

Manitoba Centre for Health Policy

# The Health Status of Community-Dwelling Older Adults in Manitoba

Spring 2019



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

Members of MCHP consult extensively with government officials, healthcare administrators, and clinicians to develop a research agenda that is topical and relevant. This strength,

along with its rigorous academic standards, enables MCHP to contribute to the health policy process. MCHP undertakes several major research projects, such as this one, every year under contract to Manitoba Health, Seniors and Active Living. In addition, our researchers secure external funding by competing for research grants. We are widely published and internationally recognized. Further, our researchers collaborate with a number of highly respected scientists from Canada, the United States, Europe, and Australia.

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

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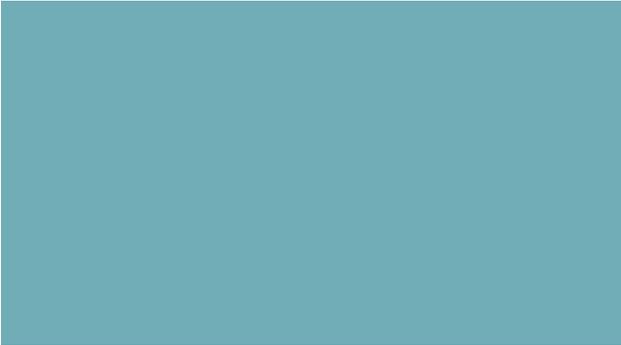
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# Executive Summary

The number of older adults in Manitoba is increasing due to both the aging of the 'baby boom' generation and increasing life expectancy. In short, there are more people in Manitoba who are living longer. This report provides information on the health status and healthcare use of older adults (age 65+) in Manitoba by age, sex, and region with a specific focus on community-dwelling older adults. The term 'community-dwelling' refers to individuals who live in a private residence, which could include a retirement community, but not a personal care home (PCH; referred to as a nursing home in most other Canadian provinces) or government-funded supportive housing.

We split our study into two five-year time periods (2005/06-2009/10 and 2010/11-2014/15). The community-dwelling older adults included in our study cohort were identified in the following manner:

- Individuals entered the study cohort either at the start of the study period (if they were already 65), or when they turned 65 (if that was during the study period); and
- Individuals exited the cohort at end of the study period, at the end of their health coverage (due to emigration from the province or being deceased), or upon their first admission to a PCH or other institution (i.e., when they were no longer community-dwelling).

The health and healthcare use data analyzed for this report are housed in the Manitoba Population Research Data Repository (referred to as the 'Repository' from this point forward) at the Manitoba Centre for Health Policy (MCHP). For each indicator, we calculated crude rates or percentages by age group (65-74, 75-84, 85+), by sex (male, female) and by health region. We used postal codes to determine what health region individuals belonged to. We also present results by zones for rural regions and by community area pairings for the city of Winnipeg.

The indicators we measured in this study are listed in Table E.1.

Table E.1: Indicators by Category

Category	Indicator
<b>Health Status</b>	Mortality Rates Cause of Death Expected Age in the Community Expected Disease-Free Community-Dwelling Years
<b>Healthcare Use</b>	Ambulatory Visit Rates Hospitalization Rates Hospital Days Emergency Department Visit Rates Specialist Visit Rates Ambulatory Consultation Visit Rates
<b>Chronic Physical Conditions and Acute Medical Events</b>	Chronic Obstructive Pulmonary Disease (COPD) Prevalence Diabetes Prevalence End Stage Kidney Disease (ESKD) Prevalence Hypertension Prevalence Ischemic Heart Disease Prevalence Acute Myocardial Infarction (AMI) Prevalence Stroke Prevalence Hip Fracture Rates
<b>Mental Health Conditions</b>	Dementia Prevalence Mood and Anxiety Disorders Prevalence Substance Use Disorder Prevalence
<b>Cancer</b>	Colorectal Cancer Rates Lung Cancer Rates Breast Cancer Rates Prostate Cancer Rates
<b>Surgical Interventions</b>	Coronary Angiogram Rates Percutaneous Coronary Intervention Rates Coronary Artery Bypass Graft Surgery Rates Hip Replacement Surgery Rates Knee Replacement Surgery Rates
<b>Prescription Drugs</b>	Number of Different Prescription Drugs Days' Supply of Prescription Drugs Most Common Drugs Dispensed Beers Drug Dispensing Prevalence Long-Acting Benzodiazepine Drug Dispensing Prevalence
<b>Prevention &amp; Screening</b>	Influenza Vaccination Prevalence Pneumococcal Vaccination Prevalence Breast Cancer Screening Prevalence Colorectal Cancer Screening Prevalence

Table E.1: Continued...

Category	Indicator
<b>Self-Reported Health Status</b>	Self-Perceived Health
	Self-Perceived Mental Health
	Self-Perceived Life Stress
	Self-Perceived Unmet Healthcare Need
	Self-Reported Instrumental Activities of Daily Living Impairment
	Self-Reported 'Need Help' with Activities of Daily Living
	Self-Reported Impact of Chronic Health Problem on Life
	Self-Reported Activity Limitations due to Chronic Condition
	Self-Reported Activity Limitations due to Pain or Discomfort
	Self-Rated Cognition
	Self-Rated Emotion
	Self-Rated Mobility
	Self-Reported Physical Activity (Leisure Time)
	Self-Reported Dental Care
<b>Social Determinants of Health</b>	Social Housing
	Income Assistance
	Victim of a Crime

## Results

We calculated the percentage of the population age 65+ for each of the regions. The largest percentages of older adult populations were found in Prairie Mountain Health and Interlake-Eastern Regional Health Authority (RHA), exceeding 15% of the population in both time periods. The smallest proportion was found in Northern Health Region, where the percentage of the population age 65+ was less than 7% in both time periods. In every region, the percentage increased from one time period to the next, indicating that the size of the older adult population is increasing faster than the younger population.

Family structure can play a major role in an older adult's life, particularly in providing informal support that maintains quality of life and allows individuals to remain in their homes rather than move to a PCH. In both time periods, the oldest age group (85+) was much less likely to be living with a spouse (~28%) than the younger age group (age 65-74; ~65%). When averaged over both time periods, approximately 26% of older adults had no known living children, and another 20% had only a single living child. The remaining ~50% of older Manitobans had two or more children. It should be noted here, however, that some of the older adult population, particularly those in the youngest age group, may also have been providing care for their own parents and/or their grandchildren.

The mortality rate for older adults more than doubled from one age group to the next (15/1000 person-years for adults age 65-74, 32/1000 person-years for adults age 75-84, and 76/1000 person-years for adults age 85+). From the earlier

to the later time period we examined, the mortality rate decreased significantly for both sexes in every age group, with one exception: the rate did not change for women age 85+ females.

Hospitalization rates increased with age, from ~12/100 person-years amongst the youngest age group (65-74) to more than 40/100 person-years for the oldest age group (85+). The two younger age groups saw a significant decrease in the rate of hospitalizations across time periods, while there was no change for the oldest age group.

The prevalence of diabetes and hypertension amongst older adults increased significantly for all three age groups and in every region of the province. On the other hand, heart attacks and strokes decreased significantly, although not for every age group and not in every region of the province. There was no increase in the incidence of colorectal, lung, breast or prostate cancer, and in fact, there were significant decreases in some age groups and regions (except for breast cancer incidence, which was stable over the study period). In regards to mental health, the biggest change was seen in the prevalence of mood and anxiety disorders (e.g., depression), which increased significantly in all age groups and regions, except in Northern Health Region, where it was significantly lower than in the rest of Manitoba and did not change over the course of the study.

This report also includes findings from the Manitoba portion of the Canadian Community Health Survey (CCHS), a national survey of health. These self-report data are an important gauge of the community's health status, because they tell us how Manitobans themselves feel about their health, not just what is recorded in the administrative data

based on physician diagnosis or interventions. There were two notable findings from the CCHS analyses. The first was that self-rated health improved from one time period to the next for the oldest age group, with more people stating that their health was 'very good' or 'excellent' in the more recent time period. The second was that self-rated cognition experienced a significant decline, with the percentage of people in the highest category ('able to remember most things, think clearly and solve day-to-day problems') decreasing over time for the two older age groups.

Finally, we examined several indicators reflecting the social determinants of health. There were large differences between regions on these indicators. For example, for the two older age groups, all rural areas had a much higher percentage of older adults living in social housing than in Winnipeg. The percentage of the older adults being reported as the victim of a crime was also different between regions, with very high prevalence in Northern Health

Region (about four times higher for the two younger age groups) compared to the rest of Manitoba. And although the overall percentages of older adults being reported as the victim of a crime declined over time for all age groups, they remained stable for older adults living in Northern Health Region.

To summarize, this is the first report to focus exclusively on community-dwelling older adults, providing a comprehensive picture of the physical and mental health status of this population. It provides an update to a previous MCHP report in by Menec et al. (2002) [1], which presented many health indicators for the entire older adult population, including those residing in institutions. In the current report, we found that the health of older Manitobans improved in some areas and declined in others. This detailed information provides an important basis for planning care delivery for the older adult population, which will continue to grow in size in the coming years.

# Chapter 1: Introduction & Background

The number of older adults in Manitoba is increasing due to both the aging of the 'baby boom' generation and increasing life expectancy. In short, there are more people who are living longer. Previous reports from the Manitoba Centre for Health Policy (MCHP) have noted this impending change to the Manitoba population. Doupe et al. (2011) pointed to projections from Statistics Canada, presented here in Figure 1.1, that

show a dramatic increase in the number of individuals over the age of 65 between 2009 and 2036 [2]. With this demographic shift in mind, the goal of this report is to provide a detailed look at the health status of older adults by age, sex, and region, with a particular focus on community-dwelling older adults. Healthcare system and social service planners require this information to address the future needs of this population.

**Figure 1.1: Past (1986-2007) and Projected (2009-2036) Number of Older Adults Living in Manitoba, Overall and by Sub-Groups (young-old; middle-old; old-old)**

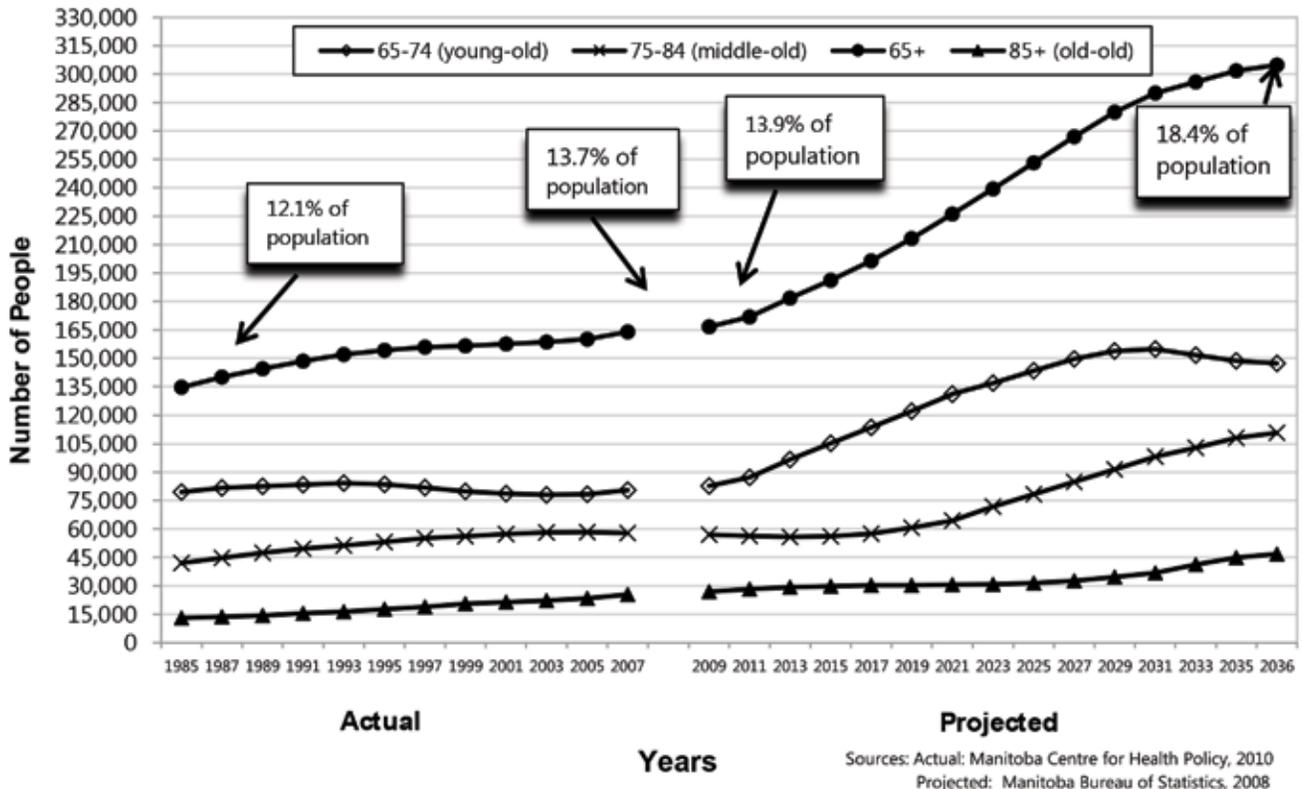


Figure reproduced with permission from Doupe et al. (2011)

The first step of planning healthcare for any population is to understand their current health status. This report presents information on a large number of health status, health service use, and social indicators. We also examine whether or not there have been changes in health status or health service use over the last decade by dividing our ten-year study period into two five-year periods and testing for differences from one period to the next.

Community-dwelling older adults are individuals who live in private residences, as opposed to personal care homes (PCH; referred to as nursing homes in most other Canadian provinces) or supportive housing facilities. Supportive housing in Manitoba refers to dwellings that are authorized by the government to provide extended services and receive financial support; they provide care to people who are still able to reside in the community,

but who are frail and/or cognitively impaired to the point where they can no longer manage in their own home, even with informal supports and home care services. Our definition of 'community-dwelling' also includes individuals living in retirement communities that are not funded or run by government agencies.

We chose to focus on community-dwelling older adults because health services are organized differently for people living in PCHs or supportive housing dwellings than for those living independently or in privately run communities. MCHP has produced a number of reports that focus on the continuum of care for older adults and the delivery of care in PCHs and supportive housing [2–4]. Together, these reports provide a comprehensive picture of the health and healthcare use of older adults [5].

# Chapter 2: Methods

## Data Sources

The health and healthcare use data analyzed for this report are housed in the Repository at MCHP. Detailed descriptions of the datasets can be found on MCHP's website ([http://umanitoba.ca/faculties/health\\_sciences/medicine/units/chs/departmental\\_units/mchp/resources/repository/descriptions.htm](http://umanitoba.ca/faculties/health_sciences/medicine/units/chs/departmental_units/mchp/resources/repository/descriptions.htm)). For the most part, the data in the Repository are considered 'administrative' data, recorded for the purposes of administering government programs like healthcare and social services. When first formed, the Repository initially held only datasets from Manitoba Health, Seniors and Active Living (MHSAL), but now has expanded to include education data, justice data, social assistance data, and social housing data, amongst other types. MCHP only receives new data once identifying information (e.g., names and addresses) has been removed. A scrambled version of the Personal Health Identification Number (PHIN) is attached to the records in the datasets. This essential piece of information allows data from individuals to be linked over time and across datasets.

The following datasets were used for this report:

- Canadian Community Health Survey;
- Drug Program Information Network;
- Emergency Department Information System;
- Hospital Abstracts;
- Long-Term Care Utilization History;
- Manitoba Cancer Registry;
- CancerCare Manitoba Breast Screening data;
- CancerCare Manitoba Colon Screening data;
- Manitoba Immunization Monitoring System;
- Medical Services (i.e., physician visit claims);
- Canada Census;
- Employment and Income Assistance Data (i.e., welfare);
- Tenant Management System (i.e., social housing data);
- Prosecutions Information Management System (PRISM);
- Manitoba Health Insurance Registry;
- Vital Statistics Mortality; and
- Diagnostic Services Manitoba (i.e., laboratory data from bloodwork, most often ordered by a physician).

Depending on the indicator, one or more of the datasets in this list contributed to the analyses.

All data management and analyses were conducted using SAS® statistical analysis software, version 9.4.

## Study Period

We examined the data over two recent five-year time periods: fiscal years (April 1st – March 31st) 2005/06-2009/10 and 2010/11-2014/15. This allowed us to compare results from one time period to the next to determine if the indicator rate or prevalence increased or decreased over time. Some indicators (e.g., frequent events like hospitalizations or ambulatory visits) required only a single year of data to provide reliable results, while other indicators required more years (up to five years of combined data) because events they described were less common. When only a single year was required, the most recent data within each study period were used. When more years were required, the data were taken from the most recent prior years. This ensured that the most recent and most relevant data are reported.

## Study Population

We defined ‘older adults’ as individuals who were 65+ years of age at some point during our study period (2005/06-2014/15). Only the period of time that a person was age 65+ was included in the rates or percentages we report. The individuals also had to be registered with MHSAL for health insurance coverage, and have resided in Manitoba while they met the other inclusion criteria.

The exclusion criteria were designed to remove individuals from the study or to restrict their inclusion to only part of a study period. We excluded all individuals who resided in a PCH or other care institution (e.g., long-term stay in hospital, or in a chronic care facility like Deer Lodge in Winnipeg). We also excluded individuals who were wards of the public trustee, since the address (and therefore health region) of these individuals is not available in the Repository.

The final study cohort can be described as follows:

- Individuals entered the study cohort either at the start of the study period (if they were already 65), or when they turned 65 (if that was during the study period); and
- Individuals exited the cohort at end of the study period, at the end of their health coverage (due to emigration from the province or being deceased), or upon their first admission to a PCH or other institution (i.e., when they were no longer community-dwelling).

## Regions

Because we analyzed the indicators by region of the province, we had to determine where each individual in the cohort lived. To assign each individual to one of five health regions (also called “regional health authorities” or RHAs) in Manitoba (Figure 2.1), we used their postal code from the beginning of each study period or at the time they first entered the cohort. We also present results by zone for the rural regions and by community area pairings for the city of Winnipeg (Figures 2.1 to 2.6). These boundaries correspond to the ones used by the RHAs to plan the delivery of care to their residents.

Figure 2.1: Manitoba Health Regions

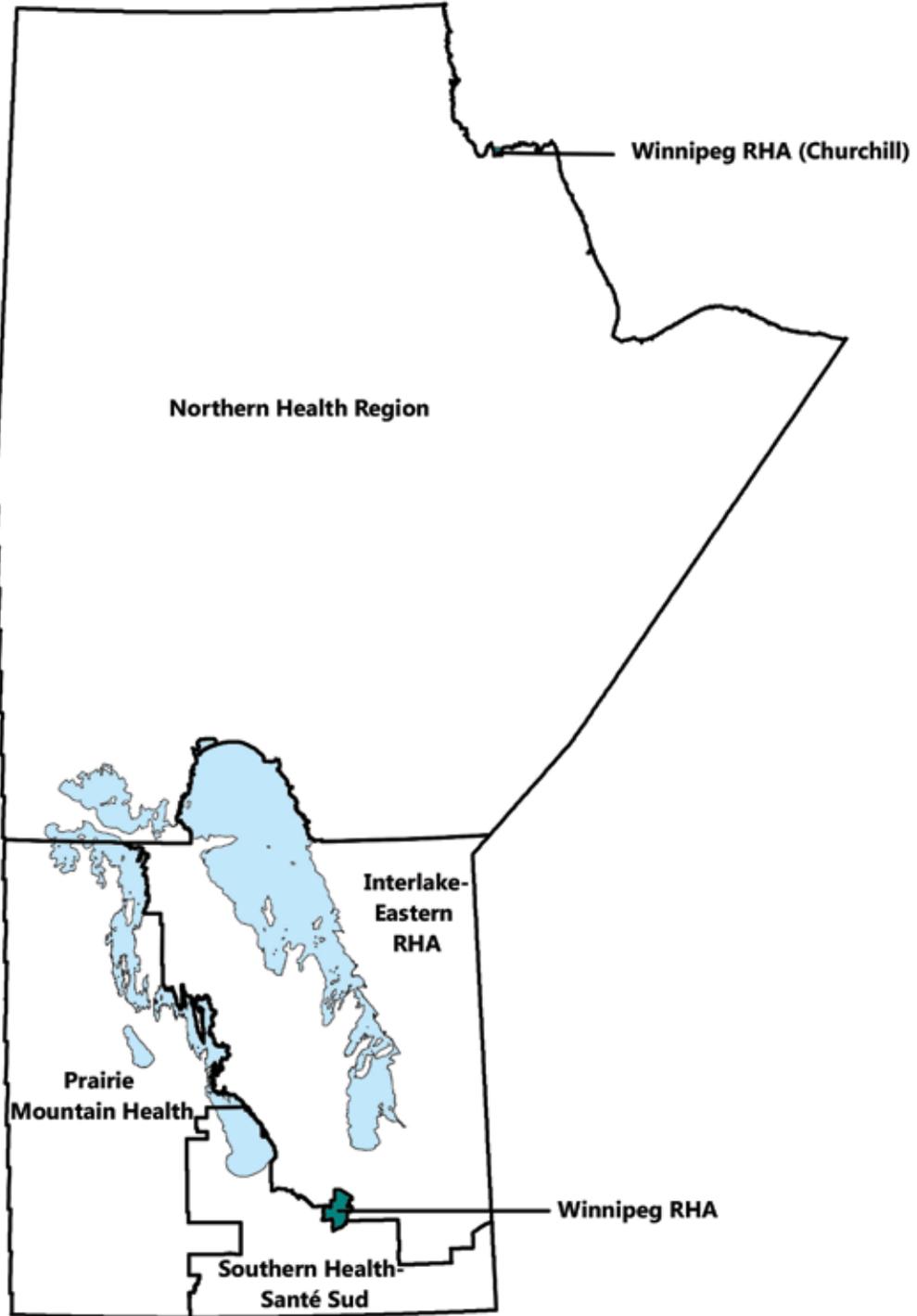


Figure 2.2: Southern Health-Santé Sud Zones

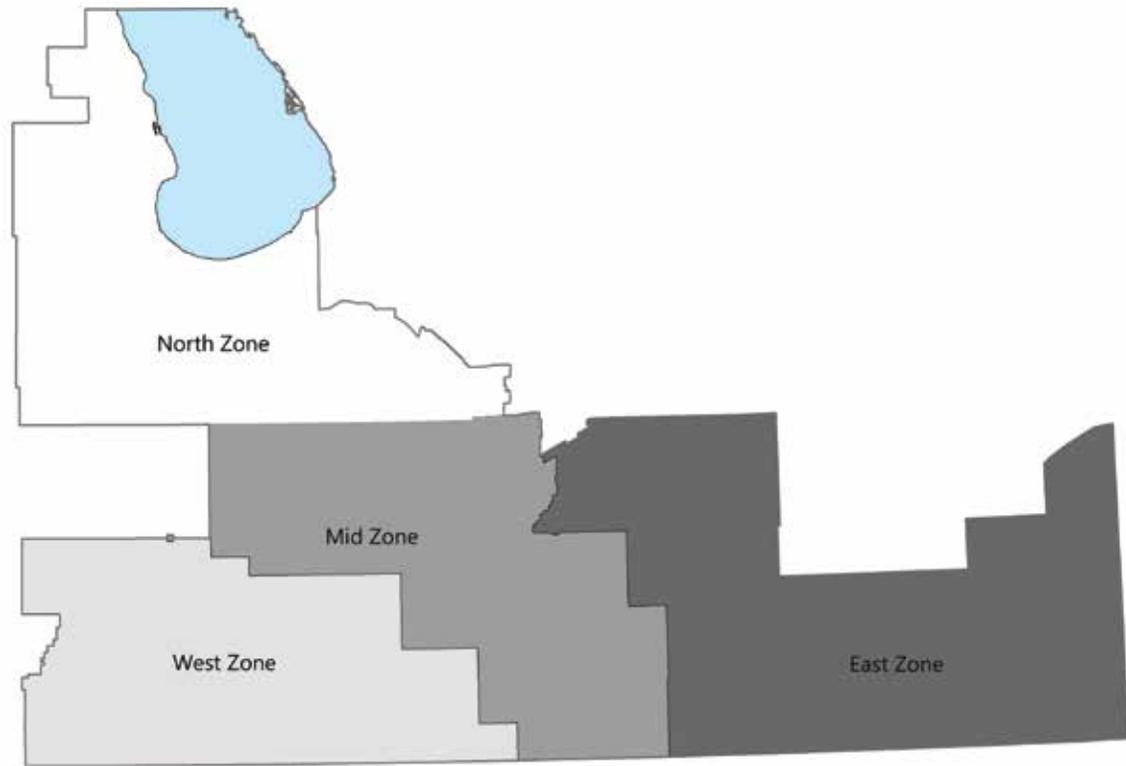


Figure 2.3: Winnipeg Regional Health Authority Community Areas

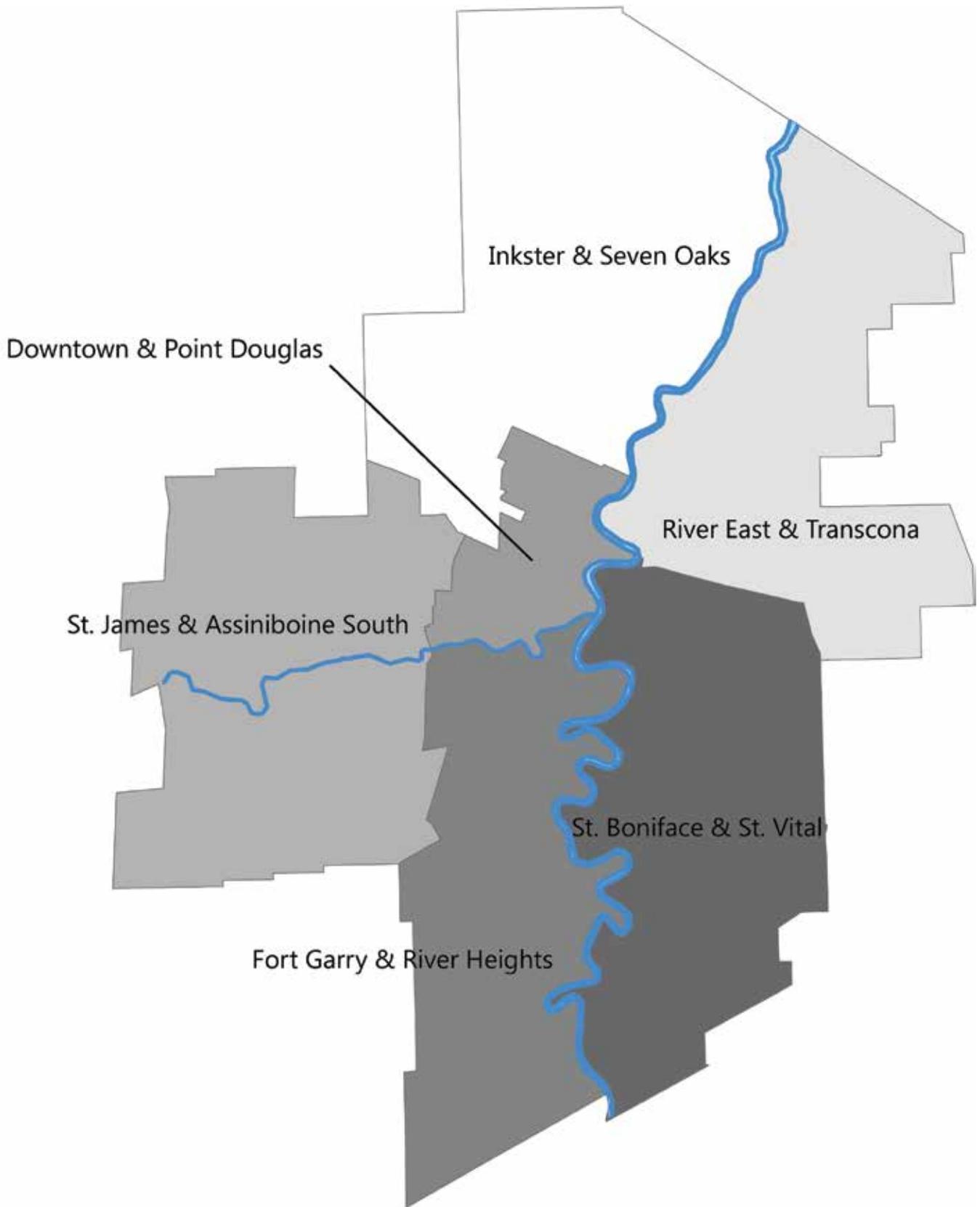


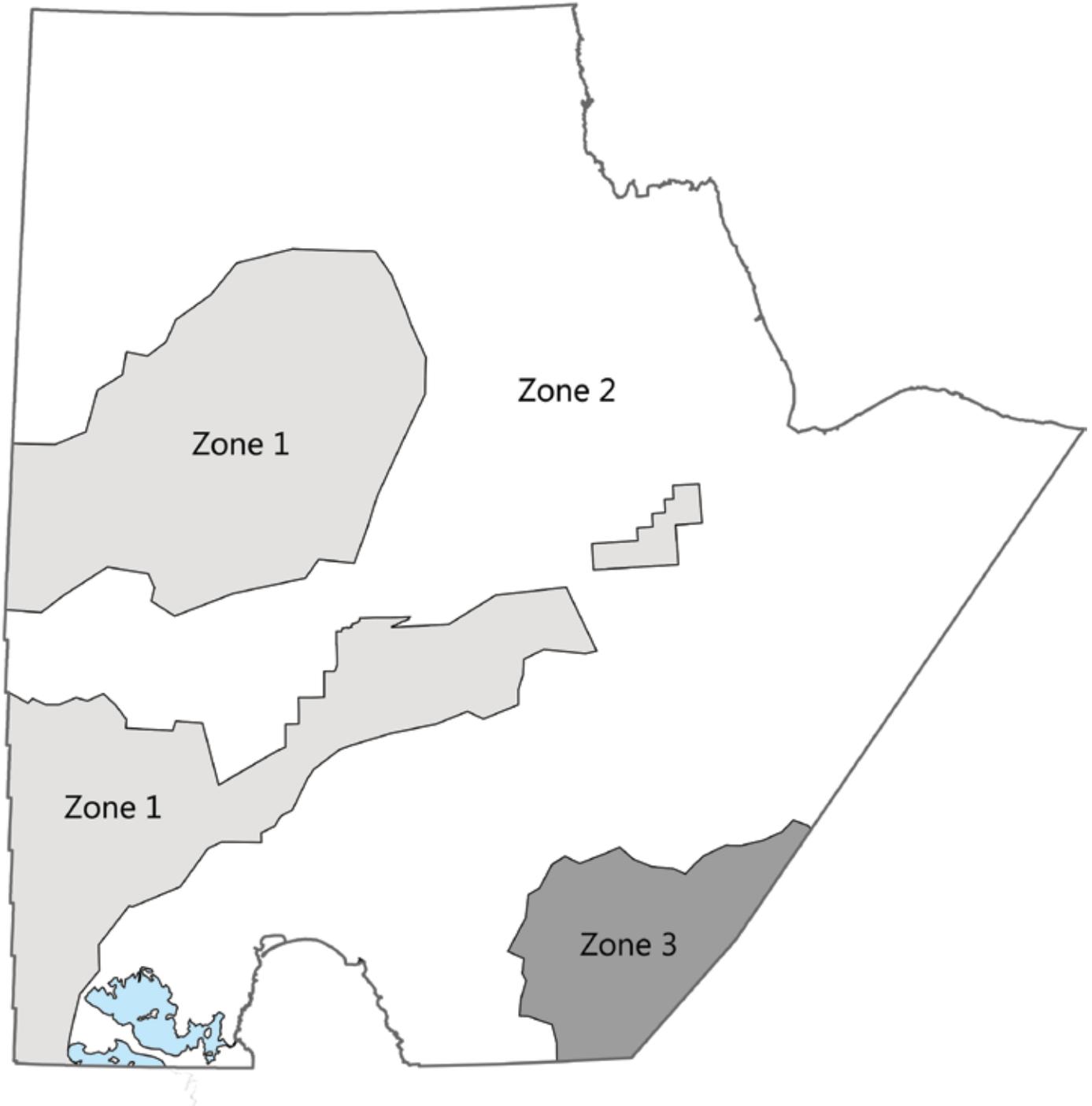
Figure 2.4: Prairie Mountain Health Zones



Figure 2.5: Interlake-Eastern Regional Health Authority Zones



Figure 2.6: Northern Health Region Zones



## Indicators

The indicators that we analyzed are listed in Table 2.1. Technical definitions of each indicator are provided in Appendix 1.

Table 2.1: Indicators by Category

Category	Indicator
<b>Health Status</b>	Mortality Rates Cause of Death Expected Age in the Community Expected Disease-Free Community-Dwelling Years
<b>Healthcare Use</b>	Ambulatory Visit Rates Hospitalization Rates Hospital Days Emergency Department Visit Rates Specialist Visit Rates Ambulatory Consultation Visit Rates
<b>Chronic Physical Conditions and Acute Medical Events</b>	Chronic Obstructive Pulmonary Disease (COPD) Prevalence Diabetes Prevalence End Stage Kidney Disease (ESKD) Prevalence Hypertension Prevalence Ischemic Heart Disease Prevalence Acute Myocardial Infarction (AMI) Prevalence Stroke Prevalence Hip Fracture Rates
<b>Mental Health Conditions</b>	Dementia Prevalence Mood and Anxiety Disorders Prevalence Substance Use Disorder Prevalence
<b>Cancer</b>	Colorectal Cancer Rates Lung Cancer Rates Breast Cancer Rates Prostate Cancer Rates
<b>Surgical Interventions</b>	Coronary Angiogram Rates Percutaneous Coronary Intervention Rates Coronary Artery Bypass Graft Surgery Rates Hip Replacement Surgery Rates Knee Replacement Surgery Rates
<b>Prescription Drugs</b>	Number of Different Prescription Drugs Days' Supply of Prescription Drugs Most Common Drugs Dispensed Beers Drug Dispensing Prevalence Long-Acting Benzodiazepine Drug Dispensing Prevalence
<b>Prevention &amp; Screening</b>	Influenza Vaccination Prevalence Pneumococcal Vaccination Prevalence Breast Cancer Screening Prevalence Colorectal Cancer Screening Prevalence

Table 2.1: Continued...

Category	Indicator
<b>Self-Reported Health Status</b>	Self-Perceived Health
	Self-Perceived Mental Health
	Self-Perceived Life Stress
	Self-Perceived Unmet Healthcare Need
	Self-Reported Instrumental Activities of Daily Living Impairment
	Self-Reported 'Need Help' with Activities of Daily Living
	Self-Reported Impact of Chronic Health Problem on Life
	Self-Reported Activity Limitations due to Chronic Condition
	Self-Reported Activity Limitations due to Pain or Discomfort
	Self-Rated Cognition
	Self-Rated Emotion
	Self-Rated Mobility
	Self-Reported Physical Activity (Leisure Time)
	Self-Reported Dental Care
<b>Social Determinants of Health</b>	Social Housing
	Income Assistance
	Victim of a Crime

## Organization of the Report

Chapter 3 situates community-dwelling older adults amongst the larger population of all older adults in Manitoba and the total population of Manitoba. We present the proportion of the total population in each region that is age 65 or older, population pyramids for both study time periods, and the proportion and rates of older adults that reside in PCHs. This information provides the context for assessing and evaluating the health status and healthcare needs of the study population.

The remaining chapters present the results of our analyses. Chapters 4-13 present the indicators in the same order as in Table 2.1. The indicators are reported as either rates or proportions (also referred to as prevalence or percentages).

## Rates and Prevalence

Rates tell us about a number of events over a period of time. For example, the rate of hospitalizations is calculated as the sum of all hospitalizations for a population (note that a person can be hospitalized more than once) divided by the total number of years that the population was at risk. This denominator takes into account the fact that somebody who dies or moves away from the province partway through the study period can no longer be hospitalized, or that somebody who turns 65 partway through the study period could not have contributed to the count of hospitalizations prior to their 65th birthday. That is, they are not at risk for the event to occur for all parts of the study period. Rates are reported as the number of events per person-year, or per hundred person-years, or even per thousand person-years.

The other way we report indicators is as a prevalence, or as the proportion or percentage of individuals affected. An example of this is the prevalence of diabetes, or the percentage of people who are diagnosed with diabetes in the province. With prevalence, each person can only be counted once, so the denominator is the total number of people, rather than the amount of time that they were at risk for some event, such as a hospitalization, to occur.

For almost every indicator, we report three key pieces of information, unless there are restrictions that prevent this (usually due to the indicator being quite rare):

1. **Crude rates/prevalence by age group (65-74, 75-84, 85+) and health region for both study time periods.** This information enables a direct comparison of the rates between age groups and regions. It also allows for a fairly straightforward assessment of the actual impact of the indicator on the population and the healthcare system. Multiplying the indicator rate for a region by the corresponding population for that region is an accurate estimate of the number of events or the number of individuals affected by the indicator. Alternatively, these crude rates are all presented in a series of tables available online in the Report Supplement at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>.
2. **Age- and sex-adjusted rates/proportions by income quintile.** Income quintile is determined by dividing the full Manitoba population into five equal subpopulations, ordered according to average household income. Household income data are

derived from the Canada census. The lowest income quintile (Q1) is the 20% of the population living in areas with the lowest average household income, and the highest income quintile (Q5) is the 20% of the population living in areas with the highest average household income, and so forth. Income is one of the major social determinants of health, and is an important lens through which to assess differences in health and to plan policies or interventions to improve health status. Because the income quintiles may not have had the same distribution across age groups or male/female sexes, they were age- and sex-adjusted to make the groups more comparable to each other.

- 3. Age- and sex-adjusted rates/proportions by zone or Winnipeg community area pairings.** The health regions are very large areas and planning within each region is usually based on smaller areas, where calculating age-specific rates is not always possible. Since the regions do not have the exact same age and sex distributions, the rates were age- and sex-adjusted to make the groups more comparable to each other, just as was done when creating income quintiles. Although the analyses by zone and community area pairings are included in the report for planning purposes, for the sake of brevity, these results are not discussed in the text.

For all indicators, we conducted a series of statistical tests to determine if the rates/proportions that are seen in one region are different from the overall Manitoba rate/proportion. This was done separately for each of the time periods. As well, for each region and for the overall Manitoba rate/proportion, we checked to see if the rate/proportion changed significantly from the first time period to the second time period. The same statistical tests were also conducted for the analyses by income quintile, testing to see if each income quintile was different from the overall Manitoba rate/proportion, and whether the rate/proportion changed over time within each income quintile. For all of these statistical tests, we used a p-value criterion of 0.01, which means that the likelihood of the results occurring by chance had to be less than one in one hundred. For the income quintile analysis specifically, we also tested to see if there was a linear trend across the income quintiles, or whether the rate tended to go up (or down) with each step in income quintile. For these tests, we used a p-value of 0.05, or a likelihood of less than one in twenty that the results could occur by chance.



# Chapter 3:

## Population & Cohort Descriptors

Prior to restricting the older adult population to our community-dwelling cohort, we first looked at the entire older adult population, i.e., all individuals registered with MHSAL who were 65+ in our study period. This was done to provide context for the community-dwelling older adult population as a subset of the total older adult population.

### Key Findings

- The size of the older adult population was not equal across regions of the province. There was a higher than average proportion of older adults in Prairie Mountain Health and Interlake-Eastern Regional Health Authority (RHA), and a lower than average proportion in Northern Health Region.
- Rural RHAs had a much higher percentage of the older adult population residing in personal care homes than Winnipeg did.
- Amongst community-dwelling older adults, the socioeconomic profile depended very much on how old they were and where they lived. In Winnipeg, for example, the youngest age group skewed toward higher incomes, while the older age groups skewed towards lower incomes.

### Region of Residence

Where do older adults in Manitoba reside? Similar to younger Manitobans, the greatest number of older adults lived in Winnipeg (see Table 3.1). The Northern Health Region had a smaller proportion of older adults than might be expected; this is made very clear in the population pyramids presented in the next part of this chapter.

**Table 3.1: Distribution of Population Age 65+ by Health Region**

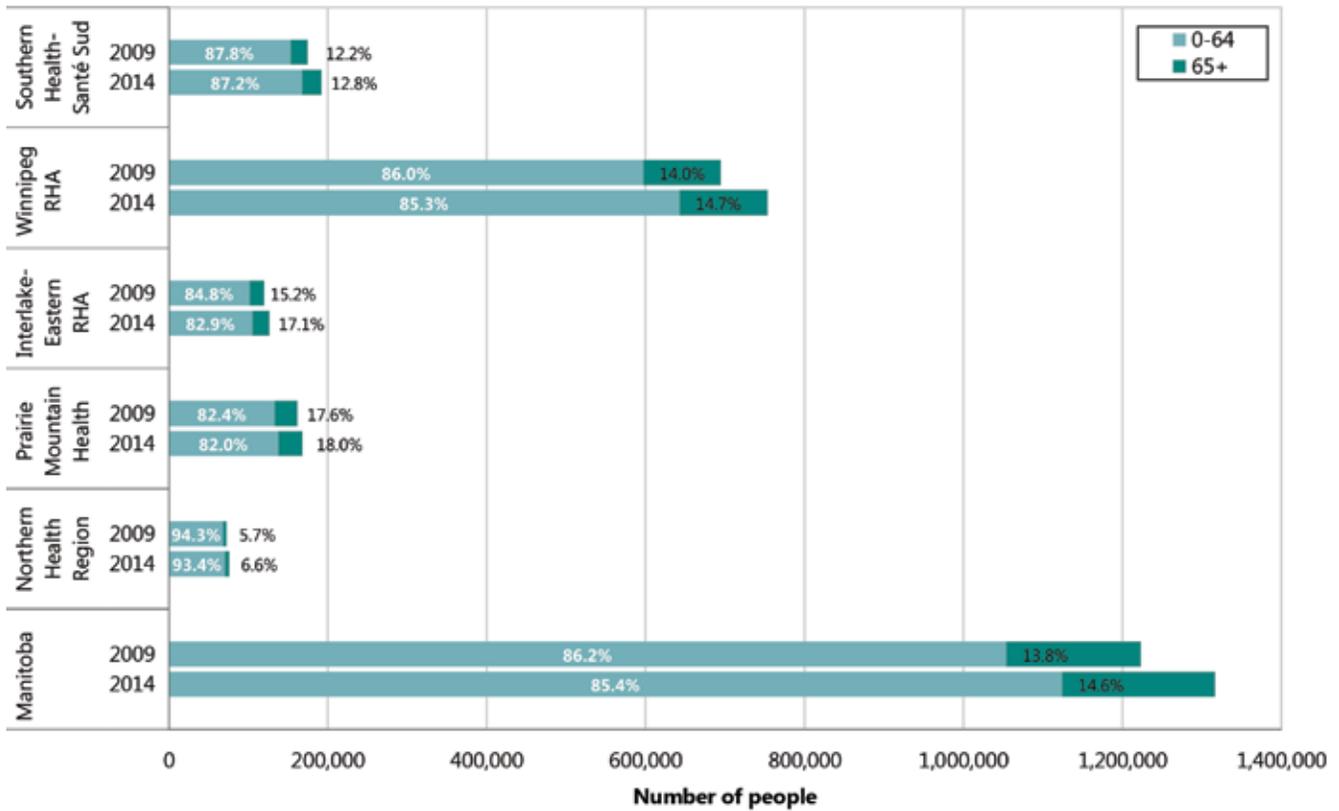
Health Region	2005/06-2009/10	2010/11-2014/15
<b>Southern Health-Santé Sud</b>	12.5	12.7
<b>Winnipeg RHA</b>	56.8	57.2
<b>Interlake-Eastern RHA</b>	11.0	11.3
<b>Prairie Mountain Health</b>	17.0	16.0
<b>Northern Health Region</b>	2.7	2.8

## Size of Older Adult Population

What proportion of the population does the older adult group make up? In Figure 3.1, we present the size of the population divided into those age 65+ and those younger than 65. We also include the percentages to provide an idea of the proportional representation of the older adult population in each region. The largest percentages of older adult populations were found in Prairie Mountain Health and Interlake-Eastern RHA, exceeding 15% of the population in both time periods.

The smallest proportion was found in Northern Health Region, where the percentage of the population age 65+ was less than 7% in both time periods. In every region, the percentage increased from one time period to the next, indicating that the size of the older adult population is increasing faster than the younger population. Prairie Mountain Health showed the smallest increase, suggesting the aging of the population may have already occurred, or that other factors are playing a role in slowing the relative growth of the older adult population over time.

Figure 3.1: Size of Older Adult Population by Health Region



## Population Pyramids

The total numbers and percentages of the population provide only a high-level look at older adults. Population pyramids for each of the regions provide a more refined way to describe the older adult population (Figures 3.2 to 3.7). Pyramids were created for the last year of each study period using the population found in the Manitoba Health Insurance Registry on December 31st, 2009 and December 31st, 2014. These population pyramids present the number of individuals in five-year age groups, ascending in order of age (i.e., the youngest individuals are at the bottom, and the oldest at the top). The left half of the graph is for the male population, and the right half is for the female population. Populations that are on average younger will have more individuals at the bottom of the pyramid (wider bars) and fewer at the top (narrower bars) so that the resulting figure resembles a pyramid. In order to illustrate the change over time, the 2014 pyramid (dark outline) is overlaid on the

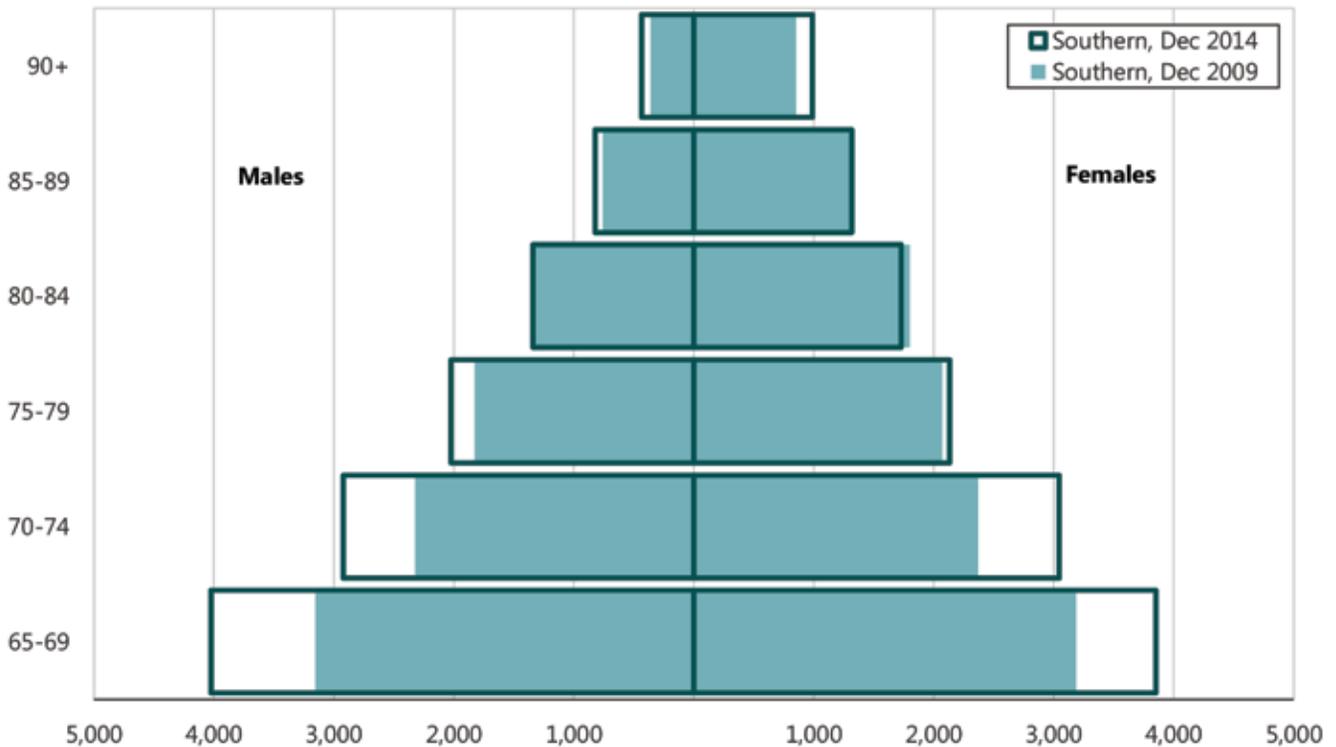
2009 pyramid (shading). For this report focusing on older adults, we present the pyramids only for those age 65+.

There are a few important findings to note here. First, in every region of Manitoba, the younger age groups (65-69, 70-74) saw the biggest increase in numbers. We should therefore expect that in the following ten years, a corresponding increase will occur in the 75-79 and 80-84 age groups. Second, the rural southern regions (Southern Health-Santé Sud, Prairie Mountain Health) had a larger proportion of individuals in the older age groups compared to the more northern regions (Northern Health Region, Interlake-Eastern RHA). Northern Health Region had a distinctly different profile from any other region, with a much smaller proportion of the older adult population in the older age groups. Third, while there was balance between the sexes in the younger ages, the number of women began to increase relative to men beginning in the 80-84 age group.

**Figure 3.2: Age Profile of Southern Health-Santé Sud for Individuals Age 65+, 2009 and 2014**

Population 2009: 21,391

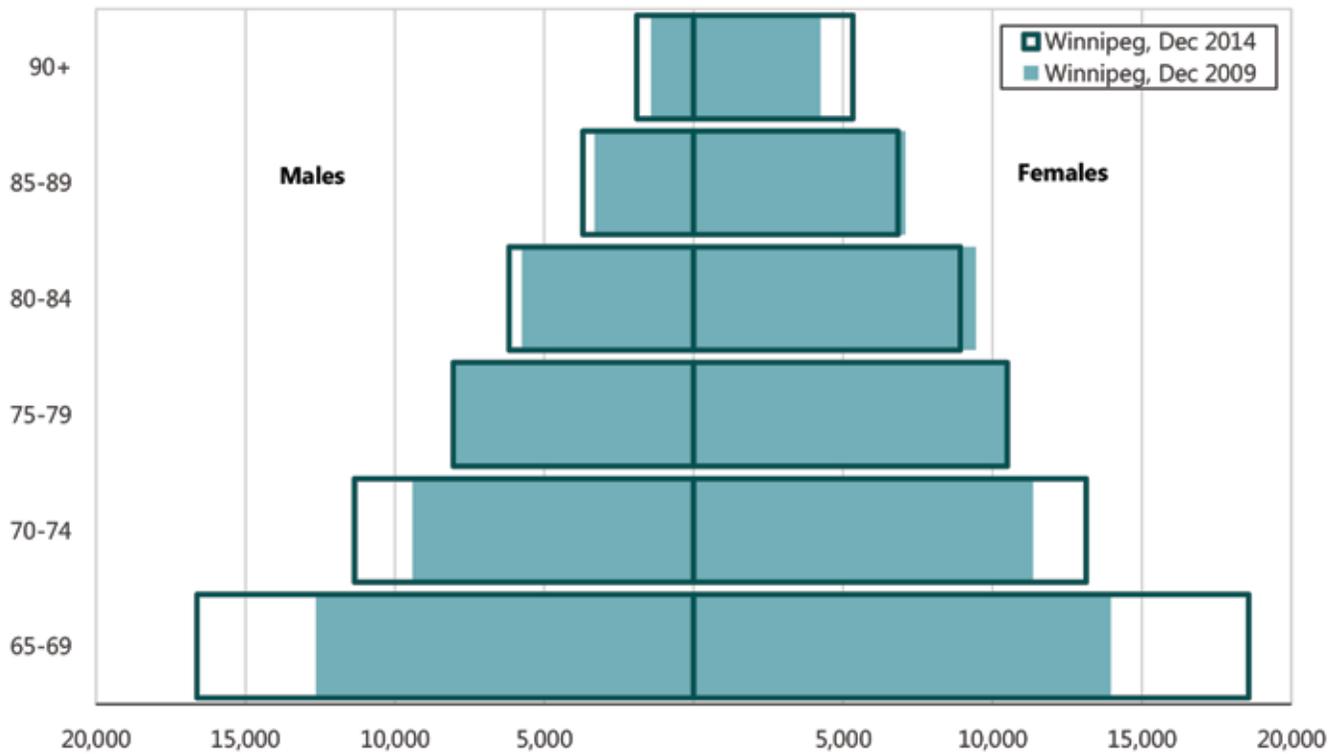
Population 2014: 24,628



**Figure 3.3: Age Profile of Winnipeg RHA for Individuals Age 65+, 2009 and 2014**

Population 2009: 97,222

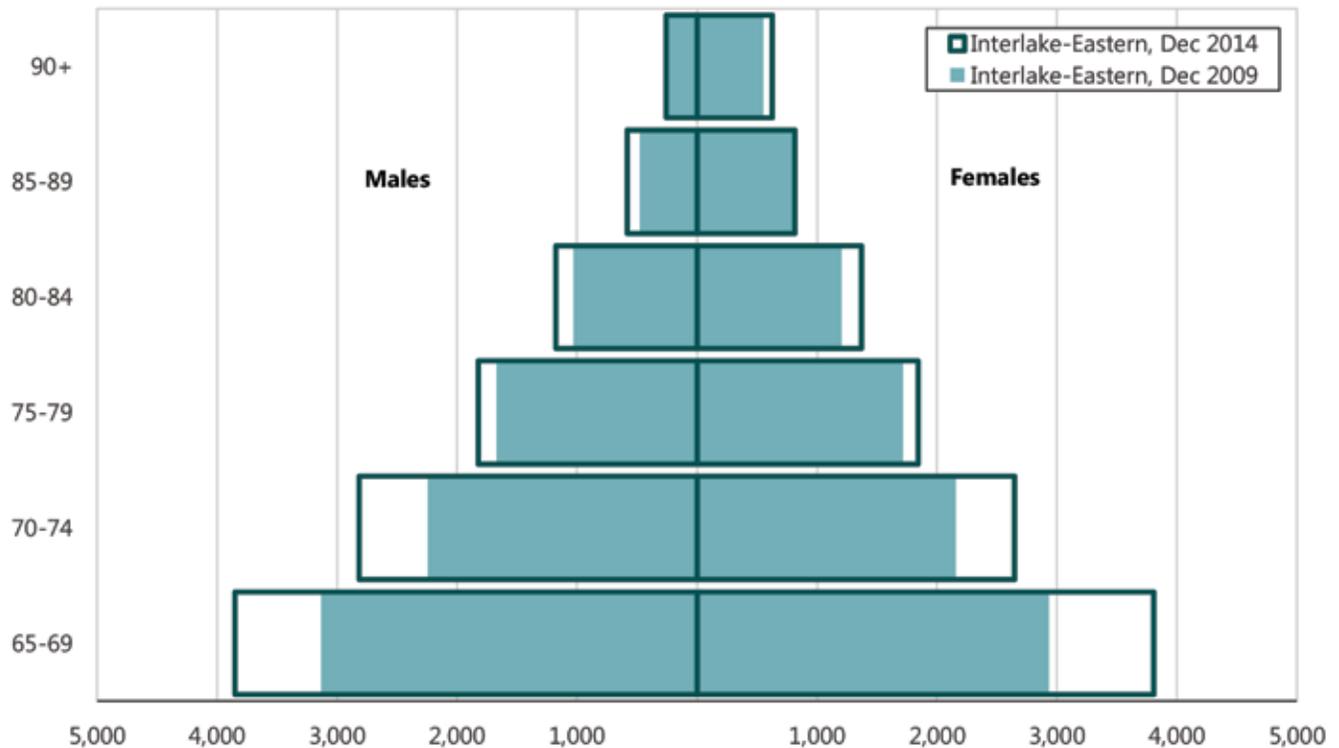
Population 2014: 111,110



**Figure 3.4: Age Profile of Interlake-Eastern RHA for Individuals Age 65+, 2009 and 2014**

Population 2009: 18,169

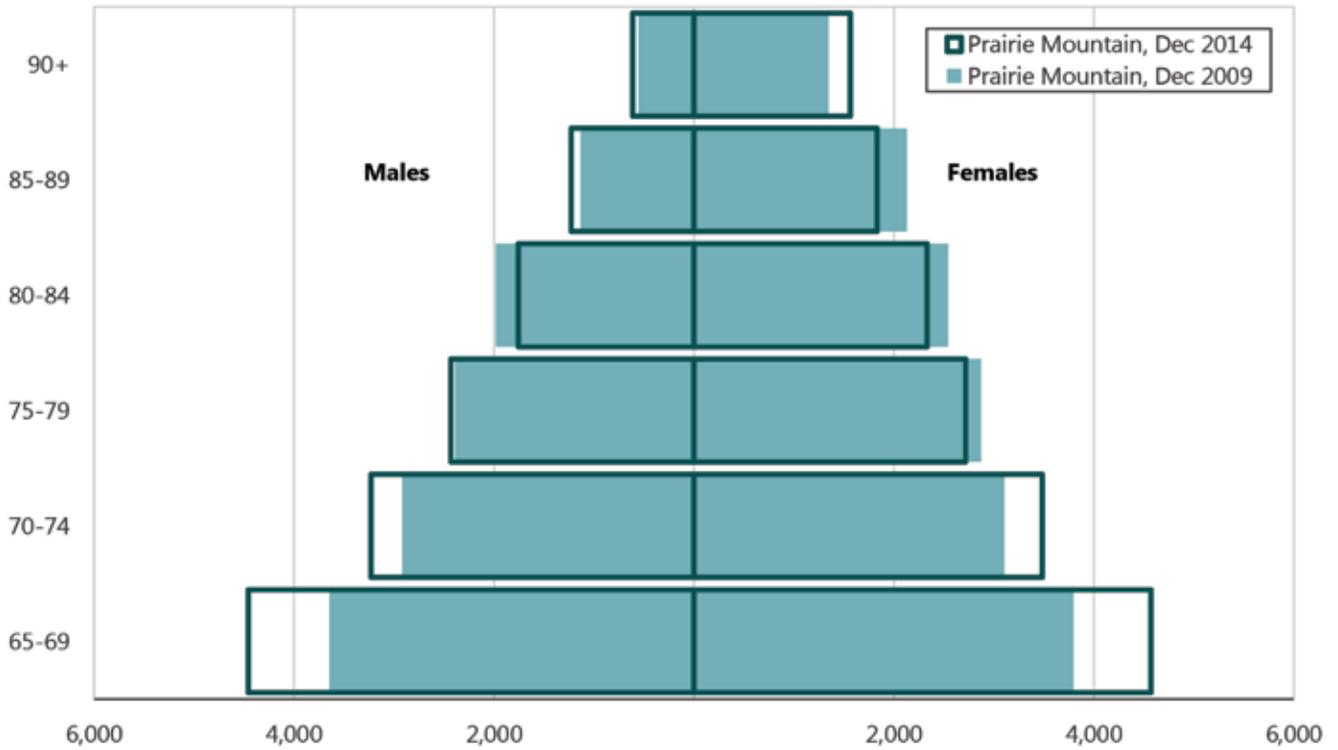
Population 2014: 21,604



**Figure 3.5: Age Profile of Prairie Mountain Health for Individuals Age 65+, 2009 and 2014**

Population 2009: 28,432

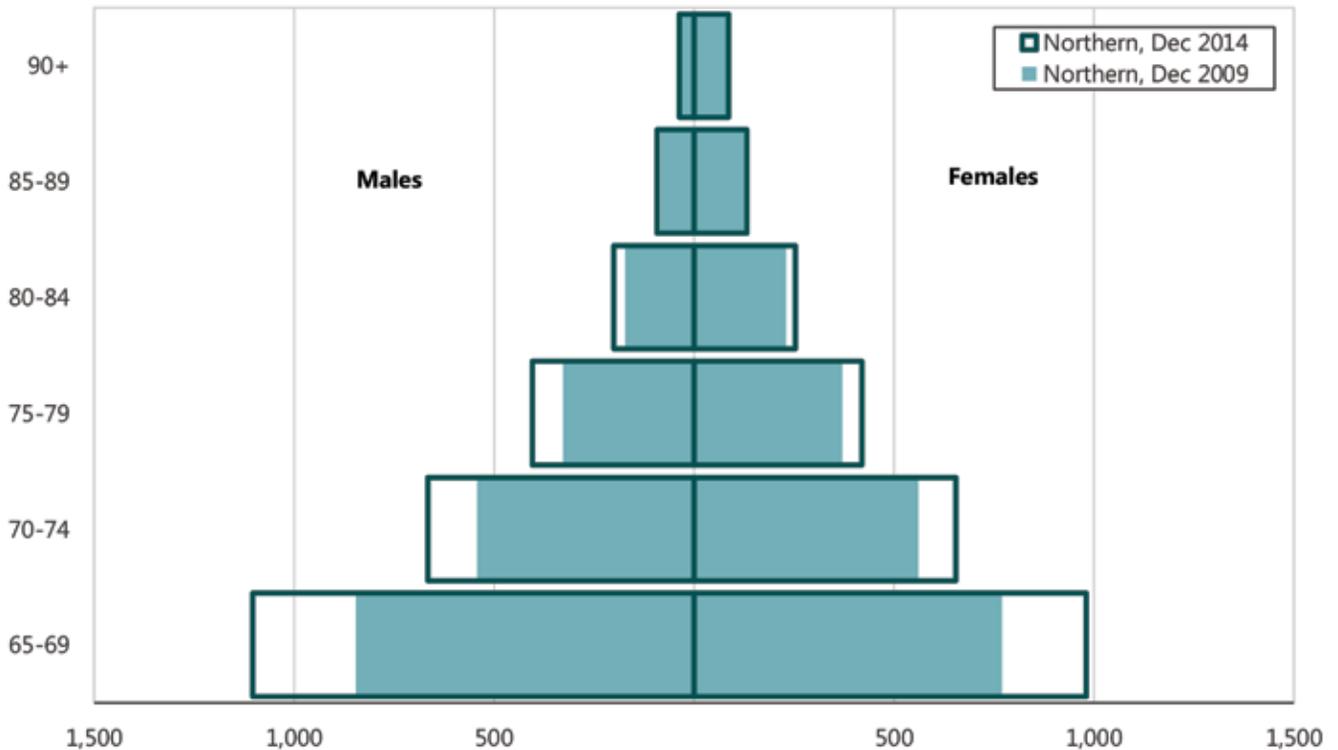
Population 2014: 30,226



**Figure 3.6: Age Profile of Northern Health Region for Individuals Age 65+, 2009 and 2014**

Population 2009: 4,160

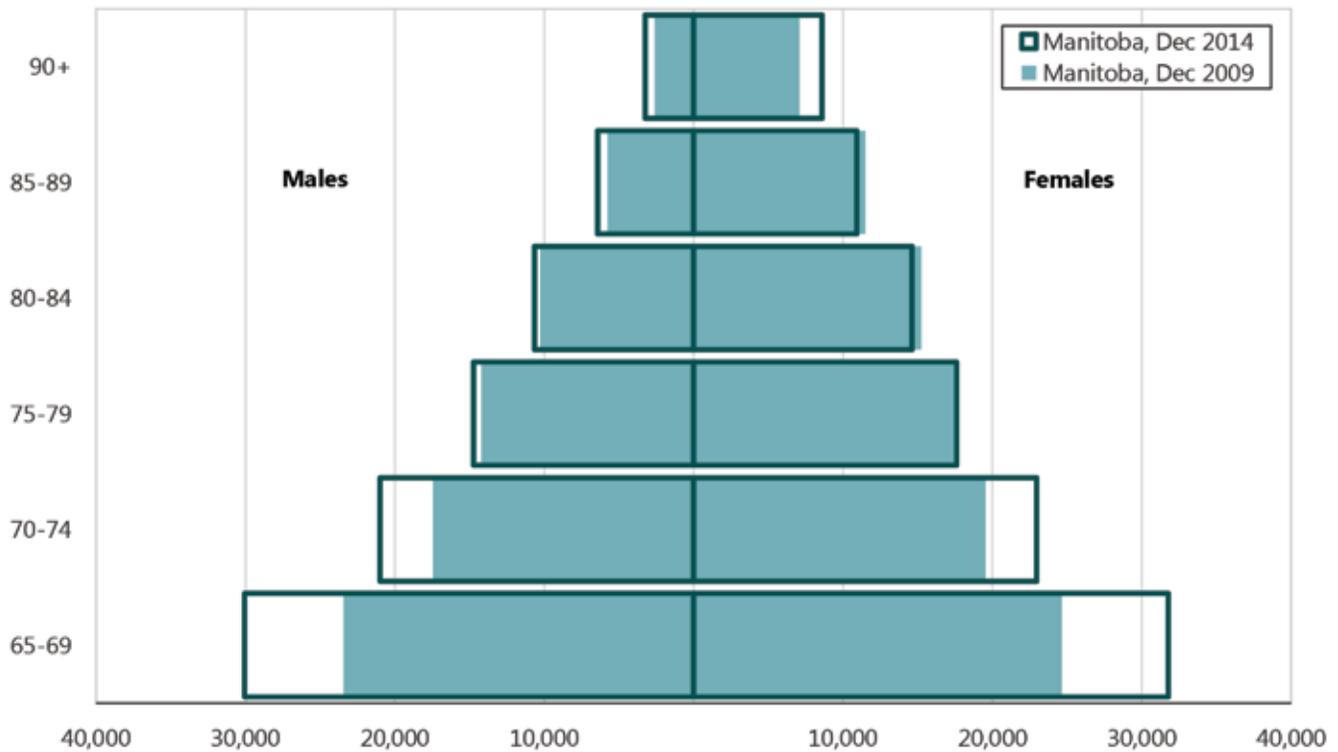
Population 2014: 5,026



**Figure 3.7: Age Profile of Manitoba for Individuals Age 65+, 2009 and 2014**

Population 2009: 169,374

Population 2014: 192,594



## Percent of Older Adult Population Living in a Personal Care Home (PCH)

The demographic details presented so far give us the big picture for the total older adult population. Here we begin to describe the cohort of individuals meeting our inclusion and exclusion criteria. This is the group of individuals that will contribute data for the indicators that follow. The main exclusion criterion that defines our cohort of community-dwelling older adults is that to be included individuals should not reside in a personal care home (PCH) or other institution. Table 3.2 provides the percentage of individuals in Manitoba residing in a PCH or other care facility. These percentages are presented for each region, by age group and sex.

As expected, the proportion of individuals who are residents in a PCH increased with age. Overall, less than 1% of the population age 65-69 resided in a PCH, but this included over 30% of males age 90+ and over 40% for females age 90+. There were also differences between the regions, especially in the oldest age group. During the second time period in the study, over half of females age 90+ in Prairie Mountain Health resided in a PCH, while only 40.1% in Winnipeg were in a PCH. For males in this age group, the numbers were 38.0% and 27.9%, respectively. The data in these tables tell us that the indicators we report apply to nearly all of the population in the younger age groups, but only about three out of five Manitobans in the oldest age groups. Importantly, the community-dwelling older adults were almost all healthier than individuals in a PCH, and the results should be interpreted with this in mind. In other words, if residents in a PCH had been included in our study, we can presume that most indicators might reflect a poorer health status than what we see in this report, which examines community-dwelling older adults only.

Table 3.2: Percent of Older Adults Living in a Personal Care Home by Health Region and Time Period

Ages	2009/10		2014/15	
	Males (%)	Females (%)	Males (%)	Females (%)
<b>Southern Health-Santé Sud</b>				
65-69	0.73%	0.35%	0.80%	0.62%
70-74	1.64%	1.60%	1.23%	1.38%
75-79	2.95%	4.25%	3.11%	3.28%
80-84	7.61%	8.16%	7.01%	8.50%
85-89	17.02%	17.69%	14.95%	16.35%
90+	34.44%	45.38%	34.79%	42.77%
<b>Winnipeg RHA</b>				
65-69	0.78%	0.77%	0.82%	0.60%
70-74	1.59%	1.62%	1.66%	1.61%
75-79	3.66%	3.95%	3.56%	3.62%
80-84	7.78%	9.22%	6.38%	8.66%
85-89	15.88%	19.37%	14.14%	18.05%
90+	28.59%	42.32%	27.89%	40.10%
<b>Interlake-Eastern RHA</b>				
65-69	0.45%	0.51%	0.29%	0.37%
70-74	1.20%	1.30%	1.07%	0.76%
75-79	2.33%	3.03%	2.63%	3.09%
80-84	6.41%	10.36%	6.13%	7.01%
85-89	13.18%	19.63%	14.09%	19.14%
90+	33.48%	43.22%	32.28%	43.22%
<b>Prairie Mountain Health</b>				
65-69	0.74%	1.11%	0.79%	1.01%
70-74	1.95%	1.71%	1.79%	1.69%
75-79	3.81%	4.52%	3.62%	3.97%
80-84	8.27%	11.64%	8.71%	10.89%
85-89	14.98%	21.12%	15.80%	22.90%
90+	39.46%	53.01%	38.01%	51.72%
<b>Northern Health Region</b>				
65-69	1.42%	0.78%	0.82%	0.71%
70-74	1.85%	2.14%	3.01%	1.53%
75-79	3.67%	6.20%	2.97%	5.25%
80-84	7.56%	14.78%	6.50%	7.11%
85-89	20.48%	17.91%	7.61%	15.91%
90+	20.00%	43.33%	35.14%	43.02%
<b>Manitoba</b>				
65-69	0.74%	0.73%	0.75%	0.64%
70-74	1.62%	1.61%	1.59%	1.49%
75-79	3.44%	4.04%	3.37%	3.62%
80-84	7.71%	9.67%	6.82%	8.81%
85-89	15.69%	19.50%	14.46%	18.72%
90+	32.04%	44.80%	31.16%	42.78%

## Community-Dwelling Older Adults

The following section describes only the community-dwelling older adult population of Manitoba. This is the cohort of individuals that contribute data to the analyses of the health and social indicators that make up the bulk of the report. The size of this cohort in each time period is presented by health region and age group in Table 3.3.

Table 3.3: Study Cohort Size by Health Region and Time Period

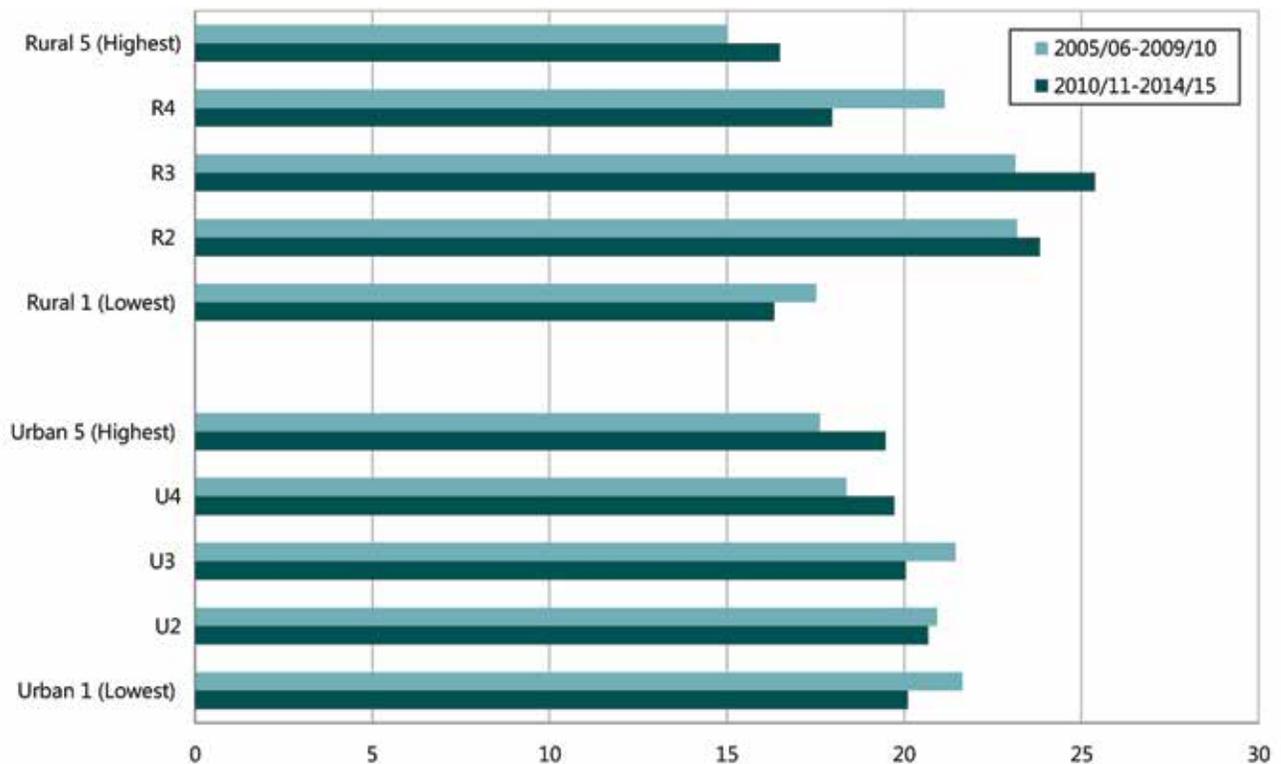
Health Region	2005/06-2009/10				2010/11-2014/15			
	65-74	75-84	85+	All Ages	65-74	75-84	85+	All Ages
<b>Southern Health-Santé Sud</b>	16,257	6,412	2,731	25,400	19,415	6,302	3,208	28,925
<b>Winnipeg RHA</b>	71,852	30,563	12,690	115,105	85,088	30,036	15,693	130,817
<b>Interlake-Eastern RHA</b>	15,751	4,698	1,859	22,308	18,649	5,135	2,028	25,812
<b>Prairie Mountain Health</b>	20,584	9,522	4,334	34,440	23,126	8,623	4,783	36,532
<b>Northern Health Region</b>	4,169	973	337	5,479	5,103	1,023	351	6,477
<b>Manitoba</b>	128,613	52,168	21,951	202,732	151,381	51,119	26,063	228,563

## Socioeconomic Status

The socioeconomic status of community-dwelling older adults is presented in Figure 3.8. Using postal codes, we assigned all individuals to an urban (Winnipeg and Brandon) or rural income quintile. Income quintiles divide the entire population of Manitoba evenly into five groups, with 20% of the population in each. In a completely equitable scenario, 20% of the older adult cohort would

be present in each of the income quintiles. What we see instead is that the community-dwelling older adult population was skewed slightly towards the lower income quintiles, with the exception of the lowest rural income quintile. Also of note is the increasing equity in the urban income quintiles over time, where the percentages for all five quintiles were closer to 20% in the more recent study period than in the early study period.

**Figure 3.8: Distribution of Population Age 65+ by Income Quintile, Manitoba**  
Percent of community-dwelling older adults in each time period



The distribution of the cohort across income quintiles is presented in Figures 3.9 to 3.13 for each of the regions and for three age groups (65-74, 75-84, 85+). There were substantial differences in the socioeconomic profiles between the age groups; these differences also depended on the health region. Among the two rural regions in the south of Manitoba, Southern Health-Santé Sud tended to have more individuals in the higher income quintiles, particularly for the 65-74 year old group (Figure 3.9), whereas in Prairie Mountain Health, the lower income quintiles outnumbered the higher income quintiles in all

age groups (Figure 3.12). In Winnipeg, the trend across income quintiles changed depending on the age group; for the 65-74 age group, the percentages decreased from the richest to the poorest income quintile, while in the older age groups, the percentages increased from the richest to the poorest (Figure 3.10). This suggests that the oldest Manitobans resided in poorer neighbourhoods than the younger Manitobans. Interestingly, there appears to be an increase in equity between the time periods, with the difference between income quintiles decreasing from the first time period to the second time period.

Figure 3.9: Percent of Community-Dwelling Older Adults by Income Quintile and Age Group, Southern Health-Santé Sud

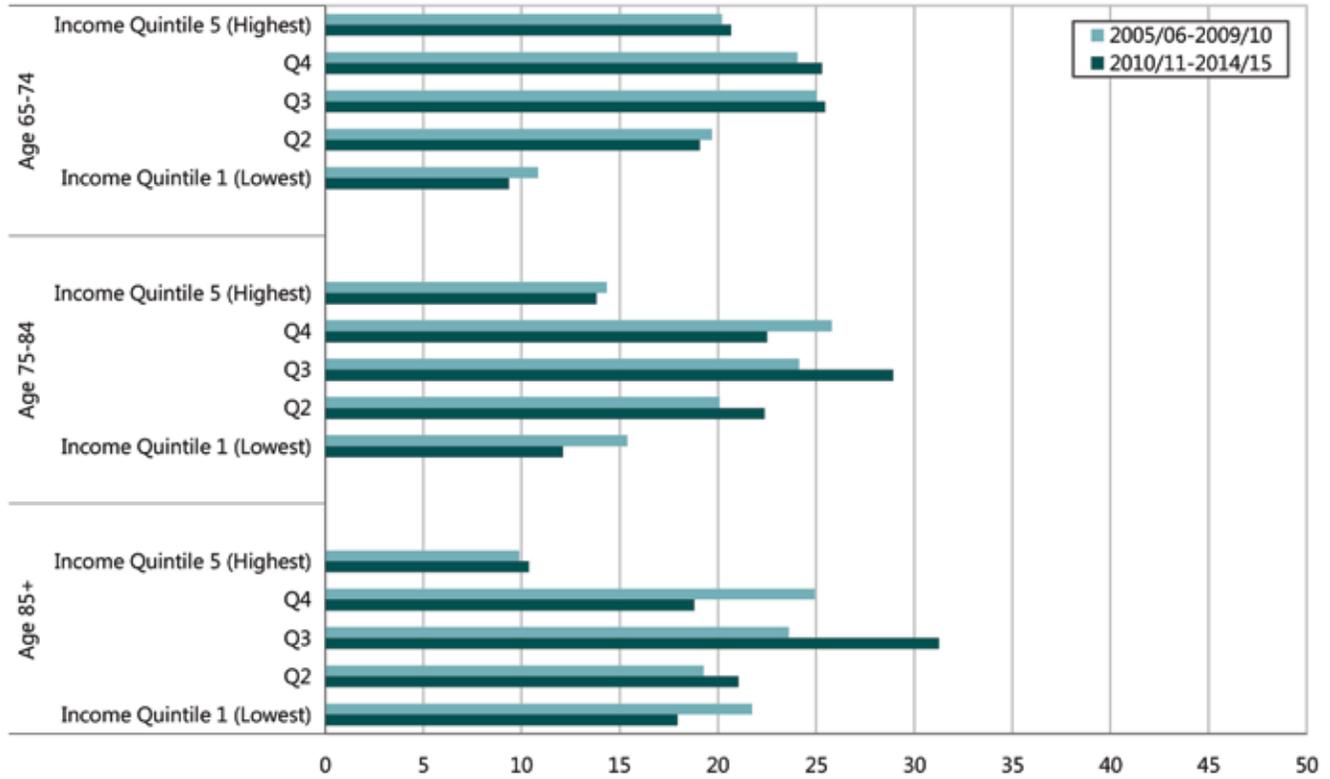


Figure 3.10: Percent of Community-Dwelling Older Adults by Income Quintile and Age Group, Winnipeg RHA

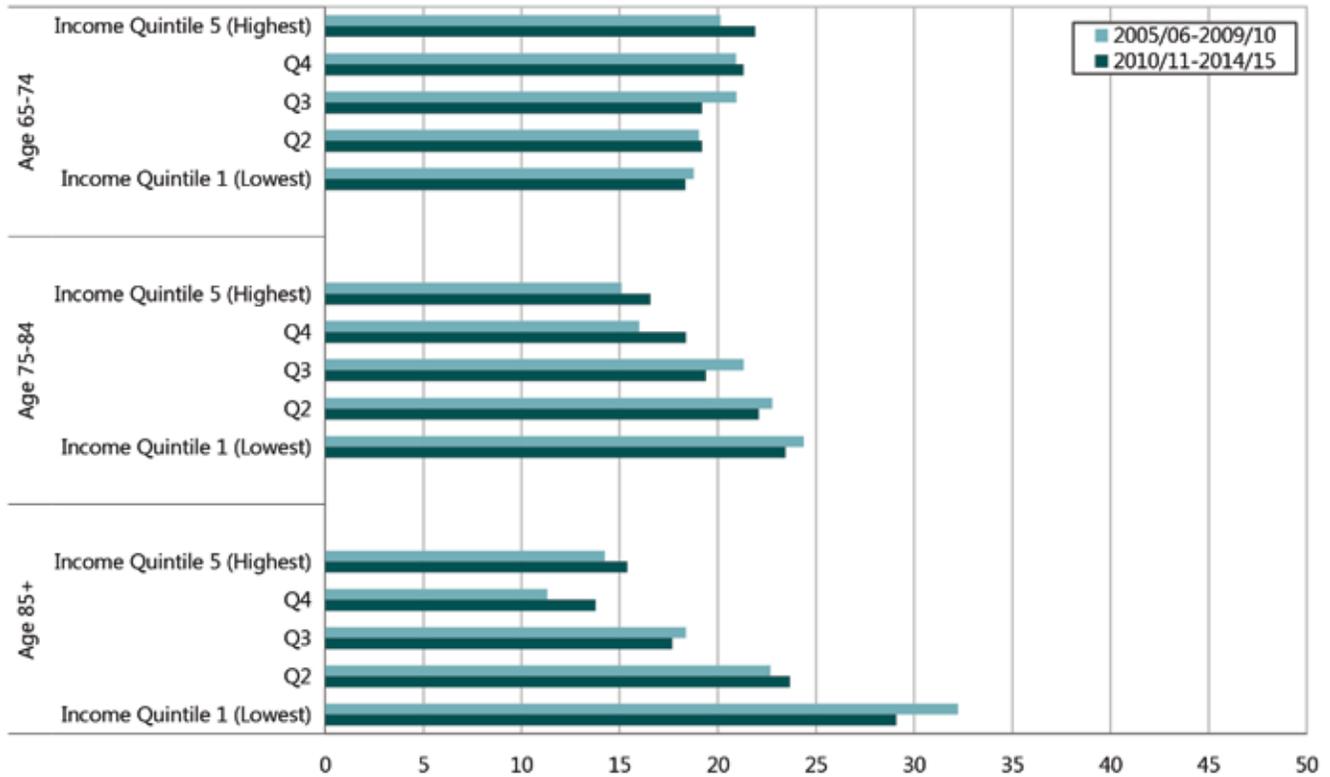


Figure 3.11: Percent of Community-Dwelling Older Adults by Income Quintile and Age Group, Interlake-Eastern RHA

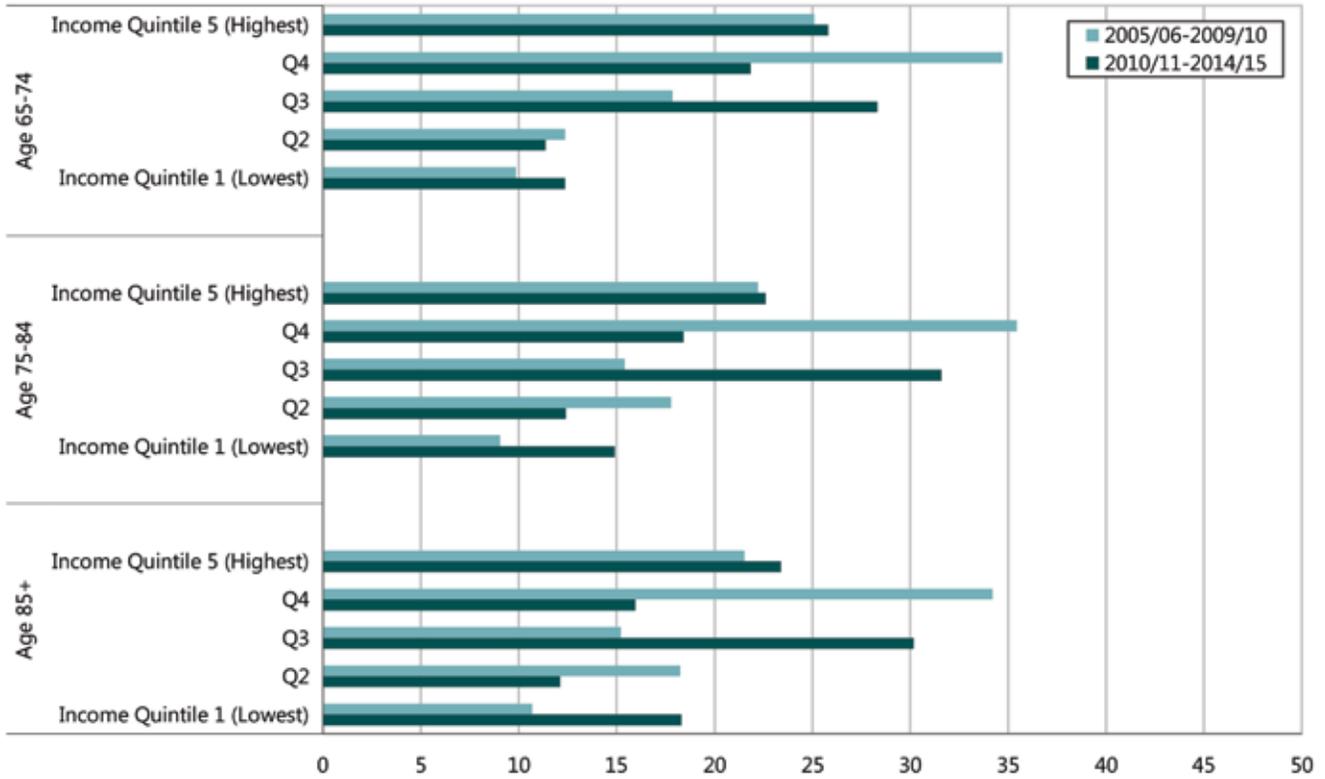


Figure 3.12: Percent of Community-Dwelling Older Adults by Income Quintile and Age Group, Prairie Mountain Health

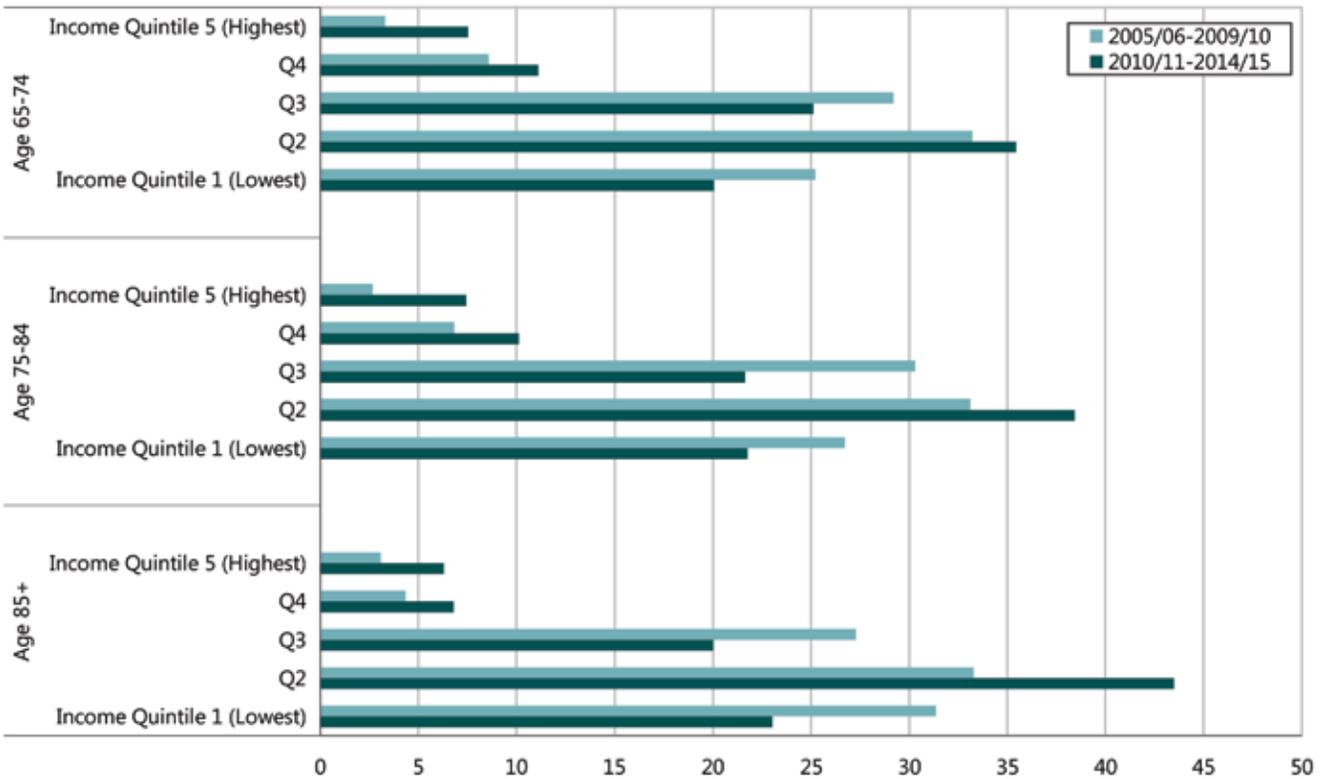
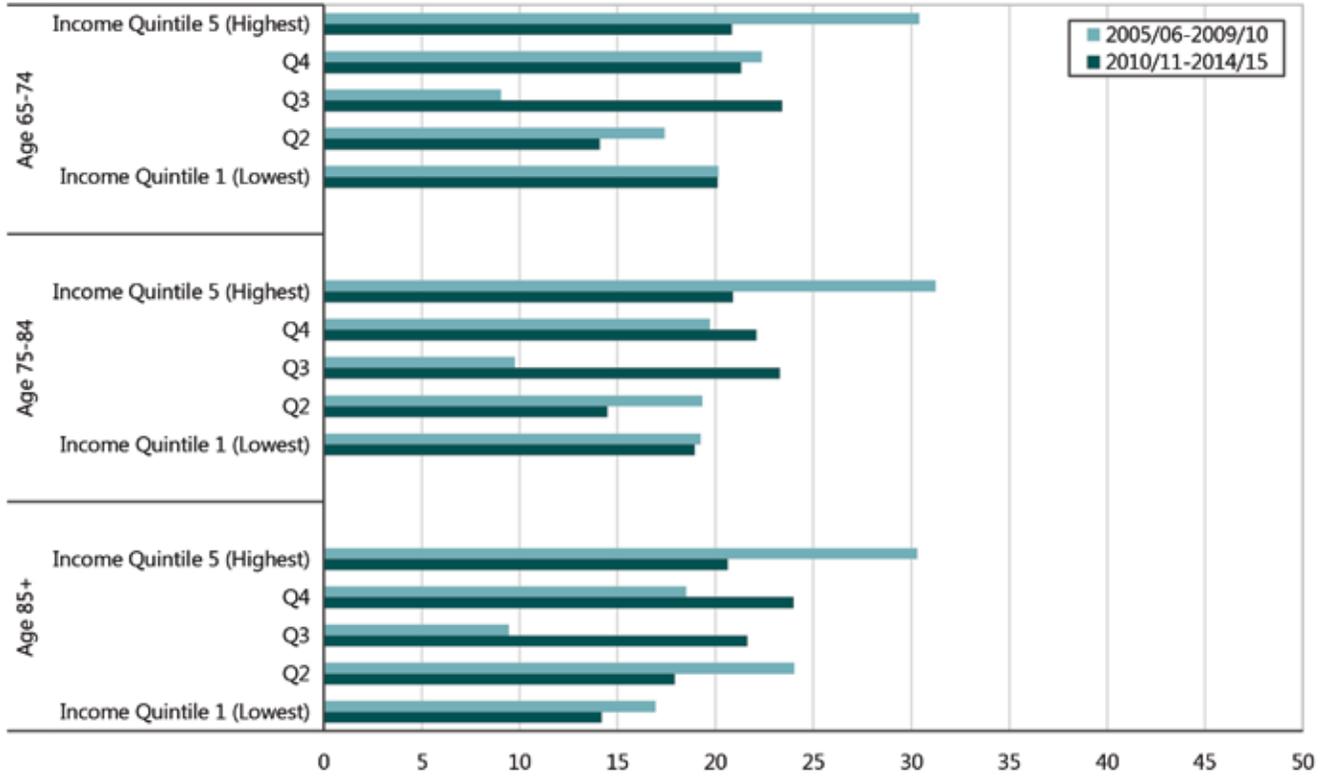


Figure 3.13: Percent of Community-Dwelling Older Adults by Income Quintile and Age Group, Northern Health Region



## Family Structure

Family structure can play a major role in an older adult's life, particularly in terms of providing informal support that maintains quality of life, allowing individuals to remain in their home rather than move to a PCH. Fortunately, the health insurance registry that has been maintained by MHSAL since 1970 records information on family structure. This means that for most older Manitobans, it is possible to ascertain if an individual is currently married and living with a spouse. It is also possible to determine whether or not they have children, and how many children, as long as those children were born after 1952. In this way, it is possible to piece together a complete family structure picture for individuals who resided in Manitoba during their child-bearing years, or who moved to Manitoba while their children were still under the age of 18. For the oldest individuals, whose children may have been 18 years old

prior to 1970, some or all of their children may not have been counted, and the 'zero children' category contains some misclassification. This should be kept in mind, particularly when comparing numbers between the first and second time periods of our study.

Table 3.4 presents the number and percent of older community-dwelling Manitobans living with a spouse by age group. The older age group was much less likely to live with a spouse (~28%) than the younger age group (~65%). There were also some notable differences between men and women, with males having a much higher likelihood of living with a spouse in all age groups, and this discrepancy increased with age. The largest differences were found in the oldest age group. This is likely due partly to differences in mortality; more women were living without a spouse than men because men tend to die younger. This is evident in long-standing differences in life expectancy, and also in the size of the male and female cohorts in the current study.

**Table 3.4: Percent of Community-Dwelling Older Adults Living with Spouses, Manitoba**

Age Group	2005/06-2009/10			2010/11-2014/15		
	Population	Count	Percent	Population	Count	Percent
<b>Male</b>						
65-74	61,984	44,856	72.4	73,397	50,564	68.9
75-84	21,564	15,024	69.7	22,269	15,213	68.3
85+	7,500	4,278	57.0	8,859	4,816	54.4
<b>All Ages</b>	<b>91,048</b>	<b>64,158</b>	<b>70.5</b>	<b>104,525</b>	<b>70,593</b>	<b>67.5</b>
<b>Female</b>						
65-74	66,629	39,115	58.7	77,984	44,976	57.7
75-84	30,604	10,864	35.5	28,850	10,659	36.9
85+	14,451	1,944	13.5	17,204	2,452	14.3
<b>All Ages</b>	<b>111,684</b>	<b>51,923</b>	<b>46.5</b>	<b>124,038</b>	<b>58,087</b>	<b>46.8</b>

We also calculated the number of Manitobans in our cohort (all age groups combined) with zero, one, two, or three or more living children. There was not much change over the two study periods. Approximately 28% of older adults had no known living children, and another 22% had only a single living child. The remaining ~50% of older Manitobans had two or more children that they may be able to rely on for support. There are considerable differences in the percentage of older adults with no children, depending on the region in which they live. In Table 3.5, we can see that

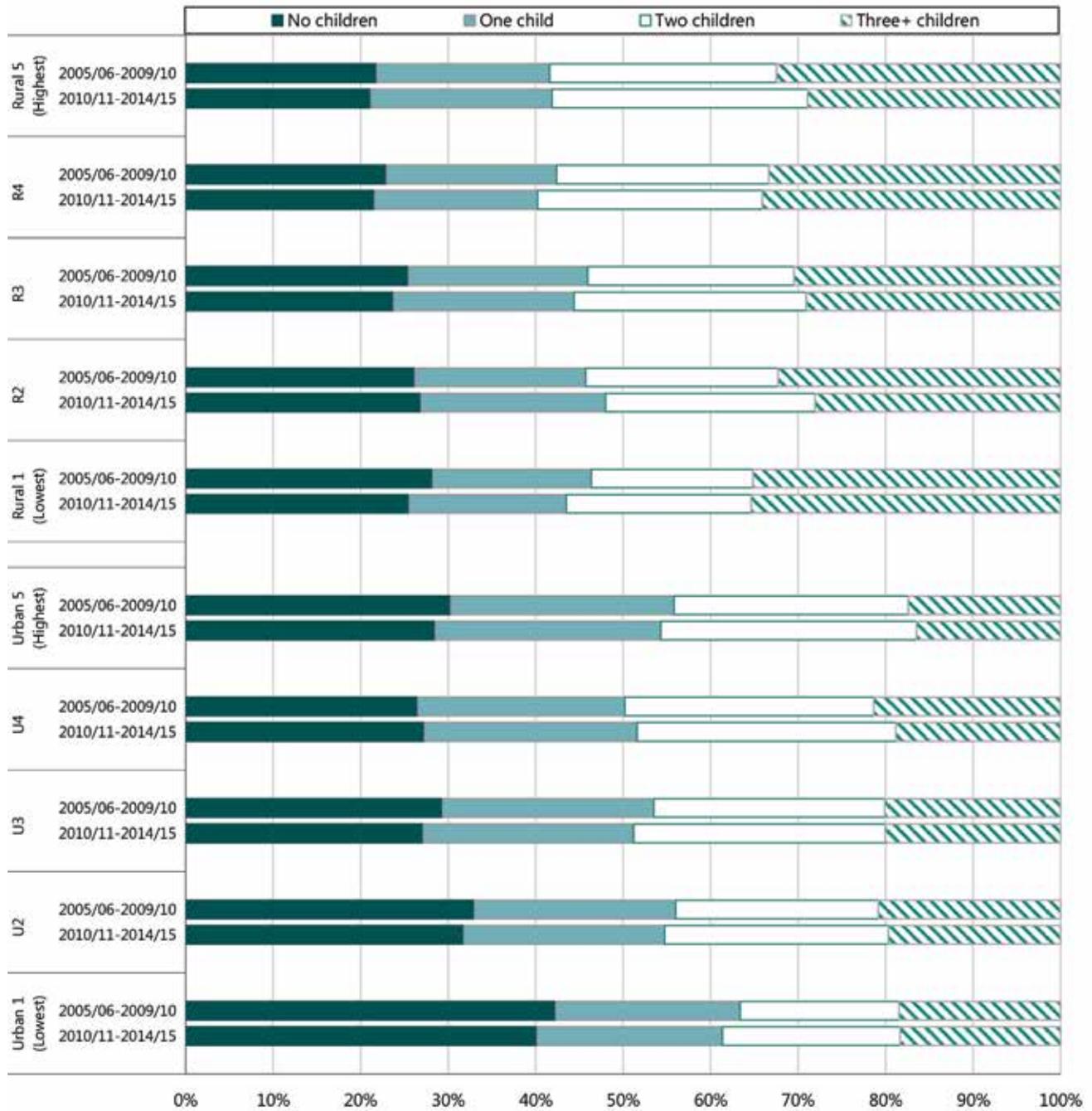
in the most recent time period, over 30% of individuals in Winnipeg RHA had no children, and Prairie Mountain Health was almost as high at 28.4%. This percentage was only 21.3% in Southern Health-Santé Sud, and 22.8% in Interlake-Eastern RHA. On the other end of the spectrum, Northern Health Region and Southern Health-Santé Sud had the highest proportion of individuals with three or more children at 38.7% and 36.3%, respectively, in the most recent time period. Only 18.8% of older adults in Winnipeg RHA had three or more children in the second period.

Table 3.5: Distribution of Community-Dwelling Older Adults by Number of Living Children and Health Region

Number of Children	2005/06-2009/10		2010/11-2014/15	
	Count	Percent	Count	Percent
<b>Southern Health-Santé Sud</b>				
0	5,572	21.9%	6,172	21.3%
1	4,412	17.4%	5,119	17.7%
2	5,701	22.4%	7,140	24.7%
3+	9,715	38.2%	10,494	36.3%
<b>Winnipeg RHA</b>				
0	37,622	32.7%	40,731	31.1%
1	26,742	23.2%	30,646	23.4%
2	27,969	24.3%	34,833	26.6%
3+	22,772	19.8%	24,607	18.8%
<b>Interlake-Eastern RHA</b>				
0	5,295	23.7%	5,892	22.8%
1	4,362	19.6%	5,302	20.5%
2	5,585	25.0%	7,305	28.3%
3+	7,066	31.7%	7,313	28.3%
<b>Prairie Mountain Health</b>				
0	10,348	30.0%	10,365	28.4%
1	7,891	22.9%	8,484	23.2%
2	8,006	23.2%	9,273	25.4%
3+	8,195	23.8%	8,410	23.0%
<b>Northern Health Region</b>				
0	1,356	24.7%	1,652	25.5%
1	906	16.5%	1,138	17.6%
2	861	15.7%	1,180	18.2%
3+	2,356	43.0%	2,507	38.7%

The number of children in a family is also related to SES. Figure 3.14 displays the number of living children who belonged to older adults by income quintile. The most apparent relationship was between income quintile and the percentage of individuals with no children. For both the rural and urban areas, the percentage of individuals with no children increased as income quintile decreased. In other words, older Manitobans living in the poorer areas of the province were more likely to appear to have no children than those living in richer areas. Among larger families of three or more children, there was no relationship with SES in the rural or urban areas.

Figure 3.14: Distribution of Community-Dwelling Older Adults by Number of Living Children and Income Quintile





# Chapter 4: Health Status Indicators

This chapter reports on three general indicators of health status: mortality rate, expected age in the community, and expected disease-free years. Mortality rates (or death rates) are presented alongside a list of the most common causes of death in Manitoba. Expected age in the community provides an indication of how long a person will remain community-dwelling. Expected disease-free years provides an indication of how long a person who is currently free of a select number of diseases or conditions can expect to remain free of those diseases or conditions.

## Key Findings

- Mortality rates decreased over the study period for all age groups and both sexes, except for females age 85+.
- Mortality was related to socioeconomic status, with higher mortality in poorer areas.
- The major causes of death amongst community-dwelling older adults were circulatory disease (e.g., stroke, heart attack) and cancer.
- The number of years that older adults can expect to live in the community, as opposed to residing in a PCH or dying, increased during the study period.

## Mortality Rates

The mortality rate is a measure of the frequency of deaths in our study cohort. As mortality is a relatively rare outcome, all five years of data in each study period were used to calculate the rate, reported as the number of deaths per thousand person-years.

Mortality rates are very different for males and females, so for our cohort of community-dwelling older adults, they were calculated separately for men and women for each of the three age groups. For the more recent study period (2010/11-2014/15), the mortality rate for men in the youngest age group (65-74) was ~60% higher than that for women. This increased to ~70% higher in the 75-84 age group, and about 50% higher for the oldest age group.

The mortality rate increased with age, more than doubling from one age group to the next. The overall mortality rates for males and females combined increased from 14.96/1000 person-years for the 65-74 age group,

(Figures 4.1 and 4.2), to 32.44/1000 person-years for the 75-84 age group, (Figures 4.3 and 4.4), to 75.91/1000 person-years in the oldest age group (Figures 4.5 and 4.6).

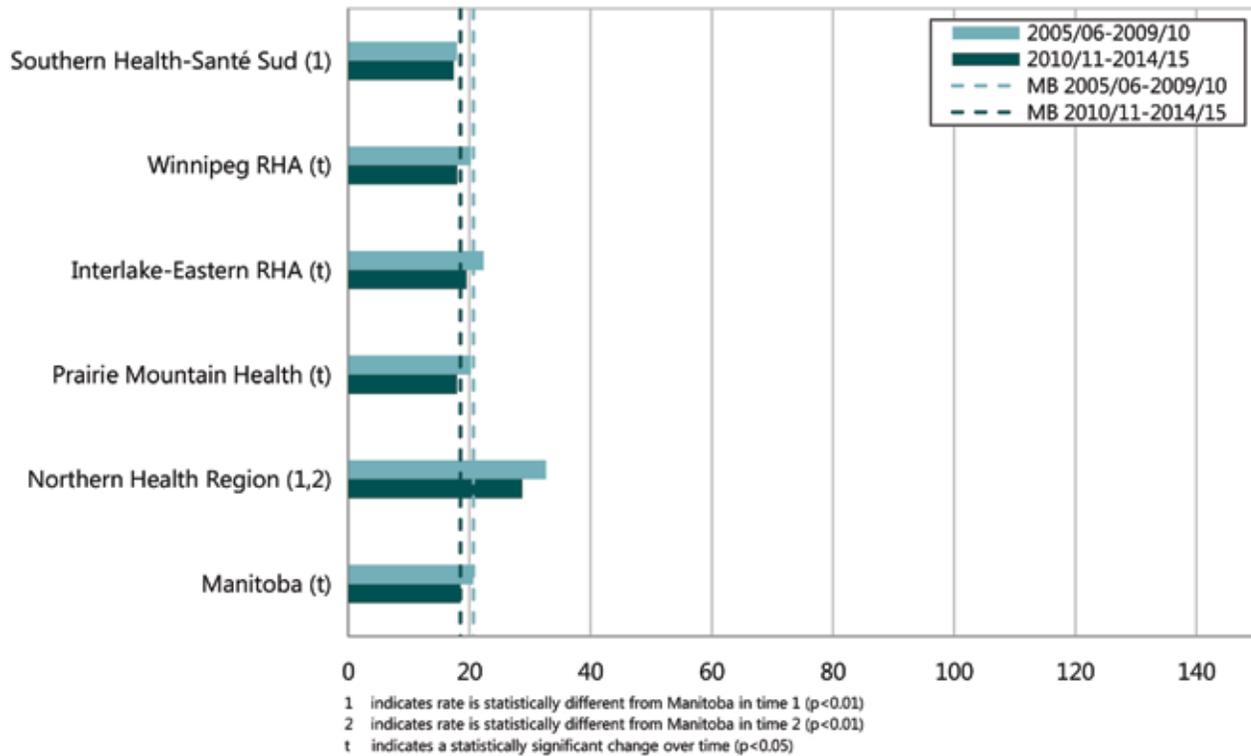
There were also geographic differences in mortality rates, and these were most pronounced in the North where the mortality rate was much higher than the Manitoba average. The differences between the Northern Health Region and the Manitoba average were statistically significant in all but one case (85+ males, 2010/11-2014/15) (Figure 4.5). The other regions were all very similar, with none significantly different from the Manitoba average.

From one time period to the next, the mortality rate decreased significantly for both sexes and every age group

with one notable exception. For the 85+ females the rate increased between the two time periods, and although this change was not statistically significant overall, there was a statistically significant increase in Southern Health-Santé Sud (Figure 4.6).

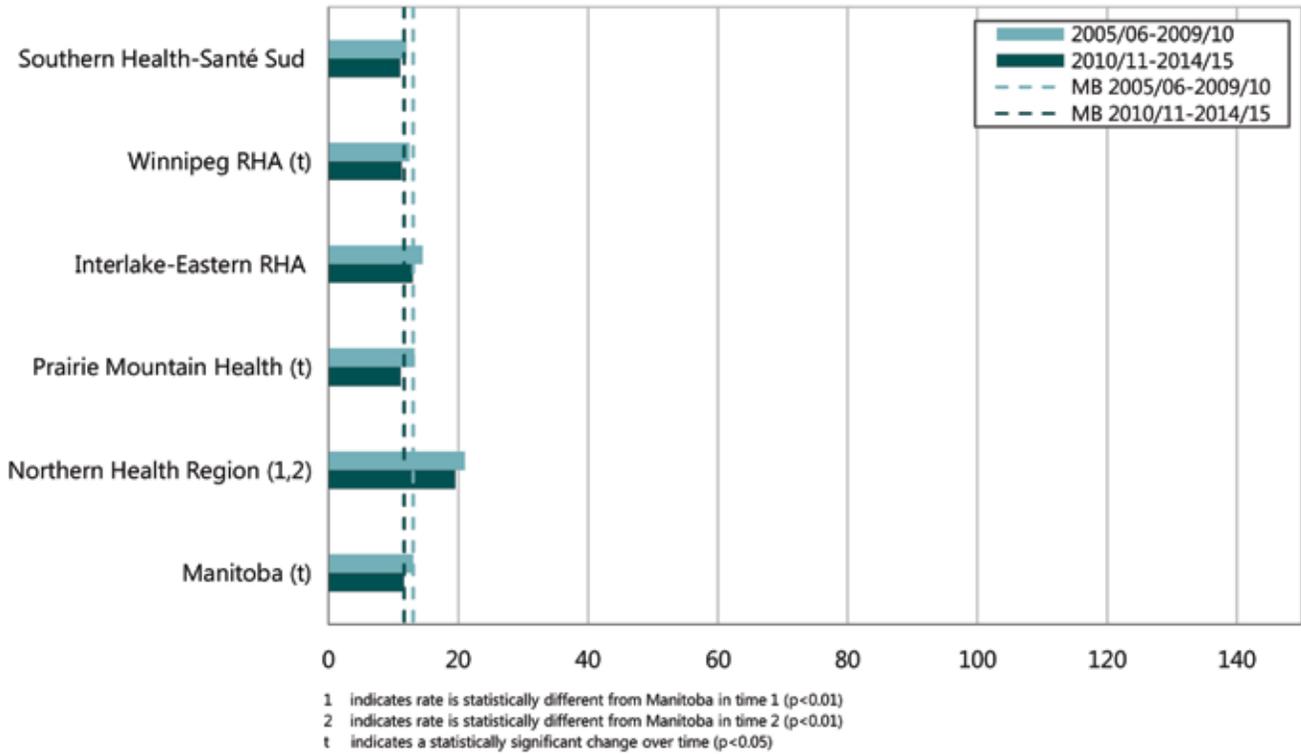
Mortality rate was tightly correlated with SES in the second time period for both males and females, with the rate increasing with each drop in income quintile (Figures 4.7 and 4.8). The biggest changes were seen for men living in urban areas, where the mortality rate decreased over time for every income quintile except for the lowest, where the rate did not decrease as much.

**Figure 4.1: Male Mortality Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older men per 1,000 person-years



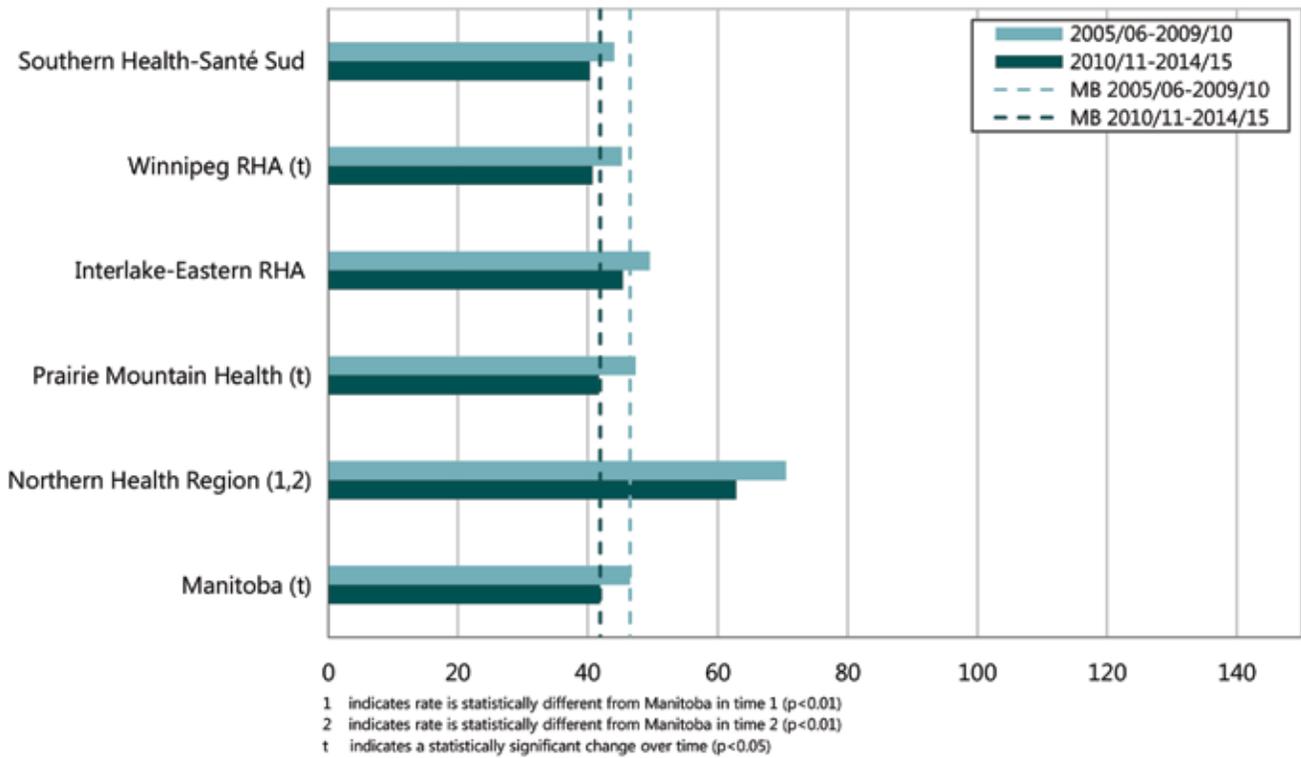
**Figure 4.2: Female Mortality Rates by Health Region, Age 65-74**

Crude rate for community-dwelling older women per 1,000 person-years



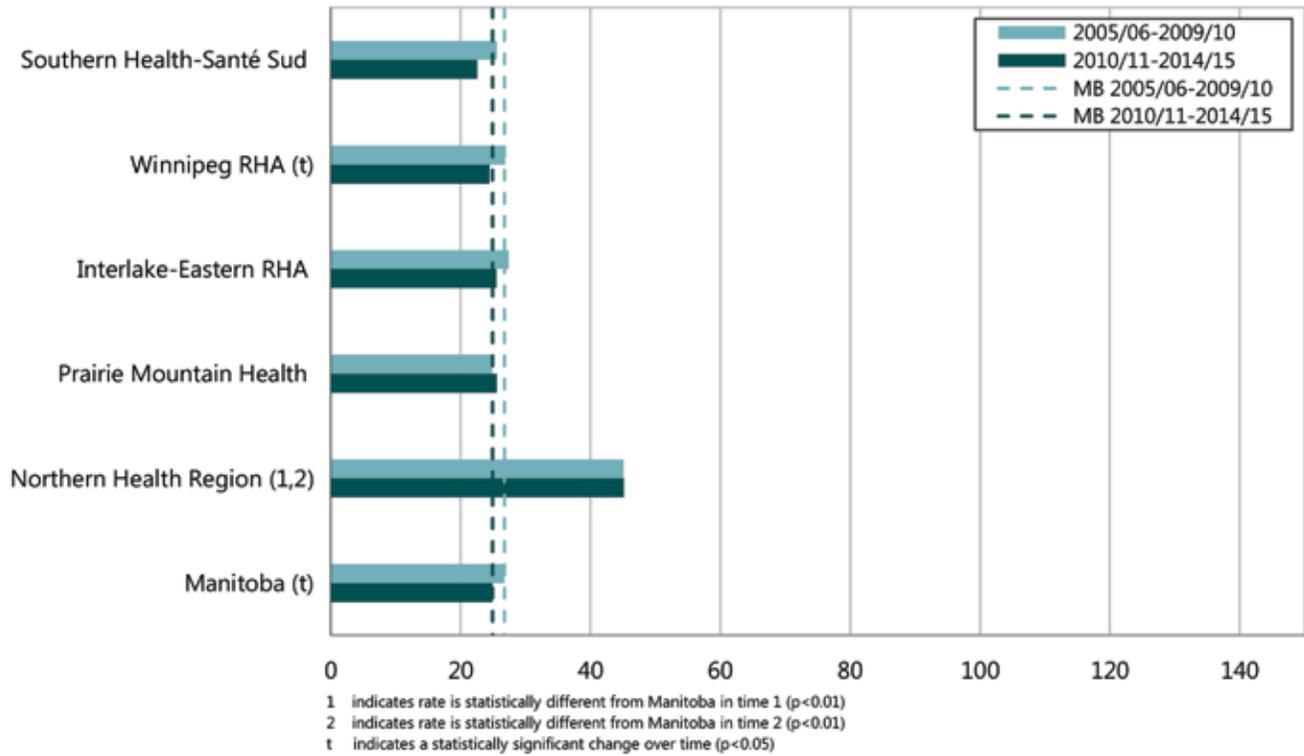
**Figure 4.3: Male Mortality Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older men per 1,000 person-years



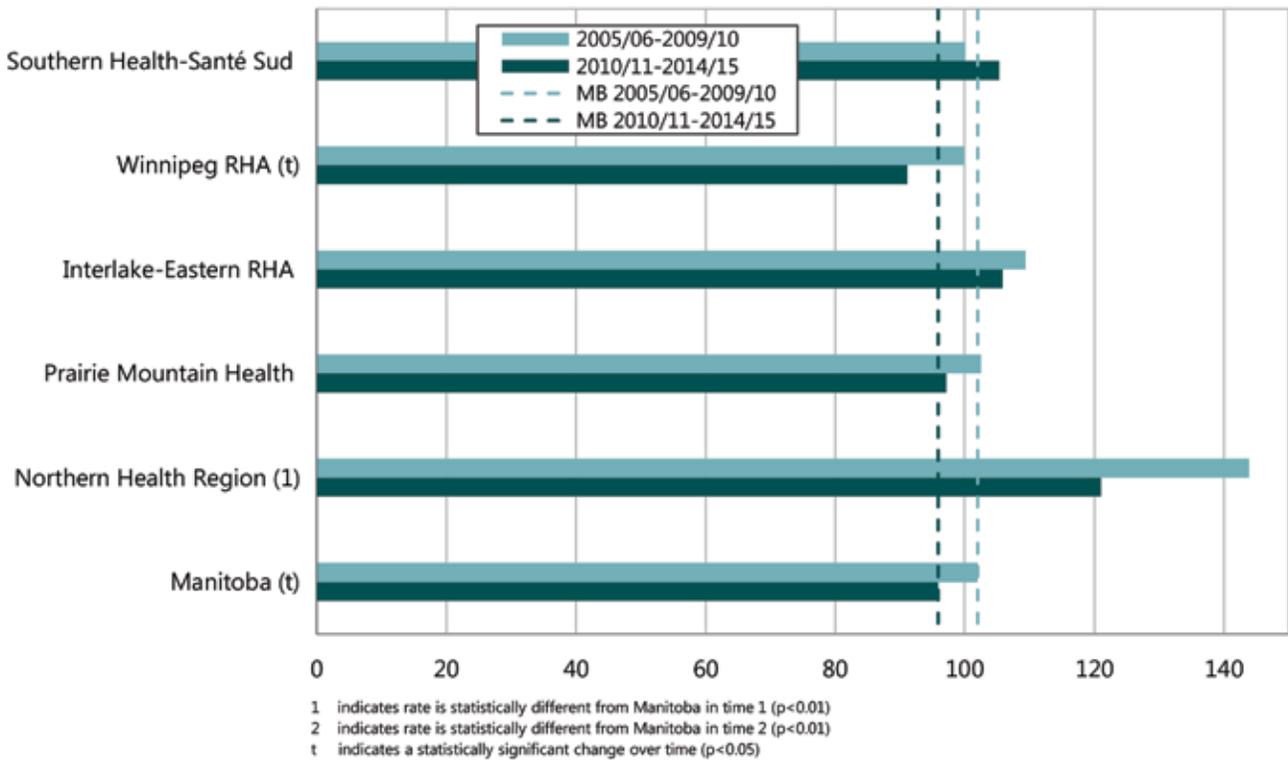
**Figure 4.4: Female Mortality Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older women per 1,000 person-years



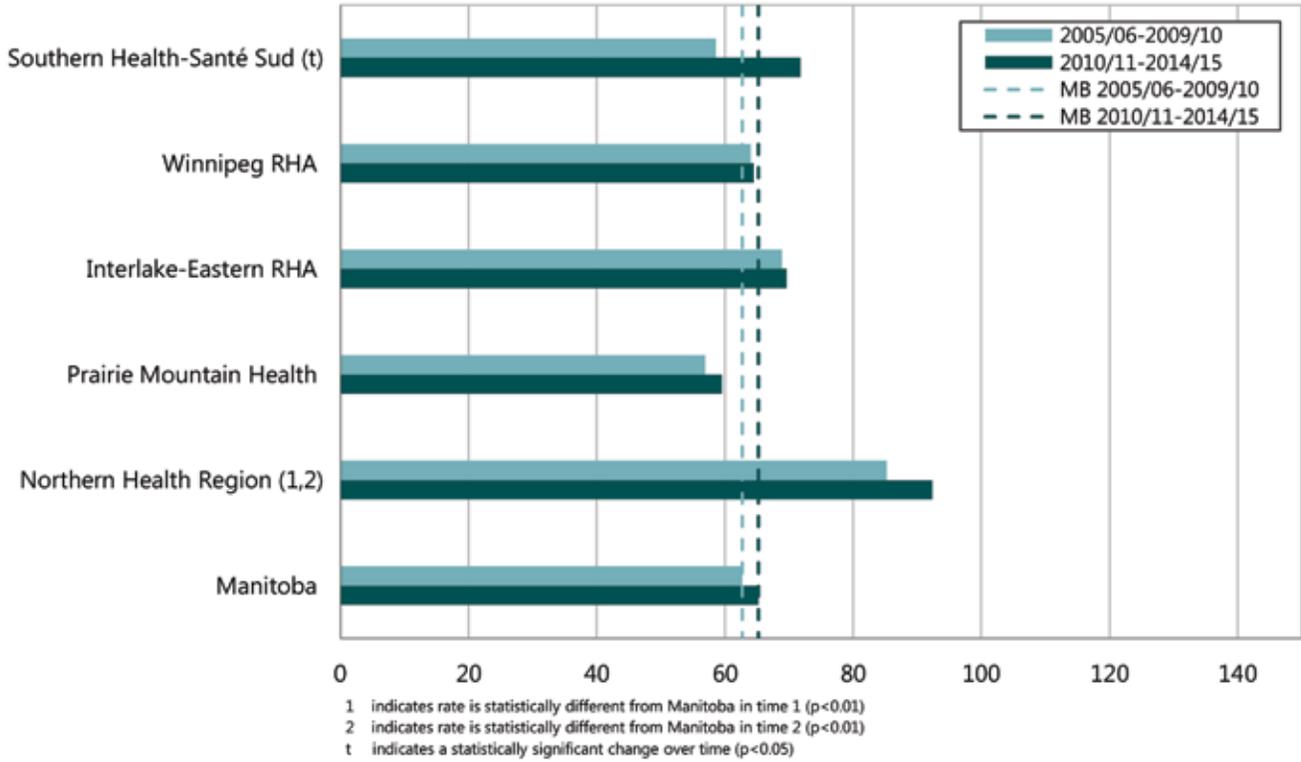
**Figure 4.5: Male Mortality Rates by Health Region, Age 85+**

Crude rate for community-dwelling older men per 1,000 person-years



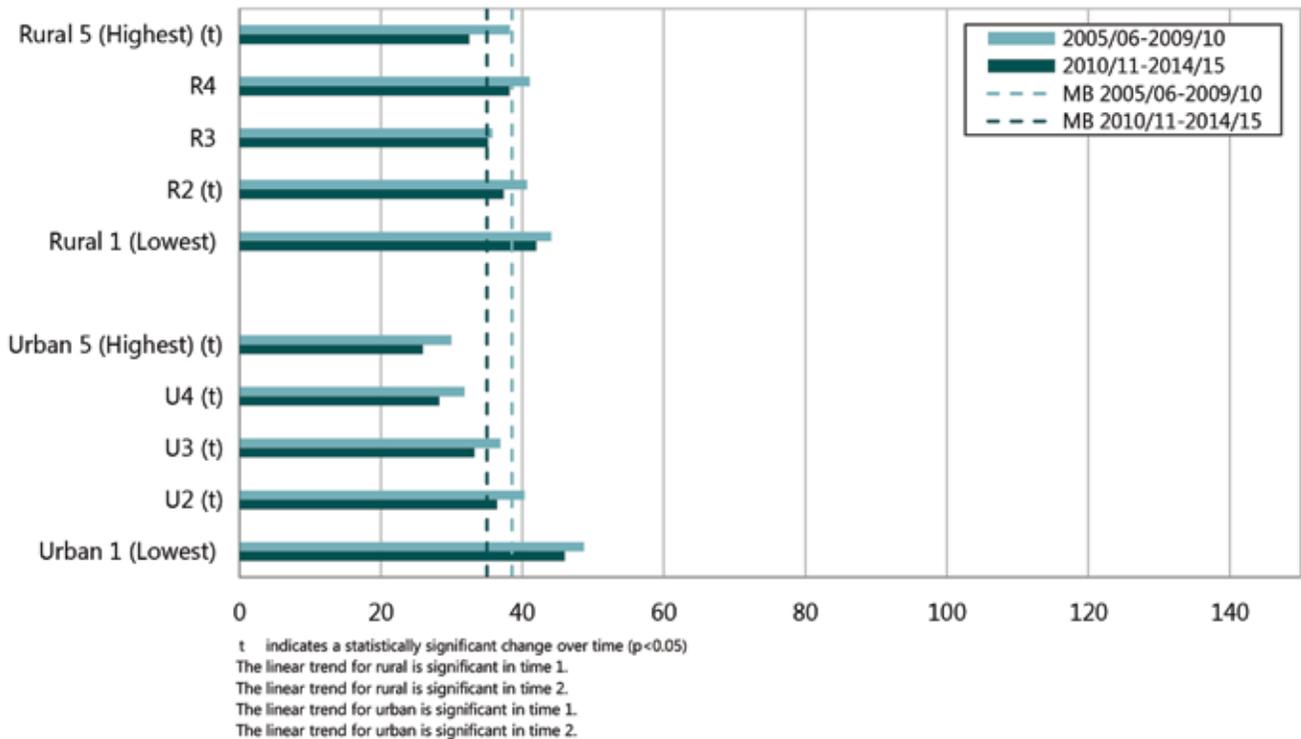
**Figure 4.6: Female Mortality Rates by Health Region, Age 85+**

Crude rate for community-dwelling older women per 1,000 person-years



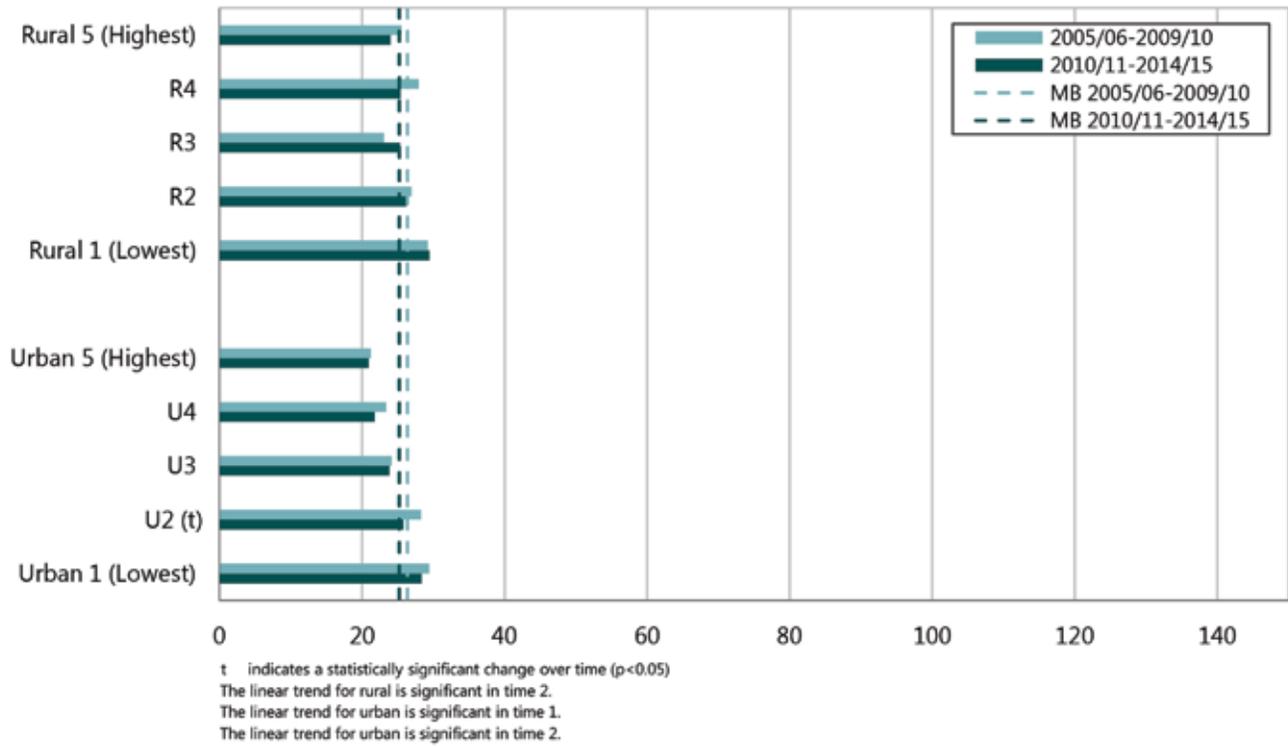
**Figure 4.7: Male Mortality Rates by Income Quintile**

Age-adjusted rate for community-dwelling older men per 1,000 person-years



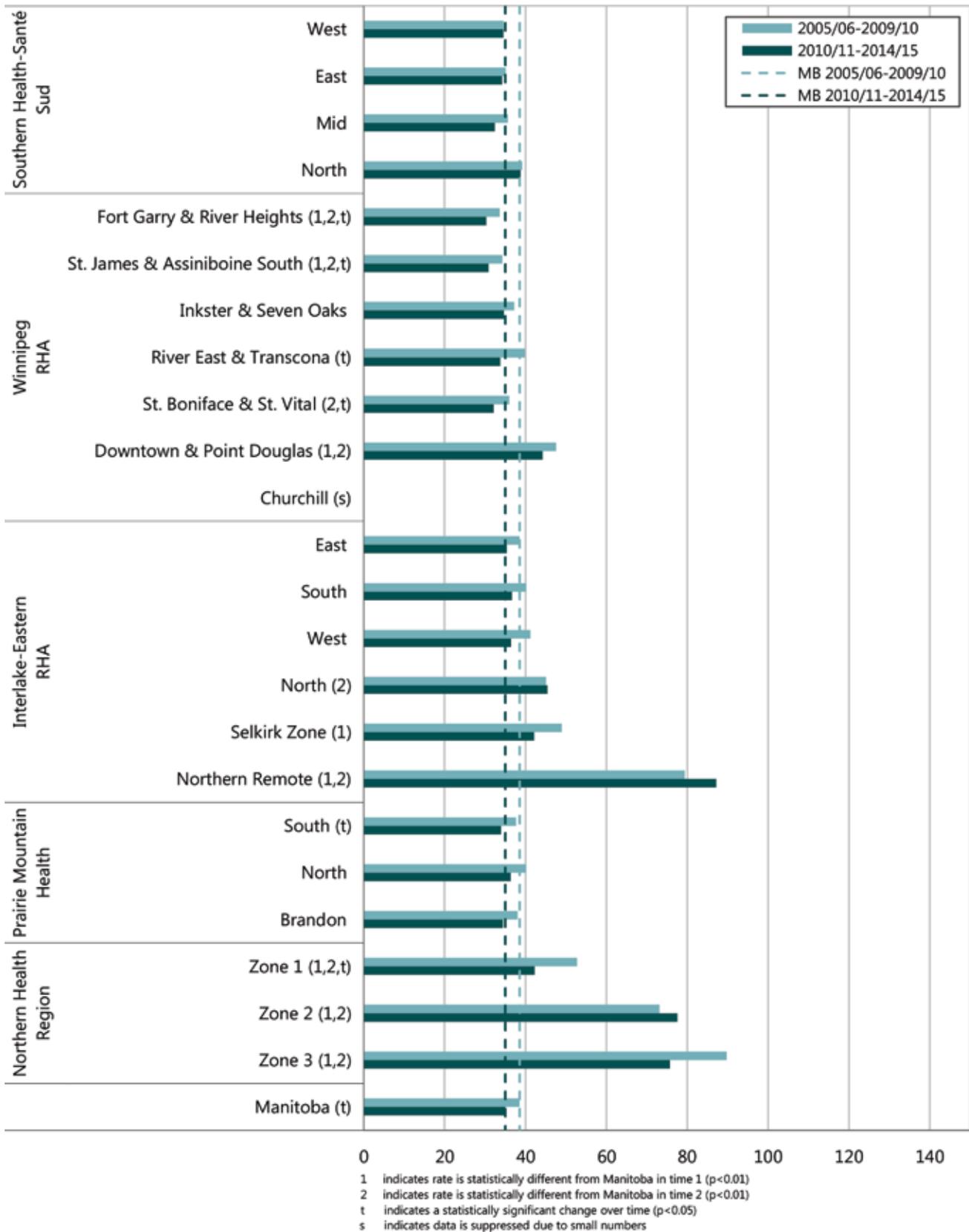
**Figure 4.8: Female Mortality Rates by Income Quintile**

Age-adjusted rate for community-dwelling older women per 1,000 person-years



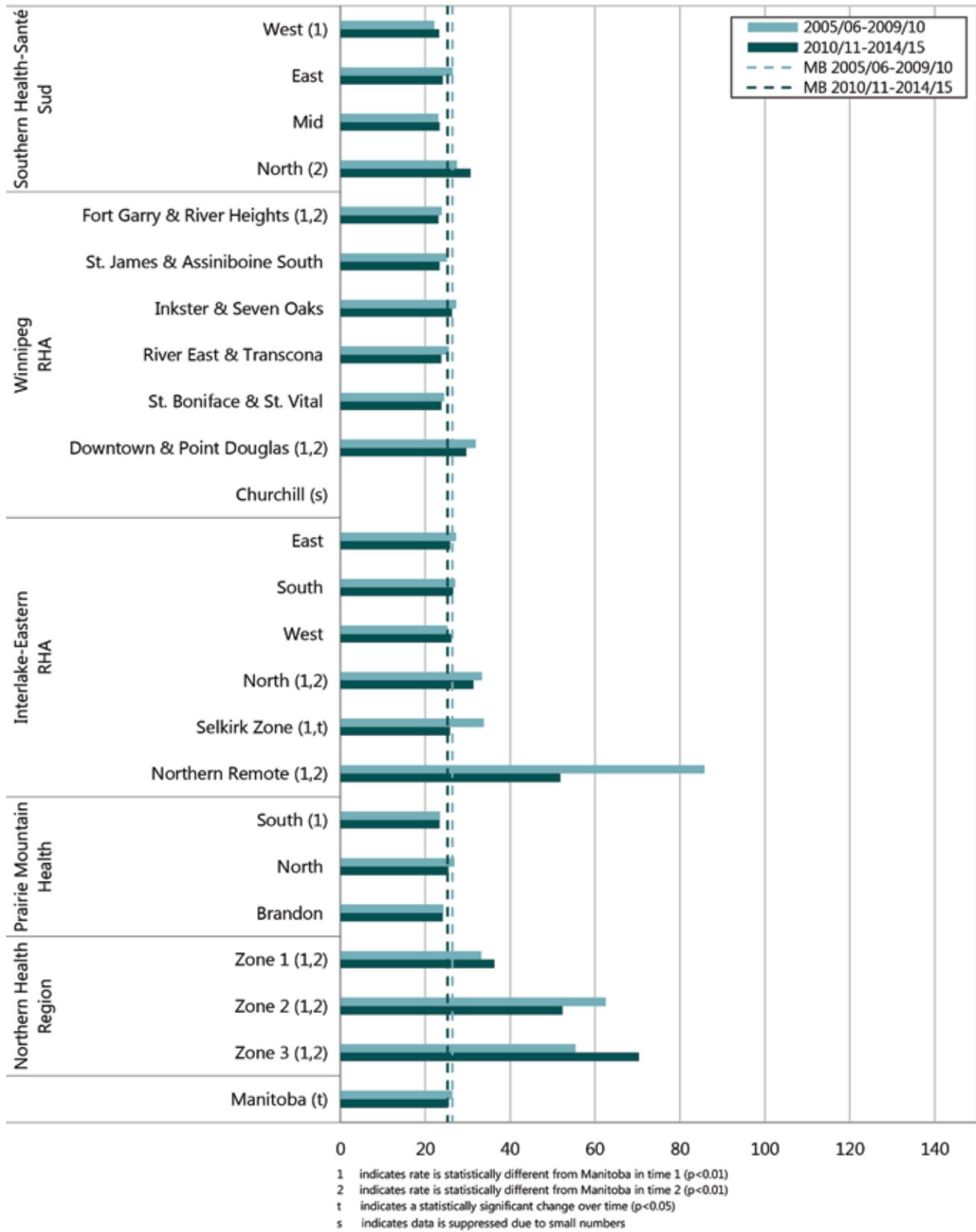
**Figure 4.9: Male Mortality Rates by Health Region Zone**

Age-adjusted rate for community-dwelling older men per 1,000 person-years



**Figure 4.10: Female Mortality Rates by Health Region Zone**

Age-adjusted rate for community-dwelling older women per 1,000 person-years



## Cause of Death

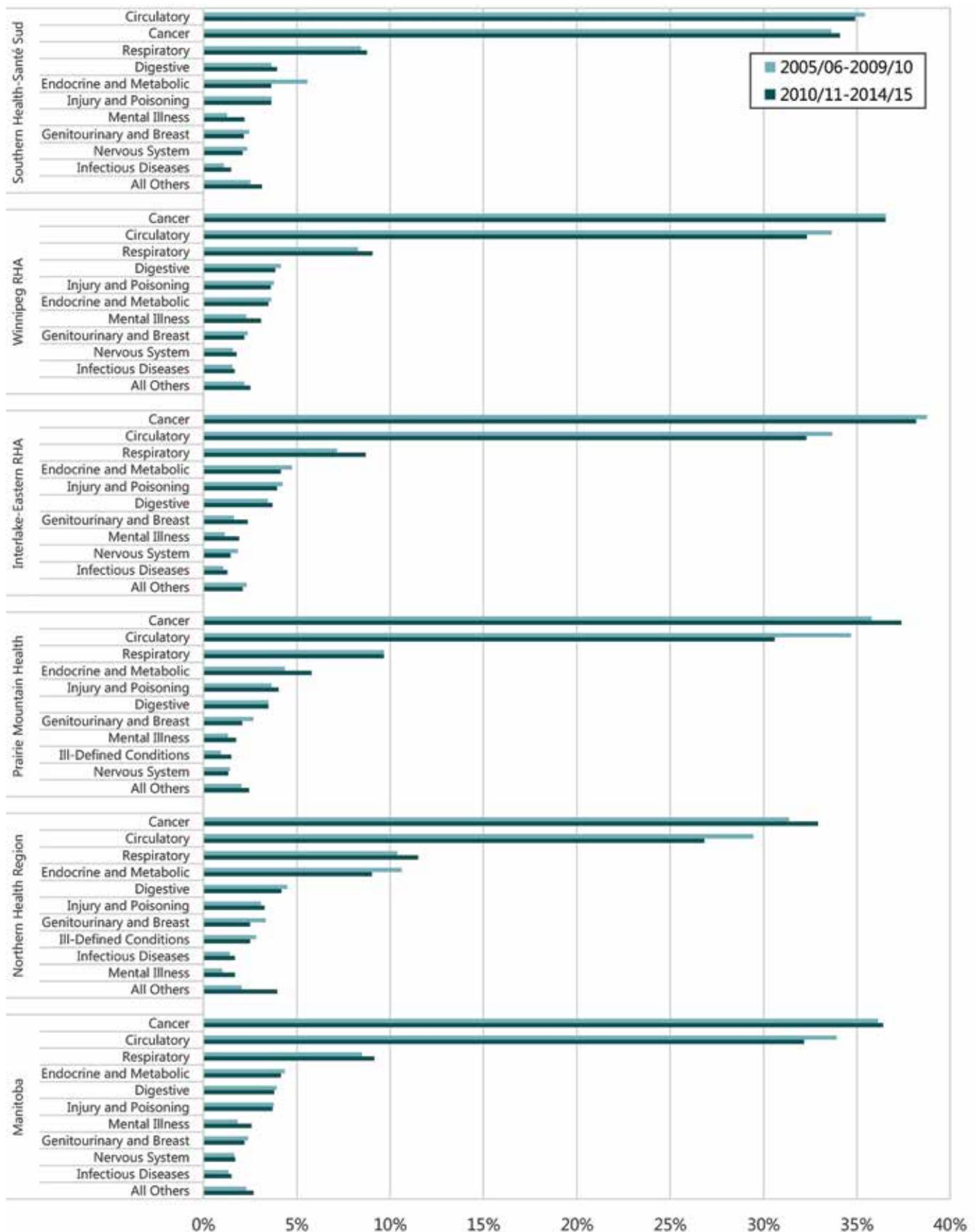
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In addition to knowing the overall mortality rates, the cause of death can inform care provision requirements for community-dwelling older adults. For all of the individuals who died during our two study periods, we identified the cause of death as noted in the Manitoba Vital Statistics mortality data. Figure 4.11 displays the top ten most common causes for each of the regions, as well as overall results for Manitoba. The most common causes of death

were cancer, circulatory disease (e.g., heart attack, stroke) and respiratory disease (e.g., chronic obstructive pulmonary disease), with cancer and circulatory causes each making up about 35% of deaths in all regions. Respiratory causes of death made up ~8% of deaths in most regions, and that was around double any other cause in all regions except Northern Health Region. In this one region, endocrine and metabolic causes of death were almost equal to respiratory causes. This was possibly due to the higher rate of diabetes in this region.

Figure 4.11: Cause of Death by Health Region, 2005/06-2009/10 and 2010/11-2014/15

Average annual percent of deaths among community-dwelling older adults



## Expected Age in the Community

Life expectancy is a commonly used metric of the health of a population. Essentially, it is the median number of years one can expect to live at birth. It can also be calculated at different ages. For example, we could calculate it at the age of 65 to determine how much longer you could expect to live, assuming you are still alive at age 65. The calculation ignores all the deaths that occur prior to age 65, so life expectancy at 65 is higher than life expectancy at birth. Because this report is focused on community-dwelling older adults, we modified the life expectancy calculation. Instead of calculating life expectancy overall, we restricted

it to community-dwelling years. This answers a slightly different question. Rather than answering “To what age can a person expect to live?” the question becomes, “To what age can a person expect to live in the community (i.e., in a private residence)?”

Table 4.1 presents the results of this analysis, presenting the expected age people can expect to live to in the community starting at age 65, age 75 and age 85. For the most part, the results echo what we saw with mortality. Expected age in the community was lower in Northern Health Region than in the rest of the province. Overall, the number of community-dwelling years increased from one time period to the next, with the exception of women at age 85 living in Southern Health-Santé Sud.

Table 4.1: Expected Age in the Community by Health Region, Age, and Sex

Time Period	Age 65		Age 75		Age 85	
	M	F	M	F	M	F
<b>Southern Health-Santé Sud</b>						
2005-09	82.6	85.1	85.5	87.4	90.5	91.6
2010-14	82.9	85.4	85.8	87.6	90.6	91.3
<b>Winnipeg RHA</b>						
2005-09	82.1	84.8	85.4	87.3	90.6	91.6
2010-14	82.9	85.2	86.1	87.6	91.1	91.6
<b>Interlake-Eastern RHA</b>						
2005-09	81.6	84.2	85.0	87.0	90.3	91.2
2010-14	82.2	84.8	85.4	87.3	90.3	91.3
<b>Prairie Mountain Health</b>						
2005-09	81.8	84.3	85.1	86.9	90.4	91.2
2010-14	82.4	84.7	85.5	87.0	90.4	91.2
<b>Northern Health Region</b>						
2005-09	79.2	81.6	83.8	85.1	90.3	90.8
2010-14	80.3	82.2	84.5	85.5	90.3	91.1
<b>Manitoba</b>						
2005-09	82.0	84.6	85.3	87.1	90.5	91.4
2010-14	82.7	85.0	85.8	87.4	90.8	91.5

## Expected Disease-Free Community-Dwelling Years

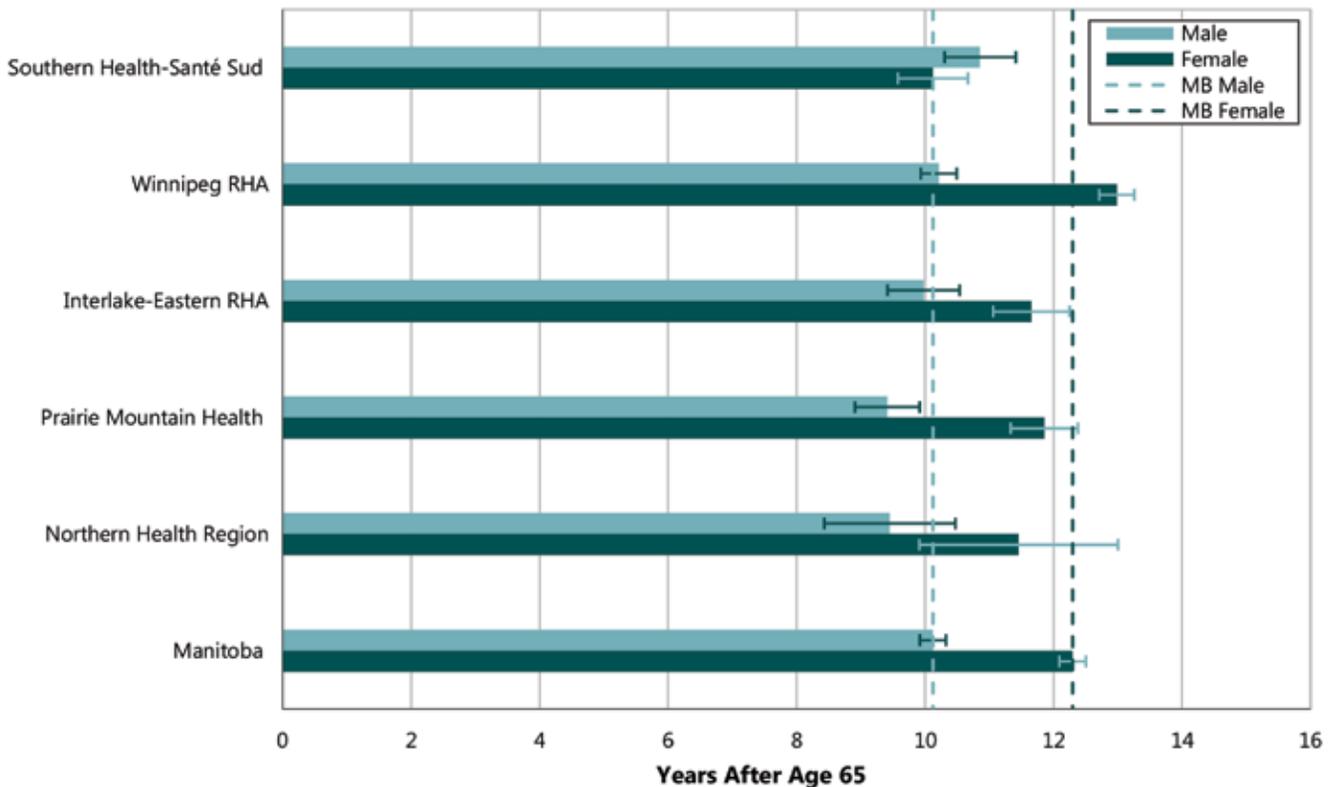
Similar to how we calculated expected community-dwelling years, we also calculated the expected disease-free years in the community at age 65. To some degree, this indicator incorporates a measure of quality of life, or at least the degree to which chronic conditions impact a person’s life. Expected disease-free community-dwelling years measures the length of time an older adult (age 65+) can expect to live in a private residence and be free of the following major chronic diseases: acute myocardial infarction (heart attack), cancer, chronic obstructive pulmonary disease, dementia (including Alzheimer’s Disease), diabetes, end stage renal disease, ischemic heart disease, and stroke. Later in this report, we present the percentage of older adults that have each of the conditions in this list separately.

To calculate expected disease-free community-dwelling years, we included all older adults in Manitoba in the second time period of our study (2010/11-2014/15) who

were not already diagnosed with any of the chronic conditions listed in the previous time period (2005/06-2009/10). Because we removed people already diagnosed with a chronic disease, not everyone is included; people who already have a chronic condition cannot contribute disease-free years to the calculation. Individuals’ disease-free community-dwelling years were calculated from age 65 or April 1, 2010 (for those who were older than 65 years) until the first diagnosis of any chronic condition from the list above, death, admission to a long-term care facility, or a move out of province.

The number of expected disease-free community dwelling years were similar in all health regions (Figure 4.12). Women might expect more disease-free years than men, for the province overall and in every region except Southern Health-Santé Sud. Importantly, however, what these findings tell us is that older adults can expect to be diagnosed with a chronic condition around the age of 75 or shortly thereafter, even if they have none of them at age 65. The median time to a diagnosis from age 65 is about 10 years for males and about 12 years for females.

Figure 4.12: Expected Disease-Free Community-Dwelling Years Residents Age 65 by Health Region and Sex



# Chapter 5: Healthcare Use

This chapter presents analyses of older adults' most frequent interactions with the healthcare system. We present the rate of ambulatory visits, which include physician visits (to all types of practitioners), specialist visits, and ambulatory consultations (i.e., referrals); we also report specialist visits and consults separately. For hospital use, we report the hospitalization rate and the number of days in hospital. We also present the rates of emergency department (ED) visits. Because healthcare use events are the most common kind of health event that occurs in Manitoba, we required only a single year in each time period to generate reliable and accurate estimates for these indicators. For all indicators in this chapter, rates were generated by counting the total number of events in the numerator, and then dividing by the person-years at risk.

## Key Findings

- Ambulatory visit rates increased from one time period to the next for all three age groups, and although the increases were small, they represent almost 50,000 more visits per year than in the earlier time period.
- While hospitalization rates declined overall, the burden on the hospital system may not have decreased correspondingly. The rate of hospital days actually increased for the oldest age group from one time period to the next. Overall, there were 20,000 more days in hospital in the more recent time period.
- Specialist visits and consults were more frequent for urban residents, particularly for Winnipeg residents and for people from higher income neighbourhoods.

## Ambulatory Visits & Hospitalizations

### Ambulatory Visit Rates

Ambulatory visits include all visits to physicians or nurse practitioners that occur outside of a hospital setting, and were calculated as a rate per person-year for 2009/10 and 2014/15.

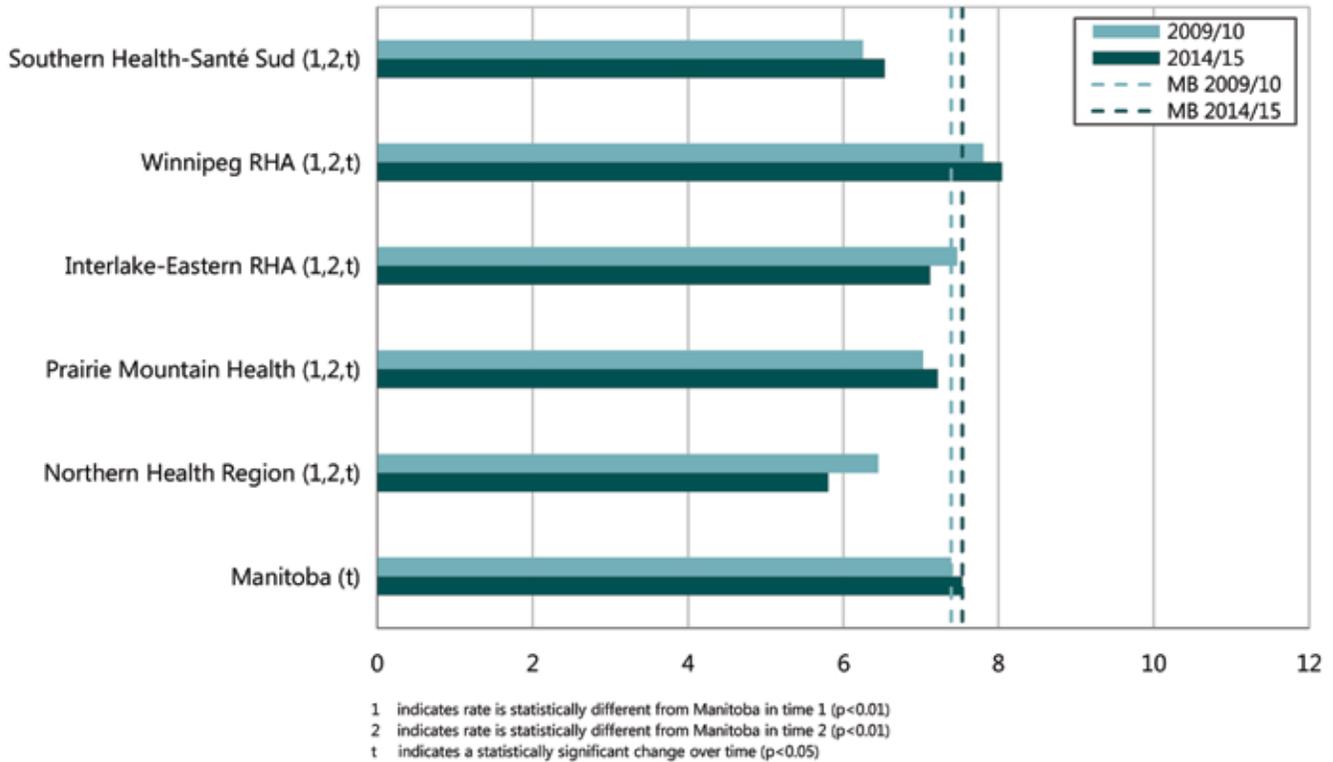
The ambulatory visit rates are presented in Figures 5.1 to 5.5. Visit rates were higher for the two older age groups (more than eight visits per person-year) than the younger age group (just over seven visits per person-

year). All three age groups experienced a modest but statistically significant increase in the rate of ambulatory visits in the second time period compared to the first. Although the increase appears small in Figures 5.1 to 5.3, it represents 44,200 more visits in 2014 than if the rates had remained the same as in 2009.

Ambulatory visit rates were consistently higher in Winnipeg than in the other regions of the province, and there was no apparent relationship between visit rates and income quintile in the urban areas of the province. In the rural areas, people in higher income quintiles had a higher rate of ambulatory visits than people in lower income quintiles. Some of the higher rural income quintiles are close to Winnipeg, while many of the poorest are in remote areas, so the trend we see regarding lower income and low visit rates in the rural areas could be due to difficulty accessing a physician.

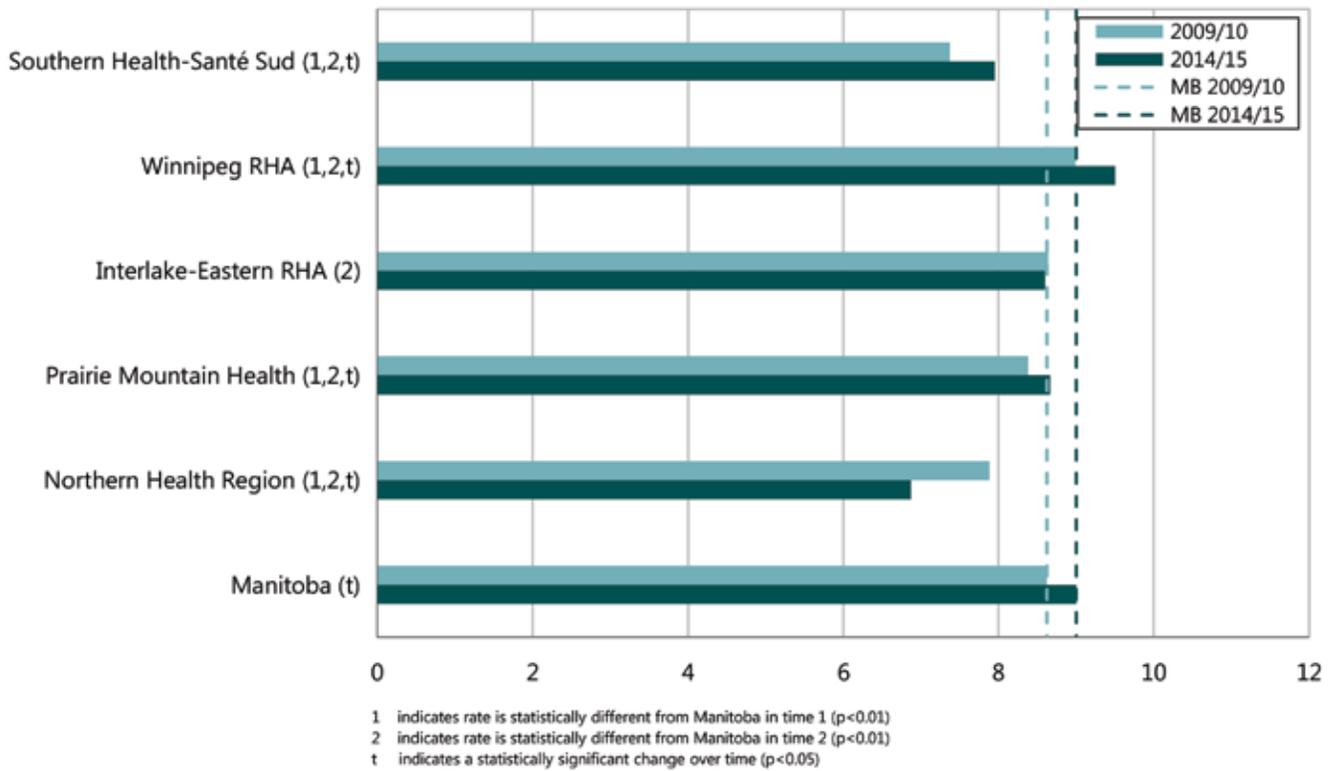
**Figure 5.1: Ambulatory Visit Rates by Health Region, Age 65-74**

Crude rate for community-dwelling older adults per person-year



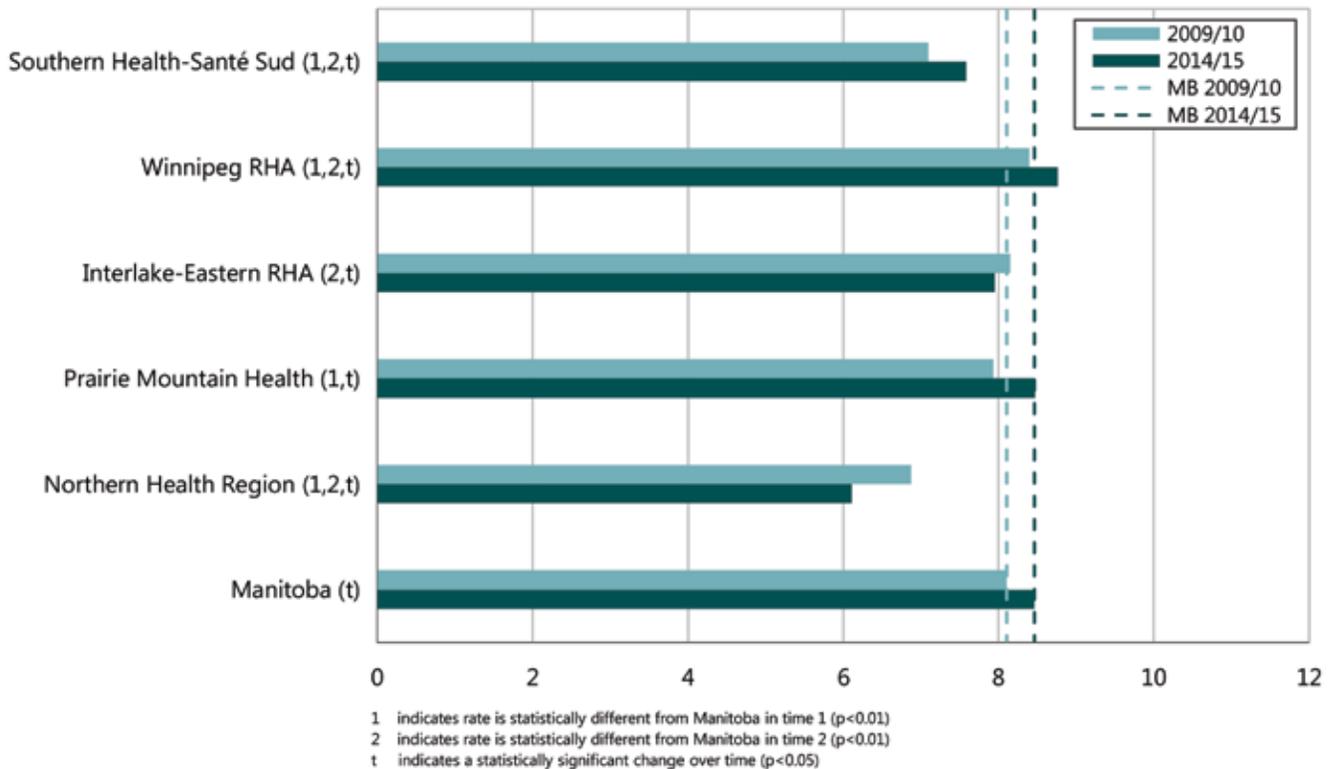
**Figure 5.2: Ambulatory Visit Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per person-year



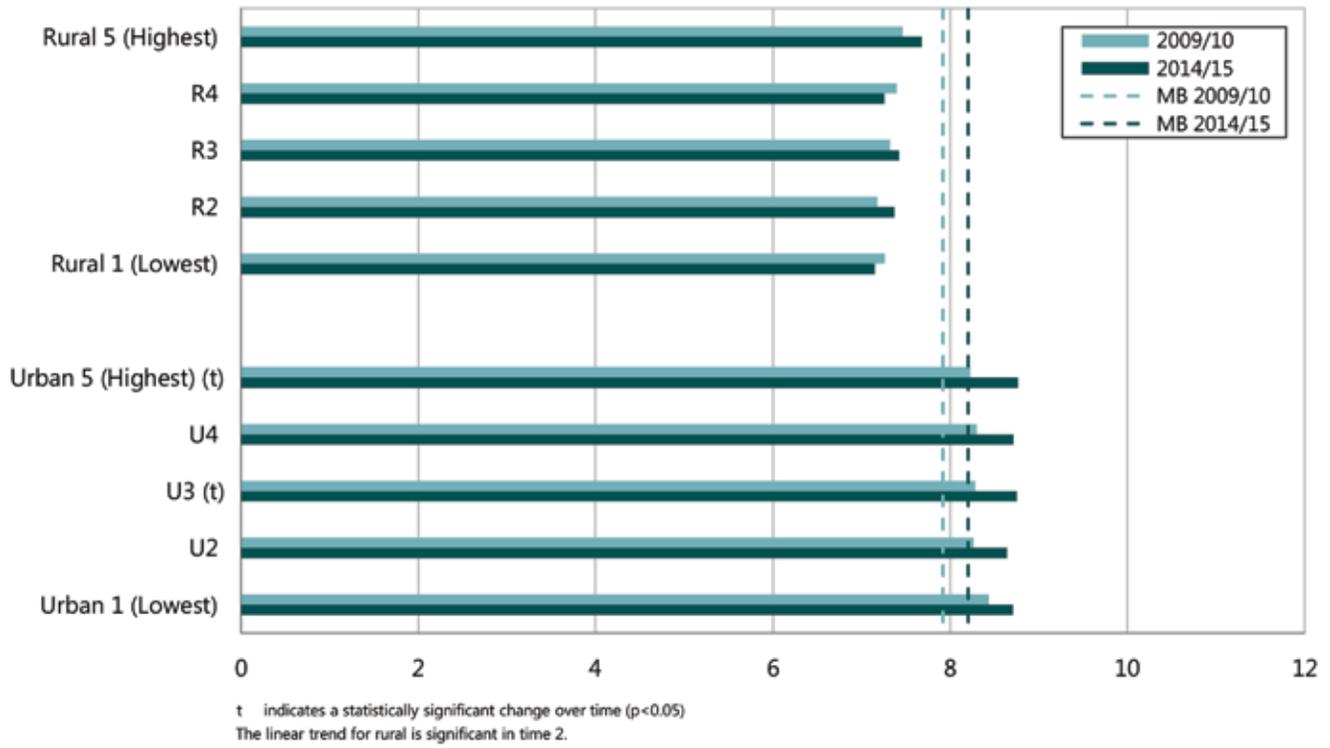
**Figure 5.3: Ambulatory Visit Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per person-year



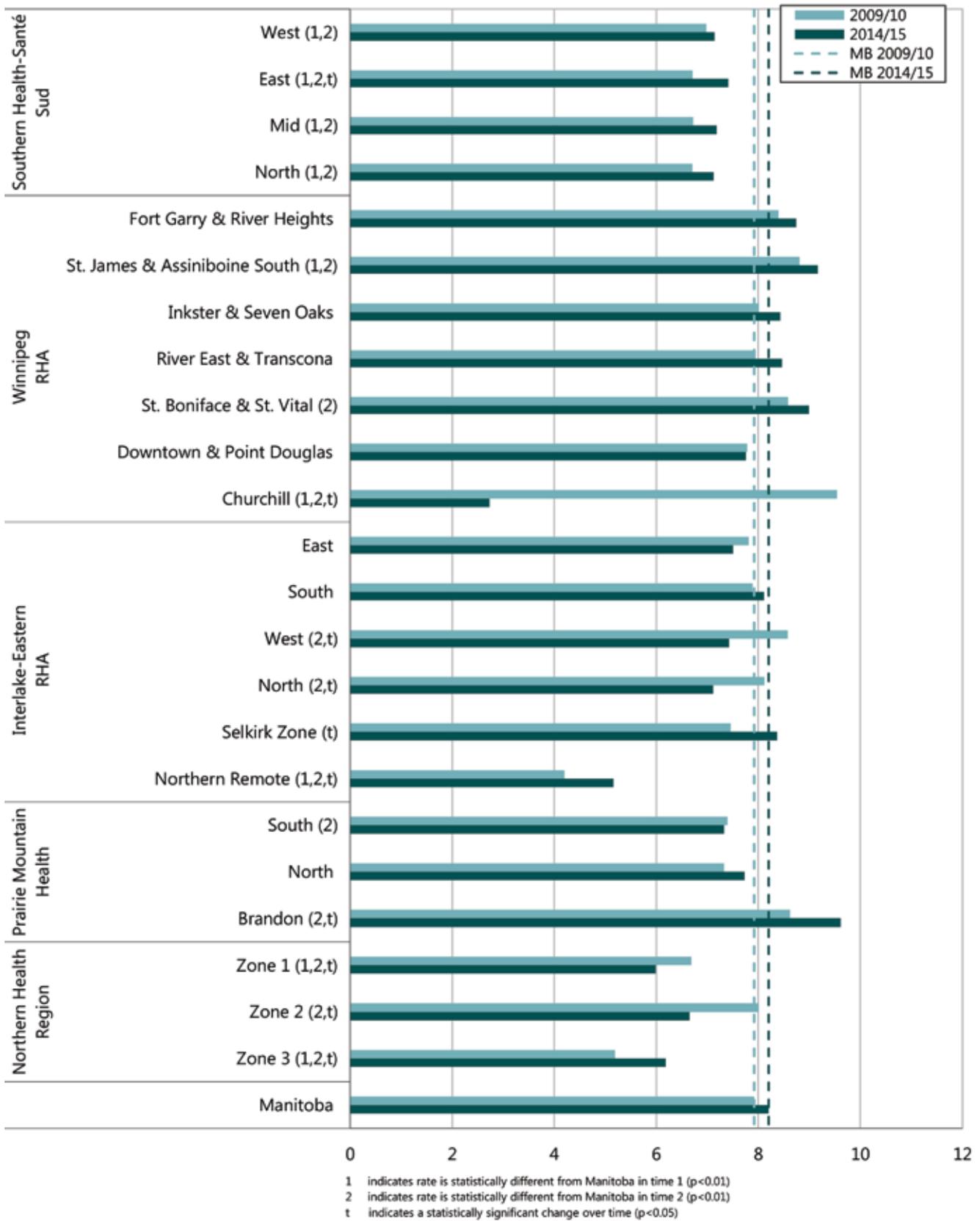
**Figure 5.4: Ambulatory Visit Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 5.5: Ambulatory Visit Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



## Concentration Curve for Ambulatory Visits

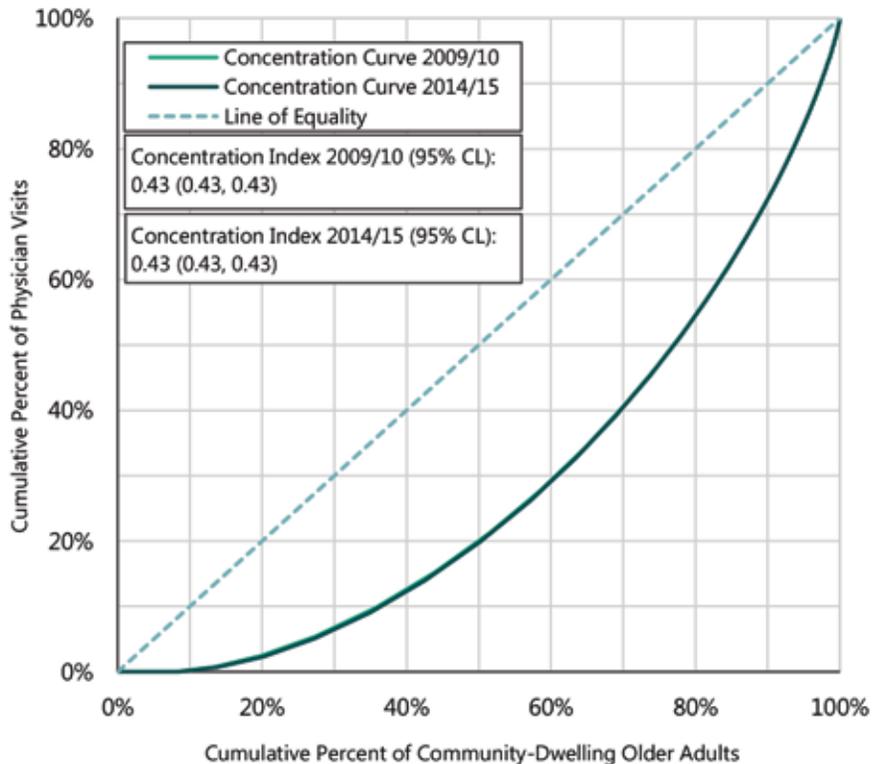
We used a concentration curve to show how ambulatory visits are distributed amongst the population of older adults.

In Figure 5.6, the cohort is sorted by the number of ambulatory visits for each of the study periods, with the group having the fewest visits to the far left and the group with the highest number of visits at the far right. The numbers of visits are summed for each group of individuals, and are graphed as the proportion of all visits in the population. As we move from the left to the right, the visits accumulate until we have accounted for 100% of the population and 100% of all visits. We also see the 'line of equality', which runs from the bottom left to the

top right. The closer the curve representing the visits stays to the line of equality, the more equal the delivery of care. And the more the curve dips below the line, the greater the concentration of visits amongst a smaller group of people. We also calculated concentration indices for both time periods – these are numeric representations of the concentration curves.

In Figure 5.6, when about 10% of the population was accounted for, the lines for both time periods were still at 0% of visits, meaning that 10% of older adults did not have a single ambulatory visit in the years that were analyzed. At 50% of the population, only 20% of all visits were accounted for. Therefore, half the population was responsible for only 20% of ambulatory visits. The last 10% of the population, however, accounted for 30% of all visits.

Figure 5.6: Concentration Curve for Ambulatory Visits, Manitoba, 2009/10 and 2014/15



## Hospitalization Rates

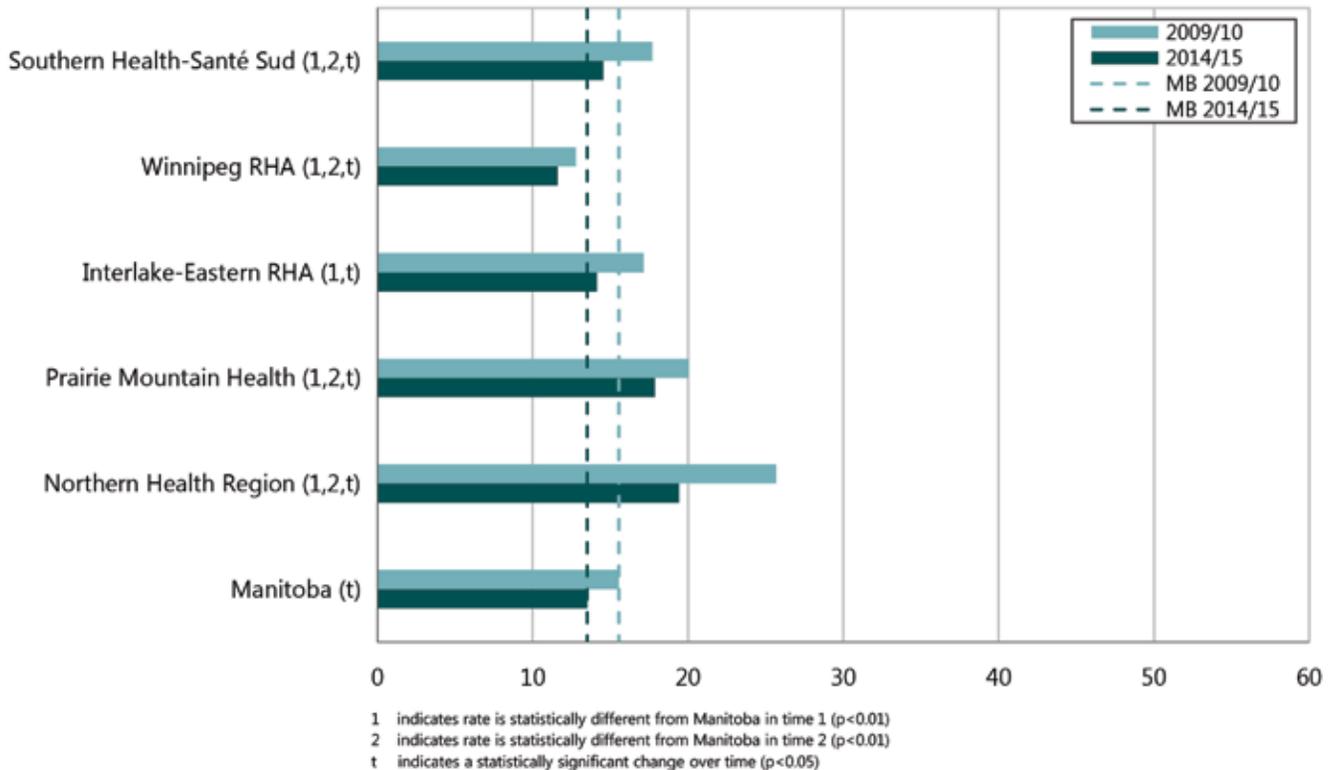
Hospitalization rates reflect the number of hospital episodes an individual had over a certain period of time. A single episode can encompass stays in multiple hospitals where a patient was directly transferred from one institution to another. Stays in non-acute care facilities (such as nursing stations), chronic care facilities, and rehabilitation facilities are not counted as hospitalizations in our analysis.

Figures 5.7 to 5.11 show that the hospitalization rate increased as individuals in our cohort aged, from around 13 hospitalizations per hundred person-years amongst the youngest age group (65-74) to more than 40 hospitalizations per hundred person-years for the oldest age group (85+). The two younger age groups saw a significant decrease in the rate of hospitalizations from one time period to the next, while there was no change over

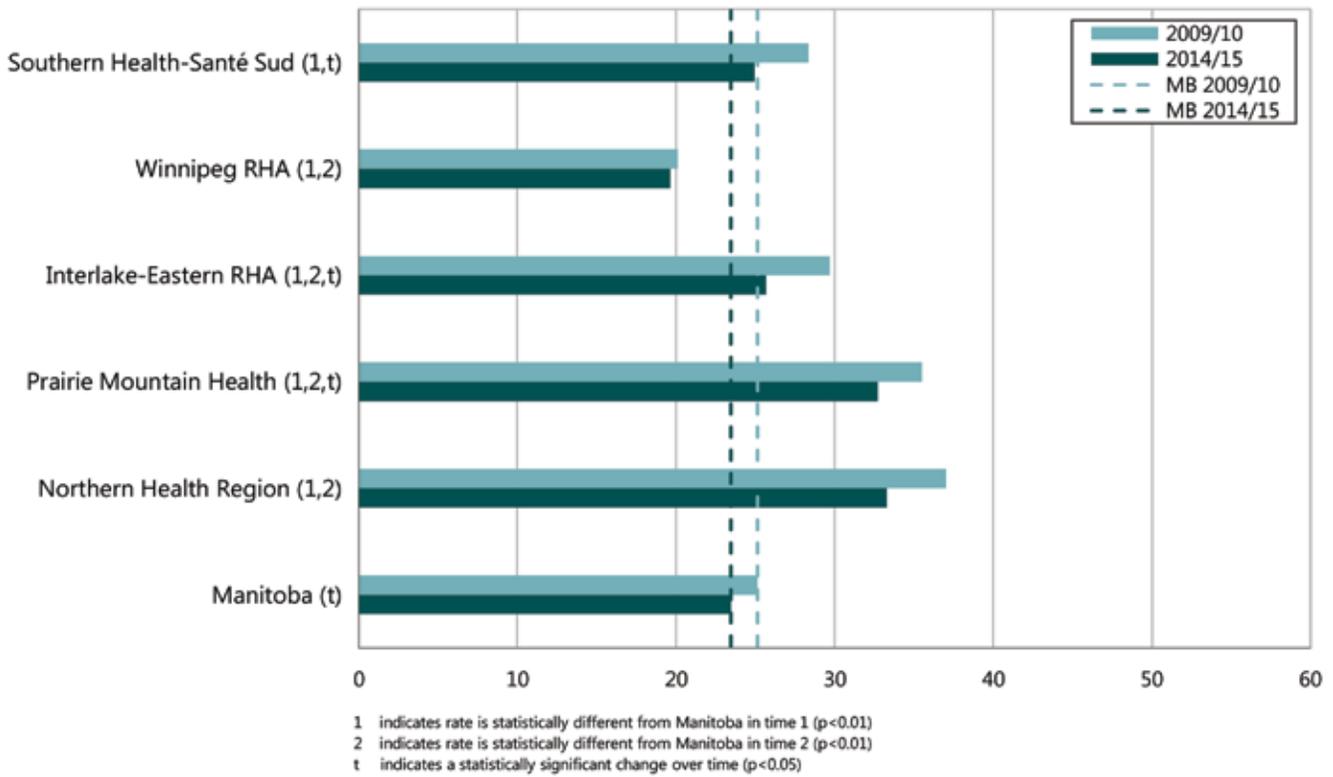
time for the oldest age group. This was consistent for most regions across Manitoba. The overall decrease in the rate represents 3,125 fewer hospitalizations in 2014 than if the rate had remained the same as in 2009.

We see that Winnipeg had the lowest hospitalization rate of all areas in Manitoba, and this finding is consistent with previous reports and analyses of hospitalizations in Manitoba. Hospitalization rates in Winnipeg were lower for all age groups than all other regions, which had rates above the Manitoba average in at least two of the age groups. There was a very strong relationship between hospitalization rate and income, with a stepwise increase in the rate of hospitalizations as we moved from the highest income quintile to the lowest income quintile, for both urban and rural areas.

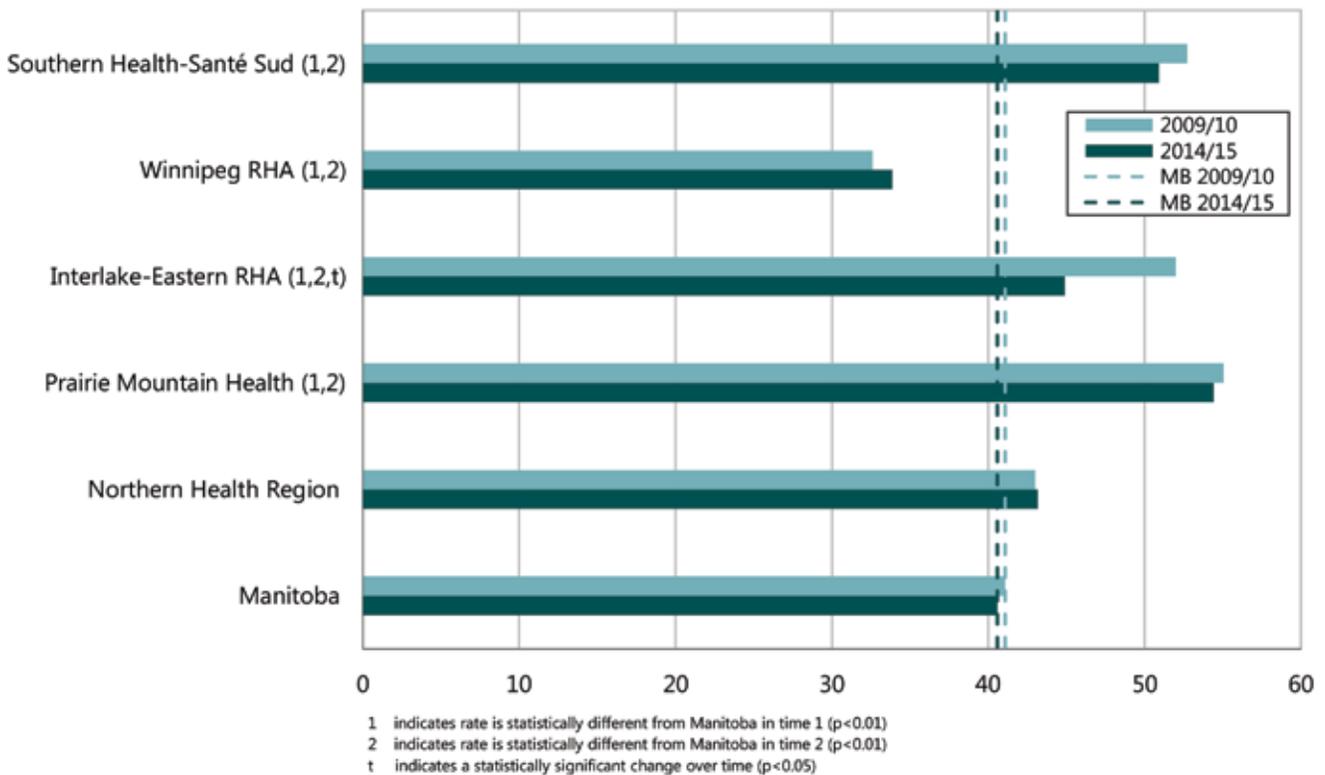
**Figure 5.7: Hospitalization Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 100 person-years



**Figure 5.8: Hospitalization Rates by Health Region, Age 75-84**  
Crude rate for community-dwelling older adults per 100 person-years

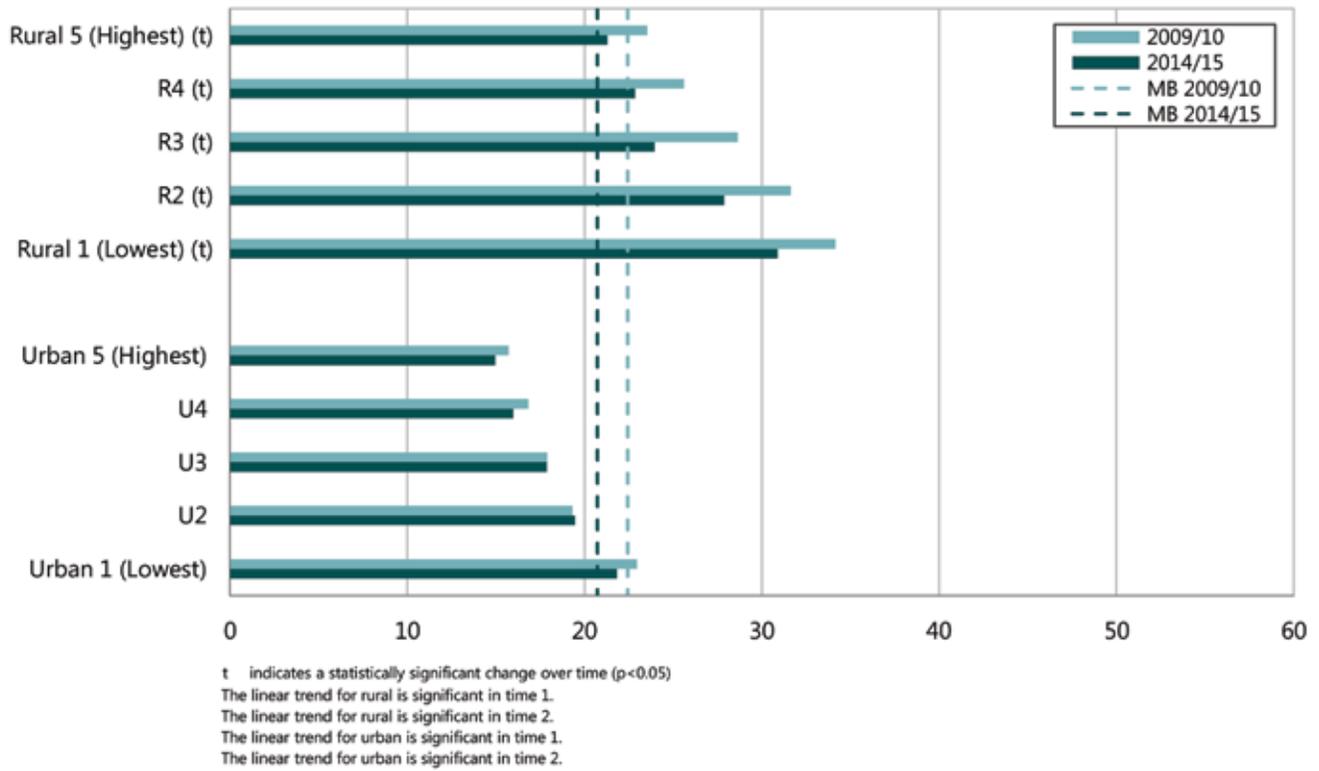


**Figure 5.9: Hospitalization Rates by Health Region, Age 85+**  
Crude rate for community-dwelling older adults per 100 person-years



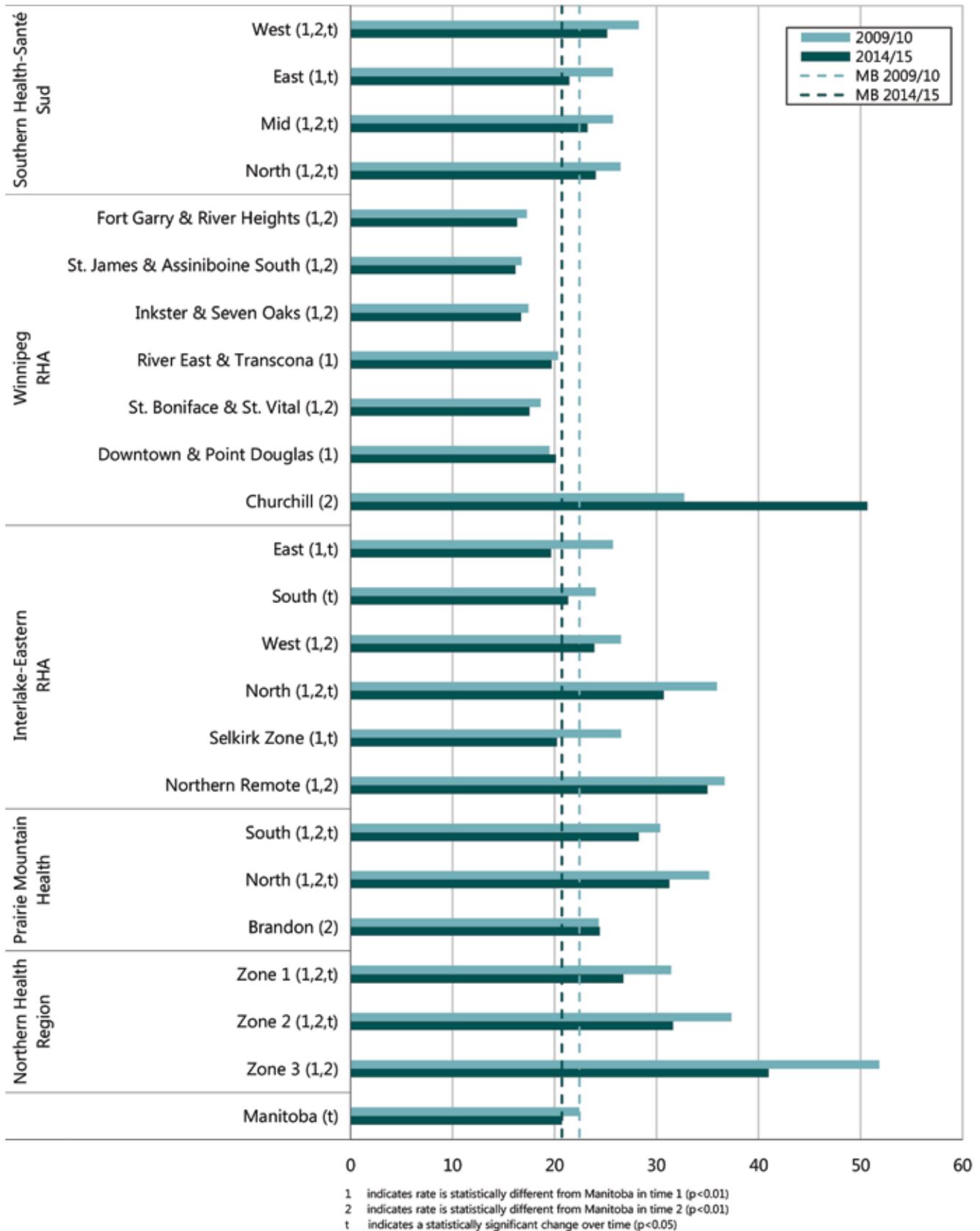
**Figure 5.10: Hospitalization Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 100 person-years



**Figure 5.11: Hospitalization Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 100 person-years

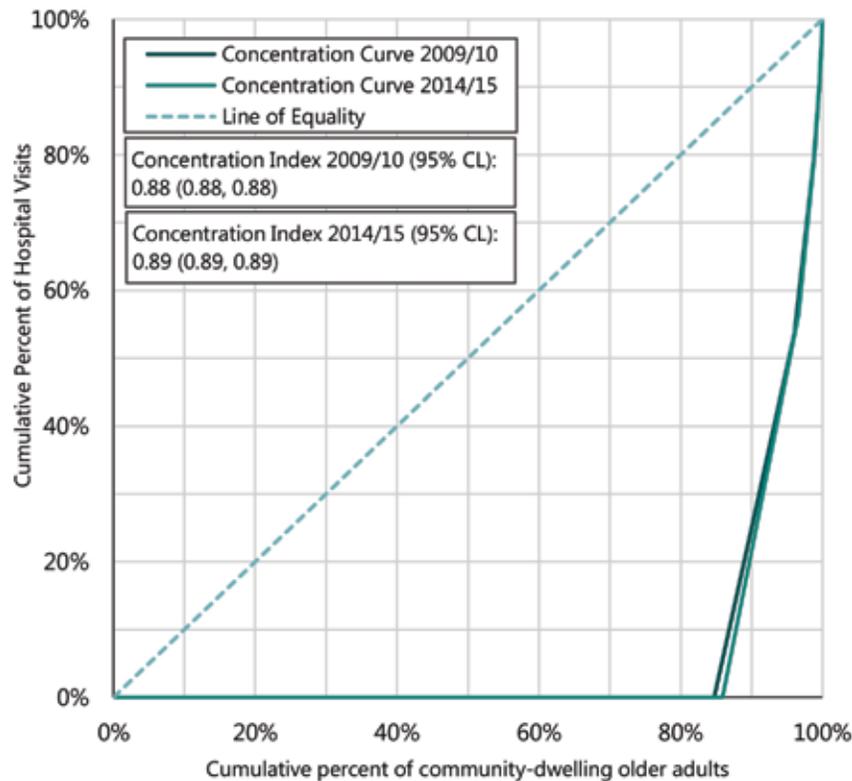


## Concentration Curve for Hospitalization Rates

The concentration indices for hospitalizations were very close to 1, which means hospitalizations were concentrated amongst a very small percentage of the population. In Figure 5.12, we see that 85% of the population did not have a single hospitalization. Less than 5% of the older adult

population accounted for almost half of all hospitalizations for this population. There was a very slight but significant change from one time period to the next: fewer older adults were hospitalized in the more recent time period. While it is true that the older adult population has much higher rates of healthcare use than younger Manitobans, our findings show that only a small proportion of older adults is responsible for the higher rate of hospitalization.

Figure 5.12: Concentration Curve for Hospitalizations, Manitoba, 2009/10 and 2014/15



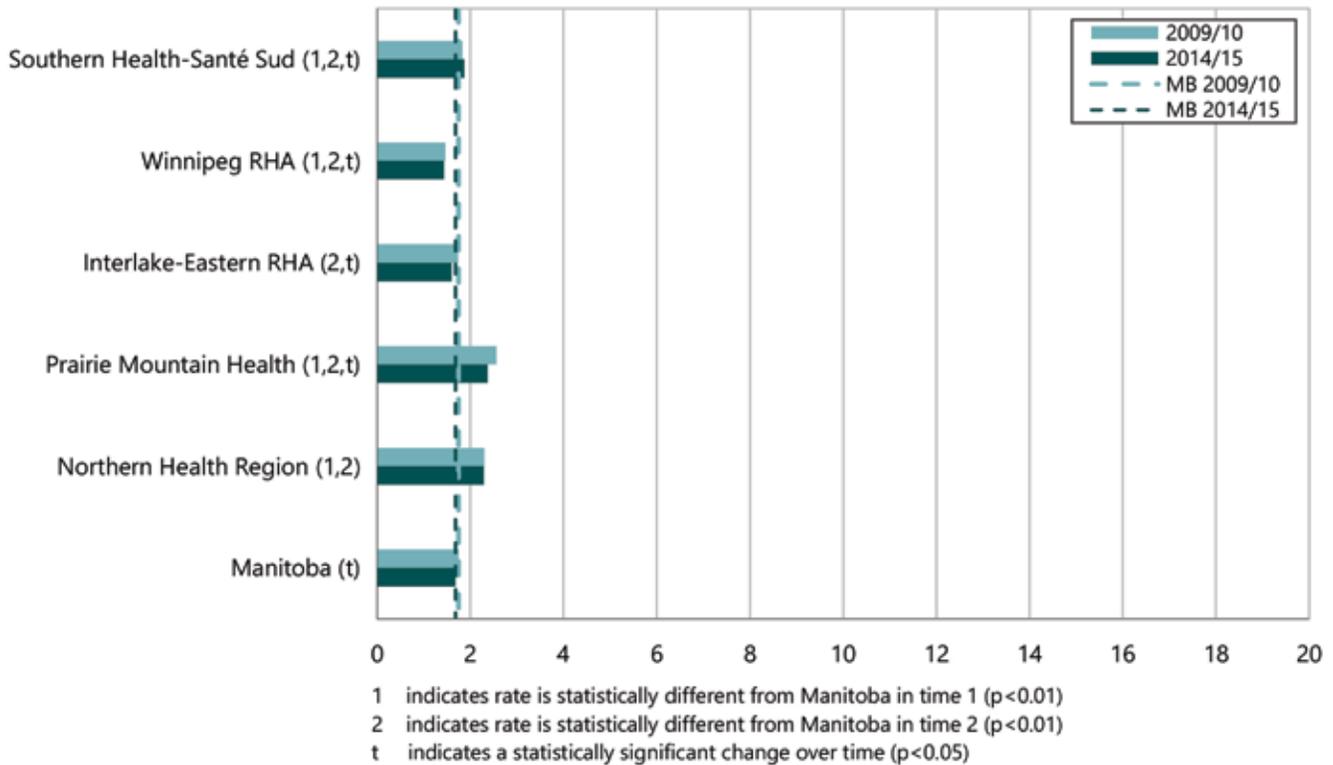
## Hospital Days

Not all hospitalizations are for the same amount of time. While many hospitalizations are relatively short in length, lasting just a few days, a longer stay may be necessary for more serious matters. We counted the total number of days older adults spent in hospital in the two time periods to produce rates per person-year. This measure is quite different from the hospitalization rates, which are presented in rates per hundred person-years.

Figures 5.13 to 5.17 indicate that Winnipeg had the lowest rates for all three age groups. The rates more than doubled with each increase in the age group, which represents a greater escalation than what we saw for hospitalization rates. This indicates that the average length of stay in hospital is greater for the older age groups than the younger. We noted a large difference in the rate of hospital days between regions for the oldest age group, where the Winnipeg RHA and Northern Health Region rates are half the rate in Southern Health-Santé Sud.

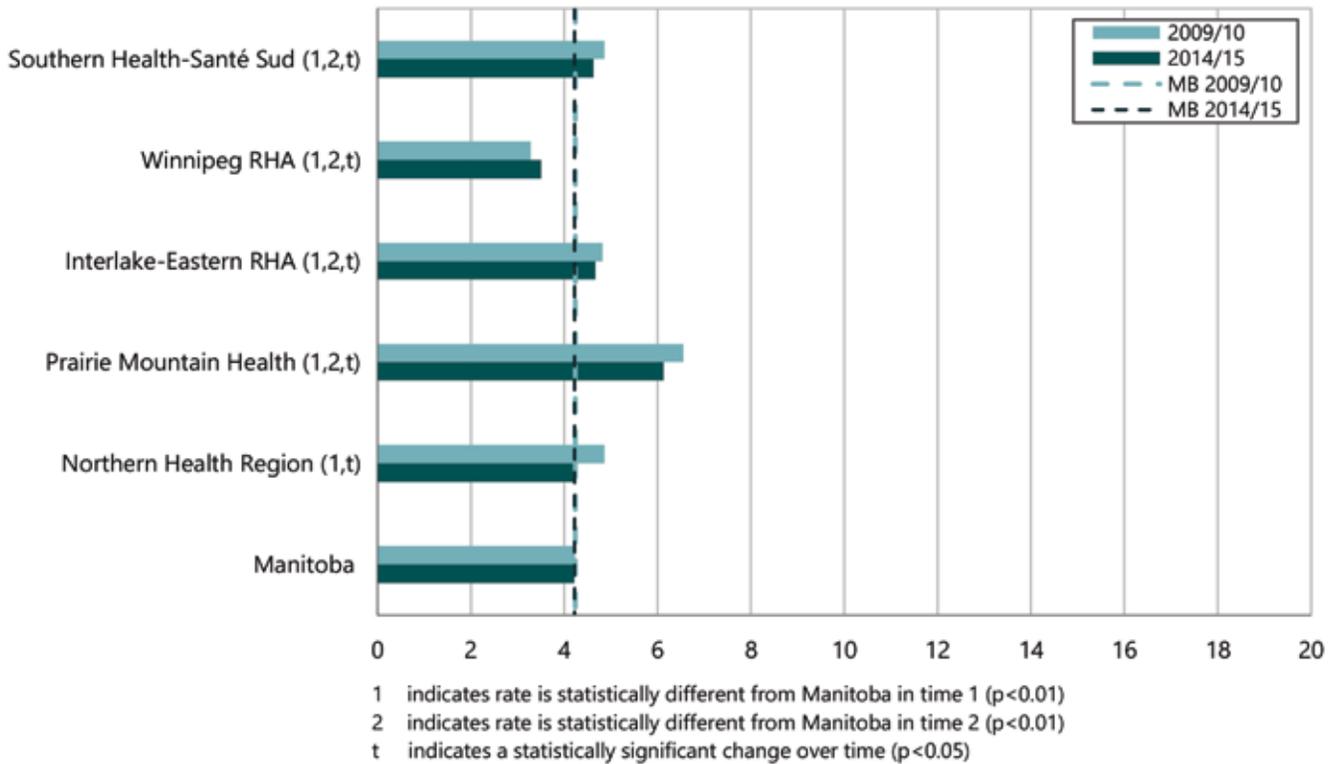
Although significant, the rates of hospital days did not increase very much for the two younger age groups from one time period to the next. For the oldest age group, however, there was an increase of about one day per person-year – a 10% change in the amount of hospital days. In total, the change in rates represents just over 15,432 extra hospital days in 2014 than if the rate had remained the same as in 2009. The rate of hospital days increased over time for the oldest age group in Southern Health-Santé Sud and Interlake-Eastern RHA, while the Northern region rate decreased, and Prairie Mountain Health had no change over time. The pattern for rates of hospital days was related to income quintiles, reflecting the impact of the social determinants of health (Figure 5.16). There was a consistent increase in the rate of hospital days with each step from the highest income quintile to the lowest income quintile, except for the highest rural income quintile, which had the highest rate in the province (in the second time period only).

**Figure 5.13: Rates of Hospital Days by Health Region, Age 65-74**  
Crude rate per person-year for community-dwelling older adults



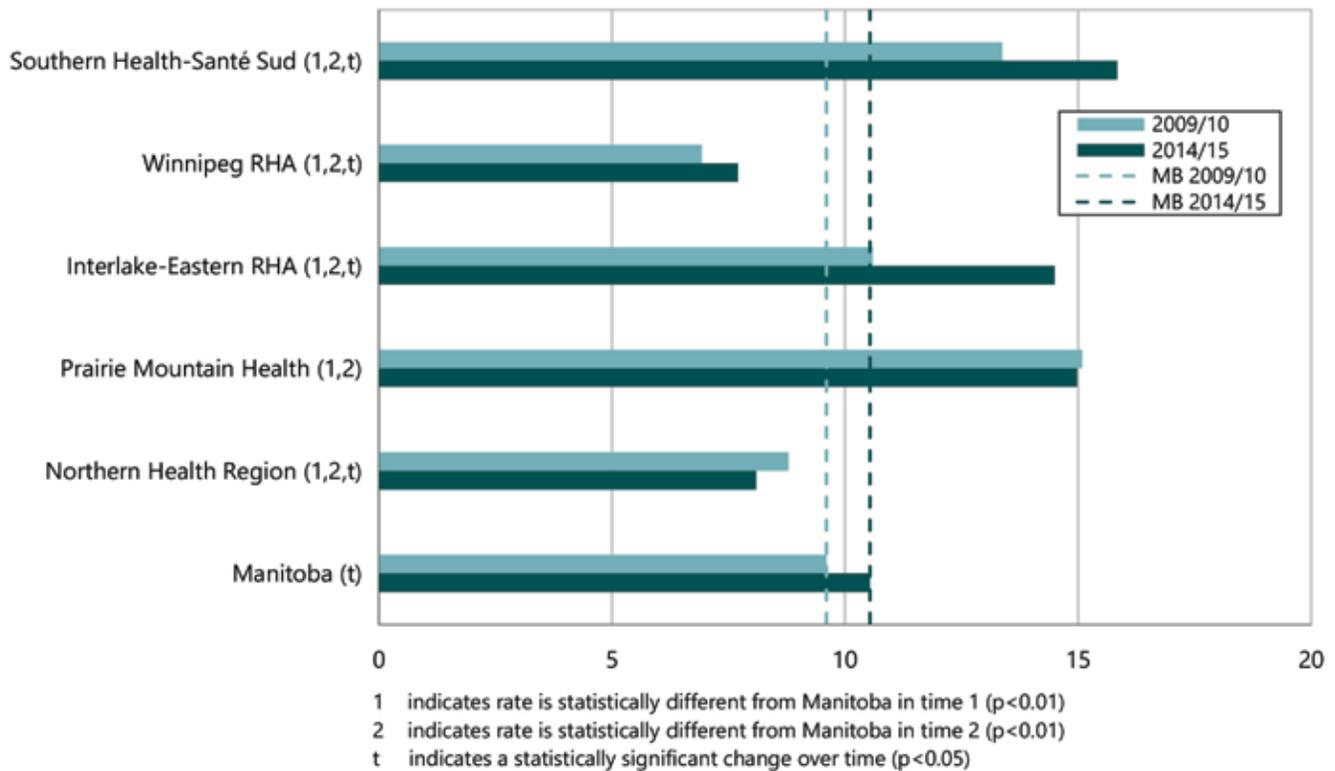
**Figure 5.14: Rates of Hospital Days by Health Region, Age 75-84**

Crude rate per person-year for community-dwelling older adults



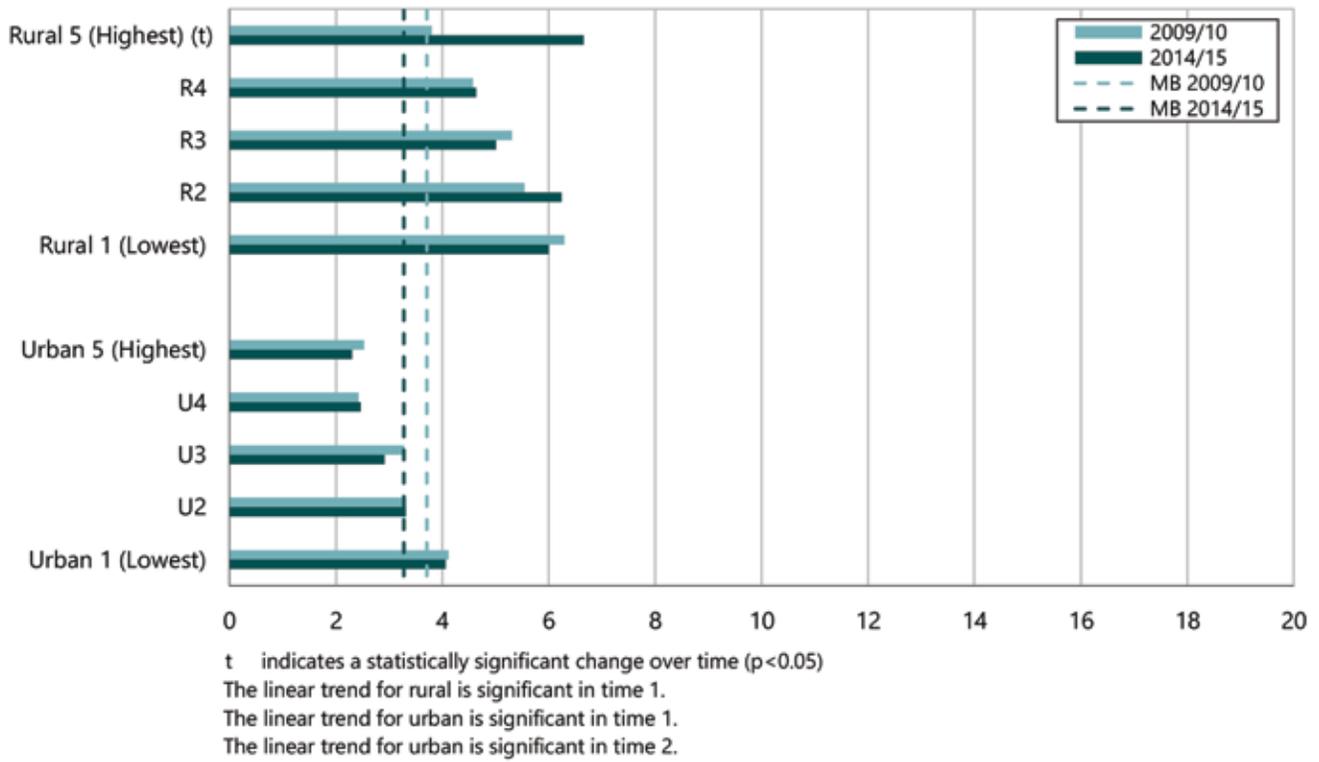
**Figure 5.15: Rates of Hospital Days by Health Region, Age 85+**

Crude rate per person-year for community-dwelling older adults



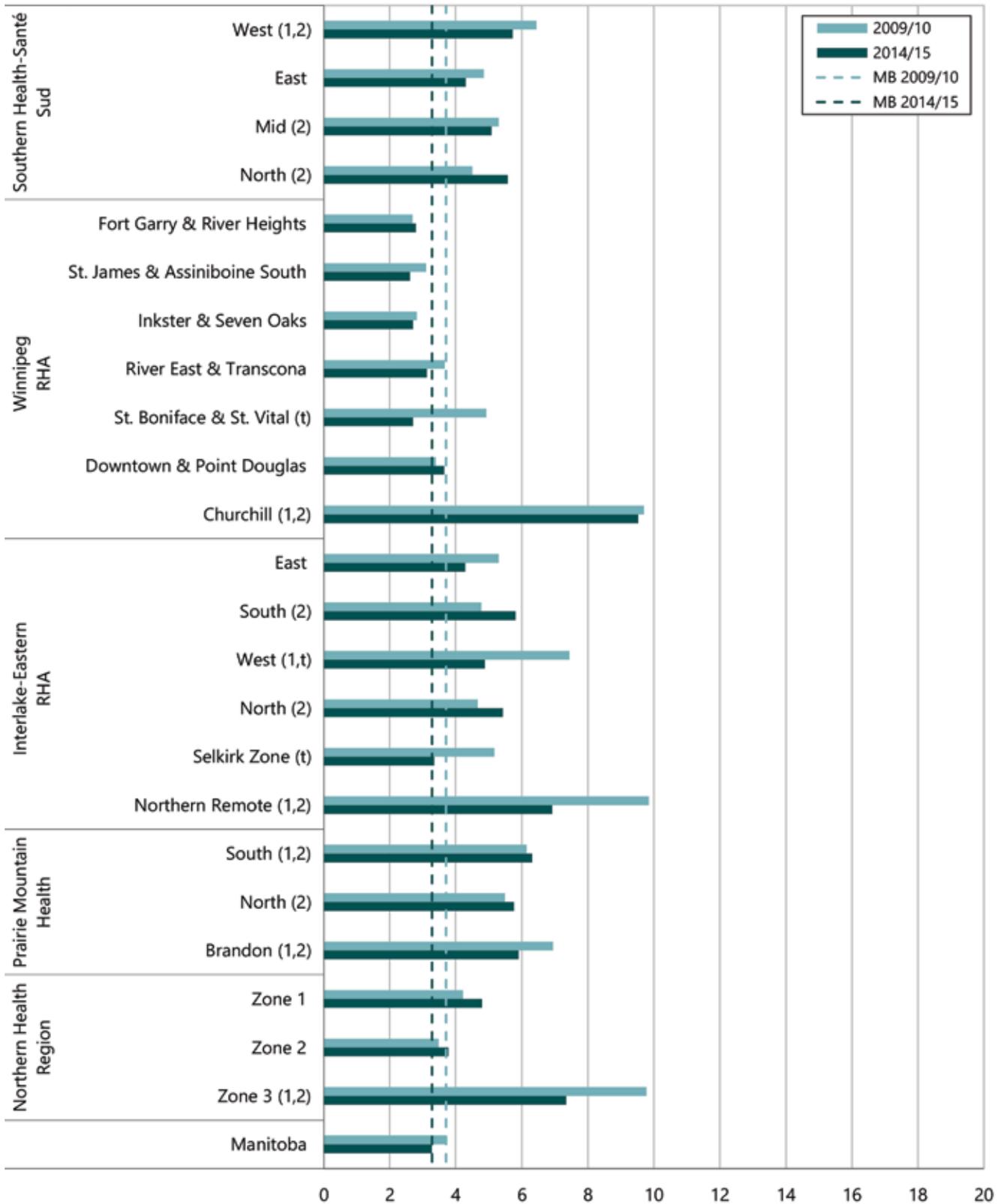
**Figure 5.16: Rates of Hospital Days by Income Quintile**

Age- and sex-adjusted rate per person-year for community-dwelling older adults



**Figure 5.17: Rates of Hospital Days by Health Region Zone**

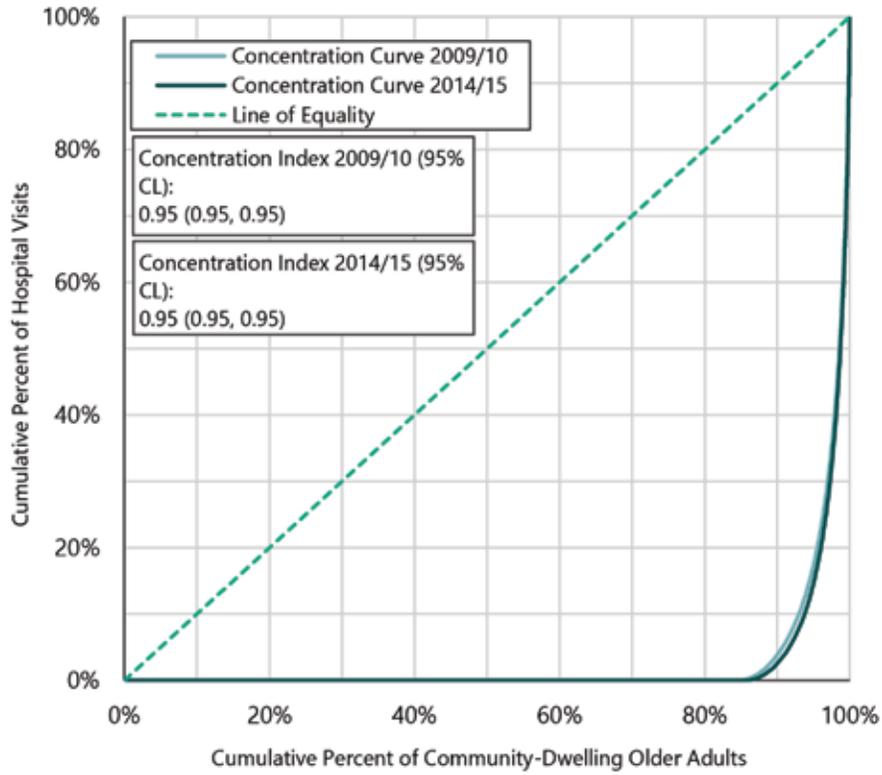
Age- and sex-adjusted rate per person-year for community-dwelling older adults



1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates rate is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)

## Concentration Curve for Rates of Hospital Days

Figure 5.18: Concentration Curve for Hospital Days, Manitoba, 2009/10 and 2014/15



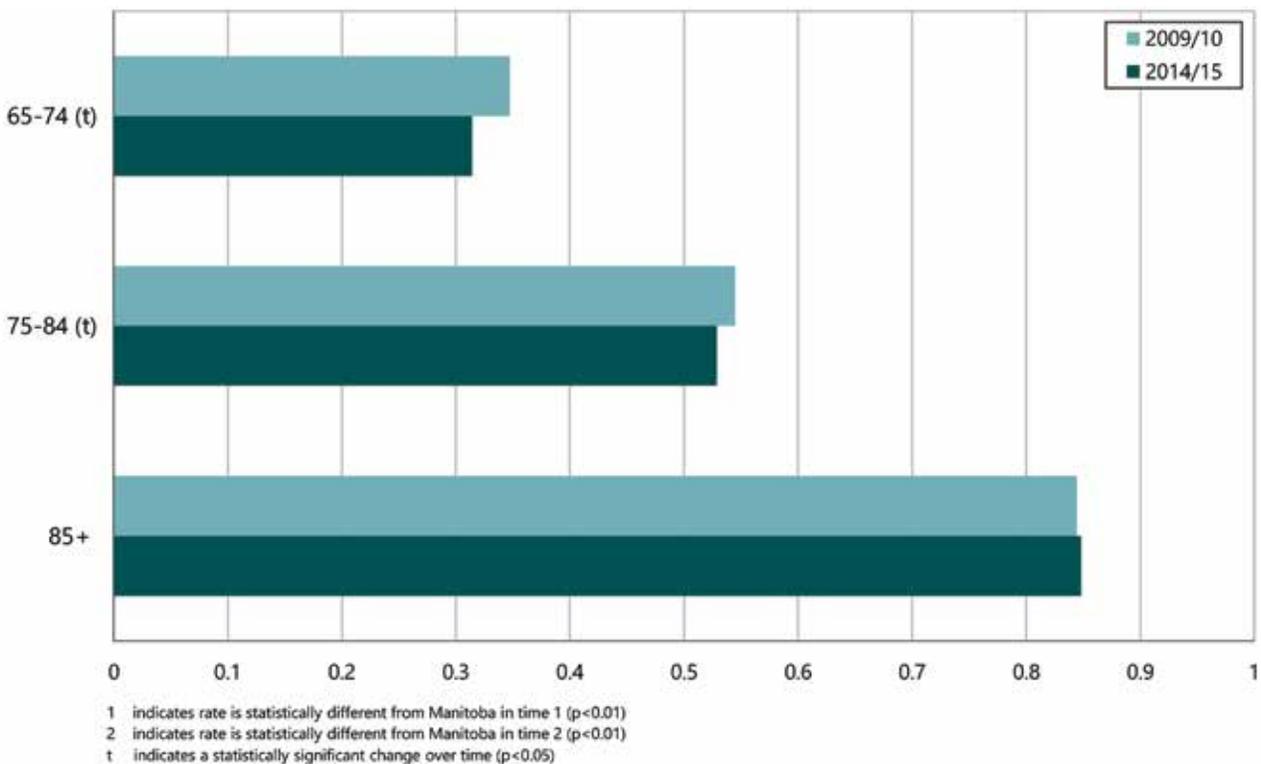
## Emergency Department Visits

A trip to the emergency department (ED) at a hospital is made because of an acute event, sudden exacerbation of a condition, or the rapid development or worsening of a symptom to a point where waiting for a scheduled visit with a physician would not be considered prudent. For older adults, unfortunately, this kind of event occurs more frequently than it does for younger people. We used data from the Emergency Department Information System (EDIS) to count the number of ED visits made by individuals in our study cohort. EDIS data were available only for the Winnipeg RHA during the time of our study.

Figure 5.19 presents the results for all three age groups, showing the increase in ED visit rate as the population ages. For the oldest age group, the rate was approximately 0.8 ED visits per person-year, so we would expect that a large proportion of this population has been to the ED at least once. For the younger age groups, there were significant decreases in ED visits from one time period to the next, but there was no change over time for the oldest age group (similar to what we saw with hospitalizations for these age groups). We also noted a strong relationship between the ED visit rate and income quintile, with people living in higher income areas having lower rates of ED visits (Figure 5.20). However, unlike what we saw for hospitalizations, the decrease over time was present across all income quintiles.

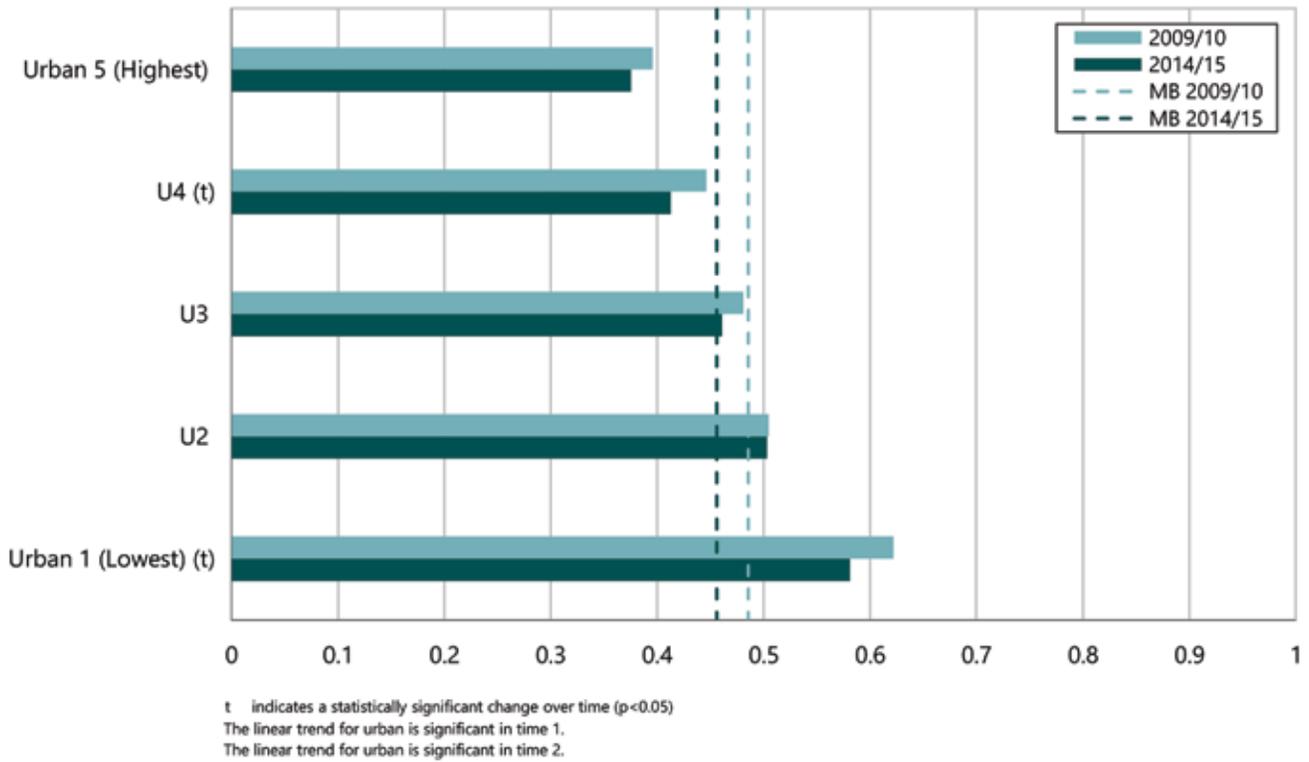
**Figure 5.19: Emergency Department Visit Rates by Age**

Crude rate for community-dwelling older adults per person-year



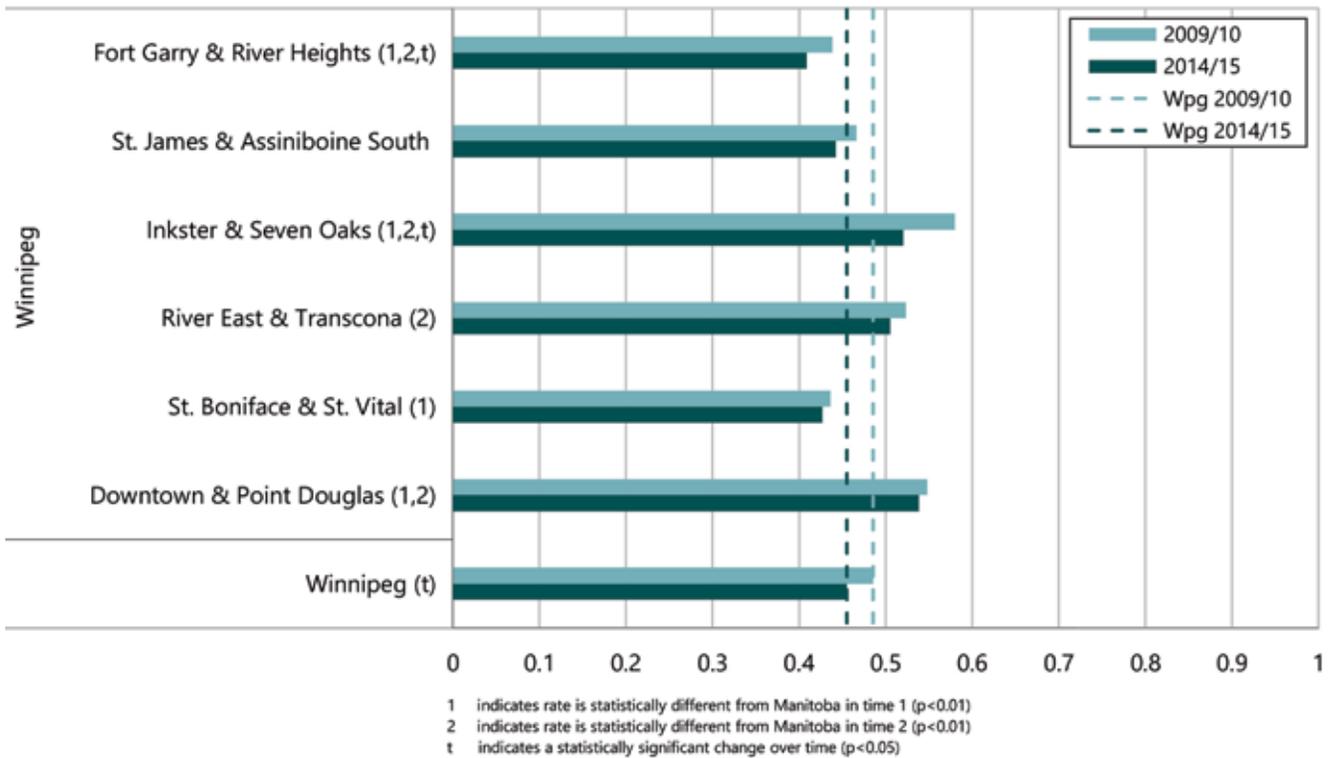
**Figure 5.20: Emergency Department Visit Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 5.21: Emergency Department Visit Rates by Winnipeg Community Area**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



## Specialist Visits & Ambulatory Consultations

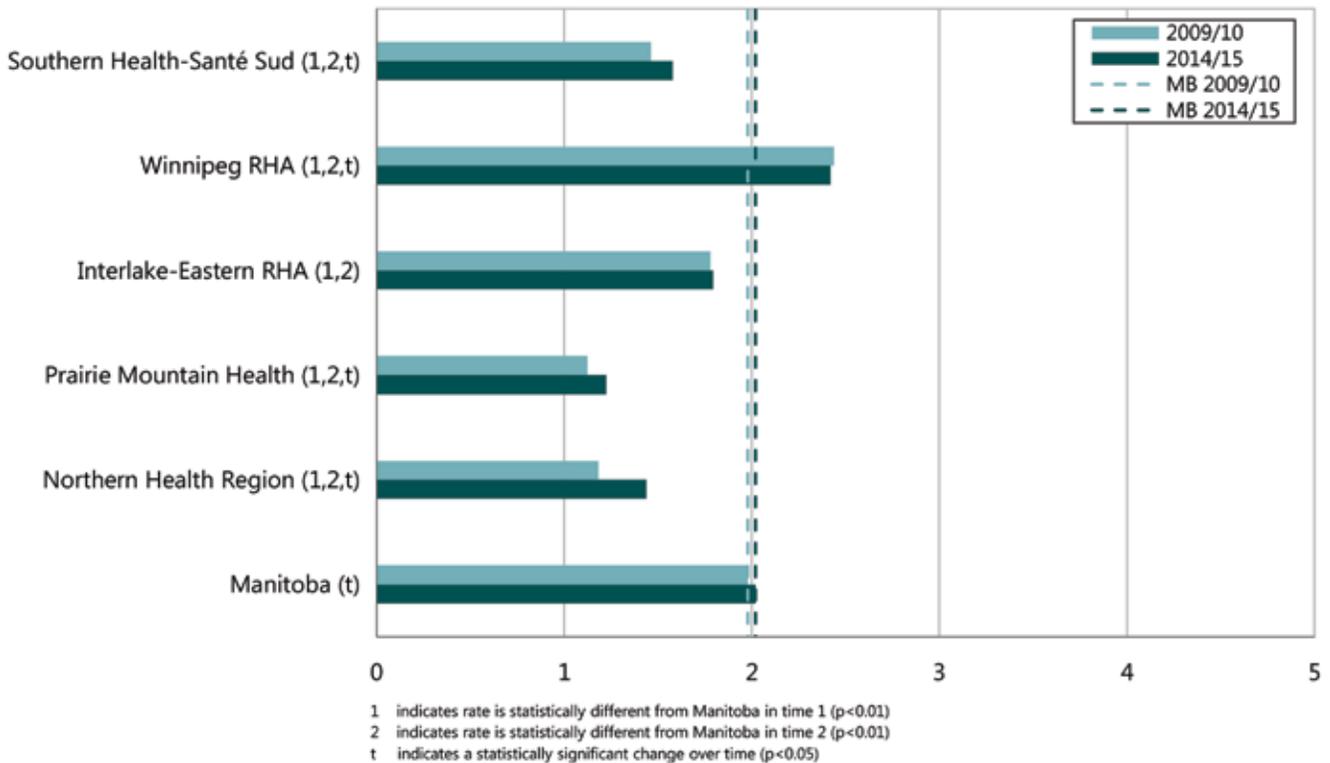
Medical specialists are often relied upon to provide care for patients when the condition being treated is complex, particularly serious, or just uncommon, and the primary care provider or patient is seeking additional input. We used two ways to measure access to specialist care. One was to measure the rate of visits to physicians who are specialists, which is a subset of the ambulatory visits rate presented earlier in this chapter. The second was to count the number of ambulatory consultations. Consults occur when one physician refers a patient to another physician (usually a specialist, a surgeon, or sometimes a family physician with training and expertise in particular conditions).

## Specialist Visits Rates

Figures 5.22 to 5.25 present the rate of specialist visits by age group, region, and income quintile. These figures show that the rate of visits to specialist physicians was higher in Winnipeg compared to rural areas. The greater number of specialist visits in Winnipeg could be related to more Winnipeg residents accessing specialists, or to patients who access specialists having more visits for follow-up or ongoing care. Unlike other healthcare use indicators, the specialist visit rates did not vary by age group; each of the three groups had on average two visits per person-year. There were small but significant increases in visits rates from one time period to the next for all three age groups. These increases translate into 12,702 more specialist visits in 2014/15 than would have been the case if that rate had not changed since 2009. We also saw a moderate but consistent inverse relationship between specialist visits and income quintile in both urban and rural areas of Manitoba. In all parts of the province, older adults living in more affluent areas were seen by specialists more often than older adults living in poorer areas.

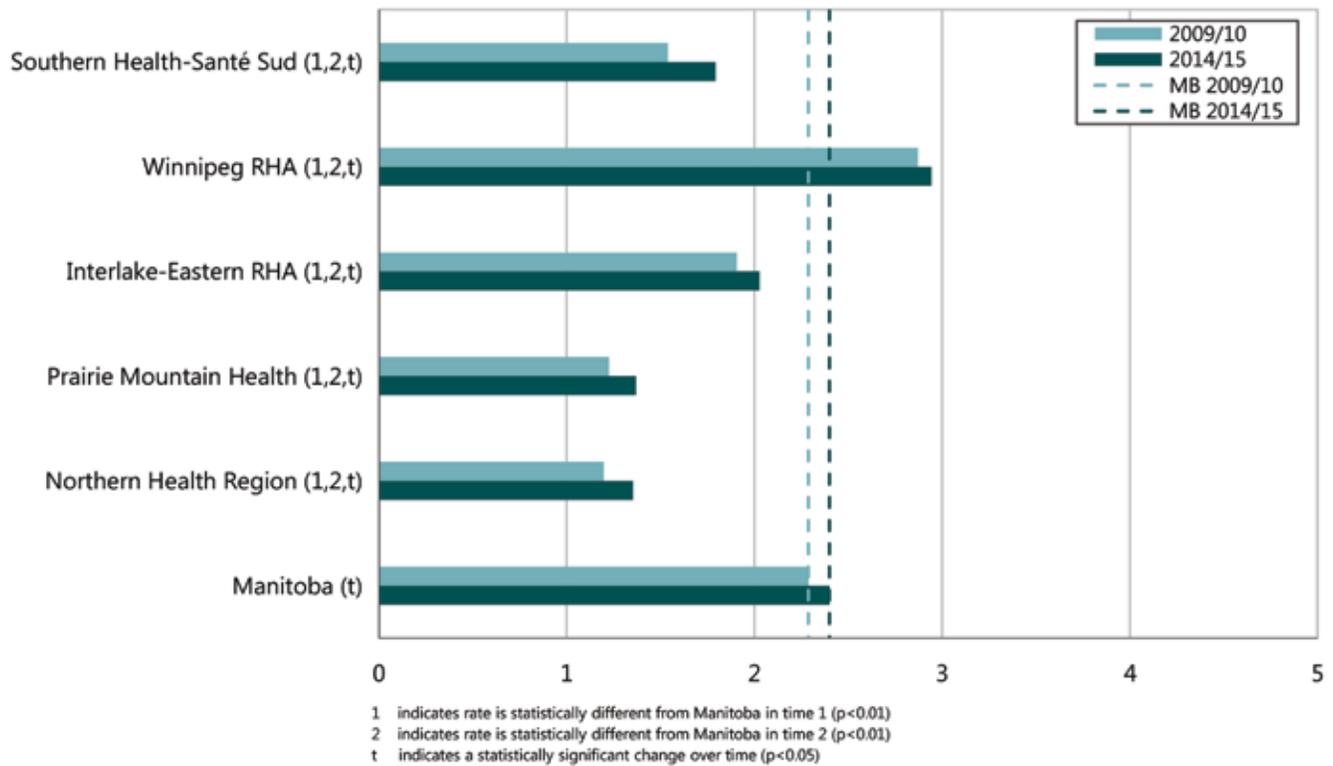
**Figure 5.22: Specialist Visit Rate by Health Regions Age 65-74**

Crude rate for community-dwelling older adults per person-year



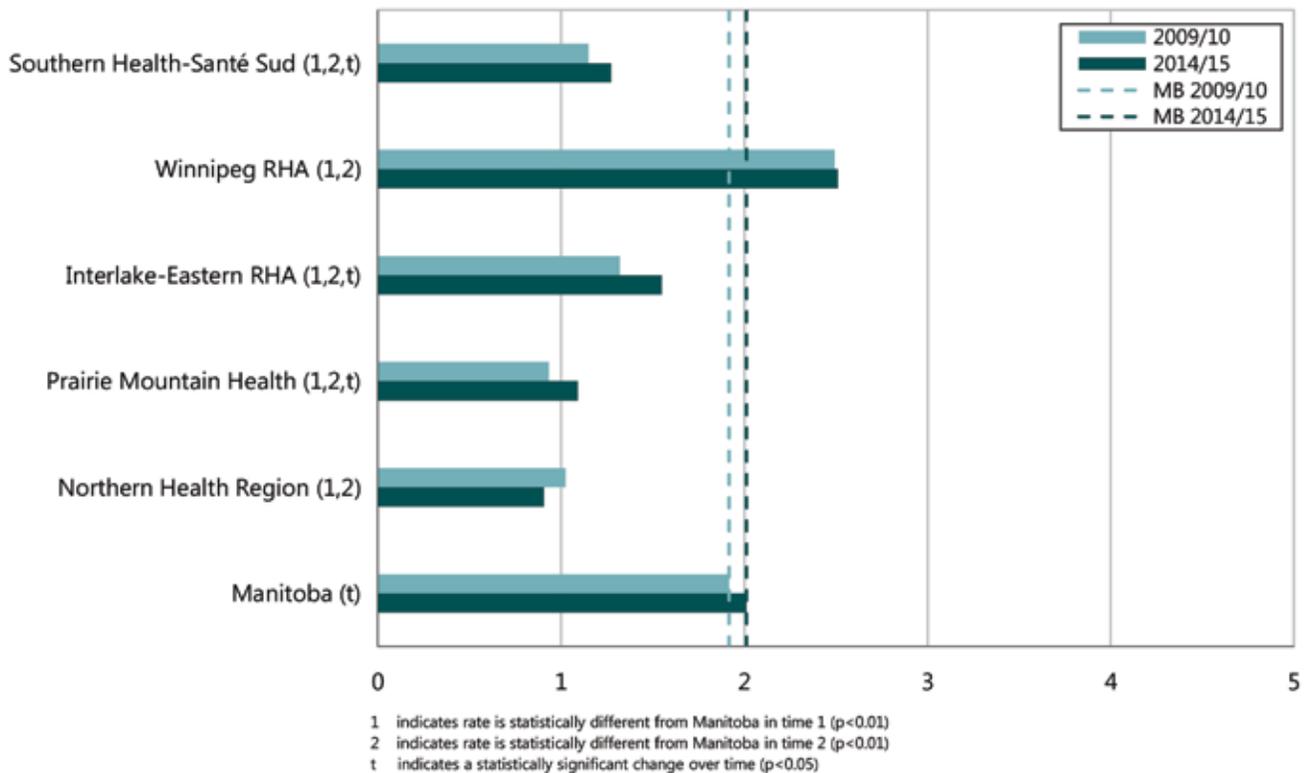
**Figure 5.23: Specialist Visit Rate by Health Regions Age 75-84**

Crude rate for community-dwelling older adults per person-year

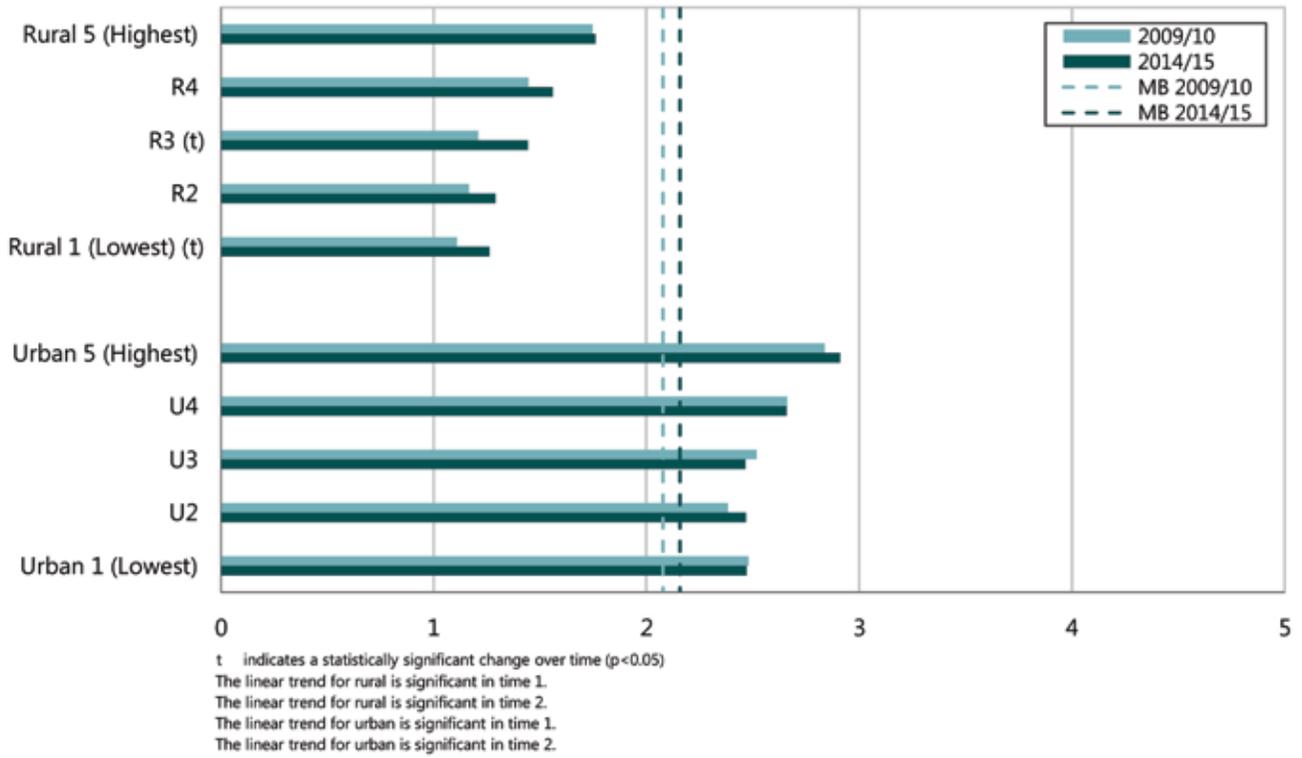


**Figure 5.24: Specialist Visit Rate by Health Regions Age 85+**

Crude rate for community-dwelling older adults per person-year

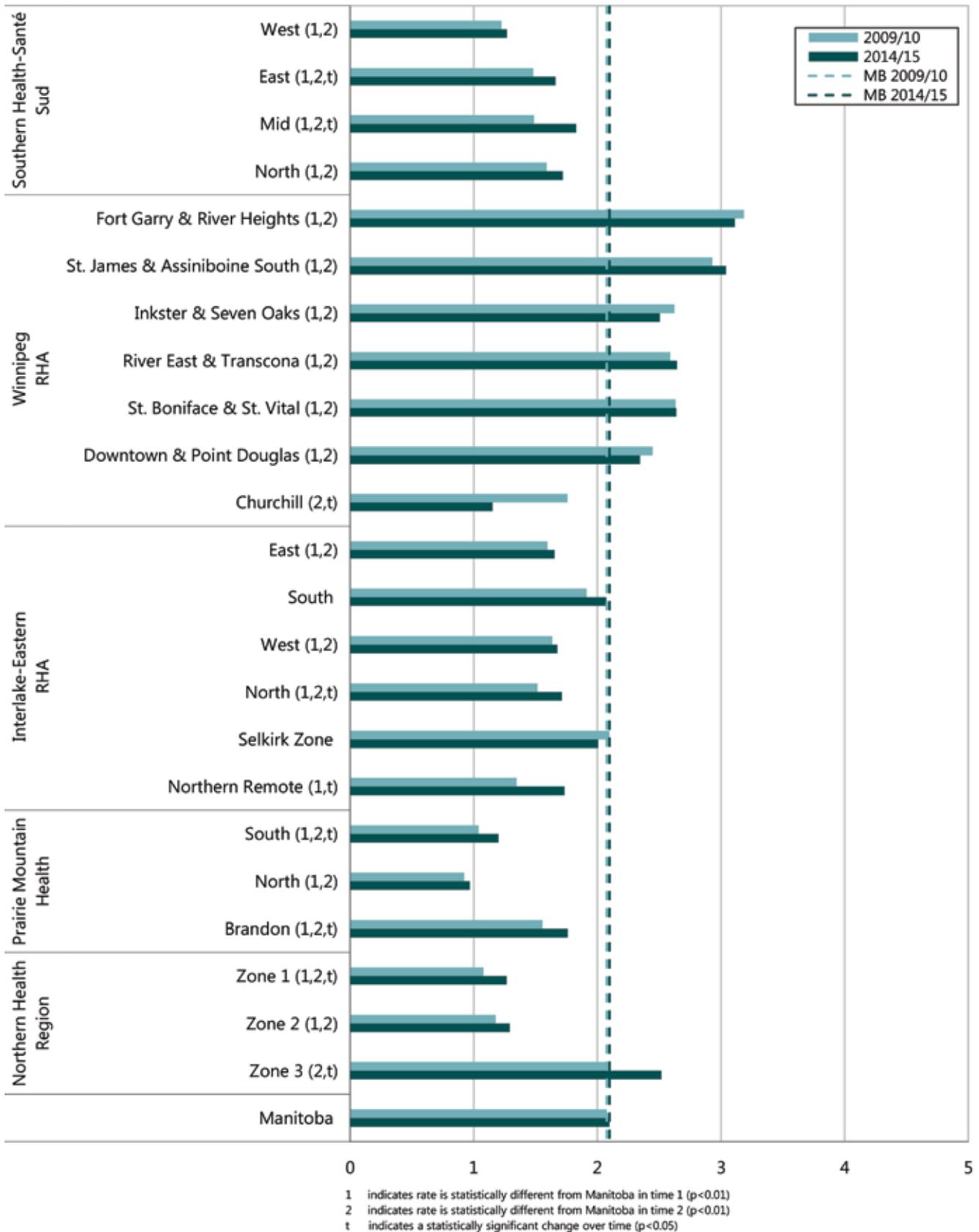


**Figure 5.25: Specialist Visit Rate by Income Quintile**  
 Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 5.26: Specialist Visit Rate by Health Region Zones**

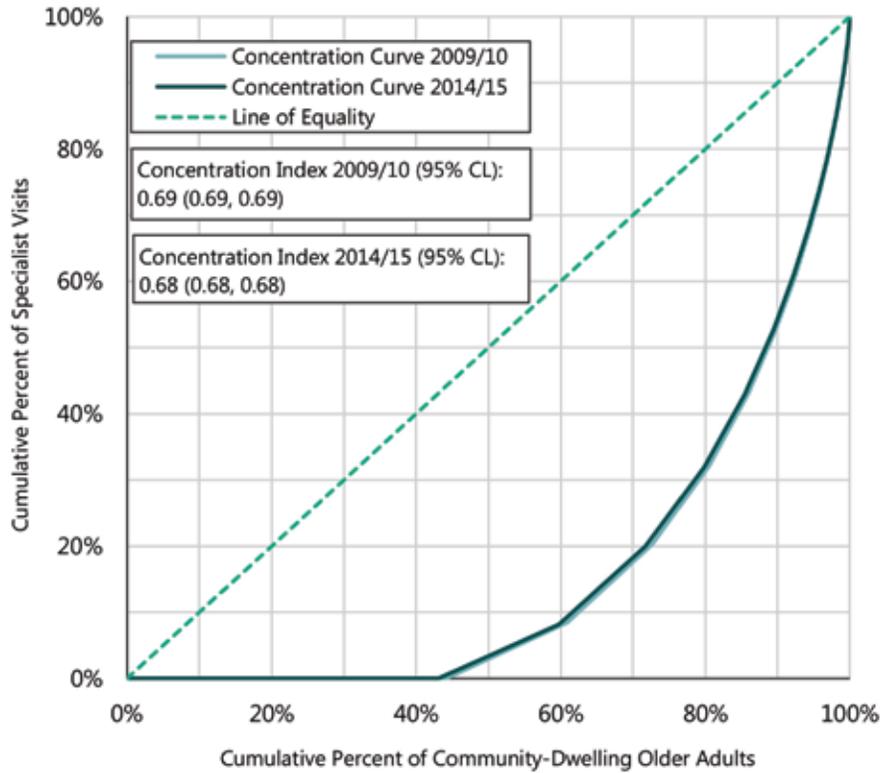
Age- and sex-adjusted rate for community-dwelling older adults per person-year



## Concentration Curve for Specialist Visits

Looking at the concentration curve for specialist visits in Figure 5.27, it is apparent that the curve does not begin to move from zero visits until about 45% of the population has been accounted for; this means about 55% of older Manitobans saw a specialist at least once, and 45% did not see a specialist at all. Ten percent of the older adult cohort (i.e., the portion at the far right of the figure) accounted for approximately 45% of all specialist visits.

**Figure 5.27: Concentration Curve for Specialist Visits, Manitoba, 2009/10 and 2014/15**



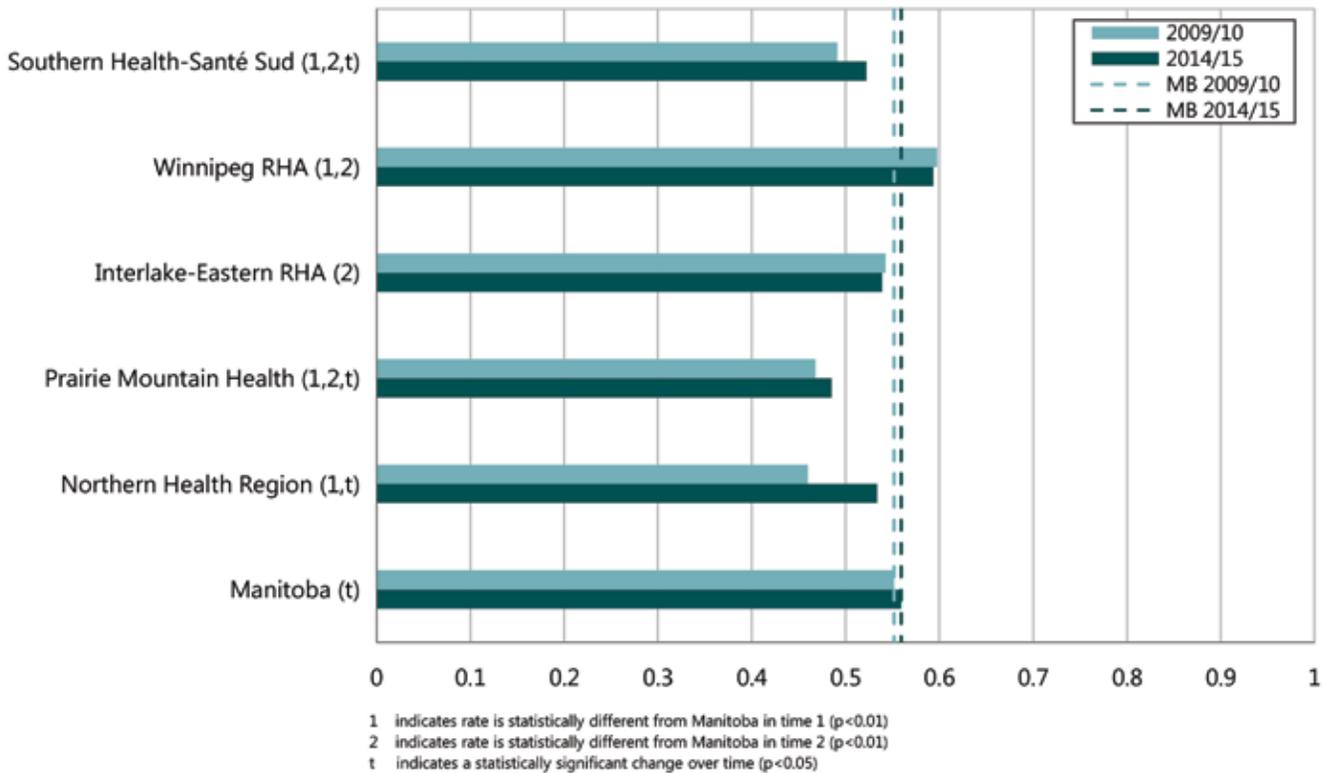
## Ambulatory Consultation Visit Rates

Figures 5.28 to 5.30 show that the consult rates were similar across all regions of the province, although Winnipeg still had a higher rate than the rest of the province. The different pattern in how specialist visits and ambulatory consults were distributed across Manitoba could represent a different likelihood in follow-up care being provided by either specialists in Winnipeg or primary care providers in rural areas. That is, while a patient in Winnipeg might continue to see a specialist for ongoing care after the consult, that care might be transferred to primary care providers for rural patients.

There was a slight increase in consult rates from one time period to the next for all age groups, and this was primarily due to increased consult rates in the rural regions. In terms of the relationship between consult rates and income, there was an inverse relationship in both urban and rural areas during both time periods. There was a significant increase in consult rates over time in only one (R3) rural income quintile (Figure 5.31).

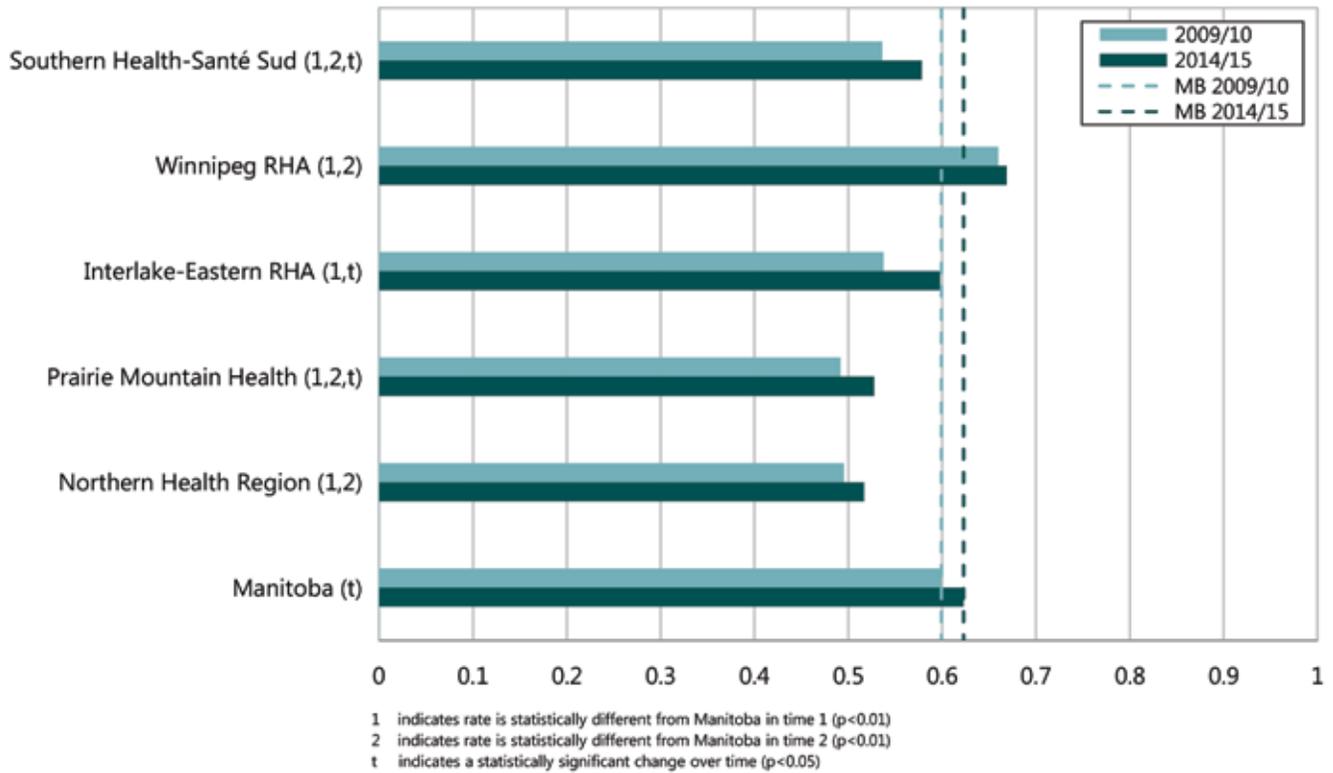
**Figure 5.28: Ambulatory Consultation Visit Rates by Health Region, Age 65-74**

Crude rate for community-dwelling older adults per person-year



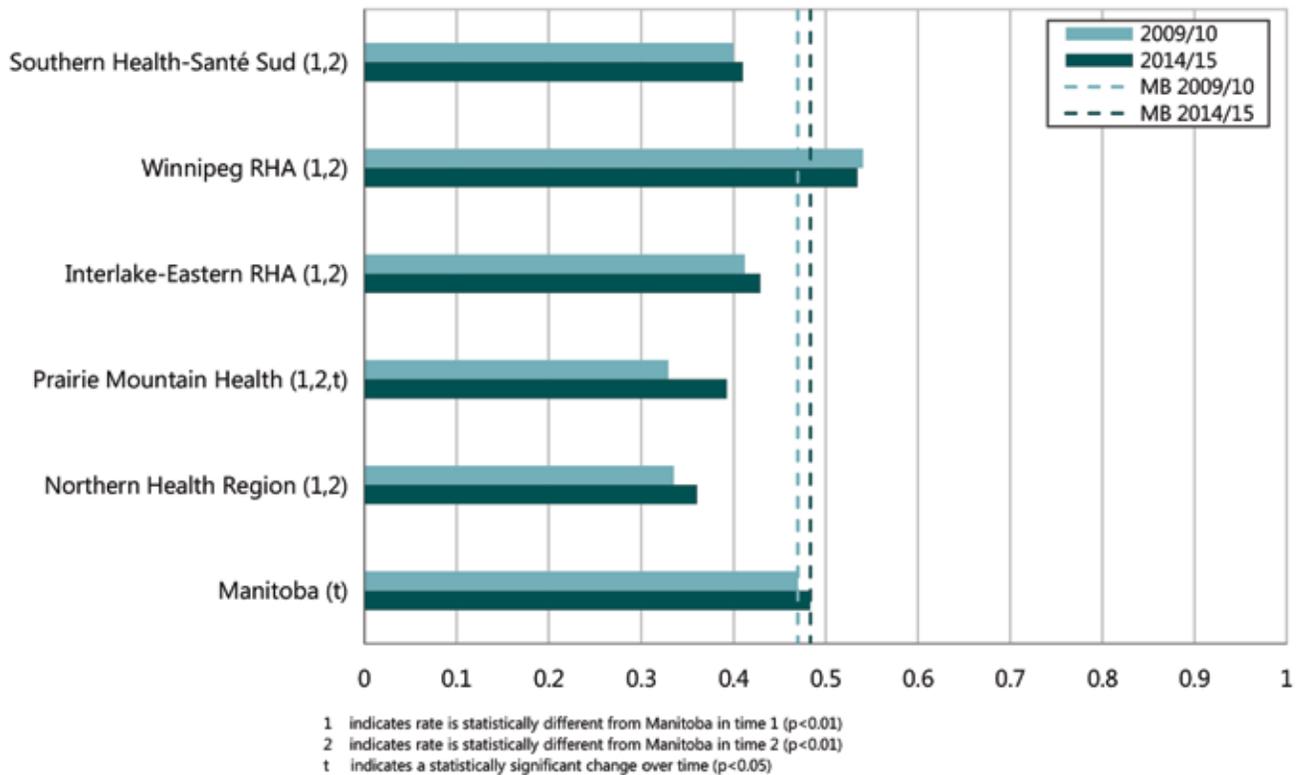
**Figure 5.29: Ambulatory Consultation Visit Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per person-year



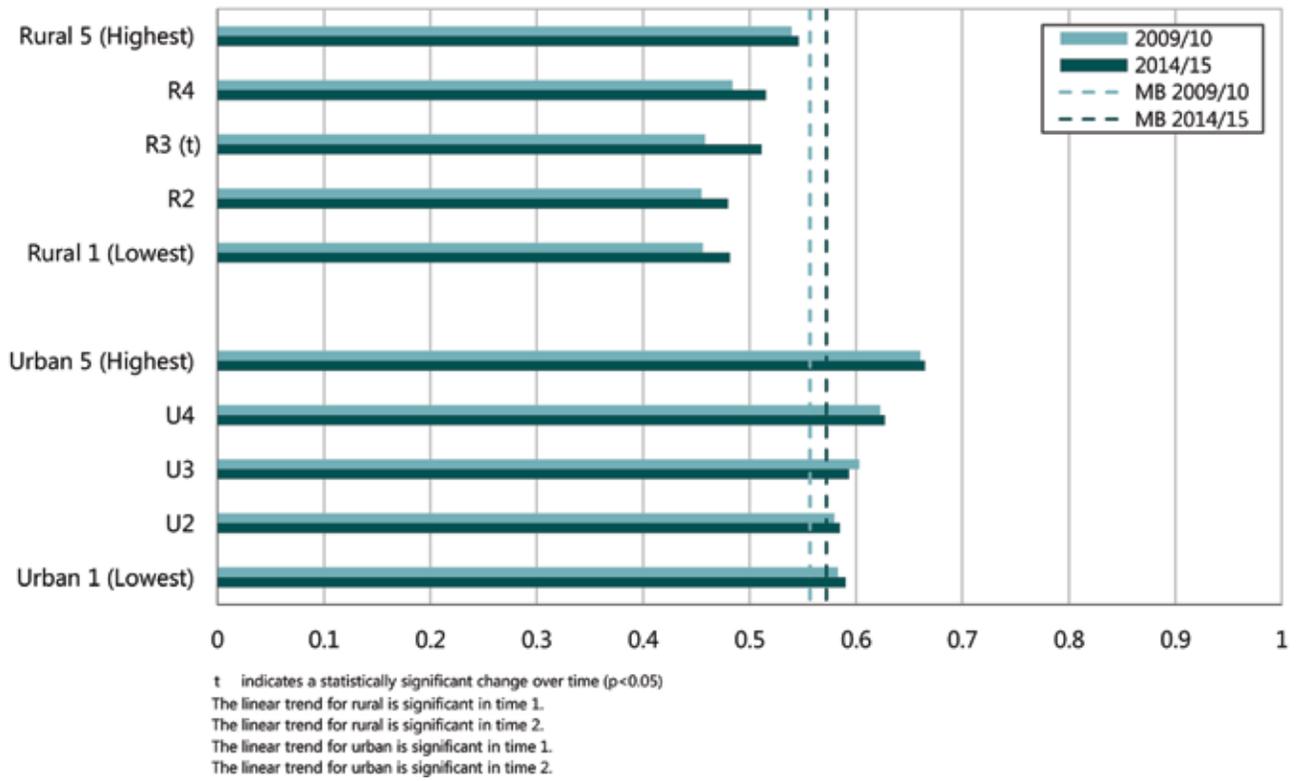
**Figure 5.30: Ambulatory Consultation Visit Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per person-year



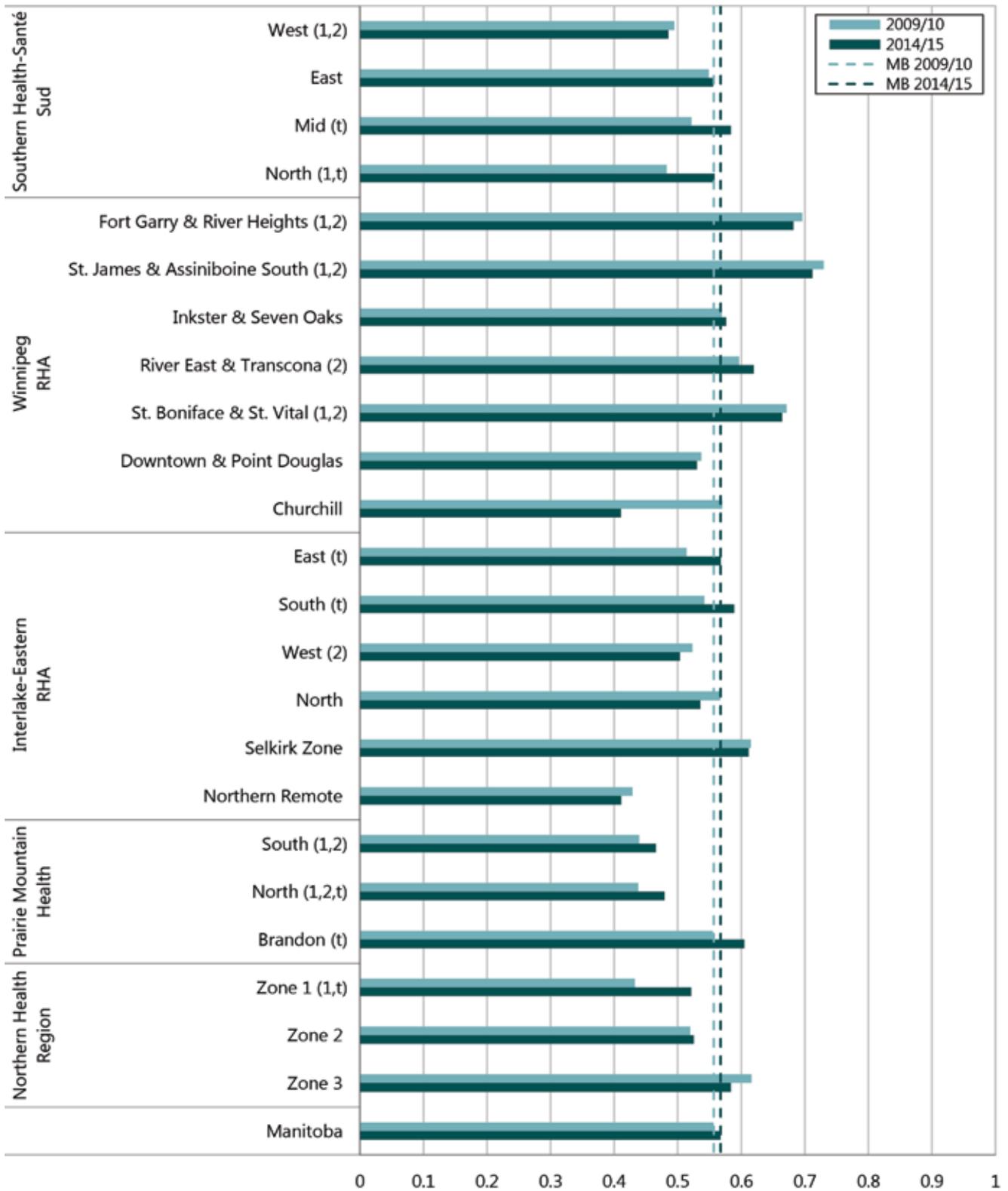
**Figure 5.31: Ambulatory Consultation Visit Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 5.32: Ambulatory Consultation Visit Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates rate is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)



## Chapter 6:

# Chronic Physical Conditions and Acute Medical Events

This chapter provides details on indicators related to physical morbidity. We first present the prevalence of five chronic diseases: chronic obstructive pulmonary disease (COPD), diabetes, end stage kidney disease, hypertension, and ischemic heart disease. The prevalence of these conditions is presented as the percentage of individuals in the study cohort diagnosed with the condition or disease in each of the two study time periods (2005/06-2009/10 and 2010/11-2014/15). Then we present prevalence or rates for three types of acute medical events: acute myocardial infarction (AMI; or heart attack), stroke, and hip fracture. AMI and stroke are presented as the prevalence of individuals who experienced an event in our two time periods. Hip fracture is presented as the rate of fractures, which allows for a person to have multiple events in the time period, and counts each one separately.

### Key Findings

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- The percentage of community-dwelling older adults with COPD, diabetes, hypertension, or a hip fracture increased during the study period.
- The percentage of community-dwelling older adults who experienced a cardiac event – AMI or stroke – decreased during the study period.
- Fifty-seven percent of the community-dwelling older adult population had at least one of the following chronic physical health or mental health conditions: COPD, diabetes, ischemic heart disease, stroke, dementia, or mood and anxiety disorder. More than one in five community-dwelling older adults had multiple conditions.

## Chronic Physical Conditions

### Chronic Obstructive Pulmonary Disease (COPD) Prevalence

Chronic Obstructive Pulmonary Disease (COPD) is a collection of respiratory conditions including chronic bronchitis and emphysema. It is characterized by reduced lung capacity and shortness of breath. One of the common causes is frequent long-term tobacco smoking. COPD is a major cause of mortality in the older adult cohort, and an accurate measure of its prevalence is important for planning health services for this population.

We classified individuals as having COPD if they met one of the following conditions:

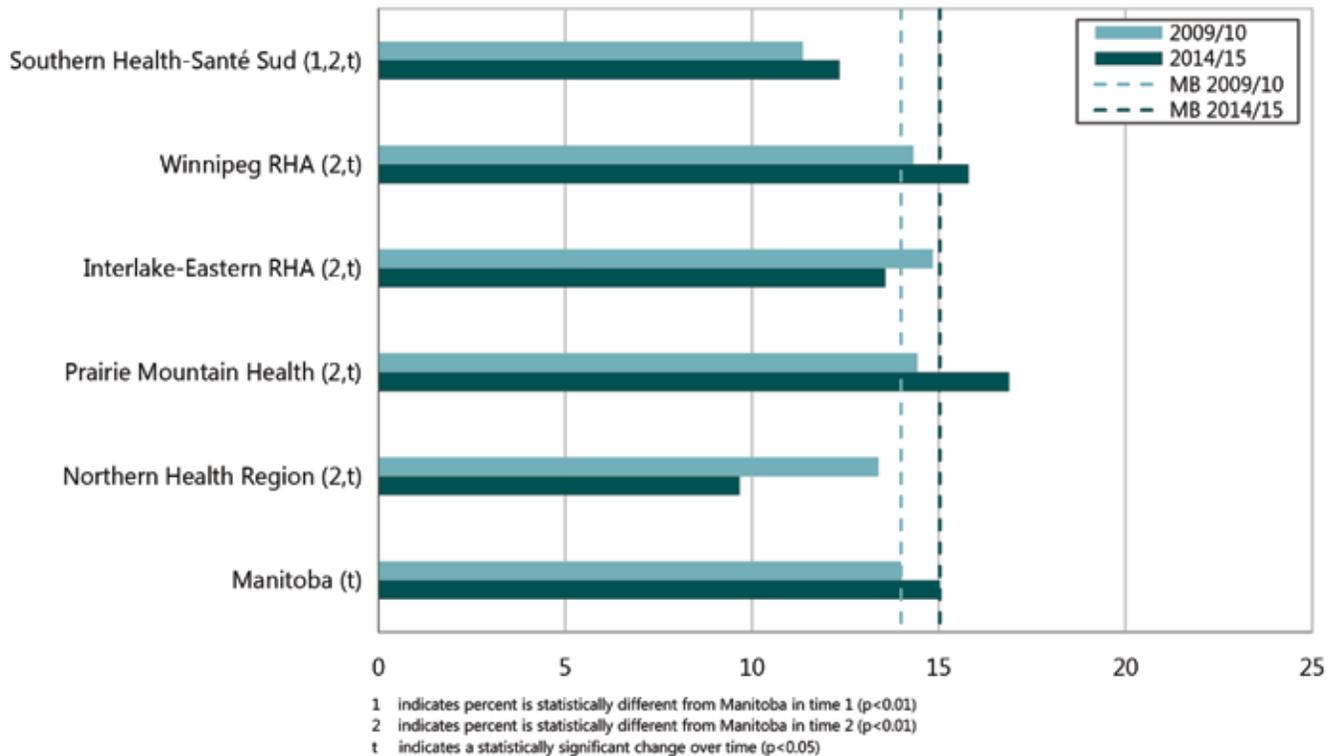
- One or more inpatient hospitalizations in one year with a COPD diagnosis; or
- One or more physician visits in one year with a COPD diagnosis.

For this indicator, we used the most recent single year of data within each time period in the study (2009/10 for the first time period, and 2014/15 for the second time period).

Figure 6.1 shows that the prevalence of COPD is about 15% in the youngest age group, but Southern Health-Santé Sud and Northern Health Region each have a significantly lower percentage of the population with COPD. The prevalence of COPD in this age group decreased significantly from one time period to the next in the Northern Health Region and Interlake-Eastern RHA, but increased significantly in all other regions. The reason for these increases may be related to a growing number of older women with a history of smoking.

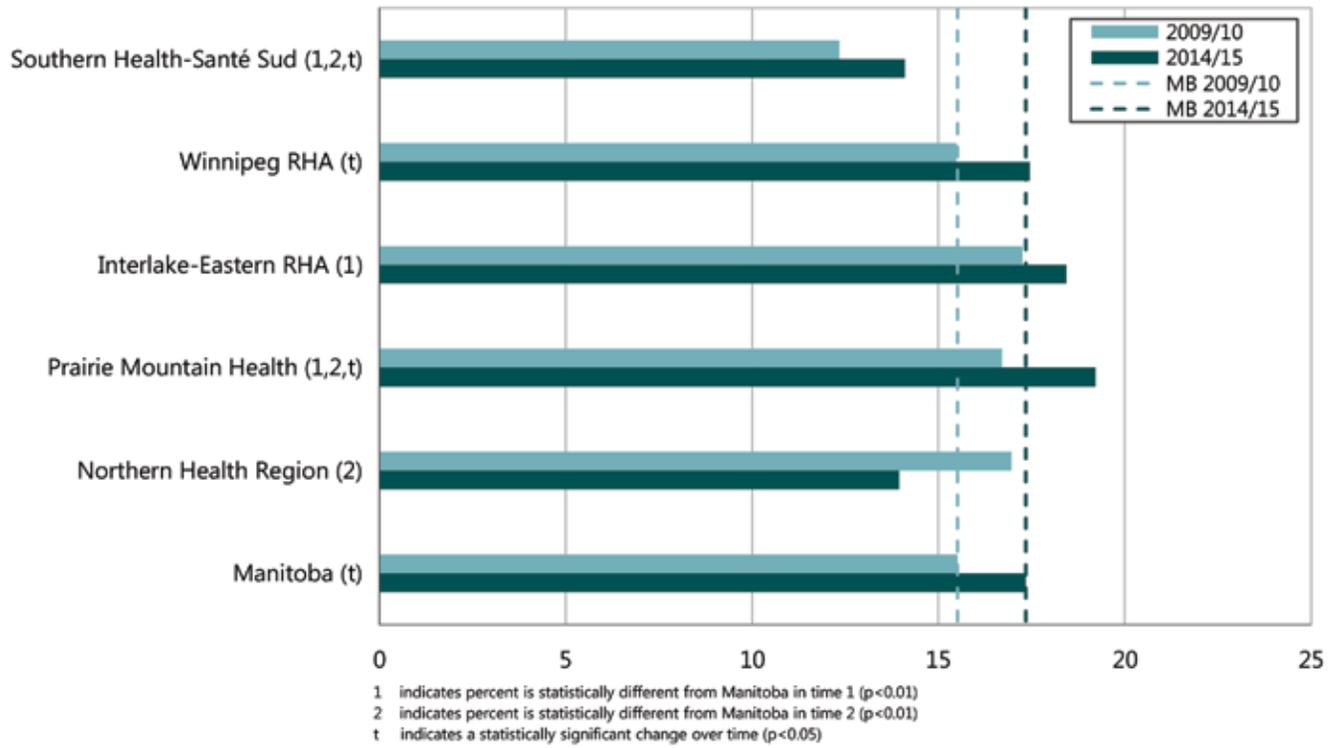
There was also a significant positive association between COPD prevalence and income quintile, as shown in Figure 6.4; this relationship was stronger in urban areas. This association may also be related to relative rates of smoking amongst the different income quintiles. Looking at changes over time, there were increases in COPD prevalence from the first study period to the second for all urban income quintiles, but almost no changes in COPD prevalence for the rural income quintiles.

**Figure 6.1: Chronic Obstructive Pulmonary Disease Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



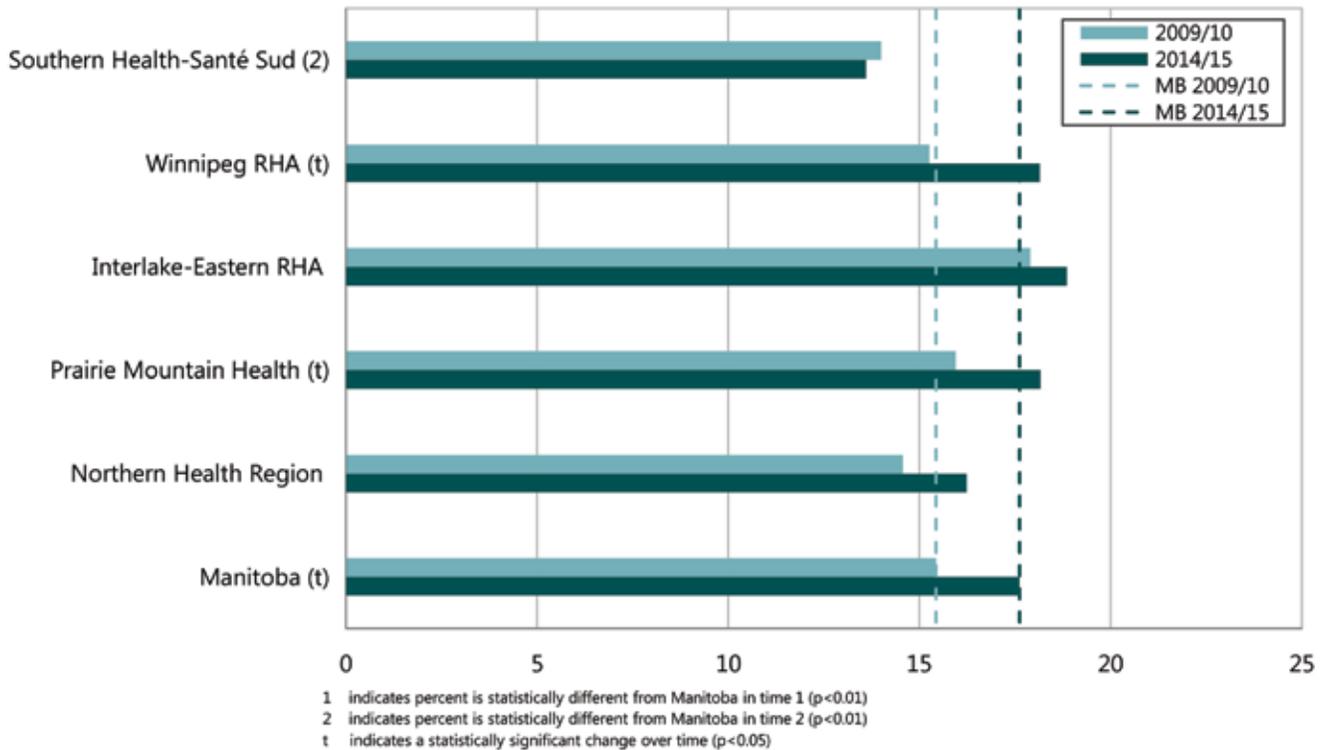
**Figure 6.2: Chronic Obstructive Pulmonary Disease Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



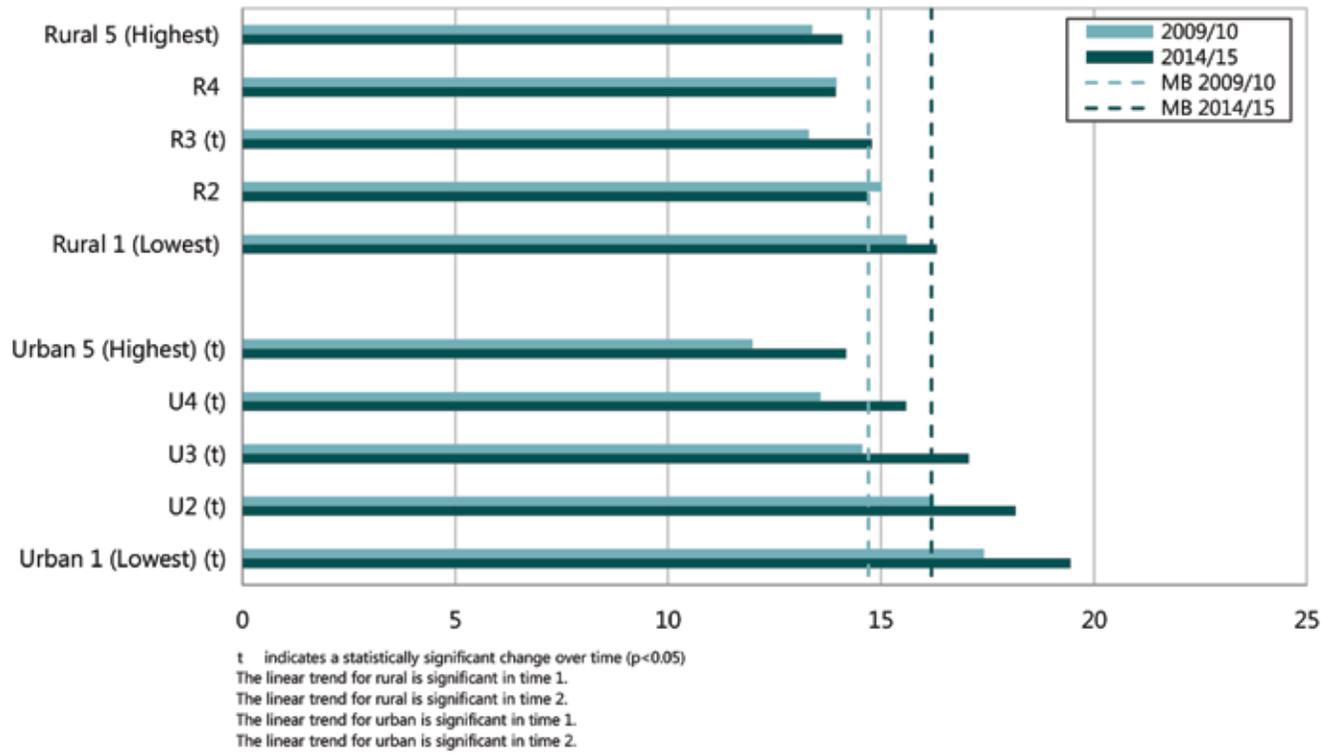
**Figure 6.3: Chronic Obstructive Pulmonary Disease Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



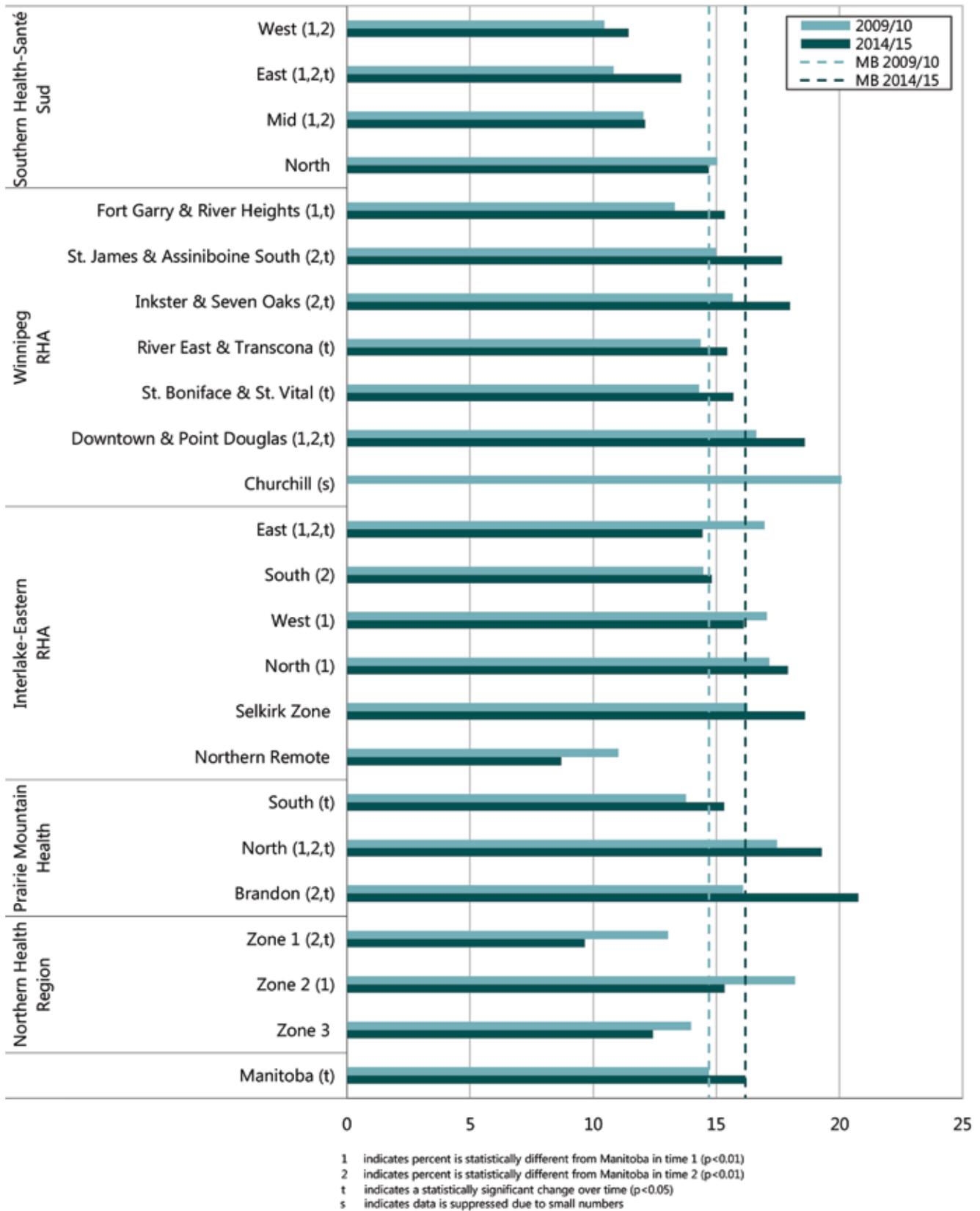
**Figure 6.4: Chronic Obstructive Pulmonary Disease Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.5: Chronic Obstructive Pulmonary Disease Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Diabetes Prevalence

Diabetes is a common chronic condition in Manitoba. Amongst older adults, it contributes to mortality and complicates the treatment of comorbidities. For this report, an individual was classified as having diabetes if they met one of the following conditions:

- One or more hospitalizations with a diagnosis of diabetes; or
- Two or more physician visits with a diagnosis of diabetes; or
- One or more prescriptions for medications to treat diabetes.

We used the most recent three years of data within each time period to determine diabetes prevalence (2007/08-2009/10 and 2012/13-2014/15).

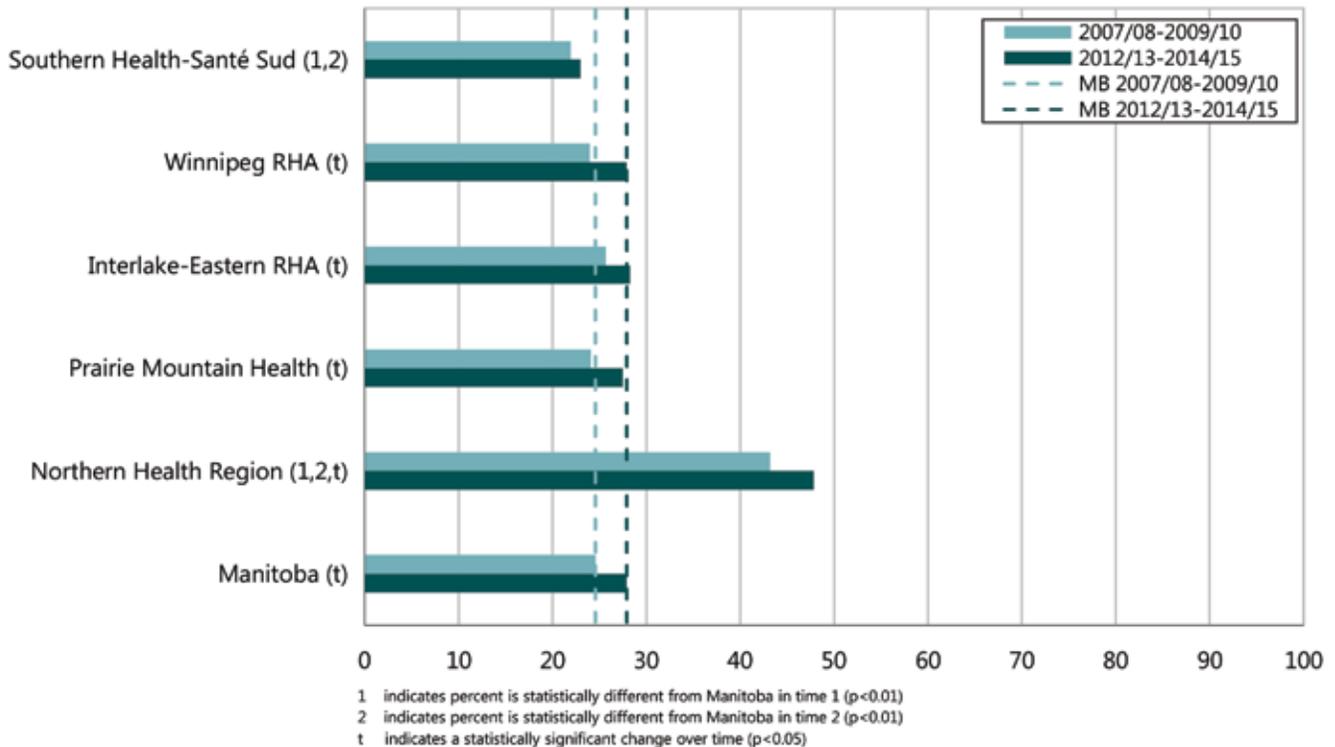
The age-specific percentages of older adults with diabetes are presented in Figures 6.6 to 6.8. There are three findings of note. First, the Northern Health Region has a much

higher prevalence of diabetes than other parts of Manitoba. Second, with very few exceptions, the prevalence of diabetes amongst older adults increased over time in all regions and for all three age groups. Third, diabetes prevalence did not appear to increase with age. The percentage of older Manitobans with diabetes was stable for the 65-74 and 75-84 age groups, and actually decreased for the 85+ age group. This may be the result of a 'healthy survivor' effect, where diabetes contributed to mortality or admission to a personal care home, which then removed these individuals from our study cohort.

Diabetes prevalence was also associated with income quintile. Figure 6.9 shows that people in higher income quintiles have a lower prevalence of diabetes. The change in prevalence over the two study periods was greater in urban income quintiles: every urban income quintile saw a significant increase in diabetes prevalence from the first study period to the second. In contrast, only two rural income quintiles saw a significant increase in diabetes prevalence over time.

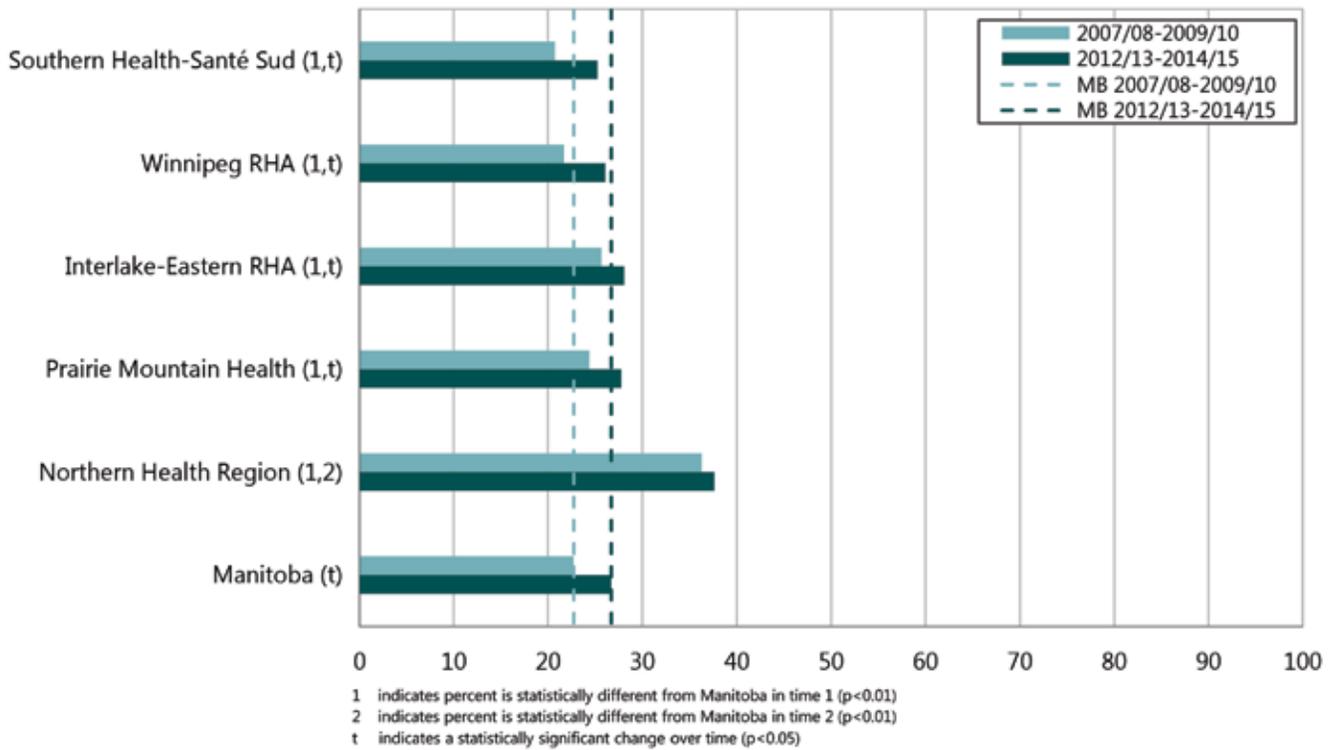
**Figure 6.6: Diabetes Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



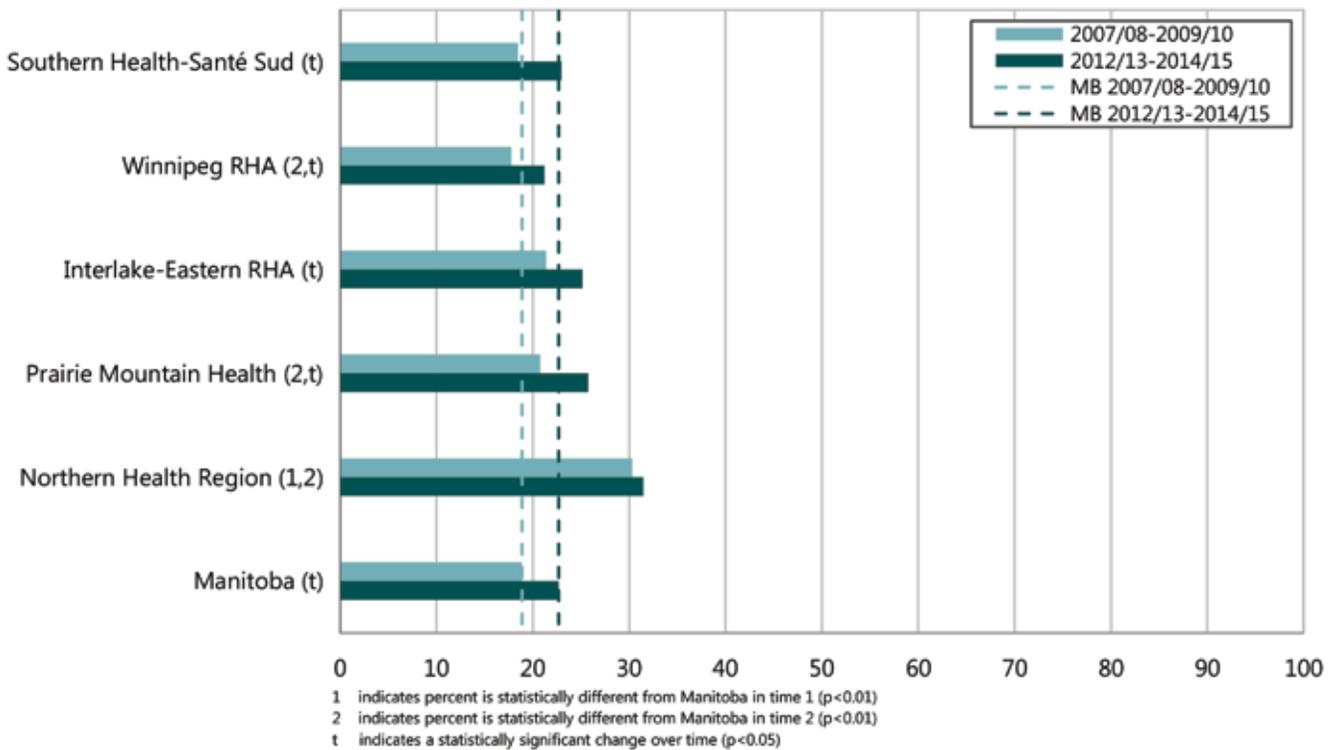
**Figure 6.7: Diabetes Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults

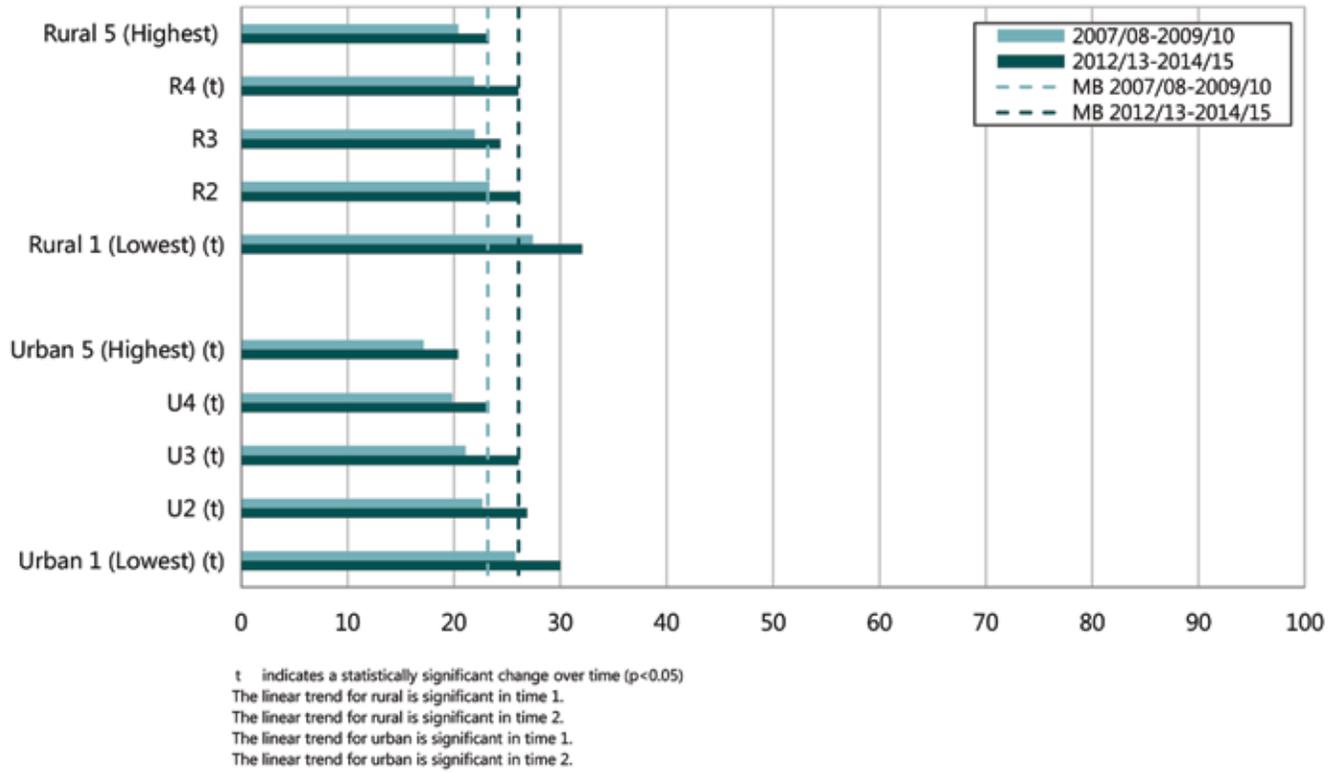


**Figure 6.8: Diabetes Prevalence by Health Region, Age 85+**

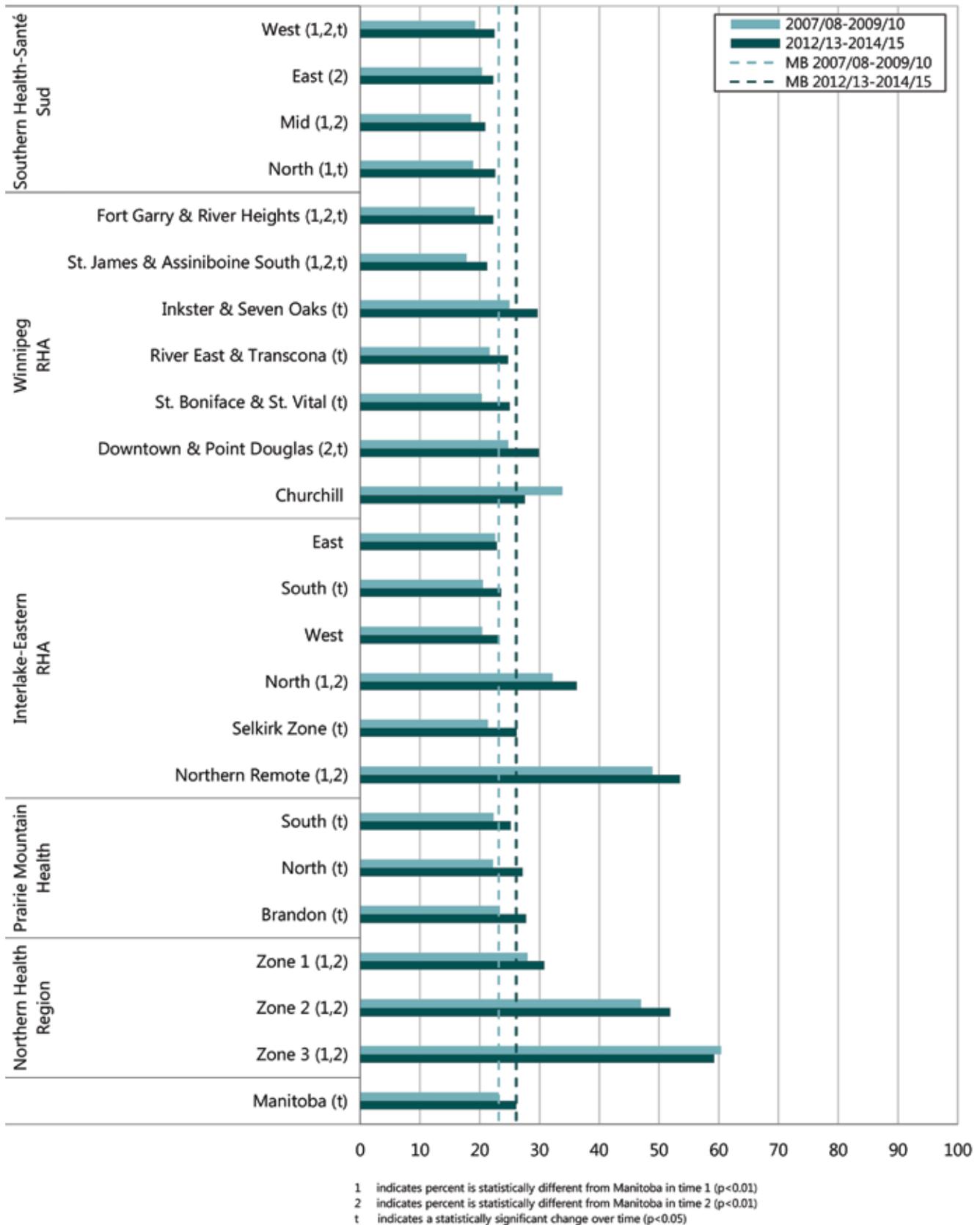
Percent of community-dwelling older adults



**Figure 6.9: Diabetes Prevalence by Income Quintile**  
 Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.10: Diabetes Prevalence by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



## End Stage Kidney Disease (ESKD) Prevalence

End stage kidney disease (ESKD) is the last stage of chronic kidney disease. ESKD patients typically require dialysis or a kidney transplant in order to live, as their kidneys can no longer clean their blood. While ESKD is a relatively rare condition in Manitoba, it has a large impact on patients, contributing substantially to morbidity and mortality. In our study, an individual was classified as having ESKD if they met one of the following conditions:

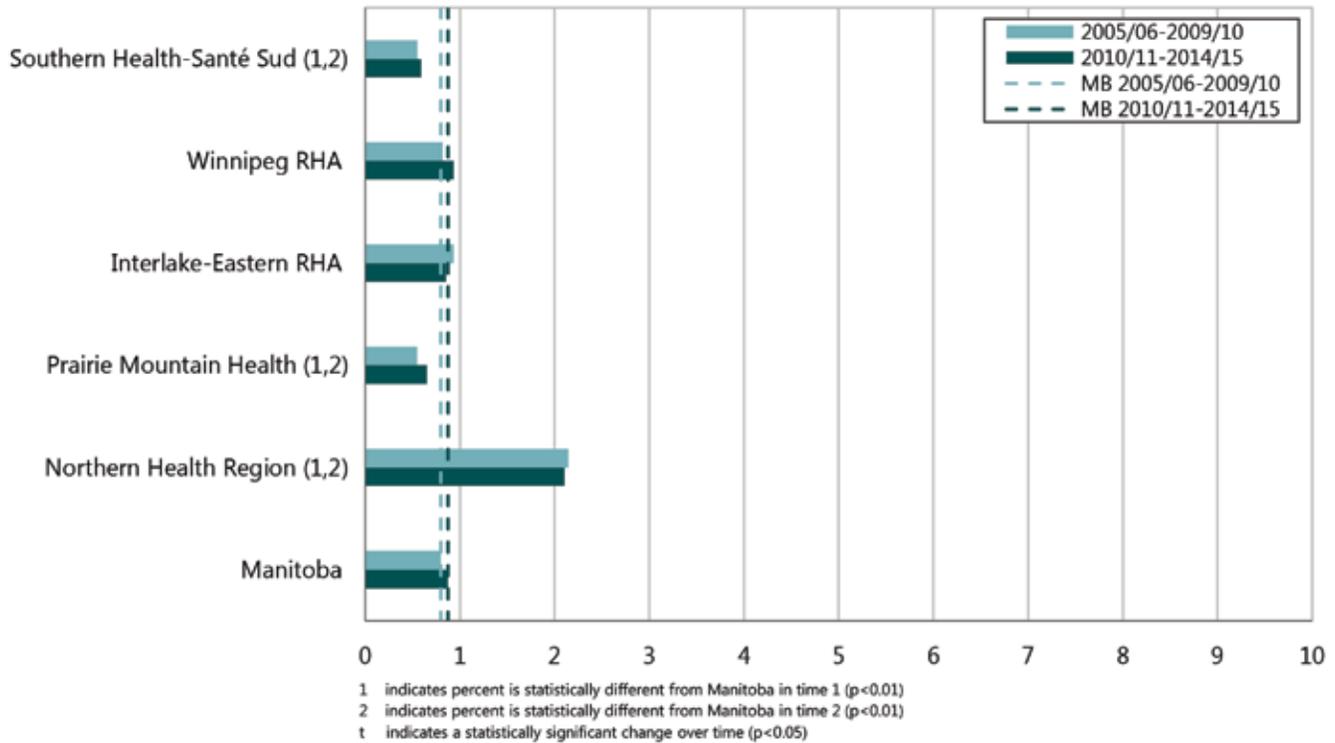
- On dialysis for a period of at least 3 months without a gap >15 days (as identified in medical claims data) and at least one diagnostic code of chronic kidney disease or renal failure during the 3 months they were on dialysis; or

- On dialysis and at least one diagnostic code of chronic kidney disease or renal failure, but died before they reached 3 months; or
- Had a kidney transplant (as identified in hospital discharge abstract data).

All five years for each study period were used to determine ESKD prevalence (2005/06-2009/10 and 2010/11-2014/15).

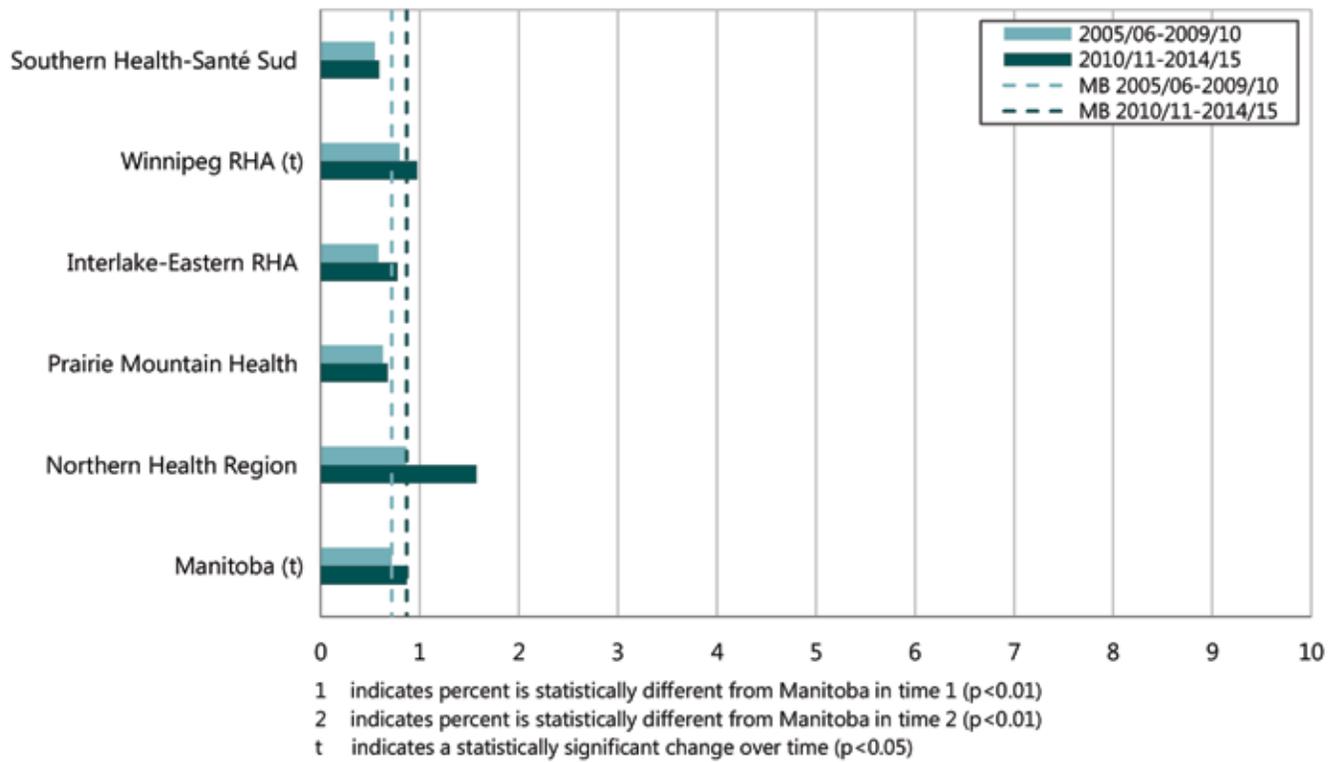
ESKD prevalence is presented in Figures 6.11 to 6.15. We saw that ESKD prevalence was significantly higher in the Northern Health Region than in other parts of Manitoba. The southern regions of Manitoba (Southern Health-Santé Sud and Prairie Mountain Health) had significantly lower ESKD prevalence in the 65-74 age group than the average for all Manitoba. The ESKD prevalence for the younger two age groups was similar from one time period to the next, but it decreased for the oldest age group over time.

**Figure 6.11: End Stage Kidney Disease Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



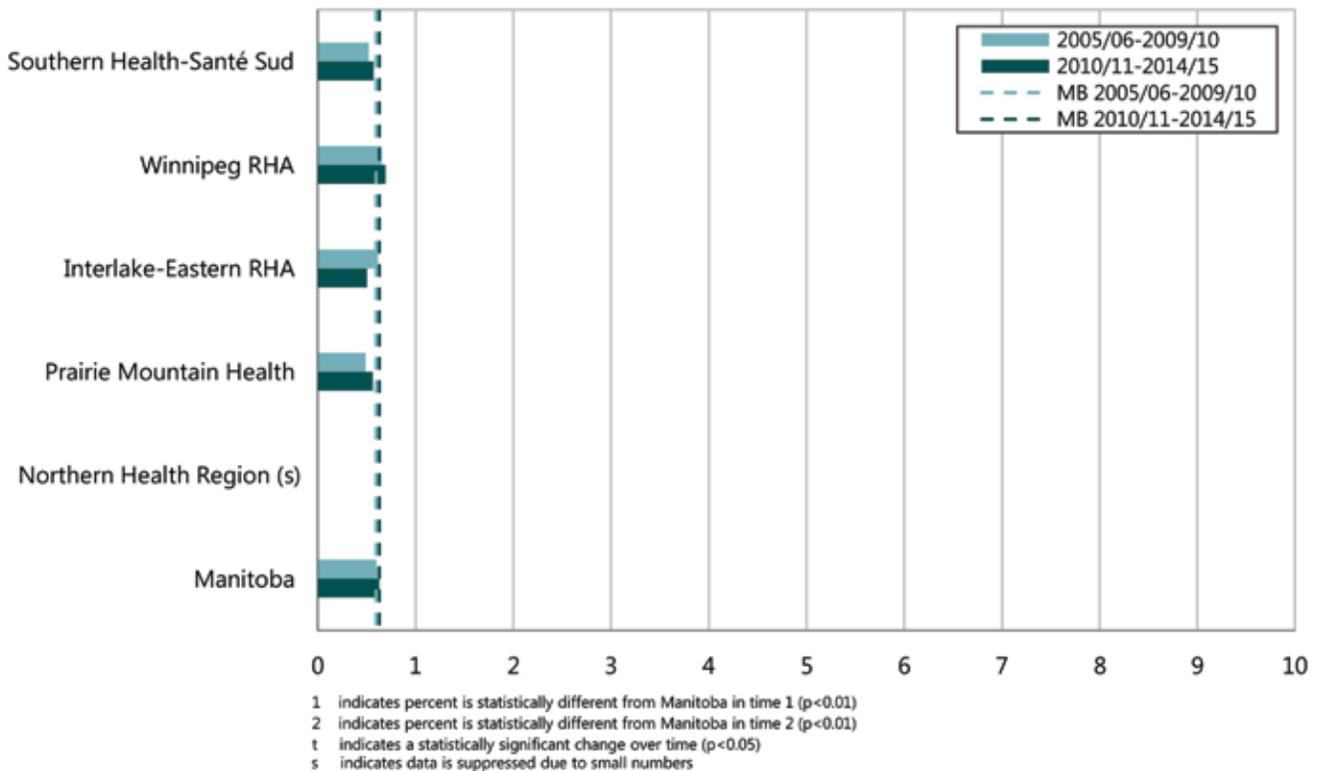
**Figure 6.12: End Stage Kidney Disease Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



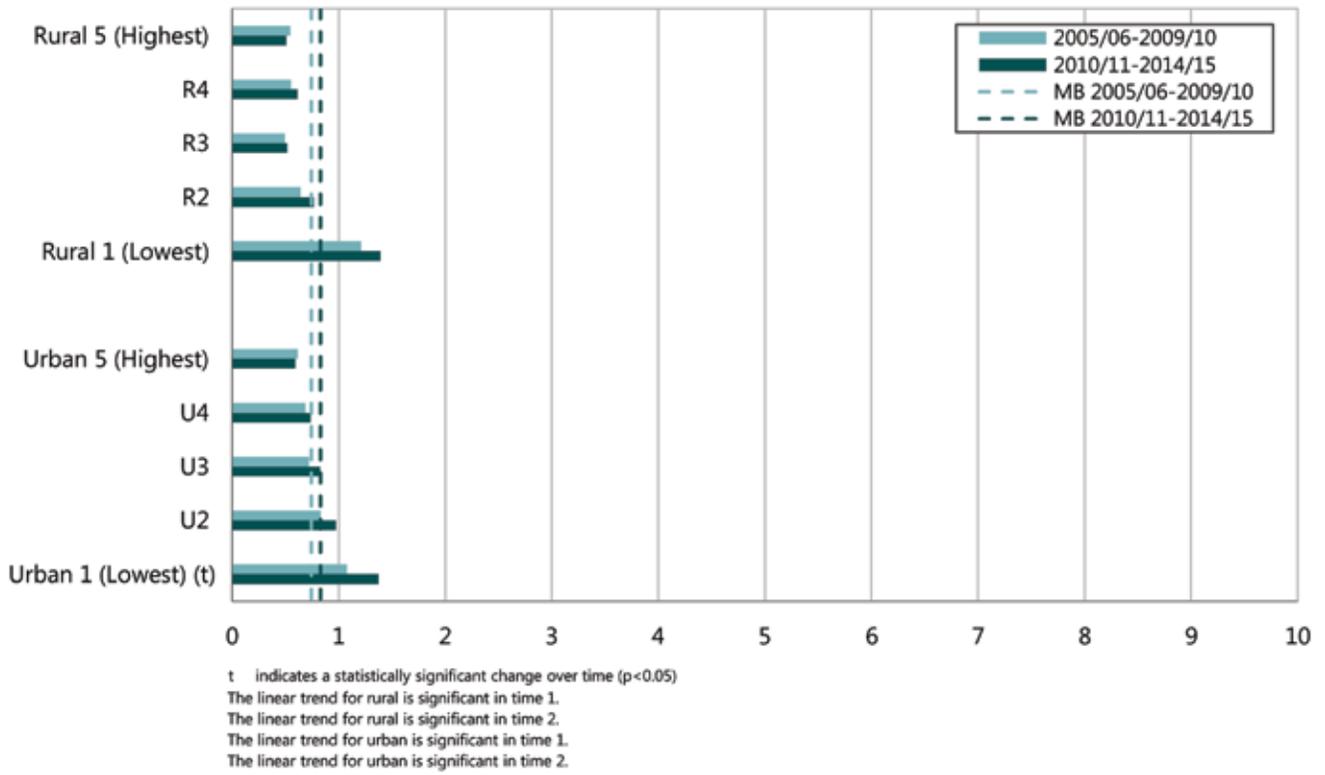
**Figure 6.13: End Stage Kidney Disease Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



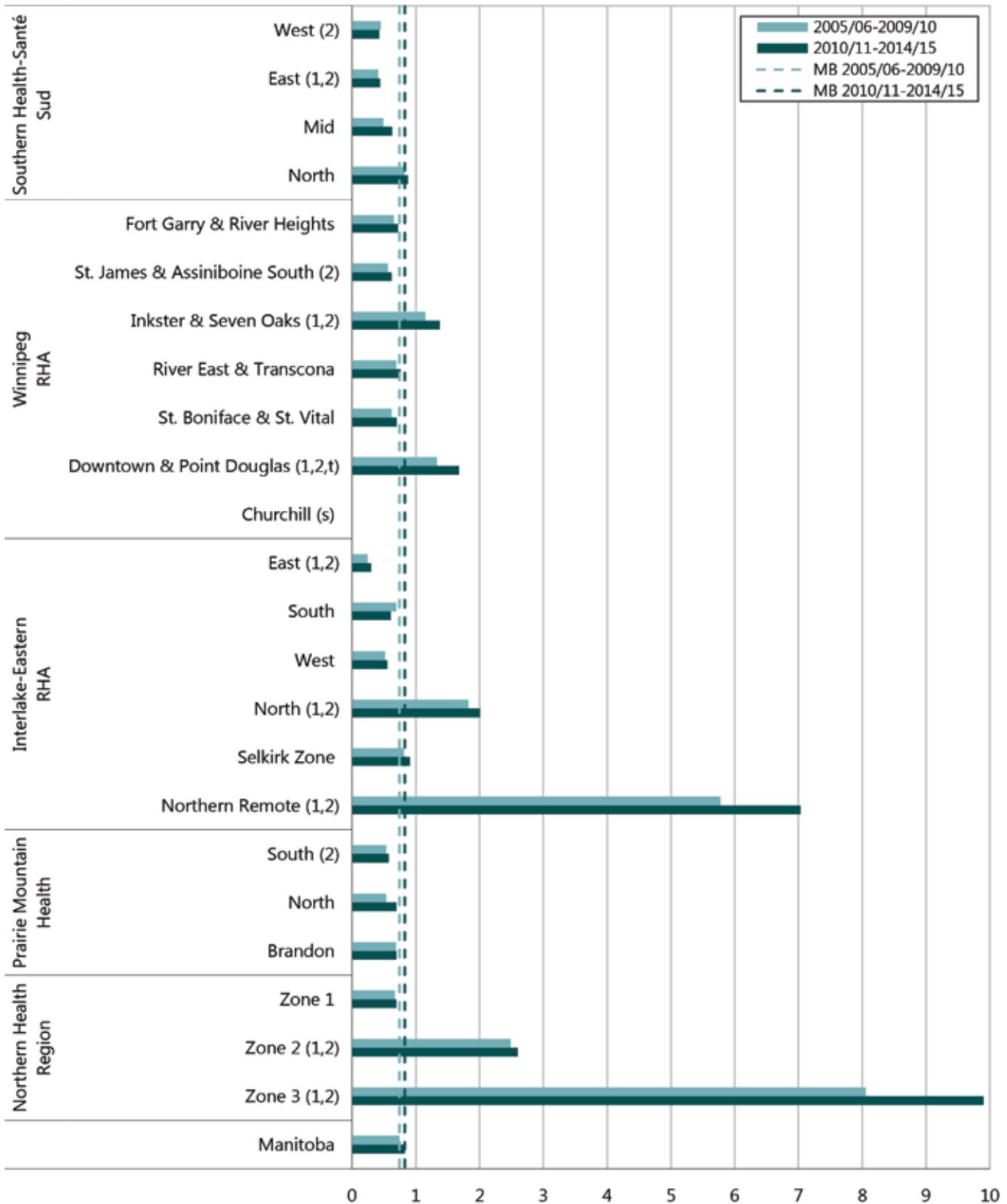
**Figure 6.14: End Stage Kidney Disease Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.15: End Stage Kidney Disease Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)  
 s indicates data is suppressed due to small numbers

## Hypertension Prevalence

Hypertension, also known as high blood pressure, is a chronic circulatory condition with no apparent symptoms. However, over the long term, it is linked with several other conditions discussed in this report (e.g., stroke, diabetes, chronic kidney disease, and dementia), and contributes to many negative health outcomes, including the development of peripheral vascular disease, atrial fibrillation, and vision loss. Treatment for hypertension involves lifestyle changes such as diet modification, increased exercise, or use of medications to reduce blood pressure. In this analysis, we classified an individual as having hypertension if they met one of the following conditions:

- At least one hospital diagnosis of hypertensive diseases (ICD10-CA codes I10-I13, I15) in a two year period; or
- At least two ambulatory visit diagnoses of hypertensive diseases (ICD-9-CM codes 401-405) in two years.

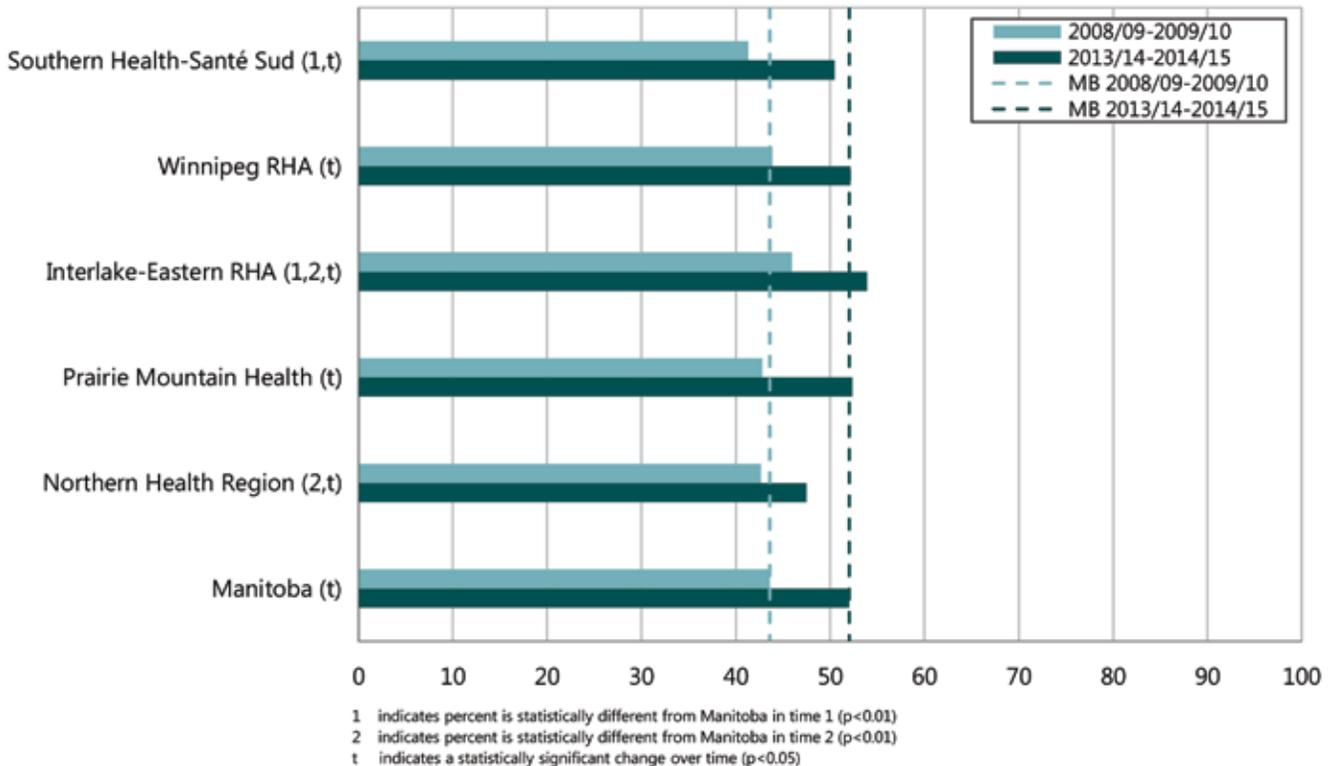
For this indicator, we calculated a two-year prevalence using the last two years of each study period (2008/09-2009/10 and 2013/14-2014/15).

We noted the very high prevalence of hypertension in Manitoba, and increases in prevalence over time for every age group in every region (Figures 6.16 to 6.18). Hypertension is linked to the development of diabetes, and may be diagnosed as part of a diabetes diagnosis. Therefore, the change in hypertension prevalence we see could be at least partially due to the increase in diabetes prevalence across Manitoba.

Hypertension prevalence increased as age increased, from about 50% for the youngest age group, to 60% for those age 75-84, to 70% for the oldest age group. The prevalence of hypertension was similar across most regions. Finally, Figure 6.19 shows that although there was a statistically significant linear trend for increasing hypertension prevalence as income quintile decreased in urban regions, these differences might not be considered clinically or practically important for making policy decisions on delivery of care.

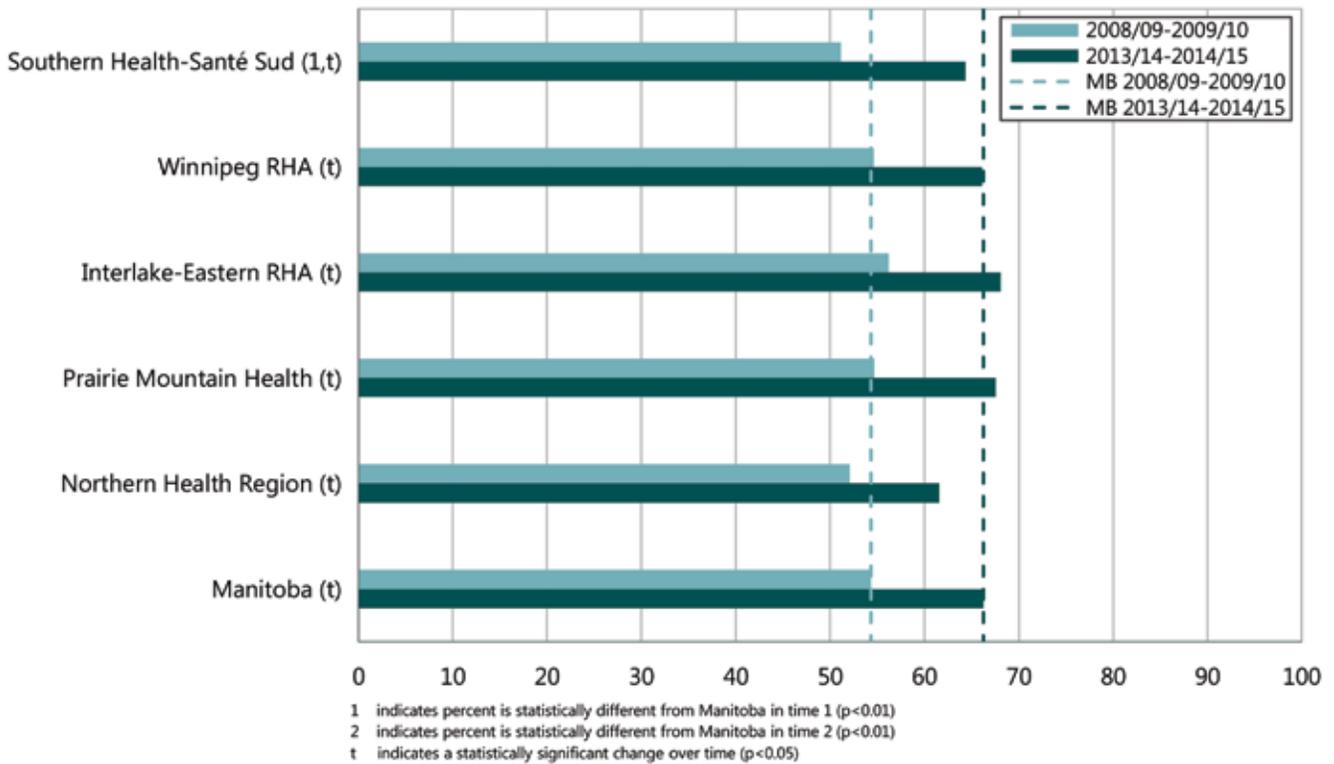
**Figure 6.16: Hypertension Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



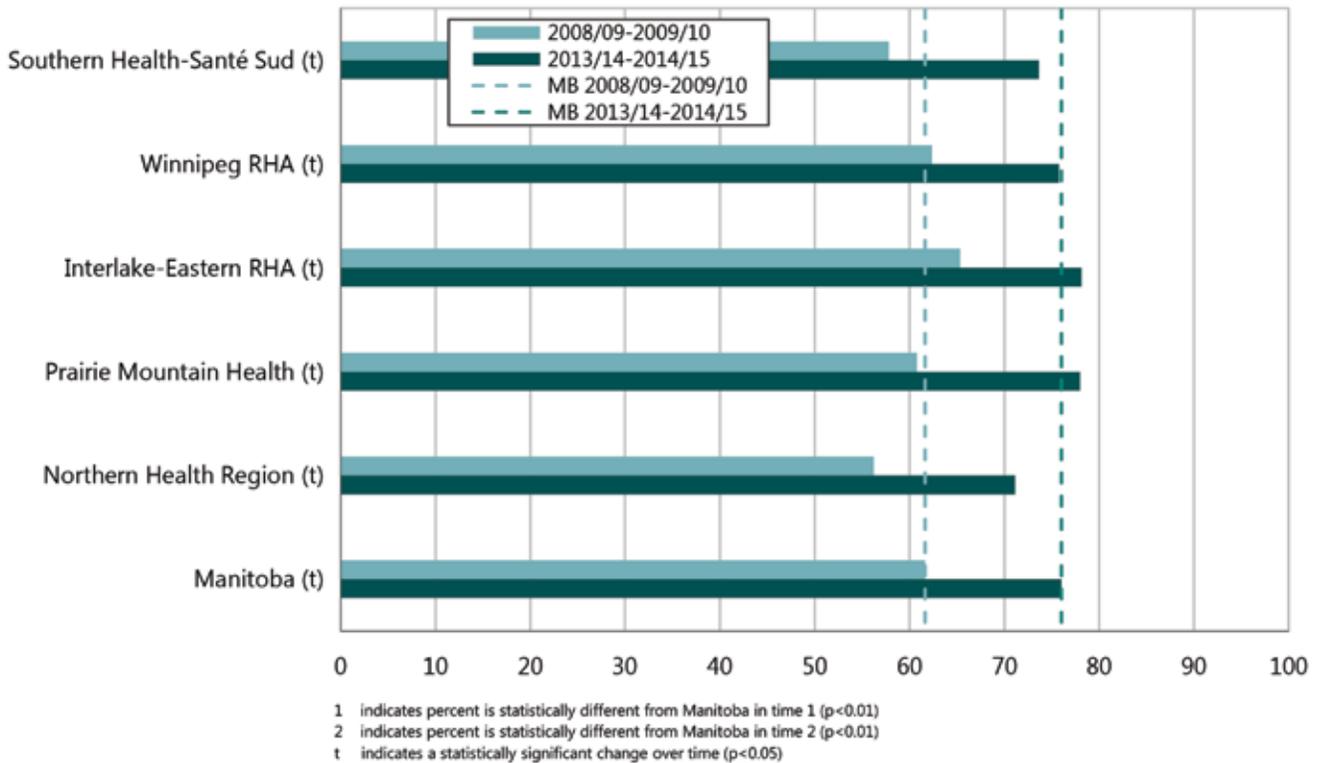
**Figure 6.17: Hypertension Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



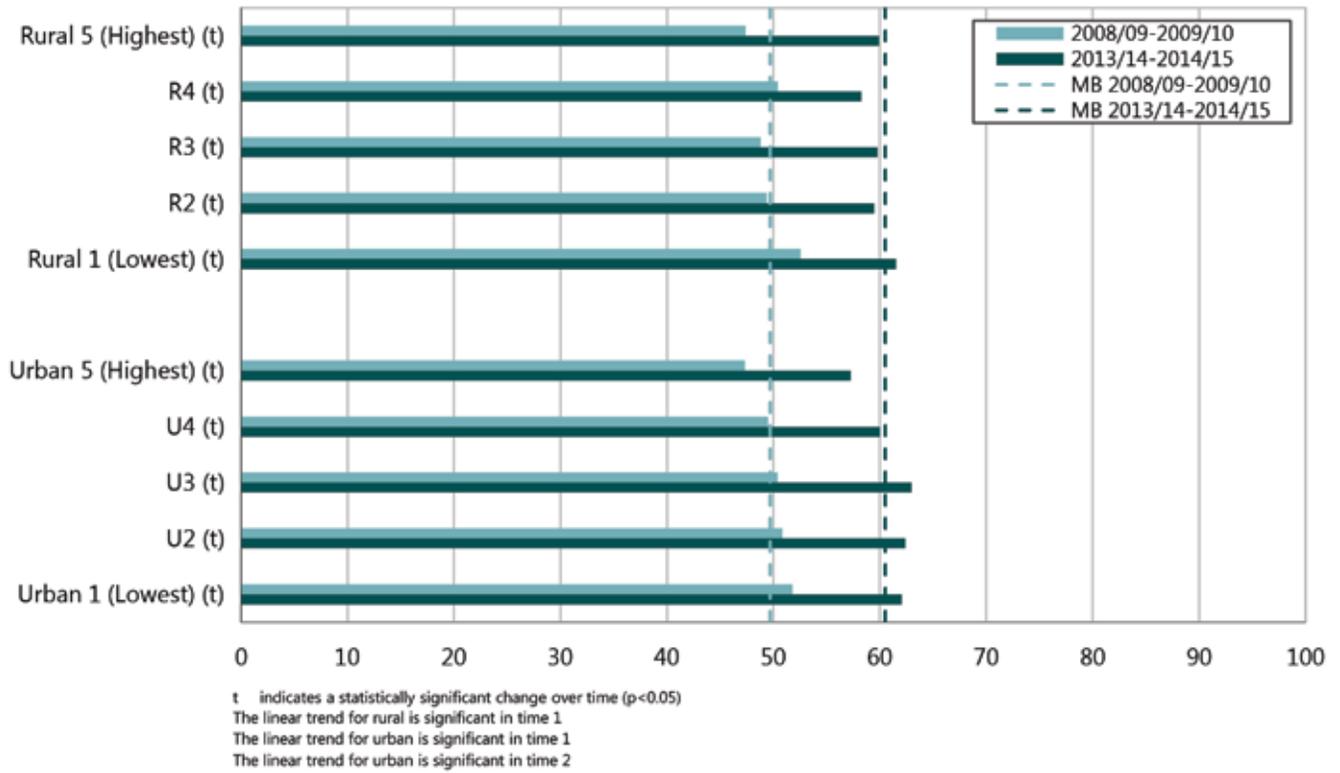
**Figure 6.18: Hypertension Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults

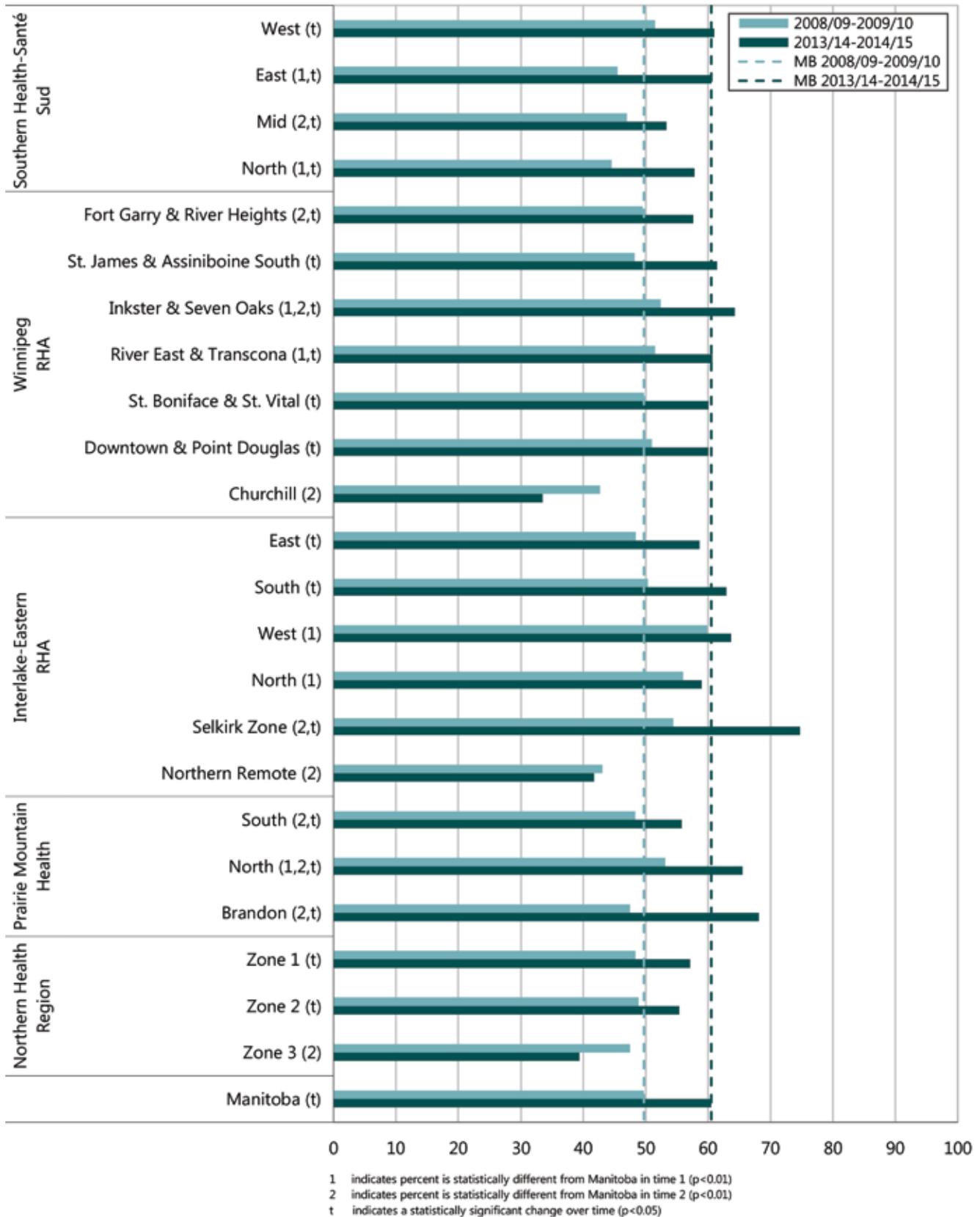


**Figure 6.19: Hypertension Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.20: Hypertension Prevalence by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



## Ischemic Heart Disease Prevalence

Ischemic heart disease (IHD), also known as coronary artery disease, is a cardiovascular condition characterized by limited blood flow to the heart due to narrowing and calcification of the blood vessels. This can lead to significant morbidity and mortality. Lifestyle changes and medications can be employed to manage and treat IHD. Procedural interventions, such as angioplasty, stents, and bypass surgery, have also been developed. In our study, an individual was classified as having IHD if they met one of the following conditions:

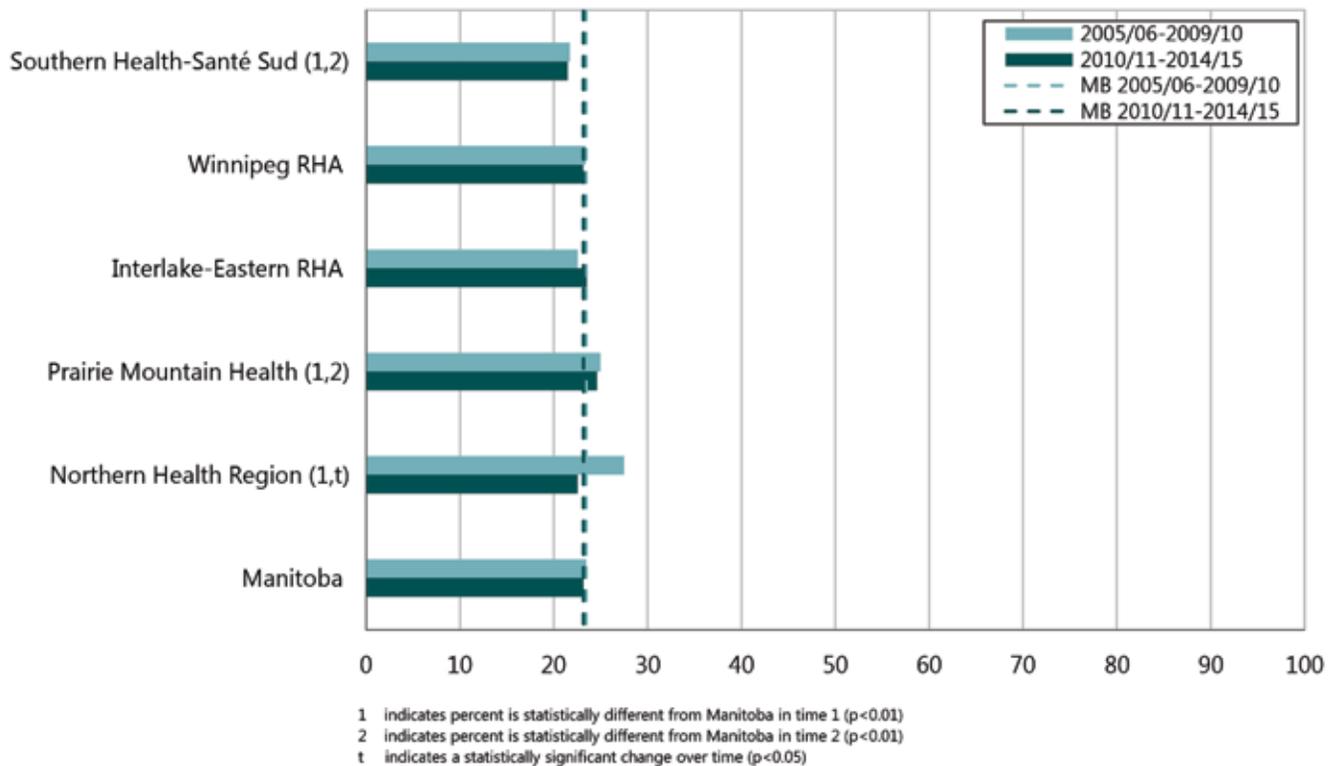
- One or more hospitalizations with a diagnosis of IHD;
- Two or more physician visits with a diagnosis of IHD; or
- One physician visit with a diagnosis of IHD and two or more prescriptions for medications to treat IHD.

A five-year prevalence for IHD was calculated using the full range for both time periods (2005/06-2009/10 & 2010/11-2014/15)

Similar to hypertension, Figures 6.21 to 6.23 show that the percentage of older adults with IHD increased as individuals age, going from ~23% in the youngest age group, to 34% for the middle age group, to almost 50% for the oldest age group. Unlike hypertension, however, for the most part, the prevalence of IHD did not change for these groups from one time period to the next.

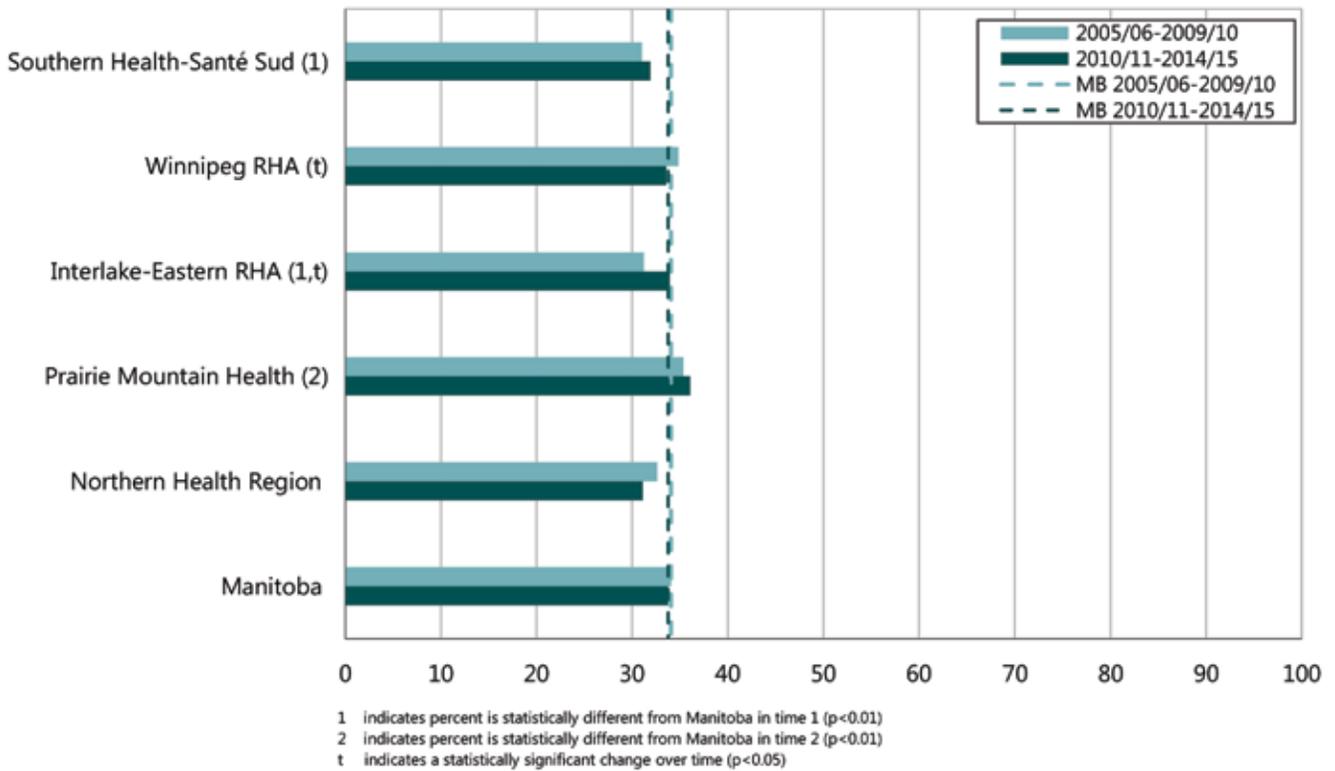
There was some slight variation in IHD prevalence by region. Southern Health-Santé Sud had a lower rate than the Manitoba average for the youngest age group. Figure 6.24 demonstrates that IHD prevalence was also related to income quintile. In rural regions, the percentage of older adults with IHD was notably higher in the poorest income quintile. In urban regions, there was strong linear association: IHD prevalence increased as income quintile decreased.

**Figure 6.21: Ischemic Heart Disease Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



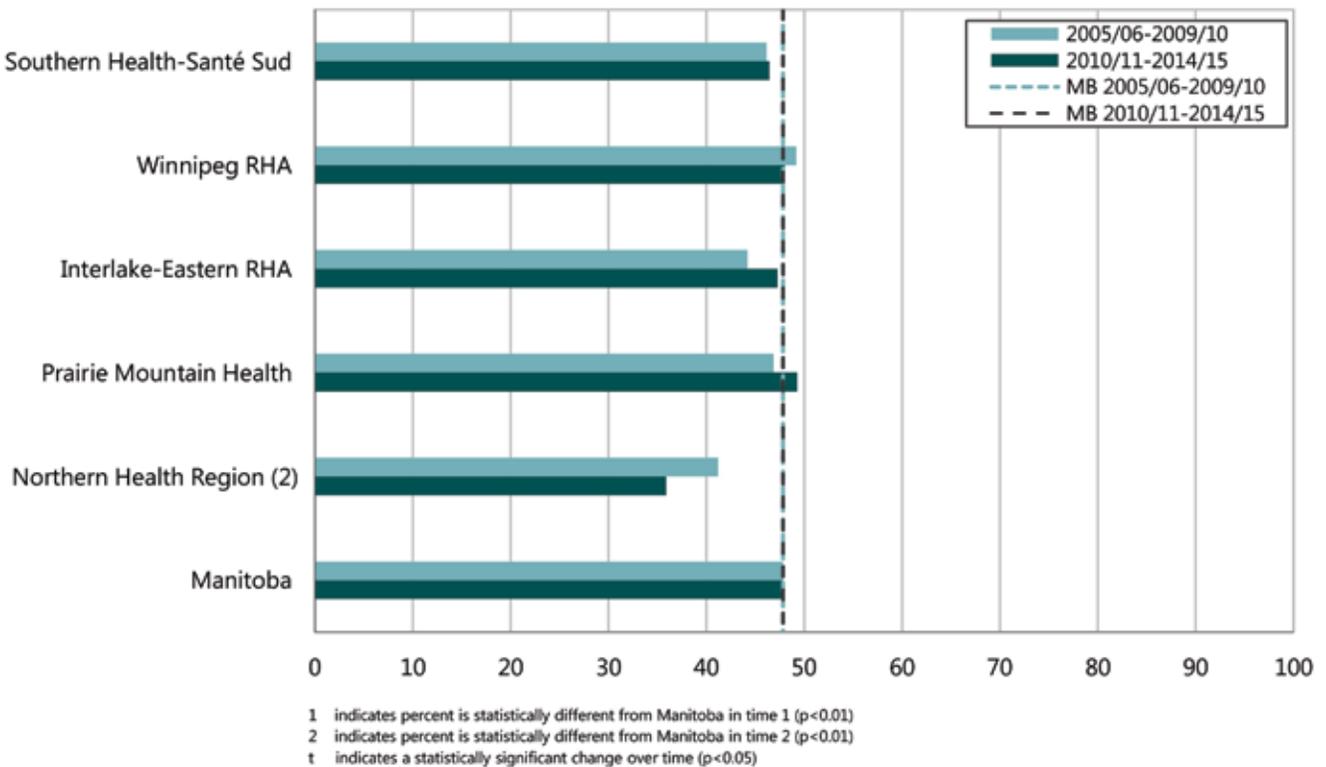
**Figure 6.22: Ischemic Heart Disease Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



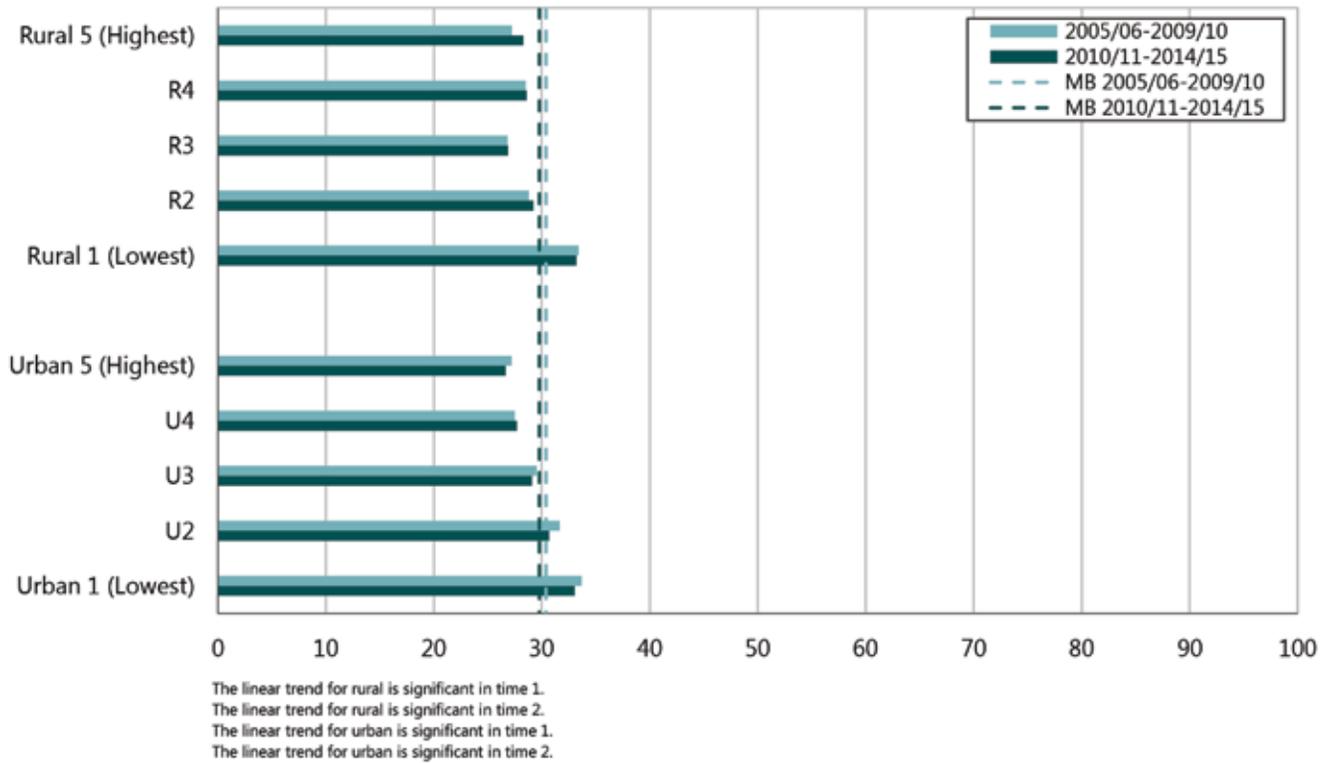
**Figure 6.23: Ischemic Heart Disease Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



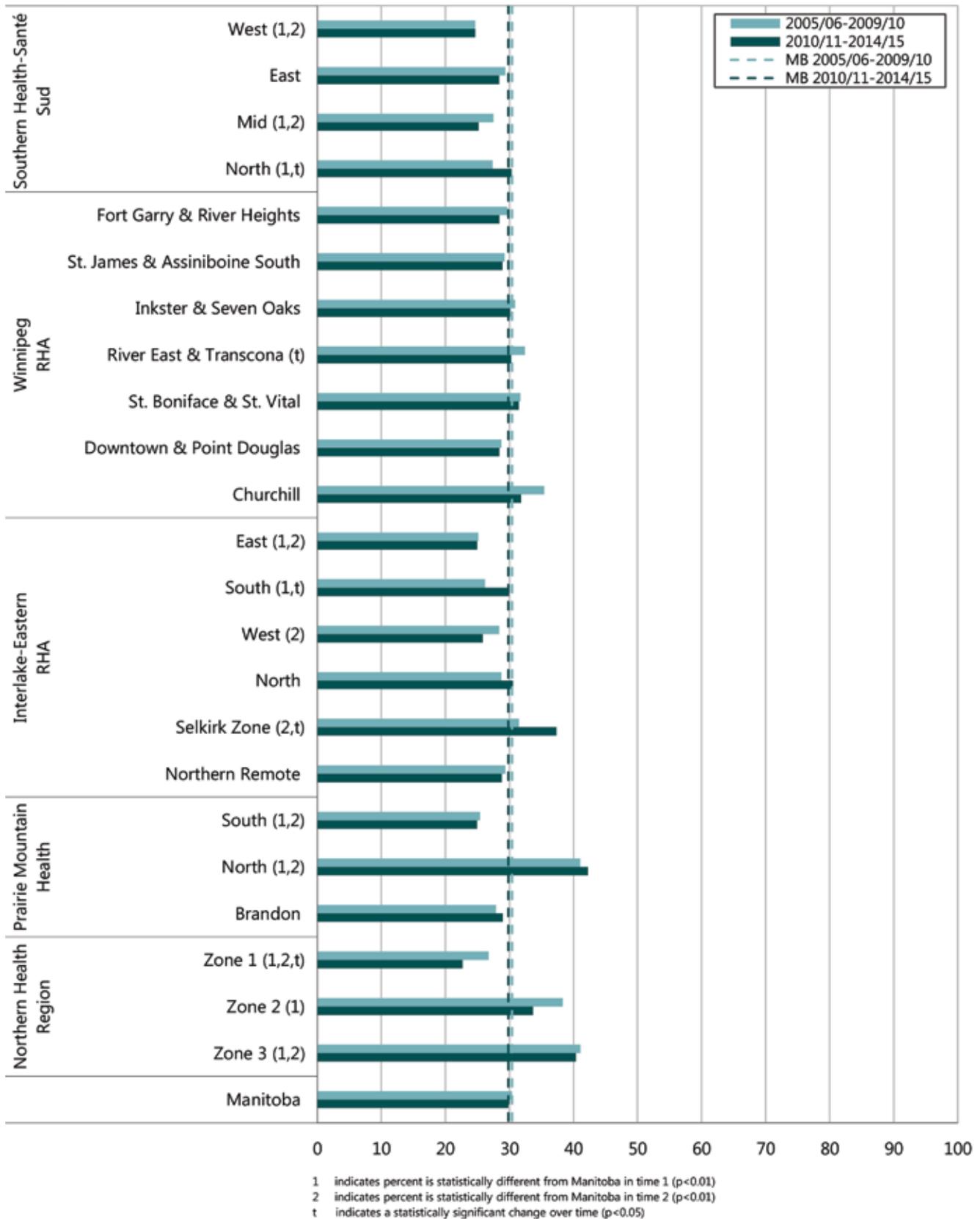
**Figure 6.24: Ischemic Heart Disease Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.25: Ischemic Heart Disease Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Acute Medical Events

### Acute Myocardial Infarction (AMI) Prevalence

Acute Myocardial Infarction (AMI) is a medical term for a heart attack. An AMI is the result of restricted blood flow to the heart over time, leading to permanent cell death in the heart. This is often precipitated by a chronic condition like the ones described in the earlier sections of this chapter (e.g., ischemic heart disease). AMIs can be relatively mild, necessitating only a short hospital stay, but can also be quite severe, leading to an extended stay in hospital, or even death.

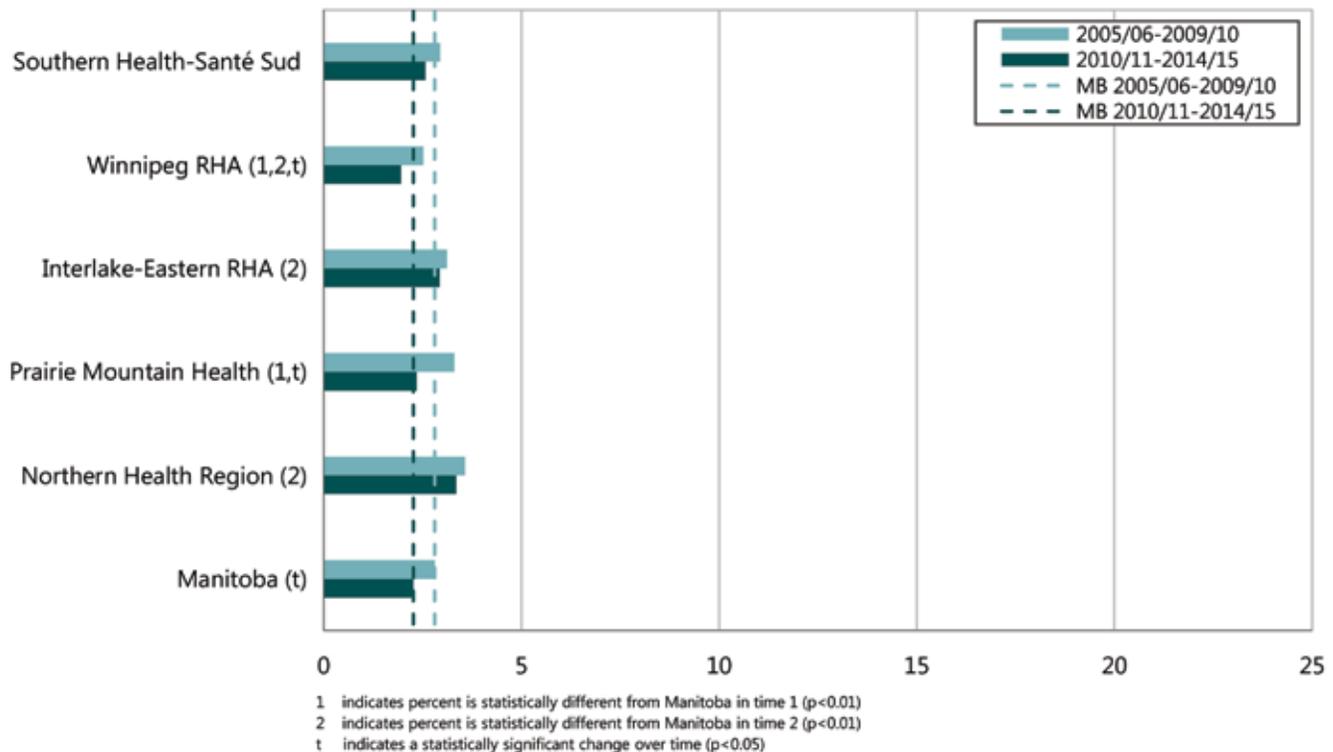
In this study, we classified an individual as having had an AMI if they met one of the following conditions:

- At least one inpatient hospitalization with a ‘most responsible diagnosis’ of AMI and a length of stay of three or more days; or
- Death with AMI listed as the primary cause of death on the Vital Statistics death record.

AMI prevalence was calculated using the full five years in each time period (2005/06-2009/10 and 2010/11-2014/15).

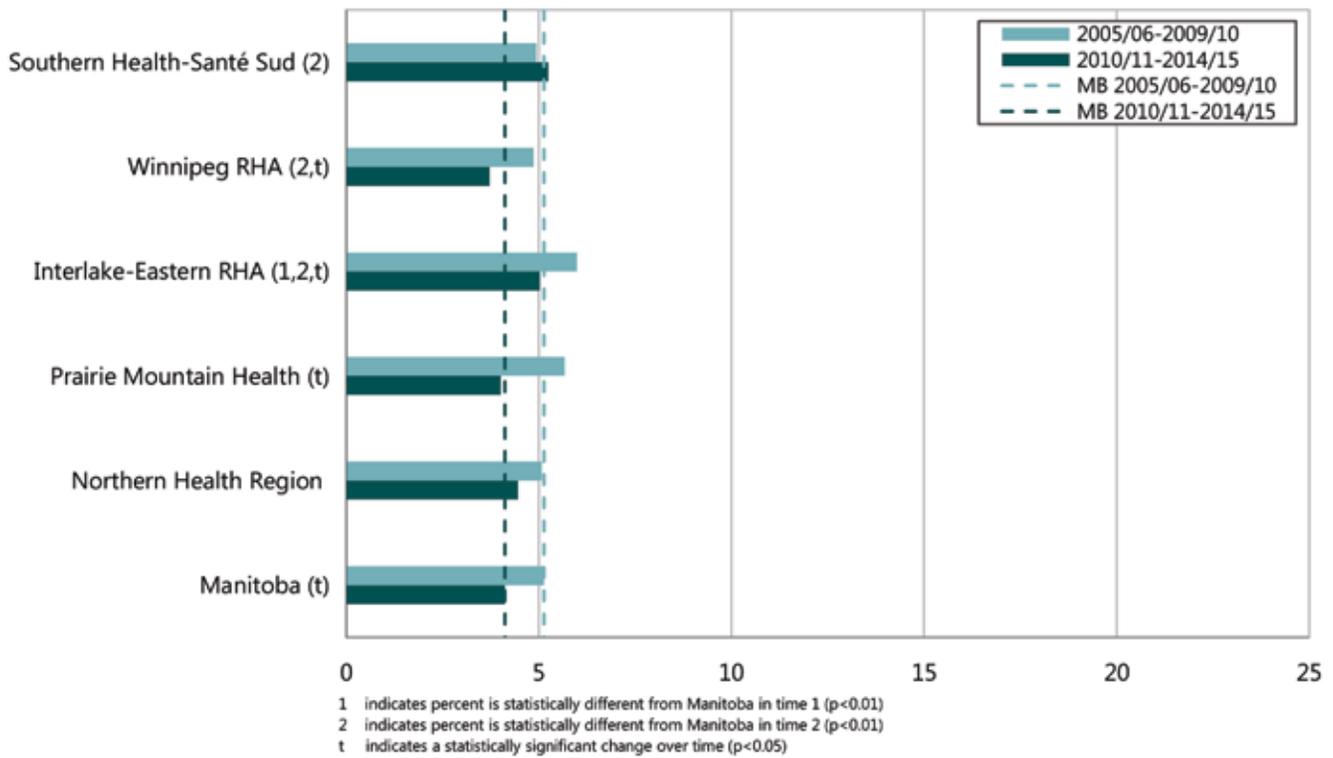
In the most recent time period, AMI prevalence increased from younger (2.5% of individuals age 65-74) to older age groups (8% of individuals age 85+) (Figures 6.26 to 6.28). For all age groups, AMI prevalence decreased significantly over time. A strong linear relationship between AMI prevalence and income quintile was apparent, with people in lower income quintiles having higher AMI prevalence, in both time periods and in both urban and rural areas (Figure 6.29). Winnipeg had significantly lower AMI prevalence than the Manitoba average among all age groups in the second time period. This may have been at least partially due to a lower likelihood of hospitalization in Winnipeg, where other supportive health services can be more easily accessed. Southern Health-Santé Sud had significantly higher rates of AMI in the older age groups compared to the Manitoba average in the most recent time period.

**Figure 6.26: Prevalence of Acute Myocardial Infarction by Health Region, Age 65-74**  
Percent of community-dwelling older adults



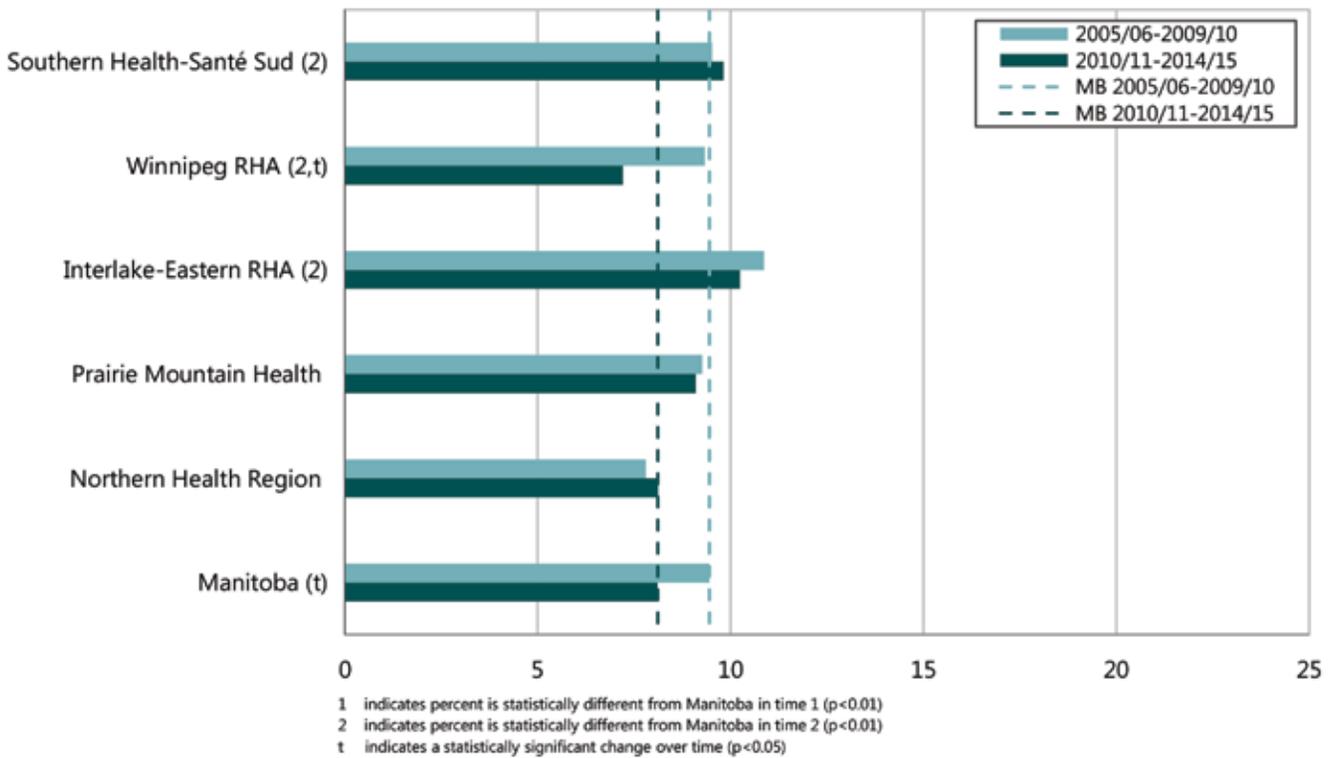
**Figure 6.27: Prevalence of Acute Myocardial Infarction by Health Region, Age 75-84**

Percent of community-dwelling older adults



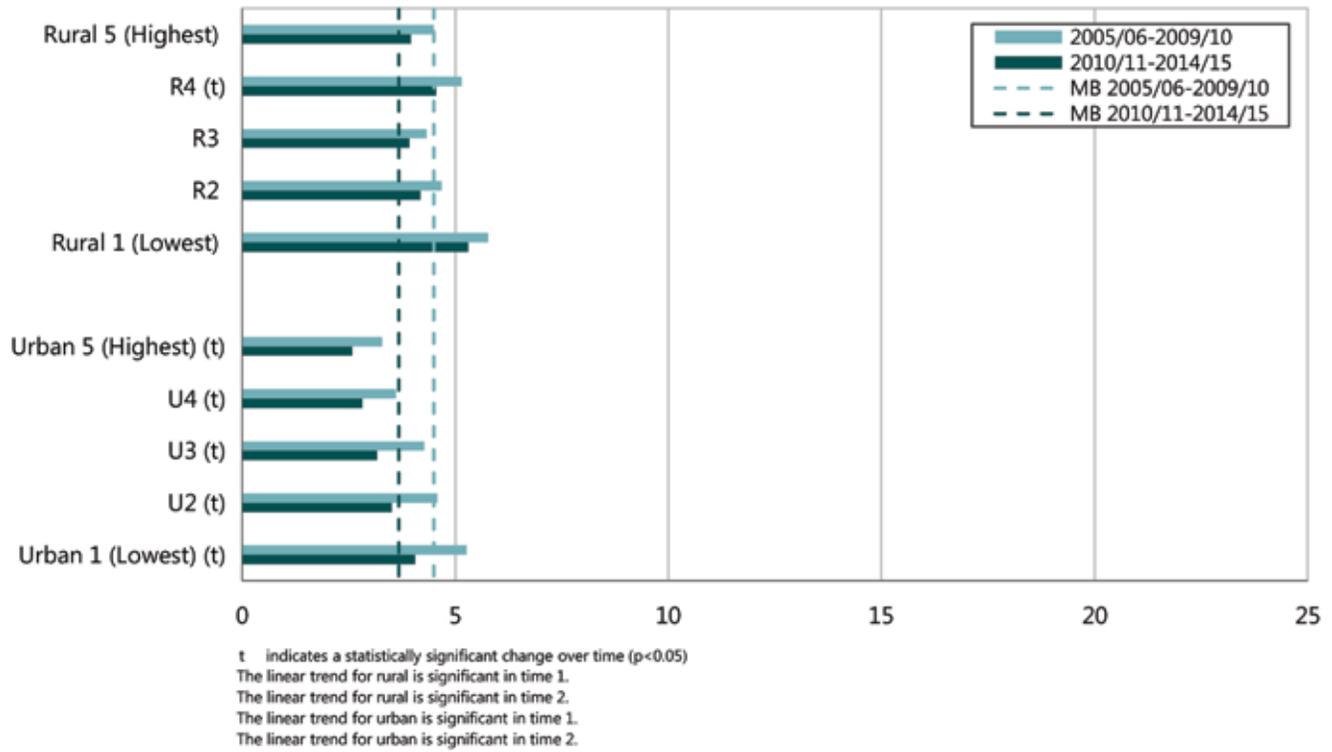
**Figure 6.28: Prevalence of Acute Myocardial Infarction by Health Region, Age 85+**

Percent of community-dwelling older adults



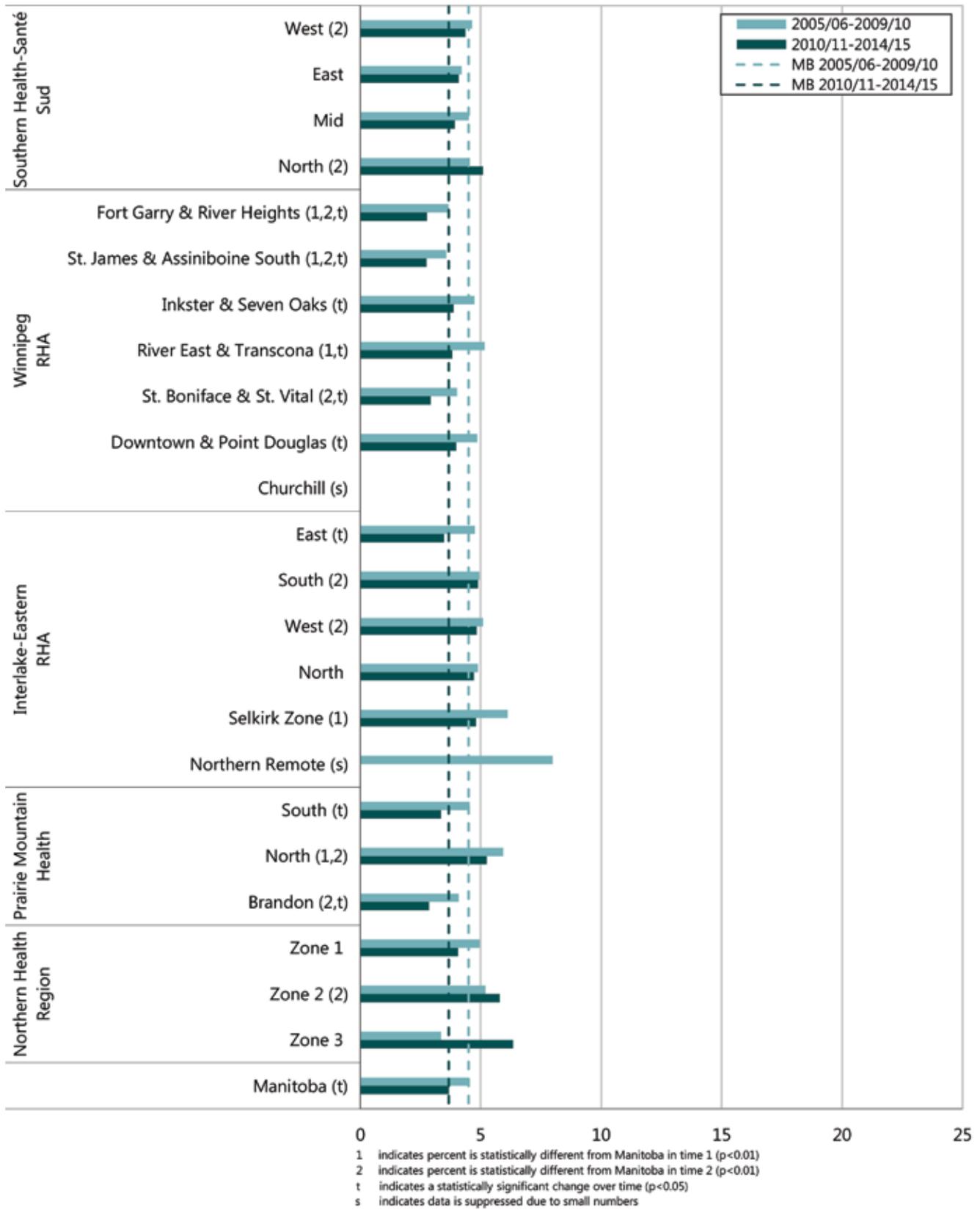
**Figure 6.29: Prevalence of Acute Myocardial Infarction by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.30: Prevalence of Acute Myocardial Infarction by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Stroke Prevalence

Similar to AMI, stroke is an event where complications in blood flow result in cell death. In this case, rather than in the heart, restricted blood flow to the brain can lead to cell death, or alternatively, bleeding in the brain can result in cell death. In this analysis, an individual was classified as having had a stroke if they met one of the following conditions:

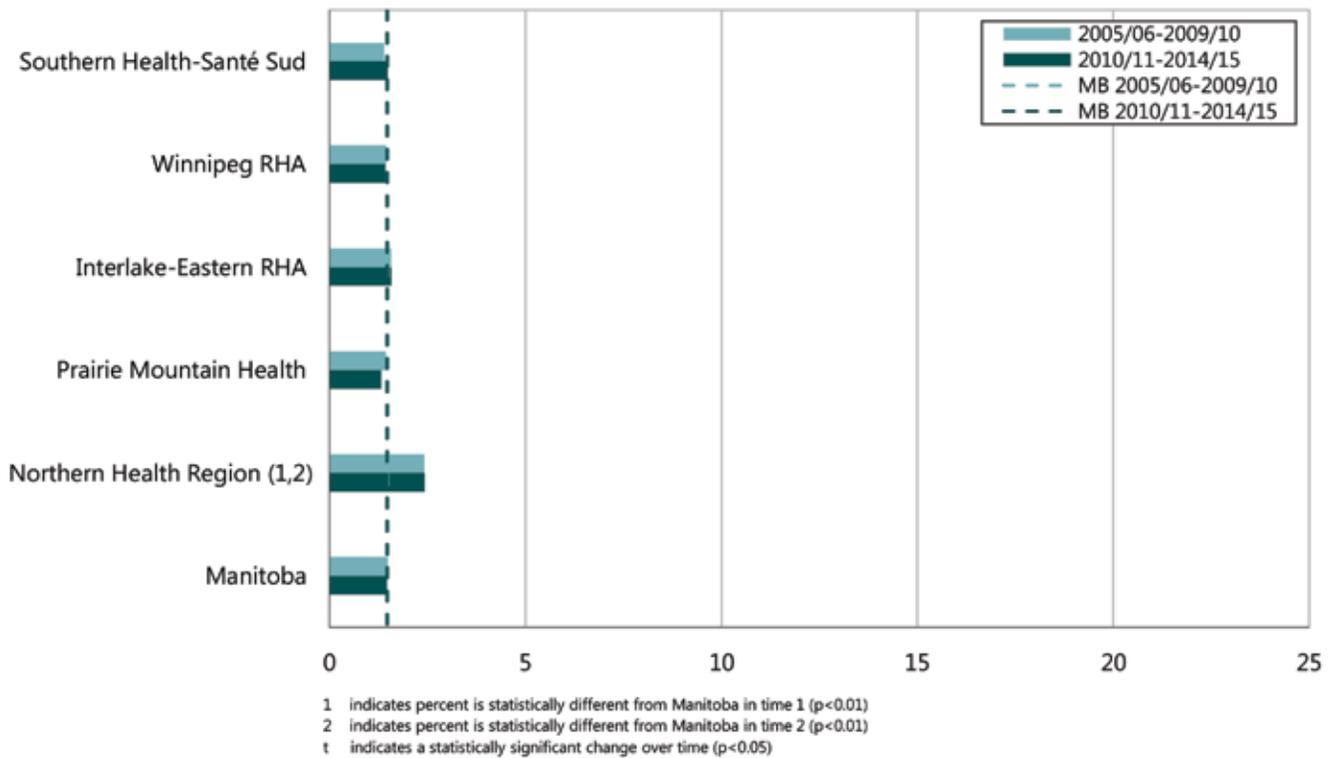
- At least one inpatient hospitalization with the ‘most responsible diagnosis’ of stroke and a length of stay of one or more days (unless the patient died in hospital); or
- A death with stroke listed as the primary cause of death on the Vital Statistics death record.

We used the entire five years in each of our two study periods to identify individuals who had had a stroke.

The prevalence of stroke increased dramatically with age, from ~1% in the youngest age group to 8% in the oldest age group (Figures 6.31 to 6.33). Northern Health Region had a significantly higher prevalence of stroke in the 65-74 and 75-84 age groups than Manitoba as a whole, but the prevalence was similar to the Manitoba average for the oldest age group. Overall, the prevalence of stroke decreased from one time period to the next for the older age groups (age 75-84 and 85+), but not for the youngest age group. There was a strong linear trend with socioeconomic status, with people in lower income quintiles having a higher prevalence of stroke (Figure 6.34), particularly in urban regions, where the trend was significant in both time periods.

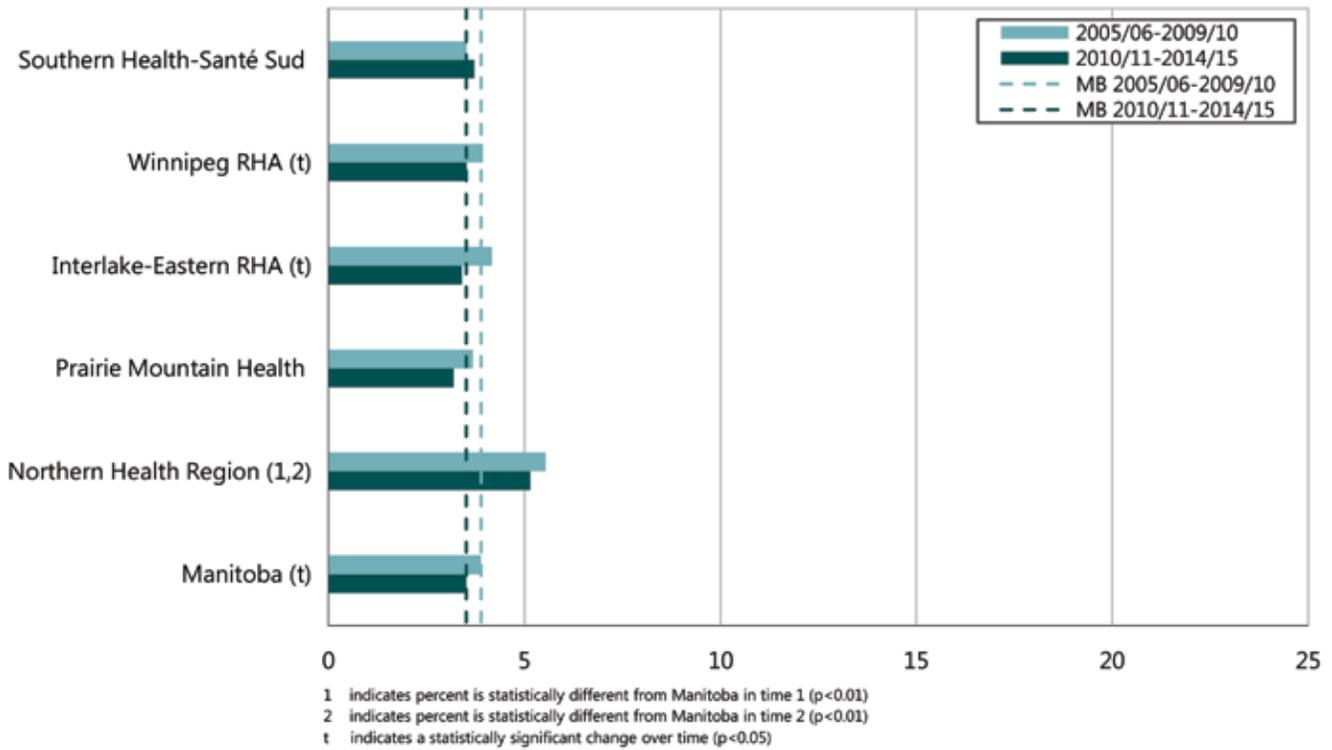
**Figure 6.31: Stroke Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



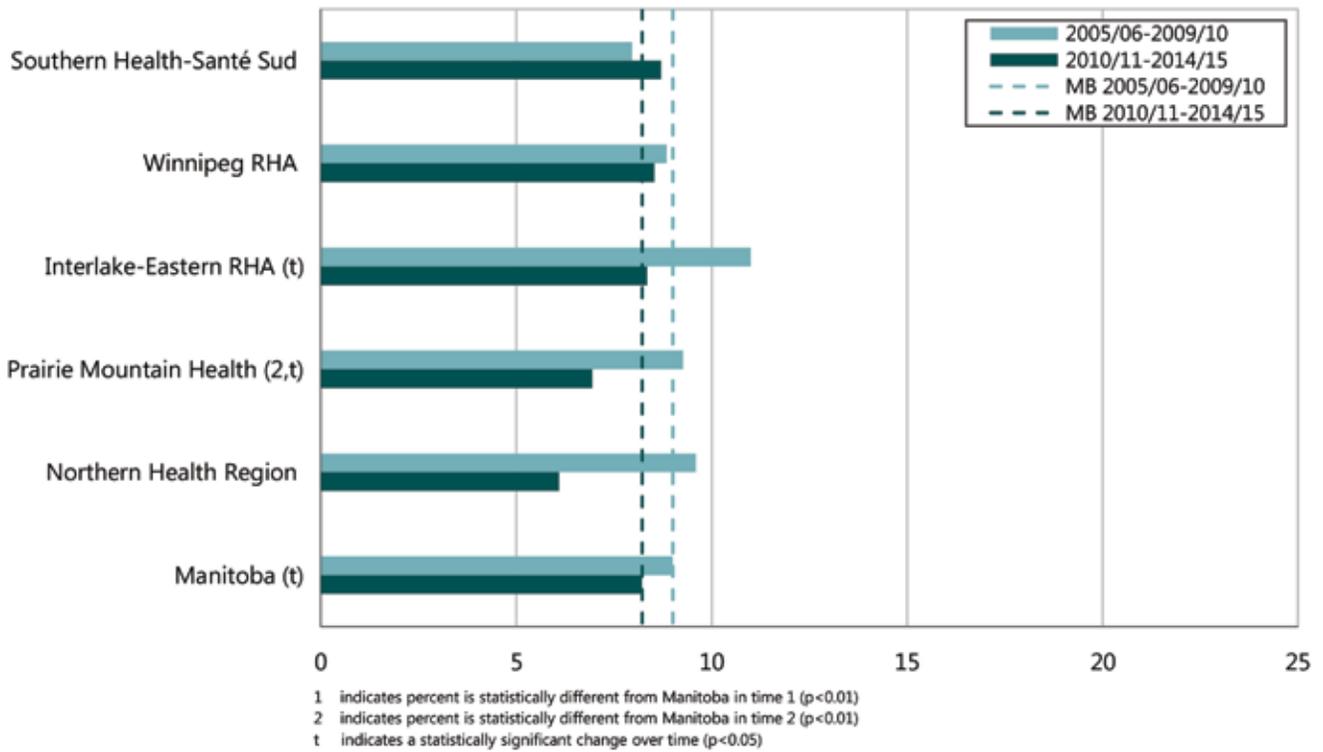
**Figure 6.32: Stroke Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



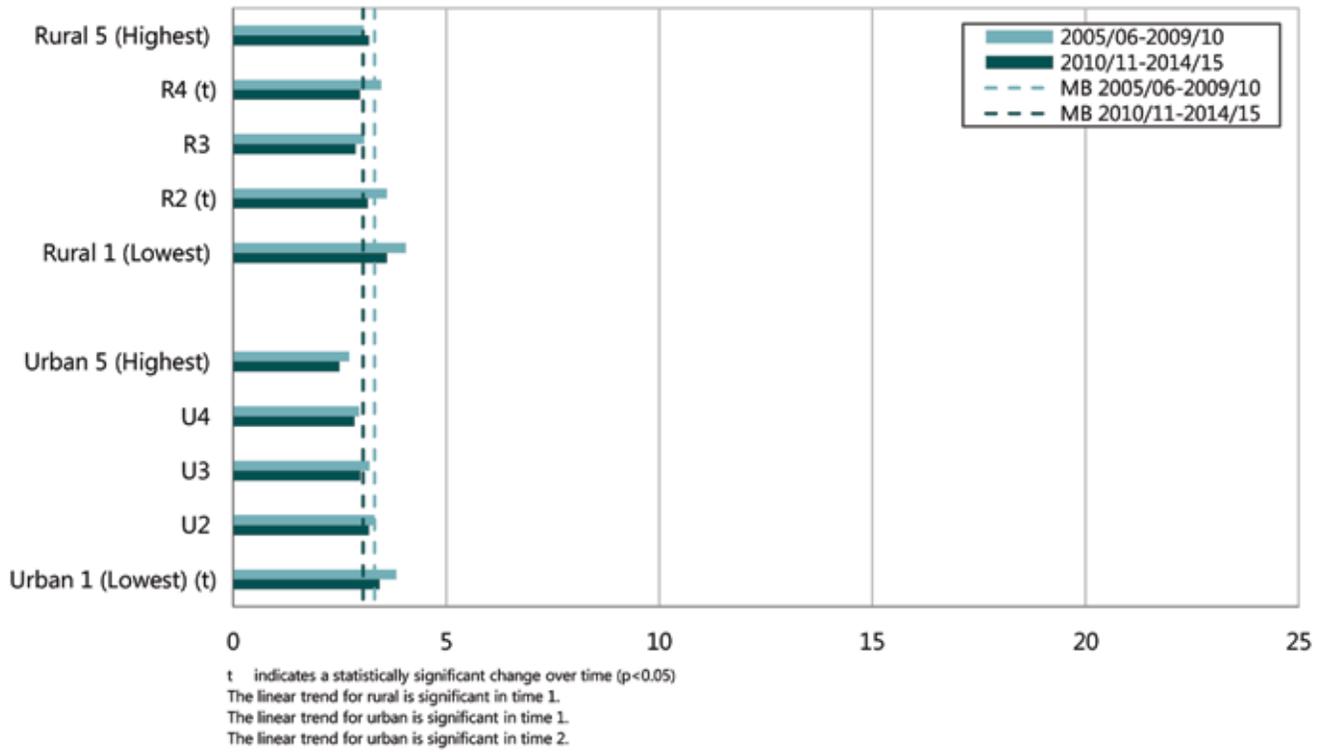
**Figure 6.33: Stroke Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults

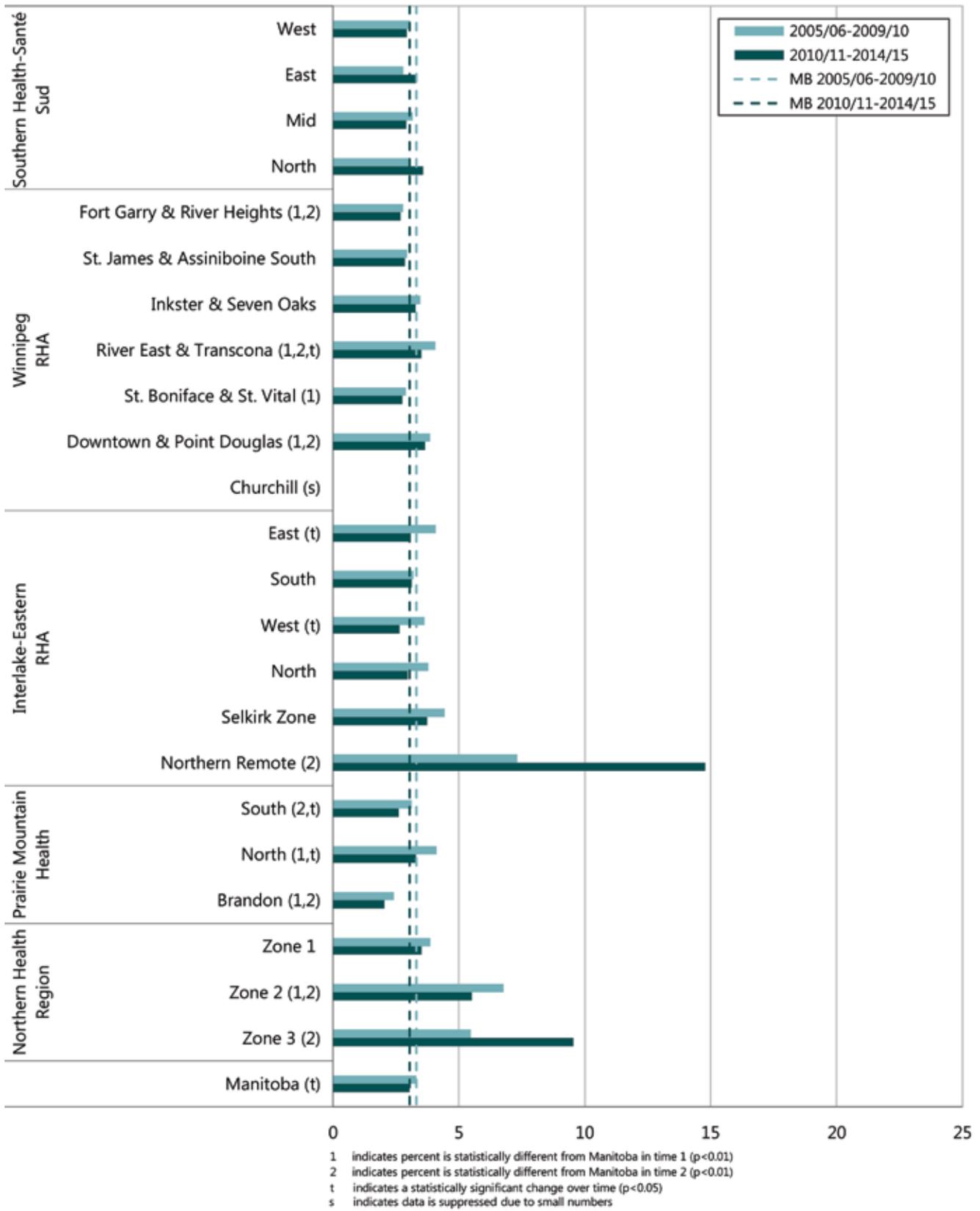


**Figure 6.34: Stroke Prevalence by Income**

Quintile Age- and sex-adjusted percent of community-dwelling older adults



**Figure 6.35: Stroke Prevalence by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



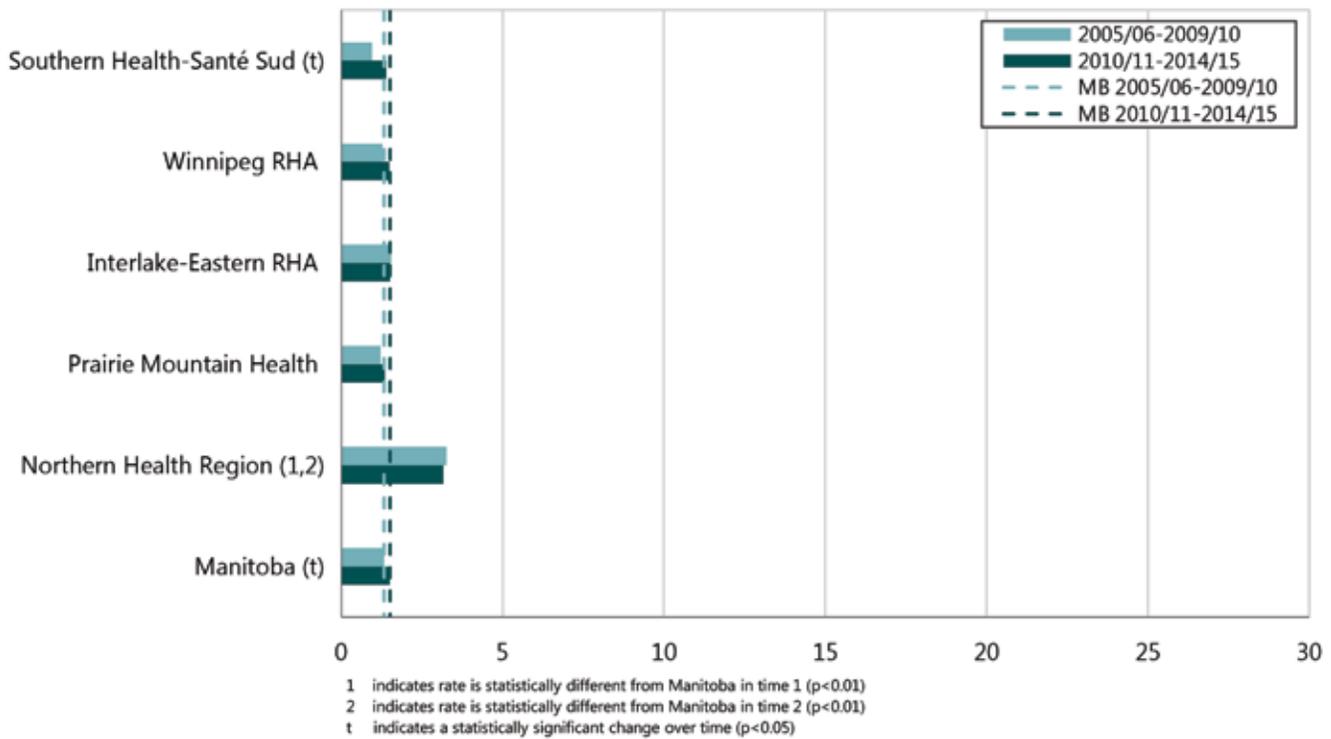
## Hip Fracture Rates

Hip fractures (or broken hips) are common among older adults. We classified individuals as having had a hip fracture if they were hospitalized with a hip fracture as the ‘most responsible cause’ of the hospitalization. Since we present this indicator as a rate (in this case the number of events per thousand person-years), we can account for a single person having more than one hip fracture during the study period. We were careful to avoid misclassifying a re-hospitalization for the same hip fracture as a new hip fracture, by not counting events occurring within six months of a previous hospitalization.

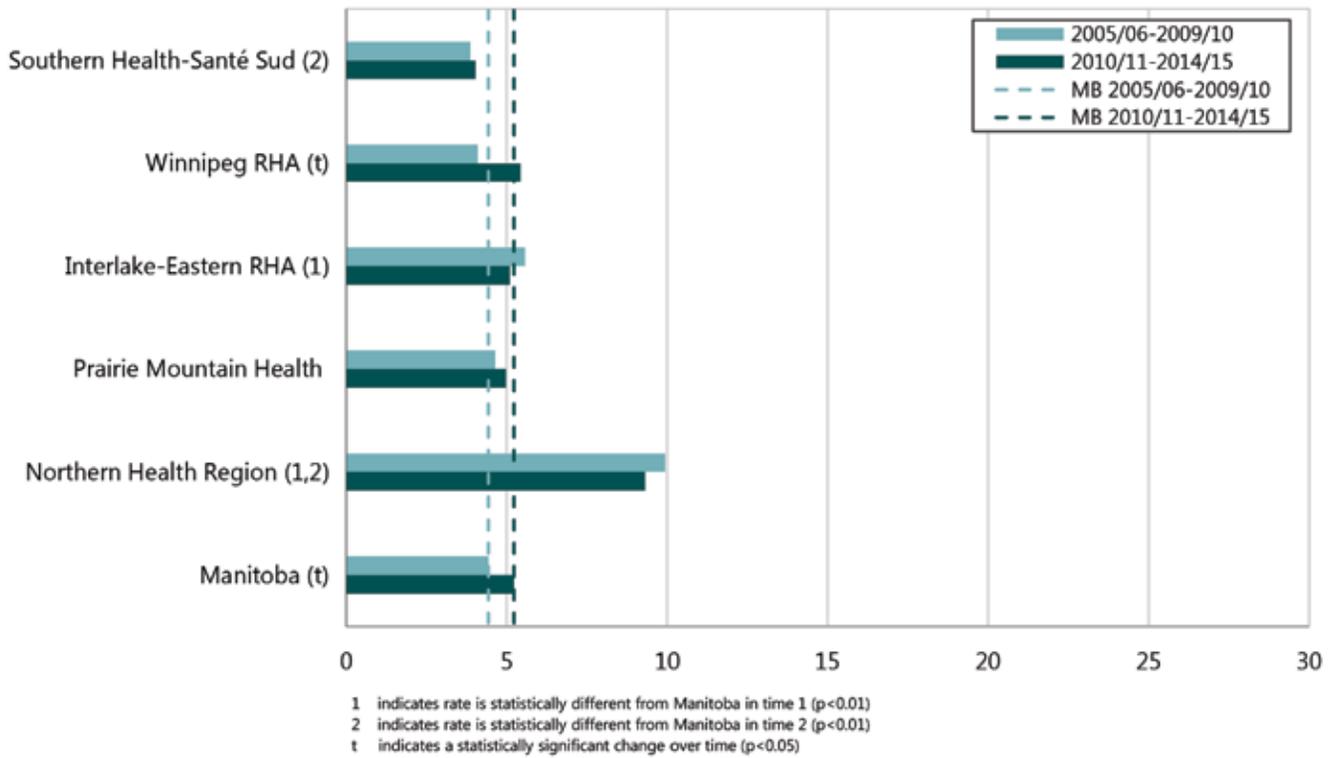
Figures 6.36 to 6.38 show that hip fracture rates increased with age. The hip fracture rate for the youngest age

group (less than 2 fractures per thousand person-years) increased for the 75-84 age group (5 fractures per thousand person-years) and the oldest age group (~15 fractures per thousand person-years). Although the rate did not increase from one time period to the next for the youngest age group, there was a statistically significant increase over time in the hip fracture rate for both of the older age groups. There were few differences among regions; only Northern Health Region had significantly higher than average hip fracture rates in both time periods for the 65-74 age groups. There was a trend of increasing hip fracture rates as income quintile decreased, and both urban and rural residents in the lowest income quintile had higher rates (Figure 6.39).

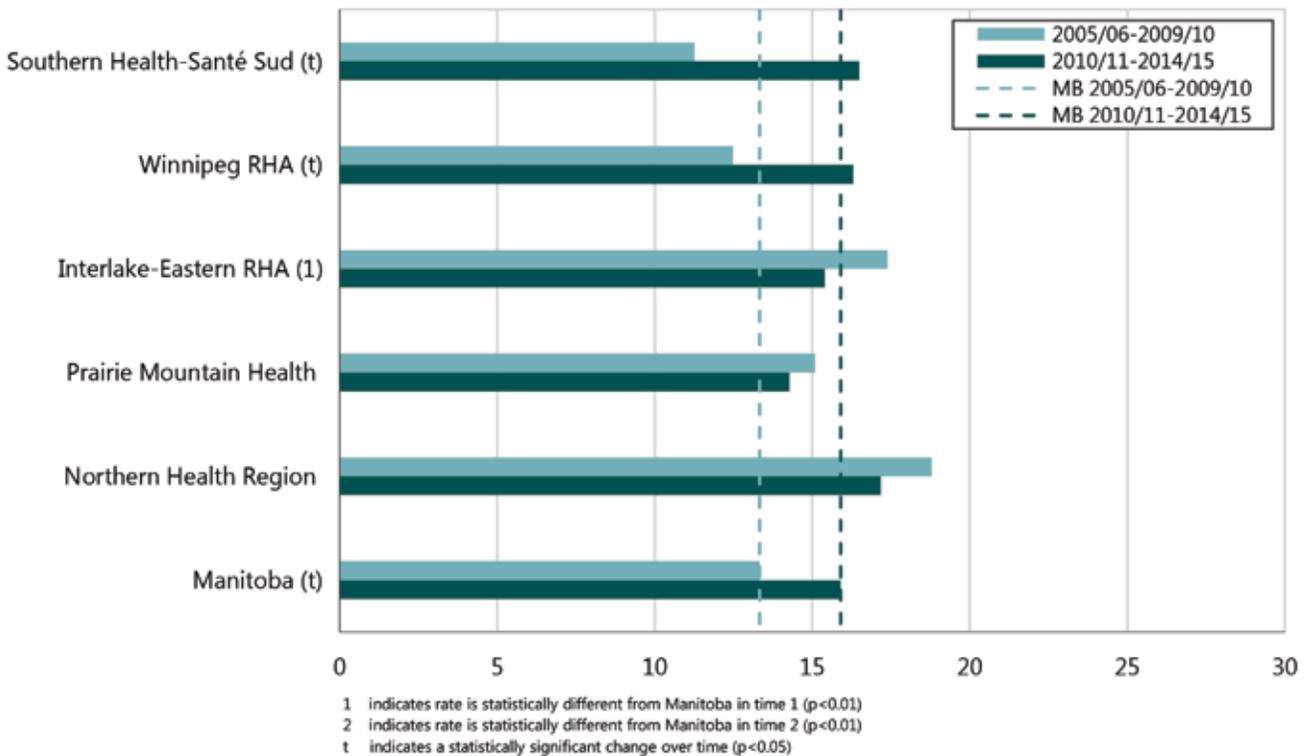
**Figure 6.36: Hip Fracture Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 1,000 person-years



**Figure 6.37: Hip Fracture Rates by Health Region, Age 75-84**  
 Crude rate for community-dwelling older adults per 1,000 person-years

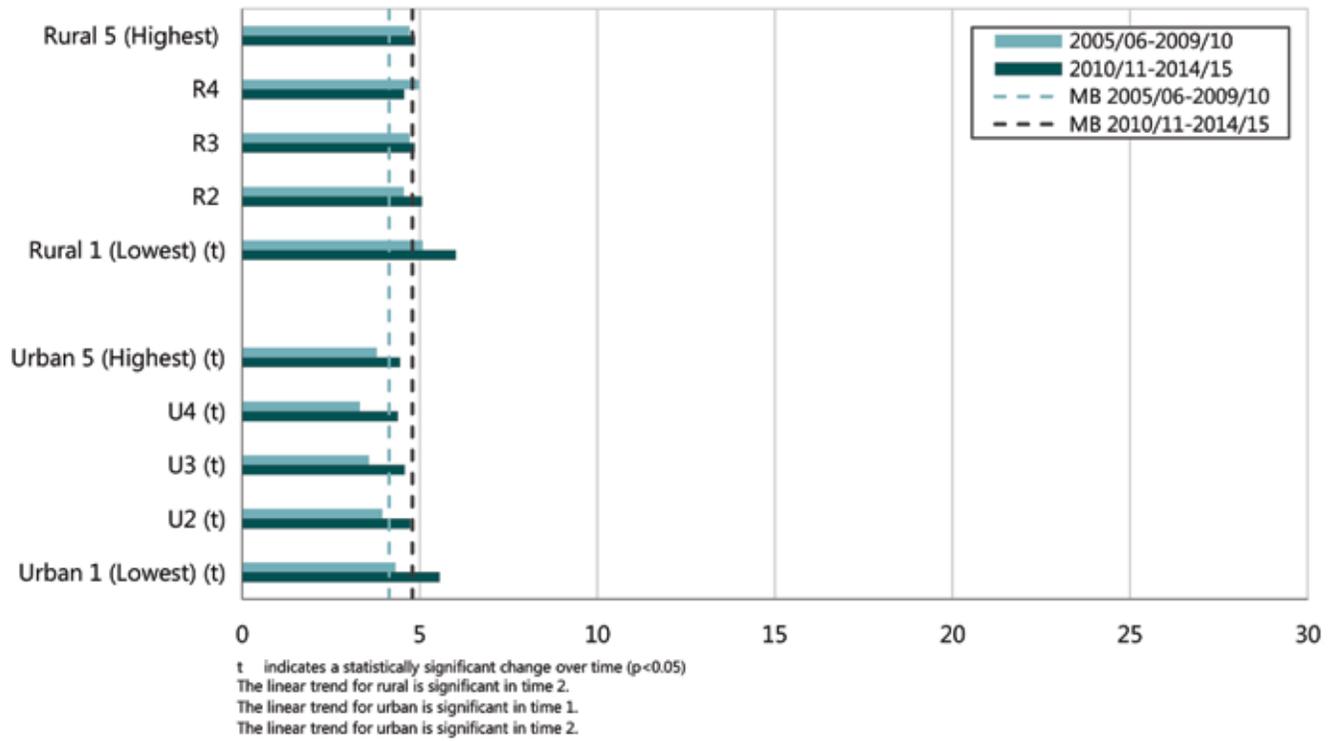


**Figure 6.38: Hip Fracture Rates by Health Region, Age 85+**  
 Crude rate for community-dwelling older adults per 1,000 person-years



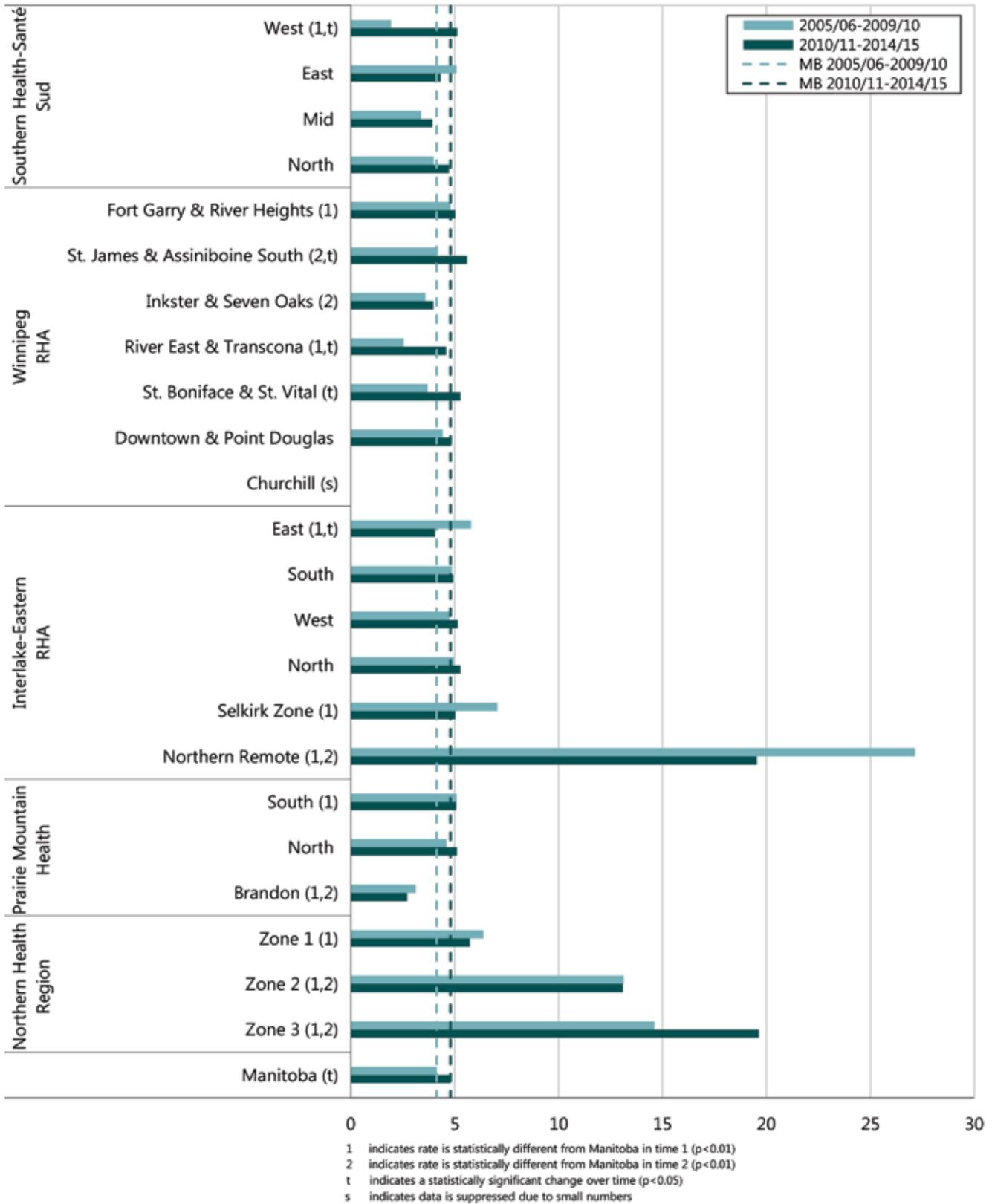
**Figure 6.39: Hip Fracture Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years

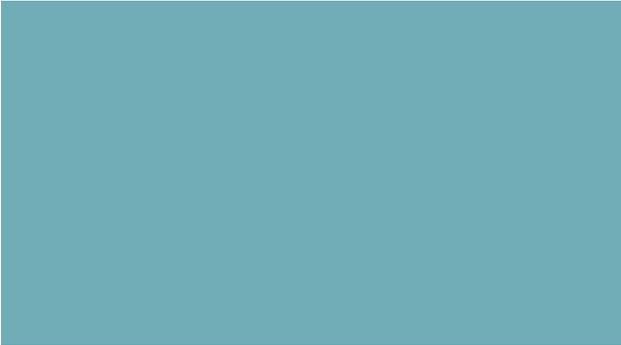


**Figure 6.40: Hip Fracture Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years







# Chapter 7: Mental Health Conditions

This chapter reports on three mental health indicators for community-dwelling older adults, covering the most prevalent conditions that affect this population: dementia, mood and anxiety disorders, and substance abuse disorder. For all three indicators, we used the entire five years of data for each time period to calculate the prevalence of these conditions in our study population. The results are reported as the percentage of the population identified as having the mental health condition.

## Key Findings

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- The prevalence of dementia, mood and anxiety disorders, and substance abuse disorders increased significantly during the study period.
- Compared to the Manitoba average, Northern Health Region had significantly lower prevalence of dementia and mood and anxiety disorders, but significantly higher prevalence of substance abuse disorder.
- The prevalence of all three of the mental health conditions we examined was correlated with socioeconomic status, with higher rates in poorer areas.

## Dementia Prevalence

An individual was classified as having dementia if they met one of the following conditions:

- One or more hospitalizations with a diagnosis for dementia (including organic psychotic conditions, cerebral degenerations, and/or senility); or
- One or more physician visits with a diagnosis for dementia.

The prevalence of dementia was calculated over the full five years of data available for each time period.

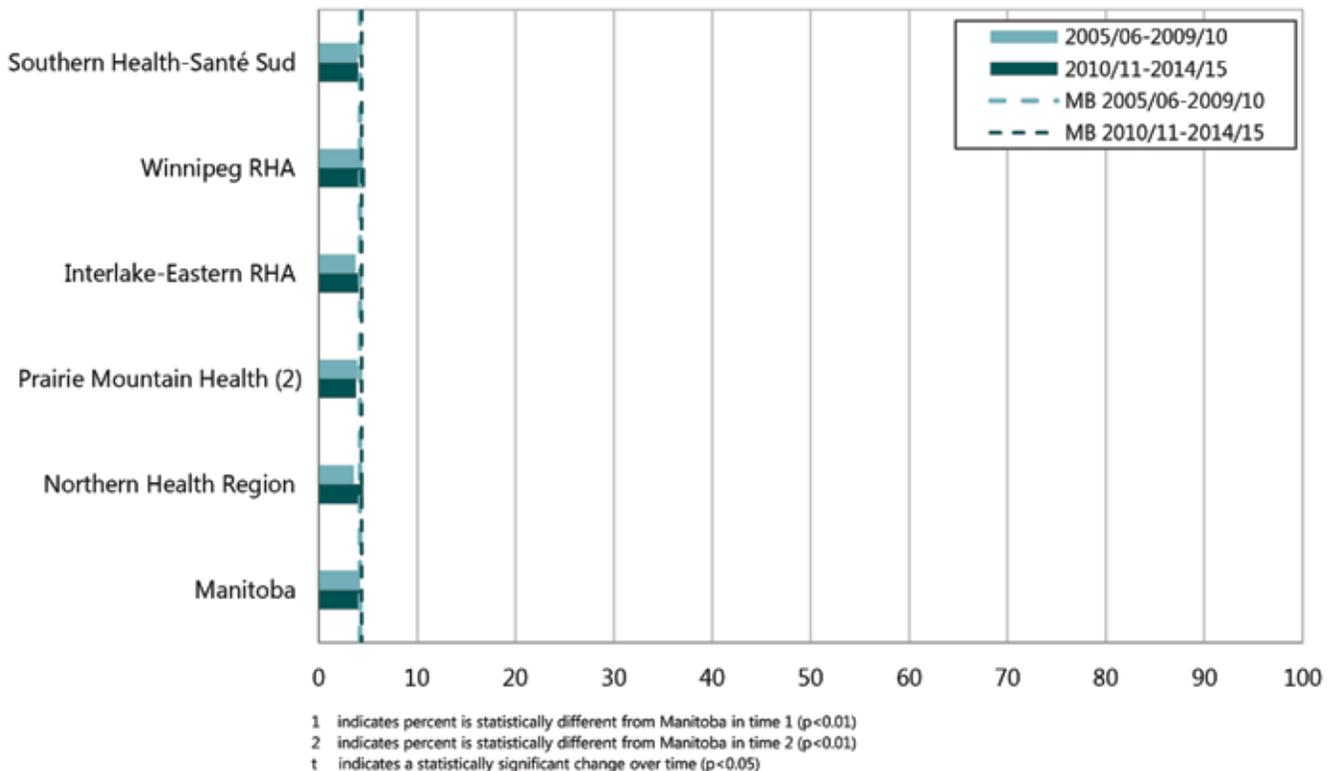
As might be expected, the prevalence of dementia increased with age. In the second time period, fewer than 5% of individuals age 65-74 were diagnosed with dementia, while closer to 17% of individuals age 75-84, and 50% of individuals in the oldest age group were (Figures 7.1 to 7.3). The prevalence was similar across regions for the youngest age group, but diverged for the older age groups. Winnipeg had the highest prevalence of dementia, significantly above the Manitoba average, while the prevalence was lower than average in Prairie Mountain Health, Northern Health Region, and Interlake-Eastern RHA.

There was a significant increase in dementia prevalence from one time period to the next for the two oldest age

groups (Figures 7.2 and 7.3). There are at least three possible explanations for this increase, and all may have contributed to the observed increase. The first is that more older adults actually have dementia. However, the lack of an increase in dementia prevalence for the 65-74 age group would suggest this is unlikely, as it should have happened here as well. The second is that physicians and nurse practitioners were more likely to recognize and diagnose dementia in the more recent time period than in the earlier one. Again, this is also unlikely, since there was no change in the 65-74 age group. The last explanation is that people diagnosed with dementia are increasingly more likely to remain in the community than they are to move into a PCH or die, thus increasing the dementia prevalence amongst community-dwelling older adults. This finding may be a testament to the quality of homecare or community support being provided to older Manitobans. However, it also suggests a growing strain on those supports as the baby boomers reach the higher prevalence age categories.

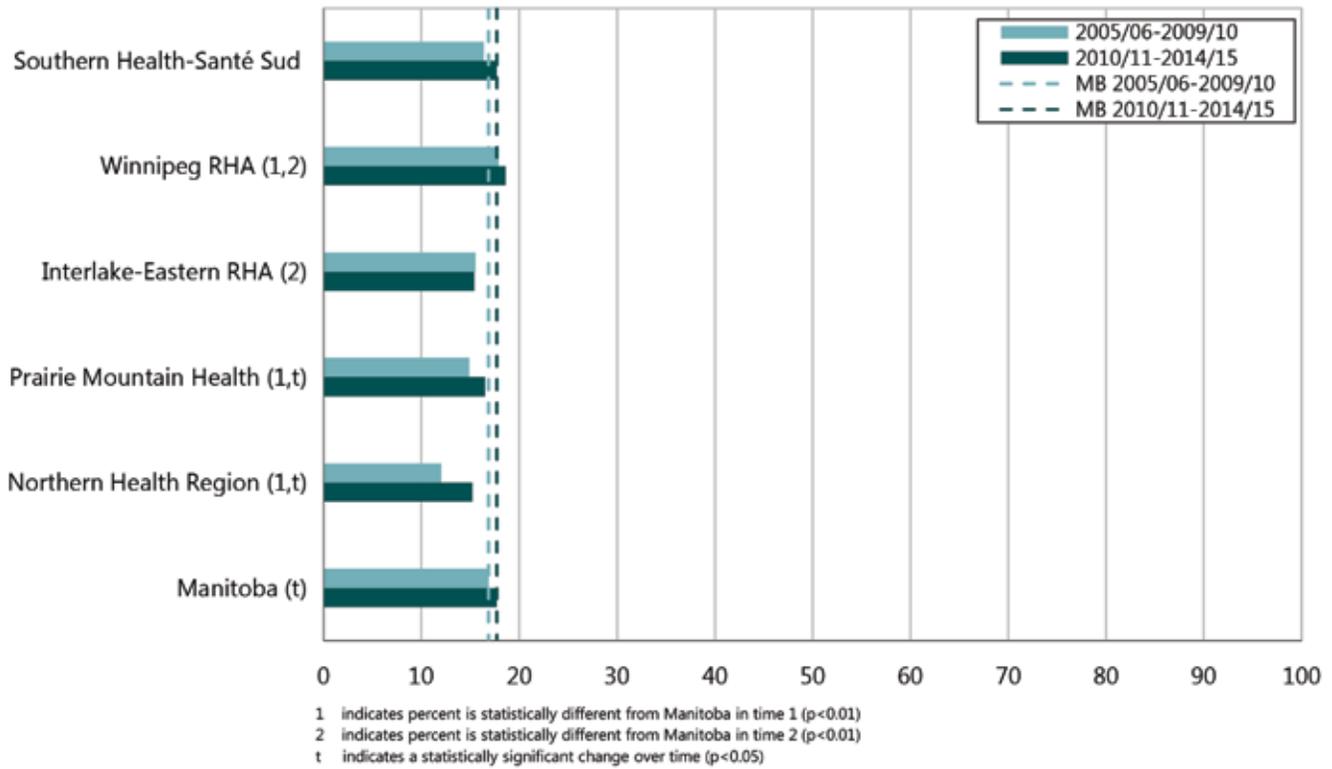
The association between income and prevalence of dementia is small but statistically significant in both rural and urban regions in the second time period (Figure 7.4). For both urban and rural areas, the higher income quintiles (3-5) have lower dementia prevalence, while the lower quintiles (1-2) have higher prevalence.

**Figure 7.1: Dementia Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



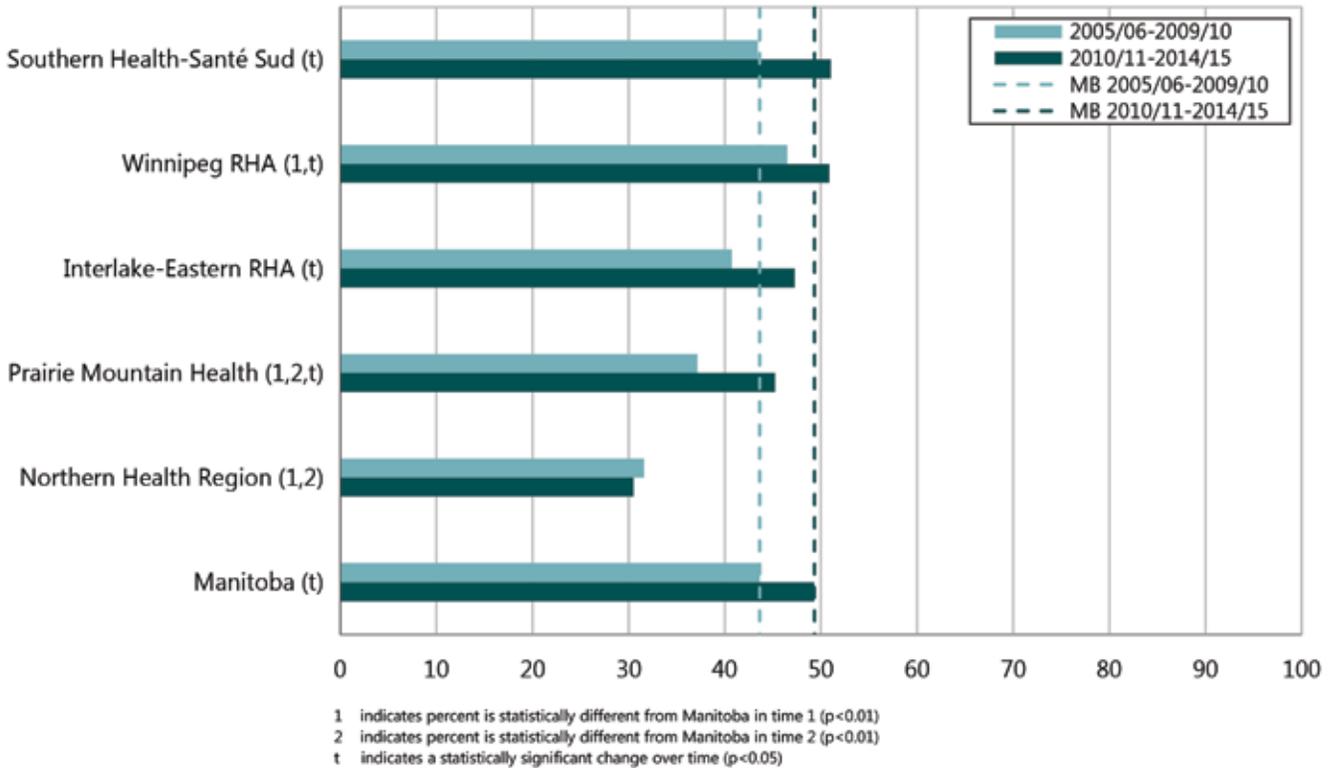
**Figure 7.2: Dementia Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



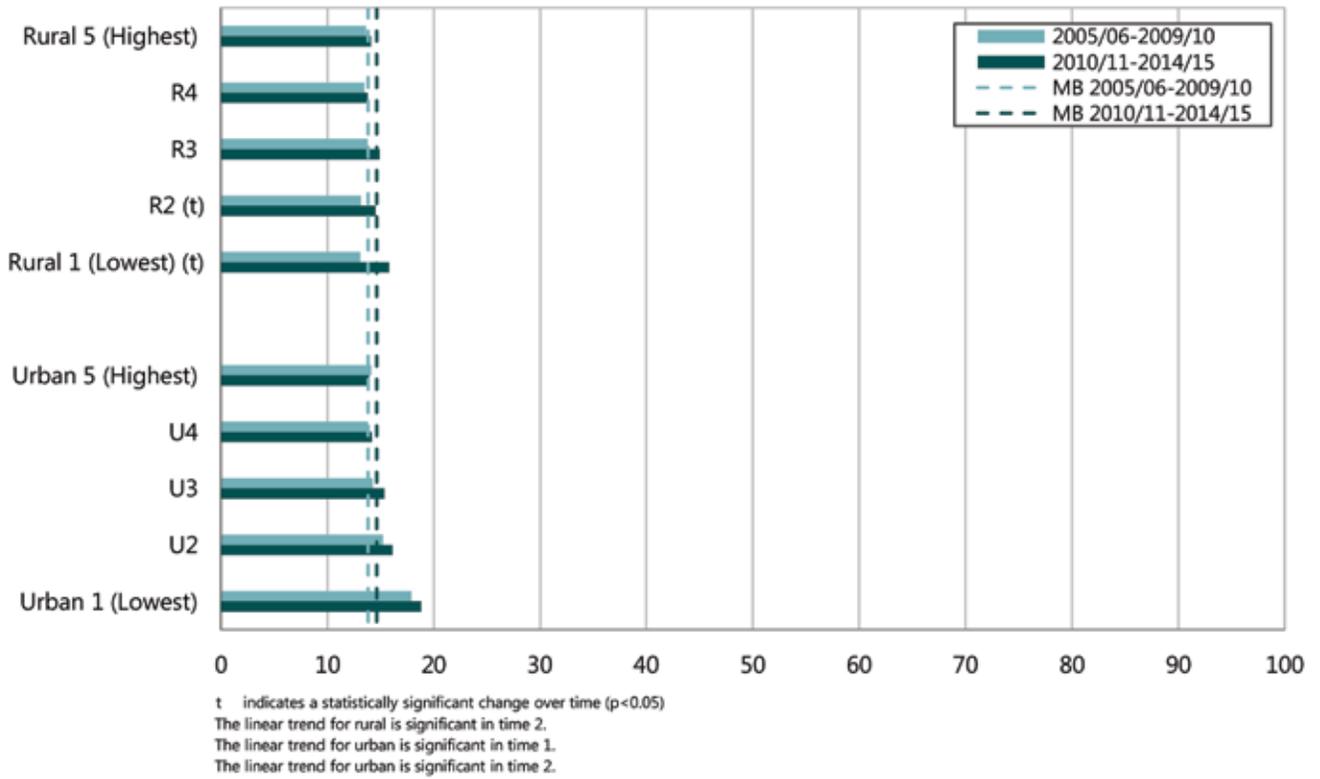
**Figure 7.3: Dementia Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults

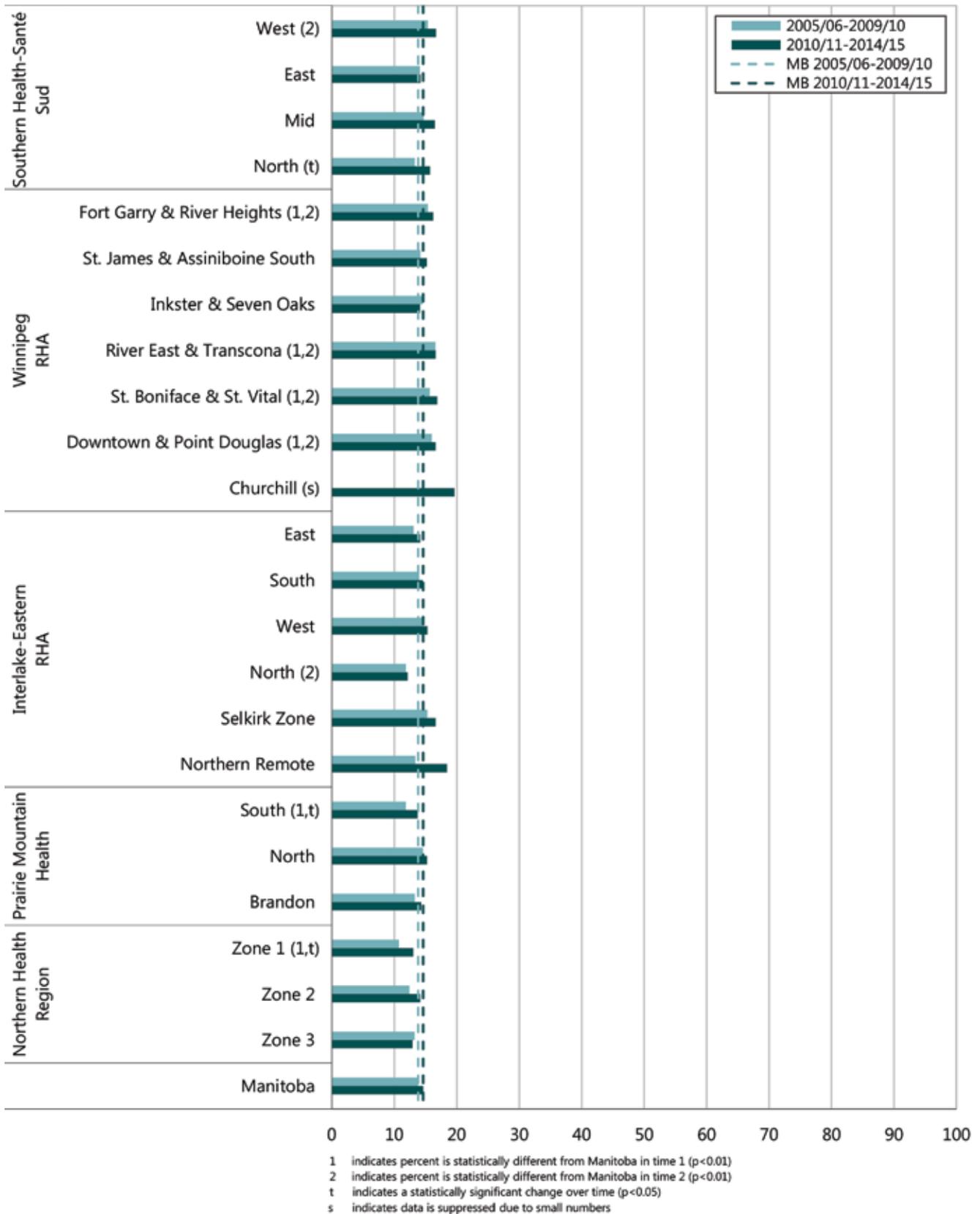


**Figure 7.4: Dementia Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 7.5: Dementia Prevalence by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



## Mood and Anxiety Disorders Prevalence

Mood and anxiety disorders are among the most prevalent mental health conditions in Manitoba. This group of disorders includes depression, anxiety and bipolar disorders, as well as manic episodes, clinical phobias, and obsessive-compulsive disorder. Treatment can include medication or counseling, or both.

For this report, an individual was classified as having a mood or anxiety disorder if they met one of the following conditions:

- One or more hospitalizations with a diagnosis of depression, anxiety, or episodic mood disorders (i.e., bipolar disorder);
- One or more physician visits with a diagnosis of depression or episodic mood disorders;
- One or more hospitalizations or physician visits with a diagnosis of anxiety, dissociative, or somatoform disorders and one or more prescriptions for an antidepressant (i.e., fluoxetine, citalopram, venlafaxine), benzodiazepine derivatives anxiolytics (i.e., diazepam), or lithium; or

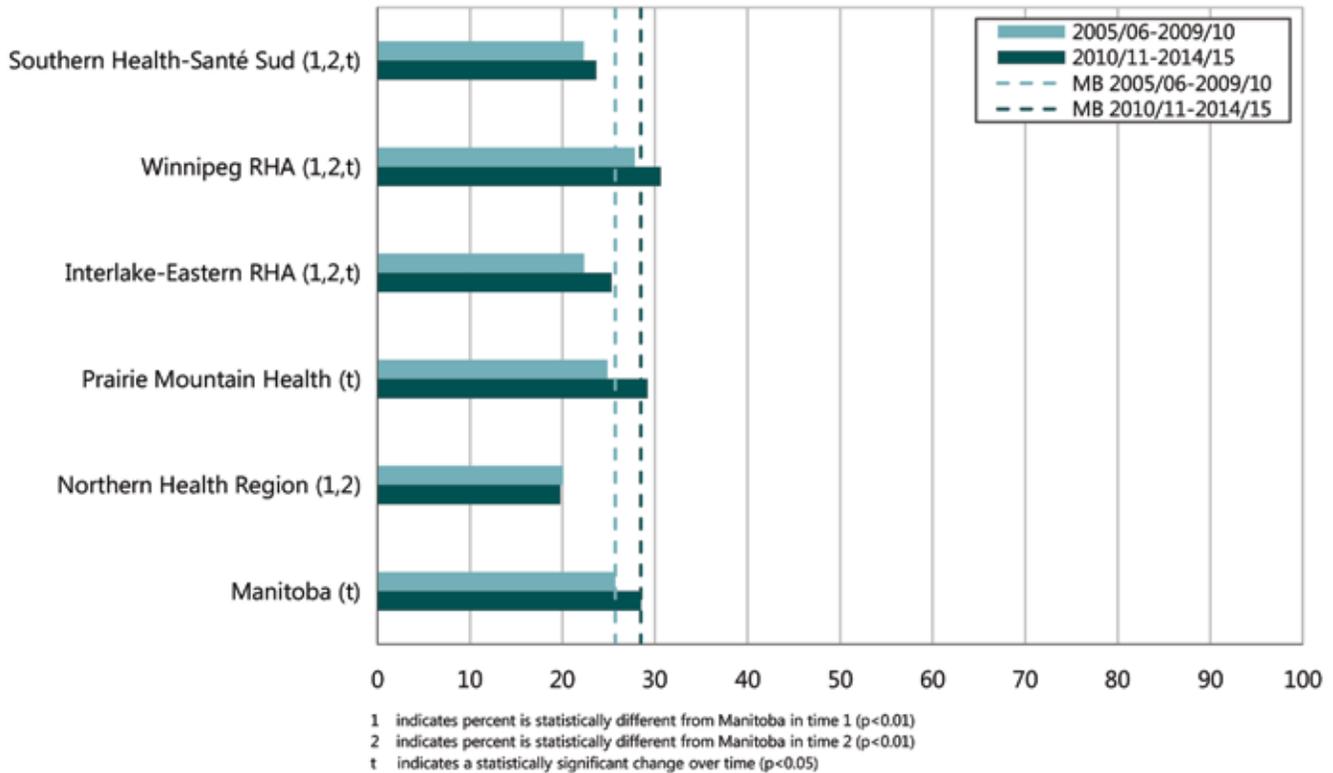
- Three or more physician visits with a diagnosis of anxiety, dissociative, somatoform disorders or adjustment reaction.

Unlike dementia, mood and anxiety disorders have a high prevalence in all three age groups of older adults (28% for the youngest group to 32% for the oldest group in the second time period) (Figures 7.6 to 7.8). For all age groups, the percentage increased significantly from the first time period to the second time period. It is possible that this across-the-board change represents a change in diagnosing patterns amongst treating physicians, rather a change in the true prevalence of mood and anxiety disorders. This finding could also be due to decreasing stigma around mental illness and, as a result, greater willingness among older adults to seek treatment.

Compared to the Manitoba average, Winnipeg and Prairie Mountain Health consistently had a higher percentage of older adults with mood and anxiety disorders, while the other regions had percentages lower than average. The relationship between mood and anxiety disorders and income was statistically significant, with the people in the lower income quintiles having higher percentages with mood and anxiety disorders (Figure 7.9).

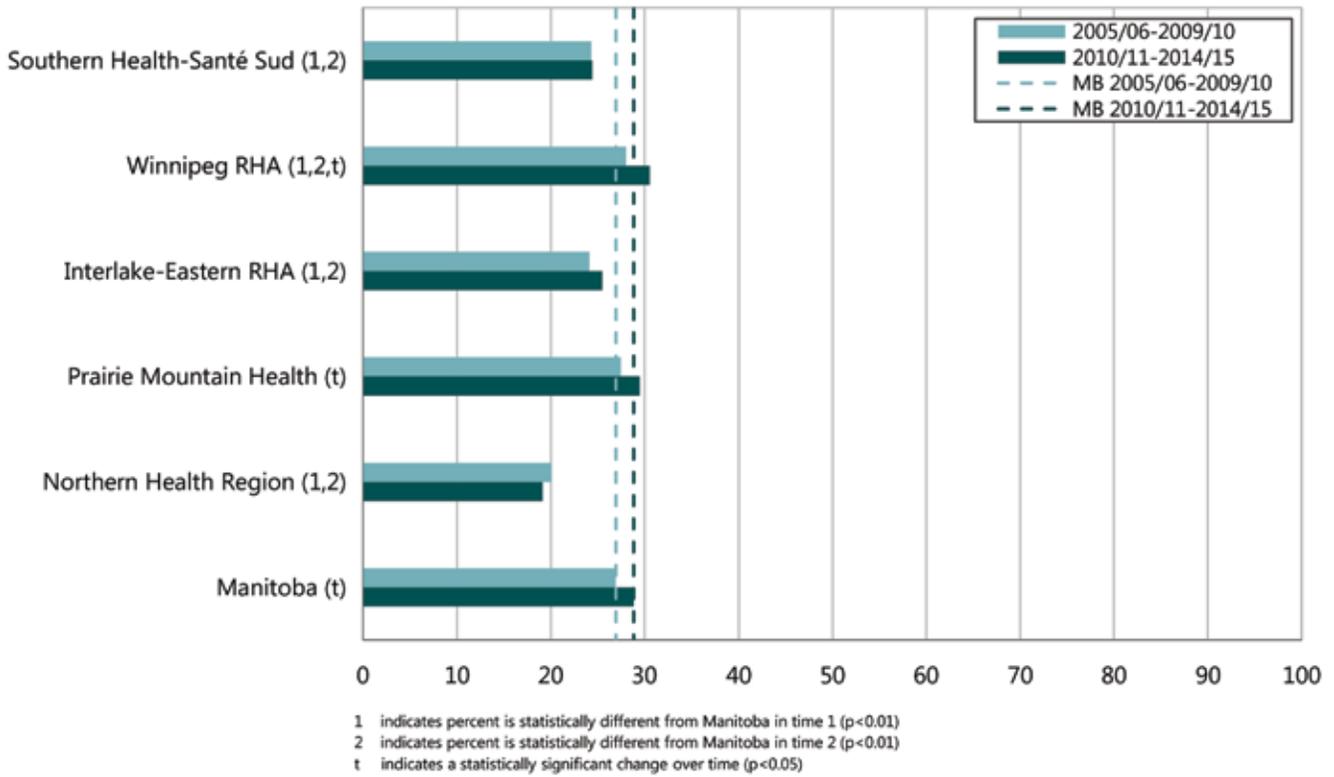
**Figure 7.6: Mood and Anxiety Disorders Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



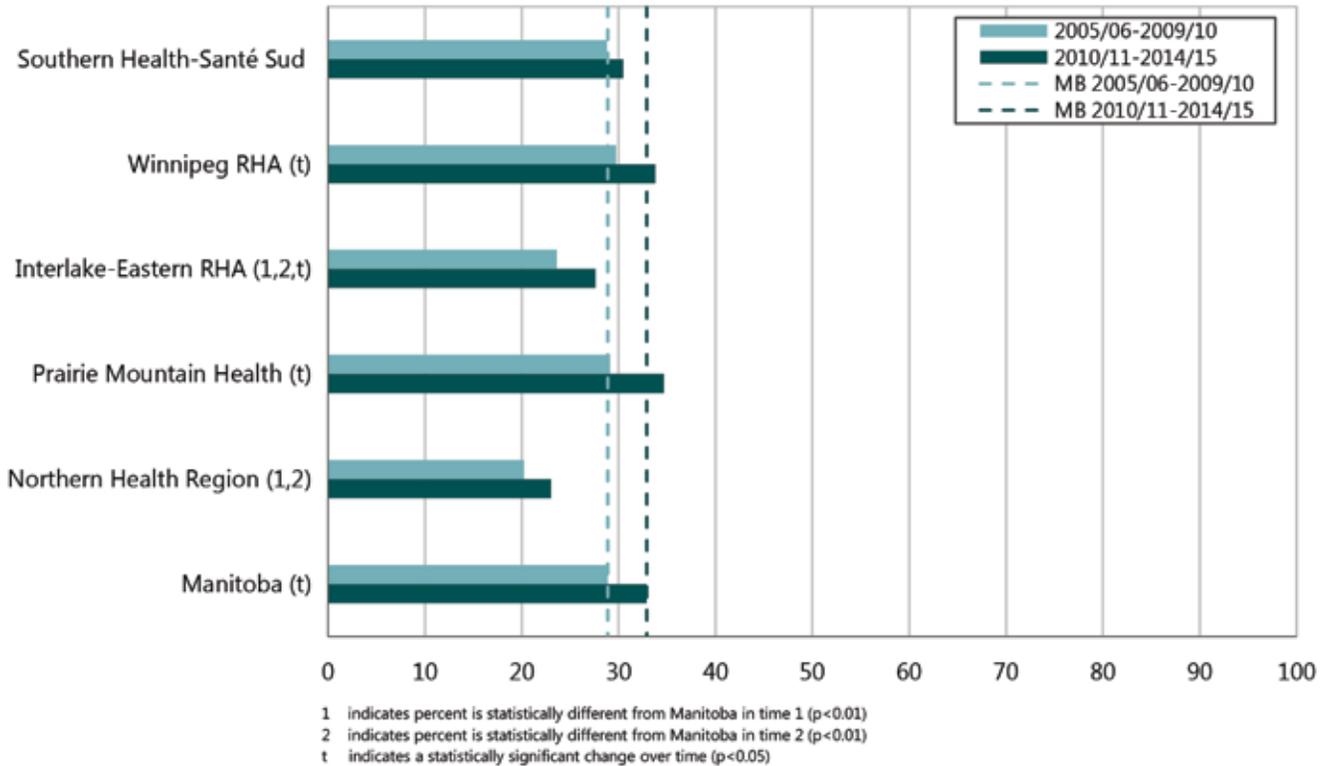
**Figure 7.7: Mood and Anxiety Disorders Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



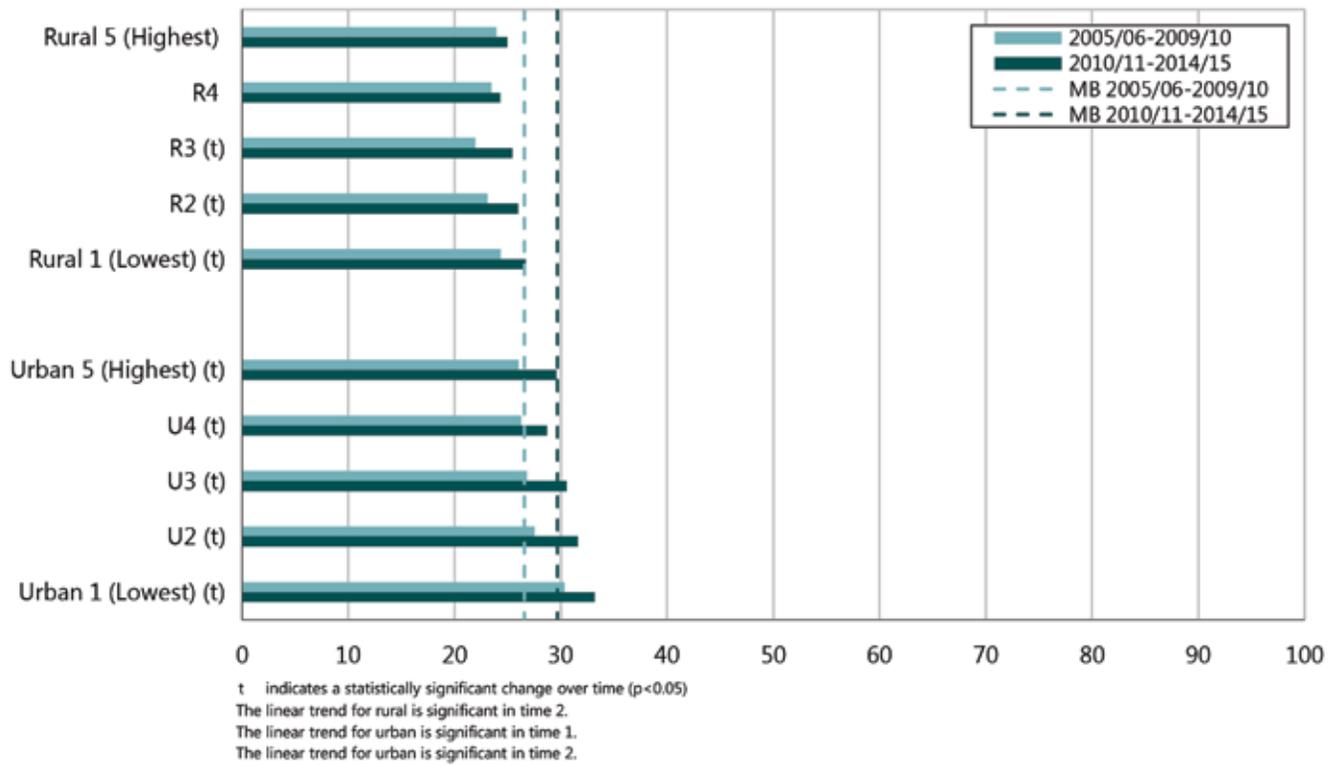
**Figure 7.8: Mood and Anxiety Disorders Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



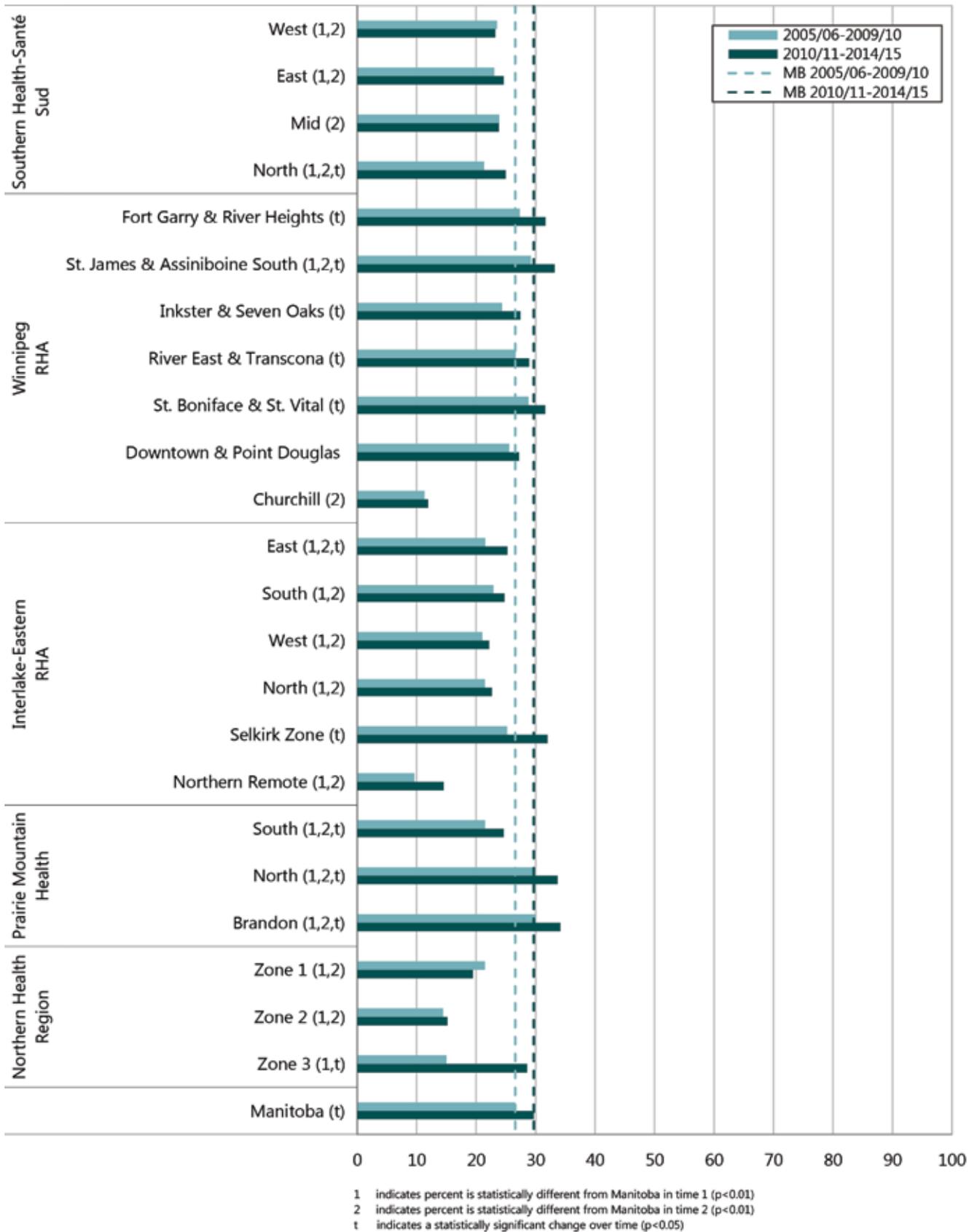
**Figure 7.9: Mood and Anxiety Disorders Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 7.10: Mood and Anxiety Disorders Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Substance Use Disorder Prevalence

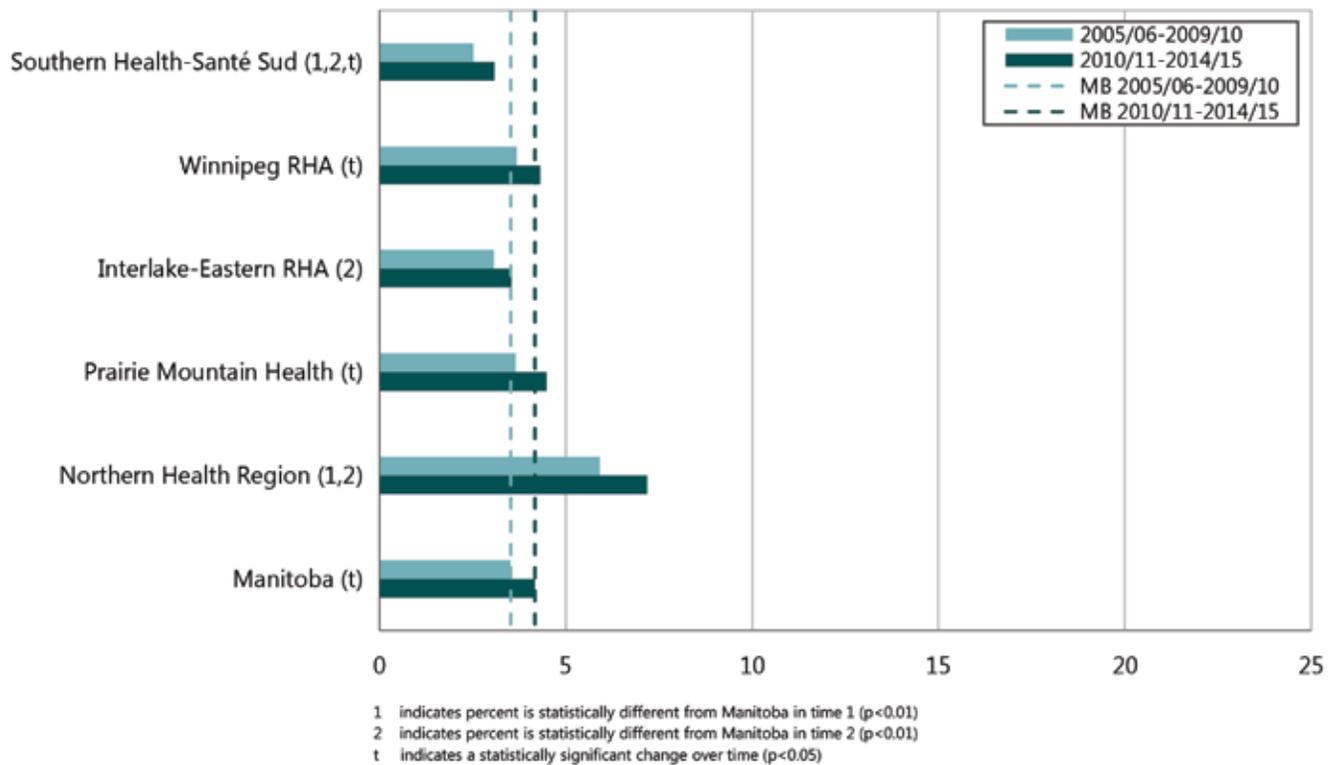
A substance use disorder is characterized by chronic or acute use of a (usually psychoactive) licit or illicit substance to a point where this use interferes with daily life or with personal/professional relationships. The most common substance use disorder in Manitoba is alcoholism.

In this analysis, an individual was classified as having a substance use disorder if they met one of the following conditions:

- One or more hospitalizations with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or non-dependent abuse of drugs; or
- One or more physician visits with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or non-dependent abuse of drugs.

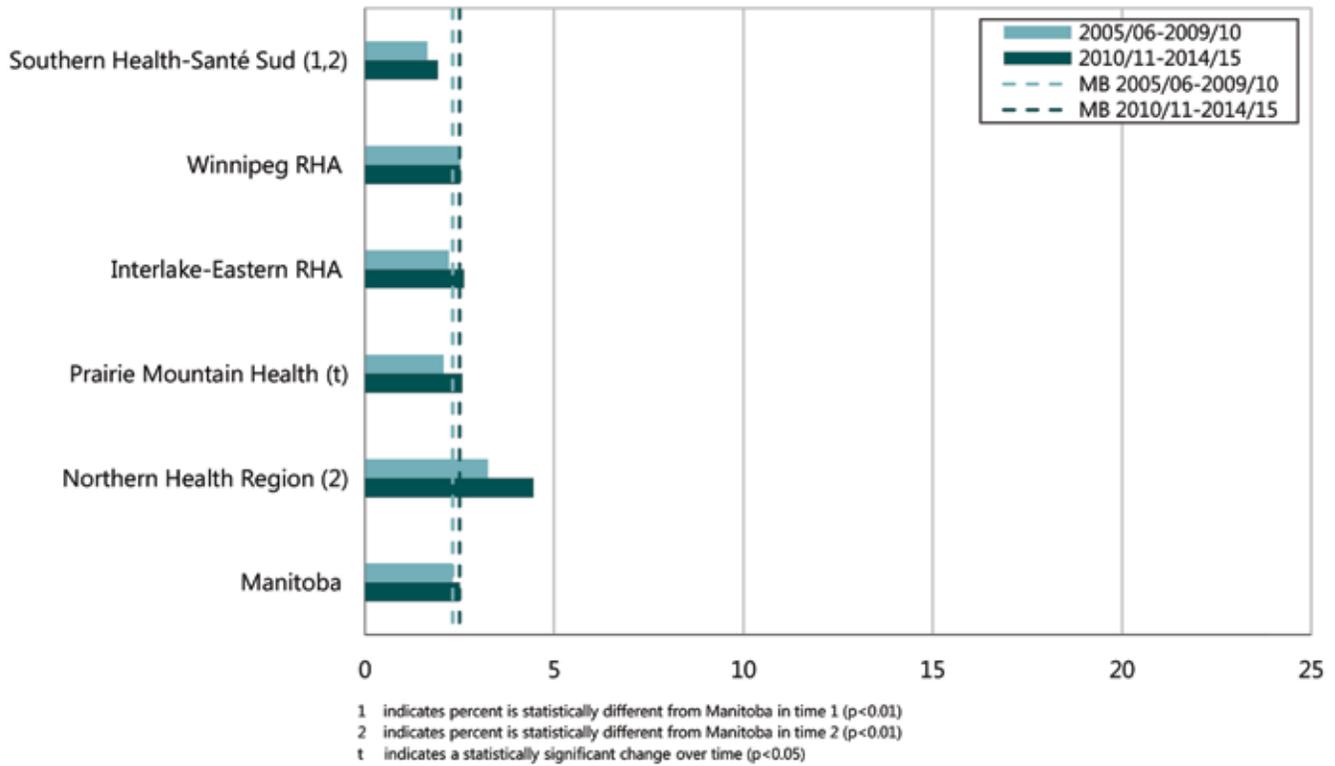
Substance use disorder was more prevalent in the youngest age group of older adults (Manitoba average of 4%) compared to the 75-84 and 85+ age groups (Manitoba average of ~2% and ~1%, respectively) (Figures 7.11 to 7.13). In the youngest age group, prevalence was significantly higher in the more recent time period, but there was no change over time for the older age groups. While Northern Health Region had a higher prevalence of substance use disorder than any other region, it also had a lower prevalence of mood and anxiety disorders and dementia. The correlation between substance use disorder prevalence and income quintile was significant for both urban and rural areas and in both time periods. It was also much stronger than the correlation observed with the other mental health conditions, particularly in the urban areas of the province, where the prevalence of substance use disorder for older adults in the lowest income quintile was more than double than in the highest income quintile (Figure 7.14).

**Figure 7.11: Substance Use Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



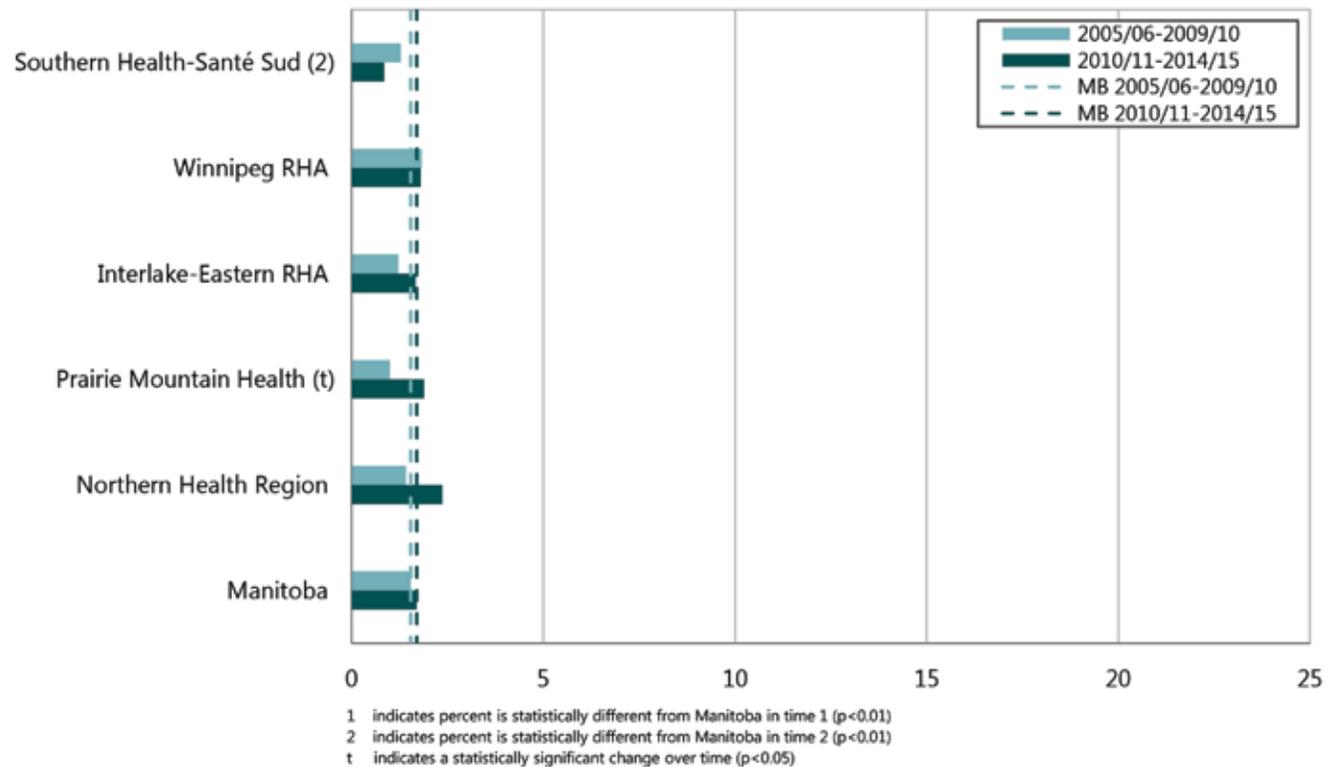
**Figure 7.12: Substance Use Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



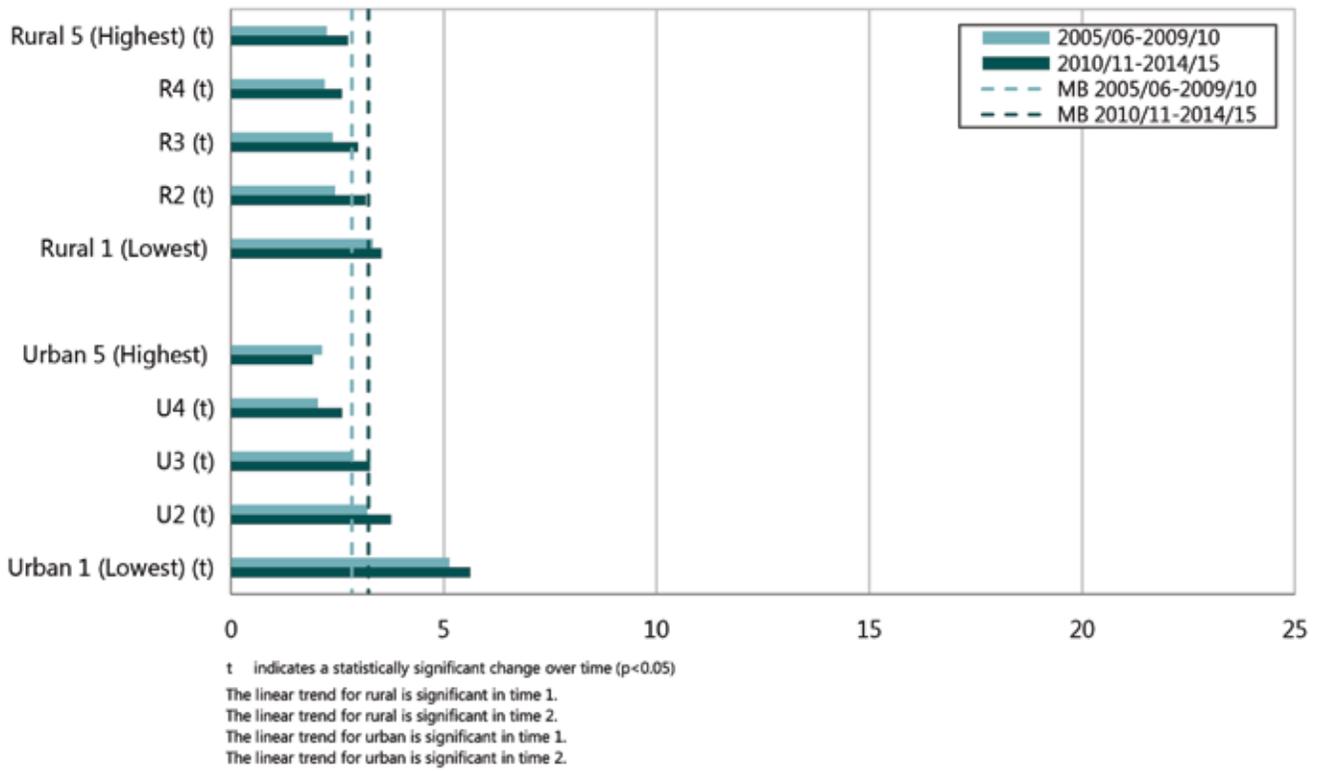
**Figure 7.13: Substance Use Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults

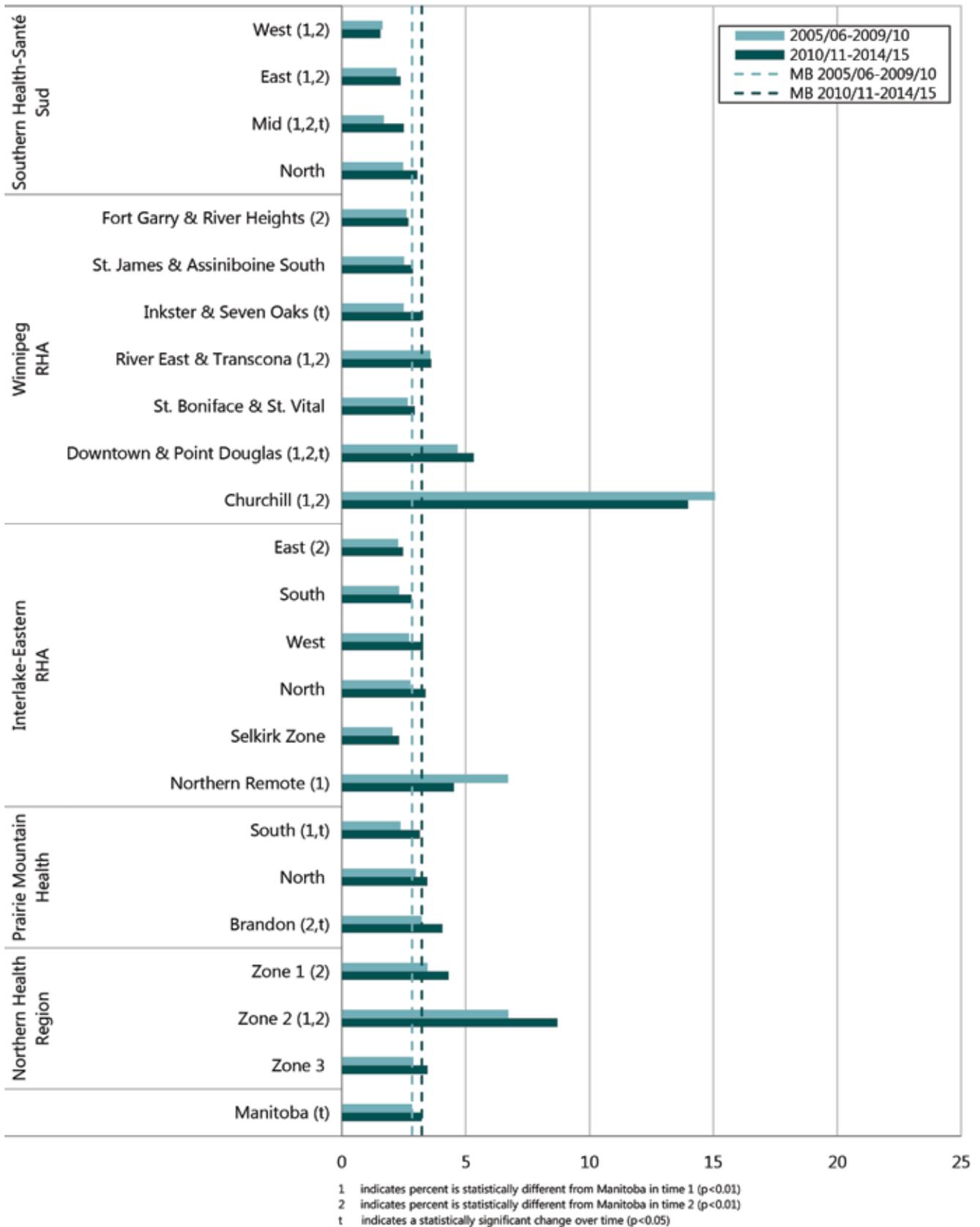


**Figure 7.14: Substance Use Prevalence by Income Quintile**

Percent of community-dwelling older adults



**Figure 7.15: Substance Use Prevalence by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



## Comorbidity Analysis

The prevalence of physical and mental health conditions are important for health system planners tasked with planning care for people who live with these conditions. As people grow older, they are increasingly likely to have several of these conditions at the same time, making delivery of care more complex. We conducted a comorbidity analysis to examine how many individuals in our cohort were living with multiple chronic conditions. The conditions we included are listed below. We chose to exclude hypertension because of its very high prevalence, and substance use disorder because of its very low prevalence.

We used the following year(s) of data for each respective condition:

- Chronic Obstructive Pulmonary Disease (COPD): 2014/15
- Dementia: 2010/11-2014/15
- Diabetes: 2012/13-2014/15
- Ischemic Heart Disease (IHD): 2010/11-2014/15
- Mood and Anxiety Disorders: 2010/11-2014/15
- Stroke: 2010/11-2014/15

We report any combination of the six conditions listed above that affected at least 1% of the older adult population in Table 7.1; therefore, any combinations of these six conditions not appearing in the table were quite rare (e.g., all combinations including stroke). Each checkmark in the table indicates the size of the older adult population affected by one or more conditions. For example, row 1 of the table has no checkmarks – therefore, 83,162 older adults (43%) had none of the conditions. But row 6 has checkmarks in the diabetes and IHD columns – therefore, 7,247 older adults (3.8%) had both of those conditions.

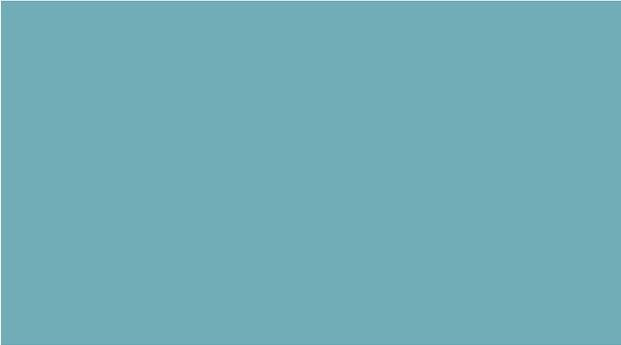
Across the whole population, Table 7.1 demonstrates that 57% of older adults had at least one of the conditions. Diabetes, mood and anxiety disorders, IHD and COPD were the most frequent single conditions for the population. The most frequent combination was IHD and diabetes, which makes sense, given their high prevalence individually. The only three-way combination to account for more than 1% of the older adult population was diabetes, IHD, and mood and anxiety disorders.

**Table 7.1: Comorbidity of Specified Chronic Conditions, 2010/11-2014/15**

COPD 2014/15	Dementia 2010/11- 2014/15	Diabetes 2012/13- 2014/15	IHD 2010/11- 2014/15	Mood & Anxiety 2010/11- 2014/15	Number	Percent
					83,162	43.0
		✓			18,843	9.8
				✓	17,760	9.2
			✓		13,765	7.1
✓					10,750	5.6
		✓	✓		7,247	3.8
			✓	✓	4,488	2.3
✓				✓	4,304	2.2
		✓		✓	3,915	2.0
	✓				3,425	1.8
✓			✓		3,137	1.6
✓		✓			3,070	1.6
	✓			✓	2,392	1.2
		✓	✓	✓	2,220	1.2

Note: COPD is Chronic Obstructive Pulmonary Disease; IHD is Ischemic Heart Disease

This comorbidity table was calculated for each of the age groups separately and reported in a table available online in the Report Supplement at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>.



## Chapter 8: Cancer

This section presents the incidence rates for the most common cancers affecting Manitobans: colorectal, lung, breast, and prostate cancer. The incidence rate is the number of new cancers diagnosed in a particular time period. In this analysis, we only looked at new cancers diagnosed during our study period; Manitobans who had previously been diagnosed with cancer were not included. Because cancer is relatively rare, we used the maximum years of data available for both of the time periods. CancerCare Manitoba data was only available until December 31, 2014, so the second time period is slightly shorter than the first, but this has no effect on the rates because the use of person-time for the denominator accounts for any differences in follow-up length. The rates are presented as new cases per 10,000 person-years.

We first present the rates for colorectal cancer and lung cancer, which occur in both males and females, followed by the rates of breast cancer (in females) and prostate cancer (in males). The specific codes used to identify individuals diagnosed as new cases of cancer are listed for each cancer. These codes identify the primary site of the cancer.

### Key Findings

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- Colorectal cancer and lung cancer rates decreased significantly during the study period. There were geographical variations in the incidence of both cancers, with higher rates in Northern Health Region and lower rates in Southern Health-Santé Sud.
- There was no change in breast cancer rates during the study period, but there was a significant decrease in prostate cancer rates over time. Neither cancer rate varied significantly across regions or had any correlation with socioeconomic status.

## Colorectal Cancer Rates

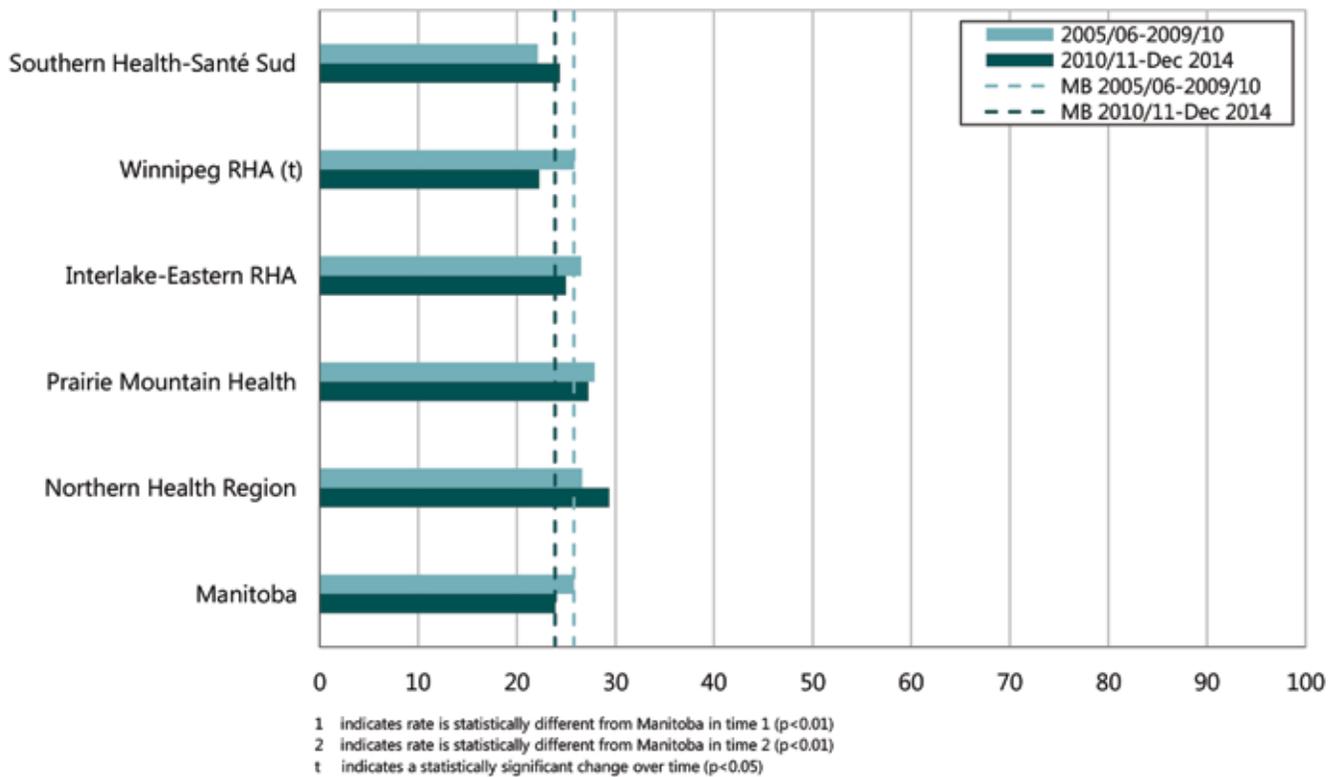
In the definition of colorectal cancer, we included all cancers of the colon, rectum and rectosigmoid. An individual was classified as having a new case of colorectal cancer if they met the following conditions:

- The person had received an ICD-O-3 diagnosis with Topography Axis C180–C189, C199, C209, C260 (site of the cancer identified as colon, rectum, or rectosigmoid), excluding ICD-O-3 Morphology Axis 9590–9989 (meaning that colorectal cancers secondary to leukemia or lymphoma were not included in this analysis); and

- The person had no prior diagnosis of colorectal cancer.

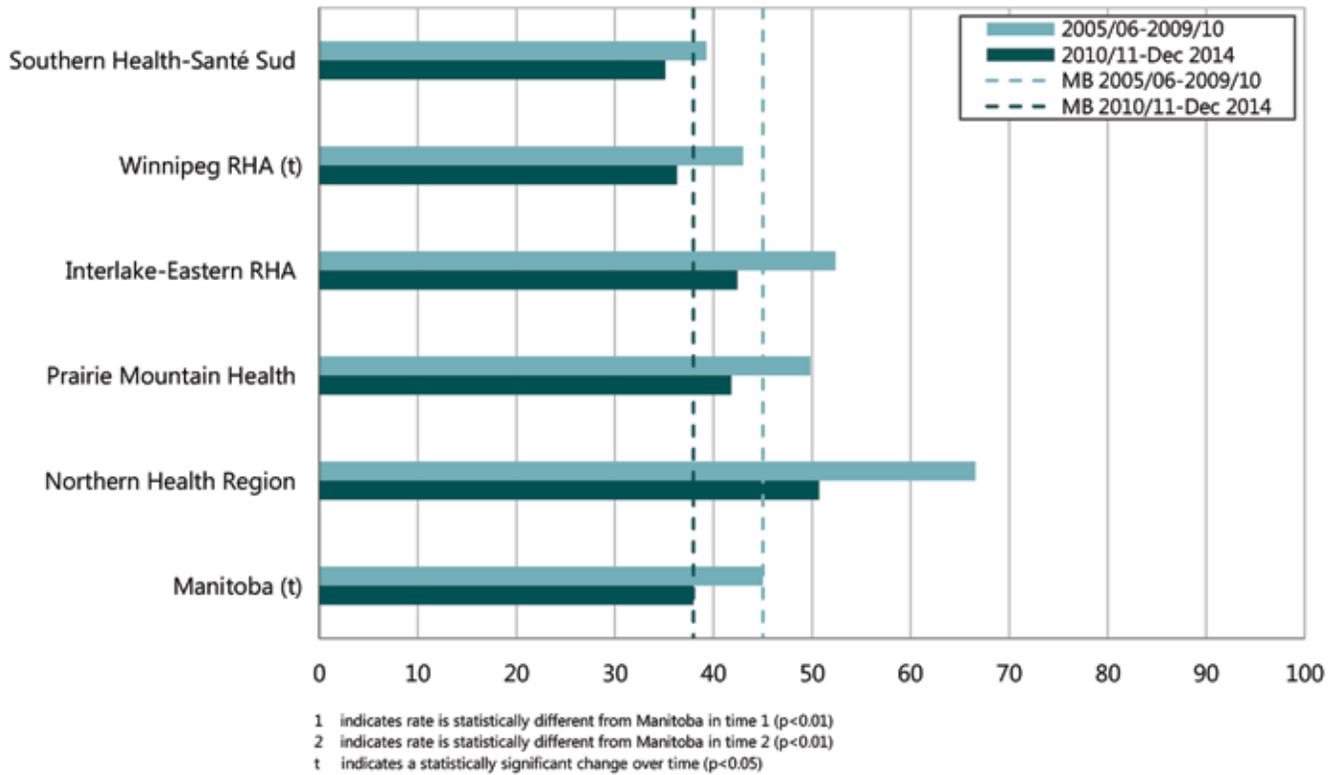
The rate of colorectal cancer increased with age, with the biggest increase in incidence occurring between the older adults age 65-74 and 75-84 (Figures 8.1 to 8.3). For the younger age groups, colorectal cancer rates increased from south to north: they were lowest in Southern Health-Santé Sud and highest in Northern Health Region. For both of the younger age groups, there was also a significant decrease in the rate over time. Figure 8.4 shows that there was no association between income quintile and colorectal cancer rate.

**Figure 8.1: Colorectal Cancer Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 10,000 person-years



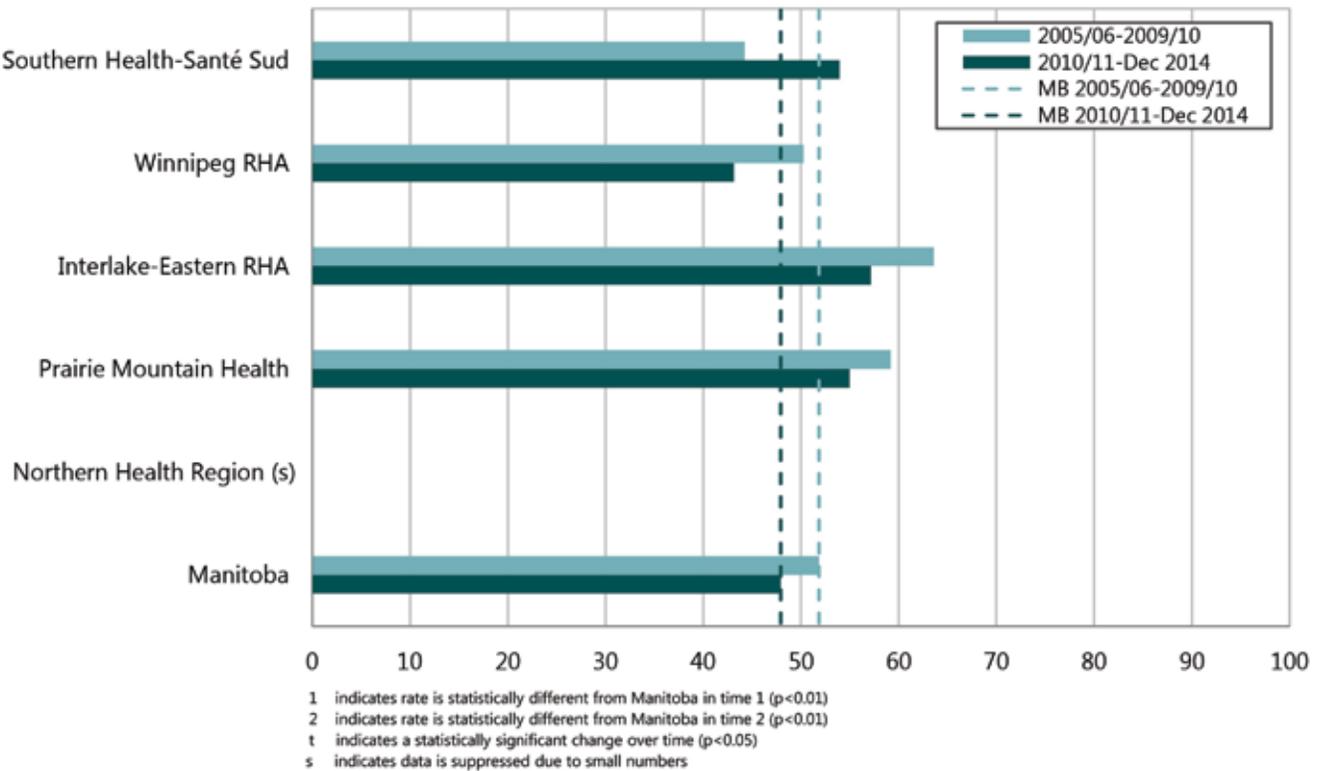
**Figure 8.2: Colorectal Cancer Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 10,000 person-years



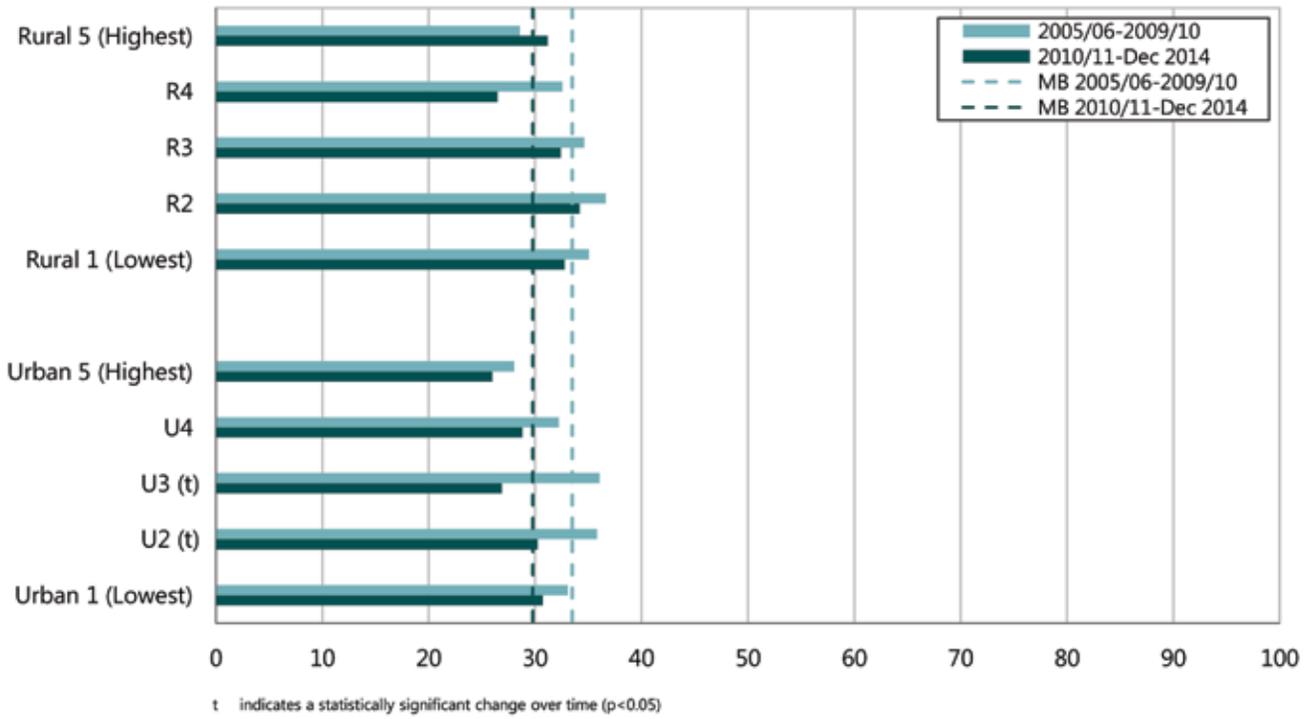
**Figure 8.3: Colorectal Cancer Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 10,000 person-years



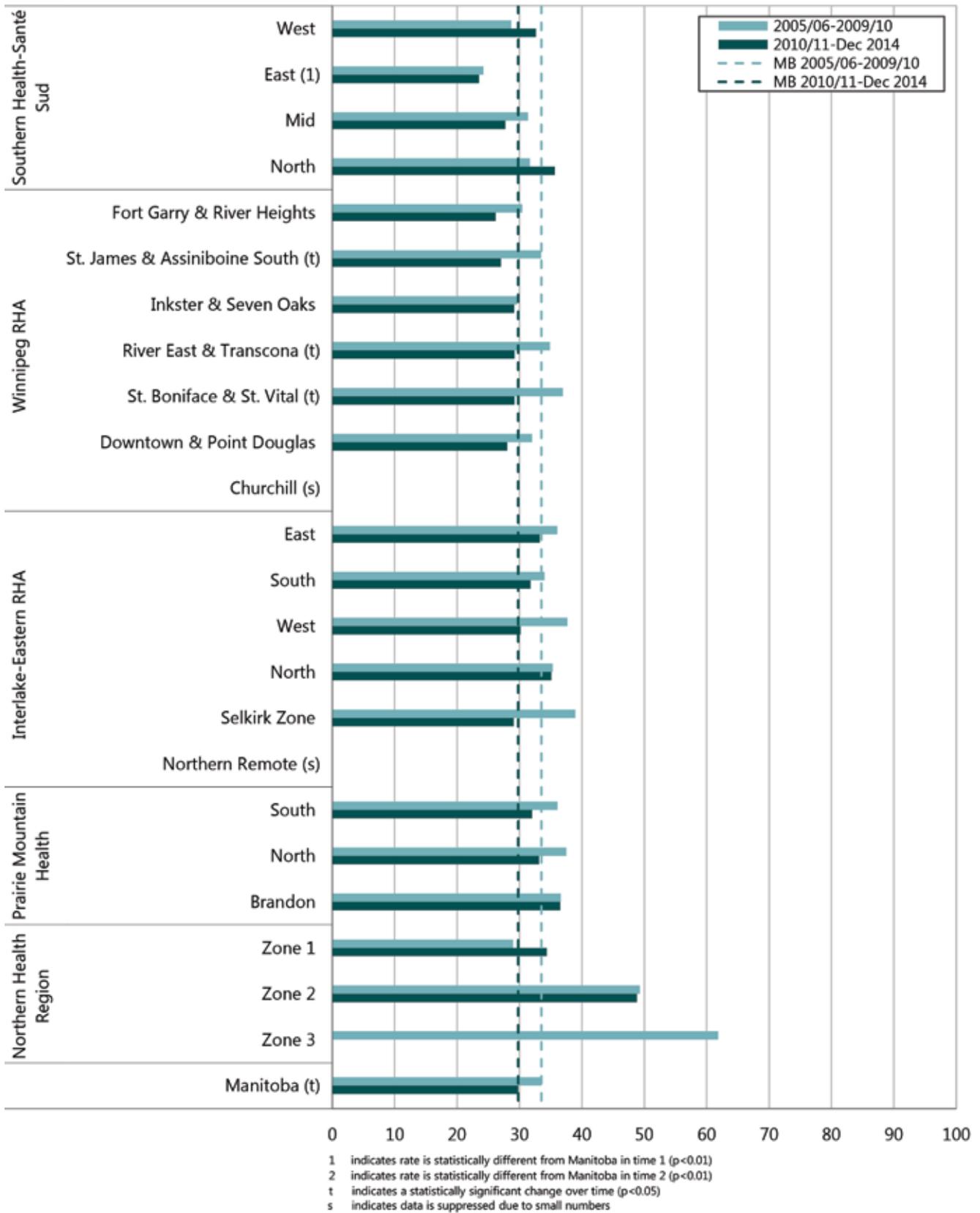
**Figure 8.4: Colorectal Cancer Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 10,000 person-years



**Figure 8.5: Colorectal Cancer Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 10,000 person-years



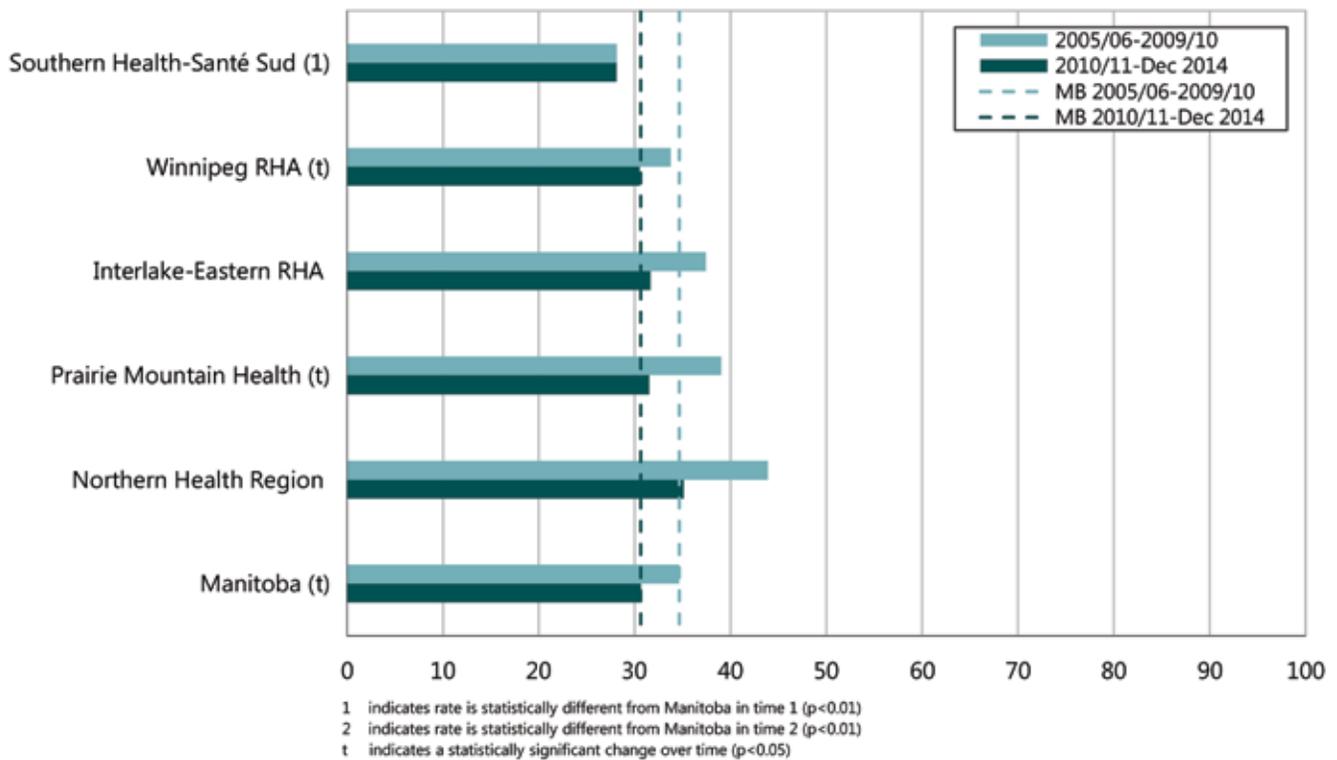
## Lung Cancer Rates

An individual was classified as having a new case of lung cancer if they met the following conditions:

- The person had received an ICD-O-3 diagnosis with Topography Axis C340–C349 (site of the cancer identified as lung or bronchus), excluding ICD-O-3 Morphology Axis 9590–9989 (meaning that lung cancers secondary to leukemia or lymphoma were not included in this analysis); and
- The person had no prior diagnosis of lung cancer.

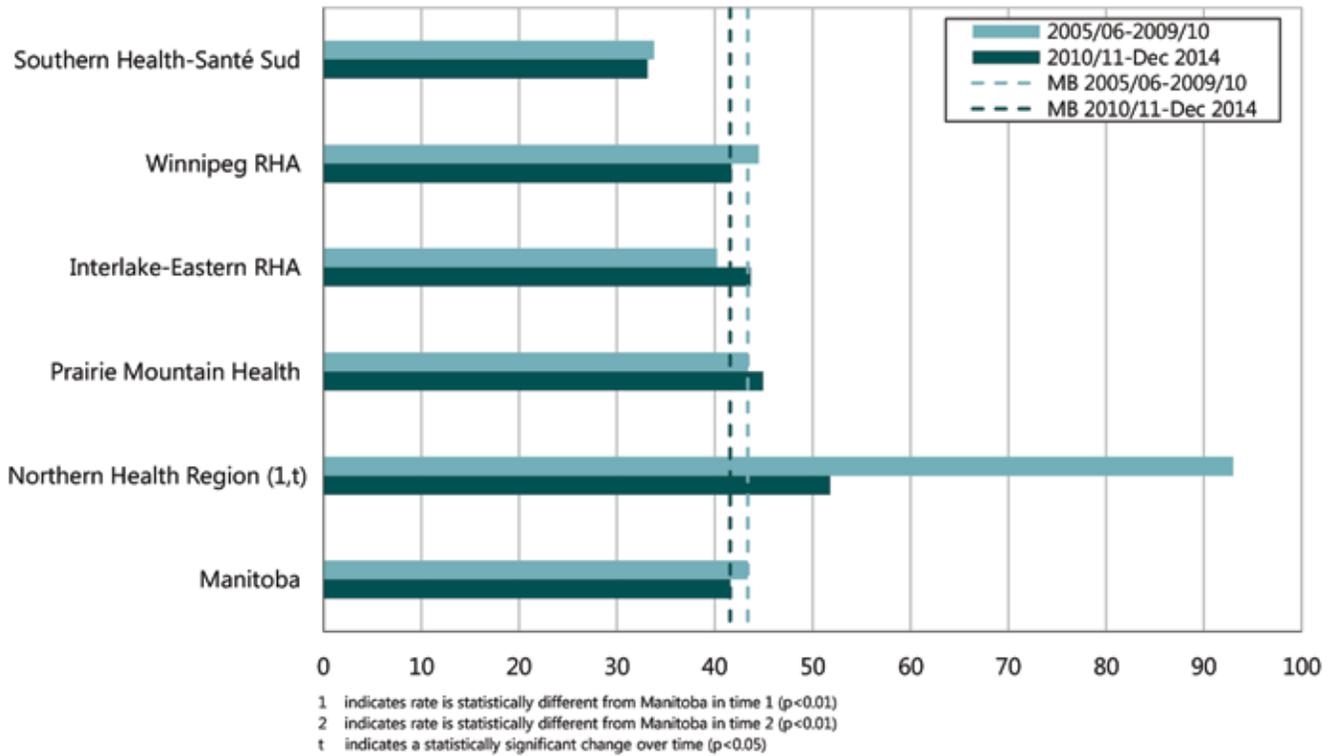
Lung cancer rates were highest in the 75-84 age group (Figures 8.6 to 8.8). There was a decrease in rates over time for the youngest age group only. We noted a strong relationship between lung cancer rates and income quintile, at least for urban areas (Figure 8.9), which was not found with colorectal cancer. What stands out in Figure 8.9, however, is how strongly related lung cancer rates are with income quintile, at least for urban areas, which was not found with colorectal cancer. The lung cancer rate for the lowest income quintile in urban areas was about twice the rate for the highest income quintile.

**Figure 8.6: Lung Cancer Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 10,000 person-years



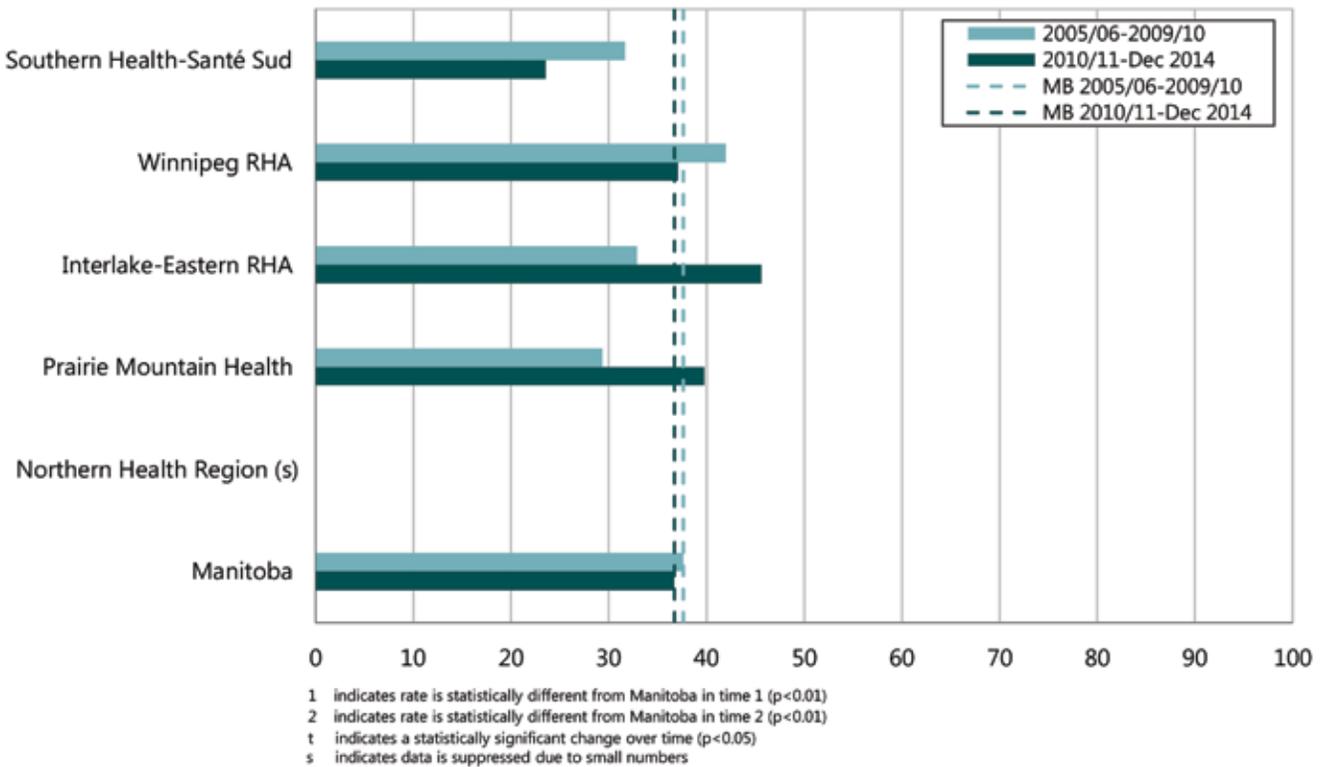
**Figure 8.7: Lung Cancer Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 10,000 person-years



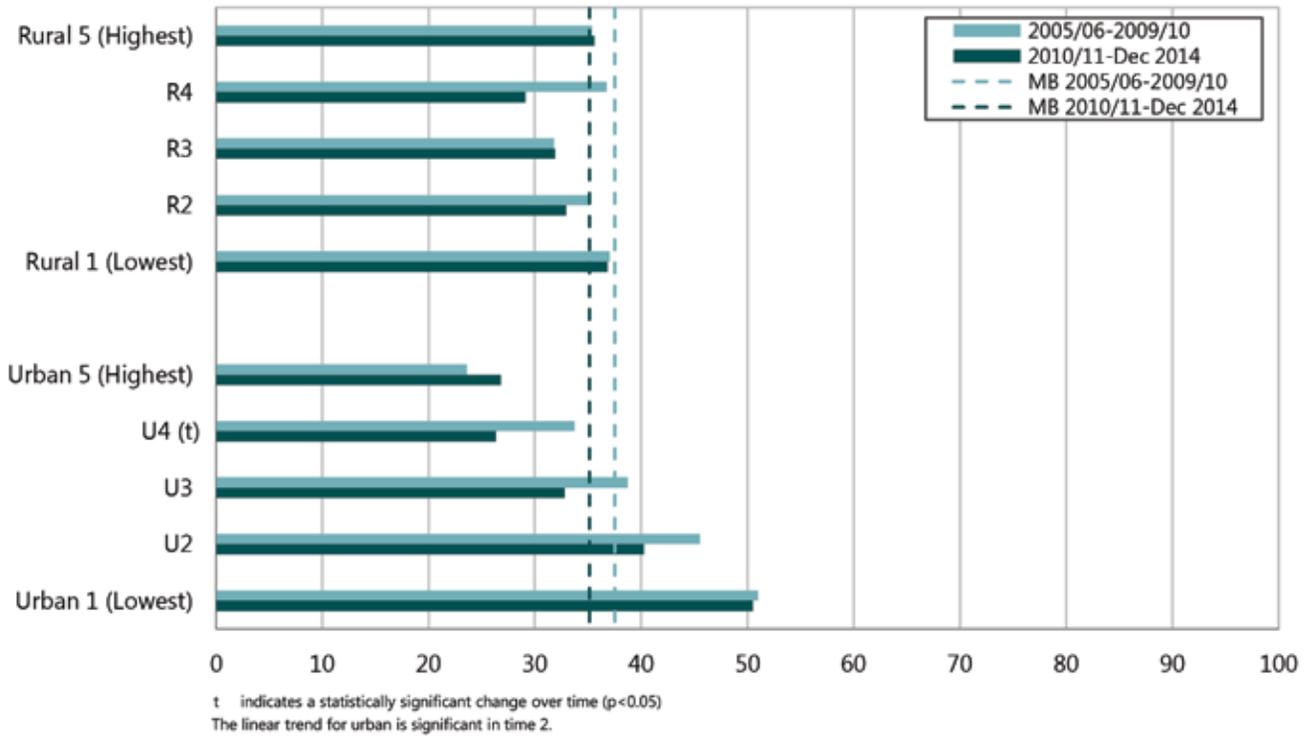
**Figure 8.8: Lung Cancer Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 10,000 person-years



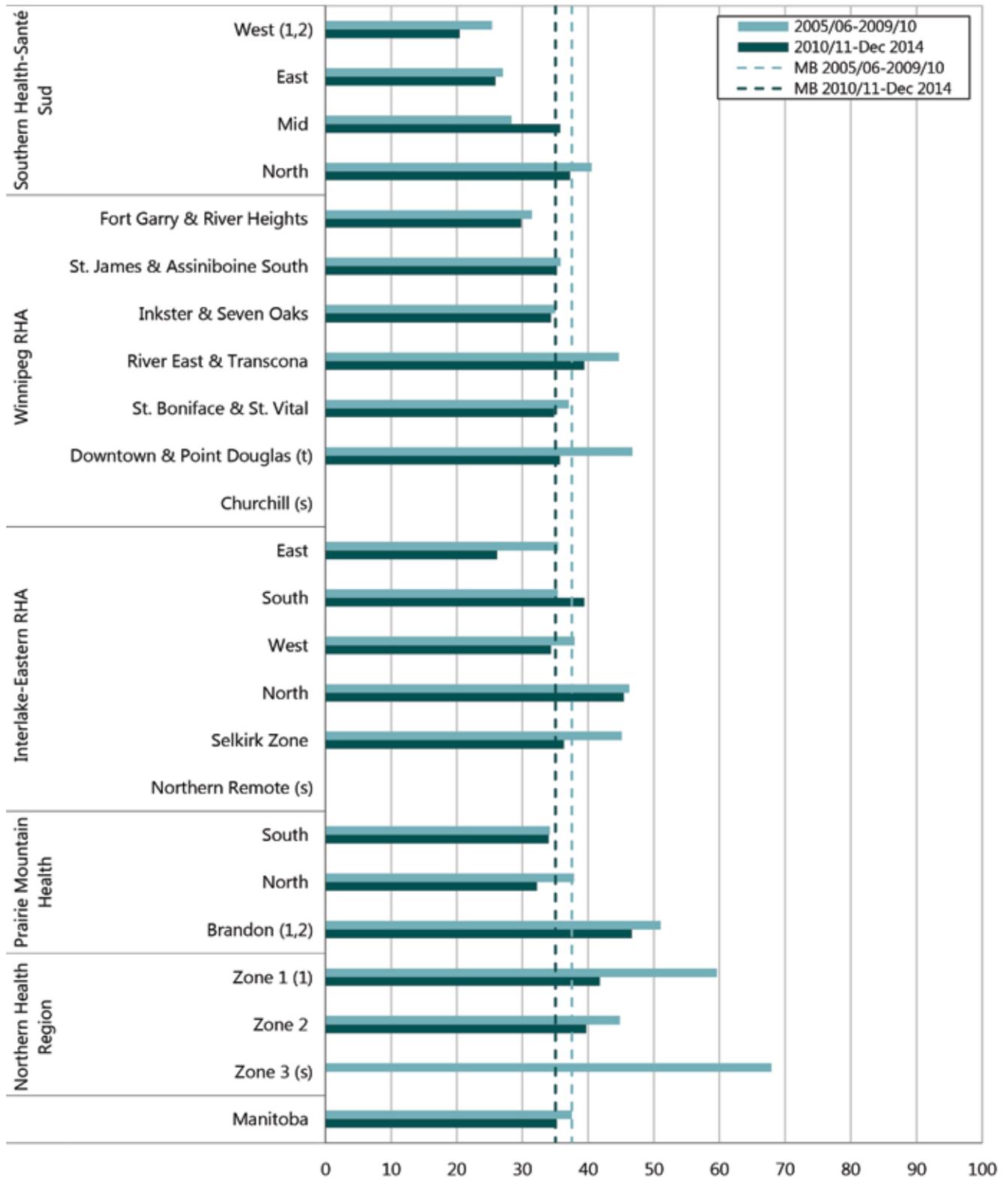
**Figure 8.9: Lung Cancer Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 10,000 person-years



**Figure 8.10: Lung Cancer Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 10,000 person-years



- 1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)
- 2 indicates rate is statistically different from Manitoba in time 2 (p<0.01)
- t indicates a statistically significant change over time (p<0.05)
- s indicates data is suppressed due to small numbers

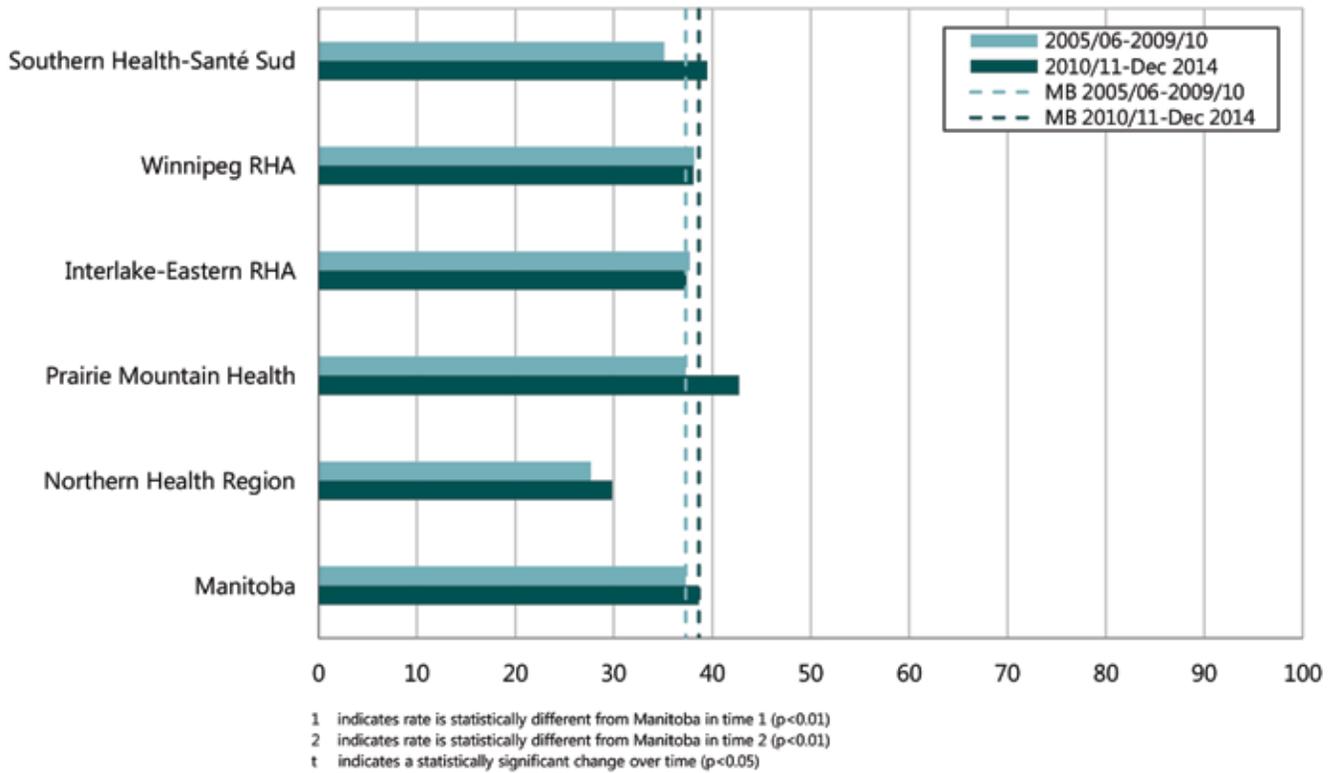
## Breast Cancer Rates

An individual was classified as having a new case of breast cancer if they met the following conditions:

- The person was female;
- The person had received an ICD-O-3 diagnosis with Topography Axis C500–C509 (site of the cancer identified as breast), excluding ICD-O-3 Morphology Axis 9590–9989 (meaning that breast cancers secondary to leukemia or lymphoma were not included in this analysis); and
- The person had no prior diagnosis of breast cancer.

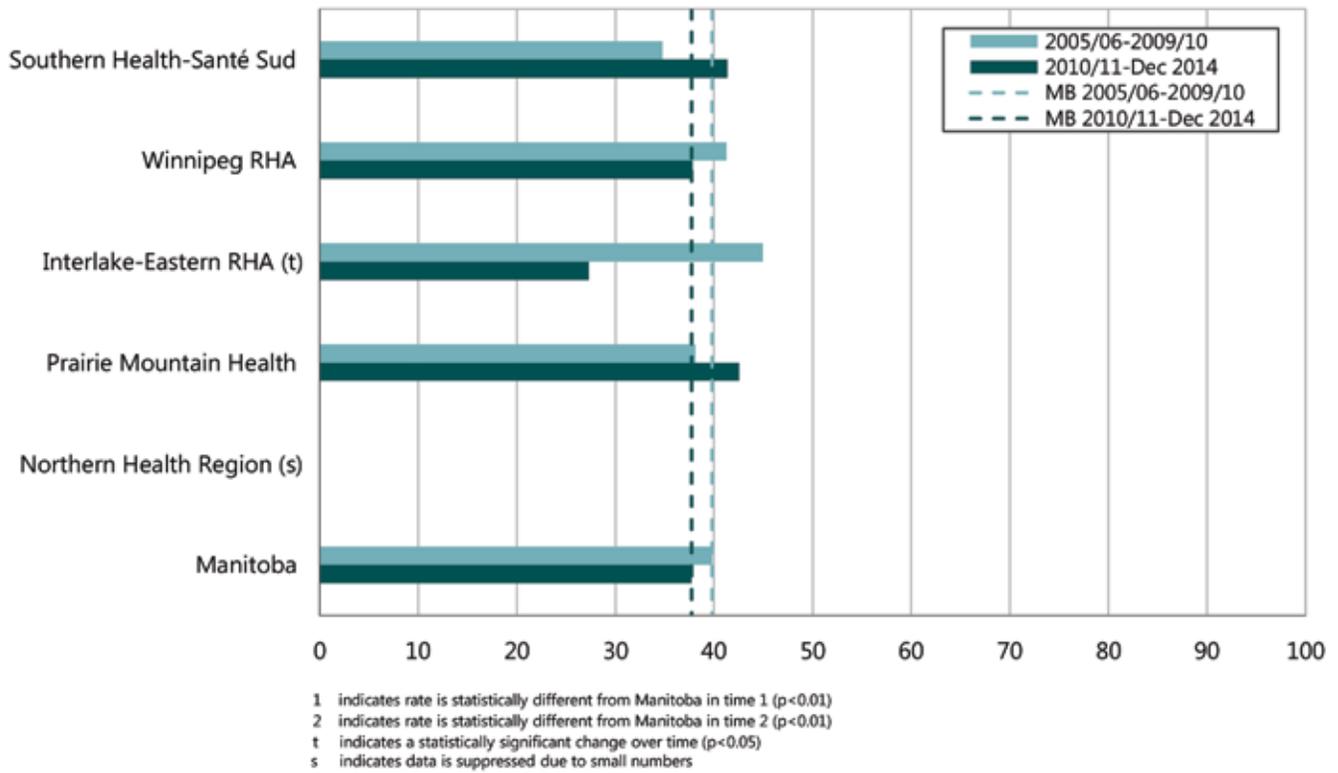
Figures 8.11 to 8.13 show that, unlike the previous cancer indicators, breast cancer was not related to age among women age 65 or older. Breast cancer rates varied little across the regions; as well, there was no change over time, and no relationship between breast cancer rates and income quintile (Figure 8.14).

**Figure 8.11: Breast Cancer Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older women per 10,000 person-years



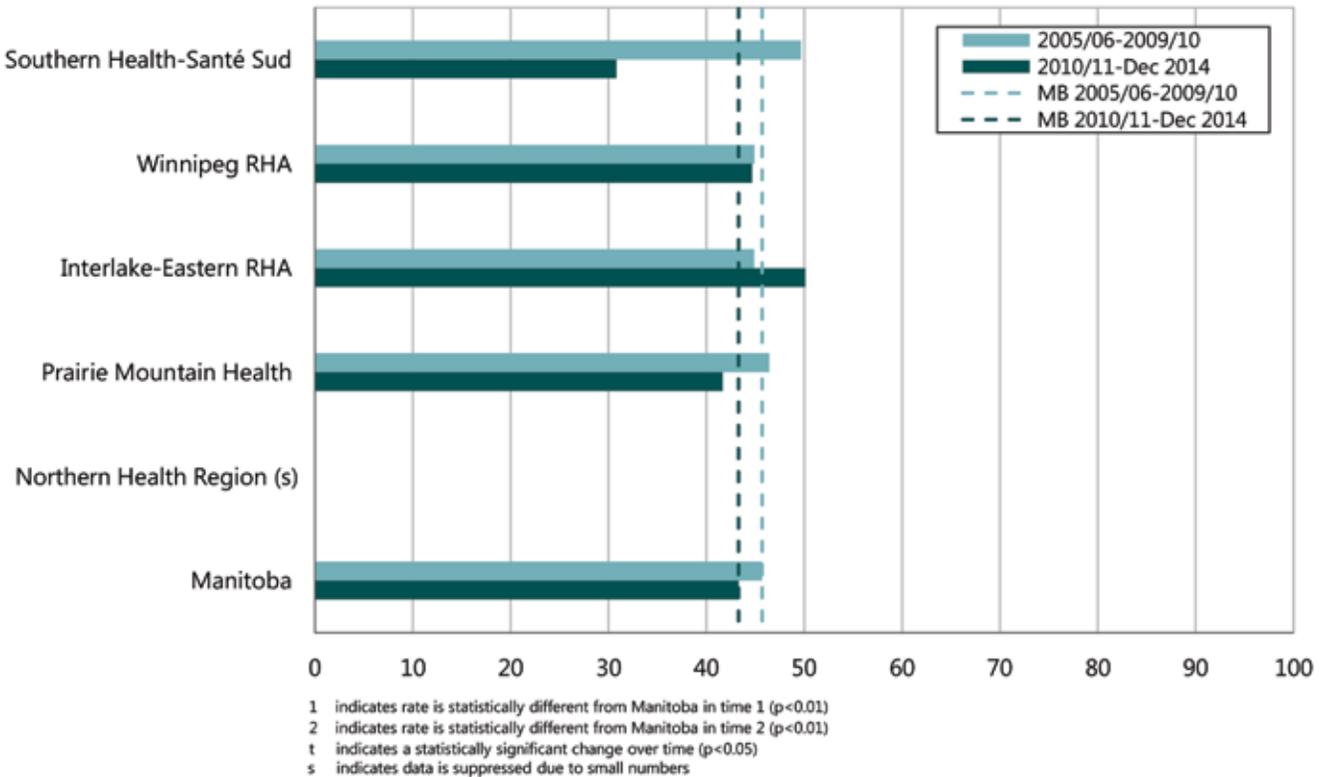
**Figure 8.12: Breast Cancer Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older women per 10,000 person-years



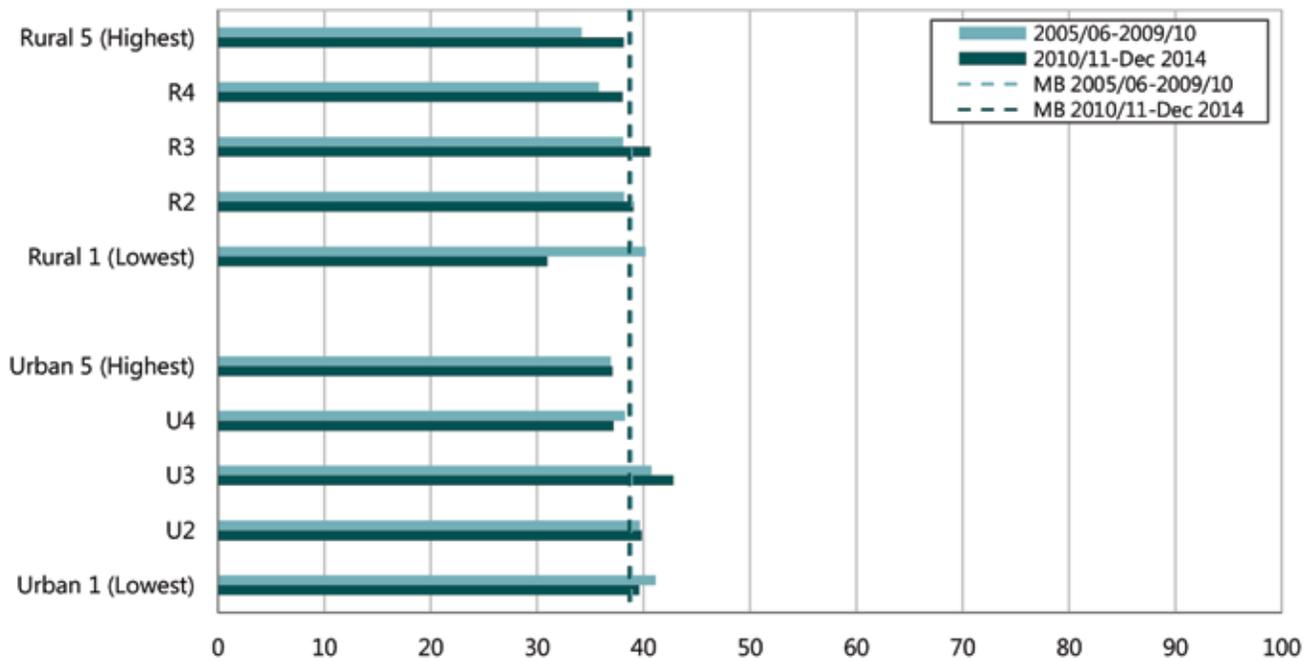
**Figure 8.13: Breast Cancer Rates by Health Region, Age 85+**

Crude rate for community-dwelling older women per 10,000 person-years



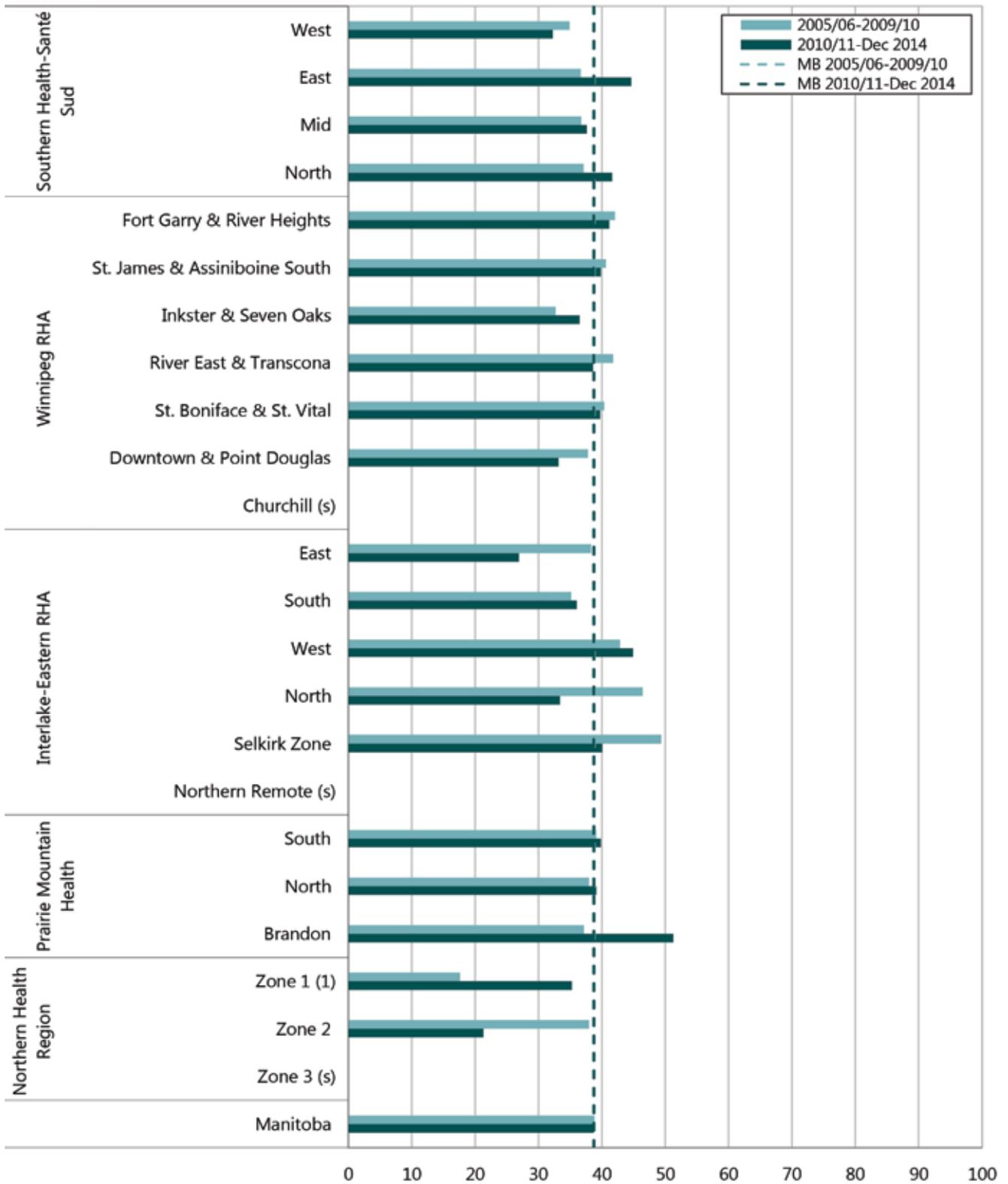
**Figure 8.14: Breast Cancer Rates by Income Quintile**

Age-adjusted rate for community-dwelling older women per 10,000 person-years



**Figure 8.15: Breast Cancer Rates by Health Region Zone**

Age-adjusted rate for community-dwelling older women per 10,000 person-years



1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates rate is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)  
 s indicates data is suppressed due to small numbers

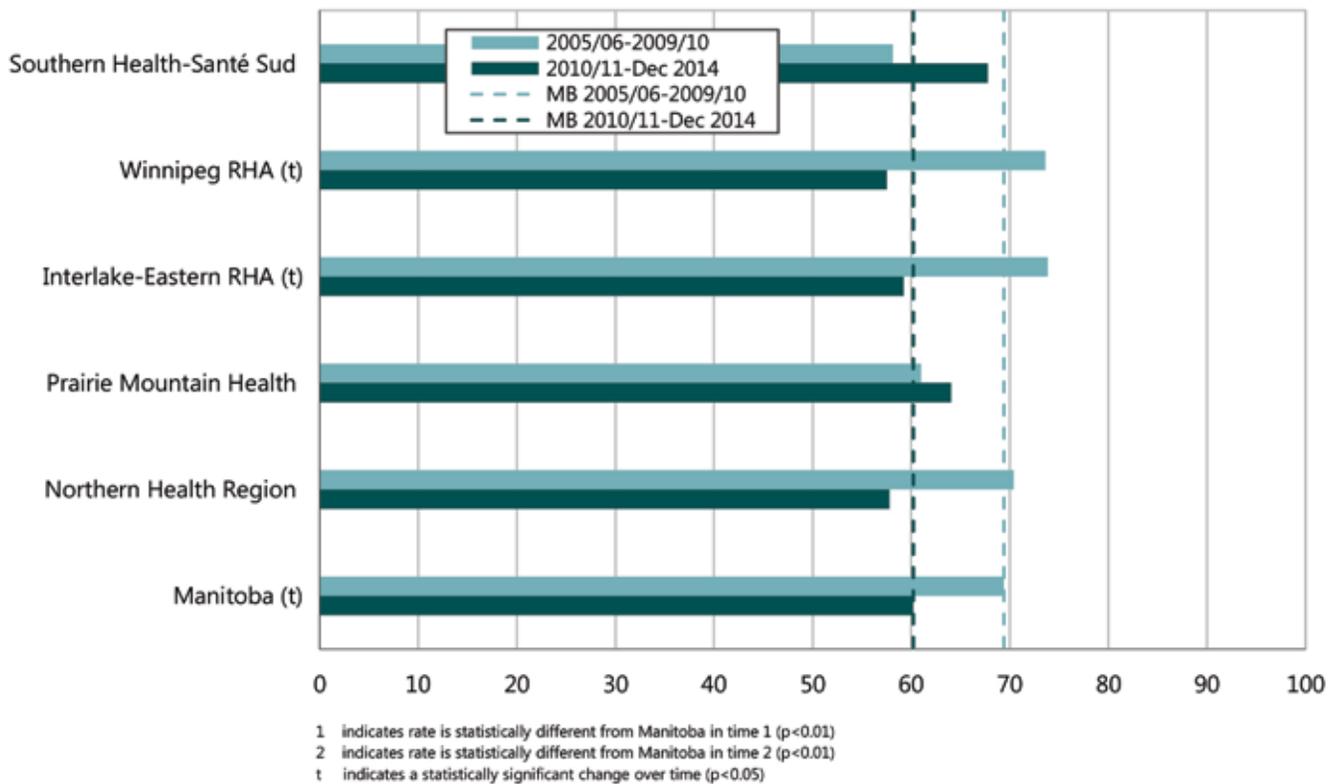
## Prostate Cancer Rates

An individual was classified as having a new case of prostate cancer if they met the following conditions:

- The person was male;
- The person had received an ICD-O-3 diagnosis with Topography Axis C619 (site of the cancer identified as prostate), excluding ICD-O-3 Morphology Axis 9590–9989 (meaning that prostate cancers secondary to leukemia or lymphoma were not included in this analysis); and
- The person had no prior diagnosis of prostate cancer.

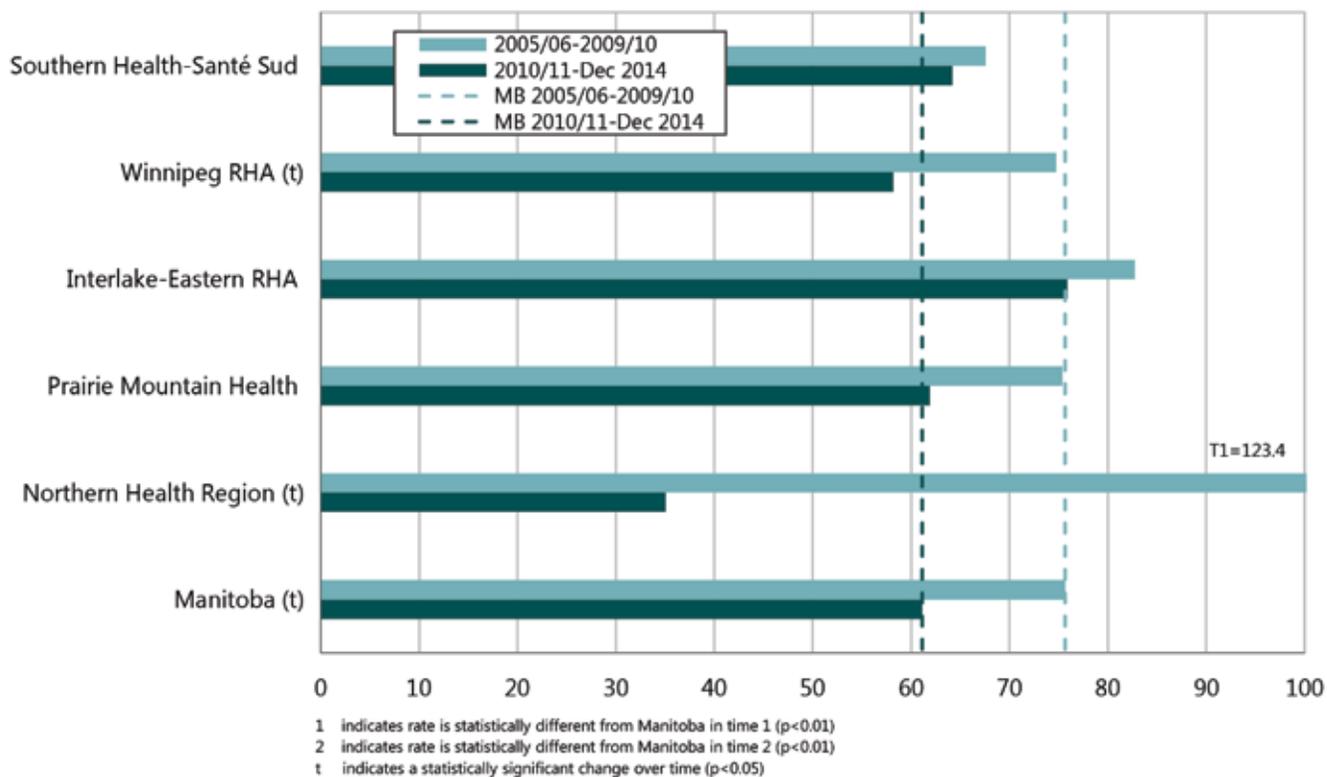
Prostate cancer rates were similar for the two younger age groups at approximately 60 new cases per 10,000 person-years, but there were about 80 new cases per 10,000 person-years for the oldest age group (Figures 8.16 to 8.18). The incidence decreased over the study period for the youngest age group only (Figure 8.16). Similar to breast cancer rates there was little variation across regions, and no statistically significant relationship between prostate cancer rates and income quintile (Figure 8.19).

**Figure 8.16: Prostate Cancer Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older men per 10,000 person-years



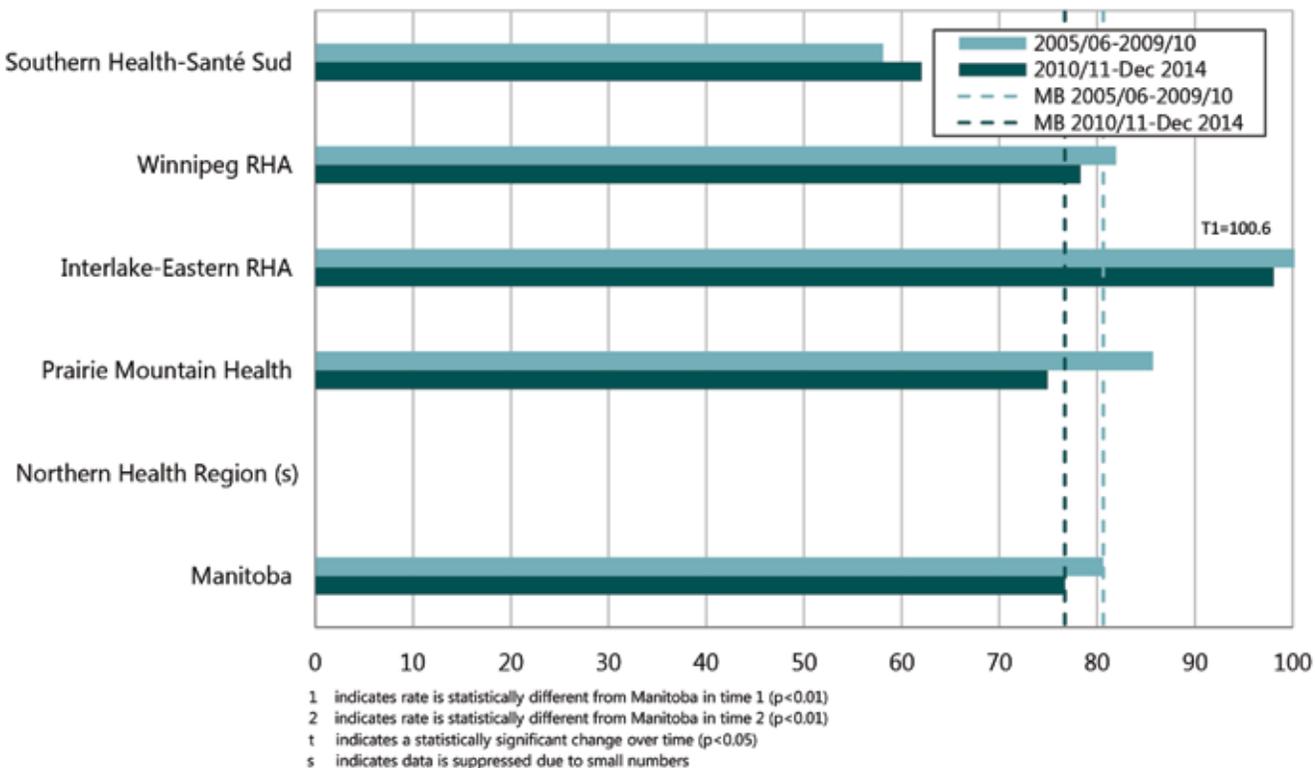
**Figure 8.17: Prostate Cancer Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older men per 10,000 person-years



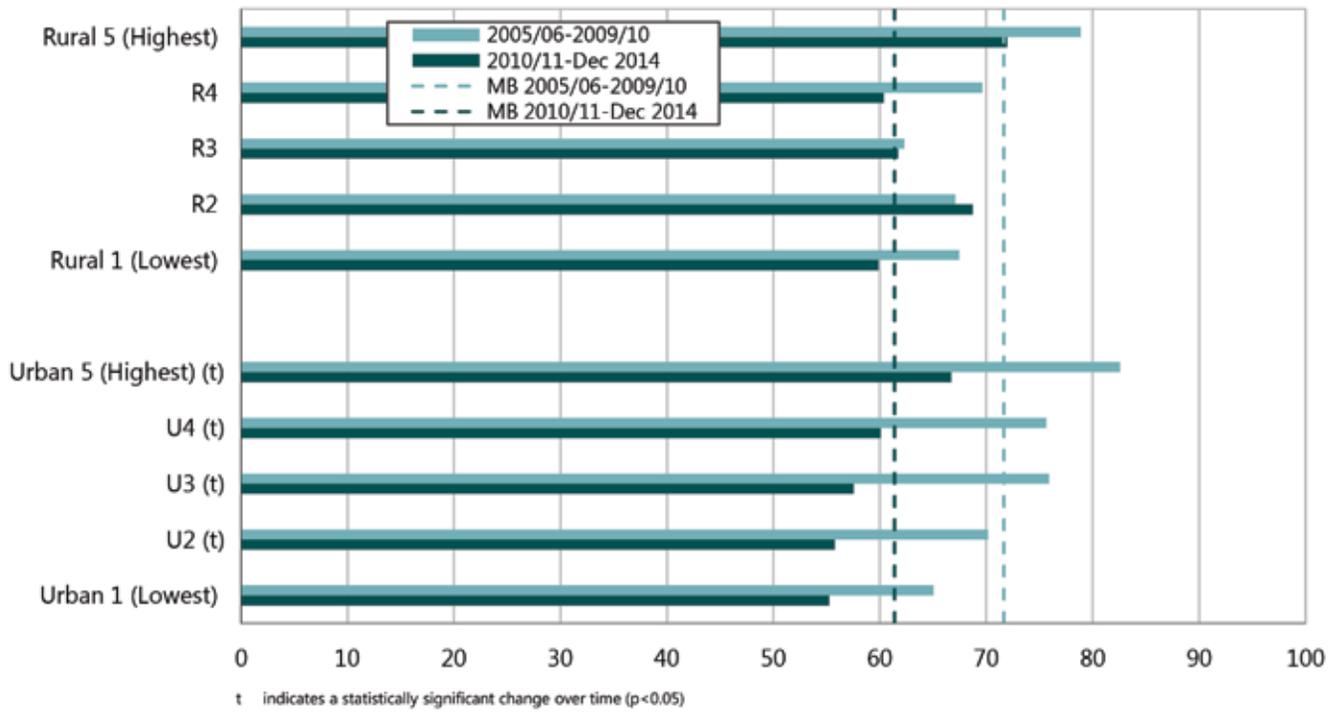
**Figure 8.18: Prostate Cancer Rates by Health Region, Age 85+**

Crude rate for community-dwelling older men per 10,000 person-years



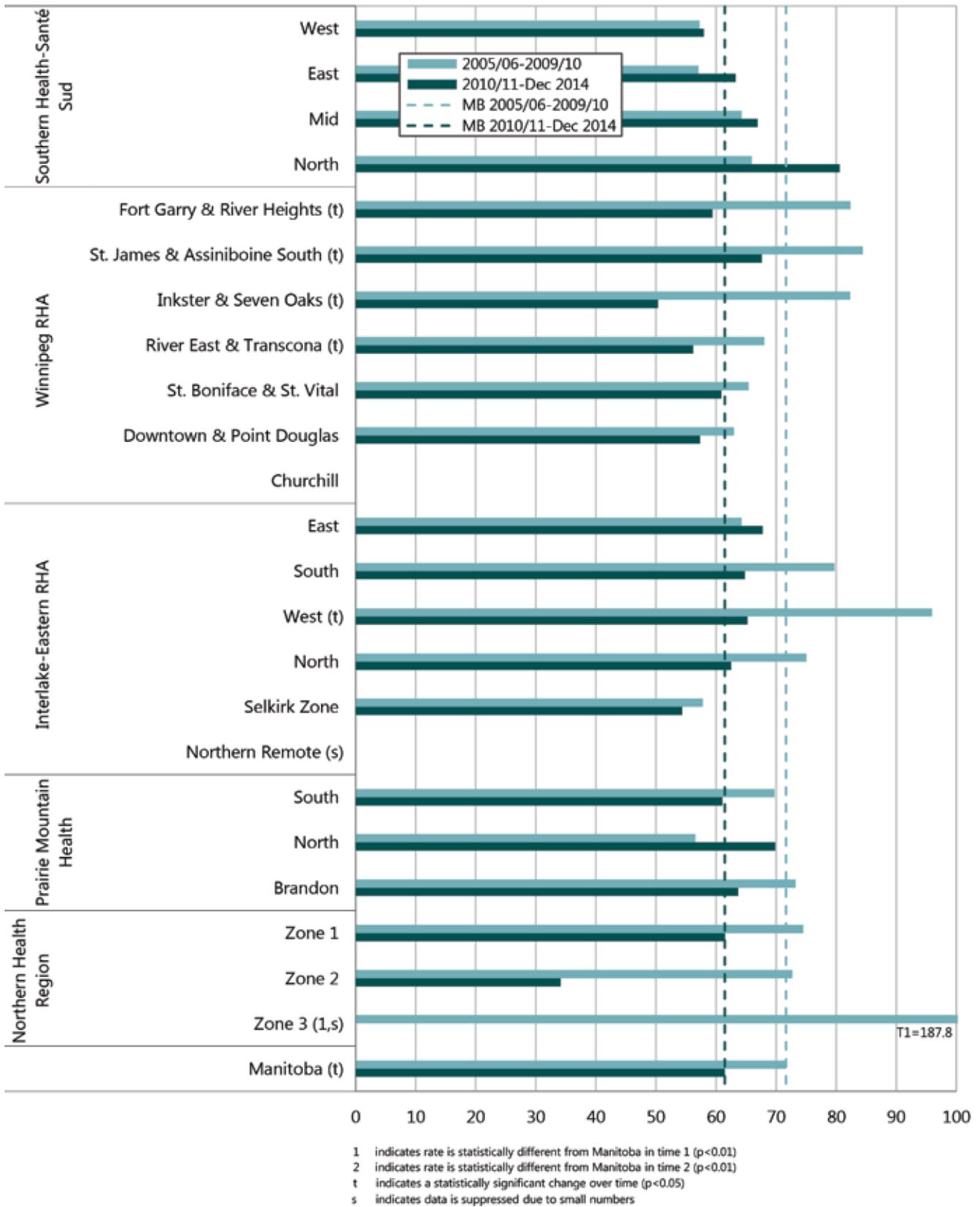
**Figure 8.19: Prostate Cancer Rates by Income Quintile**

Age-adjusted rate for community-dwelling older men per 10,000 person-years



**Figure 8.20: Prostate Cancer Rates by Health Region Zone**

Age-adjusted rate for community-dwelling older men per 10,000 person-years







# Chapter 9: Surgical Interventions

Surgery is a major medical intervention that is meant to improve the health and well-being of patients. The decision to perform a surgery depends not only on the need of the patient and the expected benefit, but also should take into account the risk to the patient. Surgical interventions present considerable risk to the patient, with the possibility of complications from anesthesia, the surgical procedure itself, and/or post-operative infections. Surgery is less of a risk for patients who are otherwise relatively healthy, but more of a risk for patients with many comorbidities or conditions that increase the risk of complication or death. From this, we deduce that a higher rate of surgical interventions might actually reflect a healthier (not a sicker) population.

Here we present some of the most common surgical interventions performed on older adults in Manitoba: three interventions for the cardiac system (coronary angiograms, percutaneous coronary interventions [PCI; also known as angioplasty and stent insertion], and coronary artery bypass surgeries) and two orthopedic procedures (hip replacements and knee replacements).

## Key Findings

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- Rates of angiograms and PCI procedures increased during the study period, and rates of heart bypass surgeries decreased, suggesting an increasing tendency towards less intensive interventions.
- There was no change for hip replacement rates over time, while knee replacement rates decreased significantly for the two younger age groups. For both procedures, poorer urban residents had lower rates of surgery compared to richer urban residents.

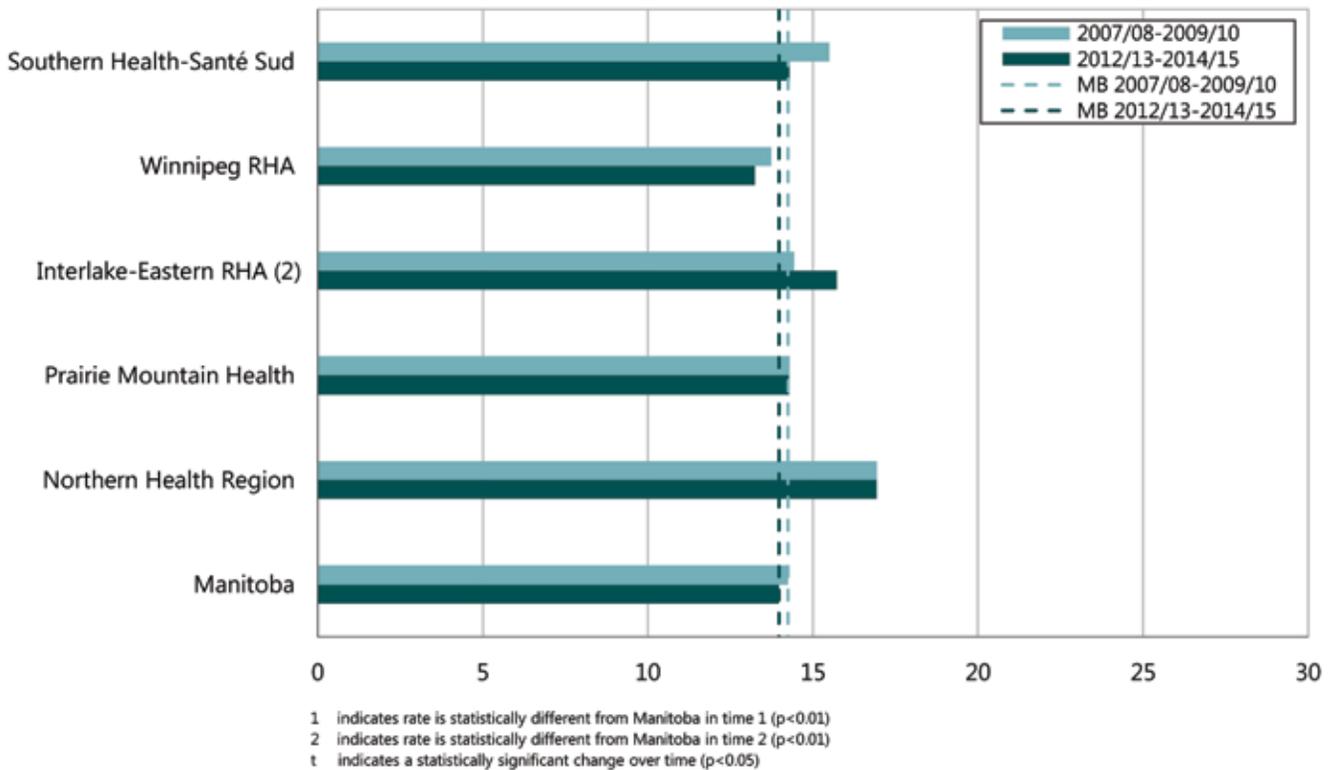
## Coronary Angiogram Rates

A coronary angiogram, also known as cardiac catheterization, is a diagnostic procedure to identify blocked or narrowed arteries and to determine how severe the blockages are. The results can be used to determine the next steps for treatment (e.g., medication or a surgical procedure). An angiogram is performed by injecting a peripheral artery with a small amount of fluid or dye, and using an x-ray to follow the fluid as it moves through the arteries to the heart. In Manitoba, angiograms are only performed at two tertiary hospitals in Winnipeg (Health Sciences Centre and St. Boniface General Hospital), so to eliminate the potential for double-counting of procedures, we only included hospitalizations from those two hospitals in the analysis. We used the last two years of each time period to calculate the rates (2007/08-2009/10 and 2012/13-2014/15).

There were some key differences in angiogram rates between age groups (Figures 9.1 to 9.3). The oldest age group had the lowest rate of angiograms of all the age groups, which might reflect the higher risk-benefit ratio this procedure would have for older individuals. Older individuals are more likely to have other conditions that could increase the risk of the procedure. We also found that the angiogram rates increased over time for the two older age groups; in the oldest age group, the rate almost doubled in the five years between the two time periods. This finding may indicate that the older adult population is getting healthier over time, since sicker or frailer older people are less likely to undergo surgery. The increase in rates may also be at least partly attributable to decreasing ‘ageism’, and changing medical opinions on the benefit of the procedure for older adults. The analyses also showed that the increase in rates was greatest for those with the lowest income, in both rural and urban areas of Manitoba.

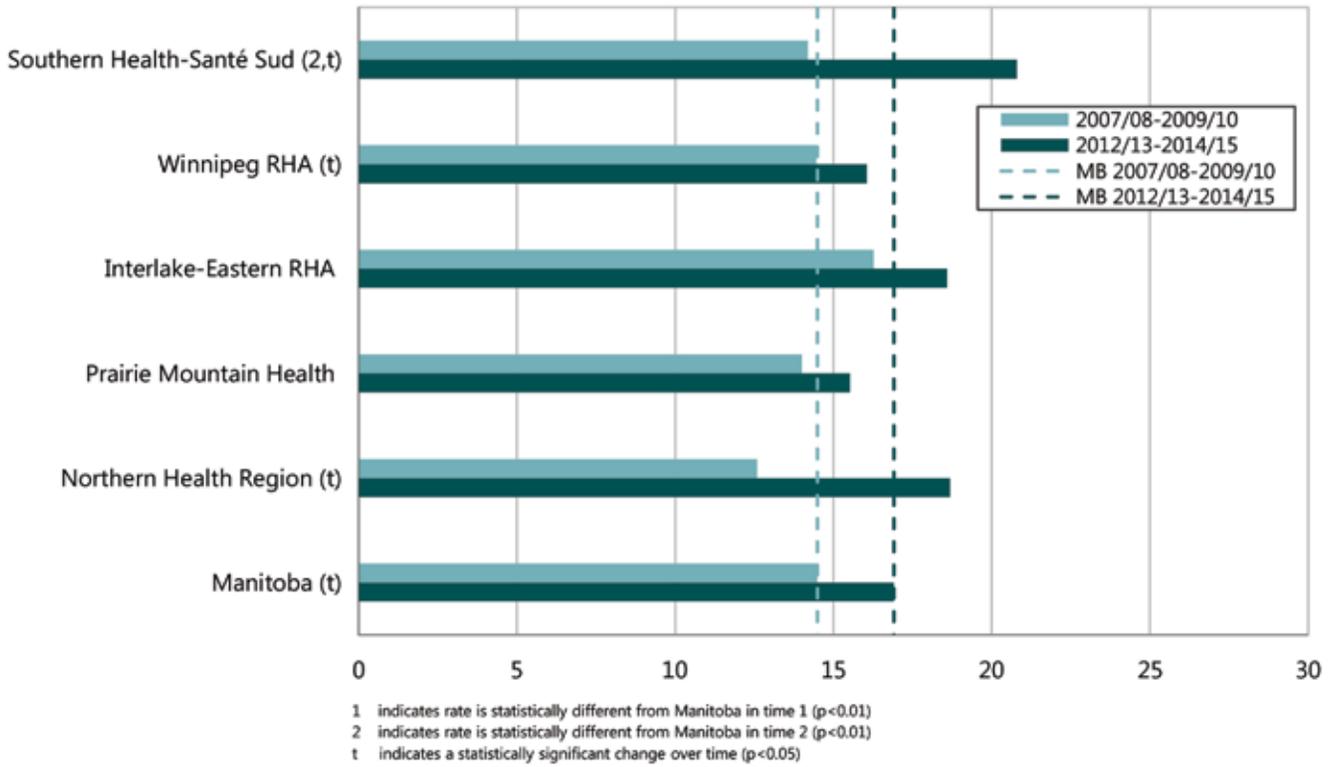
**Figure 9.1: Coronary Angiogram Rates by Health Region, Age 65-74**

Crude rate for community-dwelling older adults per 1,000 person-years



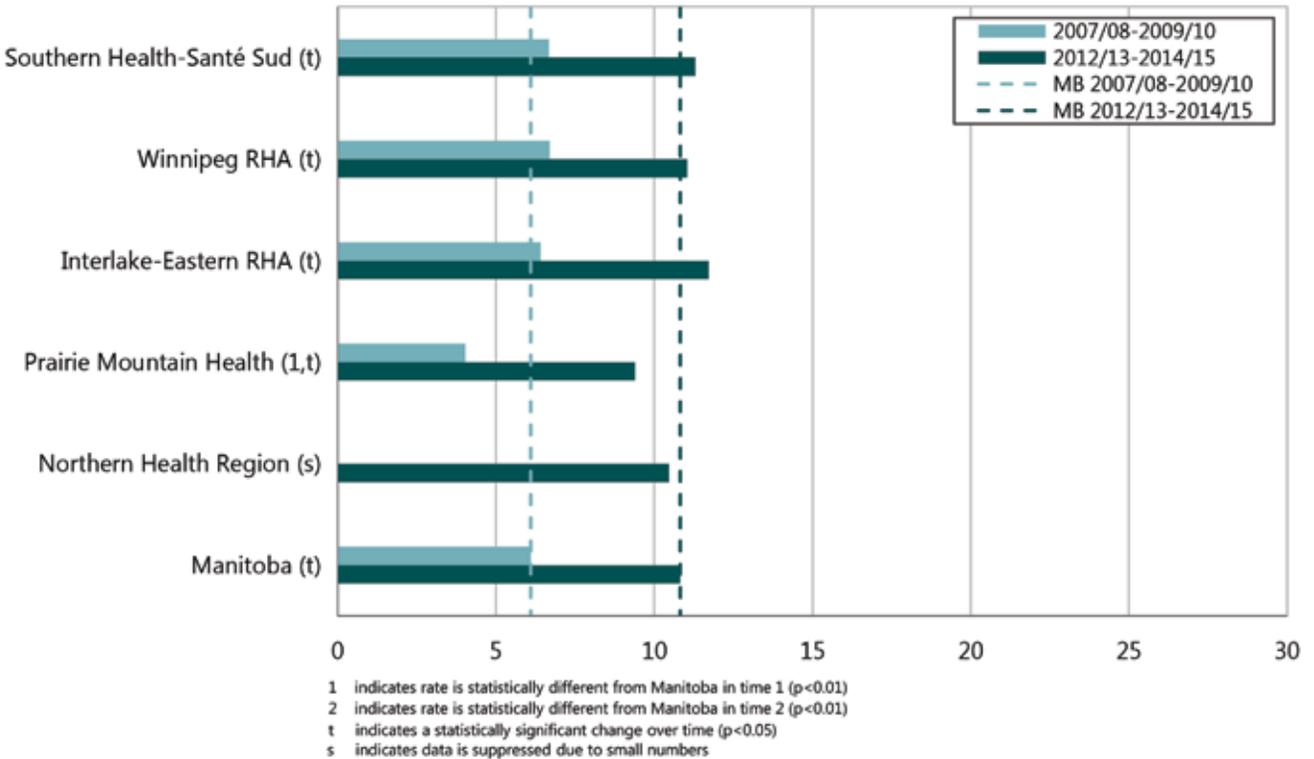
**Figure 9.2: Coronary Angiogram Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 1,000 person-years



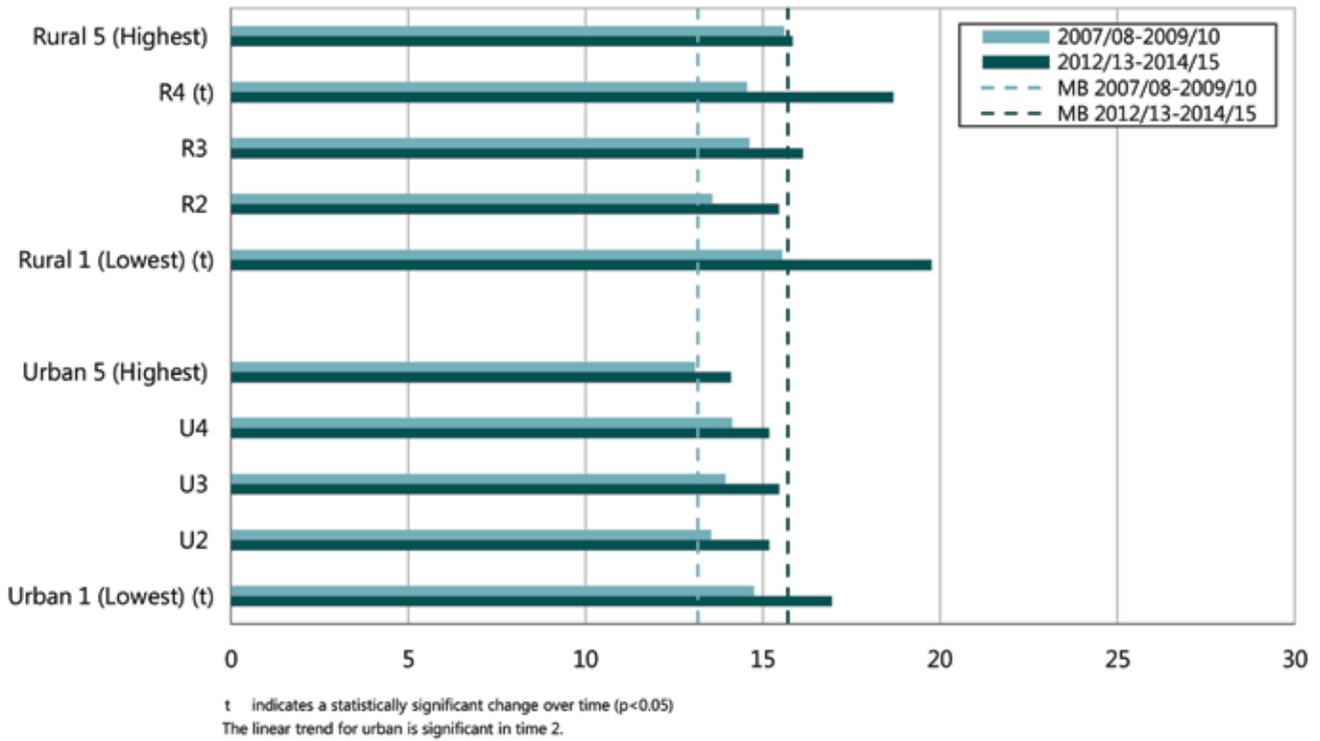
**Figure 9.3: Coronary Angiogram Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 1,000 person-years

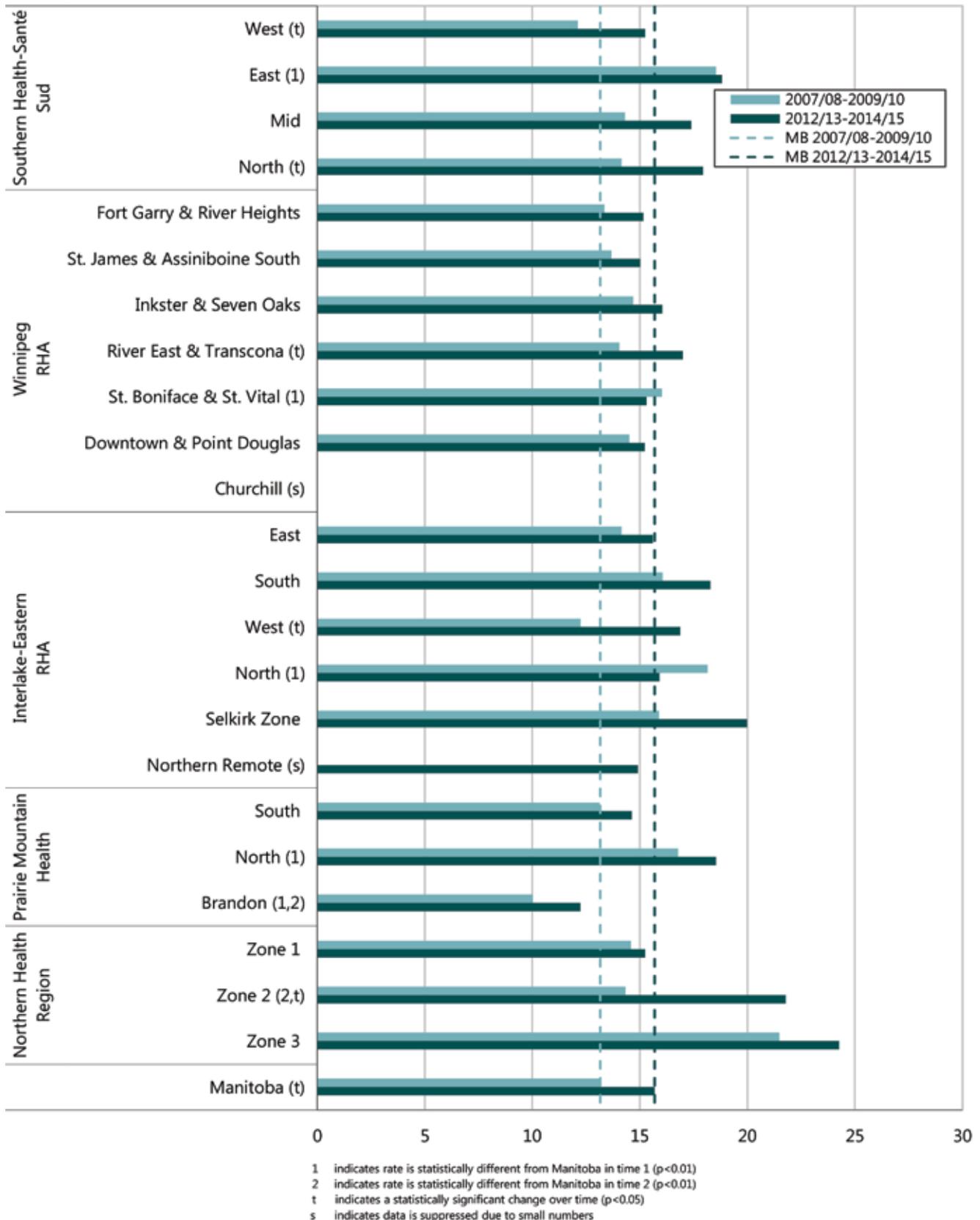


**Figure 9.4: Coronary Angiogram Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



**Figure 9.5: Coronary Angiogram Rates by Health Region Zone**  
 Age- and sex-adjusted for community-dwelling older adults per 1,000 person-years

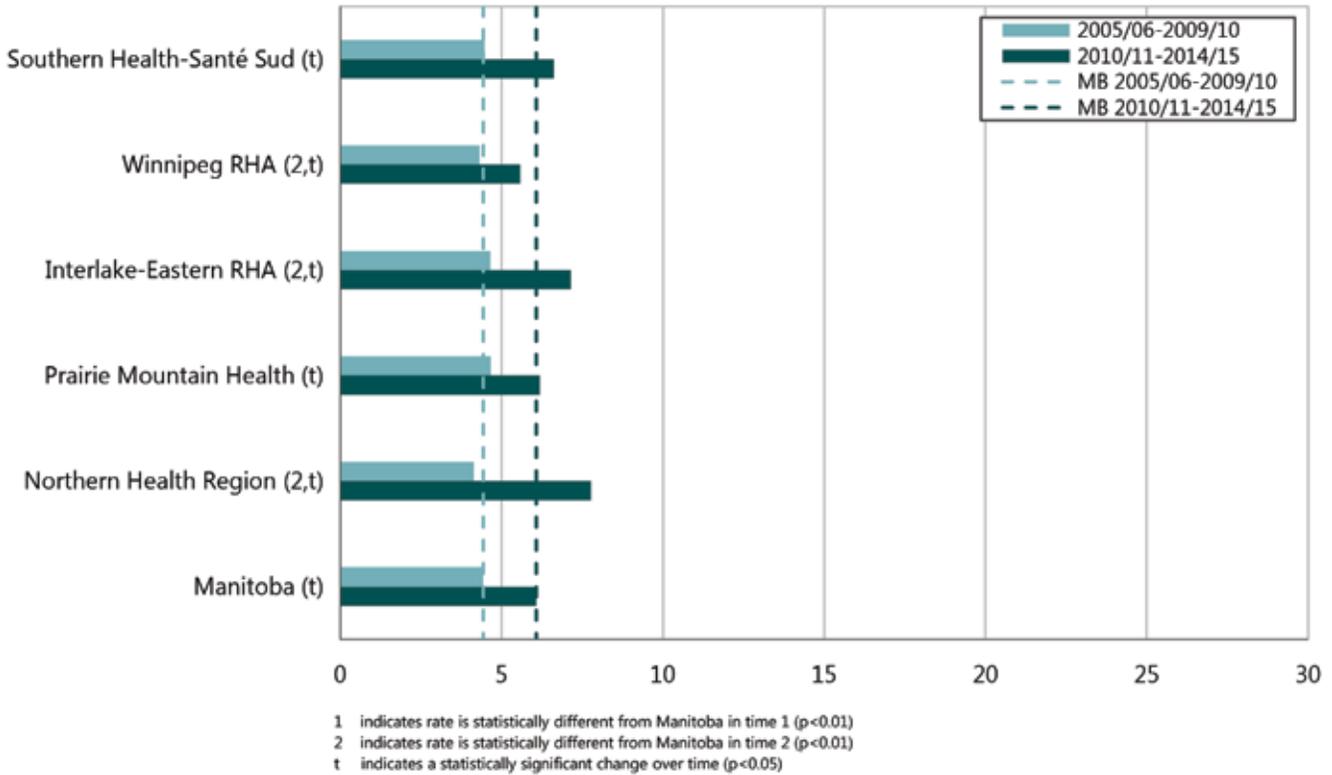


## Percutaneous Coronary Intervention (Angioplasty and Stent Insertion) Rates

Percutaneous coronary interventions (PCIs), also referred to as angioplasty and stent insertions, involve the insertion of a ‘balloon’ into the artery to push a blocked or narrowed artery back to its original shape (angioplasty), and then a wire mesh tube is inserted to help support the newly widened artery (stent insertion). The procedure helps to improve blood flow to the heart. PCIs are often performed directly after an angiogram, which identifies blocked and narrowed blood vessels. The PCI rate was calculated for both time periods using the full five years of data available (2005/06-2009/10 and 2010/11-2014/15).

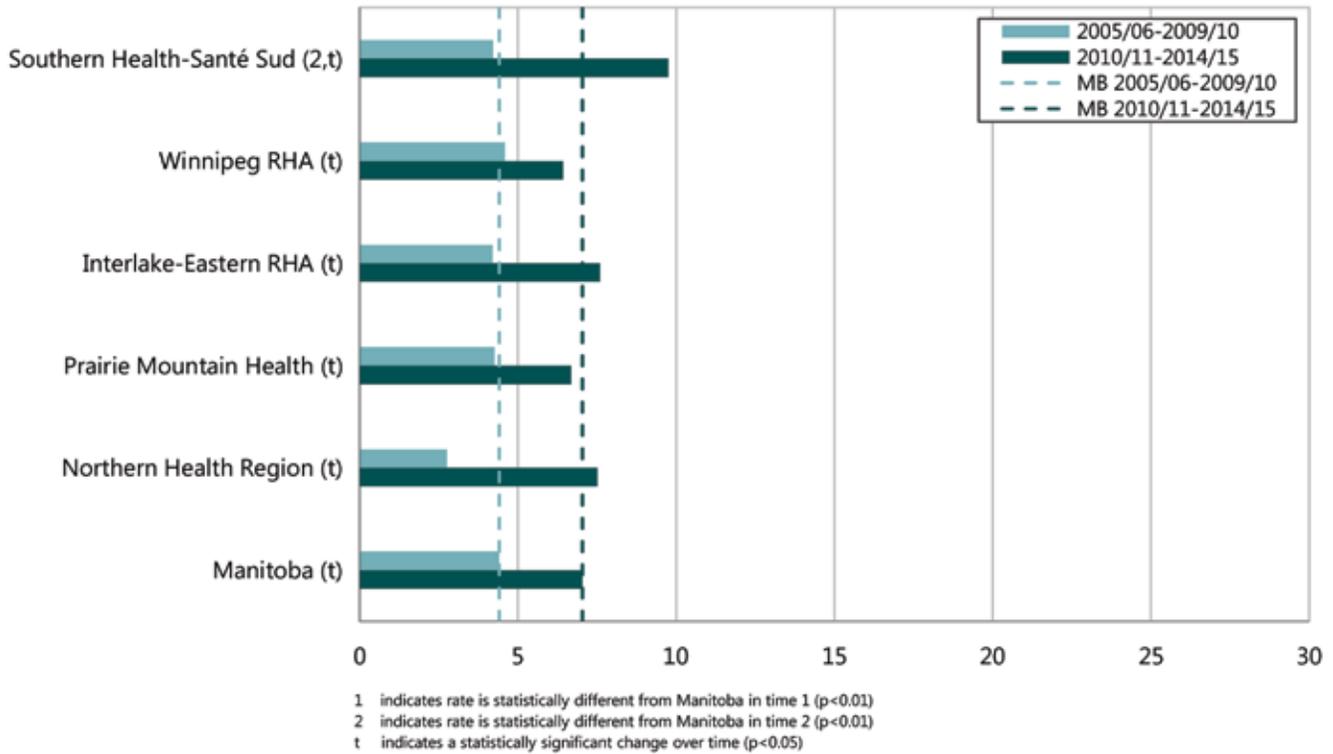
We saw similar patterns in the rates of PCIs as we did in the previous section for angiograms, except that PCI rates were lower for all three age groups. The rate of PCIs was similar between the younger two age groups, and comparatively lower for the oldest age group (Figures 9.6 to 9.8). PCI rates increased over time for the youngest and oldest age groups, in which the rates more than doubled from one time period to the next. PCI rates increased over time for residents of rural areas and urban areas (Figure 9.9), but mainly among urban residents in the lowest income quintile. This was due to the fact that the procedure was unrelated to income quintile in the first time period, but was significantly related to income quintile in the second time period, showing a steady increase in rates as income decreased. There was no relationship between PCI rates and income in the rural areas of Manitoba in either time period.

**Figure 9.6: Percutaneous Coronary Intervention Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 1,000 person-years



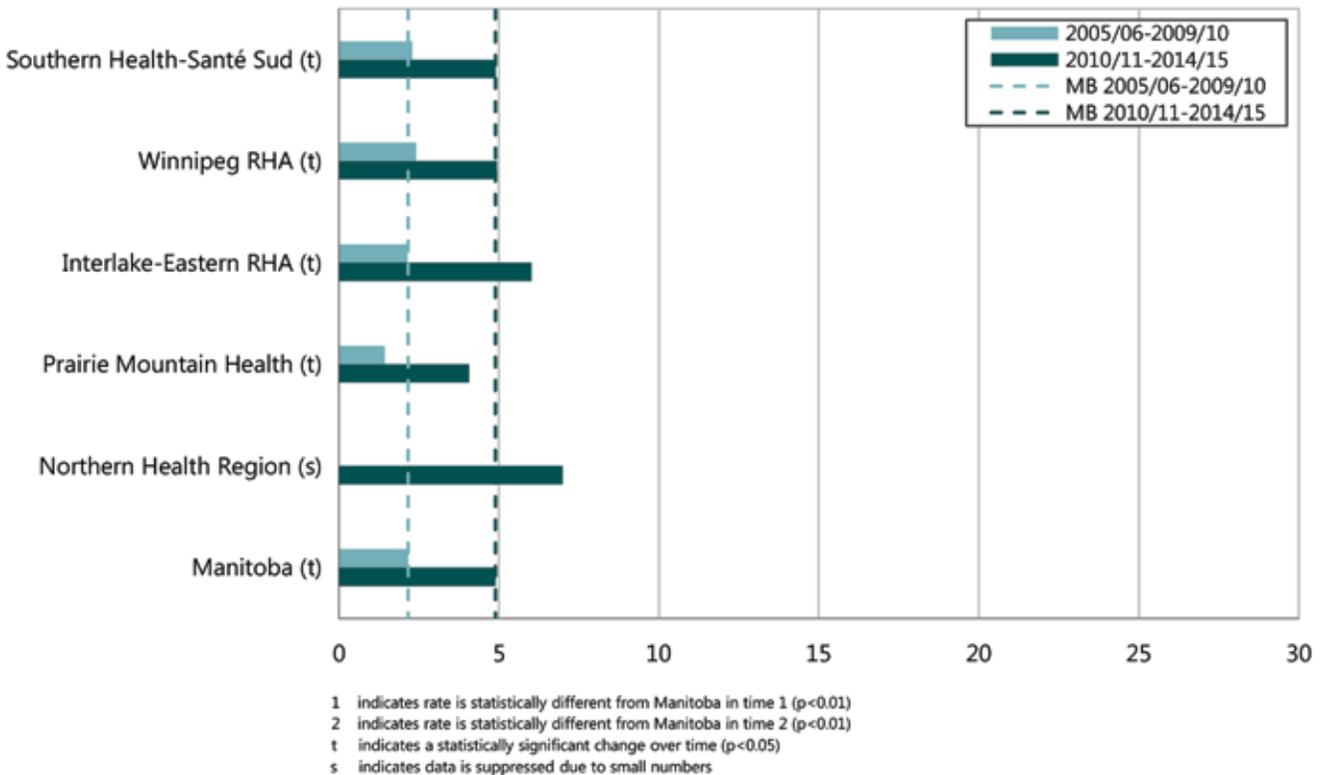
**Figure 9.7: Percutaneous Coronary Intervention Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 1,000 person-years



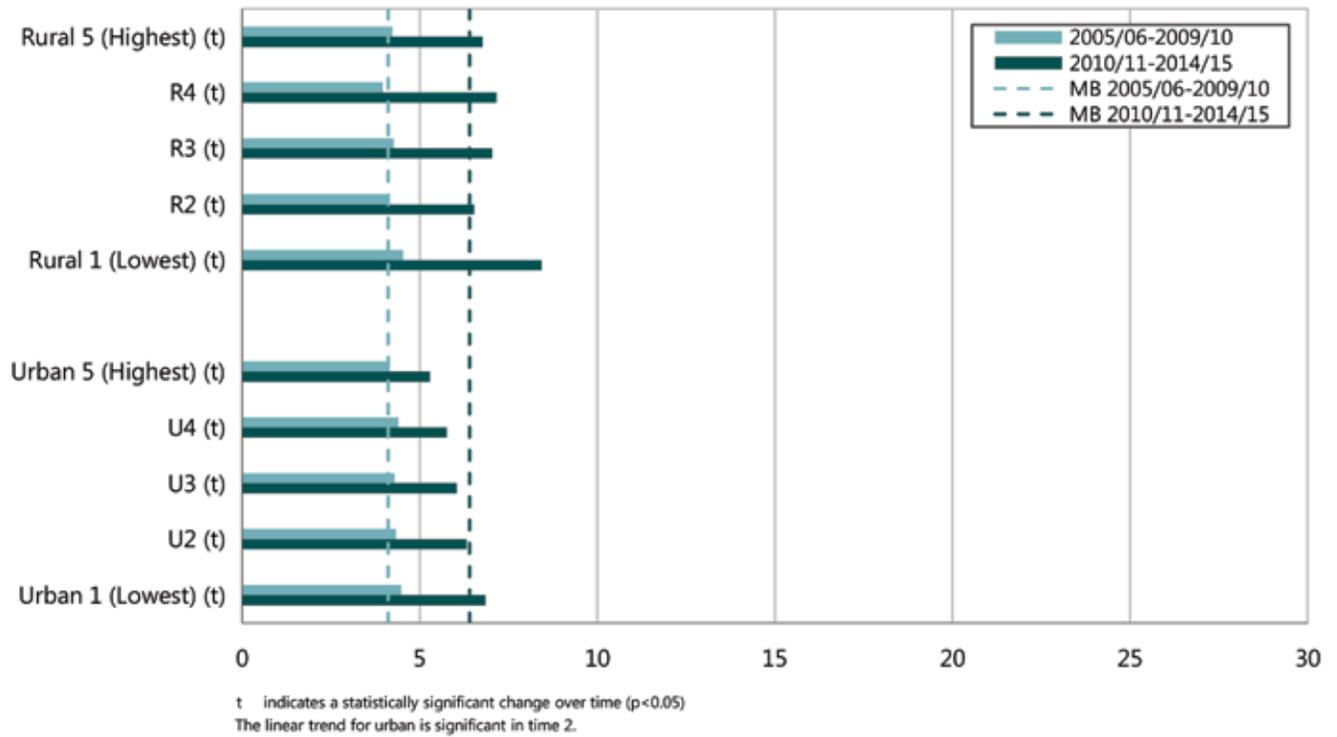
**Figure 9.8: Percutaneous Coronary Intervention Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 1,000 person-years

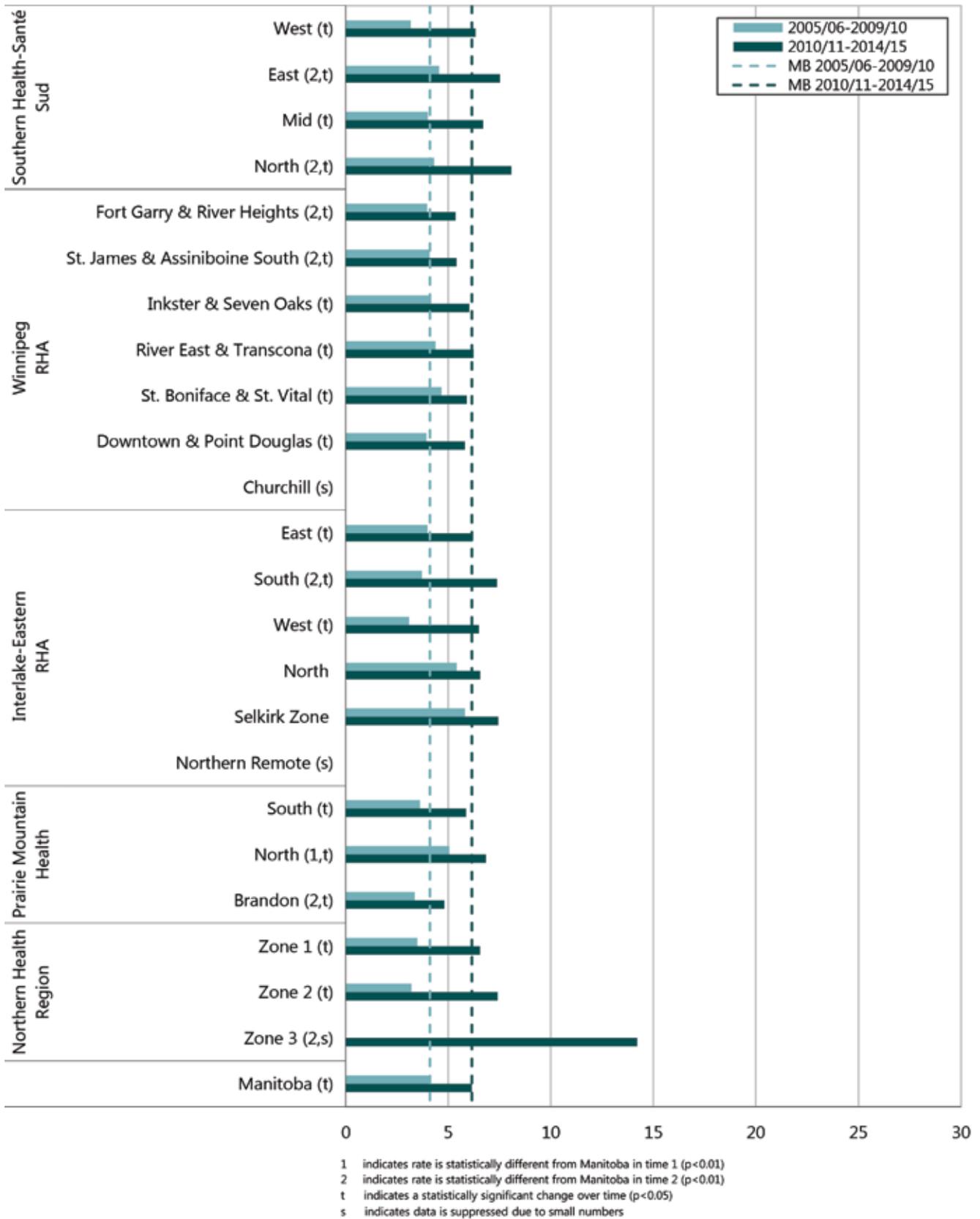


**Figure 9.9: Percutaneous Coronary Intervention Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



**Figure 9.10: Percutaneous Coronary Intervention Rates by Health Region Zone**  
 Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



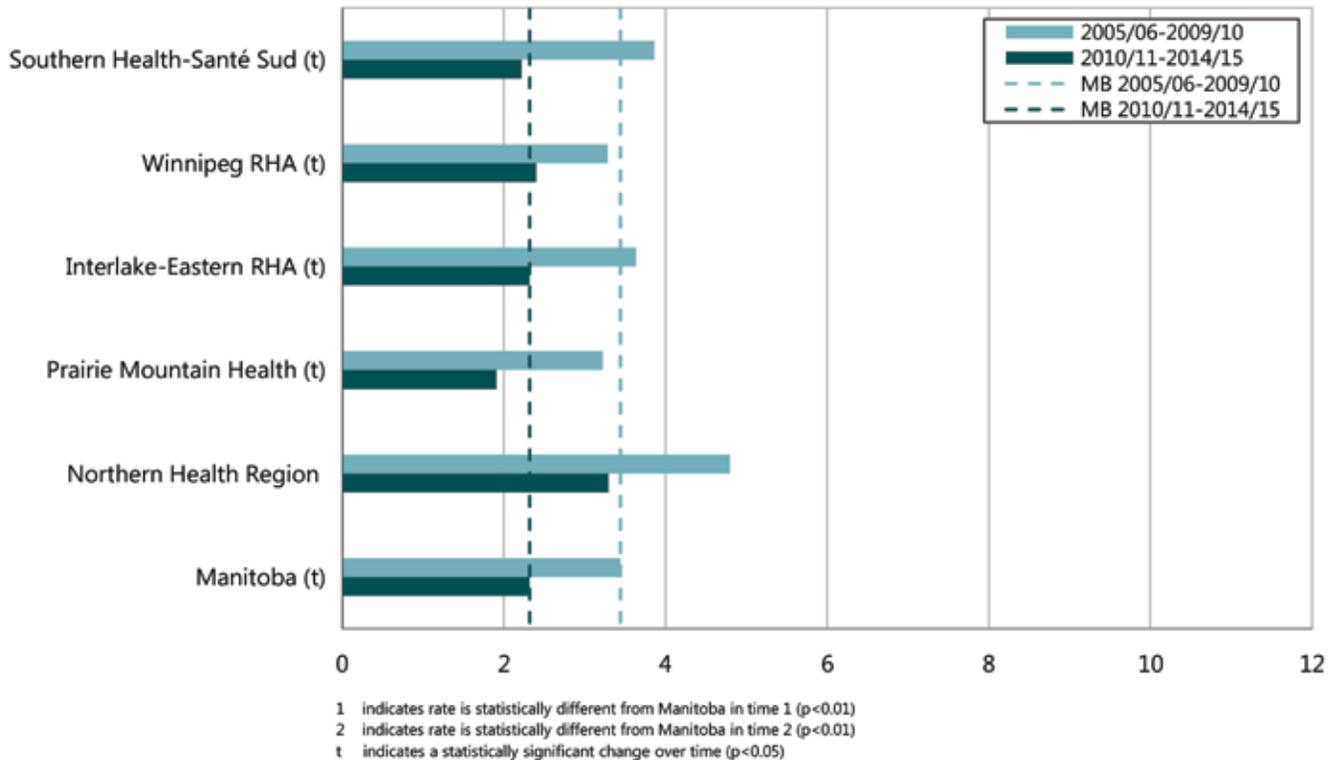
## Coronary Artery Bypass Graft Surgery Rates

Coronary artery bypass graft surgery (CABG), also simply called heart bypass surgery, is one of the most intensive cardiac interventions performed in Manitoba. In this surgery, a thoracic artery (which supplies the lungs) is diverted to a coronary artery, or a vein from the leg is grafted to a coronary artery, to improve blood flow to the heart. This procedure has a high risk of complication, as it requires that the heart be momentarily stopped and a pump employed to circulate the patient’s blood during the surgery. Given the inherent risks of CABG, this procedure is reserved for severe cases in which medication or PCI would not be sufficient to address the blocked artery, and in which the patient is otherwise healthy enough to recover from the surgery. We used the full five years of data available for each time period to calculate CABG rates (2005/06-2009/10 and 2010/11-2014/15).

Looking across the age groups, the rate of CABG was very low amongst the oldest age group (85+) (Figures 9.11 to 9.13), likely because the surgery’s inherent risks outweighed the potential benefits for a population that may have multiple health concerns. However, there was a significant increase in CABG rates from one time period to the next for this oldest age group, suggesting that a greater proportion of community-dwelling older adults age 85+ were evaluated as potentially benefiting from the surgery (Figure 9.13). But for both of the younger age groups, there were fewer CABG surgeries performed in the second time period compared to the first (Figures 9.11 and 9.12). Taking these results together with the findings for PCI rates, we see a greater use of less invasive measures to address arterial blockages. This pattern could potentially be due to earlier detection of artery hardening and narrowing, when PCIs would be deemed effective and the more drastic CABG procedure would not be immediately necessary. For CABG rates, we also noted a relationship with income for the urban areas in the second time period, where the decrease in CABG rates was smallest for the higher income areas (Figure 9.14).

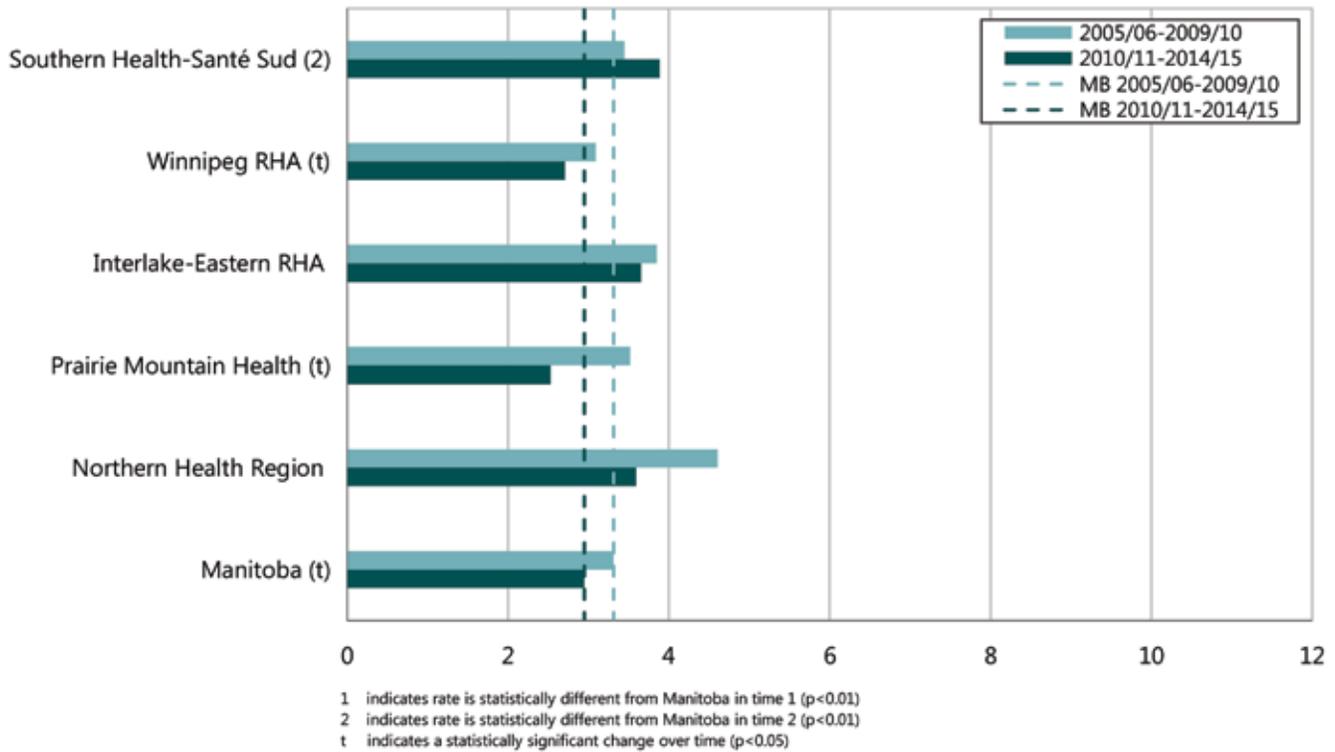
**Figure 9.11: Coronary Artery Bypass Graft Surgery Rates by Health Region, Age 65-74**

Crude rate for community-dwelling older adults per 1,000 person-years



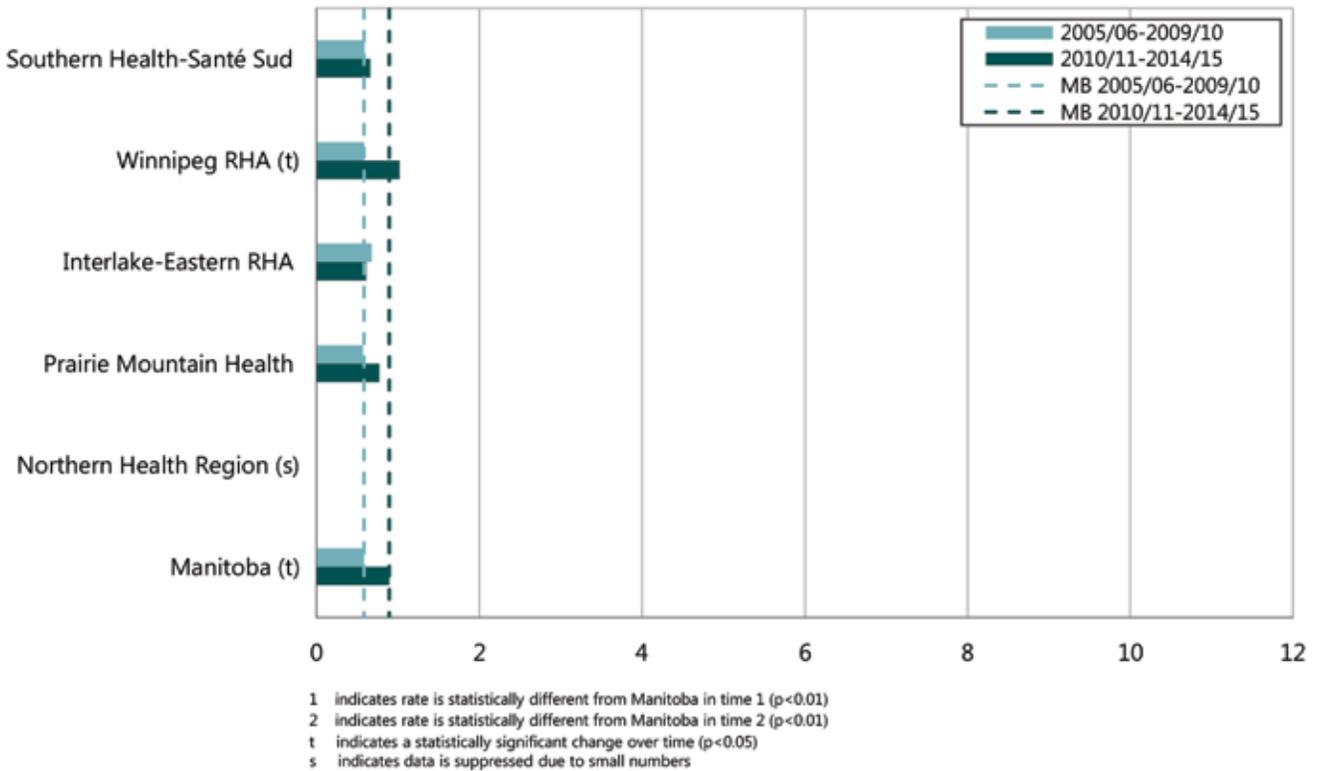
**Figure 9.12: Coronary Artery Bypass Graft Surgery Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 1,000 person-years

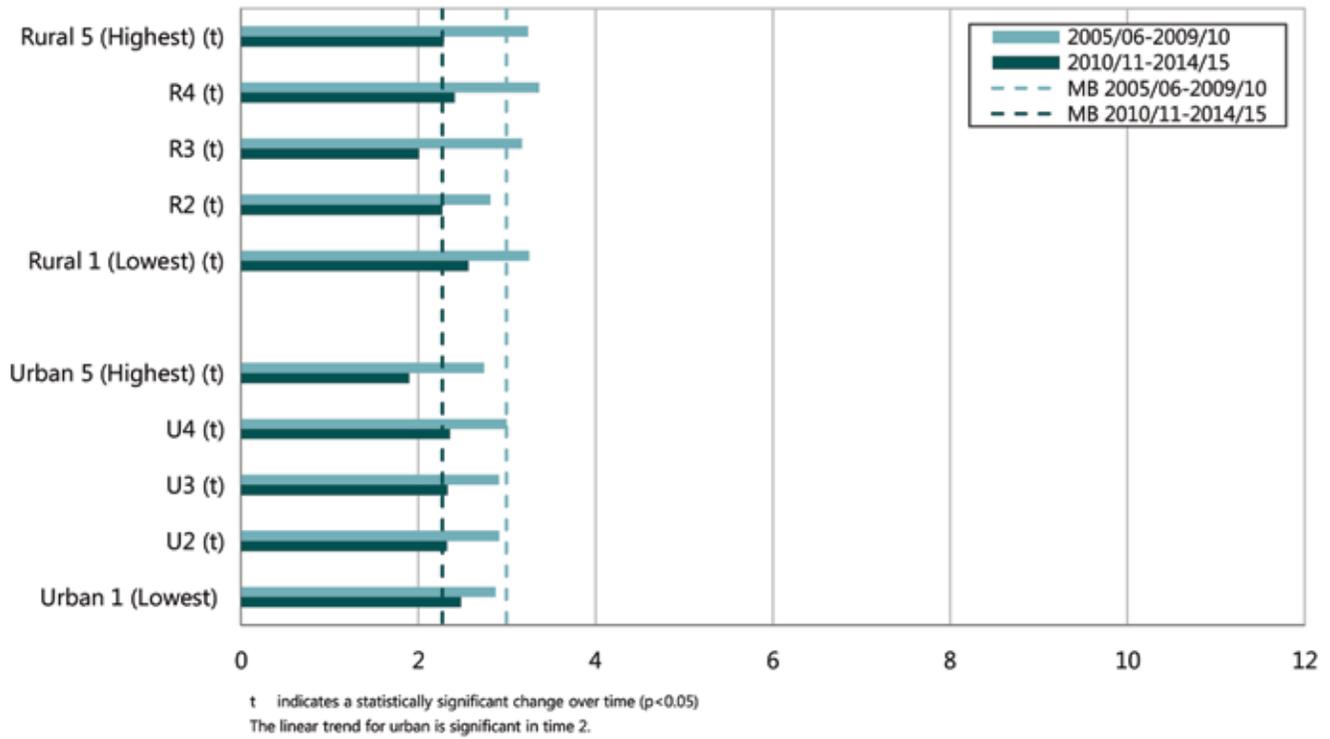


**Figure 9.13: Coronary Artery Bypass Graft Surgery Rates by Health Region, Age 85+**

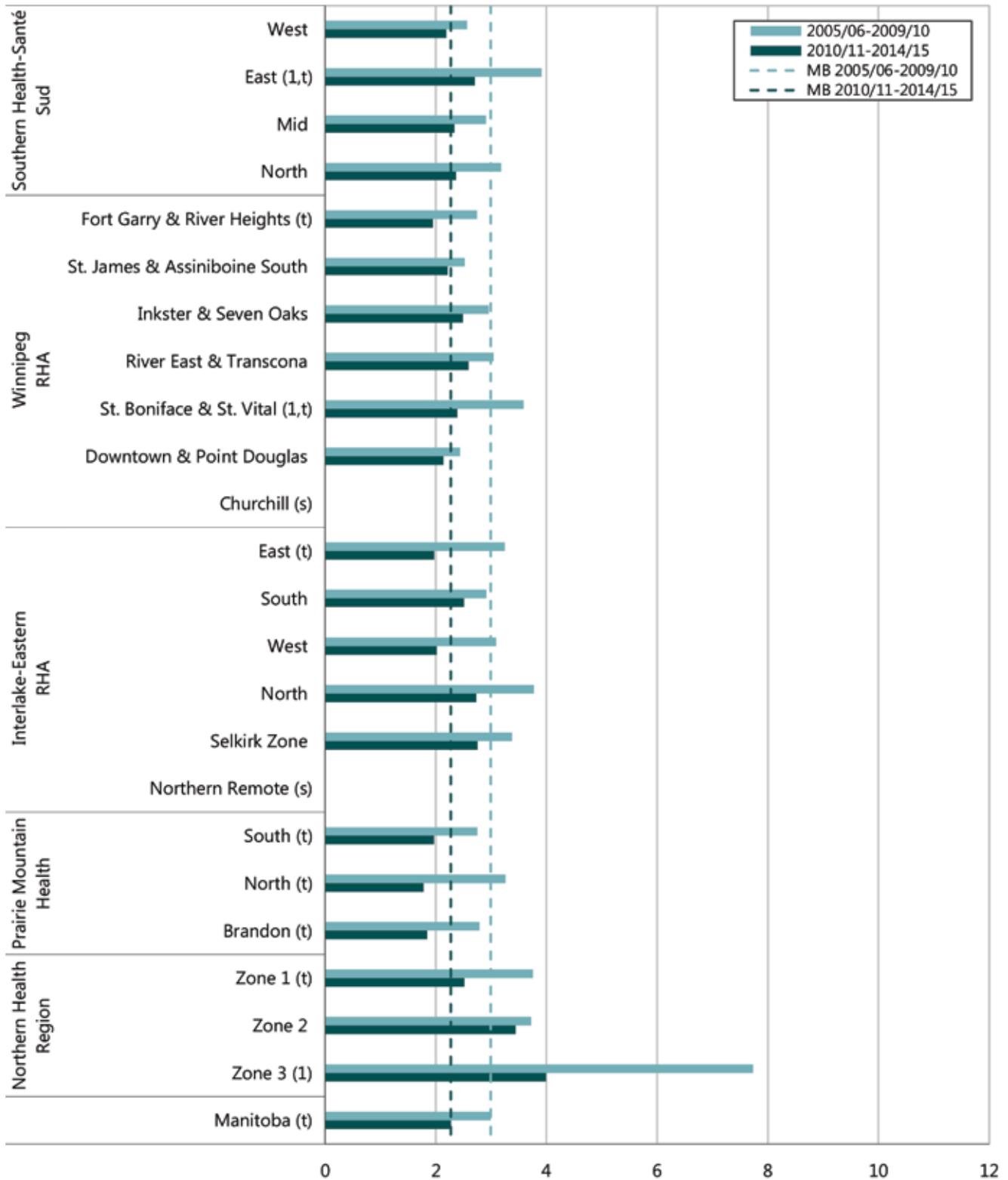
Crude rate for community-dwelling older adults per 1,000 person-years



**Figure 9.14: Coronary Artery Bypass Graft Surgery Rates by Income Quintile**  
 Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



**Figure 9.15: Coronary Artery Bypass Graft Surgery Rates by Health Region Zone**  
 Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



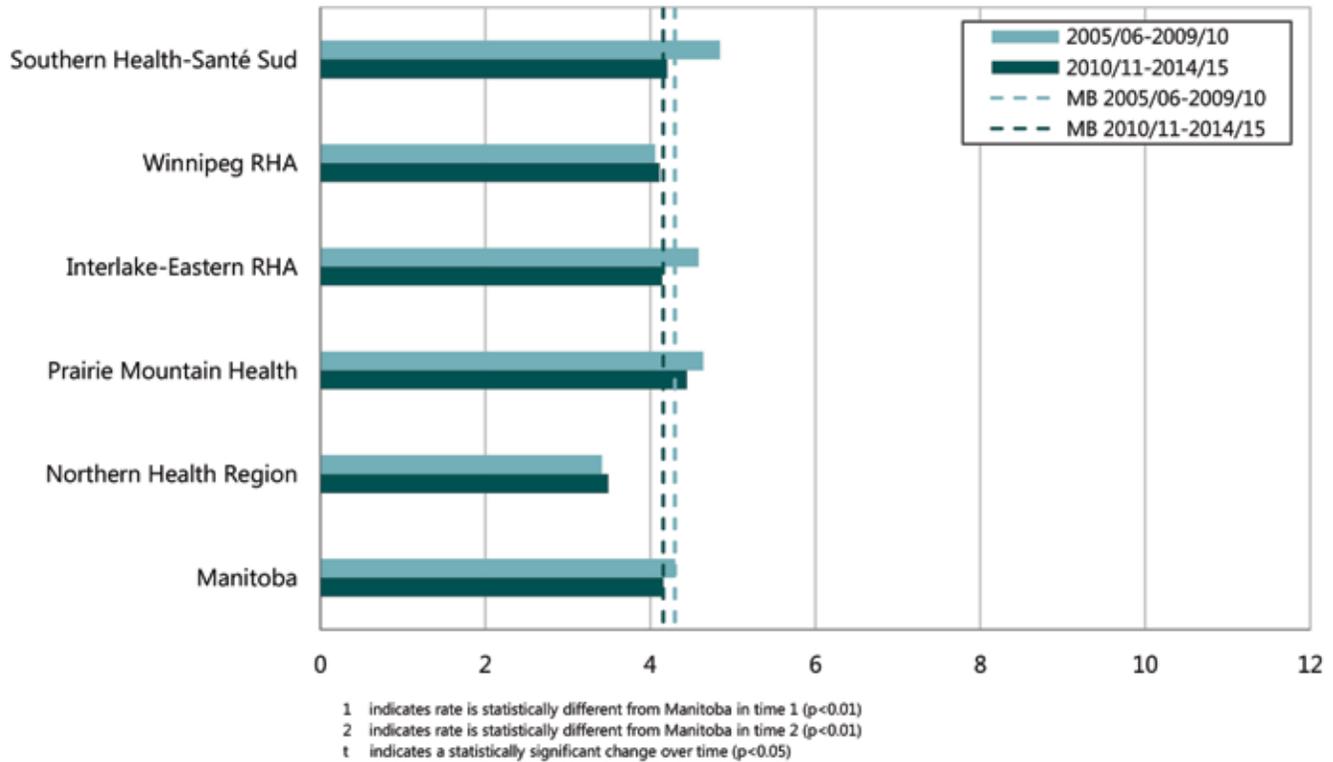
1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)  
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 t indicates a statistically significant change over time (p<0.05)  
 s indicates data is suppressed due to small numbers

## Hip Replacement Surgery Rates

Hip replacement surgeries occur when hip joint function is limited due to severe inflammation and pain, usually from arthritis. Surgery to replace the hip with an artificial joint then results in a renewed ability to be more physically active. This surgery has inherent risks (like all surgeries) and requires a lengthy recovery period, and is not an option for everyone with arthritic pain. Post-operative immobility can be a particular risk for pressure sores, especially amongst older individuals. For this indicator, we included only total (as opposed to partial) hip replacements. Hip replacement surgery is a relatively rare event, and so we used the entire five years of available data for each time period (2005/06-2009/10 and 2010/11-2014/15).

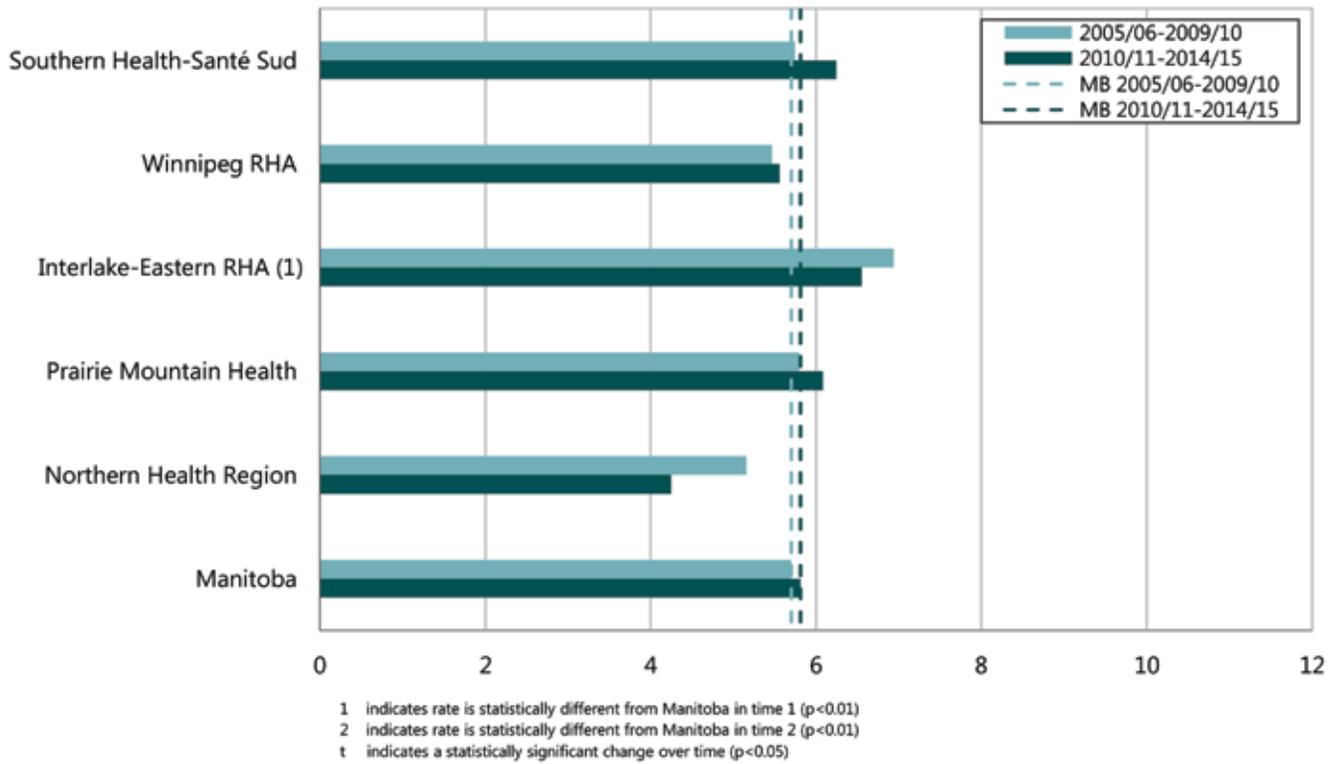
Hip replacement rates were highest amongst the 75-84 age group, approximately 50% greater than for the youngest age group and the oldest age group (Figures 9.16 to 9.18). The middle age group is where the majority of the population is likely to be affected by arthritic pain, but also where prognosis for recovery is good and the expected benefits may be greatest. There were no significant changes in hip replacement rates over time for any age group, and no significant differences between the regions, although Northern Health Region consistently had the lowest rate. We saw a significant relationship between hip replacement rates and income quintile in the urban areas. The lowest hip replacement rates occurred among people in the lowest income quintile, and the rates increased as income increased (Figure 9.19).

**Figure 9.16: Hip Replacement Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 1,000 person-years



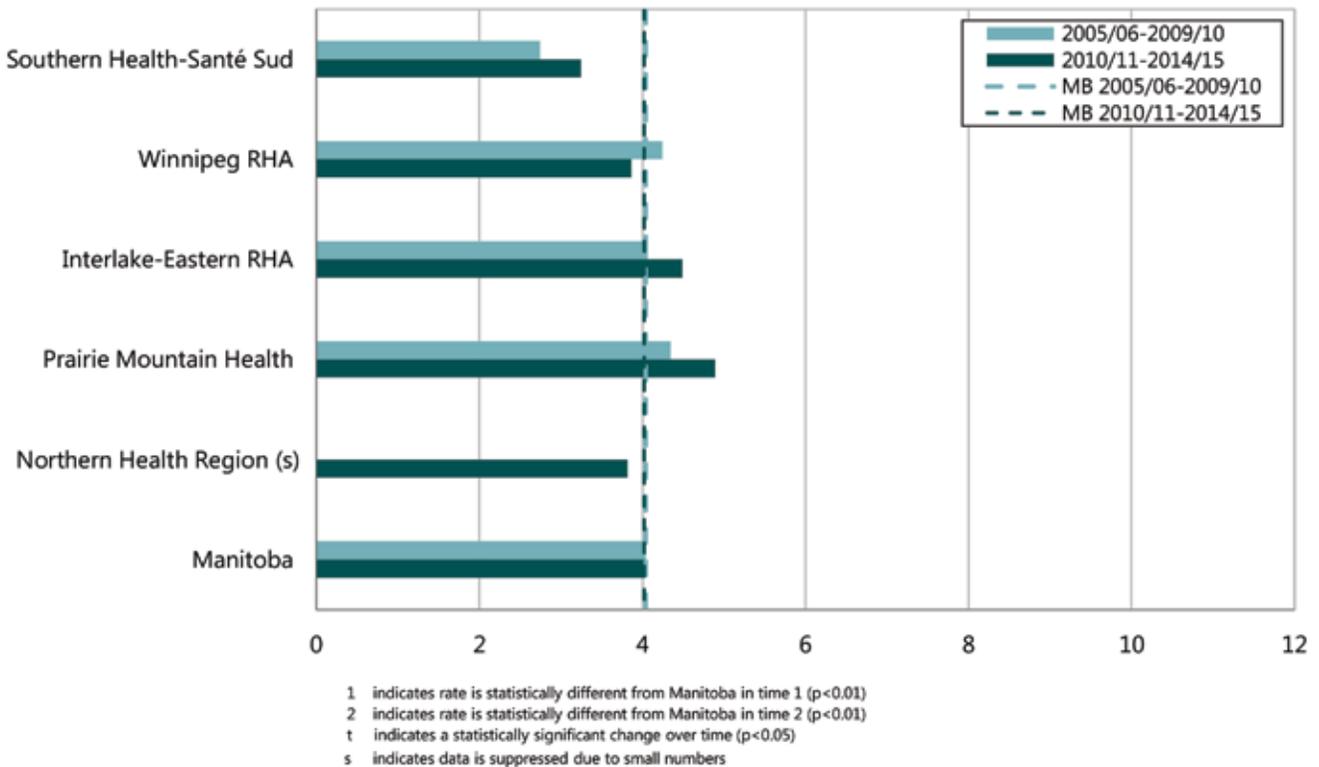
**Figure 9.17: Hip Replacement Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 1,000 person-years



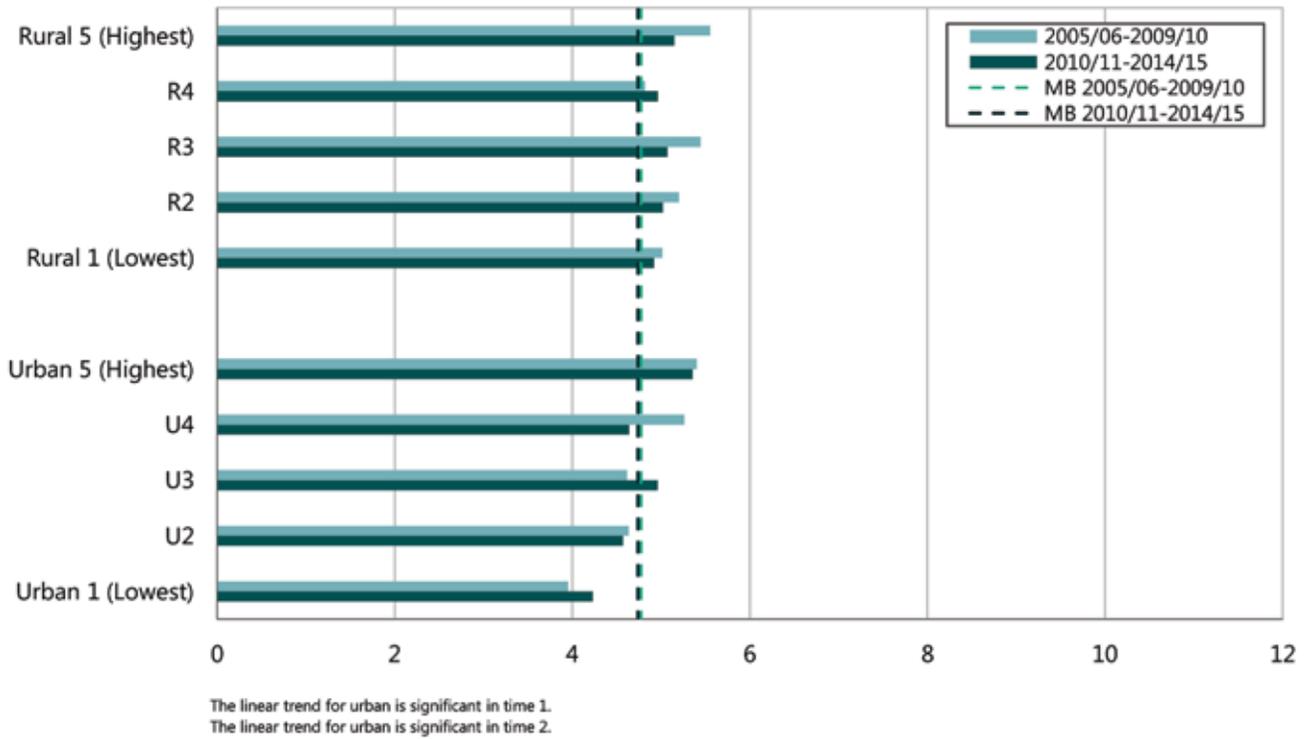
**Figure 9.18: Hip Replacement Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 1,000 person-years



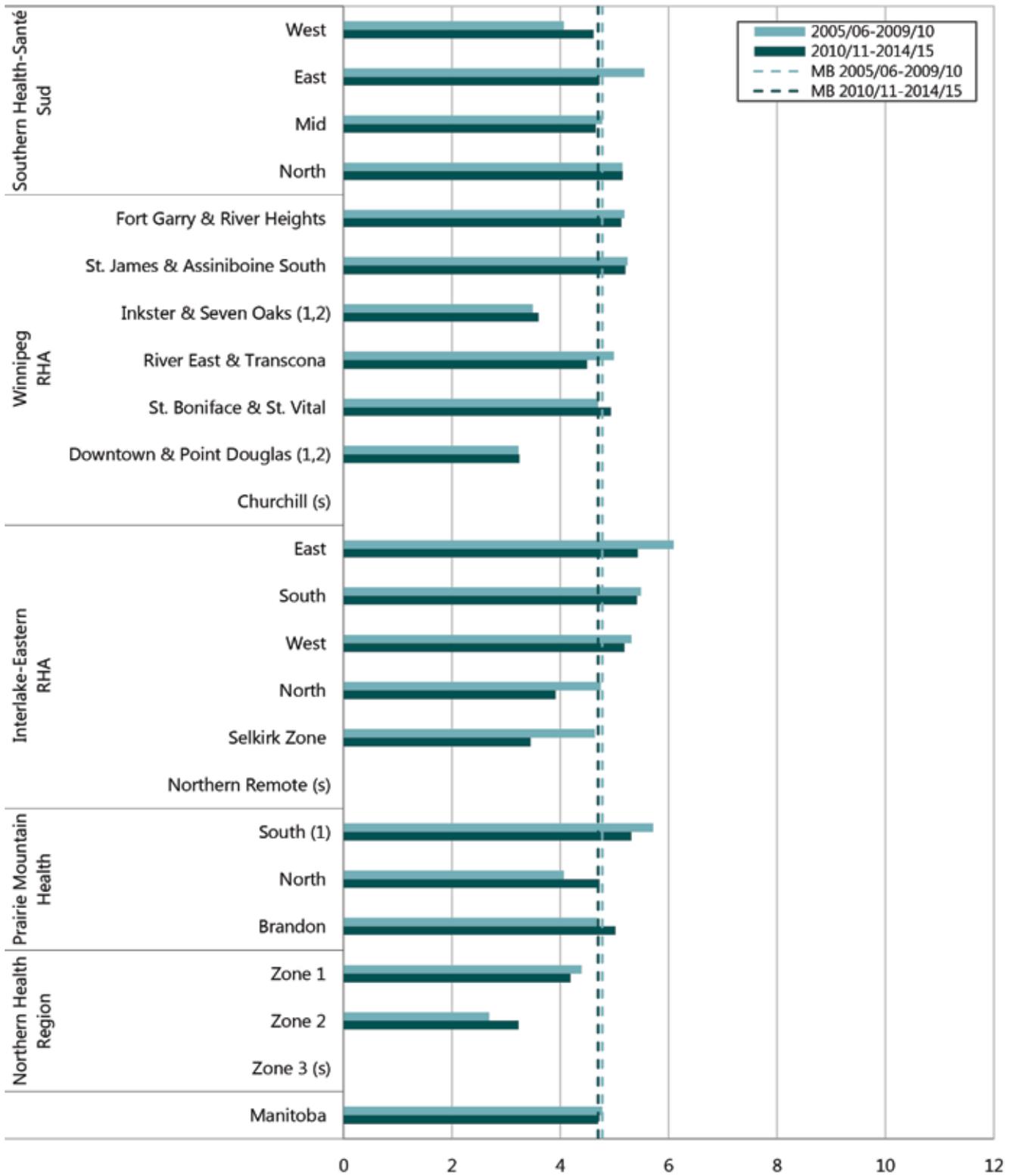
**Figure 9.19: Hip Replacement Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



**Figure 9.20: Hip Replacement Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



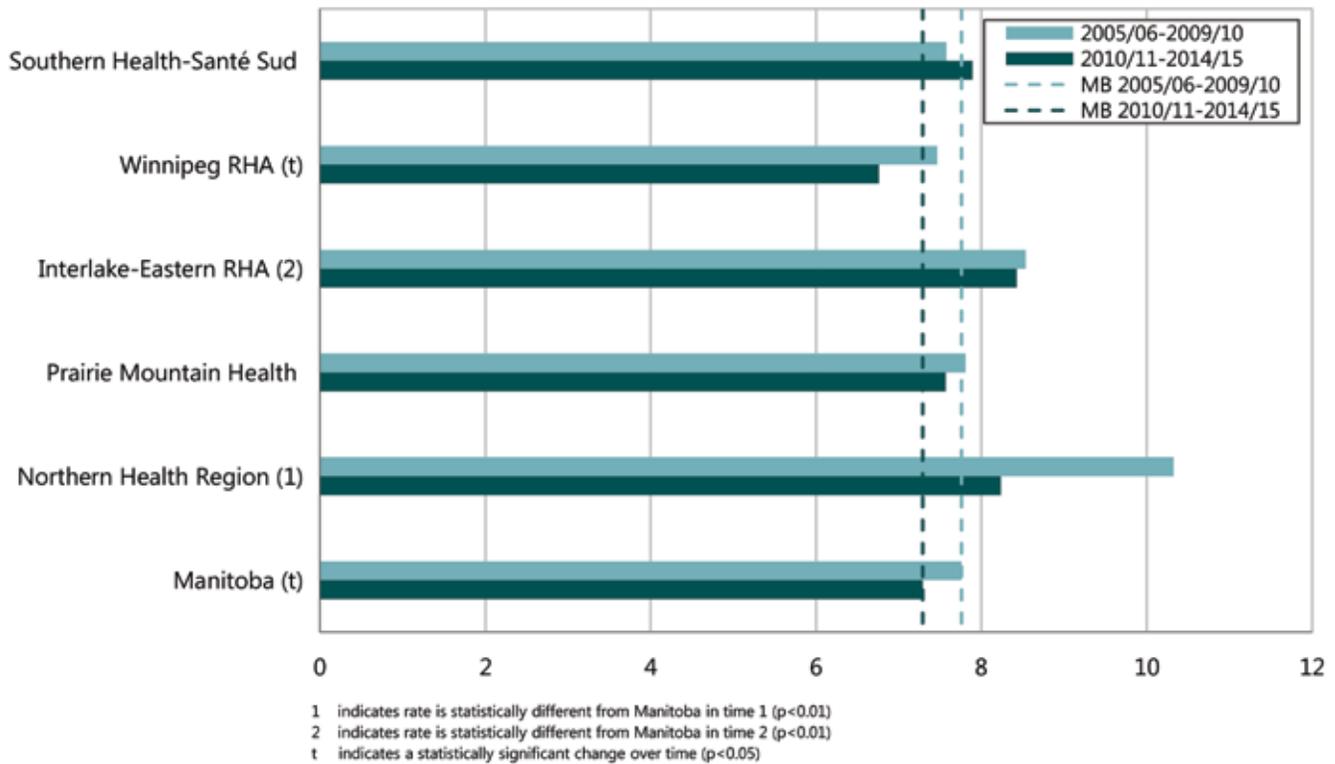
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 t indicates a statistically significant change over time (p<0.05)  
 s indicates data is suppressed due to small numbers

## Knee Replacement Surgery Rates

Knee replacement surgeries are performed when the knee joint is damaged, inflamed and causing severe pain and loss of quality of life. Surgery to replace the knee with an artificial joint then results in a renewed ability to be more physically active. This surgery has inherent risks (like all surgeries) and requires a lengthy recovery period, and is not an option for everyone with arthritic pain. For this indicator, we included only total (as opposed to partial) knee replacements. As a rare event, all five years of available data for each of the two time periods was used to calculate rates (2005/06-2009/10 and 2010/11-2014/15).

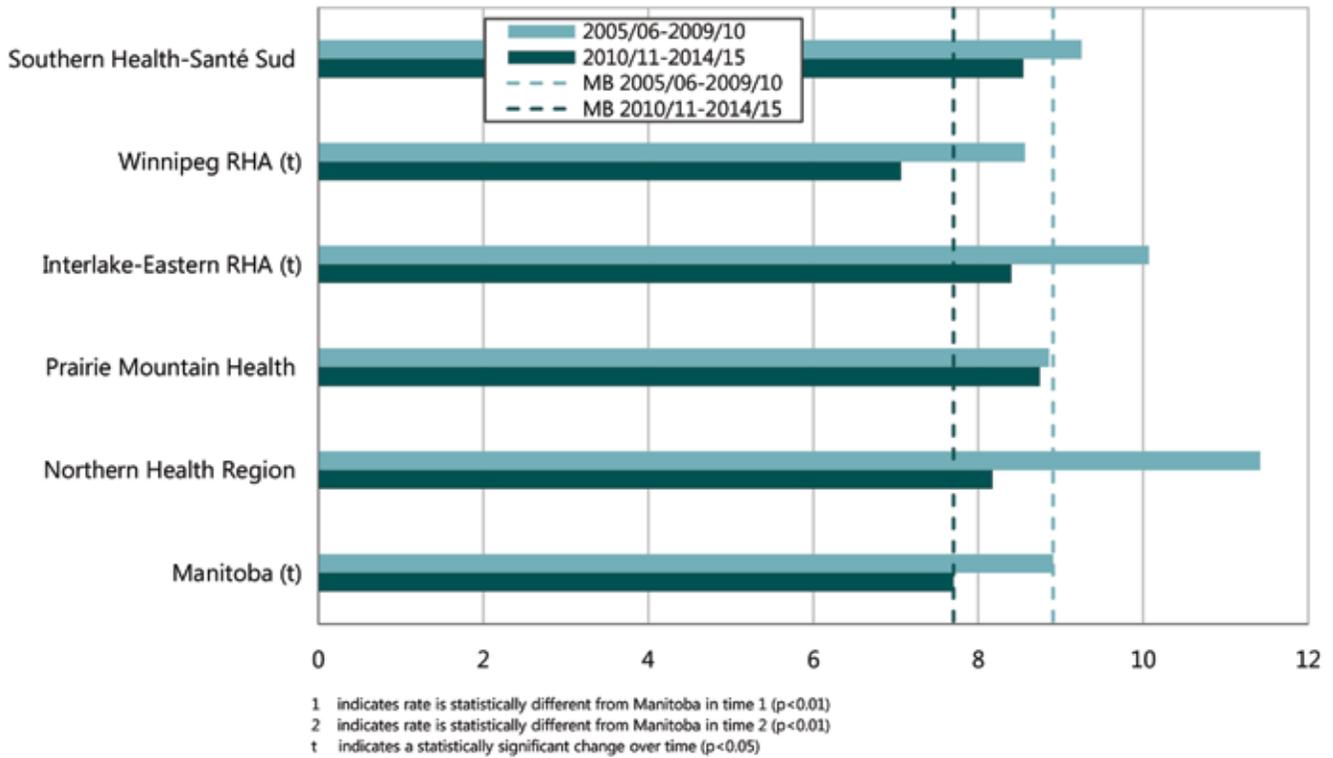
The results of the analyses indicate that knee replacement surgeries are more common than hip replacement. For the younger age groups the rate is almost double that of the oldest age group (Figures 9.21 to 9.23). There was a significant decrease in knee replacement rates for the two younger age groups over time. Knee replacement rates in urban areas were significantly associated with income quintile, where rates were similar among higher income quintiles, but the lowest income quintile had a much lower rate of knee replacements (Figure 9.24).

**Figure 9.21: Knee Replacement Rates by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per 1,000 person-years



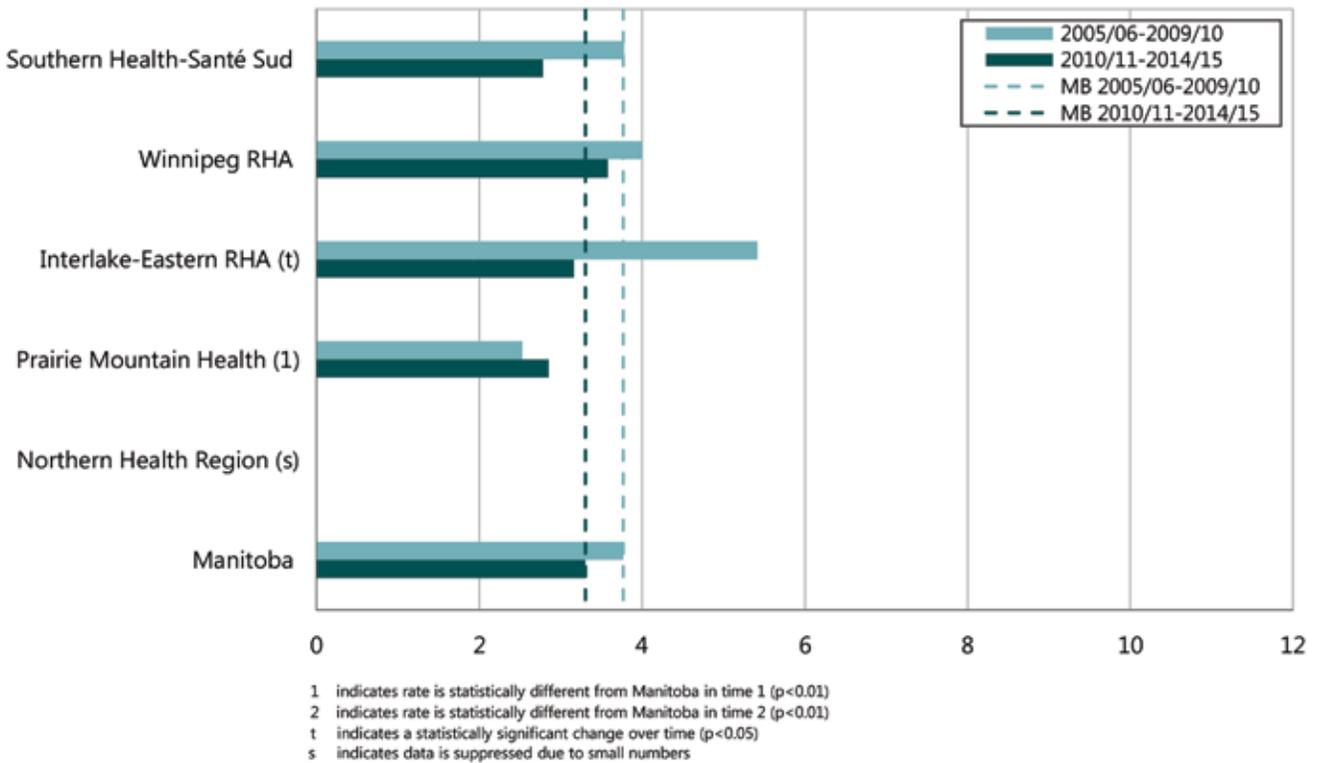
**Figure 9.22: Knee Replacement Rates by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per 1,000 person-years



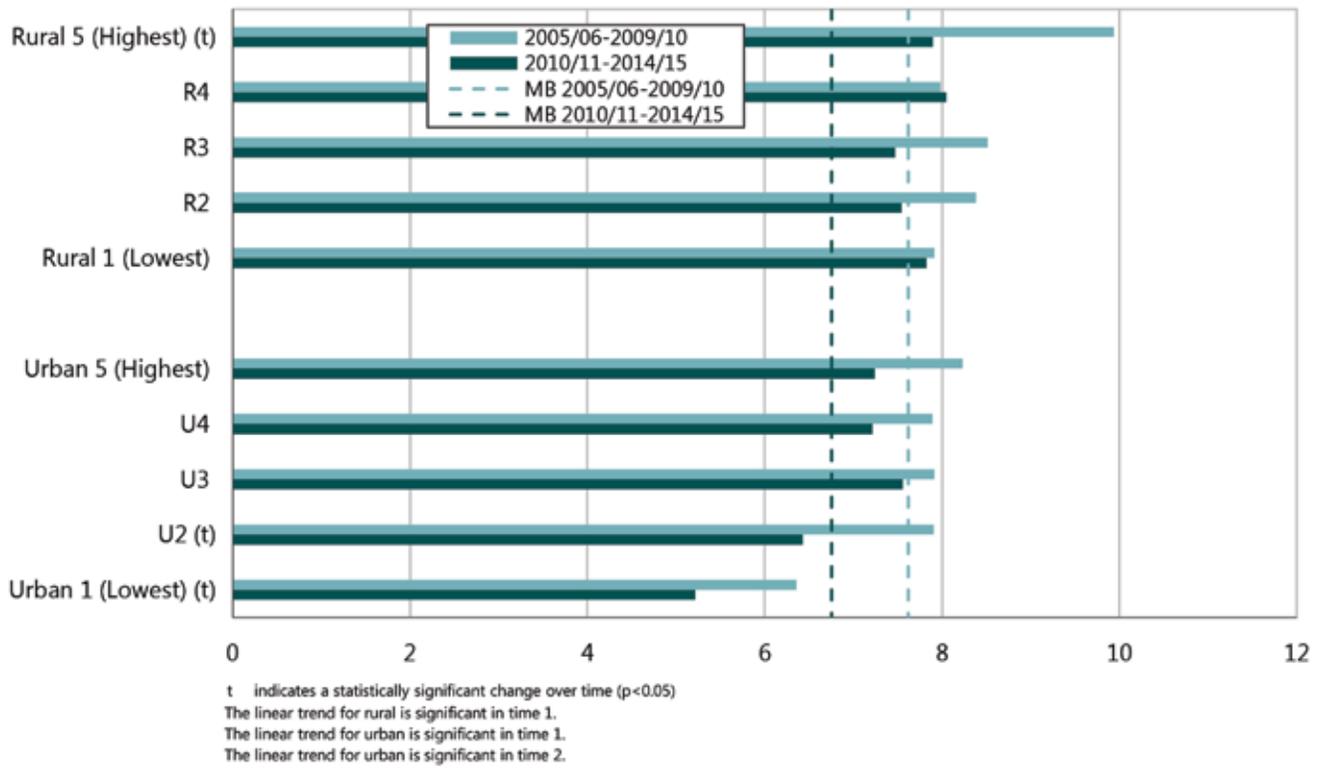
**Figure 9.23: Knee Replacement Rates by Health Region, Age 85+**

Crude rate for community-dwelling older adults per 1,000 person-years



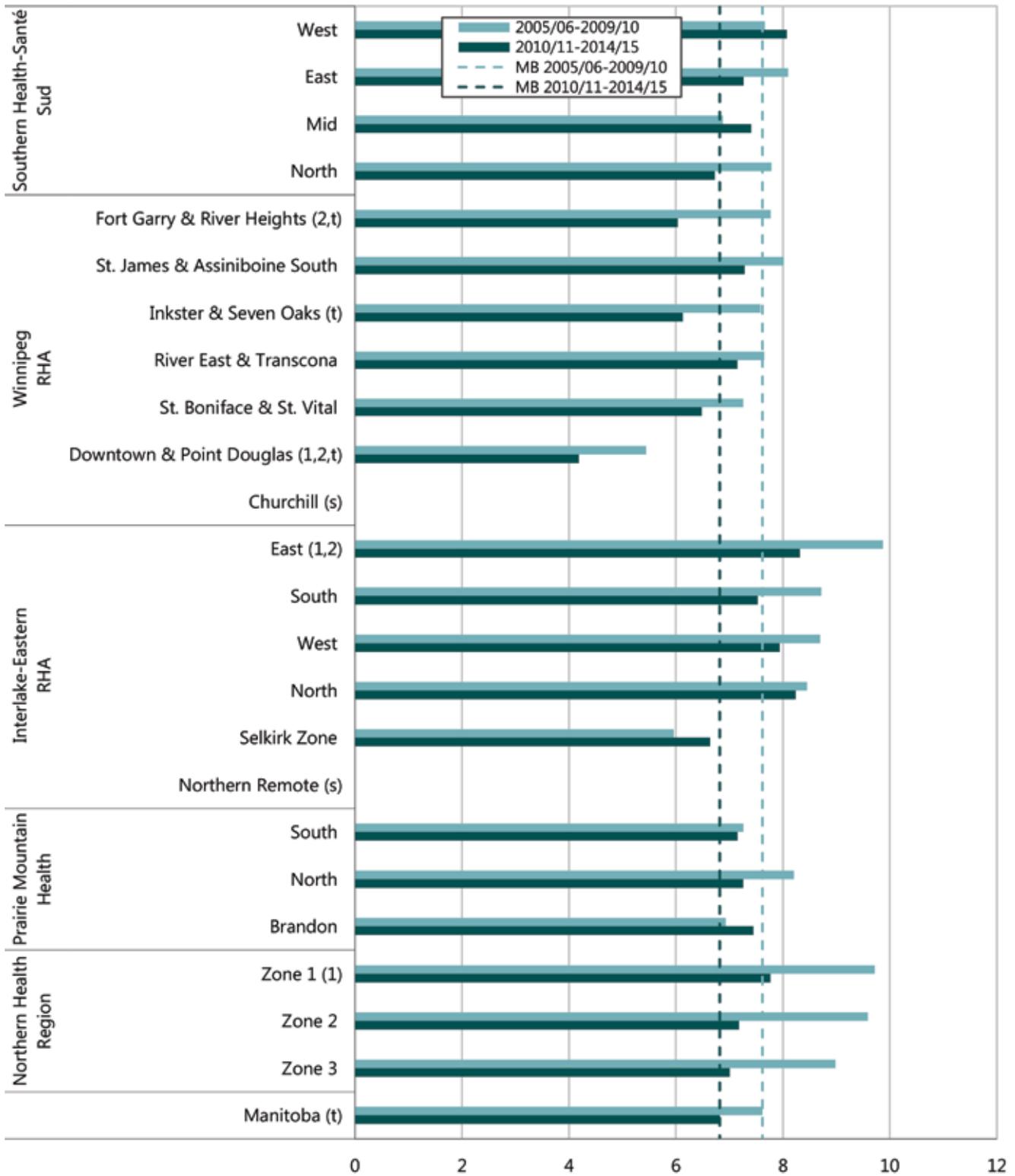
**Figure 9.24: Knee Replacement Rates by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



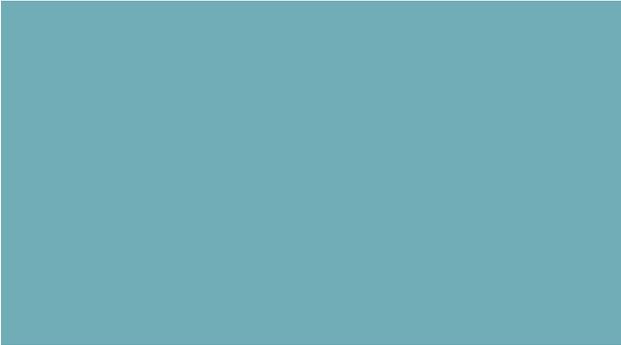
**Figure 9.25: Knee Replacement Rates by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per 1,000 person-years



- 1 indicates rate is statistically different from Manitoba in time 1 (p<0.01)
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- s indicates data is suppressed due to small numbers





# Chapter 10: Prescription Drugs

Visits to a physician or nurse practitioner often result in a prescription for a drug to treat the ailment or condition that was the reason for the visit. Because of this close relationship between encounters and prescriptions, the dispensation of prescribed drugs can serve as a proxy for assessing health (e.g., receipt of many different prescription drugs could indicate poor health status or complex medical needs), or they can serve as a measure of quality of care (e.g., receipt of certain drugs could be potentially inappropriate for certain populations). The Repository contains comprehensive information on prescription drug dispensations in the Drug Program Information Network (DPIN) data, including all dispensations of prescription drugs for Manitobans of all ages, regardless of the method of payment. It is important to note that these data are records of the dispensations of the drugs, rather than the prescriptions. To be recorded in the DPIN data, the patient would have received a prescription, and have a pharmacy prepare and dispense the drug. If the patient received a prescription but did not actually fill it, then it is not tracked in DPIN and cannot be included in our analyses.

In the following section, we present several indicators using drug data, including the number of different drugs received, the total supply of all drugs received (in days), and two indicators describing potentially inappropriate drugs prescribed to older adults.

## Key Findings

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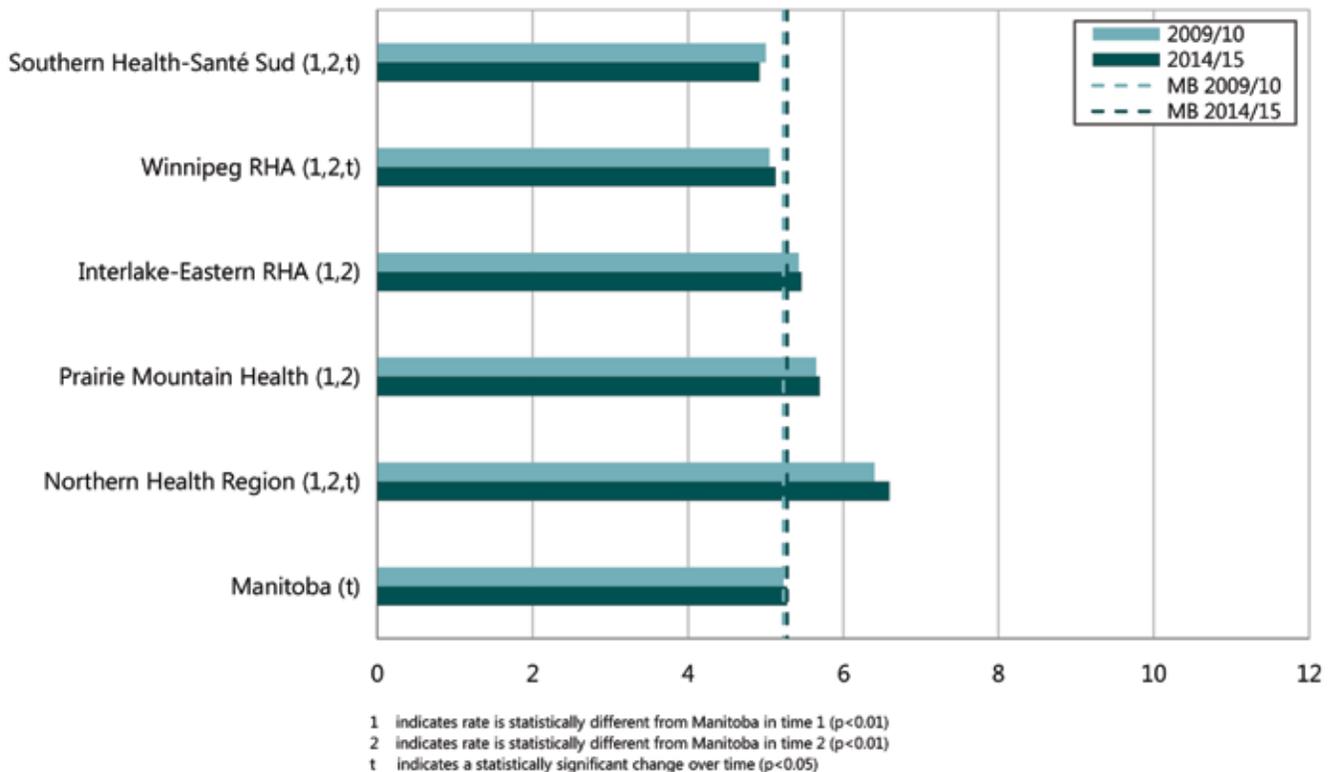
- There were some small changes in the number of different drugs prescribed and the average total days supplied of prescription drugs, with rates tending to increase from one time period to the next. Both of these drug prescription indicators were strongly related to income quintile, with people with higher incomes being less likely to be prescribed many different drugs or have a large supply of prescription drugs.
- There was a significant decrease in the number of people being dispensed a Beers List drug and in the number of people being dispensed long-acting benzodiazepines, both of which are categories of drugs that could be inappropriate for the older adult population. The findings suggest that providers are beginning to recognize the lack of evidence for the effectiveness of these drugs in the older adult population and/or the potential for adverse events (e.g., falls) related to the drugs.

## Number of Different Prescription Drugs

Here we report the average number of different prescription drugs that an individual was dispensed during the last year of each study period (2009/10 and 2014/15). We used the Anatomical Therapeutic Chemical (ATC) Classification System to determine which drugs were ‘different’ from each other. The ATC system groups drugs together based on their target anatomical systems (e.g., cardiovascular, nervous system, musculoskeletal, or alimentary system), followed by subgroups at the therapeutic or pharmacological level, and then subgroups at the pharmacological or chemical level. For example, a typical drug to treat depression has the code N06AB03, which can be broken down as N (nervous system), 06 (psychoanaleptics), A (antidepressants), B (selective serotonin reuptake inhibitors; SSRIs), and 03 (fluoxetine). In our analysis, drugs were considered different from each other at the 4th level of classification (e.g., N06AB), so that – in the above example – all SSRIs would be considered one drug. A person who switched from one SSRI to another SSRI would not be considered to have taken two different drugs.

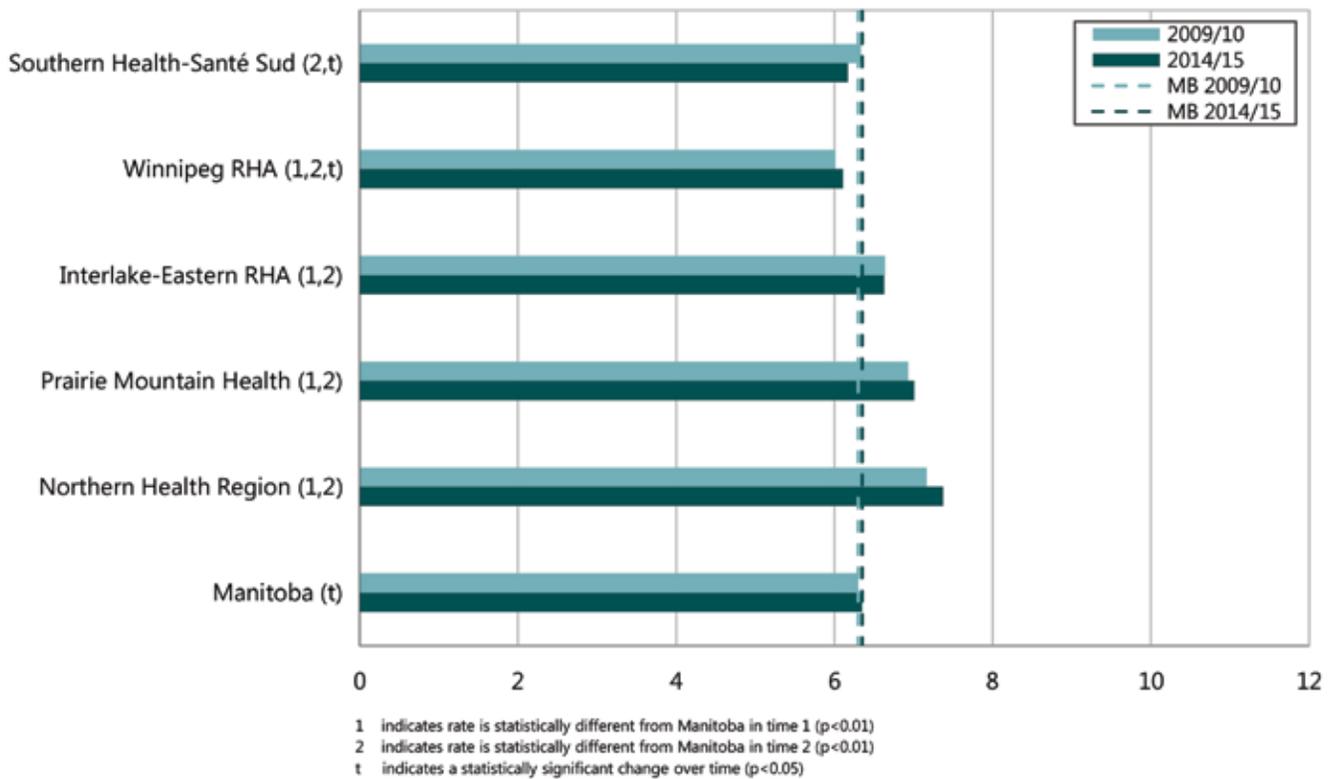
We present the results of these analyses for each of the age groups by region and time period (Figures 10.1 to 10.3). Older individuals had a higher average number of different drugs dispensed than younger individuals (5.2 different drugs for the 65-74 age group, 6.3 different drugs for the 75-84 age group, and 6.8 for the 85+ age group). For the younger age groups, the Northern Health Region had the highest average number of drugs dispensed per person, while Winnipeg and Southern were the lowest (Figure 10.1 and 10.2). For the oldest age group, Southern Health-Santé Sud, Interlake-Eastern and Prairie Mountain Health were all significantly higher than the provincial average, while Winnipeg was significantly lower than, and Northern was not different from, the Manitoba average (Figure 10.3). This indicator was strongly related to income quintile, with individuals in lower income quintiles consistently being dispensed a higher average number of different drugs than individuals in higher income quintiles for both urban and rural areas and in both time periods (Figure 10.4).

**Figure 10.1: Number of Different Prescription Drugs by Health Region, Age 65-74**  
Crude rate for community-dwelling older adults per person-year



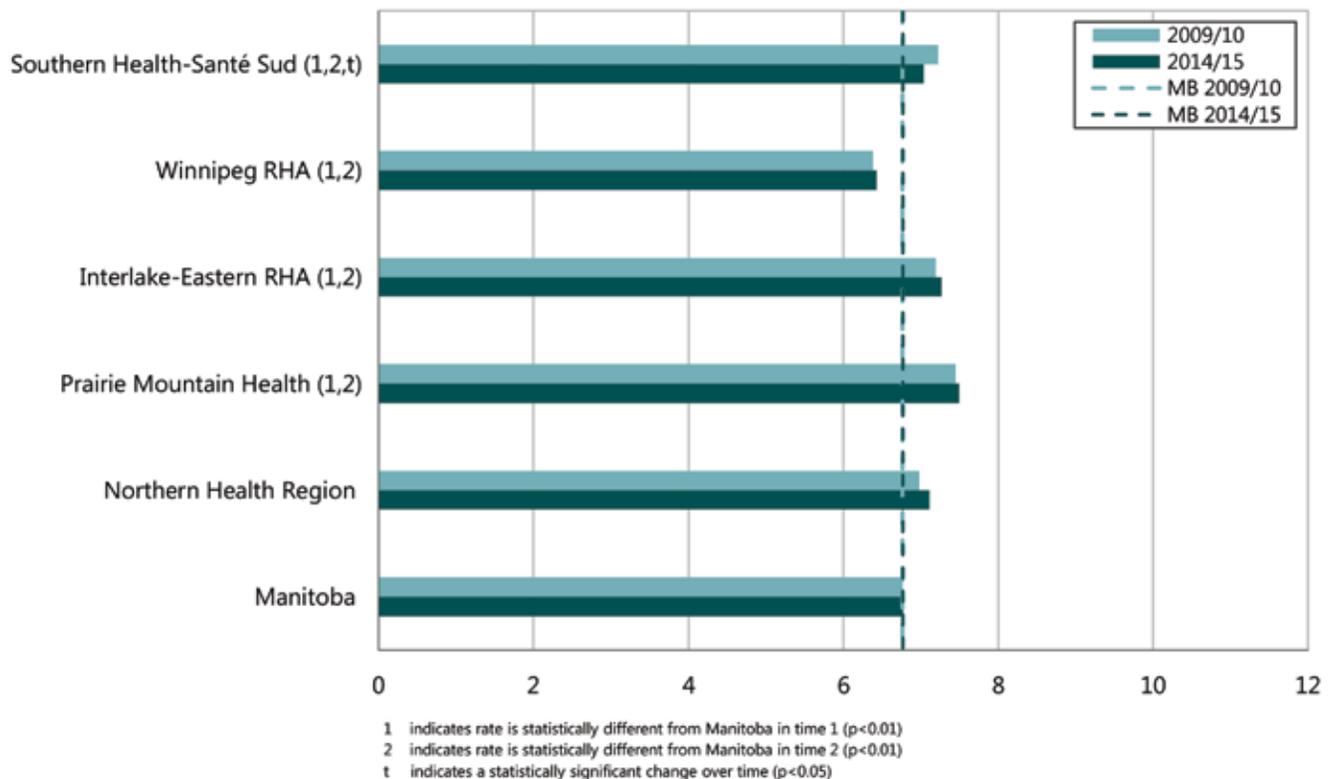
**Figure 10.2: Number of Different Prescription Drugs by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per person-year



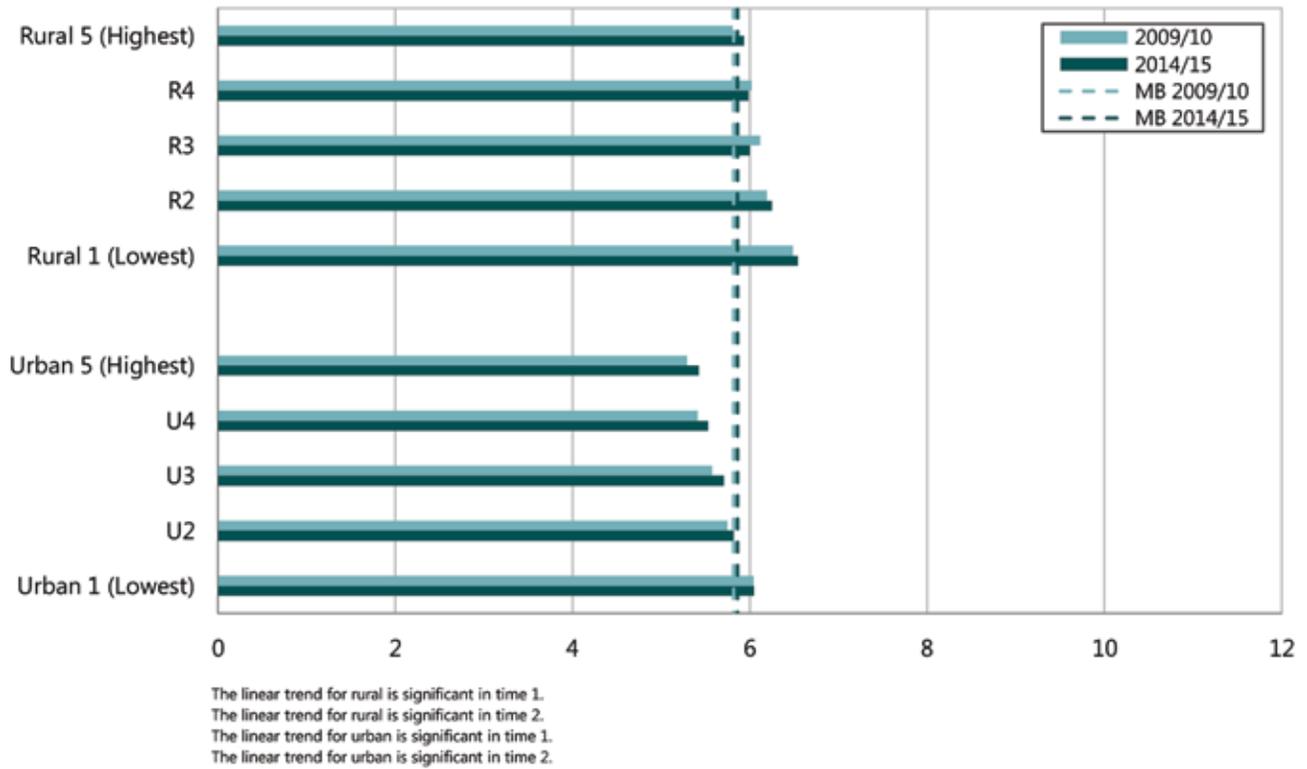
**Figure 10.3: Number of Different Prescription Drugs by Health Region, Age 85+**

Crude rate for community-dwelling older adults per person-year

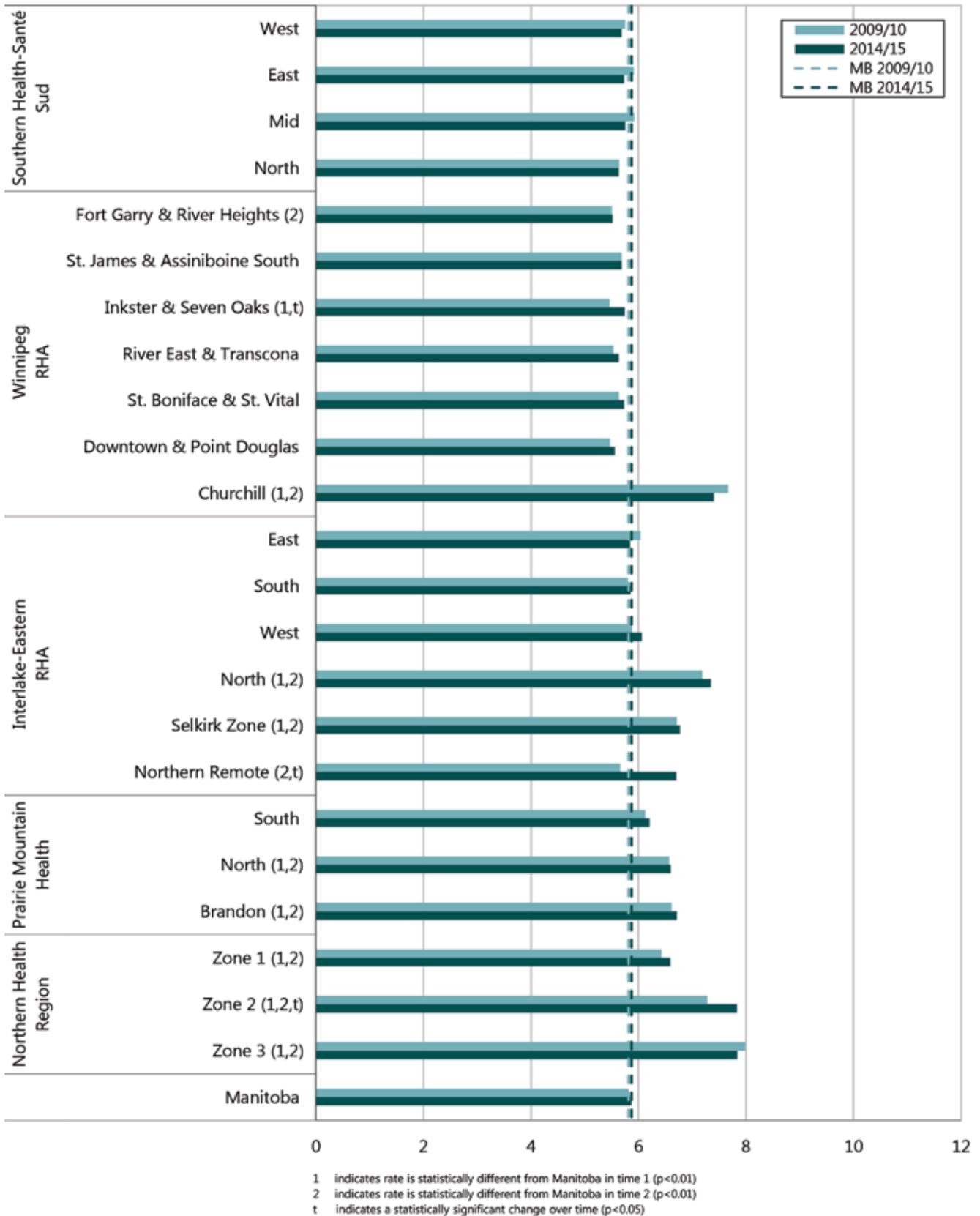


**Figure 10.4: Number of Different Prescription Drugs by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 10.5: Number of Different Prescription Drugs by Health Region Zone**  
 Age- and sex-adjusted rate for community-dwelling older adults per person-year



## Days' Supply of Prescription Drugs

The DPIN data also contains information on the days' supply of a filled prescription. The total days' supply can be a better indicator of the amount of drugs being consumed than the count of dispensations. For example, some people may receive three prescriptions with 30 days' supply, while others receive a single prescription with 90 days' supply. By taking the total of all days' supply of drugs, the differences in the dispensed amounts are accounted for.

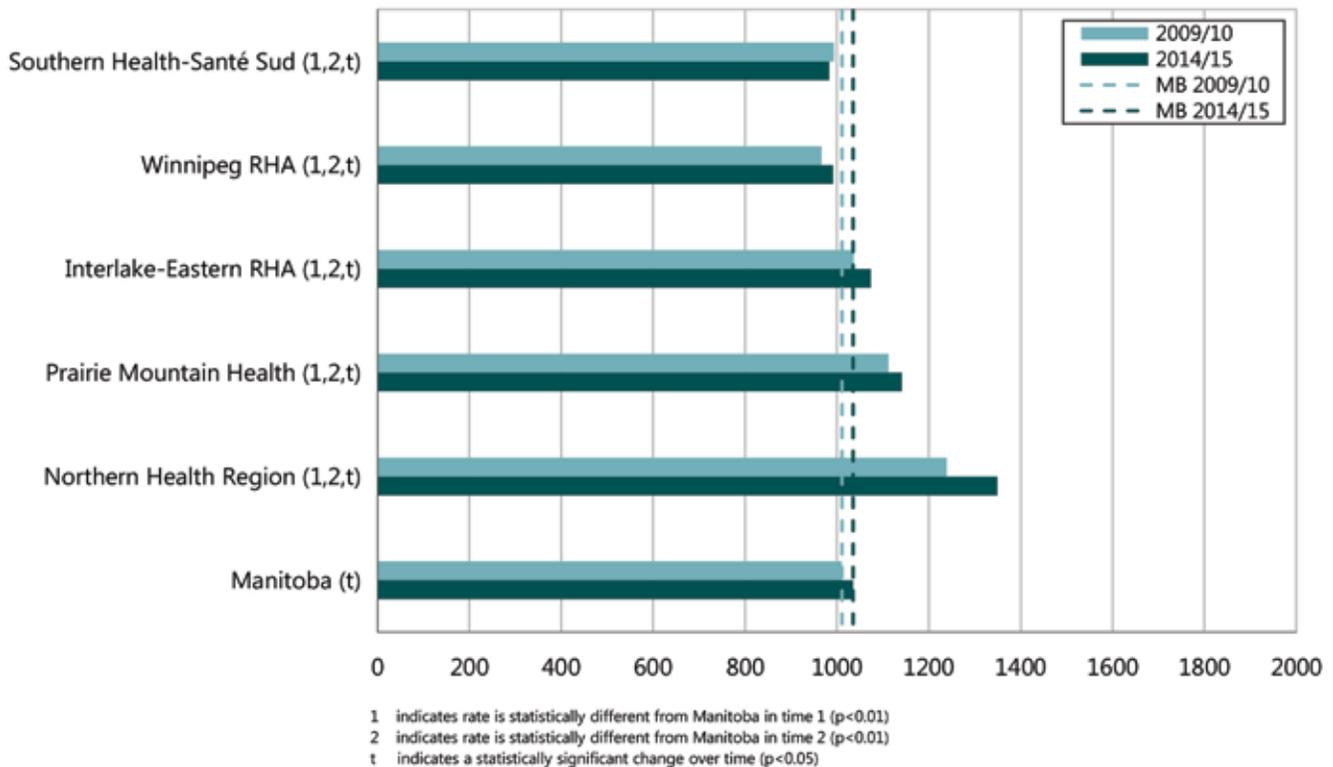
For this indicator, the total days' supply for all drugs that a person was dispensed were summed up for the year, and the average total days' supply per person was calculated for the last year in each study period (2009/10 and 2014/15). Because people could have used more than one drug in a year, and some drugs were taken every day, the total days' supply often exceeded 365. For example, if a person was

using an antidepressant and a cholesterol-lowering drug, the total days' supply in one year might be as high as 730, because each drug is taken every day for the whole year (i.e., 2 x 365 days).

The average total days' supply of prescription drugs increased with age, with about 1,000 days' supply of drugs dispensed to older adults age 65-74, 1300 days' supply to older adults age 75-84, and 1400 days' supply for older adults age 85+ (Figures 10.6 to 10.8). This means that, on average, a Manitoban who is 85 or older took about 4 pills a day (1400 divided by 365) every day in 2014/15. There was significant increase in total days' supply of prescription drugs for all age groups and regions from the first time period to the second time period. Although individuals were not actually taking a larger number of medications (see the section before this one), the total amount of medication dispensed increased. Income quintile was also strongly associated with the days' supply of prescription drugs, with lower income quintiles having a higher days' supply.

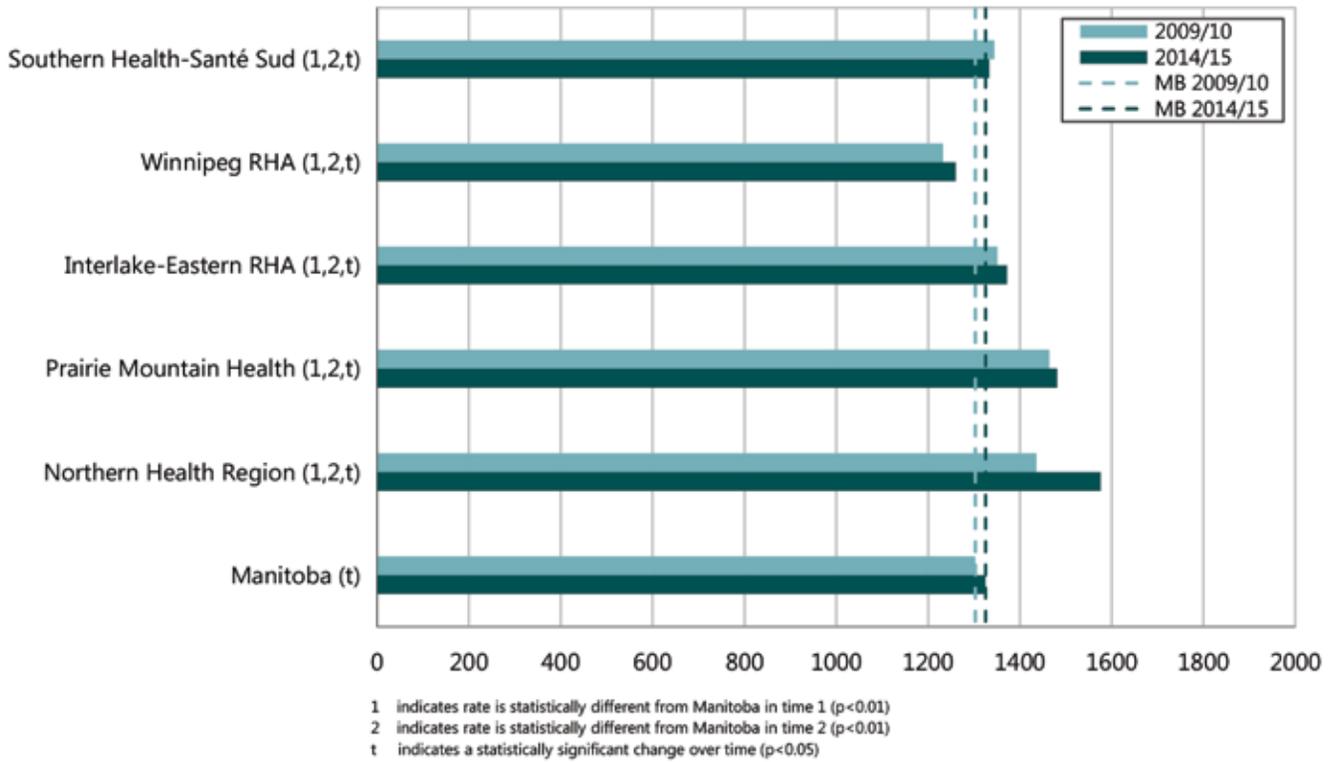
**Figure 10.6: Days' Supply of Prescription Drugs by Health Region, Age 65-74**

Crude rate for community-dwelling older adults per person-year



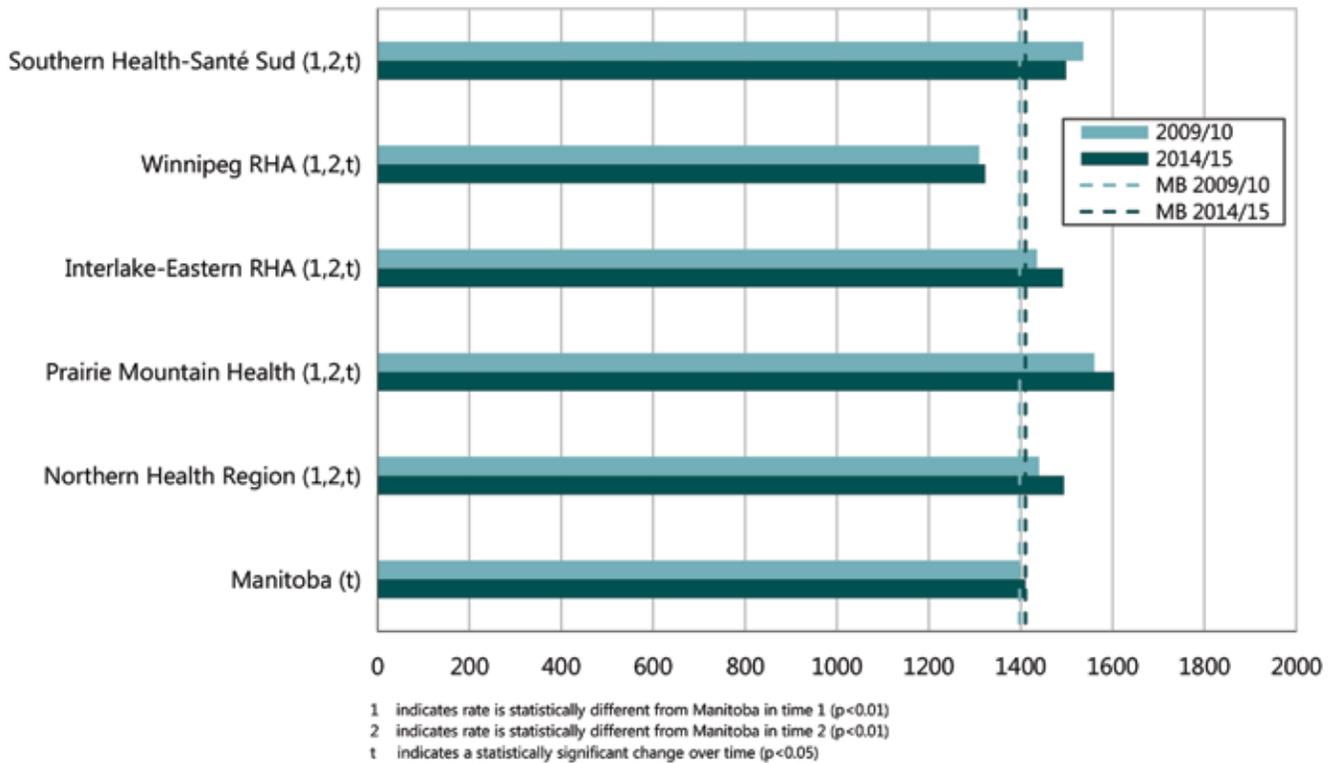
**Figure 10.7: Days' Supply of Prescription Drugs by Health Region, Age 75-84**

Crude rate for community-dwelling older adults per person-year



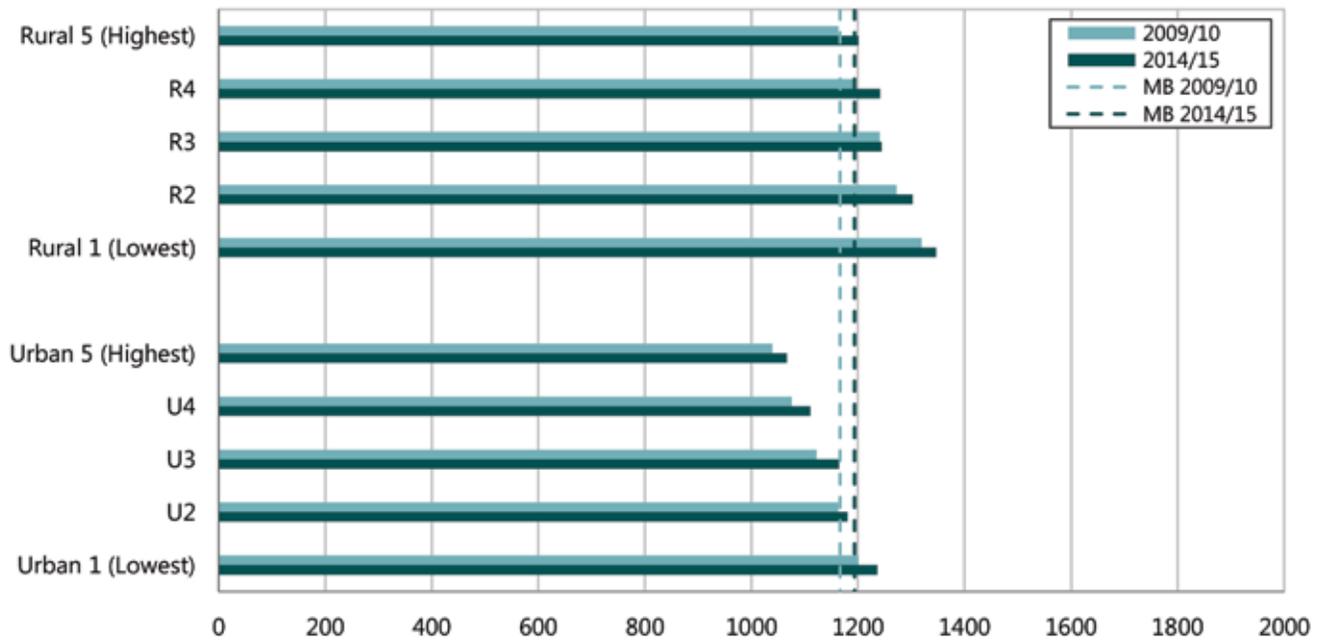
**Figure 10.8: Days' Supply of Prescription Drugs by Health Region, Age 85+**

Crude rate for community-dwelling older adults per person-year



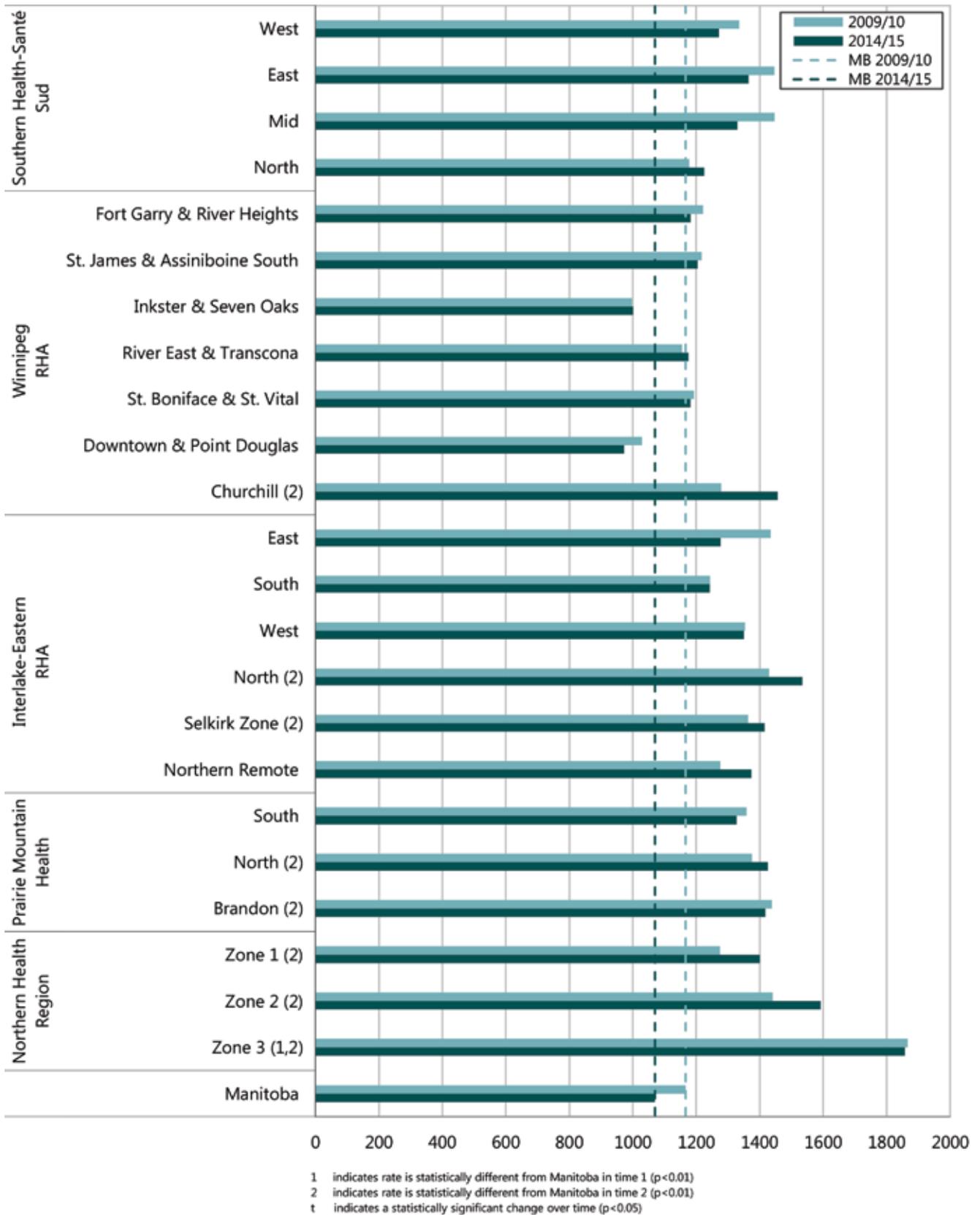
**Figure 10.9: Days' Supply of Prescription Drugs by Income Quintile**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



**Figure 10.10: Days' Supply of Prescription Drugs by Health Region Zone**

Age- and sex-adjusted rate for community-dwelling older adults per person-year



## Most Common Drugs Dispensed

We further examined the drugs being dispensed to older adults to identify which ones were the most commonly used, by total days' supply. For this analysis, drugs were grouped at the second level of the ATC system, such that, for example, all antidepressants (N06), all lipid lowering agents (C10), and all diabetes-related drugs (A10) were grouped together.

In Table 10.1, we present the total days' supply of different drugs for the entire older adult population in Manitoba, sorted by the most prescribed drugs in 2014. Most common were drugs used for hypertension or in the treatment of patients following a heart attack (C09), with a total days' supply over 26 million in 2014. The high prevalence of hypertension is likely the reason why this group of drugs was the most commonly dispensed class for older adults. The second most common class of drugs dispensed were ones used to reduce cholesterol (C10), with a total days'

supply over 23 million in 2014. The C09 and C10 classes of drugs were by far the most frequently dispensed prescription drugs for older adults in Manitoba.

The third most common class of drugs was to treat diabetes (A10), at around 15 million days supplied in 2014. Cardiac-related drugs made up the fourth, fifth and sixth most common classes of drugs being dispensed (C03, C07 and C08, respectively); these drugs are used to treat a variety of cardiac conditions (e.g., angina, coronary artery disease, arrhythmia, congestive heart failure, hypertension). Acid reducers (A02), thyroid replacement therapies (H03), and two classes of nervous system drugs (N06 and N05) made up the remaining most common drug classes. The N06 group includes anti-depressants, which had the largest increase from 2009; this corresponds with a significant increase in the rates of mood and anxiety disorders, which is reported in the next chapter. This class of drugs also includes anti-dementia drugs. The N05 class of nervous system drugs are commonly used for anxiety and sleep, and includes all benzodiazepines. This class also includes anti-psychotics, which have seen increasing use in Canada amongst older adults.

**Table 10.1: Ten Most Common Drugs by Days' Supplied for Community-Dwelling Older Adults Age 65+ in 2009/10 and 2014/15**

ATC 2 Drug Classification System	2009/10	2014/15
<b>C09.Agents Acting On The Renin-Angiotensin System</b>	22,802,513	26,199,253
<b>C10.Serum Lipid Reducing Agents</b>	18,492,042	23,616,956
<b>A10.Drugs Used In Diabetes</b>	11,673,693	15,604,933
<b>C03.Diuretics</b>	15,002,692	14,934,651
<b>C07.Beta Blocking Agents</b>	12,503,717	13,883,480
<b>C08.Calcium Channel Blockers</b>	11,665,032	13,489,790
<b>A02.Antacids, Drugs For Treatm.Of Pept.Ulc.And Flatul.</b>	10,228,543	13,054,172
<b>H03.Thyroid Therapy</b>	8,622,964	11,045,022
<b>N06.Psychoanaleptics</b>	7,777,014	10,072,014
<b>N05.Psycholeptics</b>	8,847,864	9,759,360

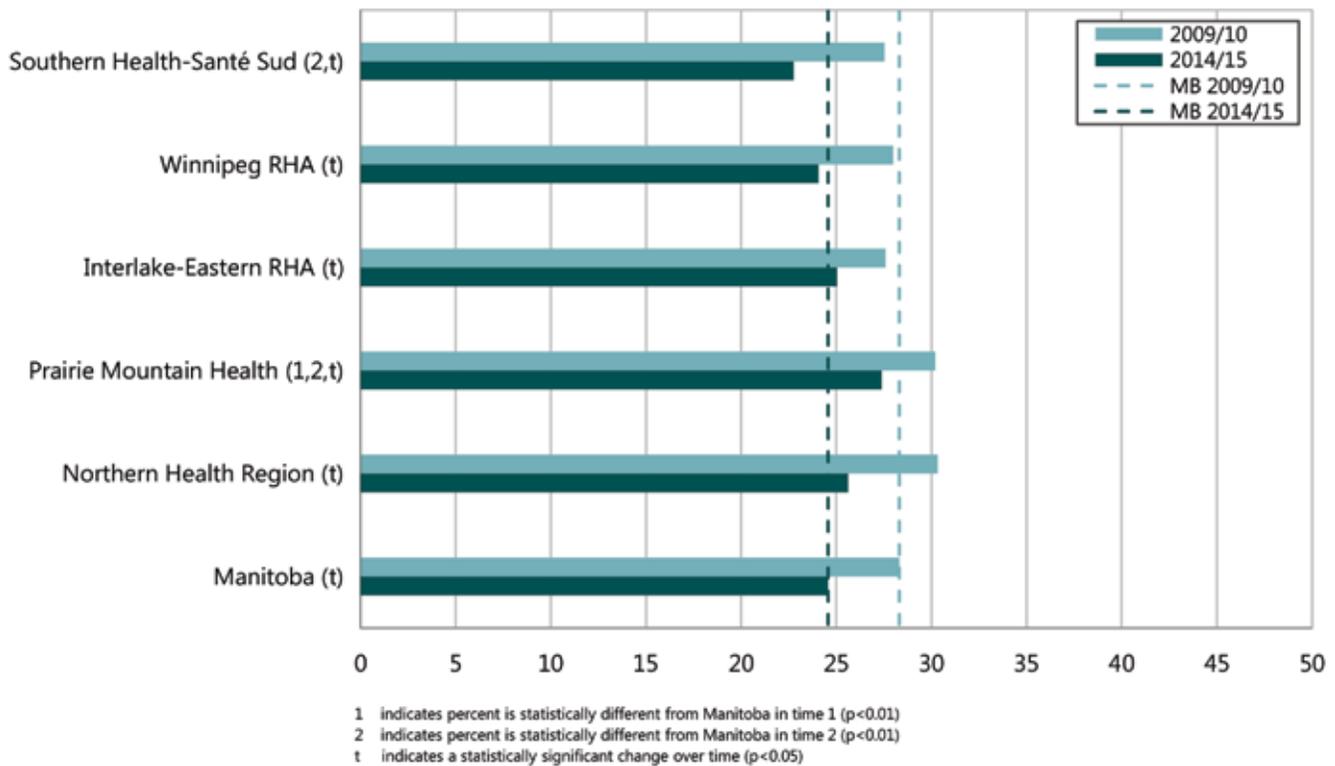
## Beers Drugs Dispensing Prevalence

Beers drugs are a group of drugs that have been found to be ineffective or increase the risk of an adverse event for older adults. Guidelines on what these drugs are, and the strength or dose that should be avoided, have been used to create indicators that assess quality of prescribing amongst primary care providers [6]. An example of a class of Beers drugs is benzodiazepines, which can act as sedatives and increase the risk of falls amongst older adults. For this indicator, we calculated the proportion of older adults in our study population that had been dispensed at least one Beers drug using a single year of data from each time period (2009/10 and 2014/15). It is important to note that there may be circumstances in which some Beers drugs are appropriate, so we would not expect the prevalence of Beers drugs prescribing to be zero for the population.

For all age groups and in all regions of the province, there was a significant decline in the percentage of the older adult population that had been prescribed a Beers drug (Figures 10.11 to 10.13). The prevalence did not differ much by age, being almost identical for the younger age groups, and just a little lower for the 85+ age group. Across regions, Beers drug prescribing was consistently significantly higher in Prairie Mountain Health than the Manitoba average, while Winnipeg tended to be lower than the Manitoba average, indicating there is still room for improvement in some areas of the province. The relationship between Beers drug prescribing and income quintile also suggests that providers in Manitoba could be doing more to ensure the older adult population is not put at risk with potentially inappropriate medications. There was a strong association between income and the percentage of the population with at least one Beers drug dispensation, with lower income associated with a higher percentage, for both time periods and in both rural and urban areas (Figure 10.14).

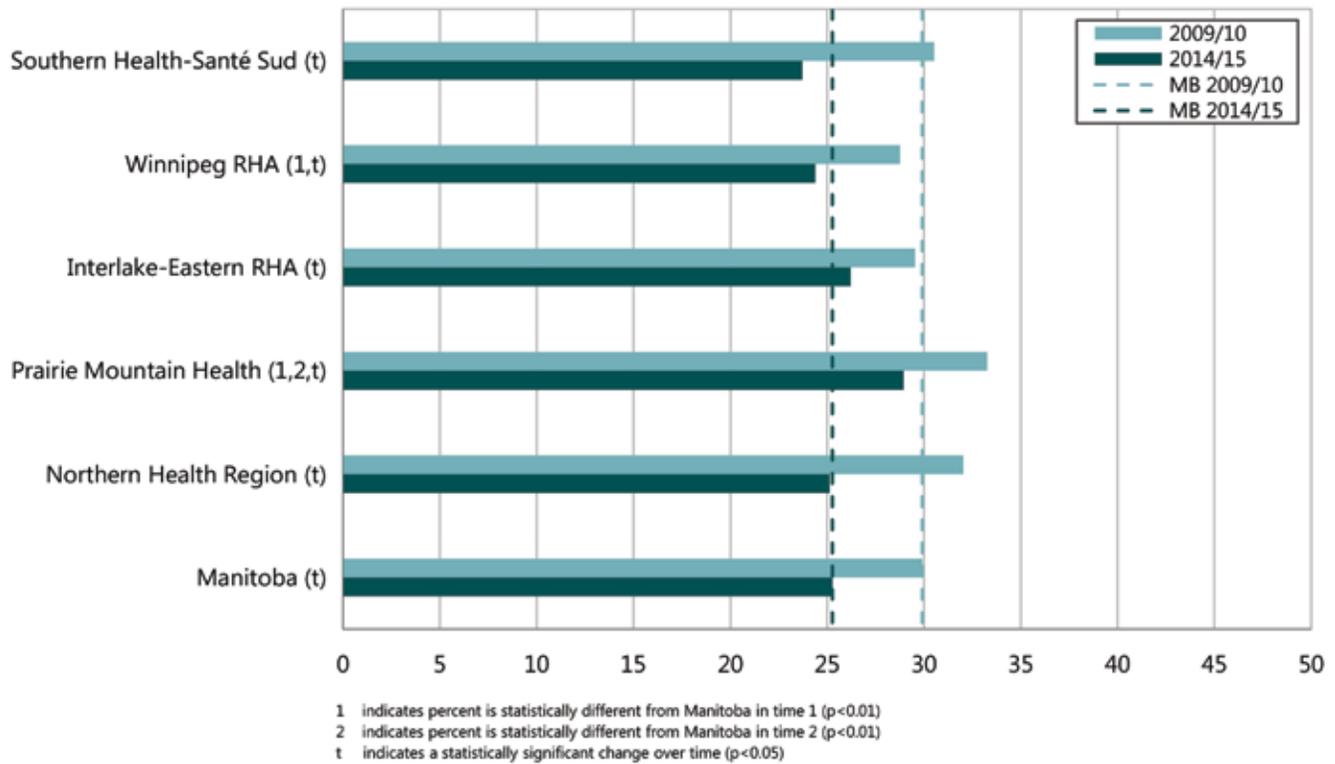
**Figure 10.11: Beers Drugs Dispensing Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



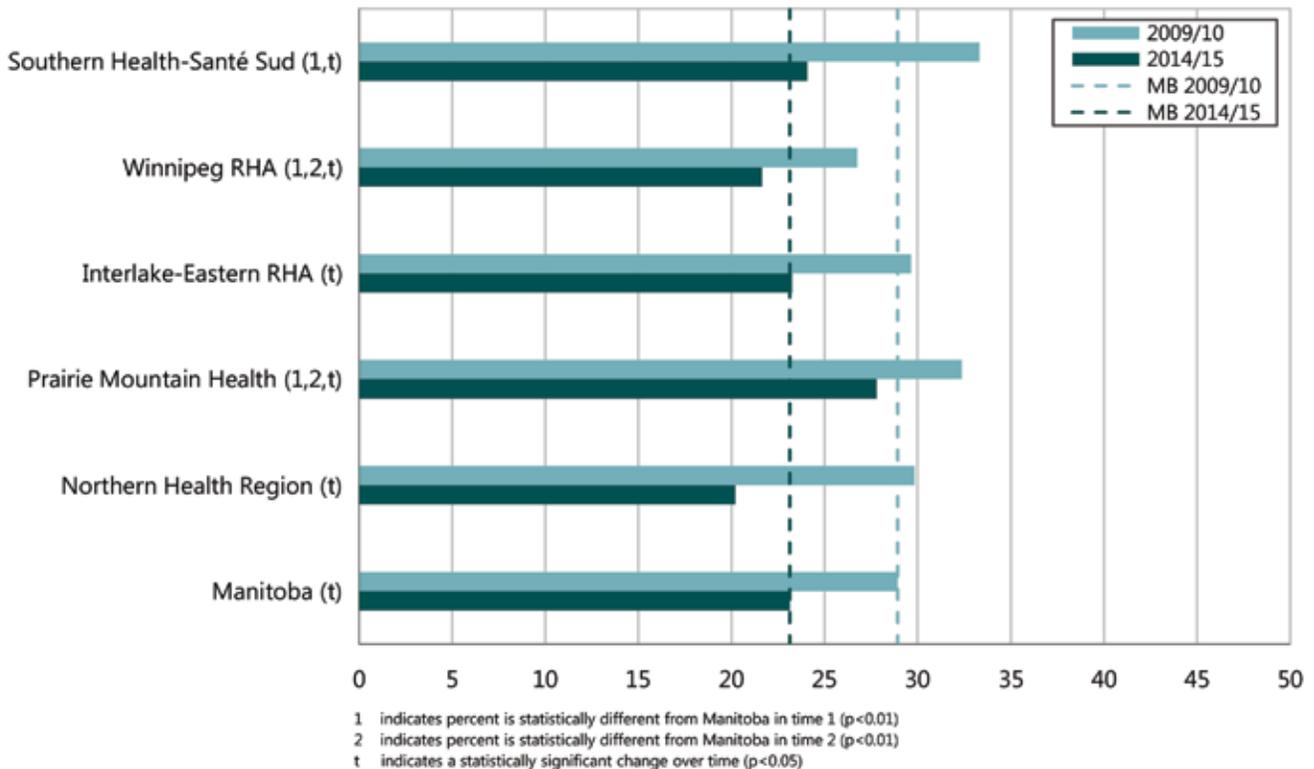
**Figure 10.12: Beers Drugs Dispensing Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



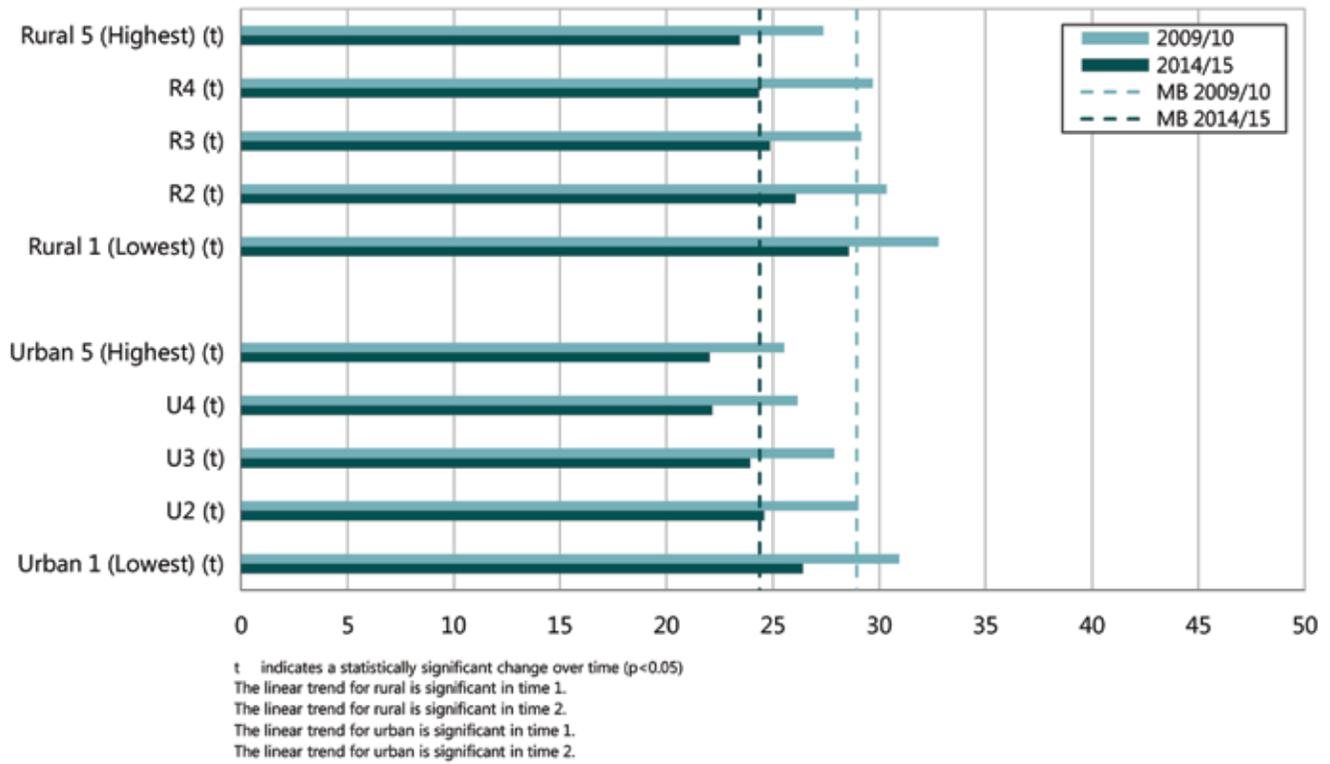
**Figure 10.13: Beers Drugs Dispensing Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



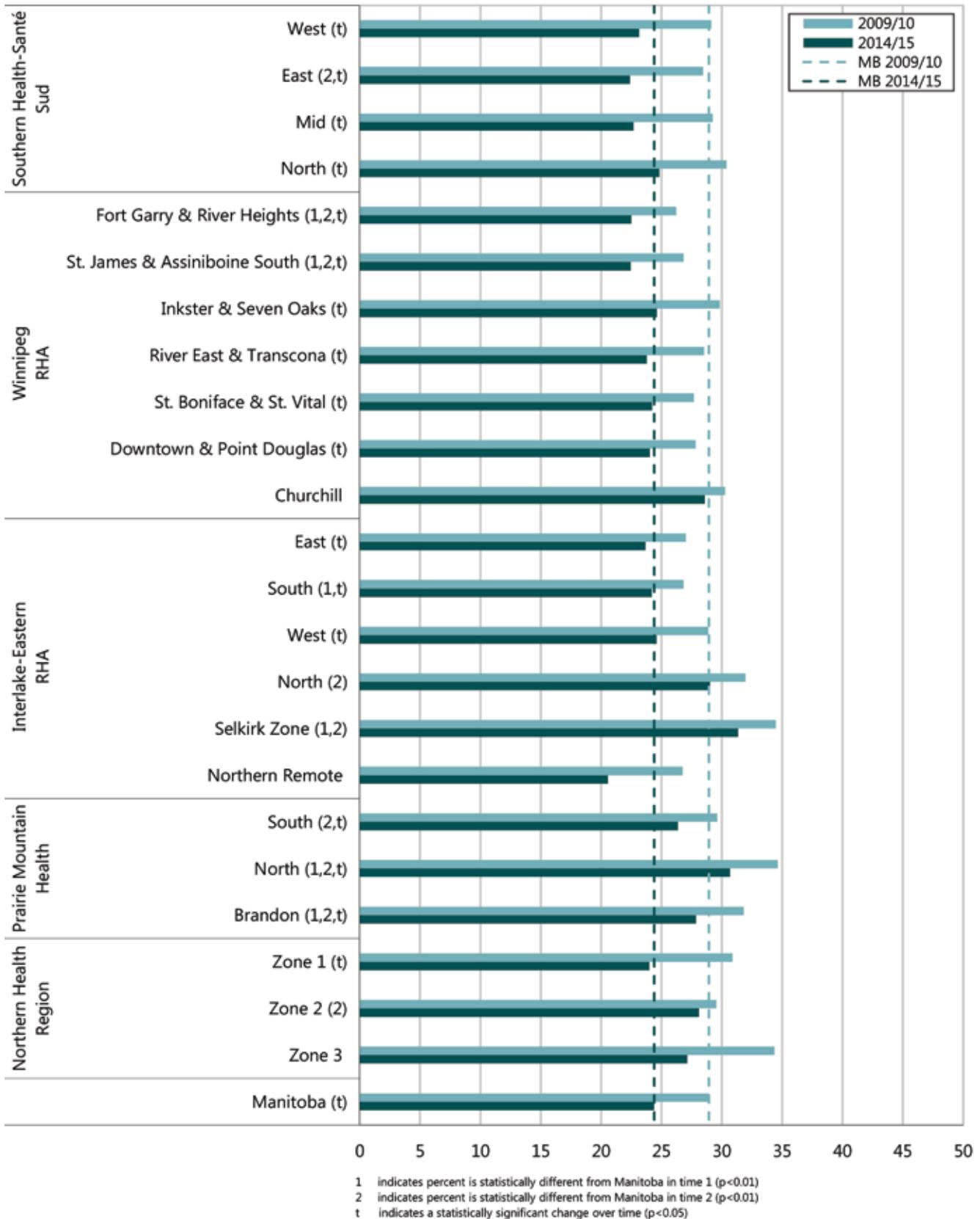
**Figure 10.14: Beers Drugs Dispensing Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 10.15: Beers Drugs Dispensing Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Long-Acting Benzodiazepine Drug Dispensing Prevalence

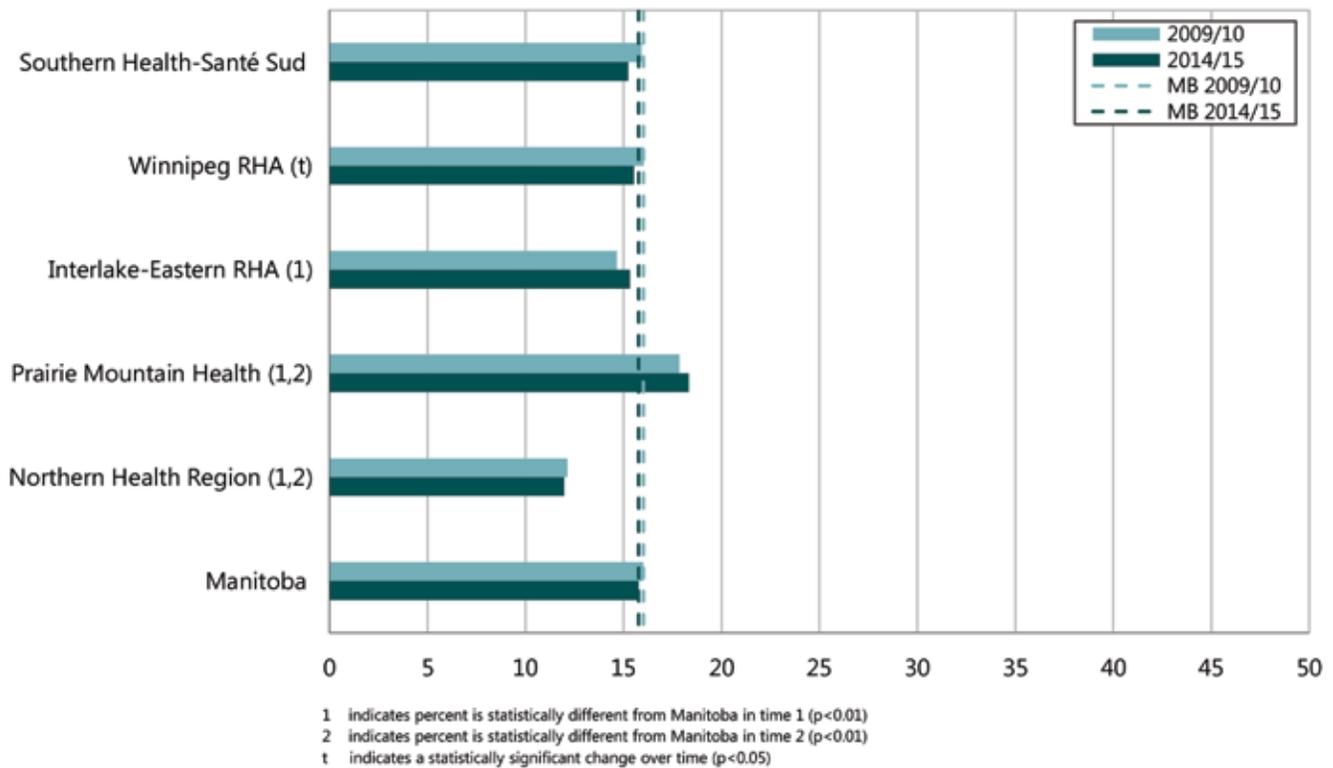
Long-acting benzodiazepines are a class of drug that pose a particular risk to older adults. An example of a benzodiazepine is diazepam (Valium). These drugs are commonly prescribed for anxiety or insomnia, and while they are very effective, they are also addictive and known to increase the risk of falls among older adults. While benzodiazepines are one of the Beers drugs, which are flagged as being potentially inappropriate for older adults, they are important to examine on their own because of how commonly they are prescribed.

For this indicator, the percentage of older adults who had at least two dispensations for benzodiazepines, or one dispensation of at least a 30-day supply of pills, was

calculated for the last year of each time period. The results differed from those for the Beers drug prescriptions indicator, despite the fact that benzodiazepines are one of the Beers drugs. Here, the percentage of the population dispensed a long-acting benzodiazepine increased with age, and although there was a significant decrease over time for the older age groups, there was no decrease for the youngest age group (Figure 10.16). Even in the populations where there was a significant decrease overall, it was not found in all regions of Manitoba. Although the decrease in Beers drugs is a good news story, there is considerable room for improvement when it comes to prescribing long-acting benzodiazepines to older adults. As well, the regional variation was much greater with benzodiazepines than with all Beers drugs combined. For example, the percentage of older adults in Northern Health Region who received a long-acting benzodiazepine was significantly lower than the provincial average for all age groups (Figures 10.16 to 10.18).

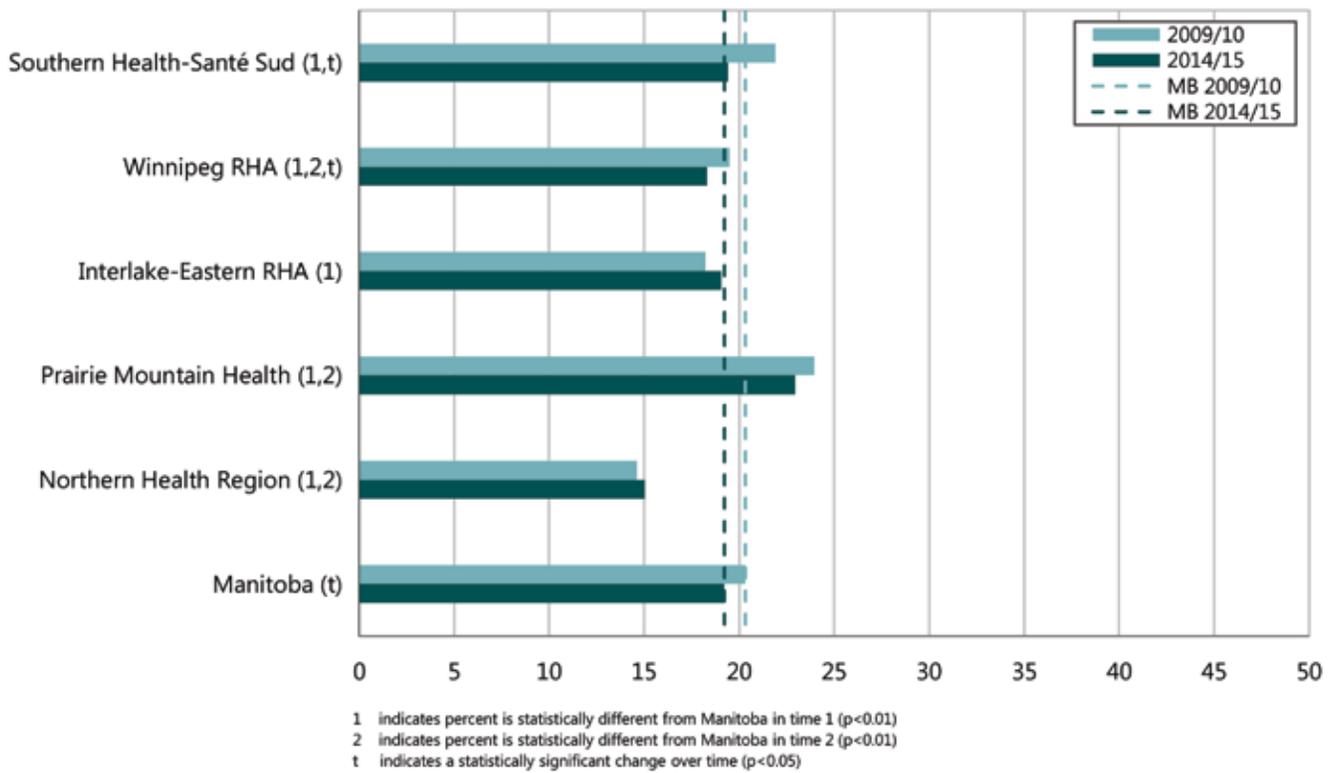
**Figure 10.16: Long-Acting Benzodiazepine Drug Dispensing Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



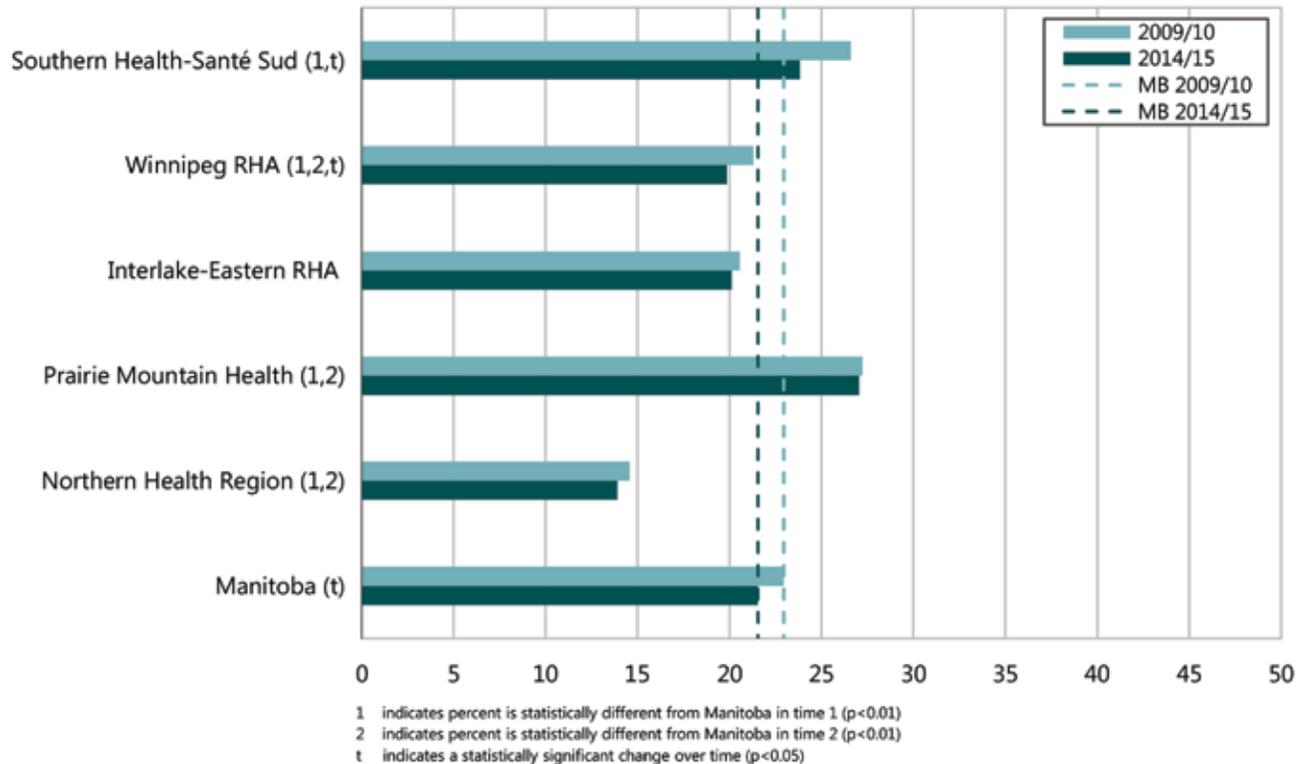
**Figure 10.17: Long-Acting Benzodiazepine Drug Dispensing Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



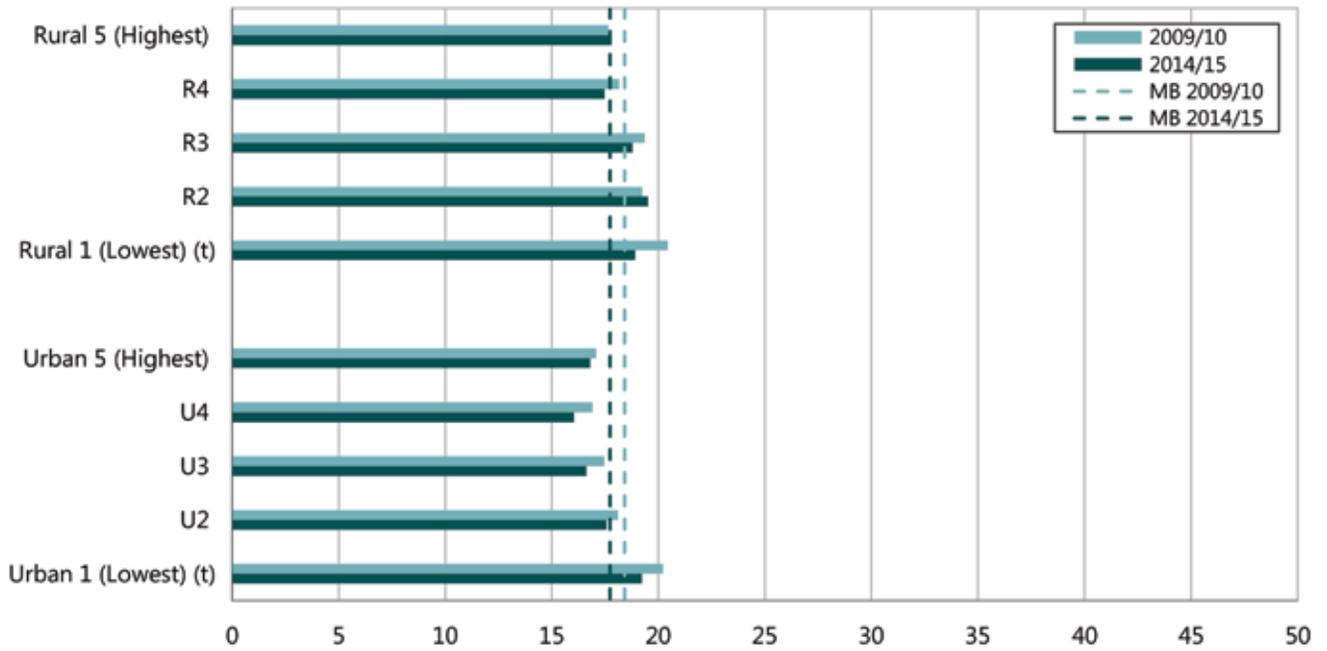
**Figure 10.18: Long-Acting Benzodiazepine Drug Dispensing Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



**Figure 10.19: Long-Acting Benzodiazepine Drug Dispensing Prevalence by Income Quintile**

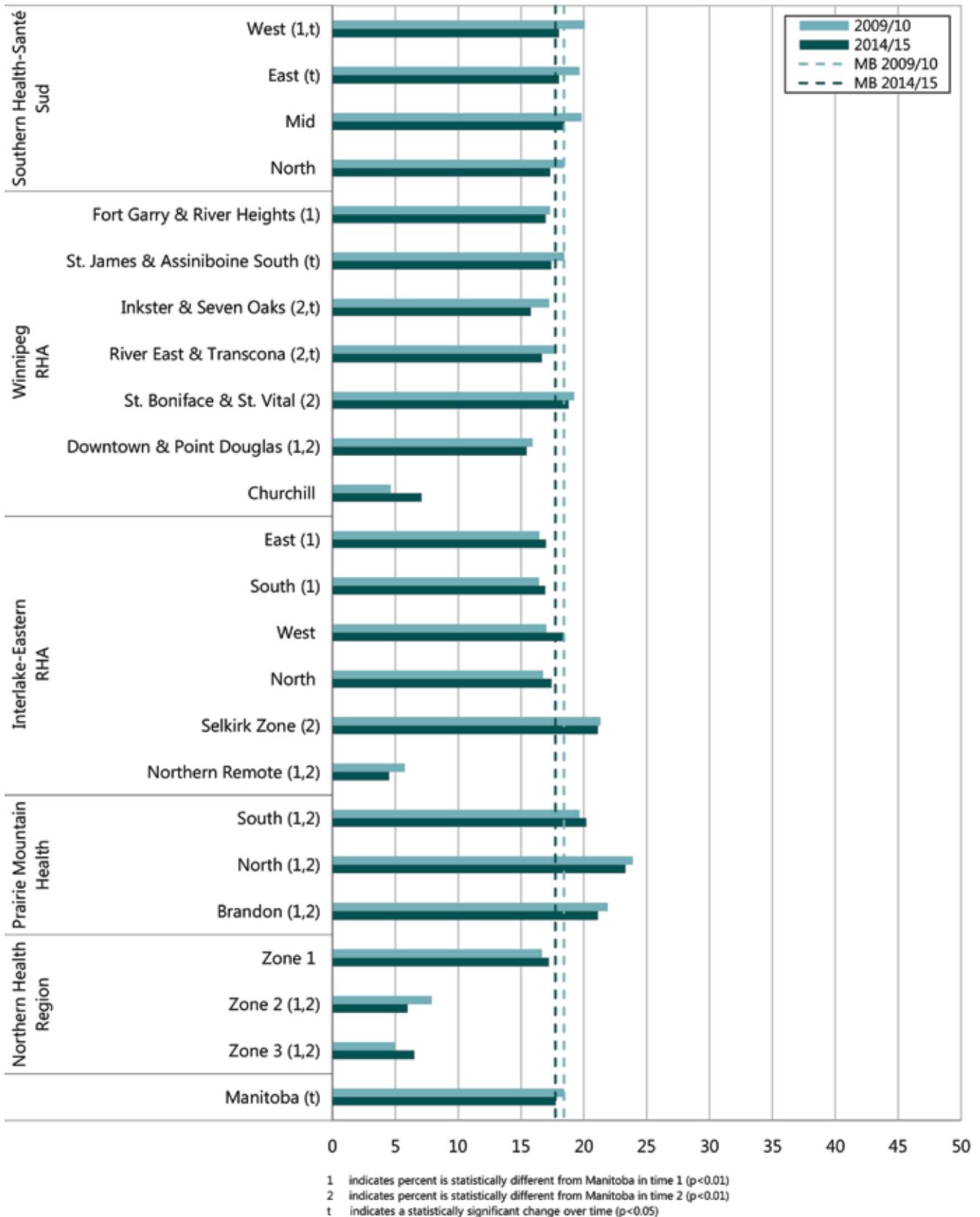
Age- and sex-adjusted percent of community-dwelling older adults



t indicates a statistically significant change over time (p<0.05)  
 The linear trend for rural is significant in time 1.  
 The linear trend for rural is significant in time 2.  
 The linear trend for urban is significant in time 1.  
 The linear trend for urban is significant in time 2.

**Figure 10.20: Long-Acting Benzodiazepine Drug Dispensing Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults





# Chapter 11: Prevention & Screening

Although much of the healthcare system is focused on addressing acute needs of patients who are sick or experiencing symptoms that require investigation and/or treatment, another aspect of healthcare is preventing disease from happening in the first place by identifying and addressing risks early on. A number of indicators have been developed or used at MCHP to measure prevalence of prevention and screening efforts in the Manitoba population. They comprise two main areas of prevention and screening: 1) vaccinations for prevention of influenza (flu) and pneumococcal infections (a leading cause of pneumonia), and 2) screening efforts to identify early stage colon and breast cancers.

## Key Findings

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- The two older age groups had higher rates of flu and pneumococcal vaccinations, which is a positive finding. However, both influenza and pneumococcal vaccination rates declined significantly during the study period.
- Screening rates for breast and colon cancer increased significantly during the study period, suggesting that the screening programs were effectively reaching the older adult population.

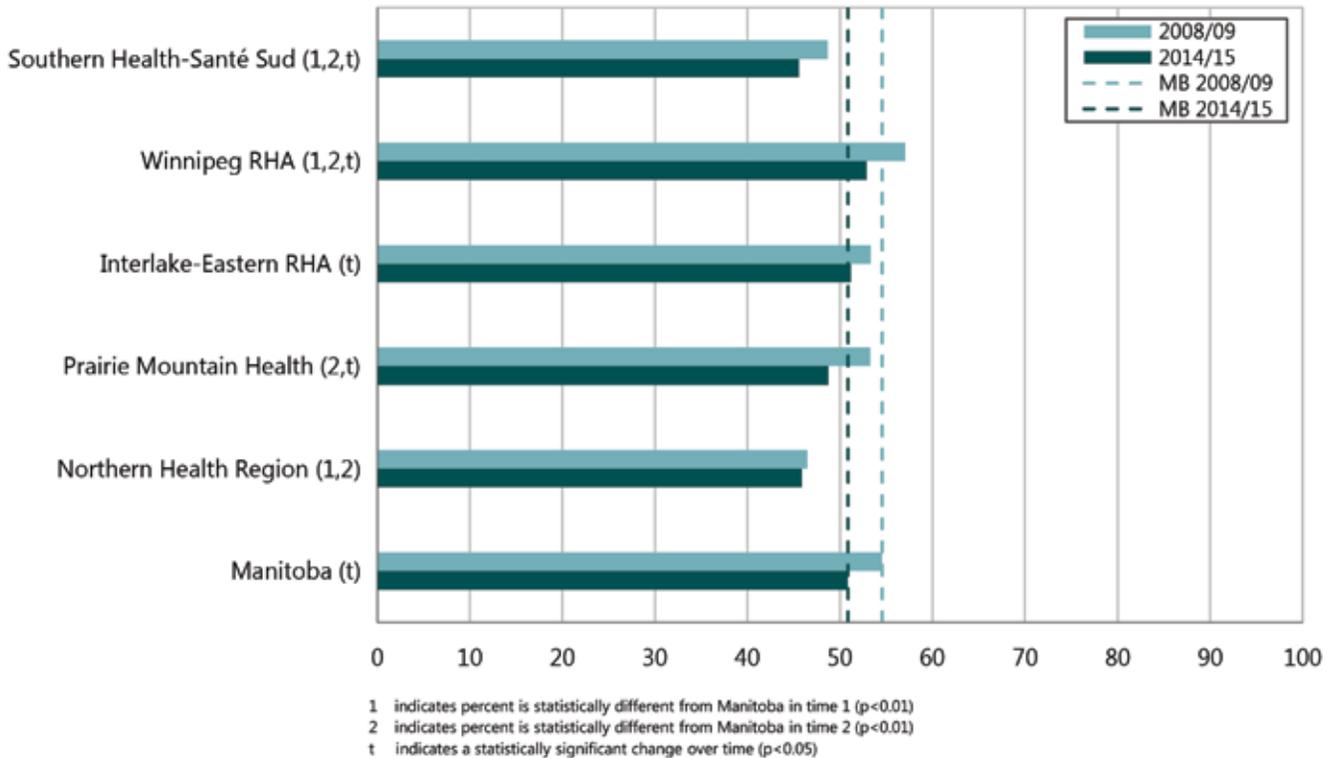
## Influenza Vaccination Prevalence

Manitoba Health, Seniors and Active Living (MHSAL) currently provides free-of-charge seasonal influenza vaccines (i.e., flu vaccines) to all Manitobans above the age of six months. MHSAL also notes that receiving the flu vaccine is “especially important for those at increased risk of serious illness,” [7] and specifically identifies people age 65+ as part of that group of individuals who are at risk. In other words, MHSAL recognizes the benefit of getting the flu vaccine for the entire older adult population in Manitoba.

For this indicator, we calculated the influenza vaccination prevalence for the last year of each time period in the study (2008/09 and 2014/15).

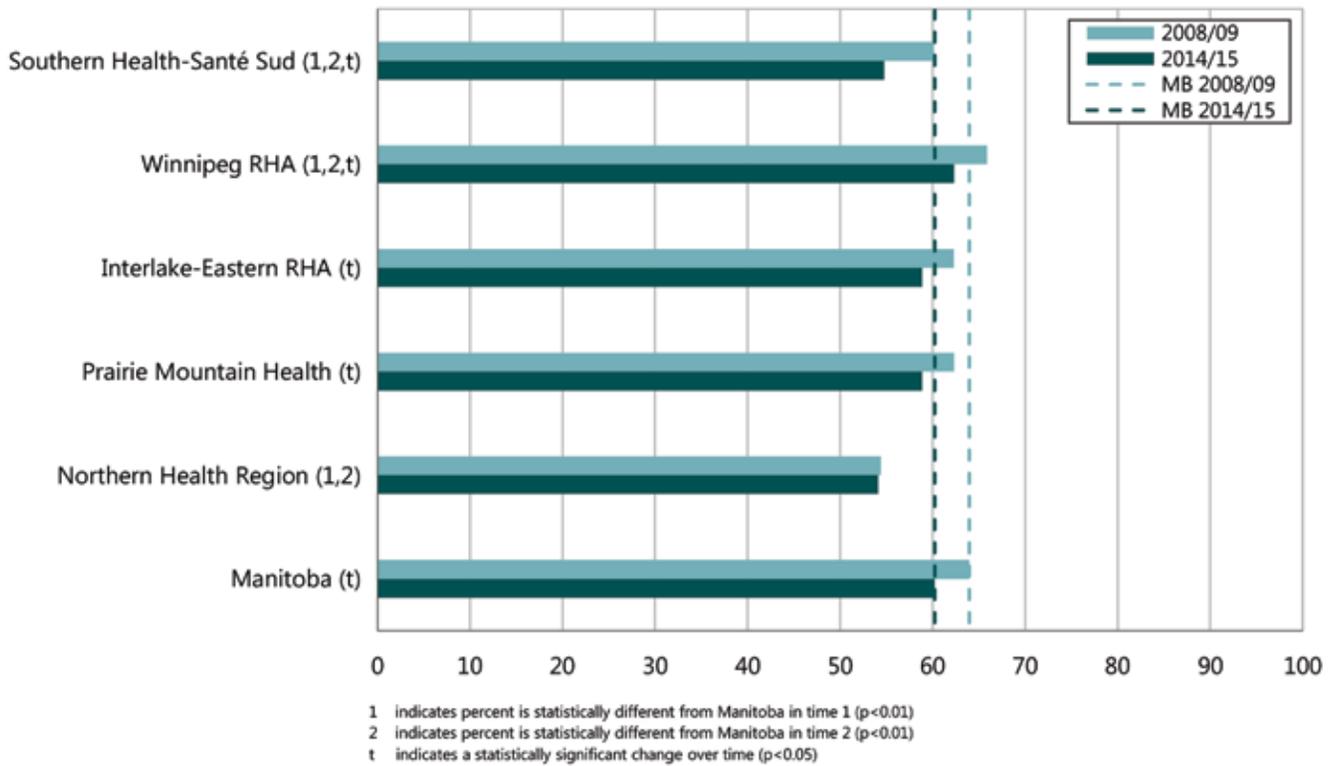
Much of the older adult population did not receive the flu vaccine (Figures 11.1 to 11.3). Only about half of the youngest age group was vaccinated in the more recent time period. The two older age groups had a higher vaccination rate than the younger age group in both time periods by about ten percent. All age groups experienced a significant decline in vaccination from one time period to the next. This pattern is fairly consistent across the province, in all regions except Northern Health Region and Southern Health-Santé Sud, which already had low flu vaccination prevalence. Finally, we noted a consistent and statistically significant relationship between flu vaccinations and income quintile, with higher income areas having higher percentages of older adults who were vaccinated, and the percentage decreasing as income decreased (Figure 11.14).

**Figure 11.1: Influenza Vaccination Prevalence by Health Region, Age 65-74**  
Percent of community-dwelling older adults



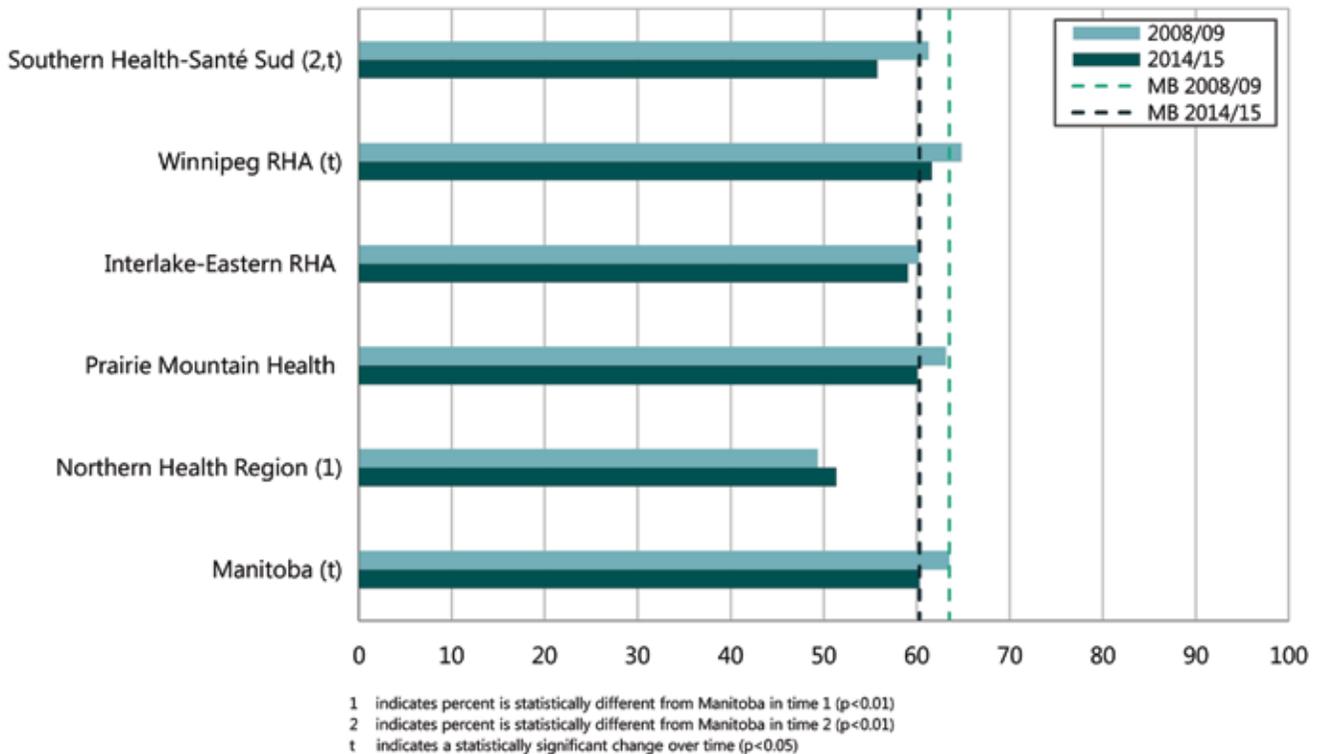
**Figure 11.2: Influenza Vaccination Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



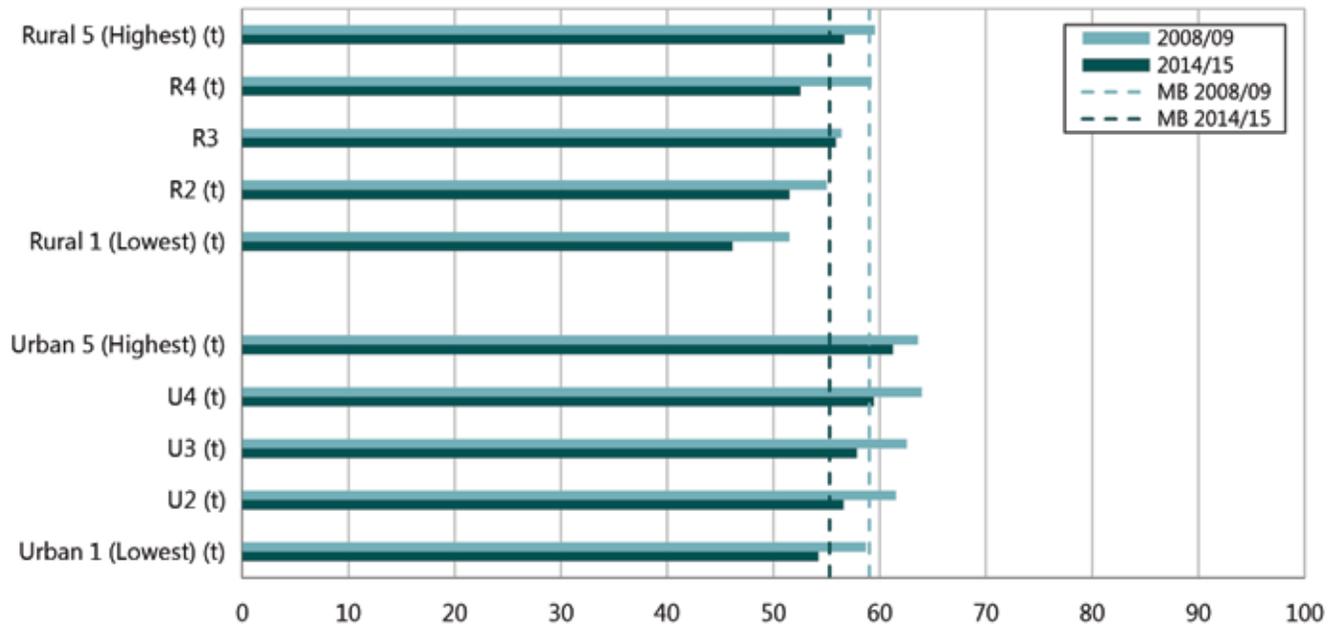
**Figure 11.3: Influenza Vaccination Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



**Figure 11.4: Influenza Vaccination Prevalence by Income Quintile**

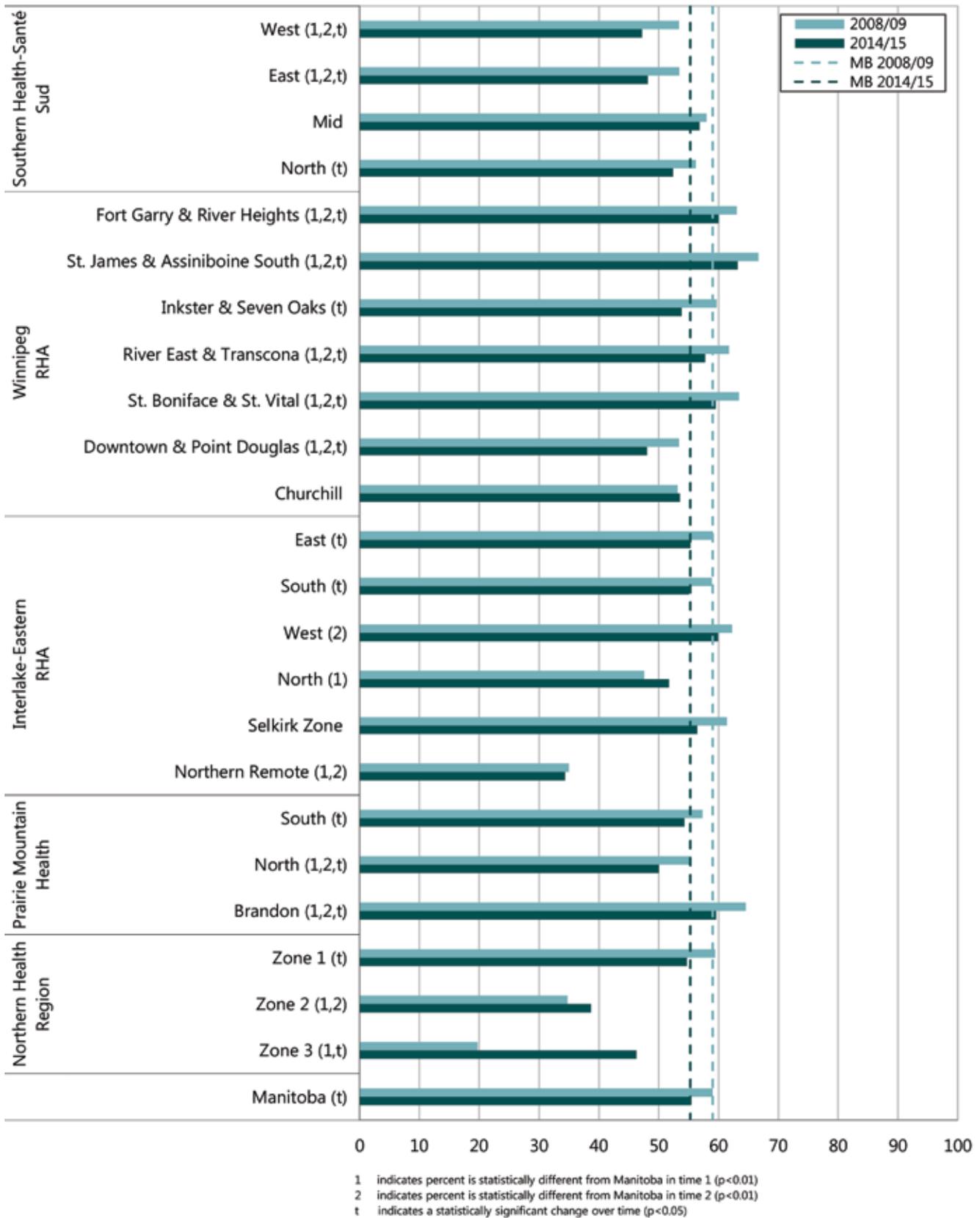
Age- and sex-adjusted percent of community-dwelling older adults



t indicates a statistically significant change over time (p<0.05)  
 The linear trend for rural is significant in time 1.  
 The linear trend for rural is significant in time 2.  
 The linear trend for urban is significant in time 1.  
 The linear trend for urban is significant in time 2.

**Figure 11.5: Influenza Vaccination Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Pneumococcal Vaccination Prevalence

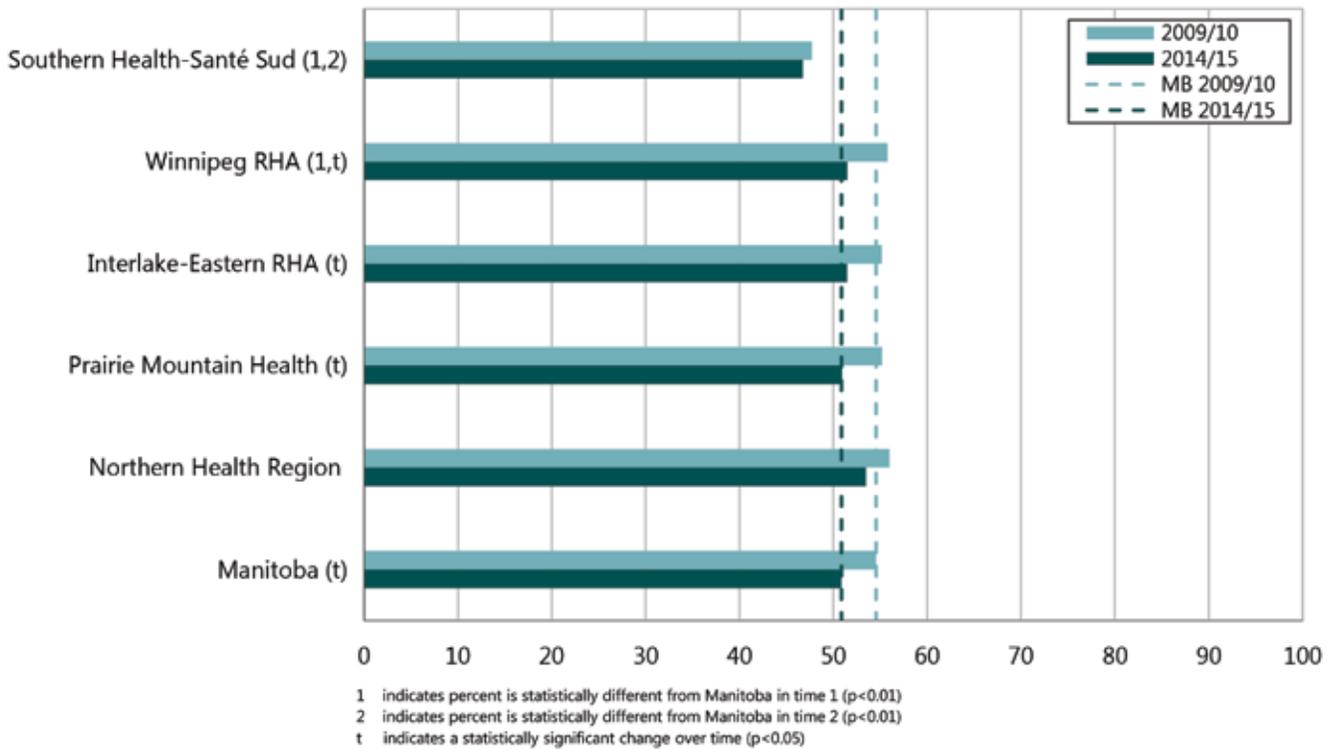
Pneumococcal infections are a leading cause of pneumonia, and while pneumonia is a dangerous condition for any individual, it is a particular risk for individuals with comorbidities. The older adult population is more likely to have comorbidities, and so pneumococcal vaccination is an important preventive measure recommended for all older adults. A pneumococcal vaccination is not done yearly, like influenza vaccination, but instead is considered a “once in a lifetime” event. Thus, we defined this indicator as the percentage of older adults age 65+ who ever had a pneumococcal vaccination up to the end of each time

period. These percentages were calculated for the last year of each time period (2009/10 and 2014/15).

The percentage of older adults who had been vaccinated for pneumococcus was around 50% for the younger age group, and around 75% for the older age groups (Figures 11.6 to 11.8). The regions had similar rates for this indicator, except for Southern Health-Santé Sud, which had consistently lower pneumococcal vaccination rates. Northern Health Region was not different from the rest of the province. There was no relationship between pneumococcal vaccination and income quintile for older adults living in urban areas. For rural areas, higher income areas had higher percentages of older adults who had been vaccinated in both time periods (Figure 11.9).

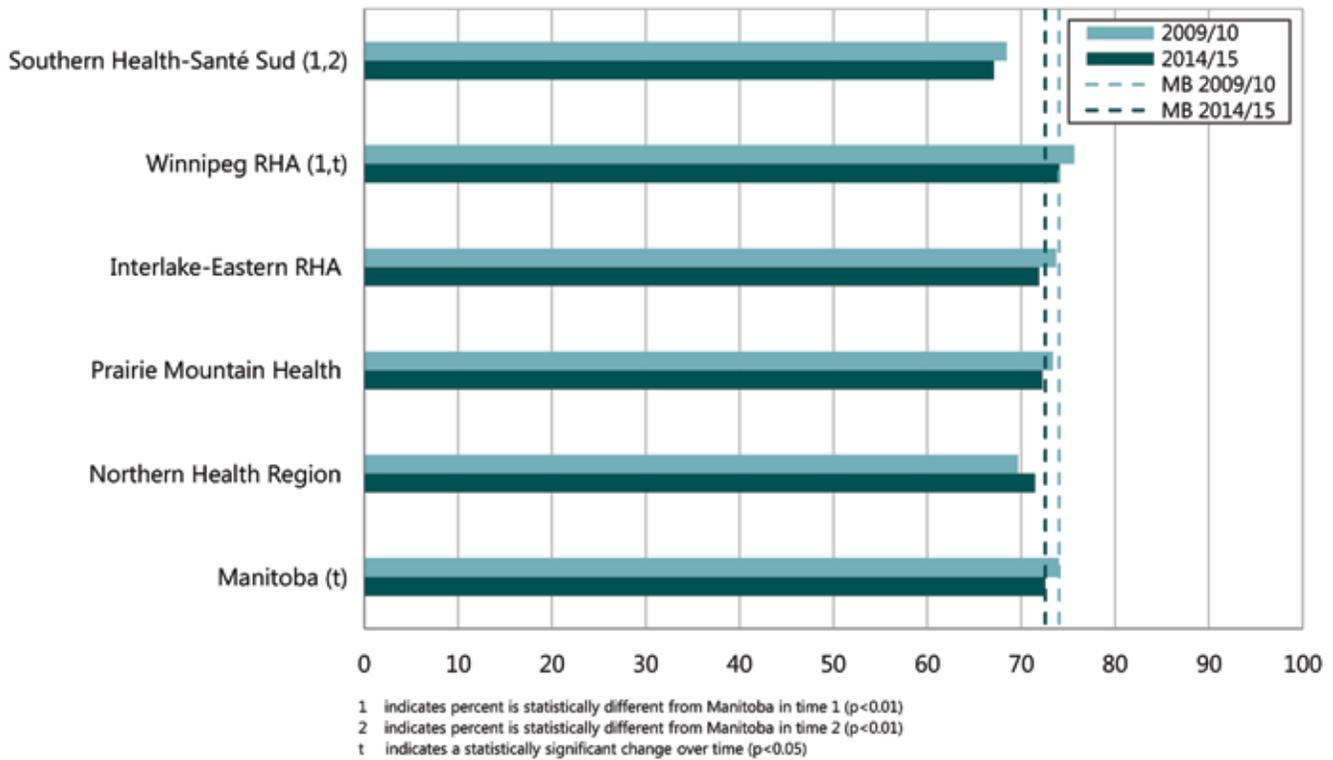
**Figure 11.6: Pneumococcal Vaccination Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older adults



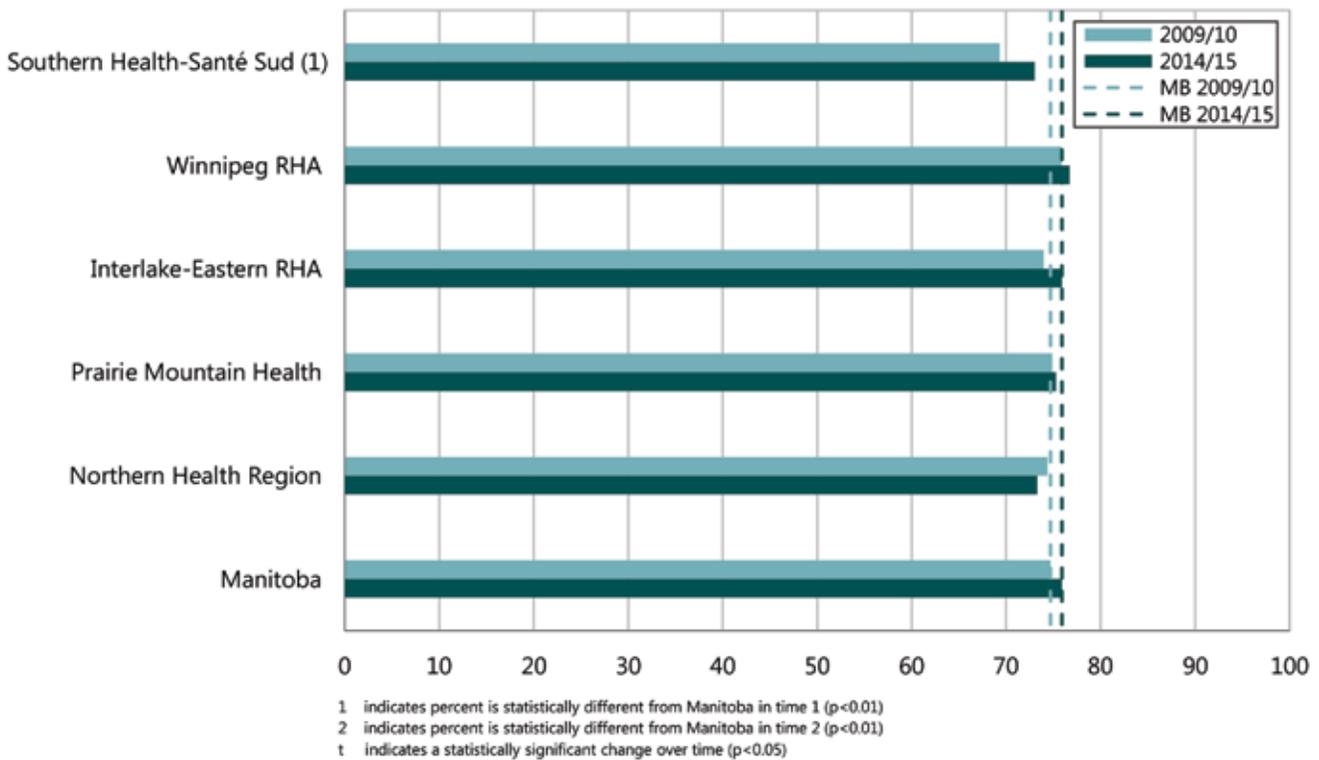
**Figure 11.7: Pneumococcal Vaccination Prevalence by Health Region, Age 75-84**

Percent of community-dwelling older adults



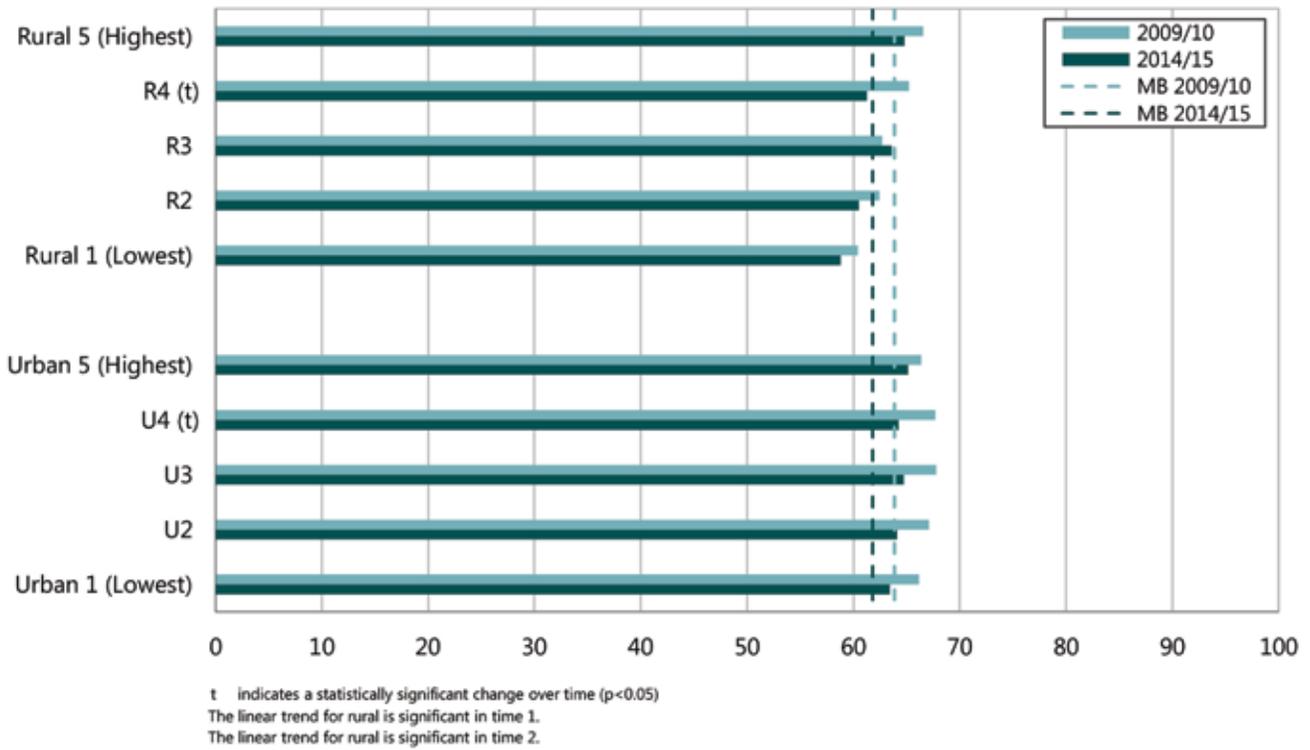
**Figure 11.8: Pneumococcal Vaccination Prevalence by Health Region, Age 85+**

Percent of community-dwelling older adults



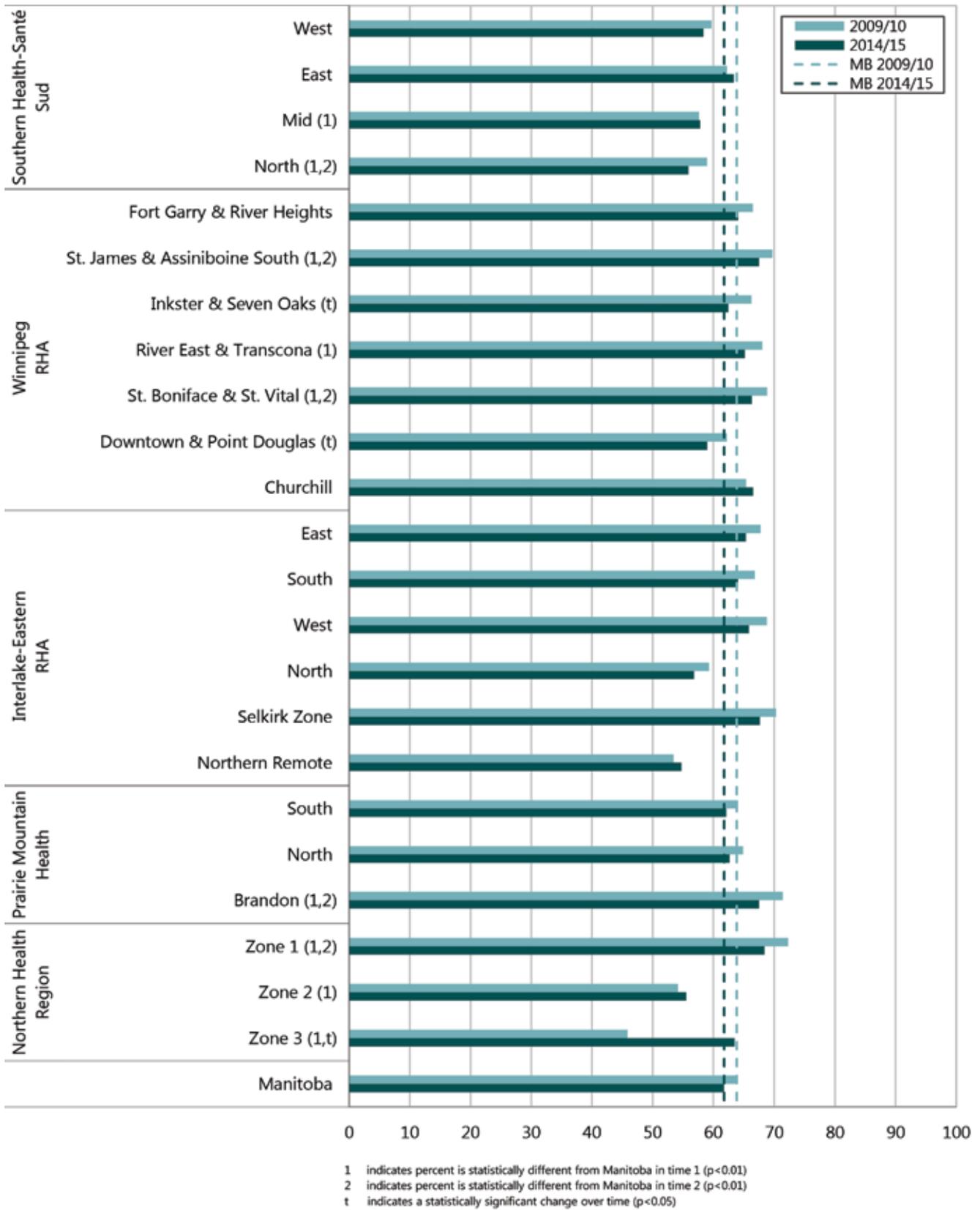
**Figure 11.9: Pneumococcal Vaccination Prevalence by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 11.10: Pneumococcal Vaccination Prevalence by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



## Breast Cancer Screening Prevalence

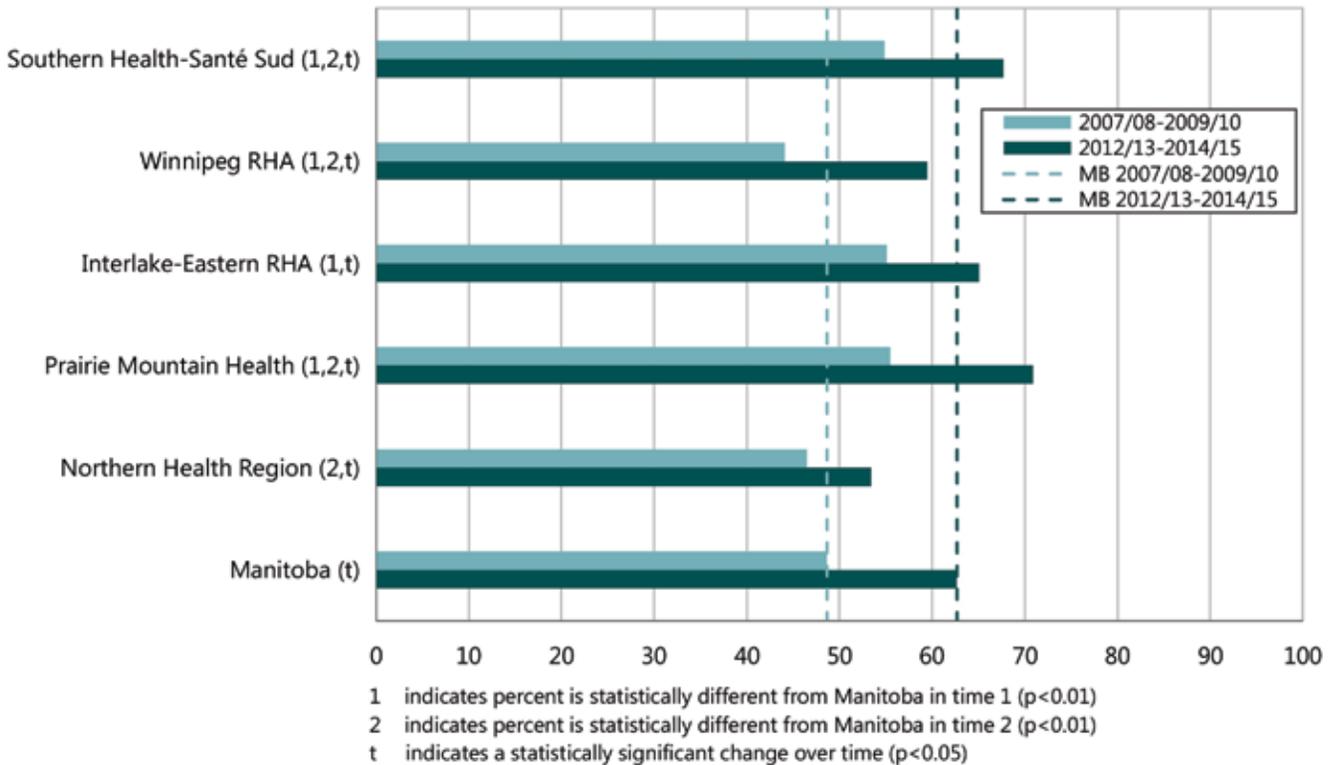
CancerCare Manitoba currently runs a breast cancer screening program for women age 50-74. The expectation is that a women would be screened once every two years, and positive results would be followed up with diagnostic testing to confirm the results. Early detection through screening is expected to lead to better treatment options and better chance of a cure. The screening program is intended for women without symptoms or a history of cancer, and so anyone with a prior history of breast cancer is excluded from this indicator. Also important to note here is that the age recommendation for the screening program changed during the study period. In the first time period, the recommendation was for women age 50-69. Because the program stops at age 74, we present results only for our youngest age group. Also, because there could be some variation in the exact time that a screen might be repeated, we used data from a three-year period (2007/08-2009/10 and 2012/13-2014/15). To adhere to CancerCare Manitoba's

recommendation, every woman should have had at least one mammogram in the three-year time period.

The results clearly show the change in the program to include women age 70-74 (Figure 11.11). The screening prevalence was just less than 50% in the first time period, where the entire group of women age 70-74 would not have been part of the program. In the second time period, the percentage of women who were screened was over 60%. For a universal screening program, there are also some considerable differences between the regions. Winnipeg RHA and Northern Health Region both had screening rates significantly lower than the provincial average, while the other regions had significantly higher rates in one or both time periods. There is also a strong and consistent relationship between breast cancer screening and income (Figure 11.12). The women living in higher income areas had similar screening prevalence across urban and rural regions. However, in the more recent time period, the low income urban areas had the lowest percentage of women screened in the province, and the low income areas rural areas had the second lowest. The regional differences may have more to do with income disparities than geographical differences.

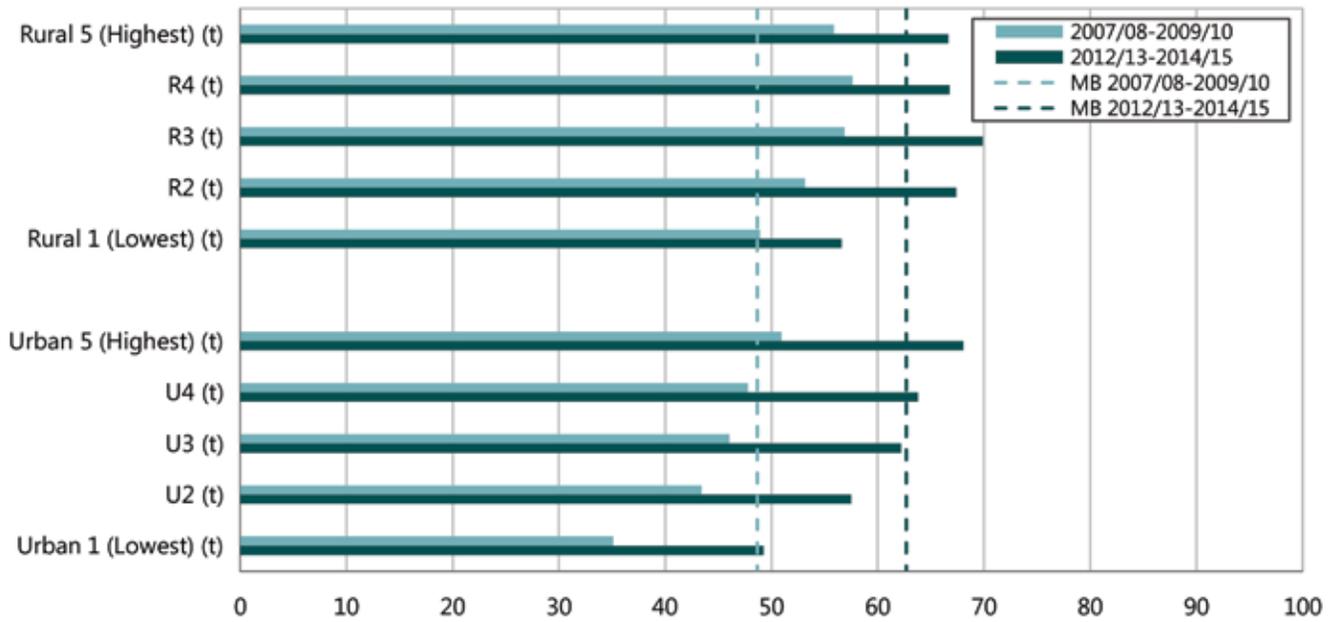
**Figure 11.11: Breast Cancer Screening Prevalence by Health Region, Age 65-74**

Percent of community-dwelling older women



**Figure 11.12: Breast Cancer Screening Prevalence by Income Quintile, Age 65-74**

Percent of community-dwelling older women



t indicates a statistically significant change over time (p<0.05)

The linear trend for rural is significant in time 1.

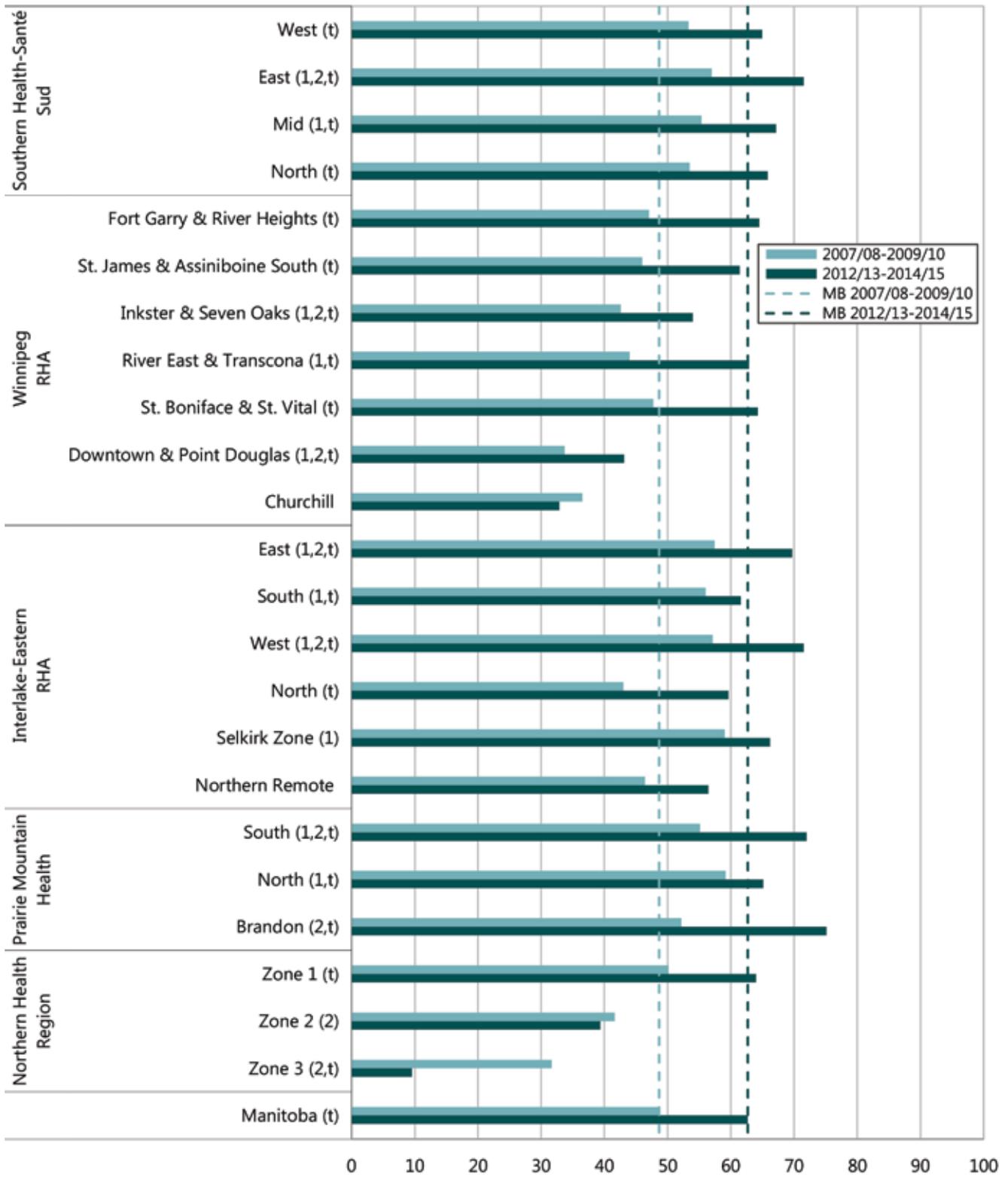
The linear trend for rural is significant in time 2.

The linear trend for urban is significant in time 1.

The linear trend for urban is significant in time 2.

**Figure 11.13: Breast Cancer Screening Prevalence by Health Region Zone, Age 65-74**

Percent of community-dwelling older women



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)

## Colorectal Cancer Screening Prevalence

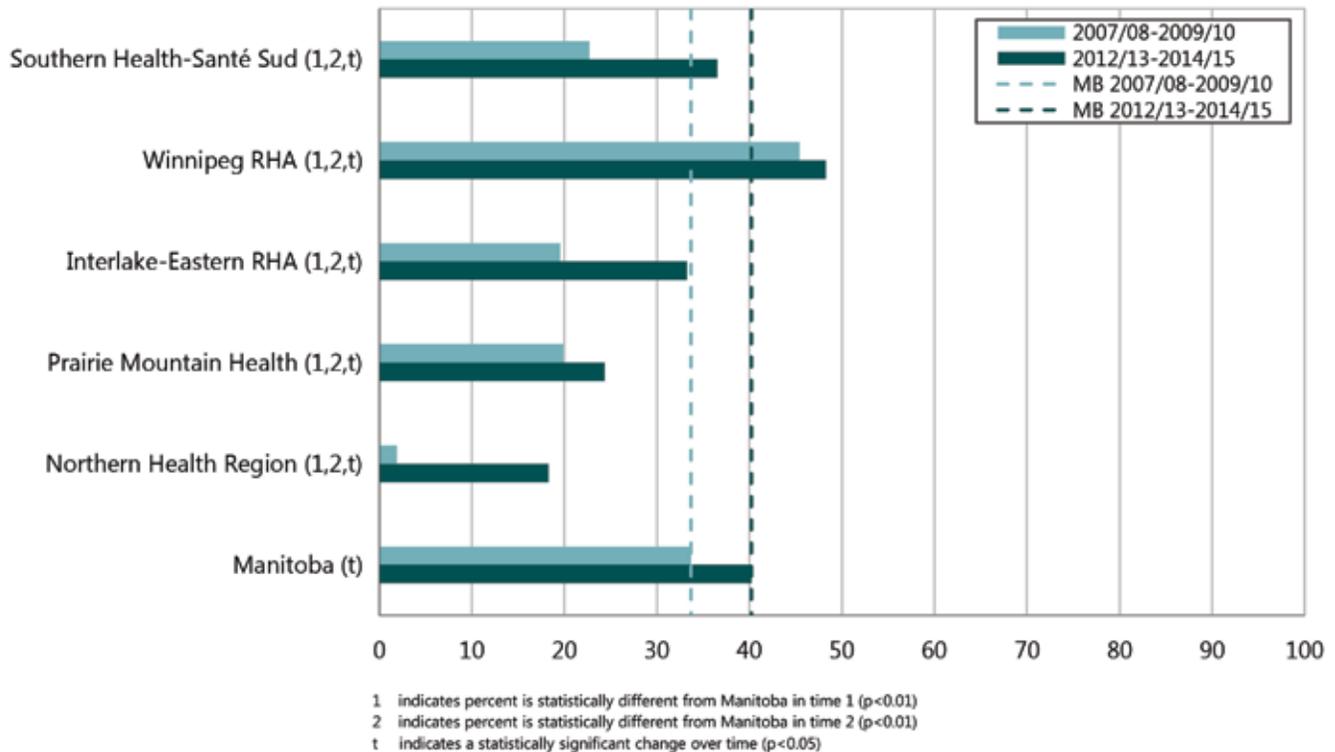
CancerCare Manitoba runs a provincial screening program for colorectal cancer. The program uses the Fecal Occult Blood Test (FOBT) to identify potential cancer cases for follow-up diagnostic testing, such as a colonoscopy. The recommendation is that individuals age 50-74 perform an FOBT every 2 years. To identify screening events, we used data from the screening program, from Diagnostic Services Manitoba (where the tests are processed), and from physician claims. Care was also taken to exclude individuals for whom the test was not for screening, but rather due to a presentation of symptoms that were being investigated. The screening program did not initially cover the entire

province but was rolled out gradually. Over the course of the study period, then, as the program was expanded to encompass more areas of the province, we would expect to see an increase in rates from one time period to the next.

In every area of the province, there was a significant increase in the percentage of older adults who completed an FOBT test, with larger prevalence in the Interlake-Eastern RHA and Southern Health-Santé Sud (Figure 11.14). Winnipeg had the smallest increase, but still had the highest percentage of older adults who completed an FOBT in both time periods. Overall for Manitoba, the percentage of older adults who completed an FOBT increased from about 33% to about 40%. We observed a strong relationship between FOBT screening and income in urban and rural areas in both time periods; higher income areas had higher percentages of older adults who had completed an FOBT (Figure 11.15).

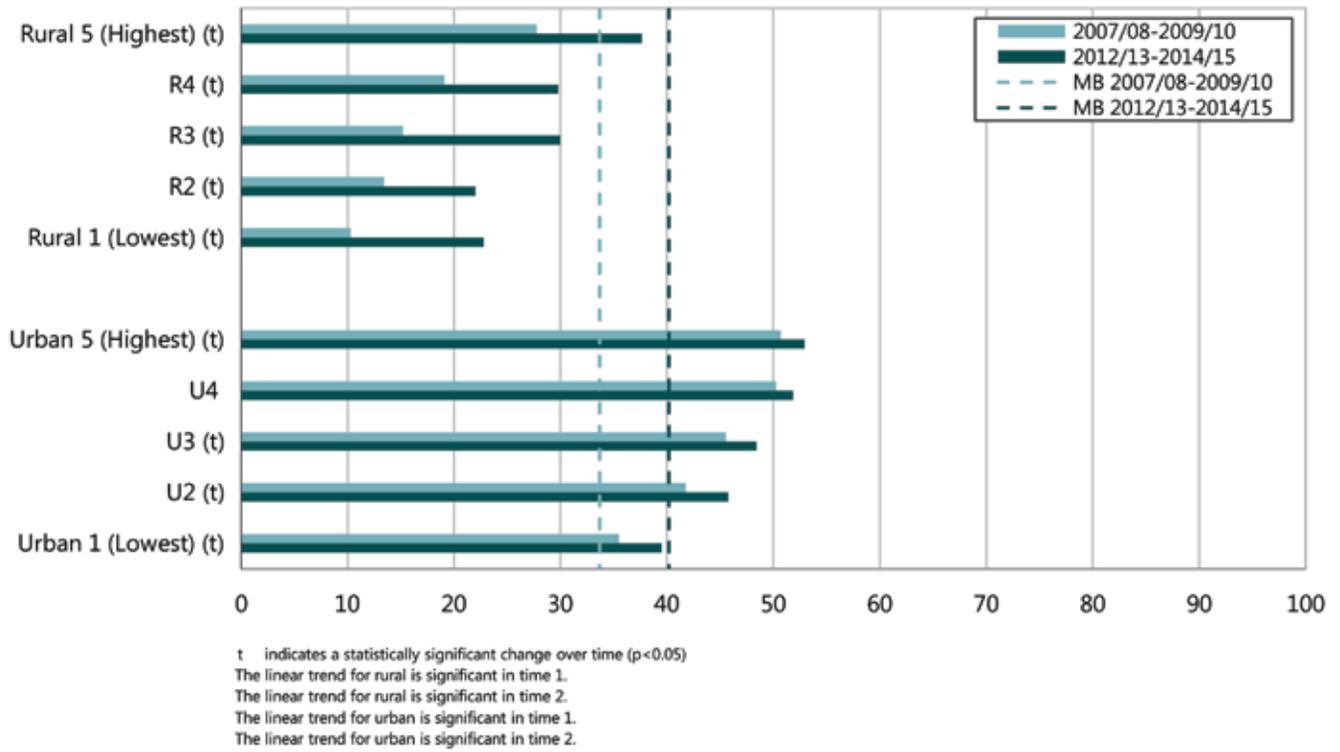
**Figure 11.14: Colorectal Cancer Screening Prevalence by Health Region, Age 65-74**

Crude percent of community-dwelling older people



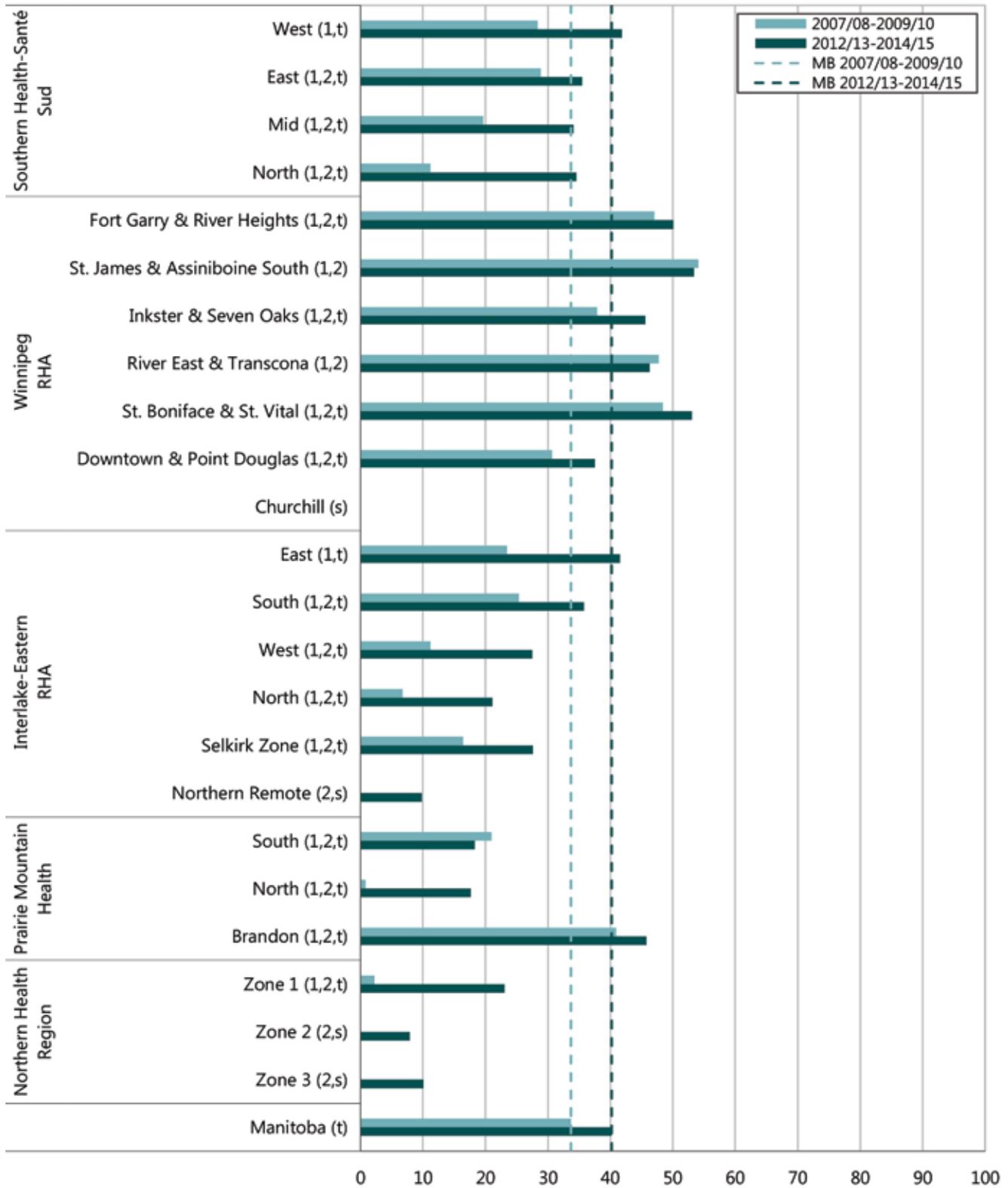
**Figure 11.15: Colorectal Cancer Screening Prevalence by Income Quintile, Age 65-74**

Percent of community-dwelling older people



**Figure 11.16: Colorectal Cancer Screening Prevalence by Health Region Zone, Age 65-74**

Percent of community-dwelling older people



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)



# Chapter 12: Self-Reported Health Status

In this section, we report on a number of indicators taken from questions posed to Manitobans as part of the Canadian Community Health Survey (CCHS), a national survey of health. This ongoing effort by Statistics Canada to gather information on the health of Canadians samples a randomly chosen group of individuals from each of the RHAs to represent the full population of the RHA. In order to make the results of analyses representative of the entire population, Statistics Canada applies a set of weights to each of the respondents, so that they represent a small group of individuals that are similar in terms of their age, their sex, and where they live.

Although the CCHS provides rich data collected directly from residents of Manitoba, there are some limitations in using CCHS data. The surveys do not include any residents of First Nations communities (though Indigenous people living in other areas can be selected). As well, because the data are collected via interview, the answers are subject to personal bias and recall error. In order to provide reliable results for these indicators, analyses in this chapter combined information from multiple waves of the CCHS within each of our study periods (see Appendix Table 2.1 for specific waves used). For most indicators in this chapter, we include the exact wording of the question(s) asked of participants in the survey, or a brief description of an index or indicator that was created by combining several questions from the survey.

## Key Findings

- Self-rated health significantly improved for the oldest age group, with the percentage of people rating their health as 'very good' or 'excellent' increasing from 24.5% in the first time period to 36.0% in the second time period.
- The impact of chronic conditions on daily life decreased, with a lower percentage of respondents in the oldest age group indicating that chronic conditions frequently affected their activities (58.5% in first time period to 47.9% in second time period).
- There was a significant decline in the percentage of people who were classified in the highest category of cognition. Self-rated cognition decreased from 55% to 41% for the oldest age group, and from 64% to 53% in the 75-84 age group.

## Self-Perceived Health

How an individual feels about their own health may be very different from how their health is assessed using administrative health data. People tend to perceive their health status relative to their peers, rather than in an absolute sense. Good health at the age of thirty can be different from good health at the age of eighty. This perception of health was analyzed for this report using data from the CCHS.

For this indicator, the CCHS asked respondents:

*“In general, would you say your health is excellent, very good, good, fair, or poor?”*

Other possible responses included ‘don’t know,’ ‘refusal’ or ‘not stated,’ but we did not include these responses in our

analyses. In Table 12.1, we present the weighted proportion of individuals in three age groups that responded either ‘excellent/very good,’ ‘good,’ or ‘fair/poor.’

While there were no changes over time for either of the younger age groups, the proportion of the oldest age group declaring they were ‘excellent/very good,’ rather than simply ‘good’ increased significantly (Table 12.1). However, the oldest age group still had a lower proportion who considered themselves in excellent/very good health compared to the younger age groups.

Figure 12.1 shows how many people in each RHA rated their health as ‘excellent/very good,’ ‘good,’ or ‘fair/poor.’ Southern Health-Santé Sud was the only RHA with a significant increase in self-perceived health. Northern Health Region had the lowest proportion of the population declaring they were in ‘excellent/very good’ health.

**Table 12.1: Self-Perceived Health by Age Group**

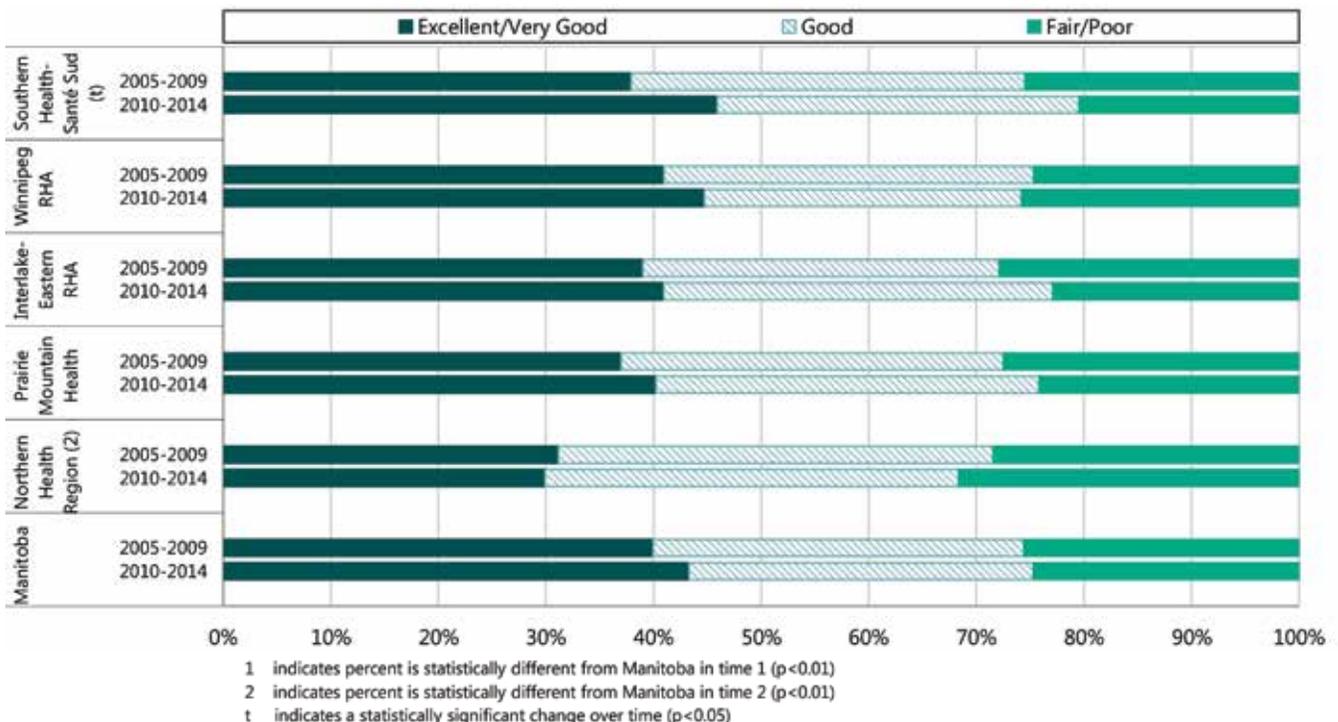
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
<b>Excellent/Very Good</b>		
65-74	48.0 (44.5-51.5)	47.6 (44.0-51.2)
75-84	34.4 (31.1-37.8)	39.4 (35.0-43.9)
85+	<b>24.5 (20.4-28.7)</b>	<b>36.0 (29.3-42.7)</b>
<b>Good</b>		
65-74	32.7 (29.7-35.6)	32.8 (29.6-36.0)
75-84	35.0 (31.7-38.4)	32.3 (28.4-36.3)
85+	<b>39.5 (34.1-44.9)</b>	<b>28.8 (23.4-34.1)</b>
<b>Fair/Poor</b>		
65-74	19.3 (16.7-21.9)	19.6 (16.8-21.9)
75-84	30.5 (27.3-33.7)	28.2 (24.0-32.5)
85+	36.0 (30.7-41.2)	35.2 (28.2-42.2)

Values in bold type indicate significantly different values

**Figure 12.1: Self-Perceived Health by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Perceived Mental Health

This indicator looks at people’s perception of their mental health, rather than trying to quantify mental health using lists of conditions, diagnoses, or health service use. The CCHS asked respondents about their mental health using the following question:

*“In general, would you say your mental health is excellent, very good, good, fair, or poor?”*

For this question, we looked at the proportion who chose ‘excellent’ or ‘very good’ compared to all other responses.

There were no significant changes in perceived mental health for any age group (Table 12.2). The proportion of people who rated their mental health status ‘excellent’ or ‘very good’ decreased with age, from ~70% in the youngest age group to ~55% in the oldest. For the most recent time period, none of the RHAs were significantly different from the Manitoba average (Figure 12.2).

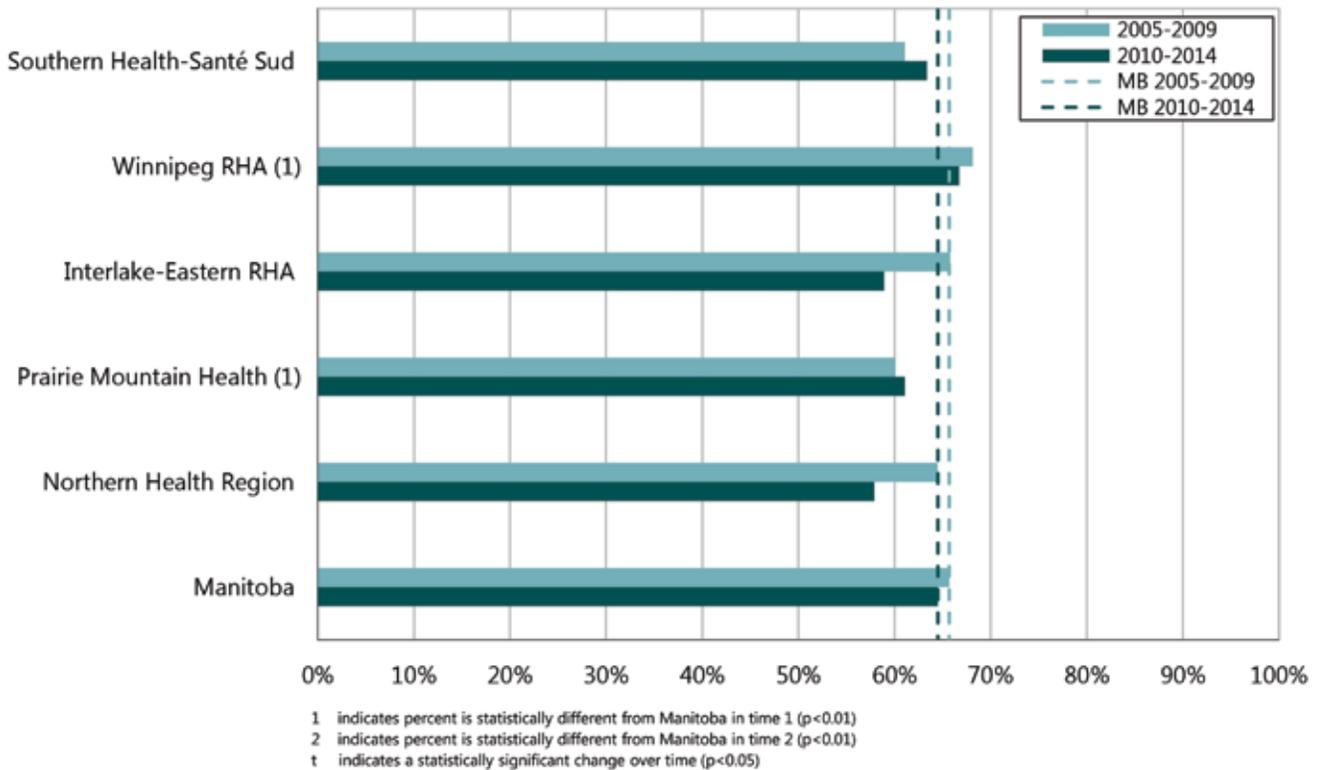
**Table 12.2: Excellent or Very Good Self-Perceived Mental Health by Age Group**

Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
65-74	72.0 (69.2-74.7)	70.2 (67.1-73.3)
75-84	61.3 (58.3-64.4)	59.5 (55.3-63.7)
85+	53.8 (48.2-59.3)	55.8 (48.6-62.9)

**Figure 12.2: Self-Perceived Excellent or Very Good Mental Health by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Perceived Life Stress

The CCHS examines some aspects of quality of life that administrative health data cannot. By contacting people directly, the CCHS was able to ask a question specifically about stress. This is not the same as general health, or even mental health, although they could be correlated. The question asked people to consider how stressful their life is using this question:

*“Thinking about the amount of stress in your life, would you say that most days are not at all stressful, not very stressful, a bit stressful, quite a bit stressful, or extremely stressful?”*

For this indicator, we calculated the proportion of the population who answered ‘not at all stressful’ or ‘not very stressful’.

The proportion of people who said most days in their lives were ‘not stressful’ or ‘not very stressful’ increased with age (Table 12.3), indicating that the older age groups were less

stressed than their younger counterparts. Despite indicating that they had poorer general health and poorer mental health in the previous sections, the oldest age group was on average less stressed than their younger counterparts. Many different aspects of life can contribute to stress, such as economic conditions, relationships with family or friends, and the role people play as caregiver for their parents, children or grandchildren. As these responsibilities change by age group, this could impact the perceived levels of stress older adults feel.

For all three age groups and in several regions of the province, the proportion of people indicating that they did not feel stressed most days decreased significantly in the second time period. Older Manitobans are more recently reporting higher levels of stress than they did previously (Figure 12.3). This change over time may also have more to do with various aspects of people’s lives, rather than their health specifically.

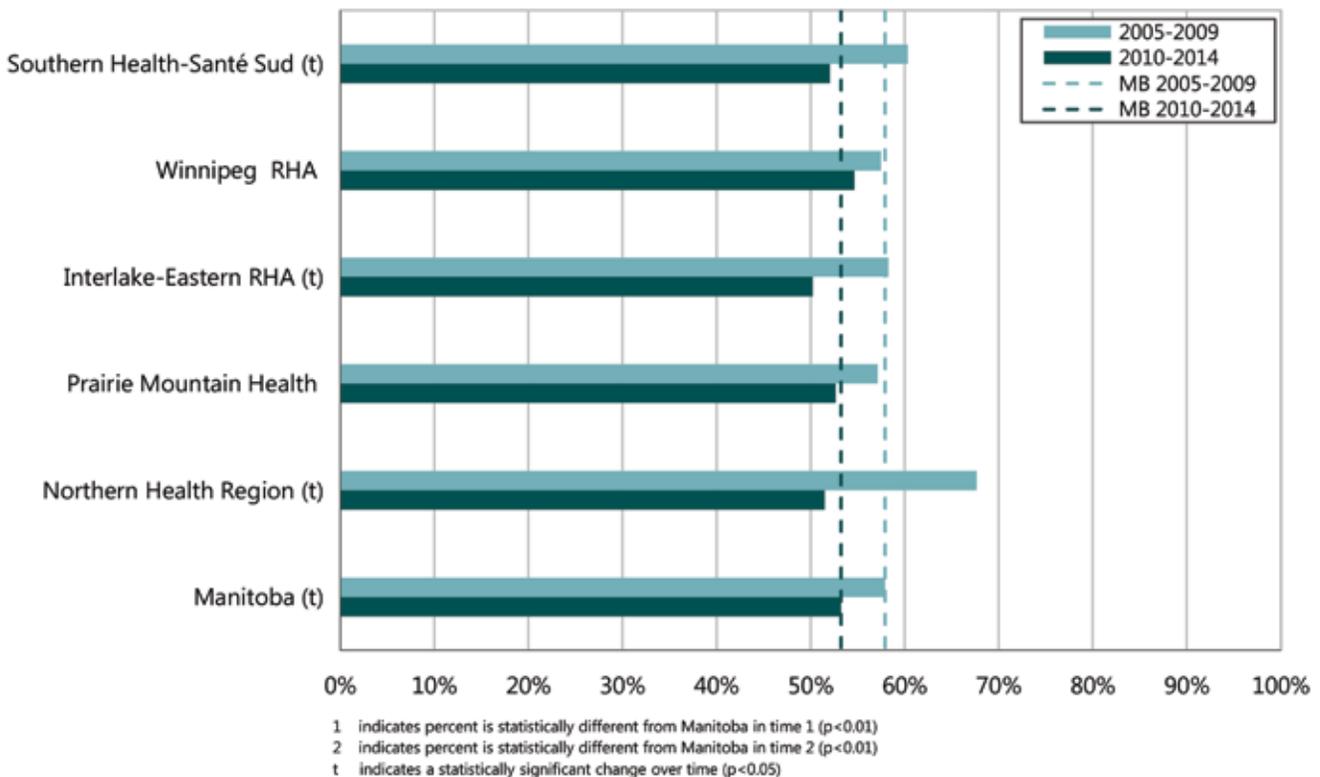
**Table 12.3: Self-Perceived Life Stress Not at All or Not Very by Age Group**

Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
65-74	56.7 (53.4-60.0)	52.3 (49.1-55.6)
75-84	57.7 (54.2-61.3)	53.7 (49.3-58.0)
85+	63.8 (58.1-69.4)	57.1 (49.5-64.7)

**Figure 12.3: Self-Perceived Life Stress Not at All or Not Very by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Perceived Unmet Healthcare Need

The CCHS allows us to address some aspects of health care that cannot be examined with the administrative data. One of these is whether individuals' healthcare needs are being met, or at least whether they believe they are being met. Some proxy measures of need can be created using administrative data, but they don't address the equally important issue of whether patients perceive that their needs are being met. It is possible that what a patient feels they need is, in fact, different from what a physician or other health professional believes they need. Respondents were asked this

question about whether their needs were met in the last year:

*"During the past 12 months, was there ever a time when you felt that you needed healthcare but you didn't receive it?"*

Responses included: 'yes', 'no' and 'don't know' ('don't know' answer were excluded from the analyses).

For the most part, people believed that their healthcare needs were being met. The proportion of individuals indicating that their needs were unmet was around 10% in both time periods for all age groups (Table 12.4). Only in the Northern Health Region was the proportion of people believing their health care needs were not being met above average (in the first time period) (Figure 12.4).

**Table 12.4: Self-Perceived Unmet Healthcare Need in the Past Year by Age Group**

Weighted crude percent age 65+, CCHS Data

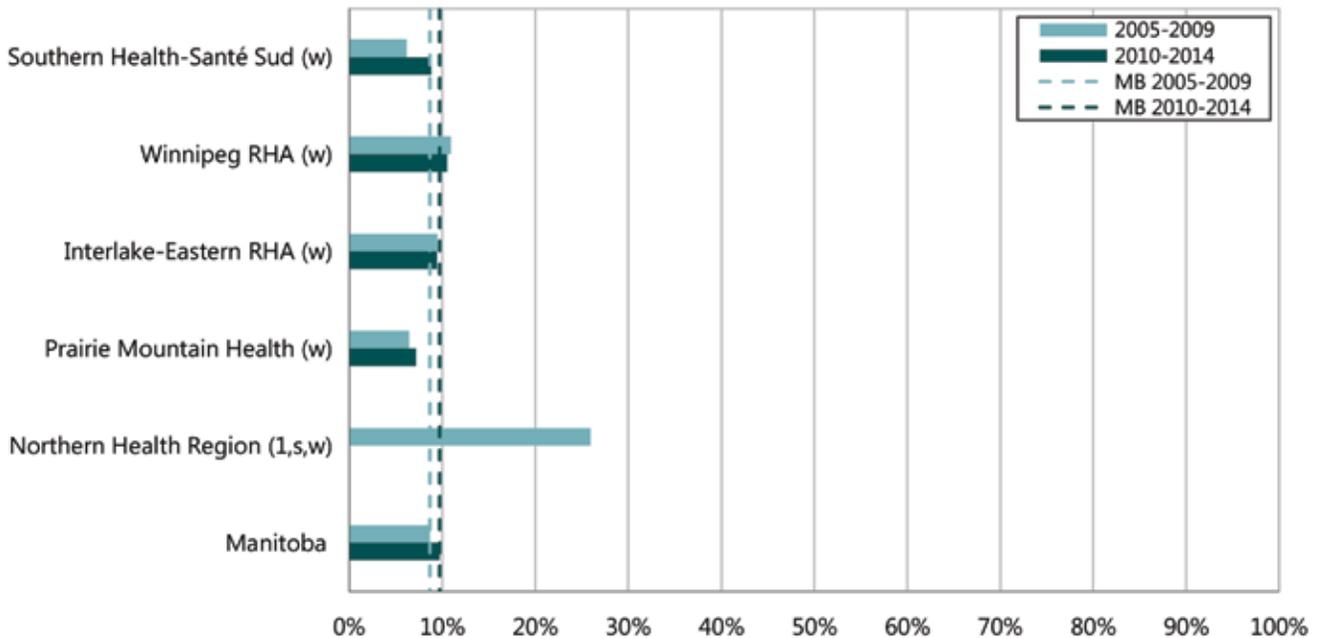
Age Group	2005-2009	2010-2014
65-74	9.1 (5.9-12.2)	10.4 (7.1-13.8)
75-84	6.9 (4.2-9.6)	11.8 (6.5-17.2)
85+	10.4 (4.0-16.8)	s

s indicates data is suppressed due to small numbers

Italicized values indicate a warning and should be interpreted with caution

**Figure 12.4: Self-Perceived Unmet Healthcare Need in the Past Year by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)

2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)

t indicates a statistically significant change over time (p<0.05)

s indicates data is suppressed due to small numbers

w indicates a warning and should be interpreted with caution

## Self-Reported Instrumental Activities of Daily Living (IADL) Impairment

IADLs are a group of activities that are considered essential to independent living, such as preparing meals, managing money, shopping for groceries, or doing laundry. The CCHS gathers information on impairment in completing these tasks with a set of questions that separately address each of these activities. This is information that is not captured in typical administrative health data. Information on the

IADLs can be summed into a single score – for this indicator, we calculated the proportion of the population that indicated ‘moderate impairment’, ‘severe impairment’, or ‘total impairment’ in IADLs, compared to individuals who reported ‘no impairment’, or ‘mild impairment’.

Table 12.5 indicates that fewer males than females had moderate to total IADL impairment in any age group, and impairments only increased significantly for the 85+ age group. The proportion of female respondents who indicated they had moderate to total IADL impairment are higher, and over two thirds of females in the oldest age group indicated that they had significant impairment in IADLs.

**Table 12.5: Moderate, Severe or Total IADL Impairments by Age Group**  
Weighted crude percent age 65+, CCHS Healthy Aging (2008-2009)

Age Group	Male	Female
65-74	6.9 (3.3-10.6)	16.9 (10.7-23.0)
75-84	9.4 (4.0-14.9)	35.0 (26.0-43.9)
85+	45.8 (32.5-59.2)	68.4 (59.1-77.6)

*Italicized values indicate a warning and should be interpreted with caution*

## Self-Reported 'Need Help' with Activities of Daily Living (ADLs)

The CCHS asks a series of questions about activities of daily living (ADLs). ADLs are critical aspects of daily living, and include things such as eating, bathing, dressing, and basic mobility, such as getting in and out of a bed or chair. The questions are slightly different from those for IADLs, and so the target responses for the indicator are slightly different as well.

For this indicator we looked at the proportion of the population stating that they 'need help with an ADL due to

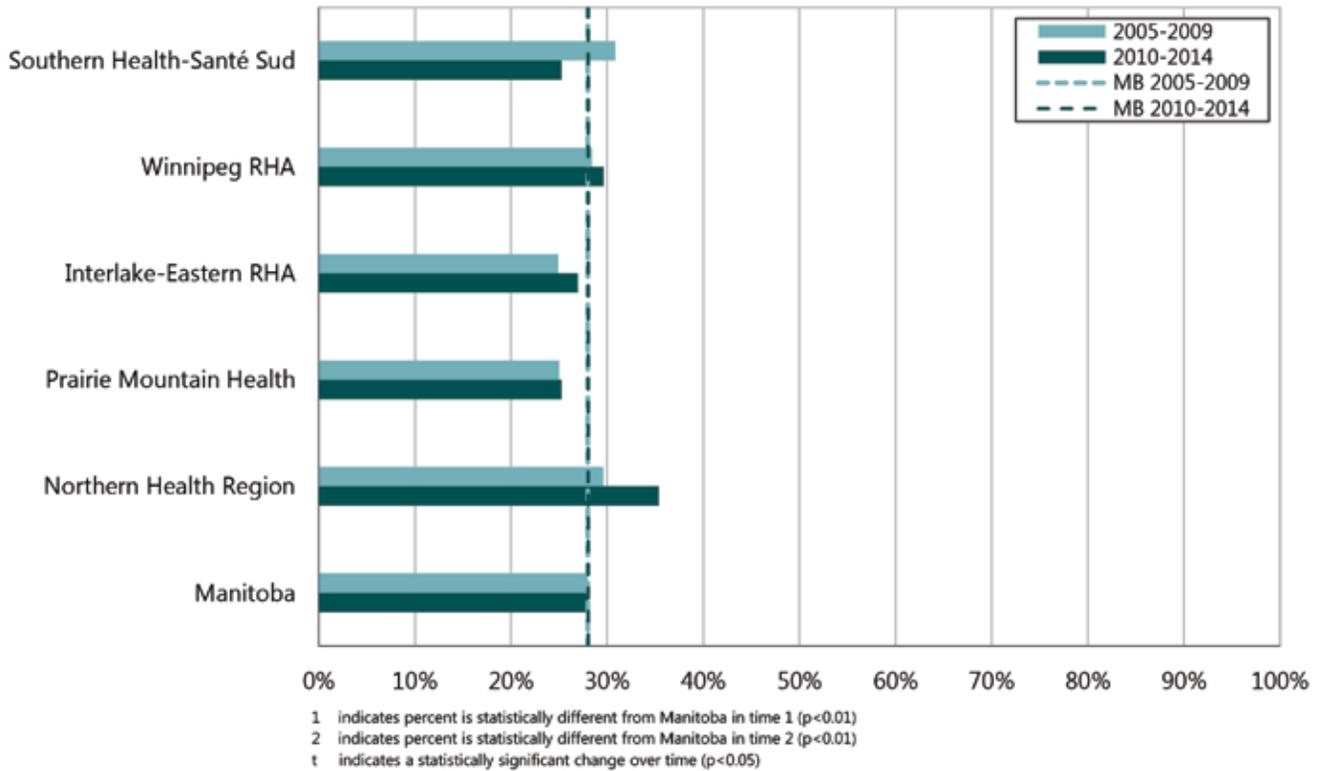
a chronic health condition'. Chronic conditions are defined as conditions that have persisted over a period of time, or are expected to persist for some time. While difficulties with IADLs would present some problems for individuals living in the community, problems with ADLs are more complex and affected individuals have a greater need for support, possibly leading to admission to a PCH.

The percentage of individuals who indicated that they need help with ADLs increased with age, but unlike with IADLs, the proportion of men and women was similar in all age groups (Table 12.6). There were no differences between the regions or any change over time (Figure 12.5).

**Table 12.6: Self-Reported 'Need Help' with ADLs due to Chronic Health Condition by Age Group**  
Weighted crude percent age 65+, CCHS Healthy Aging (2008-2009)

Age Group	2005-2009	2010-2014
65-74	14.3 (11.6-17.1)	14.2 (11.4-17.0)
75-84	33.2 (29.4-37.1)	33.5 (27.9-39.1)
85+	63.5 (56.9-70.1)	61.5 (53.3-69.7)

**Figure 12.5: Self-Reported 'Need Help' with ADLs due to Chronic Health Condition by Health Region**  
Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Reported Impact of Chronic Health Problem on Life

The CCHS contains questions about how often chronic conditions impact an individual's daily life, where a chronic condition was defined as a physical or mental health problem that has lasted, or is expected to last, for at least 6 months. This indicator is a measure of the impact of these long-term physical and mental health conditions on the principal domains of life: home, work, school, and other activities. These questions don't address whether those activities were unachievable, or the degree of impact, but rather they ask about the frequency of the impact that occurred. Table 12.7 presents the proportion of the population that stated

their chronic health problem 'often', 'sometimes', or 'never' impacted their lives. 'Not stated' was excluded from analyses.

The table presents the results for the province by age group. The oldest age group had a high proportion of individuals stating their health condition 'often' impacted lives, while the youngest age group had a high proportion of individuals stating their health condition 'never' impacted their lives. This is not surprising, given that the youngest age group was much less likely to even have a chronic health condition. Over the study period, the overall proportion declaring that chronic conditions impacted their life 'often' decreased, while the proportion choosing 'sometimes' increased (see Manitoba in Figure 12.6). This suggests that the frequency of impact is lessening for those experiencing an impact.

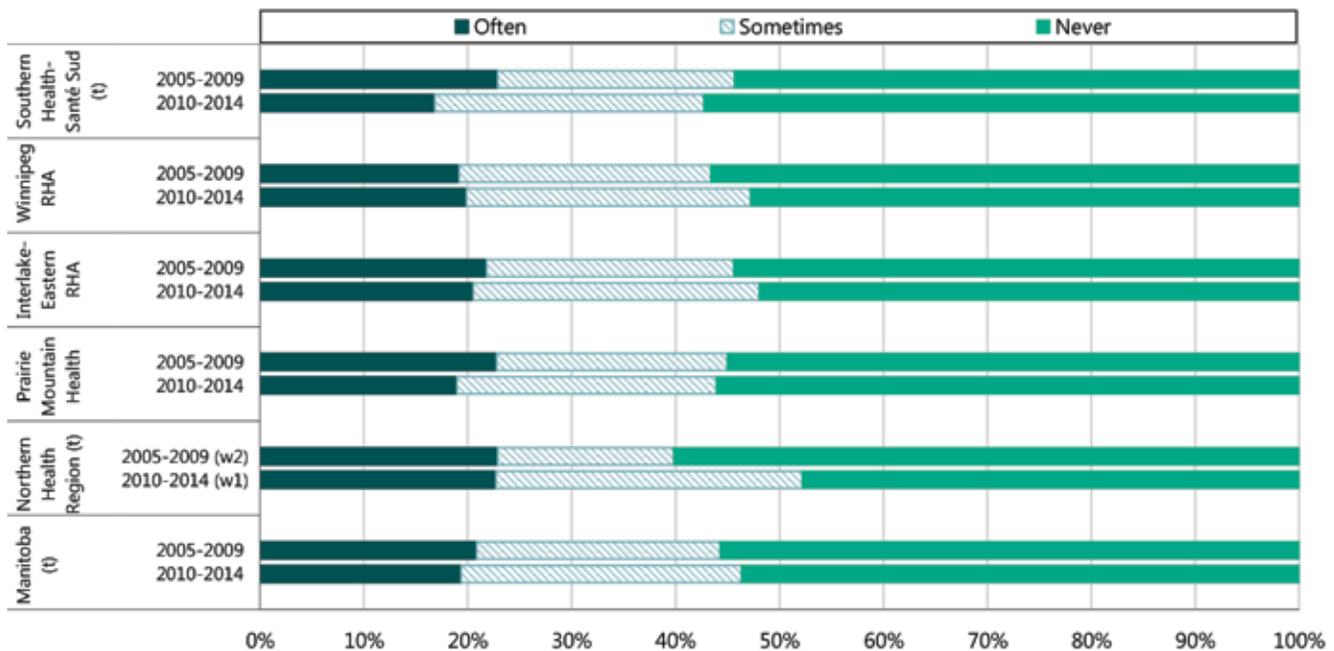
**Table 12.7: Self-Reported Impact of Chronic Health Problem on Life by Age Group**

Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
<b>Often</b>		
65-74	13.1 (10.9-15.3)	13.7 (11.3-16.1)
75-84	22.4 (19.2-25.6)	21.1 (17.3-25.0)
85+	43.3 (37.0-49.5)	34.6 (27.2-42.0)
<b>Sometimes</b>		
65-74	22.4 (19.0-25.9)	24.7 (20.9-28.4)
75-84	28.0 (24.0-32.0)	30.8 (26.3-35.4)
85+	18.1 (13.1-23.2)	25.8 (19.8-31.9)
<b>Never</b>		
65-74	64.4 (60.6-68.2)	61.7 (57.8-68.2)
75-84	49.6 (45.3-53.9)	48.1 (43.4-52.7)
85+	38.6 (32.1-45.2)	39.5 (32.5-46.5)

**Figure 12.6: Self-Reported Impact of Chronic Health Problem on Life by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)  
 w1 indicates a warning for the often category and should be interpreted with caution  
 w2 indicates a warning for the sometimes category and should be interpreted with caution

## Self-Reported Activity Limitations due to Chronic Condition

This indicator is similar to activities of daily living, but the CCHS question asks respondents to think about the frequency of specific limitations on activities at home, work or elsewhere, as opposed to simply saying whether there was some impact. Respondents were classified according to the frequency with which they experience activity limitations imposed on them by chronic physical and/or

mental health conditions. Possible classifications for this indicator were 'often', 'sometimes', and 'never'. 'Not stated' was not included in the analyses.

The results are presented in Table 12.8. Over time, the oldest age group saw a significant decrease (more than 10%) in the proportion of individuals who said they 'often' experience activity limitations due to their chronic conditions.

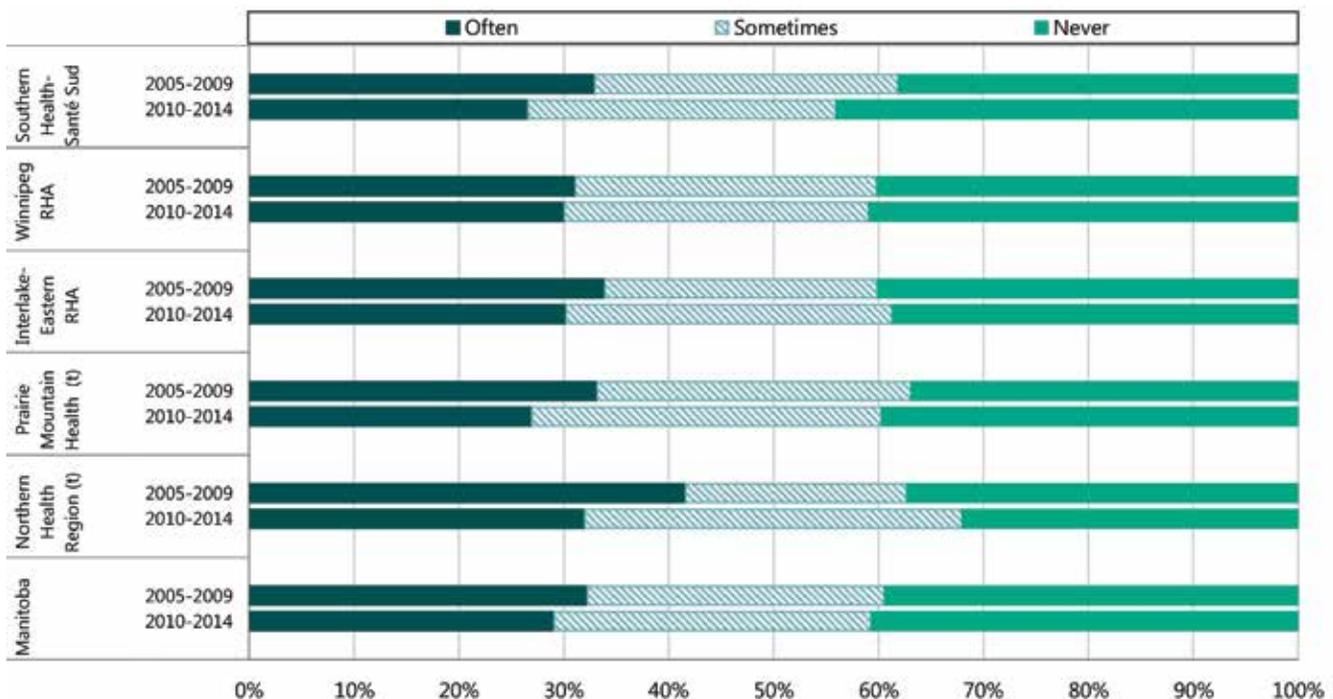
Although all regions had a lower proportion choosing 'often' in the second time period compared to the first, this change was statistically significant for Prairie Mountain Health and Northern Health Region only (Figure 12.7).

**Table 12.8: Self-Reported Activity Limitations due to Chronic Condition by Age Group**  
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
<b>Often</b>		
65-74	21.8 (18.9-24.7)	20.9 (17.8-24.0)
75-84	36.0 (32.3-39.8)	33.3 (28.8-37.9)
85+	<b>59.5 (53.0-65.9)</b>	<b>47.9 (40.0-55.7)</b>
<b>Sometimes</b>		
65-74	28.5 (24.7-32.2)	29.2 (25.7-32.7)
75-84	31.4 (27.5-35.2)	32.6 (28.3-36.8)
85+	22.2 (16.7-27.7)	28.2 (21.8-34.7)
<b>Never</b>		
65-74	49.7 (45.8-53.7)	49.9 (45.8-53.7)
75-84	32.6 (28.6-36.6)	34.1 (29.6-38.7)
85+	18.3 (13.4-23.3)	23.9 (17.2-30.7)

Values in bold type indicate significantly different values

**Figure 12.7: Self-Reported Activity Limitations Due to Chronic Condition by Health Region**  
Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Reported Activity Limitations due to Pain or Discomfort

This indicator measures one particular cause of activity limitation based on two questions:

*“Are you usually free of pain or discomfort?”*

Responses included ‘yes’, ‘no’, ‘don’t know’ and ‘not stated’. Those who answered ‘no’ to the first question were then asked:

*“How many activities does your pain or discomfort prevent?”*

Responses included ‘none’, ‘a few’, ‘some’, ‘most’, ‘don’t know’, ‘refusal’ and ‘not stated’.

We classified answers into ‘no pain or discomfort’, ‘pain prevents no activities’, ‘pain prevents a few activities’, ‘pain prevents some activities’, ‘pain prevents most activities’ and ‘not stated’ (‘not stated’ was excluded from the analyses).

A decreasing proportion of individuals in the youngest age group indicated ‘no pain’ in response to the first question (Table 12.9), and this was the only significant finding for this indicator.

**Table 12.9: Self-Reported Activity Limitations due to Pain or Discomfort by Age Group**  
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
<b>No Pain</b>		
<b>65-74</b>	<b>76.2 (73.0-79.4)</b>	<b>71.6 (68.2-74.9)</b>
75-84	72.3 (68.6-76.0)	70.5 (66.8-74.2)
85+	69.0 (63.4-74.5)	71.1 (65.1-77.1)
<b>Prevents None</b>		
65-74	6.9 (4.8-9.0)	8.0 (5.8-10.1)
75-84	6.8 (4.5-9.1)	8.1 (5.4-10.7)
85+	s	7.5 (3.8-11.2)
<b>Prevents a Few</b>		
65-74	5.0 (3.4-6.5)	7.0 (5.3-6.5)
75-84	7.1 (5.0-9.2)	7.5 (5.4-9.6)
85+	7.3 (4.6-9.9)	7.5 (4.6-10.4)
<b>Prevents Some</b>		
65-74	6.5 (4.9-8.0)	7.9 (6.0-9.8)
75-84	8.5 (5.9-11.2)	7.2 (5.4-9.1)
85+	9.1 (6.0-12.3)	7.7 (4.5-10.9)
<b>Prevents Most</b>		
65-74	5.4 (3.8-7.0)	5.6 (4.0-7.2)
75-84	5.3 (3.6-7.0)	6.6 (4.1-9.2)
85+	9.6 (6.0-13.2)	6.2 (2.2-10.2)

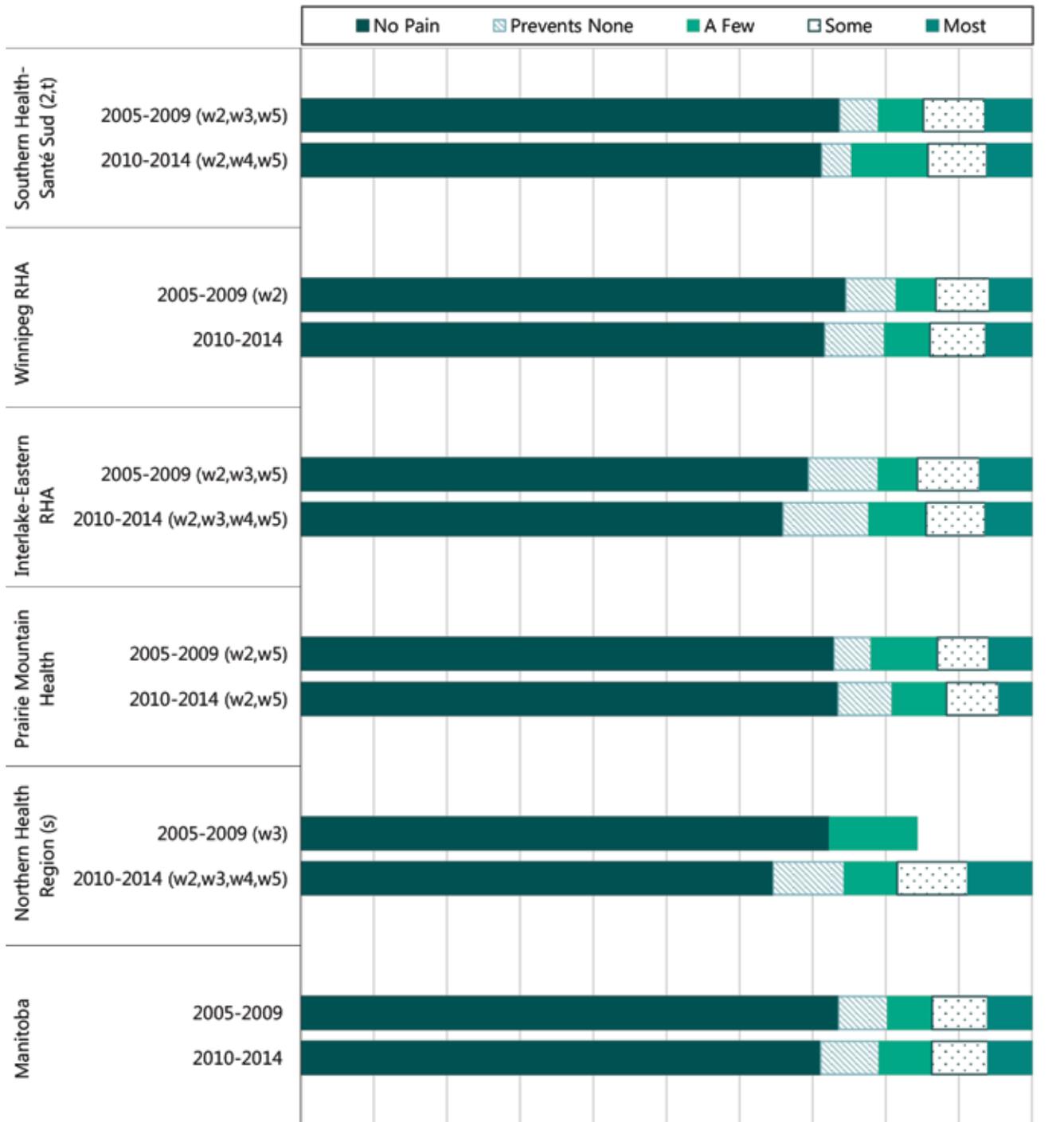
Italicized values indicate a warning and should be interpreted with caution

Values in bold type indicate significantly different values

s indicates data is suppressed due to small numbers

**Figure 12.8: Self-Reported Activity Limitations due to Pain or Discomfort by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

- 1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)
- 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)
- t indicates a statistically significant change over time (p<0.05)
- s indicates data is suppressed due to small numbers
- w2 indicates a warning for the prevents none category and should be interpreted with caution
- w3 indicates a warning for the prevents a few category and should be interpreted with caution
- w4 indicates a warning for the prevents some category and should be interpreted with caution
- w5 indicates a warning for the prevents most category and should be interpreted with caution

## Self-Rated Cognition

The CCHS incorporated a number of questions from the Health Utilities Index (HUI), a set of questionnaires used to assess health status and health-related quality of life. With the inclusion of the HUI questions, the CCHS is able to classify individuals using the HUI Mark 3 classification system to assess several different attributes, including cognition, emotion and mobility, which are presented in this and the following two sections.

For cognition, the highest ('best') category label is 'able to remember most things, think clearly and solve day to day problems', while the lowest ('worst') is 'unable to remember anything at all, and unable to think or solve day to day problems'. For this analysis, we calculated the percentage of respondents that were classified in the highest category, and compared this percentage to all others combined. For reference, the second highest category is 'able to remember most things, but have a little difficulty when trying to think and solve day to day problems'. The results of two analyses are presented: one by age group for both time periods, and the other by RHA for both time periods.

In the analysis by age group, we saw that self-rated cognition declined with age (Table 12.10). However, the oldest age group, declined by 14% (55% to 41%), while the 75-84 age group declined by 10% (63% to 53%). This significant decline in self-rated cognition may be a signal that individuals who would formerly have moved into a PCH are now more likely to remain in the community. Consistent with this hypothesis was the steady increase in the proportion of respondents whose surveys were filled in by a proxy (usually because they could not complete the survey themselves); this proportion increased from less than 2.9% on average in the first time period to 3.9% in the second time period. Agencies that provide support in the community should be aware of this change in the population they serve.

In the analysis by region, the proportion of individuals with highest-rated cognition declined in Southern Health-Santé Sud, and the percentages dropped in most other regions as well, with one notable exception (Figure 12.9). Prairie Mountain Health did not see a change in the percentage of older adults classified in the highest category, perhaps because they started with the lowest percentage. There appears to be less variation between RHAs in the more recent time period than in the first.

**Table 12.10: Highest Self-Rated Cognition by Age Group (based on HUI)**

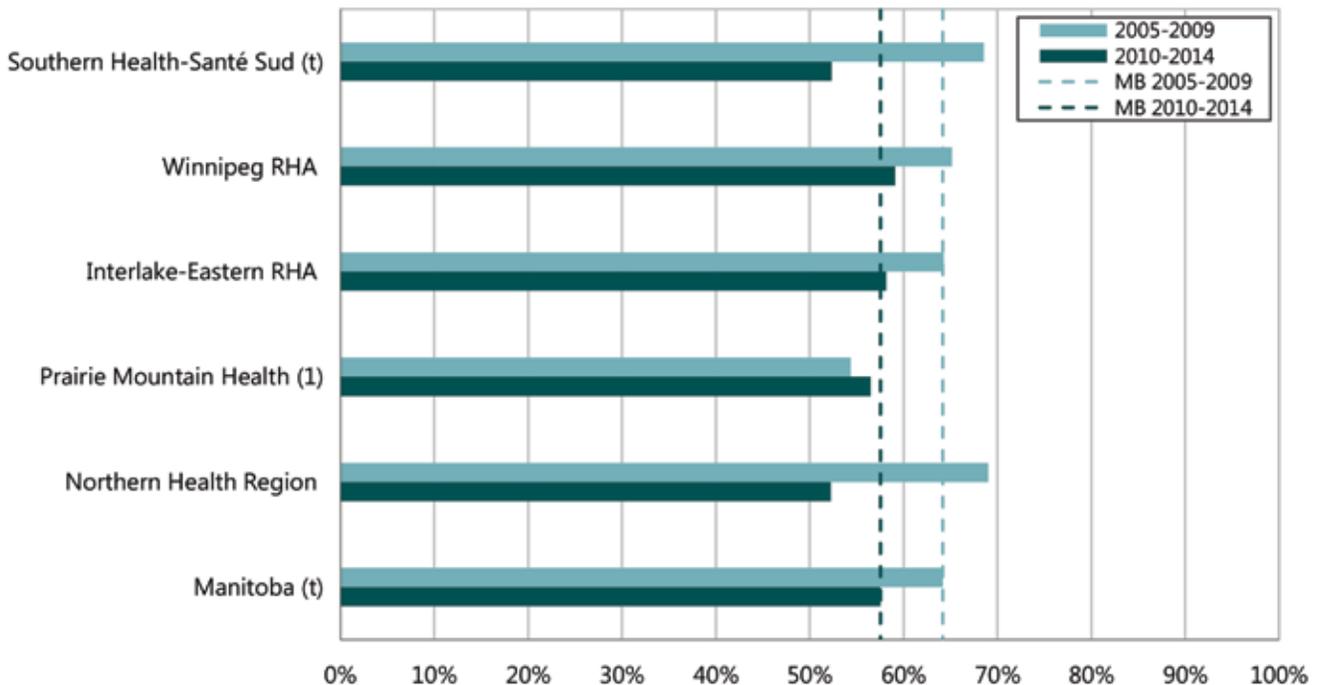
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
65-74	67.7 (63.3-72.2)	64.3 (60.9-67.8)
75-84	<b>63.6 (58.2-68.9)</b>	<b>53.2 (48.5-58.0)</b>
85+	<b>55.1 (47.6-62.6)</b>	<b>41.1 (34.6-47.6)</b>

Values in bold type indicate significantly different values

**Figure 12.9: Highest Self-Rated Cognition by Health Region (based on HUI)**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)

## Self-Rated Emotion

The CCHS also incorporated questions from the HUI to classify individuals on emotion. The scale that rated people's emotions went from 'happy and interested in life' to 'so unhappy that life is not worthwhile'. As with self-rated cognition, we calculated the proportion of individuals with the highest self-rated emotion. For reference, the second highest category was simply 'somewhat unhappy'.

Analyses are presented by age group for both time periods and by RHA for both time periods.

There was a distinct lack of variance between age groups, which was most evident in the more recent time period (Table 12.11). About 4 out of 5 older adults were classified in the highest category. For the two older age groups, there was an increase in the percentage classified as 'happy and interested in life' over time, although this was only statistically significant for the 75-84 year age group. The apparent increase in self-rated emotion was not present for Northern Health Region in the analysis by region (Figure 12.10).

**Table 12.11: Highest Self-Rated Emotion by Age Group (based on HUI)**

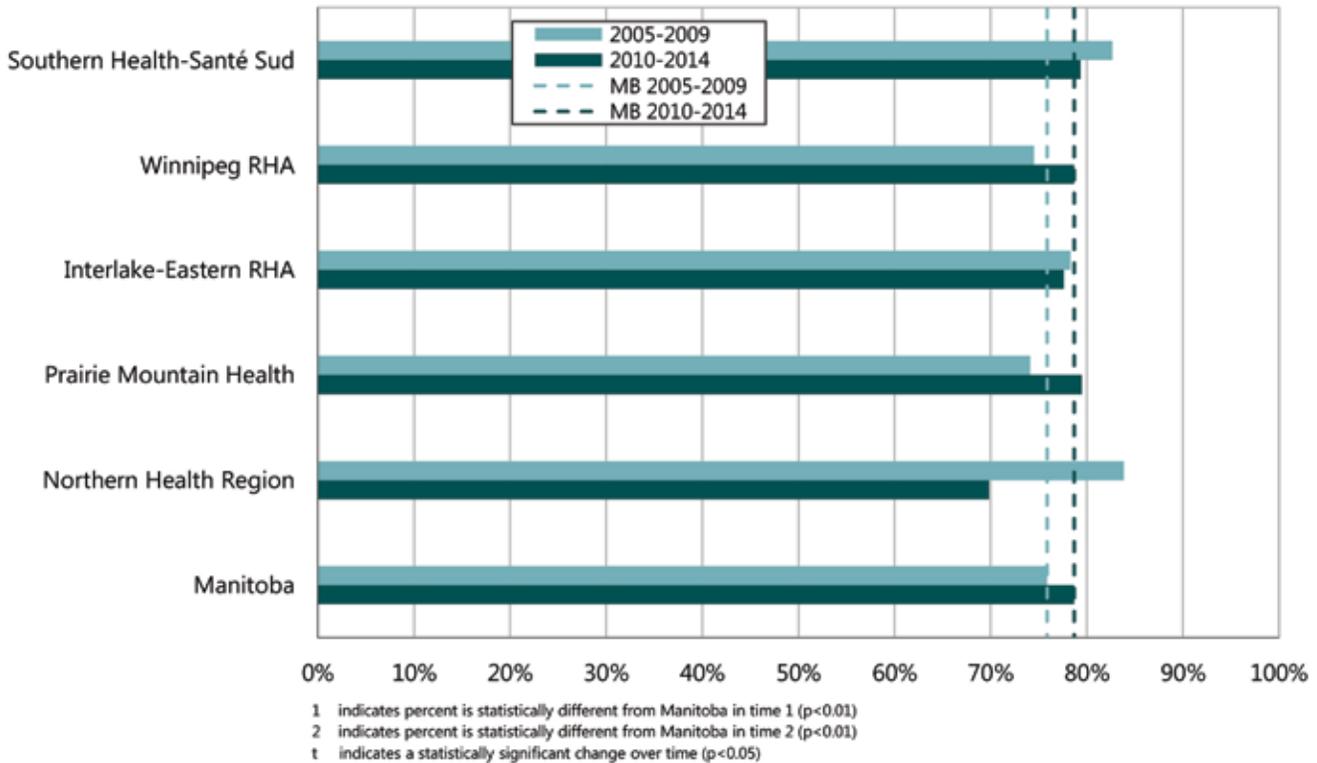
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
65-74	78.8 (74.9-82.6)	78.0 (74.9-81.1)
75-84	<b>72.9 (67.5-78.3)</b>	<b>80.2 (76.6-83.8)</b>
85+	71.0 (63.6-78.3)	77.2 (70.8-83.6)

Values in bold type indicate significantly different values

**Figure 12.10: Highest Self-Rated Emotion by Health Region (based on HUI)**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Rated Mobility

The CCHS also incorporated questions from the HUI to classify individuals on mobility. For this attribute, people were classified from ‘able to walk around the neighbourhood without difficulty, and without walking equipment’ to ‘cannot walk at all’. As with self-rated cognition and self-rated emotion, we calculated the proportion of individuals with the highest self-rated mobility. For reference, the second highest category was simply ‘able to walk around the neighbourhood with difficulty, but does not require walking equipment or the help of another person’.

Analyses are presented by age group for both time periods and by RHA for both time periods.

Only about half of the oldest age group was classified in the highest category (Table 12.12). For the youngest age group, 90% were classified in the highest category in the most recent time period. Although the numbers dropped for all three age groups between the first and second time period, none of these declines were statistically significant. Overall, there was no variation between the regions in either time period (Figure 12.11).

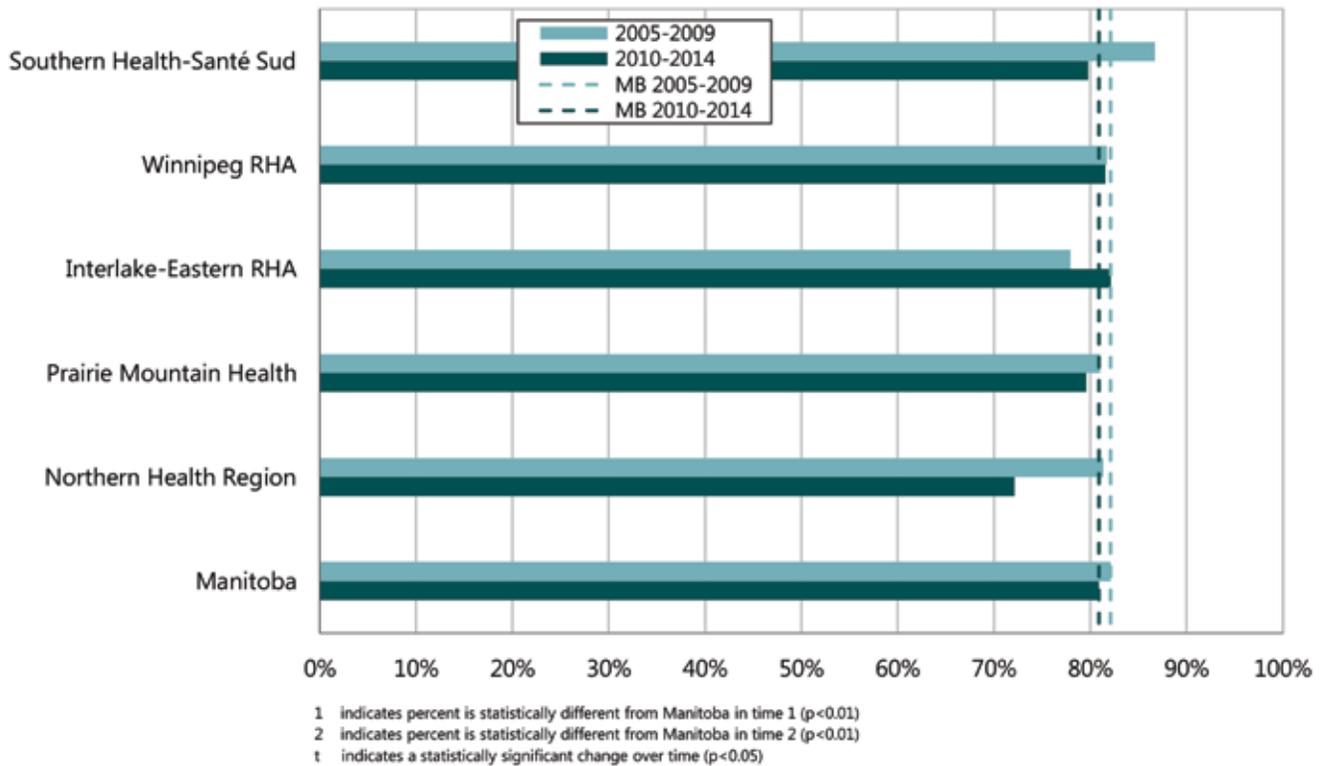
**Table 12.12: Highest Self-Rated Mobility (Ambulation) by Age Group (Based on HUI)**

Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
65-74	92.2 (89.6-94.7)	90.0 (88.0-92.0)
75-84	80.1 (75.5-84.7)	79.7 (76.1-83.3)
85+	55.4 (48.8-62.1)	52.9 (45.4-60.5)

**Figure 12.11: Highest Self-Rated Mobility (Ambulation) by Health Region (Based on HUI)**

Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Reported Physical Activity (Leisure Time)

The CCHS included a series of questions that assessed how active people were in their leisure time. Survey respondents were classified as either ‘active’, ‘moderately active’, or ‘inactive’, based on the estimated energy expenditure during their activities in the three months prior to the survey date. We calculated the percentage of older adults in each of these categories by age group, for both time periods, and by region.

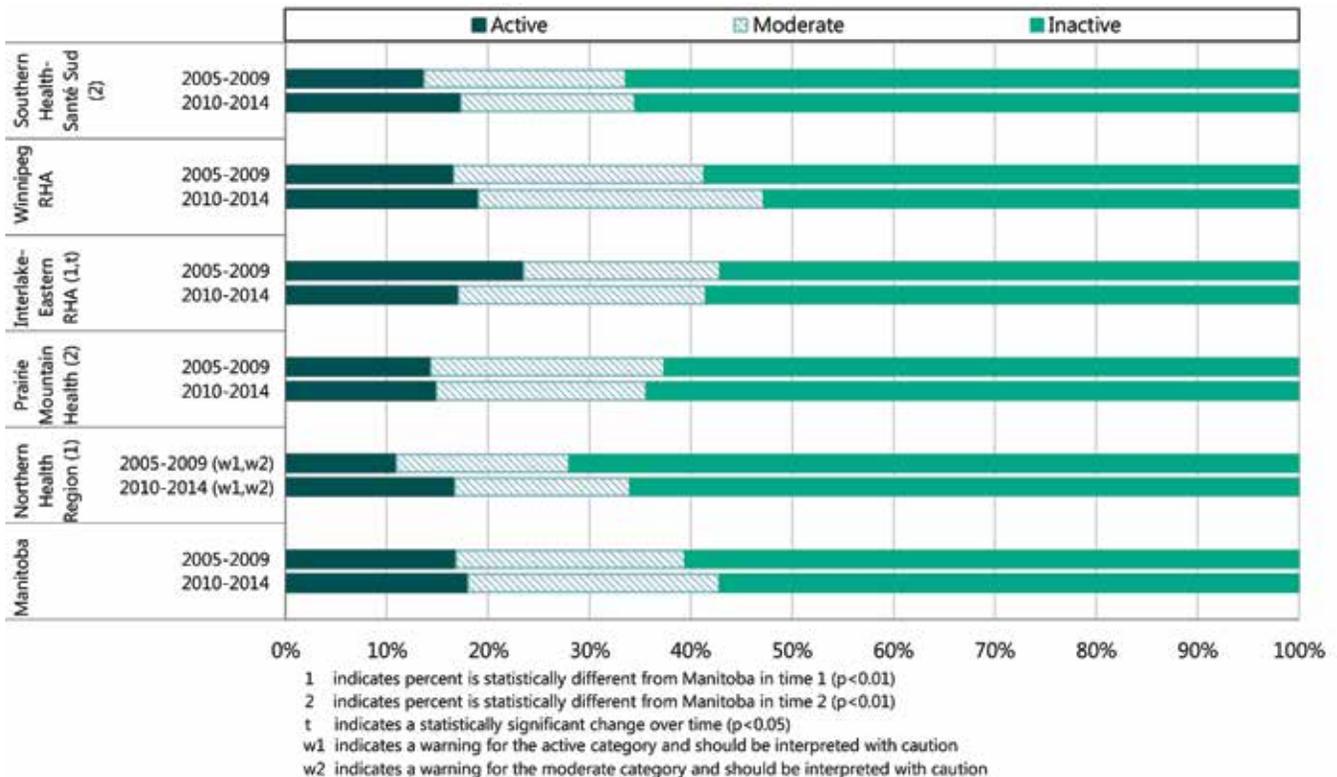
The percentage of older adults classified as ‘active’ decreased as age increased (Table 12.13). For the oldest group, fewer people were ‘inactive’ in the most recent time period than in the prior one, and the percentage classified as ‘moderately active’ increased accordingly in the more recent time period. Southern Health-Santé Sud and Prairie Mountain Health had higher percentages of older adults in the ‘inactive’ category than Manitoba as a whole (Figure 12.12).

**Table 12.13: Self-Reported Physical Activity (Leisure Time) by Age Group**  
Weighted crude percent age 65+, CCHS Data

Age Group	2005-2009	2010-2014
<b>Active</b>		
65-74	22.4 (18.9-25.9)	22.6 (19.9-25.3)
75-84	13.3 (10.4-16.2)	15.9 (12.8-19.0)
85+	5.2 (2.5-7.9)	7.1 (3.9-10.3)
<b>Moderate</b>		
65-74	25.8 (22.8-28.8)	28.4 (25.3-31.5)
75-84	21.6 (18.3-24.9)	20.3 (16.5-24.0)
85+	<b>12.9 (8.0-17.8)</b>	<b>22.2 (15.6-28.7)</b>
<b>Inactive</b>		
65-74	51.8 (47.7-55.9)	49.0 (45.7-55.9)
75-84	65.1 (61.2-68.9)	63.9 (59.5-68.3)
85+	<b>81.9 (76.6-87.2)</b>	<b>70.7 (63.9-77.6)</b>

Italicized values indicate a warning and should be interpreted with caution  
Values in bold type indicate significantly different values

**Figure 12.12: Self-Reported Physical Activity (Leisure Time) by Health Region**  
Weighted age- and sex-adjusted percent age 65+, CCHS Data



## Self-Reported Dental Care

The CCHS asked respondents about oral health, dental care, and whether they saw a dentist regularly. Regular dental checkups (or consults) are an important part of maintaining good oral health. This question was asked of respondents who indicated they had at least one of their own teeth, and thus individuals with full sets of dentures were not included in this analysis. We examined the percentage of older adults who had consulted a dental professional (dentist, dental hygienist, orthodontist) in the year prior to their survey date by age group and by region.

While there was a large number of individuals who had not seen a dentist in the year before the survey for all three age groups, the percentage of individuals who had had a consult with a dentist in the past year significantly increased over time for some regions (Table 12.14). The rates of having seen a dentist in the prior year were highest in Winnipeg, where dentists are more easily accessible than in rural/remote regions, and lowest in Northern Health Region (Figure 12.13). The increase over time was significant in Winnipeg RHA, Southern Health-Santé Sud, and Interlake-Eastern RHA.

**Table 12.14: Self-Reported Dental Care by Age Group**

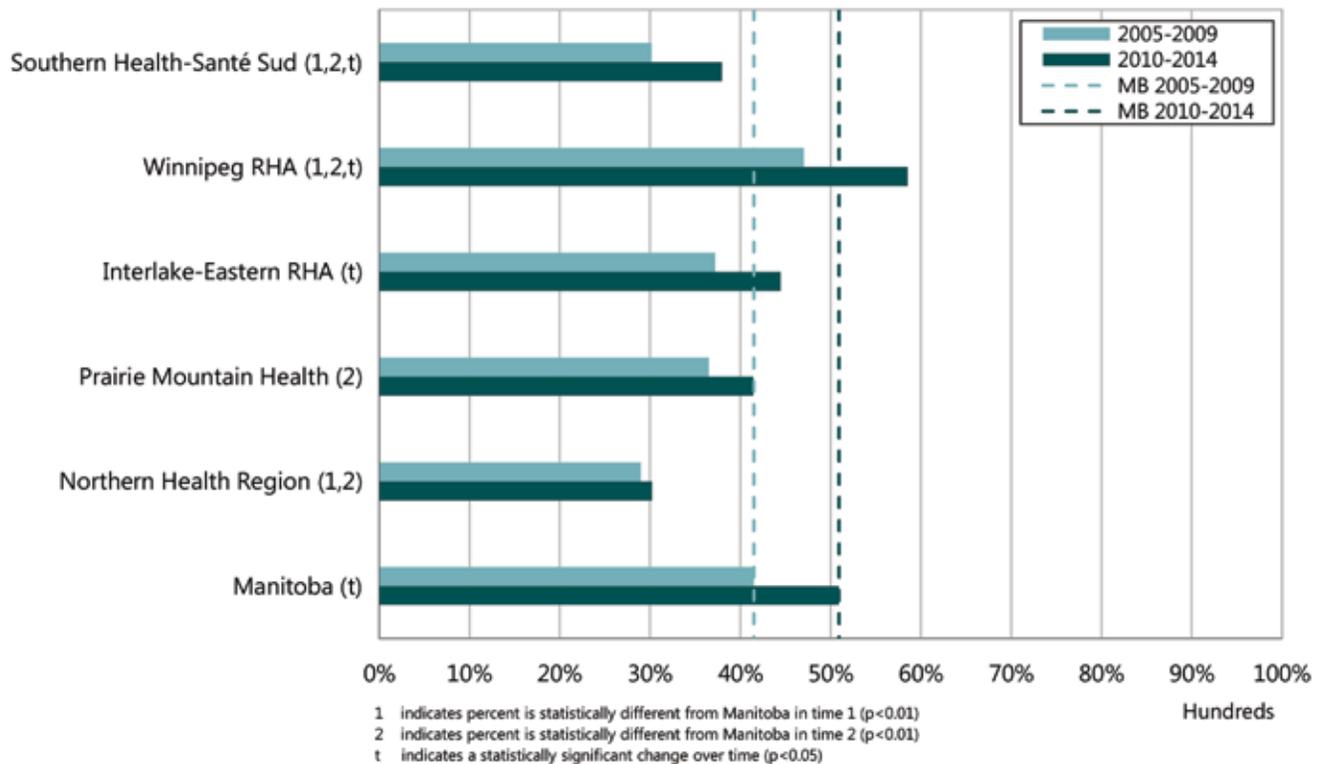
Weighted crude percent age 65+, CCHS Data

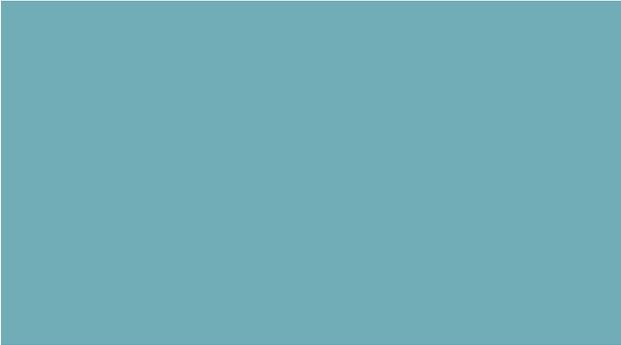
Age Group	2005-2009	2010-2014
65-74	<b>47.0 (43.3-50.7)</b>	<b>56.3 (52.9-59.8)</b>
75-84	<b>38.7 (34.7-42.6)</b>	<b>47.4 (43.3-51.6)</b>
85+	<b>28.3 (22.8-33.8)</b>	<b>40.4 (33.0-47.8)</b>

Values in bold type indicate significantly different values

**Figure 12.13: Self-Reported Dental Care by Health Region**

Weighted age- and sex-adjusted percent age 65+, CCHS Data





## Chapter 13: Social Determinants of Health

It is well known that the physical and mental health of individuals is affected by social and economic factors, often referred to collectively as the social determinants of health. We have seen that most of the health indicators in this report are related to income, with clear associations between the indicator and income quintiles in both urban and rural regions. Using administrative data from social services and the justice system, we determined the prevalence of three risk factors or social determinants of health in the older adult population: living in social housing, receiving income assistance, and being the victim of a crime [8].

### Key Findings

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- Older adults in Winnipeg are far less likely to live in social housing than those in rural RHAs. For example, in 2014, only 0.7% of the oldest age group (85+) in Winnipeg resided in social housing, compared to 11.4% in Interlake-Eastern RHA.
- Receiving income assistance is far more prevalent in Winnipeg and Northern Health Region than in other regions.
- In all age groups, the percentage of older adults reported as victims of a crime decreased significantly during the study period.

## Social Housing

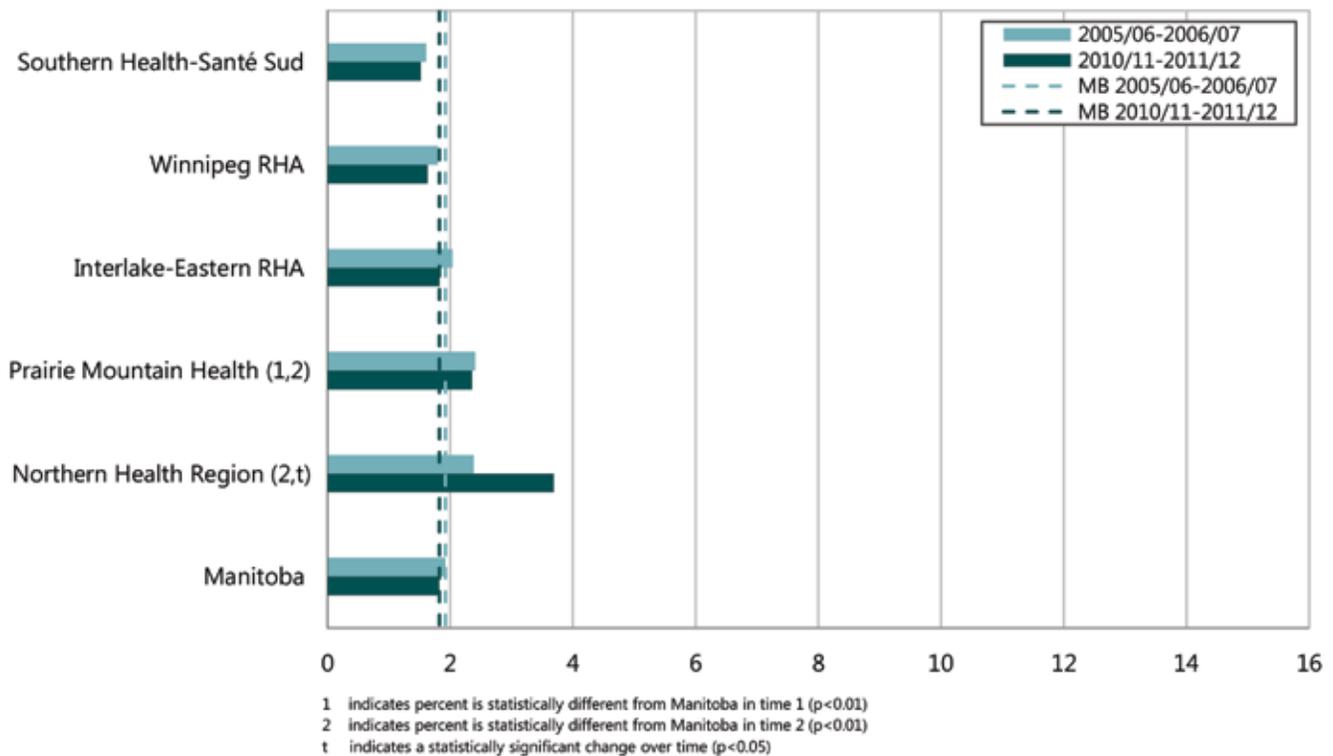
In Manitoba, government-funded social housing provides accommodations to individuals who cannot afford market rate rent or leasing conditions. A relatively large portion of the social housing units in the province are reserved for older adults (particularly in rural areas) to ensure that those on a fixed income have adequate living conditions. For this indicator, we calculated the percentage of older adults who had lived in social housing for at least one day in each of the two time periods.

The overall prevalence of social housing is similar for the two younger age groups, with about 2% of community-dwelling older adults having ever lived in social housing (Figures 13.1 to 13.3). For the youngest

age group (65-74), the prevalence was similar across all regions at about 2%, except for Northern Health Region at about 4%, in the more recent time period (Figure 13.1). For the 75-84 age group, a significantly lower than average percentage of individuals in Winnipeg had lived in social housing (<1%), while the rural RHAs tended to have higher percentages of people who had lived in social housing (~4%). The rates for the oldest age group were even higher at 5% on average in the first time period, but declined to just over 3% in the second time period. For this group, the percentage living in social housing in Winnipeg was still less than 1%, but as high as 11% in Interlake-Eastern RHA, and 8% in Prairie Mountain Health and Northern RHA (Figure 13.3). Individuals who lived in higher income areas were extremely unlikely to live in social housing.

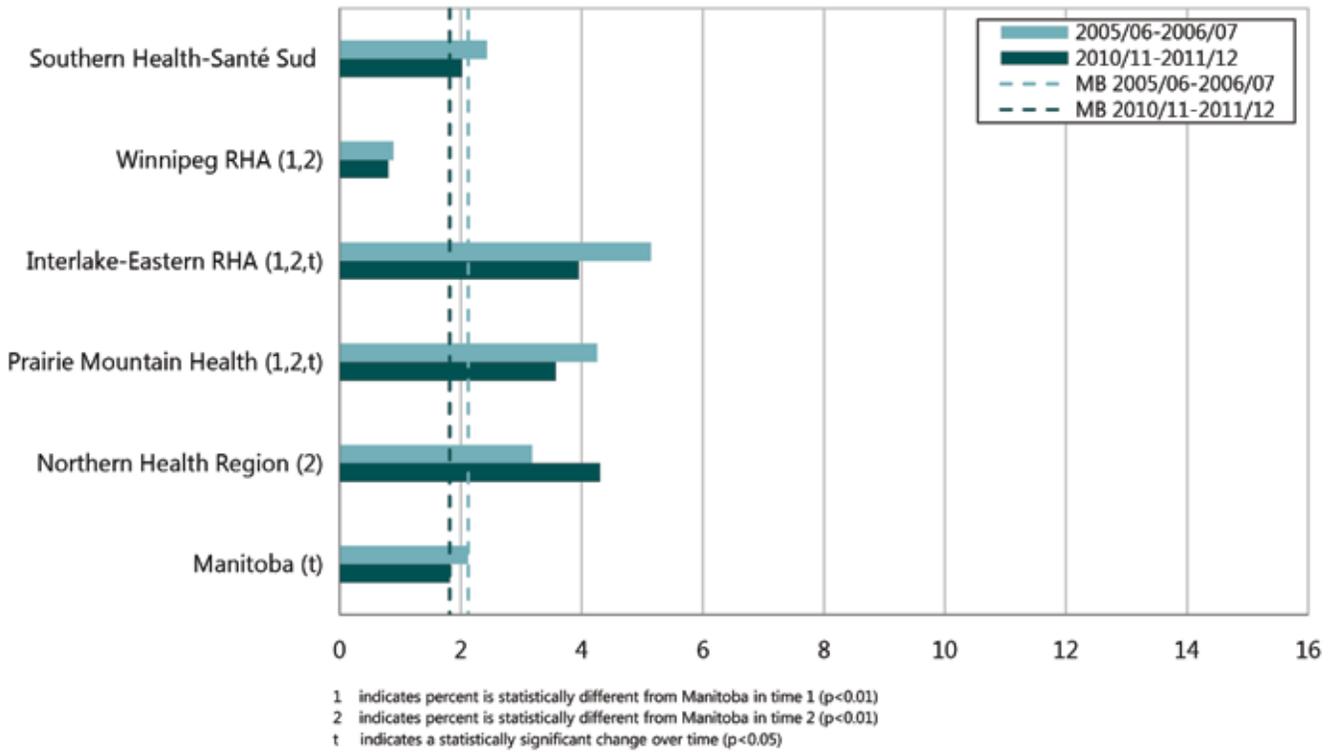
**Figure 13.1: Prevalence of Older Adults Living in Social Housing by Health Region, Age 65-74**

Percent of community-dwelling older adults



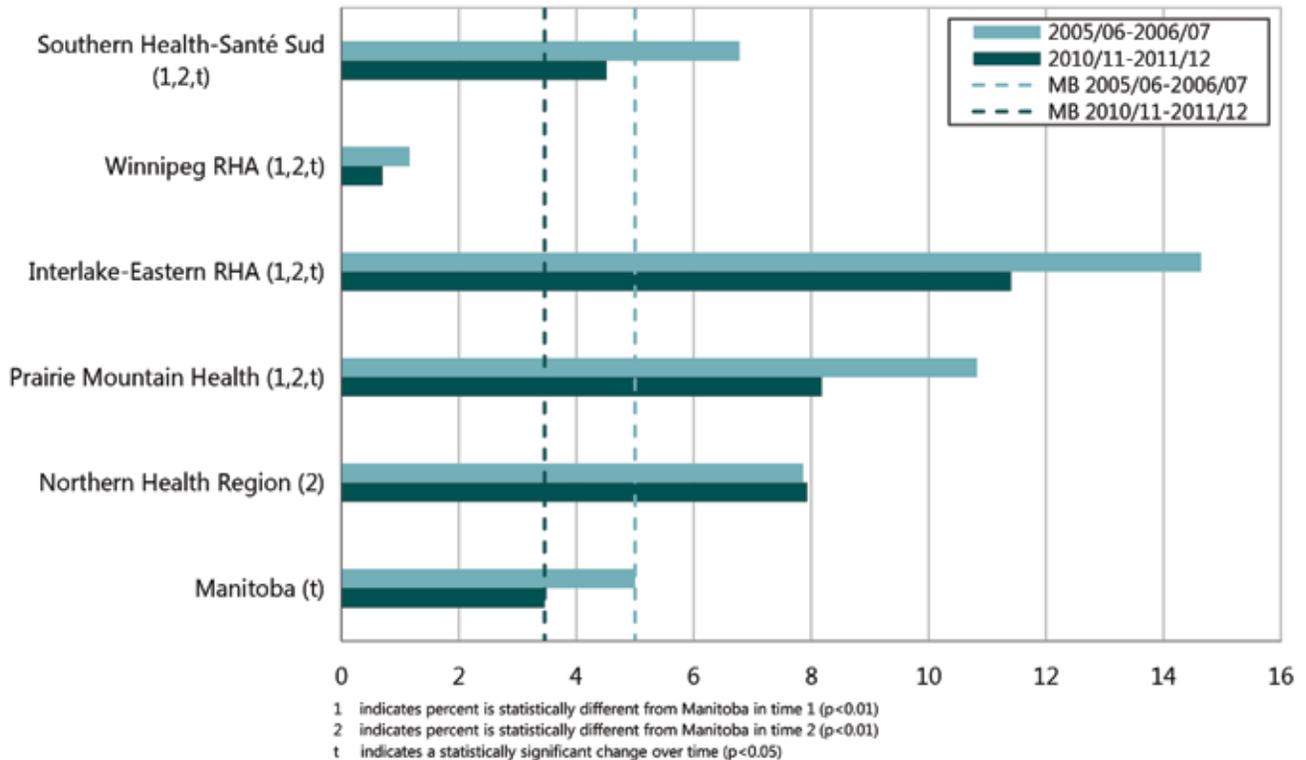
**Figure 13.2: Prevalence of Older Adults Living in Social Housing by Health Region, Age 75-84**

Percent of community-dwelling older adults



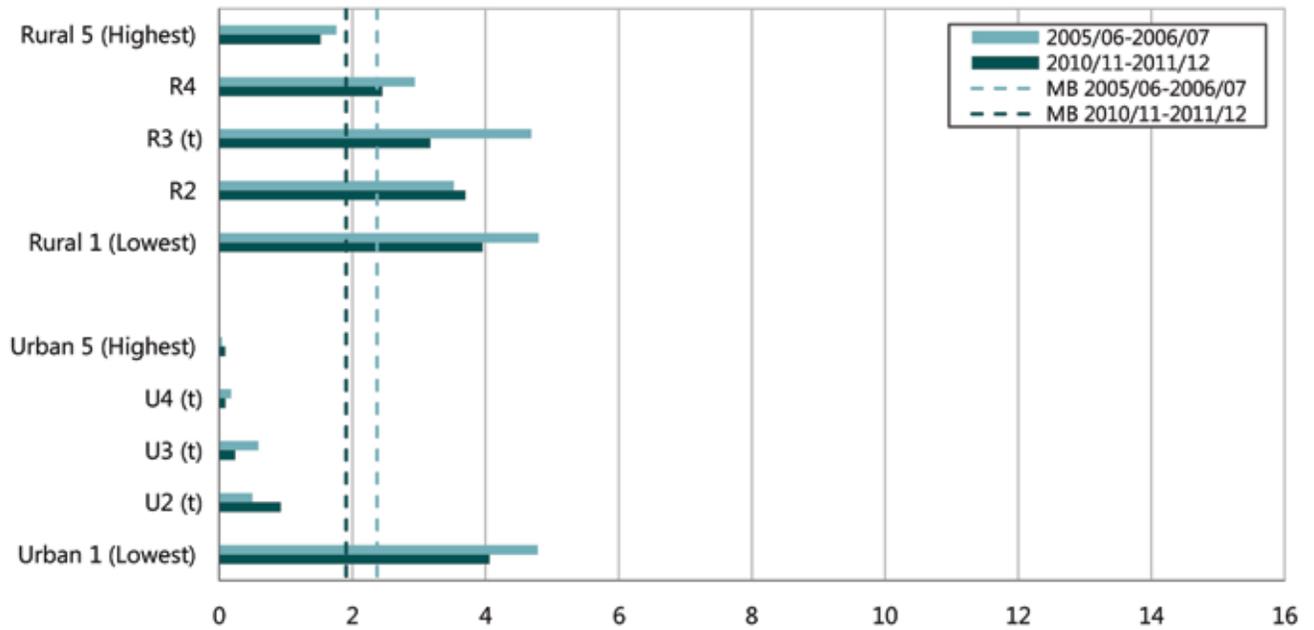
**Figure 13.3: Prevalence of Older Adults Living in Social Housing by Health Region, Age 85+**

Percent of community-dwelling older adults



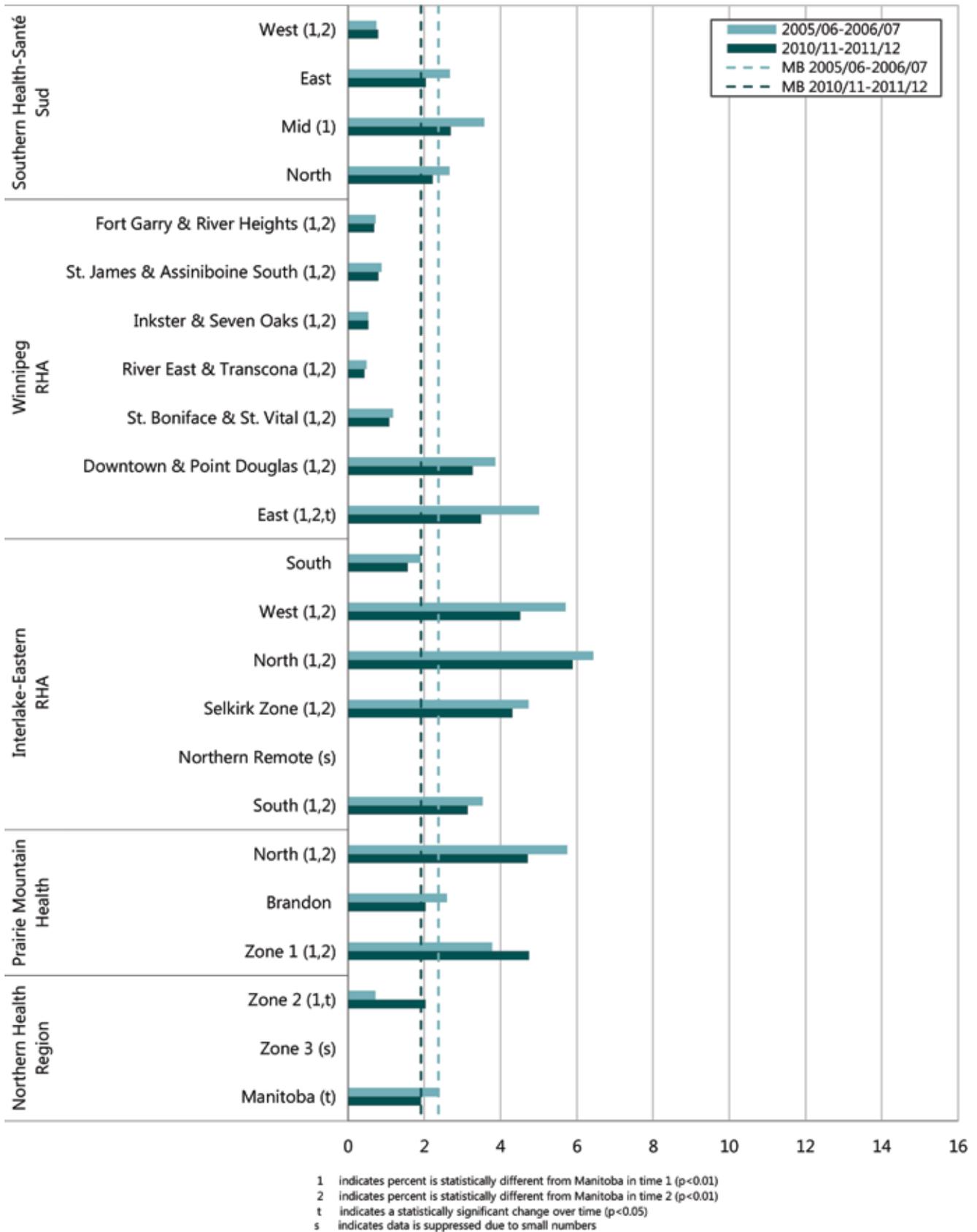
**Figure 13.4: Prevalence of Older Adults Living in Social Housing by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



t indicates a statistically significant change over time ( $p < 0.05$ )  
 The linear trend for rural is significant in time 1.  
 The linear trend for rural is significant in time 2.  
 The linear trend for urban is significant in time 1.  
 The linear trend for urban is significant in time 2.

**Figure 13.5: Prevalence of Older Adults Living in Social Housing by Health Region Zone**  
 Age- and sex-adjusted percent of community-dwelling older adults



## Income Assistance

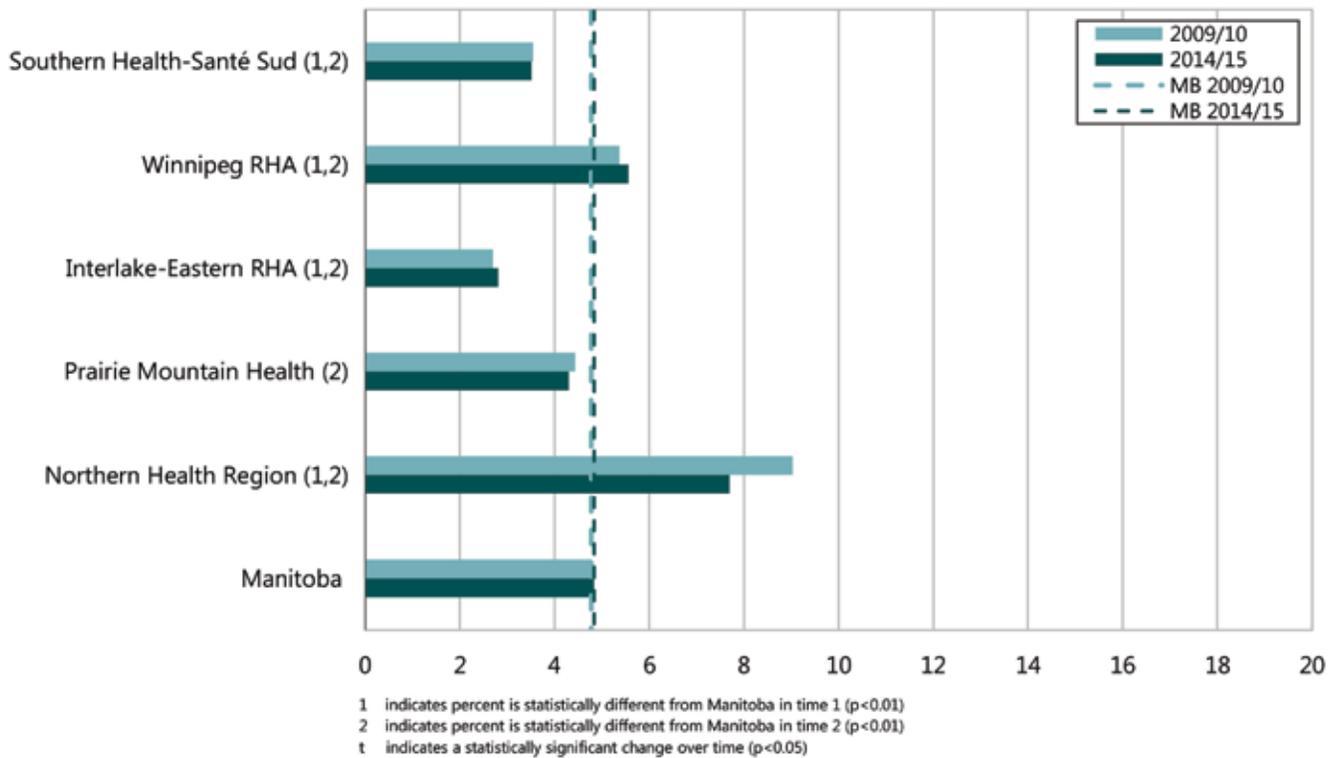
Income assistance is a financial supplement available to low-income individuals to ensure that their basic requirements of independent living are sustained. We couldn't measure this indicator directly for the older adult population since individuals over 65 are not eligible for income assistance in Manitoba; a different financial assistance program is in place for older adults, but the data for this program are not available in the MCHP Repository. For this reason, we examined whether older adults had a history of income assistance by looking to see if they were recipients when they were younger than 65, or if a household family member under 65 was receiving income assistance. For each time period, we looked back 15 years to determine older adults' history of receiving income assistance. Because our income assistance data only goes

back so many years, we don't have data for most individuals age 85+ (Figure 13.8). The figure for this age group is included here mainly to illustrate the limitations of the available data. The data are most accurate for the youngest (65-74) age group, where complete income assistance information was available for almost everyone, and this is where our discussion will focus.

The percentage of older adults receiving income assistance tended to be higher in Winnipeg than in rural regions, with the exception of Northern Health Region (Figures 13.6-13.7). The percentage of older adults with a history of income assistance remained steady at about 5% with no change over the two time periods. As expected, there was a higher percentage of individuals on income assistance in low income areas; this percentage decreased significantly in the lowest rural income quintile from one time period to the next (Figure 13.9).

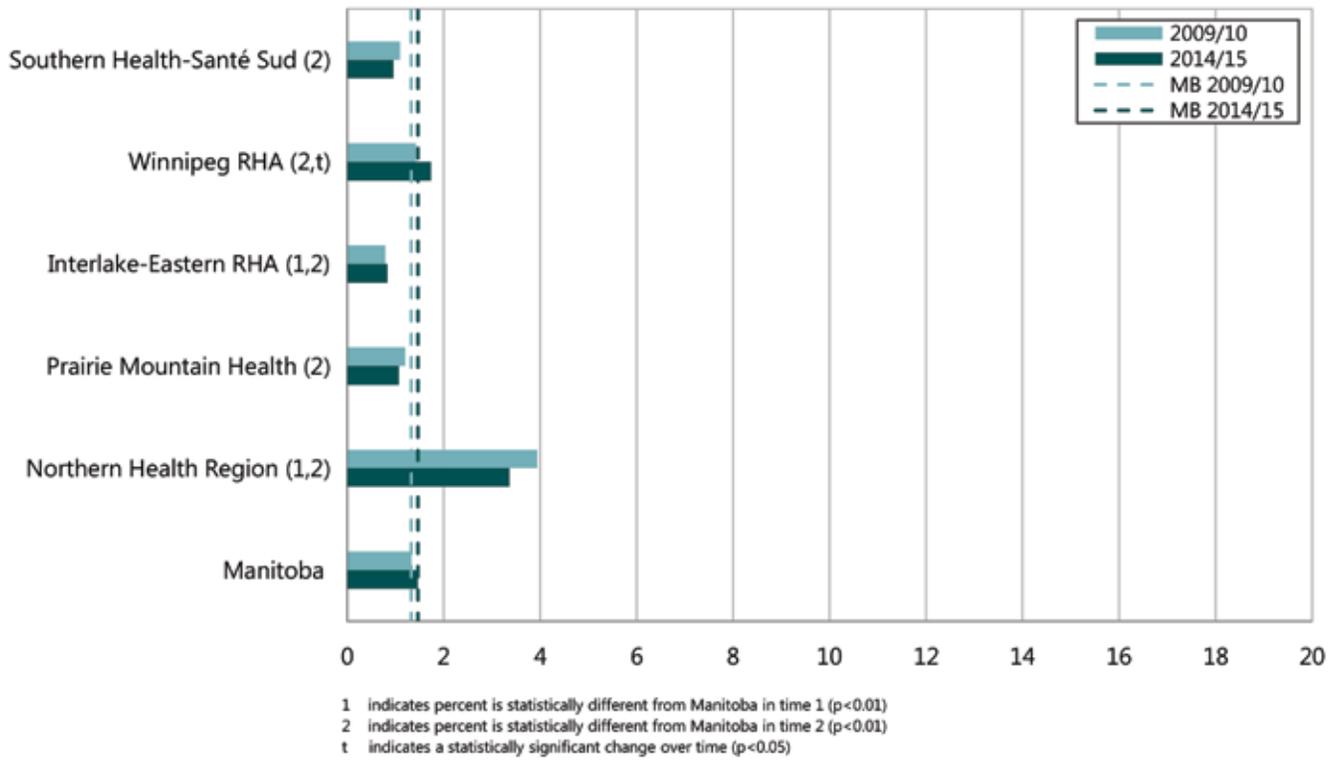
**Figure 13.6: Percent of Older Adults who Ever Received Income Assistance by Health Region, Age 65-74**

Percent of community-dwelling older adults



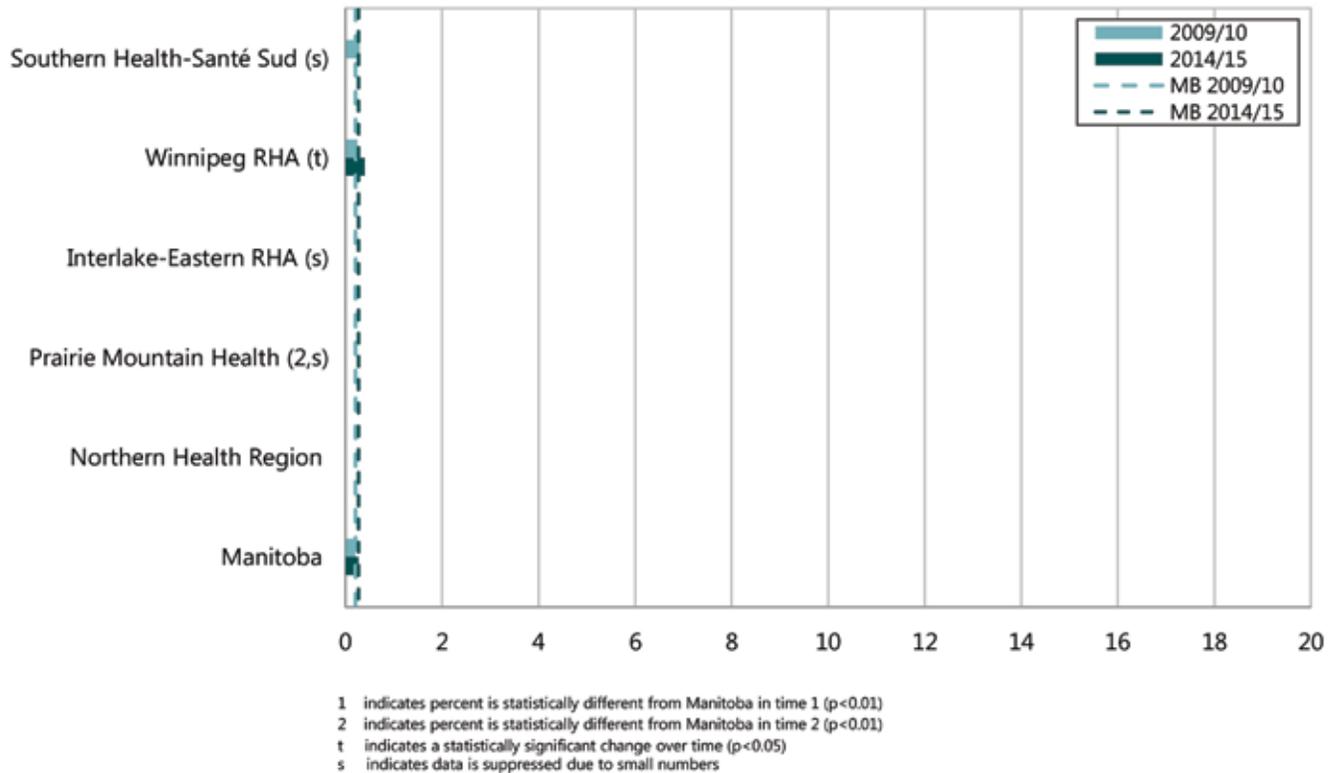
**Figure 13.7: Percent of Older Adults who Ever Received Income Assistance by Health Region, Age 75-84**

Percent of community-dwelling older adults



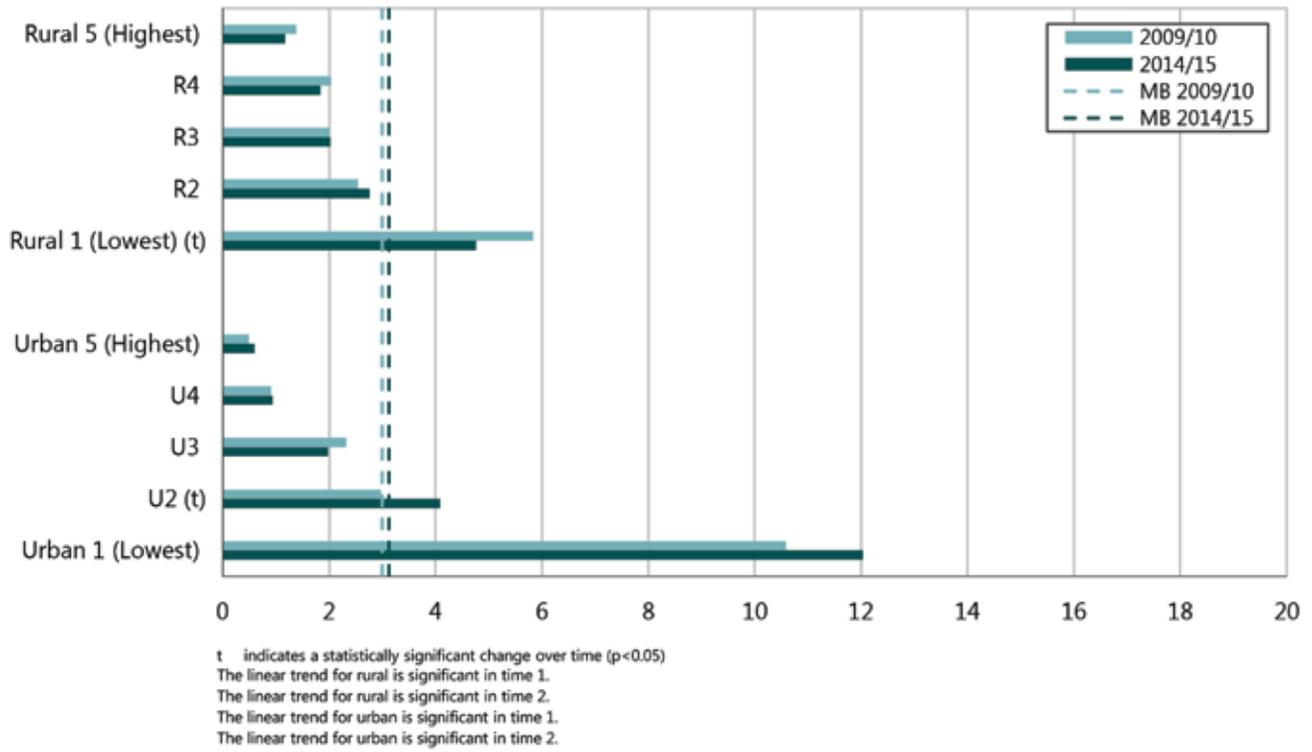
**Figure 13.8: Percent of Older Adults who Ever Received Income Assistance by Health Region, Age 85+**

Percent of community-dwelling older adults



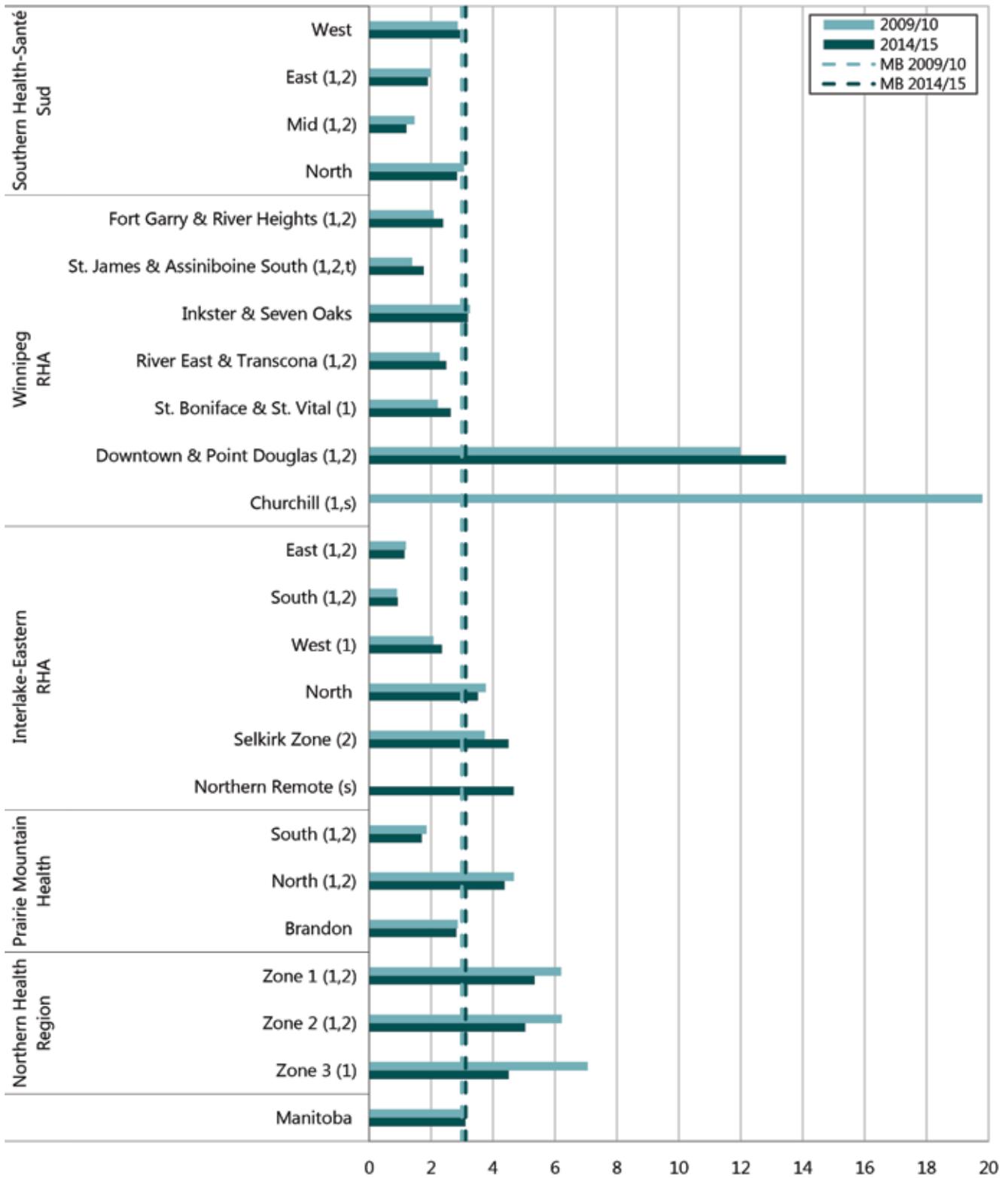
**Figure 13.9: Percent of Older Adults who Ever Received Income Assistance by Income Quintile**

Age- and sex-adjusted percent of community-dwelling older adults



**Figure 13.10: Percent of Older Adults who Ever Received Income Assistance by Health Region Zone**

Age- and sex-adjusted percent of community-dwelling older adults



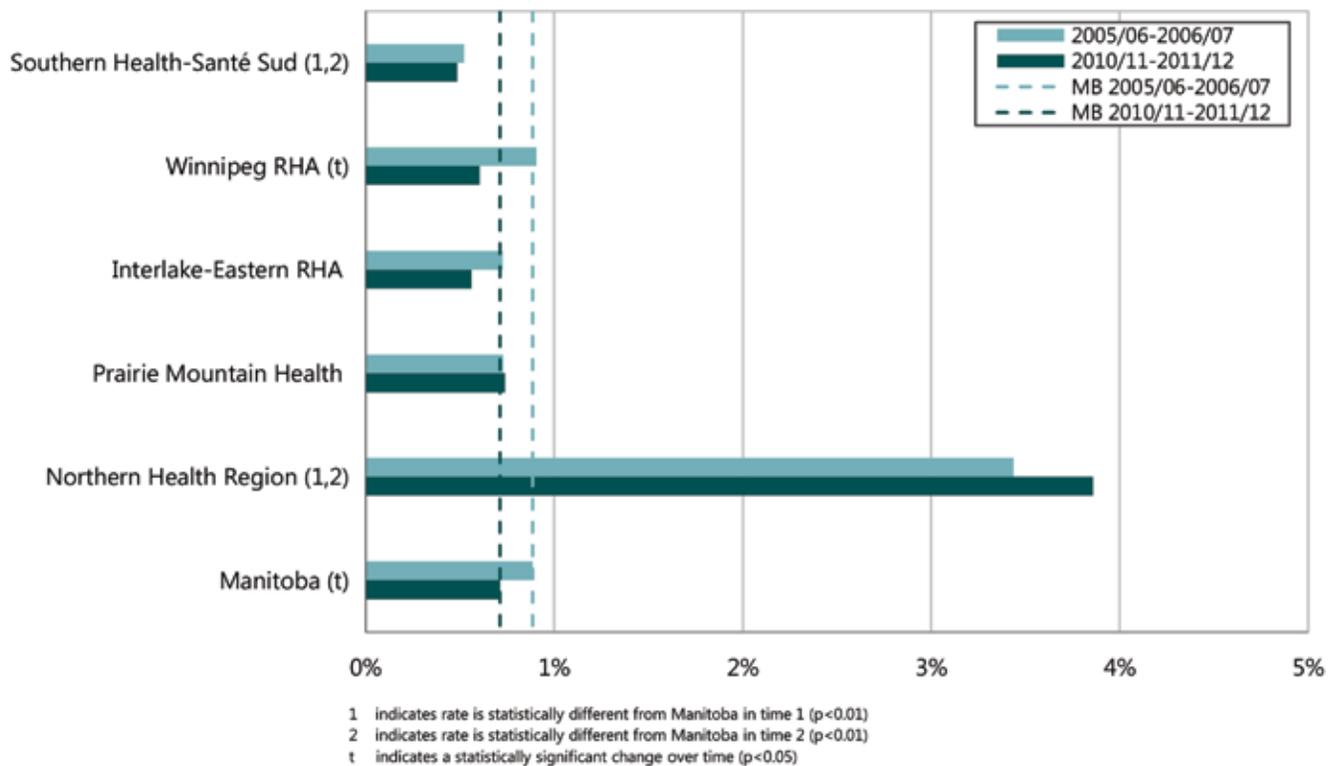
1 indicates percent is statistically different from Manitoba in time 1 (p<0.01)  
 2 indicates percent is statistically different from Manitoba in time 2 (p<0.01)  
 t indicates a statistically significant change over time (p<0.05)  
 s indicates data is suppressed due to small numbers

## Victim of a Crime

The justice system dataset in the Repository contains information on Manitobans who have been charged with crimes and prosecuted by the crown attorney. The dataset also contains information on the victims of these crimes. We used these data to determine the percentage of the older adult population in Manitoba that was identified as a victim of a crime. Examples of the types of crimes included in the dataset include assault, property crimes (theft, vandalism) and other criminal code offences (e.g., fraud). Limitations in the number of years of available data in the Repository meant that only two years of data in each time period could be used.

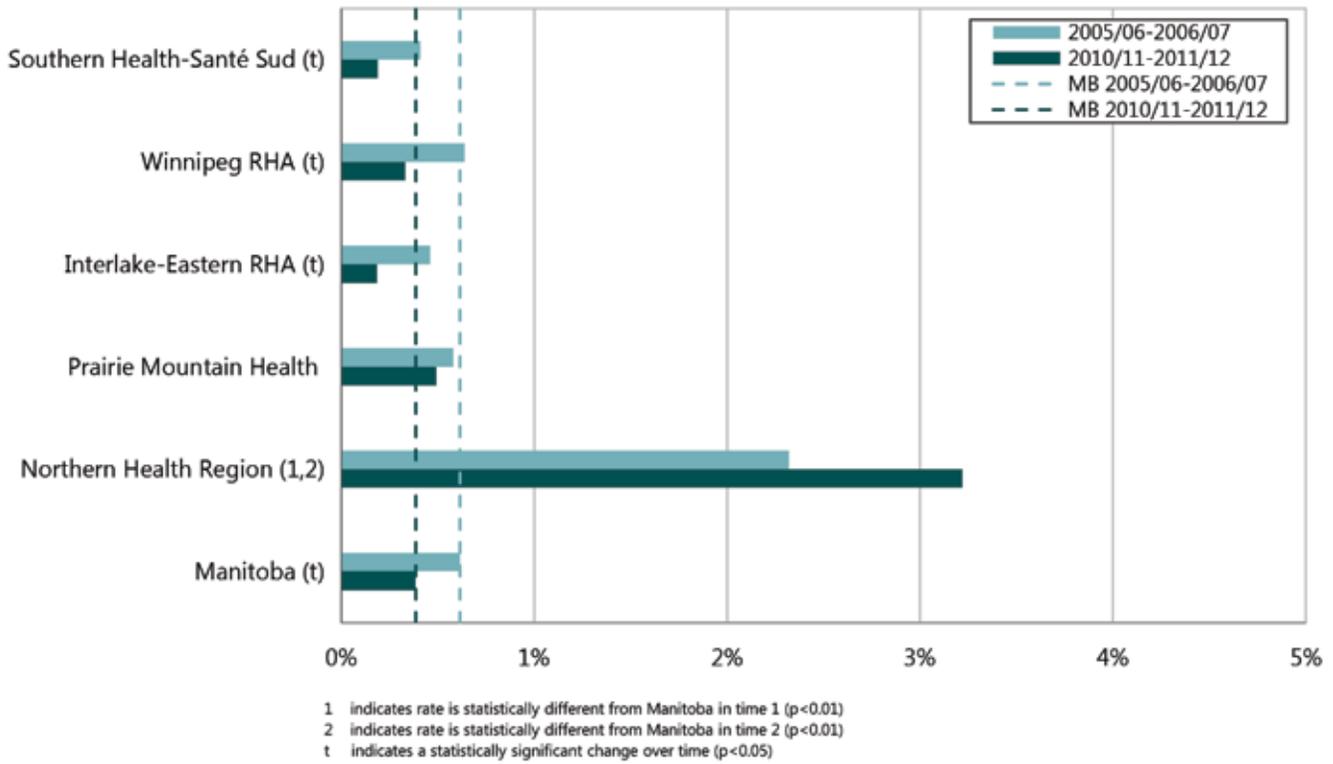
The percentage of older adults identified as victims of a crime significantly decreased over time for all three age groups (Figures 13.11-13.13). The percentage of older adults who were victims of a crime was about 4 times higher in the Northern Health Region than in other regions for the two older age groups. For the most part, there were higher percentages of older adults being victims of a crime in the lower income quintiles of rural and urban areas than in the higher income quintiles (Figure 13.14).

**Figure 13.11: Rates of Older Adults Who Were Victims of a Crime by Health Region, Age 65-74**  
Crude percent of community-dwelling older adults



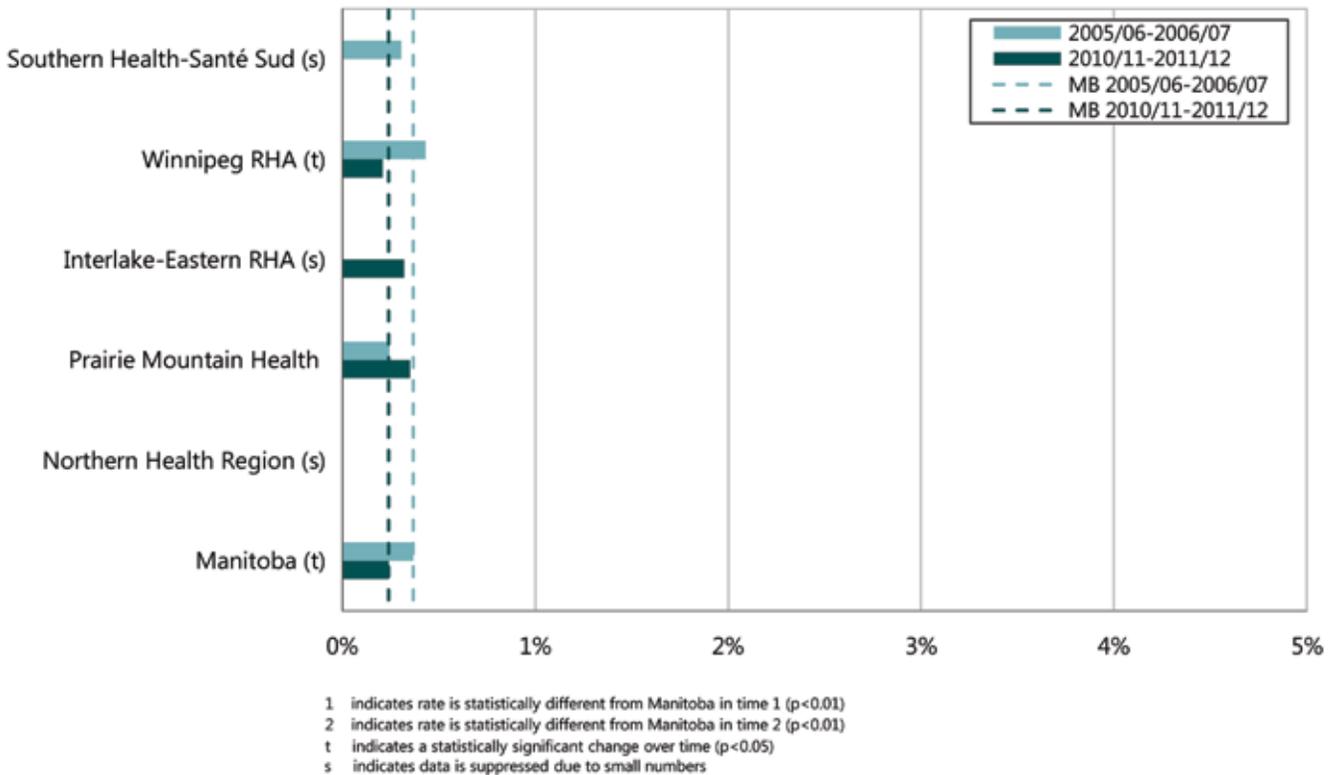
**Figure 13.12: Rates of Older Adults Who Were Victims of a Crime by Health Region, Age 75-84**

Crude percent of community-dwelling older adults



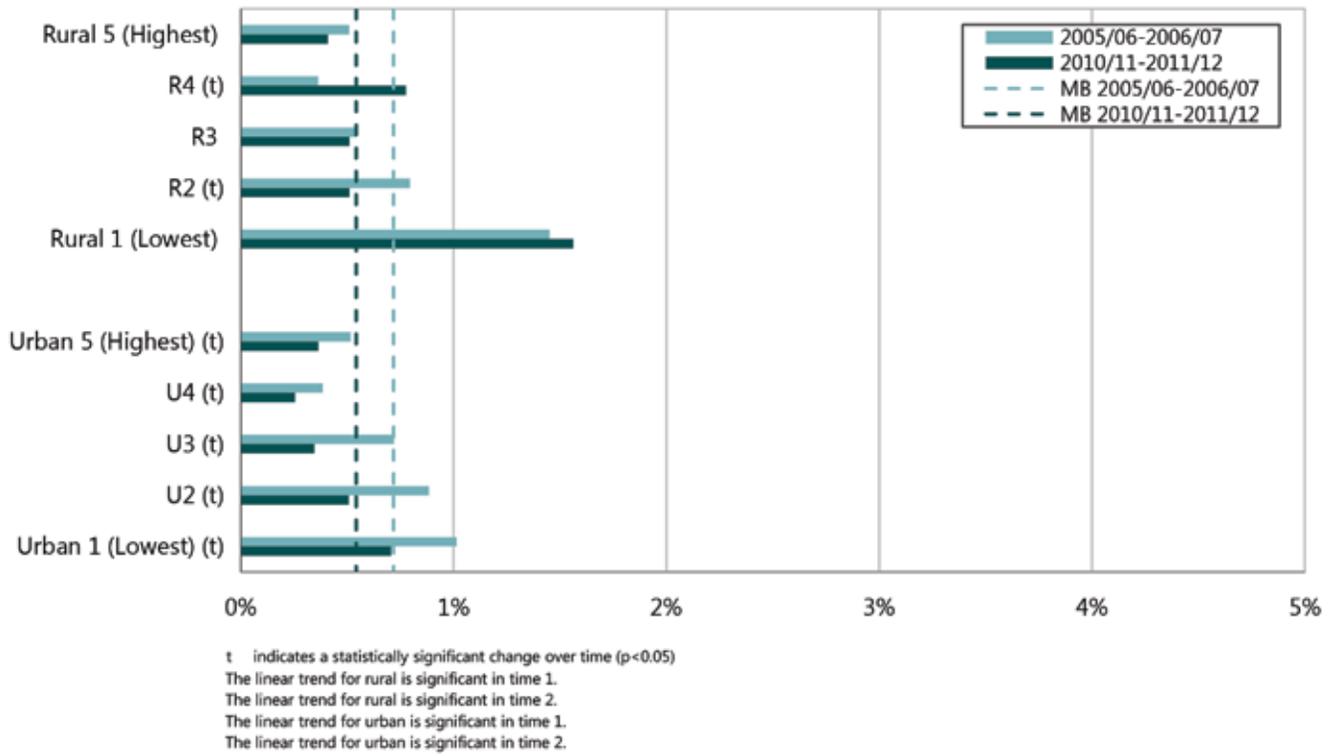
**Figure 13.13: Rates of Older Adults Who Were Victims of a Crime by Health Region, Age 85+**

Crude percent of community-dwelling older adults



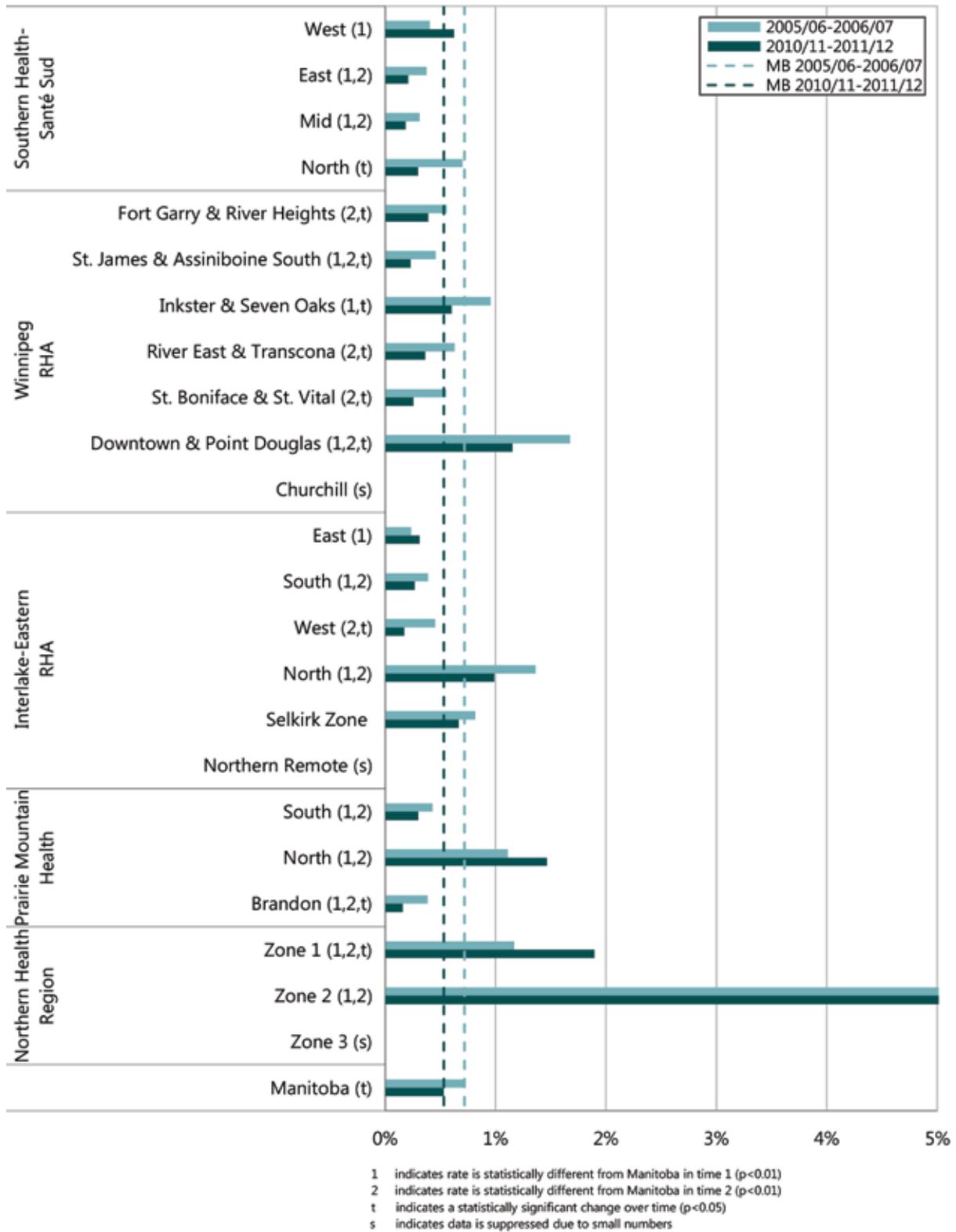
**Figure 13.14: Rates of Older Adults Who Were Victims of a Crime by Income Quintile**

Age- and sex-adjusted crude percent of community-dwelling older adults



**Figure 13.15: Rates of Older Adults Who Were Victims of a Crime by Health Region Zone**

Age- and sex-adjusted crude percent of community-dwelling older adults





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# References

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# Appendix 1:

## Technical Definitions

### Health Status Indicators

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#### Mortality Rates

Number of deaths per 1,000 person years.

#### Cause of death

Top ten causes of death (percentages out of all deaths) in each time period. Causes based on Vital Statistics data.

#### Expected Age in the Community

Expected median number of years for an older adult (age 65+) to live in a non-institutionalized setting in the community. Defined using Life Table method; based on cohort average mortality.

#### Expected Disease-free Community-Dwelling Years

Expected length of time for an older adult (age 65+) to live in a non-institutionalized setting and be free of any major chronic diseases, such as acute myocardial infarction, cancer, chronic obstructive pulmonary disease, dementia (including Alzheimer's Disease), diabetes, end stage kidney disease, ischemic heart disease and stroke. Includes individuals age 65+ in the second time period who were not identified as a prevalent case of any of the aforementioned chronic conditions in the first period. Individuals' disease-free community-dwelling years were calculated from the latter of age 65 or April 1, 2010 to first diagnosis of any disease listed, death, admission to a long-term care facility, move out of province or March 31, 2014 (whichever came first). Values were calculated directly from the chronic disease diagnosis patterns of residents using a 'life table' approach.

### Healthcare Use Indicators

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#### Ambulatory Visit Rates

Number of visits to physicians or nurse practitioners that occur outside of a hospital setting, per person-year in 2009/10 and 2014/15.

#### Hospitalization Rates

Number of inpatient hospital episodes per 100 person years. Excludes non-acute care facilities.

#### Hospital Days

Number of hospital days per person-year in 2009/10 and 2014/15. Excludes non-acute care facilities.

#### Emergency Department (ED) Visit Rates

Number of ED visits per person-year in 2009/10 and 2014/15 for Winnipeg residents only.

## Specialist Visit Rates

Number of ambulatory specialist visits per person-year in 2009/10 and 2014/15. Excludes General practice and Non-Ambulatory Specialists (Radiology and Anaesthesia).

## Ambulatory Consultation Visit Rates

Number of ambulatory consult visits per person-year in 2009/10 and 2014/15 with any of the following tariffs: 8440, 8449, 8550, 8553, 8556, 8557.

## Chronic Physical Disease and Acute Medical Events

### Chronic Obstructive Pulmonary Disease (COPD) Prevalence

Percent of individuals with one of the following in 2009/10 or 2014/15:

- one or more hospitalizations in one year with a diagnosis of COPD (ICD-9-CM codes 490, 491, 492, 493, 496; ICD-10-CA codes J40-J45), or
- one or more physician visits in one year with a diagnosis of COPD (ICD-9-CM codes as above).

### Diabetes Prevalence

Percent of individuals with one of the following in 2007/08-2009/10 or 2012/13-2014/15:

- one or more hospitalizations with a diagnosis of diabetes (ICD-9-CM code 250; ICD-10-CA codes E10-E14), or
- two or more physician visits with a diagnosis of diabetes (ICD-9-CM code as above), or
- one or more prescriptions for medications to treat diabetes (ATC code A10).

### End Stage Kidney Disease (ESKD) Prevalence

Number of individuals per 100 person-years receiving dialysis or kidney transplant:

- dialysis for 90 days with no gaps >15 days between sessions or until death (physician tariffs: 3790, 3792, 3793, 3794, 3800, 3801, 3803, 3804, 3805, 9610, 9798, 9799, 9801, 9802, 9805, 9806, 9807, 9814, 9819, 9820, 9821) and at least one physician visit for chronic kidney disease (ICD-9-CM 585) or renal failure (ICD-9-CM 586) during dialysis, or
- one or more 1 physician visit for kidney transplant (ICD-9-CM procedure: 556; tariff: 5883), or
- one or more 1 hospitalization for kidney transplant (ICD-10-CA intervention: 1PC85, 1OK85).

### Hypertension Prevalence

Percent of individuals with one of the following:

- one or more hospitalizations with a diagnosis of hypertensive diseases (ICD-10-CA: I10-I13, I15) in two years, or
- two or more physician visits with a diagnosis of hypertensive diseases (ICD-9-CM : 401-405) in two years.

### Ischemic Heart Disease (IHD) Prevalence

Percent of individuals with one of the following:

- one or more hospitalizations with a diagnosis of IHD (ICD-9-CM codes 410–414; ICD-10-CA codes I20–I22, I24, I25), or
- two or more physician visits with a diagnosis of IHD (ICD-9-CM codes as above), or
- one physician visit with a diagnosis of IHD and two or more prescriptions for medications to treat IHD (see ATC codes).

**Diagnosis codes:**

- ICD-9-CM: 410–414
- ICD-10-CA: I20–I22, I24, I25

Appendix Table 1.1: List of Drugs Used to Treat IHD

ATC Code	Generic Drug Name	ATC Code	Generic Drug Name
<b>B01AC04</b>	Clopidogrel	<b>C09AA09</b>	Fosinopril
<b>B01AC22</b>	Prasugrel	<b>C09AA10</b>	Trandolapril
<b>B01AC24</b>	Ticagrelor	<b>C09BA02</b>	Enalapril and Diuretics
<b>C01DA02</b>	Glyceryl Trinitrate	<b>C09BA03</b>	Lisinopril and Diuretics
<b>C01DA05</b>	Pentaerithryl Tetranitrate	<b>C09BA04</b>	Perindopril and Diuretics
<b>C01DA08</b>	Isosorbide Dinitrate	<b>C09BA06</b>	Quinapril and Diuretics
<b>C01DA14</b>	Isosorbide Mononitrate	<b>C09BA08</b>	Cilazapril and Diuretics
<b>C07AA02</b>	Oxprenolol	<b>C09CA01</b>	Losartan
<b>C07AA03</b>	Pindolol	<b>C09CA02</b>	Eprosartan
<b>C07AA05</b>	Propranolol	<b>C09CA03</b>	Valsartan
<b>C07AA06</b>	Timolol	<b>C09CA04</b>	Irbesartan
<b>C07AA12</b>	Nadolol	<b>C09CA06</b>	Candesartan
<b>C07AB02</b>	Metoprolol	<b>C09CA07</b>	Telmisartan
<b>C07AB03</b>	Atenolol	<b>C09CA08</b>	Olmesartan
<b>C07AB04</b>	Acebutolol	<b>C09DA01</b>	Losartan and Diuretics
<b>C07AB07</b>	Bisoprolol	<b>C09DA02</b>	Eprosartan and Diuretics
<b>C07AG01</b>	Labetalol	<b>C09DA03</b>	Valsartan and Diuretics
<b>C07BA05</b>	Propranolol and Thiazides	<b>C09DA04</b>	Irbesartan and Diuretics
<b>C07CA03</b>	Pindolol and other Diuretics	<b>C09DA06</b>	Candesartan and Diuretics
<b>C07CB03</b>	Atenolol and other Diuretics	<b>C09DA07</b>	Telmisartan and Diuretics
<b>C08CA01</b>	Amlodipine	<b>C09DA08</b>	Olmesartan and Diuretics
<b>C08CA02</b>	Felodipine	<b>C10AA01</b>	Simvastatin
<b>C08CA04</b>	Nicardipine	<b>C10AA02</b>	Lovastatin
<b>C08CA05</b>	Nifedipine	<b>C10AA03</b>	Pravastatin
<b>C08CA06</b>	Nimodipine	<b>C10AA04</b>	Fluvastatin
<b>C08DA01</b>	Verapamil	<b>C10AA05</b>	Atorvastatin
<b>C08DB01</b>	Diltiazem	<b>C10AA06</b>	Cerivastatin
<b>C09AA01</b>	Captopril	<b>C10AA07</b>	Rosuvastatin
<b>C09AA02</b>	Enalapril	<b>C10AB02</b>	Bezafibrate
<b>C09AA03</b>	Lisinopril	<b>C10AB04</b>	Gemfibrozil
<b>C09AA04</b>	Perindopril	<b>C10AB05</b>	Fenofibrate
<b>C09AA05</b>	Ramipril	<b>C10AX09</b>	Ezetimibe
<b>C09AA06</b>	Quinapril	<b>C10BX03</b>	Atorvastatin and Amlodipine
<b>C09AA07</b>	Benazepril	<b>N02BA01</b>	Acetylsalicylic Acid (Tablet Strength <= 325 Mg)
<b>C09AA08</b>	Cilazapril		

## Acute Myocardial Infarction (AMI) Prevalence

Percent of individuals with one of the following:

- one or more inpatient hospitalization with the most responsible diagnosis of AMI and a length of stay of three or more days, or
- a death with AMI listed as the primary cause of death on the Vital Statistics death record (ICD-9-CM: 410, and ICD-10-CA: I21).

## Stroke Prevalence

Percent of individuals with one of the following:

- one or more inpatient hospitalizations with the most responsible diagnosis of stroke and a length of stay of one or more days unless the patient died in hospital (ICD-9-CM, ICD-10-CA), or
- death with stroke listed as the primary cause of death on the Vital Statistics death record (ICD-10-CA).

### Diagnosis codes:

- ICD-9-CM: 431, 434, 436
- ICD-10-CA: I61, I63, I64.

## Hip Fracture Rates

Number of events per 1,000 person-years with one hospitalization with the most responsible diagnosis of hip fracture (ICD-9-CM: 820, ICD-10-CA: S72.0, S72.1, S72.2).

## Mental Health Conditions

### Dementia Prevalence

Percent of individuals with one of the following:

- one or more hospitalizations with a diagnosis for dementia, including organic psychotic conditions, cerebral degenerations and senility (ICD-9-CM: 290, 291.1, 291.2, 292.82, 294, 331, 797; ICD-10-CA: 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
- one or more physician visits with a diagnosis for dementia (ICD-9-CM 290, 294, 331, 797).

### Mood and Anxiety Disorders Prevalence

Percent of individuals with one of the following:

- 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: 296.1–296.8, 300.0, 300.2–300.4, 300.7; ICD-10-CA: 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
- one or more physician visits with a diagnosis of depression or episodic mood disorders: ICD-9-CM codes 296 and 311, or
- one or more hospitalizations or physician visits with a diagnosis of anxiety, dissociative, and somatoform disorders (ICD-9-CM: 300; ICD-10-CA: 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: N05AN01, N05BA, N06A), or
- three or more physician visits with a diagnosis of anxiety, dissociative, and somatoform disorders or adjustment reaction (ICD-9-CM: 300 & 309).

## Substance Use Disorder Prevalence

Percent of individuals with one of the following:

- one or more hospitalizations with a diagnosis for alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs (ICD-9-CM and ICD-10-CA), or
- 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).

**Diagnosis codes:**

- ICD-9-CM: 291, 292, 303, 304, 305
- ICD-10-CA: F10–F19, F55

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## Cancers

### Colorectal Cancer Rates

Number of individuals per 10,000 person-years in 2005/06-2009/10 and 2010/11-December 31, 2014 with:

- ICD-O-3 diagnosis with Topography Axis C180–C189, C199, C209, C260, and
- no prior occurrence of these diagnoses codes.

Exclusion: ICD-O-3 Morphology Axis 9590–9989

### Lung Cancer Rates

Number of individuals per 10,000 person-years in 2005/06-2009/10 and 2010/11-December 31, 2014 with:

- ICD-O-3 diagnosis with Topography Axis C340–C349, and
- no prior occurrence of these diagnoses codes.

Exclusion: ICD-O-3 Morphology Axis 9590–9989

### Breast Cancer Rates

Number of females per 10,000 person-years in 2005/06-2009/10 and 2010/11-December 31, 2014 with:

- ICD-O-3 diagnosis with Topography Axis C500–C509, and
- no prior occurrence of these diagnoses codes.

Exclusion: ICD-O-3 Morphology Axis 9590–9989

### Prostate Cancer Rates

Number of males per 10,000 person-years in 2005/06-2009/10 and 2010/11-December 31, 2014 with:

ICD-O-3 diagnosis with Topography Axis C619, and

no prior occurrence of these diagnoses codes.

Exclusion: ICD-O-3 Morphology Axis 9590–9989

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## Surgical Interventions

### Coronary Angiogram Rates

Number of coronary angiograms per 1,000 person years (CCI code 3.IP.10).

## Percutaneous Coronary Intervention (PCI) Rates

Number of PCIs (stent insertion and angioplasty) per 1,000 person-years (CCI codes 1.IJ.50 and 1.IJ.57).

## Coronary Artery Bypass Graft Surgery (CABG) Rates

Number of CABG surgeries per 1,000 person-years (CCI code 1.IJ.76).

## Hip Replacement Surgery Rates

Number of hip replacements per 1,000 person years (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).

## Knee Replacement Surgery Rates

Number of knee replacements per 1,000 person years (ICD-9-CM procedure codes 81.54 and 81.55 and CCI codes 1.VG.53.LA-PN and 1.VG.53.LA-PP).

## Prescription Drugs

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### Number of Different Prescription Drugs

Number of drugs per person-year in 2009/10 and 2014/15. Prescription drugs were grouped into classes based on their chemical/therapeutic/pharmacological agents and only one prescription is counted per class of drug. Excludes over-the-counter and homeopathic drugs.

### Days' Supply of Prescription Drugs

Number of days supplied per person-years in 2009/10 and 2014/15. Excludes over-the-counter drugs.

### Most Common Drugs Dispensed

Most commonly dispensed drugs by days' supplied for individuals in 2009/10 and 2014/15. The days supplied were summed at ATC 4th level for each person; included only records where sum of days was  $\geq 30$ . Drugs were then grouped at ATC 2nd level.

### Beers Drug Dispensing Prevalence

Percent of individuals in 2009/10 and 2014/15 who were dispensed at least one prescription for a drug on the Beers list that should be avoided by older adults. Excludes over-the-counter drugs. For a list of drugs identified for this study please see the Table of Beers Drugs in the online Report Supplement at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>.

### Long-Acting Benzodiazepine Drug Dispensing Prevalence

Percentage of individuals in 2009/10 and 2014/15 with:

- two or more prescriptions for benzodiazepines (ATC codes N05BA; N05CD; N05CF; and N03AE01), or
- one or more prescriptions for benzodiazepines (ATC as above) with a greater than 30-day supply.

For the list of drugs identified for this study please see the Long-Acting Benzodiazepines section of the Table of Beers Drugs in the online Report Supplement at <http://mchp-appserv.cpe.umanitoba.ca/deliverablesList.html>.

## Prevention and Screening

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### Influenza Vaccination Prevalence

Percent of individuals in 2008/09 and in 2014/15 who had at least one influenza vaccination (tariff codes: 8791, 8792, 8799, or 8969).

### Pneumococcal Vaccination Prevalence

Percent of individuals who ever had a pneumococcal vaccination up to the end of each time period (physician tariffs 8681–8684 and 8961).

### Breast Cancer Screening Prevalence

Women (age 65-74) with at least one mammogram over three years (tariff 7104). Excludes women with a history of breast cancer.

### Colorectal Cancer Screening Prevalence

Individuals (age 65-74) with one or more fecal occult blood test (FOBT) in two years identified in one of three data sources:

- Medical claims data: Tariff 9374
- Screening data: FOBT in either 2008/09-2009/10 or 2012/13-2013/14
- Diagnostic Services Manitoba data: Test codes 'Fecal Occult bld', 'FECAL OCCULT BLOOD', 'FECES OCCULT BLOOD'

Exclusions:

- Individuals with history of colorectal cancer
- FOBT done in hospital
- GI complaints within the past 6 months
- Colonoscopy(CS), Barium Enema (BE), or Sigmoidoscopy(Sig) within the past 6 months
- Two or more FOBT within the past year
- Any combinations of: FOBT+CS or FOBT+BE or CS+Sig or CS+BE or Sig+BE on the same day as FOBT

## Self-Reported Health Status (from Canadian Community Health Survey (CCHS))

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### Self-Perceived Health

In CCHS 3.1 (2005) to CCHS 2014. Question: In general, would you say your health is: excellent, very good, good, fair, poor? Grouped as: 'Excellent/Very Good', 'Good', and 'Fair/Poor'. Other response is 'don't know'.

### Self-Perceived Mental Health

In CCHS 3.1 (2005) to CCHS 2014. Question: In general, would you say your mental health is: excellent, very good, good, fair, poor? Analysed as the percentage who responded 'Excellent' or 'Very Good'. Other responses include 'don't know', 'refusal', or 'not stated'.

## Self-Perceived Life Stress

In CCHS 3.1 (2005) to CCHS 2014. Question: Thinking about the amount of stress in your life, would you say that most days are: not at all stressful, not very stressful, a bit stressful, quite a bit stressful, extremely stressful? Analysed as the percentage who responded 'not at all stressful' or 'not very stressful'. Other responses include 'don't know' or 'refusal'.

## Self-Perceived Unmet Healthcare Need

In CCHS 3.1 (2005), CCHS 2010 & 2014. Question: During the past 12 months, was there ever a time when you felt that you needed health care but you didn't receive it? Responses include 'yes', 'no' and 'don't know'.

## Self-Reported Instrumental Activities of Daily Living Impairment

In CCHS Healthy Aging. This variable is an overall summary measure of ratings of the ADL capacity-instrumental and physical dimensions. The instrument and the derived variable classification are developed from the ADL component of the OARS Multidimensional Functional Assessment Questionnaire. Higher values indicate greater functional impairment. Possible classifications are: 'no functional impairment', 'mild impairment', 'moderate impairment', 'severe impairment', 'total impairment' and 'not stated'. Analysed as the percentage of respondents who have moderate, severe or total impairments.

## Self-Reported 'Need Help' with Activities of Daily Living

In CCHS 3.1 (2005) to CCHS 2010 & 2014 (excl. CCHS Healthy Aging, 2011, 2012). This variable classifies respondents according to their need for help (because of health reasons) with IADLs such as preparing meals, shopping for groceries or other necessities, doing everyday housework, doing heavy household chores (washing walls, yard work), and personal care (washing, dressing or eating), moving about inside the house or paying bills. Possible classifications are: 'yes', 'no' and 'not stated'.

## Self-Reported Impact of Chronic Health Problem on Life

In CCHS 3.1 (2005) to CCHS 2014 (excl. CCHS Healthy Aging & 2011). This variable is a measure of the impact of one or more long-term (i.e. has lasted or is expected to last at least 6 months) physical and/or mental health problem on the principal domains of life: home, work, school, and other activities. Possible classifications are: 'often', 'sometimes', 'never', and 'not stated'.

## Self-Reported Activity Limitations due to Chronic Condition

In CCHS 3.1(2005) to CCHS 2014 (excl. CCHS Healthy Aging & 2011). This variable classifies respondents based on the frequency with which they experience activity limitations imposed on them by one or more long-term (i.e. has lasted or is expected to last at least 6 months) physical and/or mental health problems. Possible classifications are: 'often', 'sometimes', 'never', and 'not stated'.

## Self-Reported Activity Limitations due to Pain or Discomfort

In CCHS 2007 to CCHS 2014. This variable classifies respondents based on their activity limitation due to pain or discomfort. Possible classifications are: 'no pain or discomfort', 'pain prevents no activities', 'pain prevents a few activities', 'pain prevents some activities', 'pain prevents most activities, and 'not stated'.

## Self-Rated Cognition

In CCHS 2009, 2010, 2012-2014 & Healthy Aging. This variable classifies respondents based on their ability to remember, think and solve problems. Possible classifications are: level 1 (able to remember and think), level 2 (able to remember and some difficulty thinking), level 3 (somewhat forgetful and able to think), level 4 (somewhat forgetful and difficulty thinking), level 5 (very forgetful or great deal of difficulty thinking), level 6 (unable to remember or unable to think), and not stated. Analysed as the percentage of respondents who were classified in cognition level 1.

## Self-Rated Emotion

In CCHS 2009, 2010, 2012-2014 & Healthy Aging. This variable classifies respondents based on their levels of happiness and interest in life, and unhappiness. Possible classifications are: level 1 (happy and interested in life), level 2 (somewhat happy), level 3 (somewhat unhappy), level 4 (very unhappy), level 5 (so unhappy that life is not worthwhile), and not stated. Analysed as the percentage of respondents who were classified in emotion level 1.

## Self-Rated Mobility

In CCHS 2009, 2010, 2012-2014 & Healthy Aging. This variable classifies respondents based on their ability to walk or be mobile around the neighbourhood or for short distances. Possible classifications are: level 1 (able to walk without difficulty), level 2 (able to walk with difficulty, no aid required), level 3 (able to walk with difficulty, requires walking equipment), level 4 (able to walk with difficulty, requires wheelchair), level 5 (able to walk with difficulty, requires help from people), level 6 (cannot walk at all), and not stated. Analysed as the percentage of respondents who were classified in ambulation level 1.

## Self-Reported Physical Activity (Leisure Time)

In CCHS 3.1 (2005) to CCHS 2014 (excl. CCHS Healthy Aging). This variable categorizes respondents based on their activity level in their leisure time based on their estimated total daily energy expenditures (kcal/kg/day) during leisure activities in the past three months. Possible classifications are: 'active', 'moderately active', 'inactive' and 'not stated'.

## Self-Reported Dental Care

In CCHS 3.1 (2005) to 2014 (excluding CCHS Healthy Aging). Question: Have you consulted with a dentist, dental hygienist or orthodontist about your physical, emotional or mental health? Response options include 'yes', 'no' and 'don't know'.

## Social Determinants of Health

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### Social Housing

Percent of individuals who were in government-owned-and-managed housing for at least one day during the study period.

### Income Assistance

Percent of individuals who received income assistance for at least one day up to the end of each time period starting 15 years prior to this point. This ensured that both time periods had same exposure times.

### Victim of a Crime

Percent of individuals who were victims of a crime once or more in 2005/06-2006/07 and 2010/11-2011/12. Includes crimes against people (e.g., assault), crimes against property (e.g., theft) and other criminal code crimes (e.g., fraud).



# Appendix 2:

## Canadian Community Health Survey Years Used

Appendix Table 2.1: Canadian Community Health Survey Years Used, by Indicator

Indicator	Time 1: 2005-2009					Time 2: 2010-2014				
	CCHS 3.1 (2005)	CCHS 2007	CCHS 2008	CCHS Healthy Aging (2008-2009)	CCHS 2009	CCHS 2010	CCHS 2011	CCHS 2012	CCHS 2013	CCHS 2014
Self-Perceived Health	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-Perceived Mental Health	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-Perceived Stress	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-Perceived Unmet Healthcare Need	✓					✓				✓
Self-Reported IADLs				✓						
Self-Reported 'Need Help' with ADLs	✓	✓	✓		✓	✓			✓	✓
Self-Reported Impact of Chronic Health Problem on Life	✓	✓	✓		✓	✓		✓	✓	✓
Self-Reported Activity Limitations due to Chronic Condition	✓	✓	✓		✓	✓		✓	✓	✓
Self-Reported Activity Limitations due to Pain or Discomfort		✓	✓	✓	✓	✓	✓	✓	✓	✓
Self-Rated Cognition (HUI)				✓	✓	✓		✓	✓	✓
Self-Rated Emotion (HUI)				✓	✓	✓		✓	✓	✓
Self-Rated Mobility (HUI)				✓	✓	✓		✓	✓	✓
Self-Reported Physical Activity (Lesiure Time)	✓	✓	✓		✓	✓	✓	✓	✓	✓
Self-Reported Dental Care	✓	✓	✓		✓	✓	✓	✓	✓	✓
Sample Size Age 65+	1,327	738	712	945	706	674	740	732	850	912

Note: IADL = Instrumental Activities of Daily Living; ADL = Activities of Daily Living; HUI = Health Utilities Index







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