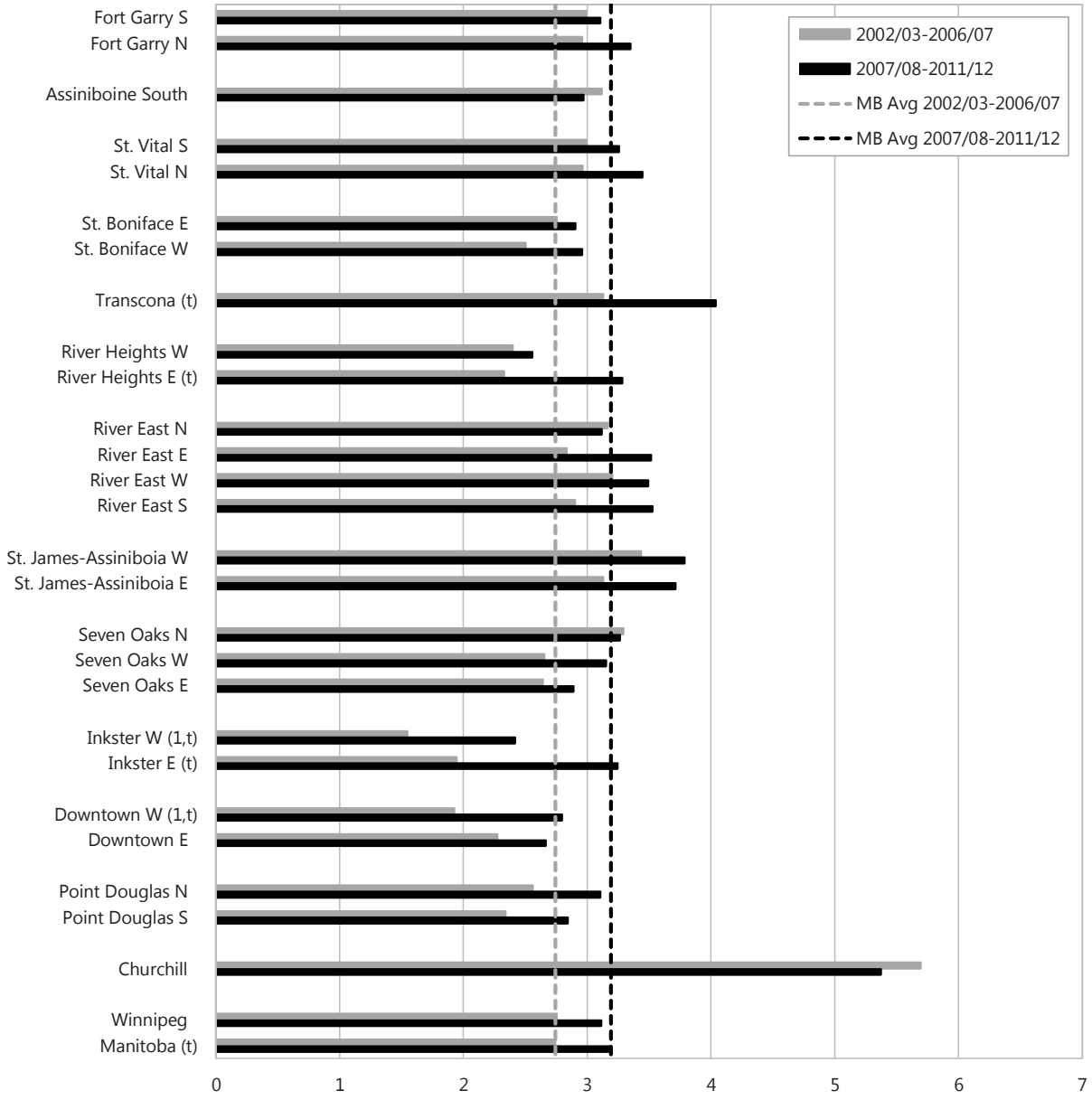


Figure 8.5.3: Knee Replacement Surgery Rate by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Age- and sex-adjusted average annual rate per 1,000 residents aged 40+



8.6 Cataract Surgery

Definition: the number of cataract surgeries performed on residents aged 50 and older per 1,000 residents aged 50 and older. Cataract surgery was defined by a physician claim with tariff codes 5611, 5612 and tariff prefix "2" (surgery); or a hospital abstract with ICD–9–CM procedure codes 13.11, 13.19, 13.2, 13.3, 13.41, 13.42, 13.43, 13.51, and 13.59; or CCI code 1.CL.89. Additional cataract surgeries for Manitoba residents were added from medical reciprocal claims for out-of-province procedures, including Alberta (tariff code 27.72) and Saskatchewan (tariff codes 135S, 136S, 226S, and 325S). Rates were calculated for 2006/07 and 2011/12 and age– and sex–adjusted to the Manitoba population aged 50 and older in 2006/07.

Key Findings

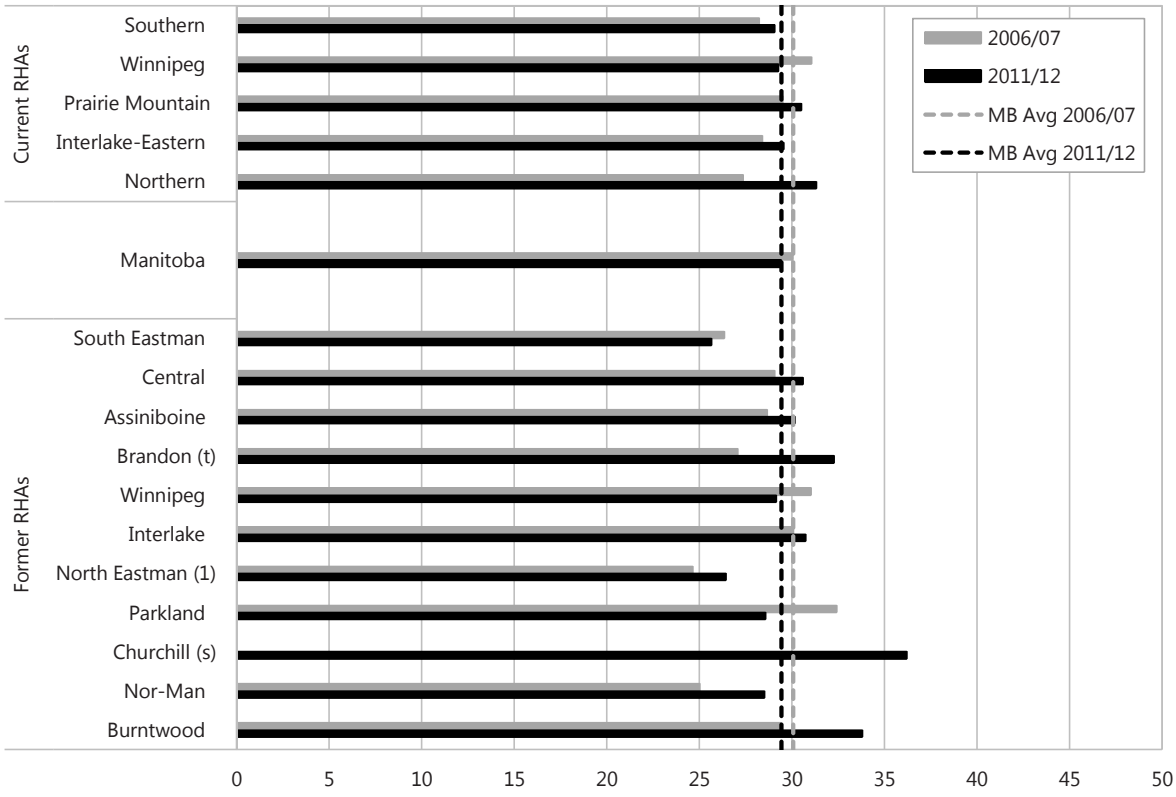
- The rate of cataract surgeries was stable in Manitoba: the slight decrease from 30.1 to 29.4 surgeries per 1,000 residents aged 50 and older was not statistically significant. There was relatively little variation in rates among regions. All showed non–significant changes over time, except for an increase in the former Brandon RHA.
- There appears to be no association between cataract surgery rates and PMR at the regional, district, or NC levels.
- Associations with income were not strong or linear (Appendix 2). Residents of lower income areas had slightly higher rates, but the trends were only significant among urban residents in the first time period and among rural residents in the second time period.

Comparison to Other Findings

- These results are consistent with those from the 2009 Atlas (Fransoo et al., 2009) and suggest the rate of cataract surgery remains stable.

Figure 8.6.1: Cataract Surgery Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 50+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.6.2: Cataract Surgery Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 50+

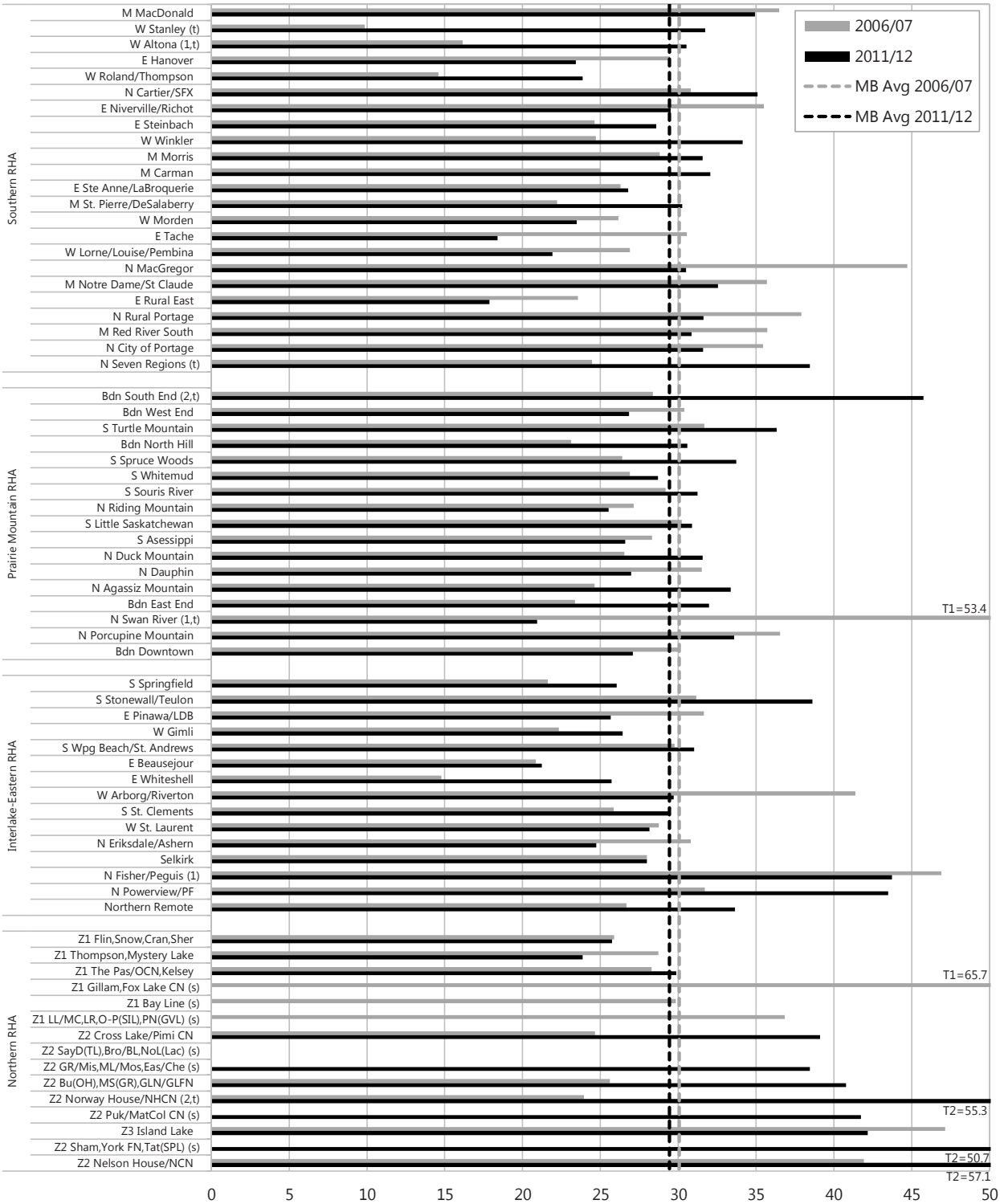
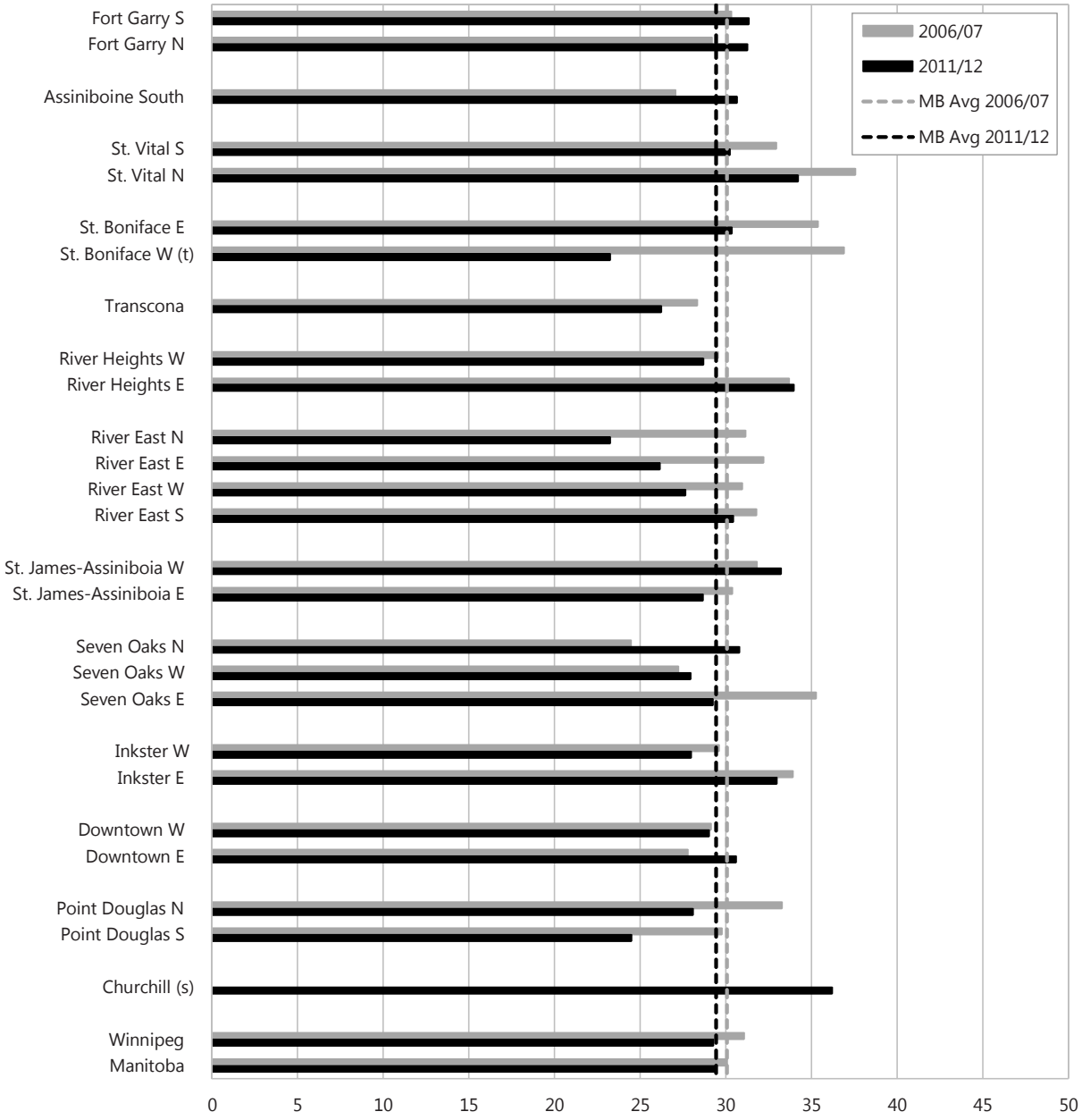


Figure 8.6.3: Cataract Surgery Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 50+



8.7 Dental Extractions Among Young Children

Definition: the number of dental extractions performed on residents aged 0 to 5 per 1,000 residents aged 0 to 5 years. Dental extraction surgeries were defined by hospitalizations with ICD–9–CM procedure codes 23.01, 23.09, 23.11, and 23.19 or CCI codes 1.FE.57 and 1.FE.89. Out–of–province procedures were excluded. Average annual crude rates were calculated for 2002/03–2006/07 and 2007/08–2011/12.

Key Findings

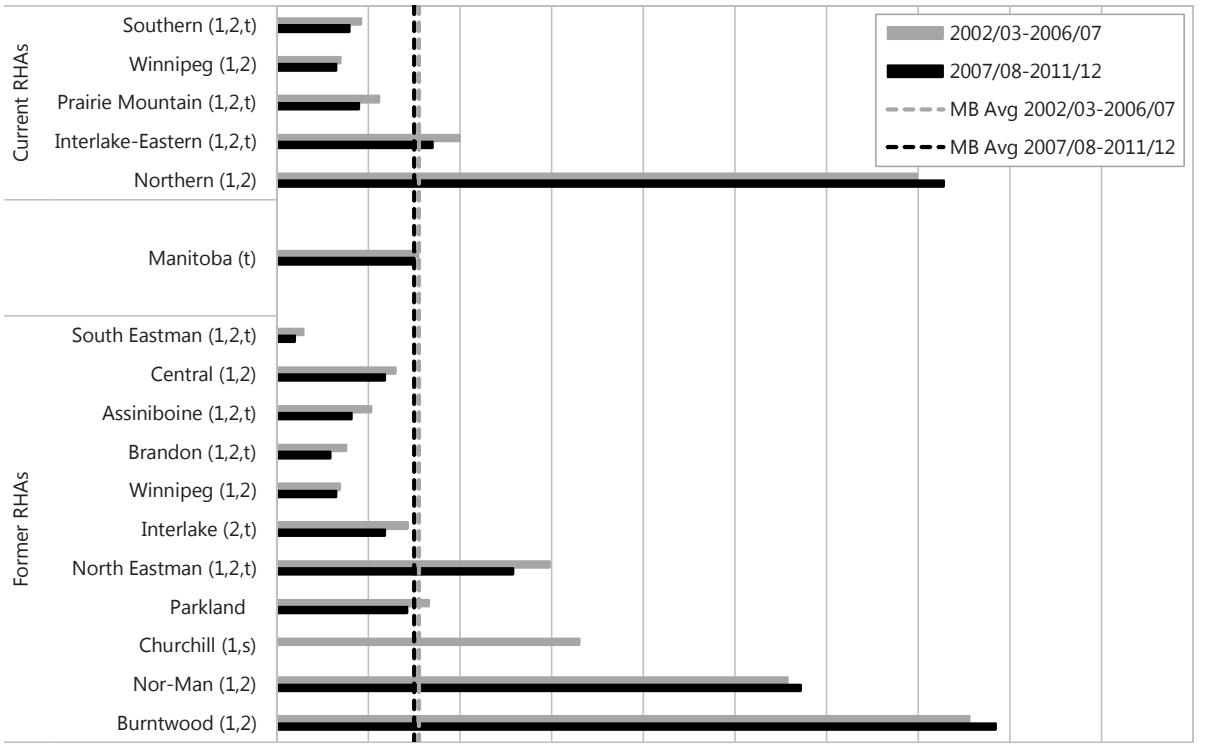
- The overall rate of dental extraction surgeries decreased slightly but significantly over time; however, the rates and changes varied dramatically by area.
- Rates decreased somewhat in most regions (though not all were statistically significant), but increased (non–significantly) in Northern region.
- Rates were related to PMR, but were much higher in Northern than any other region.
- There was also extreme variation across districts of rural regions from under two to over 100, making this the indicator with the most variation in this report.
- Rates also varied considerably across NCs within Winnipeg.
- In both urban and rural areas, there were significant relationships with income in both time periods: residents of lower income areas had dramatically higher rates (Appendix 2). Rural rates were much higher than urban rates.

Comparison to Other Findings

- The results shown here are consistent with those shown in MCHP's report on inequalities in health in Manitoba (Martens et al., 2010b).

Figure 8.7.1: Dental Extraction Surgery Rate by RHA, 2002/03-2006/07 and 2007/08-2011/12

Crude average annual rate per 1,000 residents under age 6



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.7.2: Dental Extraction Surgery Rate by District, 2002/03-2006/07 and 2007/08-2011/12

Crude average annual rate per 1,000 residents under age 6

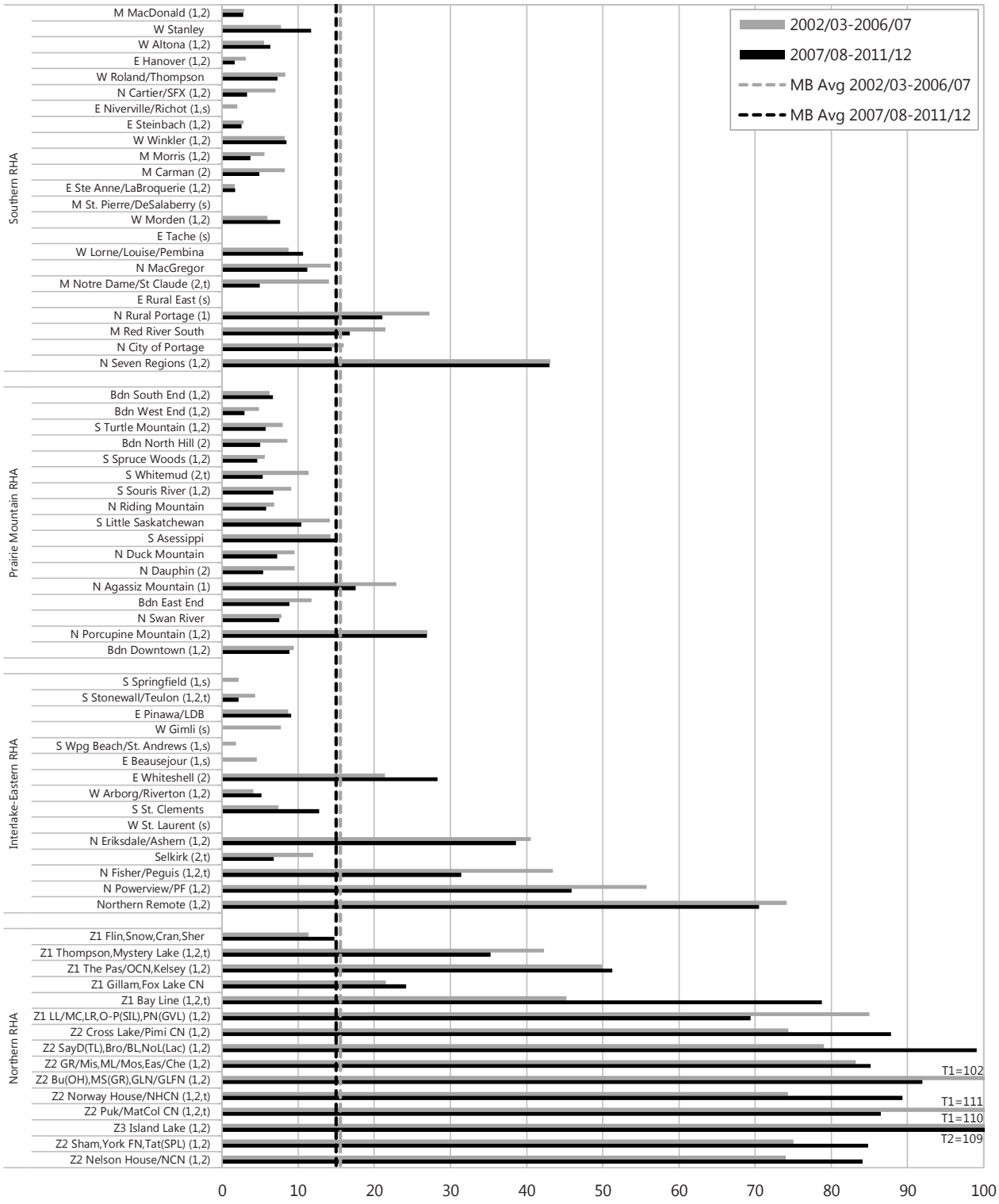
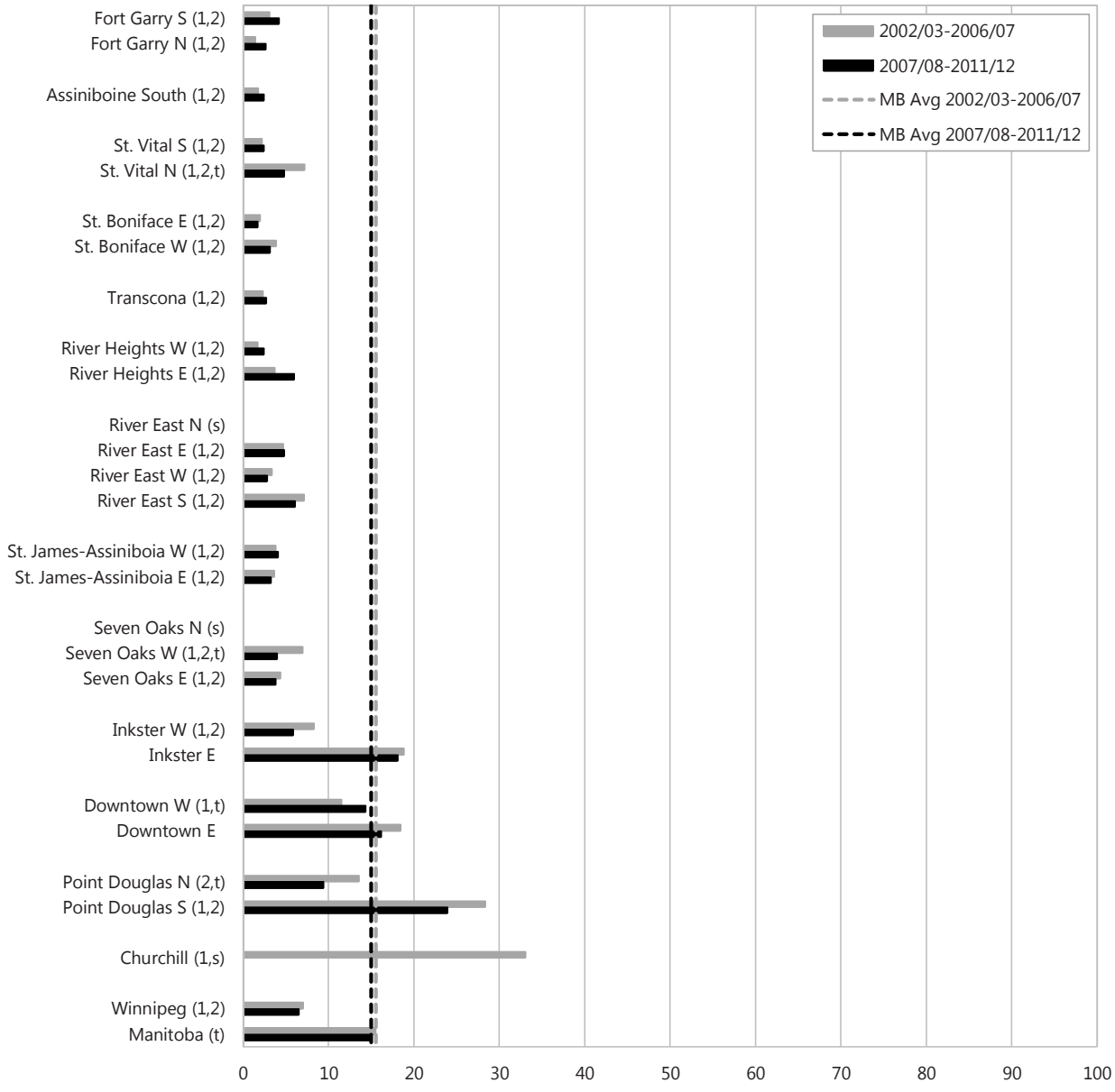


Figure 8.7.3: Dental Extraction Surgery Rate by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Crude average annual rate per 1,000 residents under age 6



8.8 Computed Tomography (CT) Scans

Definition: the number of computed tomography (CT) scans performed on residents aged 20 and older per 1,000 residents aged 20 and older years. CT scans were defined by a physician claim with tariff codes 7112–7115 and 7221–7230. Residents with multiple claims for CT scans in a day (e.g., multiple body parts scanned) were assigned only one scan for that day. Average annual crude rates are shown for 2011/12. CT scan rates shown in this report may under–estimate the "true" rates, as individual–level information regarding CT scans performed in rural hospitals are not always recorded.

Key Findings

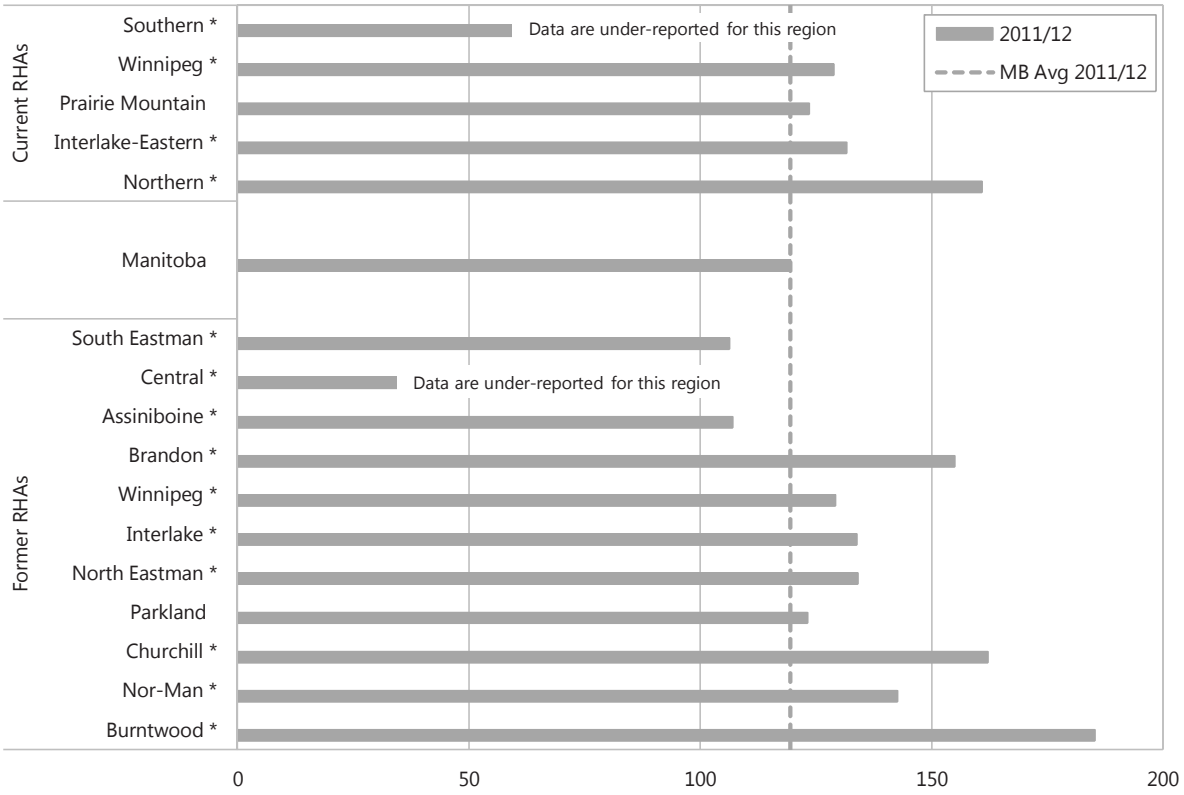
- The CT scan rate for adults in Manitoba was 120 per 1,000 residents in 2011/12. Individual–level data for previous years are known to be incomplete, so rates could not be compared over time.
- CT scan rates were not strongly related to PMR, though Northern residents had the highest rate. The main anomaly in the trend was the rate for Winnipeg.
- There was relatively little variation across regions, though more variation at the district and NC levels.
- Associations with income were mixed: among urban residents, there was a strong linear relationship, with lower income residents receiving more scans than higher income residents. Among rural areas, the relationship was distinctly non–linear.

Comparison to Other Findings

- CT scan rates have not been reported in recent MCHP studies, including the 2009 Atlas (Fransoo et al., 2009), because of incomplete data collection at the individual level. They are reported here because of changes over time in the availability of data. Interestingly, there are likely more missing data now than previously, but the distribution has changed: until recently, individual–level data for the CT scanner in Dauphin were not available, and since that facility served residents of several regions (the former RHAs of Parkland, plus some residents of NOR–MAN and Assiniboine), rates were not shown. Currently, it appears that data from CT scanners in the former Central RHA are not complete, but this issue likely affects residents from only that area (part of the new Southern region). Therefore, rates for other regions are less likely affected, so the indicator was included (with appropriate warnings for that region).

Figure 8.8.1: Computed Tomography (CT) Scan Rate by RHA, 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+



* indicates area's rate was statistically different from Manitoba average

s indicates data suppressed due to small numbers

Figure 8.8.2: Computed Tomography (CT) Scan Rate by District, 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+

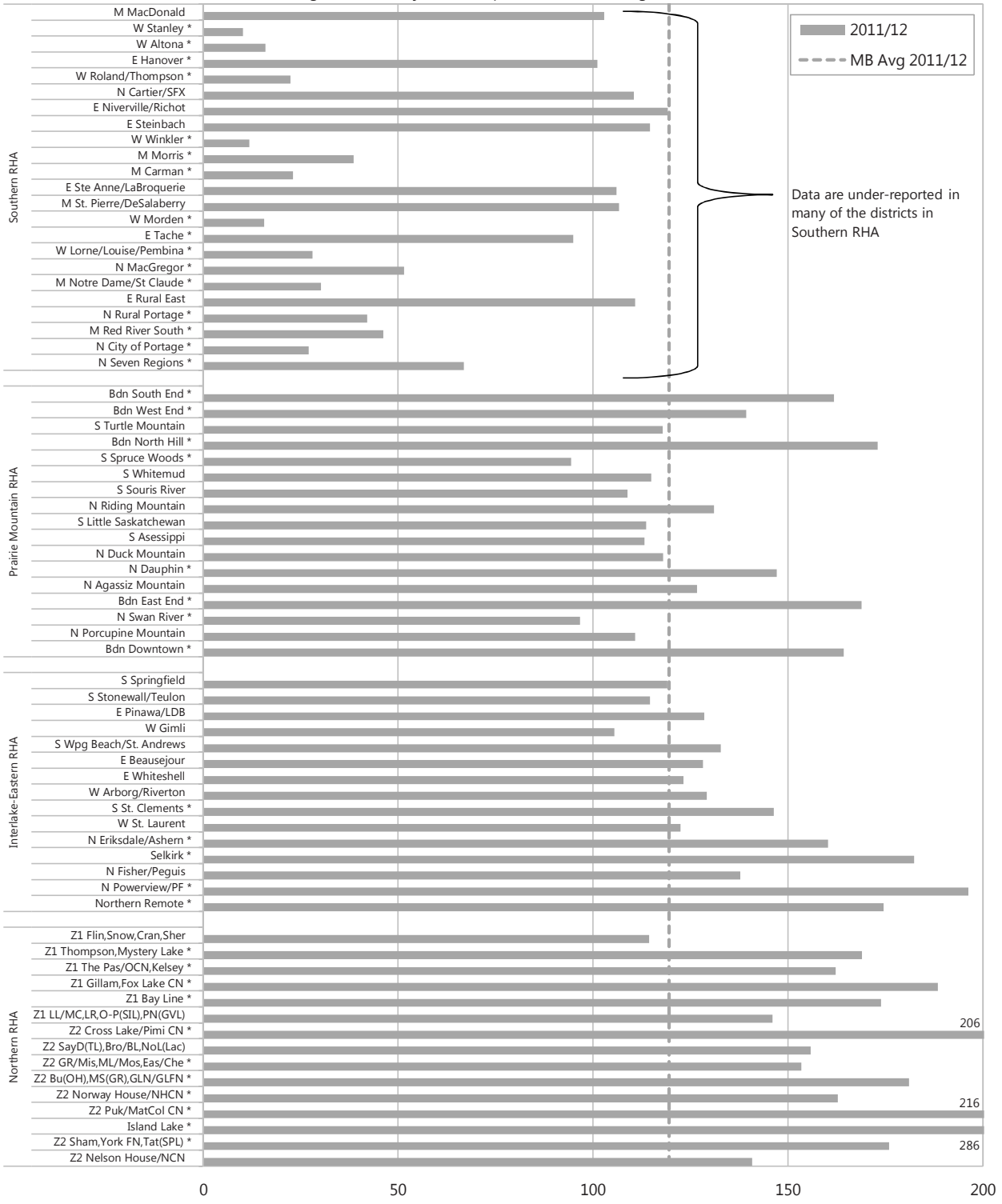
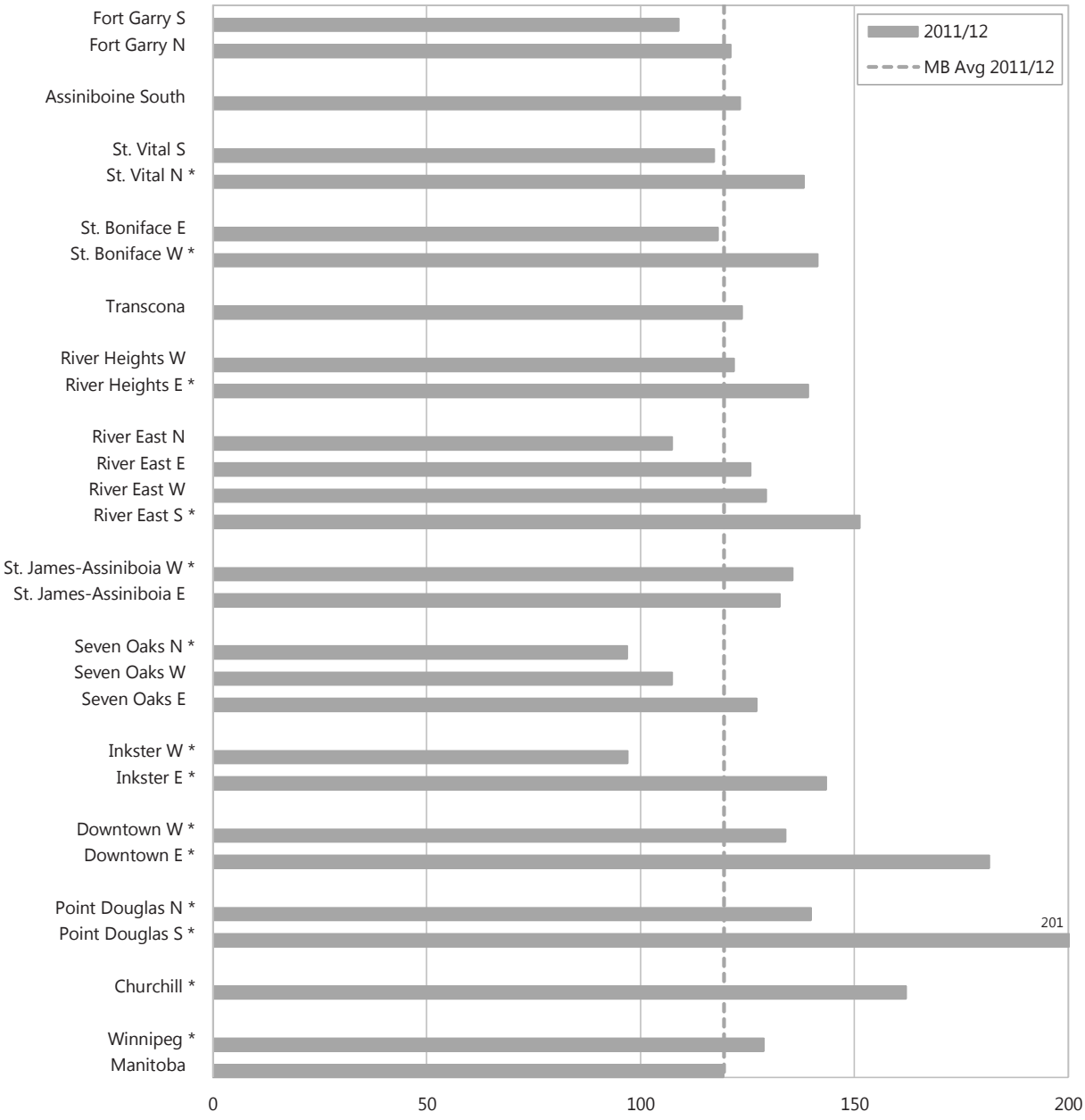


Figure 8.8.3: Computed Tomography (CT) Scan Rate by Winnipeg NC, 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+



8.9 Magnetic Resonance Imaging (MRI) Scans

Definition: the number of magnetic resonance imaging (MRI) scans performed on residents aged 20 and older per 1,000 residents aged 20 and older in a given year. MRI scans were defined by physician claims with tariff codes 7501–7528. Residents with multiple claims for MRI scans in a day (e.g., multiple body parts scanned) were assigned only one scan for that day. Rates are shown for 2006/07 and 2011/12 and age– and sex–adjusted to the Manitoba population 20 and older in the first time period. Patients treated in the Children's hospital in Winnipeg are referred to adjacent Health Sciences Centre for MRI scans. However, individual–level data for these services are not recorded. Therefore, the MRI scan rates in this report include only residents aged 20 and older.

Key Findings

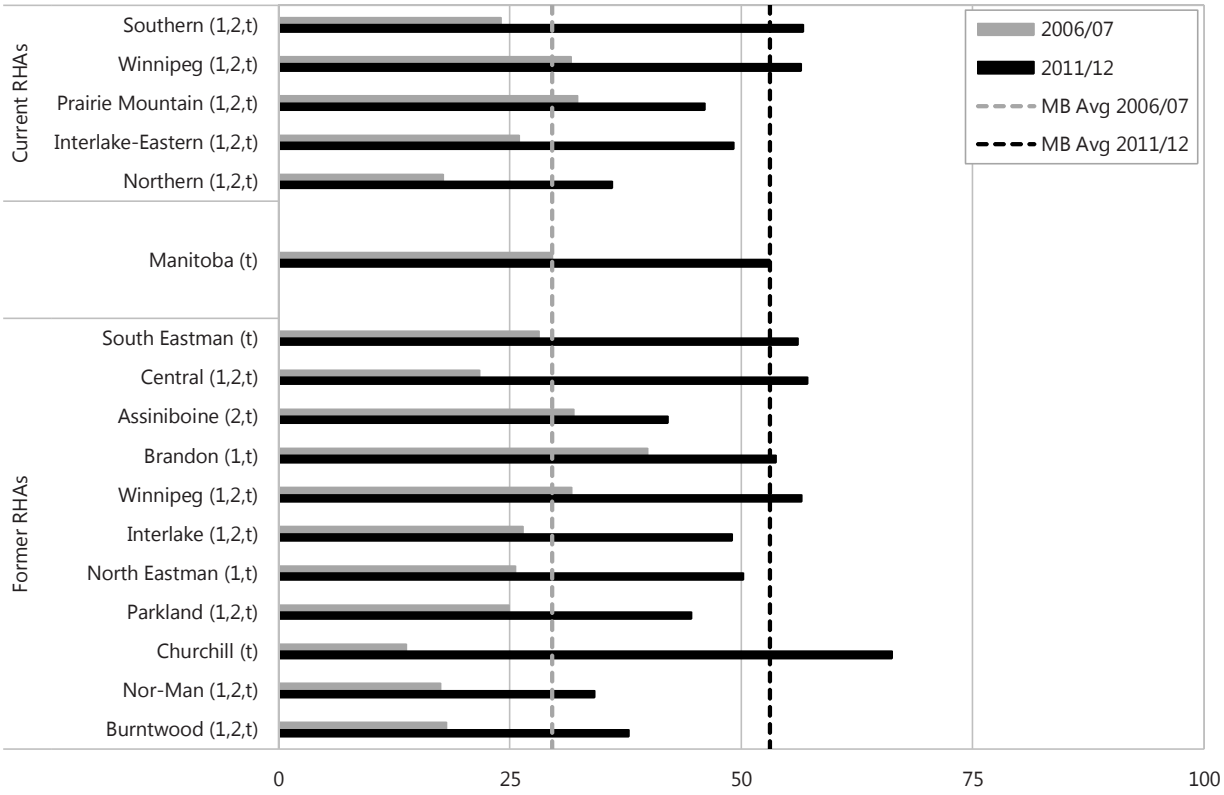
- The rate of MRI scans in Manitoba almost doubled from 29.6 to 53.1 scans per 1,000 residents aged 20 and older. Rates increased in all areas, with the largest increase in Southern region, likely related to the installation of the MRI scanner in the Boundary Trails Health Centre.
- The increased capacity also decreased the wait times for MRI scans. See the Manitoba Health website for wait time information: http://www.gov.mb.ca/health/waittime/index.html
- There was a modest inverse relationship between MRI scan rates and PMR at the regional, district, and NC levels: the areas with the least healthy residents had the lowest MRI scan rates.
  - This trend is opposite what might be expected for most health services in a universal system, though the indications for MRI scans may not be correlated with overall health status as measured by PMR. Therefore, these results should not be interpreted as problematic.
- Analyses by income quintile showed significant linear relationships: MRI scan rates were lower among residents of lower income urban and rural areas, in both time periods (Appendix 2).
  - As with regional rates above, this pattern of lower rates among residents of lower income areas should not be interpreted as problematic, as the indications (or "need") for MRI scans may not be directly related to overall health status as measured by PMR.

Comparison to Other Findings

- The 2009 Atlas report also showed a doubling of MRI scan rates from the early 2000s to the mid–2000s (Fransoo et al., 2009). The further doubling of those rates by 2011/12 as shown here reflects just how dramatically MRI scan rates have increased in Manitoba over the past decade: rates have quadrupled in most areas. However, these increases have not changed the gradient with income: in all time periods, residents of lower income areas had lower MRI scan rates than residents of higher income areas.

Figure 8.9.1: Magnetic Resonance Imaging (MRI) Scan Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+



1 indicates area's rate was statistically different from Manitoba average in first time period
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t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 8.9.2: Magnetic Resonance Imaging (MRI) Scan Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+

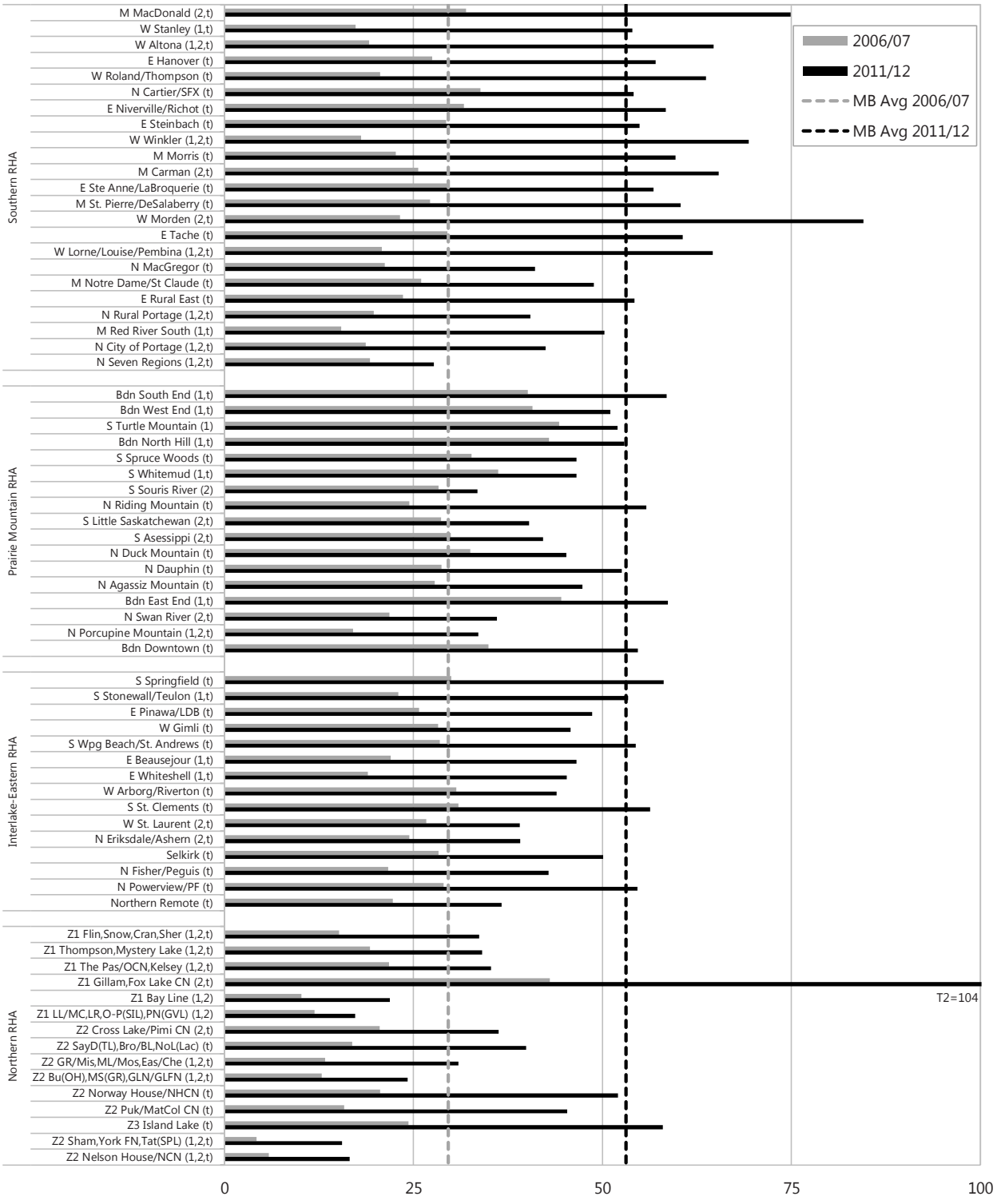
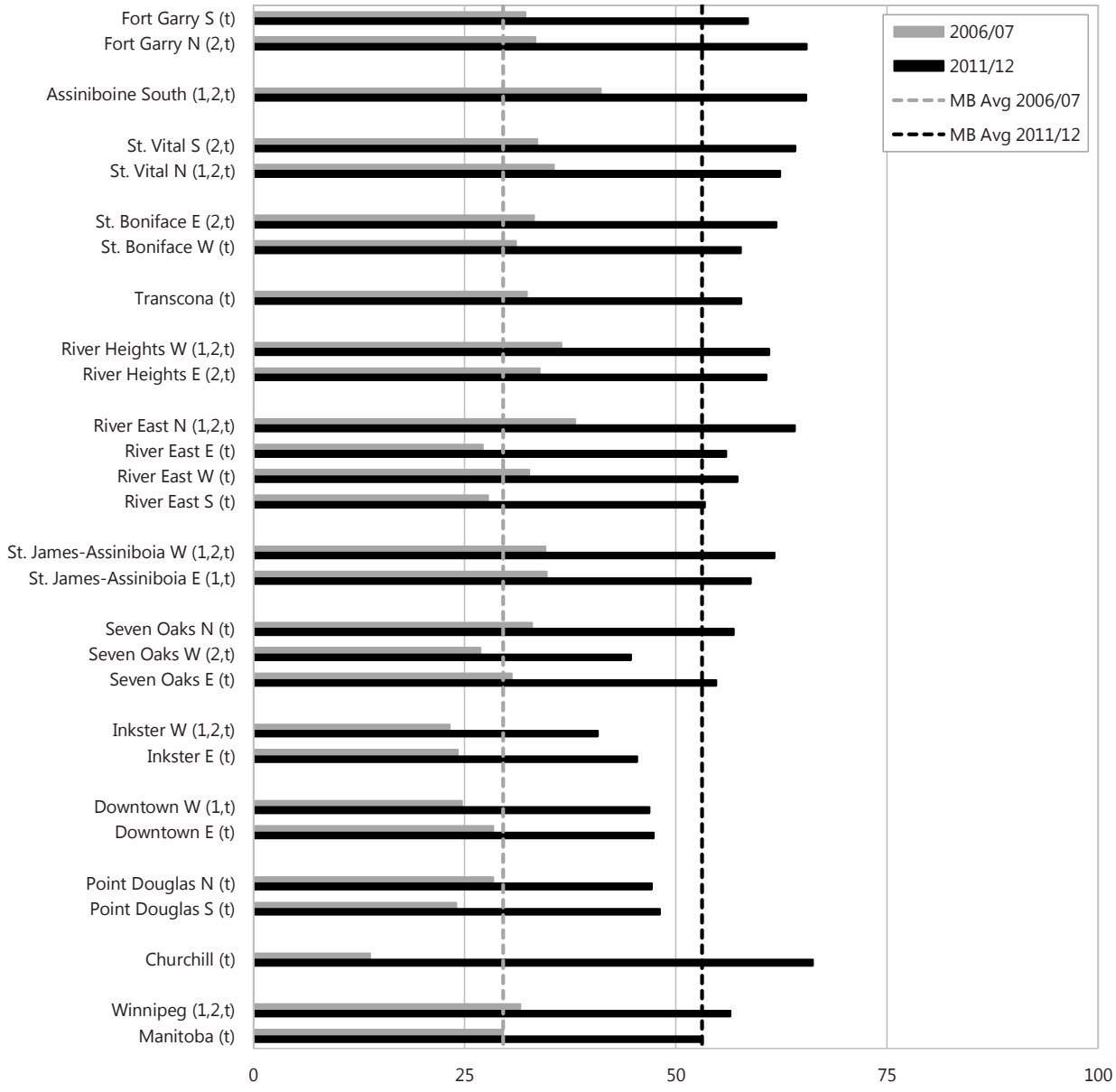


Figure 8.9.3: Magnetic Resonance Imaging (MRI) Scan Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate per 1,000 residents aged 20+



CHAPTER 9: USE OF PERSONAL CARE HOMES (PCHS)

Key Findings in Chapter 9

- All indicators in this chapter point to a decrease in the rates of use of **Personal Care Homes** (**PCHs**) in Manitoba, as was also shown in the 2009 Atlas report (Fransoo et al., 2009).
- **Personal Care Home** (**PCH**) **bed supply** per capita was basically stable over time. The exact values decreased slightly (but not significantly) over time because the population 75 years and older increased more than did the number of PCH beds.
- The proportion of the population 75 years and older being admitted to PCH and the proportion living in PCHs both decreased over time. The number of people involved actually increased slightly, but the population 75 and older increased even more, making the rates lower. These decreases may be related to the expansion of Home Care, Supportive Housing and other services.
- **Median wait times for admission to PCH** directly from hospital increased over time, whereas those for patients being admitted from the community were stable, albeit at higher values.
- There has been a slight increase in the level of care required by patients being admitted to PCH: a higher proportion of residents were admitted at level 3 not requiring close supervision, and a lower proportion at level 2 not requiring close supervision. The proportion of residents admitted at levels 2 and 3 requiring close supervision and level 4 were stable.
- **Median lengths of stay** (**by level of care**) **in PCH** decreased over time, though not for all levels of care.

Introduction

This chapter contains a number of indicators of the use of PCHs in Manitoba (also known as nursing homes). PCHs are residential facilities for people with significant chronic disease or disability, predominantly older adults.

Given ongoing efforts to delay **admission to PCHs** by providing adequate home care services and enabling people to live in the community longer, it is expected that there will be an overall decrease in the use of PCH services over the two time periods.

Indicators in this chapter are based on residents 75 years and older only as they comprise the vast majority of all residents of PCHs in Manitoba. In addition, the rates have all been age– and sex–adjusted (within the 75 and older population) to enable a fair comparison of regions within Manitoba that have different age and sex compositions. Most values are reported according to the region where the PCH is located because once a person is admitted to the PCH, they become residents of that region. Analyses were done for RHAs and Winnipeg community areas only because many districts of rural regions and Winnipeg neighbourhood clusters do not have any PCHs within their boundaries. Analyses were not done by income quintile because the quintiles are based on average area–level income reported to the Census, and income data are not collected for institutionalized persons (including PCH residents).

Data Issues

It is important to note that complete, individual–level data are not available for all PCH residents in Manitoba: there are facilities in First Nations communities in several regions that are operated by the federal government, or through transfer agreements, for which complete individual–level utilization data are not available. These beds are included in the bed supply analyses (as bed count data are available), but the use of these facilities cannot be included in other indicators (e.g., admissions, residents, etc.). Therefore, the results in this report are under–estimates of the true use of PCHs by residents of these areas.

Note Regarding Churchill

Seven beds in the Churchill Regional Health Centre function as a PCH, but this is not a truly separate, licensed PCH facility. Consequently, data are not reported exactly the same as for other PCHs. Churchill's population is quite small, especially its older adult population, so small numbers of events can cause large differences in rates. Many results for Churchill residents are suppressed due to small numbers.

9.1 Supply of PCH Beds (Provincial and Federal)

Definition: the average number of PCH beds per 1,000 residents 75 years and older. Provincial bed counts for 2005/06–2006/07 and 2010/11–2011/12 were taken from Manitoba Health data; federal bed counts were reported by each RHA. Values are not adjusted for age and sex, and statistical testing is not performed on supply measures.

Key Findings

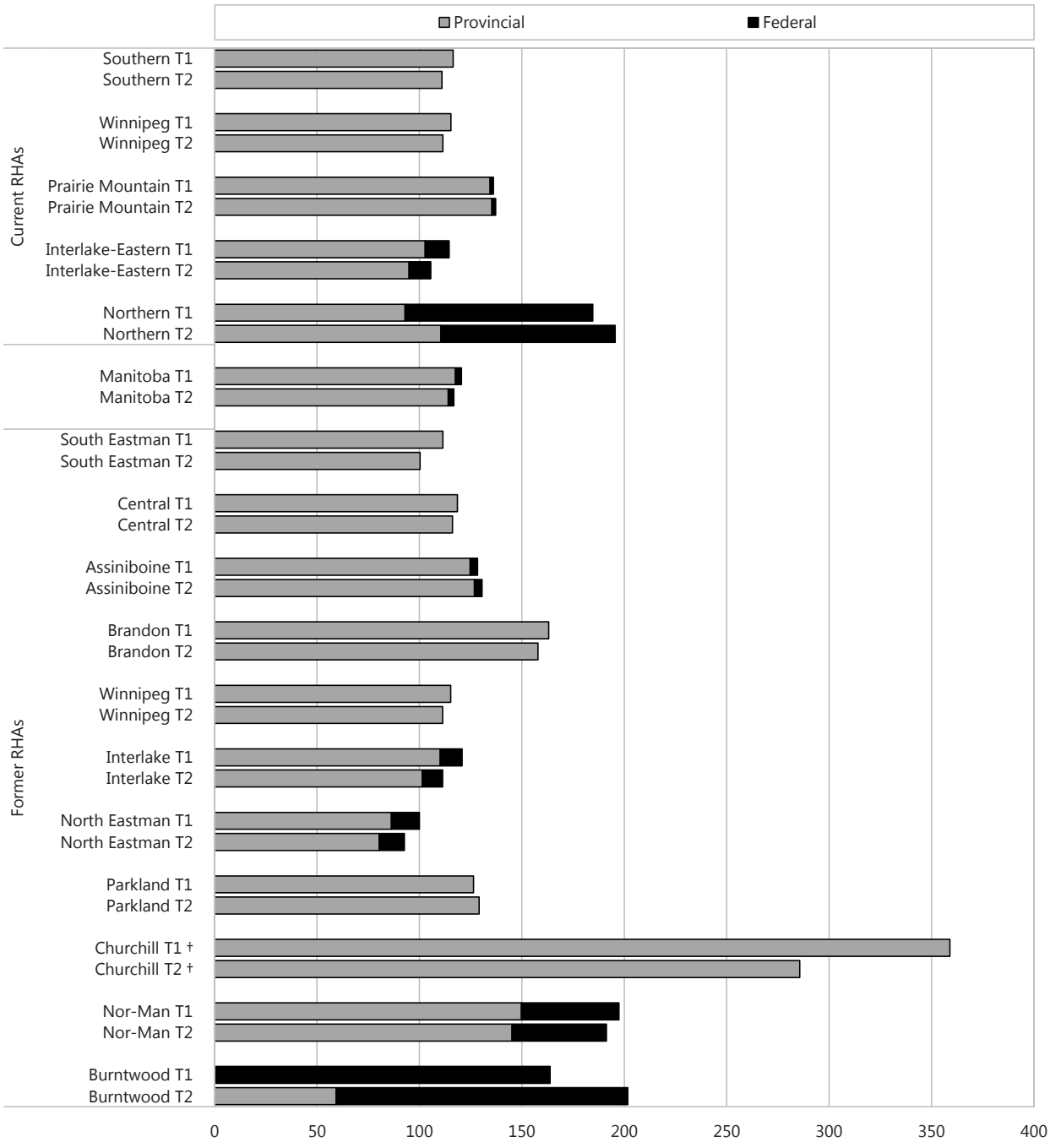
- Overall, the supply of PCH beds decreased slightly over time from 120 to 116 beds per 1,000 residents 75 years and older. The actual number of beds increased by 0.38% (37 beds), but the population 75 years and older increased by 3.5%.
- The largest change in PCH bed supply was in Northern region, increasing from 184 to 195 beds per 1,000 residents 75 years and older. This is largely the result of the Northern Spirit PCH opening in Thompson between the periods shown.
  - Northern region also has the largest supply of "federal" PCH beds, which did not change over time.
- There was no relationship between PCH bed supply and PMR, though the highest values were in Northern region.
- Among Winnipeg CAs, bed supply varied considerably—Assiniboine South and Downtown had the highest values, and Transcona and Fort Garry had the lowest.

Comparison to Other Findings

- These rates are consistent with previous research on PCH beds in Manitoba. In the 2009 Atlas, the number of PCH beds per 1,000 residents aged 75 and older was 130 in 1999/2000–2000/01 and 125 in 2004/05–2005/06 (Fransoo et al., 2009).

Figure 9.1.1: Personal Care Home Bed Supply by RHA, 2005/06–2006/07 and 2010/11–2011/12

Number of beds* per 1,000 residents 75+ years
T1=2005/06–2006/0 T2=2010/11–2011/12



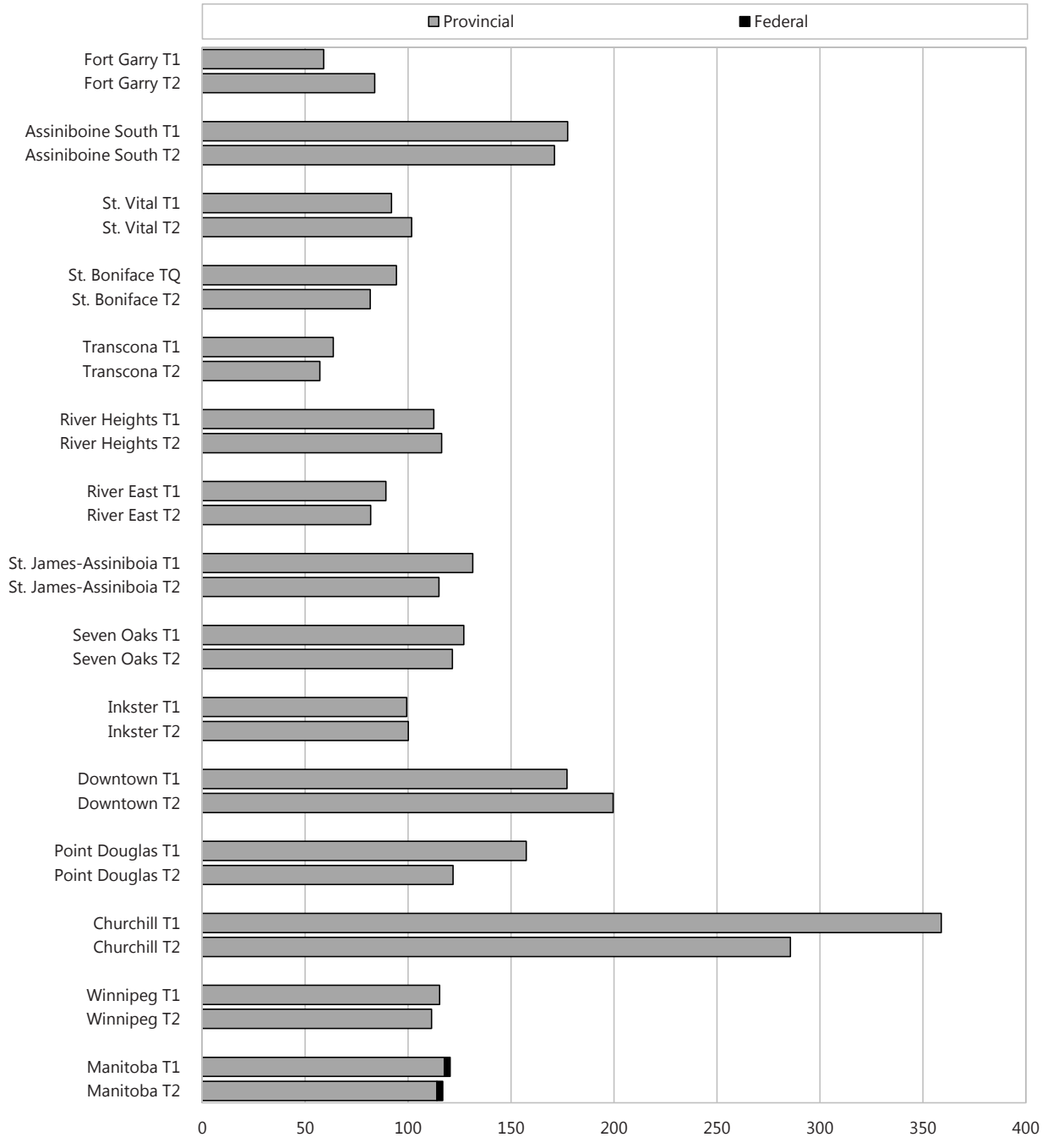
* statistical tests not performed

† the Churchill Health Centre has 28 beds, 7 of which serve as Personal Care Home beds

Figure 9.1.2: Personal Care Home Bed Supply by Winnipeg CA, 2005/06–2006/07 and 2010/11–2011/12

Number of beds* per 1,000 residents 75+ years

T1=2005/06–2006/07 T2=2010/11–2011/12



* statistical tests not performed

† the Churchill Health Centre has 28 beds, 7 of which serve as Personal Care Home beds

9.2 Admission to PCH

Definition: the percent of residents 75 years and older who were admitted to a PCH in a given year. Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH (current postal code and municipal code). Average annual values are shown for 2005/06–2006/07 and 2010/11–2011/12 and are age– and sex–adjusted to the population of Manitoba aged 75 and older in the first time period.

Key Findings

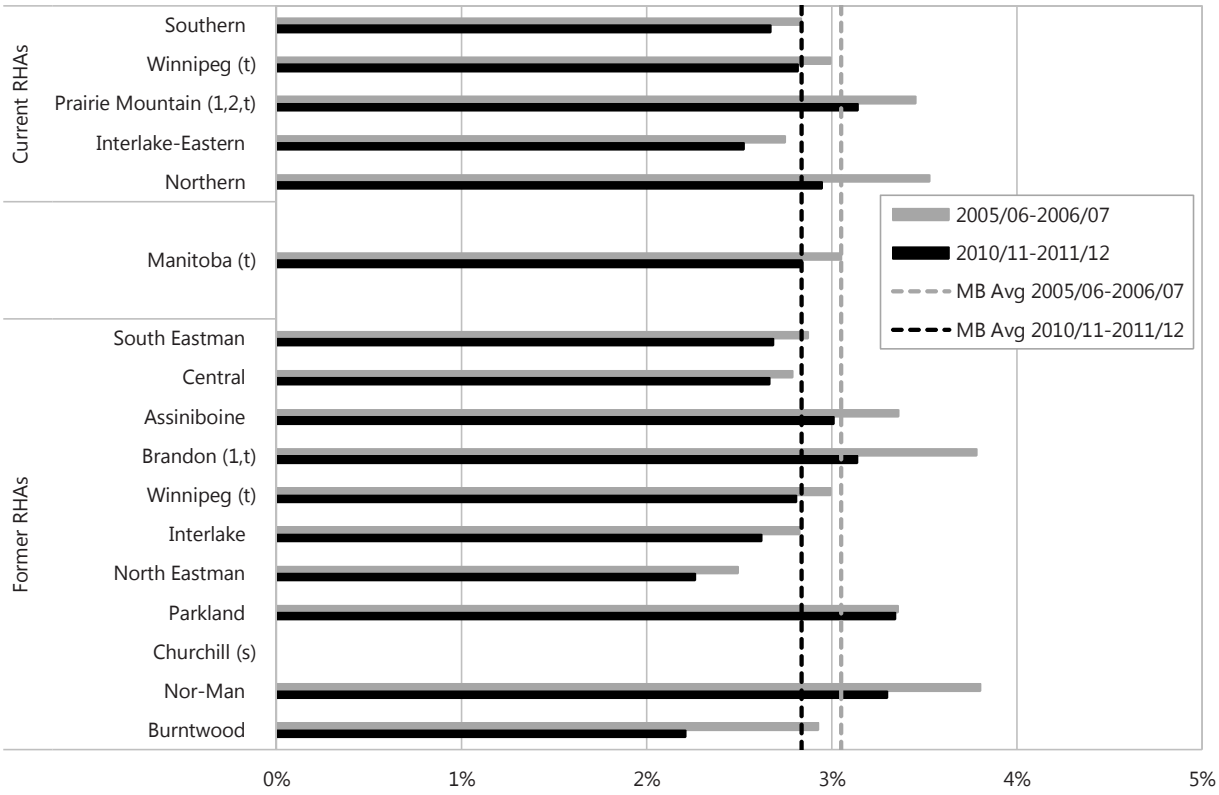
- Overall, there was a decrease in the percent of residents 75 years and older admitted to a PCH from 3.05% to 2.84%. The percent of admissions decreased in all regions, though most changes did not reach statistical significance.
  - It is worth noting that the crude rates (Appendix 2) reveal a stable proportion of 3% over time. Therefore, the decrease over time is caused by the statistical adjustment. That is, the population was older in the second time period, which might have prompted an expectation of an increase in rates; so the fact that it remained stable is what made the adjusted rate lower in time 2 than in time 1.
- PCH admission rates were not related to PMR. There was relatively little variation across regions, but substantial variation across CAs within Winnipeg.
- Admission rates were necessarily related to bed supply values, which vary considerably by region and across Winnipeg CAs (see Section 8.1).
  - This is because once a person is admitted to PCH, they become a resident of the area where the PCH is located.

Comparison to Other Findings

- These results are consistent with and extend those in the 2009 Atlas (Fransoo et al., 2009). In both time periods of both reports, the crude rates were about 3%, which suggests long–term stability in the proportion of residents 75 and older being admitted to PCH, despite the fact that the population is getting older (as noted above).

Figure 9.2.1: Admission to Personal Care Homes by RHA, 2005/06-2006/07 and 2010/11-2011/12

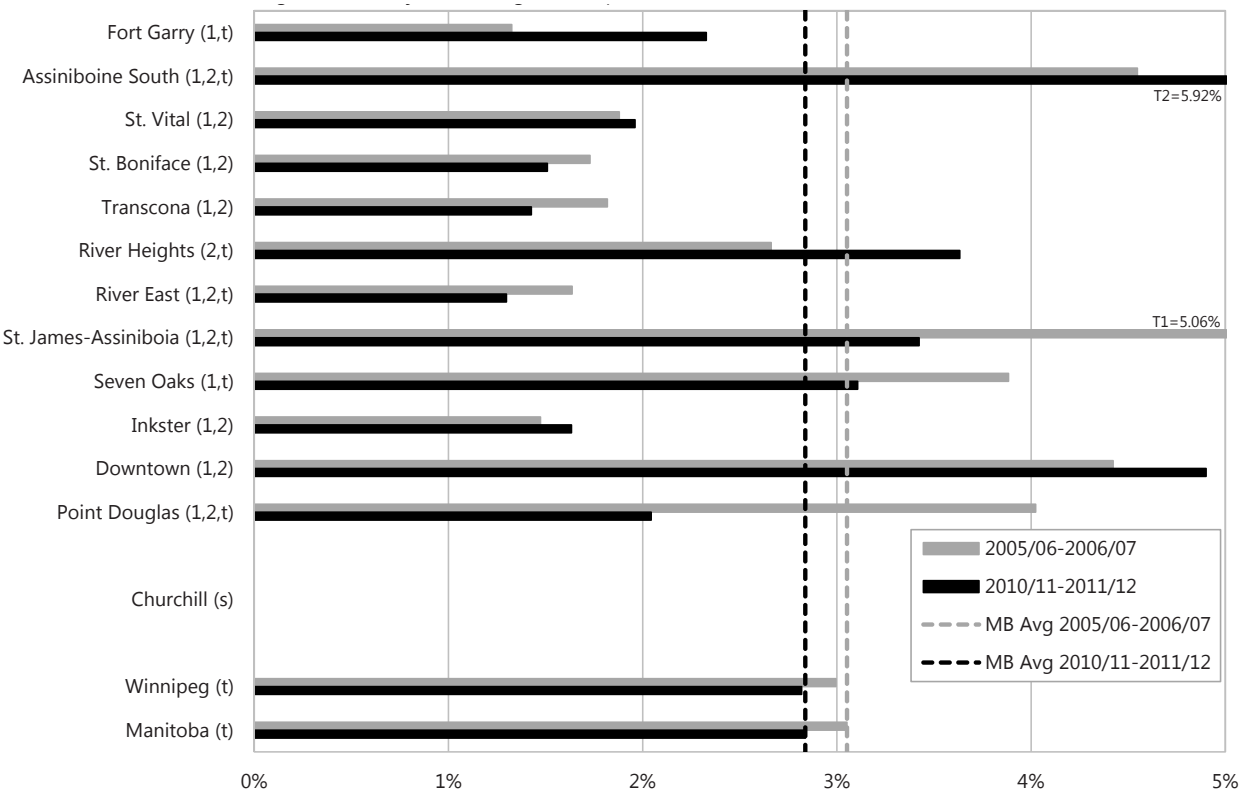
Age- and sex-adjusted average annual percent of residents 75+ admitted to a PCH



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 9.2.2: Admission to Personal Care Homes by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted average annual percent of residents 75+ admitted to a PCH



9.3 Residents in PCH

Definition: the percent of residents 75 years and older who lived in a PCH in a given year. Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH (current postal code and municipal code). Average annual values are shown for 2005/06–2006/07 and 2010/11–2011/12 and are age– and sex–adjusted to the population of Manitoba aged 75 and older in the first time period.

Key Findings

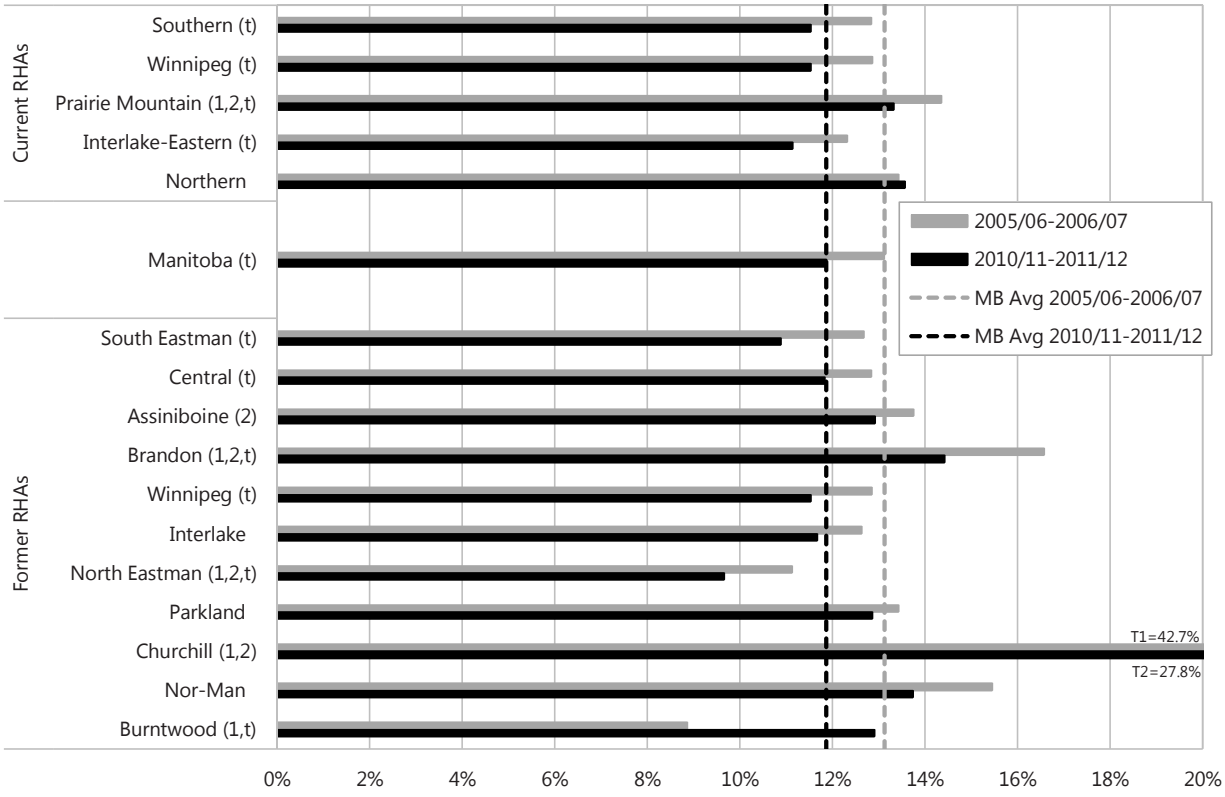
- Overall, there was a decrease in the percent of **PCH residents** 75 years and older, from 13.1% to 11.9%. This decrease was reflected in all regions except Northern, but rates varied considerably across former RHAs and across CAs in Winnipeg.
  - Rates for Churchill appear particularly high. This is largely due to two issues. First, as often happens in Churchill, these results involve a small number of people and a small base population. In both time periods, there were 10 residents in PCH. Second, Churchill PCH residents were younger than average, so their adjusted rates (42.7% and 27.8%) were much higher than their crude rates (25.6% and 20.4%; see Appendix 2).
- Among rural regions, there appears to be no relationship between the proportion of residents 75 years and older living in PCHs and PMR. Among CAs within Winnipeg, there appears to be some degree of positive relationship, with the notable exception of Assiniboine South.

Comparison to Other Findings

- These results are consistent with and extend the results in the 2009 Atlas (Fransoo et al., 2009), reflecting the ongoing decrease over time in the proportion of older adults living in PCHs.

Figure 9.3.1: Residents in Personal Care Homes by RHA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted average annual percent of residents 75+ living in a PCH



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t indicates change over time was statistically significant for that area
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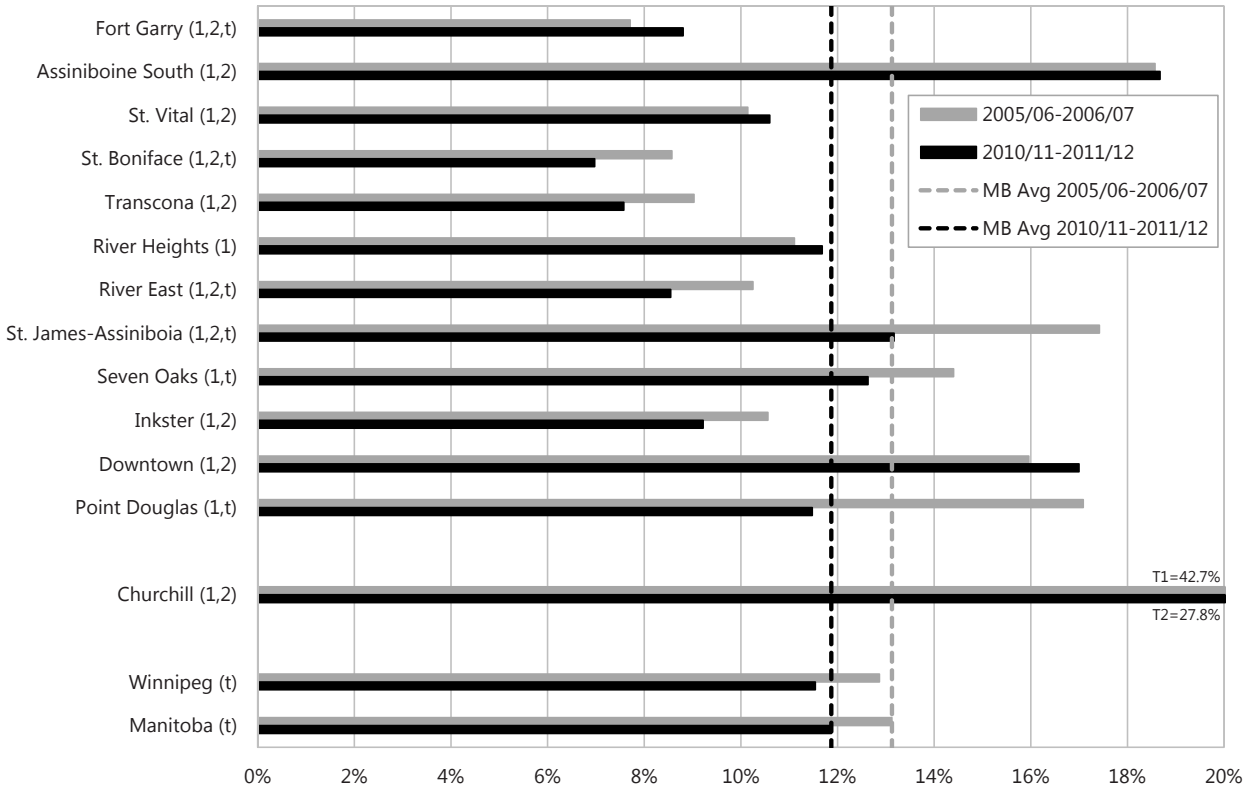
Figure 9.3.2: Residents in Personal Care Homes by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted average annual percent of residents 75+ living in a PCH



9.4 Median Waiting Times for PCH Admission from Hospital

Definition: the length of time (in weeks) spent by 50% of the residents of a PCH who were 75 years and older and waited in hospital for admission to that facility after being assessed as requiring PCH placement. Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH (current postal code and municipal code). Median values for 2005/06–2006/07 and 2010/11–2011/12 were adjusted for age, sex, RHA, and time period. For example, in 2010/11–2011/12, the median wait time for admission to PCH beds for residents in Manitoba hospital was 5.14 weeks, which means that half of all people admitted to a PCH waited less than 5.14 weeks from assessment to admission, while the other half waited longer. See Glossary for further details.

Key Findings

- There was a significant increase in median wait times for PCH admission from hospital from 2.89 weeks to 5.14 weeks. This increase was reflected in all regions.
- Wait times varied dramatically by region, but considerably less across the CAs within Winnipeg, many of which had lower than average wait times.
  - Wait times actually decreased somewhat in St. Boniface, but this change was not statistically significant.
- There was no relationship between wait times for PCH admission from hospital and PMR.

Comparison to Other Findings

- In the 2009 Atlas, wait times decreased over time, but were not separated into "from hospital" and "from community" groups as has been done in this report (Fransoo et al., 2009). About half of all admissions come from each group, but wait times differ dramatically being far lower for patients waiting in hospital versus waiting in community. Results shown here indicate that wait times from hospital increased over time.

Figure 9.4.1: Median Waiting Times for Personal Care Home Admission from the Hospital by RHA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted median number of weeks from assessment to admission by residence prior to admission per 1,000 residents 75+

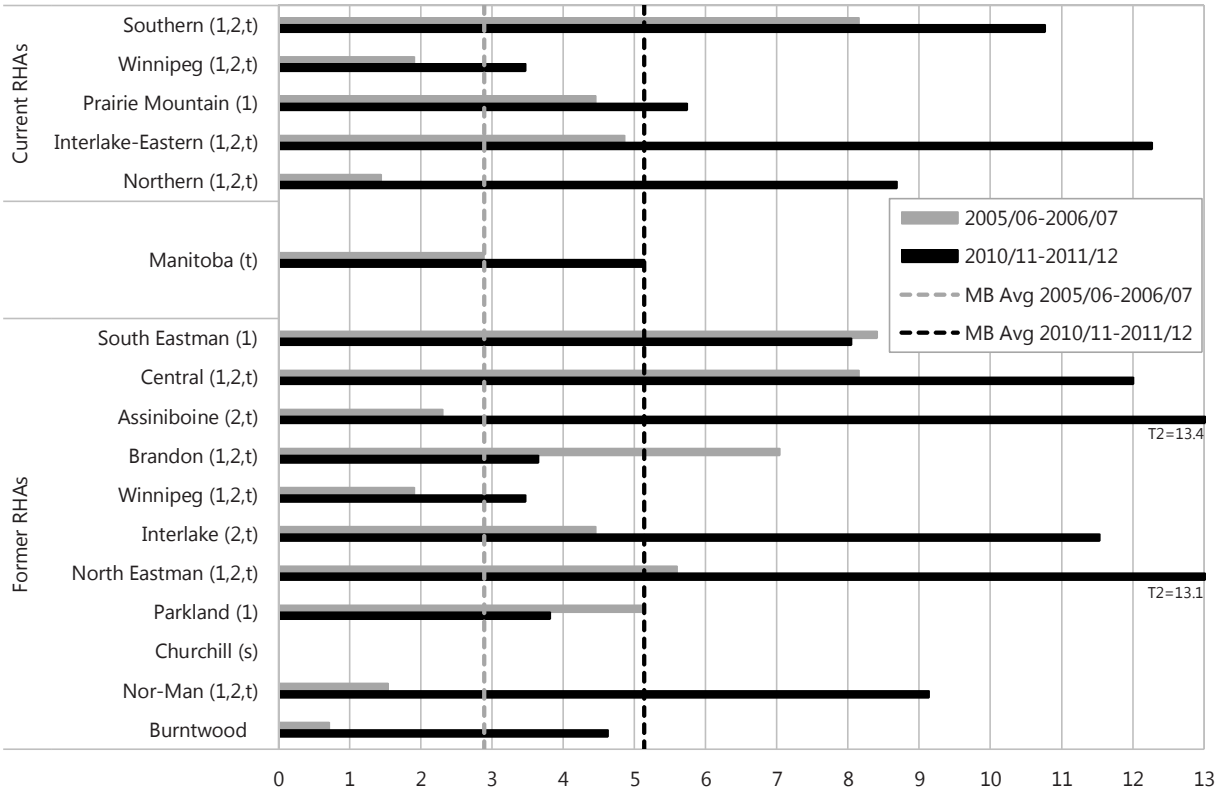


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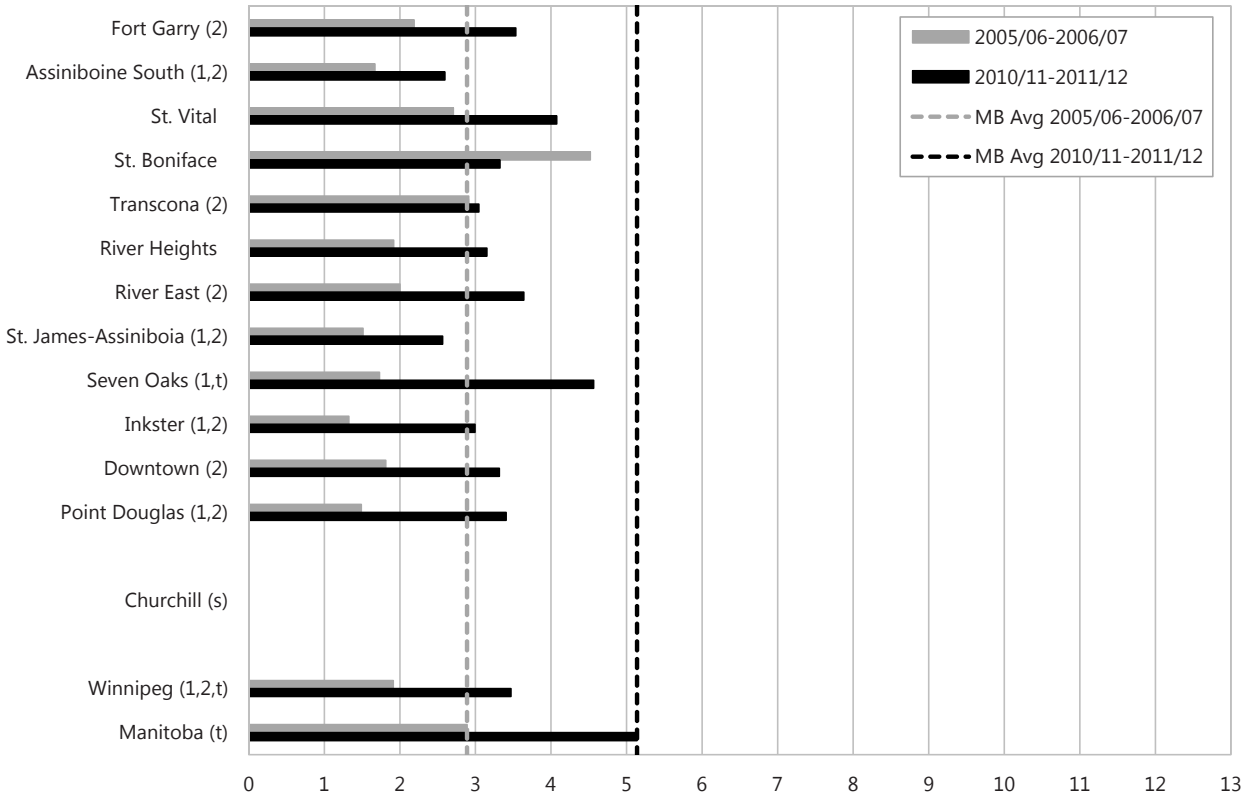
Figure 9.4.2: Median Waiting Times for Personal Care Home Admission from the Hospital by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted median number of weeks from assessment to admission by residence prior to admission per 1,000 residents 75+



9.5 Median Waiting Times for PCH Admission from the Community

Definition: the length of time (in weeks) spent by 50% of the residents of a PCH who were 75 years and older and waited in the community for admission to that facility after being assessed as requiring PCH placement. Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH (current postal code and municipal code). Median values for 2005/06–2006/07 and 2010/11–2011/12 were adjusted for age, sex, RHA, and time period. For example, in 2010/11–2011/12, the median wait time for PCH beds for community–dwelling residents in Manitoba was 11.25 weeks, which means that half of all people admitted to a PCH waited less than 11.25 weeks from assessment to admission, while the other half waited longer. See Glossary for further details.

Key Findings

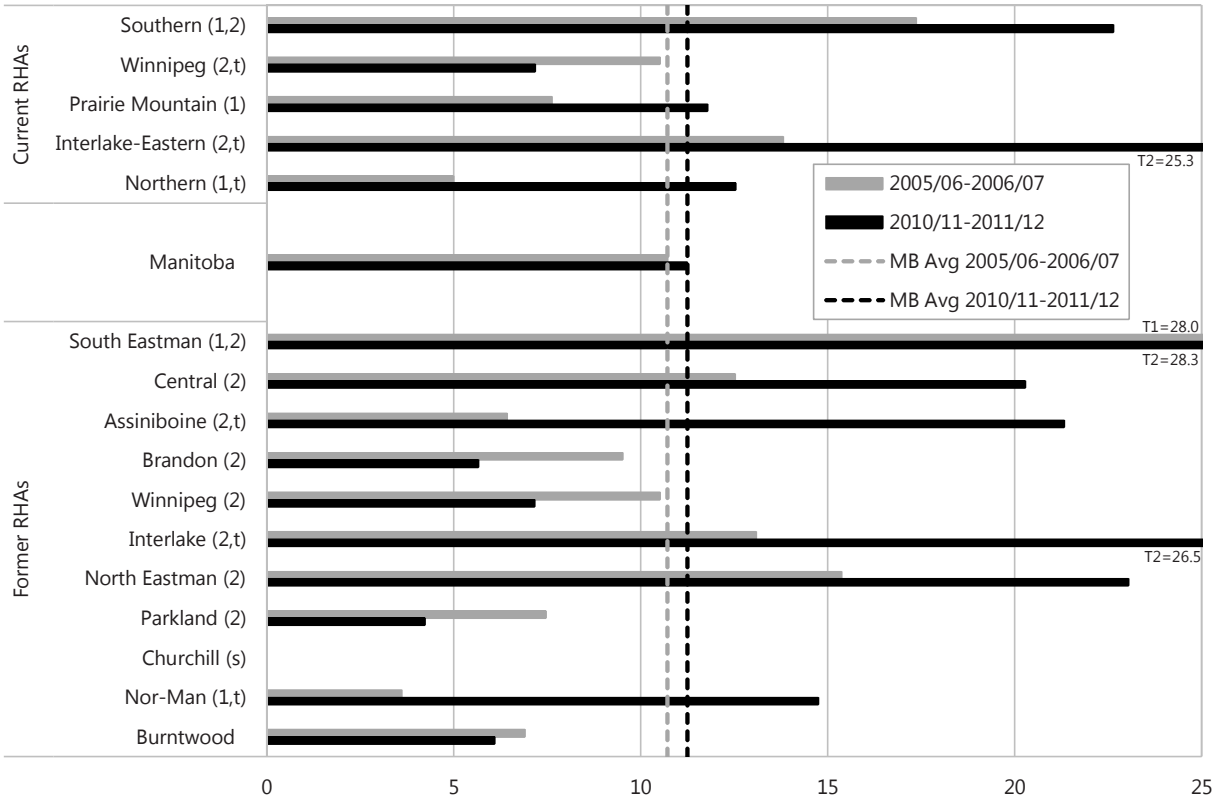
- Overall, median wait times for PCH admission from the community did not change over time; the small increase from 10.7 to 11.3 weeks was not statistically significant.
- However, the actual wait times, and how they changed over time, varied dramatically across rural regions and significantly within Winnipeg CAs.
  - Wait times decreased over time in Winnipeg, but increased in all other regions, though not all of those increases were statistically significant.
  - Increases over time were particularly large in Interlake–Eastern and Northern regions.
  - Wait times in Southern region were higher than average in both periods, especially among residents of the former South Eastman RHA, though the increase over time was not significant.
- There was no relationship between wait times for PCH admission from the community and PMR.

Comparison to Other Findings

- In the 2009 Atlas, wait times decreased over time, but were not separated into "from hospital" and "from community" groups as has been done in this report (Fransoo et al., 2009). About half of all admissions come from each group, but wait times differ dramatically being far lower for patients waiting in hospital versus waiting in the community. Results shown here indicate that wait times from the community did not change over time.

Figure 9.5.1: Median Waiting Times for Personal Care Home Admission from the Community by RHA, 2005/06-2006/07 and 2010/11-2011/12

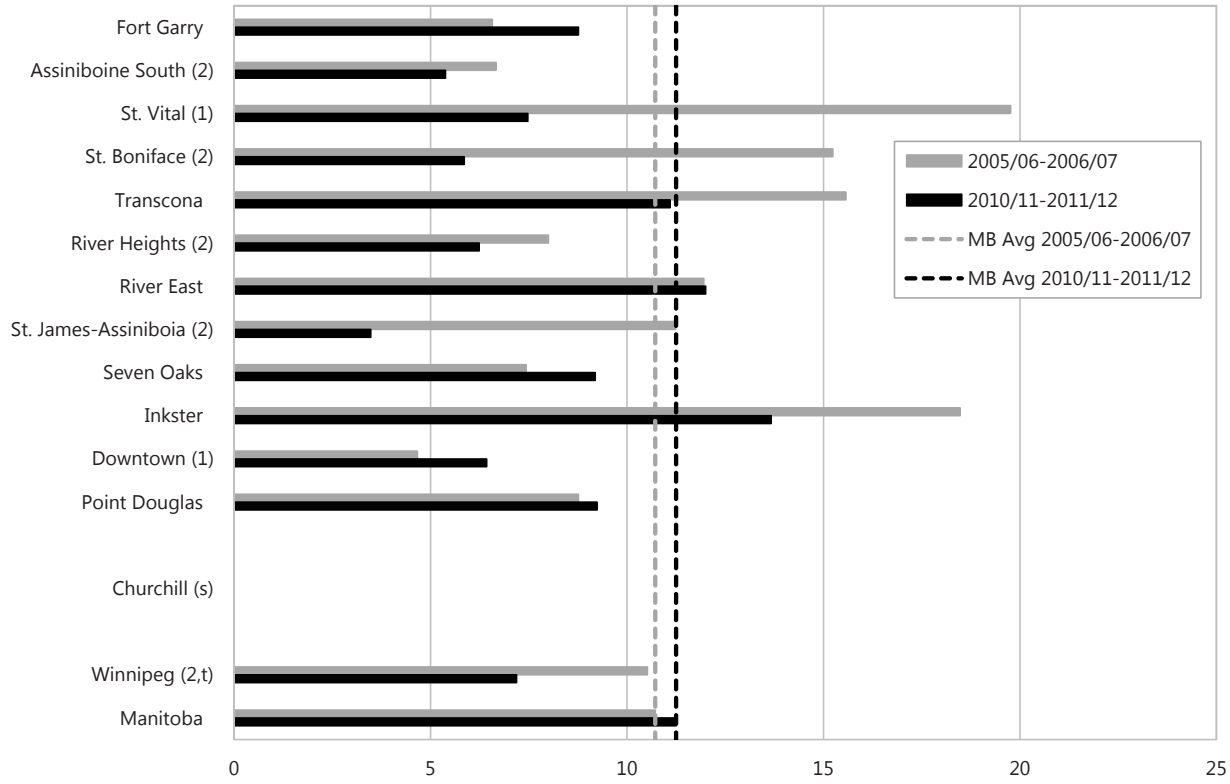
Age- and sex-adjusted median number of weeks from assessment to admission by residence prior to admission per 1,000 residents 75+



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 9.5.2: Median Waiting Times for Personal Care Home Admission from the Community by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Age- and sex-adjusted median number of weeks from assessment to admission by residence prior to admission per 1,000 residents 75+



9.6 Level of Care on Admission to PCH

Definition: the distribution of levels of care assigned to PCH residents who were 75 years and older at the time of their admission. Level 1 represents the lowest level of need and Level 4 represents the highest, though no Level 1 residents were admitted during the study years. Levels 2 and 3 are stratified into residents whose assessment indicated a need for close supervision due to possible behavioural issues ("2Y" or "3Y") and residents who did not require close supervision ("2N" or "3N"). Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH (current postal code and municipal code). Crude values are shown for 2005/06–2006/07 and 2010/11–2011/12. See Glossary for further details.

Key Findings

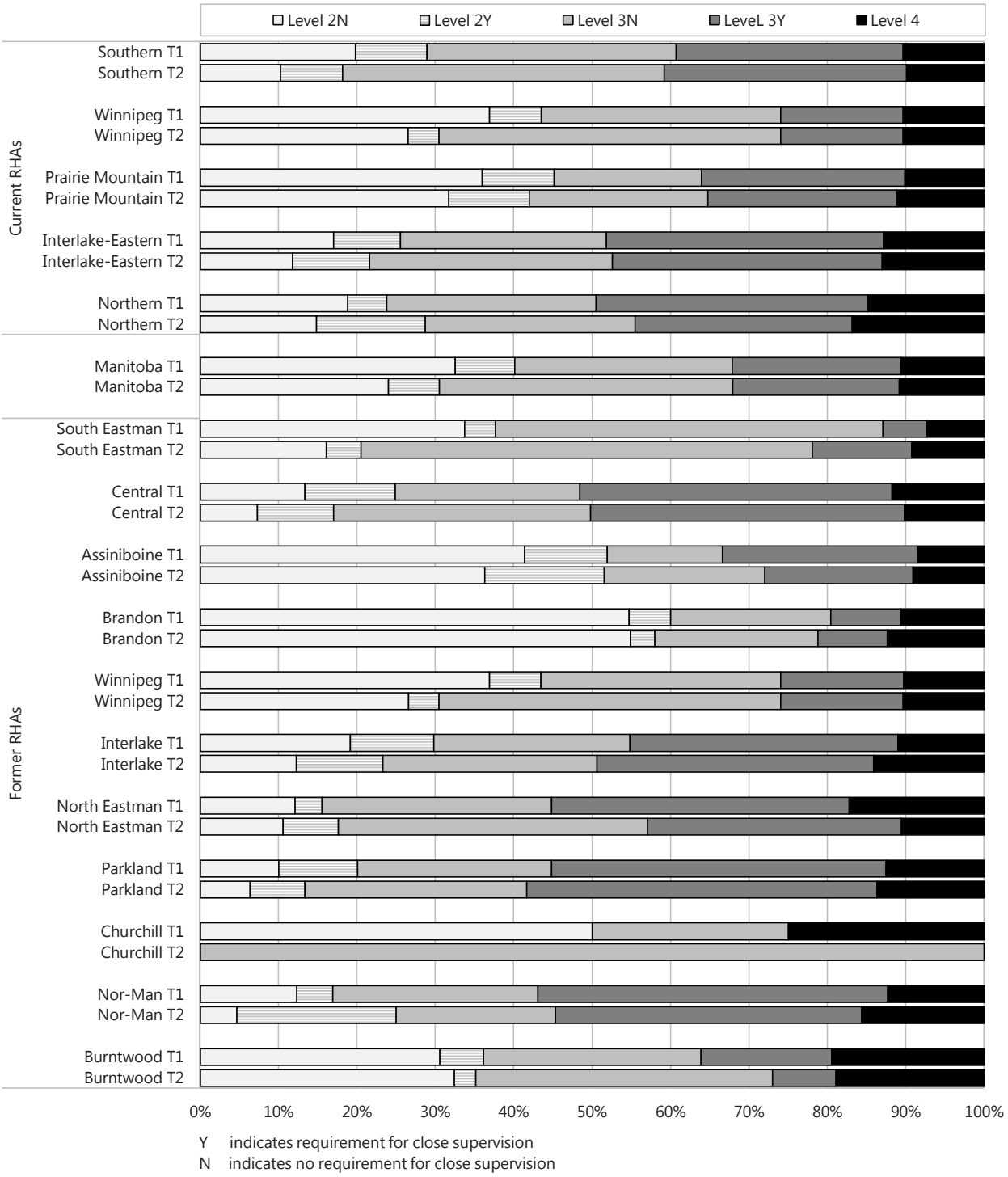
- Overall, there was an increase in the level of care on admission to PCHs, with a reduction in level 2 admissions and a corresponding increase in level 3 admissions. This overall increase was reflected in all regions, though values and changes over time varied considerably by region.
  - Level 2 admissions not requiring close supervision (2N) decreased from 32.5% to 24.0%.
  - Level 2 admission requiring close supervision (2Y) decreased from 7.59% to 6.46%
  - Level 3 admissions not requiring close supervision (3N) increased from 27.7% to 37.5%.
  - Level 3 admissions requiring close supervision (3Y) were stable at 21.6% and 21.2%.
  - Level 4 admissions were stable at 10.6% to 10.9%.
- Within Winnipeg, there was remarkable consistency in the distribution of level of care across the community areas, and all areas saw a general decrease in the proportion of level 2 admissions over time, as well as an overall increase in Level 3 admissions overtime.
- There appears to be no relationship between level of care on admission to PCH and PMR.

Comparison to Other Findings

- These results are consistent with and extend the findings of the 2009 Atlas (Fransoo et al., 2009), reflecting that the level of care on admission to PCHs continues to increase over time.

Figure 9.6.1: Level of Care on Admission to Personal Care Home for Residents Age 75+ by RHA, 2005/06-2006/07 and 2010/11-2011/12

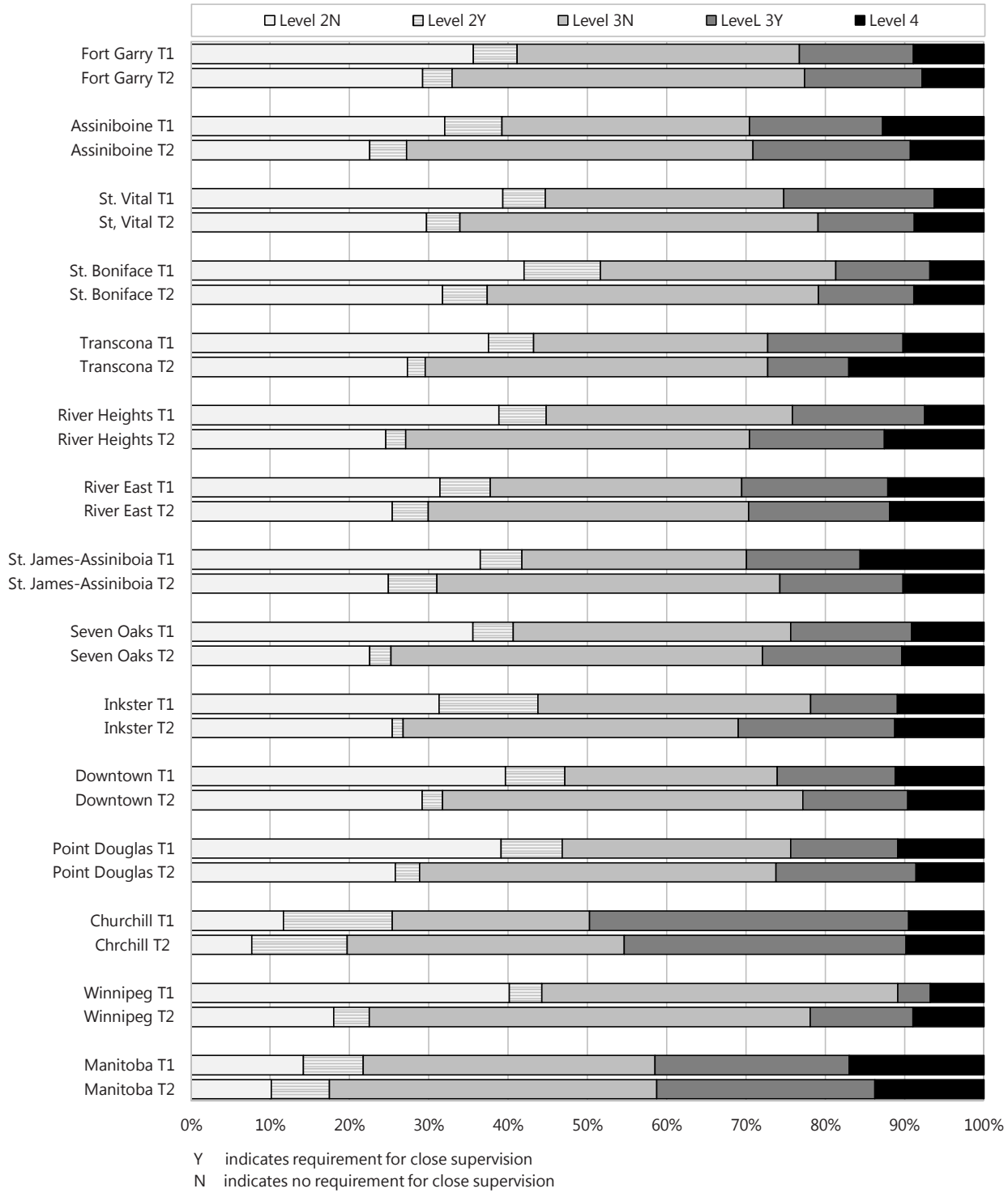
T1=2005/06-2006/07 T2=2010/11-2011/12



Y indicates requirement for close supervision
N indicates no requirement for close supervision

Figure 9.6.2: Level of Care on Admission to Personal Care Home for Residents Age 75+ by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

T1=2005/06-2006/07 T2=2010/11-2011/12



Y indicates requirement for close supervision
N indicates no requirement for close supervision

9.7 Median Length of Stay by Level of Care on Admission to PCH

Definition: the median length of stay (in years) of PCH residents who were 75 years and older according to their level of care on admission. The median length of stay is the amount of time which 50% of all residents spent in PCH before leaving the facility. The overall median length of stay for patients leaving PCHs in 2010/11–2011/12 in Manitoba was 2.21 years. This indicates that 50% of residents lived in a PCH for less than 2.21 years, while the other half lived in a PCH longer. Level 1 represents the lowest level of need, and Level 4 represents the highest. Levels 2 and 3 are stratified into residents whose assessment indicated a need for close supervision due to possible behavioural issues ("2Y" or "3Y") and those who did not ("2N" or "3N"). Area of residence was assigned based on where people lived at the time, which is determined by the location of the PCH. Crude values are shown for residents leaving a PCH in 2005/06–2006/07 and 2010/11–2011/12. See Glossary for further details.

Key Findings

- Overall, the median length of stay in PCH decreased over time from 2.45 to 2.21 years. A decrease was seen in all regions except Northern, though the only significant decrease in overall medians was in Winnipeg.
  - However, there were a number of other significant changes over time at the various levels and by region.
- Interestingly, the direction of the changes over time varied by level of care: there were decreases for patients admitted at Level 3N and 4, but increases for patients admitted at Level 2N, 2Y, and 3Y.
- There was a gradient with level of care in both time periods. Residents admitted at higher levels of care had shorter stays, though the relationships were not perfectly linear.

Comparison to Other Findings

- These results and trends are consistent with the overall findings from the 2009 Atlas (Fransoo et al., 2009), though the results here show some variability across levels that was not seen in the 2009 Atlas.

Table 9.7.1: Median Personal Care Home Length of Stay in Years by Level of Care by RHA, 2005/06-2006/07 and 2010/11-2011/12

Level of care and requirement for close supervision* assessed on admission to personal care home

	Period	All Levels	Level 1 & Level 2N	Level 1 & Level 2Y	Level 3N	Level 3Y	Level 4
Current RHAs							
Southern	**2005/06-2006/07**	2.48	3.34	1.60	2.86	1.19	1.77
Southern	**2010/11-2011/12**	2.24	4.60 (t)	2.72	1.80 (t)	2.05 (t)	1.46
Winnipeg	**2005/06-2006/07**	2.46	3.23	1.37	2.49	1.29	1.67
Winnipeg	**2010/11-2011/12**	2.14 (t)	3.21	3.15 (t)	1.69 (t)	2.00 (t)	1.38
Prairie Mountain	**2005/06-2006/07**	2.41	3.10	1.06	2.66	1.05	2.24
Prairie Mountain	**2010/11-2011/12**	2.31	3.11	2.08 (t)	1.86 (t)	1.81 (t)	1.63
Interlake-Eastern	**2005/06-2006/07**	2.69	3.57	1.02	3.32	0.744	1.52
Interlake-Eastern	**2010/11-2011/12**	2.23	6.37 (t)	2.69 (t)	2.41	1.85 (t)	1.56
Northern	**2005/06-2006/07**	1.64	2.49	s	1.40	1.10	1.01
Northern	**2010/11-2011/12**	1.99	2.53	2.13	1.36	2.19	1.40
Manitoba	**2005/06-2006/07**	2.45	3.23	1.35	2.66	1.18	1.71
Manitoba	**2010/11-2011/12**	2.21 (t)	3.32	2.69 (t)	1.76 (t)	1.96 (t)	1.51
Former RHAs							
South Eastman	**2005/06-2006/07**	2.62	3.17	s	2.56	s	1.97
South Eastman	**2010/11-2011/12**	2.35	4.45	2.73	1.64 (t)	1.15	2.12
Central	**2005/06-2006/07**	2.42	3.38	1.60	3.18	1.19	1.77
Central	**2010/11-2011/12**	2.18	4.61	2.68	2.07 (t)	2.14 (t)	1.46
Assiniboine	**2005/06-2006/07**	2.26	2.87	1.08	2.31	0.662	1.83
Assiniboine	**2010/11-2011/12**	2.33	2.93	1.86	1.63	1.88 (t)	2.08
Brandon	**2005/06-2006/07**	2.55	2.95	1.44	2.80	1.25	1.83
Brandon	**2010/11-2011/12**	2.64	3.19	2.92	1.70 (t)	1.83	2.59
Winnipeg	**2005/06-2006/07**	2.46	3.23	1.37	2.49	1.29	1.67
Winnipeg	**2010/11-2011/12**	2.14 (t)	3.21	3.15 (t)	1.69 (t)	2.00 (t)	1.38
Interlake	**2005/06-2006/07**	2.65	3.57	1.02	3.15	0.660	1.99
Interlake	**2010/11-2011/12**	2.42	6.29 (t)	2.69	2.78	1.88 (t)	1.25
North Eastman	**2005/06-2006/07**	2.86	3.54	s	3.51	1.23	1.07
North Eastman	**2010/11-2011/12**	1.86 (t)	7.53	s	1.78 (t)	1.82	1.97
Parkland	**2005/06-2006/07**	2.51	4.33	0.811	2.92	1.21	2.68
Parkland	**2010/11-2011/12**	1.89 (t)	6.48	2.85 (t)	2.04	1.73	1.08 (t)
Churchill	**2005/06-2006/07**	s	s	s	s	s	s
Churchill	**2010/11-2011/12**	s	s	s	s	s	s
Nor-Man	**2005/06-2006/07**	1.81	3.54	s	1.51	1.31	0.937
Nor-Man	**2010/11-2011/12**	2.35	2.53	1.65	2.06	1.88	2.82
Burntwood	**2005/06-2006/07**	1.43	2.14	s	0.288	0.340	1.14
Burntwood	**2010/11-2011/12**	1.53	2.11	s	0.830	2.21 (t)	0.832

* indicates requirement (Y) or no requirement (N) for close supervision

t indicates statistically significant change from the first to the last time period at $p<0.05$

s indicates data suppressed due to small numbers

Table 9.7.2: Median Personal Care Home Length of Stay in Years by Level of Care by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Level of care and requirement for close supervision* assessed on admission to personal care home

Winnipeg CA	Period	All Levels	Level 1 & Level 2N	Level 1 & Level 2Y	Level 3N	Level 3Y	Level 4
Fort Garry	**2005/06-2006/07**	2.09	2.33	1.09	2.14	1.28	2.26
Fort Garry	**2010/11-2011/12**	1.79	2.33	4.49 (t)	1.28	1.73	1.55
Assiniboine South	**2005/06-2006/07**	2.41	2.62	s	2.46	1.19	2.30
Assiniboine South	**2010/11-2011/12**	2.24	2.82	s	2.18	2.02	1.78
St. Vital	**2005/06-2006/07**	2.34	2.98	s	2.34	1.50	2.24
St. Vital	**2010/11-2011/12**	1.85	2.11	4.42	1.45	2.18	1.34
St. Boniface	**2005/06-2006/07**	2.48	3.06	s	2.68	0.770	2.44
St. Boniface	**2010/11-2011/12**	1.90	3.28	1.74	1.32 (t)	2.60 (t)	1.09
Transcona	**2005/06-2006/07**	2.37	3.40	2.18	1.48	s	1.13
Transcona	**2010/11-2011/12**	2.37	3.49	s	1.98	2.20	2.09
River Heights	**2005/06-2006/07**	2.56	3.40	0.764	2.35	1.66	2.04
River Heights	**2010/11-2011/12**	2.31	3.42	2.64 (t)	1.78	1.56	1.15
River East	**2005/06-2006/07**	2.35	2.58	0.989	3.01	1.44	0.862
River East	**2010/11-2011/12**	2.06	2.57	3.72	2.04 (t)	1.78	1.18
St. James-Assiniboia	**2005/06-2006/07**	2.37	3.73	1.73	1.74	1.32	0.526
St. James Assiniboia	**2010/11-2011/12**	1.98	2.68 (t)	2.24	1.52	2.10	1.55 (t)
Seven Oaks	**2005/06-2006/07**	2.42	3.09	2.03	2.29	0.731	1.40
Seven Oaks	**2010/11-2011/12**	2.13	3.20	3.84	1.40	1.32	1.96
Inkster	**2005/06-2006/07**	2.51	3.71	s	3.06	1.49	1.72
Inkster	**2010/11-2011/12**	2.65	3.99	s	1.15	3.15	1.54
Downtown	**2005/06-2006/07**	2.64	3.41	1.41	2.32	0.833	2.08
Downtown	**2010/11-2011/12**	2.54	4.05	3.78	1.81	2.34 (t)	2.14
Point Douglas	**2005/06-2006/07**	3.22	3.71	s	3.22	1.31	2.81
Point Douglas	**2010/11-2011/12**	2.50 (t)	4.24	4.91	1.68 (t)	2.23	1.41
Churchill	**2005/06-2006/07**	s	s	s	s	s	s
Churchill	**2010/11-2011/12**	s	s	s	s	s	s

* indicates requirement (Y) or no requirement (N) for close supervision

t indicates statistically significant change from the first to the last time period at $p<0.05$

s indicates data suppressed due to small numbers

CHAPTER 10: IMMUNIZATIONS AND PRESCRIPTION DRUG USE

Key Findings in Chapter 10

- The proportion of Manitobans aged 65 and older receiving **pneumococcal immunizations** and **influenza immunizations** decreased over time, though only the latter was a statistically significant decrease. These values suggest that new or additional efforts may be required to get immunization rates increasing again.
- Influenza immunization rates were significantly higher among higher income residents in both urban and rural areas. For pneumococcal immunizations, there was a significant gradient in rural areas, but not in urban areas.
- The two indicators of prescription drug use rates shown in this chapter were both stable over time: **pharmaceutical use** (the proportion of the population with at least one prescription dispensed) and the **number of different types of drugs dispensed** per user.
- Pharmaceutical use rates were not significantly related to income, but the number of different types of drugs dispensed was. Residents of lower income areas received more types of drugs, which may be appropriate given their demonstrated higher burden of illness.

Introduction

This chapter includes two indicators of immunizations for adults and two indicators of prescription drug use. The immunization indicators are derived from the immunization data provided by the **Manitoba Immunization Monitoring System (MIMS)**. The pharmaceutical use indicators are derived from the Drug Program Information Network (DPIN) data. These data include records for all prescriptions dispensed from community–based pharmacies in Manitoba. Data for drugs provided to patients while in hospital are not included, nor are drugs provided to PCH residents living in facilities serviced by hospital pharmacies.

Data for prescriptions dispensed from nursing stations improved dramatically in late 2004, as a result of improvements in information systems. However, this does not guarantee that all prescriptions provided to all residents served by these facilities are entered into the data system.

10.1 Influenza Immunization ("Flu Shots") Among Adults 65 and Older

Definition: the percent of residents aged 65 and older who received an influenza immunization ("flu shot") in a given year. Flu shots were defined by physician tariff codes 8791, 8792, 8793, or 8799 in the Manitoba Immunization Monitoring System (MIMS) data. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population aged 65 and older in 2006/07.

Key Findings

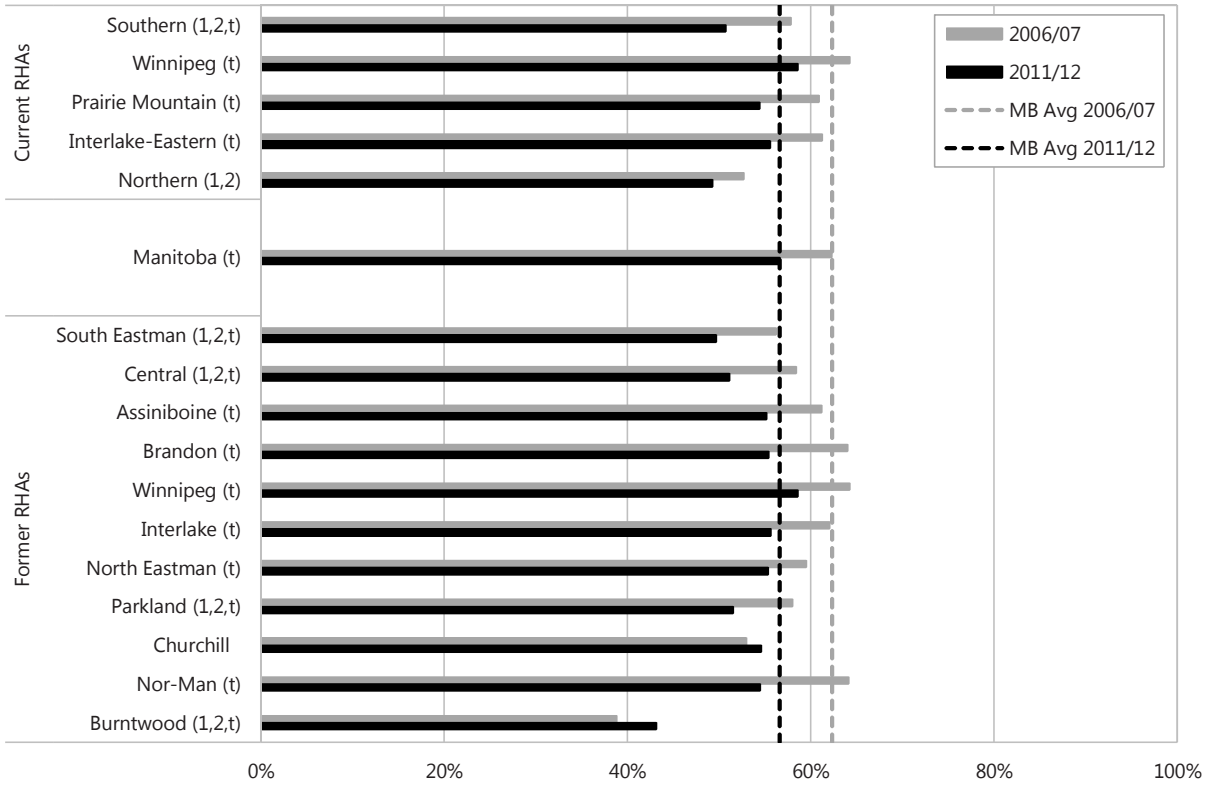
- The proportion of Manitoba residents aged 65 and older receiving a flu shot decreased from 62.3% to 56.6%. Decreases were seen in all regions, though the small decrease in Northern was not statistically significant.
  - It is possible that the low rates shown in some districts of Northern may be related to data capture issues.
- Rates do not appear to be related to health status at the regional, district, or NC levels. There was remarkably little variation across NCs in Winnipeg.
- There were significant associations between flu shot rates and income among urban and rural residents in both time periods: residents of lower income areas had lower influenza vaccination rates (Appendix 2).

Comparison to Other Findings

- The results shown here are almost exactly the opposite of those shown in the 2009 Atlas (Fransoo et al., 2009). The gains seen from the early to the mid–2000s (possibly related to reminder letters being sent) have been lost as of 2011/12.

Figure 10.1.1: Influenza Immunization Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received influenza vaccination



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 10.1.2: Influenza Immunization Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received influenza vaccination

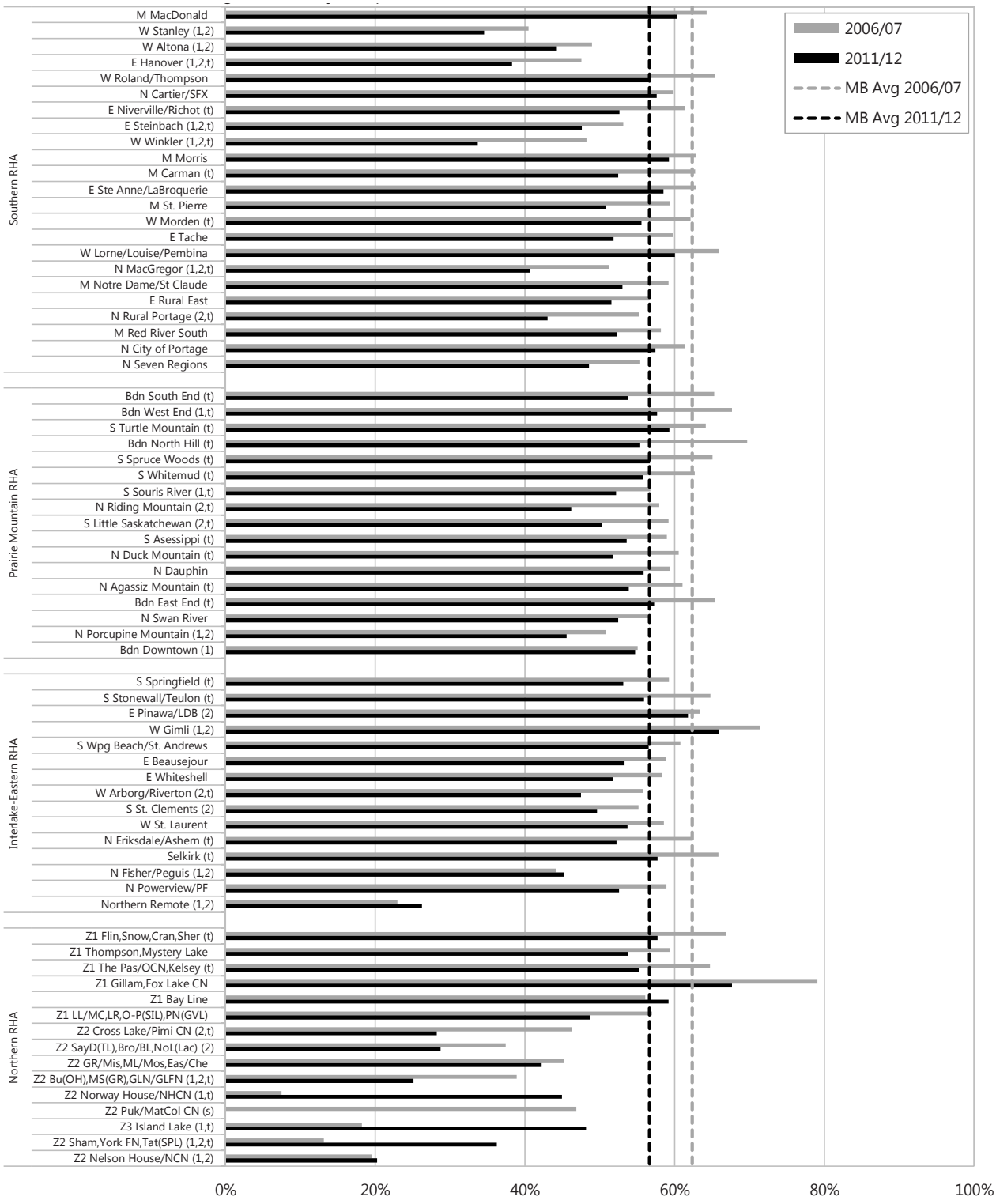
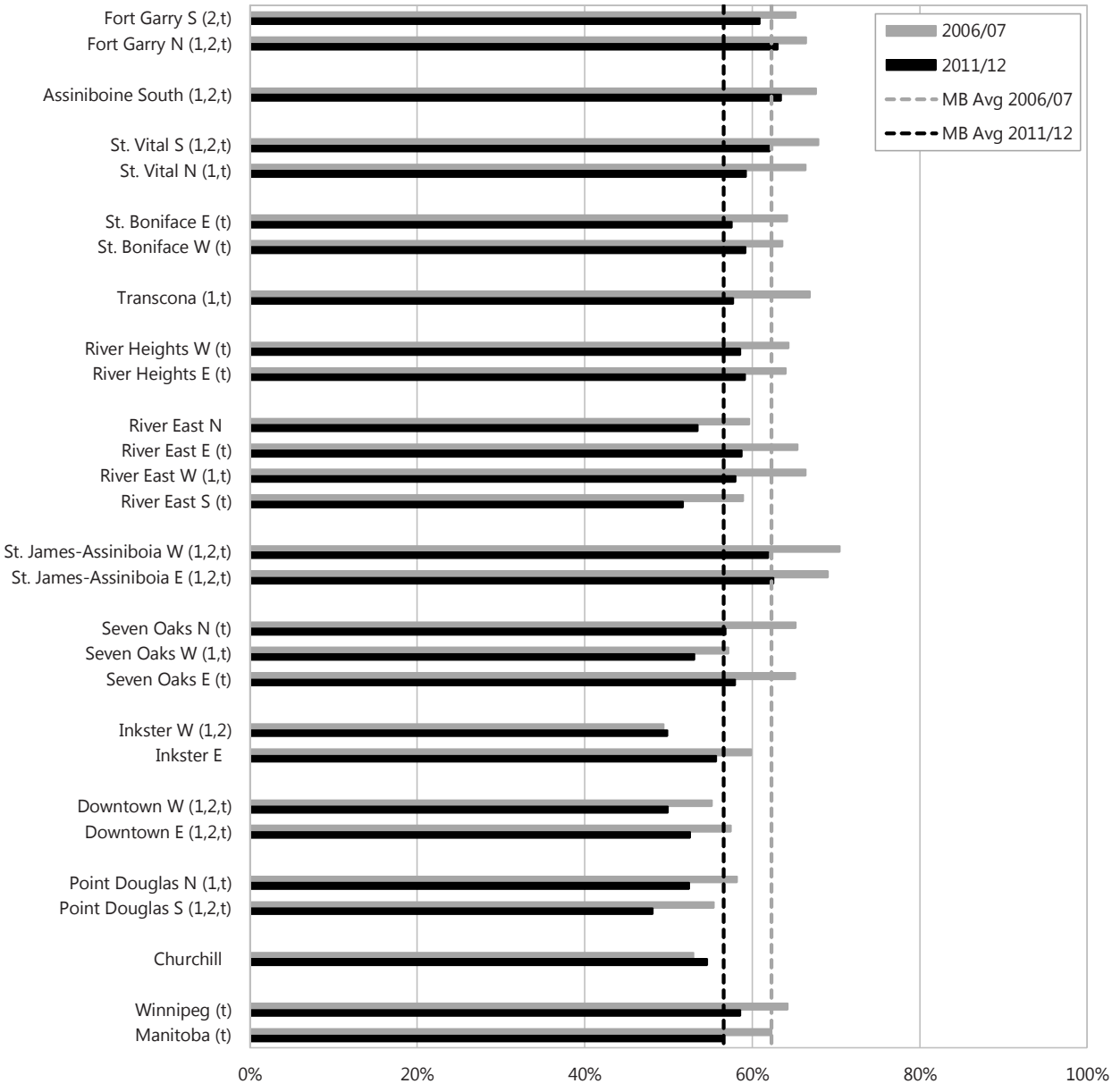


Figure 10.1.3: Influenza Immunization Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received influenza vaccination



10.2 Pneumococcal Immunization Among Adults 65 and Older

Definition: the percent of residents aged 65 and older who received an immunization for pneumonia. These rates show the cumulative percent of residents who ever had a pneumococcal vaccination, as this immunization is considered a once-in-a-lifetime event for most seniors. Pneumococcal vaccination was defined by physician tariff codes 8681–8684 or 8961 in MIMS data. Rates were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population aged 65 and older in 2006/07.

Key Findings

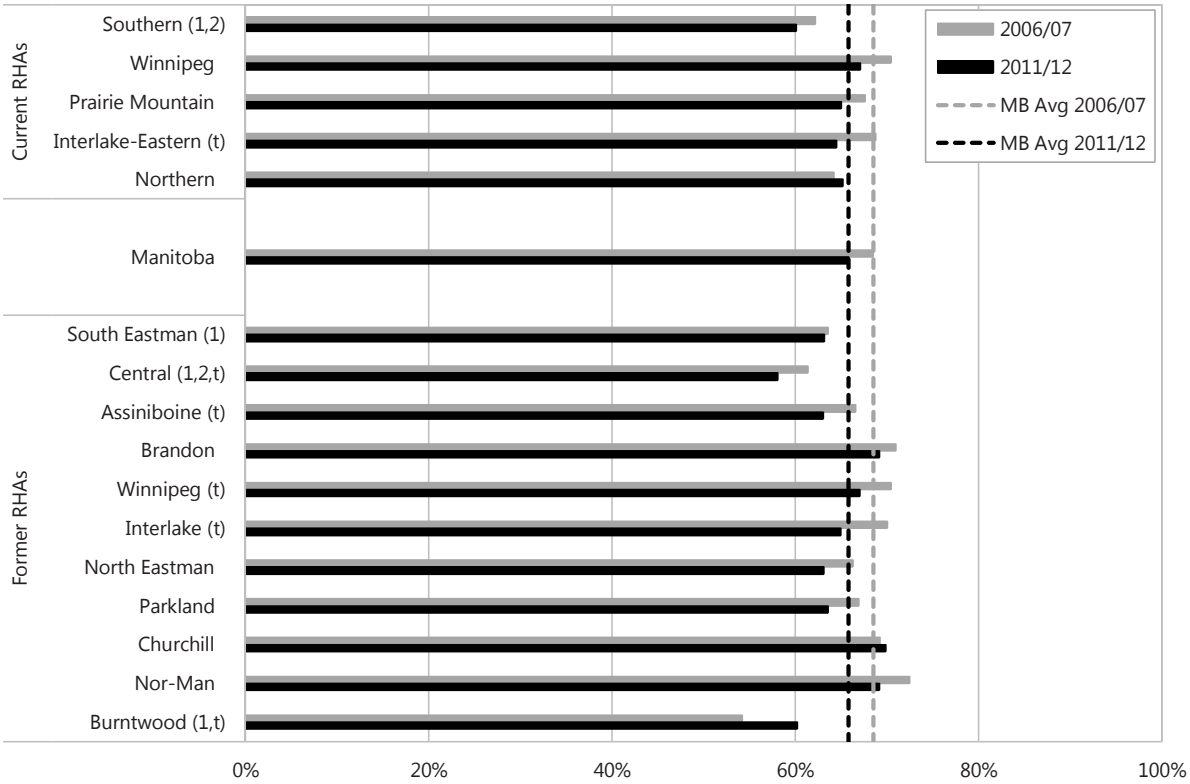
- The cumulative percent of residents aged 65 and older receiving a pneumococcal vaccination decreased slightly but not significantly from 68.5% to 65.8%. Rates declined slightly in all regions except Northern, though only the decrease in Interlake–Eastern was statistically significant over time.
- There appears to be no association between pneumonia vaccination rates and health status at the regional, district, or NC levels.
- There was particularly low variation across regions and across NCs within Winnipeg, but more variation across districts of rural regions.
- In urban areas, there was no relationship between pneumococcal vaccination rates and income (Appendix 2). However, among rural areas, there were significant gradients in both time periods with residents of lower income areas having lower vaccination rates.

Comparison to Other Findings

- These results suggest a stabilization of pneumococcal vaccination rates among adults in Manitoba. The 2009 Atlas reported a large increase from 23.6% to 58.7% (Fransoo et al., 2009); whereas values in this report are both higher and more stable, implying that rates may have peaked in the mid–2000s and are now leveling off (or perhaps decreasing slightly).

Figure 10.2.1: Pneumococcal Immunization Rate by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received a Polysaccharide (PPV-23) vaccination



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 10.2.2: Pneumococcal Immunization Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received a Polysaccharide (PPV-23) vaccination

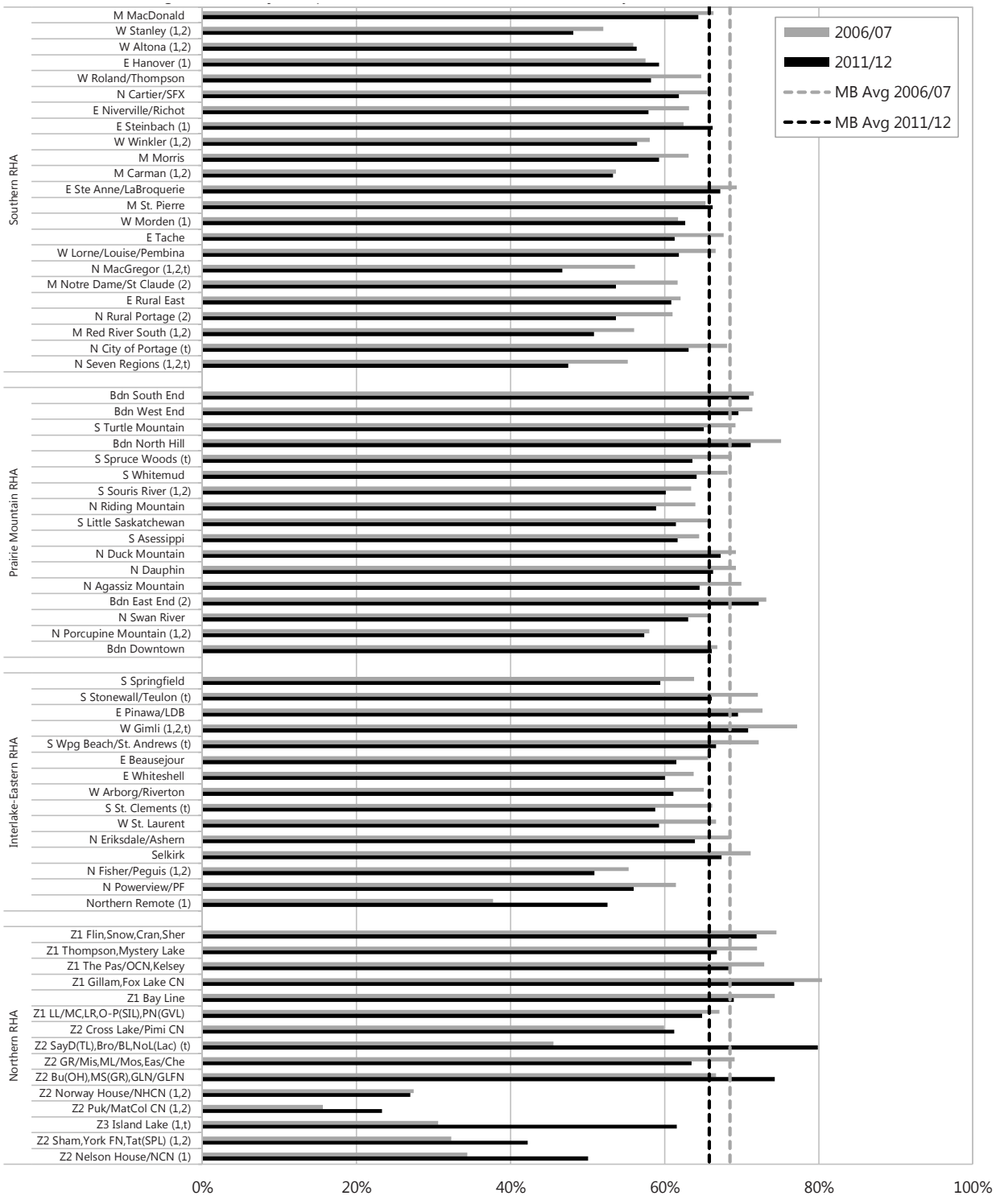
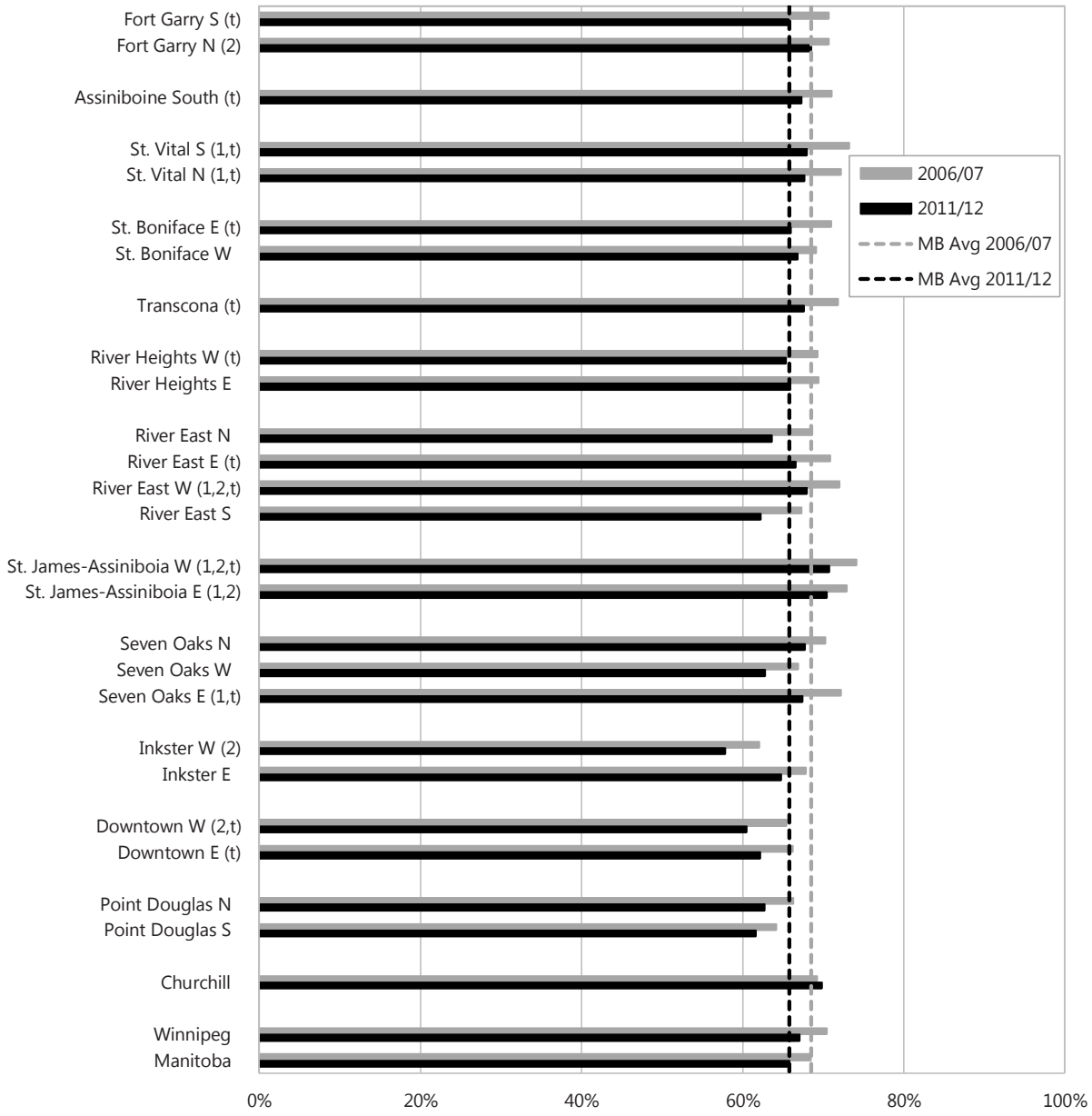


Figure 10.2.3: Pneumococcal Immunization Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents 65+ who received a Polysaccharide (PPV-23) vaccination



10.3 Pharmaceutical Use

Definition: the percent of residents (all ages) who had at least one prescription dispensed in a given year. This includes all prescriptions dispensed from community–based pharmacies across the province. Prescriptions were also limited to those covered by Manitoba Health's **Pharmacare Program** and prescriptions for over–the–counter drugs were excluded. Values were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07. See Glossary for further details.

Key Findings

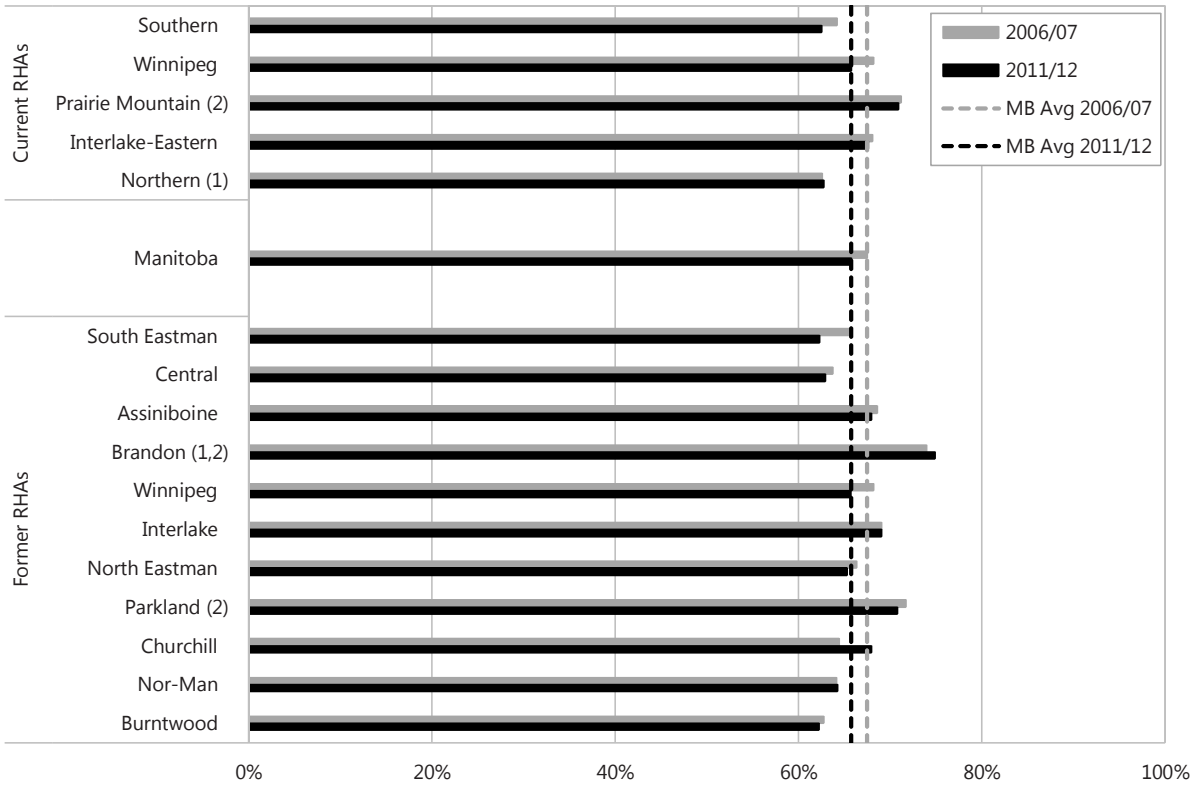
- The proportion of Manitobans with at least one prescription dispensed in a year was stable over time: the slight decrease from 67.5% to 65.7% was not statistically significant. This stability was reflected in rates for each region.
- There was remarkably little variation across regions and the NCs of Winnipeg, but slightly more variation among districts of rural regions.
- There was no relationship between pharmaceutical use and PMR rates at the regional, district, or NC levels.
- The lowest rates were seen in several of the least healthy districts within Northern region, but this may represent incomplete data capture for those residents rather than lower use of prescription drugs.
- Among urban residents, there were significant but modest relationship between drug use and income. Residents of lower income areas had higher rates, though this did not quite reach significance in the second time period. Among rural residents, there were no significant relationships with income.

Comparison to Other Findings

- The 2009 Atlas reported no change in pharmaceutical use rates, which were stable at 68.3% (Fransoo et al., 2009). The results of this report suggest that rates may have begun to decrease slowly over time.

Figure 10.3.1: Pharmaceutical Use by RHA, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one prescription dispensed for any drug



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 10.3.2: Pharmaceutical Use by District, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one prescription dispensed for any drug

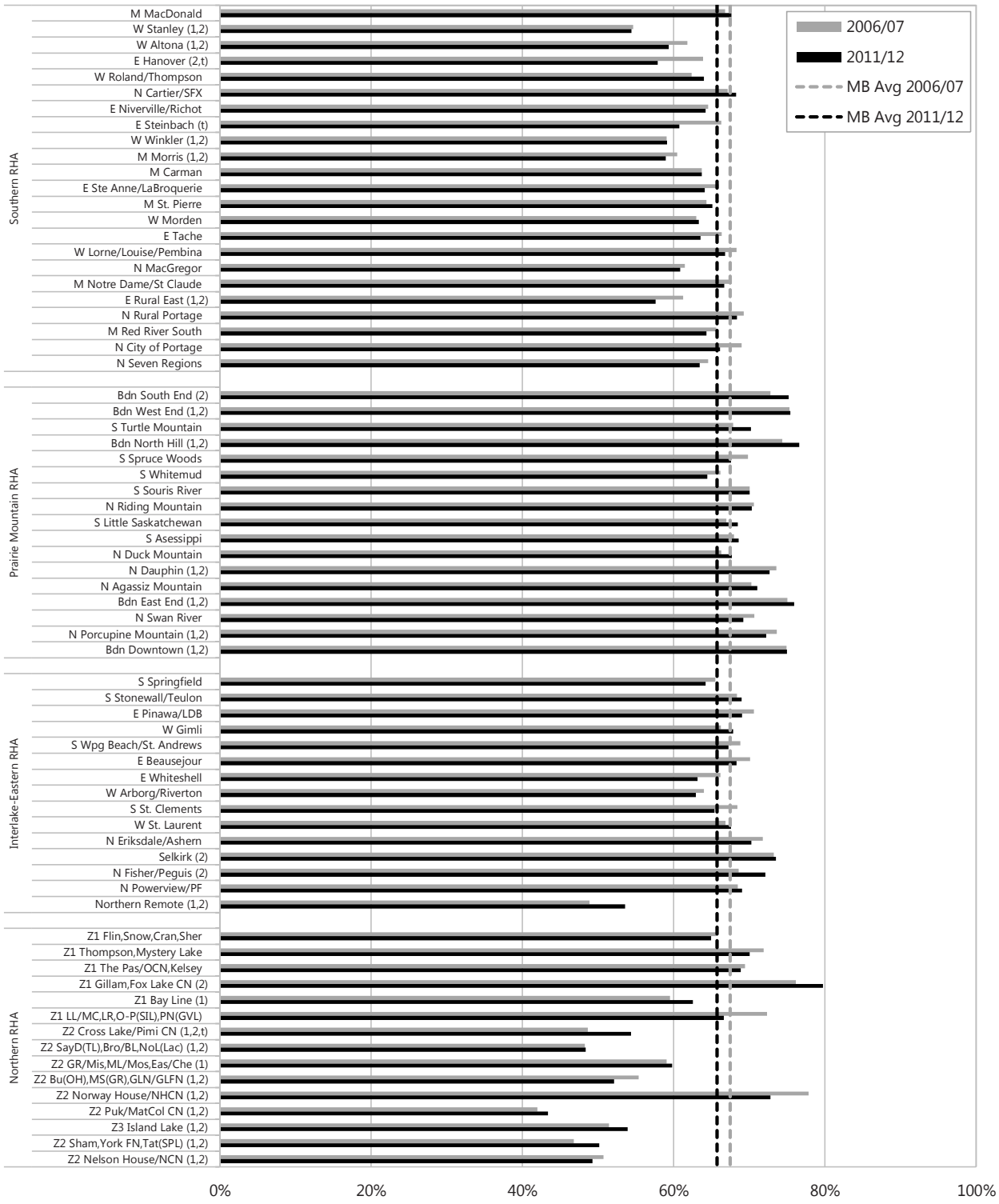
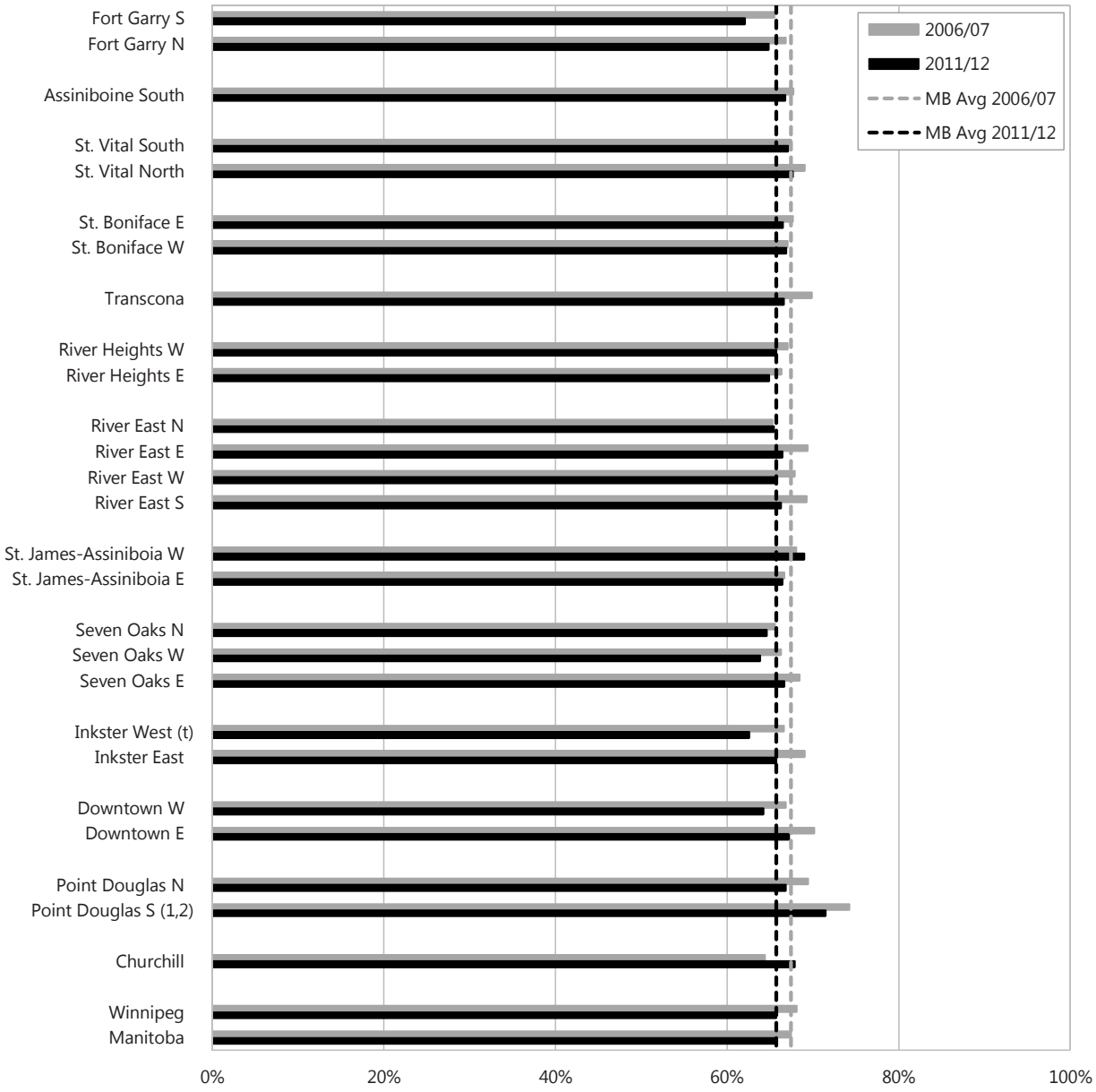


Figure 10.3.3: Pharmaceutical Use by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted percent of residents with at least one prescription dispensed for any drug



10.4 Number of Different Types of Drugs Dispensed per User

Definition: the average number of different types of drugs dispensed to each resident (all ages) who had at least one prescription in a given year. Each pharmaceutical agent that falls under a different fourth–level **Anatomic Therapeutic Chemical** (**ATC**) class is counted as a "different" drug. This ATC level separates drugs used for different health problems. A person who has several prescriptions for drugs in the same fourth–level ATC class is considered as having one drug type in that year. Values were calculated for 2006/07 and 2011/12 and were age– and sex–adjusted to the Manitoba population in 2006/07. See Glossary for further details.

Key Findings

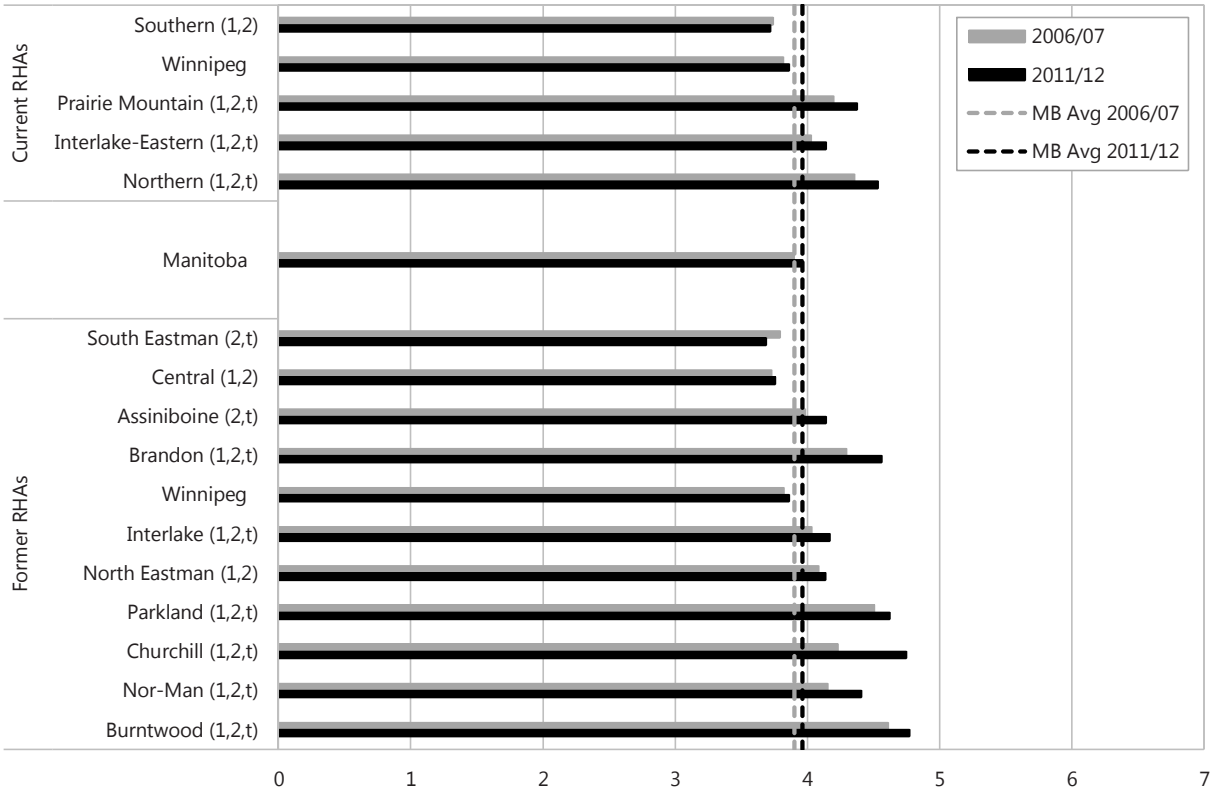
- The number of different drug types dispensed per user was stable overall: the slight increase from 3.90 to 3.96 was not statistically significant.
- Rates in Southern and Winnipeg were stable, whereas those in the other three regions increased significantly over time.
- Rates appear to be related to PMR at the regional, district, and NC levels with a higher number of different drugs being prescribed to residents of less healthy areas.
- The number of different drug types dispensed was strongly related to income in urban and rural areas in both time periods: residents of lower income areas used a higher number of different drug types (Appendix 2). This is consistent with their presumed higher need for healthcare given their poorer overall health status.
    - These trends, and in particular, the high rates among residents of the lowest income quintiles, suggest that provincial policies for prescription drug coverage appear to be working. Because without coverage, we would expect lower income residents to have low prescription drug use rates.

Comparison to Other Findings

The 2009 Atlas showed increasing rates over time (Fransoo et al., 2009), whereas the results shown here show a stable level of prescription drug use, which suggests that the number of different drugs prescribed may be leveling off near current values.

Figure 10.4.1: Number of Different Drug Types Dispensed by RHA, 2006/07 and 2011/12

Age- and sex-adjusted average number of different drugs used per resident with at least one prescription dispensed



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 10.4.2: Number of Different Drug Types Dispensed by District, 2006/07 and 2011/12

Age- and sex-adjusted average number of different drugs used per resident with at least one prescription dispensed

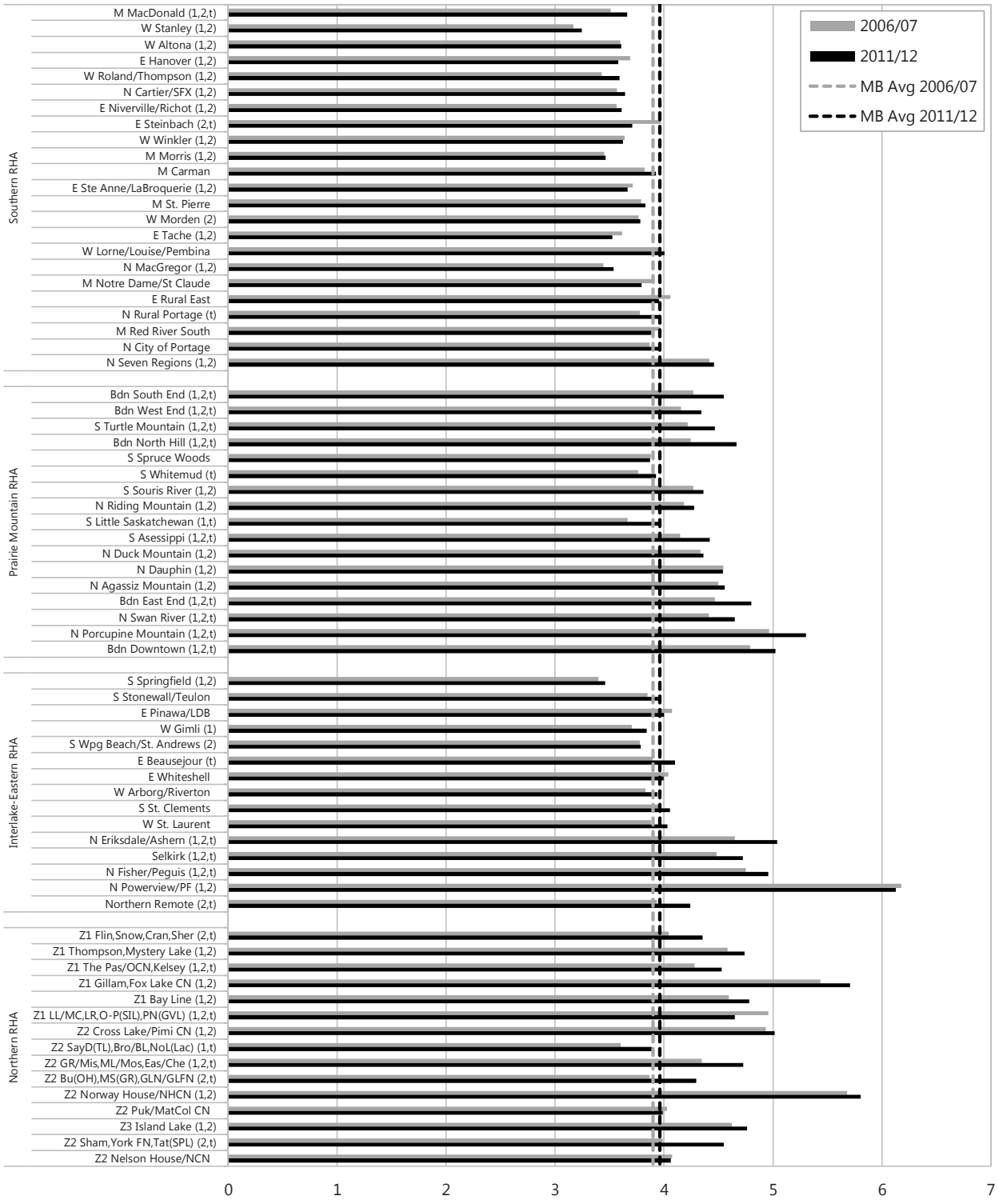
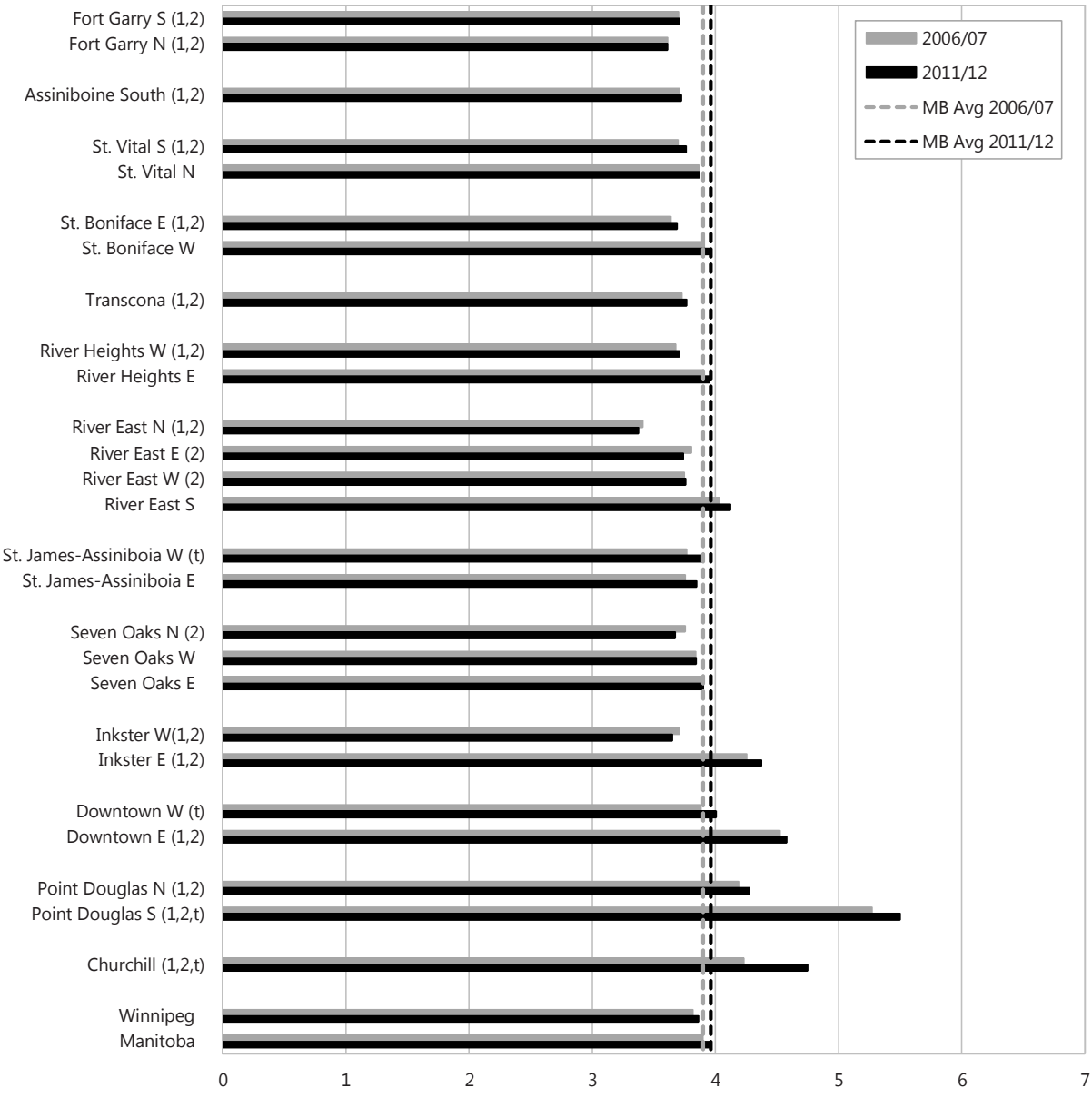


Figure 10.4.3: Number of Different Drug Types Dispensed by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted average number of different drugs used per resident with at least one prescription dispensed



CHAPTER 11: QUALITY OF PRIMARY CARE

Key Findings in Chapter 11

- Results from the quality indicators analyzed provide a mixed picture regarding changes in rates of quality of **primary care** over time:
  - Good news: A higher proportion of residents with diabetes received an annual eye exam, and a lower proportion of older adults living in PCH received prescriptions for benzodiazepines.
  - Bad news: There was a decrease in **antidepressant prescription follow–up** care.
  - No change: Rates were stable for **asthma care**, beta–blocker prescribing after heart attacks, and **benzodiazepine use** among older adults living in the community.
- Relationships with premature mortality rates and with income were mixed: some indicators showed strong trends, others showed weak trends or no association.
  - For diabetes care and post–AMI care, there were "negative" associations, indicating that residents of lower income areas were less likely to receive quality care.

Introduction

This chapter contains a number of indicators of the quality of primary care received by Manitoba residents. The indicators were adapted from MCHP's 2004 report *"Using Administrative Data to Develop Indicators of Quality in Family Practice"* (Katz, De Coster, Bogdanovic, Soodeen, & Chateau, 2004), with some revisions and up–to–date data.

Because all of the indicators in this chapter relate to quality of care, crude rates are shown, rather than adjusted rates, because good quality care should be provided to all patients regardless of age. (For most other indicators in this report, adjusted rates are used because many health conditions and health services are more common among older residents, so rates for different areas cannot be fairly compared without accounting for differences in age structure of local populations.)

11.1 Antidepressant Prescription Follow–Up

Definition: the percent of residents (all ages) with a physician diagnosis of depression (ICD–9–CM codes 296 or 311) and a new prescription for antidepressants (ATC class N06A) within two weeks who had at least three physician visits within four months of the prescription being filled. Crude percent was calculated for two 5–year periods: 2002/03–2006/07 and 2007/08–2011/12. See Glossary for further details.

Key Findings

- The rate of antidepressant prescription follow–up decreased over time[17] from 57.3% to 54.5%. Rates decreased in all regions, though the small decrease in Prairie Mountain region was not statistically significant.
- There was relatively little variation in rates across regions; and no relationship between antidepressant follow–up and PMR at the regional, district, or NC level.
- Northern had the lowest rates, but this should be interpreted with caution given previously mentioned challenges with data regarding physician visits for residents of Northern region (see Chapter 6).
- Relationships with income were non–linear, different in urban versus rural areas, and changed over time (Appendix 2).
    - In urban areas, in the first time period, residents of lower income areas were more likely to receive the follow–up visits. A similar trend was evident in the second time period, but did not reach statistical significance.
    - In rural areas, it was the opposite: residents of lower income areas were less likely to receive the follow–up visits in the first time period. The similar trend in the second time period was not statistically significant (though it was close).
        - Note: The data issues for Northern residents also affect these trends.

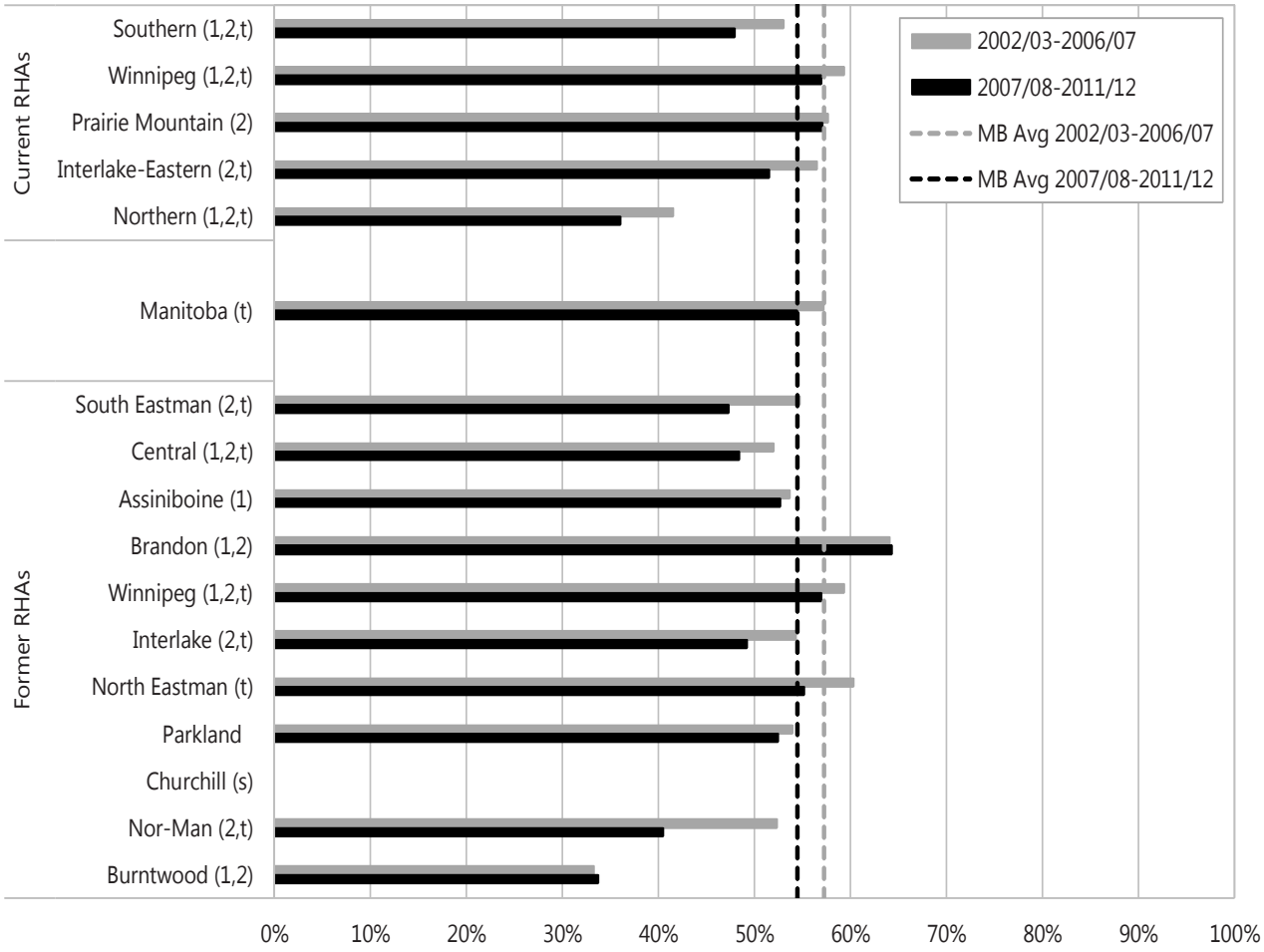
Comparison to Other Findings

- The values shown here are lower than those shown in the 2009 Atlas (Fransoo et al., 2009), suggesting that these previously stable rates are decreasing over time.

17 It is possible that the changes to the definition of ambulatory visits also affected these rates because the overall visit rate decreased by approximately 2%.

Figure 11.1.1: Antidepressant Prescription Follow-Up by RHA, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of new depression patients who received 3+ physician visits in four months



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

Figure 11.1.2: Antidepressant Prescription Follow-Up by District, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of new depression patients who received 3+ physician visits in four months

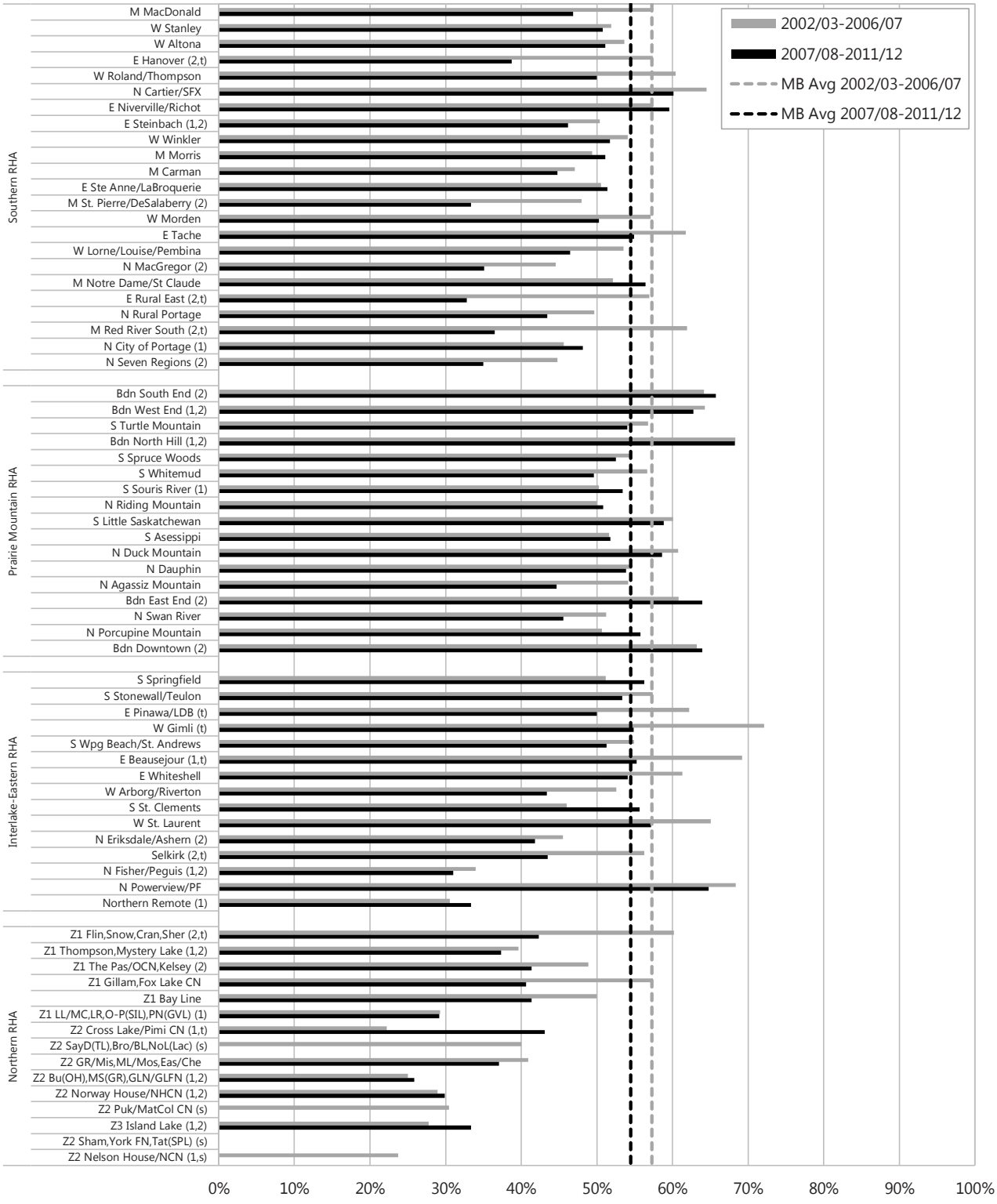
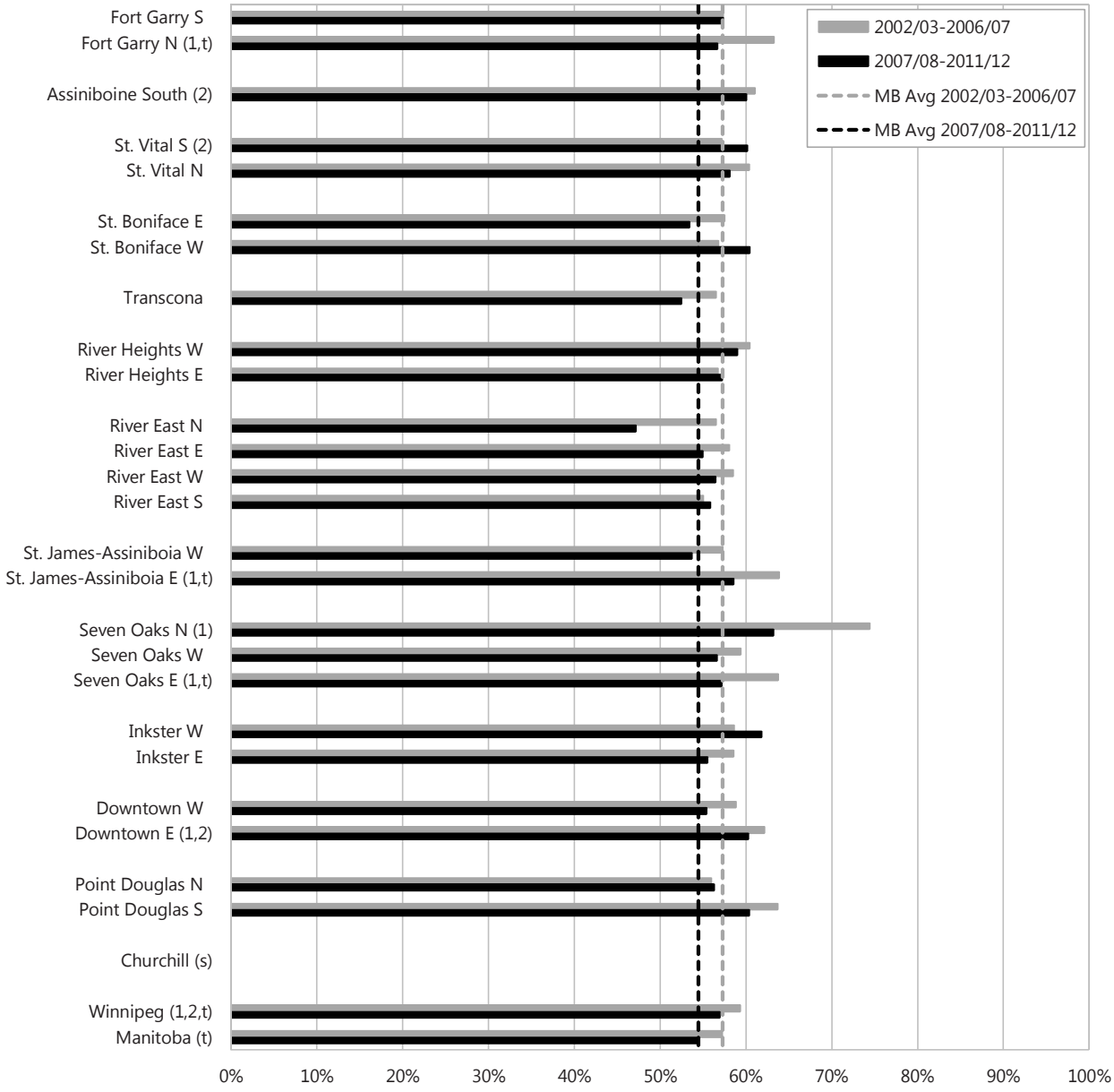


Figure 11.1.3: Antidepressant Prescription Follow-Up by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of new depression patients who received 3+ physician visits in four months



11.2 Asthma Care: Controller Medication Use

Definition: the percent of residents (all ages) with asthma receiving medications recommended for long–term control of their disease. Asthma was defined by two or more prescriptions for beta 2–agonists (ATC codes R03AA, R03AB, or R03AC). Recommended long–term controller medications included inhaled corticosteroids (ATC R03BA), leukotriene modifiers (ATC code R03DC), or adrenergics and other drugs for obstructive airway diseases (ATC code R03AK). Patients receiving ipratropium bromide (ATC codes R01AX03, R03AK04, or R03BB01) were excluded as likely Chronic Obstructive Pulmonary Disease (COPD) patients. Crude rates were calculated for 2006/07 and 2011/12.

Key Findings

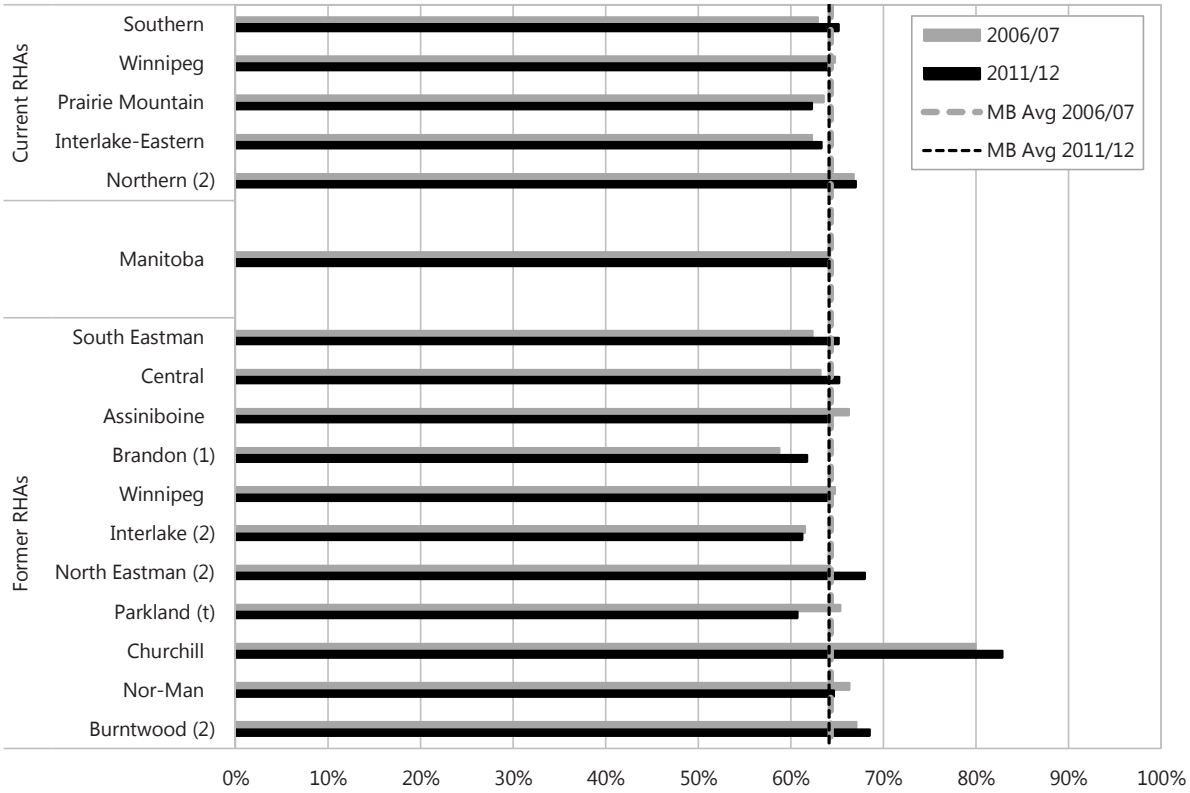
- There was no change in the proportion of residents with asthma receiving the prescriptions recommended for long–term control (64%). This stability was reflected in all regions.
- There was remarkably little variation across regions and Winnipeg NCs and relatively little variation across the districts of rural regions.
- There was no relationship between asthma care and PMR at the regional, district, or NC level.
- Among rural residents, there was no relationship between income and asthma controller medication use (Appendix 2). In urban areas, there were significant linear trends of lower rates among residents of lower income areas. However, this trend was largely driven by the particularly high rates among residents of the highest income urban areas.

Comparison to Other Findings

- The 2009 Atlas report showed increasing rates over time (Fransoo et al., 2009), whereas this report shows stable rates, implying that rates may be leveling off at around 64%.

Figure 11.2.1: Asthma Care by RHA, 2006/07 and 2011/12

Crude percent of residents with asthma receiving at least one prescription for inhaled steroids



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
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Figure 11.2.2: Asthma Care by District, 2006/07 and 2011/12

Crude percent of residents with asthma receiving at least one prescription for inhaled steroids

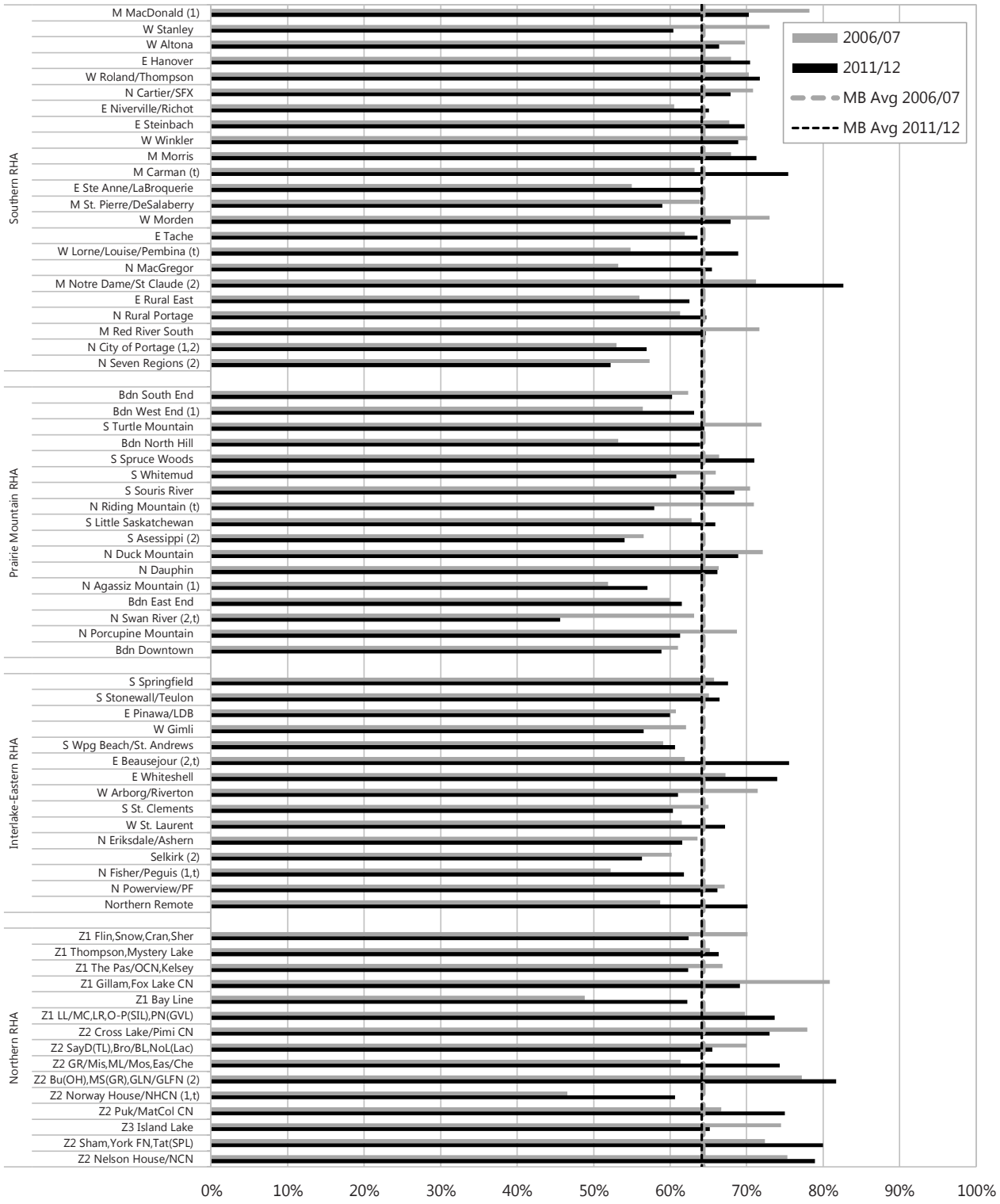
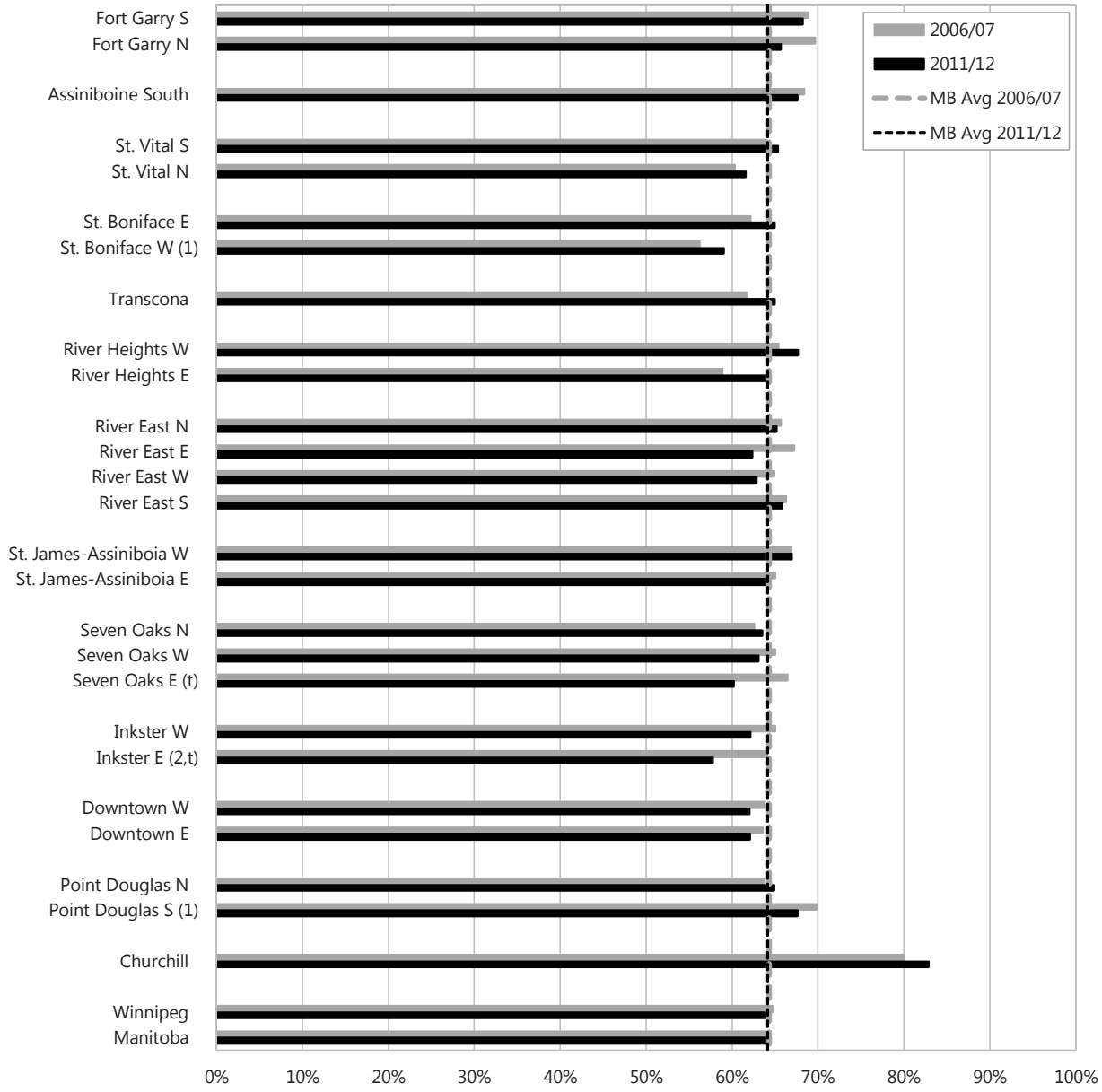


Figure 11.2.3: Asthma Care by Winnipeg NC, 2006/07 and 2011/12

Crude percent of residents with asthma receiving at least one prescription for inhaled steroids



11.3 Diabetes Care: Eye Examinations

Definition: the percent of residents aged 19 and older with diabetes who had an eye exam in a given year as defined by a visit to an ophthalmologist or an optometrist. Diabetes was defined as described in Chapter 4. Crude percent was calculated for 2006/07 and 2011/12. See Glossary (**diabetes care: eye examination**) for further details.

Key Findings

- The proportion of residents with diabetes receiving an eye exam increased over time from 33.9% to 37.5%. Rates increased in all regions.[18]
- Eye exam rates appear to be inversely related to PMR, with higher rates in the healthiest areas and lower rates in the least healthy areas. This trend was evident at the regional, district, and NC levels.
- The low rate in Northern region suggests a potential concern, as the prevalence of diabetes is higher there. This indicator may also be affected by incomplete medical claims data for Northern residents (see Chapter 6). Moreover, the Manitoba Retinal Screening Vision Program affects these rates. Nurse screeners use a camera to take a picture of the eye and images are transmitted to eye specialists in Winnipeg for reading.
- Relationships with income showed significant inverse trends for both urban and rural residents in both time periods: residents of lower income areas had lower eye exam rates. However, these trends were strongly affected by the particularly low rates for residents of the lowest income areas (urban and rural).

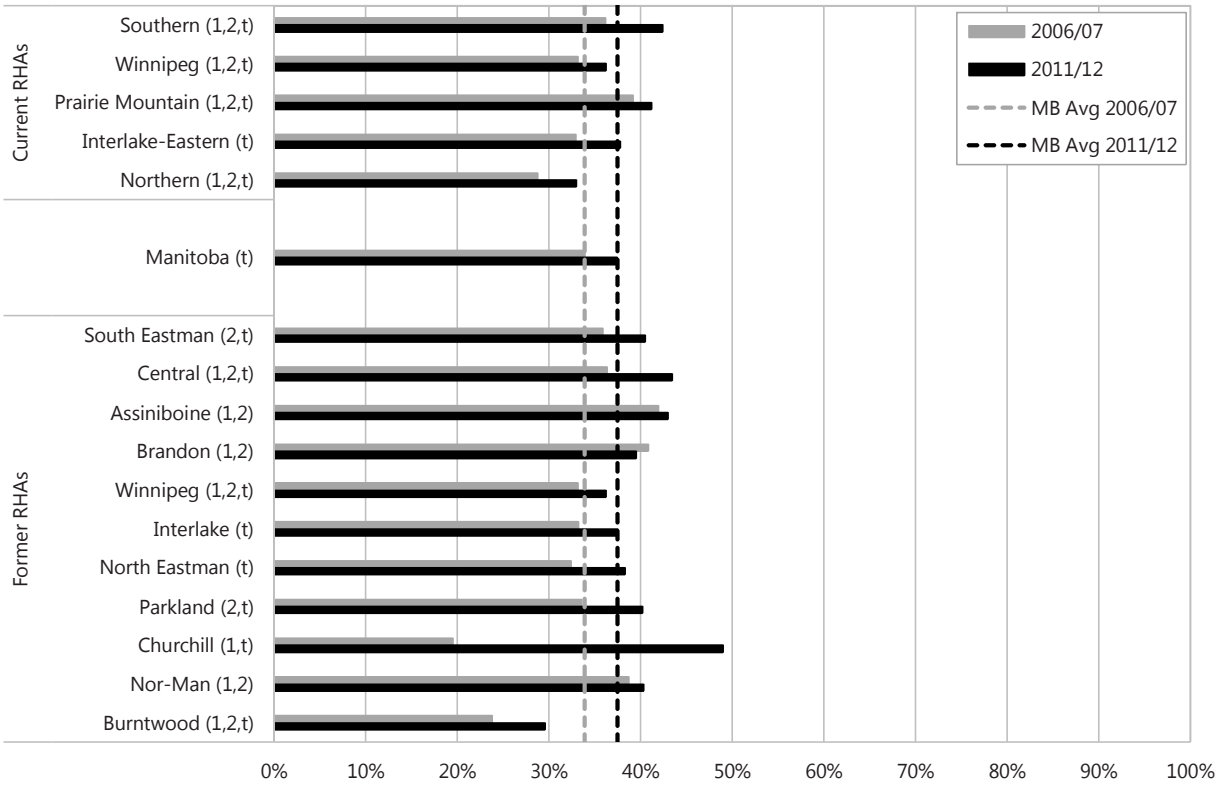
Comparison to Other Findings

- These results are consistent with and extend the findings of the 2009 Atlas (Fransoo et al., 2009), reflecting the fact that eye exam rates for residents with diabetes have been slowly increasing for many years. Unfortunately, the differences by income quintile remain.

18 It is possible that a portion of this increase may be due to improved data collection. When routine eye exams were de–insured years ago, patients with diabetes were exempted; so this remained an insured service for those patients. However, not all patients and physicians were aware of this, so some may have received the care but paid for it privately. To this case a medical claim would not have been submitted to Manitoba Health and that file is the data source for this indicator. If more patients and physicians became aware of the continued coverage, then the claims may have increased over time—also increasing rates for this indicator.

Figure 11.3.1: Diabetes Care: Eye Examinations by RHA, 2006/07 and 2011/12

Crude percent of residents aged 19+ with diabetes who had an eye examination



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2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
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Figure 11.3.2: Diabetes Care: Eye Examinations by District, 2006/07 and 2011/12

Crude percent of residents aged 19+ with diabetes who had an eye examination

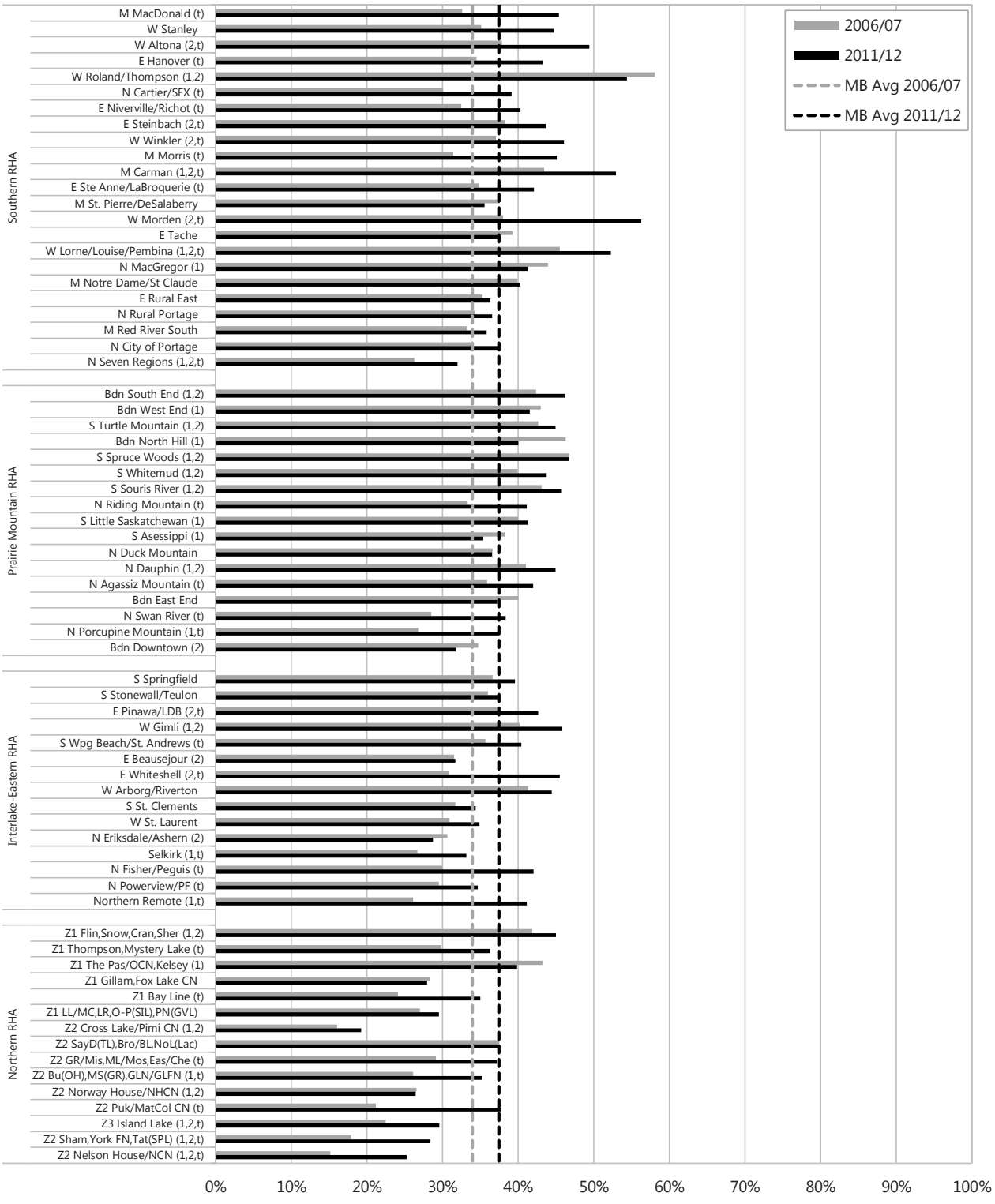
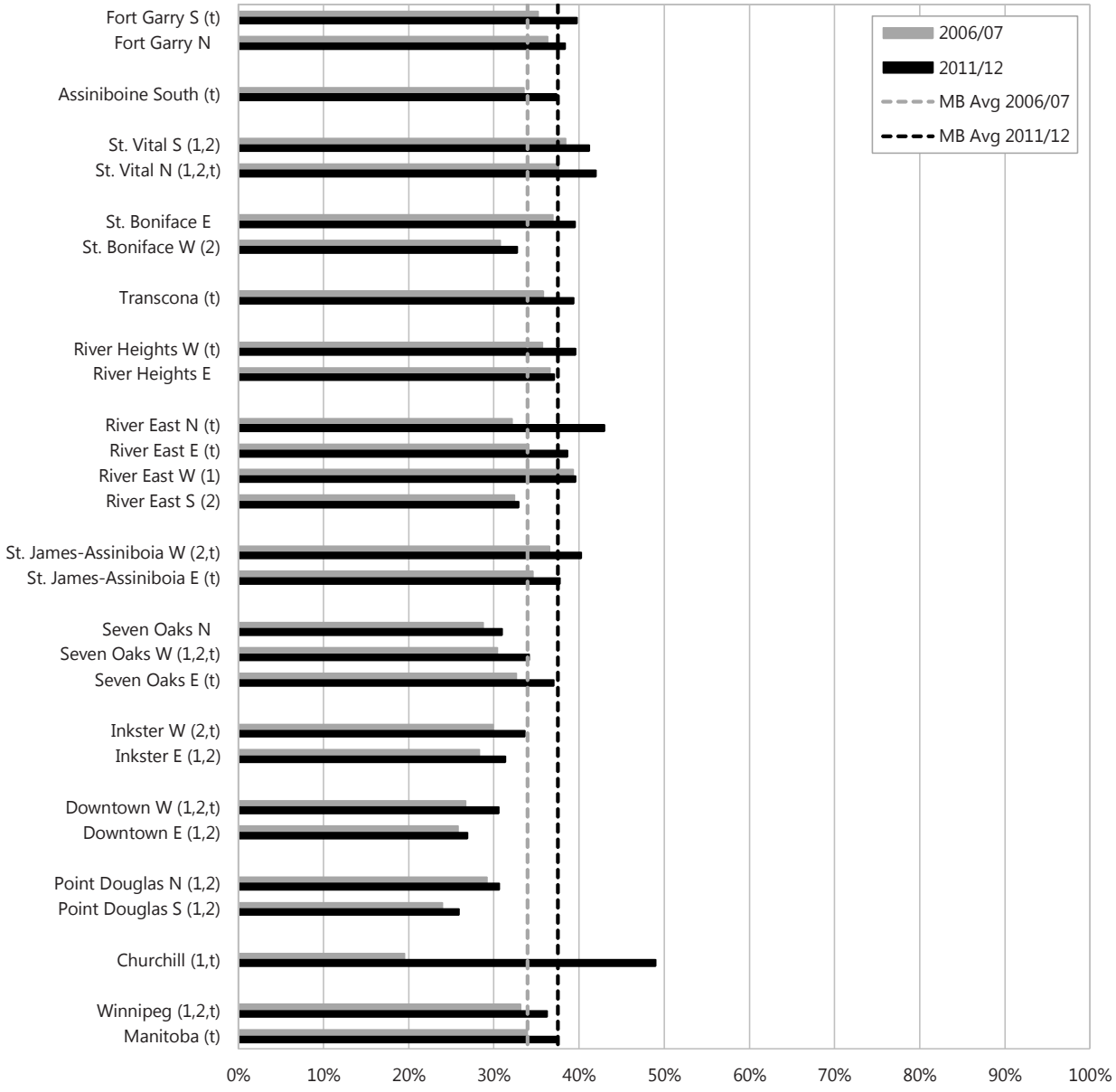


Figure 11.3.3: Diabetes Care: Eye Examinations by Winnipeg NC, 2006/07 and 2011/12

Crude percent of residents aged 19+ with diabetes who had an eye examination



11.4 Post–AMI Care: Beta–Blocker Prescribing

Definition: the percent of patients aged 20 and older hospitalized for acute myocardial infarction (AMI: ICD–9–CM code 410, ICD–10–CA code I21) who filled at least one prescription for a beta–blocker (ATC C07AA, C07AB) within four months of hospital discharge. Patients with a previous hospitalization for an AMI in the three years prior to the index AMI hospitalization were excluded. Patients with a diagnosis of asthma, chronic obstructive pulmonary disease (COPD), or peripheral vascular disease (coding details in Glossary) were also excluded because beta–blockers should not be used by those patients. Crude percent was calculated for two 5–year periods: 2002/03–2006/07 and 2007/08–2011/12.

Key Findings

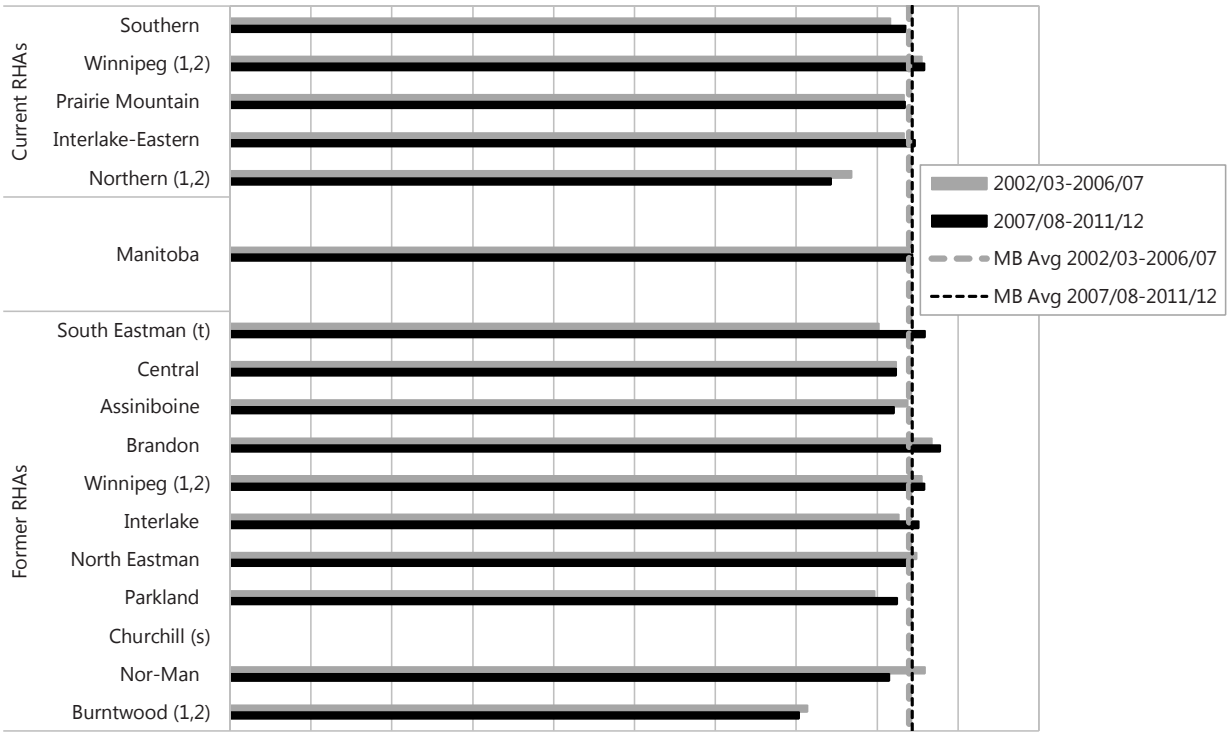
- The proportion of AMI patients receiving recommended beta–blockers was stable over time at 84%. This stability was reflected in rates for all regions.
- There was very little variation across regions, and no relationship with PMR at the regional, district, or NC level.
- The lowest rates were in Northern region, though this may be partially explained by potentially incomplete data on prescription drug use for Northern residents.
- There were no significant relationships between **post-AMI beta-blocker prescribing** rates and income in both urban and rural areas, though residents of the lowest income areas had the lowest rates. (Appendix 2).

Comparison to Other Findings

- The values shown here suggest a leveling off of post–AMI Beta–Blocker use rates in Manitoba after a period of rapidly increasing rates shown in the 2009 Atlas (Fransoo et al., 2009).

Figure 11.4.1: Post-AMI Care: Beta-Blocker Prescribing by RHA, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of AMI patients aged 20+ who received a prescription for a beta-blocker within four months



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s indicates data suppressed due to small numbers

Figure 11.4.2: Post-AMI Care: Beta-Blocker Prescribing by District, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of AMI patients aged 20+ who received a prescription for a beta-blocker within four months

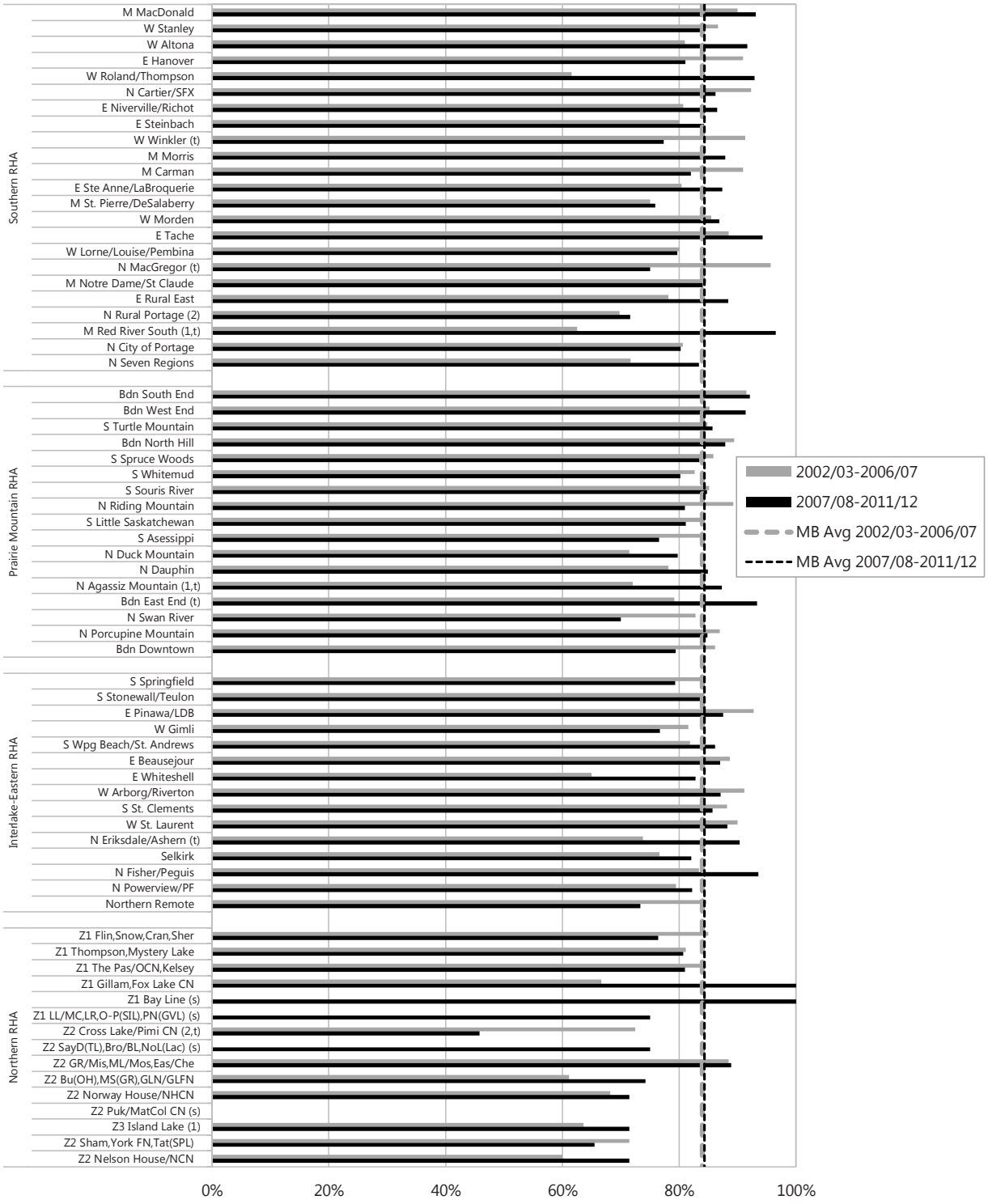
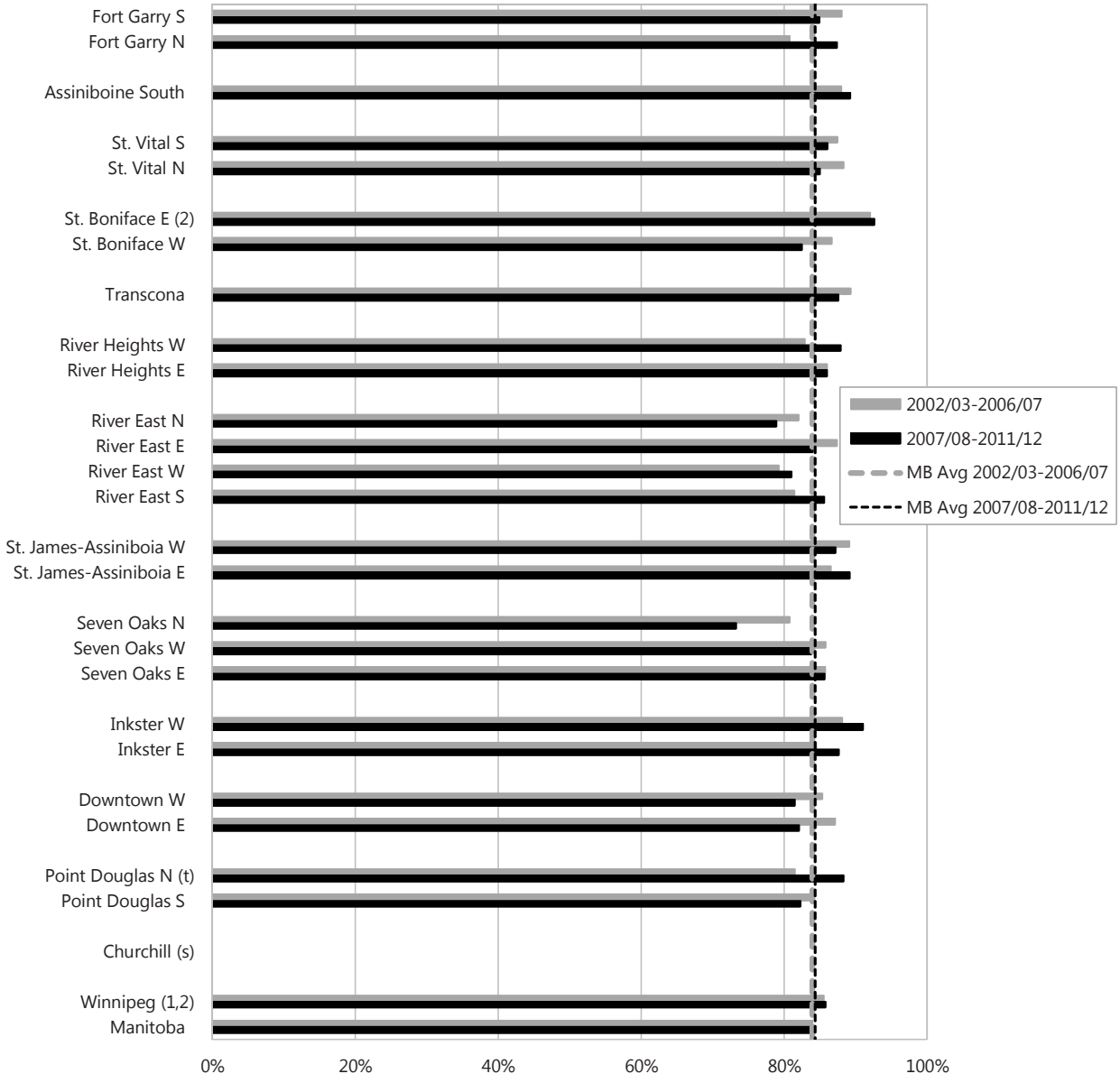


Figure 11.4.3: Post-AMI Care: Beta-Blocker Prescribing by Winnipeg NC, 2002/03-2006/07 and 2007/08-2011/12

Crude percent of AMI patients aged 20+ who received a prescription for a beta-blocker within four months



11.5 Benzodiazepine Prescribing for Community–Dwelling Seniors

Definition: the percent of residents 75 and older living in the community (i.e., not in a personal care home) who had at least two prescriptions for benzodiazepines (ATC codes N05BA, N05CD, N05CF, and N03AE01) or at least one prescription for benzodiazepines with a greater than 30 day supply dispensed. Crude percent was calculated for 2006/07 and 2011/12.

Key Findings

- Use of benzodiazepines is not recommended for seniors, so lower rates are better.
- Overall, the proportion of community–dwelling seniors (75 and older) using Benzodiazepines was stable over time at about 20%.
  - The change varied by region: rates decreased slightly (non–significantly) in Southern region, were stable in Winnipeg, and increased in Prairie Mountain, Interlake–Eastern, and Northern (though the increase in Northern did not reach statistical significance).
- There is a clear inverse relationship with PMR at the regional level, with lower rates among areas with higher PMR values. The exception to this trend is Prairie Mountain, where the rates were higher than average (and increased over time). Interestingly, there was no evidence of a similar relationship among rural districts or Winnipeg NCs.
- St. Boniface West was an exception among the NCs in Winnipeg, with particularly high rates in both time periods.
- There were inverse relationships between benzodiazepine use and income in both urban and rural areas: in lower income areas, a higher proportion of seniors received the drugs (Appendix 2).
  - The relationship was stronger and more stepwise among rural residents. In urban areas, the trend was largely driven by the higher rates among residents of the lowest income areas, whereas residents of the other urban quintiles had rates that were similar to each other.

Comparison to Other Findings

- These values are consistent with those shown in the 2009 Atlas (Fransoo et al., 2009), but suggest the increases over time shown in that report have leveled off in more recent years. This is a positive development, as lower rates are better for this indicator.

Figure 11.5.1: Benzodiazepine Prescribing for Community-Dwelling Seniors by RHA, 2005/06-2006/07 and 2010/11-2011/12

Crude percent of non-PCH seniors 75+ with 2+ prescriptions or more than a 30-day supply

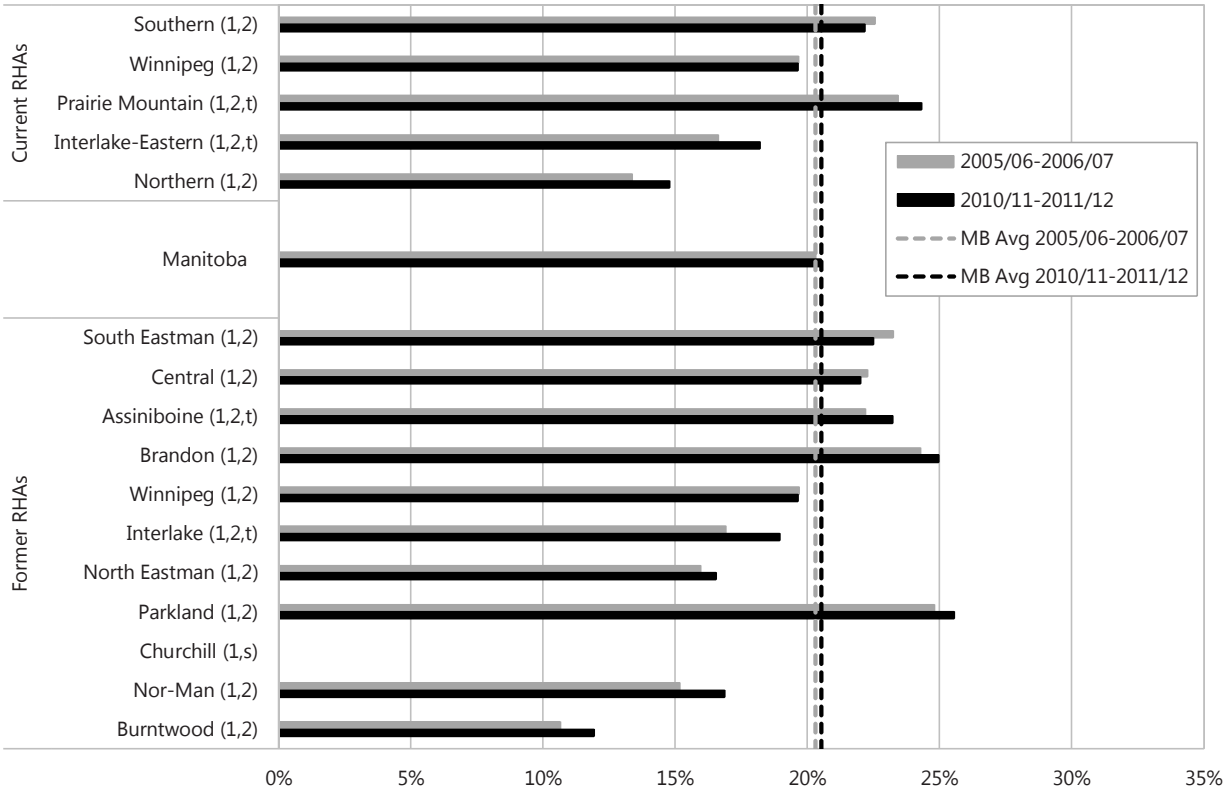


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Figure 11.5.2: Benzodiazepine Prescribing for Community-Dwelling Seniors by District, 2005/06-2006/07 and 2010/11-2011/12

Crude percent of non-PCH seniors 75+ with 2+ prescriptions or more than a 30-day supply

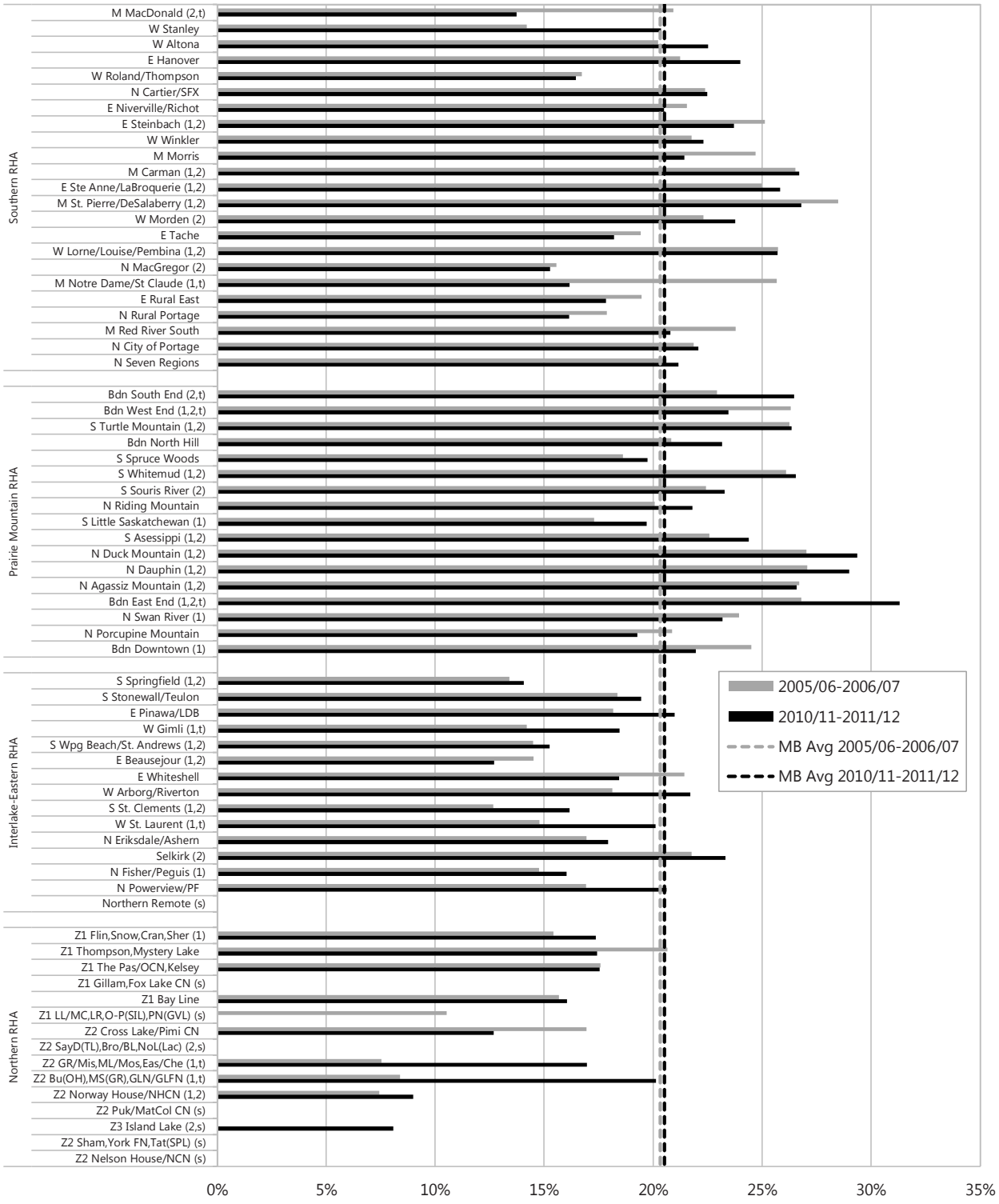
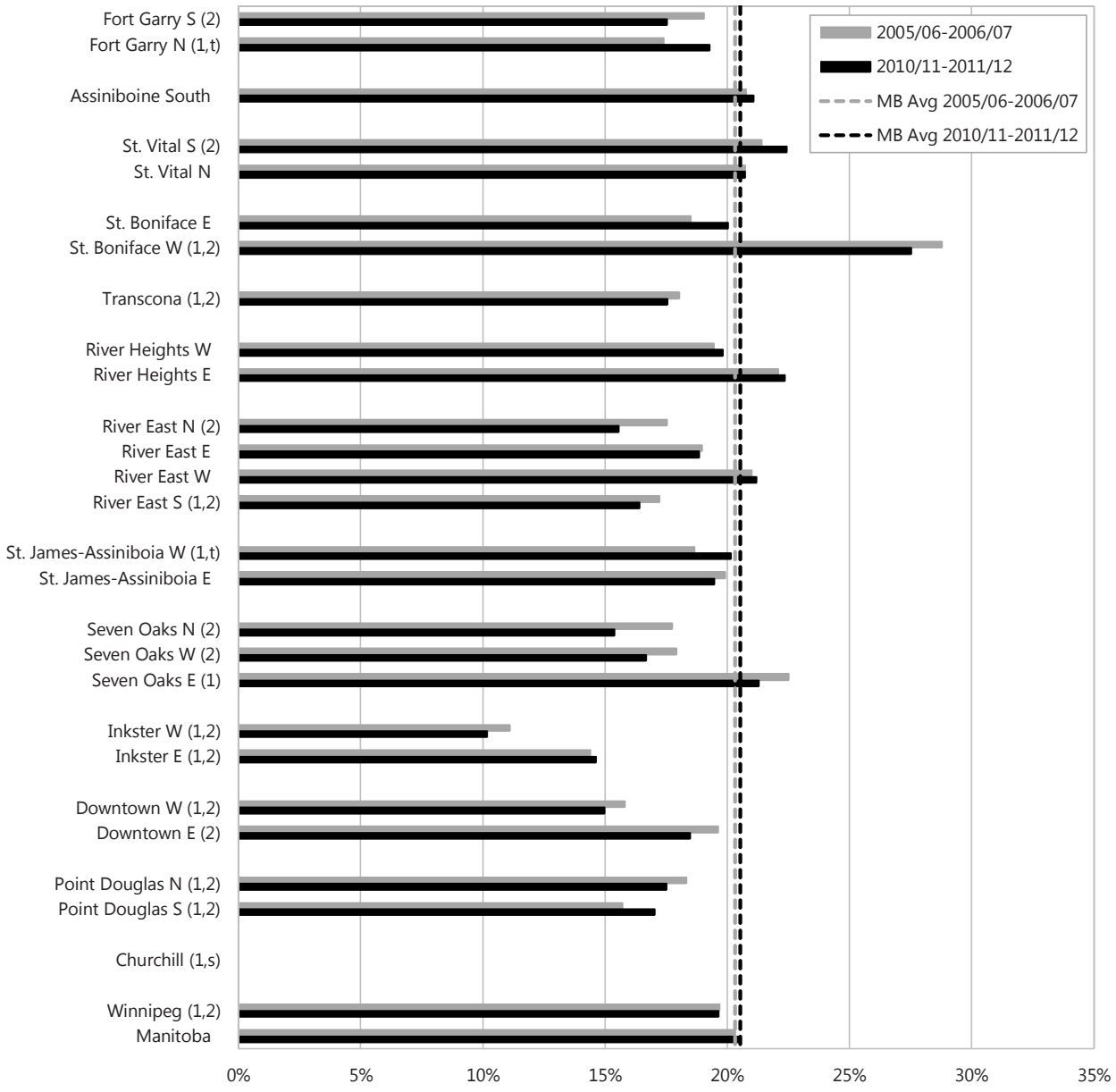


Figure 11.5.3: Benzodiazepine Prescribing for Community-Dwelling Seniors by Winnipeg NC, 2005/06-2006/07 and 2010/11-2011/12

Crude percent of non-PCH seniors 75+ with 2+ prescriptions or more than a 30-day supply



11.6 Benzodiazepine Prescribing for Residents of Personal Care Homes (PCH)

Definition: the percent of PCH residents 75 and older who had at least two prescriptions for benzodiazepines (ATC codes N05BA, N05CD, N05CF, and N03AE01) or at least one prescription for benzodiazepines with a greater than 30 day supply dispensed. PCHs with hospital–based pharmacies are excluded from this analysis as their prescription data were unavailable. Crude percent was calculated for RHAs and Winnipeg CAs in 2006/07 and 2011/12. Data were not calculated for RHA districts or Winnipeg NCs because many smaller areas do not contain a PCH.

Key Findings

- Use of benzodiazepines is not recommended for seniors, so lower rates are better.
- Overall, the proportion of PCH residents 75 and older receiving Benzodiazepines decreased over time from 34.9% to 31.9%. However, this decrease was not consistent across regions. Southern, Winnipeg, and Northern showed decreases, though the decrease in Southern was not statistically significant. By contrast, Interlake–Eastern had a significant increase over time. The rates in Prairie Mountain were stable.
- There appears to be no relationship between benzodiazepine prescribing among seniors in PCH and PMR at the regional or CA level.
- Note: Analyses of PCH residents are not done by income quintile—area–level income data are not available for most postal codes containing PCHs, and it would not be as meaningful because the relationship between income and location of residence is not the same for PCH residents as for those living in the community.

Comparison to Other Findings

- The values shown here are consistent with and extend the findings in the 2009 Atlas, which also showed a decrease over time (Fransoo et al., 2009). Together, these results reflect the ongoing decrease in benzodiazepine prescriptions among seniors living in PCHs in Manitoba.

Figure 11.6.1: Benzodiazepine Prescribing for Residents of Personal Care Homes by RHA, 2005/06-2006/07 and 2010/11-2011/12

Crude percent of PCH seniors 75+ with 2+ prescriptions or more than a 30-day supply

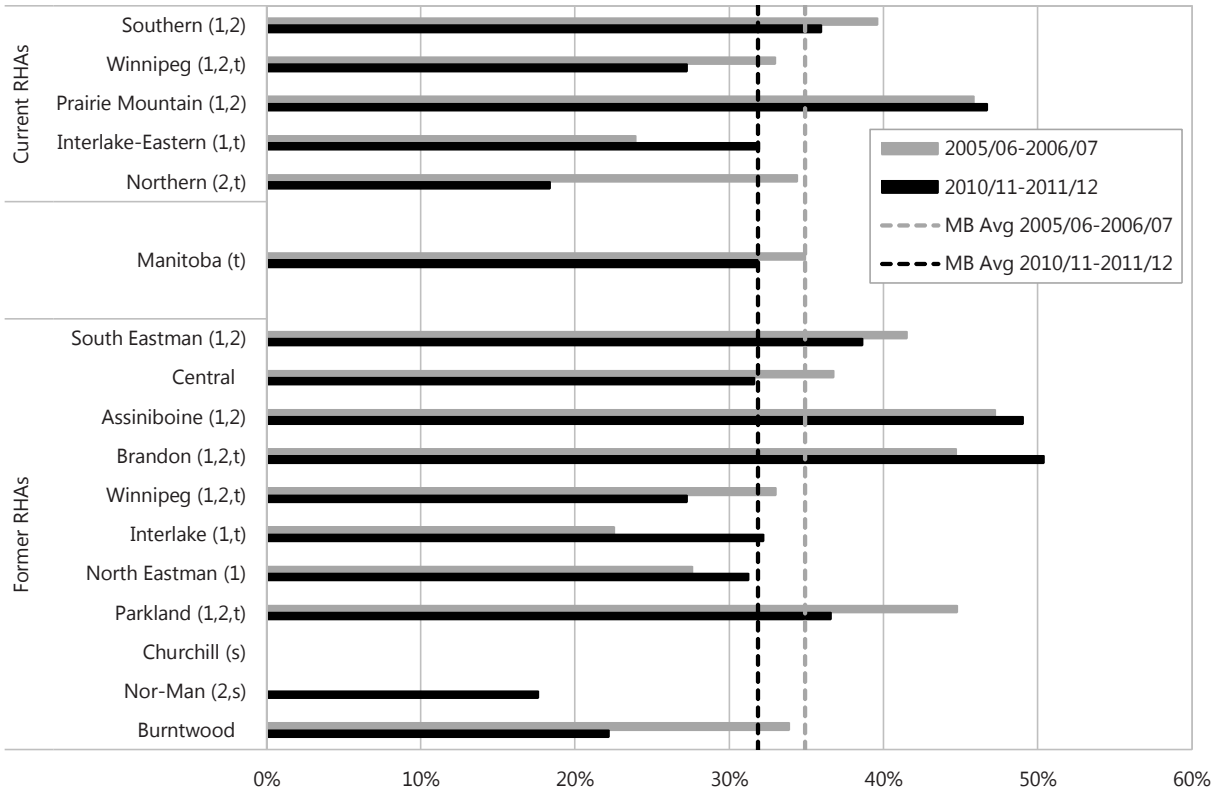


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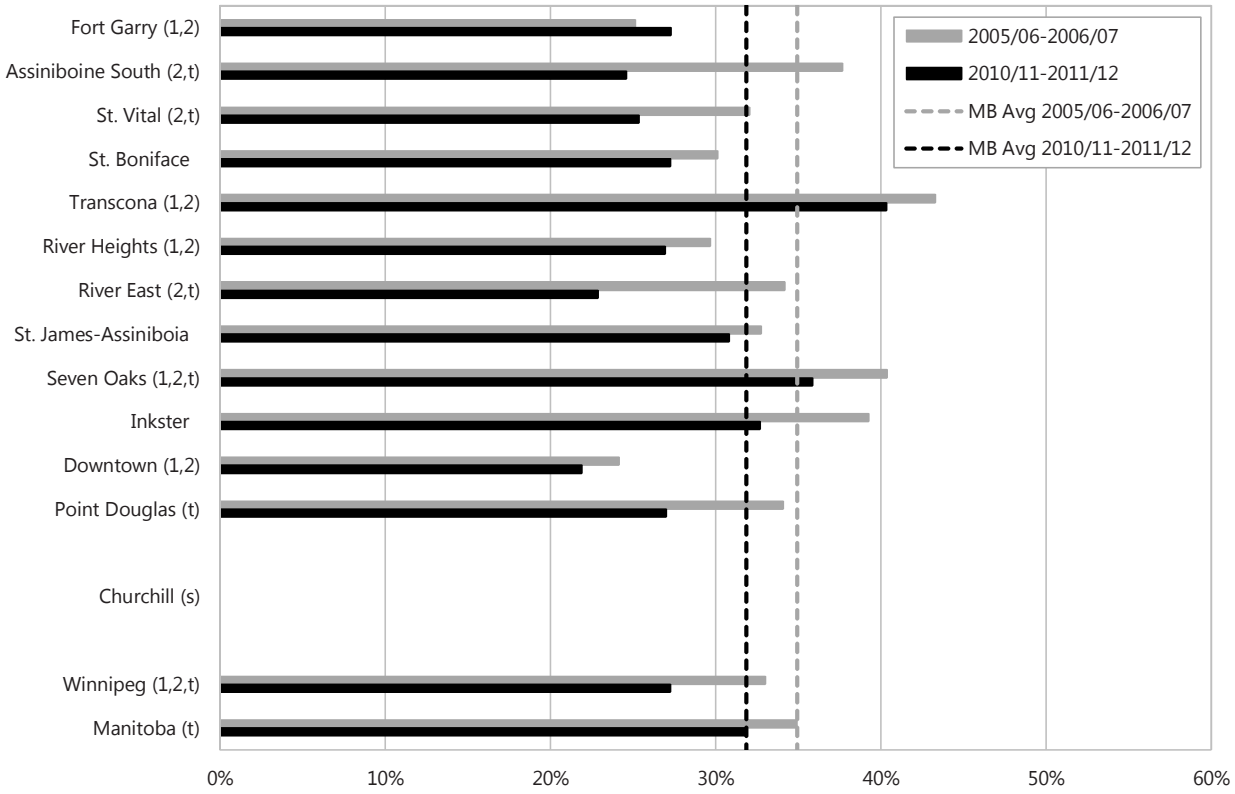
Figure 11.6.2: Benzodiazepine Prescribing for Residents of Personal Care Homes (PCH) by Winnipeg CA, 2005/06-2006/07 and 2010/11-2011/12

Crude percent of PCH seniors 75+ with 2+ prescriptions or more than a 30-day supply



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GLOSSARY

Acute Myocardial Infarction (AMI)

A sudden (acute) deprivation of blood circulation to the heart muscle (myocardium), often caused by narrowing of the coronary arteries leading to a blood clot. The clogging is usually initiated by cholesterol accumulating on the inner wall of the blood vessels that distribute blood to the heart muscle. Also known as a heart attack.

The average annual age– and sex–**adjusted** rate of hospitalization or death due to AMI per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002–2006 and 2007–2011. AMIs were defined by one of the following conditions:

- an inpatient hospitalization with the most responsible diagnosis of AMI and a **length of stay** of three or more days (unless the patient died in hospital)
- a death with AMI listed as the primary cause of death on the Vital Statistics death record

Diagnosis codes used to identify an AMI include ICD–9–CM code 410 and ICD–10–CA code I21. Hospitalizations for less than three days were excluded as likely "rule out" AMI cases; transfers between hospitals were tracked to ensure all "true" AMI cases staying at least three days in hospital(s) were counted. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2002–2011).

Adjusted—see Adjusted Rates

Adjusted Rates

Crude rate values that are statistically adjusted to control for different age and sex distributions of different geographical regions to ensure that the rates for all regions (and overtime) can be fairly compared. The adjusted values are those that the region would have had if their age and sex distribution was the same as for a standard population, which is usually the Manitoba population in the first time period. Statistical models were used to calculate these rates and to compare a given region's rate (i.e., **Regional Health Authority** (**RHA**) or **Winnipeg Community Area**) to the provincial rate, as well as to compare rates over time within a region. Appendix 2 provides crude rates (that is, unadjusted) and the observed number of events for all indicators.

To estimate and compare most adjusted rates of events in this report, the count of events for each indicator was modeled using a **generalized linear model** (**GLM**). GLMs are used to model non–normal data, such as count data. Essentially, when data follow a non–linear distribution, a link function transforms the data so that the non–linear response can be analyzed using linear regression techniques. Non–linear distributions chosen to model data in this report were the Poisson distribution, negative binomial distribution, or binomial distribution—depending on which distribution provided the best fit to the data. Covariates included in each model varied depending on the indicator under study, but all models contained covariates describing the group of interest—RHA, **income quintile**. (reference=Manitoba) and covariates to control for age (age groups or linear and quadratic terms, depending on model fit) and sex (reference=female).

To generate the adjusted rates, relative risks were estimated via contrast estimates for each region and time period. To estimate relative risks of rates rather than events, the log of the population count in each region * age * sex stratum was included in the model as an offset. Relative risks were calculated from the contrast estimates, and these contrasts were also used to compare the relative risks between time periods within a region or to compare the relative risks between a region and the province as a whole. The values obtained from the contrasts were actually a linear combination of the natural logarithm of the parameter estimates, so an exponential transformation was necessary to obtain estimates of relative risk of events in their original scale. Finally, the adjusted rates were calculated by multiplying the Manitoba crude reference rate (the rate in the first time period) by the appropriate relative risk estimate.

Administrative Data

Data generated through the routine administration of programs. Administrative data are designed to collect and store this type of data. While not originally intended for research, administrative data can be a rich source of information.

Admission to Personal Care Home (PCH)

The age– and sex–**adjusted** average annual percent of residents 75 and older who were admitted to a **personal care home** (**PCH**) for the first time was calculated for two 2–year time periods: 2005/06–2006/07 and 2010/11–2011/12. The denominator includes all Manitoba residents 75 and older as of December 31 of each year. Region assignment in the numerator was based on current postal code and municipal code, which for most PCH residents will be the address of their PCH.

Ambulatory Consultations

A subset of **ambulatory visits** that occur when one physician refers a patient to another physician (usually a specialist or surgeon) because of the complexity, obscurity, or seriousness of the condition or when the patient requests a second opinion. After the consultation, the patient usually returns to their GP/FP for ongoing management. The consultation rate is a measure of "initial" access to specialist care. People in urban areas often have higher rates of visit to specialists, since they may continue to see the specialist rather than being referred back to their GP/FP. That is why the consultation rate, rather than the total specialist visit rate, is used as an indicator for access to specialist care.

The age– and sex–**adjusted rate** of ambulatory consultations per resident was calculated for **fiscal years** 2006/07 and 2011/12. Consultations to GP/FPs and specialists are counted. The definition of a consultation is an ambulatory physician visit with one of the following physician tariff codes:

- 8440 orthopaedic spinal consultation
- 8449 extended ophthalmology consultation for the assessment and/or treatment of uveitis
- 8550 consultation
- 8552 developmental assessment and report per 15 minute period or portion thereof
- 8553 psychiatry consultation—adult
- 8554 psychiatry consultation—child
- 8556 ophthalmology consultation, including refraction and other necessary tests (GP or optometrist)
- 8557 otorhinolaryngology (ENT) consultation

The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Ambulatory Visits (Physician Visits)

Almost all contacts with physicians (GP/FPs and specialists), including office visits, walk–in clinics, home visits, **personal care home** (**PCH**; nursing home) visits, and visits to outpatient departments. Excluded are services provided to patients while admitted to hospital and emergency department visits. In previous RHA Atlas reports (Fransoo et al., 2009; Martens et al., 2003), visits for prenatal care were excluded due to global physician tariffs that could not capture the actual number of prenatal visits, but now due to improved coding practices prenatal visits are included.

The age– and sex–**adjusted rate** of ambulatory visits per resident was calculated for **fiscal years**, 2006/07 and 2011/12. The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Fransoo R, Martens PJ, Burland E, et al. *Manitoba RHA Indicators Atlas* 2009. Manitoba Centre for Health Policy. 2009. http://mchp-appserv.cpe.umanitoba.ca/reference/RHA_Atlas_Report.pdf. Accessed July 12, 2013.

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Anatomical Therapeutic Chemical (ATC) Classification

A widely used drug classification system derived from the **World Health Organization**'s Collaborating Centre for Drug Statistics Methodology. The drugs are divided into different groups at five levels according to the organ or system on which they act and/or therapeutic and chemical characteristics: 1) anatomical group, 2) therapeutic main group, 3) therapeutic/pharmacological subgroup, 4) chemical/therapeutic/pharmacological subgroup, and 5) subgroup for chemical substance.

Antidepressant Prescription Follow–up

Monitoring of persons prescribed antidepressants after the initial diagnosis of depression. Regular follow–ups are essential to track that patients' response to the medication and modify treatment if necessary. Often antidepressant medications do not begin to have a clinical effect for some time after initiating therapy, and persons diagnosed with a major depression may be at risk of **suicide**, which makes follow–up a critical part of treatment for depression.

The crude (unadjusted) percent of residents with a new prescription for antidepressants (ATC code N06A) and a diagnosis of depression (ICD–9–CM codes 296 or 311) within two weeks of each other (it is assumed that the prescription date comes after the physician visit) who then had three subsequent **ambulatory visits** within four months of the prescription being filled was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. To be included in the analysis, patients had to be alive for the entire follow–up period. To be included as a newly depressed patient, residents could not have a prescription for antidepressants or a physician visit with a diagnosis of depression in the two years prior to the index event.

Arthritis

A group of conditions that affect the health of the bone joints in the body.

The age– and sex–**adjusted prevalence** of arthritis was calculated for residents 19 and older in two 2–year time periods: 2005/06–2006/07 and 2010/11–2011/12. Arthritis was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of arthritis: ICD–9–CM codes 274, 446, 710–721, 725–729, 739; ICD–10–CA codes M00–M03, M05–M07, M10–M25, M30–M36, M65–M79
- two or more **physician visits** with a diagnosis of arthritis (ICD–9–CM codes as above)
- one physician visit with a diagnosis of arthritis (ICD–9–CM codes as above) and two or more prescriptions for medications to treat arthritis (listed below)

The denominator includes all Manitoba residents 19 and older as of December 31, 2006 and 2011.

List of drugs used to treat arthritis:

ATC code	Generic Drug Name
A07EC01	sulfasalazine
H02AB04	methylprednisolone
H02AB06	prednisolone
H02AB07	prednisone
H02AB08	triamcinolone
H02AB10	cortisone
J01AA08	minocycline
L01AA01	cyclophosphamide
L01BA01	methotrexate
L04AA01	cyclosporine
L04AA11	etanercept
L04AA12	infliximab
L04AA13	leflunomide
L04AA14	anakinra
L04AA17	adalimumab
L04AB05	certolizumab pegol
L04AB06	golimumab
L04AX01	azathioprine
M01AA01	phenylbutazone
M01AB01	indometacin
M01AB02	sulindac
M01AB03	tolmetin
M01AB05	diclofenac
M01AB08	etodolac
M01AB15	ketorolac
M01AB55	diclofenac, combinations
M01AC01	piroxicam
M01AC02	tenoxicam
M01AC06	meloxicam
M01AE01	ibuprofen
M01AE02	naproxen
M01AE03	ketoprofen
M01AE04	fenoprofen
M01AE09	flurbiprofen
M01AE11	tiaprofenic acid
M01AE12	oxaprozin
M01AG01	mefenamic acid
M01AH02	rofecoxib
M01AH03	valdecoxib
M01AX01	nabumetone

M01CB01	sodium aurothiomalate
M01CB03	auranofin
M01CB04	aurothioglucose
M01CC01	penicillamine
M02AA09	bufexamac
M02AA15	diclofenac
M02AC	Preparations with salicylic acid derivatives
M04AA01	allopurinol
M04AA03	febuxostat
M04AB01	probenecid
M04AC01	colchicine
N02AA01	morphine
N02AA03	hydromorphone
N02AA05	oxycodone
N02AA55	oxycodone, combinations
N02AA59	codeine, combinations excl. psychotropic drugs
N02AB02	meperidine
N02AB03	fentanyl
N02AD01	pentazocine
N02AX02	tramadol
N02AX52	tramadol, combinations
N02BA01	acetylsalicylic acid (tablet strength > 325 mg)
N02BA11	diflunisal
N02BE01	acetaminophen
N02BE51	acetaminophen, combinations excl. psychotropic drugs
P01BA02	hydroxychloroquine
R05DA04	codeine

Asthma Care: Controller Medication Use

The use of medication recommended for asthma. Guidelines for the treatment of asthma recommend that all patients who require the use of acute medication (e.g., beta 2–agonists) more than once a day should also be treated with long acting anti–inflammatory medication for long–term control.

The crude (unadjusted) percent of residents with asthma that filled a prescription for medications recommended for long–term control of asthma was calculated for **fiscal years** 2006/07 and 2011/12. Asthmatics were defined as individuals with a repeat prescription (i.e., two or more) for beta 2–agonists (ATC codes R03AA, R03AB or R03AC). Long–term asthma medications include inhaled corticosteroids (ATC code R03BA), leukotriene modifiers (ATC code R03DC) and adrenergics, and other drugs for obstructive airway diseases (ATC code R03AK). Patients receiving ipratropium bromide (ATC codes R01AX03, R03AK04, R03BB01) were excluded as likely COPD patients.

Benzodiazepine Use (Benzodiazepine Prescribing)

The prescription and use of benzodiazepines, a family of depressants used therapeutically to produce sedation, induce sleep, relieve anxiety and muscle spasms, and to prevent seizures. In general, benzodiazepines act as hypnotics in high doses, anxiolytics in moderate doses, and sedatives in low doses. Short–acting benzodiazepines are generally used for patients with sleep–onset insomnia (difficulty falling asleep) without daytime anxiety. Benzodiazepines with a longer duration of action are utilized to treat insomnia in patients with daytime anxiety. Repeated use of large doses or in some cases, daily use of therapeutic doses of benzodiazepines is associated with amnesia, hostility, irritability, vivid or disturbing dreams, tolerance, and physical dependence. The withdrawal syndrome is similar to that of alcohol and may require hospitalization. Abrupt cessation of benzodiazepines is not recommended and tapering–down the dose eliminates many of the unpleasant symptoms.

The crude (unadjusted) percent of seniors 75 and older who had at least two prescriptions for benzodiazepines or at least one prescription for benzodiazepines with a greater than 30 day supply was calculated for **fiscal years** 2006/07 and 2011/12. Benzodiazepines were defined using ATC N05BA, N05CD, N05CF, and N03AE01. Separate rates are provided for community–dwelling seniors, and seniors residing in **Personal Care Homes** (**PCH**). If a resident lived in a PCH for one or more days during the study period, they were categorized as a senior residing in a PCH; otherwise they were considered to be living in the community. PCHs with hospital–based pharmacies are excluded from this analysis as their prescription data were unavailable. The denominator includes all Manitoba residents 75 and older as of April 1, 2006 and 2011. Note: That if an individual died during the fiscal year, then prescriptions are looked at one year before death.

Bonferroni Method

A statistical method that adjusts the significance level when multiple comparisons are made.

C–Statistic

The probability that predicting the outcome is better than chance. Used to compare the goodness of fit of **logistic regression** models, values for this measure range from 0.5 to 1.0. A value of 0.5 indicates that the model is no better than chance at making a prediction of membership in a group and a value of 1.0 indicates that the model perfectly identifies those within a group and those not. Models are typically considered reasonable when the C–statistic is higher than 0.7 and strong when C exceeds 0.8 (Hosmer & Lemeshow, 2000; Hosmer & Lemeshow, 1989).

Hosmer DW, Lemeshow S. *Applied Logistic Regression.* 2nd ed. New York, NY: John Wiley & Sons, Inc.; 2000.

Hosmer DW, Lemeshow S. *Applied Logistic Regression*. 1st ed. New York, NY: John Wiley & Sons, Inc.; 1989.

Canadian Chronic Disease Surveillance System (CCDSS)

A surveillance system that uses linked **administrative data** sources from every province and territory to estimate the **incidence** and **prevalence** of chronic conditions, as well as related risk factors, use of health services, and health outcomes. Its aim is to foster the collection of surveillance data in a consistent and comparable way across jurisdictions. Patient privacy is protected since only population–level summaries are shared by the provinces and territories. Tracking health conditions through this approach complements other surveillance data sources, such as surveys and registries, and allows for timely reporting to support the planning and evaluation of policies and programs (Public Health Agency of Canada, 2013).

Public Health Agency of Canada. Surveillance. 2013. http://www.phac-aspc.gc.ca/surveillance-eng.php. Accessed August 1, 2013.

Canadian Classification of Interventions (CCI) System

A classification system for coding healthcare procedures in Canada, used in companion with the **International Classification of Diseases** (**ICD**), Version 10 with Canadian Enhancements (ICD–10–CA).

Canadian Institutes of Health Research (CIHR)

The Government of Canada's health research funding agency that supports the work of up to 10,000 researchers and trainees in universities, teaching hospitals, and research institutes across Canada.

CancerCare Manitoba

Health services organization responsible for cancer prevention, detection, care, research, and education throughout Manitoba. Previously called the Manitoba Cancer Treatment and Research Foundation (MCTRF).

Cardiac Catheterization

The most accurate method of identifying the location and severity of **ischemic heart disease** (**IHD**). During cardiac catheterization, a small catheter (a thin hollow tube with a diameter of 2–3 mm) is inserted through the skin into an artery in the groin or the arm. Guided with the assistance of a fluoroscope (a special x–ray viewing instrument), the catheter is then advanced to the opening of the coronary arteries, the vessels supplying blood to the heart. When the catheter is used to inject radiographic contrast (a solution containing iodine, which is easily visualized with x–ray images) into each coronary artery, the cardiac catheterization is termed coronary angiography. The images that are produced are called the angiogram, which shows the extent and severity of blockages in coronary arteries.

The average annual age– and sex–**adjusted rate** of cardiac catheterizations per 1,000 residents aged 40 and older was calculated for two 3–year time periods: 2004/05–2006/07 and 2009/10–2011/12. Cardiac catheterization was defined by hospitalizations with CCI code 3.IP.10. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2004–2006 and 2009–2011). Cardiac catheterizations were only performed at the two tertiary hospitals (Health Sciences Centre and St. Boniface General Hospital), so only hospitalizations from those two hospitals were included in the analysis in order to eliminate the potential for double–counting of procedures. To further reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included.

Case Mix Group (CMG™)

A Canadian patient classification system developed by the Canadian Institute for Health Information (CIHI). It is based on most responsible diagnosis and used to group and describe types of inpatients discharged from acute care hospitals. Each patient case is initially assigned to one of 25 mutually exclusive major clinical categories (MCC), which are based on body systems (e.g., circulatory, respiratory), then further classified as medical or surgical, and finally the CMG™ is assigned to create homogeneous groups. Cases within the same CMG™ are subsequently assigned to typical or atypical categories and classified according to age group and complexity level. A small percent of hospitalizations may not be assigned a CMG™; these cases are referred to as "ungroupable CMG™s".

Cataract Surgery

The surgical removal of cataracts, which occur when the lens of the eye becomes cloudy and normal vision is impaired. There are many causes of cataracts including (but not limited to) cortisone medication, trauma, **diabetes**, and aging. The symptoms of cataracts include double or blurred vision and unusual sensitivity to light and glare. The clouded lens is removed in its entirety by surgery and replaced with an intraocular lens made of plastic, an operation that takes less than an hour and usually does not need overnight stay in hospital.

The age– and sex–**adjusted rate** of cataract surgeries per 1,000 residents aged 50 and older was calculated for **fiscal years** 2006/07 and 2011/12. Cataract surgery was defined by a physician claim with physician tariff codes 5611, 5612 and tariff prefix "2" (surgery) or a hospitalization with ICD–9–CM procedure codes 13.11, 13.19, 13.2, 13.3, 13.41, 13.42, 13.43, 13.51, and 13.59 or CCI code 1.CL.89. Additional cataract surgeries for Manitoba residents were added from medical reciprocal claims out-of-province, including Alberta (tariff code 27.72) and Saskatchewan (tariff codes 135S, 136S, 226S, and 325S). The denominator includes all Manitoba residents aged 50 and older as of December 31, 2006 and 2011.

Causes of Death

The most frequent causes of death for Manitobans in two 5–year time periods: 2002–2006 and 2007–2011. Causes of death from the Vital Statistics death records were grouped by ICD–10 chapter, and the most frequent causes are shown for each **Regional Health Authority** (**RHA**) and the province overall (shown as average annual crude/unadjusted percent).

Causes of Hospital Days Used

The most frequent reasons for hospital days used during **inpatient hospitalizations** and **day surgeries** in **fiscal years** 2006/07 and 2011/12. Each hospital abstract has a most responsible diagnosis—a diagnosis that describes the most significant condition of a patient that contributed his or her days in hospital. Most responsible diagnoses were grouped by ICD–10–CA chapter, and the most frequent causes are shown for each **Regional Health Authority** (**RHA**) and the province overall (shown as average annual crude/unadjusted percent).

Causes of Hospitalization

The most frequent reasons for **inpatient hospitalizations** and day surgeries in **fiscal year**s 2006/07 and 2011/12. Each hospital abstract has a most responsible diagnosis—a diagnosis that describes the most significant condition of a patient that contributed to his or her stay in hospital. Most responsible diagnoses were grouped by ICD–10–CA chapter, and the most frequent causes are shown for each **Regional Health Authority** (**RHA**) and the province overall (shown as average annual crude/unadjusted percent).

Causes of Physician Visits

The most frequent reasons for **ambulatory visits** in **fiscal years** 2006/07 and 2011/12. Each visit has only one diagnosis code recorded as the "reason" for the visit, and these diagnoses were grouped by ICD–9–CM chapter. The most frequent causes are shown for each **Regional Health Authority** (**RHA**) and the province overall (shown as average annual crude/unadjusted percent).

Causes of Premature Death

The most frequent causes of premature death for Manitobans aged 0 to 74 in two 5–year time periods: 2002–2006 and 2007–2011. **Causes of death** from the Vital Statistics death records were grouped by ICD–10 chapter, and the most frequent causes are shown for each **Regional Health Authority** (**RHA**) and the province overall (shown as average annual crude/unadjusted percent).

Census Data

Social data based on a population survey (census) that includes aggregate demographic information such as age, sex, marital status, employment, and income for all persons and housing units within a dissemination area in Canada. **Statistics Canada** conducts a Census every five years. It takes account of all Canadian citizens (by birth and by naturalization), landed immigrants, and non–permanent residents together with family members living with them (Statistics Canada, 2009). Dissemination areas include between 400–700 persons and the data can be aggregated upward to various geographic levels.

Statistics Canada. 2006 Census dictionary: overview of the Census. 2009. http://www12.statcan.ca/english/census06/reference/dictionary/ovtoc.cfm. Accessed on November 5, 2009

Chronic Diseases

Conditions that are generally incurable, are often caused by a complex interaction of factors, and usually have a prolonged clinical course.

Community Health Assessment Network (CHAN)

A province–wide collaborative group consisting of representatives from all RHAs, **CancerCare Manitoba**, **Manitoba Centre for Health Policy** (**MCHP**), and **Manitoba Health**. CHAN participates in the preparation of regional guidelines to support health authorities in Manitoba by conducting community health assessments. These assessments identify community health assets and issues, set health objectives, and monitor progress towards those objectives. Winnipeg RHA planners, program teams, and others regularly use this information to identify priorities and to develop and support action plans in their daily work (Winnipeg Regional Health Authority, 2013).

Winnipeg Regional Health Authority. Community Health Assessment. 2013. http://www.wrha.mb.ca/research/cha/. Accessed August 1, 2013.

Computed Tomography (CT) Scans

A process that transforms multiple X–ray images of structures within the body into computer images. The CT scan can reveal soft tissues and other structures that cannot be seen in conventional X–rays. Using the same dosage of radiation as that of an ordinary X–ray machine, an entire slice of the body can be made visible with about 100 times more clarity with the CT scan.

The age– and sex–**adjusted rate** of CT scans per 1,000 residents aged 20 and older was calculated for **fiscal year** 2011/12. CT scans were defined by a physician claim with tariff codes 7112–7115 and 7221–7230. To count person–visits, only one scan per day is counted, as there could be multiple body parts scanned, each with their own claim. The denominator includes all Manitoba residents aged 20 and older as of December 31, 2011.

Note: individual–level information regarding CT scans performed in rural hospitals are not always recorded. Therefore, the CT scan rates shown in this report under–estimate the "true" CT scan rates to an unknown degree.

Confidence Interval (CI)

An interval calculated from data, which contain a population parameter, such as the population median or mean, with specified probability. For example, a 95% confidence interval (written as 95% CI) would have a 95% probability of containing the true population value.

Congestive Heart Failure (CHF)

A **chronic disease** that is often referred to as heart failure or congestive cardiac failure. This condition is characterized by the inability of the heart to pump a sufficient amount of blood throughout the body or by the requirement for elevated filling pressures in order to pump effectively.

The age– and sex–**adjusted** average annual **prevalence** of CHF was calculated for residents aged 40 and older in two 3–year time periods: 2004/05–2006/07 and 2009/10–2011/12. Residents were considered to have CHF if they met one of the following conditions:

- one or more **inpatient hospitalizations** in one year with a diagnosis for CHF: ICD–9–CM code 428, ICD–10–CA code I50
- two or more **physician visits** in one year with a diagnosis for CHF (ICD–9–CM code as above)

The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2004–2006 and 2009–2011).

Continuing Care

A system of care designed so that clients receive services through one assessment service and receive services as appropriate to their needs without having to transfer between service organizations.

Coronary Artery Bypass Surgery

Surgery that improves circulation throughout the body of patients with significantly narrowed or blocked coronary arteries. The procedure replaces narrowed or blocked segments, which permits increased blood flow and thus, oxygen and nutrient supply to the heart muscles.

The average annual age– and sex–**adjusted rate** of bypass surgeries per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Bypass surgeries were defined by hospitalizations with ICD–9–CM procedure codes 36.10 to 36.14 and 36.19 or CCI code 1.IJ.76. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2002–2011). CABG surgeries were only performed at the two tertiary hospitals (Health Sciences Centre and St. Boniface General Hospital), so only hospitalizations from those two hospitals were included in the analysis in order to eliminate the potential for double–counting of procedures. To further reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included.

Crude Rate

The number of events or people with a given condition divided by the number of people living in that region; often expressed as a rate per 1,000 residents (for less frequent events). Crude rates are helpful in determining the burden of disease and the number of residents who have an illness or have experienced an event. This is in contrast to **adjusted rates**, which statistically adjust the crude rates to arrive at an estimate of what a region's rate might have been if the local population's age and sex distribution was the same as that for the entire province. Crude rates can potentially be affected by the age and sex distribution of a region; hence most rates are adjusted for fair comparisons between regions.

Data Suppression

The suppression of data when the number of persons or events involved is five or less. However, data are not suppressed when the actual count is zero. This process of suppressing data is conducted to protect confidentiality and anonymity of date.

Day Surgery

Hospitalizations that involve surgical services on an outpatient basis and are typically less than one day.

The age– and sex–**adjusted rate** of day surgery hospitalizations per 1,000 residents was calculated for **fiscal years** 2006/07 and 2011/12. Multiple admissions of the same person were counted as separate events. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province day surgery hospitalizations for Manitoba residents were also included. In cases of birth, newborn hospitalizations were excluded (the mother's hospitalization was included). The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Dementia

A group of illnesses that involve memory, behavior, learning, and communication problems. The problems are progressive, which means they get worse overtime.

The age– and sex–**adjusted prevalence** of dementia was calculated for residents aged 55 and older in two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Dementia was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis for dementia, including organic psychotic conditions, cerebral degenerations and senility: ICD–9–CM codes 290, 291.1, 291.2, 292.82, 294, 331, 797; ICD–10–CA codes F00, F01, F02, F03, F04, F05.1, F06.5, F06.6, F06.8, F06.9, F09, F10.7, F11.7, F12.7, F13.7, F14.7, F15.7, F16.7, F17.7, F18.7, F19.7, G30, G31.0, G31.1, G31.9, G32.8, G91, G93.7, G94, R54
- one or more **physician visits** with a diagnosis for dementia, ICD–9–CM codes 290, 294, 331, 797

The denominator includes all Manitoba residents aged 55 and older as of December 31, 2004 and 2009.

Dental Extraction

Removal of teeth from the mouth in hospital that occurs in young children with severe tooth decay and that requires the use of anaesthesia beyond levels available in a dentist's office (i.e., general anaesthesia).

The average annual age– and sex–**adjusted rate** of dental extractions per 1,000 residents aged 0 to 5 was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Dental extraction surgeries were defined by hospitalizations with ICD–9–CM procedure codes 23.01, 23.09, 23.11, and 23.19 or CCI codes 1.FE.57 and 1.FE.89. To reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included. The denominator includes all Manitoba residents aged 0 to 5 as of December 31 of each year (2002–2011).

Diabetes

A **chronic disease** in which the pancreas no longer produces enough insulin (type 1 diabetes) or when cells stop responding to the insulin that is produced (type 2 diabetes), so that glucose in the blood cannot be absorbed into the cells of the body. The most common endocrine disorder, diabetes mellitus affects many organs and body functions, especially those involved in metabolism, and can cause serious health complications including renal failure, heart disease, **stroke**, and blindness. Symptoms include frequent urination, fatigue, excessive thirst, and hunger. Also called insulin–dependent diabetes, type 1 diabetes begins most commonly in childhood or adolescence and is controlled by regular insulin injections. The more common form of diabetes, type 2, can usually be controlled with diet and oral medication. Another form of diabetes called gestational diabetes can develop during pregnancy and generally resolves after the baby is delivered.

The age– and sex–**adjusted incidence** and **prevalence** of diabetes was calculated for residents aged 19 and older in two 3–year time periods: 2004/05–2006/07 and 2009/10–2011/12. Diabetes was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of diabetes: ICD–9–CM code 250, ICD–10–CA codes E10–E14
- two or more **physician visits** with a diagnosis of diabetes (ICD–9–CM code as above)
- one or more prescriptions for medications to treat diabetes (ATC code A10, specific drugs that were included are listed below)

For prevalence, the denominator includes all Manitoba residents aged 19 and older as of December 31, 2005 and 2010. For **incidence**, only residents at risk of developing the disease were included in the analysis, and rate of new cases was calculated per 100 **person–years**. A 10–year wash–out period prior to the start of the study years was used to distinguish between prevalent and incident cases, and residents had to be registered with Manitoba Health for the entire 10–year period to be included in the analysis. This measure of diabetes combines type 1 and type 2 diabetes, as physician claims data do not allow separate identification. Gestational diabetes has a separate diagnosis code and is not specifically included here, but some cases may be included if gestational diabetes was not properly coded.

List of drugs used to treat diabetes:

ATC code	***Generic Drug Name***
A10A	insulins and analogues
A10BA02	metformin
A10BB01	glibenclamide
A10BB02	chlorpropamide
A10BB03	tolbutamide
A10BB09	gliclazide
A10BB12	glimepiride
A10BB31	acetohexamide
A10BD03	metformin and rosiglitazone
A10BD04	glimepiride and rosiglitazone
A10BD07	metformin and sitagliptin
A10BF01	acarbose
A10BG01	troglitazone
A10BG02	rosiglitazone
A10BG03	pioglitazone
A10BH01	sitagliptin
A10BH03	saxagliptin
A10BH05	linagliptin
A10BX02	repaglinide
A10BX03	nateglinide
A10BX04	exenatide
A10BX07	liraglutide

Diabetes Care: Eye Examination

Eye examinations recommended for patients with **diabetes**. Diabetics are at a greater risk of damage to the retina than the general population. In the later stages of diabetes, individuals may develop diabetic retinopathy, which causes the swelling of blood vessels in the retina and leaking of fluid or the abnormal growth of new blood vessels on the surface of the retina. Diabetic retinopathy can develop without symptoms and, when left untreated, may cause loss of vision or blindness; regular eye examinations for diabetics help to diagnose retinopathy early and slow its progression.

Although all residents with diabetes qualify for annual eye exams without having to pay for the service, some may not indicate their diabetic status to the provider, in which case the provider may bill the patient directly. If that occurs, there would be no record of the visit in medical claims data. Furthermore, services provided by **general and family practitioners** (**GPs/FPs**) could not be included, as there is no specific tariff for this service. As a result, this indicator under–estimates eye exam rates to some degree

The crude (unadjusted) percent of residents with diabetes aged 19 and older who had an eye exam in a year was calculated for **fiscal years** 2006/07 and 2011/12. Eye exams were defined as a physician visit to an ophthalmologist or an optometrist visit in the medical claims data.

Note: Although all residents with diabetes qualify for annual eye exams without having to pay for the service, some may not indicate their diabetic status to the provider, in which case the provider may bill the patient directly. If that occurs, there would be no record of the visit in medical claims data. Furthermore, services provided by GPs and FPs could not be included, as there is no specific tariff for this service. As a result, this indicator under–estimates eye exam rates to some degree.

Districts—see Regional Health Authority (RHA) Districts

Drug Program Information Network (DPIN) Data

Health data maintained by **Manitoba Health** containing prescription drug claims from the Drug Program Information Network (DPIN), an electronic, on–line, point–of–sale prescription drug data that connect Manitoba Health and all pharmacies in Manitoba. The DPIN system generates complete drug profiles for each client including all transactions at the point of distribution. Information about pharmaceutical dispensations, prescriptions identified as potential drug utilization problems, non–adjudicated prescriptions, and ancillary programs and non–drug products is captured in real time for all Manitoba residents (including Registered First Nations), regardless of insurance coverage or final payer. Note that the prescription's indication (the physician's prescribing intent) is not collected and must be inferred from other data. Services not captured in DPIN include hospital pharmacies, **nursing stations**, ward stock, and outpatient visits at **CancerCare Manitoba**.

Expected Length of Stay (ELOS)

The length of time an individual is expected to stay in hospital, based on the patient's age, most current acute length of stay, and **case mix group** (**CMG**™) complexity. ELOS do not account for alternate level of care (non–acute) days (Canadian Institute for Health Information [CIHI], 2010).

Canadian Institute for Health Information (CIHI). *Discharge Abstract Database Abstracting Manual*, 2010–2011 Edition. Ottawa, ON: Canadian Institute for Health Information (CIHI); 2010.

Fee–for–Service

A method of payment whereby physicians bill for each service rendered, according to a pre–arranged schedule of fees and services. Physicians who are paid on a fee–for–service basis file a claim for each service rendered and are responsible for their operating costs. Other physicians are compensated under an alternate payment plan (APP).

First Nations Communities

A legal list of communities maintained by Aboriginal Affairs and Northern Development Canada (AANDC) that includes the following Census sub–division types: Indian Government Districts, Reserves, Indian Settlements, Terre Reservées, Nisga'a Lands, Nisga'a Villages, and Teslin Lands. By definition, AANDC's complete list of First Nations communities includes:

- Land reserved under the Indian Act
- Land set aside for the use and benefit of Indian people
- Areas where activities on the land are paid or administered by AANDC
- Areas listed in the Indian Lands Registry System held by Lands and Trust Services at AANDC

This broader definition of a First Nations community includes a selection of the following sub–division types: Chartered Community, Hamlet, Northern Hamlet, Northern Village, Settlement, Town, and Village.

Fiscal Year(s)

Defined as starting on April 1 and ending the following March 31. For example, the 2009/10 fiscal year would be April 1, 2009 to March 31, 2010, inclusive.

General and Family Practitioners (GPs/FPs)

Physicians who operate a general or family practice and are not certified in another specialty in Manitoba.

Generalized Liner Model (GLM)

A unified class of models for regression analysis of independent observations of a discrete or continuous response. A characteristic feature of generalized linear models is that a suitable non–linear transformation of the mean response is a linear function of the covariates. Generalized linear models provide a unified method for analyzing diverse types of univariate responses (e.g., continuous, binary, counts). Generalized linear models are actually a collection of regression models; and they include as special cases the standard linear regression for normally distributed continuous outcomes, **logistic regression** models for a binary outcome, or Poisson regression models for counts (Fox, 1997).

Fox, J. *Applied Regression Analysis, Linear Models, and Related Methods*. Thousand Oaks, CA: Sage Publications, Inc.; 1997

Health Regions (Regions)—see Regional Health Authorities (RHAs)

Heart Attack—see Acute Myocardial Infarction

Hospital Bed Supply

The number of 'setup' beds in acute care hospitals within each **Regional Health Authority** (**RHA**) divided by the population of the RHA. The bed counts were taken from the **Manitoba Health** Bed Map for **fiscal years** 2006/07 and 2011/12. Values are not **adjusted** for age and sex. These values need to be interpreted with caution because the actual number of beds in use in each hospital varies through the year and because beds can also be used for "non–acute" care. The values are shown to provide an overall indication of the relative supply of beds across the province and to track major changes over time.

Hospital Catchment (Hospitalizations and Days)

Information regarding where hospital patients came from with respect to each geographic region. Of all hospitalizations (or days) from all hospitals in each **Regional Health Authority** (**RHA**), this is the percent that were provided to: (1) RHA residents, (2) residents of other RHAs, (3) Winnipeg residents, and (4) out-of-province residents. The catchment of hospitalizations was calculated for **fiscal year**s 2006/07 and 2011/12. Hospitalizations attributed to Non–Manitoba residents were included. For this analysis, the postal code information from the hospital abstract collected at time of hospitalization was used to assign residents to RHAs rather than sourced from the **Manitoba Health Insurance Registry**. The Registry is usually the gold standard, but does not always capture all moves within the province if they are not reported and this discrepancy can be more noticeable when measuring indicators in less populated regions.

Hospital Days Used in Long Stays

An inpatient hospitalization lasting 14 days or more was considered a long hospital stay in this report.

The age– and sex–**adjusted rate** of hospital days used in long stays was calculated per 1,000 residents for **fiscal years** 2006/07 and 2011/12. If a resident had more than one long hospitalization in the period, then the days used in all long hospitalizations were summed. The total **length of stay** of each **hospital episode** is counted, taking into account transfers so as to not double–count days in hospital. Hospital episodes lasting longer than one year were truncated to maximum 365 days to remove influential outliers. Appendix 3 provides the adjusted rates of hospital days used for long stay days without outliers truncated. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were also included. In cases of birth, newborn hospitalizations were excluded (the mother's hospitalization was included). The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Hospital Days Used in Short Stays

An inpatient hospitalization lasting one day to 13 days is considered a short hospital stay in this report.

The age– and sex–**adjusted rate** of hospital days used in short stays was calculated per 1,000 residents for **fiscal years** 2006/07 and 2011/12. If a resident had more than one short hospitalization in the period, the days used in all short hospitalizations were summed. The total **length of stay** of each **hospital episode** is counted, taking into account transfers so as to not double–count days in hospital. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were also included. In cases of birth, newborn hospitalizations were excluded (the mother's hospitalization was included). The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Hospital Discharge Abstracts Data

Health data maintained by **Manitoba Health** consisting of hospital forms/computerized records (hospital abstracts) containing summaries of demographic and clinical information (e.g., gender, postal code, diagnoses, and procedure codes) completed at the point of discharge from the hospital. Several hundred thousand abstracts per year are submitted for all hospitalizations from acute care and chronic care facilities in Manitoba and for all Manitobans admitted to out–of–province facilities. The hospital abstracts data include records of both Manitoba residents and non–Manitoba residents hospitalized in Manitoba facilities and information about inpatient and **day surgery** services.

Hospital Episode

A single, continuous stay in the hospital system, irrespective of transfers between hospitals.

Hospital Location (Hospitalizations and Days)

Information regarding where **Regional Health Authority** (**RHA**) residents went for hospitalizations by the following categories: (1) percent of hospitalizations in patient's RHA, (2) percent of hospitalizations in another RHA, (3) percent of hospitalizations in a Winnipeg hospital, and (4) percent of hospitalizations outside of Manitoba. The location of hospitalizations was calculated for **fiscal year**s 2006/07 and 2011/12. Only hospitalizations attributed to Manitoba residents were counted. For this analysis, the postal code information from the hospital abstract collected at time of hospitalization was used to assign residents to RHAs rather than sourced from the **Manitoba Health Insurance Registry**. The Registry is usually the gold standard, but does not always capture all moves within the province if they are not reported and this discrepancy can be more noticeable when measuring indicators in less populated regions.

Hospital Readmissions

An unplanned, inpatient readmission to an acute care facility within 30 days of discharge from the index **hospital episode**.

The age– and sex–**adjusted** percent of hospital episodes that had a readmission within one to 30 days of discharge was calculated for **fiscal years** 2006/07 and 2011/12. Hospital episodes combine multiple inpatient admissions of the same person to create a single, continuous stay in the hospital system, irrespective of transfers between hospitals (readmissions less than 24 hours after discharge were considered to be part of the same hospital episode). Only unplanned inpatient readmissions were counted, defined by admission category "U" for urgent/emergent admissions. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were not included. In cases of birth, both the newborn and the mother's hospitalizations were included as index hospitalizations. The denominator includes all Manitoba residents hospitalized in fiscal years 2006/07 and 2011/12.

Hospital Use (Hospital Access)—see Use of Hospitals

Hospitalizations for Ambulatory Care Sensitive (ACS) Conditions

Hospitalizations for a set of medical conditions or diagnoses "for which timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition, or managing a chronic disease or condition". This grouping is comprised of 25 diseases/diagnoses, including asthma, angina, gastroenteritis, and **congestive heart failure** (**CHF**), created by Billings and colleagues (1996; 1993). The idea behind this measure was that if people receive an adequate level of good quality primary care, they should not need to be hospitalized for these conditions.

The age– and sex–**adjusted rate** of **inpatient hospitalizations** for ACS conditions (defined below) per 1,000 residents aged 0 to 74 was calculated for **fiscal years** 2006/07 and 2011/12. For all ACS conditions (except congenital syphilis), the ACS condition must be coded as the most responsible diagnosis. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were also included. Individuals who died in hospital were excluded from the numerator. The denominator includes all Manitoba residents aged 0 to 74 as of December 31, 2006 and 2011.

ACS conditions include:

- Congenital Syphilis: ICD–9–CM code 090, ICD–10–CA code A50 (newborns only)
- Immunization–related and Preventable Conditions: ICD–9–CM codes 033, 037, 045, 390, 391; ICD–10–CA codes A35, A37, A80, I00, I01 (also including hemophilus meningitis for children aged 1 to 5 only: ICD–9–CM code 320.0; ICD–10–CA code G00.0)
- Epilepsy: ICD–9–CM code 345, ICD–10–CA codes G40, G41
- Convulsions: ICD–9–CM code 780.3, ICD–10–CA code R56
- Severe ENT Infections: ICD–9–CM codes 382, 462, 463, 465, 472.1; ICD–10–CA codes H66, J02, J03, J06, J312 (cases of otitis media: ICD–9–CM code 382, ICD–10–CA code H66, with a procedure code for myringotomy with insertion of tube are excluded: ICD–9–CM procedure code 20.01, CCI code 1.DF.53.JA–TS)
- Pulmonary Tuberculosis: ICD–9–CM code 011; ICD–10–CA codes A15.0, A15.1, A15.2, A15.3, A15.7, A15.9, A16.0, A16.1, A16.2, A16.7, A16.9
- Other Tuberculosis: ICD–9–CM codes 012–018; ICD–10–CA codes A15.4, A15.5, A15.6, A15.8, A16.3, A16.4, A16.5, A16.8, A17, A18, A19
- Chronic Obstructive Pulmonary Disease (COPD): ICD–9–CM codes 491, 492, 494, 496; ICD–10–CA codes J41, J42, J43, J44, J47 (also included in 2005/06 are patients with a primary diagnosis of acute lower respiratory infection: ICD–10–CA codes J10.0, J11.0, J12–J16, J18, J21, J22; and a secondary diagnosis of COPD with acute lower respiratory infection: ICD–10–CA code J44)
- Acute Bronchitis (only included if a secondary diagnosis of COPD is also present, diagnosis codes as above): ICD–9–CM code 466.0, ICD–10–CA code J20
- Bacterial Pneumonia: ICD–9–CM codes 481, 482.2, 482.3, 482.9, 483, 485, 486; ICD–10–CA codes J13, J14, J15.3, J15.4, J15.7, J15.9, J16, J18 (patients with a secondary diagnosis of sickle–cell anaemia: ICD–9–CM code 282.6; ICD–10–CA codes D57.0, D57.1, D57.2, D57.8 and patients less than two months of age are excluded)
- Asthma: ICD–9–CM code 493, ICD–10–CA code J45
- Congestive Heart Failure: ICD–9–CM codes 402.01, 402.11, 402.91, 428, 518.4; ICD–10–CA codes I50, J81 (patients with certain cardiac procedures coded are excluded: ICD–9–CM procedure codes 36.01, 36.02, 36.05, 36.1, 37.5, 37.7; CCI codes 1.HB.53, 1.HB.54, 1.HB.55, 1.HD.53, 1.HD.54, 1.HD.55, 1.HZ.53, 1.HZ.55, 1.HZ.85, 1.IJ.50, 1.IJ.57.GQ, 1.IJ.76)
- **Hypertension:** ICD–9–CM codes 401.0, 401.9, 402.00, 402.10, 402.90; ICD–10–CA codes I10.0, I10.1, I11 (patients with certain cardiac procedures coded are excluded, procedure codes as in CHF)
- Angina: ICD–9–CM codes 411.1, 411.8, 413; ICD–10–CA codes I20, I23.82, I24.0, I24.8, I24.9 (patients with any surgical procedure coded are excluded)

- Cellulitis: ICD–9–CM codes 681, 682, 683, 686; ICD–10–CA codes L03, L04, L08, L44.4, L88, L92.2, L98.0, L98.3 (patients with any surgical procedure coded are excluded, except for incisions of skin and subcutaneous tissue: ICD–9–CM procedure code 86.0; CCI codes 1.AX.53.LA–QK, 1.IS.53.HN–LF, I.IS.53.LA–LF, 1.JU.53.GP–LG, 1.KR.53.LA–LF, 1.OA.53.LA–QK, 1.SY.53.LA–QK, 1.YA.35.HA–W1, 1.YA.35.HA–X4, 1.YA.52.HA, 1.YA.52.LA, 1.YA.55.DA–TP, 1.YA.55.LA–TP, 1.YA.56.LA, 1.YB.52.HA, 1.YB.52.LA, 1.YB.55.DA–TP, 1.YB.55.LA–TP, 1.YB.56.LA, 1.YF.35.HA–W1, 1.YF.35.HA–X4, 1.YF.52.HA, 1.YF.55.DA–TP, 1.YF.55.LA–TP, 1.YF.56.LA, 1.YG.52.HA, 1.YG.52.LA, 1.YG.55.DA–TP, 1.YG.55.LA–TP, 1.YG.56.LA, 1.YR.52.HA, 1.YR.52.LA, 1.YR.56.LA, 1.YS.35.HA–W1, 1.YS.35.HA–X4, 1.YS.52.HA, 1.YS.52.LA, 1.YS.55.DA.TP, 1.YS.55.LA–TP, 1.YS.56.LA, 1.YT.35.HA–W1, 1.YT.35.HA–X4, 1.YT.52.HA, 1.YT.52.LA, 1.YT.55.DA–TP, 1.YT.55.LA–TP, 1.YT.56.LA, 1.YU.52.HA, 1.YU.52.LA, 1.YU.55.DA–TP, 1.YU.55.LA–TP, 1.YU.56.LA, 1.YV.35.HA–W1, 1.YV.35.HA–X4, 1.YV.52.HA, 1.YV.52.LA, 1.YV.55.DA–TP, 1.YV.55.LA–TP, 1.YV.56.LA, 1.YW.52.HA, 1.YW.52.LA, 1.YW.55.DA–TP, 1.YW.55.LA–TP, 1.YW.56.LA, 1.YX.52.HA, 1.YX.52.HA–AV, 1.YX.52.LA, 1.YX.56.LA, 1.YZ.35.HA–W1, 1.YZ.35.HA–X4, 1.YZ.52.HA, 1.YZ.52.LA, 1.YZ.55.DA–TP, 1.YZ.55.LA–TP, 1.YZ.56.LA)
- **Diabetes:** ICD–9–CM codes 250.0, 250.1, 250.2, 250.3, 250.8, 250.9; ICD–10–CA codes E10.1, E10.6, E10.7, E10.9, E11.0, E11.1, E11.6, E11.7, E11.9, E13.0, E13.1, E13.6, E13.7, E13.9, E14.0, E14.1, E14.6, E14.7, E14.9
- Hypoglycemia: ICD–9–CM code 251.2; ICD–10–CA codes E16.0, E16.1, E16.2
- Gastroenteritis: ICD–9–CM code 558.9; ICD–10–CA codes K52.2, K52.8, K52.9
- Kidney/Urinary Infections: ICD–9–CM codes 590, 599.0, 599.9; ICD–10–CA codes N10, N11, n12, N13.6, N15.1, N15.8, N15.9, N16.0–N16.5, N28.83–N28.85, N36.9, N39.0, N39.9
- Dehydration/Volume Depletion: ICD–9–CM code 276.5, ICD–10–CA code E86
- Iron Deficiency Anemia: ICD–9–CM codes 280.1, 280.8, 280.9; ICD–10–CA codes D50.1, D50.8, D50.9 (patients aged 0 to 5 only)
- Nutritional Deficiencies: ICD–9–CM codes 260, 261, 262, 268.0, 268.1; ICD–10–CA codes E40–E43, E55.0, E64.3
- Failure to Thrive: ICD–9–CM code 783.4, ICD–10–CA code R62 (patients less than one year of age only)
- Pelvic Inflammatory Disease: ICD–9–CM code 614; ICD–10–CA codes N70, N73, N99.4 (female patients only, patients with a hysterectomy procedure coded are excluded: ICD–9–CM procedure codes 68.3–68.8; CCI codes 1.RM.87, 1.RM.89, 1.RM.91, 5.CA.89.CK, 5.CA.89.DA, 5.CA.89.GB, 5.CA.89.WJ, 5.CA.89.WK)
- Dental Conditions: ICD–9–CM codes 521, 522, 523, 525, 528; ICD–10–CA codes K02–K06, K08, K09.8, K09.9, K12, K13

Billings J, Anderson GM, Newman LS. Recent findings on preventable hospitalizations. *Health Aff (Millwood)* 1996;15(3):239-249.

Billings J, Zeitel L, Lukomnik J, Carey TS, Blank AE, Newman L. Impact of socio-economic status on hospital use in New York City. *Health Affairs (Millwood)* 1993;12(1):172-173.

Hypertension

Also called high blood pressure, this condition often has no symptoms; therefore hypertension is a major health problem. If left untreated, hypertension can lead to **heart attack**, **stroke**, enlarged heart, or kidney damage.

The age– and sex–**adjusted incidence** and **prevalence** of hypertension was calculated for residents aged 19 and older for **fiscal years** 2006/07 and 2011/12. Hypertension was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of hypertension: ICD–9–CM codes 401–405; ICD–10–CA codes I10–I13, I15
- one or more **physician visits** with a diagnosis of hypertension (ICD–9–CM codes as above)
- two or more prescriptions for medications to treat hypertension (listed below)

For prevalence, the denominator includes all Manitoba residents aged 19 and older as of December 31, 2006 and 2011. For **incidence**, only residents at risk of developing the disease were included in the analysis, and rate of new cases was calculated per 100 **person–years**. A 10–year wash–out period prior to the start of the study years was used to distinguish between prevalent and incident cases, and residents had to be registered with Manitoba Health for the entire 10–year period to be included in the analysis.

List of drugs used to treat hypertension:

ATC code	*Generic Drug Name*
C02AB02	methyldopa
C02AC01	clonidine
C02CA04	doxazosin
C02CA05	terazosin
C02DB02	hydralazine
C02DC01	minoxidil
C02LA01	reserpine and diuretics
C02LB01	methyldopa and diuretics
C03AA03	hydrochlorothiazide
C03BA04	chlorthalidone
C03BA11	indapamide
C03CA01	furosemide
C03CA02	bumetanide
C03CC01	etacrynic acid
C03DB01	amiloride
C03DB02	triamterene
C03EA01	hydrochlorothiazide and potassium–sparing agents
C07AA02	oxprenolol
C07AA03	pindolol
C07AA05	propranolol
C07AA06	timolol
C07AA12	nadolol
C07AB02	metoprolol
C07AB03	atenolol
C07AB04	acebutolol
C07AB07	bisoprolol
C07AG01	labetalol
C07BA05	propranolol and thiazides
C07CA03	pindolol and other diuretics
C07CB03	atenolol and other diuretics
C08CA01	amlodipine
C08CA02	felodipine
C08CA04	nicardipine
C08CA05	nifedipine
C08CA06	nimodipine
C08DA01	verapamil
C08DB01	diltiazem
C09AA01	captopril
C09AA02	enalapril
C09AA03	lisinopril
C09AA04	perindopril
C09AA05	ramipril
C09AA06	quinapril
C09AA07	benazepril
C09AA08	cilazapril
C09AA09	fosinopril
C09AA10	trandolapril
C09BA02	enalapril and diuretics
C09BA03	lisinopril and diuretics
C09BA04	perindopril and diuretics
C09BA06	quinapril and diuretics
C09BA08	cilazapril and diuretics
C09BB10	trandolapril and verapamil

ATC code	*Generic Drug Name*
C09CA01	losartan
C09CA02	eprosartan
C09CA03	valsartan
C09CA04	irbesartan
C09CA06	candesartan
C09CA07	telmisartan
C09CA08	olmesartan
C09DA01	losartan and diuretics
C09DA02	eprosartan and diuretics
C09DA03	valsartan and diuretics
C09DA04	irbesartan and diuretics
C09DA06	candesartan and diuretics
C09DA07	telmisartan and diuretics
C09DA08	olmesartan and diuretics
C09XA02	aliskiren
C09XA52	aliskiren and hydrochlorothiazide
C10BX03	atorvastatin and amlodipine
G04CA03	terazosin

Immunization Data

Health data maintained by **Manitoba Health** containing information on the immunization histories of Manitoba Health registrants (only children under the age of 18 were included prior to 2000/01). Data are collected by the **Manitoba Immunization Monitoring System** (**MIMS**), which is a population–based system that provides monitoring and reminders to help ensure that recommended immunizations are received (Manitoba Health, 2007). **Immunization data** at the **Manitoba Centre for Health Policy** (**MCHP**) include information on the type of vaccine administered, vaccine sequence schedule, service date, and provider information, as well as some demographic information from the **Manitoba Health Insurance Registry**. Immunizations for clients in First Nations communities are managed by First Nations and Inuit Health and are not included in these data. Additionally, immunizations administered by private companies may not be included.

Manitoba Health. Manitoba Immunization Monitoring System (MIMS) annual report. 2007. Communicable Disease Control, Public Health Division, Manitoba Health & Healthy Living. http://www.gov.mb.ca/health/publichealth/surveillance/mims/reports/2007.pdf. Accessed August 1, 2013.

Incidence

The number of new cases of a given event over a specified time period. The incidence rate counts only new cases in the numerator; and individuals with a history of the condition are not included in either the numerator or denominator. Thus, the denominator for incidence rates only includes the population at risk of developing the disease or having the event.

Income Quintile

A method used to measure the average household income of residents by dividing the population into five income groups (from lowest income to highest income) such that 20% of the population is in each group. The quintiles are based on dissemination area (DA) level average household income values from a public–use census files. Income quintiles are created within two population groups: urban (Winnipeg and Brandon) and rural (other Manitoba areas). Each person within a DA is "attributed" the average household income of the DA, so this is not an individual income but rather an area–level income measure. Individuals whose postal code does not link with a DA, whose DA has a suppressed average household income, or those who live in DA where 90% or more of the population is institutionalized (i.e., **personal care home**, prison) cannot not be attributed an income quintile and are referred to as "Income Unknown."

Influenza Immunization

The most effective way to prevent influenza, commonly known as the flu, and the complications arising from it in high–risk populations, such as seniors. The Canadian National Advisory Committee on Immunization recommends influenza vaccination for people at high risk. This includes people aged 65 and above, adults and children with certain chronic medical conditions, pregnant women, nursing home residents, healthcare workers who are in contact with people in the high–risk groups, and household contacts of people at risk who either cannot be vaccinated or may respond inadequately to vaccination. As of the 2010–11 flu season, the influenza vaccination is available free of charge to all Manitobans (previously it was available for free only to the target groups identified by the National Advisory Committee on Immunization).

The age– and sex–**adjusted** percent of residents aged 65 and older who received an influenza vaccination was calculated for **fiscal years** 2006/07 and 2011/12. Influenza vaccinations were defined by physician tariff codes 8791, 8792, and 8799 in **Manitoba Immunization Monitoring System** (**MIMS**) data. The denominator includes all Manitoba residents aged 65 and older as of December 31, 2006 and 2011.

Inpatient Hospitalization

Hospitalizations during which patients are formally admitted to the hospital for diagnostic, medical, or surgical treatment and typically stay for one or more days.

The age– and sex–**adjusted rate** of inpatient hospitalizations per 1,000 residents was calculated for **fiscal years** 2006/07 and 2011/12. Multiple admissions of the same person were counted as separate events. Appendix 3 provides the adjusted rates of inpatient **hospital episodes**, rather than hospitalizations, which count single, continuous stays in the hospital system, irrespective of transfers between hospitals. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were also included. In cases of birth, newborn hospitalizations were excluded (the mother's hospitalization was included). The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

International Classification of Diseases (ICD)

A classification system of disease, health conditions, and procedures. The 9th version with clinical modifications (ICD–9–CM) and the 10th version (ICD–10) were developed by the **World Health Organization** (**WHO**). The Canadian version of this disease classification (ICD–10–CA) was developed by the Canadian Institute for Health Information (CIHI) and is based on the ICD–10. The ICD–10–CA chapters are:

1. certain infectious and parasitic diseases
2. neoplasms (Cancers)
3. diseases of the blood and blood–forming organs and certain disorders involving the immune mechanism
4. endocrine, nutritional and metabolic diseases
5. mental and behavioural disorders
6. diseases of the nervous system
7. diseases of the eye and adnexa
8. diseases of the ear and mastoid process
9. diseases of the circulatory system
10. diseases of the respiratory system
11. diseases of the digestive system
12. diseases of the skin and subcutaneous tissue
13. diseases of the musculoskeletal system and connective tissue
14. diseases of the genitourinary system
15. pregnancy, childbirth and the puerperium
16. certain conditions originating in the perinatal period
17. congenital malformations, deformations, and chromosomal abnormalities
18. symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified,
19. injury, poisoning and certain other consequences of external causes
20. external causes of morbidity and mortality
21. factors influencing health status and contact with health services
22. codes for special purposes

Ischemic Heart Disease (IHD)

A condition in which blood flow (and thus oxygen) is restricted to a part of the body, usually due to narrowing of the arteries. "Ischemic heart disease" refers to heart problems caused by narrowed heart arteries. This is also known as coronary artery disease or coronary heart disease. It can ultimately lead to **heart attack**.

The age– and sex–**adjusted incidence** and **prevalence** of IHD was calculated for residents aged 19 and older in two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. IHD was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of IHD, ICD–9–CM codes 410–414; ICD–10–CA codes I20–I22, I24, I25
- two or more **physician visits** with a diagnosis of IHD (ICD–9–CM codes as above)
- one physician visit with a diagnosis of IHD (ICD–9–CM codes as above) and two or more prescriptions for medications to treat IHD (listed below)

For prevalence, the denominator includes all Manitoba residents aged 19 and older as of December 31, 2004 and 2009. For **incidence**, only residents at risk of developing the disease were included in the analysis, and rate of new cases was calculated per 100 **person–years**. A 10–year wash–out period prior to the start of the study years was used to distinguish between prevalent and incident cases, and residents had to be registered with Manitoba Health for the entire 10–year period to be included in the analysis.

List of drugs used to treat IHD are listed below:

ATC code	*Generic Drug Name*
B01AC04	clopidogrel
B01AC22	prasugrel
B01AC24	ticagrelor
C01DA02	glyceryl trinitrate
C01DA05	pentaerithrityl tetranitrate
C01DA08	isosorbide dinitrate
C01DA14	isosorbide mononitrate
C07AA02	oxprenolol
C07AA03	pindolol
C07AA05	propranolol
C07AA06	timolol
C07AA12	nadolol
C07AB02	metoprolol
C07AB03	atenolol
C07AB04	acebutolol
C07AB07	bisoprolol
C07AG01	labetalol
C07BA05	propranolol and thiazides
C07CA03	pindolol and other diuretics
C07CB03	atenolol and other diuretics
C08CA01	amlodipine
C08CA02	felodipine
C08CA04	nicardipine
C08CA05	nifedipine
C08CA06	nimodipine
C08DA01	verapamil
C08DB01	diltiazem
C09AA01	captopril
C09AA02	enalapril
C09AA03	lisinopril
C09AA04	perindopril
C09AA05	ramipril
C09AA06	quinapril
C09AA07	benazepril
C09AA08	cilazapril
C09AA09	fosinopril
C09AA10	trandolapril
C09BA02	enalapril and diuretics
C09BA03	lisinopril and diuretics
C09BA04	perindopril and diuretics
C09BA06	quinapril and diuretics
C09BA08	cilazapril and diuretics
C09CA01	losartan
C09CA02	eprosartan
C09CA03	valsartan
C09CA04	irbesartan
C09CA06	candesartan
C09CA07	telmisartan
C09CA08	olmesartan
C09DA01	losartan and diuretics
C09DA02	eprosartan and diuretics
C09DA03	valsartan and diuretics
C09DA04	irbesartan and diuretics
C09DA06	candesartan and diuretics
C09DA07	telmisartan and diuretics
C09DA08	olmesartan and diuretics
C10AA01	simvastatin
C10AA02	lovastatin
C10AA03	pravastatin
C10AA04	fluvastatin
C10AA05	atorvastatin
C10AA06	cerivastatin
C10AA07	rosuvastatin
C10AB02	bezafibrate
C10AB04	gemfibrozil
C10AB05	fenofibrate
C10AX09	ezetimibe
C10BX03	atorvastatin and amlodipine
N02BA01	acetylsalicylic acid (tablet strength <= 325 mg)

Johns Hopkins Adjusted Clinical Group® (ACG®) Case–Mix System

A population/patient case–mix adjustment system developed by researchers at Johns Hopkins University School of Hygiene and Public Health in Baltimore, Maryland, U.S.A to measure the illness burden (morbidity) of individual patients and enrolled populations. This system quantifies morbidity by grouping individuals based on their age, gender, and ICD–9–CM and ICD–10–CA diagnoses from their hospitalizations and **physician visits** over a defined time period (typically one year). The goal of the ACG system is to assign each individual a single, mutually exclusive ACG value, which is a relative measure of the individual's expected or actual consumption of health services. ACGs were formerly known as Ambulatory Care Groups.

Length of Stay (LOS)

The duration of care counted from admission to separation (discharge) for residents within a healthcare facility. In this report, it was calculated for the entire episode of care.

Level of Care on Admission to Personal Care Home (PCH)

The distribution of levels of care assigned to **personal care home** (**PCH**) residents 75 years and older at the time of their admission to a provincial PCH for **fiscal years** 2005/06–2006/07 and 2010/11–2011/12. Level 1 represents the lowest level of need, and Level 4 represents the highest. For the study years there were zero residents admitted at level of care 1. Levels 2 and 3 are stratified by the close supervision indicator (coded as yes/no on assessment to indicate the need for close supervision due to possible behavioural issues), but due to small numbers level 4 was not stratified. This indicator only includes information on provincial PCH beds; federal beds are not included due to lack of information in the provincial data.

Life Expectancy at Birth

The expected length of life from birth was calculated based on the patterns of mortality in the population from the preceding five years. Data were analyzed for two 5–year time periods, 2002–2006 and 2007–2011. Values were not age–**adjusted** but calculated directly from the mortality experience of local residents using a "life table" approach. Small differences in life expectancy values imply important differences in health status.

Location of Visits to General and Family Practitioners (GPs/FPs)

Information regarding where **Regional Health Authority** (**RHA**) residents went for **ambulatory visits** to GPs/FPs by the following categories: (1) percent of visits in patient's RHA **district**, (2) percent of visits elsewhere in patient's RHA, (3) percent of visits to another RHA, and (4) percent of visits to Winnipeg. The location of ambulatory visits was calculated for **fiscal years** 2006/07 and 2011/12. Only ambulatory visits to GPs/FPs were counted, defined by mdbloc = 11. Only visits for Manitoba residents within Manitoba were counted; this may result in some possible under–counting of visits to RHA districts that border other provinces.

Location of Visits to Specialists

Information regarding where **Regional Health Authority** (**RHA**) residents went for **ambulatory visits** to specialists by the following categories: (1) percent of visits in patient's RHA **district**, (2) percent of visits elsewhere in patient's RHA, (3) percent of visits to another RHA, and (4) percent of visits to Winnipeg hospital. The location of ambulatory visits was calculated for **fiscal years** 2006/07 and 2011/12. Only ambulatory visits to specialists were counted, including all medical specialists, paediatricians, psychiatrists, obstetricians and gynecologists, and surgeons (defined by mdbloc codes other than 11). Only visits for Manitoba residents within Manitoba were counted; this may result in some possible under–counting of visits to RHA districts that border other provinces.

Logistic Regression

A regression technique used when the outcome is a binary, or dichotomous, variable. Logistic regression models the probability of an event as a function of other factors. These models are only able to state that there is a relationship ("association") between the explanatory and the outcome variables. This is not necessarily a causal relationship, since it is based on observational data. An explanatory variable may be associated with an increase or decrease (not that it caused the increase or decrease).

Long Term Care Utilization History Data

Data that are maintained by **Manitoba Health** and record chronic and rehabilitative care provided by long term care institutions in Manitoba, including hospital patients awaiting placement. These data include details on admissions, hospitalizations, assessments, levels of care, and rate changes.

Lower Limb Amputations Among Residents with Diabetes

The removal of the lower limb (below or including the knee) by amputation among those with a diagnosis of diabetes.

The age– and sex–**adjusted** percent of residents with diabetes aged 19 and older who had a lower limb amputation (below or including the knee) was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Diabetes was defined in the three fiscal years prior to the five-year study period: 1999/00–2001/02 and 2004/05–2006/07. Amputation was defined by a hospitalization with a surgery for a lower limb amputation, identified by ICD–9–CM procedure codes 84.10–84.17 and CCI codes 1.VC.93, 1.VG.93, 1.VQ.93, 1.WA.93, 1.WE.93, 1.WJ.93, 1.WL.93, and 1.WM.93. This definition does not include all amputations, but only those for which there was an existing condition of diabetes coded with the amputation; therefore the hospital abstract for the amputation must also indicate a diagnosis of diabetes (defined by ICD–9–CM diagnosis code 250 and ICD–10–CA codes E10–E14). Amputations associated with accidental injury were excluded (defined by ICD–9–CM diagnosis codes 895, 896, 897 and ICD–10–CA codes: S78, S88, S98, T05.3, T05.4, T05.5, T13.6). Ten–year values for amputations are available in Appendix 3.

Magnetic Resonance Imaging (MRI) Scans

Another way to take pictures of the inside of the body, MRI uses magnetism and radio waves. It produces much more detailed images than X–rays because of its ability to separate different types of tissues. MRI can be used to look at any area of the body and is especially useful in diagnosing disease within the soft tissues of the head, spinal cord, kidneys, urinary tract, pancreas, and liver, as well as, tendon and ligament damage in joints.

The age– and sex–**adjusted rate** of MRIs per 1,000 residents aged 20 and older was calculated for **fiscal years** 2006/07 and 2011/12. MRIs were defined by a physician claim with physician tariff codes 7501–7528. To count person–visits, only one scan per day is counted, as there could be multiple body parts scanned each with their own claim. The denominator includes all Manitoba residents aged 20 and older as of December 31, 2006 and 2011.

Majority of Care

The extent to which individuals see a given healthcare provider (versus one or more other providers) over a specified period of time. Individuals with a regular family physician (or specialist) may have improved health outcomes as a result of one physician managing their healthcare needs over an extended period of time. Previously known as continuity of care.

The age– and sex–**adjusted** percent of residents receiving more than 50% of their **ambulatory visits** over a two year period from the same physician was calculated for two 2–year time periods: 2005/06–2006/07 and 2010/11–2011/12. For children aged 0 to 14, the primary physician could be either a GP/FP or a paediatrician; for residents aged 15 to 59, only GPs and FPs could be the primary physician and for seniors 60 years and older, the primary physician; could be either a GP/FP or an internal medicine specialist. The denominator includes all Manitoba residents with three or more **physician visits** in the two–year periods, and residents with less than three visits were excluded from analyses.

Manitoba Centre for Health Policy (MCHP)

A unit within the Department of Community Health Sciences, Faculty of Medicine, University of Manitoba. MCHP is active in health services research, evaluation, and policy analysis, concentrating on using the Manitoba Population Health Research Data Repository (Repository) to describe and explain patterns of care and profiles of health and illness.

Manitoba Health

A provincial government department responsible for providing healthcare services in Manitoba. From April 1, 2008 to November 2009, this department was part of a larger department called Manitoba Health.

Manitoba Health Insurance Registry

A longitudinal population–based registry maintained by **Manitoba Health** of all individuals who have been registered with Manitoba Health at some point since 1970. The registry includes individual–level demographics; family composition information; residential postal codes; and data fields for registration, birth, entry into province, and migration in/out-of-province. It provides the needed follow–up information to track residents for longitudinal and intergenerational analyses. Individuals who are insured federally, such as military personnel and federal inmates, are not included in this dataset. RCMP were previously excluded but will be included starting April 13, 2013. "Snapshot files" of the **Manitoba Health Insurance Registry** data, received semi–annually at the **Manitoba Centre for Health Policy** (**MCHP**) from Manitoba Health, are used to create and maintain information in the **MCHP Research Registry**.

Manitoba Immunization Monitoring System (MIMS)

A population–based monitoring system that provides monitoring and reminders to help achieve high levels of immunization. The goal of this system is to compile information on all immunizations administered in Manitoba to ensure recommended immunizations are received. Immunization status is monitored by comparing the system record and the recommended schedule. This system also gives information on immunization histories and some demographic information from the **Manitoba Health Insurance Registry**.

Material Deprivation Index—see Social and Material Deprivation Indices

MCHP Research Registry

A longitudinal population based registry that is derived from data in the Manitoba Health Insurance Registry and other data files in the MCHP Data Repository. "Snapshot files" of the Manitoba Health Insurance Registry data, received semi–annually at MCHP from Manitoba Health, are integrated with historical registry data at MCHP to maintain the MCHP Research Registry.

Median Length of Stay by Level of Care in Personal Care Home (PCH)

The amount of time (in years) that 50% of **personal care home** (**PCH**) residents lived in a PCH, according to their level of care on admission, for PCH residents 75 years and older who left their PCH in **fiscal years** 2005/06–2006/07 and 2010/11–2011/12. The median length of stay is the amount of time for which half of all residents stayed. For example, in Manitoba in the two year period from 2010/11–2011/12, the median was 2.21 years overall. So one half of residents lived in a PCH for less than 2.21 years, while the other half resided in a PCH longer, though the medians vary dramatically by level of care. Level 1 represents the lowest level of need, and level 4 represents the highest. As very few residents were admitted at level of care 1, levels 1 and 2 are combined in this analysis. Levels 1–2 and 3 are stratified by the close supervision indicator (coded as yes/no on assessment to indicate the need for close supervision due to possible behavioural issues), but due to small numbers level 4 was not. Unadjusted quintile regression models were employed to test for a significant difference in crude (unadjusted) medians overtime. This indicator only includes information on provincial PCH beds; federal beds are not included due to lack of information in the provincial data.

Median Wait Time for Admission to Personal Care Home (PCH)

The amount of time it took (in weeks) for 50% of **personal care home** (**PCH**) residents to be admitted after being assessed as requiring PCH placement for PCH residents 75 years and older admitted in **fiscal years** 2005/06–2006/07 and 2010/11–2011/12. The median wait time is the amount of time for which half of all residents waited. **Adjusted** medians were estimated in quintile regression models, controlling for age, sex, **Regional Health Authority** (**RHA**), and time period, and separate models were run for residents assessed for PCH placement while in hospital versus residing in the community. For example, in the two year period 2010/11–2011/12, the adjusted median for residents assessed in hospital was 11.25 weeks, so half of these PCH residents waited less than 11.25 weeks from assessment to placement, while half waited longer. This indicator only includes information on provincial PCH beds; federal beds are not included due to lack of information in the provincial data.

Medical Services Data

Health data maintained by **Manitoba Health** consisting of claims for **physician visits** in offices, hospitals, and outpatient departments; **fee–for–service** components for tests such as lab and x–ray procedures performed in offices and hospitals; payments for on–call agreements (e.g., anesthesiologists) that are not attributed to individual patients; as well as information about physicians' specialties. These data files contain records for both Manitoba and non–Manitoba residents who visit Manitoba providers. Some information is also included for services received by Manitoba residents from providers in other provinces. In Manitoba, fee–for–service providers must submit claims to Manitoba Health for reimbursement; a small proportion of salaried physicians also submit evaluation claims (**shadow billing**).

Mood and Anxiety Disorders

A group of diagnoses in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV TR) classification system where a disturbance in the person's mood is hypothesized to be the main underlying feature. Anxiety disorder is a group of diagnoses in this classification system that includes one or more anxiety disorders as the main diagnosis.

The age– and sex–**adjusted prevalence** of mood and anxiety disorders was calculated for residents aged 10 and older in two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Mood and anxiety disorders were defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of depression, episodic mood disorders (i.e., bipolar disorder, manic episode), or anxiety (i.e., anxiety disorders, phobic disorders, obsessive–compulsive disorders): ICD–9–CM codes 296.1–296.8, 300.0, 300.2–300.4, 300.7; ICD–10–CA codes F31, F32, F33, F34.1, F38.0, F38.1, F40, F41.0–F41.3, F41.8, F41.9, F42, F43.1, F43.2, F43.8, F45.2, F53.0, F93.0
- one or more **physician visits** with a diagnosis of depression or episodic mood disorders: ICD–9–CM codes 296 and 311.
- one or more hospitalizations or physician visits with a diagnosis of anxiety, dissociative, and somatoform disorders: ICD–9–CM code 300; ICD–10–CA codes F32, F34.1, F40, F41, F42, F44, F45.0, F45.1, F48, F68.0, F99 and one or more prescriptions for an antidepressant (i.e., fluoxetine, citalopram, desipramine, venlafaxine), benzodiazepine derivatives anxiolytics (i.e., diazepam), or lithium (an antipsychotic): ATC codes N05AN01, N05BA, N06A
- three or more physician visits with a diagnosis of anxiety, dissociative, and somatoform disorders or adjustment reaction, ICD–9–CM codes 300 and 309

The denominator includes all Manitoba residents aged 10 and older as of December 31, 2004 and 2009.

Number of Different Types of Drugs Dispensed per User

The average number of different types of drugs prescribed to each resident who had at least one prescription in the year. Each pharmaceutical agent that falls under a different fourth–level ATC class is counted as a new drug for each resident (see also **Anatomical Therapeutic Chemical** (**ATC**) **Classification**). A person could have several prescriptions for drugs in the same fourth– level ATC class, but this would only count as one drug type in that year. This essentially separates drugs used for different health problems and avoids double–counting prescriptions for drugs in the same group.

The age– and sex–**adjusted** average number of different types of drugs dispensed to each resident who had at least one prescription in the year was calculated for **fiscal years** 2006/07 and 2011/12. Nearly all prescriptions dispensed from community–based pharmacies across the province were included; prescriptions drugs given to hospitalized patients and some nursing home residents in **personal care homes** (**PCHs**) with hospital–based pharmacies were not included. Prescriptions were limited to those covered by **Manitoba Health**'s **Pharmacare Program** and prescriptions for over the counter drugs were excluded; these exclusions were made in order to have a fair, common set of drugs across the province when looking prescription use. The denominator includes Manitoba residents with at least one prescription each **fiscal year**.

Nurse Practitioners

Registered nurses (RNs) with advanced training that allows them to provide a full range of **primary care** services to patients. "They work in partnership with physicians and other healthcare professionals to provide care in a variety of healthcare settings" (Nurse Practitioner Association of Manitoba, 2006).

Nurse Practitioner Association of Manitoba. What is a nurse practitioner? 2006. http://www.nursepractitioner.ca/what-is-a-np. Accessed August 1, 2013.

Nursing Stations

A healthcare clinic, usually located in the northern isolated communities, where the **majority of care** is provided by nursing personnel.

Odds Ratio (OR)

The ratio of the odds (likelihood) of an event occurring in one group to the odds of it occurring in another group or to a data–based estimate of that ratio. These groups might be men and women, an experimental group and a control group, or any other dichotomous classification.

Osteoporosis

A disease that leads to reduction in bone density, making bones more likely to break.

The age– and sex–**adjusted prevalence** of osteoporosis was calculated for residents aged 50 and older in two 3–year time periods: 2004/05–2006/07 and 2009/10–2011/12. Osteoporosis was defined by one of the following conditions:

- one or more hospitalizations with one of the following diagnoses:
  - osteoporosis: ICD–9–CM code 733.0, ICD–10–CA code M81
  - hip fracture: ICD–9–CM code 820–821, ICD–10–CA code S72
  - spine fracture, ICD–9–CM code 805; ICD–10–CA codes S12.0–S12.2, S12.7, S12.9, S22.0, S22.1, S32.0–S32.2, T08
  - humerus fracture: ICD–9–CM code 812, ICD–10–CA codes S42.2–S42.4
  - wrist fracture (radius, ulna and carpal bones): ICD–9–CM code 813–814, ICD–10–CA codes S52, S62.0, S62.1

(Note that fractures in hospital associated with a diagnosis code for a major trauma (e.g., crushing injuries or motor vehicle accidents) are excluded: ICD–9–CM codes 925–929, E800–E848; ICD–10–CA codes S07, S17, S18, S28.0, S38, S47, S57, S67, S77, S87, S97, T04, T14.7, V01–V99)

- one or more **physician visits** with one of the following diagnoses:
  - osteoporosis: ICD–9–CM code 733
  - hip fracture: ICD–9–CM codes 820–821
  - spine fracture: ICD–9–CM code 805
  - humerus fracture: ICD–9–CM code 812
  - wrist fracture: ICD–9–CM codes 813–814
- one or more prescriptions for medications to treat osteoporosis (listed below)

ATC code	***Generic Drug Name***
G03XC01	raloxifene
H05AA02	teriparatide
H05BA01	calcitonin (salmon synthetic)
M05BA04	alendronic acid
M05BA07	risedronic acid
M05BA08	zoledronic acid
M05BB01	etidronic acid and calcium
M05BB02	risedronic acid and calcium
M05BB03	alendronic acid and vitamin D
M05BB04	risedronic acid and calcium and vitamin D
M05BX04	denosumab

The denominator includes all Manitoba residents aged 50 and older as of December 31, 2005 and 2010. This definition will under–count the true number of fractures because some will have been treated in emergency departments at which individual–level physician claims data are not routinely collected; this includes urban community hospitals and many rural hospitals.

List of drugs used to treat osteoporosis:

p–value

The probability of obtaining a test statistic or estimate that is at least as extreme as the one observed, assuming that the null hypothesis is true. When the p–value is below the set significance value α (usually set at 0.05), then the null hypothesis is rejected and the obtained estimate or test statistic is statistically significant.

Percutaneous Coronary Interventions (PCI)

Percutaneous transluminal coronary angioplasty (PTCA) procedures, commonly known as "angioplasty" or "balloon angioplasty". These procedures treat the narrowed coronary arteries of the heart often found in people with coronary heart disease. Angioplasty procedures use a balloon–tipped catheter to enlarge a narrowing in a coronary artery and, if necessary, a small lattice–shaped metal tube called a stent is inserted permanently into the artery to help hold it open so blood can flow through it more easily.

The average annual age– and sex–**adjusted rate** of PCIs per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. PCIs were defined by hospitalizations with ICD–9–CM procedure codes 36.01, 36.02, 36.05, and 36.06 and CCI codes 1.IJ.50 and 1.IJ.57. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2002–2011). PCIs were only performed at the two tertiary hospitals (Health Sciences Centre and St. Boniface General Hospital), so only hospitalizations from those two hospitals were included in the analysis in order to eliminate the potential for double–counting of procedures. To further reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included.

Person–Years

A measurement of observation time per person and is often used as the denominator in **incidence** rates when, for varying periods, individuals are at risk of developing a disease, using a health service, or dying. Instead of using the number of people at the start of the observation period as the denominator, one can determine for each person the actual time at risk, from the beginning of the study period until the disease is detected, the person is lost to follow–up (i.e., moves out-of-province or dies), or the end of the study period. If a study period is one year and a person is disease free for the entire period then they will have a person–year value of one; while if another person develops a disease six months after the start of the study, they will have a person–year value of 0.5 (Young, 1998).

Young, T. K. *Population Health: Concepts and Methods*. 1st ed. New York, NY: Oxford University Press; 1998.

Personal Care Home (PCH)

Residential facilities (nursing homes) for persons with chronic illness or disability, predominantly older adults. In Manitoba, PCHs can be proprietary (for profit) or non–proprietary. Non–proprietary homes can be secular or ethno–cultural (associated with a particular religious faith or language) as well as either freestanding or juxtaposed with an acute care facility. Some PCH facilities may be funded by the provincial (provincial PCHs) or federal (federal PCHs) government. There is no designated PCH facility in Churchill; however, seven of the hospital beds in the Churchill Health Centre serve as PCH beds.

Personal Care Home (PCH) Bed Supply

The average annual number of **personal care home** (**PCH**) beds per 1,000 residents 75 years and older. Provincial bed counts were taken from the **Manitoba Health** Bed Map for **fiscal years** 2005/06–2006/07 and 2010/11–2011/12. Federal bed counts and counts for Churchill were provided by the **Regional Health Authorities** (**RHAs**). Values are not **adjusted** for age and sex.

Personal Care Home (PCH) Residents

The age– and sex–**adjusted** average annual percent of residents 75 years and older who were in a **personal care home** (**PCH**) for at least one day in the **fiscal year** was calculated for two 2–year time periods: 2005/06–2006/07 and 2010/11–2011/12. The denominator includes all Manitoba residents 75 years and older as of December 31 of each year. Region assignment in the numerator was based on current postal code and municipal code, which for most PCH residents will be the address of their PCH.

Personal Health Information Number (PHIN)

A unique nine–digit numeric identifier assigned by **Manitoba Health** to every person registered for health insurance in Manitoba, and to non–residents who are treated at facilities which submit claims electronically. Introduced as a linkage key in 1984, it was issued to the public in 1994 as the basic access identifier for the Pharmacare/**Drug Programs Information Network** (**DPIN**). At the **Manitoba Centre for Health Policy** (**MCHP**), the PHIN is either a scrambled (encrypted) version of the Manitoba Health PHIN or an alphanumeric identifier assigned via the **MCHP Research Registry** to individuals who do not have scrambled numeric PHINs.

Pharmacare Program

A drug benefit program for eligible Manitobans, regardless of age, whose incomes are seriously affected by high prescription drug costs. Coverage is based on a person's total family income and the amount he/she pays for eligible prescription drugs. To qualify, an individual must meet all of the following criteria (Manitoba Health, 2013):

1) eligible for **Manitoba Health** coverage
2) prescriptions are not paid through other provincial or federal programs
3) prescription costs are not covered by a private drug insurance program
4) eligible prescription drug costs exceed the individual's Pharmacare deductible

Manitoba Health. Manitoba Pharmacare Program. 2013. http://www.gov.mb.ca/health/pharmacare. Accessed August 19, 2013.

Pharmaceutical Use

A measure of the total number of prescriptions per resident and includes any prescription medication captured in Manitoba's Drug Programs Information Network (DPIN).

The age– and sex–**adjusted** percent of residents who were dispensed at least one prescription in a **fiscal year** was calculated for fiscal years 2006/07 and 2011/12. Nearly all prescriptions dispensed from community–based pharmacies across the province were included; prescription drugs given to hospitalized patients and some nursing home residents in **personal care homes** (**PCHs**) with hospital–based pharmacies were not included. Prescriptions were limited to those covered by **Manitoba Health**'s **Pharmacare Program** and prescriptions for over the counter drugs were excluded; these exclusions were made in order to have a fair, common set of drugs across the province when looking prescription use. The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Physician Visits—see Ambulatory Visits

Physician Use (Access to Physicians)

The percent of residents who see a physician at least once over the course of a year gives an indication of the accessibility of ambulatory care for local residents.

The age– and sex–**adjusted** percent of residents who received at least one ambulatory visit in a **fiscal year** was calculated for fiscal years 2006/07 and 2011/12. **Ambulatory visits** include virtually all contacts with physicians (GP/FPs and specialists), except during inpatient hospitalization and emergency department visits. The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Pneumococcal Immunization

Vaccination for pneumonia, an inflammation of the lungs caused by a bacterial, viral, or fungal infection. Bacterial pneumonia in adults is commonly caused by a bacterium called Streptococcus pneumoniae.

The age– and sex–**adjusted** percent of residents aged 65 and older who received a pneumococcal vaccination was calculated for **fiscal years** 2006/07 and 2011/12. For most seniors, a pneumococcal vaccination is considered a "once in a lifetime" event, so these rates show the "cumulative" percent of residents who ever had a pneumococcal vaccination, as defined by physician tariff codes 8681–8684 and 8961 in **Manitoba Immunization Monitoring System** (**MIMS**) data. The denominator includes all Manitoba residents aged 65 and older as of December 31, 2006 and 2011.

Population Health Research Data Repository (Repository)

A comprehensive collection of administrative, registry, survey, and other data primarily comprised of residents of Manitoba. This repository is housed at the **Manitoba Centre for Health Policy** (**MCHP**). It was developed to describe and explain patterns of healthcare and profiles of health and illness, facilitating inter–sectoral research in areas such as healthcare, education, and social services. The administrative health data, for example, hold records for virtually all contacts with the provincial healthcare system, the **Manitoba Health** Services Insurance Plan (including physicians, hospitals, **personal care homes** (**PCHs**), home care, and pharmaceutical prescriptions) of all registered individuals. MCHP acts as a trustee or steward of the information in the Repository for agencies such as Manitoba Health.

Population Pyramids (Population Profile)

A graphic representation of the age and sex distribution of a population. Most developing countries have a population pyramid triangular in shape, indicating a very young population with few people in the oldest age brackets. Most developed countries have a population pyramid that looks more rectangular with more elderly expanding the "top part" of the pyramid.

The crude (unadjusted) percent and number of residents within each five–year age group (0 to 4, 5 to 9, etc., up to 90 and older years old) is shown for both males (on the left side of the graph) and females (on the right side). There are two types of population pyramids shown for each **Regional Health Authority** (**RHA**) in this report:

- The first pyramid is a comparison of one RHA to the Manitoba population on December 31, 2006, showing the percent of males and females in each five–year age category. For each RHA and for Manitoba, the male and female bars add up to 100%.
- The second pyramid shows how each RHA has changed over time. The RHA population on December 31, 2006 is compared with that on December 31, 2011, showing the actual number of males and females in each five–year age category (males on the left, females on the right). The numbers in each of the bars add up to the total population for that RHA in each year.

Post–Acute Myocardial Infarction (AMI) Care: Beta–Blocker Prescribing

The prescription of beta–blockers, also known as beta–adrenergic blocking drugs, to patients who have experienced an **acute myocardial infarction** (**AMI**). These drugs have been shown to lower the risk of subsequent **heart attacks** after patients have suffered an AMI.

The crude (unadjusted) percent of patients aged 20 and older hospitalized for an AMI who then filled at least one prescription for a beta–blocker within four months of hospital discharge was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. AMI patients were identified by a hospitalization with a diagnosis of AMI (ICD–9–CM code 410 or ICD–10–CA code I21). Beta–blocker medications were defined by ATC codes C07AA and C07AB. To be included in the analysis, patients had to be alive for the entire follow–up period. Patients with a previous hospitalization for an **Acute Myocardial Infarction** (**AMI**) in the three years prior to the index AMI hospitalization were excluded from analyses. Patients with the following diagnoses in hospital in the three years prior to the index event were also excluded from analyses because beta–blockers are contra–indicated for patients with these conditions:

- Asthma: ICD–9–CM code 493, ICD–10–CA code J45
- chronic obstructive pulmonary disease: ICD–9–CM codes 491 and 492, ICD–10–CA codes J41–J44
- peripheral vascular disease: ICD–9–CM codes 443 and 459, ICD–10–CA codes I73, I79.2, I87

Potential Years of Life Lost (PYLL)

An indicator of early death (before age 75) that gives greater weight to deaths occurring at a younger age than to those at later ages. PYLL emphasizes the loss of the potential contribution that younger individuals can make to society. By emphasizing the loss of life at an early age, PYLL focuses attention on the need to deal with the major causes of early deaths, such as injury, in order to improve health status. This indicator has some similarity to premature mortality and life expectancy, but PYLL is more sensitive to deaths at younger ages (beyond infancy). For example, the death of a 50-year-old contributes "1 death" to premature mortality, but "25 years" to PYLL; whereas the death of a 70-year-old also contributes "1 death" to premature mortality, but only "5 years" to PYLL.

The age– and sex–**adjusted** average annual number of years between age at death and age of 75 for the population 1 to 74 years was calculated for calendar years 2002–2006 and 2007–2011. For each death, the PYLL value is calculated as: PYLL = 75 – age at death. The denominator includes all Manitoba residents 1 to 74 years as of December 31 of each year (2002–2011).

Premature Mortality Rate (PMR)

An indicator of population health status that is often correlated with other commonly used measures. PMR is an important indicator of general health of a population with high premature mortality rates indicating poor health.

The average annual age– and sex–**adjusted rate** of premature deaths per 1,000 residents 0 to 74 years was calculated for 10 calendar years (2002–2011), as well as for two 5–year time periods: 2002–2006 and 2007–2011. The 10–year rates are used to determine the ordering of regions in all graphs in the report. The denominator includes all Manitoba residents 0 to 74 years as of December 31 of each year (2002–2011).

Prevalence

The proportion of the population that has a given disease at a given time. The **administrative data** used for this study do not directly indicate who has a disease, but rather who received health services treatment for that disease; that is, they received some combination of **physician visits**, hospitalizations, or prescription drugs. Period prevalence is the measure of a disease or condition in a population during a given period of time.

Primary Care

The first contact of a patient with the healthcare system. "In Manitoba, one of the core services provided by the primary healthcare system. It includes assessment, diagnosis and treatment of common illnesses generally provided by family physicians and nurses." (Manitoba Health, 2006).

Manitoba Health. Primary health care: working together for better health: Primary Health Care Policy Framework. 2006.

Public Trustee

A provincial government Special Operating Agency that has the responsibility to look after the financial and other affairs of residents unable to do so themselves. These are individuals of any age who cannot look after their own affairs. Because this office has total responsibility for such persons, their address of record in the **Manitoba Health Insurance Registry** is that of the Public Trustee Office.

Provider Registry

Data, also known as the Physician Master File or the Physician Resource File, that contain "snapshots" of provider and practice information obtained quarterly from **Manitoba Health**. Physician and practice details available through this registry include specialty, age, location of training, years of practice, payment methods, workloads, and practice groups.

Region of Residence

Virtually all analyses in this report allocate health service use to the region where the patient who received the service lived, regardless of where the service was provided. For example, if a resident of Northern Health Region travels to Winnipeg for a physician visit, the visit contributes to the visit rate for Northern residents. With claims–based analyses, more than one record per person is possible. The residence information on the first–occurring record for a given year was generally used.

Regional Health Authorities (RHAs)

Governance structures established by the province of Manitoba in 1997 that are responsible for the delivery and administration of health services for regional health services. As of July 1, 2002, there were 11 RHAs in Manitoba: Assiniboine, Brandon, Burntwood, Central, Churchill, Interlake, NOR–MAN, North Eastman, Parkland, South Eastman, and Winnipeg. On April 17, 2012, the Ministry of Health announced that the former 11 RHAs would be amalgamated into five RHAs as follows: Interlake–Eastern RHA (includes the former Interlake and North Eastman RHAs), Northern Heath Region (includes the former Burntwood and NOR–MAN RHAs), Prairie Mountain Health (includes the former Assiniboine, Brandon, and Parkland RHAs), Southern Health—Santé Sud (includes the former Central and South Eastman RHAs), and Winnipeg RHA (includes former Churchill and Winnipeg proper RHAs). See Appendix 1 for further details.

Regional Health Authority (RHA) Districts

Subdivisions of **Regional Health Authorities** (**RHA**) defined primarily based on municipal code and some postal codes for analysis purposes. Districts were created collaboratively by individual RHAs, **Manitoba Centre for Health Policy** (**MCHP**), and **Manitoba Health**. Since the amalgamation of RHAs in 2012, there are 70 districts in Manitoba.

Regional Health Authority (RHA) Zones

Subdivisions of **Regional Health Authorities** (**RHA**) defined primarily based on municipal code and some postal codes for analysis purposes. After the amalgamation of the RHAs into five health regions in 2012, zones were created collaboratively by individual RHAs, **Manitoba Centre for Health Policy** (**MCHP**), and **Manitoba Health**. There are 16 zones in Manitoba that encompass 70 **districts**.

Resource Utilization Bands (RUBs)

A simplified ranking system of overall morbidity level that is based on the **Johns Hopkins Adjusted Clinical Group®** (**ACG®**) **Case–Mix System**. Individuals are assigned a RUB based on sorting their ACG® value into one of six categories as follows: 0–Non–user, 1–Healthy User, 2–Low Morbidity, 3–Moderate Morbidity, 4–High Morbidity, 5–Very High Morbidity. Note that for the purposes of this report, RUBs 0, 1, and 2 were grouped into one category.

Respiratory Disease—see Total Respiratory Morbidity

Shadow Billing

Claims (billings) submitted to the provincial government by physicians on alternate payment plans for services they provide. Unlike physician claims submitted by fee–for–service physicians for payment, these claims are for administrative purposes only (i.e., as a record of services provided). Also known as "Evaluation Claims" and "Dummy Claims".

Social Deprivation Index - see Social and Maternal Deprivation Indices

Social and Material Deprivation Indices

Factor scores based on Canadian **Census data** that reflect both the deprivation of relationships among individuals in the family, the workplace, and the community (social deprivation) and the deprivation of goods and conveniences (material deprivation). Indicator variables included in social deprivation are: proportion of the population aged 15 and older that are separated, divorced, or widowed; proportion of the population that lives alone; and proportion of the population that has moved in the past five years. Indicator variables included in material deprivation are: average household income, unemployment rate for those aged 15 and older, and proportion of population aged 15 and older without high school graduation (Pampalon and Raymond, 2000) (Pampalon & Raymond, 2000).

Social and material deprivation indices were calculated for Census year 2006 at the geographic level of Dissemination Area (DA). DAs are the smallest standard geographic unit for which Census data are collected and typically have a population of 400 to 700 people. DAs with missing values for any indicator variable had values imputed from corresponding Census subdivisions, a larger census geographic unit. First Nations communities with missing values had the weighted means from Northern or Southern First Nations communities applied. Population–weighted mean scores and 95% **confidence intervals** (**CIs**) were calculated for larger geographical regions (**Regional Health Authorities** (**RHA**), **Winnipeg Community Area**, etc.) and comparisons to the Manitoba average for each index were calculated via weighted t–tests. Values above zero indicate more deprivation and values below zero represent less deprivation, so negative values represent "good" results. Additional factor analyses were run separately for males and females, urban versus rural dissemination, areas as well as using average personal income instead of average household income, and values are shown in the online appendix for this report (on the MCHP website).

Pampalon R, Raymond G. A deprivation index for health and welfare planning in Quebec. *Chronic Dis Can* 2000;21(3):104-113

Socioeconomic Factor Index (SEFI)

A factor score based on Canadian **Census data** that reflect non–medical social determinants of health and includes the following indicator variables: average household income, proportion of single parent households, unemployment rate for those aged 15 and older, and proportion of population aged 15 and older without high school graduation. SEFI scores range from approximately –5 to +5, and a value of zero represents the Manitoba average with 95% of scores falling within ±2 points. Scores less than zero indicate more favourable socioeconomic conditions, while scores greater than zero indicate less ideal socioeconomic conditions (Chateau et al., 2012)

SEFI scores were calculated for Census years 2001 and 2006 in a factor analysis at the geographic level of dissemination area (PA), the smallest standard geographic unit for which all Census data are collected and typically have a population of 400 to 700 people. DAs with missing values for any indicator variable had values imputed from corresponding Census subdivisions, a larger census geographic unit. First Nations communities with missing values had the weighted means from Northern or Southern First Nations communities applied. Population–weighted mean SEFI scores and 95% CIs were calculated for larger geographical regions (**Regional Health Authorities** (**RHA**), **Winnipeg Community Area**, etc.) and comparisons to the Manitoba average SEFI and within region between Census years were calculated via weighted t–tests. Values above zero indicate more deprivation, and values below zero represent less deprivation, so negative values represent "good" results.

Chateau D, Metge C, Prior H, Soodeen R-A. Learning from the census: The socio-economic factor index (SEFI) and health outcomes in Manitoba. *Canadian Journal of Public Health*. 2012;103 (Suppl.2):S23-S27.

Specialist Physicians

A physician whose practice is limited to a specific area of medicine that requires additional training. SPs are identified by a code in the **Provider Registry**. This includes physicians in the area of psychiatry, pediatrics, obstetrics and gynecology, medical specialty (internal, neurology, geriatrics, heumatology, dermatology), general surgery, oral surgery, and surgery specialty (thoracic and cardio, plastic, urological, orthopaedic, neurological, ophthalmology, and otorhinolaryngology).

Statistics Canada

A federal government agency commissioned with producing statistics to help better understand Canada's population, resources, economy, society, and culture (Statistics Canada, 2012).

Statistics Canada. About us. 2012. http://www.statcan.gc.ca/about–apercu/about–apropos–eng.htm. Accessed August 2, 2012.

Stroke

A sudden death of brain cells due to a lack of oxygen when the blood flow to the brain is impaired by blockage or rupture of an artery to the brain.

The average annual age– and sex–**adjusted rate** of hospitalization or death due to stroke per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002–2006 and 2007–2011. Strokes were defined by one of the following conditions:

- an inpatient hospitalization with the most responsible diagnosis of **stroke** and a **length of stay** of one or more days (unless the patient died in hospital)
- a death with stroke listed as the primary cause of death on the Vital Statistics death record

Diagnosis codes used to identify strokes include ICD–9–CM codes 431, 434, 436 and ICD–10–CA codes I61, I63, I64. Transfers between hospitals were tracked and only **hospital episode**s were counted, not individual hospitalizations, to reduce double–counting. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2000–2009).

Substance Abuse

The excess use of and reliance on a drug, alcohol, or other chemical that leads to severe negative effects on the individual's health and well–being or the welfare of others.

The age– and sex–**adjusted prevalence** of substance abuse was calculated for residents aged 10 and older in two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Substance abuse was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs: ICD–9–CM codes 291, 292, 303, 304 or 305; ICD–10–CA codes F10–F19, F55
- one or more **physician visits** with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs (ICD–9–CM codes as above)

The denominator includes all Manitoba residents aged 10 and older as of December 31, 2004 and 2009.

Suicide

The act of intentionally killing oneself.

The average annual age– and sex–**adjusted rate** of suicides per 1,000 residents aged 10 and older was calculated for two 5–year time periods: 2002–2006 and 2007–2011. Suicides were defined as any death record in **Vital Statistics Registry** with any of the following causes:

- Intentional self–harm: ICD–10–CA codes X60–X84
- Late effects of intentional self–harm: ICD–10–CA code Y87.0
- Poisoning of undetermined intent: ICD–10–CA codes Y10–Y19
- Other events of undetermined intent: ICD–10–CA codes Y20–Y34

Events of undetermined intent were included for the purposes of developing a more "inclusive" definition in an attempt to overcome suspected under–counting of suicides in **administrative data**; however accidental poisonings were not included in the counts of suicide deaths as the uncertainty around the cause of death was too high. The denominator includes all Manitoba residents aged 10 and older as of December 31 of each year (2002–2011).

The Need To Know Team (NTK)

A collaborative research team of the **Manitoba Centre for Health Policy** (**MCHP**), the 11 Manitoba **Regional Health Authorities** (**RHAs**), and **Manitoba Health**. The goal of the team is to: create new knowledge directly relevant to rural and northern RHAs; develop useful models for health information infrastructure, training, and interaction that increase the capacity for collaborative research; and disseminate and apply health research to increase the effectiveness of health services and the health of RHA populations.

Total Hip Replacement

The complete removal of the ball and socket of the hip joint and replacement with artificial materials. A metal ball with a stem (a prosthesis) is inserted into the femur (thigh bone) and an artificial plastic cup socket is placed in the acetabulum (a "cup–shaped" part of the pelvis). The prosthesis may be fixed in the central core of the femur with cement. Alternatively, a "cementless" prosthesis is used which has microscopic pores that allow bony ingrowth from the normal femur into the prosthesis stem. The cementless hip lasts longer and is especially an option for younger patients.

The average annual age– and sex–**adjusted rate** of total hip replacement surgeries per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Hip replacement surgeries were defined by hospitalizations with ICD–9–CM procedure codes 81.50, 81.51 and 81.53 and CCI codes 1.VA.53.LA–PN and 1.VA.53.PN–PN. To reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2002–2011).

Total Knee Replacement

The replacement of parts of the knee joint are with artificial materials. The ends of the thigh bone (femur) and the shin bone (tibia) are removed as is often the underside of the kneecap (patella). The artificial parts are then cemented into place. The new knee typically has a metal shell on the end of the femur, a metal and plastic trough on the tibia, and sometimes a plastic button in the kneecap.

The average annual age– and sex–**adjusted rate** of total knee replacement surgeries per 1,000 residents aged 40 and older was calculated for two 5–year time periods: 2002/03–2006/07 and 2007/08–2011/12. Knee replacement surgeries were defined by hospitalizations with ICD–9–CM procedure codes 81.54 and 81.55 and CCI codes 1.VG.53.LA–PN and 1.VG.53.LA–PP. To reduce double–counting, only interventions that were not marked Out of Hospital, or OOH, were included. The denominator includes all Manitoba residents aged 40 and older as of December 31 of each year (2002–2011).

Total Mortality Rate

The average annual age– and sex–**adjusted rate** of deaths per 1,000 residents was calculated for two 5–year time periods: 2002–2006 and 2007–2011. The denominator includes all Manitoba residents as of December 31 of each year (2002–2011).

Total Respiratory Morbidity (TRM)

A measure of the burden of all types of respiratory illnesses in the population and includes the following diseases: asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction. This combination of diagnoses is used to overcome problems resulting from different physicians (or specialists) using different diagnosis codes for the same underlying illness (e.g., asthma versus chronic bronchitis).

The age– and sex–**adjusted prevalence** of TRM was calculated for all residents for **fiscal years** 2006/07 and 2011/12. TRM was defined by one of the following conditions:

- one or more hospitalizations with a diagnosis of asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction, ICD–9–CM codes 466, 490, 491, 492, 493, or 496; ICD–10–CA codes J20, J21, J40–J45
- one or more **physician visits** with a diagnosis of asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction (ICD–9–CM codes as above)

The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Type I Error

A statistical error that produces a false positive result, whereby the test statistic predicts incorrectly a significant difference or correlation between groups. The likelihood of Type I errors can be reduced by using more conservative alpha level (thresholds of significance), such as 0.01 rather than 0.05.

Meyers LS, Gamst G, Guarino AJ. *Applied multivariate research: design and interpretation*. Thousand Oaks, CA: Sage Publications Inc., 2006.

Use of Hospitals (Access to Hospitals)

The percent of residents who are admitted to a hospital at least once over the course of a year gives an indication of the accessibility of hospital care for local residents.

The age– and sex–**adjusted** percent of residents who were admitted to an acute care hospital as an inpatient at least once in a **fiscal year** was calculated for fiscal years 2006/07 and 2011/12. All Manitoba hospitals were included; **personal care homes** (**PCHs**), **nursing stations,** and long–term care facilities were excluded (Deer Lodge Centre, Manitoba Adolescent Treatment Centre, Rehabilitation Centre for Children, and Riverview Health Centre). Out-of-province hospitalizations for Manitoba residents were also included. In cases of birth, newborn hospitalizations were excluded (the mother's hospitalization was included). The denominator includes all Manitoba residents as of December 31, 2006 and 2011.

Vital Statistics Mortality Registry

A longitudinal population–based registry maintained by Manitoba's Vital Statistics Agency that is prepared from administrative mortality data. These data files include everyone who has died in Manitoba. The cause of death is also indicated, with some entries including both the external cause of injury and the medical reason for death. Prior to 1984, data are also included for deaths of Manitoba residents that occurred outside of Manitoba.

Winnipeg Community Areas (CAs)

The 12 planning **districts** within the Winnipeg **Regional Health Authority** (**RHA**). The 12 CAs are St. James–Assiniboia, Assiniboine South, Fort Garry, St. Vital, St. Boniface, Transcona, River East (includes East St. Paul), Seven Oaks (includes West St. Paul), Inkster, Point Douglas, Downtown, and River Heights. See Appendix 1 for a full list of further details.

World Health Organization (WHO)

The United Nations agency for health. One role of the organization is to set healthcare standards for classifying and coding diseases, diagnoses, and procedures, such as the **International Classification of Disease** (**ICD**).

Winnipeg Neighbourhood Clusters (NCs)

Aggregate geographies of neighborhoods within Winnipeg defined based on population and natural community boundaries (Census divisions). Winnipeg is divided into 25 NCs based on Census Divisions—23 of which are within the boundaries of the City of Winnipeg and two additional divisions (East and West St. Paul) just outside the city boundaries. See Appendix 1 for further details.

Zones—see Regional Health Authority (RHA) Zones

APPENDIX 1: ADMINISTRATIVE AREA BOUNDARIES

Districts and Zones Within Each Health Region:

Southern Health/Santé Sud Health Region

North Zone
Seven Regions
MacGregor
Rural Portage
Cartier/St. Francis Xavier
City of Portage

Mid Zone
Notre Dame/St Claude
Carman
MacDonald
Morris
St. Pierre/DeSalaberry
Red River South

West Zone
Lorne/Louise/Pembina
Stanley
Altona
Morden
Winkler
Roland/Thompson

East Zone
Niverville/Richot
Tache
Ste Anne/LaBroquerie
Steinbach
Hanover
Rural East

Prairie Mountain Health Region

North Zone
Duck Mountain
Porcupine Mountain
Riding Mountain
Agassiz Mountain
Dauphin
Swan River

Brandon Zone
Bdn West End
Bdn North Hill
Bdn Downtown
Bdn South End
Bdn East End

South Zone
South Asessippi
Little Saskatchewan
Turtle Mountain
Souris River
Whitemud
Spruce Woods

Interlake–Eastern Regional Health Authority

Selkirk Zone
Selkirk

South Zone
Stonewall/Teulon
Wpg Beach/St. Andrews
St. Clements
Springfield

East Zone
Beausejour
Pinawa/Lac Du Bonnet
Whiteshell

West Zone
Gimli
Arborg/Riverton
St. Laurent

North Zone
Powerview/Pine Falls
Fisher/Peguis
Eriksdale/Ashern

Northern Remote Zone
Northern Remote

Northern Health Region

Zone 1: Direct Service Communities

The Pas/OCN,Kels (The Pas, Opaskawayak CN, RM of Kelsey with the exclusion of Cranberry Portage)
Flin,Snow,Cran,Sher (Flin Flon, Snow Lake, Cranberry Portage, Sherridon/Cold Lake)
LL/MC,LR,O–P(SIL),PN(GVL) (Lynn Lake, Leaf Rapids, South Indian Lake , O-Pipon-Na-Piwin (South Indian Lake)
Cree Nation, Granville Lake, Marcel Colomb First Nation
Thompson, Myst Lake (Thompson and the LGD of Mystery Lake)
Bay Line (The Bay Line (Thicket Portage, Pikwitonei, Wabowden, Ilford, War Lake First Nation, Cormorant))
Gillam, Fox Lake Cree Nation

Zone 2: Non–Direct Service Communities

GR/Mis,ML/Mos,Eas/Che (Grand Rapids, Misipawistik Cree Nation, Moose Lake, Mosakahiken Cree Nation, Easterville, Chemawawin Cree Nation, Unorganized Territory
Puk/Mat Col CN (Pukatawagan, Mathias Colomb Cree Nation)
SayD(TL),Bro/BL,NoL(Lac) (Churchill / Sayisi Dene (Tadoule Lake) First Nation, Barren Lands (Brochet) First Nation, Brochet, Northlands (Lac Brochet) First Nation)
Nelson House/NCN (Nisichawayasihk (Nelson House) CN, Incorporated Community of Nelson House)
Sham,York FN,Tat(SPL) (Shamattawa First Nation, York Factory First Nation, Tataskweyak (Split Lake) Cree Nation)
Bu(OH),MS(GR),GLN/GLFN (Bunibonibee (Oxford House) Cree Nation, Manto Sipi (God's River) Cree Nation, God's Lake First Nation, God's Lake Narrows, Oxford House)
Cross Lake/Pimi CN (Cross Lake FN, Incorporated Community of Cross Lake)

Zone 3
Island Lake (Island Lake (Garden Hill First Nation, Red Sucker Lake First Nation, St. Theresa Point First Nation, Wasagamack First Nation), Island Lake, Red Sucker Lake)

Neighbourhood Clusters and Community Areas Within Winnipeg Health Region:
The lists below indicate which of the 228 Winnipeg "neighbourhood areas" fall within each of the 25 NCs.

St. James–Assiniboia West
Assiniboia Downs
Buchanan
Crestview
Glendale
Heritage Park
Kirkview
Saskatchewan North
Sturgeon Creek
Westwood
St. James–Assiniboia East
Airport
Booth
Birchwood
Bruce Park
Deer Lodge
Jameswood
Kensington
King Edward
Murray Industrial Park
Omand's Creek Industrial
Silver Heights
St. James Industrial
Woodhaven

Fort Garry North
Beaumont
Brockville
Buffalo
Chevrier
Crescent Park
Linden Ridge
Linden Woods
Maybank
Parker
Pembina Strip
Point Road
West Fort Garry Industrial
Whyte Ridge
Wildwood

Assiniboine South
Betsworth
Edgeland
Elmhurst
Eric Coy
Marlton
Old Tuxedo
Ridgedale
Ridgewood South
River West Park
Roblin Park
South Tuxedo
Southboine
Tuxedo
Tuxedo Industrial
Varsity View
Vialoux
West Perimeter South
Westdale
Wilkes South

St. Vital North
Alpine Place
Elm Park
Glenwood
Kingston Crescent
Lavalee
Norberry
Pulberry
St. George
Varennes
Victoria Crescent
Worthington

St. Vital South
Dakota Crescent
Maple Grove Park
Meadowood
Minnetonka
Normand Park
River Park South
St Vital Centre
St Vital Perimeter South
Vista

Fort Garry South
Agassiz
Bridgwater Forest
Cloutier Drive
Fairfield Park
Fort Richmond
La Barriere
Montcalm
Parc La Salle
Perrault
Richmond Lakes
Richmond West
South Pointe
St. Norbert
Trappistes
Turnbull Drive
University
Waverley Heights
Waverley West B
Waverley West D
Waverley West E
Waverley West F
Waverley West Town Centre

St. Boniface East
Archwood
Dugald
Dufresne
Holden
Island Lakes
Maginot
Mission Industrial
Niakwa Park
Niakwa Place
Royalwood
Sage Creek
Southdale
Southland Park
St. Boniface Industrial Park
Stock Yards
Symington Yards
The Mint
Tissot
Windsor Park

Point Douglas South
Dufferin
Dufferin Industrial
Lord Selkirk Park
North Point Douglas
South Point Douglas
William Whyte

St. Boniface West
Central St. Boniface
North St. Boniface
Norwood East

River East West
Kildonan Drive
Munroe West
River East
Rossmere–A
Rossmere–B
Valhalla
Norwood West

River East East
Eaglemere
Grassie
Kil–Cona Park
Kildonan Crossing
McLeod Industrial
Munroe East
North Transcona Yards
Springfield North
Springfield South
Valley Gardens

River East North
East St. Paul RM

Seven Oaks West
Amber Trails
Mandalay West
Rosser–Old Kildonan
The Maples

Seven Oaks East
Garden City
Jefferson
Kildonan Park
Leila–McPhilips Triangle
Leila North
Margaret Park
Riverbend
Rivergrove
Seven Oaks
Templeton–Sinclair
West Kildonan Industrial

Transcona
Canterbury Park
Griffin
Kern Park
Kildare–Redonda
Meadows
Melrose
Mission Gardens
Peguis
Radisson
Regent
Transcona North
Transcona South
Transcona Yards
Victoria West

River East South
Chalmers
East Elmwood
Glenelm
Talbot–Grey
Tyne–Tees

Seven Oaks North
West St. Paul RM

Inkster West
Inkster Gardens
North Inkster Industrial
Oak Point Highway
Tyndall Park

Inkster East
Brooklands
Burrows–Keewatin
Inkster Industrial Park
Pacific Industrial
Shaughnessy Park
Weston
Weston Shops

Point Douglas North
Burrows Central
Inkster–Faraday
Luxton
Mynarski
Robertson
St. John's
St. John's Park

Downtown East
Armstrong Point
Broadway–Assiniboine
Centennial
Central Park
China Town
Civic Centre
Colony
Exchange District
Legislature
Logan–CPR
Portage–Ellice
Portage and Main
South Portage
Spence
The Forks
West Alexander
West Broadway

River Heights West
Central River Heights
Crescentwood
Earl Grey
Ebby–Wentworth
Grant Park
J. B. Mitchell
Mathers
North River Heights
Rockwood
Sir John Franklin
South River Heights
Wellington Crescent

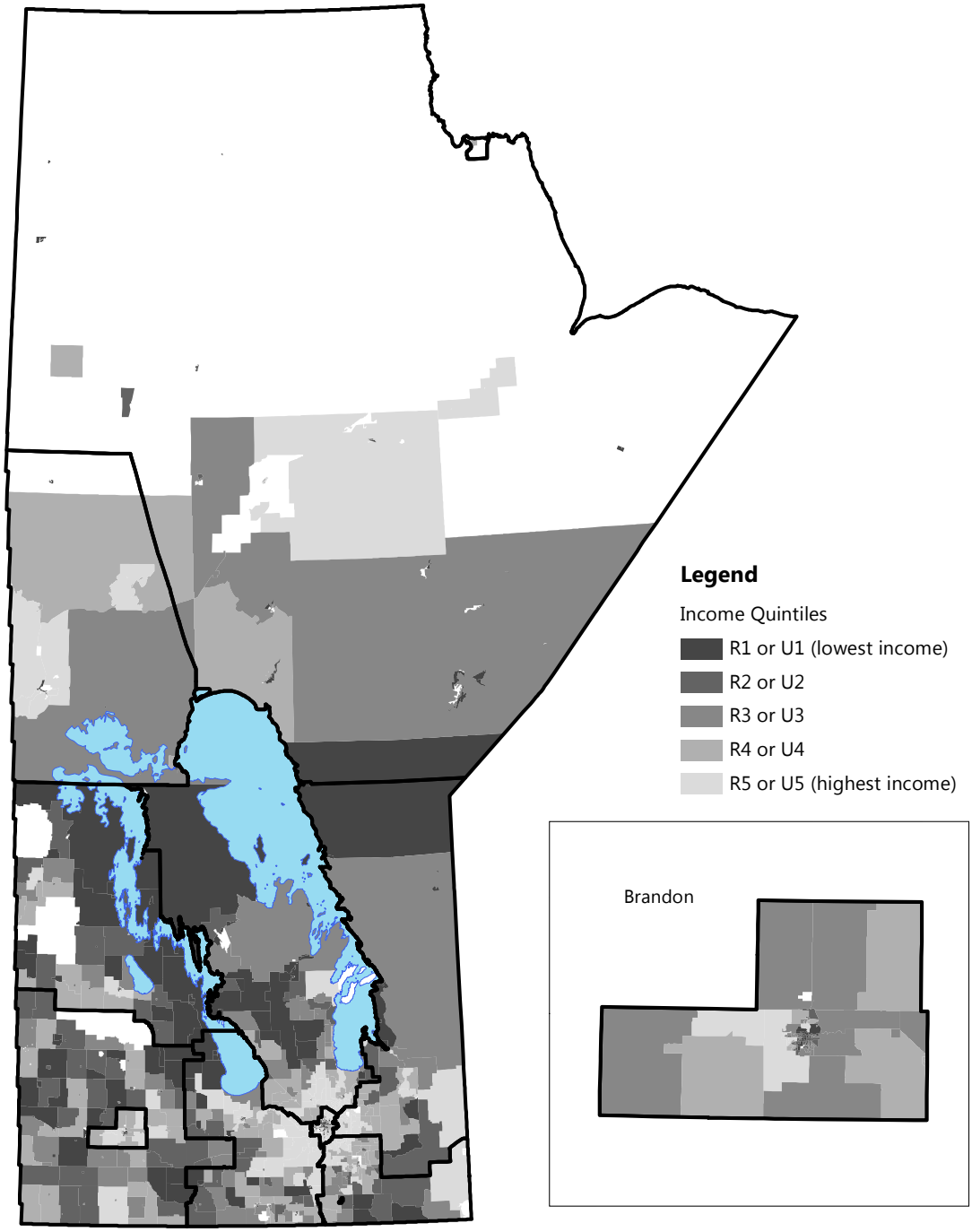
River Heights East
Lord Roberts
McMillan
River–Osborne
Riverview
Roslyn

Downtown West
Daniel McIntyre
Minto
Polo Park
Sargent Park
St. Matthews
West Wolseley
Wolseley

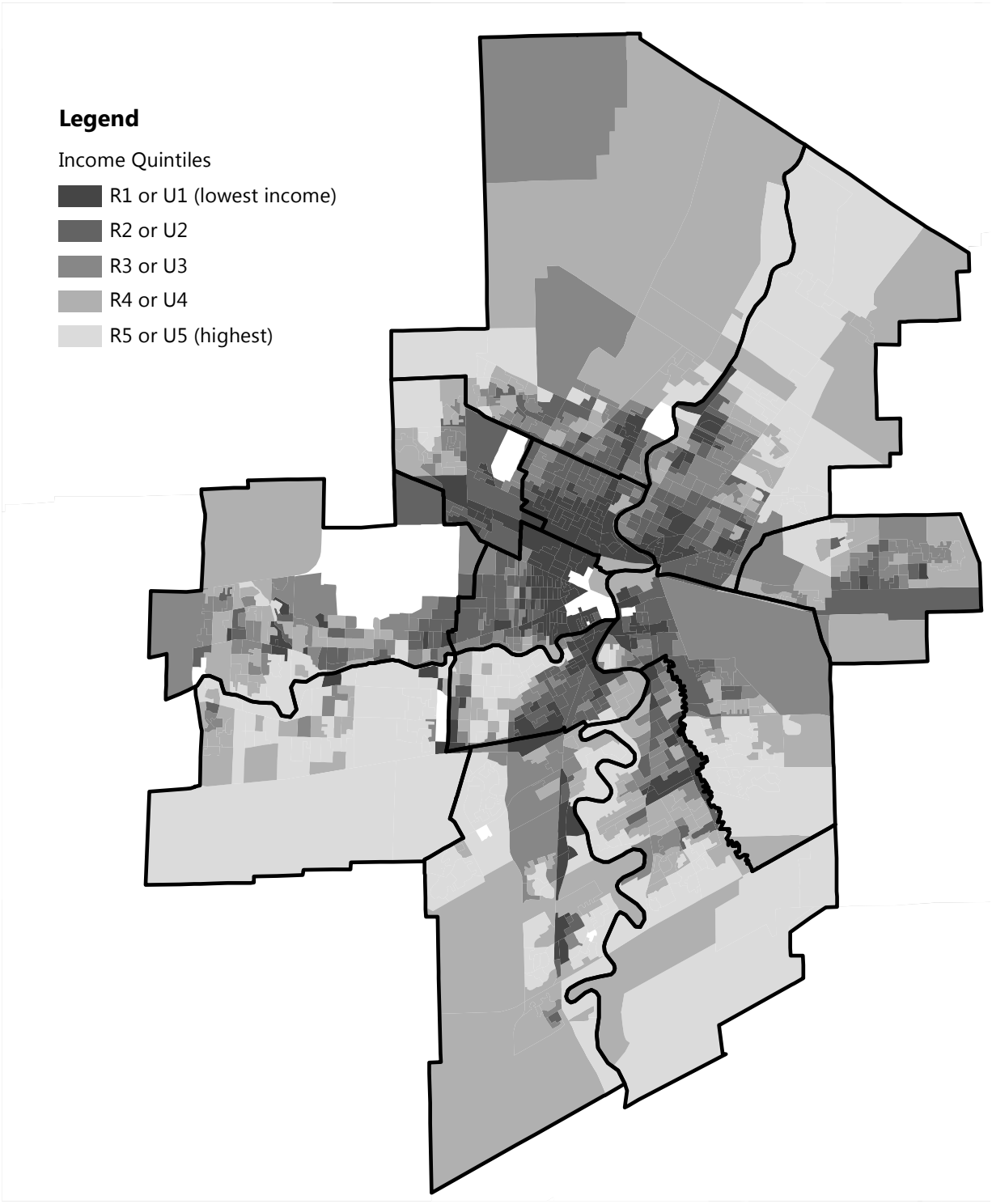
APPENDIX 2: INDICATOR CRUDE RATES, OBSERVED NUMBERS, INCOME QUINTILES, AND ADDITIONAL ANALYSIS

Appendix Figure 2.1: Distribution of Rural and Urban Income Quintiles in Manitoba 2006 Census Dissemination Areas

Quintile Breaks are at different points in Winnipeg & Brandon



Appendix Figure 2.2: Distribution of Urban Income Quintiles in Winnipeg 2006 Census Dissemination Areas



Appendix Table 2.1: Premature Mortality Rate, 2001-2010 Among Residents Younger than 75

Regional Health Authority	Number observed per year	CRUDE rate per 1,000
	2001-2010	
Current RHAs		
Southern	394	2.56
Winnipeg	1,997	3.20
Prairie Mountain	538	3.70
Interlake-Eastern	418	3.80
Northern	257	3.69
Manitoba	3,708	3.36
Former RHAs		
South Eastman	133	2.26
Central	262	2.74
Assiniboine	230	3.72
Brandon	140	3.05
Winnipeg	1,993	3.20
Interlake	274	3.82
North Eastman	144	3.77
Parkland	168	4.45
Churchill	3.30	3.46
Nor-Man	88.7	3.74
Burntwood	168	3.66

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000
	2001-2010	
Fort Garry S	74.5	2.14
Fort Garry N	63.5	2.29
Assiniboine South	85.6	2.52
St. Vital S	72.1	2.14
St. Vital N	84.4	3.47
St. Boniface E	80.5	2.34
St. Boniface W	60.6	4.44
Transcona	87.4	2.73
River Heights W	84.8	2.65
River Heights E	70.0	3.75
River East N	17.6	1.82
River East E	70.7	2.62
River East W	121	3.58
River East S	62.7	3.71
St. James-Assiniboia W	102	3.44
St. James-Assiniboia E	94.1	3.98
Seven Oaks N	11.9	2.89
Seven Oaks W	56.7	2.57
Seven Oaks E	116	3.74
Inkster W	34.0	1.95
Inkster E	57.4	4.24
Downtown W	112	3.09
Downtown E	182	5.57
Point Douglas N	97.8	3.83
Point Douglas S	94.6	6.76
Churchill	3.30	3.46

Appendix Table 2.2: Socioeconomic Factor Index (SEFI)

Regional Health Authority	Population 2001	SEFI Value 2001	Population 2006	SEFI Value 2006
Current RHAs				
Southern	149,518	0.024	156,125	0.007
Winnipeg	631,907	-0.249	647,360	-0.217
Prairie Mountain	157,039	0.212	155,645	0.161
Interlake-Eastern	113,631	0.150	119,080	0.108
Northern	64,495	1.09	66,610	1.32
Manitoba	1,116,590	-0.030	1,144,820	-0.012
Former RHAs				
South Eastman	53,879	-0.126	58,715	-0.179
Central	95,639	0.108	97,410	0.120
Assiniboine	69,320	0.179	67,895	0.103
Brandon	46,253	-0.137	48,245	-0.201
Winnipeg	630,949	-0.250	646,440	-0.218
Interlake	75,030	0.123	78,555	0.086
North Eastman	38,601	0.203	40,525	0.150
Parkland	41,466	0.656	39,505	0.704
Churchill	958	0.476	920	0.787
Nor-Man	23,578	0.652	23,045	0.786
Burntwood	40,917	1.34	43,565	1.60

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Population 2001	SEFI Value 2001	Population 2006	SEFI Value 2006
Fort Garry S	34,096	-0.671	35,550	-0.553
Fort Garry N	27,820	-1.10	30,900	-1.01
Assiniboine South	37,235	-1.27	37,680	-1.14
St. Vital S	33,073	-0.885	34,625	-0.745
St. Vital N	26,495	-0.066	26,140	-0.122
St. Boniface E	32,205	-0.749	36,470	-0.746
St. Boniface W	15,194	0.050	15,085	-0.031
Transcona	30,479	-0.257	31,670	-0.171
River Heights W	34,992	-0.746	35,565	-0.599
River Heights E	21,620	-0.169	21,565	-0.183
River East N	7,677	-1.58	8,755	-1.31
River East E	26,754	-0.221	26,800	-0.208
River East W	37,728	-0.145	37,030	-0.199
River East S	17,065	0.693	16,920	0.583
St. James-Assiniboia W	31,943	-0.492	31,675	-0.405
St. James-Assiniboia E	28,958	-0.212	28,215	-0.252
Seven Oaks N	4,085	-1.19	4,360	-0.901
Seven Oaks W	21,233	-0.253	23,120	-0.232
Seven Oaks E	30,848	-0.104	32,025	-0.065
Inkster W	16,744	-0.385	16,280	-0.368
Inkster E	12,487	0.839	12,395	0.903
Downtown W	35,360	0.385	35,085	0.344
Downtown E	29,394	0.861	29,875	0.993
Point Douglas N	23,935	0.689	24,295	0.569
Point Douglas S	13,529	1.68	14,360	1.75
Churchill	958	0.476	920	0.787

Appendix Table 2.3: Social and Material Deprivation Index, Canadian Census 2006

Regional Health Authority	Population	Mean Social Index Value	Population	Mean Material Index Value
	Social Deprivation		Material Deprivation	
Current RHAs				
Southern	156,125	-0.419	156,125	0.290
Winnipeg	647,360	0.264	647,360	-0.398
Prairie Mountain	155,645	0.0593	155,645	0.325
Interlake-Eastern	119,080	-0.355	119,080	0.330
Northern	66,610	-0.701	66,610	1.45
Manitoba	1,144,820	0.0227	1,144,820	-0.0228
Former RHAs				
South Eastman	58,715	-0.472	58,715	0.0817
Central	97,410	-0.387	97,410	0.416
Assiniboine	67,895	-0.0980	67,895	0.405
Brandon	48,245	0.363	48,245	-0.284
Winnipeg	646,440	0.264	646,440	-0.400
Interlake	78,555	-0.280	78,555	0.281
North Eastman	40,525	-0.500	40,525	0.424
Parkland	39,505	-0.0413	39,505	0.931
Churchill	920	0.336	920	0.871
Nor-Man	23,045	-0.250	23,045	0.786
Burntwood	43,565	-0.940	43,565	1.80

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Population	Mean Social Index Value	Population	Mean Material Index Value
	Social Deprivation		Material Deprivation	
Fort Garry S	35,550	-0.128	35,550	-0.698
Fort Garry N	30,900	-0.166	30,900	-1.05
Assiniboine South	37,680	-0.292	37,680	-1.18
St. Vital S	34,625	-0.335	34,625	-0.779
St. Vital N	26,140	0.738	26,140	-0.333
St. Boniface E	36,470	-0.295	36,470	-0.820
St. Boniface W	15,085	1.21	15,085	-0.339
Transcona	31,670	-0.244	31,670	-0.200
River Heights W	35,565	0.539	35,565	-0.818
River Heights E	21,565	1.47	21,565	-0.661
River East N	8,755	-1.07	8,755	-1.11
River East E	26,800	-0.155	26,800	-0.342
River East W	37,030	0.473	37,030	-0.283
River East S	16,920	0.774	16,920	0.204
St. James-Assiniboia W	31,675	0.219	31,675	-0.551
St. James-Assiniboia E	28,215	0.750	28,215	-0.470
Seven Oaks N	4,360	-0.482	4,360	-0.725
Seven Oaks W	23,120	-0.316	23,120	-0.303
Seven Oaks E	32,025	0.301	32,025	-0.199
Inkster W	16,280	-0.803	16,280	-0.350
Inkster E	12,395	0.500	12,395	0.544
Downtown W	35,085	0.545	35,085	0.00495
Downtown E	29,875	1.65	29,875	0.372
Point Douglas N	24,295	0.451	24,295	0.279
Point Douglas S	14,360	1.06	14,360	1.23
Churchill	920	0.336	920	0.871

Appendix Table 2.4: Total Mortality

Regional Health Authority	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Current RHAs				
Southern	1,117	7.00	1,141	6.53
Winnipeg	5,412	8.18	5,491	7.92
Prairie Mountain	1,700	10.6	1,669	10.3
Interlake-Eastern	930	8.02	988	8.23
Northern	377	5.35	410	5.65
Manitoba	9,864	8.43	9,974	8.14
Former RHAs				
South Eastman	339	5.74	357	5.28
Central	778	7.74	784	7.33
Assiniboine	790	11.4	740	10.8
Brandon	407	8.38	430	8.26
Winnipeg	5,407	8.19	5,488	7.93
Interlake	627	8.23	678	8.66
North Eastman	303	7.61	310	7.43
Parkland	502	11.9	498	12.0
Churchill	4.60	4.64	3.80	4.05
Nor-Man	166	6.73	171	6.96
Burntwood	211	4.61	240	4.98

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Fort Garry S	166	4.63	170	4.37
Fort Garry N	212	7.29	239	7.45
Assiniboine South	317	8.56	334	9.12
St. Vital S	200	5.81	291	7.67
St. Vital N	234	8.71	218	8.11
St. Boniface E	146	4.23	174	4.41
St. Boniface W	191	12.5	185	12.1
Transcona	194	5.84	192	5.57
River Heights W	326	9.27	310	8.69
River Heights E	224	10.8	202	9.79
River East N	34.4	3.56	40.0	3.70
River East E	204	7.26	209	7.22
River East W	390	10.2	417	10.8
River East S	119	6.68	112	6.25
St. James-Assiniboia W	267	8.33	293	9.09
St. James-Assiniboia E	357	13.4	343	12.9
Seven Oaks N	69.4	16.3	77.2	15.8
Seven Oaks W	157	7.10	161	6.35
Seven Oaks E	312	9.46	303	8.32
Inkster W	50.2	2.87	56.6	3.00
Inkster E	137	9.69	128	8.56
Downtown W	301	8.01	279	6.96
Downtown E	364	10.4	347	9.92
Point Douglas N	215	7.96	197	7.01
Point Douglas S	219	14.8	211	13.5
Churchill	4.60	4.64	3.80	4.05

Income Quintile	ADJUSTED rate per 1,000 2002-2006	ADJUSTED rate per 1,000 2007-2011
Income Unknown	34.2	36.7
Lowest Rural R1	11.0	11.5
R2	8.75	8.05
R3	8.76	7.96
R4	7.38	7.08
Highest Rural R5	6.98	6.44
Lowest Urban U1	11.5	10.9
U2	7.58	6.91
U3	6.50	6.00
U4	5.64	5.36
Highest Urban U5	5.27	4.61
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.2632
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.4916

bold trends = significant

Appendix Table 2.5: Premature Mortality; Death Before Age 75

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Current RHAs				
Southern	393	2.62	400	2.43
Winnipeg	2,008	3.27	1,979	3.07
Prairie Mountain	529	3.66	530	3.60
Interlake-Eastern	400	3.67	440	3.92
Northern	246	3.56	279	3.92
Manitoba	3,680	3.38	3,733	3.27
Former RHAs				
South Eastman	132	2.36	136	2.12
Central	260	2.78	264	2.64
Assiniboine	229	3.71	221	3.60
Brandon	137	3.04	143	2.96
Winnipeg	2,005	3.27	1,976	3.07
Interlake	257	3.60	294	4.03
North Eastman	143	3.80	146	3.71
Parkland	163	4.30	166	4.43
Churchill	3.80	3.90	2.60	2.83
Nor-Man	86.8	3.64	94.8	4.01
Burntwood	159	3.52	184	3.88

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Fort Garry S	78.0	2.29	72.4	1.96
Fort Garry N	70.2	2.60	58.6	1.99
Assiniboine South	86.8	2.54	83.2	2.48
St. Vital S	65.6	2.00	81.8	2.30
St. Vital N	90.6	3.73	77.4	3.17
St. Boniface E	74.0	2.24	86.4	2.31
St. Boniface W	59.4	4.36	61.0	4.47
Transcona	87.4	2.75	86.0	2.63
River Heights W	93.8	2.94	75.6	2.34
River Heights E	70.8	3.80	66.8	3.56
River East N	18.4	1.97	18.0	1.72
River East E	69.0	2.57	72.4	2.65
River East W	118	3.50	124	3.68
River East S	63.0	3.74	60.6	3.55
St. James-Assiniboia W	106	3.56	98.6	3.37
St. James-Assiniboia E	90.8	3.84	89.0	3.77
Seven Oaks N	12.4	3.17	11.4	2.52
Seven Oaks W	56.0	2.65	58.6	2.43
Seven Oaks E	118	3.95	116	3.49
Inkster W	31.2	1.83	36.8	2.01
Inkster E	56.4	4.26	56.6	4.00
Downtown W	113	3.20	113	2.97
Downtown E	186	5.65	178	5.40
Point Douglas N	101	4.02	92.4	3.47
Point Douglas S	88.4	6.41	101	6.82
Churchill	3.80	3.90	2.60	2.83

Income Quintile	ADJUSTED rate per 1,000	
	2002-2006	2007-2011
Income Unknown	17.8	18.9
Lowest Rural R1	4.58	4.75
R2	3.32	3.15
R3	3.34	3.04
R4	2.86	2.73
Highest Rural R5	2.69	2.40
Lowest Urban U1	5.28	5.04
U2	3.49	3.18
U3	2.85	2.67
U4	2.32	2.11
Highest Urban U5	1.95	1.60

linear trend rural T1	**<.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	**0.0167**
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	**0.0043**

bold trend = significant

Appendix Table 2.6: Male Life Expectancy

Regional Health Authority	Number observed per year 2002-2006	Life Expectancy 2002-2006	Number observed per year 2007-2011	Life Expectancy 2007-2011
Current RHAs				
Southern	2,958	77.7	2,921	79.2
Winnipeg	12,826	77.1	13,027	78.3
Prairie Mountain	4,338	76.5	4,177	77.4
Interlake-Eastern	2,568	76.3	2,702	76.8
Northern	1,067	71.3	1,161	71.4
Manitoba	24,530	76.5	24,698	77.5
Former RHAs				
South Eastman	911	78.5	938	79.9
Central	2,047	77.3	1,983	78.7
Assiniboine	2,032	76.5	1,842	78.1
Brandon	1,001	77.1	1,005	78.5
Winnipeg	12,811	77.1	13,019	78.3
Interlake	1,729	76.7	1,848	76.9
North Eastman	839	75.5	854	76.7
Parkland	1,305	75.7	1,330	74.6
Churchill	15.0	72.4	8.00	81.2
Nor-Man	431	73.6	452	73.9
Burntwood	636	69.8	709	69.9

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2002-2006	Life Expectancy 2002-2006	Number observed per year 2007-2011	Life Expectancy 2007-2011
Fort Garry S	434	80.7	457	82.1
Fort Garry N	493	79.8	556	82.2
Assiniboine South	663	80.1	661	81.4
St. Vital S	459	79.5	630	80.1
St. Vital N	569	78.2	557	78.9
St. Boniface E	405	82.0	470	83.3
St. Boniface W	419	74.5	411	76.6
Transcona	495	77.8	476	79.9
River Heights W	736	78.9	679	80.6
River Heights E	473	76.1	461	77.3
River East N	96.0	82.1	121	82.3
River East E	425	77.9	447	78.9
River East W	920	79.4	1,023	78.8
River East S	323	75.3	308	76.2
St. James-Assiniboia W	656	78.4	693	80.0
St. James-Assiniboia E	852	77.0	836	77.4
Seven Oaks N	110	76.0	113	79.4
Seven Oaks W	343	77.7	361	79.5
Seven Oaks E	793	77.3	768	77.9
Inkster W	133	84.9	165	84.5
Inkster E	336	72.6	319	73.3
Downtown W	703	75.2	617	77.4
Downtown E	956	69.3	865	71.3
Point Douglas N	582	73.7	518	75.3
Point Douglas S	437	68.7	507	66.7
Churchill	15.0	72.4	8.00	81.2

Income Quintile	Life Expectancy 2002-2006	Life Expectancy 2007-2011
Income Unknown	60.1	57.6
Lowest Rural R1	73.3	73.0
R2	75.9	76.9
R3	76.0	77.6
R4	77.9	78.6
Highest Rural R5	78.7	79.7
Lowest Urban U1	71.9	72.9
U2	77.0	78.7
U3	79.1	80.0
U4	81.0	81.9
Highest Urban U5	81.9	83.1
linear trend rural T1		**0.0075**
linear trend rural T2		**0.0191**
linear trend urban T1		**0.0122**
linear trend urban T2		**0.0174**

bold trend = significant

Appendix Table 2.7: Female Life Expectancy

Regional Health Authority	Number observed per year	Life Expectancy	Number observed per year	Life Expectancy
	2002-2006		2007-2011	
Current RHAs				
Southern	2,629	83.0	2,786	83.7
Winnipeg	14,235	81.7	14,430	82.7
Prairie Mountain	4,159	82.3	4,167	82.3
Interlake-Eastern	2,082	81.6	2,236	82.2
Northern	817	76.4	891	76.4
Manitoba	24,790	81.5	25,171	82.2
Former RHAs				
South Eastman	785	83.2	847	84.3
Central	1,844	83.0	1,939	83.4
Assiniboine	1,921	82.7	1,859	82.6
Brandon	1,032	82.7	1,147	82.4
Winnipeg	14,227	81.7	14,419	82.7
Interlake	1,404	82.0	1,541	82.3
North Eastman	678	80.7	695	82.0
Parkland	1,206	81.0	1,161	81.4
Churchill	8.00	80.0	11.0	79.7
Nor-Man	400	77.6	401	78.4
Burntwood	417	75.2	490	74.8

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	Life Expectancy	Number observed per year	Life Expectancy
	2002-2006		2007-2011	
Fort Garry S	394	85.8	391	87.7
Fort Garry N	569	83.5	640	85.8
Assiniboine South	921	82.9	1009	83.3
St. Vital S	543	83.2	825	83.3
St. Vital N	599	84.3	533	86.1
St. Boniface E	324	87.0	400	89.8
St. Boniface W	537	81.2	513	81.7
Transcona	478	82.1	483	83.5
River Heights W	897	83.6	869	85.5
River Heights E	644	81.7	550	83.8
River East N	77.0	86.7	79.0	87.5
River East E	595	80.4	596	82.0
River East W	1028	84.4	1063	85.6
River East S	273	82.2	252	83.3
St. James-Assiniboia W	678	83.1	773	84.3
St. James-Assiniboia E	936	81.1	880	81.3
Seven Oaks N	237	79.4	273	79.9
Seven Oaks W	442	80.1	442	82.1
Seven Oaks E	768	82.9	745	84.4
Inkster W	118	88.1	118	97.3
Inkster E	349	78.5	322	79.4
Downtown W	805	81.3	777	80.8
Downtown E	861	76.7	868	76.3
Point Douglas N	494	82.2	468	82.6
Point Douglas S	660	69.7	550	70.9
Churchill	8.00	80.0	11.0	79.7

Income Quintile	Life Expectancy	
	2002-2006	2007-2011
Income Unknown	61.1	59.2
Lowest Rural R1	79.9	79.3
R2	82.1	82.9
R3	81.8	82.5
R4	83.4	83.7
Highest Rural R5	83.5	84.2
Lowest Urban U1	79.1	79.7
U2	84.5	85.1
U3	85.6	86.8
U4	86.4	86.8
Highest Urban U5	85.9	87.8
linear trend rural T1		**0.0294**
linear trend rural T2		**0.0490**
linear trend urban T1		0.0896
linear trend urban T2		0.0549

bold trend = significant

Appendix Table 2.8: Potential Years of Life Lost Among Residents Aged 1-75

Regional Health Authority	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Current RHAs				
Southern	6,480	43.9	6,364	39.4
Winnipeg	31,459	51.8	31,715	49.8
Prairie Mountain	7,865	55.1	8,318	57.3
Interlake-Eastern	6,568	61.0	6,657	60.0
Northern	5,551	82.2	6,022	86.7
Manitoba	59,182	55.0	60,455	53.7
Former RHAs				
South Eastman	2,277	41.2	2,075	32.8
Central	4,203	45.6	4,289	43.6
Assiniboine	3,514	57.6	3,283	54.2
Brandon	1,883	42.5	2,182	45.9
Winnipeg	31,392	51.8	31,672	49.9
Interlake	3,953	56.1	4,119	57.1
North Eastman	2,616	70.2	2,538	65.4
Parkland	2,468	66.1	2,852	77.3
Churchill	66.8	69.8	42.6	47.2
Nor-Man	1,584	67.7	1,666	71.8
Burntwood	3,967	89.9	4,356	94.1

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Fort Garry S	1,215	36.1	1,130	31.0
Fort Garry N	981	36.7	867	29.8
Assiniboine South	1,184	35.0	1,227	36.8
St. Vital S	1,126	34.7	1,254	35.7
St. Vital N	1,299	54.1	1,083	44.9
St. Boniface E	973	29.8	1,247	33.8
St. Boniface W	791.0	58.7	853	63.2
Transcona	1,364	43.4	1,333	41.2
River Heights W	1,357	43.0	1,059	33.1
River Heights E	1,154	62.6	988	53.2
River East N	284	30.6	250	24.1
River East E	1,094	41.2	1,038	38.5
River East W	1,492	44.5	1,693	50.6
River East S	1,091	65.7	1,043	62.0
St. James-Assiniboia W	1,357	46.1	1,255	43.3
St. James-Assiniboia E	1,116	47.7	1,309	56.1
Seven Oaks N	165	42.5	149	33.3
Seven Oaks W	849	40.7	847	35.6
Seven Oaks E	1,576	53.2	1,769	53.8
Inkster W	502	29.9	634	35.1
Inkster E	900	69.2	947	68.0
Downtown W	2,112	60.8	2,238	59.7
Downtown E	3,656	113	3,615	111
Point Douglas N	1,878	75.7	1,599	61.0
Point Douglas S	1,876	139	2,246	155
Churchill	66.8	69.8	42.6	47.2

Income Quintile	ADJUSTED rate per 1,000 2002-2006	ADJUSTED rate per 1,000 2007-2011
Income Unknown	280	313
Lowest Rural R1	93.2	99.3
R2	67.2	54.4
R3	58.0	54.7
R4	48.7	42.9
Highest Rural R5	42.3	37.9
Lowest Urban U1	89.8	84.4
U2	50.5	47.0
U3	38.9	37.6
U4	31.7	31.5
Highest Urban U5	25.3	23.2
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.5159
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.9651

bold trend = significant

Appendix Table 2.9: Suicide Rate Among Residents Aged 10+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Current RHAs				
Southern	13.4	0.0990	12.4	0.0839
Winnipeg	89.6	0.153	96.0	0.156
Prairie Mountain	21.8	0.155	23.2	0.163
Interlake-Eastern	19.4	0.191	20.2	0.191
Northern	15.4	0.276	24.6	0.429
Manitoba	161	0.157	178	0.166
Former RHAs				
South Eastman	5.00	0.100	6.00	0.105
Central	8.40	0.0984	6.40	0.0705
Assiniboine	11.0	0.180	8.00	0.132
Brandon	4.40	0.104	6.00	0.132
Winnipeg	89.6	0.153	95.6	0.155
Interlake	8.60	0.128	9.60	0.138
North Eastman	10.8	0.311	10.6	0.291
Parkland	6.40	0.174	9.20	0.253
Churchill	0.000	0.000		
Nor-Man	4.20	0.206	5.60	0.276
Burntwood	11.2	0.316	19.0	0.512

Winnipeg Community Areas	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Fort Garry	4.40	0.0768	5.00	0.079
Assiniboine South	2.00	0.0601	4.80	0.145
St. Vital	5.60	0.103	5.40	0.0931
St. Boniface	4.00	0.0908	5.20	0.107
Transcona	3.40	0.117	2.80	0.0920
River Heights	6.40	0.127	7.60	0.148
River East	11.2	0.134	13.4	0.156
St. James-Assiniboia	6.20	0.117	6.20	0.116
Seven Oaks	6.80	0.129	7.00	0.118
Inkster	5.80	0.214	5.40	0.184
Downtown	22.0	0.348	17.4	0.267
Point Douglas	11.80	0.332	15.4	0.414
Churchill	0.000	0.000		

Income Quintile	ADJUSTED rate per 1,000	
	2002-2006	2007-2011
Income Unknown	0.245	0.276
Lowest Rural R1	0.375	0.353
R2	0.150	0.166
R3	0.131	0.195
R4	0.107	0.141
Highest Rural R5	0.0839	0.113
Lowest Urban U1	0.337	0.338
U2	0.143	0.153
U3	0.120	0.107
U4	0.0735	0.0872
Highest Urban U5	0.0690	0.0752
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.2441
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.7057

bold trend = significant

blank cells = suppressed

Appendix Table 2.10: Hypertension Prevalence Among Residents Aged 19+

Regional Health Authority	Number observed 2006/07	CRUDE percent 2006/07	Number observed 2011/12	CRUDE percent 2011/12
Current RHAs				
Southern	26,232	22.9%	29,674	23.3%
Winnipeg	121,948	23.8%	136,123	24.5%
Prairie Mountain	34,915	29.1%	37,804	30.1%
Interlake-Eastern	24,326	27.9%	27,877	29.9%
Northern	9,944	23.0%	11,785	25.3%
Manitoba	218,333	24.8%	244,345	25.7%
Former RHAs				
South Eastman	9,259	21.5%	10,672	21.6%
Central	16,973	23.7%	19,002	24.4%
Assiniboine	15,739	30.5%	16,713	31.4%
Brandon	9,208	24.6%	10,434	25.4%
Winnipeg	121,784	23.8%	135,937	24.5%
Interlake	15,981	27.8%	18,326	30.0%
North Eastman	8,345	28.3%	9,551	29.8%
Parkland	9,968	32.1%	10,657	34.1%
Churchill	164	24.5%	186	25.7%
Nor-Man	3,685	22.7%	4,381	25.8%
Burntwood	6,259	23.2%	7,404	25.0%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed 2006/07	CRUDE percent 2006/07	Number observed 2011/12	CRUDE percent 2011/12
Fort Garry S	5,823	21.0%	6,976	21.3%
Fort Garry N	5,337	23.1%	6,323	24.6%
Assiniboine South	7,013	24.6%	7,597	26.0%
St. Vital S	5,902	21.9%	7,640	24.7%
St. Vital N	5,509	25.9%	5,568	25.5%
St. Boniface E	5,987	21.9%	7,184	22.8%
St. Boniface W	2,968	23.9%	3,184	25.0%
Transcona	5,565	22.3%	6,436	23.6%
River Heights W	6,671	23.6%	7,067	24.1%
River Heights E	3,886	22.4%	3,891	21.6%
River East N	1563	20.7%	1,803	21.4%
River East E	4,730	22.2%	5,469	24.2%
River East W	9,125	29.7%	9,687	30.3%
River East S	2,753	20.8%	2,853	20.5%
St. James-Assiniboia W	7,065	28.0%	7,556	29.0%
St. James-Assiniboia E	5,790	27.0%	5,903	27.0%
Seven Oaks N	902	26.2%	1,050	26.5%
Seven Oaks W	4,195	24.4%	5,317	26.3%
Seven Oaks E	7,302	27.4%	8,431	28.1%
Inkster W	2,783	21.8%	3,389	23.2%
Inkster E	2,468	24.0%	2,752	25.0%
Downtown W	5,990	21.1%	6,519	21.4%
Downtown E	5,290	20.3%	5,672	20.2%
Point Douglas N	4,749	23.9%	5,024	23.2%
Point Douglas S	2,418	23.7%	2,646	23.4%
Churchill	164	24.5%	186	25.7%

Income Quintile	ADJUSTED percent 2006/07	ADJUSTED percent 2011/12
Income Unknown	23.1%	24.4%
Lowest Rural R1	28.9%	30.6%
R2	25.8%	26.7%
R3	25.9%	26.4%
R4	25.6%	26.1%
Highest Rural R5	24.3%	24.9%
Lowest Urban U1	25.4%	26.2%
U2	24.8%	25.6%
U3	24.5%	25.0%
U4	23.9%	24.4%
Highest Urban U5	22.1%	22.2%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0420**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.0576

bold trend = significant

Appendix Table 2.11: Hypertension Incidence Among Residents Aged 19+

Regional Health Authority	Average number of new cases	CRUDE rate per 100 person-years	Average number of new cases	CRUDE rate per 100 person-years
	2006/07		2011/12	
Current RHAs				
Southern	2,023	3.11	1,810	2.62
Winnipeg	8,936	3.28	8,349	3.01
Prairie Mountain	2,401	3.83	2,081	3.43
Interlake-Eastern	1,764	3.68	1,831	3.77
Northern	969	3.75	834	3.24
Manitoba	16,146	3.40	14,957	3.10
Former RHAs				
South Eastman	740	3.04	642	2.38
Central	1,283	3.15	1,168	2.77
Assiniboine	1,056	3.88	902	3.47
Brandon	637	3.22	596	3.02
Winnipeg	8,928	3.28	8,340	3.01
Interlake	1,130	3.56	1,174	3.64
North Eastman	634	3.92	657	4.03
Parkland	708	4.48	583	3.91
Churchill	8.00	2.51	9.00	2.81
Nor-Man	284	3.00	247	2.73
Burntwood	685	4.18	587	3.51

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Average number of new cases	CRUDE rate per 100 person-years	Average number of new cases	CRUDE rate per 100 person-years
	2006/07		2011/12	
Fort Garry S	435	3.09	474	3.33
Fort Garry N	414	3.57	383	3.04
Assiniboine South	497	3.22	452	2.88
St. Vital S	501	3.30	440	2.71
St. Vital N	386	3.45	354	3.27
St. Boniface E	430	2.81	443	2.63
St. Boniface W	190	2.77	203	2.97
Transcona	439	2.90	489	3.13
River Heights W	471	3.15	385	2.56
River Heights E	255	2.89	219	2.45
River East N	137	2.94	153	2.95
River East E	375	3.05	350	2.94
River East W	567	3.59	471	3.01
River East S	240	3.21	203	2.69
St. James-Assiniboia W	489	3.72	484	3.65
St. James-Assiniboia E	413	3.75	346	3.11
Seven Oaks N	70.0	3.57	61.0	2.76
Seven Oaks W	301	3.46	284	3.29
Seven Oaks E	539	3.92	471	3.32
Inkster W	241	3.45	214	3.17
Inkster E	161	3.03	166	3.31
Downtown W	471	3.12	447	3.01
Downtown E	350	3.05	356	3.12
Point Douglas N	384	3.59	311	2.93
Point Douglas S	172	3.29	181	3.34
Churchill	8.00	2.51	9.00	2.81

Income Quintile	ADJUSTED rate per 100 person-years	
	2006/07	2011/12
Income Unknown	2.42	3.16
Lowest Rural R1	4.29	4.03
R2	3.42	3.22
R3	3.65	3.06
R4	3.52	3.06
Highest Rural R5	3.34	3.03
Lowest Urban U1	3.58	3.29
U2	3.37	3.15
U3	3.37	3.01
U4	3.31	2.97
Highest Urban U5	2.88	2.55
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.2429
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.3102

bold trend = significant

Appendix Table 2.12: Arthritis Prevalence Among Residents Aged 19+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	22,016	19.2%	23,399	18.4%
Winnipeg	107,201	20.9%	115,253	20.7%
Prairie Mountain	27,227	22.7%	29,593	23.6%
Interlake-Eastern	18,846	21.6%	21,132	22.7%
Northern	8,562	19.8%	9,369	20.1%
Manitoba	184,565	21.0%	199,505	21.0%
Former RHAs				
South Eastman	8,155	19.0%	8,531	17.2%
Central	13,861	19.3%	14,868	19.1%
Assiniboine	10,740	20.8%	11,407	21.4%
Brandon	8,108	21.6%	9,229	22.5%
Winnipeg	107,078	20.9%	115,080	20.7%
Interlake	11,965	20.8%	13,651	22.3%
North Eastman	6,881	23.3%	7,481	23.4%
Parkland	8,379	27.0%	8,957	28.7%
Churchill	123.00	18.4%	173	23.9%
Nor-Man	3,709	22.8%	3,495	20.5%
Burntwood	4,853	18.0%	5,874	19.8%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry S	4,853	17.5%	5,699	17.4%
Fort Garry N	4,522	19.6%	5,221	20.3%
Assiniboine South	6,291	22.1%	6,424	22.0%
St. Vital S	5,277	19.6%	6,360	20.6%
St. Vital N	4,727	22.3%	4,864	22.3%
St. Boniface E	5,303	19.4%	6,203	19.7%
St. Boniface W	2,509	20.2%	2,596	20.4%
Transcona	4,985	19.9%	5,350	19.6%
River Heights W	5,850	20.7%	5,994	20.5%
River Heights E	3,680	21.2%	3,571	19.9%
River East N	1,338	17.7%	1,581	18.8%
River East E	4,164	19.5%	4,582	20.3%
River East W	6,680	21.7%	7,209	22.5%
River East S	2,527	19.1%	2,759	19.8%
St. James-Assiniboia W	5,747	22.8%	6,035	23.1%
St. James-Assiniboia E	4,672	21.8%	4,855	22.2%
Seven Oaks N	810	23.5%	889	22.5%
Seven Oaks W	3,312	19.3%	3,787	18.7%
Seven Oaks E	5,933	22.3%	6,364	21.2%
Inkster W	2,161	16.9%	2,402	16.4%
Inkster E	2,206	21.5%	2,301	20.9%
Downtown W	5,637	19.8%	5,553	18.2%
Downtown E	6,256	24.0%	6,323	22.5%
Point Douglas N	4,468	22.5%	4,673	21.6%
Point Douglas S	3,170	31.0%	3,485	30.8%
Churchill	123	18.4%	173	23.9%

Income Quintile	ADJUSTED percent	
	2005/06-2006/07	2010/11-2011/12
Income Unknown	24.0%	22.8%
Lowest Rural R1	22.7%	23.6%
R2	19.8%	20.0%
R3	20.7%	20.9%
R4	20.6%	20.1%
Highest Rural R5	20.3%	20.0%
Lowest Urban U1	24.2%	24.1%
U2	21.0%	21.0%
U3	20.5%	20.1%
U4	19.7%	19.6%
Highest Urban U5	19.0%	18.9%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0013**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.9222

bold trend = significant

Appendix Table 2.13: Total Respiratory Morbidity Prevalence

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	13,048	7.94%	11,756	6.49%
Winnipeg	77,874	11.7%	71,232	9.95%
Prairie Mountain	18,781	11.8%	20,675	12.6%
Interlake-Eastern	12,297	10.5%	12,124	9.92%
Northern	4,753	6.72%	3,917	5.27%
Manitoba	127,202	10.8%	120,147	9.53%
Former RHAs				
South Eastman	4,788	7.71%	4,357	6.14%
Central	8,260	8.08%	7,399	6.72%
Assiniboine	6,439	9.46%	6,563	9.48%
Brandon	6,656	13.4%	8,864	16.4%
Winnipeg	77,805	11.7%	71,177	10.0%
Interlake	7,965	10.4%	8,086	10.2%
North Eastman	4,332	10.8%	4,038	9.44%
Parkland	5,686	13.7%	5,248	12.6%
Churchill	69.0	7.35%	55.0	5.74%
Nor-Man	1,965	8.12%	1,472	5.88%
Burntwood	2,788	5.99%	2,445	4.96%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Fort Garry S	3,302	9.24%	3,614	8.55%
Fort Garry N	2,951	9.67%	2,858	8.69%
Assiniboine South	3,973	10.8%	3,547	9.70%
St. Vital S	3,386	9.56%	3,722	9.45%
St. Vital N	3,065	11.5%	3,018	11.1%
St. Boniface E	3,598	9.82%	3,603	8.68%
St. Boniface W	1,544	10.2%	1,460	9.55%
Transcona	4,154	12.5%	3,460	9.68%
River Heights W	3,672	10.4%	3,521	9.76%
River Heights E	2,070	10.2%	1,939	9.27%
River East N	765	7.51%	724	6.58%
River East E	3,621	12.8%	2,671	9.06%
River East W	3,917	10.2%	3,675	9.35%
River East S	2,338	13.3%	1,990	10.9%
St. James-Assiniboia W	4,070	12.8%	3,618	11.1%
St. James-Assiniboia E	3,319	12.5%	3,048	11.4%
Seven Oaks N	467	10.5%	422	8.34%
Seven Oaks W	2,784	12.1%	2,604	9.63%
Seven Oaks E	4,041	11.9%	3,908	10.2%
Inkster W	2,264	12.9%	1,883	9.54%
Inkster E	2,279	15.6%	1,826	11.8%
Downtown W	4,866	13.1%	4,082	9.75%
Downtown E	4,670	13.7%	4,005	11.0%
Point Douglas N	4,013	14.7%	3,540	12.0%
Point Douglas S	2,676	18.1%	2,439	14.6%
Churchill	69.0	7.35%	55.0	5.74%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	13.1%	11.4%
Lowest Rural R1	9.95%	9.26%
R2	9.07%	7.97%
R3	8.91%	8.14%
R4	9.33%	7.88%
Highest Rural R5	9.12%	8.07%
Lowest Urban U1	14.2%	12.3%
U2	12.7%	11.1%
U3	11.5%	10.4%
U4	10.8%	9.50%
Highest Urban U5	9.52%	8.57%

linear trend rural T1	**0.0155**
linear trend rural T2	**<.0001**
compare rural trends over time	0.0979
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.2630

bold trend = significant

Appendix Table 2.14: Diabetes Prevalence Among Residents Aged 19+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Current RHAs				
Southern	8,341	7.39%	10,124	8.12%
Winnipeg	42,863	8.42%	51,607	9.46%
Prairie Mountain	12,105	10.1%	14,059	11.3%
Interlake-Eastern	8,811	10.2%	10,738	11.7%
Northern	6,045	14.0%	7,599	16.5%
Manitoba	78,681	8.99%	94,724	10.1%
Former RHAs				
South Eastman	2,908	6.96%	3,588	7.45%
Central	5,433	7.64%	6,536	8.54%
Assiniboine	5,225	10.1%	5,979	11.3%
Brandon	3,289	8.89%	3,983	9.84%
Winnipeg	42,776	8.41%	51,505	9.45%
Interlake	5,694	9.94%	6,980	11.6%
North Eastman	3,117	10.7%	3,758	12.0%
Parkland	3,591	11.5%	4,097	13.1%
Churchill	87.0	12.9%	102	14.6%
Nor-Man	2,012	12.3%	2,429	14.5%
Burntwood	4,033	15.1%	5,170	17.7%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Fort Garry S	1,924	6.98%	2,375	7.67%
Fort Garry N	1,575	6.95%	2,037	7.98%
Assiniboine South	1,866	6.54%	2,312	7.95%
St. Vital S	1,723	6.59%	2,483	8.24%
St. Vital N	1,885	8.86%	2,131	9.79%
St. Boniface E	1,928	7.23%	2,456	8.03%
St. Boniface W	1,041	8.38%	1,196	9.43%
Transcona	2,043	8.23%	2,419	9.05%
River Heights W	1,989	7.07%	2,232	7.68%
River Heights E	1,274	7.32%	1,394	7.87%
River East N	389	5.27%	500	5.90%
River East E	1,643	7.76%	2,012	9.08%
River East W	2,806	9.16%	3,244	10.2%
River East S	1,165	8.74%	1,318	9.71%
St. James-Assiniboia W	2,229	8.83%	2,598	10.0%
St. James-Assiniboia E	1,822	8.55%	1,977	9.12%
Seven Oaks N	292	8.67%	381	9.71%
Seven Oaks W	1,723	10.3%	2,287	11.6%
Seven Oaks E	2,663	10.1%	3,391	11.6%
Inkster W	1,093	8.74%	1,557	10.9%
Inkster E	1,140	11.3%	1,396	13.1%
Downtown W	2,455	8.61%	2,838	9.52%
Downtown E	2,773	10.5%	3,103	11.2%
Point Douglas N	1,987	10.0%	2,339	11.1%
Point Douglas S	1,348	13.1%	1,529	14.0%
Churchill	87.0	12.9%	102	14.6%

Income Quintile	ADJUSTED percent	
	2004/05-2006/07	2009/10-2011/12
Income Unknown	12.3%	15.6%
Lowest Rural R1	14.7%	17.1%
R2	9.25%	10.6%
R3	9.14%	10.4%
R4	8.01%	8.70%
Highest Rural R5	7.77%	8.19%
Lowest Urban U1	11.0%	12.1%
U2	9.06%	9.89%
U3	8.01%	8.91%
U4	7.27%	8.22%
Highest Urban U5	6.08%	6.77%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0126**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.5748

bold trend = significant

Appendix Table 2.15: Diabetes Incidence Among Residents Aged 19+

Regional Health Authority	Average number of new cases	CRUDE rate per 100 person-years	Average number of new cases	CRUDE rate per 100 person-years
	2004/05-2006/07		2009/10-2011/12	
Current RHAs				
Southern	665	0.764	618	0.672
Winnipeg	3,258	0.868	3,208	0.841
Prairie Mountain	877	0.964	805	0.896
Interlake-Eastern	650	0.959	684	0.977
Northern	465	1.48	496	1.59
Manitoba	5,943	0.908	5,837	0.876
Former RHAs				
South Eastman	241	0.765	217	0.629
Central	424	0.763	401	0.698
Assiniboine	388	0.950	345	0.873
Brandon	245	0.930	228	0.841
Winnipeg	3,248	0.867	3,205	0.841
Interlake	402	0.896	454	0.980
North Eastman	248	1.08	230	0.972
Parkland	244	1.03	232	1.00
Churchill	9.7	2.07	3.00	0.728
Nor-Man	154	1.28	142	1.24
Burntwood	311	1.60	355	1.80

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Average number of new cases	CRUDE rate per 100 person-years	Average number of new cases	CRUDE rate per 100 person-years
	2004/05-2006/07		2009/10-2011/12	
Fort Garry S	141	0.727	127	0.656
Fort Garry N	121	0.789	130	0.744
Assiniboine South	134	0.613	152	0.678
St. Vital S	146	0.728	160	0.721
St. Vital N	150	0.921	139	0.890
St. Boniface E	175	0.878	165	0.743
St. Boniface W	85	0.908	79	0.846
Transcona	167	0.820	155	0.759
River Heights W	152	0.725	144	0.686
River Heights E	98	0.791	87	0.716
River East N	32.0	0.547	38	0.558
River East E	131	0.807	124	0.751
River East W	209	0.874	201	0.848
River East S	84	0.866	85	0.886
St. James-Assiniboia W	165	0.850	159	0.822
St. James-Assiniboia E	133	0.831	116	0.727
Seven Oaks N	22.0	0.819	26.0	0.849
Seven Oaks W	132	1.09	131	1.05
Seven Oaks E	191	0.968	205	1.01
Inkster W	87	0.906	101	1.08
Inkster E	98	1.353	83	1.19
Downtown W	181	0.907	178	0.907
Downtown E	173	1.13	172	1.18
Point Douglas N	157	1.08	156	1.10
Point Douglas S	84	1.28	92	1.39
Churchill	9.7	2.07	3.00	0.728

Income Quintile	ADJUSTED rate per 100 person-years	
	2004/05-2006/07	2009/10-2011/12
Income Unknown	1.01	1.02
Lowest Rural R1	1.42	1.47
R2	0.924	0.881
R3	0.919	0.868
R4	0.797	0.730
Highest Rural R5	0.789	0.683
Lowest Urban U1	1.12	1.11
U2	0.959	0.887
U3	0.839	0.807
U4	0.736	0.706
Highest Urban U5	0.623	0.569
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0089**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.3792

bold trend = significant

Appendix Table 2.16: Ischemic Heart Disease Prevalence Among Residents Aged 19+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	8,856	7.96%	8,344	6.84%
Winnipeg	44,287	8.75%	42,360	7.92%
Prairie Mountain	12,790	10.7%	12,906	10.5%
Interlake-Eastern	7,300	8.51%	7,537	8.36%
Northern	2,710	6.27%	2,766	6.14%
Manitoba	76,499	8.80%	74,391	8.10%
Former RHAs				
South Eastman	3,254	7.96%	3,033	6.48%
Central	5,602	7.96%	5,311	7.06%
Assiniboine	5,094	9.79%	5,007	9.56%
Brandon	3,040	8.33%	2,897	7.27%
Winnipeg	44,241	8.75%	42,315	7.92%
Interlake	4,905	8.64%	5,027	8.46%
North Eastman	2,395	8.26%	2,510	8.15%
Parkland	4,656	14.9%	5,002	16.1%
Churchill	46.00	6.63%	45.0	6.72%
Nor-Man	1,142	6.88%	1,053	6.40%
Burntwood	1,568	5.90%	1,713	5.98%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	1,894	6.92%	1,922	6.48%
Fort Garry N	1,808	8.23%	1,967	7.93%
Assiniboine South	2,662	9.37%	2,325	8.03%
St. Vital S	1,798	7.03%	2,152	7.33%
St. Vital N	2,244	10.5%	1,998	9.20%
St. Boniface E	1,970	7.60%	2,066	6.95%
St. Boniface W	1,403	11.3%	1,171	9.25%
Transcona	1,893	7.64%	1,844	7.06%
River Heights W	2,693	9.61%	2,529	8.82%
River Heights E	1,543	8.77%	1,319	7.46%
River East N	451	6.32%	490	5.96%
River East E	1,532	7.35%	1,572	7.22%
River East W	3,480	11.3%	3,385	10.8%
River East S	1,048	7.85%	963	7.12%
St. James-Assiniboia W	2,664	10.6%	2,488	9.70%
St. James-Assiniboia E	2,482	11.6%	2,070	9.59%
Seven Oaks N	381	11.5%	375	9.85%
Seven Oaks W	1,275	7.73%	1,486	7.86%
Seven Oaks E	2,812	10.9%	2,733	9.56%
Inkster W	573	4.59%	622	4.49%
Inkster E	885	8.87%	862	8.13%
Downtown W	1,933	6.76%	1,608	5.49%
Downtown E	2,003	7.52%	1,807	6.75%
Point Douglas N	1,766	8.91%	1,602	7.81%
Point Douglas S	1,048	10.2%	959	9.07%
Churchill	46.0	6.63%	45.0	6.72%

Income Quintile	ADJUSTED percent	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	10.9%	10.5%
Lowest Rural R1	10.6%	10.5%
R2	8.32%	7.84%
R3	8.11%	7.60%
R4	8.61%	7.31%
Highest Rural R5	8.00%	6.98%
Lowest Urban U1	10.1%	9.06%
U2	9.22%	8.14%
U3	8.69%	7.44%
U4	8.07%	6.96%
Highest Urban U5	7.67%	6.68%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**<.0001**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.1718

bold trend = significant

Appendix Table 2.17: Ischemic Heart Disease Incidence Among Residents Aged 19+

Regional Health Authority	Average number of new cases	CRUDE rate per 100 person-year	Average number of new cases	CRUDE rate per 100 person-year
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	575	0.701	515	0.586
Winnipeg	2,737	0.770	2,595	0.700
Prairie Mountain	812	0.928	811	0.926
Interlake-Eastern	490	0.748	504	0.731
Northern	205	0.611	207	0.614
Manitoba	4,846	0.774	4,650	0.715
Former RHAs				
South Eastman	212	0.724	182	0.563
Central	363	0.688	333	0.600
Assiniboine	339	0.857	331	0.850
Brandon	185	0.727	174	0.650
Winnipeg	2,733	0.770	2,592	0.700
Interlake	319	0.738	331	0.728
North Eastman	171	0.769	172	0.737
Parkland	288	1.28	305	1.40
Churchill	4.20	0.861	3.40	0.745
Nor-Man	72.0	0.578	71.6	0.588
Burntwood	133	0.631	136	0.629

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Average number of new cases	CRUDE rate per 100 person-year	Average number of new cases	CRUDE rate per 100 person-year
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	131	0.706	121	0.640
Fort Garry N	115	0.823	107	0.665
Assiniboine South	145	0.729	124	0.588
St. Vital S	109	0.578	125	0.601
St. Vital N	138	0.890	121	0.793
St. Boniface E	131	0.716	132	0.631
St. Boniface W	77.4	0.880	58.4	0.657
Transcona	140	0.712	132	0.652
River Heights W	164	0.835	148	0.740
River Heights E	90.0	0.769	77.0	0.665
River East N	30.4	0.589	34.6	0.548
River East E	105	0.663	103	0.631
River East W	206	0.917	191	0.845
River East S	68.0	0.711	68.8	0.713
St. James-Assiniboia W	155	0.857	137	0.741
St. James-Assiniboia E	143	0.975	109	0.720
Seven Oaks N	18.2	0.745	22.0	0.792
Seven Oaks W	81.2	0.690	96.0	0.766
Seven Oaks E	166	0.886	170	0.859
Inkster W	43.2	0.456	51.2	0.523
Inkster E	58.2	0.820	62.0	0.853
Downtown W	128	0.652	112	0.562
Downtown E	119	0.811	111	0.740
Point Douglas N	116	0.828	124	0.860
Point Douglas S	55.0	0.871	55.4	0.821
Churchill	4.20	0.861	3.40	0.745

Income Quintile	ADJUSTED rate per 100 person-year	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	0.826	0.699
Lowest Rural R1	0.966	0.945
R2	0.758	0.692
R3	0.725	0.640
R4	0.725	0.616
Highest Rural R5	0.691	0.603
Lowest Urban U1	0.887	0.776
U2	0.842	0.716
U3	0.774	0.650
U4	0.703	0.600
Highest Urban U5	0.685	0.556
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0104**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.1447

bold trend = significant

Appendix Table 2.18: Congestive Heart Failure Prevalence Among Residents Aged 40+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Current RHAs				
Southern	1,238	1.80%	1,210	1.59%
Winnipeg	5,501	1.73%	5,428	1.60%
Prairie Mountain	1,636	2.05%	1,513	1.85%
Interlake-Eastern	1,145	1.96%	1,142	1.80%
Northern	368	1.66%	335	1.40%
Manitoba	10,040	1.83%	9,753	1.66%
Former RHAs				
South Eastman	395	1.59%	399	1.40%
Central	843	1.92%	811	1.70%
Assiniboine	705	1.95%	570	1.56%
Brandon	293	1.32%	341	1.45%
Winnipeg	5,498	1.74%	5,425	1.60%
Interlake	727	1.87%	749	1.79%
North Eastman	418	2.12%	394	1.83%
Parkland	639	2.99%	603	2.79%
Churchill	3.00	0.806%	3.33	0.802%
Nor-Man	138	1.42%	124	1.22%
Burntwood	230	1.86%	211	1.52%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Fort Garry S	175	1.09%	177	0.973%
Fort Garry N	219	1.49%	256	1.52%
Assiniboine South	278	1.43%	288	1.45%
St. Vital S	210	1.24%	272	1.40%
St. Vital N	276	2.02%	250	1.81%
St. Boniface E	174	1.05%	195	1.00%
St. Boniface W	194	2.46%	173	2.16%
Transcona	220	1.45%	233	1.42%
River Heights W	328	1.85%	305	1.65%
River Heights E	201	2.01%	166	1.66%
River East N	40.0	0.786%	51.7	0.89%
River East E	166	1.29%	195	1.43%
River East W	493	2.34%	526	2.42%
River East S	134	1.81%	122	1.63%
St. James-Assiniboia W	269	1.58%	307	1.73%
St. James-Assiniboia E	338	2.42%	281	1.99%
Seven Oaks N	54.7	2.32%	51.3	1.89%
Seven Oaks W	164	1.64%	170	1.47%
Seven Oaks E	343	1.98%	333	1.77%
Inkster W	60.0	0.817%	63.7	0.779%
Inkster E	131	2.22%	119	1.88%
Downtown W	265	1.63%	203	1.21%
Downtown E	307	2.17%	266	1.85%
Point Douglas N	234	1.99%	205	1.66%
Point Douglas S	222	3.74%	215	3.46%
Churchill	3.00	0.806%	3.33	0.802%

Income Quintile	ADJUSTED percent	
	2004/05-2006/07	2009/10-2011/12
Income Unknown	3.23%	3.03%
Lowest Rural R1	2.46%	2.35%
R2	1.93%	1.66%
R3	1.90%	1.68%
R4	1.93%	1.59%
Highest Rural R5	1.76%	1.46%
Lowest Urban U1	2.20%	1.98%
U2	1.80%	1.62%
U3	1.51%	1.42%
U4	1.33%	1.30%
Highest Urban U5	1.30%	1.13%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		**0.0037**
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.8149

bold trend = significant

Appendix Table 2.19: Osteoporosis Prevalence Among Residents Aged 50+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Current RHAs				
Southern	4,762	10.6%	4,611	8.84%
Winnipeg	26,804	12.8%	24,256	10.3%
Prairie Mountain	7,705	13.6%	7,090	11.6%
Interlake-Eastern	4,253	10.7%	3,869	8.49%
Northern	1,265	10.0%	1,222	8.35%
Manitoba	45,205	12.4%	41,383	10.1%
Former RHAs				
South Eastman	1,609	10.3%	1,450	7.66%
Central	3,153	10.8%	3,161	9.50%
Assiniboine	3,577	13.6%	3,189	11.3%
Brandon	2,345	15.7%	2,268	13.7%
Winnipeg	26,791	12.8%	24,230	10.3%
Interlake	2,956	11.2%	2,590	8.59%
North Eastman	1,297	9.75%	1,279	8.29%
Parkland	1,783	11.4%	1,633	9.92%
Churchill	13.0	6.22%	26.0	9.70%
Nor-Man	644	10.9%	554	7.94%
Burntwood	621	9.29%	668	8.71%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2004/05-2006/07		2009/10-2011/12	
Fort Garry S	1,246	11.6%	1,163	9.48%
Fort Garry N	1,321	13.9%	1,365	11.6%
Assiniboine South	1,853	13.6%	1,604	10.8%
St. Vital South	1,150	11.0%	1,284	9.38%
St. Vital North	1,402	14.5%	1,165	11.6%
St. Boniface E	1,131	10.7%	1,183	9.05%
St. Boniface W	832	15.3%	756	13.0%
Transcona	871	9.33%	832	7.70%
River Heights W	1,901	15.6%	1,740	13.2%
River Heights E	1,154	16.4%	1,020	14.0%
River East N	276	8.88%	283	7.13%
River East E	843	10.3%	830	8.80%
River East W	2,240	14.5%	1,972	11.9%
River East S	483	10.9%	368	7.64%
St. James-Assiniboia W	1,572	12.9%	1,497	11.4%
St. James-Assiniboia E	1,670	17.6%	1,301	12.8%
Seven Oaks N	240	15.0%	201	10.6%
Seven Oaks W	639	9.43%	614	7.66%
Seven Oaks E	1,568	13.3%	1,359	10.3%
Inkster West	278	6.27%	296	5.56%
Inkster East	428	11.5%	331	8.17%
Downtown W	1,203	11.9%	928	8.49%
Downtown E	1,202	13.6%	1,017	10.9%
Point Douglas N	812	10.9%	663	8.40%
Point Douglas S	476	12.7%	458	11.6%
Churchill	13.0	6.22%	26.0	9.70%

Income Quintile	ADJUSTED percent	
	2004/05-2006/07	2009/10-2011/12
Income Unknown	15.6%	14.8%
Lowest Rural R1	11.3%	10.3%
R2	11.7%	10.2%
R3	11.5%	10.0%
R4	11.7%	9.38%
Highest Rural R5	11.8%	9.38%
Lowest Urban U1	13.3%	11.5%
U2	12.5%	10.2%
U3	12.3%	10.1%
U4	12.0%	9.92%
Highest Urban U5	12.9%	10.2%

linear trend rural T1	0.2463
linear trend rural T2	**0.0009**
compare rural trends over time	**0.0015**
linear trend urban T1	0.1092
linear trend urban T2	**0.0002**
compare urban trends over time	0.1210

bold trend = significant

Appendix Table 2.20: Heart Attack (AMI) Rate Among Residents Aged 40+

Regional Health Authority	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Current RHAs				
Southern	269	3.99	317	4.24
Winnipeg	1,311	4.19	1,278	3.83
Prairie Mountain	434	5.47	414	5.09
Interlake-Eastern	237	4.13	294	4.71
Northern	82.4	3.79	84.8	3.60
Manitoba	2,357	4.36	2,407	4.16
Former RHAs				
South Eastman	80.8	3.36	99.8	3.59
Central	188	4.34	217	4.62
Assiniboine	183	5.08	177	4.86
Brandon	110	5.02	88.2	3.79
Winnipeg	1,311	4.20	1,277	3.83
Interlake	169	4.45	210	5.09
North Eastman	67.6	3.51	84.2	3.98
Parkland	140	6.59	148	6.89
Churchill				
Nor-Man	39.2	4.08	39.6	3.96
Burntwood	43.2	3.56	45.2	3.34

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2002-2006	CRUDE rate per 1,000 2002-2006	Number observed per year 2007-2011	CRUDE rate per 1,000 2007-2011
Fort Garry S	42.8	2.69	48.4	2.75
Fort Garry N	46.2	3.25	52.4	3.19
Assiniboine South	68.4	3.57	64.0	3.24
St. Vital S	44.4	2.70	51.8	2.74
St. Vital N	53.6	3.95	58.2	4.23
St. Boniface E	36.2	2.26	46.4	2.45
St. Boniface W	32.6	4.14	37.8	4.73
Transcona	61.2	4.08	52.4	3.25
River Heights W	63.0	3.55	69.4	3.78
River Heights E	38.8	3.88	38.8	3.88
River East N	9.40	1.93	13.0	2.28
River East E	53.2	4.23	51.0	3.78
River East W	134	6.43	112	5.19
River East S	41.8	5.70	32.0	4.29
St. James-Assiniboia W	73.0	4.33	68.6	3.89
St. James-Assiniboia E	70.0	5.03	57.8	4.09
Seven Oaks N	13.4	5.80	10.0	3.78
Seven Oaks W	44.6	4.56	44.0	3.93
Seven Oaks E	104.2	6.10	84.4	4.56
Inkster W	18.6	2.57	20.4	2.55
Inkster E	35.0	6.01	36.2	5.81
Downtown W	57.2	3.51	65.0	3.90
Downtown E	58.2	4.15	66.0	4.63
Point Douglas N	62.0	5.31	59.0	4.86
Point Douglas S	48.6	8.28	38.2	6.24
Churchill				

Income Quintile	ADJUSTED rate per 1,000 2002-2006	ADJUSTED rate per 1,000 2007-2011
Income Unknown	7.51	6.45
Lowest Rural R1	5.56	5.84
R2	4.45	4.25
R3	3.96	4.52
R4	4.25	4.48
Highest Rural R5	3.74	3.78
Lowest Urban U1	5.14	5.00
U2	4.73	4.15
U3	4.19	3.42
U4	3.57	3.05
Highest Urban U5	3.08	2.82
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.8983
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.3172

bold trend = significant

Appendix Table 2.21: Stroke Rate Among Residents Aged 40+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Current RHAs				
Southern	190	2.83	174	2.33
Winnipeg	816	2.61	881	2.64
Prairie Mountain	293	3.69	246	3.03
Interlake-Eastern	177	3.10	160	2.57
Northern	62.2	2.86	60.8	2.58
Manitoba	1,583	2.93	1,554	2.69
Former RHAs				
South Eastman	58.8	2.45	61.6	2.22
Central	131	3.04	112	2.39
Assiniboine	133	3.69	113	3.11
Brandon	51.4	2.34	44.0	1.89
Winnipeg	816	2.61	880	2.64
Interlake	118	3.11	104	2.53
North Eastman	59.2	3.07	55.8	2.63
Parkland	108	5.09	89.0	4.13
Churchill	0.00	0.00		
Nor-Man	21.6	2.25	20.2	2.02
Burntwood	40.6	3.34	40.6	3.00

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002-2006		2007-2011	
Fort Garry S	32.0	2.01	29.8	1.69
Fort Garry N	40.4	2.84	39.2	2.39
Assiniboine South	44.2	2.31	49.0	2.48
St. Vital S	30.0	1.83	39.6	2.09
St. Vital N	27.8	2.05	31.0	2.25
St. Boniface E	18.6	1.16	30.2	1.59
St. Boniface W	26.2	3.33	27.4	3.43
Transcona	33.8	2.25	36.0	2.24
River Heights W	49.2	2.78	50.0	2.72
River Heights E	31.8	3.18	27.6	2.76
River East N	5.40	1.11	7.40	1.30
River East E	31.8	2.53	36.2	2.68
River East W	81.4	3.90	85.8	3.97
River East S	19.0	2.59	15.4	2.06
St. James-Assiniboia W	41.8	2.48	48.0	2.72
St. James-Assiniboia E	57.4	4.13	55.0	3.90
Seven Oaks N	7.40	3.20	11.2	4.23
Seven Oaks W	28.8	2.95	33.4	2.99
Seven Oaks E	42.4	2.48	52.2	2.82
Inkster W	9.20	1.27	10.8	1.35
Inkster E	15.2	2.61	15.8	2.54
Downtown W	40.0	2.46	36.4	2.18
Downtown E	46.6	3.33	43.8	3.07
Point Douglas N	27.2	2.33	37.2	3.07
Point Douglas S	28.0	4.77	32.0	5.23
Churchill	0.00	0.00		

Income Quintile	ADJUSTED rate per 1,000	
	2002-2006	2007-2011
Income Unknown	7.59	7.10
Lowest Rural R1	3.82	3.52
R2	3.35	2.60
R3	3.39	2.85
R4	2.96	2.30
Highest Rural R5	2.84	2.48
Lowest Urban U1	3.21	2.98
U2	2.48	2.40
U3	2.17	2.45
U4	2.07	2.00
Highest Urban U5	1.88	1.82
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.6438
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.6925

bold trend = significant

Appendix Table 2.22: Lower Limb Amputations Among Residents With Diabetes Aged 19+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	104	1.66%	96.0	1.15%
Winnipeg	443	1.36%	442	1.03%
Prairie Mountain	153	1.58%	162	1.34%
Interlake-Eastern	149	2.26%	135	1.53%
Northern	129	2.88%	160	2.65%
Manitoba	984	1.64%	1,001	1.27%
Former RHAs				
South Eastman	21.0	1.01%	21.0	0.716%
Central	83.0	1.98%	75.0	1.38%
Assiniboine	59.0	1.37%	57.0	1.09%
Brandon	24.0	0.995%	23.0	0.697%
Winnipeg *		1.36%	442	1.03%
Interlake	100	2.28%	90.0	1.58%
North Eastman	49.0	2.23%	45.0	1.45%
Parkland	70.0	2.35%	82.0	2.28%
Churchill			0.00	0.00%
Nor-Man	29.0	1.83%	42.0	2.08%
Burntwood	100	3.45%	118	2.94%

blank cells = suppressed

* *values for the current Winnipeg RHA are based on values for the former Winnipeg and Churchill RHAs; as a consequence, suppression of values for the former Churchill RHA results in suppression of values for the former Winnipeg RHA*

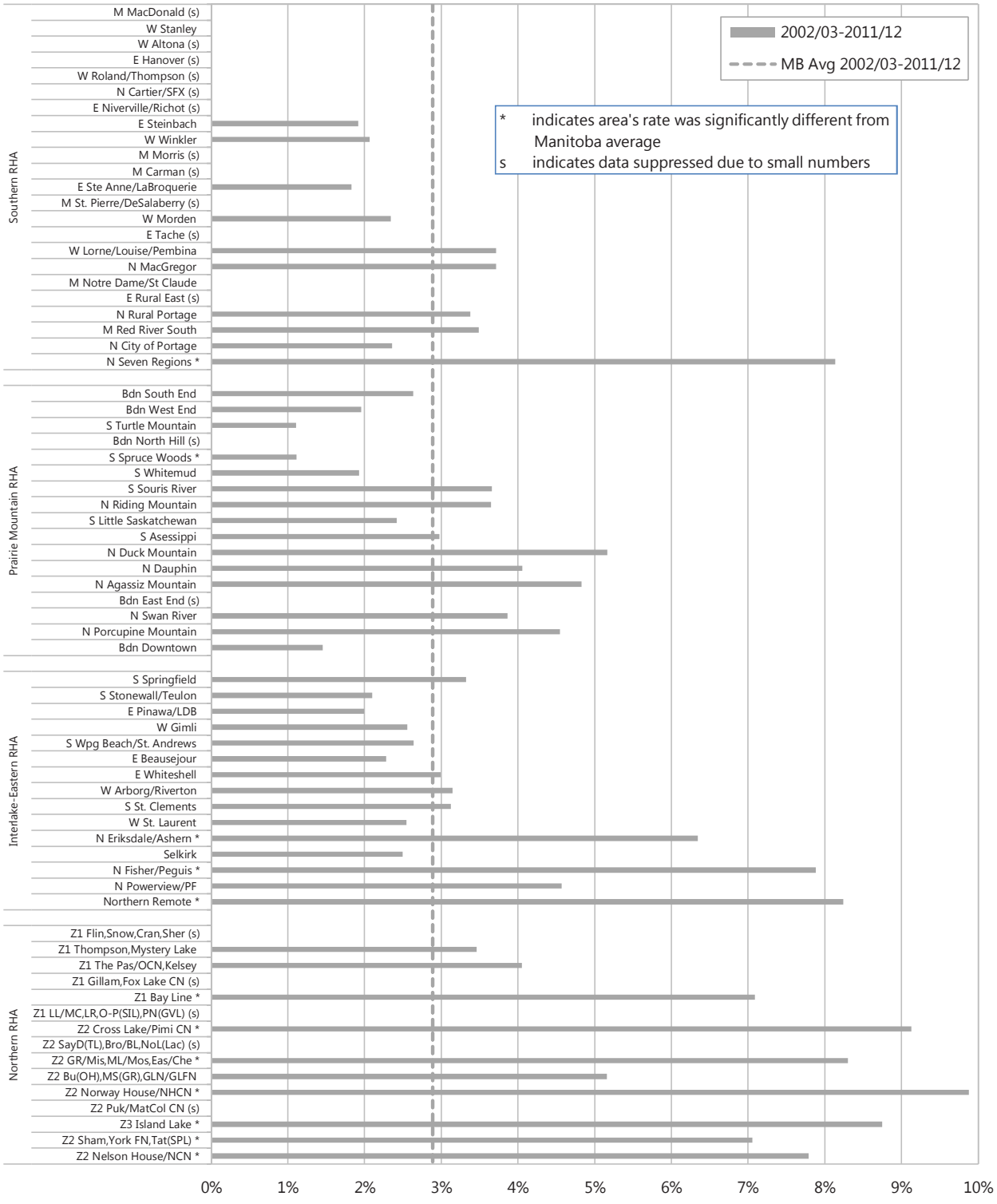
Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	15.0	1.07%	16.0	0.835%
Fort Garry N	7.00	0.645%	11.0	0.679%
Assiniboine South	12.0	0.824%	10.0	0.530%
St. Vital S	9.00	0.726%	9.00	0.503%
St. Vital N	19.0	1.28%	17.0	0.906%
St. Boniface E	14.0	1.08%	9.00	0.468%
St. Boniface W	10.0	1.19%	9.00	0.849%
Transcona	23.0	1.48%	22.0	1.09%
River Heights W	9.00	0.558%	15.0	0.766%
River Heights E	12.0	1.18%	18.0	1.40%
River East N				
River East E	15.0	1.29%	9.00	0.546%
River East W	23.0	1.07%	26.0	0.911%
River East S	17.0	1.81%	15.0	1.30%
St. James-Assiniboia W	21.0	1.27%	22.0	0.981%
St. James-Assiniboia E	13.0	0.849%	20.0	1.09%
Seven Oaks N				
Seven Oaks W	16.0	1.37%	15.0	0.858%
Seven Oaks E	37.0	1.84%	29.0	1.08%
Inkster W	6.00	0.792%	7.00	0.647%
Inkster E	17.0	1.99%	19.0	1.65%
Downtown W	32.0	1.64%	26.0	1.09%
Downtown E	55.0	2.53%	51.0	1.88%
Point Douglas N	30.0	1.97%	29.0	1.46%
Point Douglas S	27.0	2.46%	31.0	2.35%
Churchill			0.00	0.00%

Income Quintile	ADJUSTED percent	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	1.75%	1.55%
Lowest Rural R1	3.18%	2.63%
R2	2.02%	1.55%
R3	1.75%	1.52%
R4	1.36%	1.02%
Highest Rural R5	1.50%	0.979%
Lowest Urban U1	1.97%	1.56%
U2	1.47%	1.07%
U3	1.04%	0.930%
U4	1.08%	0.524%
Highest Urban U5	0.607%	0.553%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.3280
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.8324

bold trend = significant

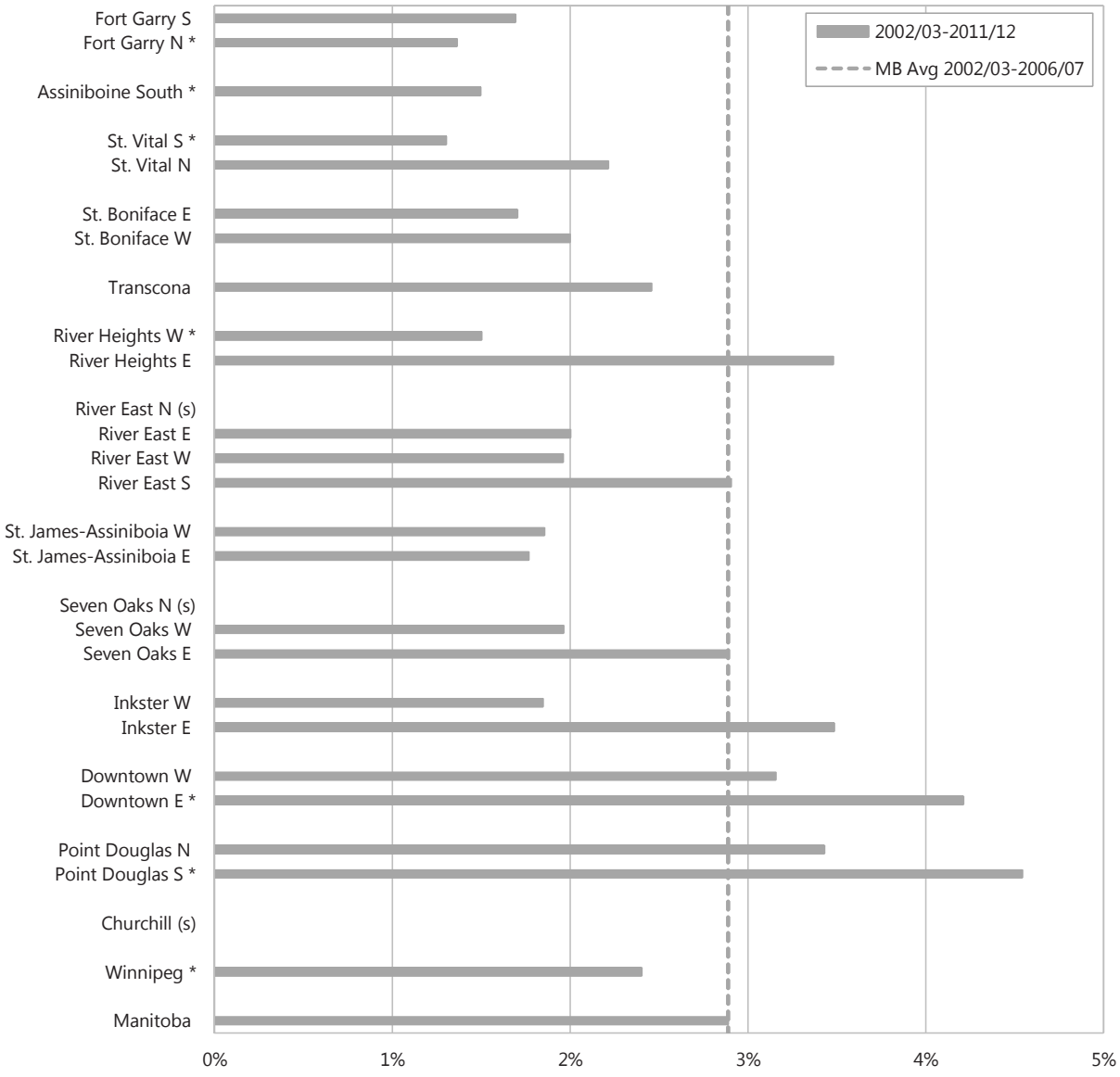
Appendix Figure 2.3: Lower Limb Amputation Among Residents With Diabetes by District, 2002/03-2011/12

Age- and sex-adjusted percent of diabetics (aged 19+) who had an amputation in a 10-year period



Appendix Figure 2.4: Lower Limb Amputation Among Residents With Diabetes by Winnipeg NC, 2002/03-2011/12

Age- and sex-adjusted percent of diabetics (aged 19+) who had an amputation in a 10-year period



* indicates area's rate was significantly different from Manitoba average
s indicates data suppressed due to small numbers

Appendix Table 2.23: Lower Limb Amputations Among Residents With Diabetes Aged 19+

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent
	2002/03-2011/12	
Fort Garry S	9.00	1.79%
Fort Garry N	25.0	1.38%
Assiniboine South	15.0	1.51%
St. Vital S	22.0	1.37%
St. Vital N	17.0	2.16%
St. Boniface E	32.0	1.85%
St. Boniface W	24.0	1.91%
Transcona	16.0	2.57%
River Heights W	40.0	1.43%
River Heights E	23.0	3.34%
River East N	34.0	
River East E		2.06%
River East W	24.0	1.91%
River East S	41.0	2.87%
St. James-Assiniboia W	27.0	1.93%
St. James-Assiniboia E	32.0	1.70%
Seven Oaks N	26.0	
Seven Oaks W		2.05%
Seven Oaks E	24.0	2.89%
Inkster W	58.0	1.98%
Inkster E	15.0	3.51%
Downtown W	30.0	3.07%
Downtown E	60.0	4.14%
Point Douglas N	90.0	3.35%
Point Douglas S	51.0	4.37%
Churchill	48.0	1.51%

blank cells = suppressed

Appendix Table 2.24: Mood and Anxiety Disorders Prevalence Among Residents Aged 10+

Regional Health Authority	Number observed 2002/03-2006/07	CRUDE percent 2002/03-2006/07	Number observed 2007/08-2011/12	CRUDE percent 2007/08-2011/12
Current RHAs				
Southern	26,883	19.8%	27,893	18.9%
Winnipeg	148,709	25.4%	153,170	24.9%
Prairie Mountain	33,107	23.5%	36,485	25.6%
Interlake-Eastern	21,085	20.7%	22,729	21.5%
Northern	9,774	17.5%	9,728	17.0%
Manitoba	240,754	23.5%	251,181	23.5%
Former RHAs				
South Eastman	10,282	20.5%	10,718	18.8%
Central	16,601	19.4%	17,175	18.9%
Assiniboine	12,599	20.5%	12,831	21.2%
Brandon	11,817	27.8%	13,593	30.0%
Winnipeg	148,574	25.4%	153,031	24.9%
Interlake	13,810	20.5%	14,851	21.4%
North Eastman	7,275	20.9%	7,878	21.6%
Parkland	8,691	23.6%	10,061	27.7%
Churchill	135	16.5%	139	18.0%
Nor-Man	4,325	21.1%	3,676	18.3%
Burntwood	5,449	15.4%	6,052	16.3%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed 2002/03-2006/07	CRUDE percent 2002/03-2006/07	Number observed 2007/08-2011/12	CRUDE percent 2007/08-2011/12
Fort Garry S	7,087	22.4%	7,288	21.4%
Fort Garry N	5,520	21.4%	6,229	21.6%
Assiniboine South	8,556	25.6%	8,439	25.4%
St. Vital S	7,145	23.5%	7,802	23.0%
St. Vital N	6,578	27.4%	6,427	26.5%
St. Boniface E	7,124	23.6%	7,990	23.1%
St. Boniface W	3,884	28.0%	3,735	26.9%
Transcona	8,163	28.0%	8,151	26.8%
River Heights W	8,704	27.6%	8,957	27.9%
River Heights E	5,727	30.1%	5,560	29.2%
River East N	1,726	20.0%	2,010	20.6%
River East E	6,026	24.5%	6,179	24.4%
River East W	8,747	25.1%	8,781	24.9%
River East S	4,071	26.3%	4,041	26.0%
St. James-Assiniboia W	7,477	26.0%	8,346	28.6%
St. James-Assiniboia E	6,485	27.0%	6,863	28.5%
Seven Oaks N	970	25.3%	1,030	23.5%
Seven Oaks W	4,179	21.6%	4,018	18.1%
Seven Oaks E	7,771	26.3%	8,041	24.7%
Inkster W	2,686	17.8%	2,638	15.9%
Inkster E	2,788	23.6%	2,930	23.1%
Downtown W	8,065	24.5%	8,039	23.0%
Downtown E	9,402	30.6%	9,103	30.3%
Point Douglas N	6,061	26.0%	6,180	25.7%
Point Douglas S	3,632	29.1%	4,254	33.2%
Churchill	135	16.5%	139	18.0%

Income Quintile	ADJUSTED percent 2002/03-2006/07	ADJUSTED percent 2007/08-2011/12
Income Unknown	35.5%	39.5%
Lowest Rural R1	19.9%	20.9%
R2	19.1%	19.3%
R3	19.6%	20.4%
R4	20.9%	19.6%
Highest Rural R5	19.5%	19.3%
Lowest Urban U1	28.0%	28.1%
U2	24.3%	24.1%
U3	23.4%	23.3%
U4	22.0%	21.7%
Highest Urban U5	21.3%	21.1%
linear trend rural T1		0.4644
linear trend rural T2		**0.0445**
compare rural trends over time		0.0529
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.6432

bold trend = significant

Appendix Table 2.25: Substance Abuse Prevalence Among Residents Aged 10+

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	4,670	3.45%	5,729	3.88%
Winnipeg	29,157	4.98%	31,477	5.12%
Prairie Mountain	6,996	4.97%	8,156	5.73%
Interlake-Eastern	4,305	4.22%	5,514	5.21%
Northern	6,198	11.1%	5,665	9.90%
Manitoba	51,617	5.05%	56,851	5.31%
Former RHAs				
South Eastman	1,936	3.87%	2,286	4.02%
Central	2,734	3.20%	3,443	3.79%
Assiniboine	2,560	4.18%	2,883	4.76%
Brandon	2,673	6.28%	3,097	6.83%
Winnipeg	29,057	4.97%	31,351	5.11%
Interlake	2,665	3.96%	3,428	4.94%
North Eastman	1,640	4.72%	2,086	5.73%
Parkland	1,763	4.78%	2,176	5.99%
Churchill	100	12.3%	126	16.3%
Nor-Man	1,695	8.26%	1,559	7.74%
Burntwood	4,503	12.7%	4,106	11.1%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	873	2.76%	1,024	3.00%
Fort Garry N	611	2.37%	693	2.40%
Assiniboine South	1,138	3.41%	1,154	3.48%
St. Vital S	884	2.90%	1,073	3.17%
St. Vital N	1,133	4.73%	1,284	5.29%
St. Boniface E	953	3.16%	1,231	3.57%
St. Boniface W	809	5.83%	854	6.14%
Transcona	1,263	4.33%	1,615	5.31%
River Heights W	1,169	3.71%	1,214	3.79%
River Heights E	1,089	5.72%	1,108	5.81%
River East N	254	2.95%	361	3.69%
River East E	950	3.86%	1,226	4.84%
River East W	1,375	3.94%	1,701	4.83%
River East S	1,122	7.25%	1,187	7.65%
St. James-Assiniboia W	1,119	3.89%	1,283	4.40%
St. James-Assiniboia E	1,093	4.55%	1,273	5.29%
Seven Oaks N	135	3.52%	146	3.33%
Seven Oaks W	658	3.40%	622	2.81%
Seven Oaks E	1,408	4.77%	1,492	4.58%
Inkster W	464	3.07%	442	2.67%
Inkster E	877	7.41%	930	7.34%
Downtown W	2,209	6.71%	2,147	6.15%
Downtown E	3,731	12.1%	3,331	11.1%
Point Douglas N	1,719	7.38%	1,827	7.61%
Point Douglas S	2,021	16.2%	2,133	16.6%
Churchill	100	12.3%	126	16.3%

Income Quintile	ADJUSTED percent	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	10.0%	11.3%
Lowest Rural R1	6.81%	6.86%
R2	4.86%	4.84%
R3	4.34%	4.82%
R4	4.04%	4.58%
Highest Rural R5	3.86%	4.16%
Lowest Urban U1	8.42%	8.08%
U2	5.07%	5.33%
U3	4.10%	4.35%
U4	3.25%	3.50%
Highest Urban U5	2.38%	2.56%

linear trend rural T1	**<.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	0.0686
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.0780

bold trend = significant

Appendix Table 2.26: Dementia Prevalence Among Residents Aged 55+

Regional Health Authority	Number observed 2002/03-2006/07	CRUDE percent 2002/03-2006/07	Number observed 2007/08-2011/12	CRUDE percent 2007/08-2011/12
Current RHAs				
Southern	3,202	9.39%	3,772	9.65%
Winnipeg	17,771	11.2%	19,365	10.9%
Prairie Mountain	4,314	9.51%	4,867	10.0%
Interlake-Eastern	2,198	7.28%	2,520	7.24%
Northern	470	5.44%	482	4.82%
Manitoba	29,520	10.6%	32,314	10.3%
Former RHAs				
South Eastman	912	7.86%	1,117	8.07%
Central	2,290	10.2%	2,655	10.5%
Assiniboine	1,937	9.10%	2,133	9.51%
Brandon	972	8.49%	1,288	10.0%
Winnipeg *	17,763	11.2%		10.9%
Interlake	1,570	7.78%	1,795	7.79%
North Eastman	628	6.26%	725	6.16%
Parkland	1,405	11.1%	1,446	10.8%
Churchill	8.00	5.41%		
Nor-Man	280	6.65%	262	5.36%
Burntwood	190	4.29%	220	4.31%

blank cells = suppressed

* *values for the current Winnipeg RHA are based on values for the former Winnipeg and Churchill RHAs; as a consequence, suppression of values for the former Churchill RHA results in suppression of values for the former Winnipeg RHA*

Winnipeg Neighbourhood Cluster	Number observed 2002/03-2006/07	CRUDE percent 2002/03-2006/07	Number observed 2007/08-2011/12	CRUDE percent 2007/08-2011/12
Fort Garry S	548	7.06%	639	7.00%
Fort Garry N	767	11.1%	1,001	11.4%
Assiniboine South	1,256	12.3%	1,437	12.3%
St. Vital S	746	10.5%	1,058	10.8%
St. Vital N	755	9.88%	752	9.35%
St. Boniface E	455	5.88%	644	6.69%
St. Boniface W	663	15.5%	696	15.1%
Transcona	543	7.93%	595	7.70%
River Heights W	1,338	14.1%	1,473	14.3%
River Heights E	702	12.5%	693	11.8%
River East N	89.0	4.24%	108	4.00%
River East E	586	10.3%	685	9.98%
River East W	1,457	11.8%	1,666	12.4%
River East S	309	9.32%	293	8.59%
St. James-Assiniboia W	807	8.29%	1,025	9.69%
St. James-Assiniboia E	1,351	17.3%	1,280	16.2%
Seven Oaks N	250	21.3%	315	22.6%
Seven Oaks W	548	11.3%	594	9.90%
Seven Oaks E	998	10.9%	1,081	10.6%
Inkster W	84.0	3.01%	112	3.08%
Inkster E	333	11.7%	345	11.6%
Downtown W	888	11.8%	768	9.63%
Downtown E	1,073	15.8%	1,012	14.7%
Point Douglas N	488	8.64%	464	8.04%
Point Douglas S	729	25.1%	624	21.7%
Churchill	8.00	5.41%		

Income Quintile	ADJUSTED percent 2002/03-2006/07	ADJUSTED percent 2007/08-2011/12
Income Unknown	54.6%	58.9%
Lowest Rural R1	8.73%	8.97%
R2	7.96%	8.22%
R3	9.11%	9.80%
R4	8.31%	8.80%
Highest Rural R5	8.46%	8.14%
Lowest Urban U1	12.0%	11.7%
U2	8.66%	8.69%
U3	8.21%	8.57%
U4	7.79%	8.14%
Highest Urban U5	8.52%	8.49%
linear trend rural T1		0.8852
linear trend rural T2		0.3321
compare rural trends over time		0.5691
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.6160

bold trend = significant

Appendix Table 2.27: Use of Physicians

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	127,013	77.3%	135,630	74.9%
Winnipeg	555,640	83.4%	586,723	81.9%
Prairie Mountain	130,651	82.1%	132,992	80.7%
Interlake-Eastern	93,963	80.3%	97,386	79.7%
Northern	44,987	63.6%	46,728	62.9%
Manitoba	954,734	80.9%	1,001,925	79.4%
Former RHAs				
South Eastman	47,576	76.6%	51,372	72.4%
Central	79,437	77.7%	84,258	76.5%
Assiniboine	54,269	79.8%	53,957	78.0%
Brandon	42,488	85.8%	46,280	85.8%
Winnipeg	554,966	83.4%	586,025	81.9%
Interlake	61,897	80.6%	63,682	80.1%
North Eastman	32,066	79.6%	33,704	78.8%
Parkland	33,894	81.4%	32,755	78.8%
Churchill	674	71.8%	698	72.9%
Nor-Man	17,221	71.2%	16,712	66.7%
Burntwood	27,766	59.7%	30,016	60.9%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Fort Garry S	29,334	82.0%	33,790	79.9%
Fort Garry N	25,494	83.5%	27,419	83.4%
Assiniboine South	30,974	84.3%	30,893	84.4%
St. Vital S	30,108	85.0%	33,429	84.9%
St. Vital N	22,740	85.5%	22,976	84.8%
St. Boniface E	31,067	84.8%	34,763	83.7%
St. Boniface W	12,676	83.7%	12,843	84.0%
Transcona	27,886	83.7%	29,224	81.8%
River Heights W	29,763	84.4%	30,056	83.3%
River Heights E	17,139	84.1%	17,148	82.0%
River East N	8,378	82.2%	9,053	82.3%
River East E	23,756	83.7%	24,077	81.6%
River East W	32,253	84.3%	32,521	82.7%
River East S	14,253	80.9%	14,365	78.5%
St. James-Assiniboia W	27,104	85.0%	27,723	85.1%
St. James-Assiniboia E	22,416	84.6%	22,390	83.7%
Seven Oaks N	3,726	83.9%	4,205	83.1%
Seven Oaks W	18,829	82.0%	21,578	79.8%
Seven Oaks E	28,518	84.1%	31,467	82.3%
Inkster W	14,289	81.3%	15,445	78.2%
Inkster E	11,696	80.3%	11,971	77.7%
Downtown W	30,103	81.0%	32,912	78.6%
Downtown E	28,052	82.2%	29,092	79.9%
Point Douglas N	22,182	81.5%	23,385	79.2%
Point Douglas S	12,230	82.7%	13,300	79.8%
Churchill	674	71.8%	698	72.9%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	80.5%	69.0%
Lowest Rural R1	74.4%	73.3%
R2	76.7%	74.5%
R3	78.3%	75.6%
R4	79.8%	78.7%
Highest Rural R5	80.3%	79.6%
Lowest Urban U1	83.4%	81.0%
U2	82.6%	81.3%
U3	83.2%	81.8%
U4	83.3%	82.1%
Highest Urban U5	83.2%	82.2%
linear trend rural T1		**0.0015**
linear trend rural T2		**0.0003**
compare rural trends over time		0.7376
linear trend urban T1		0.9520
linear trend urban T2		0.5072
compare urban trends over time		0.6707

bold trend = significant

Appendix Table 2.28: Ambulatory Visits

Regional Health Authority	Number observed	CRUDE rate per resident	Number observed	CRUDE rate per resident
	2006/07		2011/12	
Current RHAs				
Southern	633,254	3.85	654,472	3.61
Winnipeg	3,345,142	5.02	3,446,605	4.81
Prairie Mountain	764,579	4.80	807,338	4.90
Interlake-Eastern	528,543	4.51	548,582	4.49
Northern	198,211	2.80	207,272	2.79
Manitoba	5,495,115	4.66	5,689,436	4.51
Former RHAs				
South Eastman	235,260	3.79	237,778	3.35
Central	397,994	3.89	416,694	3.79
Assiniboine	300,760	4.42	301,339	4.35
Brandon	268,935	5.43	319,752	5.93
Winnipeg	3,341,915	5.02	3,443,627	4.82
Interlake	339,574	4.42	357,621	4.50
North Eastman	188,969	4.69	190,961	4.46
Parkland	194,884	4.68	186,247	4.48
Churchill	3,227	3.44	2,978	3.11
Nor-Man	91,009	3.76	79,327	3.17
Burntwood	107,202	2.31	127,945	2.60

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per resident	Number observed	CRUDE rate per resident
	2006/07		2011/12	
Fort Garry S	165,950	4.64	190,140	4.50
Fort Garry N	147,079	4.82	159,726	4.86
Assiniboine South	192,207	5.23	190,817	5.22
St. Vital S	174,641	4.93	199,943	5.08
St. Vital N	145,848	5.49	143,561	5.30
St. Boniface E	174,412	4.76	198,200	4.77
St. Boniface W	78,097	5.16	79,381	5.19
Transcona	155,782	4.67	155,174	4.34
River Heights W	186,441	5.29	182,644	5.06
River Heights E	112,740	5.53	110,478	5.28
River East N	41527	4.07	44,088	4.01
River East E	133,970	4.72	131,784	4.47
River East W	194,757	5.09	191,624	4.88
River East S	82,743	4.70	81,216	4.44
St. James-Assiniboia W	169,654	5.32	173,505	5.33
St. James-Assiniboia E	143,313	5.41	140,020	5.24
Seven Oaks N	22,227	5.00	24,334	4.81
Seven Oaks W	106,412	4.64	115,750	4.28
Seven Oaks E	177,397	5.23	185,549	4.85
Inkster W	76,074	4.33	77,488	3.93
Inkster E	71,030	4.87	67,539	4.38
Downtown W	176,351	4.75	183,242	4.38
Downtown E	190,962	5.59	189,302	5.20
Point Douglas N	133,238	4.89	135,132	4.57
Point Douglas S	89,063	6.02	92,990	5.58
Churchill	3,227	3.44	2,978	3.11

Income Quintile	ADJUSTED rate per resident	
	2006/07	2011/12
Income Unknown	0.758	0.762
Lowest Rural R1	0.633	0.635
R2	0.648	0.692
R3	0.694	0.721
R4	0.727	0.739
Highest Rural R5	0.731	0.739
Lowest Urban U1	0.728	0.725
U2	0.756	0.748
U3	0.760	0.751
U4	0.773	0.758
Highest Urban U5	0.756	0.749
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.6382
linear trend urban T1		**0.0369**
linear trend urban T2		0.0918
compare urban trends over time		0.7718

bold trend = significant

Appendix Table 2.29: Ambulatory Consultation Rate

Regional Health Authority	Number observed	CRUDE rate per resident	Number observed	CRUDE rate per resident
	2006/07		2011/12	
Current RHAs				
Southern	35,170	0.214	44,582	0.246
Winnipeg	203,799	0.306	223,180	0.312
Prairie Mountain	35,411	0.222	40,877	0.248
Interlake-Eastern	31,233	0.267	35,963	0.294
Northern	13,655	0.193	15,016	0.202
Manitoba	320,108	0.271	360,467	0.286
Former RHAs				
South Eastman	13,560	0.218	17,964	0.253
Central	21,610	0.211	26,618	0.242
Assiniboine	12,997	0.191	15,733	0.227
Brandon	12,273	0.248	14,526	0.269
Winnipeg	203,658	0.306	222,912	0.312
Interlake	20,864	0.272	23,333	0.294
North Eastman	10,369	0.257	12,630	0.295
Parkland	10,141	0.244	10,618	0.255
Churchill	141	0.150	268	0.280
Nor-Man	4,385	0.181	5,176	0.207
Burntwood	9,270	0.199	9,840	0.200

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per resident	Number observed	CRUDE rate per resident
	2006/07		2011/12	
Fort Garry S	10,717	0.300	12,626	0.299
Fort Garry N	10,032	0.329	11,405	0.347
Assiniboine South	13,161	0.358	13,571	0.371
St. Vital S	11,291	0.319	13,390	0.340
St. Vital N	8,954	0.337	9,692	0.358
St. Boniface E	11,310	0.309	14,005	0.337
St. Boniface W	4,759	0.314	4,893	0.320
Transcona	9,759	0.293	10,719	0.300
River Heights W	12,016	0.341	12,482	0.346
River Heights E	6,914	0.339	7,301	0.349
River East N	3,052	0.299	3,573	0.325
River East E	7,834	0.276	8,514	0.289
River East W	12,539	0.328	13,534	0.344
River East S	4,657	0.264	4,905	0.268
St. James-Assiniboia W	11,104	0.348	11,692	0.359
St. James-Assiniboia E	9,254	0.349	9,402	0.352
Seven Oaks N	1,411	0.318	1,571	0.310
Seven Oaks W	6,141	0.268	6,894	0.255
Seven Oaks E	10,893	0.321	12,170	0.318
Inkster W	4,323	0.246	4,662	0.236
Inkster E	3,919	0.269	3,923	0.254
Downtown W	9,356	0.252	10,369	0.248
Downtown E	9,419	0.276	10,064	0.277
Point Douglas N	7,186	0.264	7,543	0.255
Point Douglas S	3,657	0.247	4,012	0.241
Churchill	141	0.150	268	0.280

Income Quintile	ADJUSTED rate per resident	
	2006/07	2011/12
Income Unknown	0.243	0.241
Lowest Rural R1	0.228	0.237
R2	0.218	0.236
R3	0.215	0.240
R4	0.239	0.268
Highest Rural R5	0.269	0.292
Lowest Urban U1	0.297	0.298
U2	0.296	0.306
U3	0.303	0.308
U4	0.327	0.319
Highest Urban U5	0.332	0.333

linear trend rural T1	**0.0076**
linear trend rural T2	**0.0006**
compare rural trends over time	0.5913
linear trend urban T1	**0.0389**
linear trend urban T2	0.0877
compare urban trends over time	0.7973

bold trend = significant

Appendix Table 2.30: Majority of Care

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	72,301	66.0%	79,074	69.1%
Winnipeg	375,110	76.6%	384,290	75.5%
Prairie Mountain	79,481	66.5%	84,462	69.1%
Interlake-Eastern	60,008	73.4%	63,373	75.1%
Northern	21,808	61.8%	23,618	64.7%
Manitoba	610,659	72.9%	636,662	73.3%
Former RHAs				
South Eastman	27,998	69.0%	33,050	78.7%
Central	44,303	64.2%	46,024	63.5%
Assiniboine	34,349	69.5%	35,704	73.3%
Brandon	23,628	60.3%	27,992	64.5%
Winnipeg	374,621	76.6%	383,685	75.5%
Interlake	38,018	71.1%	41,779	75.7%
North Eastman	21,990	77.7%	21,594	74.0%
Parkland	21,504	69.6%	20,766	68.9%
Churchill	489	89.9%	605	91.9%
Nor-Man	11,200	74.4%	10,026	69.9%
Burntwood	10,608	52.5%	13,592	61.3%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry S	19,145	73.6%	20,426	70.6%
Fort Garry N	16,676	75.5%	18,306	76.6%
Assiniboine South	20,579	75.7%	20,391	75.6%
St. Vital S	19,680	74.4%	22,198	75.1%
St. Vital N	15,806	76.8%	15,740	75.5%
St. Boniface E	19,487	71.8%	21,807	71.9%
St. Boniface W	8,713	77.1%	8,468	74.4%
Transcona	20,611	83.3%	19,913	80.2%
River Heights W	19,264	73.6%	19,595	75.5%
River Heights E	11,377	74.7%	10,947	73.3%
River East N	5,769	83.5%	6,082	82.4%
River East E	16,904	82.1%	16,232	78.5%
River East W	23,579	83.6%	22,737	80.8%
River East S	9,704	76.8%	9,242	75.0%
St. James-Assiniboia W	18,677	77.4%	17,755	71.1%
St. James-Assiniboia E	15,097	76.1%	14,664	74.1%
Seven Oaks N	2,703	84.2%	3,003	84.9%
Seven Oaks W	13,134	80.4%	14,756	80.6%
Seven Oaks E	20,678	82.7%	22,190	82.3%
Inkster W	9,542	76.6%	10,527	78.9%
Inkster E	7,273	72.6%	7,698	73.5%
Downtown W	19,840	74.7%	20,534	73.7%
Downtown E	18,258	71.4%	17,691	69.0%
Point Douglas N	14,753	75.2%	15,135	76.1%
Point Douglas S	7,372	65.2%	7,648	67.6%
Churchill	489	89.9%	605	91.9%

Income Quintile	ADJUSTED percent	
	2005/06-2006/07	2010/11-2011/12
Income Unknown	75.8%	76.2%
Lowest Rural R1	63.3%	63.5%
R2	64.8%	69.2%
R3	69.4%	72.1%
R4	72.7%	73.9%
Highest Rural R5	73.1%	73.9%
Lowest Urban U1	72.8%	72.5%
U2	75.6%	74.8%
U3	76.0%	75.1%
U4	77.3%	75.8%
Highest Urban U5	75.6%	74.9%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.6382
linear trend urban T1		**0.0369**
linear trend urban T2		0.0918
compare urban trends over time		0.7718

bold trend = significant

Appendix Table 2.31: Use of Hospitals Among Residents

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	11,673	7.10%	12,120	6.69%
Winnipeg	38,733	5.81%	39,368	5.50%
Prairie Mountain	14,901	9.36%	14,670	8.91%
Interlake-Eastern	8,607	7.35%	8,439	6.90%
Northern	6,679	9.45%	6,217	8.37%
Manitoba	81,185	6.88%	81,521	6.46%
Former RHAs				
South Eastman	4,057	6.54%	4,438	6.25%
Central	7,616	7.45%	7,682	6.98%
Assiniboine	6,323	9.29%	6,033	8.72%
Brandon	3,762	7.60%	3,979	7.38%
Winnipeg	38,648	5.81%	39,261	5.49%
Interlake	5,603	7.30%	5,496	6.91%
North Eastman	3,004	7.46%	2,943	6.88%
Parkland	4,816	11.6%	4,658	11.2%
Churchill	85.0	9.05%	107	11.2%
Nor-Man	2,179	9.01%	2,133	8.51%
Burntwood	4,500	9.68%	4,084	8.29%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Fort Garry S	1,670	4.67%	1,959	4.63%
Fort Garry N	1,530	5.01%	1,648	5.01%
Assiniboine South	1,902	5.18%	1,935	5.29%
St. Vital S	1,786	5.04%	1,935	4.92%
St. Vital N	1,631	6.13%	1,565	5.77%
St. Boniface E	1,769	4.83%	1,867	4.50%
St. Boniface W	981	6.48%	964	6.31%
Transcona	1,747	5.24%	1,797	5.03%
River Heights W	2,031	5.76%	1,976	5.47%
River Heights E	1,322	6.49%	1,214	5.80%
River East N	399	3.91%	415	3.77%
River East E	1,447	5.10%	1,589	5.39%
River East W	2,602	6.80%	2,573	6.55%
River East S	1,090	6.19%	1,095	5.99%
St. James-Assiniboia W	1,829	5.74%	1,892	5.81%
St. James-Assiniboia E	1,781	6.72%	1,676	6.27%
Seven Oaks N	272	6.12%	253	5.00%
Seven Oaks W	1,127	4.91%	1,291	4.77%
Seven Oaks E	2,082	6.14%	2,104	5.50%
Inkster W	676	3.85%	737	3.73%
Inkster E	1,013	6.95%	896	5.81%
Downtown W	2,164	5.82%	2,197	5.25%
Downtown E	2,675	7.83%	2,647	7.27%
Point Douglas N	1,757	6.45%	1,596	5.40%
Point Douglas S	1,365	9.23%	1,440	8.63%
Churchill	85.0	9.05%	107	11.2%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	10.6%	12.0%
Lowest Rural R1	11.1%	10.3%
R2	8.96%	7.99%
R3	8.41%	7.76%
R4	7.24%	6.77%
Highest Rural R5	6.75%	5.95%
Lowest Urban U1	7.52%	6.72%
U2	5.90%	5.44%
U3	5.41%	4.93%
U4	5.09%	4.83%
Highest Urban U5	4.68%	4.36%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.8426
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.5419

bold trend = significant

Appendix Table 2.32: Inpatient Hospitalizations

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	17,430	106	18,050	99.7
Winnipeg	50,250	75.4	50,779	70.9
Prairie Mountain	23,515	148	22,800	138
Interlake-Eastern	12,770	109	12,239	100
Northern	10,245	145	9,247	124
Manitoba	115,093	97.5	114,217	90.6
Former RHAs				
South Eastman	5,729	92.3	6,383	89.9
Central	11,701	114	11,667	106
Assiniboine	10,320	152	9,739	141
Brandon	5,105	103	5,243	97.2
Winnipeg	50,131	75.3	50,607	70.8
Interlake	8,407	109	8,118	102
North Eastman	4,363	108	4,121	96.3
Parkland	8,090	194	7,818	188
Churchill	119	127	172	180
Nor-Man	3,511	145	3,322	133
Burntwood	6,734	145	5,925	120

blank cells = suppressed

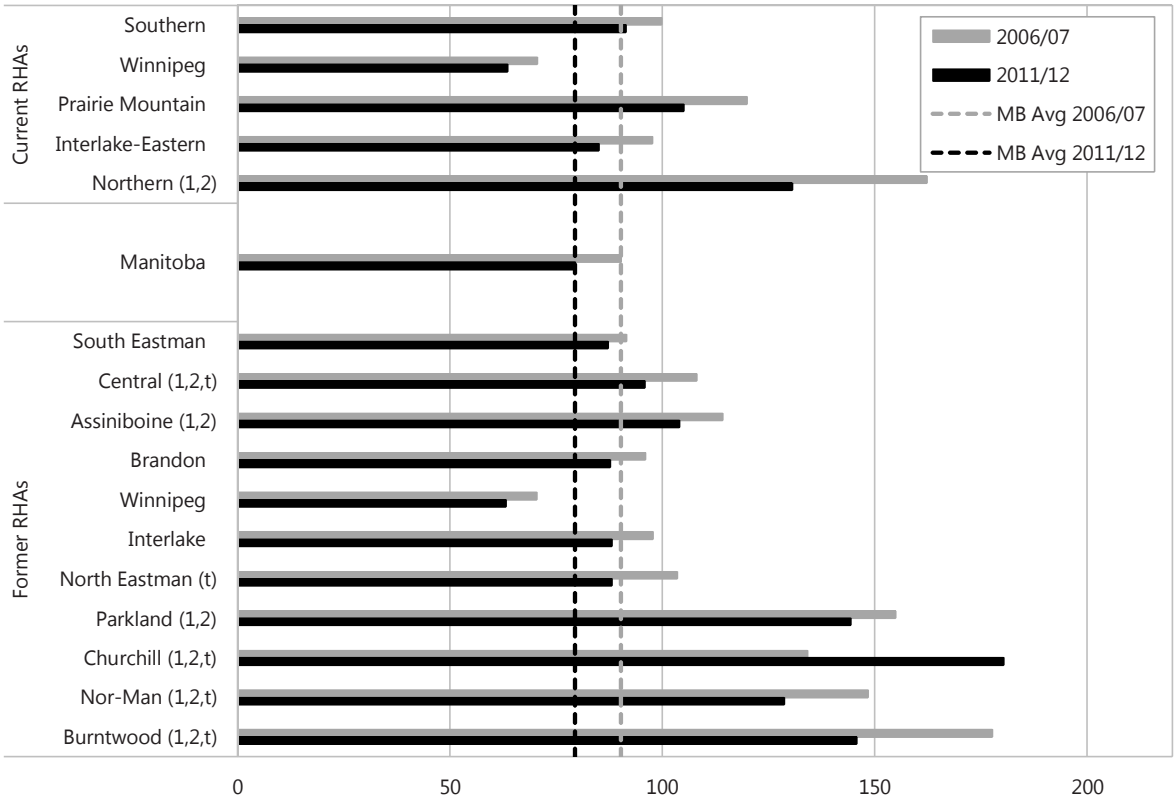
Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	2,122	59.4	2,447	57.9
Fort Garry N	1,955	64.0	2,114	64.3
Assiniboine South	2,417	65.8	2,468	67.5
St. Vital S	2,272	64.1	2,396	60.9
St. Vital N	2,119	79.7	2,053	75.8
St. Boniface E	2,182	59.6	2,370	57.1
St. Boniface W	1,292	85.3	1,250	81.8
Transcona	2,217	66.5	2,288	64.0
River Heights W	2,619	74.3	2,602	72.1
River Heights E	1,751	85.9	1,584	75.7
River East N	483	47.4	525	47.7
River East E	1,838	64.7	2,000	67.8
River East W	3,537	92.4	3,389	86.2
River East S	1,415	80.4	1,394	76.2
St. James-Assiniboia W	2,368	74.3	2,405	73.8
St. James-Assiniboia E	2,277	85.9	2,144	80.2
Seven Oaks N	329	74.0	317	62.6
Seven Oaks W	1,438	62.7	1,595	59.0
Seven Oaks E	2,711	80.0	2,713	70.9
Inkster W	807	45.9	926	46.9
Inkster E	1,294	88.8	1,167	75.7
Downtown W	2,832	76.2	2,894	69.1
Downtown E	3,672	108	3,599	98.9
Point Douglas N	2,307	84.7	2,027	68.6
Point Douglas S	1,877	127	1,940	116
Churchill	119.0	127	172	180

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	147	174
Lowest Rural R1	180	162
R2	143	126
R3	130	118
R4	109	101
Highest Rural R5	98.4	86.3
Lowest Urban U1	103	90.5
U2	77.9	71.1
U3	70.6	63.8
U4	65.5	61.1
Highest Urban U5	59.6	56.1
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.9416
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.3944

bold trend = significant

Appendix Figure 2.5: Hospital Inpatient Episode Rate by RHA, 2006/07 and 2011/12

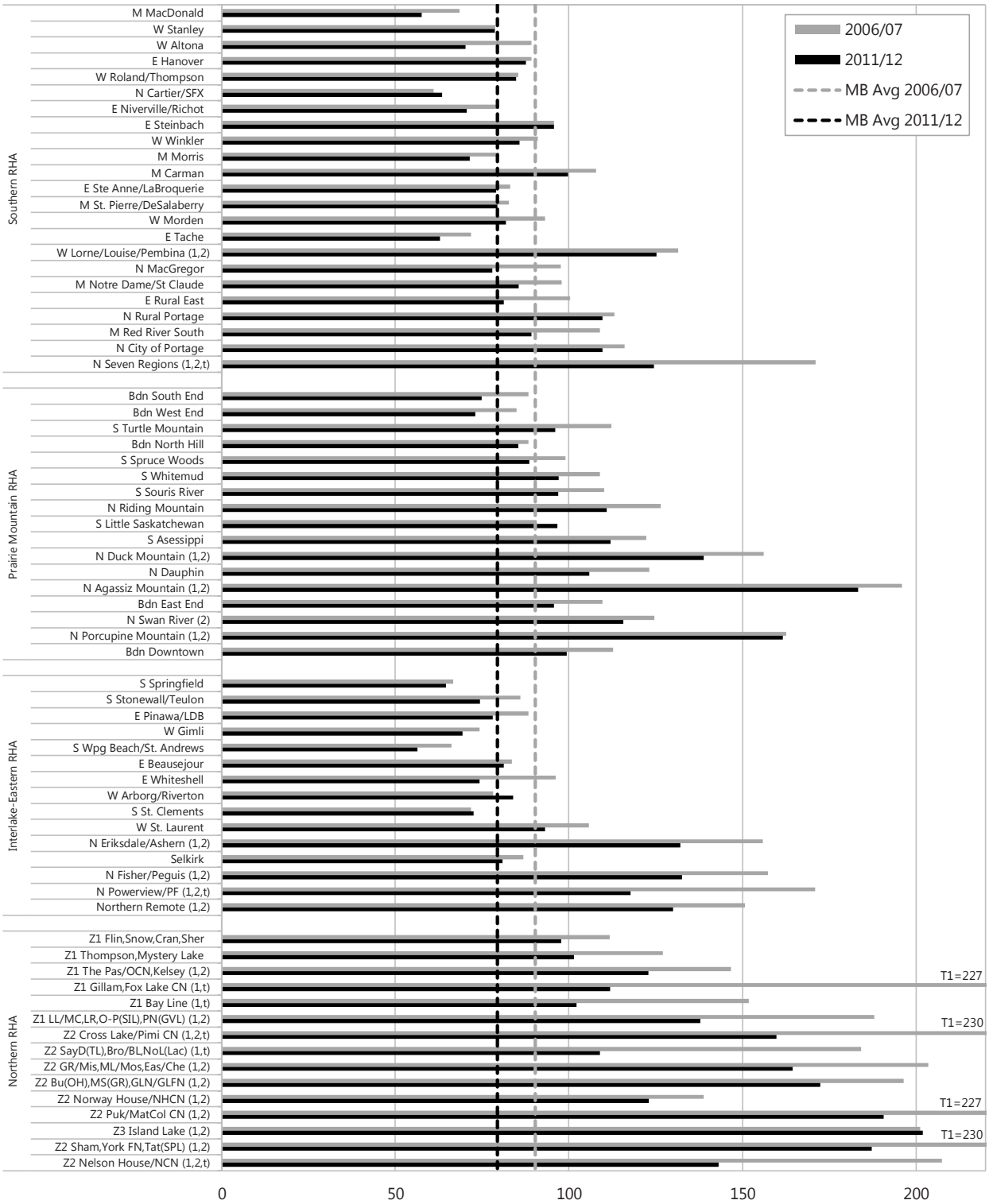
Age- and sex-adjusted rate of hospital episodes per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

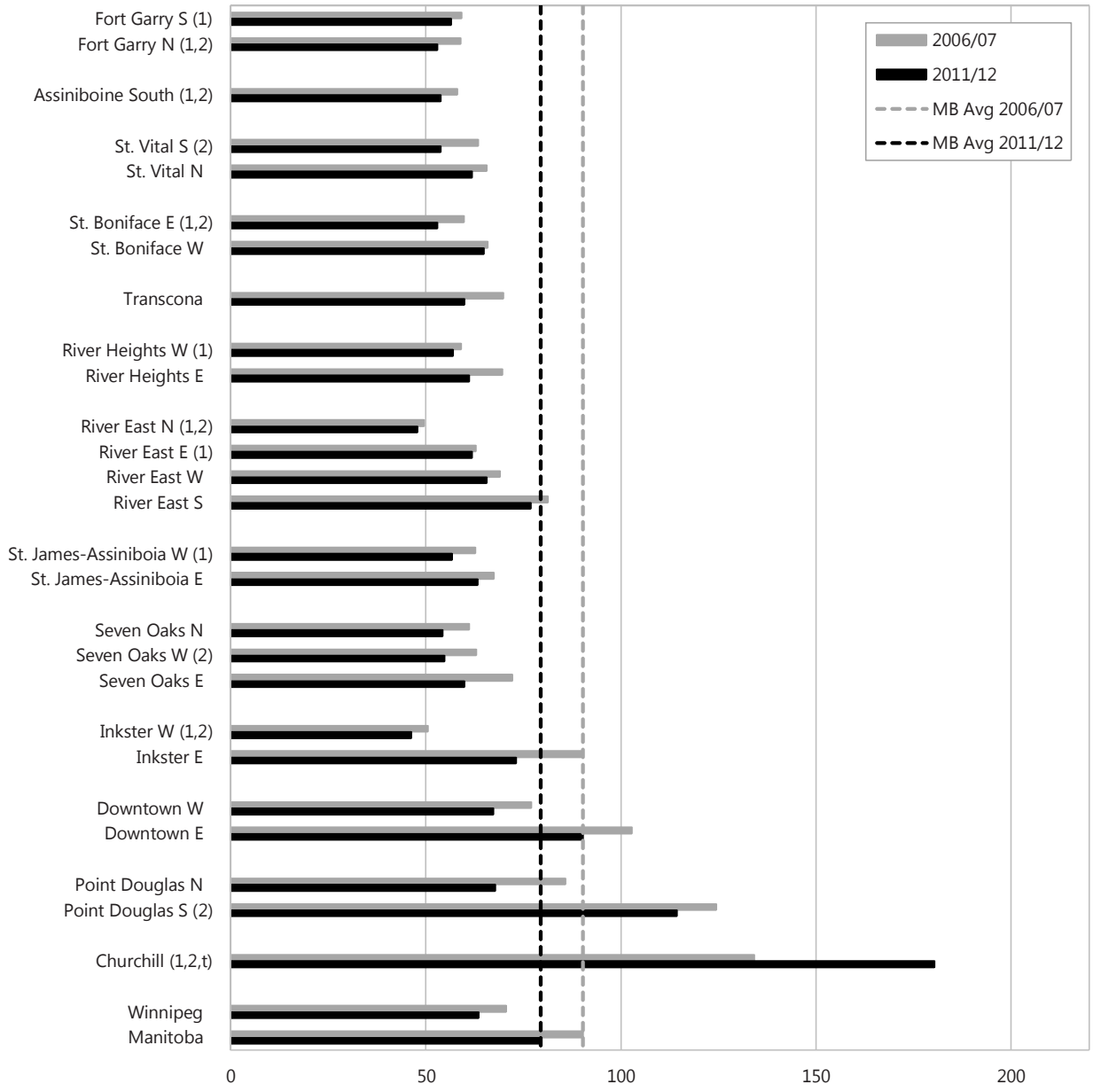
Appendix Figure 2.6: Hospital Inpatient Episode Rate by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital episodes per 1,000 residents



Appendix Figure 2.7: Hospital Inpatient Episode Rate by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital episodes per 1,000 residents



Appendix Table 2.33: Hospital Inpatient Episodes

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	15,669	95.4	15,823	87.4
Winnipeg	48,548	72.9	49,083	68.5
Prairie Mountain	20,842	131	19,986	121
Interlake-Eastern	11,503	98.3	11,006	90.0
Northern	9,245	131	8,308	112
Manitoba	106,613	90.3	105,211	83.4
Former RHAs				
South Eastman	5,135	82.7	5,633	79.4
Central	10,534	103	10,190	92.6
Assiniboine	8,932	131	8,268	119
Brandon	4,859	98.1	5,003	92.8
Winnipeg	48,442	72.8	48,927	68.4
Interlake	7,553	98.3	7,262	91.4
North Eastman	3,950	98.1	3,744	87.5
Parkland	7,051	169	6,715	162
Churchill	106	113	156	163
Nor-Man	3,085	128	2,855	114
Burntwood	6,160	132	5,453	111

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	2,056	57.5	2,374	56.2
Fort Garry N	1,893	62.0	2,042	62.1
Assiniboine South	2,349	63.9	2,382	65.1
St. Vital S	2,206	62.3	2,336	59.3
St. Vital N	2,051	77.1	1,991	73.5
St. Boniface E	2,118	57.8	2,296	55.3
St. Boniface W	1,254	82.8	1,221	79.9
Transcona	2,140	64.2	2,210	61.9
River Heights W	2,551	72.3	2,512	69.6
River Heights E	1,702	83.5	1,522	72.7
River East N	469	46.0	502	45.6
River East E	1,767	62.2	1,949	66.1
River East W	3,420	89.4	3,293	83.8
River East S	1,368	77.7	1,345	73.5
St. James-Assiniboia W	2,281	71.6	2,305	70.7
St. James-Assiniboia E	2,198	83.0	2,063	77.1
Seven Oaks N	325	73.1	310	61.3
Seven Oaks W	1,373	59.8	1,546	57.2
Seven Oaks E	2,610	77.0	2,604	68.1
Inkster W	783	44.6	888	45.0
Inkster E	1,254	86.1	1,124	72.9
Downtown W	2,734	73.6	2,805	67.0
Downtown E	3,524	103	3,469	95.3
Point Douglas N	2,208	81.1	1,972	66.8
Point Douglas S	1,808	122	1,866	112
Churchill	106	113	156	163

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	137	163
Lowest Rural R1	160	142
R2	127	109
R3	114	103
R4	97.9	89.2
Highest Rural R5	89.3	77.9
Lowest Urban U1	98.1	87.0
U2	75.1	68.2
U3	67.9	61.5
U4	62.8	58.7
Highest Urban U5	57.7	54.0
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.9101
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.4487

bold trend = significant

Appendix Table 2.34: Day Surgery Hospitalizations

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	10,621	64.6	13,607	75.2
Winnipeg	46,121	69.2	50,006	69.8
Prairie Mountain	14,132	88.8	17,048	103
Interlake-Eastern	8,902	76.0	10,581	86.5
Northern	4,240	60.0	5,021	67.6
Manitoba	84,272	71.4	96,517	76.5
Former RHAs				
South Eastman	3766	60.7	4978	70.1
Central	6,855	67.0	8,629	78.4
Assiniboine	5786	85.0	7069	102
Brandon	4975	100	5742	106
Winnipeg	46,059	69.2	49,909	69.8
Interlake	5,851	76.2	6,664	83.8
North Eastman	3051	75.8	3917	91.6
Parkland	3,371	81.0	4,237	102
Churchill	62.0	66.0	97.0	101
Nor-Man	1314	54.3	1791	71.5
Burntwood	2,926	62.9	3,230	65.6

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	2268	63.4	2670	63.2
Fort Garry N	2036	66.7	2398	72.9
Assiniboine South	2776	75.5	3025	82.7
St. Vital S	2460	69.4	2949	74.9
St. Vital N	2093	78.7	2145	79.1
St. Boniface E	2419	66.0	2971	71.6
St. Boniface W	1109	73.2	1122	73.4
Transcona	2482	74.5	2396	67.1
River Heights W	2371	67.2	2620	72.6
River Heights E	1477	72.5	1611	77.0
River East N	766	75.1	824	74.9
River East E	1947	68.6	2054	69.6
River East W	3216	84.0	3338	84.9
River East S	1176	66.8	1071	58.5
St. James-Assiniboia W	2570	80.6	2928	89.9
St. James-Assiniboia E	2146	81.0	2190	81.9
Seven Oaks N	310	69.8	347	68.6
Seven Oaks W	1311	57.1	1547	57.2
Seven Oaks E	2608	76.9	2771	72.5
Inkster W	883	50.3	972	49.2
Inkster E	949	65.1	918	59.6
Downtown W	2101	56.5	2234	53.4
Downtown E	1968	57.6	2100	57.7
Point Douglas N	1735	63.7	1709	57.8
Point Douglas S	882	59.7	999	59.9
Churchill	62.0	66.0	97.0	101

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	55.7	68.5
Lowest Rural R1	82.0	89.4
R2	77.7	84.7
R3	73.6	81.6
R4	75.7	79.8
Highest Rural R5	72.3	77.6
Lowest Urban U1	74.5	70.0
U2	74.8	70.8
U3	71.9	70.1
U4	71.0	68.9
Highest Urban U5	66.9	65.8

linear trend rural T1	**0.016**
linear trend rural T2	**0.002**
compare rural trends over time	0.678
linear trend urban T1	**0.016**
linear trend urban T2	0.174
compare urban trends over time	0.453

bold trend = significant

Appendix Table 2.35: Hospital Days Used in Short Stays (1-13 Days)

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	47,622	290	44,683	247
Winnipeg	153,490	230	155,189	217
Prairie Mountain	69,320	435	63,058	383
Interlake-Eastern	37,841	323	35,759	292
Northern	29,328	415	25,490	343
Manitoba	340,092	288.1	327,064	259
Former RHAs				
South Eastman	14,876	240	15,280	215
Central	32,746	320	29,403	267
Assiniboine	31,211	459	26,936	389
Brandon	16,181	327	15,678	291
Winnipeg	153,150	230	154,735	216
Interlake	24,778	323	23,433	295
North Eastman	13,063	324	12,326	288
Parkland	21,928	527	20,444	492
Churchill	340	362	454	474
Nor-Man	9,376	388	8,575	342
Burntwood	19,952	429	16,915	343

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	6,401	179	7,103	168
Fort Garry N	5,888	193	6,529	199
Assiniboine South	7,728	210	7,354	201
St. Vital S	6,918	195	7,030	179
St. Vital N	6,405	241	6,530	241
St. Boniface E	6,214	170	6,814	164
St. Boniface W	4,115	272	3,985	261
Transcona	6,774	203	6,746	189
River Heights W	7,787	221	7,986	221
River Heights E	5,289	259	4,795	229
River East N	1421	139	1,548	141
River East E	5,395	190	6,197	210
River East W	11,373	297	11,214	285
River East S	4,299	244	4,108	225
St. James-Assiniboia W	7,562	237	7,698	236
St. James-Assiniboia E	7,150	270	6,757	253
Seven Oaks N	1,068	240	979	193
Seven Oaks W	4,149	181	4,847	179
Seven Oaks E	8,280	244	8,416	220
Inkster W	2,456	140	2,585	131
Inkster E	3,916	269	3,409	221
Downtown W	8,461	228	9,028	216
Downtown E	11,533	338	11,013	303
Point Douglas N	6,784	249	6,166	209
Point Douglas S	5,784	391	5,898	354
Churchill	340	362	454	474

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	429	468
Lowest Rural R1	508	424
R2	418	327
R3	370	307
R4	307	261
Highest Rural R5	282	234
Lowest Urban U1	315	271
U2	234	216
U3	218	185
U4	184	177
Highest Urban U5	169	159
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.8764
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.5498

bold trend = significant

Appendix Table 2.36: Hospital Days Used in Long Stays (14-365 Days)

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	96,955	590	100,992	558
Winnipeg	388,634	583	328,349	459
Prairie Mountain	150,300	944	153,573	932
Interlake-Eastern	62,052	530	64,988	532
Northern	30,044	425	30,085	405
Manitoba	755,838	640	718,016	569
Former RHAs				
South Eastman	31,341	505	29,103	410
Central	65,614	642	71,889	653
Assiniboine	61,828	909	70,666	1,021
Brandon	45,070	910	45,029	835
Winnipeg	388,422	584	328,065	459
Interlake	38,699	504	43,722	550
North Eastman	23,353	580	21,266	497
Parkland	43,402	1,043	37,878	911
Churchill	212	226	284	296
Nor-Man	9,838	407	11,910	475
Burntwood	20,206	434	18,175	369

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	13,589	380	13,896	329
Fort Garry N	15,779	517	14,771	449
Assiniboine South	18,647	507	23,644	646
St. Vital S	15,573	439	14,763	375
St. Vital N	15,162	570	11,489	424
St. Boniface E	12,085	330	10,575	255
St. Boniface W	11,819	780	9,417	616
Transcona	12,207	366	10,082	282
River Heights W	26,288	745	21,059	583
River Heights E	18,462	906	11,223	536
River East N	1,942	191	1,756	160
River East E	10,277	362	11,117	377
River East W	31,907	834	21,450	546
River East S	9,006	511	6,926	379
St. James-Assiniboia W	16,965	532	17,332	532
St. James-Assiniboia E	23,629	892	17,972	672
Seven Oaks N	3,629	817	3,301	652
Seven Oaks W	14,232	620	10,817	400
Seven Oaks E	24,970	737	19,249	503
Inkster W	3,982	227	4,111	208
Inkster E	8,997	617	6,233	404
Downtown W	18,481	497	15,393	368
Downtown E	28,113	823	26,117	718
Point Douglas N	17,875	657	12,512	424
Point Douglas S	14,806	1,001	12,860	771
Churchill	212	226	284	296

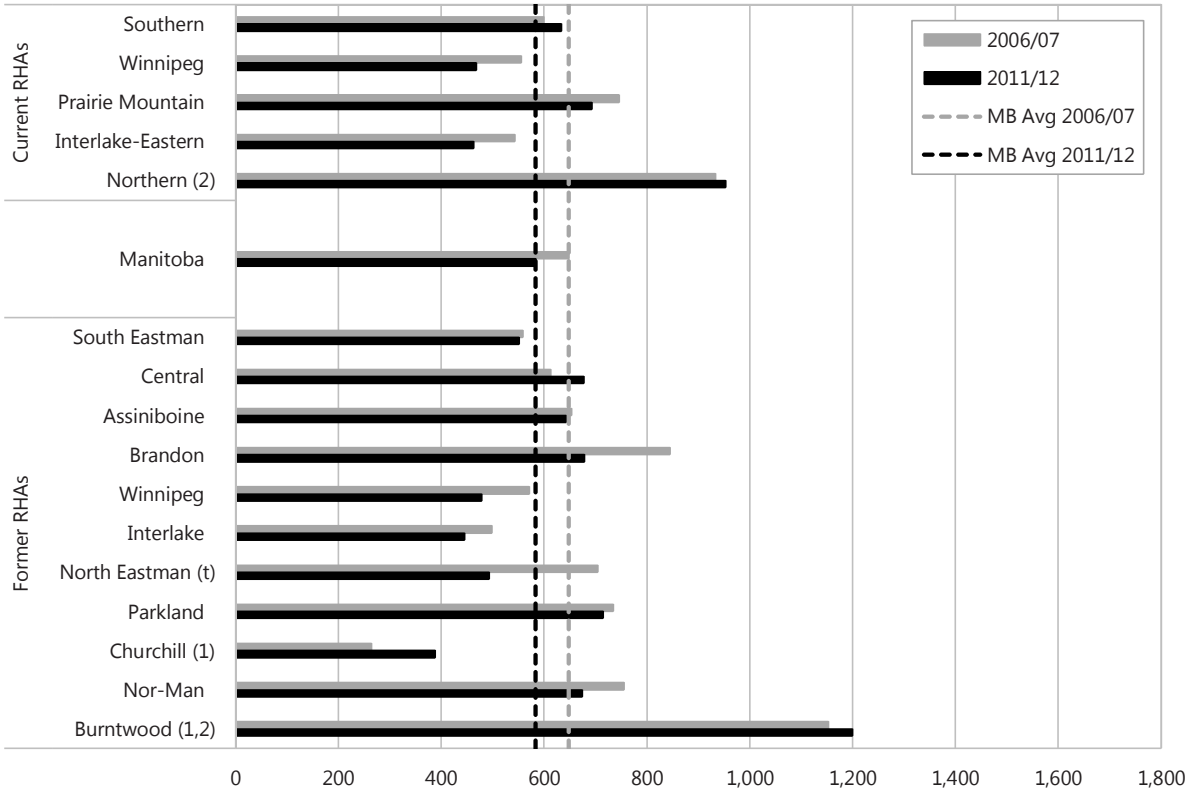
Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	5,025	5,635
Lowest Rural R1	939	836
R2	640	709
R3	600	619
R4	502	609
Highest Rural R5	578	399
Lowest Urban U1	930	742
U2	556	511
U3	462	365
U4	443	408
Highest Urban U5	348	249

linear trend rural T1	**0.0029**
linear trend rural T2	**<.0001**
compare rural trends over time	0.4688
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.7049

bold trend = significant

Appendix Figure 2.8: Hospital Days (14+) Used in Long Stays by RHA, 2006/07 and 2011/12

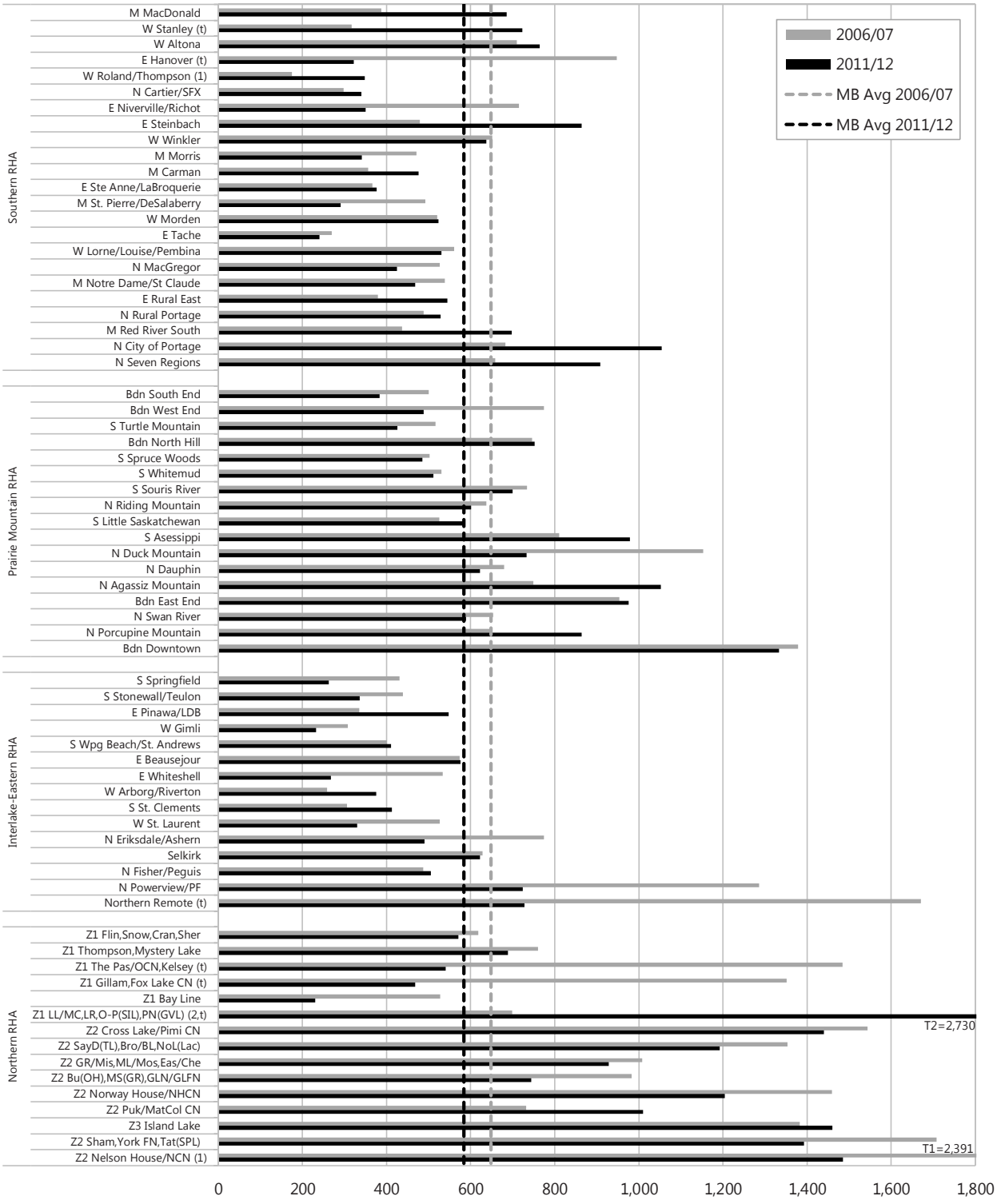
Age- and sex-adjusted rate of hospital days used in stays of 14+ days per 1,000 residents



1 indicates area's rate was statistically different from Manitoba average in first time period
2 indicates area's rate was statistically different from Manitoba average in second time period
t indicates change over time was statistically significant for that area
s indicates data suppressed due to small numbers

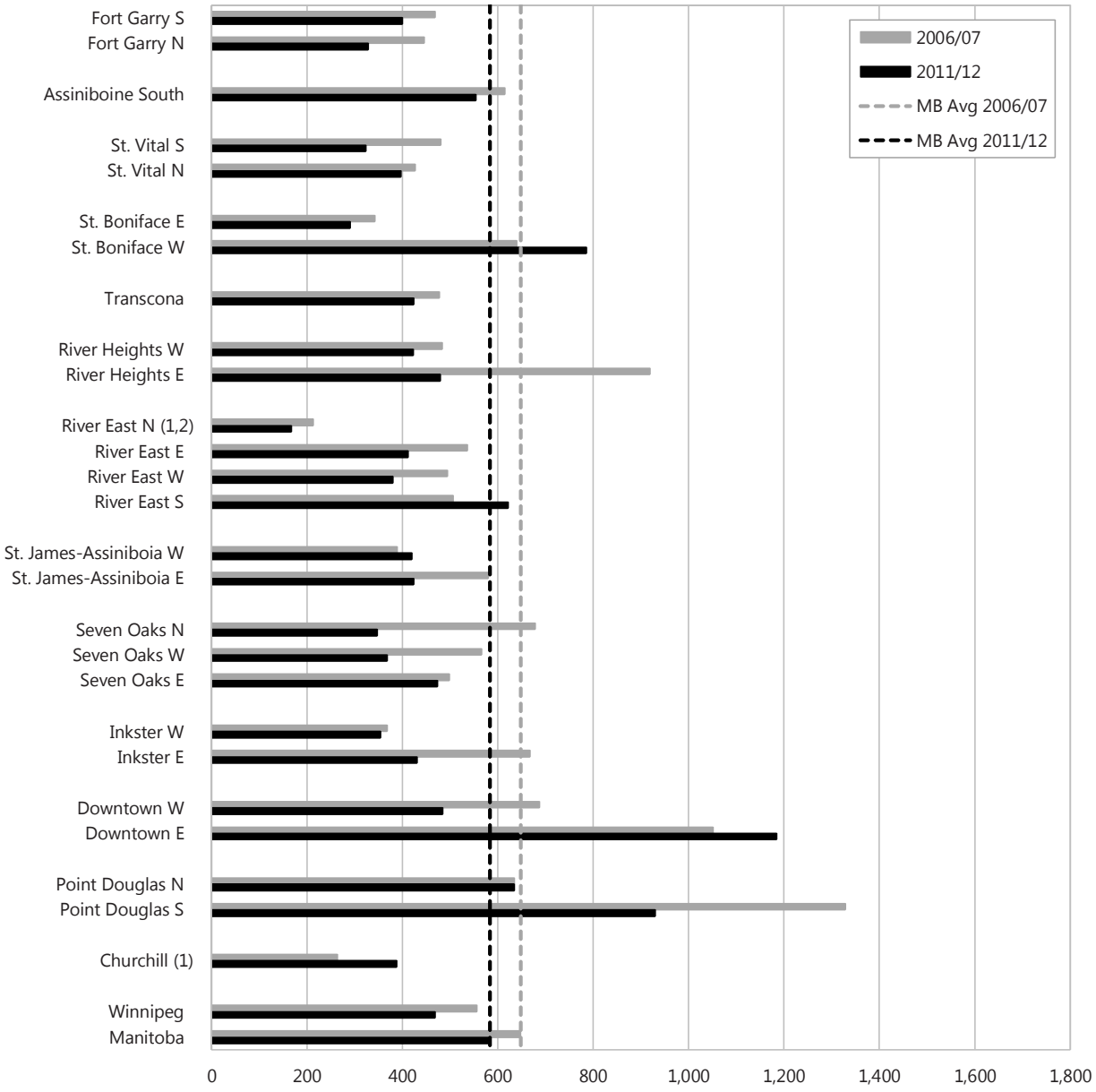
Appendix Figure 2.9: Hospital Days (14+) Used in Long Stays by District, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of 14+ days per 1,000 residents



Appendix Figure 2.10: Hospital Days (14+) Used in Long Stays by Winnipeg NC, 2006/07 and 2011/12

Age- and sex-adjusted rate of hospital days used in stays of 14+ days per 1,000 residents



Appendix Table 2.37: Hospital Days (14+) Used in Long Stays

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	100,062	609	105,893	585
Winnipeg	391,250	587	330,004	461
Prairie Mountain	152,795	960	159,768	970
Interlake-Eastern	62,268	532	65,047	532
Northern	30,377	430	31,362	422
Manitoba	764,890	648	736,257	584
Former RHAs				
South Eastman	31,948	515	29,191	411
Central	68,114	666	76,702	697
Assiniboine	63,357	931	75,472	1,090
Brandon	46,036	930	46,418	861
Winnipeg	391,038	588	329,720	461
Interlake	38,729	504	43,722	550
North Eastman	23,539	584	21,325	499
Parkland	43,402	1,043	37,878	911
Churchill	212	226	284	296
Nor-Man	9,838	407	12,021	480
Burntwood	20,539	442	19,341	393

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	13,589	380	13,896	329
Fort Garry N	15,779	517	14,771	449
Assiniboine South	18,647	507	23,986	656
St. Vital S	15,573	439	14,763	375
St. Vital N	15,162	570	11,511	425
St. Boniface E	12,085	330	10,575	255
St. Boniface W	11,819	780	9,506	622
Transcona	12,217	367	10,332	289
River Heights W	26,288	745	21,059	583
River Heights E	19,095	937	11,257	538
River East N	1,942	191	1,756	160
River East E	10,310	363	11,148	378
River East W	31,907	834	21,450	546
River East S	9,006	511	6,926	379
St. James-Assiniboia W	16,965	532	17,582	540
St. James-Assiniboia E	23,668	893	17,972	672
Seven Oaks N	3,629	817	3,301	652
Seven Oaks W	14,362	626	10,826	400
Seven Oaks E	24,970	737	19,385	507
Inkster W	3,982	227	4,290	217
Inkster E	9,521	653	6,233	404
Downtown W	19,244	518	15,415	368
Downtown E	28,471	834	26,117	718
Point Douglas N	17,902	658	12,652	428
Point Douglas S	14,905	1,008	13,011	780
Churchill	212	226	284	296

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	5,063	6,244
Lowest Rural R1	974	862
R2	652	764
R3	607	642
R4	506	634
Highest Rural R5	578	408
Lowest Urban U1	946	743
U2	557	519
U3	472	366
U4	443	409
Highest Urban U5	348	249
linear trend rural T1		**0.0016**
linear trend rural T2		**<.0001**
compare rural trends over time		0.5102
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.7376

bold trend = significant

Appendix Table 2.38: Hospital Readmission Within 30 Days of Discharge

Regional Health Authority	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	1,674	9.62%	1,552	8.69%
Winnipeg	3,951	7.54%	3,796	7.07%
Prairie Mountain	2,578	12.1%	2,270	10.9%
Interlake-Eastern	1,259	10.4%	1,032	8.85%
Northern	1,104	10.3%	877	9.01%
Manitoba	10,566	9.28%	9,527	8.37%
Former RHAs				
South Eastman	482	8.30%	503	7.74%
Central	1,192	10.3%	1,049	9.23%
Assiniboine	1118	12.7%	990	11.7%
Brandon	426	8.18%	389	7.04%
Winnipeg	3,943	7.55%	3,779	7.07%
Interlake	855	10.9%	715	9.41%
North Eastman	404	9.57%	317	7.80%
Parkland	1,034	14.2%	891	12.9%
Churchill	8.00	6.30%	17.0	8.99%
Nor-Man	473	13.7%	334	10.6%
Burntwood	631	8.73%	543	8.25%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE percent	Number observed	CRUDE percent
	2006/07		2011/12	
Fort Garry S	156	6.89%	157	6.02%
Fort Garry N	152	7.53%	145	6.66%
Assiniboine South	160	6.60%	152	6.44%
St. Vital S	148	6.44%	166	6.52%
St. Vital N	145	6.71%	187	8.31%
St. Boniface E	151	6.32%	169	6.49%
St. Boniface W	109	8.08%	94.0	7.14%
Transcona	169	6.91%	185	7.32%
River Heights W	201	7.46%	200	7.58%
River Heights E	138	7.94%	136	7.92%
River East N	27.0	4.75%	45.0	6.88%
River East E	114	5.74%	147	6.73%
River East W	351	9.98%	250	7.42%
River East S	147	9.33%	112	7.14%
St. James-Assiniboia W	190	7.80%	162	6.81%
St. James-Assiniboia E	167	7.24%	127	5.79%
Seven Oaks N	13.0	4.11%	18.0	6.36%
Seven Oaks W	125	8.12%	100	5.80%
Seven Oaks E	209	7.63%	183	6.62%
Inkster W	54.0	6.21%	57.0	5.11%
Inkster E	97.0	6.87%	86.0	6.60%
Downtown W	227	7.52%	228	7.38%
Downtown E	347	8.96%	357	9.41%
Point Douglas N	163	6.80%	149	6.39%
Point Douglas S	183	9.50%	167	8.44%
Churchill	8.00	6.30%	17.0	8.99%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	8.29%	7.33%
Lowest Rural R1	12.0%	11.1%
R2	11.6%	9.78%
R3	10.2%	9.42%
R4	9.64%	8.54%
Highest Rural R5	8.71%	8.39%
Lowest Urban U1	8.62%	8.22%
U2	7.66%	7.13%
U3	7.38%	6.71%
U4	6.26%	6.20%
Highest Urban U5	6.69%	6.00%
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.4154
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.7547

bold trend = significant

Appendix Table 2.39: Hospitalization Rate for Ambulatory Care Sensitive Conditions Among Residents Aged 0-74

Regional Health Authority	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	1,427	9.25	1,052	6.16
Winnipeg	3,495	5.65	2,946	4.42
Prairie Mountain	2,155	15.0	1,856	12.4
Interlake-Eastern	1,302	11.9	1,043	9.12
Northern	1,340	19.3	979	13.4
Manitoba	9,836	8.96	8,016	6.81
Former RHAs				
South Eastman	398	6.74	337	4.98
Central	1,029	10.8	715	6.94
Assiniboine	931	15.3	763	12.2
Brandon	406	8.85	379	7.56
Winnipeg	3,480	5.63	2,919	4.39
Interlake	825	11.5	680	9.18
North Eastman	477	12.5	363	9.01
Parkland	818	21.9	714	19.0
Churchill	15.0	16.3	27.0	29.0
Nor-Man	416	17.8	346	14.3
Burntwood	924	20.1	633	13.0

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed	CRUDE rate per 1,000	Number observed	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	142	4.18	128	3.18
Fort Garry N	87.0	3.09	59.0	1.97
Assiniboine South	111	3.28	94.0	2.80
St. Vital S	122	3.65	89.0	2.43
St. Vital N	120	5.00	128	5.16
St. Boniface E	130	3.72	119	3.03
St. Boniface W	59.0	4.38	51.0	3.72
Transcona	159	5.01	138	4.07
River Heights W	125	3.90	95.0	2.89
River Heights E	98.0	5.33	94.0	4.91
River East N	21.0	2.13	16.0	1.51
River East E	111	4.11	106	3.82
River East W	214	6.38	165	4.82
River East S	150	8.99	97.0	5.54
St. James-Assiniboia W	145	4.96	137	4.65
St. James-Assiniboia E	131	5.60	108	4.51
Seven Oaks N	11.0	2.70	17.0	3.64
Seven Oaks W	98.0	4.48	112	4.34
Seven Oaks E	192	6.23	151	4.30
Inkster W	67.0	3.93	44.0	2.30
Inkster E	143	10.4	93.0	6.36
Downtown W	211	6.04	201	5.04
Downtown E	403	12.6	351	10.2
Point Douglas N	187	7.34	142	5.05
Point Douglas S	243	17.6	184	11.6
Churchill	15.0	16.3	27.0	29.0

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	24.9	19.3
Lowest Rural R1	21.7	17.4
R2	15.1	10.1
R3	12.7	8.67
R4	9.78	6.09
Highest Rural R5	6.82	4.50
Lowest Urban U1	11.3	8.27
U2	6.27	4.50
U3	4.99	3.66
U4	3.80	2.62
Highest Urban U5	2.53	2.09
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.1671
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.5806

bold trend=significant

Appendix Table 2.40: Cardiac Catheterization Among Residents Aged 40+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2004/05-2006/07		2009/10-2011/12	
Current RHAs				
Southern	445	6.47	634	8.32
Winnipeg	2,117	6.67	2,640	7.79
Prairie Mountain	509	6.38	643	7.87
Interlake-Eastern	415	7.10	569	8.99
Northern	154	6.97	219	9.13
Manitoba	3,644	6.64	4,712	8.03
Former RHAs				
South Eastman	194	7.83	257	9.02
Central	250	5.70	377	7.90
Assiniboine	200	5.52	291	7.96
Brandon	122	5.50	129	5.49
Winnipeg	2,116	6.68	2637	7.79
Interlake	257	6.62	366	8.76
North Eastman	158	8.04	203	9.44
Parkland	187	8.75	223	10.3
Churchill			3.67	8.82
Nor-Man	66.0	6.81	94.0	9.27
Burntwood	88.0	7.10	125	9.03

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2004/05-2006/07		2009/10-2011/12	
Fort Garry S	96.7	5.99	132	7.24
Fort Garry N	92.7	6.28	106	6.27
Assiniboine South	115	5.92	141	7.10
St. Vital S	106	6.28	134	6.88
St. Vital N	121	8.90	142	10.3
St. Boniface E	123	7.44	146	7.47
St. Boniface W	55.3	7.02	67.3	8.42
Transcona	111	7.27	130	7.93
River Heights W	112	6.30	129	6.95
River Heights E	67.0	6.70	77.0	7.70
River East N	23.3	4.58	34.0	5.83
River East E	80.3	6.26	92.3	6.78
River East W	156	7.39	187	8.57
River East S	51.7	6.98	70.3	9.38
St. James-Assiniboia W	127	7.41	160	9.00
St. James-Assiniboia E	91.0	6.51	111	7.82
Seven Oaks N	9.67	4.10	16.3	6.01
Seven Oaks W	59.7	5.97	92.3	7.98
Seven Oaks E	130	7.52	166	8.82
Inkster W	37.0	5.04	49.7	6.07
Inkster E	51.0	8.64	59.7	9.46
Downtown W	86.7	5.32	113	6.70
Downtown E	90.7	6.43	118	8.22
Point Douglas N	79.0	6.69	102	8.31
Point Douglas S	43.0	7.23	62.7	10.1
Churchill			3.67	8.82

Income Quintile	ADJUSTED rate per 1,000	
	2004/05-2006/07	2009/10-2011/12
Income Unknown	2.65	2.97
Lowest Rural R1	8.10	11.4
R2	6.52	8.54
R3	6.76	8.36
R4	6.34	8.51
Highest Rural R5	6.73	8.16
Lowest Urban U1	7.82	9.94
U2	7.77	8.96
U3	6.88	7.93
U4	6.66	7.29
Highest Urban U5	6.16	6.73
linear trend rural T1		**0.0215**
linear trend rural T2		**<.0001**
compare rural trends over time		0.2543
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.0955

bold trend = significant

Appendix Table 2.41: Percutaneous Coronary Intervention Among Residents Aged 40+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	130	1.93	225	3.02
Winnipeg	741	2.37	957	2.86
Prairie Mountain	165	2.07	238	2.93
Interlake-Eastern	136	2.37	199	3.19
Northern	43.0	1.98	64.0	2.72
Manitoba	1,215	2.25	1,686	2.92
Former RHAs				
South Eastman	48.2	2.01	88.8	3.20
Central	82.0	1.90	137	2.91
Assiniboine	68.4	1.90	111	3.05
Brandon	41.8	1.90	50.8	2.18
Winnipeg	741	2.37	955	2.86
Interlake	86.0	2.26	128	3.11
North Eastman	49.6	2.57	70.8	3.34
Parkland	54.4	2.55	76.4	3.55
Churchill			1.60	3.93
Nor-Man	18.6	1.93	29.0	2.90
Burntwood	24.4	2.01	35.0	2.59

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	34.4	2.16	44.4	2.52
Fort Garry N	28.8	2.02	37.0	2.25
Assiniboine South	44.0	2.30	48.8	2.47
St. Vital S	37.2	2.26	52.0	2.75
St. Vital N	40.2	2.96	53.0	3.85
St. Boniface E	41.0	2.56	52.6	2.77
St. Boniface W	18.8	2.39	24.8	3.10
Transcona	37.8	2.52	50.2	3.12
River Heights W	33.8	1.91	51.0	2.78
River Heights E	29.0	2.90	29.8	2.98
River East N	7.00	1.44	13.0	2.28
River East E	29.2	2.32	40.0	2.97
River East W	50.4	2.41	66.2	3.07
River East S	21.4	2.92	22.4	3.00
St. James-Assiniboia W	45.0	2.67	56.8	3.22
St. James-Assiniboia E	31.4	2.26	42.8	3.03
Seven Oaks N	4.40	1.90	3.80	1.44
Seven Oaks W	21.8	2.23	29.6	2.65
Seven Oaks E	44.4	2.60	62.6	3.38
Inkster W	12.2	1.68	19.0	2.38
Inkster E	15.2	2.61	22.0	3.53
Downtown W	34.0	2.09	36.8	2.21
Downtown E	32.6	2.33	40.2	2.82
Point Douglas N	30.4	2.60	37.0	3.05
Point Douglas S	16.4	2.79	19.4	3.17
Churchill			1.60	3.93

Income Quintile	ADJUSTED rate per 1,000	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	1.15	1.10
Lowest Rural R1	2.46	3.68
R2	1.98	3.02
R3	2.07	3.05
R4	2.09	2.94
Highest Rural R5	2.14	2.89
Lowest Urban U1	2.84	3.64
U2	2.74	3.32
U3	2.62	2.97
U4	2.29	2.67
Highest Urban U5	2.06	2.53

linear trend rural T1	0.3506
linear trend rural T2	**0.0181**
compare rural trends over time	0.3636
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.6777

bold trend = significant

Appendix Table 2.42: Coronary Artery Bypass Surgery Among Residents Aged 40+

Regional Health Authority	Number observed per year 2002/03-2006/07	CRUDE rate per 1,000 2002/03-2006/07	Number observed per year 2007/08-2011/12	CRUDE rate per 1,000 2007/08-2011/12
Current RHAs				
Southern	108	1.61	107	1.43
Winnipeg	482	1.54	445	1.33
Prairie Mountain	121	1.53	114	1.40
Interlake-Eastern	93.6	1.63	96.0	1.54
Northern	37.0	1.70	40.4	1.72
Manitoba	843	1.56	802	1.39
Former RHAs				
South Eastman	38.8	1.61	42.0	1.51
Central	69.4	1.60	64.6	1.38
Assiniboine	47.0	1.30	50.8	1.39
Brandon	32.2	1.47	25.4	1.09
Winnipeg	482	1.54	444	1.33
Interlake	62.2	1.64	60.8	1.47
North Eastman	31.4	1.63	35.2	1.66
Parkland	42.2	1.98	37.4	1.74
Churchill				
Nor-Man	18.2	1.89	16.2	1.62
Burntwood	18.8	1.55	24.2	1.79

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2002/03-2006/07	CRUDE rate per 1,000 2002/03-2006/07	Number observed per year 2007/08-2011/12	CRUDE rate per 1,000 2007/08-2011/12
Fort Garry S	22.6	1.42	22.6	1.28
Fort Garry N	19.2	1.35	19.6	1.19
Assiniboine South	24.2	1.26	23.0	1.16
St. Vital S	24.6	1.50	22.4	1.18
St. Vital N	28.0	2.07	24.0	1.75
St. Boniface E	30.4	1.90	28.4	1.50
St. Boniface W	12.4	1.58	12.6	1.58
Transcona	27.4	1.83	19.8	1.23
River Heights W	25.6	1.44	20.6	1.12
River Heights E	15.0	1.50	10.8	1.08
River East N	5.40	1.11	4.80	0.841
River East E	17.4	1.38	15.2	1.13
River East W	35.2	1.69	31.6	1.46
River East S	11.8	1.61	12.4	1.66
St. James-Assiniboia W	32.0	1.90	23.0	1.30
St. James-Assiniboia E	20.6	1.48	19.4	1.37
Seven Oaks N	2.80	1.21	3.80	1.44
Seven Oaks W	15.2	1.56	16.0	1.43
Seven Oaks E	30.4	1.78	28.0	1.51
Inkster W	8.40	1.16	11.2	1.40
Inkster E	10.8	1.85	9.40	1.51
Downtown W	16.2	0.99	21.8	1.31
Downtown E	19.2	1.37	18.4	1.29
Point Douglas N	18.8	1.61	15.6	1.29
Point Douglas S	8.20	1.40	10.0	1.63
Churchill				

Income Quintile	ADJUSTED rate per 1,000 2002/03-2006/07	ADJUSTED rate per 1,000 2007/08-2011/12
Income Unknown	0.463	0.449
Lowest Rural R1	1.80	1.87
R2	1.61	1.32
R3	1.53	1.44
R4	1.61	1.52
Highest Rural R5	1.51	1.41
Lowest Urban U1	1.79	1.78
U2	1.82	1.50
U3	1.70	1.33
U4	1.53	1.26
Highest Urban U5	1.41	1.11
linear trend rural T1		0.176
linear trend rural T2		0.100
compare rural trends over time		0.844
linear trend urban T1		**0.004**
linear trend urban T2		**<.0001**
compare urban trends over time		0.136

bold trend = significant

Appendix Table 2.43: Hip Replacement Surgery Among Residents Aged 40+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	122	1.81	163	2.18
Winnipeg	578	1.85	683	2.04
Prairie Mountain	182	2.30	196	2.41
Interlake-Eastern	113	1.97	142	2.27
Northern	29.8	1.37	43.4	1.84
Manitoba	1,027	1.90	1,228	2.12
Former RHAs				
South Eastman	39.2	1.63	58.6	2.11
Central	82.4	1.90	104	2.22
Assiniboine	87.4	2.42	96.0	2.63
Brandon	48.4	2.21	49.4	2.12
Winnipeg	577	1.85	682	2.04
Interlake	75.0	1.97	90.8	2.20
North Eastman	37.8	1.96	50.8	2.40
Parkland	46.4	2.18	50.2	2.33
Churchill			1.20	2.95
Nor-Man	13.8	1.43	23.8	2.38
Burntwood	16.0	1.32	19.6	1.45

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	25.2	1.58	32.6	1.85
Fort Garry N	27.6	1.94	41.8	2.55
Assiniboine South	45.0	2.35	49.6	2.51
St. Vital S	31.2	1.90	35.8	1.89
St. Vital N	30.6	2.26	32.6	2.37
St. Boniface E	28.8	1.80	33.8	1.78
St. Boniface W	16.2	2.06	17.6	2.20
Transcona	24.2	1.61	28.0	1.74
River Heights W	37.8	2.13	46.2	2.52
River Heights E	22.4	2.24	25.2	2.52
River East N	9.40	1.93	12.2	2.14
River East E	21.6	1.72	24.4	1.81
River East W	47.2	2.26	60.0	2.78
River East S	9.00	1.23	10.4	1.39
St. James-Assiniboia W	39.4	2.34	47.8	2.71
St. James-Assiniboia E	36.2	2.60	40.0	2.83
Seven Oaks N	4.20	1.82	5.20	1.96
Seven Oaks W	8.80	0.901	13.8	1.23
Seven Oaks E	35.4	2.07	38.0	2.05
Inkster W	4.60	0.63	7.00	0.876
Inkster E	9.20	1.58	7.60	1.22
Downtown W	22.4	1.38	22.4	1.34
Downtown E	19.6	1.40	25.6	1.80
Point Douglas N	16.0	1.37	16.2	1.34
Point Douglas S	5.00	0.852	7.80	1.27
Churchill			1.20	2.95

Income Quintile	ADJUSTED rate per 1,000	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	1.12	1.29
Lowest Rural R1	2.06	2.05
R2	2.05	2.29
R3	1.96	2.26
R4	1.90	2.25
Highest Rural R5	1.93	2.38
Lowest Urban U1	1.86	1.95
U2	1.75	2.07
U3	1.91	1.92
U4	2.02	2.30
Highest Urban U5	2.13	2.25

linear trend rural T1	0.3028
linear trend rural T2	0.1429
compare rural trends over time	0.0795
linear trend urban T1	**0.0149**
linear trend urban T2	**0.0188**
compare urban trends over time	0.8880

bold trend = significant

Appendix Table 2.44: Knee Replacement Surgery Among Residents Aged 40+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	176	2.61	260	3.48
Winnipeg	850	2.72	1,075	3.22
Prairie Mountain	228	2.88	294	3.62
Interlake-Eastern	176	3.07	235	3.77
Northern	53.2	2.44	78.6	3.34
Manitoba	1,484	2.74	1,945	3.36
Former RHAs				
South Eastman	64.2	2.67	94.6	3.41
Central	112	2.58	166	3.53
Assiniboine	107	2.98	133	3.65
Brandon	56.0	2.55	71.6	3.08
Winnipeg	849	2.72	1,073	3.22
Interlake	120	3.15	158	3.84
North Eastman	56.2	2.92	76.8	3.63
Parkland	64.8	3.04	89.6	4.16
Churchill	1.60	4.25	1.80	4.42
Nor-Man	24.2	2.52	37.4	3.74
Burntwood	29.0	2.39	41.2	3.05

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	43.4	2.73	53.6	3.04
Fort Garry N	40.2	2.82	55.4	3.37
Assiniboine South	59.2	3.09	61.0	3.08
St. Vital S	40.2	2.45	59.8	3.16
St. Vital N	43.2	3.19	52.8	3.84
St. Boniface E	41.8	2.61	52.8	2.78
St. Boniface W	21.0	2.67	24.8	3.10
Transcona	41.2	2.75	59.0	3.66
River Heights W	45.0	2.54	49.8	2.71
River Heights E	25.2	2.52	35.0	3.50
River East N	12.4	2.55	15.2	2.66
River East E	30.8	2.45	46.6	3.46
River East W	76.4	3.66	89.8	4.16
River East S	18.8	2.57	22.8	3.05
St. James-Assiniboia W	63.2	3.75	75.4	4.28
St. James-Assiniboia E	49.8	3.58	56.2	3.98
Seven Oaks N	7.20	3.12	8.20	3.10
Seven Oaks W	24.0	2.46	35.8	3.20
Seven Oaks E	49.2	2.88	58.4	3.16
Inkster W	8.40	1.16	16.2	2.03
Inkster E	10.8	1.85	18.8	3.02
Downtown W	28.4	1.74	42.4	2.54
Downtown E	28.4	2.03	34.4	2.41
Point Douglas N	28.2	2.41	34.2	2.82
Point Douglas S	12.4	2.11	15.0	2.45
Churchill	1.60	4.25	1.80	4.42

Income Quintile	ADJUSTED rate per 1,000	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	0.893	0.805
Lowest Rural R1	2.87	3.60
R2	2.74	3.43
R3	2.69	3.66
R4	2.88	3.24
Highest Rural R5	3.04	3.54
Lowest Urban U1	2.65	3.12
U2	2.75	3.31
U3	3.00	3.39
U4	2.87	3.21
Highest Urban U5	2.63	2.97
linear trend rural T1		0.4112
linear trend rural T2		0.6506
compare rural trends over time		0.3617
linear trend urban T1		0.8569
linear trend urban T2		0.4675
compare urban trends over time		0.5277

bold trend = significant

Appendix Table 2.45: Cataract Surgery Among Residents 50+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2006/07		2011/12	
Current RHAs				
Southern	1,290	28.0	1,468	27.3
Winnipeg	6,696	31.2	6,860	28.4
Prairie Mountain	1,863	32.3	1,971	31.8
Interlake-Eastern	1,088	26.7	1,290	27.5
Northern	255	19.8	338	22.4
Manitoba	11,239	30.1	11,959	28.4
Former RHAs				
South Eastman	404	25.0	454	23.1
Central	886	29.6	1,014	29.7
Assiniboine	854	32.1	920	32.4
Brandon	431	28.3	549	32.3
Winnipeg	6,692	31.3	6,853	28.4
Interlake	775	28.6	909	29.3
North Eastman	313	22.9	381	23.9
Parkland	578	36.7	502	30.3
Churchill			7.00	24.7
Nor-Man	124	20.3	160	22.3
Burntwood	131	19.3	178	22.4

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2006/07		2011/12	
Fort Garry S	292	26.7	381	29.8
Fort Garry N	303	30.7	378	31.4
Assiniboine South	360	25.9	462	30.7
St. Vital S	320	28.5	398	27.5
St. Vital N	413	42.6	361	35.8
St. Boniface E	332	30.3	377	27.7
St. Boniface W	234	42.4	148	24.8
Transcona	248	26.1	243	21.7
River Heights W	405	33.0	389	29.2
River Heights E	253	35.9	262	35.6
River East N	73.0	22.4	71.0	17.6
River East E	232	27.6	227	23.2
River East W	599	38.3	562	33.3
River East S	138	30.5	119	24.2
St. James-Assiniboia W	408	33.3	474	35.8
St. James-Assiniboia E	355	36.6	325	31.5
Seven Oaks N	37.0	22.6	55.0	27.9
Seven Oaks W	157	22.5	200	24.4
Seven Oaks E	452	37.5	384	28.4
Inkster W	92.0	20.2	112	20.5
Inkster E	126	33.0	121	29.2
Downtown W	279	27.4	277	24.7
Downtown E	225	25.2	250	26.3
Point Douglas N	250	33.5	190	23.6
Point Douglas S	109	28.8	87.0	21.0
Churchill			7.00	24.7

Income Quintile	ADJUSTED rate per 1,000	
	2006/07	2011/12
Income Unknown	17.7	13.4
Lowest Rural R1	29.0	34.3
R2	27.9	30.1
R3	30.6	27.5
R4	29.2	29.2
Highest Rural R5	29.1	29.5
Lowest Urban U1	33.3	30.1
U2	33.1	30.2
U3	30.4	31.5
U4	31.5	29.8
Highest Urban U5	29.3	30.4

linear trend rural T1	0.7246
linear trend rural T2	**0.0233**
compare rural trends over time	0.0700
linear trend urban T1	**0.0157**
linear trend urban T2	0.9567
compare urban trends over time	0.0762

bold trend = significant

Appendix Table 2.46: Dental Extraction Surgery Among Residents Under Age 6

Regional Health Authority	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	131	9.28	129	8.00
Winnipeg	312	7.03	304	6.56
Prairie Mountain	124	11.2	109	9.03
Interlake-Eastern	159	20.0	141	17.1
Northern	613	69.9	707	72.8
Manitoba	1,339	15.5	1,392	15.0
Former RHAs				
South Eastman	15.6	2.98	13.0	2.05
Central	115	13.0	116	11.8
Assiniboine	45.4	10.4	38.8	8.24
Brandon	27.6	7.63	24.8	5.91
Winnipeg	308	6.97	303	6.55
Interlake	72.4	14.3	61.4	11.8
North Eastman	86.8	29.9	79.6	25.8
Parkland	51.0	16.7	45.8	14.3
Churchill	3.40	33.1		
Nor-Man	142	55.8	149	57.2
Burntwood	472	75.6	558	78.5

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000	Number observed per year	CRUDE rate per 1,000
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	7.40	3.10	10.6	4.20
Fort Garry N	2.80	1.44	5.00	2.65
Assiniboine South	3.60	1.80	4.80	2.47
St. Vital S	4.80	2.25	5.80	2.43
St. Vital N	12.4	7.21	8.20	4.83
St. Boniface E	5.00	1.98	4.80	1.70
St. Boniface W	3.20	3.86	2.80	3.15
Transcona	5.40	2.33	6.40	2.73
River Heights W	3.60	1.70	5.00	2.43
River Heights E	4.00	3.72	6.40	5.98
River East N				
River East E	9.40	4.72	9.60	4.84
River East W	7.00	3.40	6.00	2.84
River East S	10.4	7.17	9.00	6.08
St. James-Assiniboia W	6.80	3.86	7.40	4.14
St. James-Assiniboia E	5.80	3.67	5.00	3.30
Seven Oaks N			0.00	0.00
Seven Oaks W	10.8	6.98	7.20	4.01
Seven Oaks E	8.60	4.40	8.80	3.85
Inkster W	10.4	8.34	7.60	5.90
Inkster E	24.6	18.9	25.2	18.1
Downtown W	33.2	11.5	45.2	14.4
Downtown E	53.8	18.4	47.4	16.2
Point Douglas N	30.0	13.6	22.2	9.41
Point Douglas S	43.6	28.4	42.2	23.9
Churchill	3.40	33.1		

Income Quintile	CRUDE rate per 1,000	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	19.0	21.0
Lowest Rural R1	48.9	48.6
R2	25.2	27.5
R3	22.9	20.9
R4	12.6	8.87
Highest Rural R5	10.0	8.96
Lowest Urban U1	16.2	14.5
U2	6.91	6.27
U3	4.39	4.52
U4	2.83	2.26
Highest Urban U5	1.45	1.57

linear trend rural T1	**<.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	**0.0005**
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.5412

bold trend = significant

Appendix Table 2.47: Computed Tomography (CT) Scan Among Residents Aged 20+

Regional Health Authority	Number observed per year	CRUDE rate per 1,000
	2011/12	
Current RHAs		
Southern *	7,458	59.9
Winnipeg	68,232	125
Prairie Mountain	16,493	134
Interlake-Eastern	12,759	140
Northern	5,964	131
Manitoba	111,550	119
Former RHAs		
South Eastman	4,734	97.8
Central *	2,724	35.8
Assiniboine	6,294	120
Brandon	5,983	148
Winnipeg	68,133	125
Interlake	8,434	141
North Eastman	4,325	138
Parkland	4,216	137
Churchill	99.0	139
Nor-Man	2,154	129
Burntwood	3,810	133

* data are under-reported in these regions

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE rate per 1,000
	2011/12	
Fort Garry S	3,135	97.5
Fort Garry N	3,085	122
Assiniboine South	3,732	130
St. Vital S	3,494	115
St. Vital N	2,984	139
St. Boniface E	3,447	111
St. Boniface W	1,859	148
Transcona	2,965	111
River Heights W	3,571	124
River Heights E	2,326	131
River East N	833	101
River East E	2,615	118
River East W	4,619	147
River East S	1,732	127
St. James-Assiniboia W	3,838	150
St. James-Assiniboia E	3,013	140
Seven Oaks N	399	103
Seven Oaks W	1,970	99.1
Seven Oaks E	3,735	126
Inkster W	1,183	82.8
Inkster E	1,364	127
Downtown W	3,449	116
Downtown E	4,256	154
Point Douglas N	2,567	121
Point Douglas S	1,962	177
Churchill	99.0	139

Income Quintile	ADJUSTED rate per 1,000
	2011/12
Income Unknown	105
Lowest Rural R1	121
R2	96.3
R3	97.6
R4	100
Highest Rural R5	117
Lowest Urban U1	166
U2	135
U3	127
U4	121
Highest Urban U5	110
linear trend rural	0.6865
linear trend urban	**<.0001**

bold trend = significant

Appendix Table 2.48: Magnetic Resonance Imaging (MRI) Scan Among Residents Aged 20+

Regional Health Authority	Number observed per year 2006/07	CRUDE rate per 1,000 2006/07	Number observed per year 2011/12	CRUDE rate per 1,000 2011/12
Current RHAs				
Southern	2,680	23.9	7,044	56.6
Winnipeg	15,890	31.5	30,701	56.2
Prairie Mountain	3,905	33.2	5,864	47.6
Interlake-Eastern	2,353	27.5	4,831	52.9
Northern	716	17.0	1,575	34.7
Manitoba	25,577	29.6	50,075	53.6
Former RHAs				
South Eastman	1,164	27.7	2,691	55.6
Central	1,516	21.6	4,353	57.2
Assiniboine	1,683	33.3	2,298	44.0
Brandon	1,432	39.0	2,128	52.8
Winnipeg	15,881	31.6	30,653	56.2
Interlake	1,571	27.8	3,150	52.6
North Eastman	782	27.0	1,681	53.6
Parkland	790	26.0	1,438	46.9
Churchill	9.00	13.7	48.0	67.6
Nor-Man	279	17.6	577	34.7
Burntwood	437	16.7	998	34.8

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2006/07	CRUDE rate per 1,000 2006/07	Number observed per year 2011/12	CRUDE rate per 1,000 2011/12
Fort Garry S	845	31.1	1,826	56.8
Fort Garry N	766	33.8	1,620	64.2
Assiniboine South	1,182	42.3	1,930	67.4
St. Vital S	891	33.8	1,942	64.0
St. Vital N	746	35.6	1,346	62.6
St. Boniface E	901	33.4	1,930	62.3
St. Boniface W	375	30.6	716	57.0
Transcona	792	32.3	1,537	57.4
River Heights W	1,004	36.0	1,747	60.5
River Heights E	554	32.2	1,014	57.0
River East N	299	40.5	552	67.0
River East E	567	27.1	1,238	55.8
River East W	994	32.9	1,840	58.4
River East S	343	26.4	707	51.8
St. James-Assiniboia W	877	35.3	1,622	63.2
St. James-Assiniboia E	728	34.4	1,285	59.5
Seven Oaks N	116	34.4	233	59.9
Seven Oaks W	447	26.6	875	44.0
Seven Oaks E	820	31.3	1,621	54.8
Inkster W	288	23.1	571	40.0
Inkster E	239	23.7	479	44.5
Downtown W	663	23.8	1,333	44.7
Downtown E	673	26.2	1,208	43.7
Point Douglas N	540	27.8	969	45.7
Point Douglas S	231	23.1	512	46.3
Churchill	9.00	13.7	48.0	67.6

Income Quintile	ADJUSTED rate per 1,000 2006/07	ADJUSTED rate per 1,000 2011/12
Income Unknown	12.6	27.6
Lowest Rural R1	21.2	43.2
R2	26.7	46.5
R3	25.6	47.3
R4	25.6	52.5
Highest Rural R5	27.1	54.7
Lowest Urban U1	29.0	51.5
U2	31.0	55.1
U3	33.0	55.3
U4	33.3	58.3
Highest Urban U5	35.2	61.6
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.1837
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.6018

bold trend = significant

Appendix Table 2.49: Admission to Personal Care Homes Among Residents 75+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	285	2.85%	294	2.83%
Winnipeg	1,418	2.99%	1,496	3.02%
Prairie Mountain	546	3.59%	519	3.51%
Interlake-Eastern	188	2.60%	191	2.43%
Northern	43.0	3.18%	37.5	2.57%
Manitoba	2,479	3.05%	2,537	3.02%
Former RHAs				
South Eastman	84.0	2.80%	89.5	2.69%
Central	201	2.87%	204	2.90%
Assiniboine	254	3.51%	234	3.39%
Brandon	143	3.89%	134	3.53%
Winnipeg	1,417	2.99%	1,496	3.02%
Interlake	137	2.73%	140	2.57%
North Eastman	50.5	2.30%	51.5	2.11%
Parkland	149	3.46%	151	3.69%
Churchill				
Nor-Man	31.0	3.69%	28	3.23%
Burntwood	12.0	2.34%	9.50	1.61%

Winnipeg Community Areas	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry	51.5	1.26%	118	2.41%
Assiniboine South	143	4.88%	205	6.77%
St. Vital	79.5	1.78%	105	2.09%
St. Boniface	54.0	1.62%	56.5	1.49%
Transcona	24.5	1.56%	22.5	1.29%
River Heights	150	2.86%	212	4.20%
River East	114	1.56%	107	1.34%
St. James-Assiniboia	276	4.91%	212	3.57%
Seven Oaks	176	3.88%	158	3.32%
Inkster	20.0	1.46%	24.5	1.80%
Downtown	213	4.91%	224	5.82%
Point Douglas	118	4.27%	53.0	2.34%
Churchill				

blank cells = suppressed

Appendix Table 2.50: Residents in Personal Care Homes Among Residents 75+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	1,288	12.9%	1,280	12.4%
Winnipeg	6,104	12.9%	6,250	12.6%
Prairie Mountain	2,290	15.1%	2,256	15.3%
Interlake-Eastern	822	11.4%	838	10.6%
Northern	161	11.9%	169	11.6%
Manitoba	10,663	13.1%	10,792	12.8%
Former RHAs				
South Eastman	367	12.2%	362	10.9%
Central	921	13.2%	919	13.1%
Assiniboine	1,054	14.6%	1,029	14.9%
Brandon	636	17.4%	629	16.6%
Winnipeg	6,099	12.9%	6,245	12.6%
Interlake	604	12.0%	619	11.4%
North Eastman	218	9.91%	219	8.96%
Parkland	601	14.0%	599	14.6%
Churchill	5.00	25.6%	5.00	20.4%
Nor-Man	126	15.0%	118	13.5%
Burntwood	34.5	6.73%	51.0	8.64%

Winnipeg Community Areas	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry	292	7.15%	452	9.26%
Assiniboine South	616	21.1%	682	22.5%
St. Vital	426	9.53%	575	11.5%
St. Boniface	262	7.87%	259	6.83%
Transcona	117	7.42%	116	6.63%
River Heights	639	12.2%	709	14.0%
River East	702	9.66%	705	8.89%
St. James-Assiniboia	920	16.4%	812	13.7%
Seven Oaks	661	14.6%	663	14.0%
Inkster	144	10.5%	146	10.7%
Downtown	804	18.5%	817	21.2%
Point Douglas	518	18.8%	312	13.8%
Churchill	5.00	25.6%	5.00	20.4%

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Appendix Table 2.51: Median Waiting Times for Personal Care Home Admission from Hospital Among Residents 75+

Regional Health Authority	Number observed per year	Median number of weeks	Number observed per year	Median number of weeks
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	270	12.5	331	17.3
Winnipeg	1,403	6.56	1,212	10.2
Prairie Mountain	623	7.91	573	14.0
Interlake-Eastern	193	7.58	200	15.8
Northern	54.0	4.79	46.0	9.58
Manitoba	2,573	7.56	2,375	12.6
Former RHAs				
South Eastman	70.0	12.1	101	15.9
Central	200	12.7	230	17.9
Assiniboine	307	7.69	259	22.9
Brandon	160	9.08	142	6.32
Winnipeg	1,401	6.54	1,211	10.2
Interlake	129	7.32	144	16.1
North Eastman	64.0	8.09	56.0	14.9
Parkland	156	7.13	172	6.92
Churchill				
Nor-Man	42.0	4.07	30.0	10.7
Burntwood	12.0	7.30	16.0	7.54

Winnipeg Community Areas	Number observed per year	Median number of weeks	Number observed per year	Median number of weeks
	2005/06-2006/07		2010/11-2011/12	
Fort Garry	92.0	7.98	98.0	8.17
Assiniboine South	72.0	4.11	57.0	8.61
St. Vital	98.0	8.34	96.0	9.17
St. Boniface	94.0	9.81	101	9.16
Transcona	53.0	7.46	37.0	10.7
River Heights	205	6.16	140	14.7
River East	200	5.92	192	9.67
St. James-Assiniboia	168	5.36	140	6.02
Seven Oaks	118	5.18	105	9.60
Inkster	30.0	7.13	33.0	17.1
Downtown	178	6.30	118	12.5
Point Douglas	93.0	7.59	94.0	10.8
Churchill				

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Appendix Table 2.52: Median Waiting Times for Personal Care Home Admission from Community Among Residents 75+

Regional Health Authority	Number observed per year	Median number of weeks	Number observed per year	Median number of weeks
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	290	25.5	286	31.2
Winnipeg	1,102	21.3	1,626	19.5
Prairie Mountain	392	18.1	471	22.9
Interlake-Eastern	195	20.5	268	32.3
Northern	47.0	7.64	55.0	20.2
Manitoba	2,051	21.0	2,717	22.6
Former RHAs				
South Eastman	108	31.4	104	37.4
Central	182	22.0	182	27.7
Assiniboine	184	22.5	259	31.1
Brandon	85.0	12.0	84.0	13.5
Winnipeg	1,100	21.4	1,626	19.5
Interlake	143	19.5	182	31.6
North Eastman	52.0	23.3	86.0	33.9
Parkland	123	15.6	128	12.5
Churchill				
Nor-Man	23.0	7.76	34.0	22.3
Burntwood	24.0	7.52	21.0	16.9

Winnipeg Community Areas	Number observed per year	Median number of weeks	Number observed per year	Median number of weeks
	2005/06-2006/07		2010/11-2011/12	
Fort Garry	54.0	17.4	145	24.3
Assiniboine South	53.0	12.7	94.0	17.6
St. Vital	108	28.9	143	20.9
St. Boniface	125	20.1	148	19.3
Transcona	35.0	20.0	51.0	21.0
River Heights	130	21.8	178	21.2
River East	163	22.8	253	23.7
St. James-Assiniboia	139	28.8	202	13.6
Seven Oaks	79.0	14.1	117	17.0
Inkster	34.0	27.4	38.0	22.2
Downtown	117	15.2	153	16.0
Point Douglas	63.0	18.4	104	17.0
Churchill				

blank cells = suppressed

Appendix Table 2.53: Influenza Immunization Rate Among Residents Aged 65+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	11,474	57.3%	11,191	50.1%
Winnipeg	58,970	64.5%	58,246	58.1%
Prairie Mountain	17,149	61.3%	15,595	54.1%
Interlake-Eastern	10,154	60.0%	10,499	54.2%
Northern	1,944	50.6%	2,103	47.1%
Manitoba	100,619	62.3%	98,475	55.8%
Former RHAs				
South Eastman	3,616	55.4%	3,757	48.7%
Central	7,858	58.3%	7,434	50.8%
Assiniboine	8,145	61.6%	7,397	55.0%
Brandon	4,439	64.3%	4,069	55.3%
Winnipeg	58,936	64.5%	58,209	58.1%
Interlake	6,978	61.1%	7,052	54.4%
North Eastman	3,176	57.9%	3,447	53.6%
Parkland	4,565	58.3%	4,129	51.4%
Churchill	34.0	50.7%	37.0	52.9%
Nor-Man	1,287	62.6%	1,233	52.8%
Burntwood	657	36.8%	870	40.9%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Fort Garry S	2,656	64.0%	3,003	59.5%
Fort Garry N	2,849	67.1%	3,286	63.7%
Assiniboine South	3,846	67.7%	4,112	62.8%
St. Vital S	2,669	67.7%	3,453	61.7%
St. Vital N	3,163	66.7%	2,726	59.1%
St. Boniface E	2,653	62.5%	3,049	56.2%
St. Boniface W	1,767	65.3%	1,636	60.4%
Transcona	2,382	65.9%	2,280	56.7%
River Heights W	3,653	65.4%	3,547	59.0%
River Heights E	2,166	65.3%	1,952	59.5%
River East N	570	57.1%	667	51.0%
River East E	1,945	64.7%	2,155	58.0%
River East W	5,563	67.4%	5,050	59.0%
River East S	1,065	59.0%	868	51.1%
St. James-Assiniboia W	4,145	69.4%	4,075	61.5%
St. James-Assiniboia E	3,618	70.4%	3,089	63.5%
Seven Oaks N	440	66.1%	450	56.7%
Seven Oaks W	1,329	56.5%	1,596	51.8%
Seven Oaks E	3,702	65.7%	3,372	58.2%
Inkster W	579	48.3%	769	48.3%
Inkster E	976	60.5%	872	55.4%
Downtown W	2,255	55.8%	2,024	49.6%
Downtown E	2,157	58.1%	1,931	52.5%
Point Douglas N	1,853	58.7%	1,505	52.2%
Point Douglas S	935	56.6%	742	48.5%
Churchill	34.0	50.7%	37.0	52.9%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	73.4%	71.4%
Lowest Rural R1	53.8%	47.7%
R2	59.1%	52.6%
R3	58.5%	52.6%
R4	61.6%	55.9%
Highest Rural R5	62.7%	56.5%
Lowest Urban U1	62.8%	55.7%
U2	62.5%	55.6%
U3	63.7%	57.1%
U4	65.2%	58.7%
Highest Urban U5	64.9%	60.5%

linear trend rural T1	**<.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	0.4716
linear trend urban T1	**0.0056**
linear trend urban T2	**<.0001**
compare urban trends over time	0.0530

bold trend = significant

Appendix Table 2.54: Pneumococcal Polysaccharide (PPV-23) Immunization Rate Among Residents Aged 65+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	12,338	61.6%	13,122	58.7%
Winnipeg	64,591	70.6%	66,147	66.0%
Western	19,036	68.1%	18,585	64.4%
Interlake-Eastern	11,377	67.3%	12,053	62.2%
Northern	2,345	61.1%	2,745	61.5%
Manitoba	110,602	68.5%	113,505	64.3%
Former RHAs				
South Eastman	4,071	62.4%	4,746	61.5%
Central	8,267	61.3%	8,376	57.2%
Assiniboine	8,864	67.0%	8,428	62.6%
Brandon	4,926	71.4%	5,086	69.2%
Winnipeg	64,547	70.6%	66,100	66.0%
Interlake	7,859	68.8%	8,161	63.0%
North Eastman	3,518	64.1%	3,892	60.5%
Parkland	5,246	67.0%	5,071	63.1%
Churchill	44.0	65.7%	47.0	67.1%
Nor-Man	1,441	70.1%	1,547	66.2%
Burntwood	904	50.6%	1,198	56.3%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Fort Garry S	2,872	69.2%	3,222	63.8%
Fort Garry N	3,042	71.6%	3,571	69.2%
Assiniboine South	4,036	71.0%	4,335	66.2%
St. Vital S	2,878	73.0%	3,761	67.2%
St. Vital N	3,448	72.7%	3,111	67.4%
St. Boniface E	2,925	68.9%	3,482	64.2%
St. Boniface W	1,928	71.2%	1,850	68.3%
Transcona	2,556	70.7%	2,662	66.2%
River Heights W	3,942	70.6%	3,948	65.7%
River Heights E	2,356	71.0%	2,171	66.2%
River East N	649	65.0%	784	59.9%
River East E	2,102	70.0%	2,431	65.4%
River East W	6,072	73.6%	5,935	69.3%
River East S	1,219	67.5%	1,039	61.2%
St. James-Assiniboia W	4,350	72.8%	4,650	70.2%
St. James-Assiniboia E	3,843	74.8%	3,484	71.6%
Seven Oaks N	472	70.9%	533	67.2%
Seven Oaks W	1,546	65.7%	1,866	60.5%
Seven Oaks E	4,121	73.2%	3,925	67.8%
Inkster W	723	60.3%	882	55.4%
Inkster E	1,108	68.7%	1,009	64.1%
Downtown W	2,674	66.1%	2,438	59.8%
Downtown E	2,486	67.0%	2,271	61.7%
Point Douglas N	2,119	67.2%	1,793	62.2%
Point Douglas S	1,080	65.4%	947	61.9%
Churchill	44.0	65.7%	47.0	67.1%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	71.8%	72.7%
Lowest Rural R1	62.5%	60.4%
R2	64.7%	62.6%
R3	64.4%	62.8%
R4	67.8%	65.6%
Highest Rural R5	70.0%	66.6%
Lowest Urban U1	70.5%	67.9%
U2	70.0%	66.9%
U3	70.8%	67.5%
U4	70.7%	67.1%
Highest Urban U5	69.6%	67.4%
linear trend rural T1		**<.0001**
linear trend rural T2		**0.0001**
compare rural trends over time		0.7476
linear trend urban T1		0.7856
linear trend urban T2		0.8481
compare urban trends over time		0.9522

bold trent = significant

Appendix Table 2.55: Pharmaceutical Use Rate

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	103,703	63.1%	111,328	61.5%
Winnipeg	455,310	68.3%	480,356	67.1%
Prairie Mountain	114,802	72.1%	119,838	72.8%
Interlake-Eastern	79,840	68.2%	84,384	69.0%
Northern	40,818	57.7%	42,977	57.8%
Manitoba	796,548	67.5%	841,016	66.7%
Former RHAs				
South Eastman	38,804	62.5%	42,270	59.6%
Central	64,899	63.5%	69,058	62.7%
Assiniboine	47,716	70.1%	48,829	70.5%
Brandon	36,720	74.2%	40,596	75.3%
Winnipeg	454,726	68.3%	479,711	67.1%
Interlake	53,148	69.2%	55,799	70.2%
North Eastman	26,692	66.3%	28,585	66.8%
Parkland	30,366	73.0%	30,413	73.1%
Churchill	584	62.2%	645	67.3%
Nor-Man	15,171	62.7%	15,657	62.5%
Burntwood	25,647	55.1%	27,320	55.5%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Fort Garry S	23,180	64.8%	26,001	61.5%
Fort Garry N	20,416	66.9%	21,920	66.7%
Assiniboine South	25,485	69.3%	25,578	69.9%
St. Vital S	24,009	67.8%	27,138	68.9%
St. Vital N	18,833	70.8%	18,927	69.8%
St. Boniface E	24,509	66.9%	27,781	66.9%
St. Boniface W	10,554	69.7%	10,730	70.2%
Transcona	22,962	68.9%	23,941	67.0%
River Heights W	24,266	68.8%	24,667	68.3%
River Heights E	14,154	69.4%	14,242	68.1%
River East N	6,654	65.3%	7,314	66.5%
River East E	19,461	68.5%	19,744	66.9%
River East W	27,068	70.7%	27,469	69.9%
River East S	11,888	67.5%	11,907	65.1%
St. James-Assiniboia W	22,607	70.9%	23,624	72.5%
St. James-Assiniboia E	18,386	69.4%	18,612	69.6%
Seven Oaks N	3,004	67.6%	3,387	66.9%
Seven Oaks W	15,131	65.9%	17,215	63.7%
Seven Oaks E	23,596	69.6%	25,969	67.9%
Inkster W	11,507	65.5%	12,250	62.1%
Inkster E	9,784	67.1%	9,901	64.2%
Downtown W	24,479	65.9%	26,446	63.2%
Downtown E	23,596	69.1%	24,164	66.4%
Point Douglas N	18,477	67.9%	19,283	65.3%
Point Douglas S	10,720	72.5%	11,501	69.0%
Churchill	584	62.2%	645	67.3%

Income Quintile	ADJUSTED percent	
	2006/07	2011/12
Income Unknown	65.4%	54.5%
Lowest Rural R1	66.1%	66.3%
R2	65.6%	64.2%
R3	66.0%	64.4%
R4	67.2%	65.9%
Highest Rural R5	67.5%	66.7%
Lowest Urban U1	71.3%	68.6%
U2	68.6%	66.8%
U3	68.3%	66.5%
U4	67.4%	65.7%
Highest Urban U5	66.3%	65.5%

linear trend rural T1	0.2741
linear trend rural T2	0.5488
compare rural trends over time	0.7251
linear trend urban T1	**0.0068**
linear trend urban T2	0.0641
compare urban trends over time	0.5386

bold trend = significant

Appendix Table 2.56: Number of Different Drug Types Dispensed

Regional Health Authority	Number observed per year 2006/07	CRUDE rate per resident 2006/07	Number observed per year 2011/12	CRUDE rate per resident 2011/12
Current RHAs				
Southern	372,268	3.59	405,128	3.64
Winnipeg	1,739,405	3.82	1,885,815	3.93
Western	496,715	4.33	543,990	4.54
Interlake-Eastern	324,453	4.06	361,210	4.28
Northern	159,400	3.91	180,604	4.21
Manitoba	3,106,338	3.90	3,391,940	4.03
Former RHAs				
South Eastman	137,130	3.53	148,445	3.51
Central	235,138	3.62	256,683	3.72
Assiniboine	200,354	4.20	215,286	4.41
Brandon	154,015	4.19	180,621	4.45
Winnipeg	1,737,157	3.82	1,882,904	3.93
Interlake	215,344	4.05	239,837	4.30
North Eastman	109,109	4.08	121,373	4.24
Parkland	142,346	4.69	148,083	4.87
Churchill	2,248	3.86	2,911	4.53
Nor-Man	59,263	3.91	67,234	4.30
Burntwood	100,137	3.91	113,370	4.16

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year 2006/07	CRUDE rate per resident 2006/07	Number observed per year 2011/12	CRUDE rate per resident 2011/12
Fort Garry S	81,181	3.51	93,391	3.59
Fort Garry N	72,378	3.54	81,517	3.72
Assiniboine South	96,014	3.76	100,150	3.92
St. Vital S	84,484	3.51	102,177	3.76
St. Vital N	75,485	4.01	76,738	4.06
St. Boniface E	85,123	3.47	100,059	3.60
St. Boniface W	43,690	4.15	45,229	4.21
Transcona	81,623	3.55	88,904	3.71
River Heights W	92,080	3.79	95,539	3.87
River Heights E	56,789	4.02	57,881	4.06
River East N	21,275	3.20	23,824	3.27
River East E	70,209	3.61	73,165	3.70
River East W	110,333	4.08	114,558	4.17
River East S	44,819	3.77	46,519	3.91
St. James-Assiniboia W	89,498	3.96	98,037	4.15
St. James-Assiniboia E	73,549	4.00	76,341	4.10
Seven Oaks N	11,682	3.88	13,064	3.85
Seven Oaks W	54,715	3.61	63,489	3.69
Seven Oaks E	94,508	4.00	104,759	4.04
Inkster W	37,503	3.26	41,159	3.37
Inkster E	39,485	4.03	41,248	4.16
Downtown W	90,808	3.72	99,751	3.78
Downtown E	102,534	4.35	107,508	4.45
Point Douglas N	73,880	4.00	78,717	4.09
Point Douglas S	53,512	4.99	59,180	5.13
Churchill	2,248	3.86	2,911	4.53

Income Quintile	ADJUSTED rate per resident 2006/07	ADJUSTED rate per resident 2011/12
Income Unknown	4.87	5.10
Lowest Rural R1	4.47	4.63
R2	3.96	4.02
R3	3.96	4.05
R4	3.86	3.89
Highest Rural R5	3.79	3.82
Lowest Urban U1	4.37	4.47
U2	3.87	3.99
U3	3.77	3.82
U4	3.65	3.71
Highest Urban U5	3.57	3.57
linear trend rural T1		**<.0001**
linear trend rural T2		**<.0001**
compare rural trends over time		0.1025
linear trend urban T1		**<.0001**
linear trend urban T2		**<.0001**
compare urban trends over time		0.0886

bold trend = significant

Appendix Table 2.57: Antidepressant Prescription Follow-Up

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	1,937	53.1%	1,644	48.0%
Winnipeg	8,970	59.4%	8,148	57.0%
Prairie Mountain	2,384	57.7%	2,556	57.1%
Interlake-Eastern	1,435	56.6%	1,264	51.6%
Northern	462	41.6%	382	36.1%
Manitoba	15,229	57.3%	14,027	54.5%
Former RHAs				
South Eastman	752	54.8%	679	47.4%
Central	1,185	52.1%	965	48.4%
Assiniboine	915	53.7%	920	52.7%
Brandon	993	64.1%	1,105	64.4%
Winnipeg	8,965	59.4%	8,144	57.0%
Interlake	873	54.4%	734	49.3%
North Eastman	562	60.4%	530	55.2%
Parkland	476	54.0%	531	52.5%
Churchill				
Nor-Man	252	52.4%	148	40.5%
Burntwood	210	33.3%	234	33.8%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	365	57.4%	392	57.4%
Fort Garry N	386	63.3%	326	56.7%
Assiniboine South	534	61.1%	448	60.1%
St. Vital S	400	57.2%	395	60.2%
St. Vital N	433	60.4%	360	58.2%
St. Boniface E	374	57.5%	357	53.4%
St. Boniface W	209	56.8%	205	60.5%
Transcona	467	56.5%	453	52.5%
River Heights W	567	60.4%	465	59.0%
River Heights E	311	56.8%	323	57.3%
River East N	125	56.6%	92.0	47.2%
River East E	374	58.1%	325	55.0%
River East W	498	58.5%	483	56.5%
River East S	245	55.1%	248	55.9%
St. James-Assiniboia W	457	57.3%	418	53.7%
St. James-Assiniboia E	481	63.9%	388	58.6%
Seven Oaks N	70.0	74.5%	74.0	63.2%
Seven Oaks W	221	59.4%	208	56.7%
Seven Oaks E	454	63.8%	400	57.2%
Inkster W	156	58.6%	149	61.8%
Inkster E	167	58.6%	175	55.6%
Downtown W	495	58.9%	427	55.5%
Downtown E	571	62.2%	474	60.3%
Point Douglas N	354	56.0%	353	56.3%
Point Douglas S	251	63.7%	206	60.4%
Churchill				

Income Quintile	CRUDE percent	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	73.3%	77.4%
Lowest Rural R1	49.9%	47.6%
R2	49.6%	46.4%
R3	54.8%	49.5%
R4	55.2%	49.4%
Highest Rural R5	54.6%	51.0%
Lowest Urban U1	61.8%	59.4%
U2	58.4%	56.8%
U3	61.1%	56.5%
U4	57.9%	58.3%
Highest Urban U5	57.5%	55.5%

linear trend rural T1	**0.0047**
linear trend rural T2	0.0590
compare rural trends over time	0.5454
linear trend urban T1	**0.0369**
linear trend urban T2	0.1454
compare urban trends over time	0.6916

bold trend = significant

Appendix Table 2.58: Asthma Care

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	1,879	63.0%	2,275	65.2%
Winnipeg	11,084	64.8%	12,690	64.2%
Prairie Mountain	2,332	63.6%	2,748	62.4%
Interlake-Eastern	1,772	62.4%	2,137	63.4%
Northern	1,024	66.8%	1,260	67.1%
Manitoba	18,120	64.3%	21,151	64.1%
Former RHAs				
South Eastman	659	62.4%	780	65.2%
Central	1,220	63.3%	1,495	65.3%
Assiniboine	954	66.3%	1,082	64.0%
Brandon	708	58.8%	931	61.8%
Winnipeg	11,060	64.8%	12,656	64.2%
Interlake	1,255	61.6%	1,436	61.3%
North Eastman	517	64.3%	701	68.1%
Parkland	670	65.4%	735	60.7%
Churchill	24.0	80.0%	34.0	82.9%
Nor-Man	355	66.4%	465	64.7%
Burntwood	669	67.1%	795	68.6%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Fort Garry S	502	68.9%	585	68.3%
Fort Garry N	407	69.7%	416	65.7%
Assiniboine South	498	68.4%	584	67.7%
St. Vital S	476	64.1%	570	65.4%
St. Vital N	420	60.3%	445	61.6%
St. Boniface E	495	62.2%	622	65.0%
St. Boniface W	238	56.3%	273	59.1%
Transcona	468	61.7%	578	65.0%
River Heights W	526	65.4%	598	67.7%
River Heights E	343	58.9%	408	64.1%
River East N	115	65.7%	122	65.2%
River East E	427	67.2%	426	62.4%
River East W	576	64.9%	676	62.9%
River East S	335	66.3%	427	65.9%
St. James-Assiniboia W	493	66.8%	602	67.0%
St. James-Assiniboia E	434	65.1%	491	64.4%
Seven Oaks N	62.0	62.6%	68.0	63.6%
Seven Oaks W	346	65.0%	375	63.1%
Seven Oaks E	553	66.5%	585	60.2%
Inkster W	257	65.1%	255	62.2%
Inkster E	366	64.1%	348	57.8%
Downtown W	657	63.8%	805	62.1%
Downtown E	836	63.6%	916	62.1%
Point Douglas N	627	63.8%	735	64.9%
Point Douglas S	603	69.9%	746	67.6%
Churchill	24.0	80.0%	34.0	82.9%

Income Quintile	CRUDE percent	
	2006/07	2011/12
Income Unknown	54.4%	59.5%
Lowest Rural R1	62.3%	61.9%
R2	64.4%	65.8%
R3	64.8%	65.0%
R4	64.6%	63.6%
Highest Rural R5	65.5%	66.7%
Lowest Urban U1	63.8%	63.4%
U2	63.3%	61.0%
U3	63.8%	64.9%
U4	65.6%	64.8%
Highest Urban U5	67.9%	68.4%
linear trend rural T1		0.2396
linear trend rural T2		0.1452
compare rural trends over time		0.9145
linear trend urban T1		**0.0156**
linear trend urban T2		**0.0006**
compare urban trends over time		0.5625

bold trend = significant

Appendix Table 2.59: Diabetes Care: Eye Examinations Among Residents Aged 19+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Current RHAs				
Southern	3,019	36.2%	4,297	42.4%
Winnipeg	14,215	33.2%	18,715	36.3%
Prairie Mountain	4,746	39.2%	5,795	41.2%
Interlake-Eastern	2,903	32.9%	4,061	37.8%
Northern	1,741	28.8%	2,511	33.0%
Manitoba	26,695	33.9%	35,513	37.5%
Former RHAs				
South Eastman	1,044	35.9%	1,454	40.5%
Central	1,975	36.4%	2,843	43.5%
Assiniboine	2,194	42.0%	2,571	43.0%
Brandon	1,345	40.9%	1,576	39.6%
Winnipeg	14,198	33.2%	18,665	36.2%
Interlake	1,892	33.2%	2,620	37.5%
North Eastman	1,011	32.4%	1,441	38.3%
Parkland	1,207	33.6%	1,648	40.2%
Churchill	17.0	19.5%	50.0	49.0%
Nor-Man	780	38.8%	981	40.4%
Burntwood	961	23.8%	1,530	29.6%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2006/07		2011/12	
Fort Garry S	677	35.2%	945	39.8%
Fort Garry N	572	36.3%	782	38.4%
Assiniboine South	626	33.5%	864	37.4%
St. Vital S	662	38.4%	1,023	41.2%
St. Vital N	709	37.6%	895	42.0%
St. Boniface E	712	36.9%	971	39.5%
St. Boniface W	320	30.7%	392	32.8%
Transcona	732	35.8%	953	39.4%
River Heights W	710	35.7%	884	39.6%
River Heights E	466	36.6%	517	37.1%
River East N	125	32.1%	215	43.0%
River East E	560	34.1%	778	38.7%
River East W	1,104	39.3%	1,284	39.6%
River East S	378	32.4%	434	32.9%
St. James-Assiniboia W	815	36.6%	1,046	40.3%
St. James-Assiniboia E	630	34.6%	747	37.8%
Seven Oaks N	84.0	28.8%	118.0	31.0%
Seven Oaks W	524	30.4%	781	34.1%
Seven Oaks E	869	32.6%	1,257	37.1%
Inkster W	327	29.9%	524	33.7%
Inkster E	323	28.3%	438	31.4%
Downtown W	655	26.7%	868	30.6%
Downtown E	715	25.8%	836	26.9%
Point Douglas N	580	29.2%	717	30.7%
Point Douglas S	323	24.0%	396	25.9%
Churchill	17.0	19.5%	50.0	49.0%

Income Quintile	CRUDE percent	
	2006/07	2011/12
Income Unknown	15.1%	20.1%
Lowest Rural R1	30.6%	35.6%
R2	37.5%	40.0%
R3	34.7%	40.8%
R4	37.0%	41.5%
Highest Rural R5	35.3%	40.3%
Lowest Urban U1	31.5%	31.8%
U2	32.9%	36.7%
U3	35.4%	39.1%
U4	36.4%	39.8%
Highest Urban U5	37.1%	39.5%

linear trend rural T1	**0.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	0.8869
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.2728

bold trend = significant

Appendix Table 2.60: Post-AMI Care: Beta-Blocker Prescribing Among Residents Aged 20+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Current RHAs				
Southern	748	81.7%	1,019	83.5%
Winnipeg	3,387	85.6%	4,037	85.9%
Prairie Mountain	1,087	83.3%	1,213	83.4%
Interlake-Eastern	681	83.4%	916	84.7%
Northern	289	76.9%	364	74.3%
Manitoba	6,207	84.0%	7,569	84.3%
Former RHAs				
South Eastman	231	80.2%	353	85.9%
Central	517	82.3%	666	82.3%
Assiniboine	438	83.7%	541	82.1%
Brandon	315	86.8%	267	87.8%
Winnipeg	3,385	85.5%	4,032	85.8%
Interlake	473	82.7%	624	85.1%
North Eastman	208	84.9%	292	83.7%
Parkland	334	79.7%	405	82.5%
Churchill				
Nor-Man	122	85.9%	141	81.5%
Burntwood	167	71.4%	223	70.3%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2002/03-2006/07		2007/08-2011/12	
Fort Garry S	133	88.1%	158	84.9%
Fort Garry N	105	80.8%	160	87.4%
Assiniboine South	183	88.0%	216	89.3%
St. Vital S	119	87.5%	186	86.1%
St. Vital N	152	88.4%	182	85.0%
St. Boniface E	127	92.0%	202	92.7%
St. Boniface W	78.0	86.7%	99.0	82.5%
Transcona	184	89.3%	177	87.6%
River Heights W	131	82.9%	226	87.9%
River Heights E	86.0	86.0%	117	86.0%
River East N	32.0	82.1%	45.0	78.9%
River East E	160	87.4%	153	84.1%
River East W	314	79.3%	283	81.1%
River East S	110	81.5%	107	85.6%
St. James-Assiniboia W	213	89.1%	245	87.2%
St. James-Assiniboia E	167	86.5%	206	89.2%
Seven Oaks N	21.0	80.8%	22.0	73.3%
Seven Oaks W	127	85.8%	140	83.8%
Seven Oaks E	259	85.8%	270	85.7%
Inkster W	67.0	88.2%	92.0	91.1%
Inkster E	82.0	84.5%	107	87.7%
Downtown W	140	85.4%	168	81.6%
Downtown E	149	87.1%	188	82.1%
Point Douglas N	163	81.5%	190	88.4%
Point Douglas S	83.0	83.8%	93.0	82.3%
Churchill				

Income Quintile	CRUDE percent	
	2002/03-2006/07	2007/08-2011/12
Income Unknown	73.2%	74.1%
Lowest Rural R1	77.0%	80.9%
R2	82.6%	80.8%
R3	83.4%	83.6%
R4	82.2%	83.7%
Highest Rural R5	85.6%	83.4%
Lowest Urban U1	82.0%	84.3%
U2	85.9%	86.0%
U3	87.9%	89.0%
U4	88.3%	85.3%
Highest Urban U5	86.7%	87.0%
linear trend rural T1		0.1628
linear trend rural T2		0.4693
compare rural trends over time		0.5651
linear trend urban T1		0.2635
linear trend urban T2		0.6171
compare urban trends over time		0.6139

bold trend = significant

Appendix Table 2.61: Benzodiazepine Prescribing for Community-Dwelling Residents Aged 75+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	2,090	22.6%	2,145	22.2%
Winnipeg	8,739	19.7%	9,133	19.7%
Prairie Mountain	3,260	23.4%	3,274	24.3%
Interlake-Eastern	1,132	16.6%	1,355	18.2%
Northern	174	13.4%	209	14.8%
Manitoba	15,424	20.3%	16,144	20.5%
Former RHAs				
South Eastman	650	23.3%	707	22.5%
Central	1,441	22.3%	1,438	22.0%
Assiniboine	1,472	22.2%	1,459	23.2%
Brandon	799	24.3%	849	25.0%
Winnipeg	8,739	19.7%	9,131	19.7%
Interlake	796	16.9%	968	19.0%
North Eastman	337	16.0%	387	16.6%
Parkland	989	24.8%	966	25.6%
Churchill	0.00	0.00%		
Nor-Man	119	15.2%	138	16.9%
Burntwood	55.5	10.7%	71.0	12.0%

blank cells = suppressed

Winnipeg Neighbourhood Cluster	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry S	326	19.0%	344	17.5%
Fort Garry N	388	17.4%	519	19.3%
Assiniboine South	533	20.8%	567	21.1%
St. Vital S	360	21.4%	528	22.4%
St. Vital N	521	20.7%	481	20.7%
St. Boniface E	306	18.5%	443	20.0%
St. Boniface W	438	28.8%	389	27.5%
Transcona	271	18.0%	297	17.6%
River Heights W	585	19.5%	598	19.8%
River Heights E	418	22.1%	378	22.4%
River East N	56.5	17.5%	63.0	15.6%
River East E	207	19.0%	265	18.8%
River East W	951	21.0%	1,033	21.2%
River East S	163	17.2%	131	16.4%
St. James-Assiniboia W	457	18.7%	611	20.2%
St. James-Assiniboia E	551	19.9%	497	19.5%
Seven Oaks N	41.0	17.7%	40.0	15.4%
Seven Oaks W	174	17.9%	194	16.7%
Seven Oaks E	680	22.5%	641	21.3%
Inkster W	56.0	11.1%	59.5	10.2%
Inkster E	114	14.4%	103	14.6%
Downtown W	338	15.8%	280	15.0%
Downtown E	370	19.6%	307	18.5%
Point Douglas N	330	18.3%	257	17.5%
Point Douglas S	109	15.7%	110	17.0%
Churchill	0.00	0.00%		

Income Quintile	CRUDE percent	
	2005/06-2006/07	2010/11-2011/12
Income Unknown	14.2%	18.5%
Lowest Rural R1	22.6%	23.1%
R2	21.9%	22.1%
R3	20.6%	21.2%
R4	19.8%	21.4%
Highest Rural R5	18.4%	18.2%
Lowest Urban U1	22.8%	22.9%
U2	19.7%	19.6%
U3	18.9%	19.2%
U4	18.0%	18.2%
Highest Urban U5	19.1%	19.3%

linear trend rural T1	**<.0001**
linear trend rural T2	**<.0001**
compare rural trends over time	0.9656
linear trend urban T1	**<.0001**
linear trend urban T2	**<.0001**
compare urban trends over time	0.7980

bold trend = significant

Appendix Table 2.62: Benzodiazepine Prescribing for Personal Care Home Residents 75+

Regional Health Authority	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Current RHAs				
Southern	231	39.6%	205	36.0%
Winnipeg	1,648	33.0%	1,430	27.3%
Prairie Mountain	897	45.9%	881	46.7%
Interlake-Eastern	191	23.9%	261	32.0%
Northern	10.5	34.4%	25.0	18.4%
Manitoba	3,154	34.9%	2,929	31.9%
Former RHAs				
South Eastman	145	41.5%	136	38.6%
Central	85.5	36.8%	68.5	31.6%
Assiniboine	411	47.2%	430	49.1%
Brandon	256	44.7%	300	50.4%
Winnipeg	1,648	33.0%	1,430	27.3%
Interlake	131	22.6%	193	32.2%
North Eastman	59.5	27.6%	68.0	31.3%
Parkland	231	44.8%	152	36.6%
Churchill				
Nor-Man			20.0	17.6%
Burntwood	10.0	33.9%	5.00	22.2%

Winnipeg Community Areas	Number observed per year	CRUDE percent	Number observed per year	CRUDE percent
	2005/06-2006/07		2010/11-2011/12	
Fort Garry	76.5	25.2%	117	27.3%
Assiniboine South	184	37.7%	127	24.6%
St. Vital	144	32.1%	149	25.4%
St. Boniface	89.5	30.1%	85.5	27.3%
Transcona	60.0	43.3%	55.5	40.4%
River Heights	124	29.7%	114	27.0%
River East	247	34.2%	182	22.9%
St. James-Assiniboia	162	32.8%	153	30.8%
Seven Oaks	233	40.4%	204	35.9%
Inkster	55.0	39.3%	43.0	32.7%
Downtown	136	24.2%	122	21.9%
Point Douglas	139	34.1%	80.0	27.0%
Churchill				

Rates by income quintile not applicable for PCH residents

blank cells = suppressed

APPENDIX 3: REGRESSION MODELS FOR READMISSION BY TYPE OF HOSPITAL EPISODE

Appendix Table 3.1: Logistic Regression: Probability of Readmission per Medical Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.02 (0.01–0.02)**	<0.0001
Number of Previous Hospitalizations in Year Before Index Episode	**1.24 (1.22–1.26)**	<0.0001
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	**2.26 (1.88–2.72)**	<0.0001
RUB 4	**2.96 (2.46–3.57)**	<0.0001
RUB 5	**3.28 (2.71–3.98)**	<0.0001
Discharge Disposition (ref = Discharged Home Without Support Services)		
Discharged Home With Support Services	**1.37 (1.27–1.48)**	<0.0001
Transferred to PCH/Chronic Care/Other Facility	**0.69 (0.61–0.77)**	<0.0001
Signed-Out Against Medical Advice/Did Not Return From A Pass	**1.73 (1.46–2.06)**	<0.0001
Income Quintile (ref = U5)		
R1 (lowest)	**1.50 (1.30–1.73)**	<0.0001
R2	**1.49 (1.29–1.72)**	<0.0001
R3	**1.31 (1.13–1.52)**	0.0004
R4	**1.30 (1.11–1.52)**	0.0009
R5 (highest)	**1.36 (1.15–1.61)**	0.0004
U1 (lowest)	1.02 (0.88–1.19)	0.7631
U2	1.15 (0.99–1.35)	0.0763
U3	1.01 (0.86–1.19)	0.9010
U4	1.02 (0.86–1.21)	0.8292
Income Unknown	1.20 (0.95–1.51)	0.1243
Age (Years)	**1.005 (1.004–1.007)**	<0.0001
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	**1.28 (1.19–1.39)**	<0.0001
LOS 2- Less Than ELOS	**1.19 (1.10–1.29)**	<0.0001
Admitted from the Emergency Department (ref = No)	**1.22 (1.13–1.30)**	<0.0001
Mental Illness Diagnoses in Index Episode (ref=No)	**0.87 (0.80–0.95)**	0.0016
Males (vs. Females)	1.03 (0.98–1.09)	0.2474
Discharged on a Friday (ref = No)	1.02 (0.95–1.10)	0.5434

* model fit statistic: C=0.684

† bolded values indicate that the factor effect is significant at p<0.05

Appendix Table 3.2: Logistic Regression: Probability of Readmission per Surgical Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.01 (0.01–0.02)**	<0.0001
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	**1.60 (1.25–2.06)**	0.0002
RUB 4	**2.54 (1.96–3.29)**	<0.0001
RUB 5	**3.54 (2.71–4.62)**	<0.0001
Number of Previous Hospitalizations in Year Before Index Episode	**1.17 (1.13–1.21)**	<0.0001
Admitted from the Emergency Department (ref = No)	**1.56 (1.40–1.74)**	<0.0001
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	**1.63 (1.43–1.86)**	<0.0001
LOS 2- Less Than ELOS	**1.60 (1.40–1.83)**	<0.0001
Discharge Disposition (ref = Discharged Home Without Support Services)		
Discharged Home With Support Services	**1.50 (1.29–1.74)**	<0.0001
Transferred to PCH/Chronic Care/Other Facility	**0.64 (0.51–0.81)**	0.0002
Signed-Out Against Medical Advice/Did Not Return From A Pass	**1.98 (1.16–3.39)**	0.0128
Income Quintile (ref = U5)		
R1 (lowest)	**1.48 (1.18–1.86)**	0.0008
R2	**1.39 (1.09–1.75)**	0.0068
R3	**1.40 (1.11–1.77)**	0.0048
R4	1.17 (0.91–1.50)	0.2346
R5 (highest)	1.16 (0.90–1.51)	0.2518
U1 (lowest)	1.14 (0.92–1.41)	0.2371
U2	0.96 (0.76–1.20)	0.7022
U3	1.09 (0.87–1.37)	0.4482
U4	1.00 (0.79–1.27)	0.9750
Income Unknown	1.21 (0.81–1.82)	0.3571
Discharged on a Friday (ref = No)	1.11 (0.98–1.26)	0.1033
Age (Years)	1.001 (0.998–1.004)	0.4547
Males (vs. Females)	0.99 (0.89–1.09)	0.7843
Mental Illness Diagnoses in Index Episode (ref=No)	1.02 (0.84–1.25)	0.8223

* model fit statistic: C=0.697

† bolded values indicate that the factor effect is significant at p<0.05

Appendix Table 3.3: Logistic Regression: Probability of Readmission per Mental Illness Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.04 (0.02–0.08)**	<0.0001
Number of Previous Hospitalizations in Year Before Index Episode	**1.30 (1.24–1.36)**	<0.0001
Discharge Disposition (ref = Discharged Home Without Support Services)		
Discharged Home With Support Services	1.22 (0.96–1.56)	0.1030
Transferred to PCH/Chronic Care/Other Facility	**0.61 (0.45–0.83)**	0.0016
Signed-Out Against Medical Advice/Did Not Return From A Pass	**2.15 (1.50–3.07)**	<0.0001
Admitted from the Emergency Department (ref = No)	**1.42 (1.16–1.75)**	0.0008
Income Quintile (ref = U5)		
R1 (lowest)	1.08 (0.67–1.74)	0.7613
R2	1.34 (0.82–2.18)	0.2426
R3	1.44 (0.88–2.34)	0.1441
R4	1.04 (0.61–1.77)	0.8745
R5 (highest)	1.38 (0.80–2.36)	0.2446
U1 (lowest)	1.17 (0.75–1.83)	0.4883
U2	0.91 (0.56–1.48)	0.6984
U3	1.07 (0.65–1.74)	0.7969
U4	0.91 (0.54–1.55)	0.7371
Income Unknown	1.11 (0.53–2.34)	0.7821
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	1.21 (0.73–2.01)	0.4505
RUB 4	1.31 (0.77–2.23)	0.3134
RUB 5	1.44 (0.82–2.52)	0.2006
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	0.89 (0.67–1.20)	0.4556
LOS 2- Less Than ELOS	1.01 (0.76–1.34)	0.9453
Age (Years)	1.003 (0.998–1.007)	0.2112
Discharged on a Friday (ref = No)	1.15 (0.92–1.42)	0.2169
Males (vs. Females)	0.92 (0.77–1.10)	0.3503

* model fit statistic: C=0.651

† bolded values indicate that the factor effect is significant at p<0.05

Appendix Table 3.4: Logistic Regression: Probability of Readmission per Obstetric Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.02 (0.01–0.03)**	<0.0001
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	**1.77 (1.49–2.11)**	<0.0001
LOS 2- Less Than ELOS	**3.18 (2.65–3.82)**	<0.0001
Number of Previous Hospitalizations in Year Before Index Episode	**1.41 (1.33–1.51)**	<0.0001
Admitted from the Emergency Department (ref = No)	**2.12 (1.73–2.60)**	<0.0001
Discharge Disposition (ref = Discharged Home Without Support Services)		
Discharged Home With Support Services	**3.30 (1.53–7.12)**	0.0024
Transferred to PCH/Chronic Care/Other Facility	**2.39 (1.15–4.98)**	0.0198
Signed-Out Against Medical Advice/Did Not Return From A Pass	**3.20 (2.03–5.04)**	<0.0001
Income Quintile (ref = U5)		
R1 (lowest)	**1.75 (1.18–2.60)**	0.0051
R2	1.26 (0.83–1.91)	0.2829
R3	**1.95 (1.31–2.92)**	0.0011
R4	1.51 (0.99–2.30)	0.0570
R5 (highest)	**1.68 (1.10–2.57)**	0.0164
U1 (lowest)	**1.74 (1.18–2.57)**	0.0050
U2	1.14 (0.75–1.73)	0.5505
U3	1.19 (0.77–1.83)	0.4285
U4	1.15 (0.74–1.78)	0.5451
Income Unknown	2.23 (0.84–5.93)	0.1080
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	**1.46 (1.16–1.82)**	0.0010
RUB 4 and RUB 5	**2.21 (1.53–3.21)**	<0.0001
Mental Illness Diagnoses in Index Episode (ref=No)	1.36 (0.76–2.44)	0.3008
Discharged on a Friday (ref = No)	1.08 (0.89–1.31)	0.4276
Age (Years)	1.00 (0.98–1.01)	0.4667

* model fit statistic: C=0.709

† bolded values indicate that the factor effect is significant at p<0.05

Appendix Table 3.5: Logistic Regression: Probability of Readmission per Live Birth Hospital Episode*, Manitoba, 2011/12

Covariates	Adjusted Odds Ratio † (95% Confidence Interval)	p-value
Intercept	**0.01 (0.01–0.02)**	<0.0001
Resource Utilization Band (RUB) (ref = 0-2)		
RUB 3	**1.99 (1.48–2.68)**	<0.0001
RUB 4 and RUB 5	**4.74 (1.93–11.64)**	0.0007
Discharged Home Without Support Services (ref = Yes)	**2.75 (1.65–4.59)**	0.0001
Income Quintile (ref = U5)		
R1 (lowest)	1.35 (0.81–2.26)	0.2558
R2	1.11 (0.63–1.96)	0.7288
R3	**1.69 (1.00–2.85)**	0.0498
R4	1.13 (0.63–2.01)	0.6832
R5 (highest)	1.15 (0.64–2.09)	0.6346
U1 (lowest)	1.52 (0.93–2.48)	0.0952
U2	1.18 (0.70–1.99)	0.5358
U3	1.25 (0.73–2.14)	0.4075
U4	1.27 (0.74–2.18)	0.3878
Income Unknown	2.75 (0.80–9.46)	0.1096
Males (vs. Females)	**1.25 (1.01–1.54)**	0.0377
Difference in Actual (LOS) vs. Expected Length of Stay (ELOS) (ref = LOS within ±1 of ELOS)		
LOS 2+ More Than ELOS	0.83 (0.60–1.16)	0.2778
LOS 2- Less Than ELOS	0.86 (0.57–1.30)	0.4842
Discharged on a Friday (ref = No)	1.16 (0.88–1.53)	0.2844

* model fit statistic: C=0.605

† bolded values indicate that the factor effect is significant at p<0.05

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