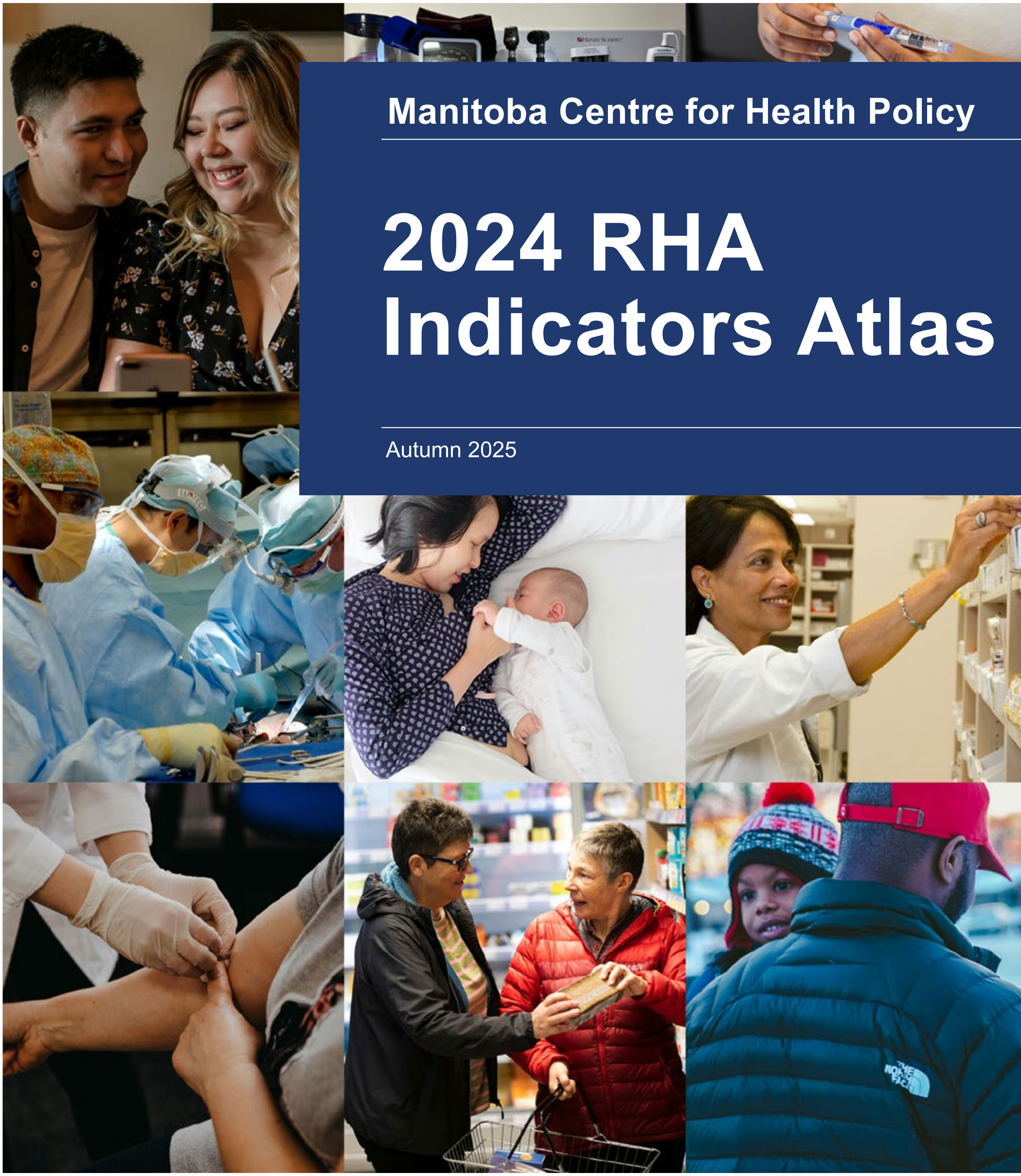
Manitoba Centre for Health Policy

2024 RHA Indicators Atlas

Autumn 2025



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Territory Acknowledgement

The University of Manitoba campuses and research spaces are located on original lands of Anishinaabeg, Ininiwak, Anisininewuk, Dakota Oyate, Dene and Inuit, and on the National Homeland of the Red River Métis.

UM recognizes that the Treaties signed on these lands are a lifelong, enduring relationship, and we are dedicated to upholding their spirit and intent. We acknowledge the harms and mistakes of the past and the present. With this understanding, we commit to supporting Indigenous excellence through active Reconciliation, meaningful change, and the creation of an environment where everyone can thrive. Our collaboration with Indigenous communities is grounded in respect and reciprocity and this guides how we move forward as an institution.

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About the Manitoba Centre for Health Policy

The Manitoba Centre for Health Policy (MCHP) conducts world-class population-based research on health and the social determinants of health. Our mission is to conduct collaborative research and analytics which inform solutions to support a thriving society.

We curate Manitoba's unique data repository and develop trainees in population-based research. Our work is guided by our core values of innovation, reconciliation, excellence, IDEA (Inclusion, Diversity, Equity, and Accessibility), and teamwork and collaboration. MCHP is located within the Rady Faculty of Health Sciences at the University of Manitoba.

We use data held within the Manitoba Population Research Data Repository (Repository) to examine patterns in population-based health and wellbeing and explore relationships with factors such as income, education, employment, and social status. Linkable at the individual level and over time, the Repository holds a comprehensive collection of de-identified administrative, registry, survey, and other data primarily relating to Manitobans across multiple sectors including health, justice, education, social services and more.

New data sets continue to be added to the Repository, and all other data sets are updated on an annual basis. MCHP acts as a steward of the information in the Repository for agencies such as Manitoba Health and provides access to the data to researchers, students and groups outside of MCHP for a wide variety of research and educational purposes.

MCHP conducts two streams of research: contracted “Deliverable” projects for the Manitoba Government and grant-funded research. We produce several research projects every year under contract with Manitoba Health, which contributes to the health policy process. MCHP consults extensively with government officials, healthcare administrators and clinicians to develop a research agenda that is topical and relevant. Our research team also conducts studies funded through research grants. Research topics range across several areas of expertise such as newborn and maternal health, Indigenous health and wellbeing, older adults, family medicine, data quality, child development, mental health and substance use, and more. We collaborate with community partners, stakeholders and scientists worldwide, and our research is published in some of the field’s most preeminent journals.

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Abbreviations

ACS	Ambulatory Care Sensitive
ACR	Albumin to Creatinine Ratio
ALC	Alternate Level of Care
AMI	Acute Myocardial Infarction
ATC	Anatomical Therapeutic Chemical
CA	Community Area
CABG	Coronary Artery Bypass Graft
CCDSS	Canadian Chronic Disease Surveillance System
CCI	Canadian Classification of Health Interventions
CHF	Congestive Heart Failure
CIHI	Canadian Institute for Health Information
CT	Computed Tomography
DA	Dissemination Area
DER-CA	Diabetes Education Resource for Children and Adolescents
DPIN	Drug Program Information Network
eGFR	Estimated Glomerular Filtration Rate
HbA1c	Hemoglobin A1C
ICD	International Classification of Diseases
IHD	Ischemic Heart Disease
LGA	Large for Gestational Age
LE	Life Expectancy
MCHP	Manitoba Centre for Health Policy
MHSLTC	Manitoba Health, Seniors and Long-Term Care
MIMS	Manitoba Immunization Monitoring System
MRI	Magnetic Resonance Imaging
NC	Neighbourhood Cluster
NTK	The ‘Need To Know’ Team
PCH	Personal Care Home
PCI	Percutaneous Coronary Interventions
PHIN	Personal Health Identification Number
PHIMS	Public Health Information Management System
PMR	Premature Mortality Rate

PYLL	Potential Years of Life Lost
R-GINDEX	Revised-Graduated Prenatal Care Utilization Index
RHA	Regional Health Authority
SEFI	Socioeconomic Factor Index
SHDS	Shared Health Diagnostic Services
SGA	Small for Gestational Age
SNOMED	Systematized Nomenclature of Medicine
TMR	Total Mortality Rate
TRM	Total Respiratory Morbidity
TP	Time Period
VBAC	Vaginal Birth After C-Section

Executive **Summary**

The 2024 RHA Indicators Atlas updates many indicators from previous Atlases. It differs from past Atlases in that it includes a 20-year trend analysis for almost all indicators rather than only a select few. It also includes a time period analysis involving three periods as opposed to only two. The years covered in the trend analysis were 2003/04 – 2022/23, while the years used in the three time periods were 2012/13, 2017/18, and 2022/23. The trend analysis shows whether the rate for an indicator has increased or decreased (or has no trend) over a 20-year period. For some indicators the trend may be gradual and steady, while for others we may see a dramatic change during the earlier years followed by a levelling off, or vice versa. The time period analysis makes two comparisons where the second period is compared to the first period and the third period is compared to the second period.

The two types of analyses allow for a comprehensive assessment that includes the current status of the indicators and how they may have changed more recently and over time. For example, we may notice a decreasing trend for an indicator, but no significant differences between time periods. This would suggest that the decreasing trend occurred gradually over the 20-years. Alternatively, perhaps no trend observed, but there was a significant difference between the second and third time periods. This would suggest that a change has occurred more recently and may signal something to plan for. Another example is where a trend exists and there is a significant difference between the first and second periods, but no difference between the second and third periods. This would suggest that even though a trend existed over time, the results for that indicator may have plateaued.

The interpretation of the results in this Atlas should consider the impact of the COVID-19 pandemic. The effect of the pandemic on the indicators are most noticeable in the trend analysis figures where dramatic or sudden changes from 2019/20 to

2020/21 may occur, which are often followed by a return to pre-pandemic levels by 2022/23. It is trickier to parse out COVID-19 effects in the time period analysis results since some indicators require periods that include the early part of the pandemic, while others do not. However, it is prudent to be aware of the pandemic while interpreting these results.

The following sections summarize the major findings from this study, including the impact of COVID-19, and each are described in more detail in the main body of the report.

Manitoba keeps growing and aging.

- Manitoba's population grew in all Regional Health Authorities (RHAs) between 2017 and 2022, but not at as high of a rate as previously reported. In other words, the rate of population size increase has slowed.
- Over time, the proportion of the population between the ages of 0 and 19 years has consistently decreased, while the proportion 65 years and older has increased.
- Regional population age and sex structures were different from the overall provincial structure in 2022. Compared to Manitoba:
  - The Southern Health-Santé Sud region had a higher percentage of children and lower percentage of adults and older adults.
  - The Winnipeg RHA had a lower percentage of children, a higher percentage of adults, and a similar percentage of older adults.
  - The Interlake-Eastern RHA had a lower percentage of children and adults and a higher percentage of older adults.
  - Prairie Mountain Health had a slightly higher percentage of children, a lower percentage of adults and a higher percentage of older adults.
  - The Northern Health Region had a much higher percentage of children, a lower percentage of adults, and a much lower percentage of older adults.

The overall health status of Manitobans has improved and continues to improve over time.

- The 20-year trend analysis shows a significant improvement over time for most mortality indicators in each of the RHAs, except for the Northern Health Region, where residents have experienced increasing rates of premature mortality, number of potential years of life lost, and deaths by suicide.
- The time period analysis shows that indicators that typically reflect population health status have not changed significantly in Manitoba, suggesting the longer-term improvements identified in the trend analysis have occurred gradually.
- All indicators in this chapter are strongly related to income, where those in lower incomes areas experience poorer health outcomes (e.g., higher mortality rates).

The prevalence and incidence of most chronic illnesses has declined, but with a growing population, there are more people living with these illnesses than before.

- In the province overall, significant decreasing trends in the prevalence and incidence of most of the chronic illnesses were observed over the 20-year period. Only the prevalence and incidence of diabetes had significant trends (increasing over time). Similar findings were observed among the RHAs, except for in the Interlake-Eastern RHA, Prairie Mountain Health, and Northern Health Region, where the prevalence of hypertension has significantly increased over time.
- In Manitoba, the time period analysis showed that the prevalence or incidence of all conditions between the first and second periods did not change or had decreased significantly. Similar results occurred when comparing the third to the second period; however, diabetes incidence and congestive heart failure prevalence were both higher.
- Within the regions, the Winnipeg RHA and Prairie Mountain Health showed significant increases in the prevalence of diabetes between the second and third time periods. Meanwhile, the prevalence of congestive heart failure in the third period was

significantly lower than in the second period in the Northern Health Region, while it was significantly higher in the Winnipeg RHA.

- Despite the decreased prevalence and incidence observed for many of the conditions, the actual number of individuals living with these conditions continues to rise as a result of the increasing size and aging of the population.
- The rates of the two key health events (heart attacks and strokes) have significantly decreased over time and between each of the time periods across all regions.

Mental illness continues to be a concern.

- The prevalence of mood and anxiety disorders have significantly increased over the 20-year period, which was also observed from the second time period to the third period indicating the slope of the trend is steeper now than in the past.
- Substance use disorder prevalence significantly decreased over the 20-year period but did not change between second and third periods suggesting that the prevalence has plateaued. However, individuals also receive care in the community setting of which data is not available – therefore, the true prevalence is likely higher than reported and may not actually have levelled off.

The rate of visits with physicians and nurse practitioners is stable, but the proportion of the population making those visits has decreased.

- The rate of ambulatory visits has remained relatively stable over time in the province and across the regions. However, a significant decrease in the percentage of the population having visited a physician or nurse practitioner in a given year was observed. This may indicate that those who are accessing these services are making a higher number of visits.
- The rate of ambulatory consultations with specialists has significantly increased over time, but not significant between the time periods indicating that increase has occurred gradually.
- Continuity of care increased significantly between the second and third time periods indicating that more people, on average, are visiting a lower number of different primary care providers.

Hospital use continues to decrease over time and remains responsive to population needs.

- Overall, hospital use indicators for the province have shown a decreasing trend over the 20-year period. The trends across the regions were similar to the province with exceptions for the percent of hospital readmissions in the Winnipeg RHA, and for the rate of hospital days for alternate level of care (ALC) stays in the Interlake-Eastern RHA, Prairie Mountain Health, and Northern Health Region, which all demonstrated a significantly increasing trend.
- Many of the indicators showed a decrease in hospital use between the second and third periods. The regions showed similar responses for almost all the indicators; however, the rate of injury hospitalizations in the third period was significantly higher than in the second period in the Northern Health Region, while they were significantly lower in each of the other regions. The rate of acute care hospital days was also significantly higher in the third period in this region.
- The most common causes of hospitalizations were spread across many disease categories and did not change much over time. Pregnancy and birth were the leading causes in all regions, followed by either circulatory diseases or digestive disorders.
- Results for all indicators in this chapter show that hospital care continues to be responsive to needs of the population in areas where health status and income are lower.

Diagnostic and surgical procedures reveal a mix of results across the services analyzed.

- In the province, cardiac catheterizations, percutaneous coronary interventions, hip replacements, computed tomography (CT) scans and magnetic resonance imaging (MRI) scans have increased over time, while coronary artery bypass graft surgeries have decreased. Prairie Mountain Health had an increasing trend for knee replacements, and a decreasing trend for cataract surgeries, whereas trends for these two procedures did not reach statistical significance in the province overall nor any of the other regions.

- In Manitoba, coronary artery bypass surgery rates decreased significantly across the three time periods. MRI rates increased significantly between the first and second periods, but not between the second and third periods. Meanwhile the rates of CT scans increased significantly between the second and third periods. Cataract surgery rates did not show a significant change between the time periods, but they increased significantly in the Southern Health-Santé Sud region, Winnipeg RHA, and Interlake-Eastern RHA between the second and third periods.

Maternal and child health indicators show a mixed but overall positive picture of changes over time.

- The birth rate decreased slightly in Manitoba, which was observed in both the trend and time period analysis.
- The percentage of women receiving inadequate prenatal care significantly increased over the 20-year period and from the second to third time periods (i.e., more recently). However, including virtual visits in the calculation of this indicator attenuated the amount of increase.
- The percentage of preterm births among all live births significantly increased over the 20-year period and from the second to third time periods (i.e., more recently).
- The percentage of small for gestational age births among all live births increased, though this appears to have plateaued. Those born large for gestational age have decreased significantly over time.
- The percentage of Caesarean sections has increased over time, while the percentage of vaginal births among women with a prior Caesarean section decreased.
- The percentage of live births where breastfeeding initiation occurred in hospital increased significantly over the 20-year period; however, there was a significant decrease from the second to third time periods.
- The infant mortality rate (0-12 months) and child mortality rate (1-19 years) both decreased significantly over the 20-year span, however, there were non-significant decreases between the second and third periods suggesting that they may have levelled off.
- There was stability in the location of births in Manitoba overall: the vast majority occurred in a designated maternity hospital in the mother's home region or in the Winnipeg RHA. Among three of the regions, there were notable changes that occurred from the second and third periods. Prairie Mountain Health had an increased proportion of births in their home region and a decrease in the proportion in the Winnipeg RHA, while the opposite occurred in the Southern Health-Santé Sud and the Northern Health Region where the proportion of births in their home regions decreased and the proportion in the Winnipeg RHA increased.
- For many of the indicators in this chapter, there were significant associations with health status (i.e., premature mortality rate) and area-level income: those from regions with worse health status and from lower income areas had significantly poorer outcomes.

The quality of primary care indicators has worsened in Manitoba.

- The percentage of residents receiving appropriate asthma care significantly decreased between the more recent time periods.
- The percentage of residents with diabetes undergoing eye examinations and the percentage of heart attack patients dispensed appropriate beta-blocker medications both decreased over time and significantly from the second to third period.
- Potentially inappropriate use of benzodiazepines among older adults decreased significantly across time periods, both among those living in personal care homes and those living in community settings.

There continues to be decreases in the rate at which Manitobans (aged 75 years and older) use personal care homes; however, the number of admissions and residents have been stable or are slightly higher.

- There have been significant decreases in the percentage of adults aged 75 and older admitted and residing in personal care homes (PCHs) over time, although the total number of admissions increased from 5,022 in the second time period to 5,246 in the third period.
- The median wait times to PCH admission have decreased among patients panelled in hospital and among those panelled in community settings.
- The median length of stay for PCH residents decreased between the first and second periods, and between the second and third periods.
- The level of care of PCH residents at the time of admission increased over time. The data shows a major shift in the proportion of admissions that were Level 3N from the second period to the third period. This resulted in decreases in the proportion of all admissions from the other levels of care. Given the decrease in the number of admissions, this indicates a reduction in the number of admissions with higher and lower acuity. These results may reflect a data error and should be interpreted with caution.

Immunizations and prescription drug use appear to have increased steadily.

- The proportion of all Manitobans receiving influenza immunizations and Manitobans aged 65 and older receiving pneumococcal immunizations have increased over time, which was reflected in both the time period and trend analyses.
- The number of different types of drugs dispensed per user increased significantly over the 20-years and increased non-significantly across the periods. This indicates a slight but steady increase over time. This indicator was related to income in both rural and urban areas, where residents of lower income areas received more types of drugs.
- The percentage of Manitobans dispensed at least one antidepressant has increased significantly over time, while the percentage dispensed an opioid has decreased.
- The percentage of the population who were dispensed an opioid was related to income in both rural and urban areas where individuals from areas with lower incomes had a higher percentage of people who were dispensed an opioid.

Rates for three lab tests were examined that were not done in previous Atlases and may help planners anticipate the future burden of some conditions. These included the urine albumin to creatinine ratio (ACR), estimated glomerular filtration rate (eGFR), and hemoglobin A1C (HbA1c) tests.

- The rates of each test have increased over the 20-year period. Within the rural regions, the most dramatic increases occurred between 2010/11 and 2015/16 when more facilities began recording data in the provincial laboratory system. Increases in the Winnipeg RHA were relatively steady compared to those in the rural regions.
- There were significant increases from the first to second time period for each test, while it only increased from the second to third period for ACR tests. There were non-significant decreases for eGFR and HbA1c tests from the second to third periods. The fact that HbA1c test rates increased from the first to second period and that diabetes incidence and prevalence increased from the second to third periods provides evidence that these tests could yield information to help planners anticipate future burden. The test rates decreased in the third period; therefore, it will be interesting to see if diabetes incidence and prevalence responds similarly in the future.

Impact of COVID-19

Globally, the COVID-19 pandemic has had a profound impact on the health of populations and undoubtedly overburdened health systems, which were required to continually adapt as transmission and exposure rates varied considerable over time, and knowledge of the disease improved, and vaccination development progressed. Health service delivery was altered, leading to delays and cancellations of procedures and challenging patients' ability to attend follow-up appointments, make acute care visits, or be admitted to hospital. This health service disruption posed a significant risk of indirect morbidity and mortality from other preventable and treatable diseases.

The pandemic had widespread but varied effects across several indicators analysed in this report. The following identifies those indicators and summarizes the changes that occurred around the time of the pandemic and throughout the remainder of study years:

- **Mortality**. There were small increases in the annual total mortality rate, premature mortality rate, and potential years of lost life that occurred from 2019/20 to 2020/21, before returning to pre-pandemic levels in 2022/23. In the time period analysis, although each not reaching statistical significance, the 5-year average annual rate in 2018-2022 was lower than the rate in 2013-2017 for total mortality, while it was higher for premature mortality rate. The results in this chapter suggest a real impact of COVID-19 on mortality, especially among the 75 years of age and under population.
- **Physician and nurse practitioner services**. Prior to the pandemic, almost all primary care visits and specialist consults were conducted in person. In an effort to reduce contact between people, virtual care was quickly implemented, and in-person care was reserved for urgent situations. Indeed, we saw decreases in indicator measures in the first year of the pandemic and a gradual return to more expected levels. The proportion of the population who saw a primary care provider dropped by about 5-6 percentage points from 2019/20 to 2020/21 before climbing back to near pre-pandemic levels by 2022/23 (except in the Northern Health Region). The decrease in the rate of visits went from 4.8 visits per person in 2019/20 to 4.6 in 2020/21 and then exceeded pre-pandemic rates by 2022/23. The proportion of visits for ill-defined conditions (which includes chest and respiratory symptoms) and mental illness were higher in 2022/23 than in 2017/18, which may be attributed to the pandemic. The rate of specialist consultations steadily increased over time before decreasing in 2020/21 and returning to near pre-pandemic levels by 2022/23. Taken together, these results suggest that pivoting to virtual care was an effective strategy to allow for primary care and specialist care to be continued at customary levels.
- **Hospital services**. Hospitals were required to balance between caring for COVID-19 patients and caring for patients with other health issues, while trying to keep patients and staff safe from exposure and infection. Decisions were made about what care could not wait and what could be delayed. This, in addition to public health orders that restricted contact among people and reduced activity in the community, were likely contributing factors that influenced the number of people needing and using hospital services. Almost all indicators in the report showed decreases in the 2020/21 rates before returning to pre-pandemic levels by 2022/23. While the rates of hospital separations, hospitalization for day surgery, acute care hospital days, and for ambulatory care sensitive conditions had been decreasing gradually prior to the pandemic, more noticeable drops occurred in 2020/21. For example, the rate of hospital separations decreased by about 1% from 2015/16 to 2019/20, before it decreased by 14% in 2020/21. There were 12,106 fewer hospital separations in 2020/21 than in 2019/20. Over these same years, the day surgery hospitalization rate decreased by approximately 4% by 2019/20 and then decreased by 22% from 77 to 60 hospitalizations per 1,000 people in 2020/21. Between 2019/20 and 2020/21, this represented a difference of 22,498-day surgery hospitalizations. The reasons for decreases in day surgery suggest that surgeries related to cancer, the digestive system, and the circulatory system were prioritized as their proportions of surgeries increased, while the proportions related to the eye, musculoskeletal system and health status and contact (i.e., circumstances impacting a person's health, even if those circumstances are not themselves diseases, injuries, or external causes) decreased as a result of possibly being delayed or cancelled.

- **Surgical and diagnostic procedures**. Similar to the hospital services, surgeries and procedures were prioritized based on which could not wait or be postponed. Among the surgeries and procedures considered in this report, cardiac catheterizations, hip and knee replacements, and magnetic resonance imaging dramatically decreased in 2020/21 before returning to pre-pandemic levels by 2022/23. Coronary artery bypass graft (CABG) surgeries also showed a slight decrease; however, they have been decreasing over time, and it is difficult to see in the results whether the decrease was related to the COVID-19 pandemic or if it was due to a decreasing trend that has been occurring over the past 17 years. It is noteworthy that there were 72 fewer CABG surgeries performed in 2020/21 compared to 2019/20.
- **Vaccinations**. There was a substantial increase in the proportion of the population who received their influenza vaccination from 28% in 2019/20 to 33% in 2020/21. This is the highest percentage increase since 2009/10 during the H1N1 pandemic. Despite the increase during the peak of pandemic, vaccination rates dropped in 2022/2023, with its rates falling to lower levels than in pre-pandemic years. Among individuals 65 years and older, the percentage who have received a pneumococcal vaccination (at least one time during their life) slightly increased from the pre- to post-pandemic period.

Conclusions

This Atlas provides an assessment of the health of Manitobans for a range of population level health and health service use indicators. For these types of indicators, it often requires a substantial amount of time for changes to emerge. The analytical approaches used allow for an understanding of the more current situation as well as over the longer-term. Indeed, Manitobans have become healthier over time as evidenced by decreased mortality, chronic illness, and health services use rates. Despite these decreases, they are not enough to counter our growing and aging population. As a result, there are more people living with diseases and who are using hospital and physician services than ever before in Manitoba.

Many of the health indicators in this report show that lower income areas have poorer outcomes. The consistent relationship between health and wealth is a well-documented and systemic pattern observed around the world. Income serves as a key marker for access to the broader determinants of health (including education, housing, nutritional food, recreational opportunities, and safe environments). Residents of lower income areas have significantly higher mortality rates and higher prevalences of physical and mental illnesses. On a positive note, the health gap between the wealthy and poor from the second and third periods improved for some indicators (i.e., rates became more evenly distributed across income quintiles) and did not get worse for any of the other indicators. Among the indicators where the health gap improved, notable ones included hypertension and ischemic heart disease prevalence in both rural and urban areas, premature mortality, diabetes prevalence and incidence, and MRIs in rural areas, and teen pregnancy rate in urban areas. Reducing health gaps related to income and the social determinants of health should remain a priority in Manitoba.

Lastly, there was, and will likely continue to be, variation in indicator rates between the regions. However, there were only a few instances where the trends of some indicators within a particular region differed from other regions and from the province overall. The Northern Health Region had the highest number of these divergent indicators, which included premature mortality, potential years of lost life, suicide rates, influenza immunizations, and opioid use. All of which had a significant trend over time in the region, while they did not change or had a trend in the opposite direction in the province overall.

This report focuses mainly on the adjusted rates at the regional levels (which make for fair comparisons). The crude rates and actual numbers of people and events are described in the online supplement and provide important information for RHAs in terms of the actual volume of services used. In addition, the online supplement includes the crude and adjusted rates for indicators at the smaller geographic areas within each of the regions. A region-level indicator result should not be assumed to the be the same across the areas of that region. Understanding that there is variation within each of the regions is important for the purposes of planning services and resources.

Chapter 1: **Introduction & Methods**

1.1 Background

This report was produced by the Manitoba Centre for Health Policy (MCHP) and provides indicators of population health status, health care use, and quality of care for all residents of the five Regional Health Authorities (RHAs, also known as the 'health regions') in Manitoba. In total, there are over 110 indicators in the report.

Reports of this type, referred to as Atlases, have been produced by MCHP approximately every five years for the past 30 plus years.[1–3] Typically, the Atlases provide results for indicators from two time periods interspaced by five years. If possible, the first period in an Atlas is the same as the second period in the previous Atlas, which connects the Atlases in a consistent way and allows for indicators to be assessed over multiple periods. The current Atlas differs from previous ones in a few ways. First, the indicators are measured over three time periods as opposed to only two. However, the first time period does not align perfectly with the previous Atlas given the length of time between reports (six years) and the preference to use the most recent data available. As a result, the time periods in this report are advanced by one year. Second, this Atlas includes a 20-year trend analysis to assess for any longitudinal trends. While this has been done previously for a select few indicators, this Atlas conducted this analysis for as many indicators as possible. Each of these changes were implemented to more comprehensively assess how the indicators and the health of Manitobans have changed over time while using the most recent data available.

The analyses and discussion in this report are descriptive, not explanatory. That is, the results show what is captured within the data, not how or why those results came about. Answering the latter questions requires information about context, history, and local circumstances, which are not available in administrative data.

1.2 The Indicators - Key Concepts

Most indicators in this report were measured using a population-based approach, where the indicator results are based upon virtually every person living in Manitoba. Almost all of the indicators reflect where people live, not where they received services. For example, a person living in a remote area may be hospitalized in the Winnipeg RHA, but the hospitalization is attributed back to the remote area. Thus, the results offer insight into the complete health and health care use patterns of the population living in the area, regardless of where they received their care. However, there are select indicators that show the distribution of locations of service provision to provide insight regarding patient travel patterns.

Residents of some areas receive health services in nursing stations operated by the federal or provincial government (or through local agreements). Most of the services provided in these settings are not recorded in the provincial data files used in our analysis. Services provided by physicians and nurse practitioners visiting the nursing stations are supposed to be recorded, though the completeness of such reporting is uncertain. Therefore, the service use rates shown in this report may underestimate the total level of service provision to some residents. This issue is most prominent in the Northern Health Region but also affects other regions to some extent.

Since age and sex are often key determinants of health status and health service use, most results shown are adjusted using statistical models that control for age and sex differences among areas. This allows for fair comparisons of health status and health service use across areas that have different population compositions. The actual number of people or events observed, along with corresponding crude rates (the number of events divided by the population) are provided in the online supplementary material. It should be noted that at the time of the analyses, only male and female sex was available in the administrative data. As such, it is not possible to identify individuals who describe their gender as non-binary and incorporate that in the analysis. This fact should also be considered for any indicators separated by male and female sex, and indicators calculated amongst only those recorded in the data as female (e.g., birth rate).

Lastly, definitions of some indicators have been refined and improved over time. This report uses the most up-to-date definitions, so there may be slight changes in results between reports attributable to changing/updated definitions over time. In addition, the source data used are continually being revised and corrected, so even some indicators using consistent definitions over time may not have the same results as observed previously (though the differences are typically insignificant). As a result, the values shown in this report are more accurate than those in previous reports. Definitions of most terms used in this report are available in MCHP's online **Concept Dictionary.**

1.3 Indicator Measures

The main types of indicator measures used in this report have implications for the provision of services and include:

1. Prevalence or Percentage - the proportion of the population with a certain condition or who experienced a particular event over a specified period of time and is an indication of how common a condition or event is in a population.
2. Incidence or Event Rate - the number of new cases or events (new or recurrent) over a specified period for the population at risk and is an indication of how frequent a condition or event occurs in a population.

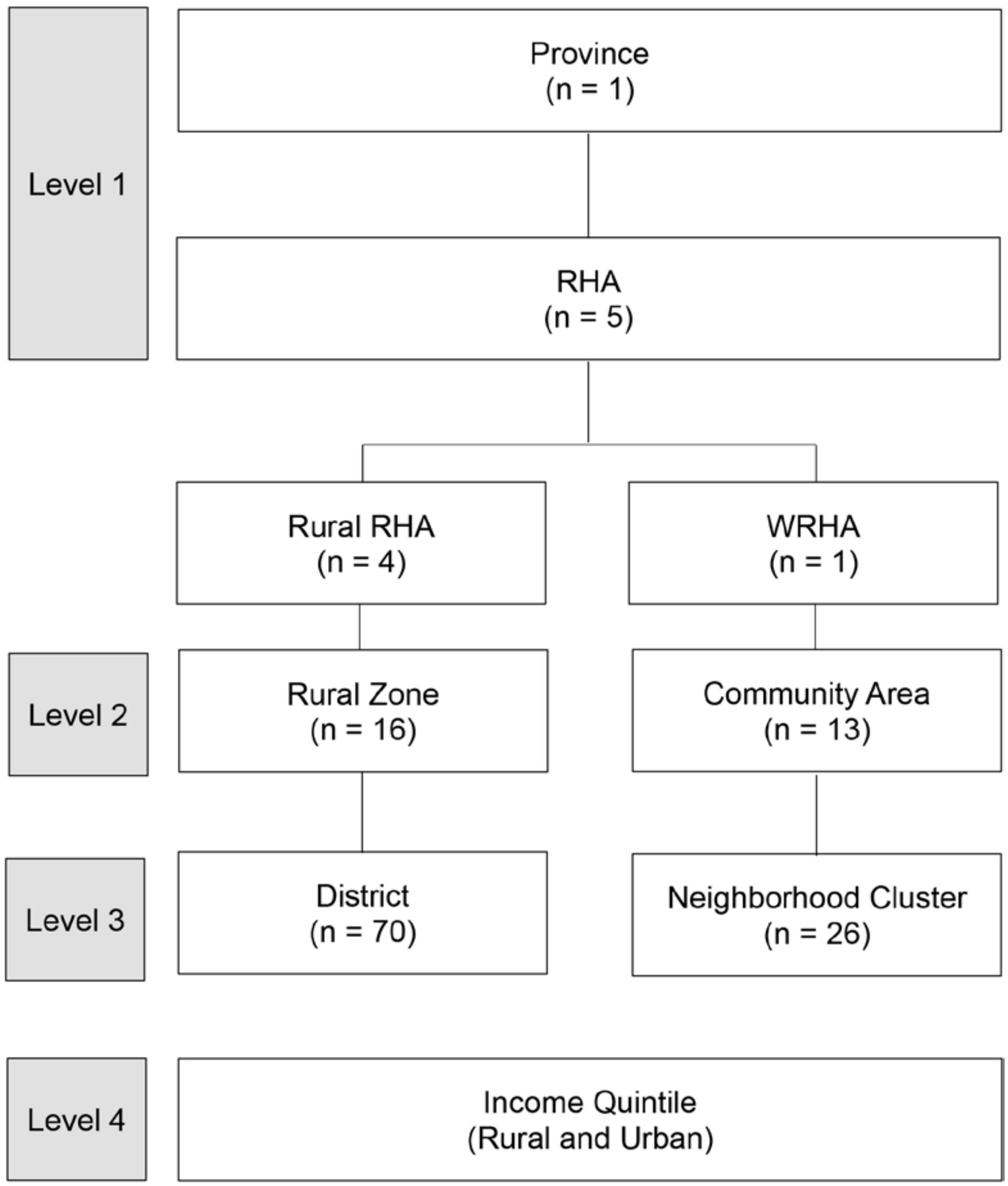
Other indicators found in this report include reasons or causes for certain events (e.g., hospitalizations), measures related to socioeconomic status and deprivation, and where Manitobans received services.

Measurement Levels

Indicator measures are provided at 4 levels (Figure 1.1). Levels 1 to 3 are defined by geographical areas and include the province (Level 1), RHAs (Level 1), rural RHA zones and districts (Levels 2 & 3, respectively), and Winnipeg RHA community areas (CA) and neighbourhood clusters (Levels 2 & 3, respectively). Maps that illustrate the geographic boundaries are provided for Level 1 (Figure 1.2), Levels 2 & 3 rural RHAs (Figures 1.3 to 1.6), and Levels 2 & 3 Winnipeg RHA (Figure 1.7).

Measurement Level 4 separates the provincial population into rural and urban income quintiles based on dissemination area average household income values obtained from the Canadian Census. The income quintiles for each dissemination area based on the 2021 Census data are illustrated for Rural RHAs in Figures 1.8 to 1.11 and for the two urban cities in Figure 1.12 (Winnipeg) and 1.13 (Brandon).

Figure 1.1: Indicator Measurement Levels



Note. Results for Level 1 are presented in the written report. Results for Levels 2, 3, and 4 are presented in the online supplement.

Figure 1.2: Map of Manitoba Regional Health Authorities

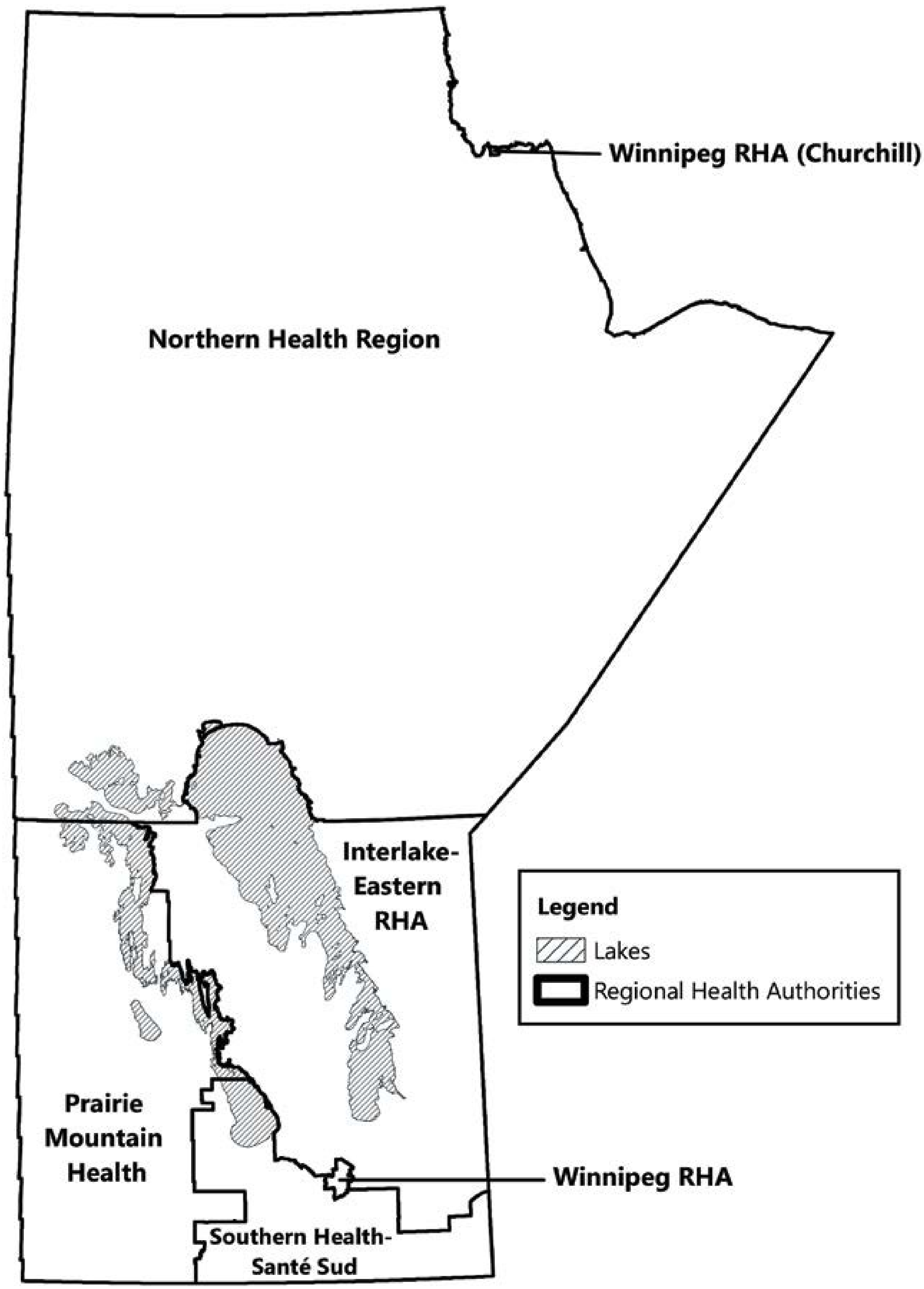


Figure 1.3: Map of Southern Health-Santé Sud, Showing Zones and Districts

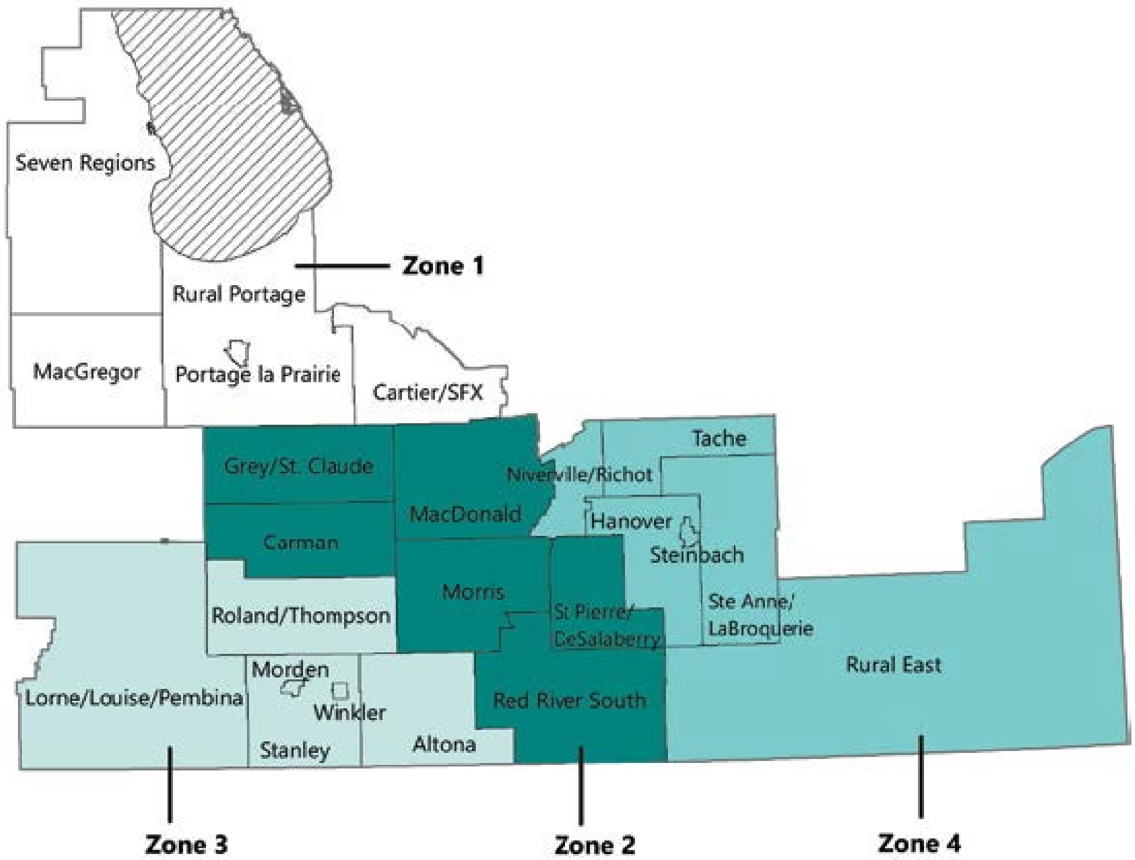


Figure 1.4: Map of Interlake-Eastern RHA, Showing Zones and Districts

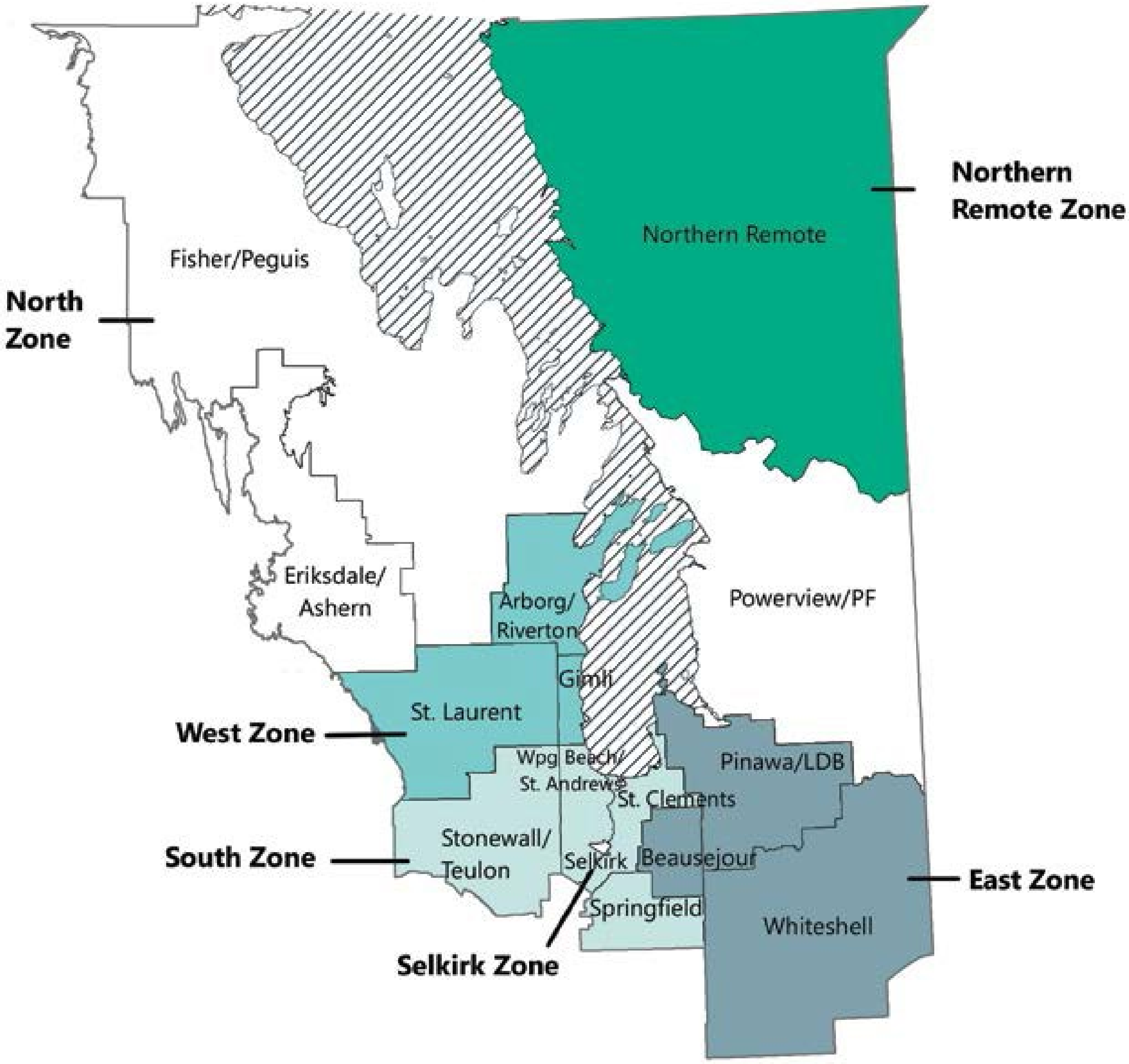


Figure 1.5: Map of Prairie Mountain Health, Showing Zones and Districts

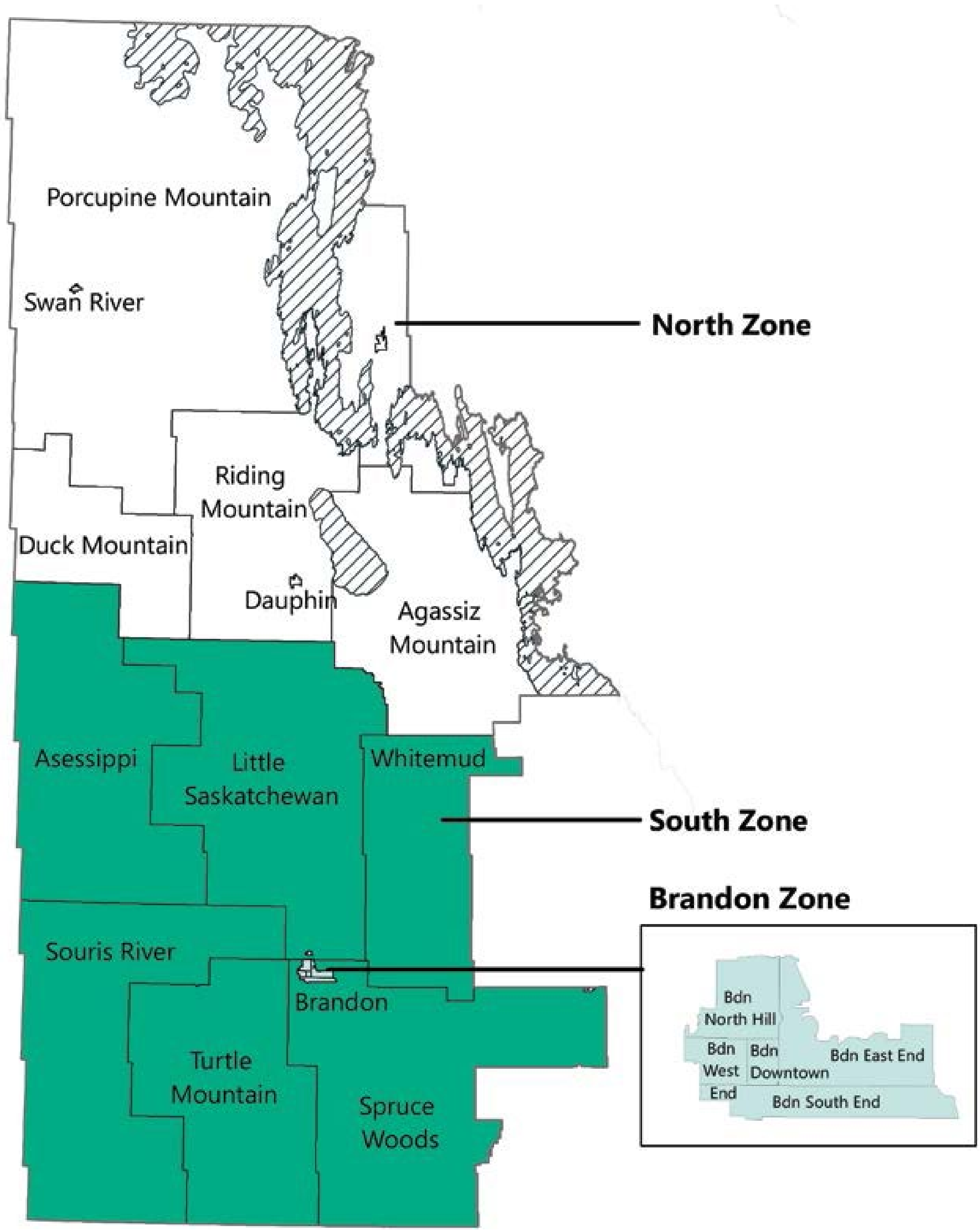


Figure 1.6: Map of Northern Health Region, Showing Zones and Districts

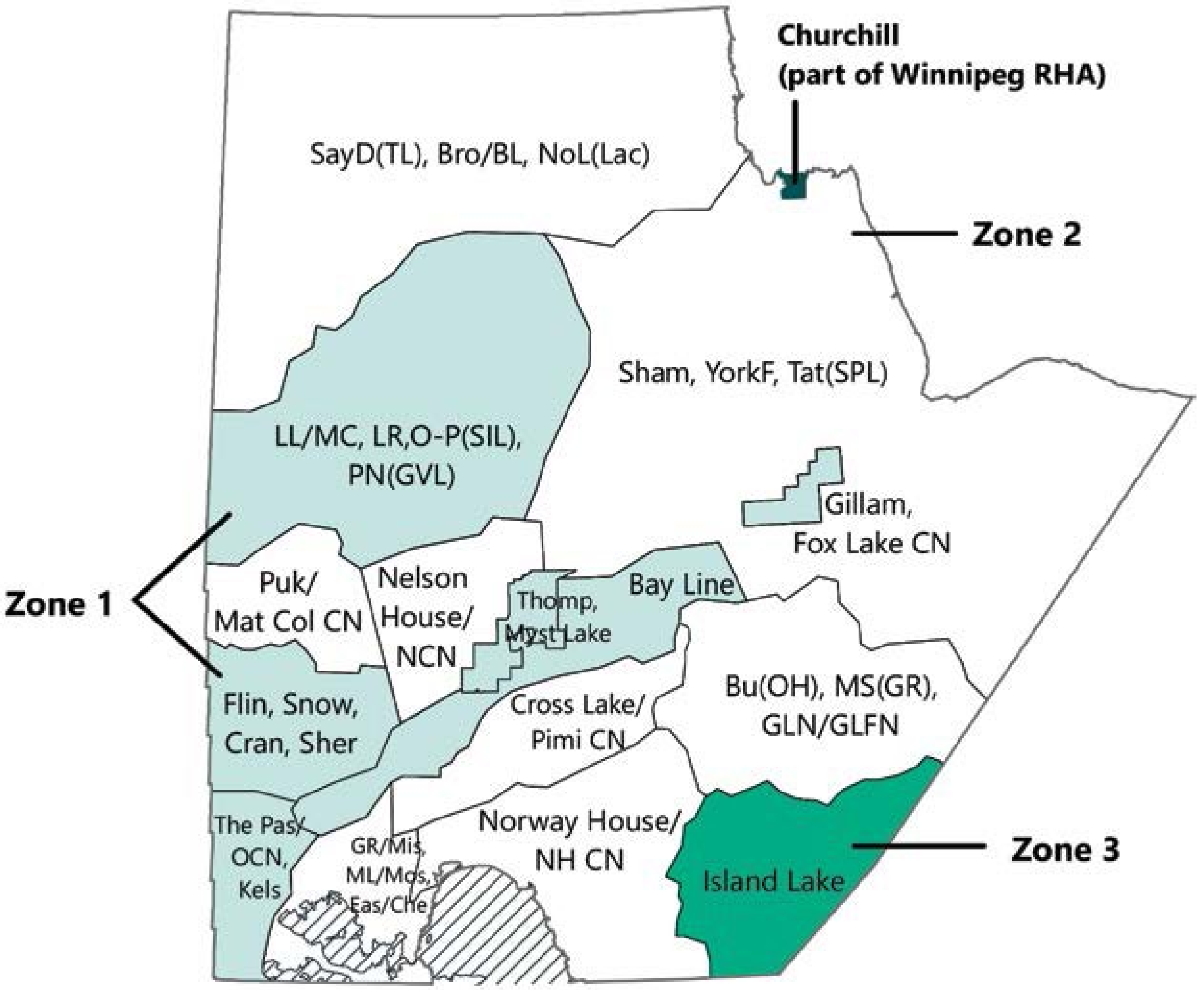
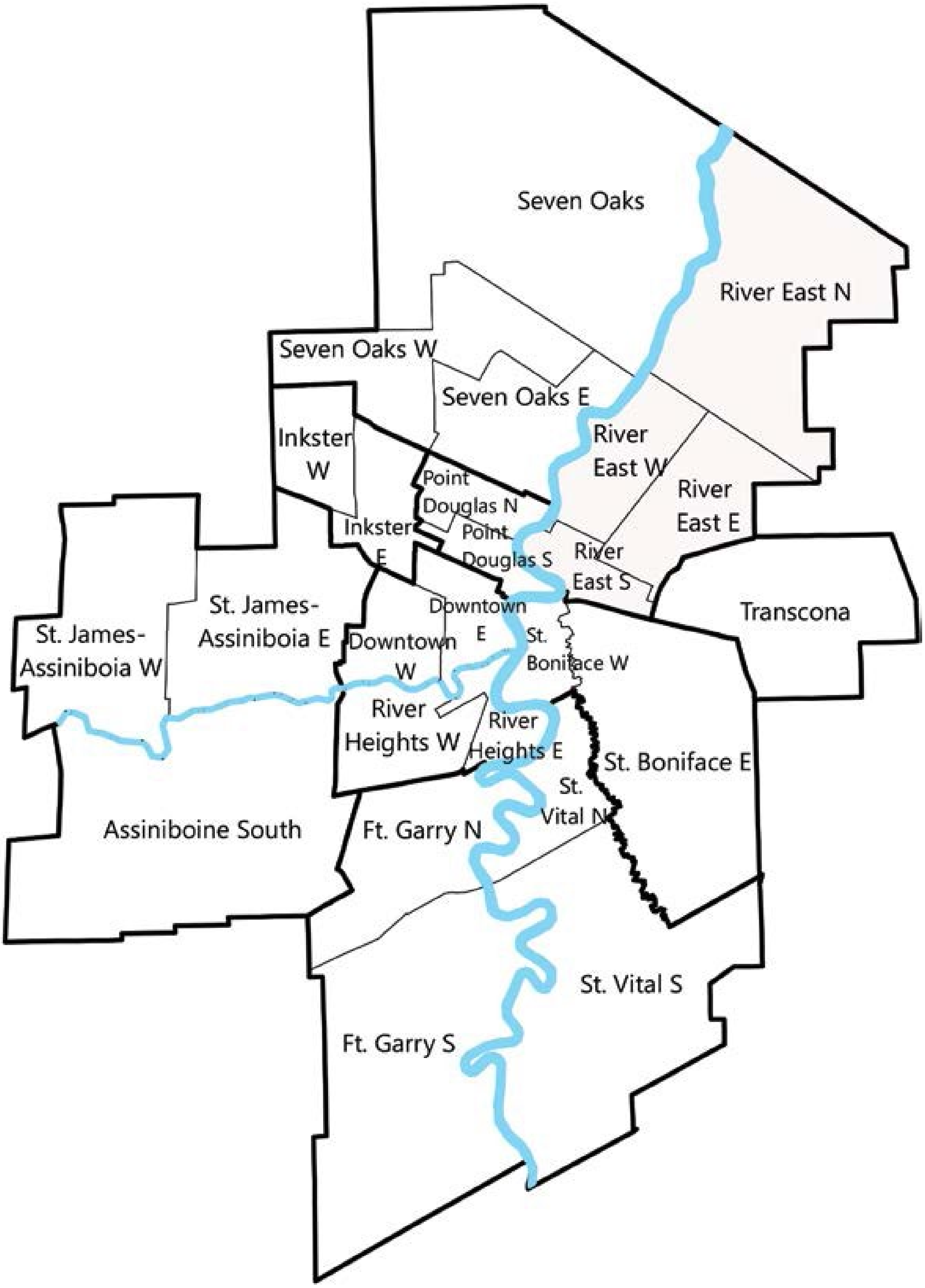


Figure 1.7: Map of Winnipeg RHA, Showing Community Areas and Neighbourhood Clusters



* Churchill (not shown on this map) is also part of the Winnipeg RHA.

Figure 1.8: Distribution of Income Quintiles in Southern Health-Santé Sud 2021 Census Dissemination Areas

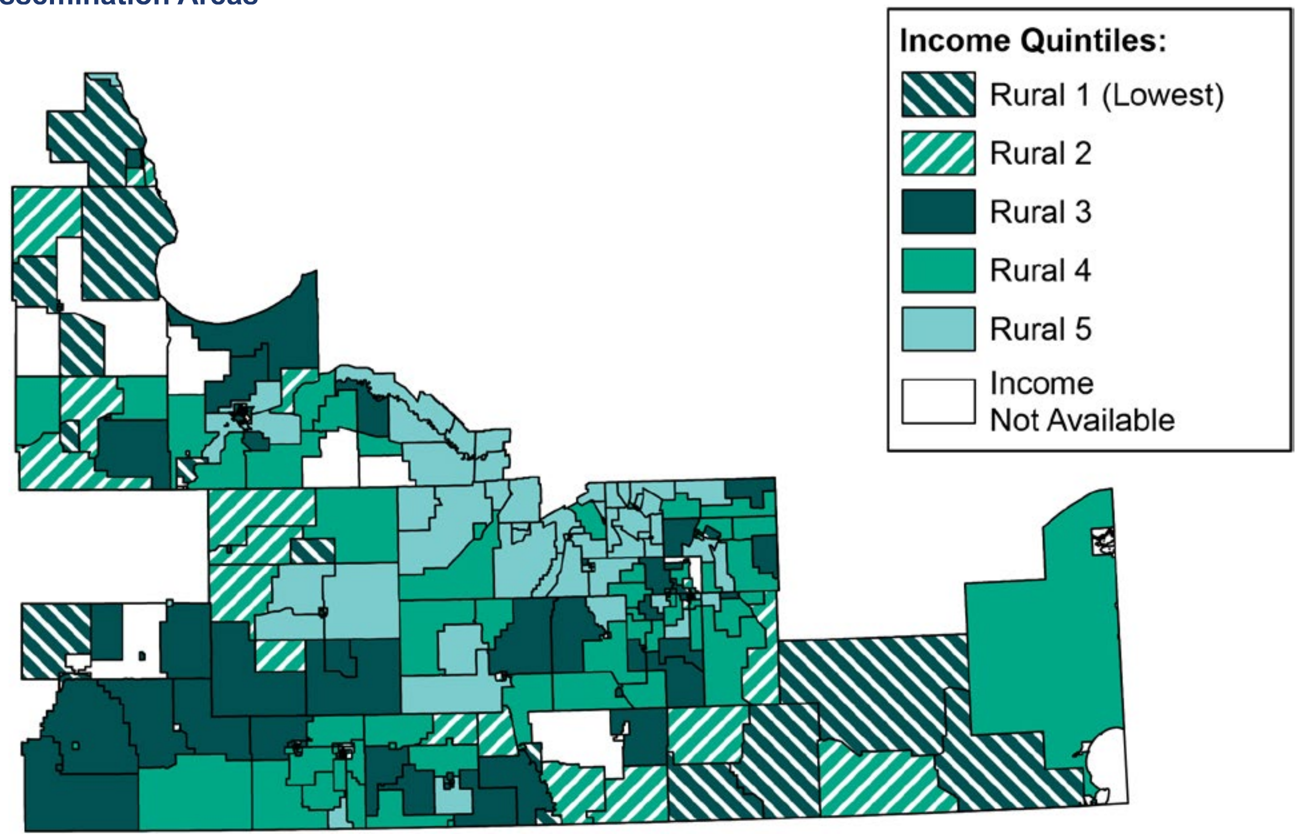


Figure 1.9: Distribution of Interlake-Eastern RHA 2021 Census Dissemination Areas

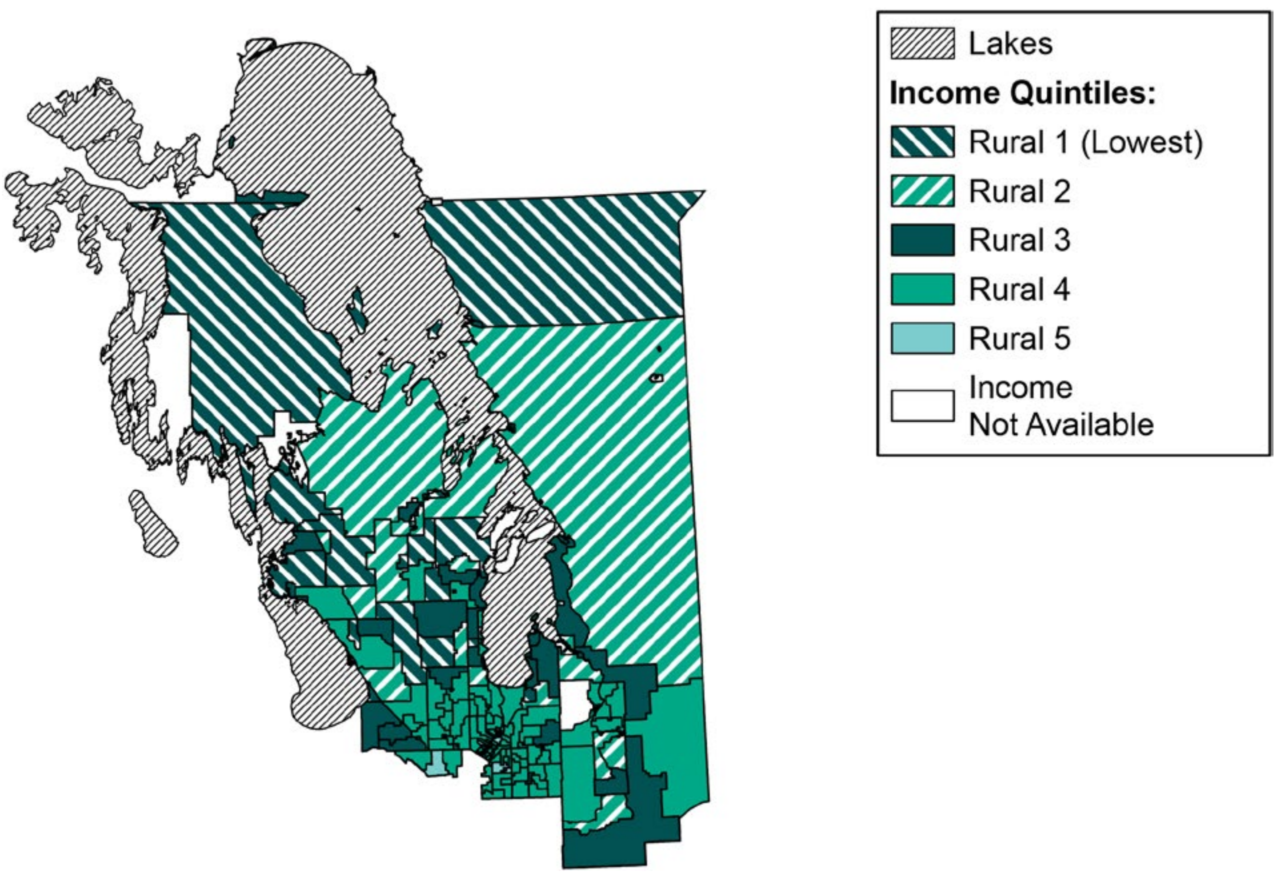


Figure 1.10: Distribution of Income Quintiles in Prairie Mountain Health 2021 Census Dissemination Areas

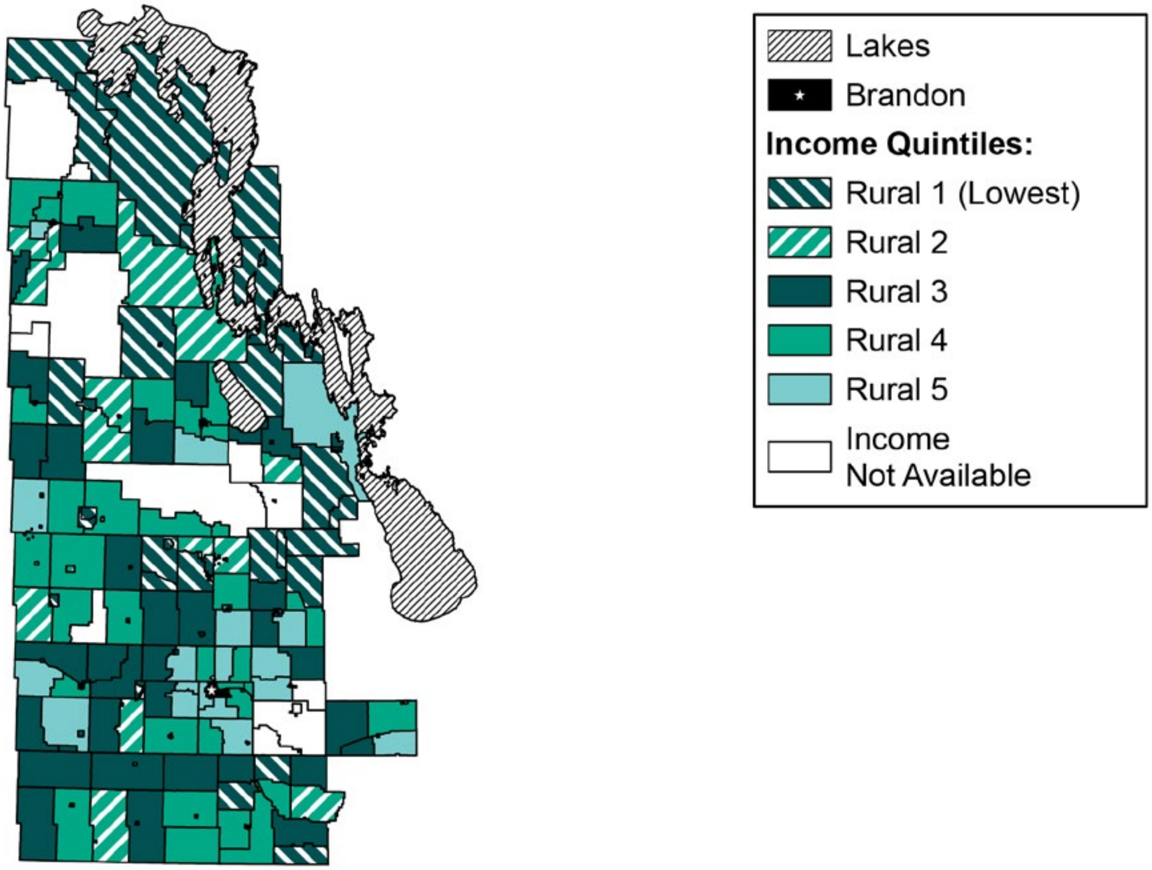


Figure 1.11: Distribution of Northern Health Region 2021 Census Dissemination Areas

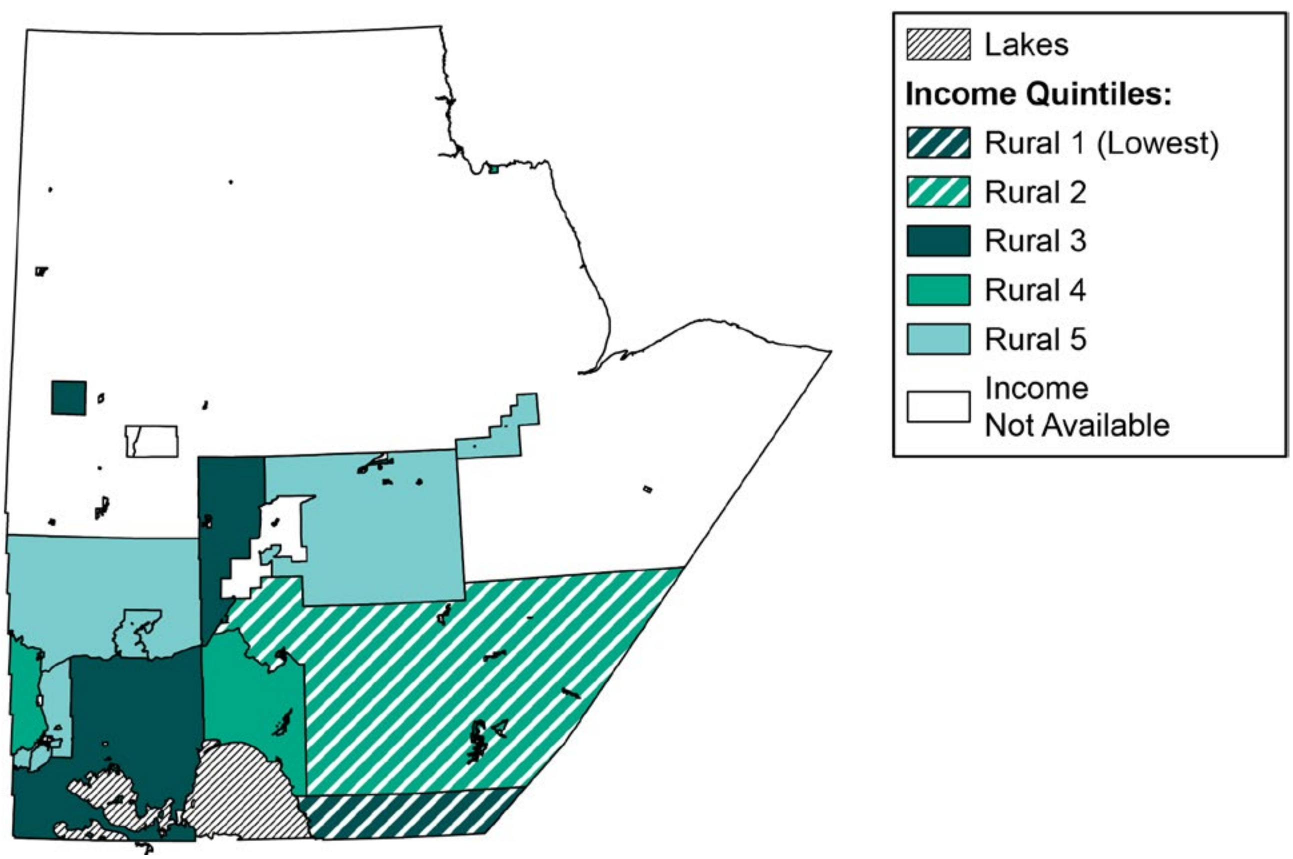


Figure 1.12: Distribution of Income Quintiles in Winnipeg RHA 2021 Census Dissemination Areas

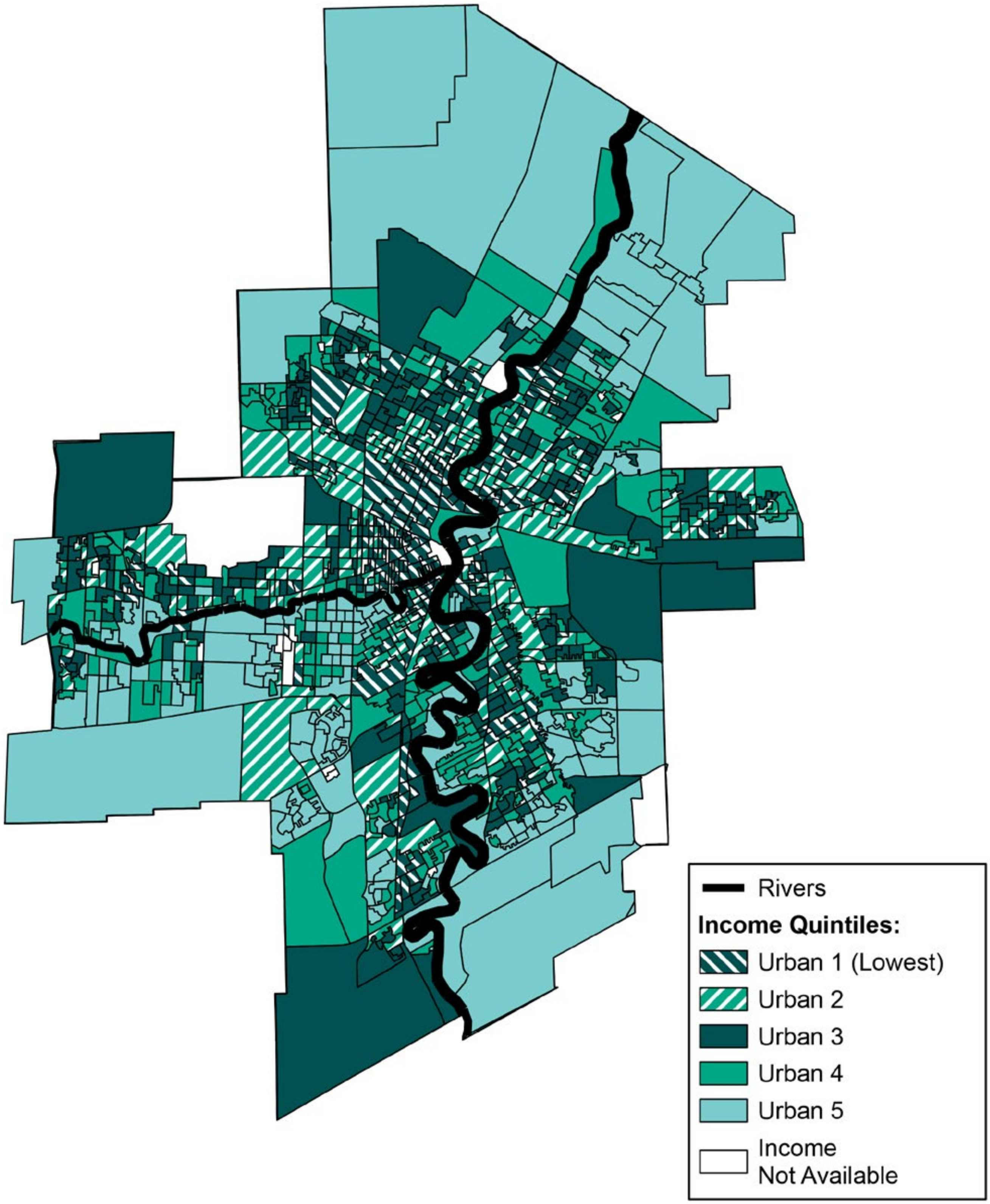
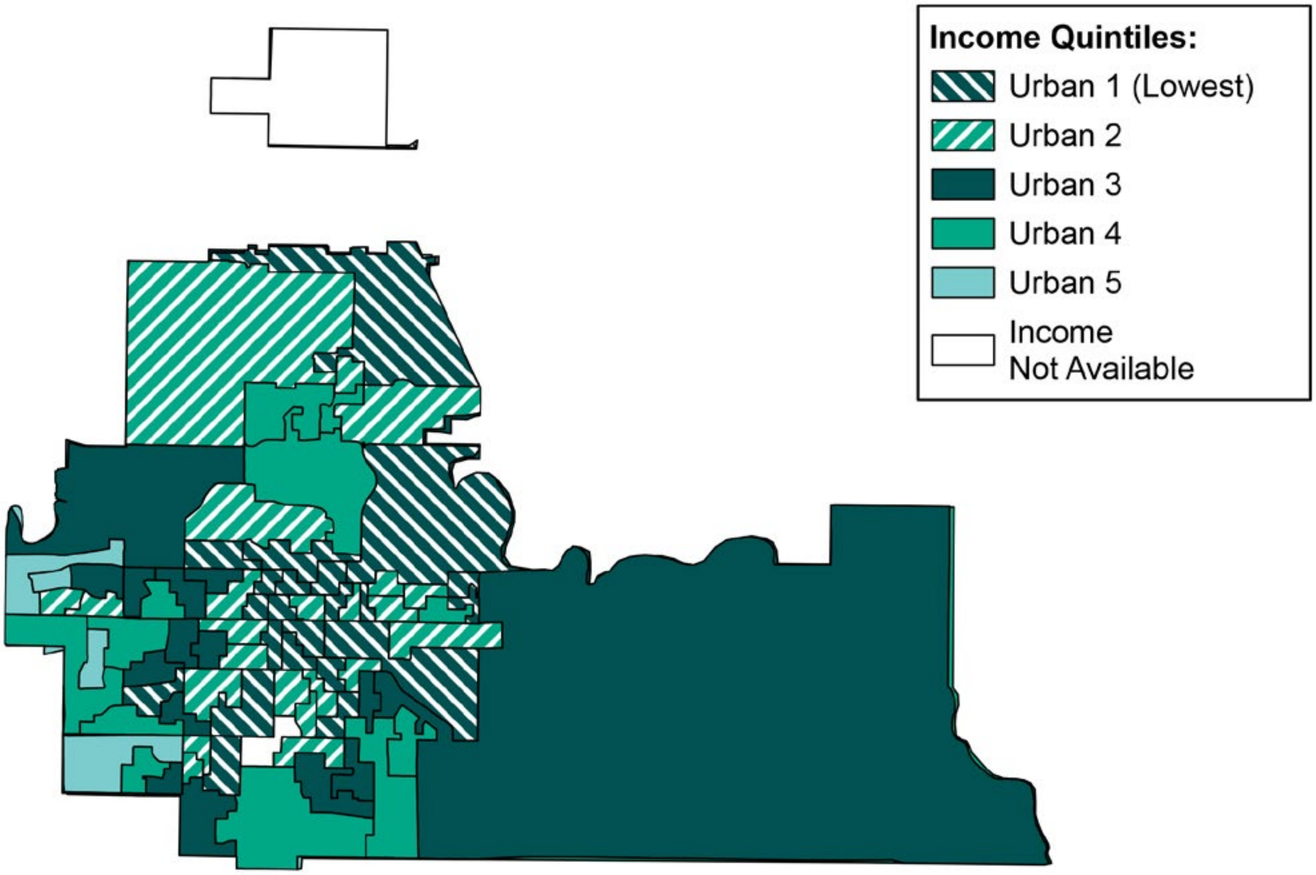


Figure 1.13: Distribution of Income Quintiles in Brandon 2021 Census Dissemination Areas



Statistical Analyses

Three types of analyses were conducted for most indicators: (1) time period analysis, (2) trend analysis, and (3) income quintile analysis. Each type of analysis is described below.

Time Period Analysis

Indicators were measured at all four measurement levels for three time periods. The most recently available data at the time of analysis were used, and the last year of each successive reporting period was interspaced by five years. Fiscal years or calendar years were used depending on the indicator and the source data required to measure it. Unless otherwise specified, the reporting years for the three time periods covered:

- Time Period 1 (TP1)
  - 2008/09 - 2012/13 (fiscal years), or
  - 2008 - 2012 (calendar years)
- Time Period 2 (TP2)
  - 2013/14 - 2017/18 (fiscal years), or
  - 2013 - 2017 (calendar years)
- Time Period 3 (TP3)
  - 2018/19 - 2022/23 (fiscal years), or
  - 2018 - 2022 (calendar years)

The reporting years listed above were used for indictors that occur less frequently to ensure stable rates and avoid suppression. For indicators that occur more frequently, the reporting years were adjusted to one, two, or three years rather than all five years. For example, hospitalizations occur at a frequency great enough where only one year is required to calculate their rates. In this case, the reporting years covered in the three time periods were 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

The measures in TP1 and TP2 were adjusted to the sex and age distribution of the denominator in TP3 (typically the Manitoba population as of December 31, 2022). To calculate the adjusted rates, a generalized linear model was used. Most models have main effects that include age, sex, region of residence, and year. The interaction of year and region or residence are also included in all models for the comparison of indicator results between the region and Manitoba overall. To improve model fit, linear and quadratic age effects were sometimes included. These adjustments allow results to be validly compared across areas, ensuring that any differences between them were not determined by differences in the age and sex distributions of local populations.

Statistical testing was done to assess for any changes between the adjusted measures from one time period to the next. It is important to note the existence of the COVID-19 pandemic during T3 and its impact on the indicators. For indicators measured over one year, T3 will include only the third year of the pandemic, while indicators measured over three years it will include the first three years of the pandemic. Meanwhile, T3 will cover both pre-pandemic and pandemic years for the indicators measured over a 5-year period. The testing included the following comparisons:

a. Within Group Comparisons where an indicator measure in one time period is compared to the same measure in the adjacent time period within the same measurement level (e.g., RHA, Rural RHA District). The indicator measures were compared for the following time periods:
   - TP2 compared to TP1
   - TP3 compared to TP2

   The level of significance for these tests was set at $p<0.05$.

b. Between Group Comparisons where an indicator measure for a measurement level area (e.g., RHA, Rural RHA District) in one time period is compared to the indicator measure for Manitoba overall in that same period. This analysis included the following between group comparisons:
   - Measurement Level Area TP1 compared to Manitoba TP1
   - Measurement Level Area TP2 compared to Manitoba TP2
   - Measurement Level Area TP3 compared to Manitoba TP3

The level of significance for these tests was set at $p<0.01$ for all area comparisons to Manitoba except for Level 3 areas (RHA District and Winnipeg Neighbourhood Cluster), where the significance level was set to p<0.005. Lower significance levels were set to reduce the occurrence of a type 1 error, or false positive test, which can happen with multiple comparisons. In this instance, multiple comparisons are generated with regions are being repeatedly compared to the overall Manitoba rate.

For select indicators, additional time period analyses were done to provide the TP2 and TP3 counts and crude rates by age groups and sex. No statistical testing was done for this analysis, and results are only available in the online supplement in Microsoft Excel tables. The indicators this analysis applies to are noted in the relevant indicator sections within the written report.

Trend Analysis

Indicators were measured over a 20-year span for Manitoba and each RHA (measurement level 1). The indicators were measured annually, unless the indicator had a validated definition that required more than one year of data (e.g., diabetes prevalence). Therefore, this analysis included indicator measures for each year from 2003/04 to 2022/23 (fiscal years), or 2003 to 2022 (calendar years), unless otherwise specified.

The measures for each year were adjusted to the denominator in the most recent year (typically the Manitoba population as of December 31, 2022). To calculate the adjusted rates, a generalized linear model was used. Most models have main effects that include age, sex, region of residence, and year. The interaction of year and region or residence are also included in all models for the comparison of indicator results between the region and Manitoba overall. To improve model fit, linear and quadratic age effects were sometimes included. These adjustments allow results to be validly compared across areas, ensuring that any differences between them were not determined by differences in the age and sex distributions of local populations.

A trend test was used to assess the linear relationship (e.g., increasing or decreasing) between the adjusted measure and time (e.g., fiscal year) and the level of significance for these tests was set at p<0.05.

Income Quintile Analysis

The adjusted indicator measures by urban (Winnipeg and Brandon) and rural (all other areas of Manitoba) income quintiles were calculated for each period in the time period analysis. An area-level income value from the 2006, 2011, 2016, and 2021 Canadian Census data was assigned to each resident (using the Census that was closest to the time period being analysed). These rates were age- and sex-adjusted to account for the different demographic profile of these groups (e.g., residents of the lowest income areas are younger than residents of the highest income areas).

For each time period, the relationship between the indicator measure and income quintile was assessed. The following tests for trends and statistical comparisons were made:

- Linear trend for rural and urban income quintiles separately in TP1.
- Linear trend for rural and urban income quintiles separately in TP2.
- Linear trend for rural and urban income quintiles separately in TP3.
- Slope of the linear trend for rural (or urban) in TP2 compared to the slope of the linear trend for rural (or urban) in TP1.
- Slope of the linear trend for rural (or urban) in TP3 compared to the slope of the linear trend for rural (or urban) in TP2.

The level of significance for these tests was set at p<0.05.

1.4 Data Sources and Years of Data Used

The data used for this report are housed at MCHP, which maintains the Manitoba Population Research Data Repository. Most of the data in the Repository are derived from administrative records: data which were collected in order to administer health and social services. Data are sent to MCHP from Manitoba Health, Seniors and Long-Term Care (MHSLTC) only after identifying information (e.g., names, addresses) have been removed and personal health identification numbers (PHINs) are scrambled. The encrypted identifiers allow these files to be linked for individual-level analyses while still protecting privacy. As well, area-level information from public-use Census data, like average household income for a dissemination area, is used to provide insight into the influence of socioeconomic factors on health and health care use.

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

- Canadian Census
- Diabetes Education Resource for Children and Adolescents (DER-CA)
- Shared Health Diagnostic Services
- Drug Program Information Network (DPIN)
- Hospital Discharge Abstracts
- Long Term Care Utilization
- Manitoba Health Insurance Registry
- Medical (Physician) Claims – Medical Services
- Provider Registry
- Manitoba Immunization Monitoring System (MIMS)
- Public Health Information Management System (PHIMS)
- Vital Statistics Mortality Registry

In the hospital abstract data system, the Canadian version of the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10-CA) was used for coding diseases, while the Canadian Classification of Interventions (CCI) system was used for surgical procedures and interventions as of April 1, 2004, and the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) prior to that date. Records in the medical claims data (for physician visits) remain in the ICD-9-CM system.[4]

1.5 Organization of the Report

What is in this Report?

The purpose of this report is to provide data for regional and provincial planners and decision-makers and covers the following areas:

- Introduction and Methods (Chapter 1)
- Demographics (Chapter 2)
- Population Health Status and Mortality (Chapter 3)
- Physical Illness (Chapter 4)
- Mental Illness (Chapter 5)
- Physician and Nurse Practitioner Services (Chapter 6)
- Hospital Services (Chapter 7)
- High Profile Surgical and Diagnostic Services (Chapter 8)
- Maternal and Child Health (Chapter 9)
- Quality of Primary Care (Chapter 10)
- Use of Personal Care Homes (Chapter 11)
- Immunization and Prescription Drug Use (Chapter 12)
- Lab Tests (Chapter 13)

Presentation of the results are provided in this written report, which focuses specifically on the results at measurement level 1, and in an online supplement that includes the results for each measurement level illustrated in Figure 1.1. Each chapter of the written report presents their indicator results in a similar format. First, the key findings for the chapter are listed, followed next by a brief chapter introduction and then by the indicator results. For each indicator, a definition is provided, followed by the reporting years for the time period analysis and the trend analysis. The key findings for the indicator are then highlighted followed by the figures displaying the adjusted rates from the time period and trend analysis.

The online supplement includes downloadable Microsoft Excel files for the time period and trend analyses, as well as the age and sex stratified analysis. See the Appendix for a description of the types of information provided in the online supplement. The time period analysis files contain the figures used in the written report, and also include the counts, crude measures, and adjusted measures in table format for all measurement levels, including the smaller geographic areas (rural RHA zones and districts, Winnipeg RHA community areas and neighbourhood clusters) where possible. These smaller area results should be referred to when considering heterogeneity in the regional results (e.g., while life expectancy may have improved in a region, it does not mean that it improved for each district or community area within that region). The counts and crude measures in these files provide valuable information regarding how often certain events are occurring and whether those are increasing or decreasing. These files also include the indicator results by rural and urban income quintile in table and figures forms. The online supplement also includes excel files for the trend analysis results, which contain tables for the counts, crude measures, and adjusted measures at the provincial and regional levels.

An indicator definitions file is also included in the online supplement. This is an excel file that is organized by chapter and provides more detailed information for measuring each indicator.

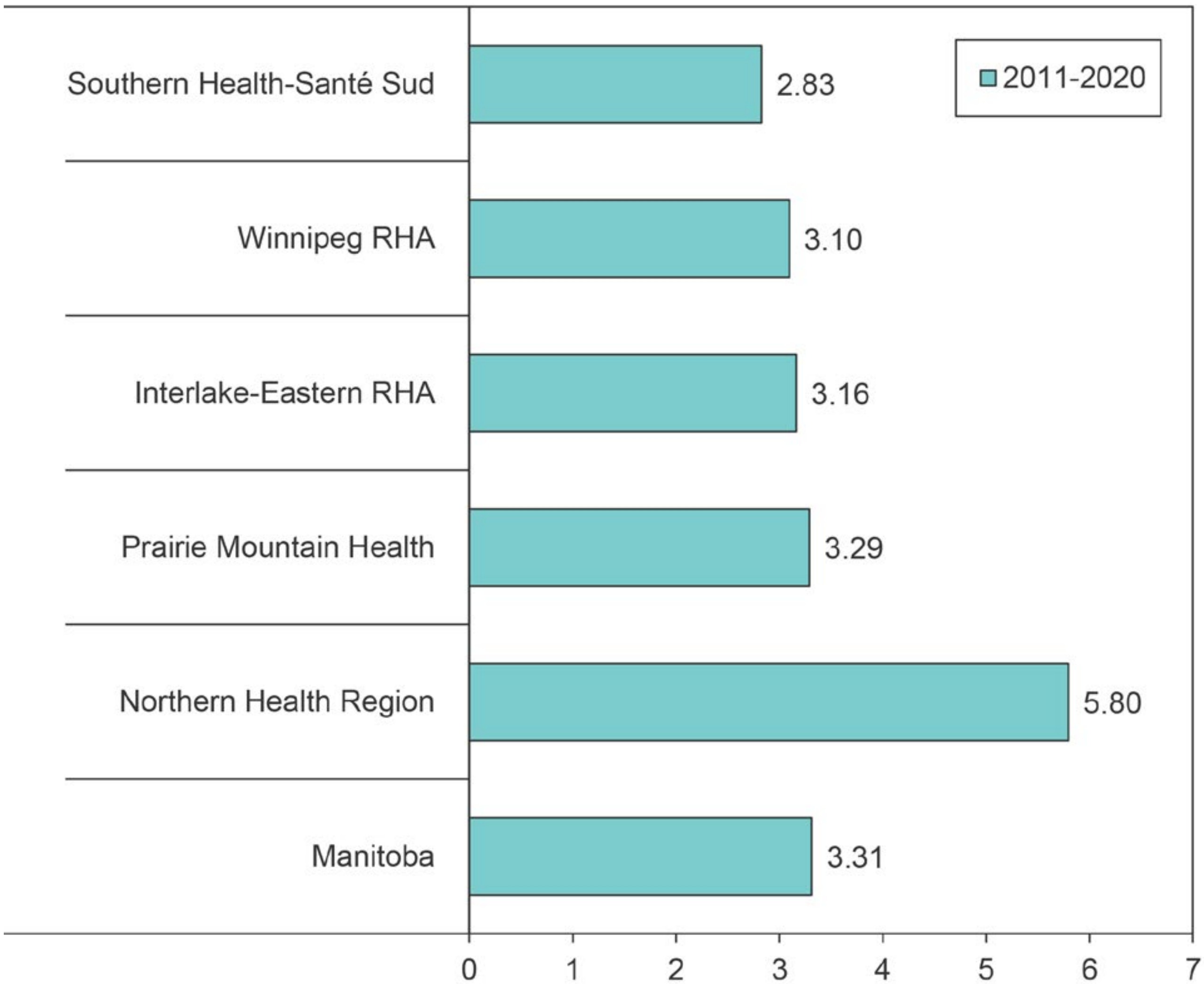
The Graphs: Order of the Regions

The health regions are shown in each figure in a particular order, which is consistent throughout the report and similar to other MCHP reports. This order is based on the overall health status of the population of each area as measured by the adjusted premature mortality rate (PMR). We use a Statistics Canada definition where a death before the age of 75 years is considered premature, so the PMR reflects how many residents of that area died before reaching the age of 75 (per 1,000 area residents under 75).[5] PMR is considered the best single indicator of the overall health status of a region's population and need for health care,[6–8] and is correlated with morbidity and with self-rated health, as well as with socioeconomic indicators.[9]

Because some districts have small populations, ten years of data (2011-2020) were used to ensure reliable PMR estimates. Like most other indicators in this report, the PMR data were adjusted to the Manitoba population to account for the age and sex composition of each area's population. Adjusted PMR values for the health regions are shown in Figure 1.14. Southern Health-Santé Sud had the lowest PMR (i.e., the best overall health status) and is shown at the top of the graph and the other regions follow in order of increasing PMR: Winnipeg RHA, Interlake-Eastern RHA, Prairie Mountain Health, and the Northern Health Region. The PMR for Manitoba overall is shown at the bottom. The order in this report is slightly different from the 2019 Atlas (based on the PMR for 2007-2016), where Prairie Mountain Health was shown above the Interlake-Eastern RHA. The tables for the smaller geographic areas found in the online supplement also list the areas (e.g., districts) according to their ranked adjusted PMR.

Given the consistent ordering of the regions on the figures, we can make observations about a potential relationship between health status and the indicator. For example, if the rate for an indicator increases (or decreases) incrementally from the Southern Health-Santé Sud to the Northern Health Region, we may suspect that there is a relationship. If the indicator rates show variability across the regions, then it is more likely that the indicator is not related to health status. Because these relationships were not statistically tested, comments are only made about the 'appearance' of a possible relationship for indicators where a clear pattern is observed in the figures. Further research would be required to establish if a relationship does exist and the strength of that relationship.

Figure 1.14: Premature Mortality Rate by Health Region, 2011-2020
Age and sex adjusted average annual rate of death before the age of 75 per 1,000 residents (age 0-74)



Chapter 2: **Demographics**

Key Findings in Chapter 2

Manitoba's population grew from 1,367,828 in 2017 to 1,437,521 in 2022, representing a 5.1% increase. This was a lower rate of growth than the 7.1% increase that occurred between 2011 and 2016.[3] Each region's population size also increased over time, ranging from an increase of 0.4% in the Northern Health Region to 10.2% in the Southern Health-Santé Sud region. Manitoba continues to be an aging population where the proportion of the population who were older adults (65 years and older) increased from 15.3% in 2017 to 17.1% in 2022 (an 11.8% increase). Whereas the proportion of the population who were children (0-19 years) or adults (20-64 years) decreased by 2.4% and 2.0%, respectively. This pattern where children have been making up a steadily decreasing proportion of the population and older adults making up a steadily increasing portion has consistently occurred over the 20-year span between 2003 and 2022 in the province and within each region.

Population structures in the regions were different from that in the province overall in 2022. Comparing the proportion of the population in a region who were children, adults, or older adults to the corresponding proportion for Manitoba overall illustrates those differences and can be summarized as follows:

- The Southern Health-Santé Sud region had a higher proportion of children and lower proportion of adults and older adults.
- The Winnipeg RHA had a lower proportion of children, a higher proportion of adults, and a similar proportion of older adults.
- The Interlake-Eastern RHA had a lower proportion of children and adults and a higher proportion of older adults.
- Prairie Mountain Health had a slightly higher proportion of children, a lower proportion of adults and a higher proportion of older adults.
- The Northern Health Region had a much higher proportion of children, a lower proportion of adults, and a much lower proportion of older adults.

The report includes three area-level measures (i.e., not at the individual level) that served as proxies for socioeconomic status. These were the socioeconomic factor index (SEFI), material deprivation index, and the social deprivation index. In general, higher scores on these indices reflect less desirable socioeconomic conditions and more deprivation, while lower scores reflect better conditions and less deprivation. At the regional level, the highest SEFI and material deprivation index scores were in the Northern Health Region, while the lowest scores were in the Southern Health-Santé Sud region and Winnipeg RHA. Meanwhile, the lowest social deprivation index scores were in the Northern Health Region, while the highest were in Prairie Mountain Health. Over the 20-year period, the SEFI and material index scores improved in Southern Health-Santé Sud, Interlake-Eastern RHA, and Prairie Mountain Health regions, while they worsened or remained stable in the Winnipeg RHA and the Northern Health Region. The opposite was observed for social deprivation, where the index scores for the Southern, Interlake-Eastern RHA, and Prairie Mountain Health regions worsened, and the Winnipeg RHA and the Northern Health Region improved or remained stable. Given the nature of these indicators and how they are established, “ecological fallacy” is cautioned where incorrect conclusions about individuals are drawn from data about groups. Therefore, the policy focus should remain on community-level interventions rather than individual risk profiling when using these results.

Introduction

This chapter describes the age and sex composition of the population for the province and each of Manitoba’s health regions, along with three indicators of socioeconomic status/deprivation. Because of their nature, these indicators were not calculated for the urban and rural income quintiles.

Demographic summaries that describe the distribution of 2022 population by three age groups (children, adults, and older adults) is shown first for Manitoba overall and each health region. This is followed by the distributions for each year from 2003 to 2022 for Manitoba to observe any patterns over time. Population pyramids that graphically display the age and sex structure for Manitoba and each region follow. These pyramids were used to assess any differences in the age and sex composition within a region between 2017 and 2022, as well as to compare the compositions between a region and the province in 2022.

The chapter concludes with three socioeconomic/deprivation measures, which include the SEFI and the material and social deprivation indices. These measures are derived from Canadian Census data collected at the dissemination level and assigned to individuals based on their postal codes. The SEFI is a proxy for socioeconomic status, while the material deprivation index reflects the deprivation of goods and conveniences, and the social deprivation index reflects the deprivation of relationships among individuals in the family, the workplace, and the community.

2.1 Demographic Summaries

Definition: The percentage of the population as of December 31 in a given year by three age groups: Children (0-19 years), Adults (20-64 years), and Older Adults (65 years and older).

Time period analysis: Demographic summaries were calculated for two one-year periods: 2017 and 2022.

Trend analysis: Demographic summaries were calculated for each one-year period from 2003 to 2022.

Key Findings

Time Period Analysis (Figure 2.1)

- Manitoba’s population grew from 1,367,828 in 2017 to 1,437,521 in 2022. This was an increase of 69,693 residents and represents a growth of 5.1%. This percentage of growth is lower than the 7.1% increase from 2011 to 2016 that was reported in the previous Atlas.[3]
- The population size (i.e., number of people) in every region increased, though the percentage of growth varied considerably: Southern Health-Santé Sud increased by 10.2%, Winnipeg RHA by 4.7%, Interlake-Eastern RHA by 5.8%, Prairie Mountain Health by 3.1%, and Northern Health Region by 0.4%.
- In 2022, 24.6% of the population were between the ages of 0-19 years, 58.4% between 20-64 years, and 17.1% were 65

years and older. Compared to the proportions in 2017, this represents a decrease of 2.4% in the 0-19 group, a decrease of 2.0% in the 20-64 group, and an increase of 11.6% in the 65 years and older group.

- A similar pattern existed within each region despite the demographic profiles varying widely. The Northern Health Region had the youngest population, the Interlake-Eastern RHA had the oldest, and the Winnipeg RHA had the greatest proportion of adults between the ages of 20-64 years.

Trend Analysis (Figure 2.2)

- The demographic summary in Manitoba from 2003 to 2022 shows a clear shifting over time, where the proportion of the population who are 0-19 years has steadily decreased from 27.4% to 24.6%, while the proportion who are 65 years and older has steadily increased from 13.6% to 17.1%.
- A similar trend was evident in all regions, though the actual distributions (i.e., proportions in each age group) were different.

Figure 2.1: Demographic Summary by Health Region, 2022
Crude percent of residents per age group (years), all ages

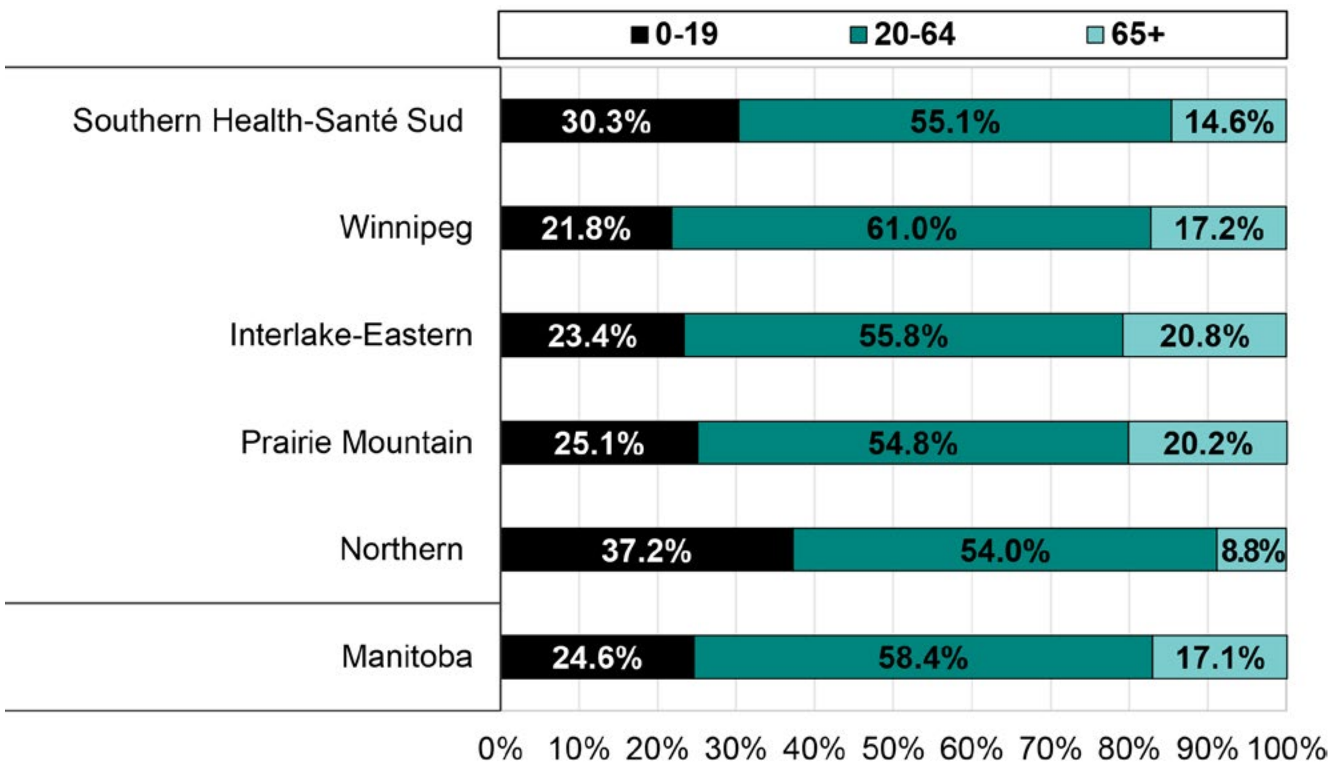
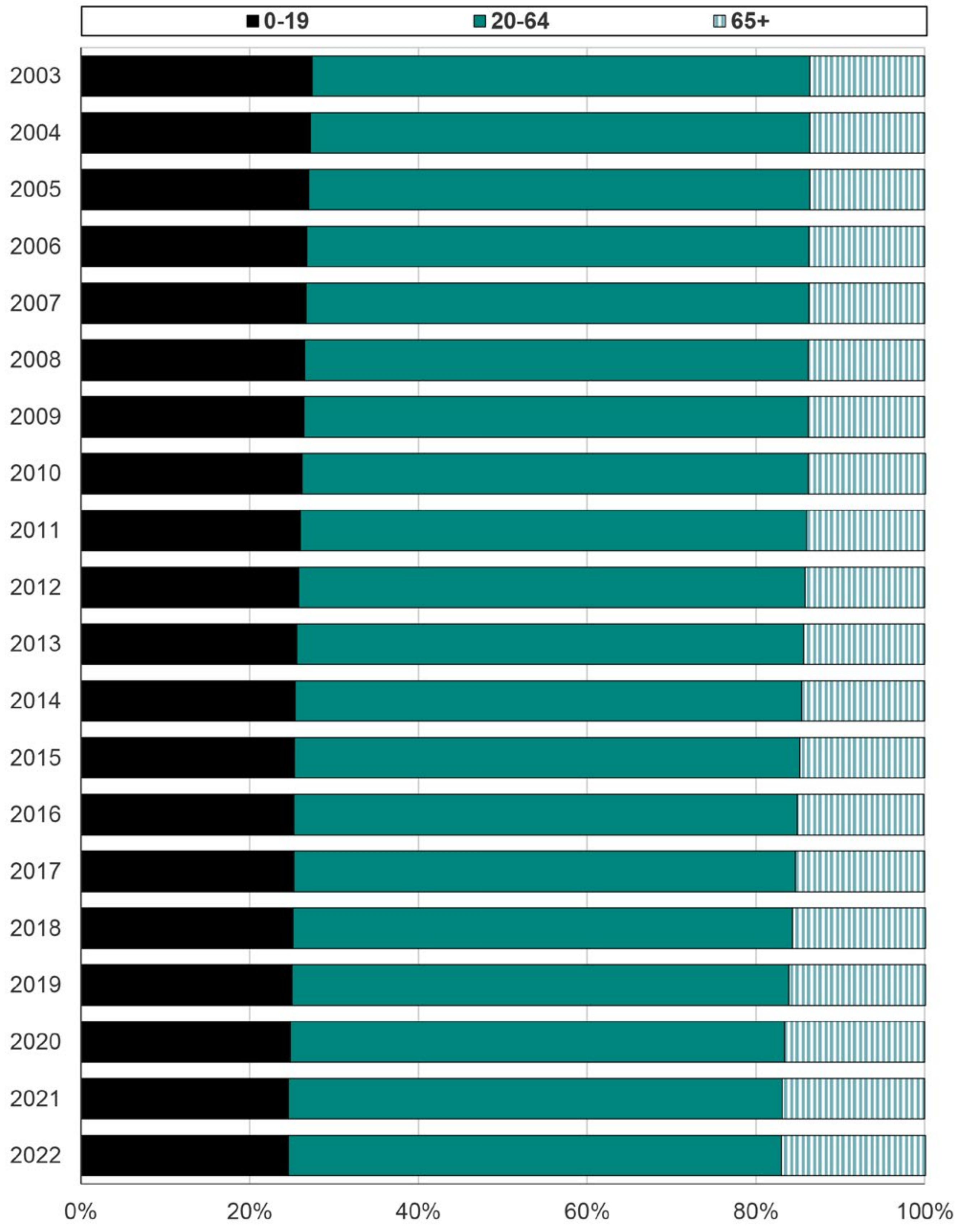


Figure 2.2: Demographic Summary for Manitoba, 2003 to 2022
Crude percent of residents per age group (years), all ages



2.2 Population Pyramids

Definition: A graphic representation of the age and sex structure of a population as of December 31 of a given year. The number of male and female residents within five-year age groupings (from 0-4 to 90 and older) were identified and values are shown in two different ways:

- Pyramids that compare the population structures within a region by showing the **number** of males and females in each five-year age grouping in 2017 and 2022. This allows an assessment of how the provincial and regional population structures have changed over time (Figures 2.3, 2.4, 2.6, 2.8, 2.10, and 2.12).
- Pyramids that compare the population structure of a region to the Manitoba population structure by showing the **percentage** of males and females in each five-year age grouping in 2022. This allows comparison of a region's population structure to that of Manitoba overall (Figures 2.5, 2.7, 2.9, 2.11, 2.13).

Areas with younger populations have a triangular shape, reflecting the presence of many young residents and few elderly, whereas areas with older populations have more rectangular, or vertical shapes.

Figure 2.3: Age and Sex Profile for Manitoba, 2017 and 2022
Crude count of residents (all ages)

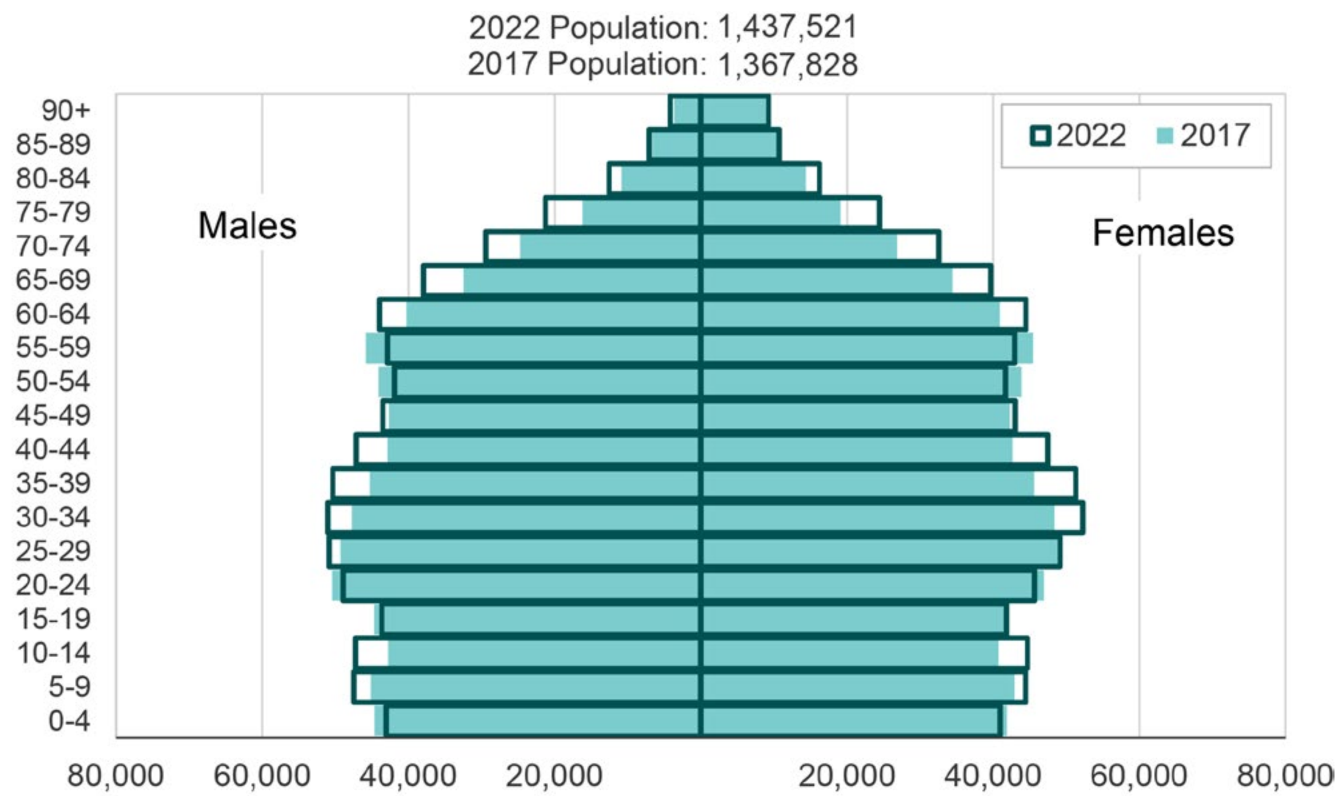


Figure 2.4: Age and Sex Profile for Southern Health-Santé Sud, 2017 and 2022
Crude count of residents (all ages)

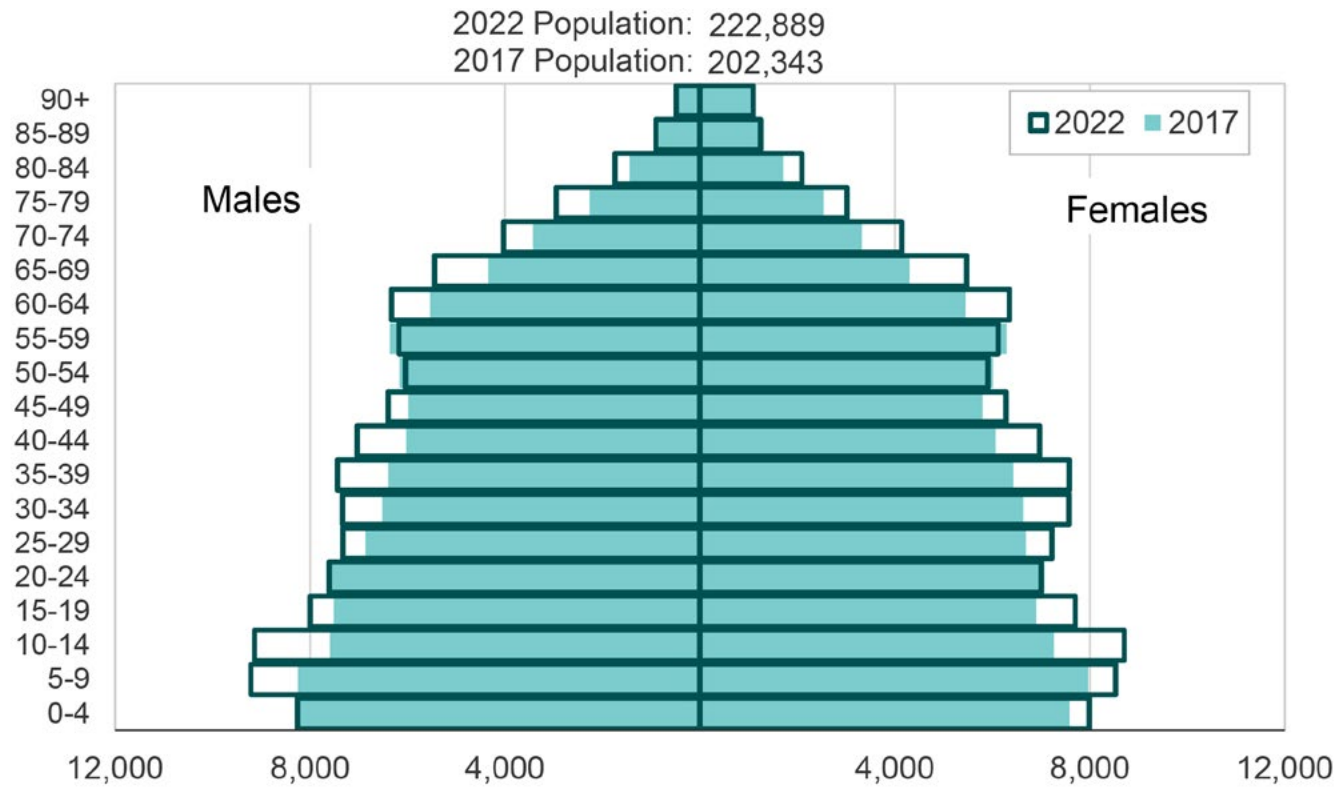


Figure 2.5: Age and Sex Profile for Southern Health-Santé Sud vs. Manitoba, 2022
Crude percent of residents (all ages)

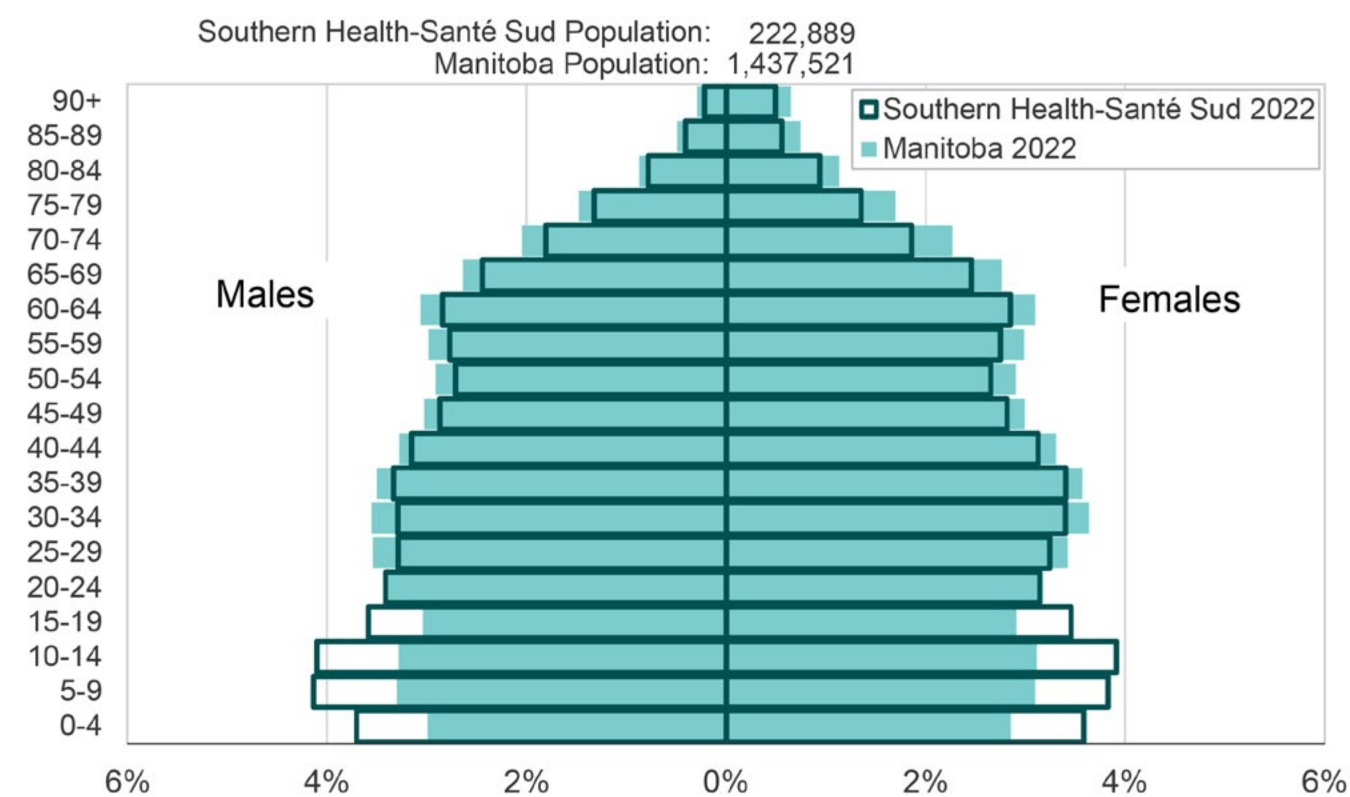


Figure 2.6: Age and Sex Profile for the Winnipeg RHA, 2017 and 2022
Crude count of residents (all ages)

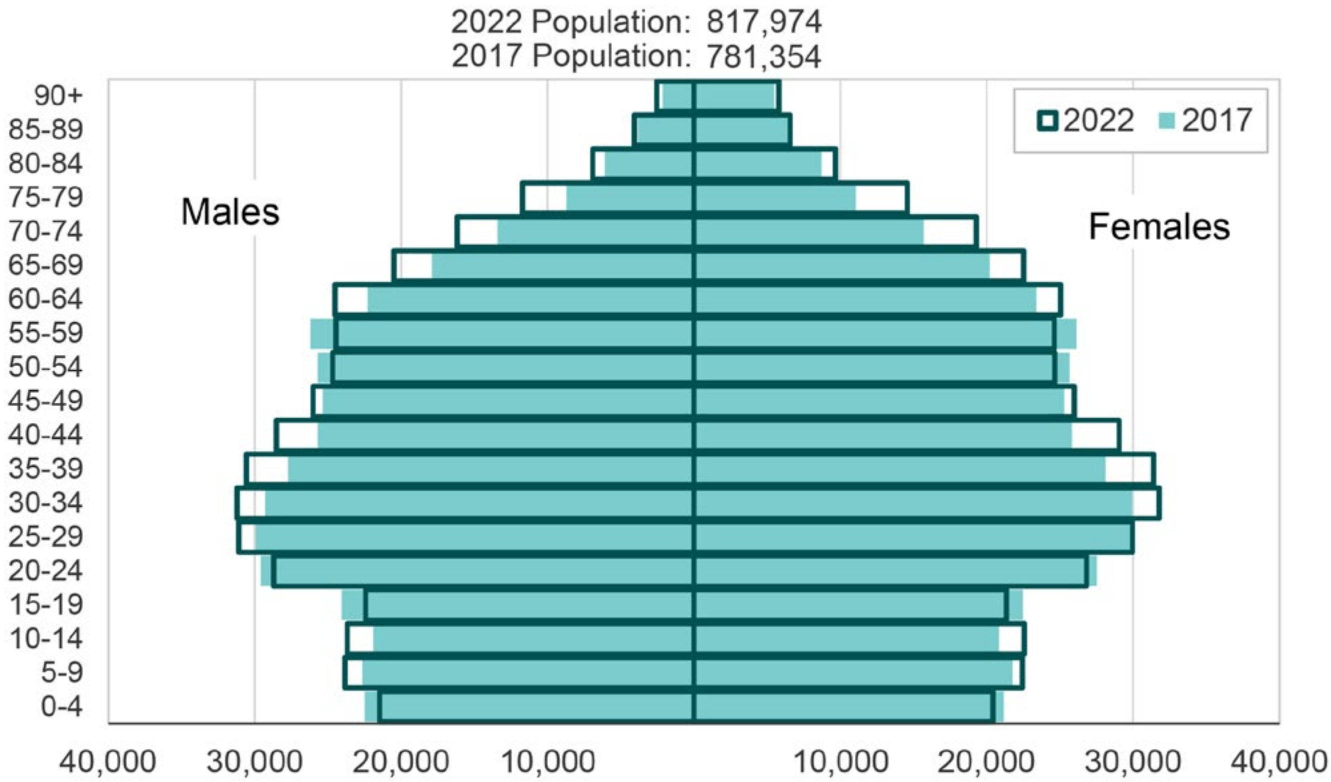


Figure 2.7: Age and Sex Profile for the Winnipeg RHA vs. Manitoba, 2022
Crude percent of residents (all ages)

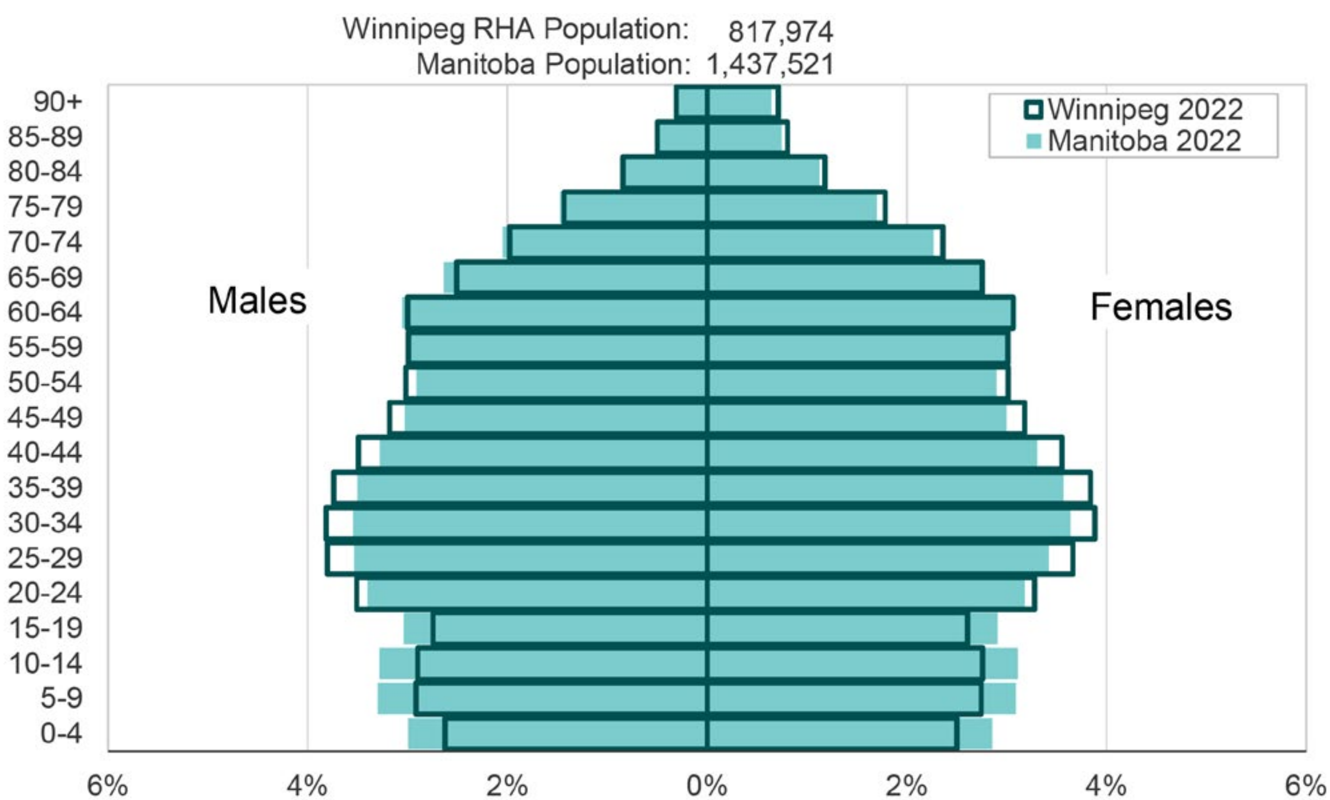


Figure 2.8: Age and Sex Profile for the Interlake-Eastern RHA, 2017 and 2022
Crude count of residents (all ages)

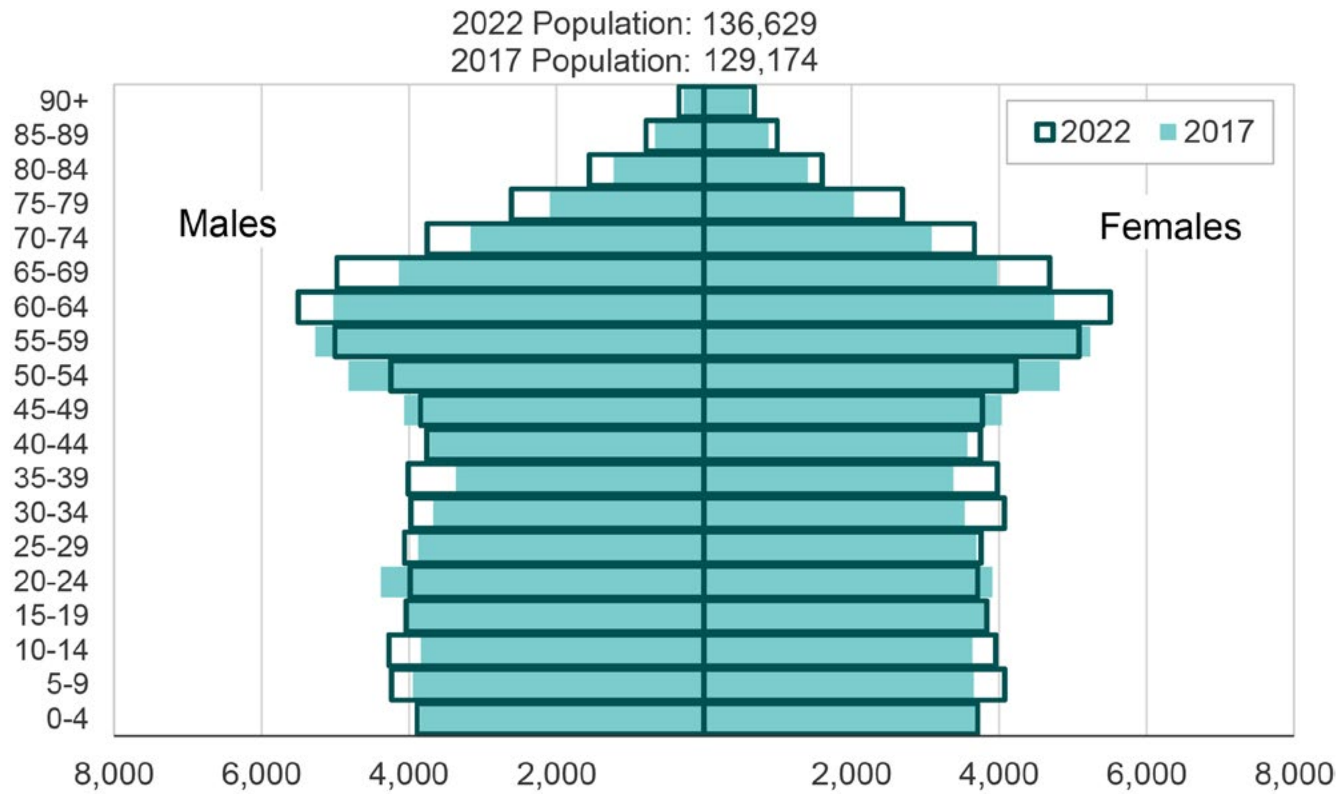


Figure 2.9: Age and Sex Profile for the Interlake-Eastern RHA vs. Manitoba, 2022
Crude percent of residents (all ages)

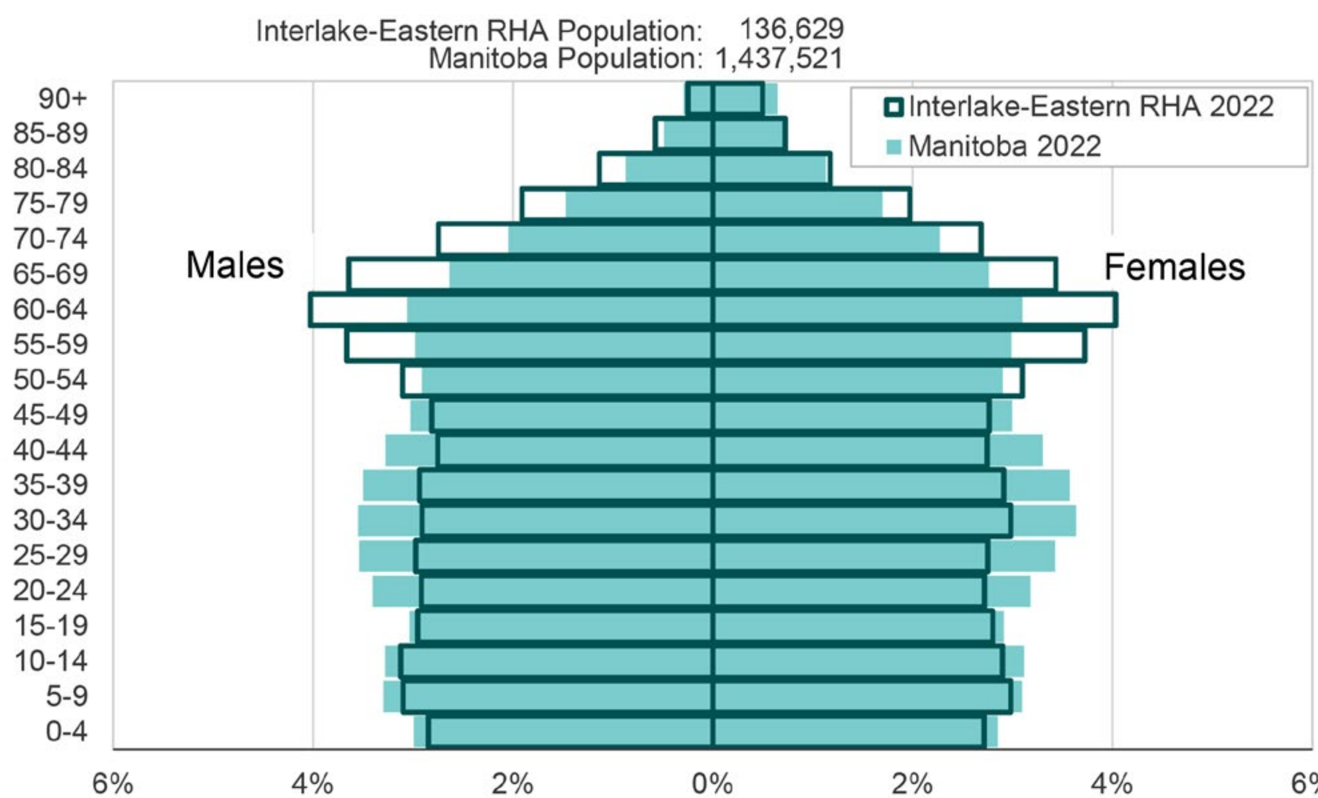


Figure 2.10: Age and Sex Profile for Prairie Mountain Health, 2017 and 2022
Crude count of residents (all ages)

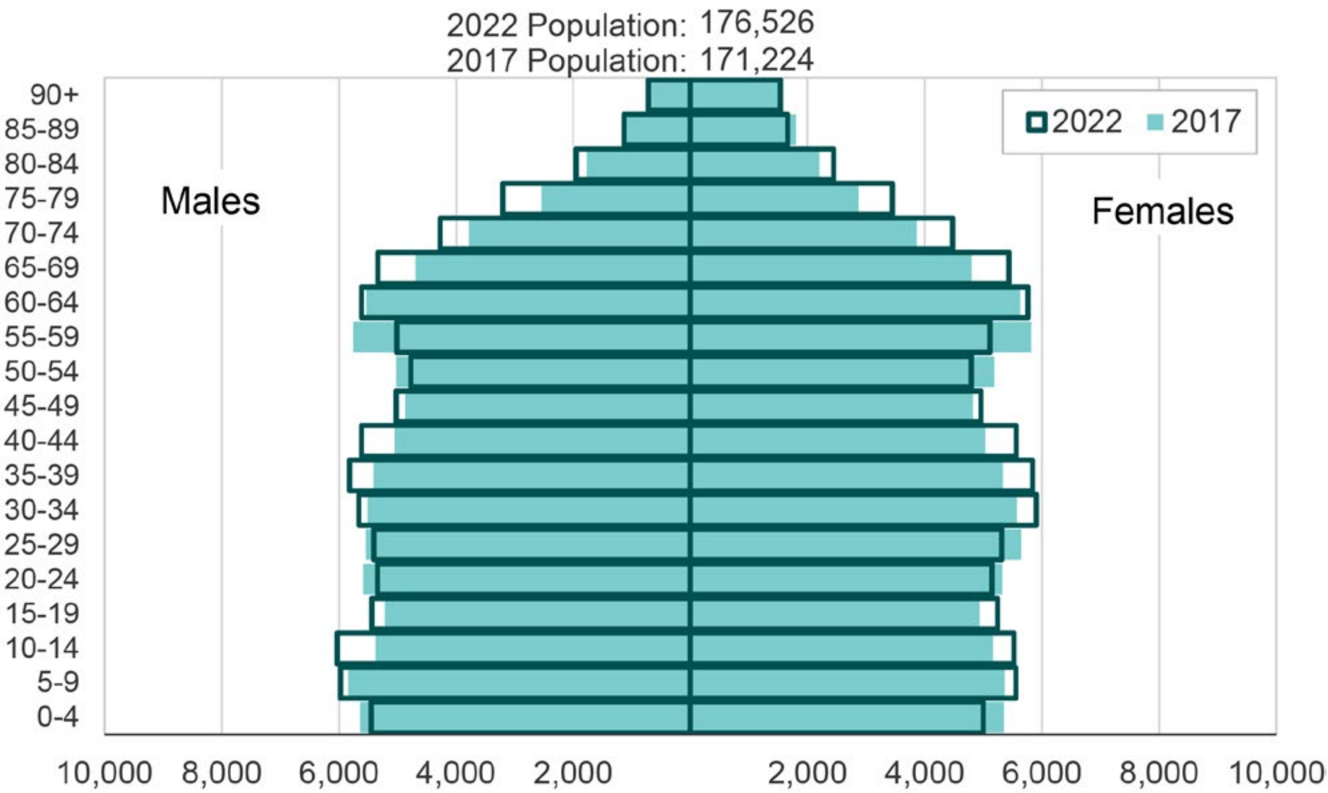


Figure 2.11: Age and Sex Profile for Prairie Mountain Health vs. Manitoba, 2022
Crude count of residents (all ages)

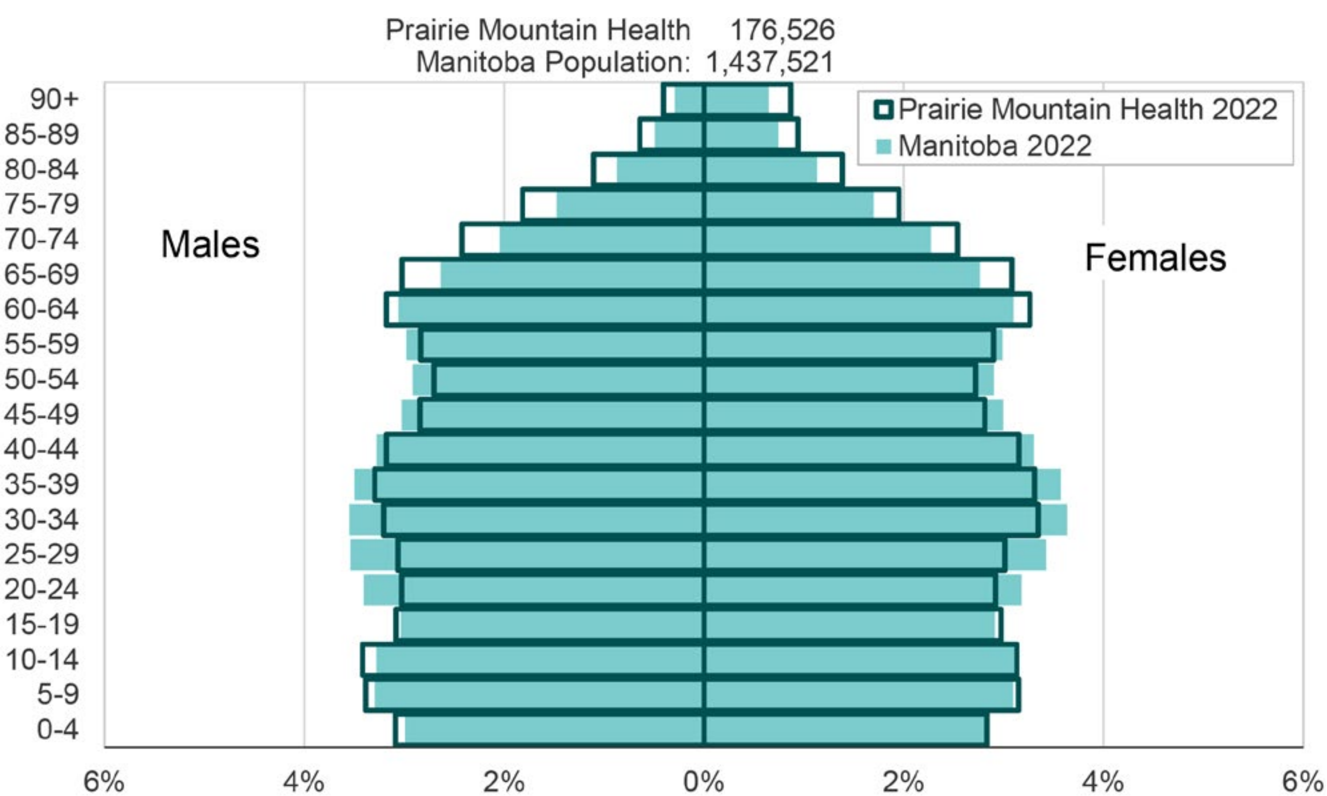


Figure 2.12: Age and Sex Profile for the Northern Health Region, 2017 and 2022
Crude count of residents (all ages)

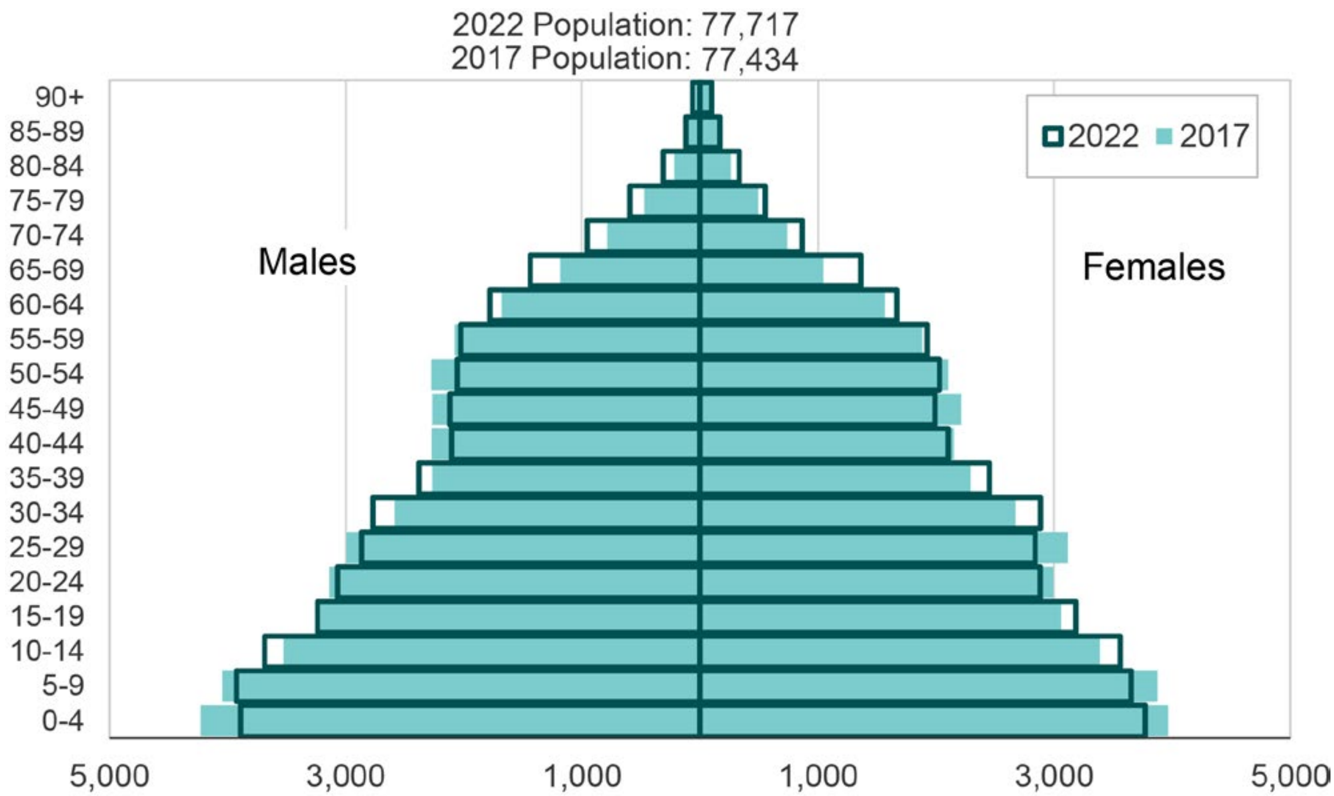
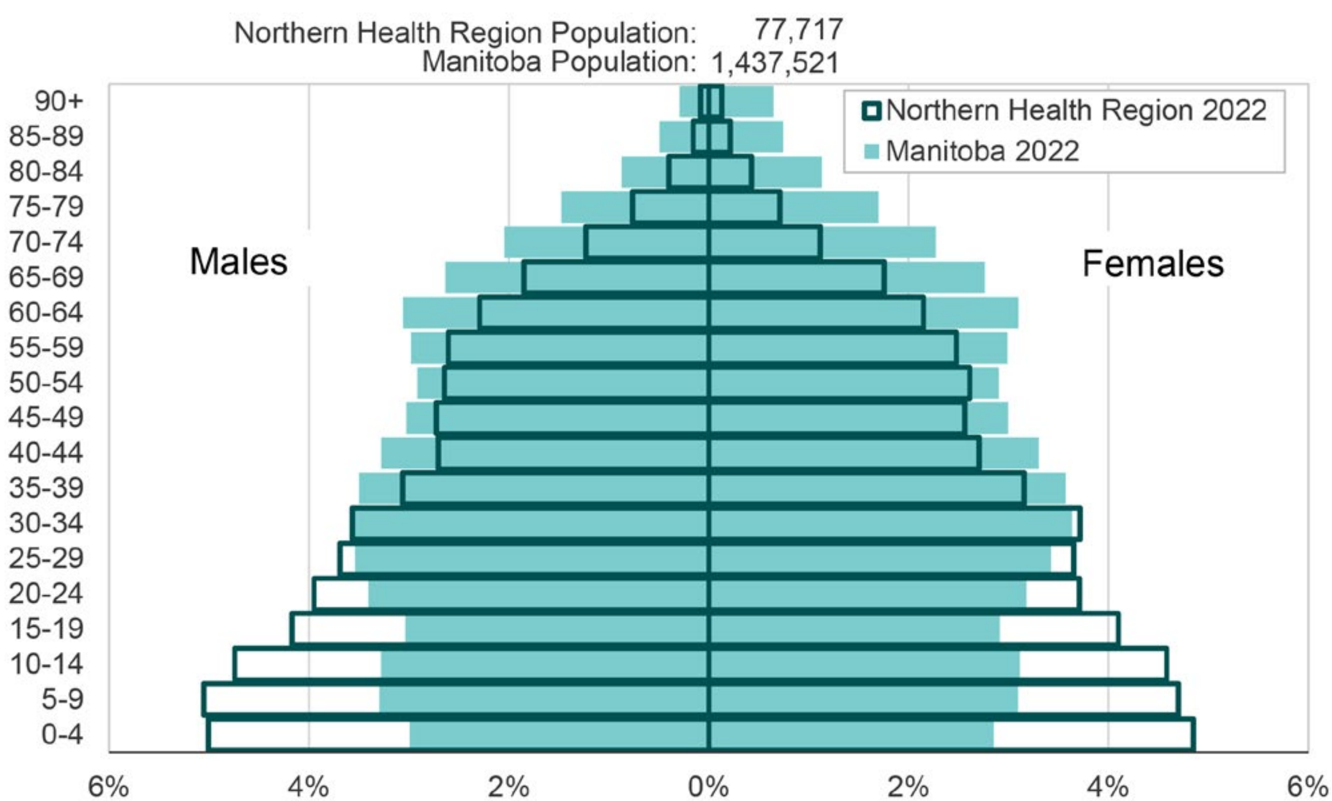


Figure 2.13: Age and Sex Profile for the Northern Health Region vs. Manitoba, 2022
Crude count of residents (all ages)



2.3 Socioeconomic Factor Index (SEFI)

Definition: An index calculated using the average household income, the percentage of single parent households, the unemployment rate of the population age 15 and older, and the percentage of the population age 15 and older without a high school diploma obtained from Canadian Census data.[5] This data is provided at the dissemination area, which is a small, relatively stable geographic unit composed of one or more adjacent dissemination blocks with an average population of 400 to 700 persons. Scores range from -5 to +5 and lower scores (e.g., below zero) indicate better status, while higher scores (e.g., above zero) indicate worse status.[10]

Time period analysis: The average SEFI score was calculated for 3 one-year periods: 2011 (TP1), 2016 (TP2), and 2021 (TP3).

Trend analysis: The average SEFI score was calculated for each one-year period from 2003 to 2022.

Key Findings

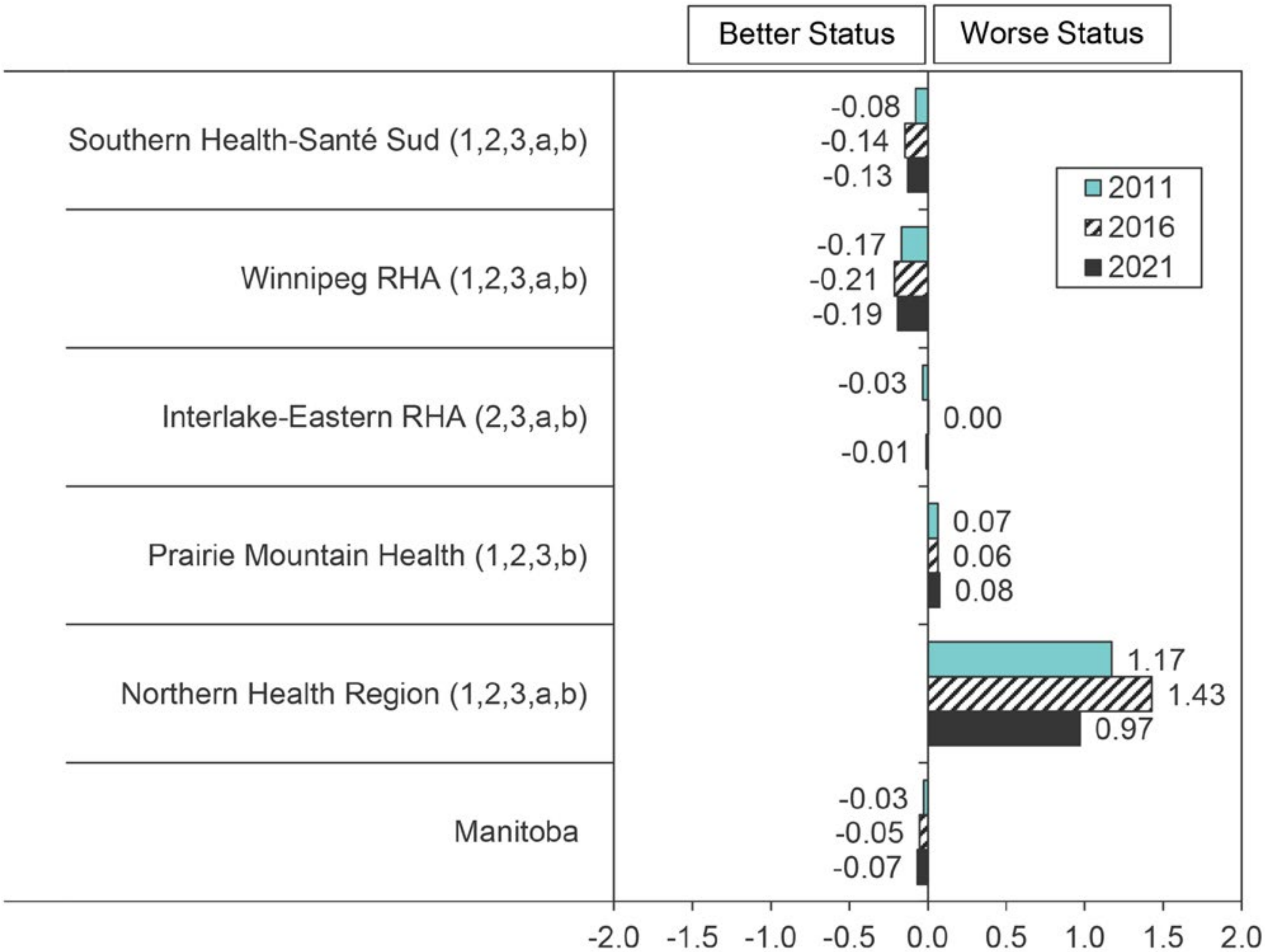
Time Period Analysis (Figure 2.14)

- The average SEFI scores fluctuated across the time periods in each region and were significantly different from the Manitoba scores in all three periods, except for the Interlake-Eastern RHA in TP1.
- The Northern Health Region had the highest average SEFI score (‘worse conditions’) in each period. However, the TP3 score was significantly lower than the TP2 score indicating an improvement.
- The Winnipeg RHA and Southern Health-Santé Sud region had the lowest average SEFI scores (‘better conditions’) in all three periods.

Trend Analysis (Figure 2.15)

- SEFI scores decreased (‘conditions improved’) significantly over time in the Southern Health-Santé Sud, Prairie Mountain Health, and Interlake-Eastern RHA, while no linear trend was observed in the Winnipeg RHA and the Northern Health Region. There was also a noticeable improvement that occurred between 2008 and 2009 in each of the regions except the Winnipeg RHA.

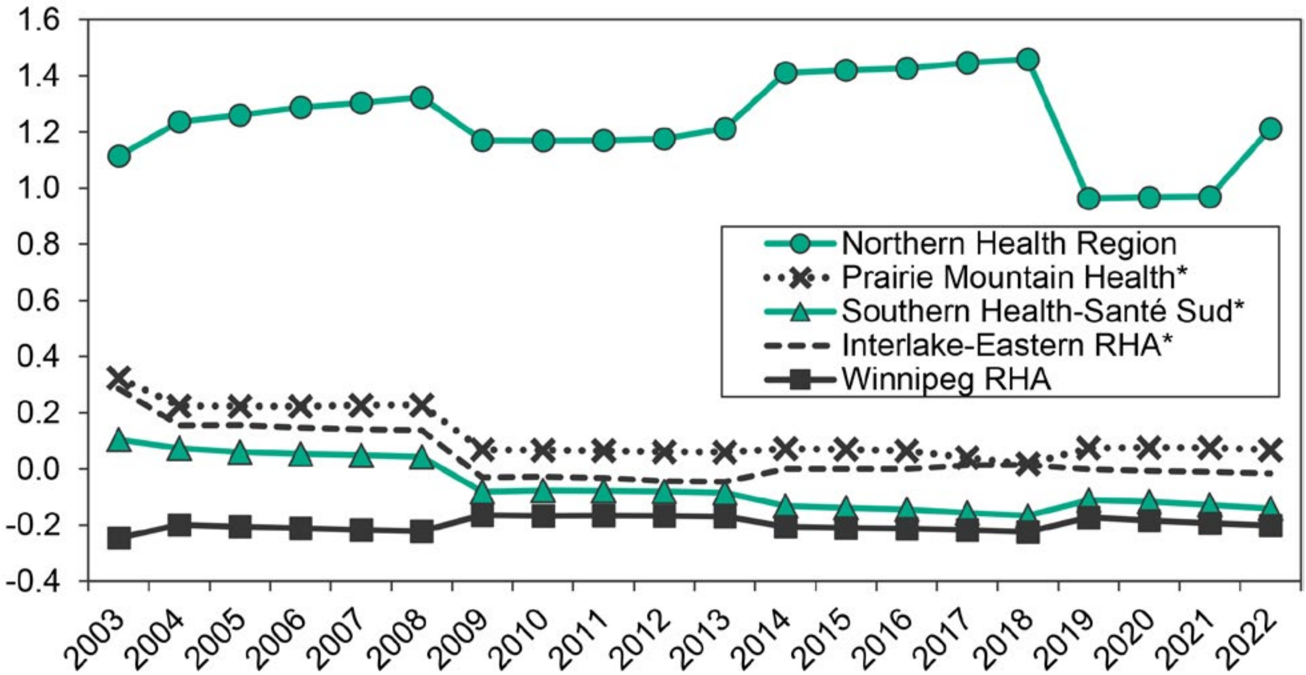
Figure 2.14: Socioeconomic Status by Health Region, Canadian Census Years 2011, 2016, and 2021
Average score on MCHP's Socioeconomic Factor Index (SEFI). Lower values indicate better status



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 2.15: Socioeconomic Status by Health Region, 2003 to 2022

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



* statistically significant linear trend over time.

2.4 Material Deprivation Index

Definition: The material deprivation index is calculated from Canadian Census data and includes average household income, the unemployment rate of the population age 15 and older, and the percentage of the population age 15 and older without a high school diploma. This data is provided at the dissemination area, which is a small, relatively stable geographic unit composed of one or more adjacent dissemination blocks with an average population of 400 to 700 persons. Scores range from -5 to +5 and lower scores (e.g., below zero) indicate better status ('less deprivation'), while higher scores (e.g., above zero) indicate worse status ('more deprivation').[10]

Time period analysis: The average material deprivation score was calculated for 3 one-year periods: 2011 (TP1), 2016 (TP2), and 2021 (TP3).

Trend analysis: The average material deprivation score was calculated for each one-year period from 2003 to 2022.

Key Findings

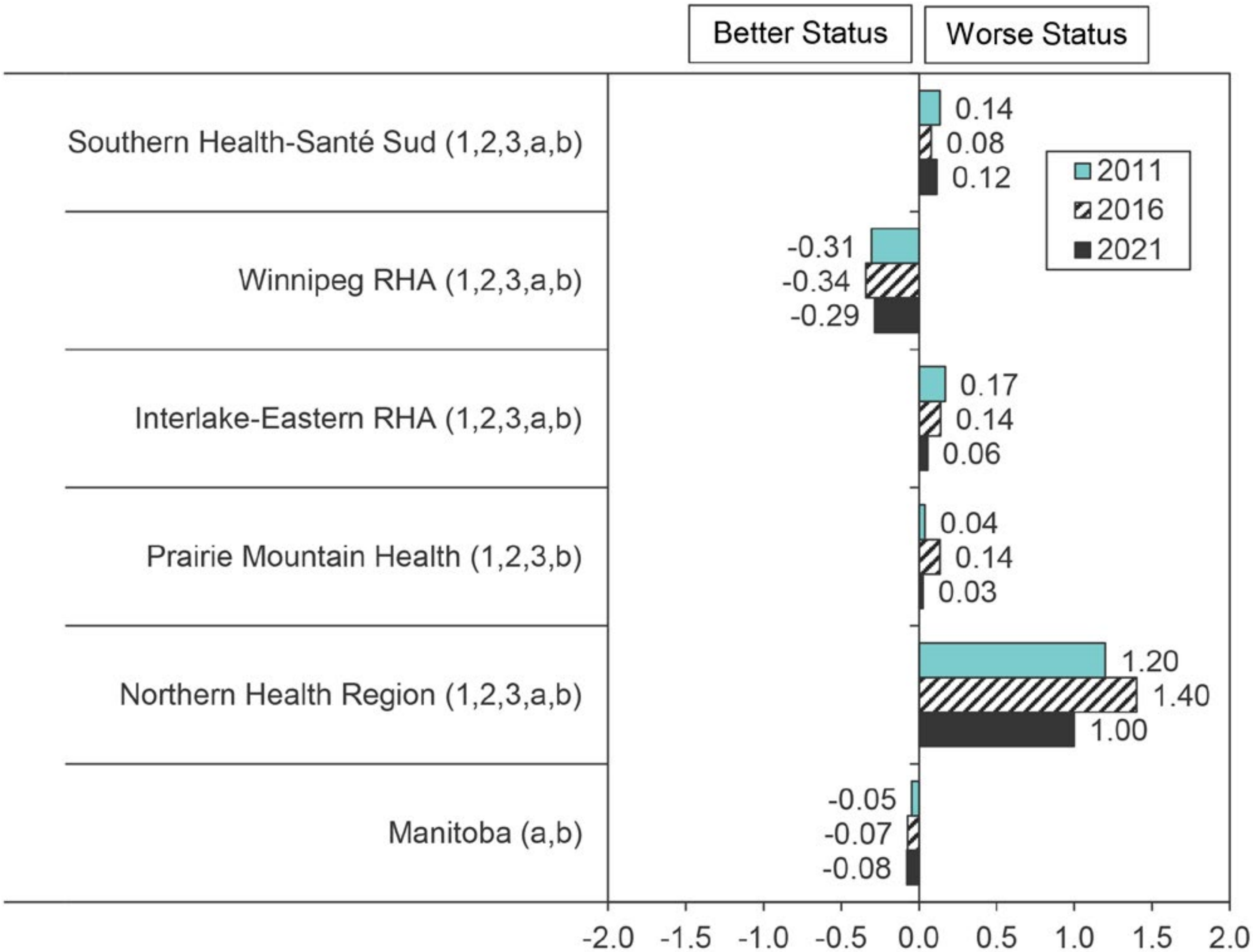
Time Period Analysis (Figure 2.16)

- The average material deprivation score improved each period in the Interlake-Eastern RHA. Scores also improved between TP2 and TP3 in the Prairie Mountain Health and the Northern Health Region and the scores in each region were significantly different from the Manitoba scores in all three periods.
- The Northern Health Region had the highest average scores ('more deprivation') in each period. However, its TP3 score was significantly lower than its TP2 score indicating an improvement.
- The Winnipeg RHA had the lowest average scores ('less deprivation') in all three periods, although itsTP3 score was significantly higher than its TP2 score indicating more deprivation recently.

Trend Analysis (Figure 2.17)

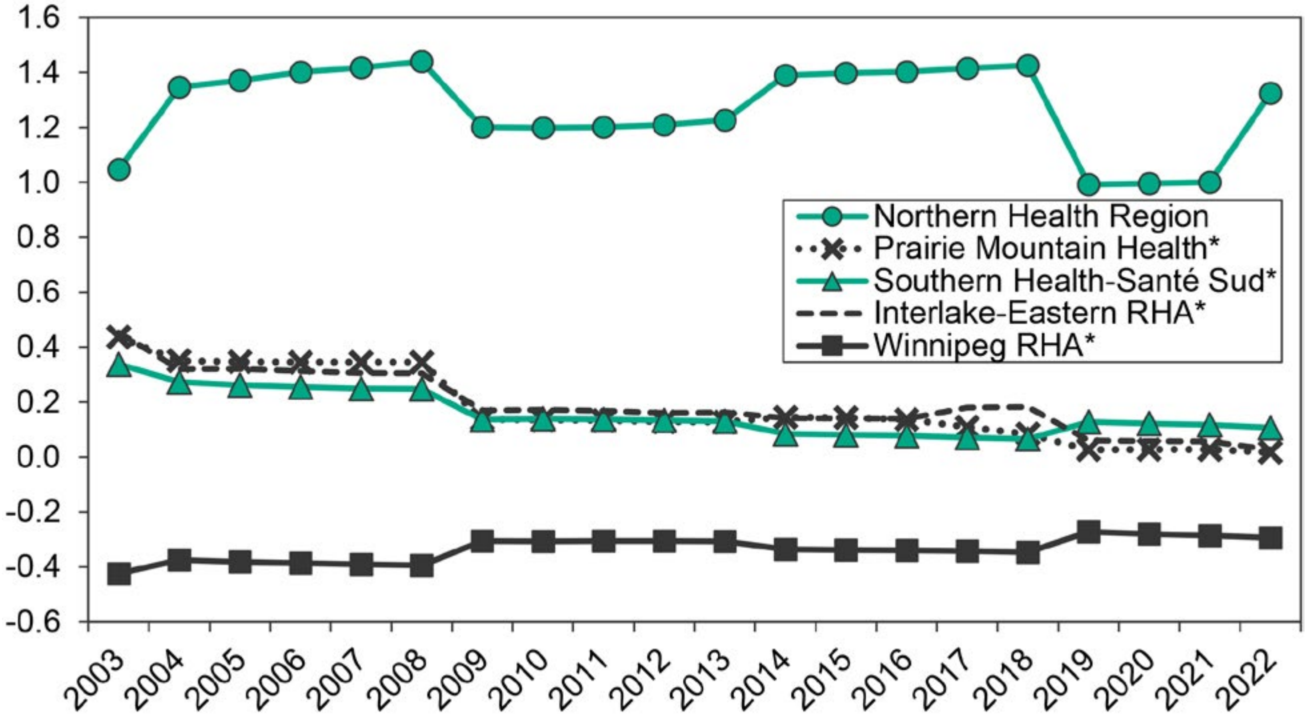
- Material deprivation scores significantly decreased ('less deprivation') over time in Manitoba and in the Southern Health-Santé Sud, Prairie Mountain Health, and Interlake-Eastern RHA, while it increased ('more deprivation') in the Winnipeg RHA. The scores in the Northern Health Region varied the most and no linear trend was observed.

Figure 2.16: Material Deprivation by Health Region, Canadian Census Years 2011, 2016, and 2021
Average score on MCHP's Material Deprivation Index. Lower values indicate better status



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 2.17: Material Deprivation by Health Region, 2003 to 2022
Average score on MCHP's Material Deprivation Index. Lower values indicate better status



* statistically significant linear trend over time.

2.5 Social Deprivation Index

Definition: The social deprivation index is calculated from Canadian Census data and includes the percentage of the population age 15 and older who are separated, divorced, or widowed, the percentage of the population that lives alone, and the percentage of the population that has moved at least once in the past five years.[11] This data is provided at the dissemination area, which is a small, relatively stable geographic unit composed of one or more adjacent dissemination blocks with an average population of 400 to 700 persons. Scores range from -5 to +5 and lower scores (e.g., below zero) indicate better status ('less deprivation'), while higher scores (e.g., above zero) indicate worse status ('more deprivation').[10]

Time period analysis: The average social deprivation score was calculated for 3 one-year periods: 2011 (TP1), 2016 (TP2), and 2021 (TP3).

Trend analysis: The average social deprivation score was calculated for each one-year period from 2003 to 2022.

Key Findings

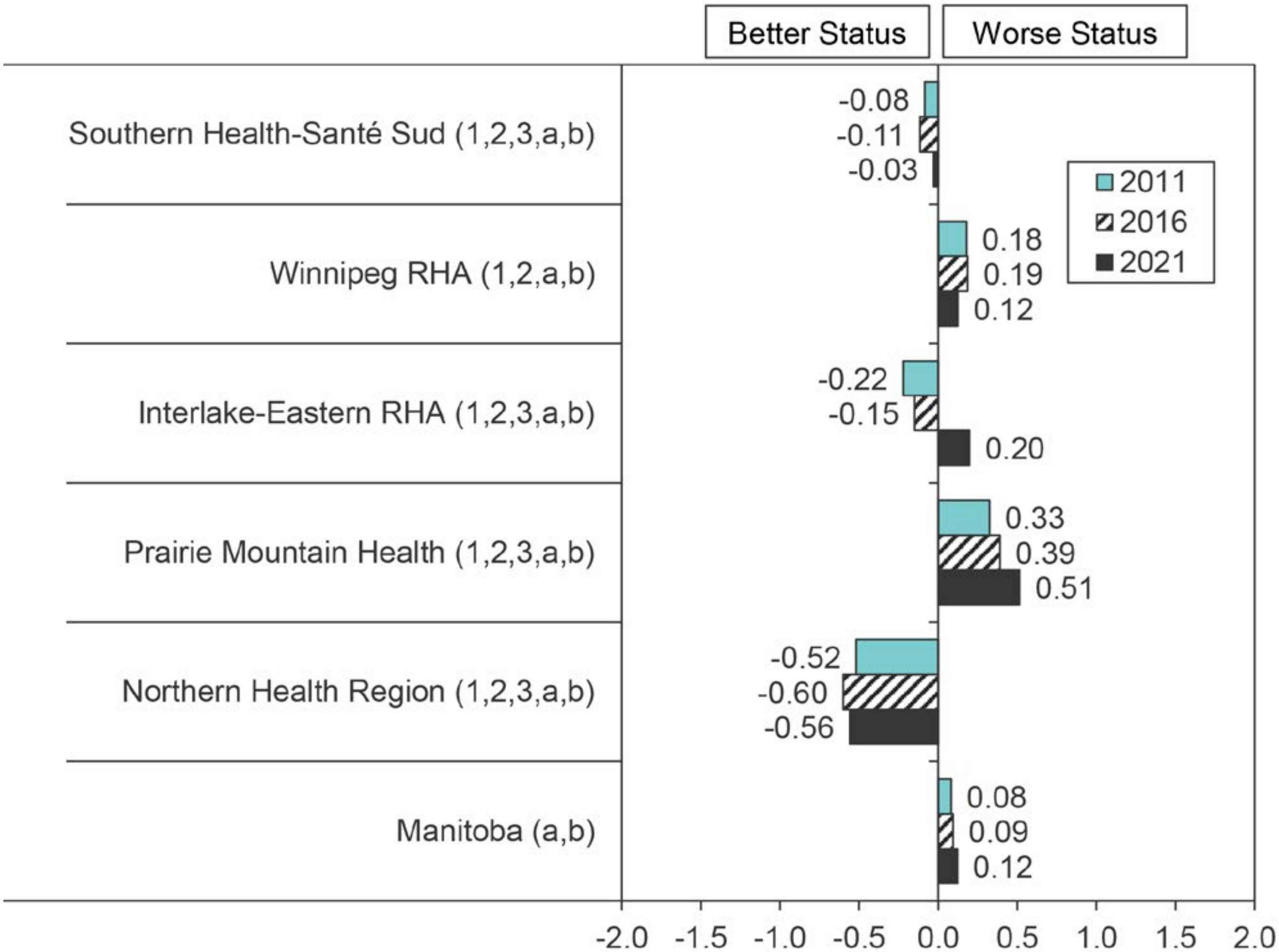
Time Period Analysis (Figure 2.18)

- The average social deprivation scores got significantly worse each period in the Interlake-Eastern RHA and Prairie Mountain Health. The scores in all regions were significantly different from the Manitoba scores in all three periods, except for the Winnipeg RHA in TP3.
- The Northern Health Region had the lowest average scores ('less deprivation') in each period; however, its TP3 score was significantly higher than its TP2 score indicating more deprivation.
- Prairie Mountain Health had the highest scores ('more deprivation') in all three periods and experienced significantly more deprivation each period.
- The Winnipeg RHA was the only region with better scores in TP3 compared to TP2. All other areas showed significantly worse scores between those periods.

Trend Analysis (Figure 2.19)

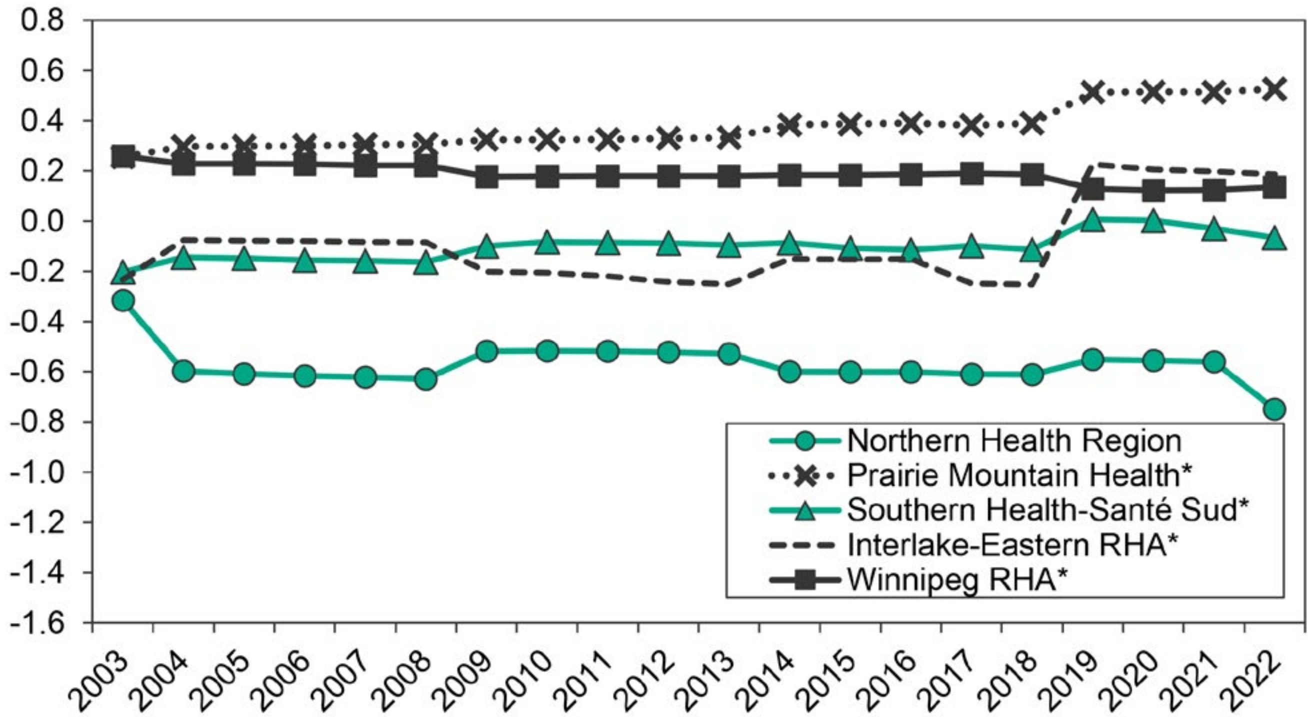
- Social deprivation scores significantly decreased ('less deprivation') over time in the Winnipeg RHA, while they increased ('more deprivation') in Southern Health-Santé Sud, Prairie Mountain Health, and Interlake-Eastern RHA. The scores in the Interlake-Eastern RHA showed a dramatic increase ('more deprivation') between 2018 and 2019 and remained elevated to 2022. No linear trend existed in the Northern Health Region

Figure 2.18: Social Deprivation by Health Region, Canadian Census Years 2011, 2016, and 2021
Average score on MCHP's Social Deprivation Index. Lower values indicate better status



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 2.19: Social Deprivation by Health Region, 2003 to 2022
Average score on MCHP's Social Deprivation Index. Lower values indicate better status



* statistically significant linear trend over time.

Chapter 3:
Population Health Status and Mortality

Key Findings in Chapter 3

- The time period analysis reveals that population health status continues to improve or remain stable in Manitoba, though many of the changes were not statistically significant. A concerning observation was that both premature mortality and potential years of lost life increased (not significantly) from the second to third time periods, which may be a result of the COVID-19 pandemic.
- The rate of deaths caused by injuries has decreased (not significantly) between the time periods. This observation was maintained when deaths by suicide and deaths by unintentional injuries were parsed out. However, deaths by suicides made up a greater proportion of injury deaths over the time periods.
- The 20-year trend analysis shows a significant improvement over time for most indicators in each of the regions, except for the Northern Health Region where residents have experienced increasing premature mortality, number of potential years of life lost, and suicide rates.
- Many of the indicators appear to have responded to the COVID-19 pandemic as expected. Outcomes were worse around 2019/20 and then returned to pre-pandemic levels by 2022/23.
- All indicators in this chapter are strongly related to income, where those in lower income areas experience poorer health outcomes (e.g., higher mortality rates).

Introduction

This chapter includes indicators of mortality and population health status. The total mortality rate and life expectancy indicators are perhaps the most widely used indicators of population health status, especially for international comparisons, given that they are based on the mortality experience of the entire population. The premature mortality rate (PMR), by contrast, focuses on the population under 75 years of age. Potential Years of Life Lost (PYLL) also uses only those under the age of 75 but further excludes infants (age 0-1) in its calculations. The PYLL is more sensitive to deaths among younger residents because it is a rate determined by the number of years below 75 at which each death occurs.[3] For example, the death of a 50-year-old contributes '25' to the PYLL measure, but only '1' to the premature mortality rate. So, while the PMR is a good indicator of overall health status and need for health care, PYLL rates give an indication of whether premature deaths are occurring among relatively younger or older 'under 75' residents. This chapter also includes mortality rates due to injury, which are further separated into deaths caused by suicide and unintentional injuries.

The causes of all deaths and causes of premature death show that deaths in the "All Others" category (i.e., deaths by causes outside of the top ten causes) have increased across the three time periods. The increase, in particular that from the second to third time period, is due in part to the deaths coded as R99 ('other ill-defined and unspecified causes of mortality'), and R69 ('unknown and unspecified causes of morbidity'), which are a part of the ICD-10-CM chapter for symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified. These codes appeared at much higher frequencies in 2017, 2018, and 2020 and were treated as data errors or a missing cause of death. Therefore, they were included in the "All Others" cause of death category.

Mortality indicators are routinely calculated for calendar years (not fiscal years like most other indicators) because Vital Statistics data are collected and organized by calendar year.

For areas with small populations, small changes in the number of deaths and the age of decedents can cause very high or low rates, or what appear to be dramatic changes over time. Therefore, caution is required when interpreting some of the results shown for the smaller geographic areas in the online supplement.

3.1 Total Mortality Rate (TMR)

Definition: The number of deaths per 1,000 residents.

Time period analysis: The average annual TMR was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The TMR was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

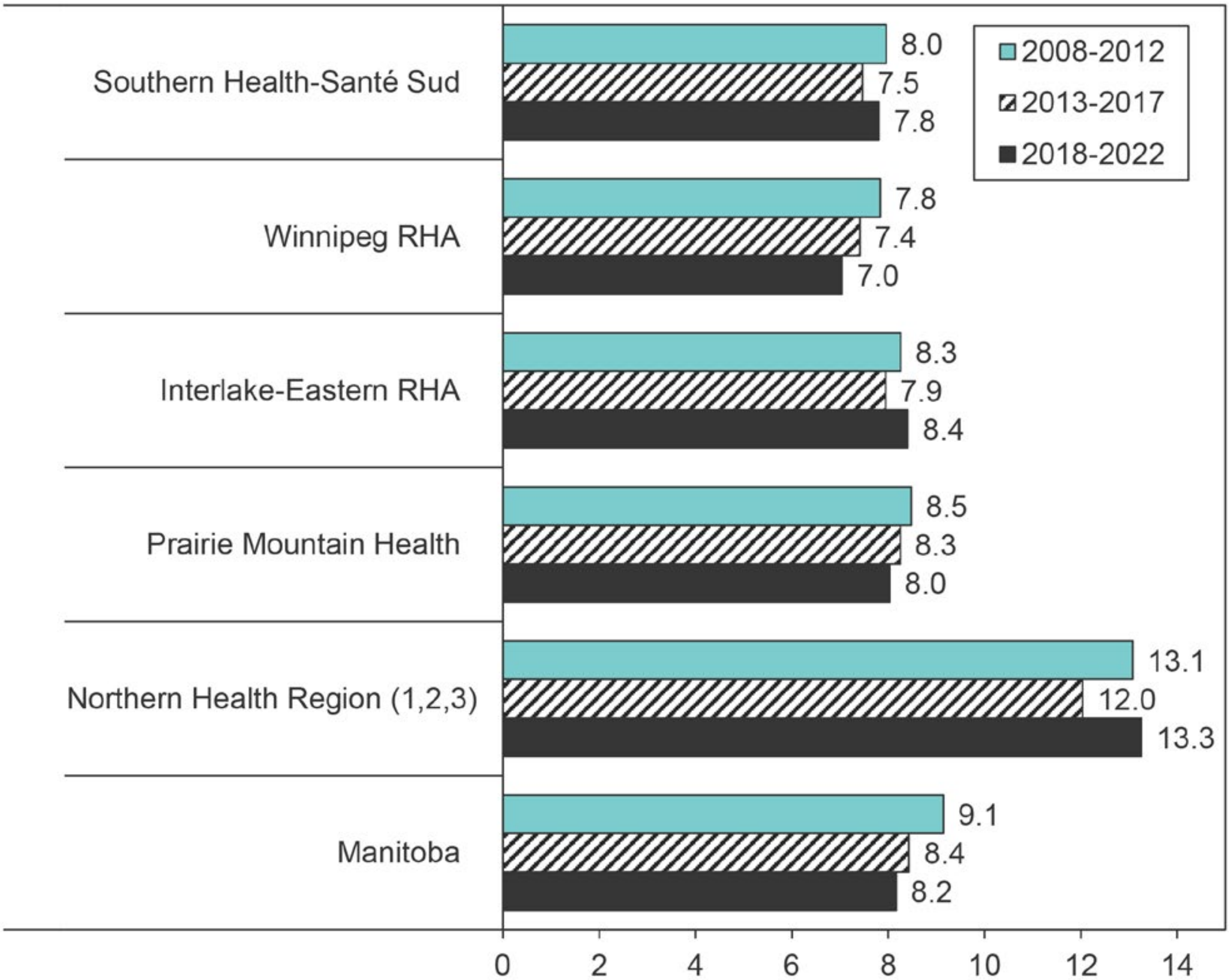
Time Period Analysis (Figure 3.1)

- The average annual TMR for Manitoba decreased from 9.1 deaths per 1,000 residents in TP1 to 8.4 in TP2 to 8.2 in TP3, although none of these decreases between subsequent periods reached the level of statistical significance. The rates decreased in all regions from TP1 to TP2 and continued to decrease in the Winnipeg RHA and Prairie Mountain Health region from TP2 to TP3, while they increased in the Southern Health-Santé Sud region, Interlake-Eastern RHA, and Northern Health Region. None of the changes across periods in the regions were statistically significant.
- The Northern Health Region had the highest rates in all three periods, which were each significantly higher than the rates for the corresponding periods in Manitoba.
- There were strong associations between income and TMR in rural and urban areas in each period (online supplement). Mortality rates were higher among residents of lower income areas. However, the TP3 rates in rural areas was highest for those in the second income quintile.

Trend Analysis (Figure 3.2)

- TMR significantly decreased over time in Manitoba overall, and the Winnipeg RHA, Interlake-Eastern RHA, and Prairie Mountain Health regions. Meanwhile, no linear trends were observed in the Southern Health-Santé Sud and the Northern Health Region. The rates showed an increase from 2019 to 2020 in all regions before returning to near 2019 levels by 2022.

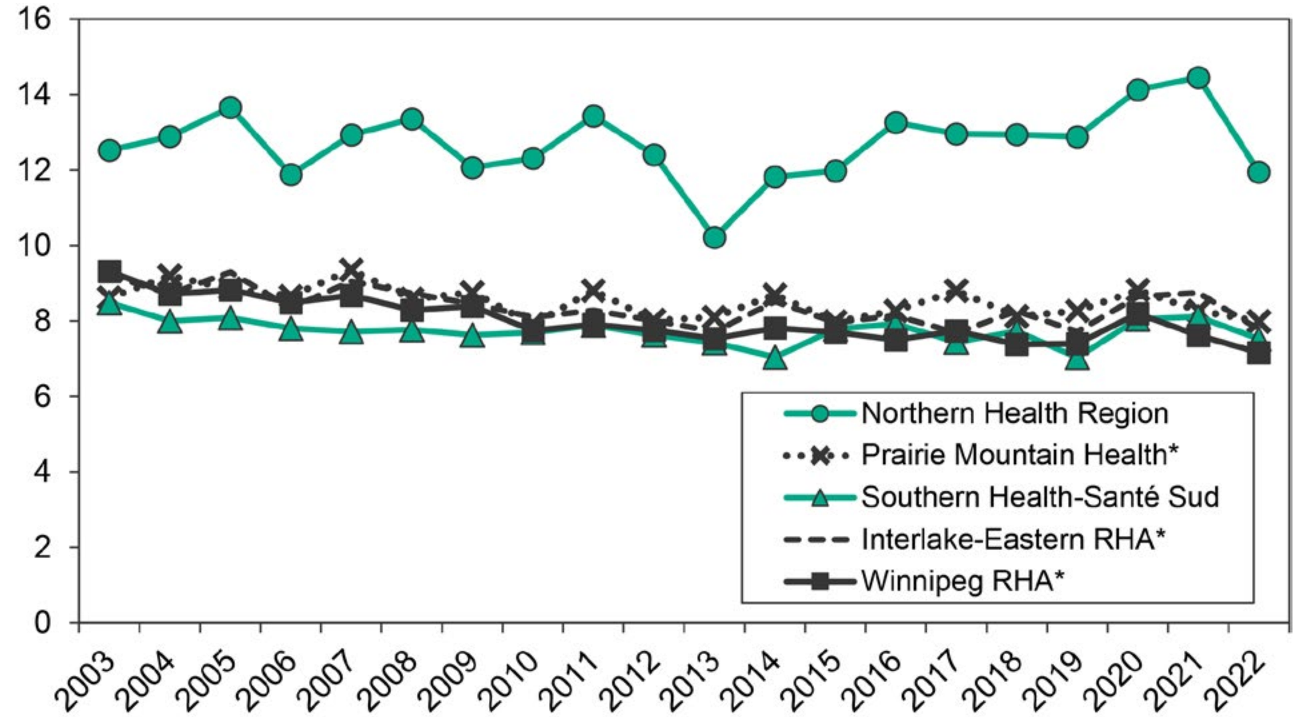
Figure 3.1: Total Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022
Age- and sex-adjusted average annual rate of death per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.2: Total Mortality Rates by Health Region, 2003 to 2022

Age- and sex-adjusted rate of deaths per 1,000 residents (all ages)



* statistically significant linear trend over time.

3.2 Causes of Deaths

Definition: Cause of death among all deaths obtained from the Vital Statistics death records and grouped by ICD-10 chapter. The percent of deaths by ICD-10 chapter in Manitoba between 2018-2022 were calculated and the top ten highest were determined and used to set the order for each region.

Note: ICD codes in Chapter 18 (Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified) include the code R99 for 'Other ill-defined and unspecified causes of mortality', which appeared in very high frequency in 2017 and 2018. This may reflect a data error, and this code was treated as a missing cause of death and moved to the "All other causes" category. This chapter also includes the code R69 for 'Unknown and unspecified causes of morbidity', which only appeared in 2020 and was the cause of death of 8.3% deaths in that year. This code was also moved to the "All other causes" category.

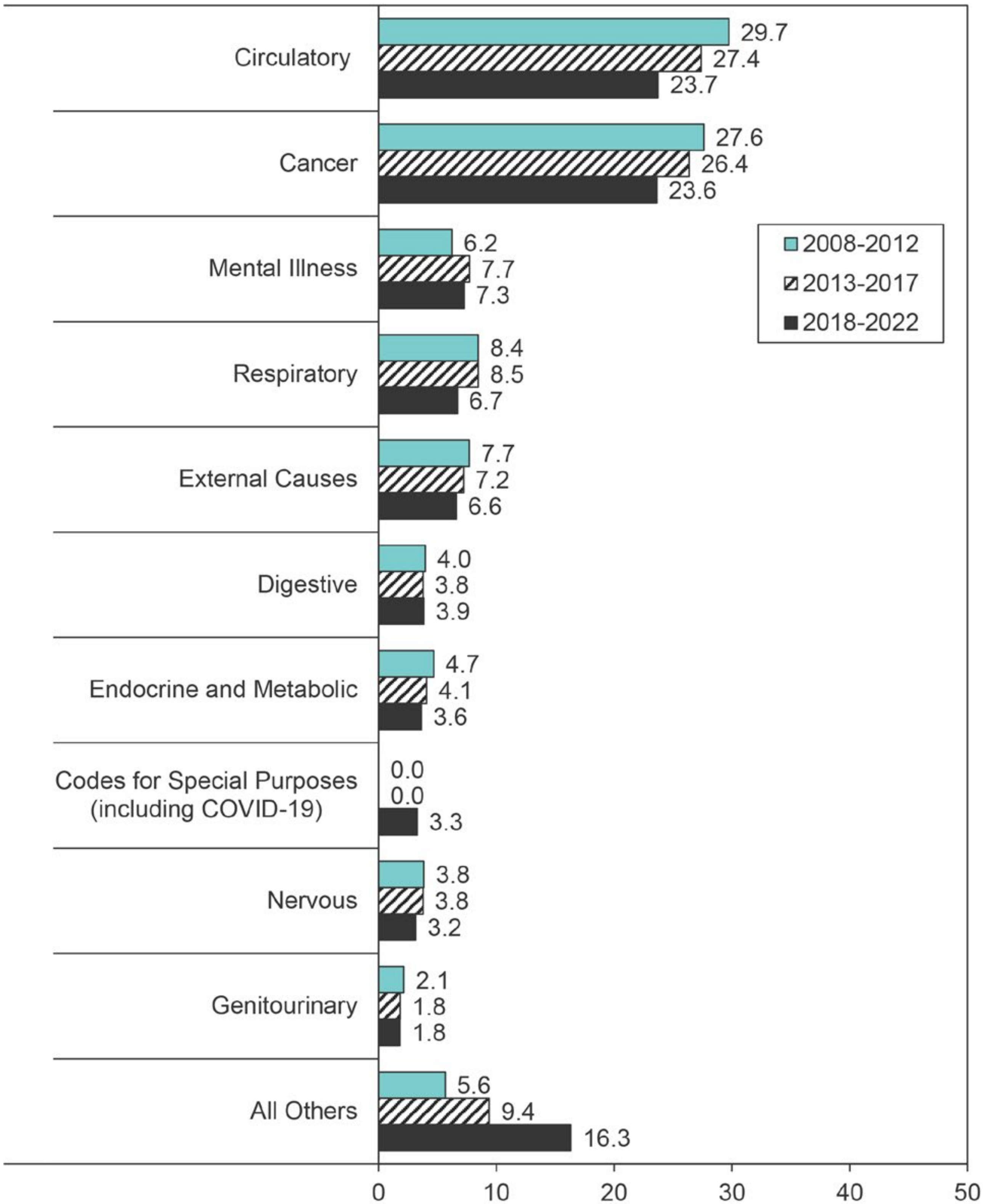
Time period analysis: The average annual crude percentage of all deaths by cause were identified for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3). The number of deaths used as the denominators in the percentage calculations for each time period are provided in the footnote of each figure.

Key Findings

Time Period Analysis (Figures 3.3 – 3.8)

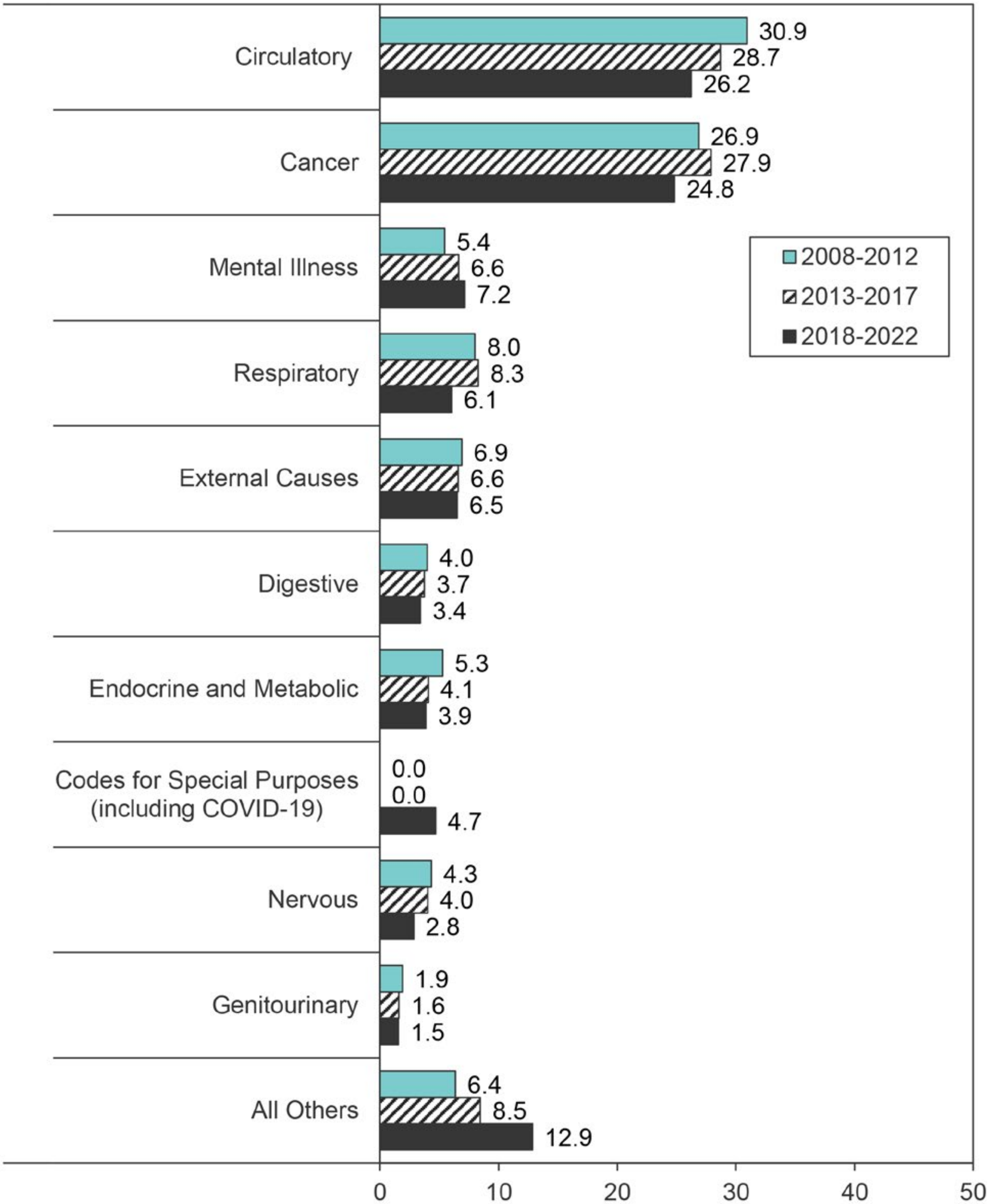
- In 2018-2022, the most common causes of death in Manitoba were circulatory disease (23.7%) and cancer (23.6%), followed by mental illness (7.3%), respiratory disease (6.7%), and external causes, which include injury and poisoning (6.6%).
- The percentage of deaths attributable to circulatory disease, cancer, external causes, and endocrine and metabolic conditions decreased between each period, while the percentage of deaths caused by mental illness increased between TP1 and TP2 and decreased between TP2 and TP3. Respiratory deaths also decreased between TP2 and TP3, which may be due to the coding practice for COVID-19 deaths. COVID-19 deaths that may have otherwise been categorized as respiratory in TP1 and TP2 appear in the Codes for Special Purposes category in TP3.
- The rankings of top causes varied somewhat by health region, though circulatory disease and cancer were the top two in each region. Northern Health Region had a unique profile, with external causes being the third most common cause and made up a considerably higher proportion of that region's deaths than was observed in the other regions. These differences were likely related to the relatively young population of Northern Health Region, as opposed to areas with older populations where deaths due to chronic illnesses are more likely.
- The percentage of deaths due to all other causes outside of the top ten increased from 5.6% in TP1 to 9.4% in TP2 to 16.3% in TP3 (see the note in the definition for this indicator).

Figure 3.3: Most Common Causes of Death in Manitoba, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



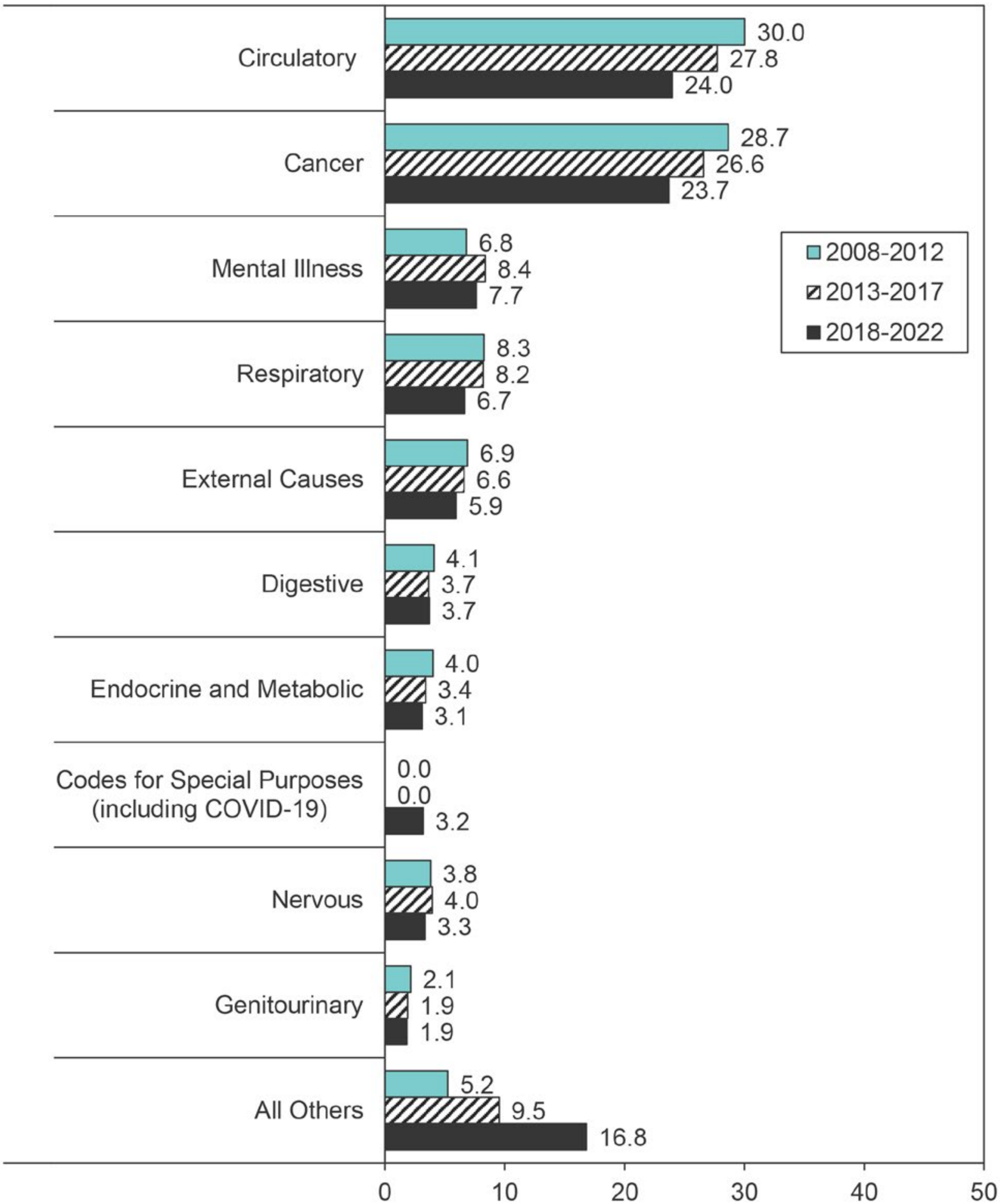
s data suppressed due to small numbers
* denominators: T1 = 49,789; T2 = 52,460; T3 = 57,634

Figure 3.4: Causes of Death in Southern Health-Santé Sud, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



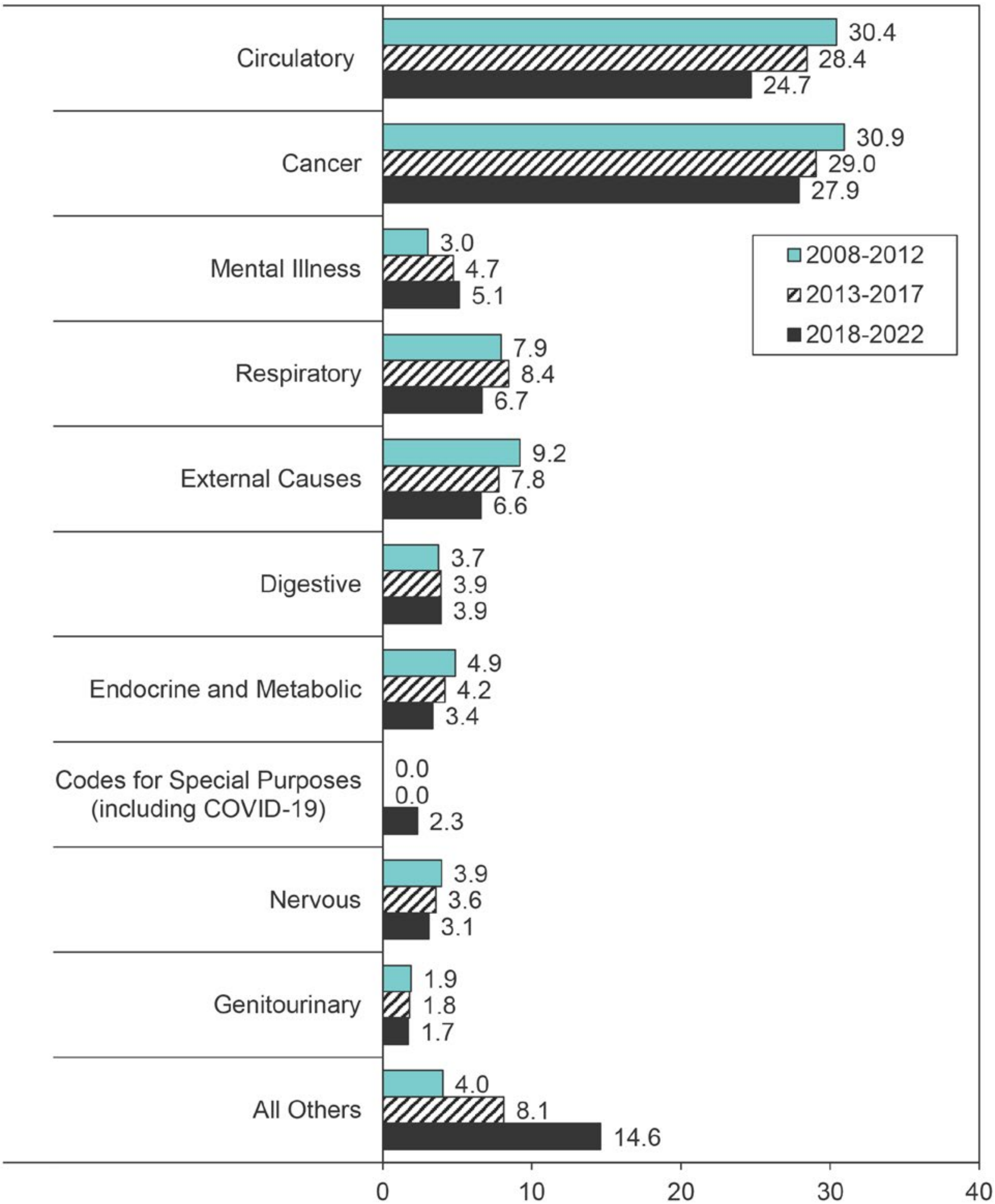
s data suppressed due to small numbers
* denominators: T1 = 5,766; T2 = 6,289; T3 = 7,098

Figure 3.5: Causes of Death in the Winnipeg RHA, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



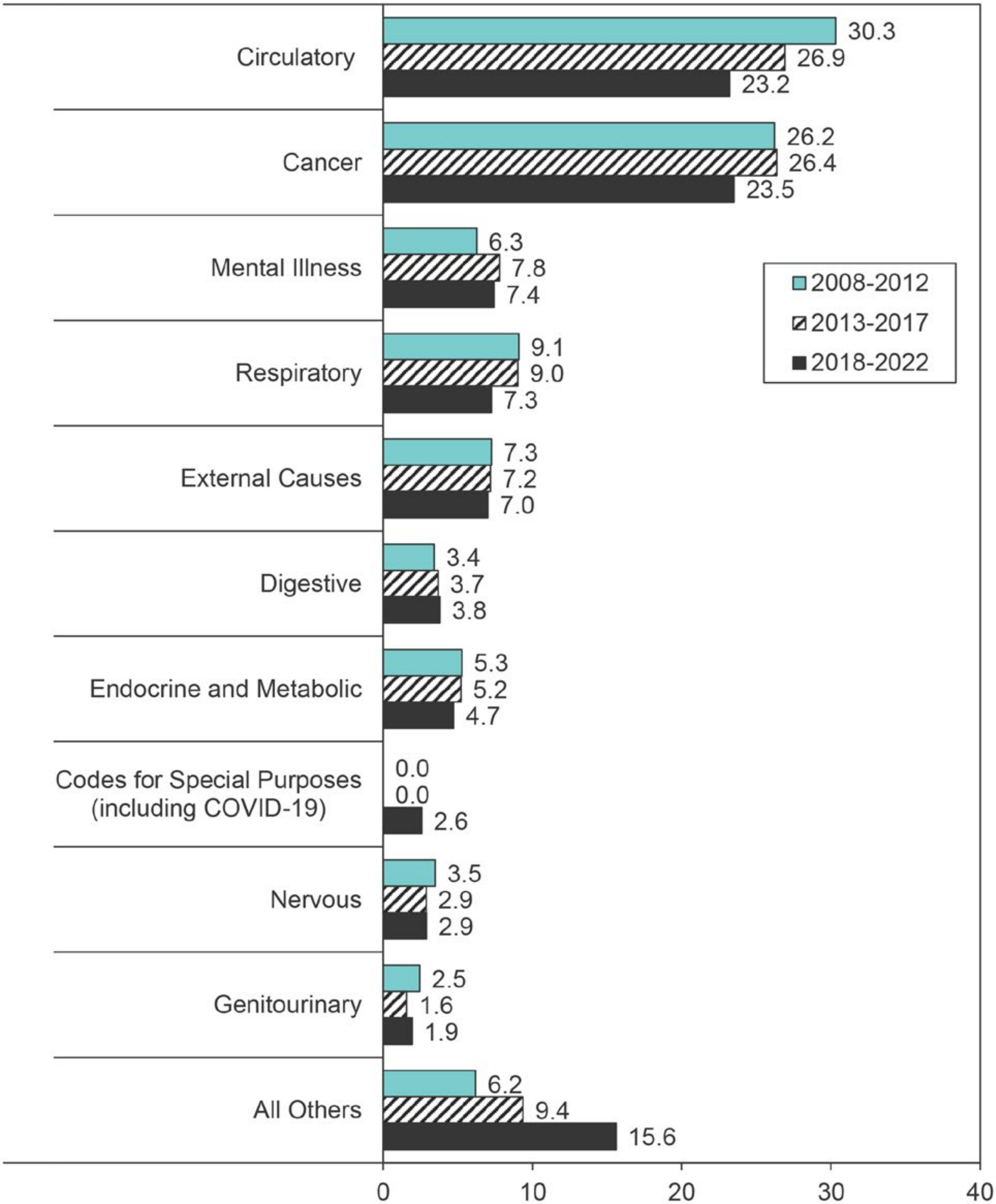
s data suppressed due to small numbers
* denominators: T1 = 27,542; T2 = 28,869; T3 = 31,701

Figure 3.6: Causes of Death in the Interlake-Eastern RHA, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



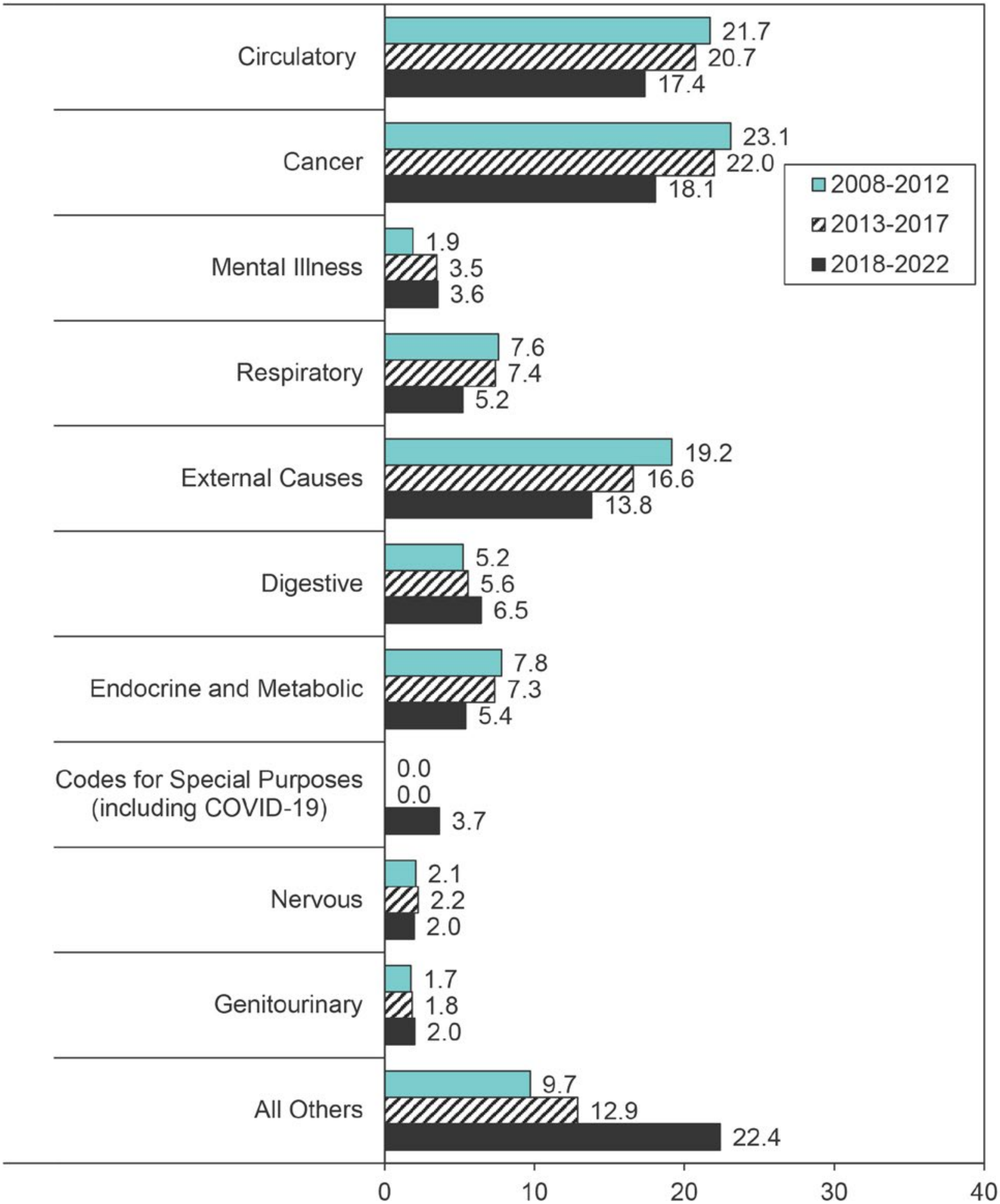
s data suppressed due to small numbers
* denominators: T1 = 4,902; T2 = 5,315; T3 = 6,030

Figure 3.7: Causes of Death in Prairie Mountain Health, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



s data suppressed due to small numbers
* denominators: T1 = 8,119; T2 = 8,344; T3 = 8,495

Figure 3.8: Causes of Death in the Northern Health Region 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



s data suppressed due to small numbers
* denominators: T1 = 2,067; T2 = 2,193; T3 = 2,727

3.3 Premature Mortality Rate (PMR)

Definition: The number of deaths per 1,000 residents aged 0-74.

Time period analysis: The average annual PMR was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population aged 0-74 in TP3.

Trend analysis: The PMR was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population aged 0-74 in 2022.

Key Findings

Time Period Analysis (Figure 3.9)

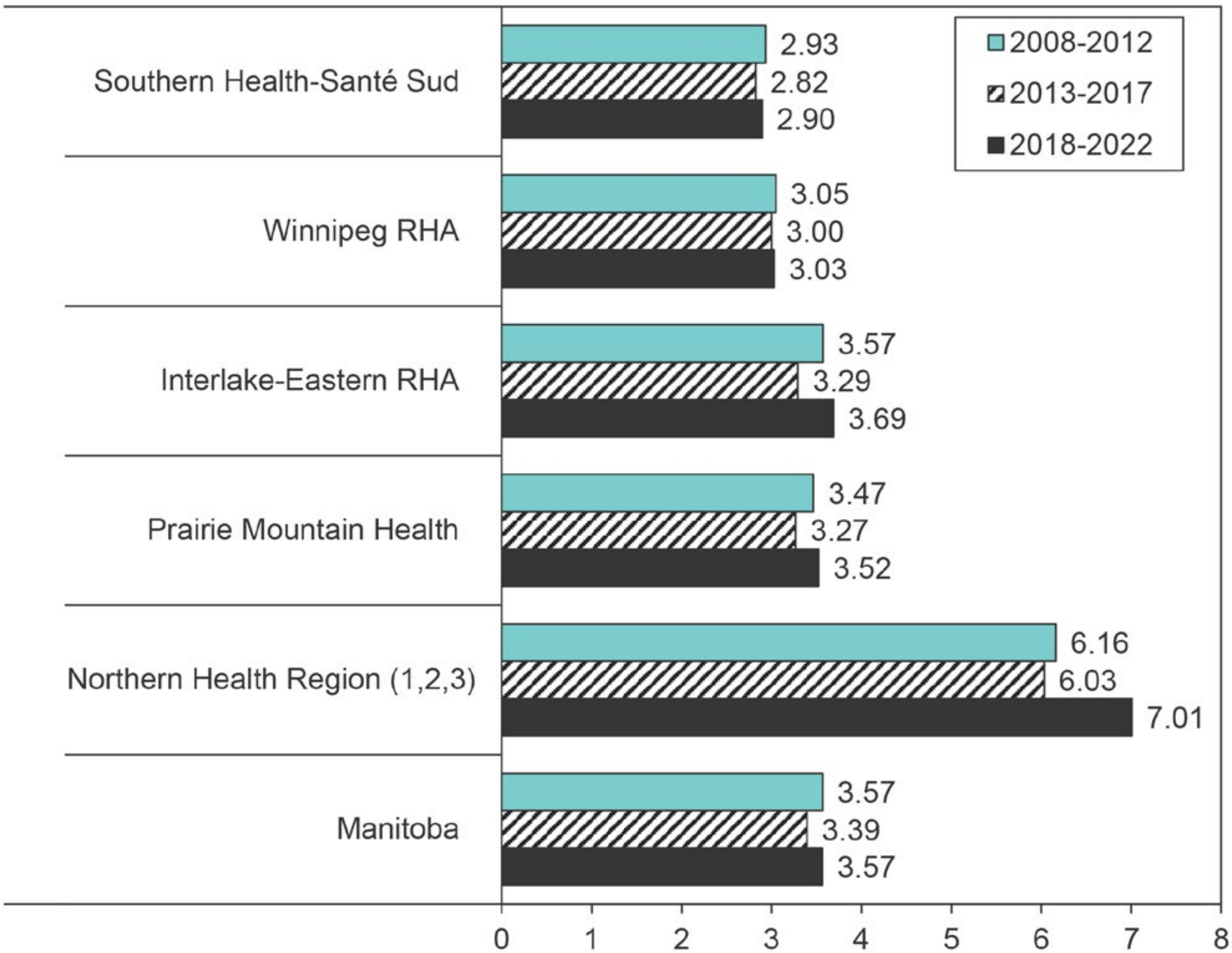
- In Manitoba, the average annual PMR decreased from 3.6 deaths per 1,000 residents aged 0-74 in TP1 to 3.4 in TP2 before returning to 3.6 in TP3. The differences between periods were not statistically significant. A similar pattern was also observed in each region.
- The Northern Health Region had the highest rates in all three periods, which were all significantly higher than the Manitoba rates in the corresponding periods.
- There were strong associations between income in rural and urban areas in all three periods (see online supplement). The rates were higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 3.10)

- PMR significantly decreased over time in Manitoba overall and in all regions except the Northern Health Region where it has increased (particularly between 2012 and 2021). The rates increased from 2019 to 2021 in all regions before returning to near 2019 levels by 2022.

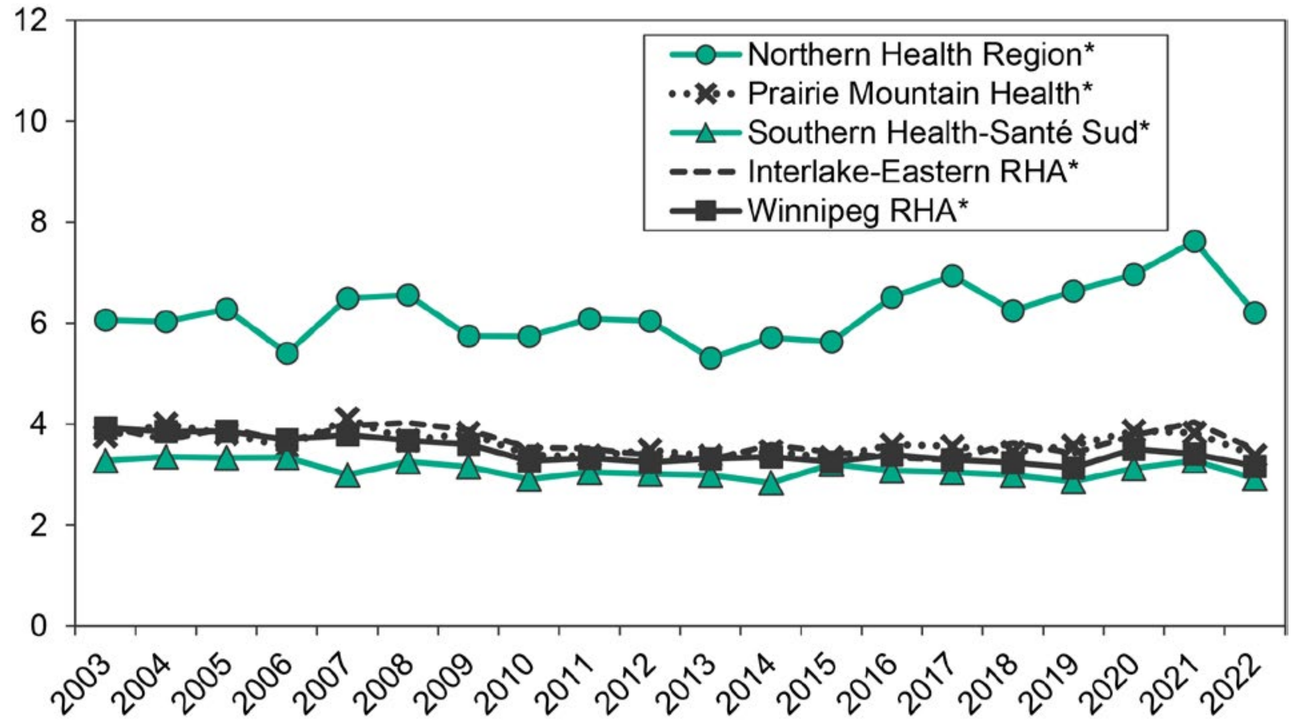
Figure 3.9: Premature Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022

Age- and sex-adjusted average annual rate of death before the age of 75 per 1,000 residents (age 0-74)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.10: Premature Mortality Rates by Health Region, 2003 to 2022
Age- and sex-adjusted rate of deaths before age 75 per 1,000 residents (age 0-74)



* statistically significant linear trend over time.

3.4 Causes of Premature Deaths

Definition: Cause of death among residents aged 0-74 years obtained from the Vital Statistics death records and grouped by ICD-10 chapter. The percent of deaths by ICD-10 chapter in Manitoba between 2018-2022 were calculated and the top ten highest were determined and used to set the order for each region

Note: ICD Codes in Chapter 18 (Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified) include the code R99 for ‘Other ill-defined and unspecified causes of mortality’, which appeared in very high frequency in 2017 and 2018. This may reflect a data error, and this code was treated as a missing cause of death and moved to the “All other causes” category. This chapter also includes the code R69 for ‘Unknown and unspecified causes of morbidity’, which only appeared in 2020. This code was also moved to the “All other causes” category.

Time period analysis: The average annual crude percentage of all premature deaths by cause were identified for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3). The number of premature deaths used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

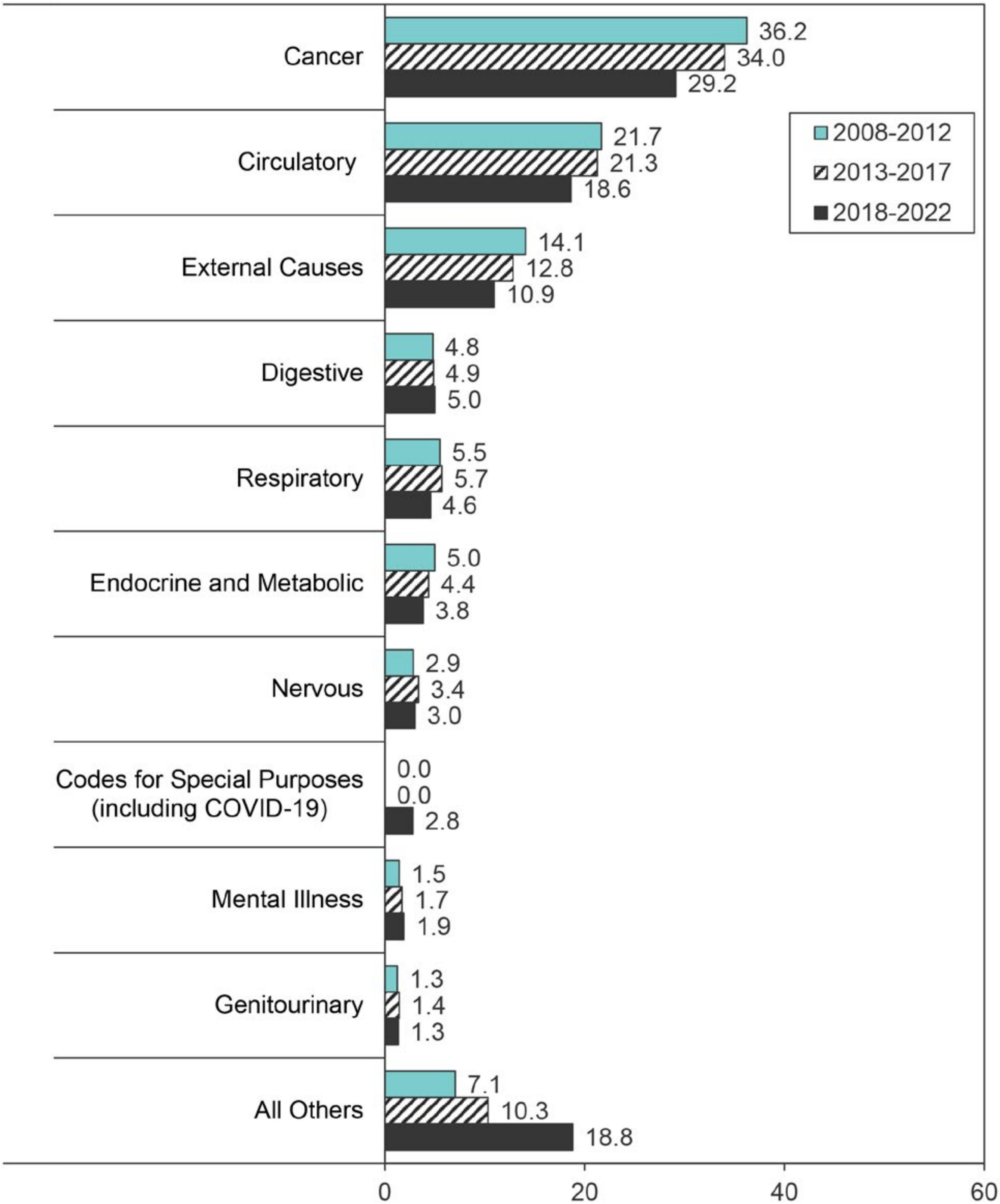
Key Findings

Time Period Analysis (Figures 3.11 – 3.16)

- From 2018-2022, the most common causes of premature death in Manitoba were cancer (29.2%) and circulatory disease (18.6%), followed by external causes (i.e., injury and poisoning) (10.9%), digestive conditions (5.0%), and respiratory disease (4.6%).
- As was seen with causes of total mortality, cancer and circulatory disease were responsible for nearly 50% of all premature deaths.
- The top three causes of premature death in Manitoba decreased over the three periods, as did endocrine and metabolic condition causes. The percentage of deaths for the remaining causes were relatively stable across the three periods, except for deaths in the Respiratory and Codes for Special Purposes categories. Respiratory deaths were stable between TP1 and TP2, then decreased between TP2 and TP3. However, COVID-19 deaths that may have otherwise been categorized as Respiratory in TP1 and TP2 appear in the Codes for Special Purposes category in TP3.
- The rankings varied somewhat by health region though cancer was the top cause in all regions except the Northern Health Region, where it was ranked second. External causes were the most common cause in the Northern Health Region but made up less of the premature deaths over the time periods.
- Prairie Mountain Health and Northern Health Region also had the highest percentage of premature deaths caused by endocrine and metabolic conditions, which includes diabetes.

Figure 3.11: Most Common Causes of Premature Death in Manitoba, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths before age 75 (age 0-74)

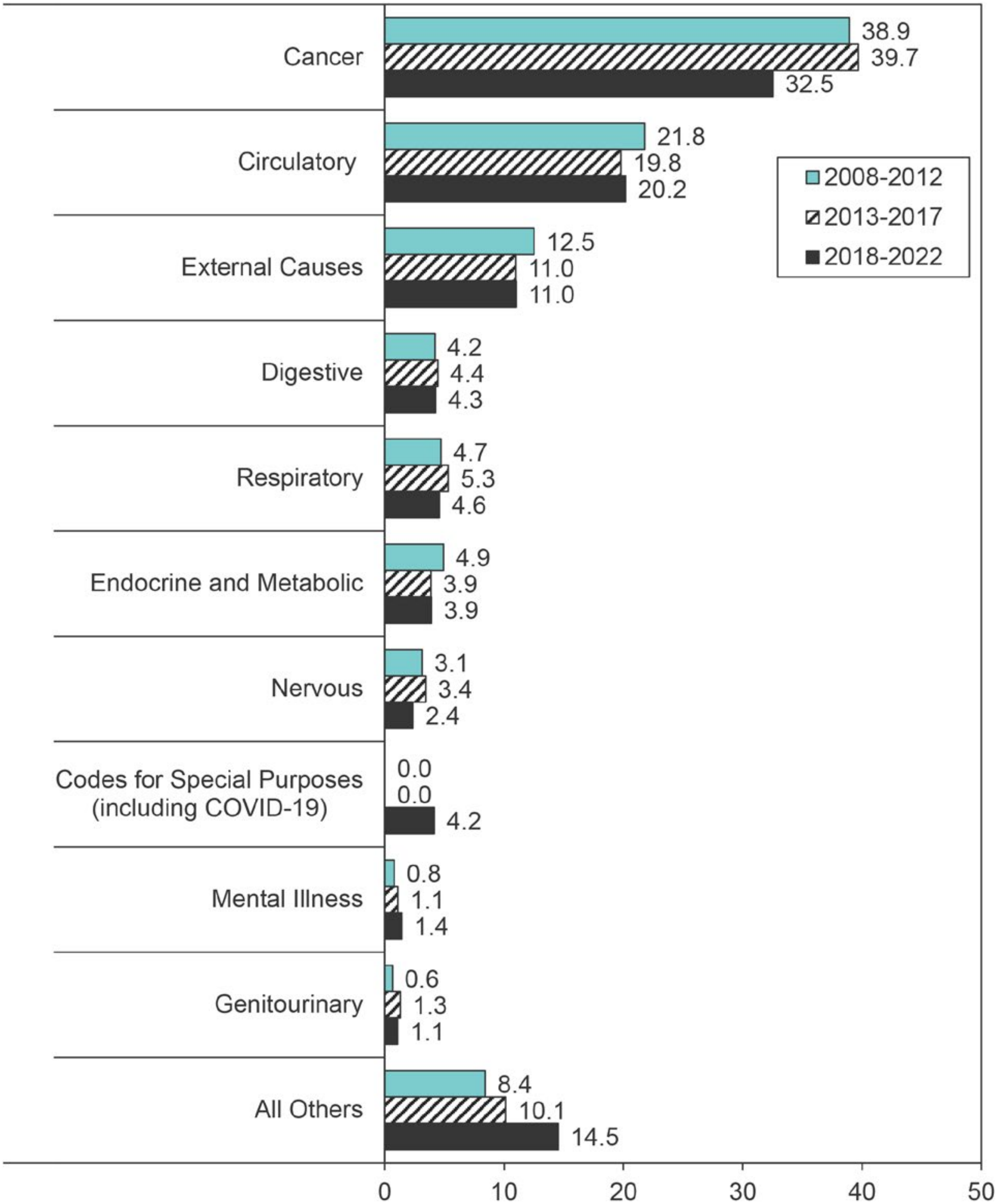


s data suppressed due to small numbers

* denominators: T1 = 18,599; T2 = 20,304; T3 = 23,478

Figure 3.12: Causes of Premature Death in Southern Health-Santé Sud, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths before age 75 (age 0-74)

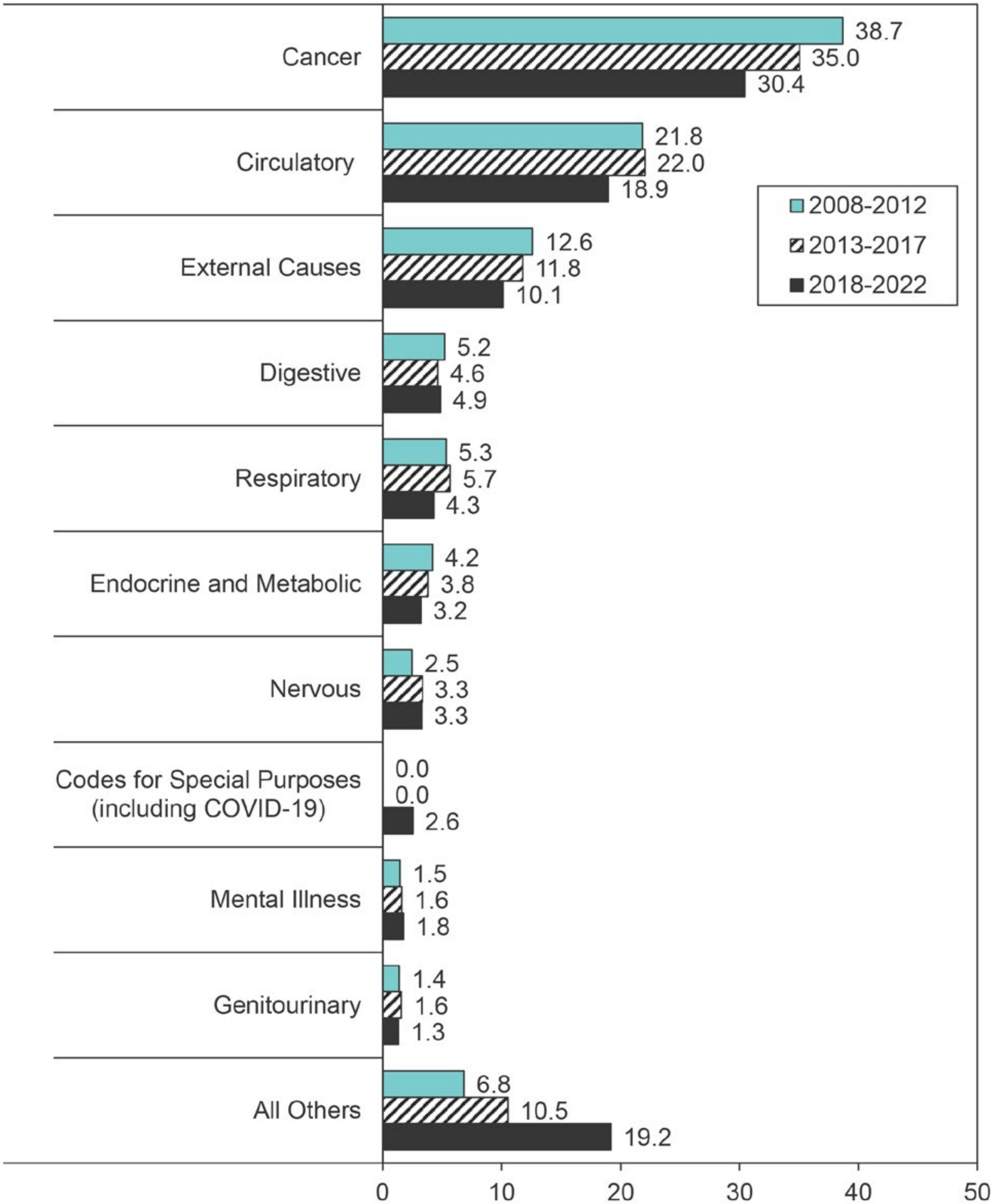


s data suppressed due to small numbers

* denominators: T1 = 2,040; T2 = 2,362; T3 = 2,670

Figure 3.13: Causes of Premature Death in the Winnipeg RHA, 2008-2012, 2013-2017, and 2018-2022

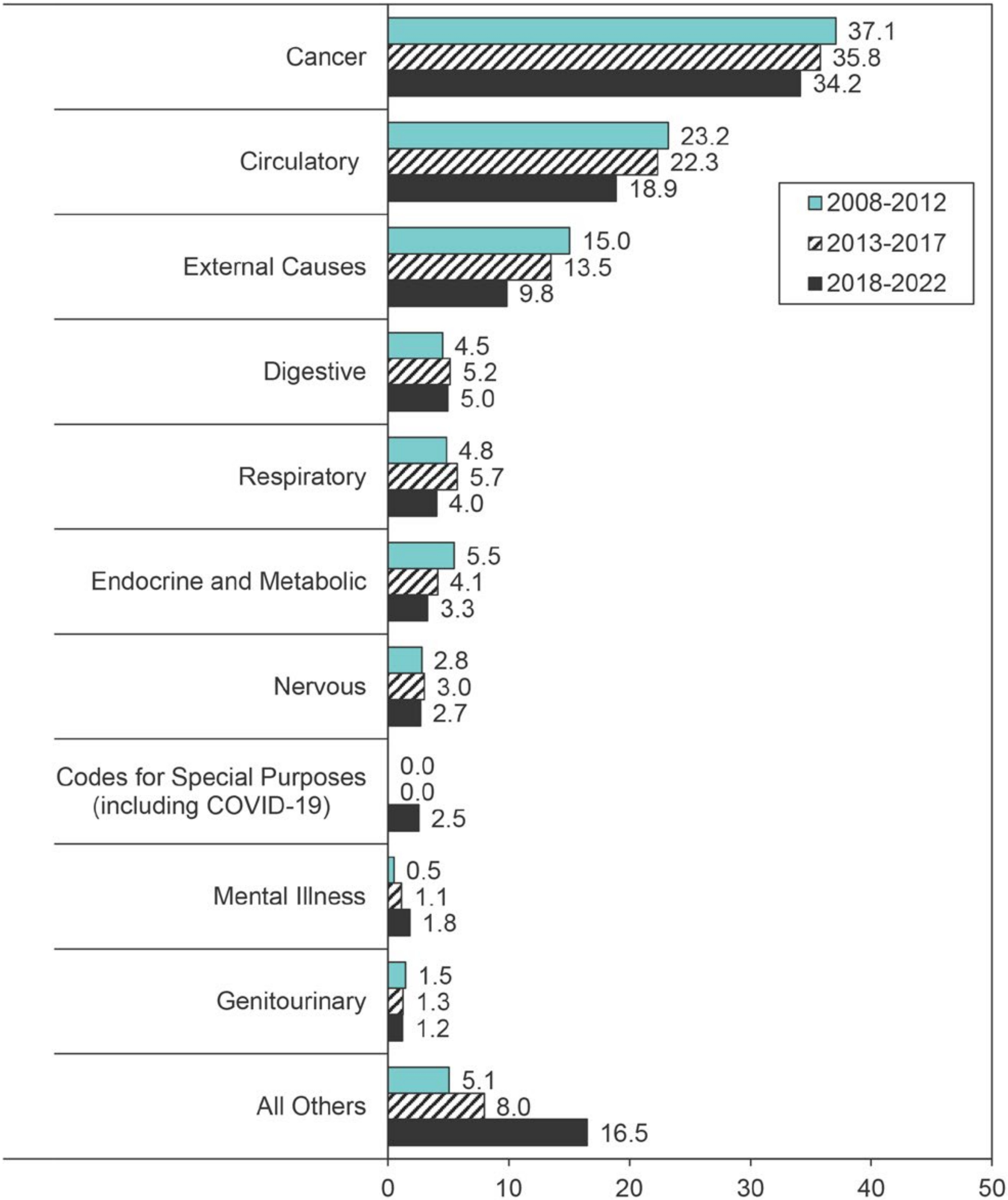
Average annual crude percent* of deaths before age 75 (age 0-74)



s data suppressed due to small numbers

* denominators: T1 = 9,853; T2 = 10,767; T3 = 12,250

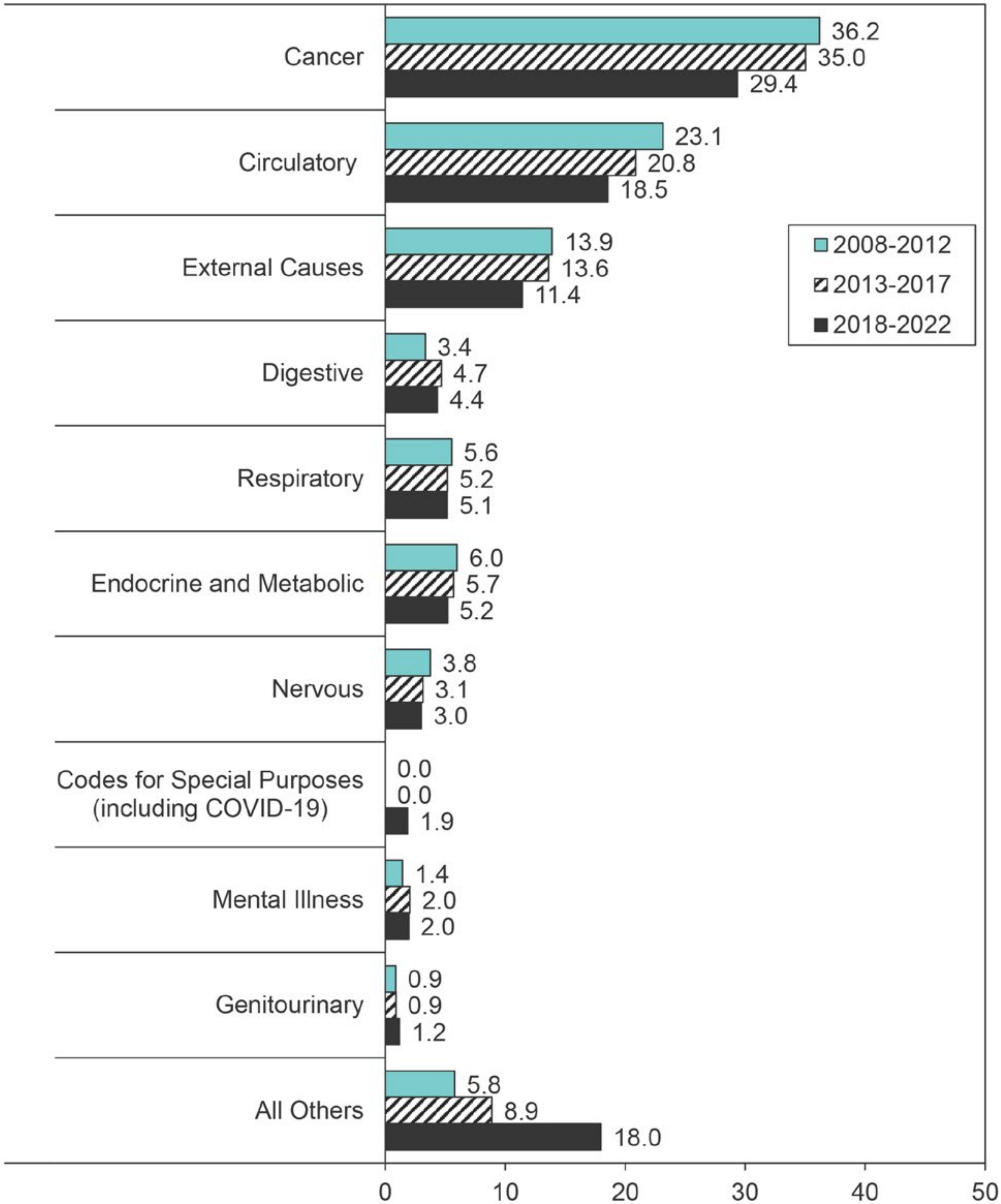
Figure 3.14: Causes of Premature Death in the Interlake-Eastern RHA, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths before age 75 (age 0-74)



s data suppressed due to small numbers
* denominators: T1 = 2,188; T2 = 2,284; T3 = 2,793

Figure 3.15: Causes of Premature Death in Prairie Mountain Health, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths before age 75 (age 0-74)

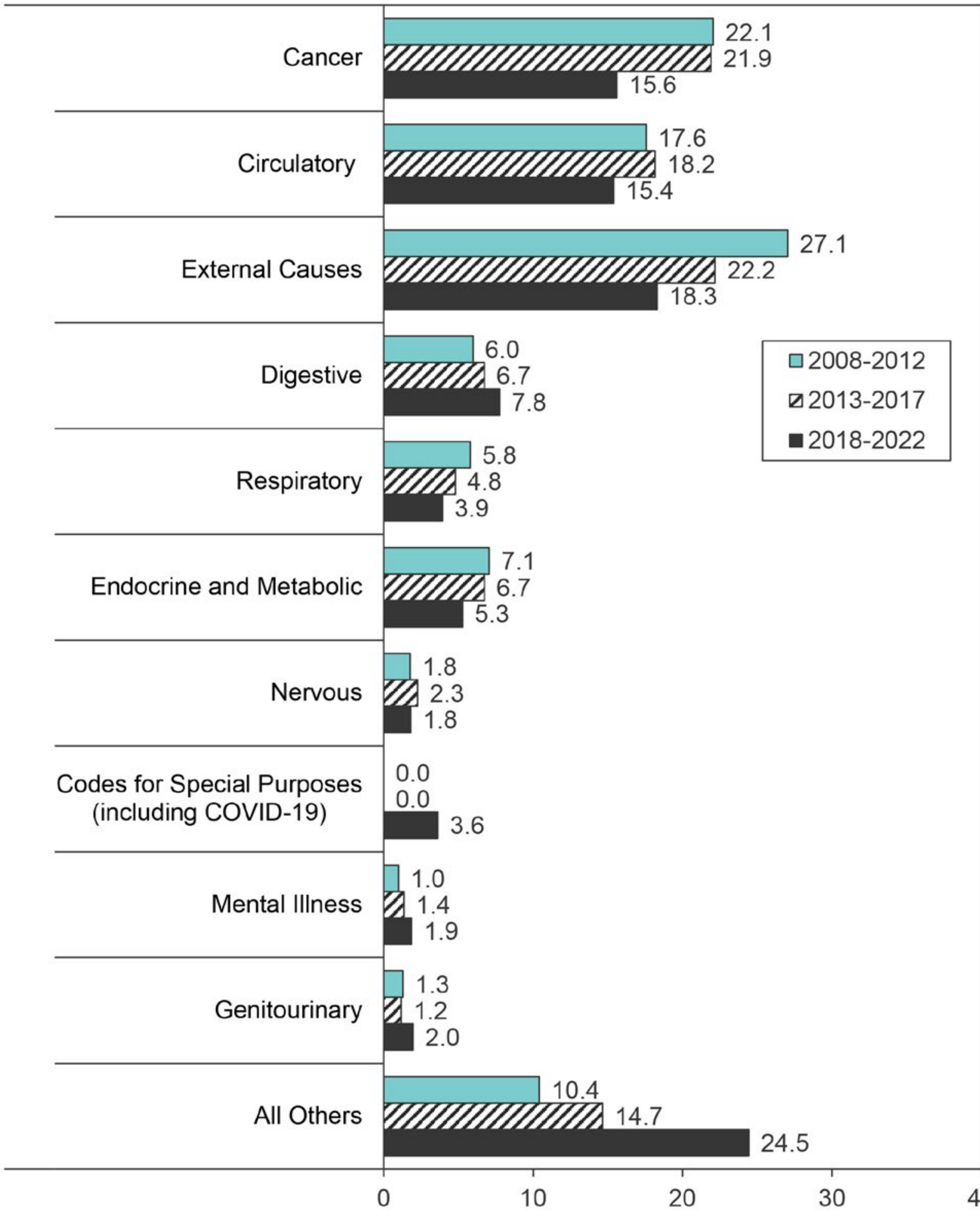


s data suppressed due to small numbers

* denominators: T1 = 2,558; T2 = 2,734; T3 = 3,069

Figure 3.16: Causes of Premature Death in the Northern Health Region, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths before age 75 (age 0-74)



s data suppressed due to small numbers

* denominators: T1 = 1,401; T2 = 1,542; T3 = 1,930

3.5 Male Life Expectancy (LE)

Definition: The expected length of life from birth for males based on the average annual mortality in the population. LE values are not age-adjusted but calculated directly from the mortality experience of local residents using a 'life table' approach. Small differences in LE values imply important differences in population health status.

Time period analysis: The male LE was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3).

Trend analysis: The male LE was calculated for each one-year period from 2003 to 2022.

Key Findings

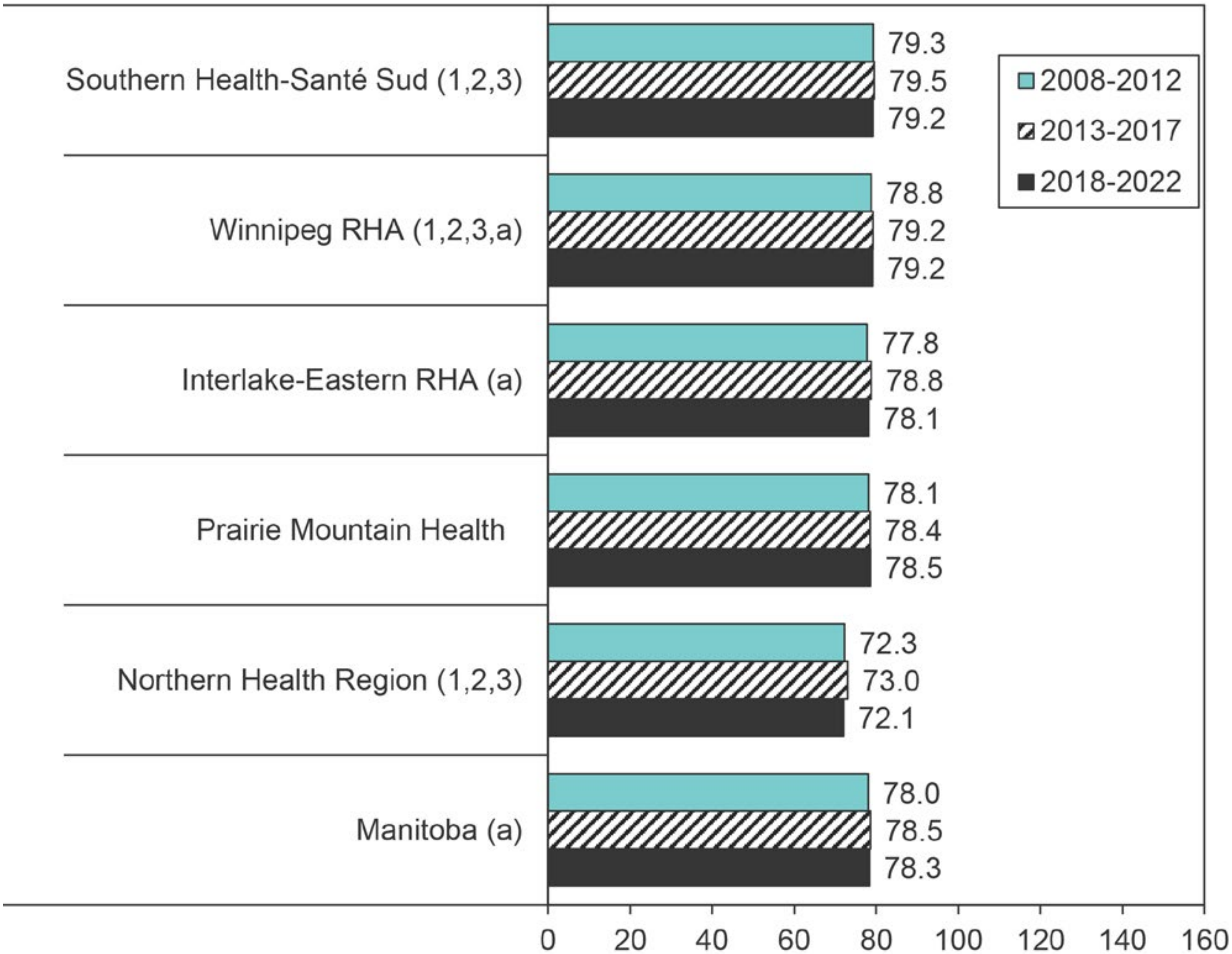
Time Period Analysis (Figure 3.17)

- In Manitoba, the male LE increased from 78.0 years in TP1 to 78.5 years in TP2 and then decreased to 78.3 years in TP3. Only the increase between TP1 and TP2 was statistically significant. Similarly, significant increases were seen in between TP1 and TP2 in the Winnipeg RHA and Interlake-Eastern RHA. No significant changes between periods were seen in any of the other regions.
- LE was highest in Southern Health-Santé Sud and the Winnipeg RHA for all three periods, which were significantly higher than LE's in Manitoba. Meanwhile, the Northern Health Region had significantly lower LE's than Manitoba in all three periods.
- There were strong associations between income and LE in rural and urban areas in both time periods (see online supplement). LE was higher among residents of higher income areas.

Trend Analysis (Figure 3.18)

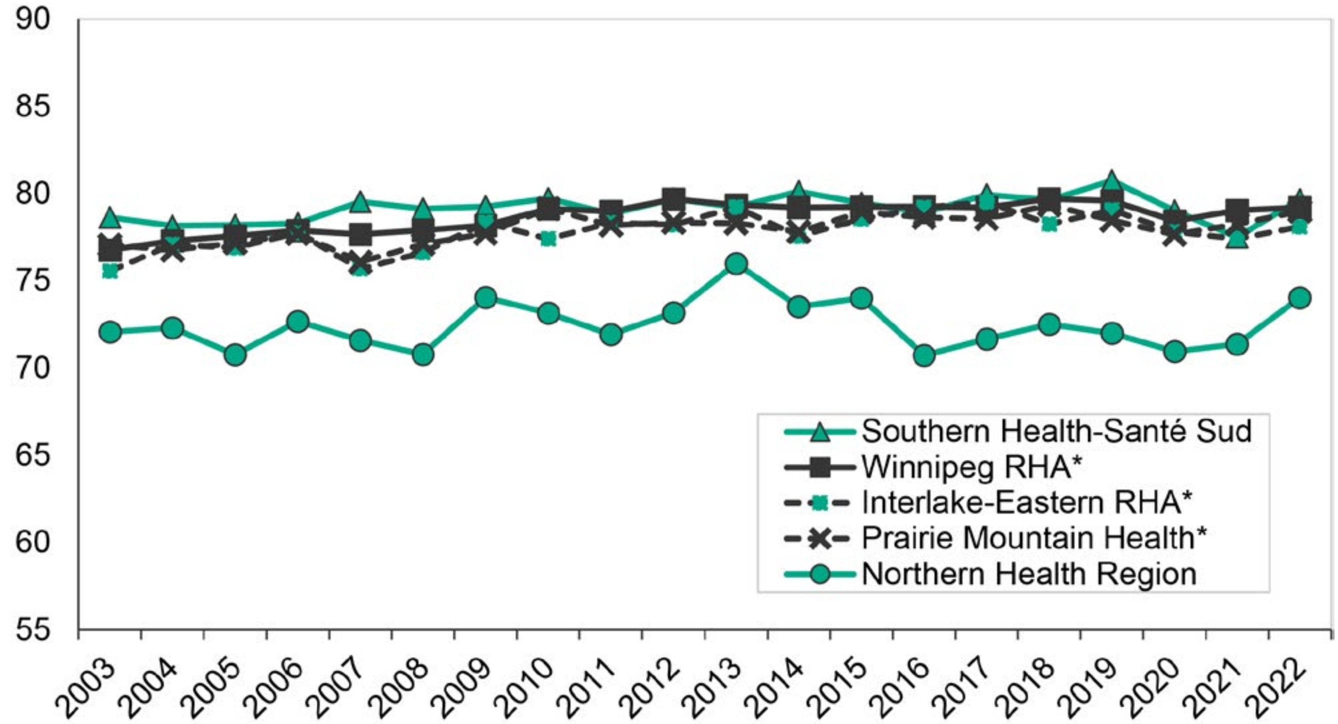
- There was a steady and significant increase in the LE for males in Manitoba overall and in all regions except the Southern Health-Santé Sud region and the Northern Health Region, where no linear trends were observed.

Figure 3.17: Male Life Expectancy at Birth by Health Region, 2008-2012, 2013-2017, and 2018-2022
Life expectancy at birth in years



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.18: Male Life Expectancy at Birth by Health Region, 2003 to 2022
Life expectancy at birth in years



* statistically significant linear trend over time

3.6 Female Life Expectancy (LE)

Definition: The expected length of life from birth for females based on the average annual mortality in the population. LE values are not age-adjusted but calculated directly from the mortality experience of local residents using a 'life table' approach. Small differences in LE values imply important differences in population health status.

Time period analysis: The female LE was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3).

Trend analysis: The female LE was calculated for each one-year period from 2003 to 2022.

Key Findings

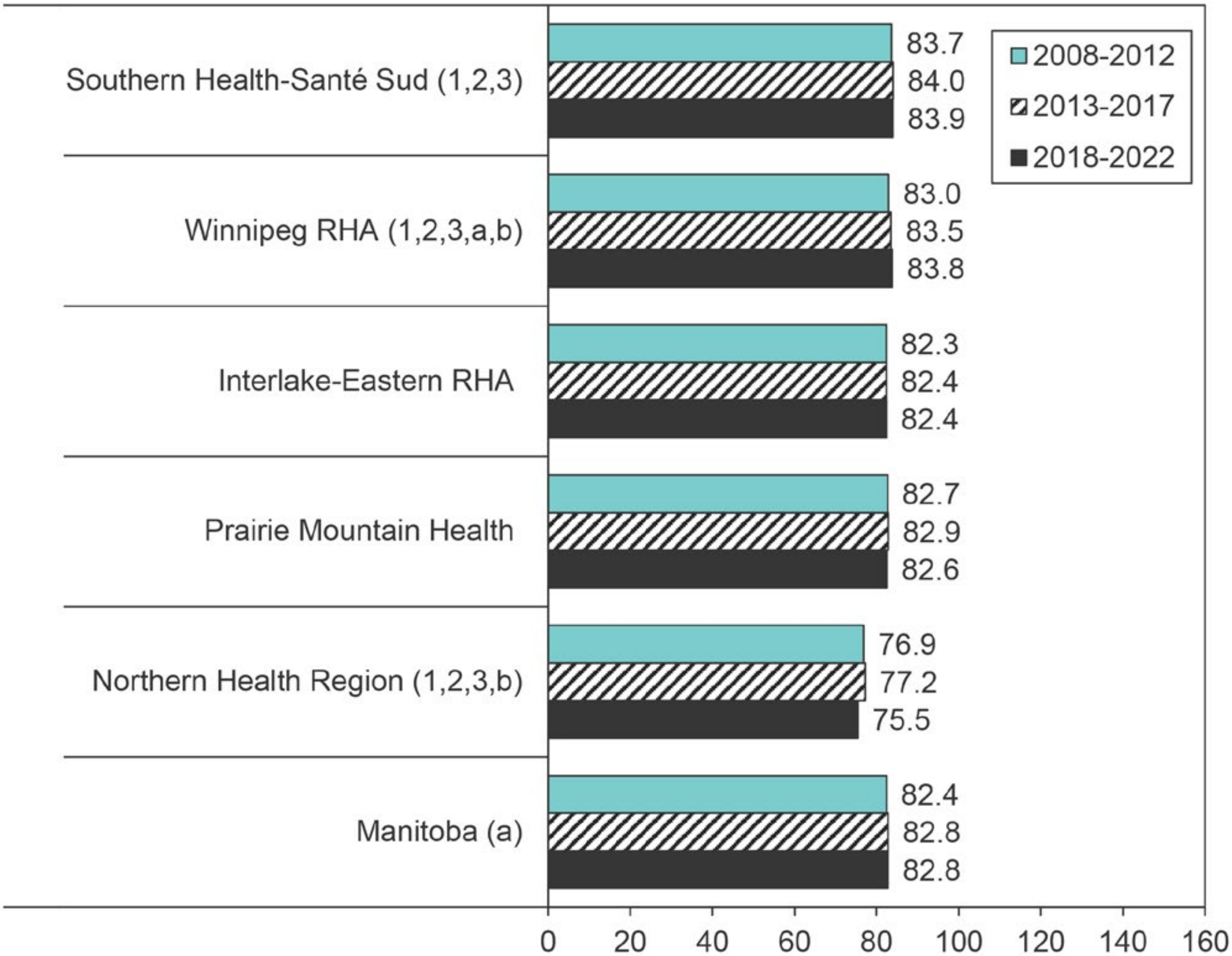
Time Period Analysis (Figure 3.19)

- In Manitoba, the female LE significantly increased from 82.4 years in TP1 to 82.8 years in TP2 and remained at that length for TP3. Significant increases were also seen between the each of the time periods in the Winnipeg RHA.
- LE was highest in the Southern Health-Santé Sud region for all three periods, which were significantly greater than those in Manitoba. The LE in the Winnipeg RHA were also significantly higher than those in Manitoba, while the Northern Health Region had significantly lower LE's than Manitoba in all three periods. Furthermore, the Northern Health Region had a significant decrease from 77.2 years in TP2 to 75.5 in TP3.
- There were associations between income and LE in rural and urban areas in all three periods, although the trend in urban areas in TP1 did not reach the level of significance (see online supplement).

Trend Analysis (Figure 3.20)

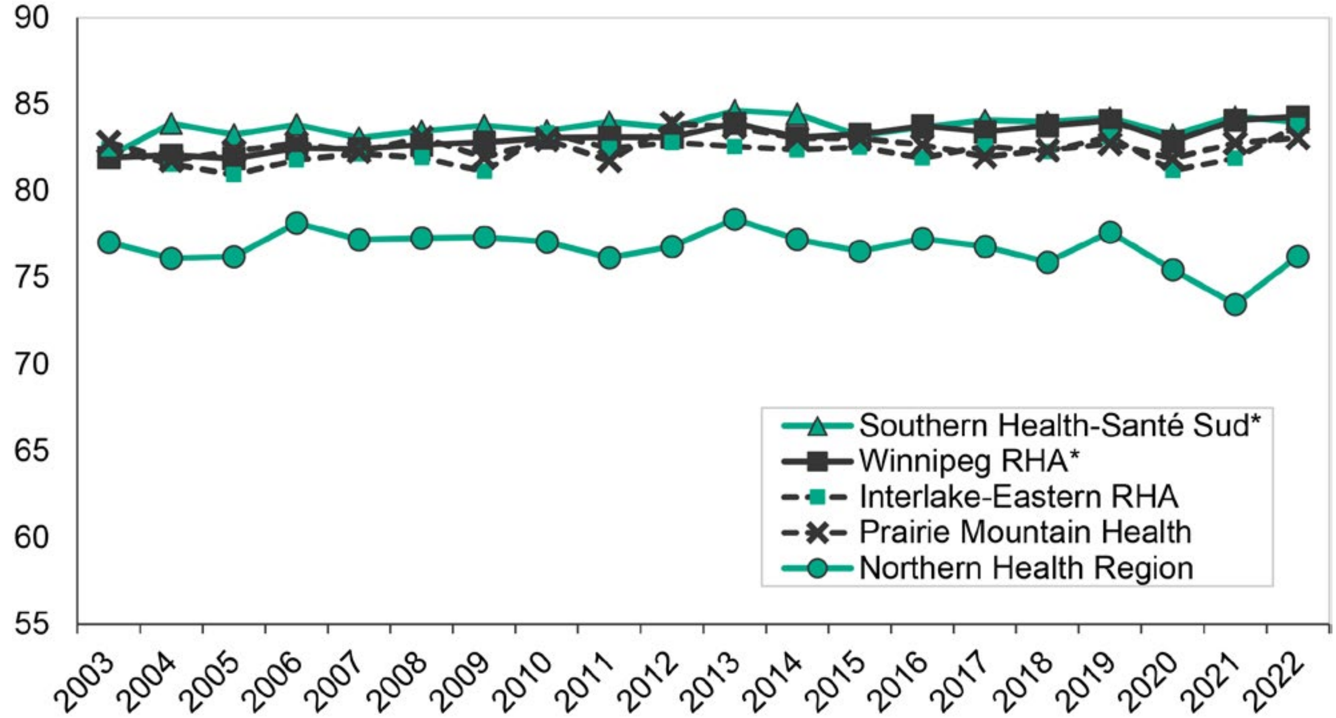
- There was a steady and significant increase in LE over time for females in Manitoba and in the Southern Health-Santé Sud and Winnipeg RHA, while no clear trend was detected in any of the other regions.

Figure 3.19: Female Life Expectancy at Birth by Health Region, 2008-2012, 2013-2017, and 2018-2022
Life expectancy at birth in years



1,2,3	statistically significant difference from the Manitoba average in the first, second or third time period
a	statistically significant difference between the first and second time period
b	statistically significant difference between the second and third time period
s	data suppressed due to small numbers

Figure 3.20: Female Life Expectancy at Birth by Health Region, 2003 to 2022
Life expectancy at birth in years



* statistically significant linear trend over time

3.7 Potential Years of Life Lost (PYLL)

Definition: The number of potential years of life lost per 1,000 residents aged 1-74. The PYLL value is calculated as the difference (in years) between 75 years of age and the age at death.

Time period analysis: The average annual PYLL rate was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population aged 1-74 in TP3.

Trend analysis: The PYLL rate was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population aged 1-74 in 2022.

Key Findings

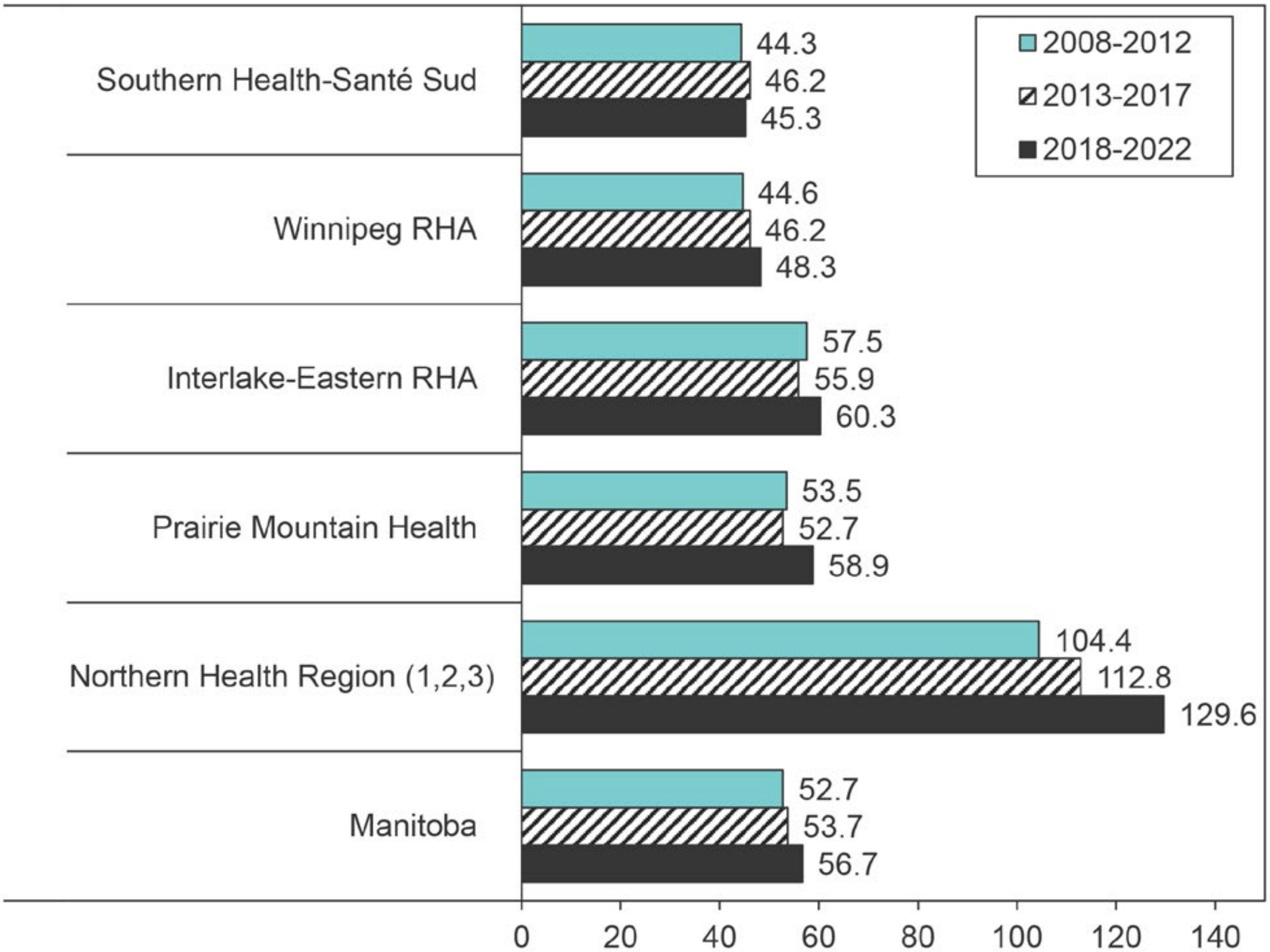
Time Period Analysis (Figure 3.21)

- The PYLL rate in Manitoba increased from 52.7 years per 1,000 residents aged 1-74 in TP1 to 53.7 in TP2 to 56.7 in TP3. These increases were not statistically significant. This pattern was also observed across the regions.
- Northern Health Region had the highest PYLL rates in all three periods, which were significantly higher than the Manitoba rates.
- There were strong associations between income and PYLL rates in rural and urban areas in all three periods (see online supplement). PYLL rates were higher among residents of lower income areas, however, the rate in rural areas was highest for those in the second income quintile 2

Trend Analysis (Figure 3.22)

- The PYLL rate remained stable over time in Manitoba overall and in each region, except for the Northern Health Region, which significantly increased.

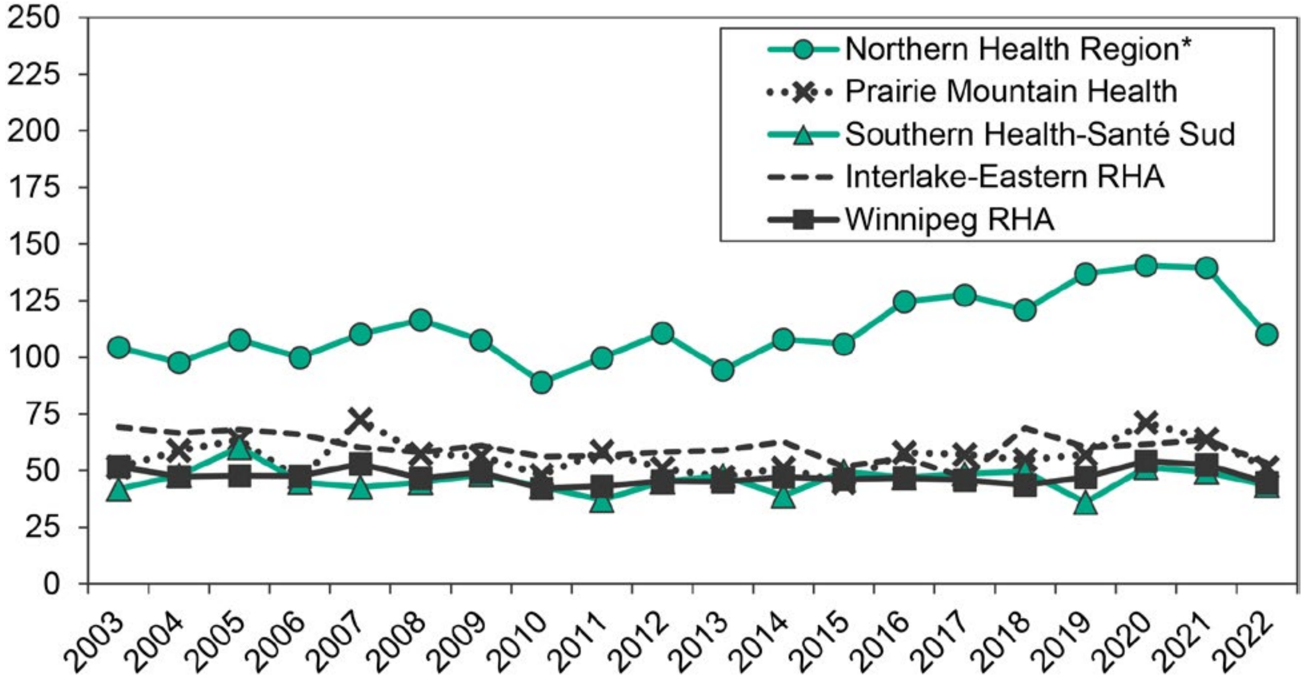
Figure 3.21: Potential Years of Life Lost by Health Region, 2008-2012, 2013-2017, and 2018-2022
Age- and sex-adjusted average annual potential years of life lost before the age of 75 per 1,000 residents (age 1-74)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.22: Potential Years of Life Lost by Health Region, 2003 to 2022

Age- and sex-adjusted average annual potential years of life lost before the age of 75 per 1,000 residents (age 1-74)



* statistically significant linear trend over time.

3.8 Injury Mortality Rate

Definition: The number of deaths caused by injuries per 10,000 residents. Injuries were defined as a death recorded in the Vital Statistics Mortality data with any of the following ICD-10-CA codes:

- V01-X59 Accidental deaths
- X60-X84 Suicide
- X85-Y09 Assault
- Y10-Y34 Event of undetermined intent
- Y35-Y36 Legal intervention/war
- Y85, Y86 Sequelae of external causes of morbidity and mortality
- Y87, Y89

Excluded are those related to medical error, or drug complications, or supplementary factors (not direct injury causes), as follows:

- Y40-Y84 Complications of medical and surgical care
- Y88 Sequelae with surgical and medical care as external cause
- Y90-Y98 Supplementary factors related to causes of morbidity and mortality classified elsewhere

Time period analysis: The average annual rate of deaths caused by injury was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The rate of deaths caused by injury was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 3.23)

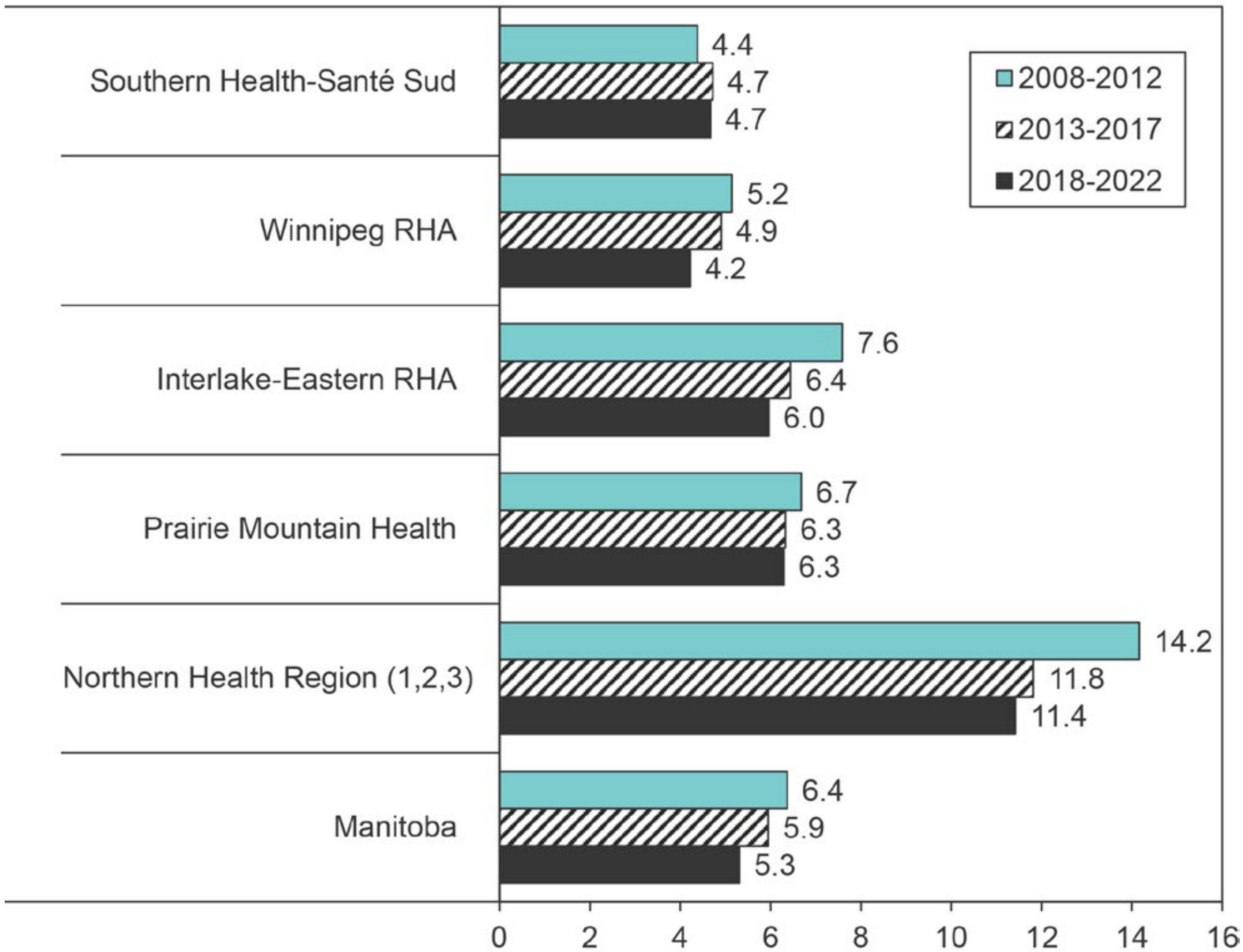
- In Manitoba, the average annual rate of deaths caused by injury decreased from 6.4 deaths per 10,000 residents in TP1 to 5.9 in TP2 to 5.3 in TP3, although none of the changes were significant. A similar pattern was observed in each of the regions with no significant differences occurring between periods.
- The highest rates were in the Northern Health Region in all three periods, which were significantly higher than the rates in Manitoba. The rates in the other regions were not significantly different from the Manitoba rates.
- The rate of injury deaths appears to be related to health status as it increases across the regions from the Southern Health-Santé Sud region to Northern Health Region.
- There were significant associations between income and injury death rates in urban and rural areas in all three periods (see online supplement). Rates were higher among residents from lower income areas.

Trend Analysis (Figure 3.24)

- There was a significant decrease in the injury death rates over time in Manitoba overall and in the Winnipeg RHA and Interlake-Eastern RHA, while no trend was observed in the other regions.

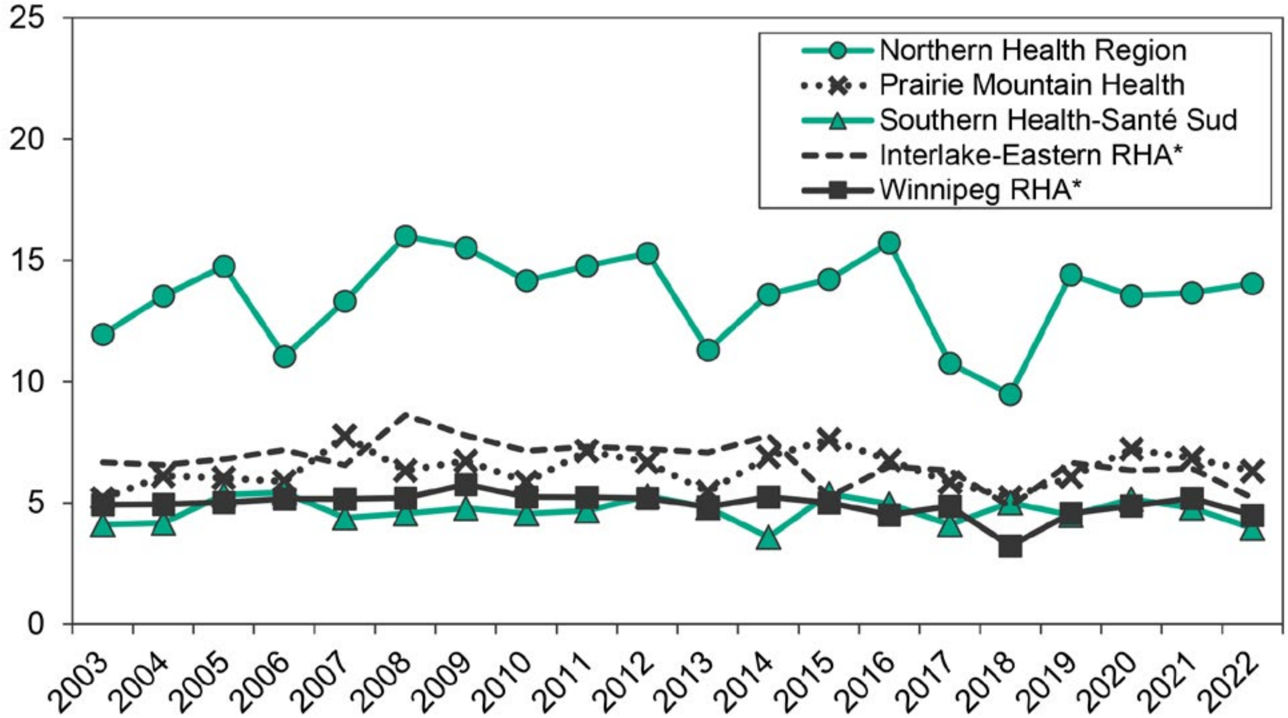
Figure 3.23: Injury Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022

Age- and sex-adjusted average annual rate of death per 10,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.24: Injury Mortality Rate by Health Region, 2003 to 2022
Age- and sex-adjusted rate of deaths per 10,000 residents (all ages)



* statistically significant linear trend over time.

3.9 Causes of Injury Deaths

Definition: Cause of injury death obtained from the Vital Statistics death records. The percent of deaths by ICD-10 chapter in Manitoba between 2018-2022 were calculated and the top ten highest were determined and used to set the order for each region

Time period analysis: The average annual crude percentage of all injury deaths by cause were identified for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3). The number of injury deaths used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

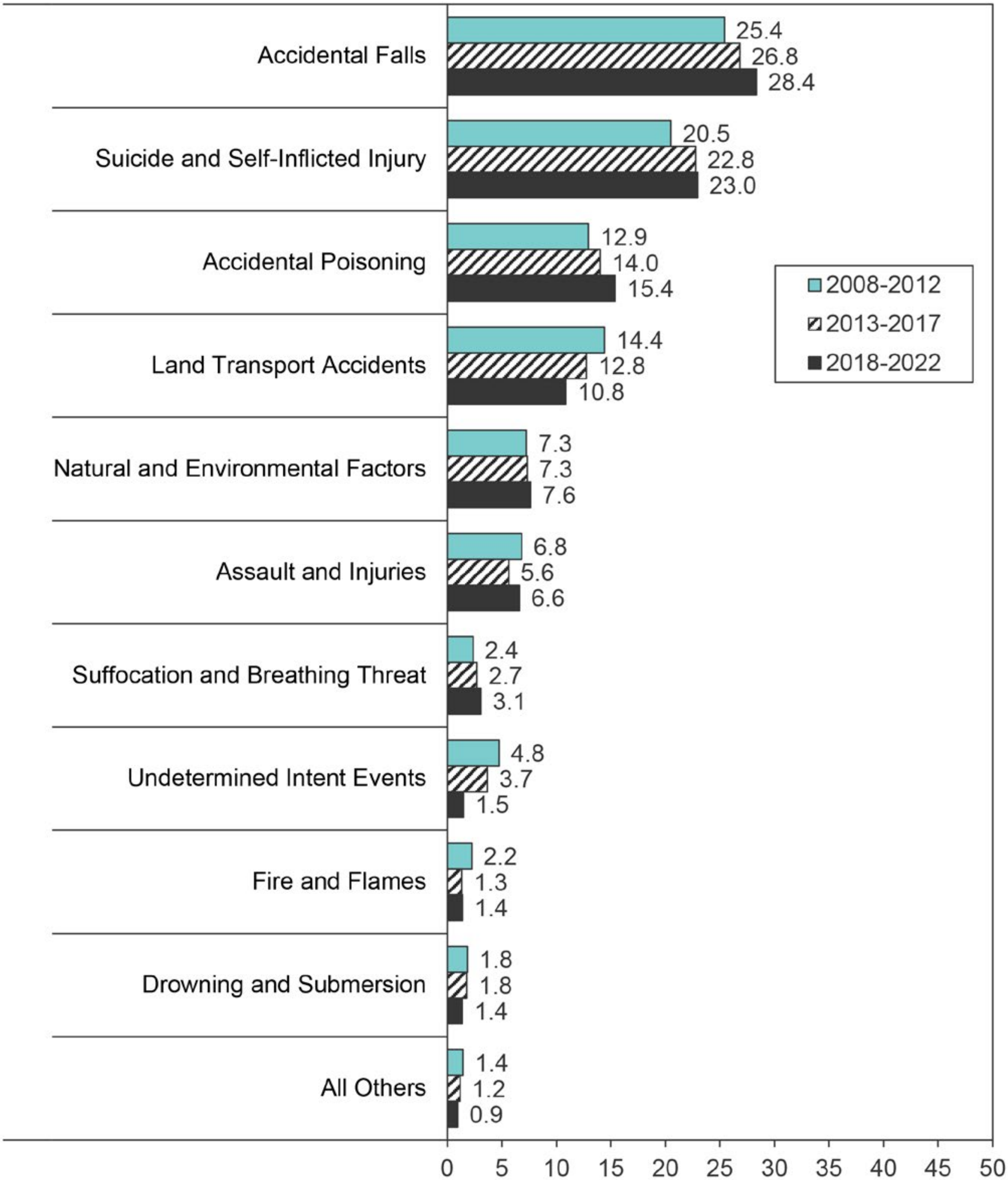
Key Findings

Time Period Analysis (Figures 3.25 – 3.30)

- From 2018-2022, the most common causes of injury death in Manitoba were accidental falls (28.4%) and suicide/self-inflicted injury (23.0%), followed by accidental poisonings (15.4%), land transport accidents (10.8%), natural and environmental factors (7.6%), and assault (6.6%).
- Accidental falls and suicide were responsible for over 50% of all injury deaths, and both have increased over the three periods. Accidental poisonings also increased across each period, while land transport accidents and undetermined intent events decreased. The remaining causes and all other causes category were stable over time.
- The rankings varied by health region though accidental falls were the top cause in all regions except the Northern Health Region. Suicide/self-inflicted injury deaths were the most common followed by accidental poisonings and assault in the Northern Health Region. In Southern Health-Santé Sud, Interlake-Eastern RHA, and Prairie Mountain Health, land transport accidents were more common than accidental poisonings.

Figure 3.25: Most Common Causes of Injury Mortality in Manitoba, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths (all ages)

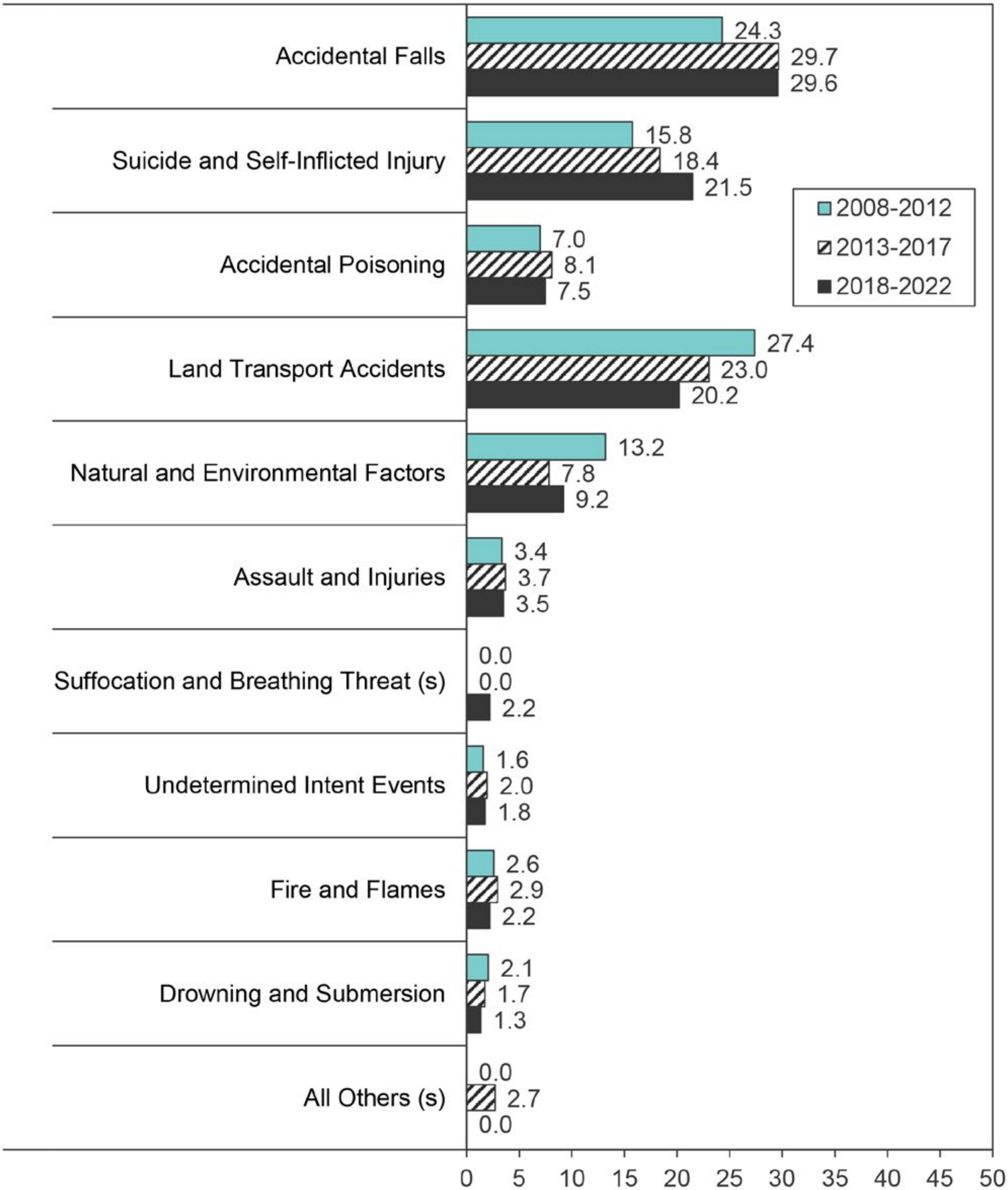


s data suppressed due to small numbers

* denominators: T1 = 3,736; T2 = 3,724; T3 = 3,716

Figure 3.26: Causes of Injury Mortality in Southern Health-Santé Sud, 2008-2012, 2013-2017, and 2018-2022

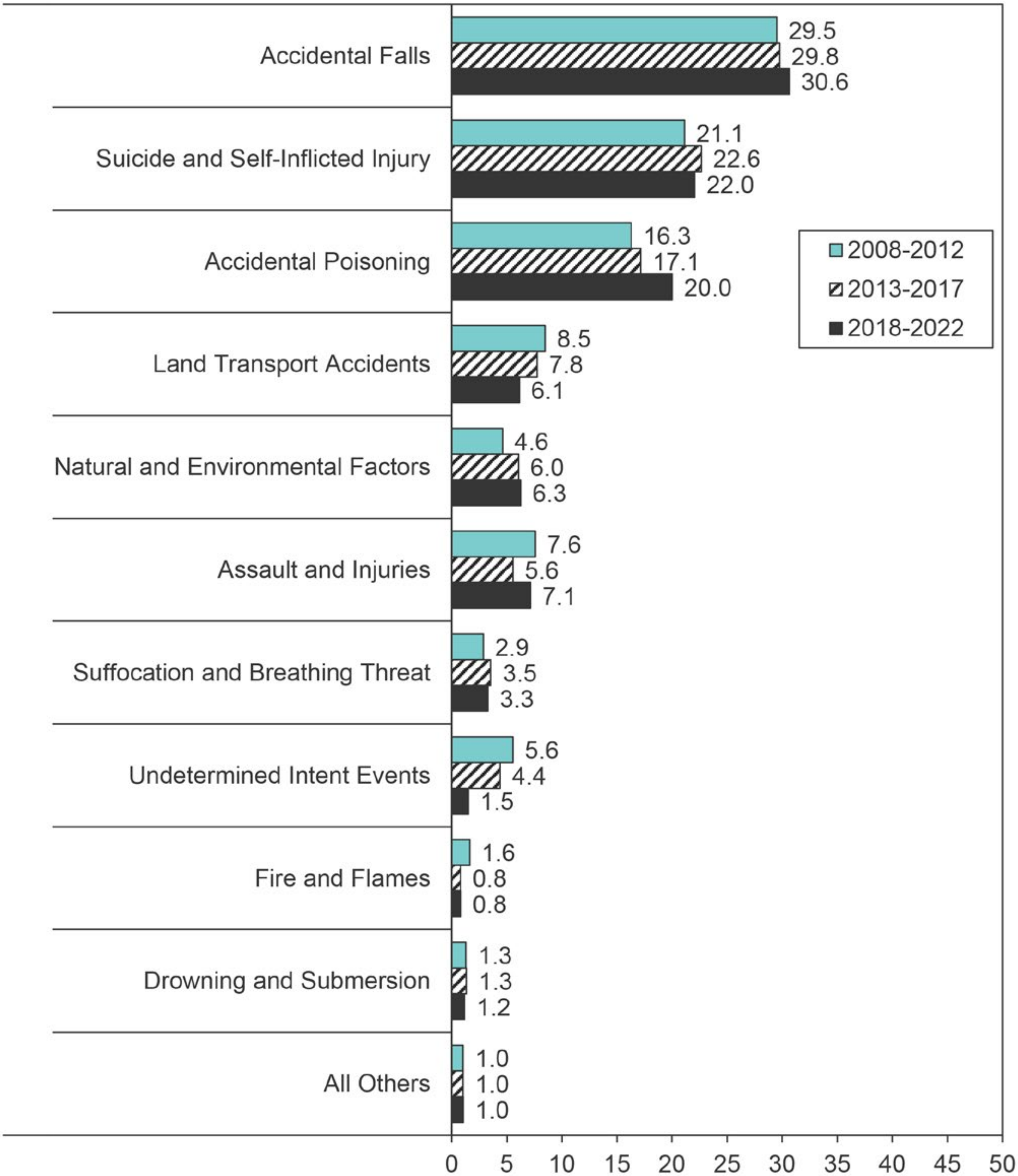
Average annual crude percent* of deaths (all ages)



s data suppressed due to small numbers

* denominators: T1 = 383; T2 = 408; T3 = 451

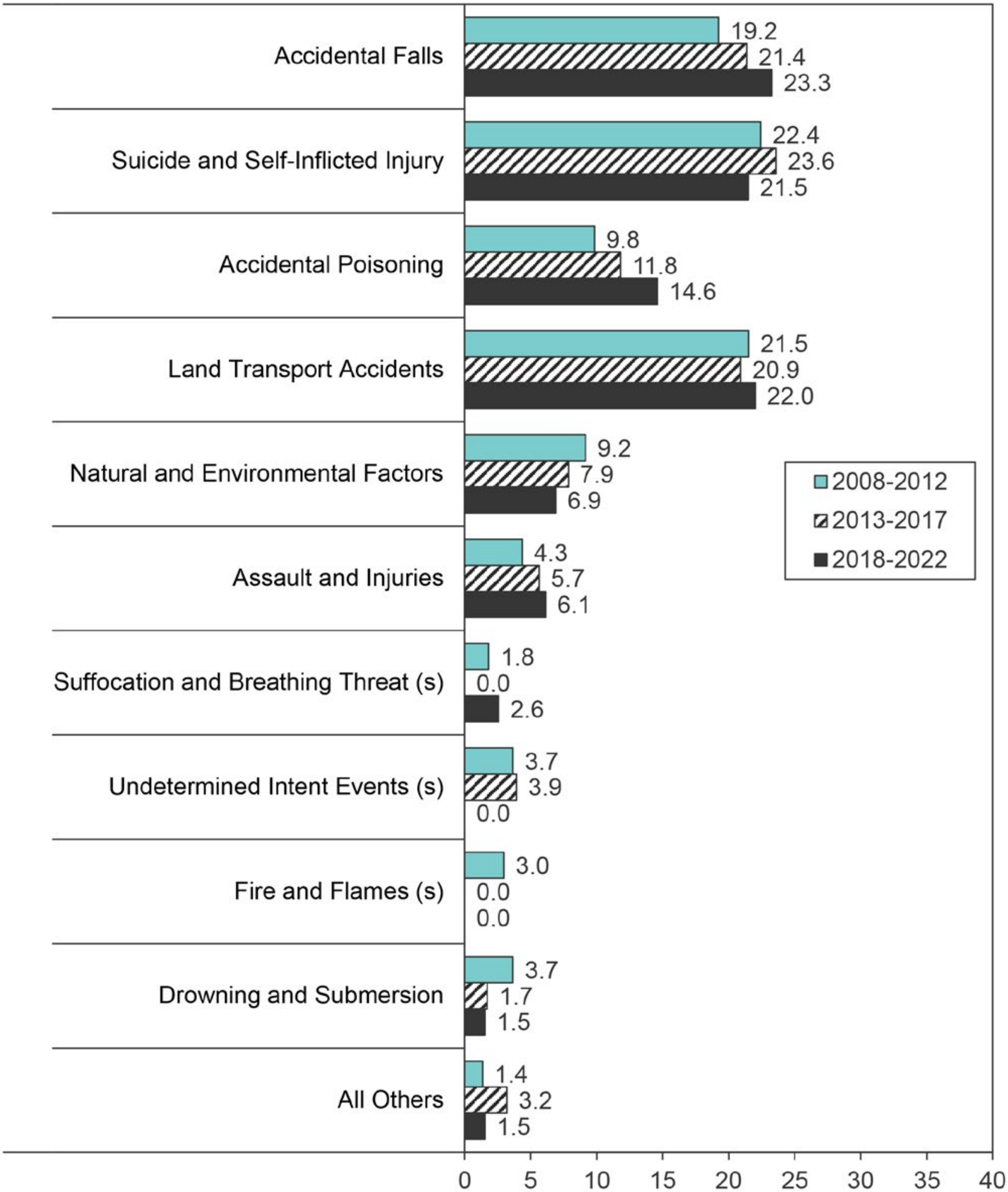
Figure 3.27: Causes of Injury Mortality in the Winnipeg RHA, 2008-2012, 2013-2017, and 2018-2022
Average annual crude percent* of deaths (all ages)



s data suppressed due to small numbers
* denominators: T1 = 1,854; T2 = 1,868; T3 = 1,824

Figure 3.28: Causes of Injury Mortality in the Interlake-Eastern RHA, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths (all ages)

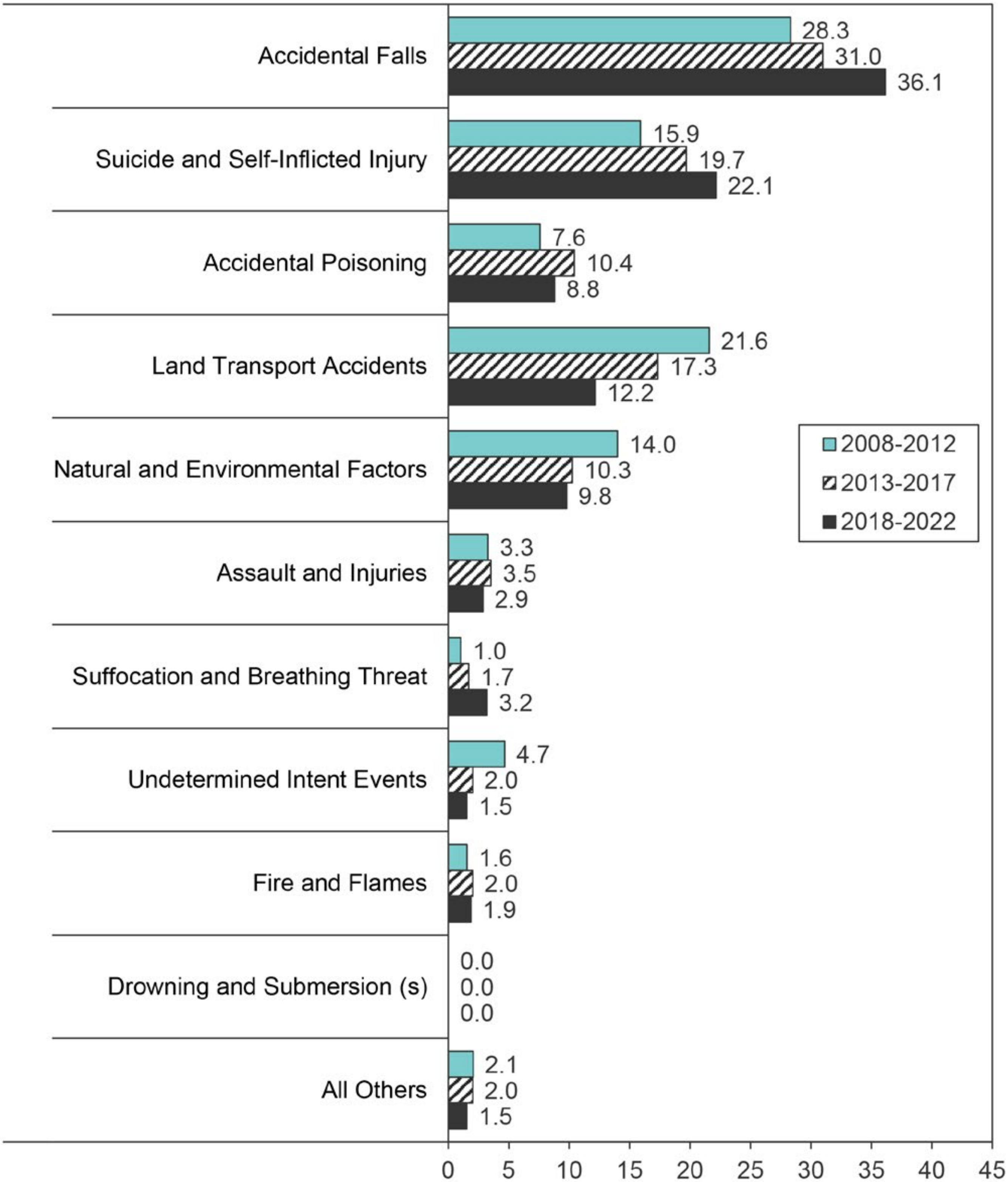


s data suppressed due to small numbers

* denominators: T1 = 437; T2 = 407; T3 = 391

Figure 3.29: Causes of Injury Mortality in Prairie Mountain Health, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths (all ages)

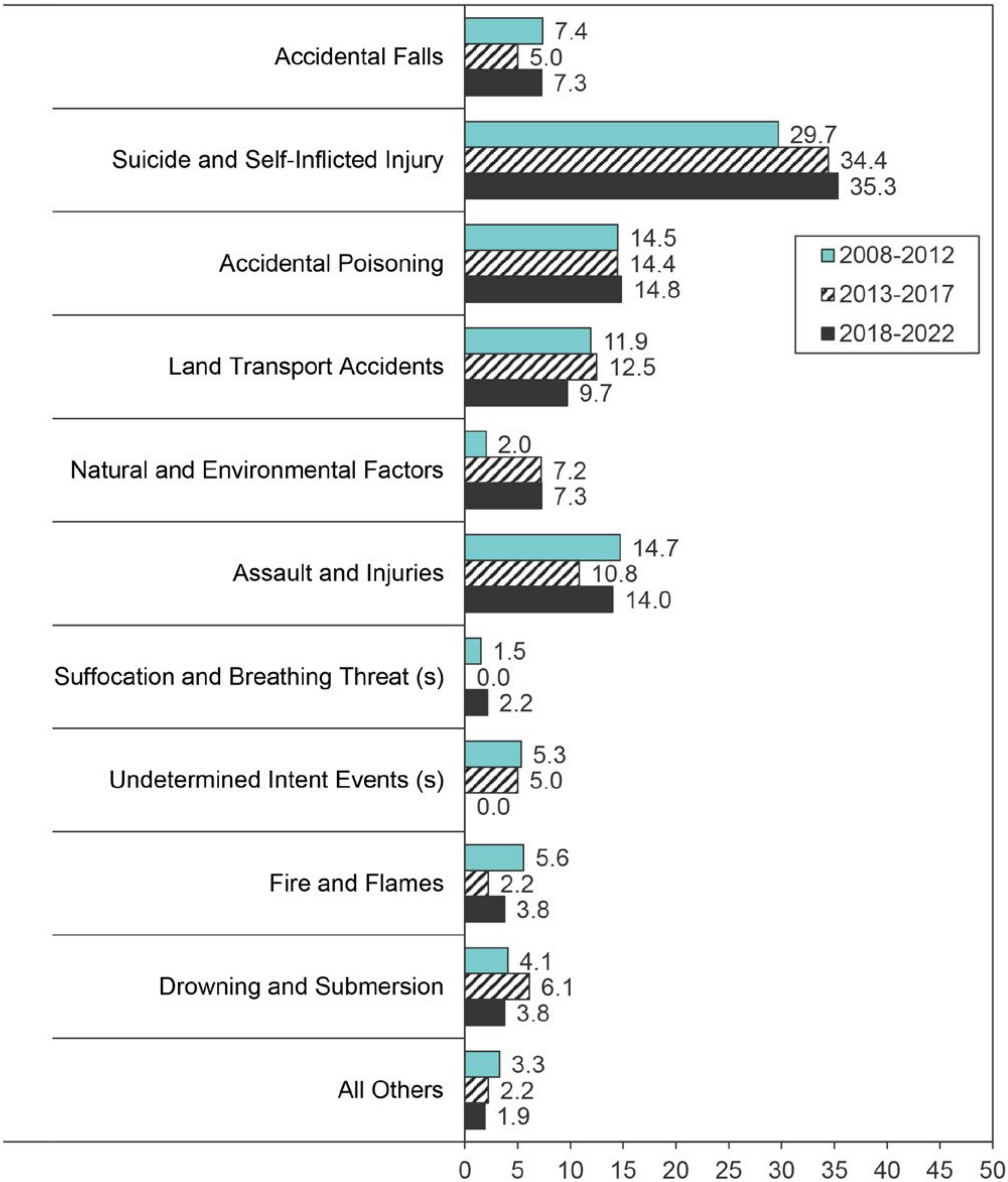


s data suppressed due to small numbers

* denominators: T1 = 579; T2 = 594; T3 = 592

Figure 3.30: Causes of Injury Mortality in the Northern Health Region, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of deaths (all ages)



s data suppressed due to small numbers

* denominators: T1 = 394; T2 = 360; T3 = 371

3.10 Suicide Rate

Definition: The number of deaths due to suicide per 10,000 residents aged 10 years and older. Suicide was defined as a death recorded in Vital Statistics Mortality data with any of the following ICD-10-CA codes:

- X60-X84 Intentional self-harm
- Y87.0 Late effects of intentional self-harm
- Y10-Y19 Poisoning of undetermined intent
- Y20-Y34 Other events of undetermined intent
- Y87.2 Late effects of other events of undetermined intent

A relatively ‘inclusive’ definition was used in an attempt to overcome suspected undercounting of suicides in administrative data; however, deaths due to accidental poisoning were excluded.

Time period analysis: The average annual suicide rate was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population 10 years or older in TP3.

Trend analysis: The suicide rate was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population 10 years or older in 2022.

Key Findings

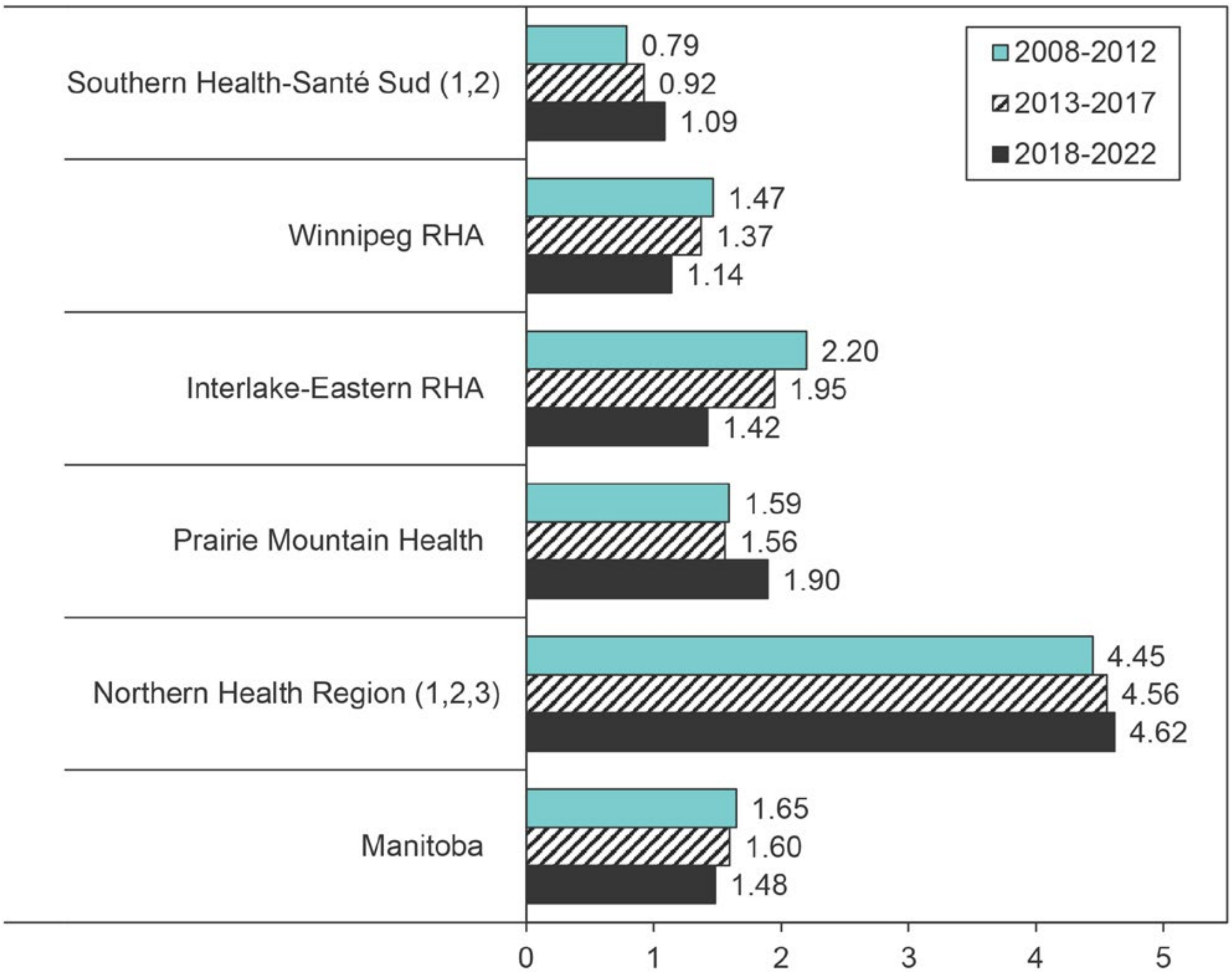
Time Period Analysis (Figure 3.31)

- In Manitoba, the average annual suicide rate remained the same across all three periods at approximately 1.6 suicides per 10,000 residents aged 10 years or older. The number of deaths due to suicide has remained relatively stable across the three periods with 941 occurring in TP1, 982 in TP2, and 908 in TP3 (online supplement).
- The rates were not significantly different between any of the periods in any of the regions either.
- Suicide rates in the Southern Health-Santé Sud region were significantly lower than the rates in Manitoba in TP1 and TP2, while the rates in the Northern Health Region were significantly higher than the Manitoba rates in each time period.
- The rate of suicides appears to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between income and suicide rates in urban and rural areas in all three periods (see online supplement). Rates were higher among residents of lower income areas.

Trend Analysis (Figure 3.32)

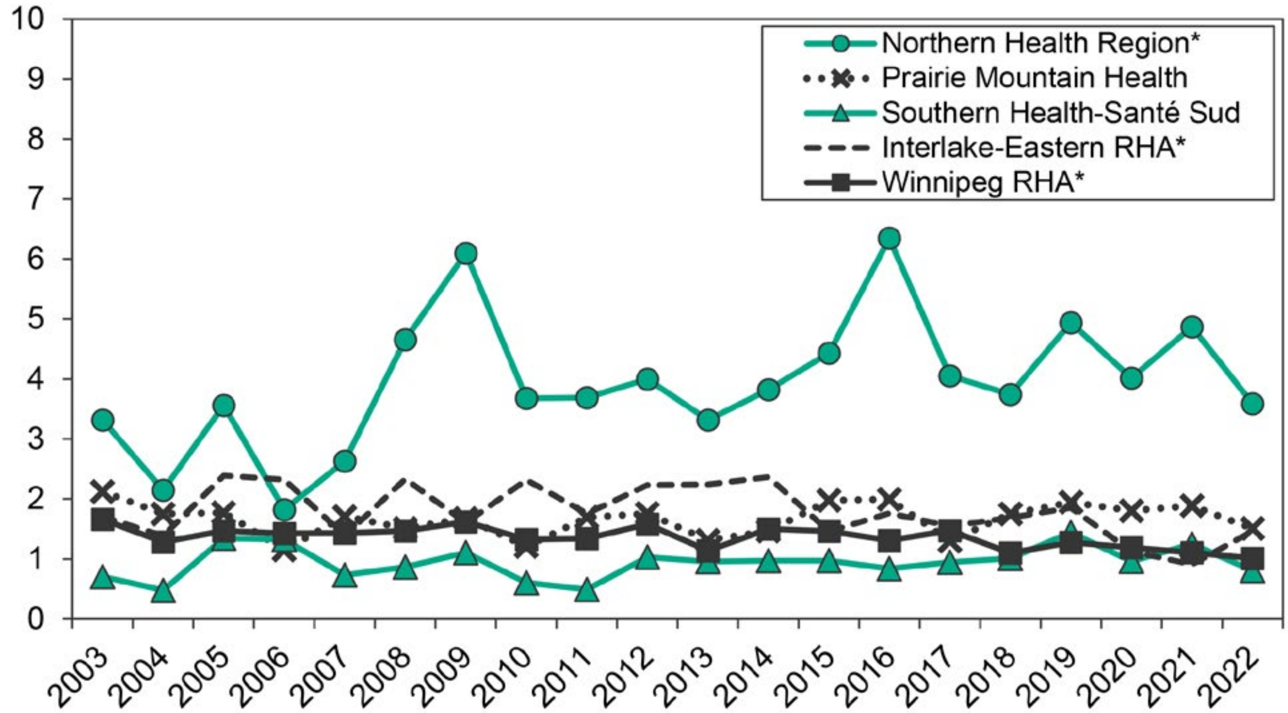
- Suicide rates did not change over time in Manitoba overall and significantly decreased in the Winnipeg RHA and Interlake-Eastern RHA. However, they significantly increased over time in the Northern Health Region.

Figure 3.31: Suicide Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022
Age- and sex-adjusted average annual rate of death per 10,000 residents (age 10+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.32: Suicide Rate by Health Region, 2003 to 2022
Age- and sex-adjusted rate of deaths per 10,000 residents (age 10+)



* statistically significant linear trend over time.

3.11 Unintentional Injury Mortality Rate

Definition: The number of deaths caused by unintentional injuries per 10,000 residents. Unintentional injuries were defined as a death recorded in the Vital Statistics Mortality data with any of the following ICD-10-CA codes in the chapter 'External Causes of Morbidity and Mortality':

- V01-Y98 excluding any overlap with ICD-10-CA codes related to suicide listed in section 3.10.

Time period analysis: The average annual rate of deaths caused by unintentional injury was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The rate of deaths caused by unintentional injury was calculated for one-year periods from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

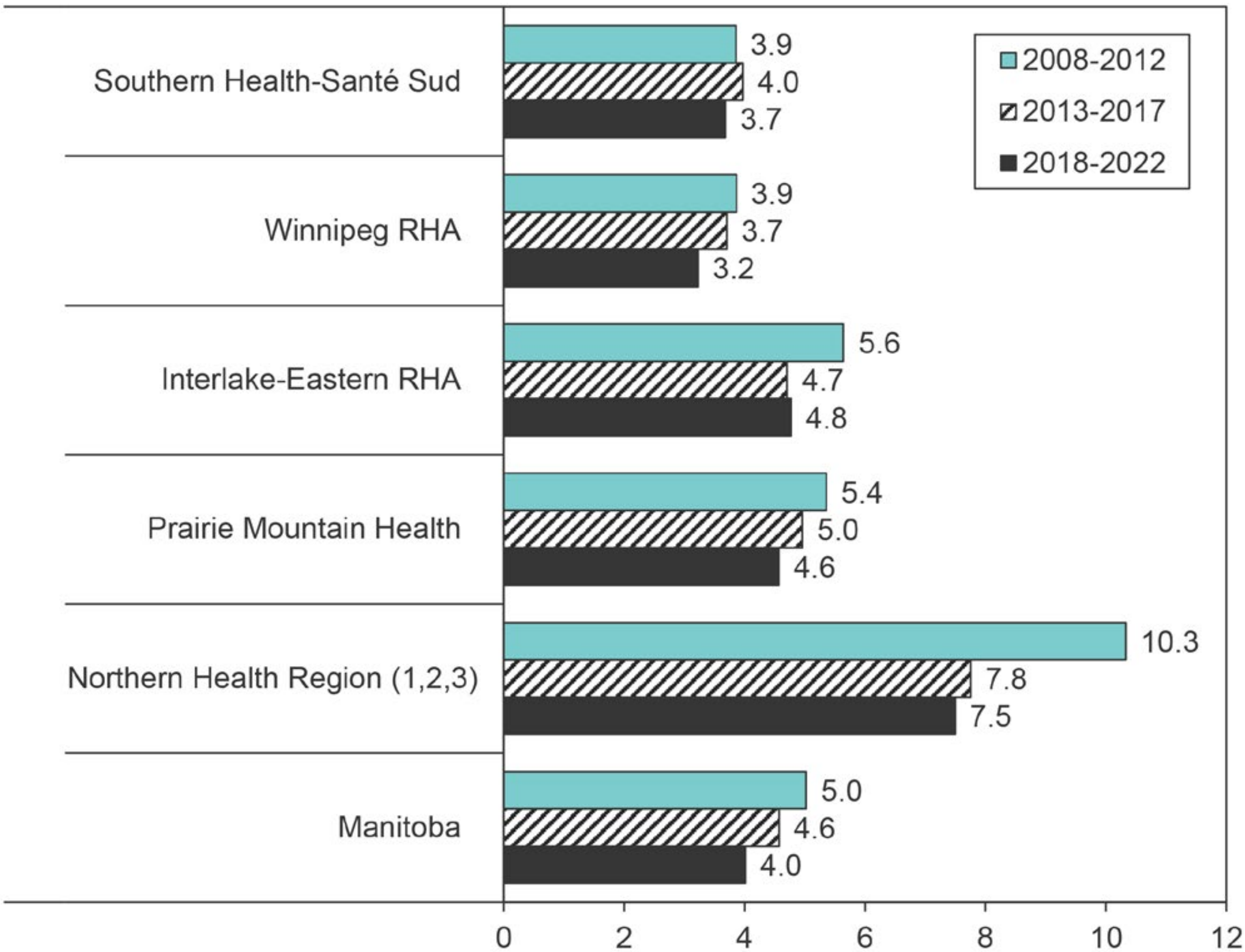
Time Period Analysis (Figure 3.33)

- In Manitoba, the average annual rate of deaths caused by unintentional injury decreased from 5.0 deaths per 10,000 residents in TP1 to 4.6 in TP2 to 4.0 in TP3, although none of the changes were significant. Similar patterns were observed in the regions with no significant differences between periods.
- The highest rates were in the Northern Health Region for all three periods, which were significantly higher than the rates in Manitoba. The rates in the other regions were not different from those in Manitoba.
- The rate of unintentional injury deaths appears to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between income and unintentional injury death rates in urban and rural areas in all three periods (see online supplement). Rates were higher among residents of lower income areas.

Trend Analysis (Figure 3.34)

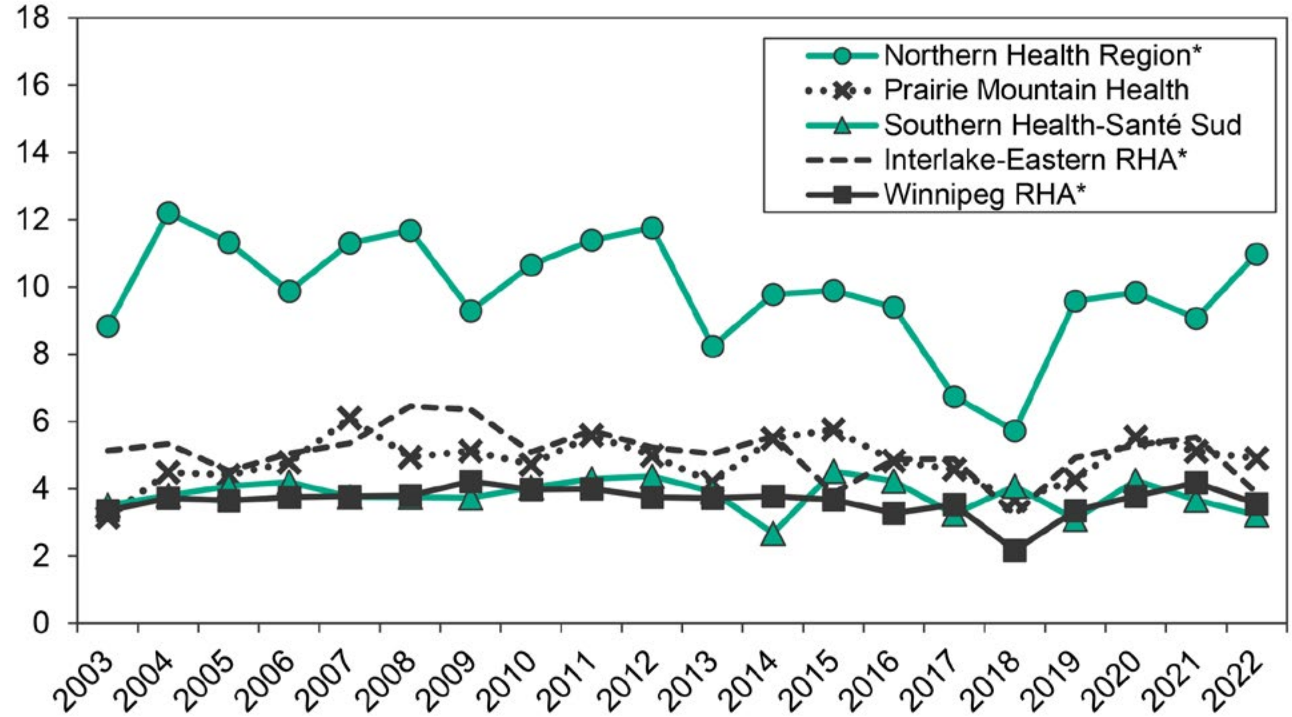
- There was a significant decrease in the unintentional injury death rates over time in Manitoba overall and in the Winnipeg RHA, Interlake-Eastern RHA, and the Northern Health Region, while no linear trend was observed for the Southern Health-Santé Sud region and Prairie Mountain Health region.

Figure 3.33: Unintentional Injury Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022
Age- and sex-adjusted average annual rate of death per 10,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 3.34: Unintentional Injury Mortality Rate by Health Region, 2003 to 2022
Age- and sex-adjusted rate of deaths per 10,000 residents (all ages)



* statistically significant linear trend over time.

3.12 Opioid-Related Mortality Rate

Definition: The number of deaths related to opioid use per 100,000 residents aged 10 years and older. Opioid-related mortality was defined as a death recorded in Vital Statistics Mortality data with any of the following causes:

- Poisoning as primary cause of death with ICD-10-CA codes:
  - **X40-X49** Accidental poisoning
  - **X60-X69** Intentional self-poisoning
  - **X85-X90** Assault by drugs & other substances
  - **Y10-Y19** Poisoning of undetermined intent

AND

- Poisoning by opioids as underlying cause of death with ICD-10-CA codes:
  - **T40.0** Poisoning by opium
  - **T40.1** Poisoning by heroin
  - **T40.2** Poisoning by other opioids
  - **T40.3** Poisoning by methadone
  - **T40.4** Poisoning by other synthetic narcotics[4]
  - **T40.6** Poisoning by other and unspecified narcotics

Due to the relatively small number of opioid-related deaths in smaller geographic areas, results were only produced at the regional level.

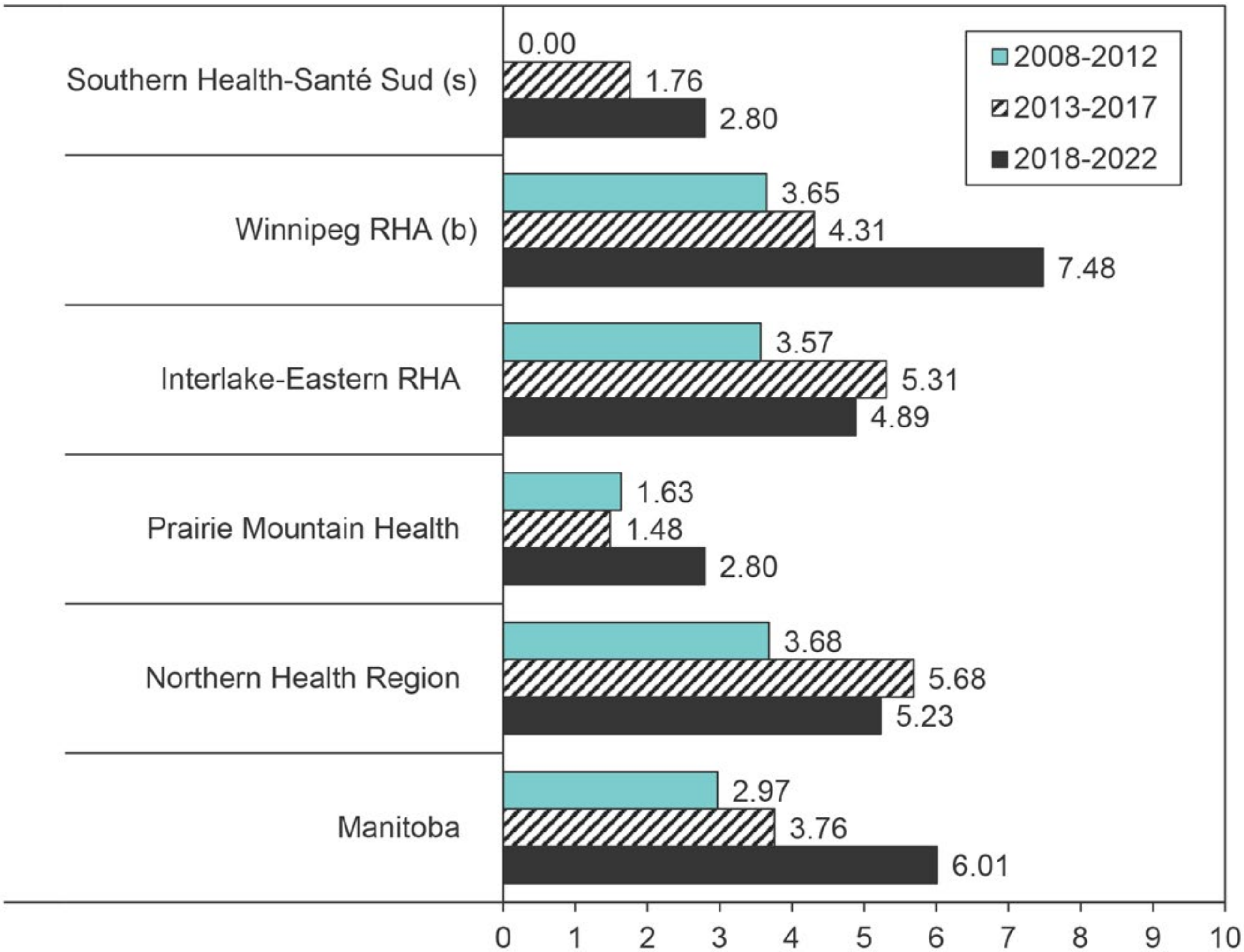
Time period analysis: The average annual rate of opioid-related deaths was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population 10 years or older in TP3.

Key Findings

Time Period Analysis (Figure 3.35)

- In Manitoba, the average annual rate of opioid-related deaths increased from 2.97 deaths per 100,000 residents aged 10 years or older in TP1 to 3.76 in TP2 to 6.01 in TP3, although none of the differences between periods were significant. However, the actual number of opioid-related deaths have increased from 171 in TP1 to 230 in TP2 to 368 in TP3 (online supplement).
- The rates were not significantly different between any of the periods in any of the regions except in the Winnipeg RHA where there was a significant increase between TP2 and TP3.

Figure 3.35: Opioid-Related Mortality by Health Region, 2008-2012, 2013-2017, and 2018-2022
Age- and sex-adjusted average annual rate of death per 100,000 residents (age 10+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Chapter 4:
Physical Illness

Key Findings in Chapter 4

- Overall, the results suggest that the burden of physical illness among Manitobans has remained stable or been slightly reduced.
- Of the eight chronic physical illnesses studied in this report, the prevalence of three decreased significantly between the second and third periods (ischemic heart disease, arthritis, and total respiratory morbidity), one of them increased (congestive heart failure), and four did not change (hypertension, diabetes, osteoporosis, and dementia). Three chronic physical illnesses were measured for incidence; diabetes increased, ischemic heart disease decreased, and hypertension did not change.
- The prevalence of diabetes increased over the 20-year period, while the prevalence of arthritis, total respiratory morbidity, ischemic heart disease, osteoporosis, and congestive heart disease decreased. The incidence of hypertension and ischemic heart disease also decreased over time, while the diabetes incidence increased.
- The rates of the heart attacks and strokes decreased from the second to third periods, while the percentage of individuals with diabetes who received lower limb amputations remained unchanged. However, rates for all three indicators had decreased significantly over the 20-year period.
- Despite the decreased prevalence and incidence observed for many of the conditions, the number of individuals living with these conditions and requiring care have increased over time as result of the continually increasing population size. Obviously, a concern for planners who need to prepare for the actual number of people, as opposed to the proportion of the population, who need care.

Introduction

This chapter reports on the presence of chronic physical illnesses and three key health events. While common measures of the presence of illnesses include prevalence and incidence, it should be noted that administrative data do not directly indicate who 'has' a given illness, but rather who uses health services for that illness. Therefore, the measures in this chapter are considered 'diagnostic' or 'treatment' prevalences and incidences. Illnesses with the highest prevalence are presented first, and for selected illnesses, estimates of incidence (i.e., new cases) are also provided. This chapter is divided into two sections:

- Section A, which contains prevalence and incidence estimates for a number of key chronic illnesses during each of the three time periods.
- Section B, which contains the annal rates of key adverse health events (e.g., heart attacks and strokes). These events are expressed as rates because they could happen to the same person more than once in a given period.

Each indicator starts with the case definition used to identify Manitoba residents as having the disease or event. Most definitions use a combination of data from physician visits, hospitalizations, and prescription drug use, though some also use laboratory data. In Manitoba, these data systems cover the entire population. Hospital claims are coded using the ICD-10-CA system, whereas physician claims use the ICD-9-CM system. The codes used in each system are listed in the definition for each indicator.

The prevalence and incidence indicators are based in part on data from the medical claims data, which include fee-for-service and shadow billing claims from physicians and nurse practitioners. These values likely underestimate the true presence of disease in Northern and remote areas where a significant amount of care is delivered in nursing stations, because this care is not coded into provincial data systems.

While the prevalence represents the proportion of the population who are living with a particular illness, the incidence estimates how many people developed the condition in a given year. The incidence is expressed as the rate of new cases per 100 person-years at risk. For example, out of 100 people without diabetes, how many will develop it over the next year if we assume all 100 people live for the entire year?

Finally, there is a possibility that someone with a particular chronic illness may not have that diagnosis attributed to them in the time period under study. For example, a Manitoba resident with diabetes may visit physicians several times for reasons other than their diabetes, so none of those visits would get the diagnosis code for diabetes. In this case, the person could be erroneously classified as not having diabetes in that period. But even in this case, data from prescription drug use and medical laboratory tests often ensure the case is still identified. Alternatively, there may also be instances for misclassification to occur where a patient is identified as having a condition when, in fact, that is not true (i.e., false positives). The algorithms used in these analyses attempt to identify as many true positives as possible, while minimizing the number of false positives.[3]

Section A: Chronic Illness

4.1 Hypertension Prevalence

Definition: The percentage of residents aged 19 years and older with hypertension (high blood pressure) in a one-year period as defined by any of the following:

- One or more hospitalizations with:
    - ICD-9-CM codes 401-405
    - ICD-10-CA codes I10-I13, I15, or
- Two or more physician visits:
    - ICD-9-CM codes 401-405, or
- Two or more dispensations of medications to treat hypertension (see online supplement file to see drug codes used to identify dispensations)

Time period analysis: Prevalence was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 19 and older in TP3. Counts and crude prevalence by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Prevalence was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 19 and older as of December 31, 2022.

Key Findings

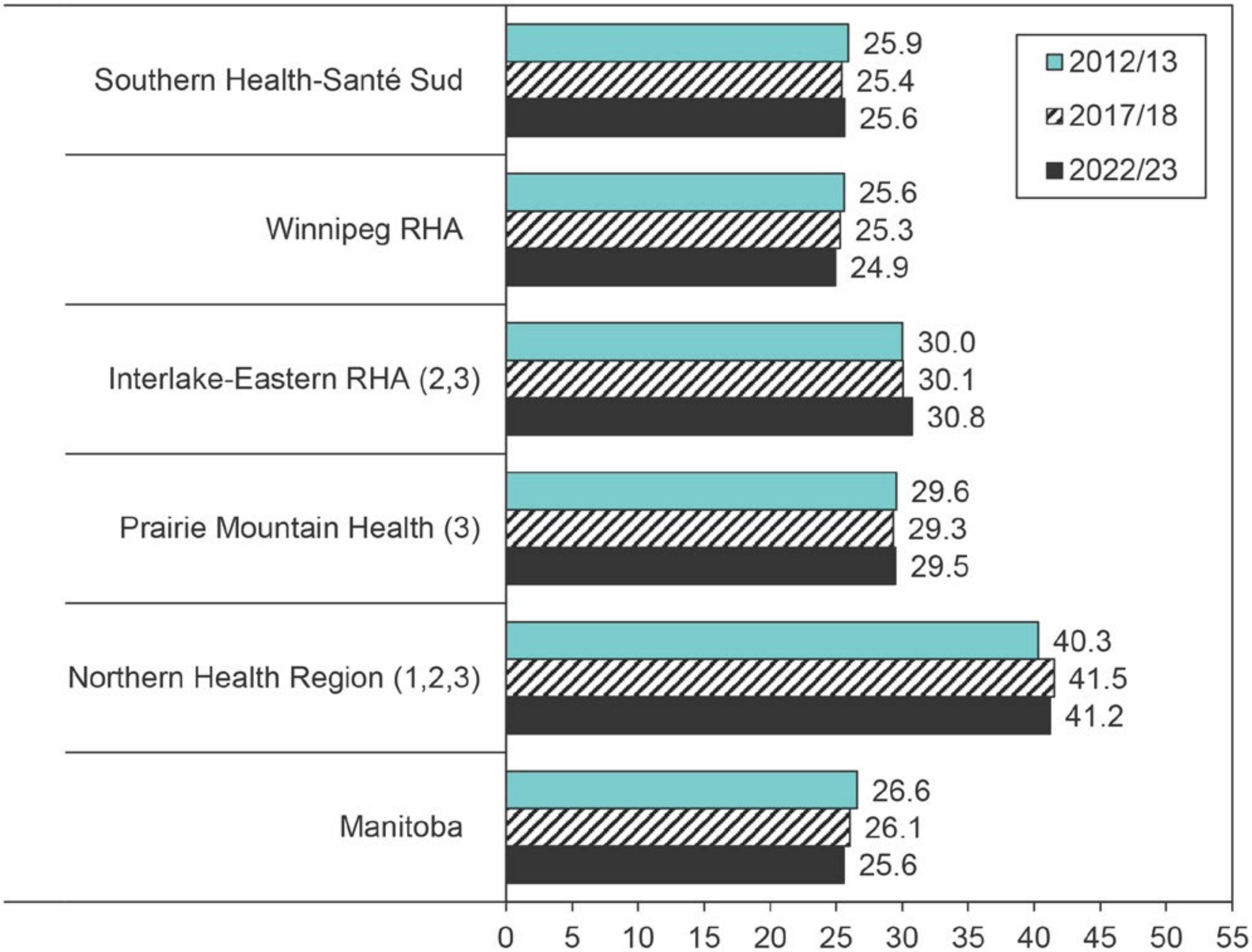
Time Period Analysis (Figure 4.1)

- Hypertension prevalence in Manitoba decreased slightly from 26.6% of the population 19 years and older in TP1 to 26.1% in TP2 to 25.6% in TP3. There were also small changes in the regions, but none of these were significant. However, given the increase in population size that occurred over time, the total number of people living with hypertension has increased (online supplement). In fact, the 281,388 people with hypertension in TP3 was 26,000 more people than in TP2.
- Compared to Manitoba, the prevalence was significantly higher in all three periods in the Northern Health Region, in TP2 and TP3 in Interlake-Eastern RHA, and TP3 in Prairie Mountain Health.
- Hypertension prevalence appears to be related to health status as the prevalence increases across the regions from the Southern Health-Santé Sud region to the Northern Health Region.
- There were significant associations between income and prevalence in urban and rural areas in all three periods (see online supplement). The prevalence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in both urban and rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.2)

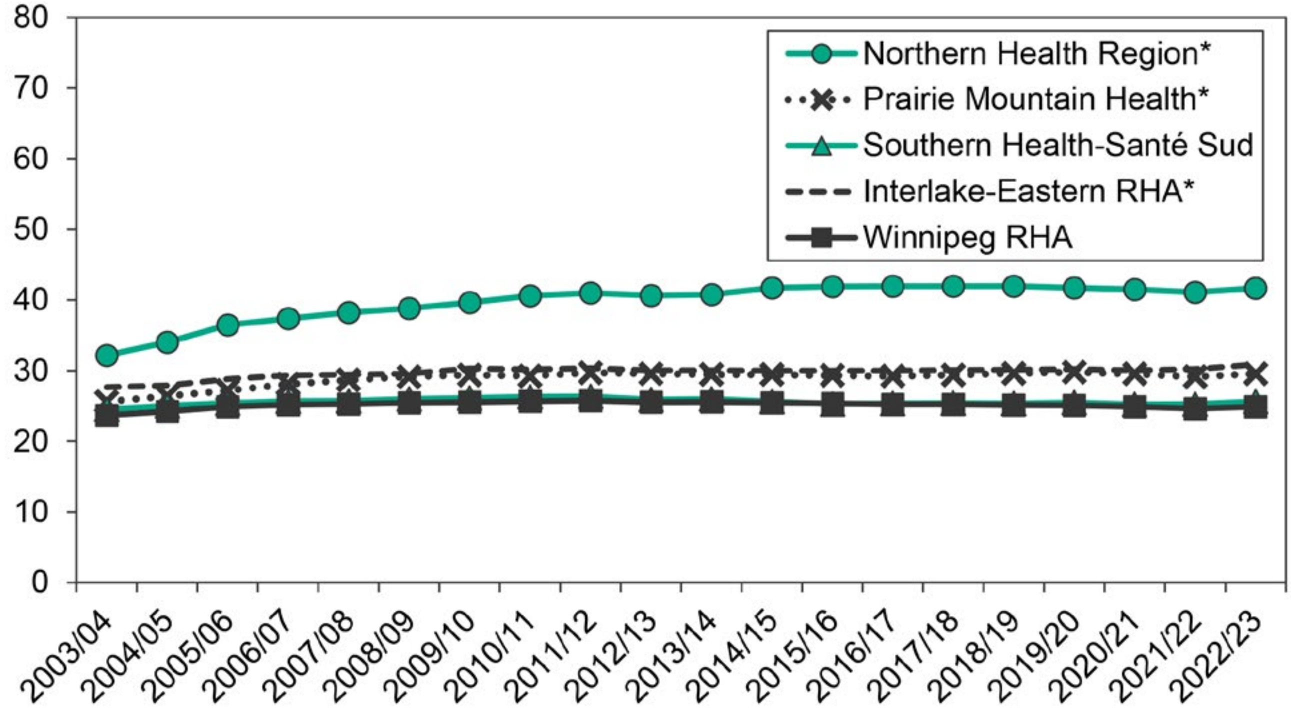
- Hypertension prevalence did not change over time in Manitoba or in the Southern Health-Santé Sud and Winnipeg RHA. However, it significantly increased in the Interlake-Eastern RHA, Prairie Mountain Health, and the Northern Health Region.

Figure 4.1: Prevalence of Hypertension by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.2: Prevalence of Hypertension by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



* statistically significant linear trend over time.

4.2 Hypertension Incidence

Definition: The number of new cases of hypertension (high blood pressure) among residents aged 19 years and older per 100 person-years at risk. A one-year washout period was used for each time period to identify and remove any prevalent cases of hypertension. Hypertension was identified among those at risk using the definition in section 4.1.

Time period analysis: Incidence was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 19 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Incidence was calculated for one-year periods from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population at risk aged 19 and older as of December 31, 2022.

Key Findings

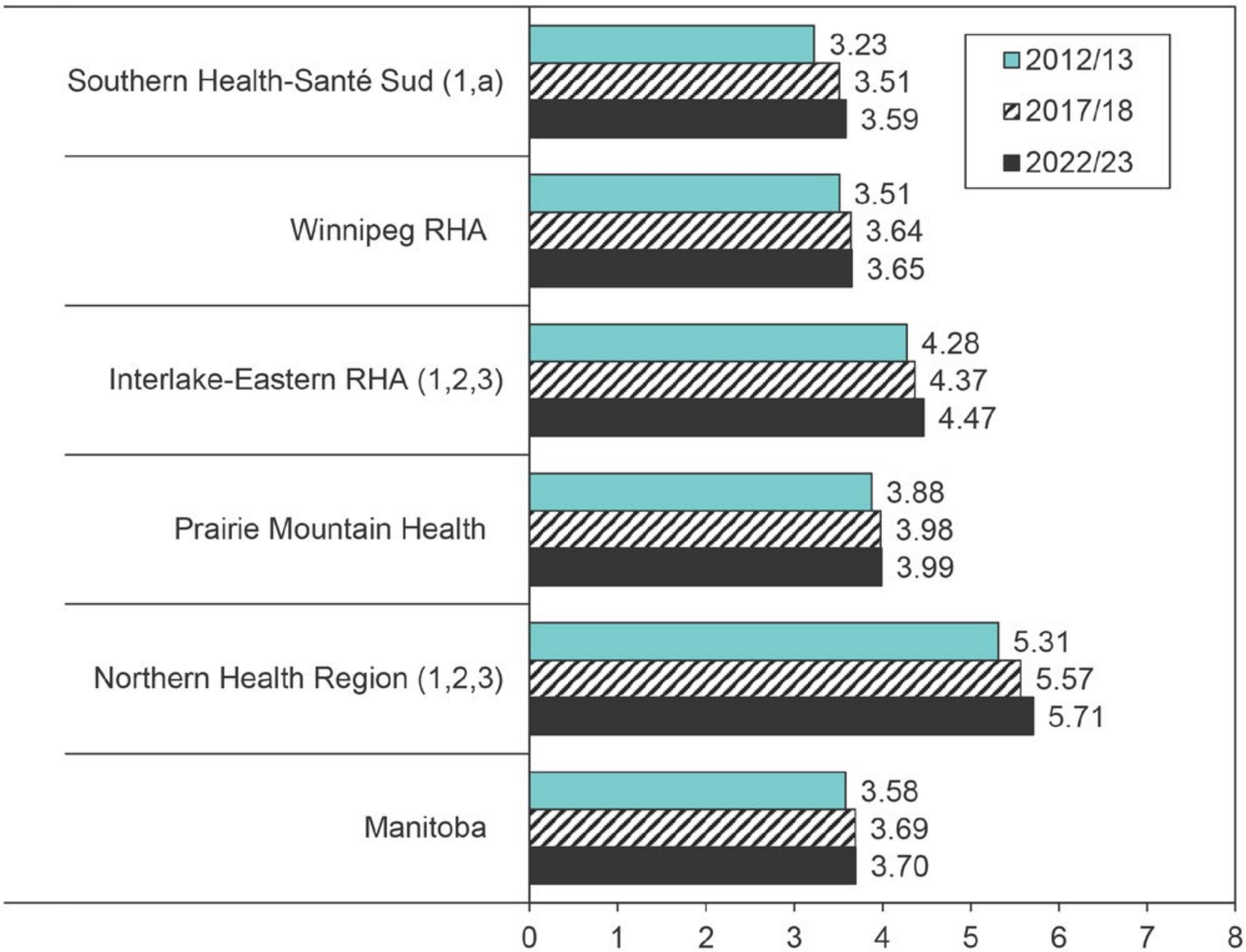
Time Period Analysis (Figure 4.3)

- In Manitoba, hypertension incidence increased from 3.6 cases per 100 person-years at risk in TP1 to 3.7 in TP2 and TP3, although the increase was not significant. The actual number of people who develop hypertension has increased over time with 22,249 people identified in TP3. However, the TP3 rate was only 2.6% higher than the TP2 rate as opposed to the TP2 rate of 9.9% which was higher than TP1 (online supplement).
- Incidence increased in all regions, although the only statistically significant increase occurred between TP1 and TP2 in the Southern Health-Santé Sud region.
- Compared to Manitoba, the incidence rates in the Interlake-Eastern RHA and Northern Health Region were significantly higher in all three periods. The incidence in the other regions were not significantly different from those in Manitoba for any of the periods except for the Southern Health-Santé Sud region which had a significantly lower rate in TP1.
- Hypertension incidence appears to be related to health status as the rate increases across the regions from the Southern Health-Santé Sud region to the Northern Health Regions. However, Interlake-Eastern RHA had higher incidence rates than Prairie Mountain Health region.
- There were significant associations between income and incidence in urban and rural areas in all three periods (see online supplement). The incidence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.4)

- Hypertension incidence significantly decreased over time in Manitoba and in all regions. However, the rates appear to level out around 2015/16.

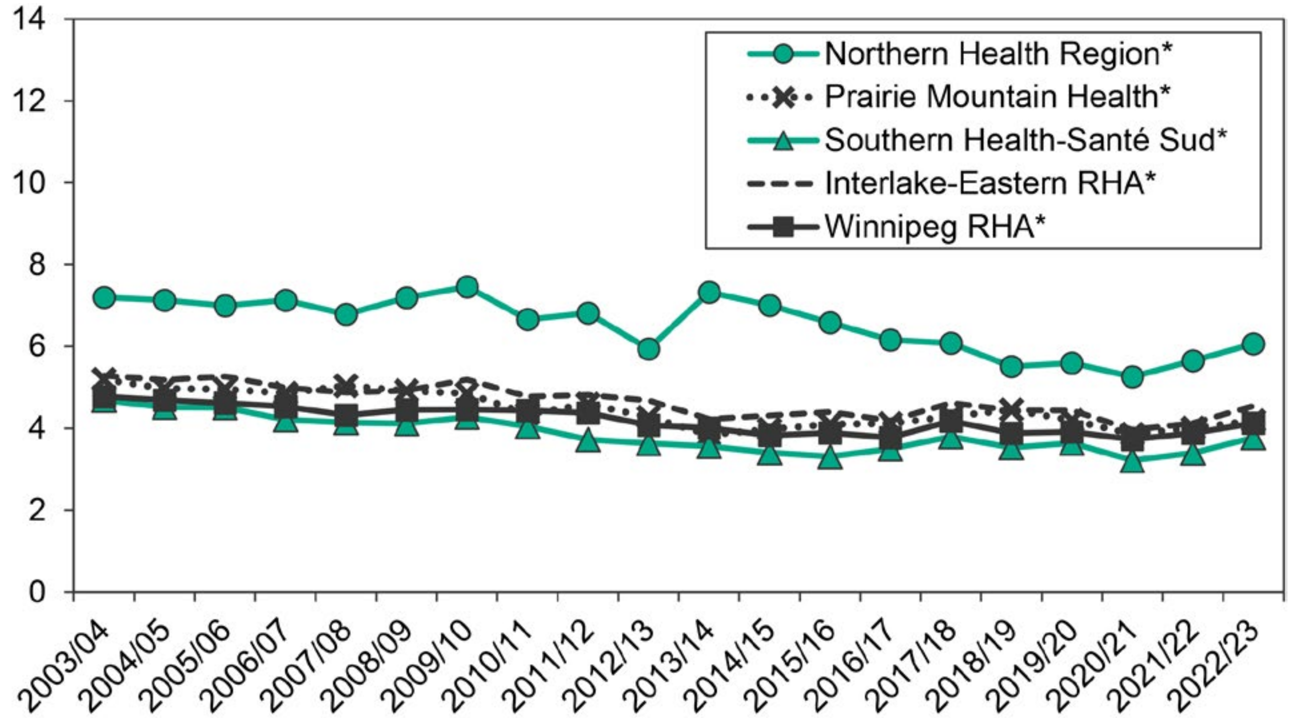
Figure 4.3: Incidence of Hypertension by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted incidence rate per 100 person-years at risk for residents (age 19+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.4: Incidence of Hypertension by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted incidence rate per 100 person years at risk among residents (age 19+)



* statistically significant linear trend over time.

4.3 Arthritis Prevalence

Definition: The percentage of residents aged 19 years and older with arthritis (rheumatoid or osteoarthritis) in a two-year period as defined by any of the following:

- One or more hospitalizations:
  - ICD-9-CM codes 274, 446, 710-721, 725-729, 739
  - ICD-10-CA codes M00-M03, M05-M07, M10-M25, M30-M36, M65-M79, or
- Two or more physician visits:
  - ICD-9-CM codes 274, 446, 710-721, 725-729, 739, or
- One physician visit:
  - ICD-9-CM codes 274, 446, 710-721, 725-729, 739 and two or more dispensations of medications used to treat rheumatoid arthritis (see online supplement file to see drug codes used to identify dispensations)

Time period analysis: Prevalence was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) periods and were age- and sex-adjusted to the Manitoba population age 19 and older in TP3.

Trend analysis: Prevalence was calculated for 10 two-year periods starting from 2003/04-2004/05 and ending at 2021/22-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 19 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 4.5)

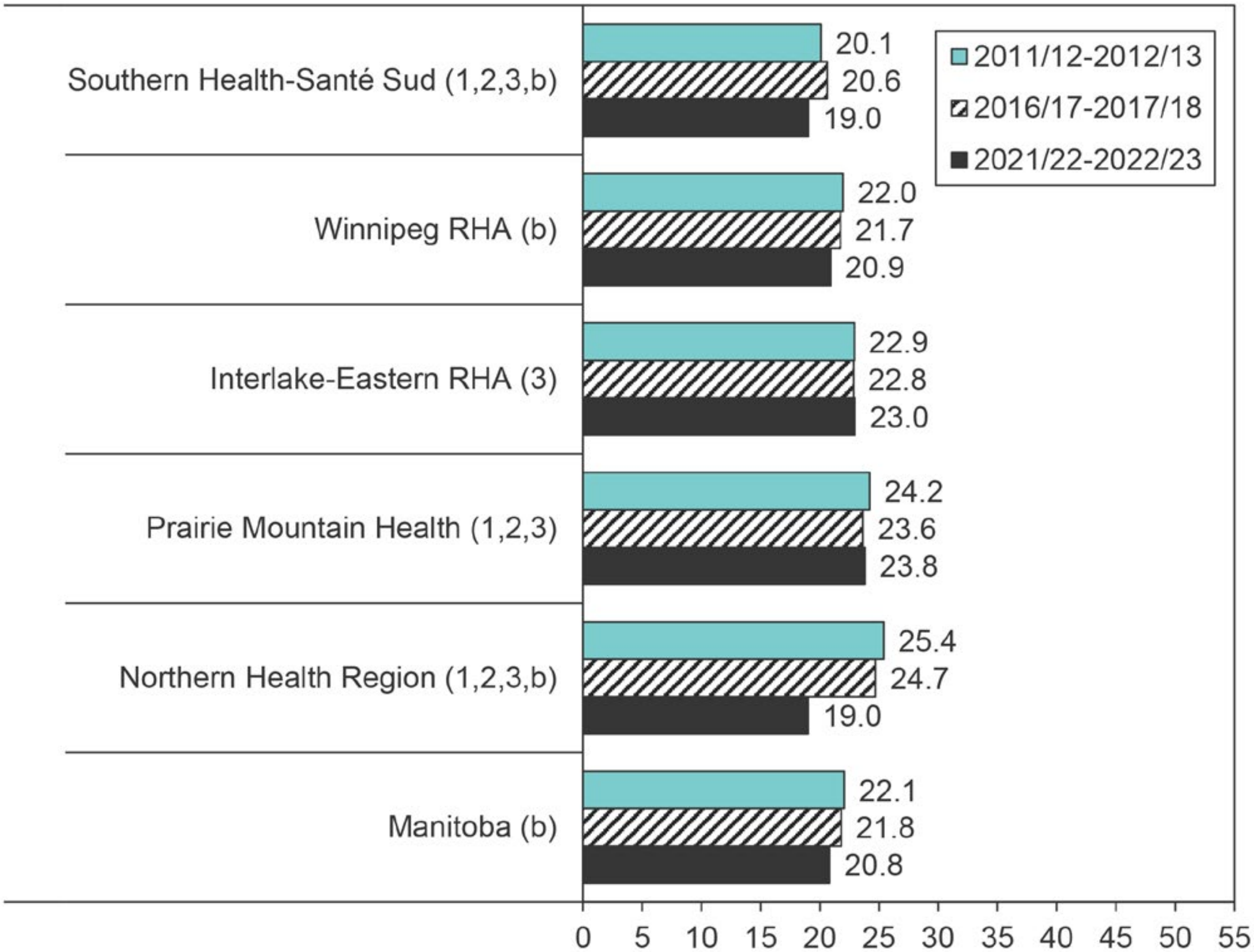
- In Manitoba, the arthritis prevalence decreased slightly over time from 22.1% of the population 19 years or older in TP1 to 21.8% in TP2 to 20.8% in TP3. The decrease from TP2 to TP3 was significant. Despite these decreases, the number of people living with arthritis has increased for each time period (online supplement). There were 203,724 people with arthritis in TP1, 220,402 in TP2, and 229,264 in TP3.
- There were significant decreases in the prevalence from TP2 to TP3 observed in Southern Health-Santé Sud, Winnipeg RHA, and Northern Health Regions.
- The prevalence was higher in all three periods in Prairie Mountain Health compared to those in Manitoba. The Northern Health Region also had a higher prevalence than Manitoba in TP1 and TP2, but a significantly lower prevalence in TP3. Meanwhile, the TP3 prevalence in Interlake-Eastern RHA was significantly higher than that in Manitoba, but not significantly different in the first two periods.
- Southern Health-Santé Sud had the lowest prevalences for each period, which were all significantly lower than those in Manitoba.
- Arthritis prevalence appears related to health status as the prevalence increases across the regions from the Southern Health-Santé Sud region to the Northern Health Region. However, the Northern Health Region had the lowest prevalence among the region in TP3.
- There were significant associations between income and prevalence in urban and rural areas in all three periods (see online supplement). The prevalence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the urban areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.6)

- The prevalence of arthritis decreased significantly over time in Manitoba and in Southern Health-Santé Sud, Winnipeg RHA, and the Northern Health Region. The slope of the decrease in the Northern Health Region is more noticeable at the 2017/18-2018/19 period and throughout the remainder of the study years. Further exploration should be undertaken to determine if there is a true decrease in the prevalence or if there is another reason for the decrease observed (i.e., shadow billing not submitted, patients receiving service from providers who do not submit medical claims)

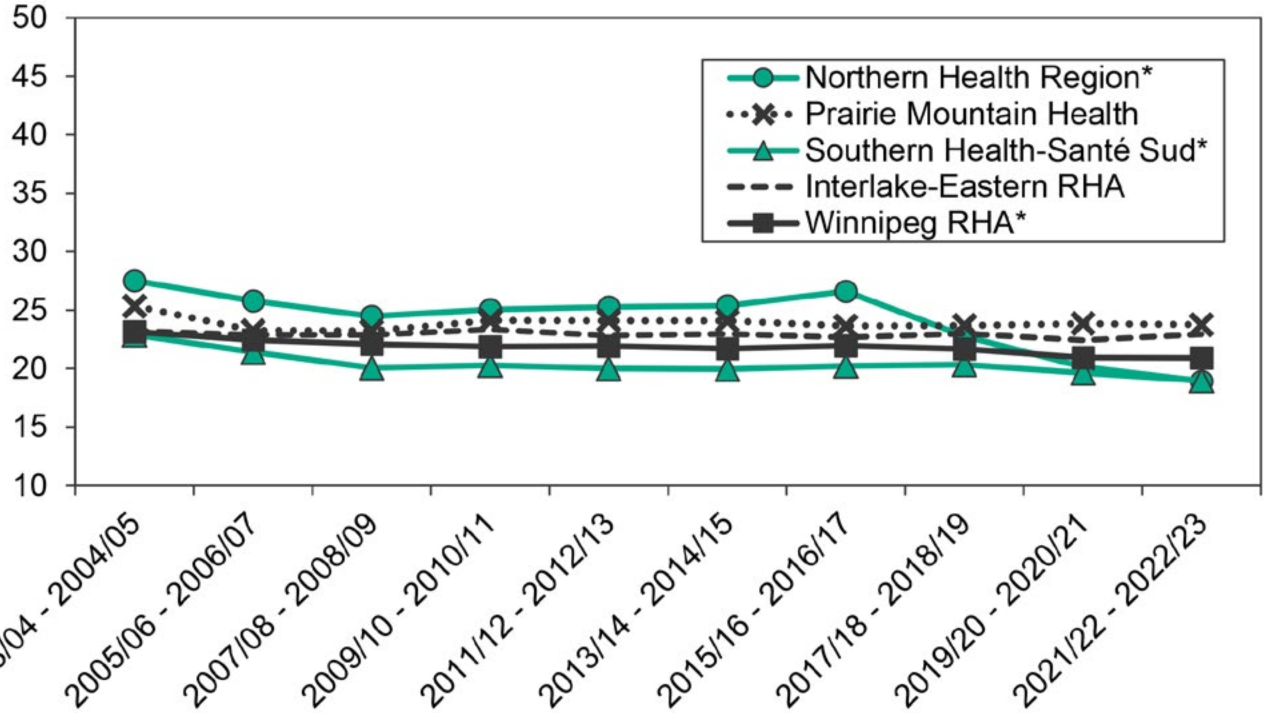
Figure 4.5: Prevalence of Arthritis by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.6: Prevalence of Arthritis by Health Region, 2003/04-2004/05 to 2021/22-2022/23
Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



* statistically significant linear trend over time.

4.4 Diabetes Prevalence

Definition: The percentage of residents (all ages) and older with diabetes (type 1 or 2) in a three-year period as defined by any of the following:

- One or more hospitalizations:
  - ICD-9-CM code 250
  - ICD-10-CA codes E10-E14, or
- Two or more physician visits:
  - ICD-9-CM code 250, or
- One or more dispensations of medications to treat diabetes (see online supplement file to see drug codes used to identify dispensations), or
- One or more glycosylated hemoglobin (HbA1c) test with a result ≥ 6.5%, or
- Identified as having type 1 or type 2 diabetes in youth, as identified in the Diabetes Education Resource for Children and Adolescents (DER-CA) database.

Note the individuals with 1+ dispensations for metformin (ATC-Anatomical Therapeutic Chemical code A10BA) or semaglutide (ATC code A10BJ06) without any other diabetes related prescriptions, without a diagnosis for diabetes from a hospital or physician visit, without high HbA1c, and not in DER-CA, were not included.

Time period analysis: Prevalence was calculated for 3 three-year periods: 2010/11-2012/13 (TP1), 2015/16-2017/18 (TP2), and 2020/21-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3. Counts and crude prevalence by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Prevalence was calculated for 6 three-year periods starting from 2005/06-2007/08 and ending at 2020/21-2022/23. All periods were age- and sex-adjusted to the Manitoba population as of December 31, 2021 (midpoint year of the three-year time period.

Key Findings

Time Period Analysis (Figure 4.7)

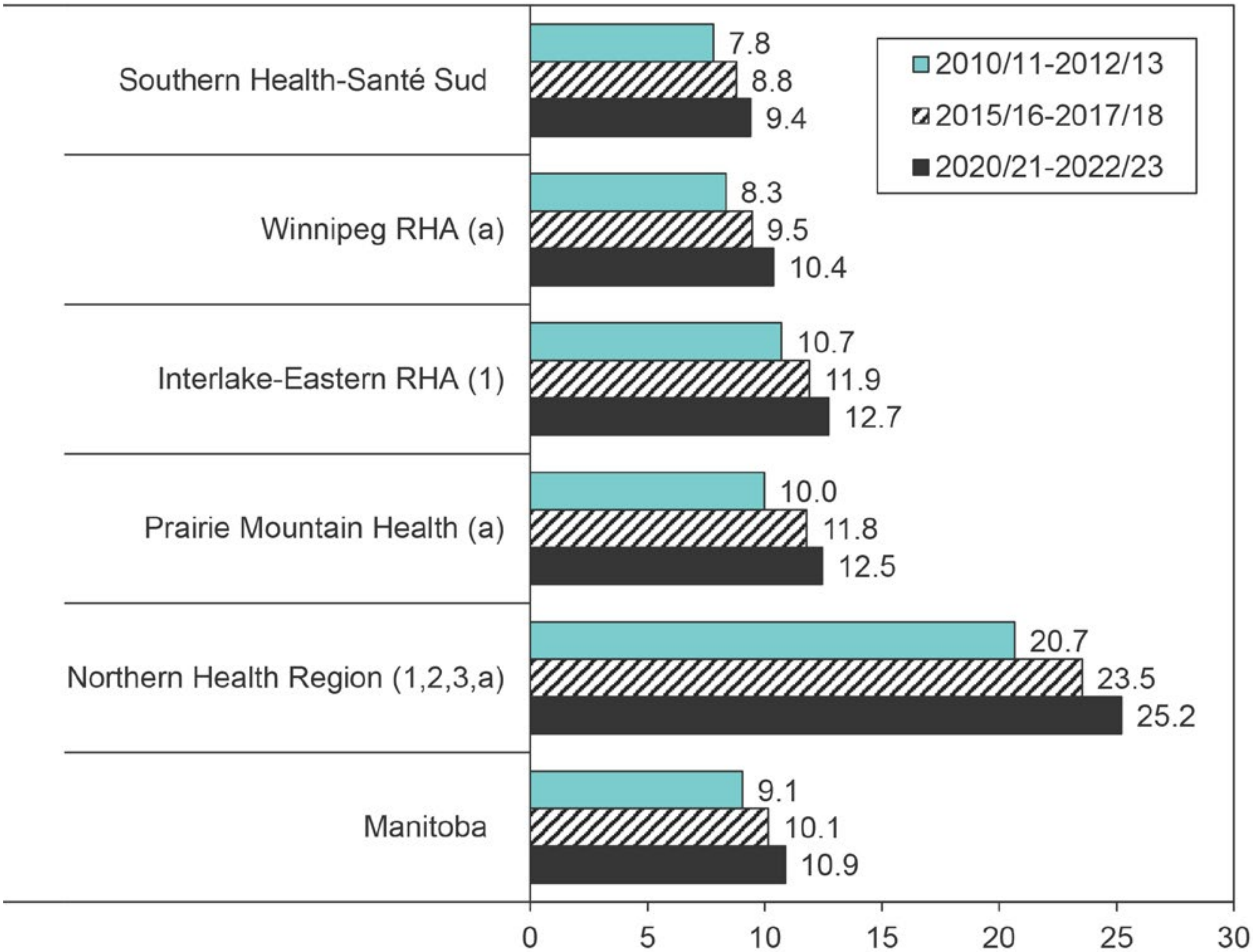
- Diabetes prevalence increased in Manitoba from 9.1% of the population in TP1 to 10.1% in TP2 to 10.9% in TP3, although the increases were not significant. There were 153,956 people identified who were living with diabetes in TP3 (online supplement). This was a 17.5% increase from the number in TP2, and a 46.2% increase from TP1.
- Prevalence also increased in all regions, which were statistically significant between TP1 to TP2 in the Winnipeg RHA, Prairie Mountain Health, and the Northern Health Region.
- The Northern Health Region had the highest prevalence in each period, which were all significantly higher than those in Manitoba. No significant differences between the other regions and Manitoba occurred except in Interlake-Eastern RHA where the prevalence was significantly higher in TP1.
- Diabetes prevalence appears to be related to health status as the prevalence increases across the regions from the Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between income and prevalence in urban and rural areas in all three periods (see online supplement). Prevalence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.8)

- Diabetes prevalence has increased steadily over time in Manitoba and in all regions.

Figure 4.7: Prevalence of Diabetes by Health Region, 2010/11-2012/13, 2015/16-2017/18, and 2020/21-2022/23

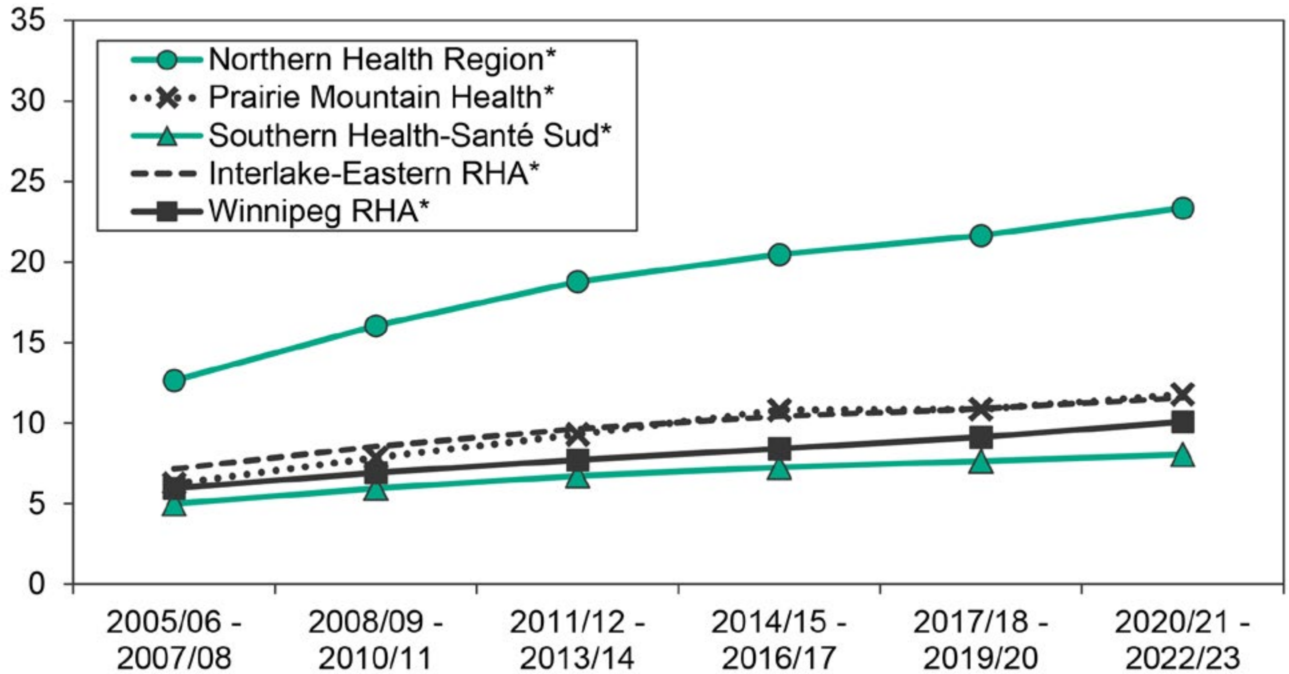
Age- and sex-adjusted percent of residents (all ages) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.8: Prevalence of Diabetes by Health Region, 2005/06-2007/08 to 2020/21-2022/23

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



* statistically significant linear trend over time.

4.5 Diabetes Incidence

Definition: The average number of new cases of diabetes among residents (all ages) per 100 person-years at risk. A three-year washout period was used for each time period to identify and remove any prevalent cases of diabetes. Diabetes was identified among those at risk using the definition in section 4.4.

Time period analysis: Incidence was calculated for 3 three-year periods: 2010/11-2012/13 (TP1), 2015/16-2017/18 (TP2), and 2020/21-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population at risk in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Incidence was calculated for 6 three-year periods starting from 2005/06-2007/08 and ending at 2020/21-2022/23. All periods were age- and sex-adjusted to the Manitoba population at risk as December 31, 2021 (midpoint year of the three-year time period).

Key Findings

Time Period Analysis (Figure 4.9)

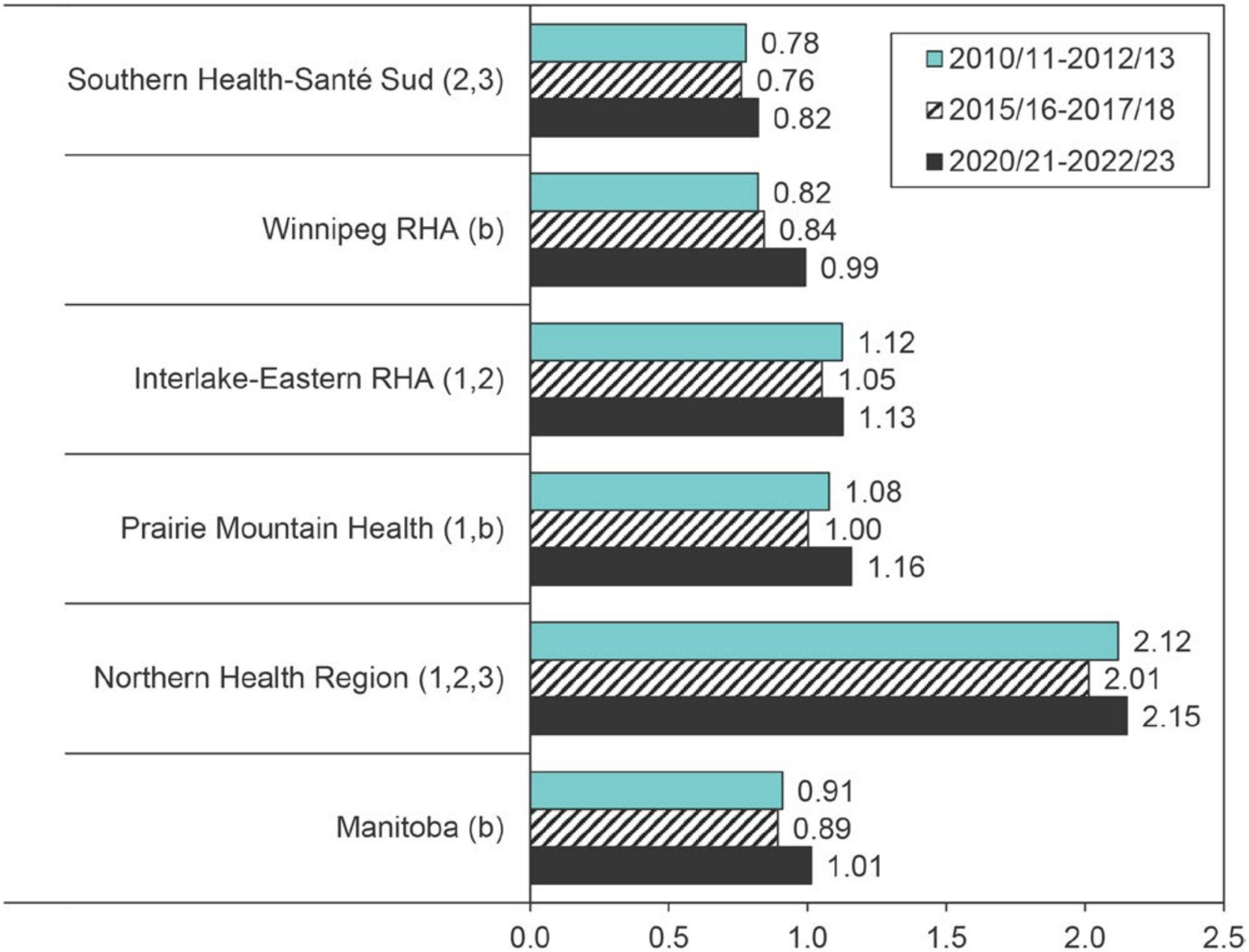
- In Manitoba, diabetes incidence decreased slightly from 0.91 per 100 person-years at risk in TP1 to 0.89 in TP2 and then increased significantly to 1.01 in TP3. The number of new cases of diabetes has increased by 6,082 from 28,490 in TP2 to 34,572 in TP3 (online supplement).
- Significant increases in the incidence from TP2 to TP3 were also observed in the Winnipeg RHA and Prairie Mountain Health regions.
- The incidence rates were lowest in the Southern Health-Santé Sud region, which were significantly lower than those in Manitoba for TP2 and TP3. The rates were highest in the Northern Health Region, which were significantly higher than the Manitoba rates in all three periods.
- Diabetes incidence appears to be related to health status as the rate increases across the regions from Southern Health-Santé Sud region to the Northern Health Region.
- There were significant associations between income and incidence in urban and rural areas in all three periods (see online supplement). The incidence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.10)

- Diabetes incidence increased steadily over time in Manitoba and in all regions except the Southern Health-Santé Sud region where it has remained stable.

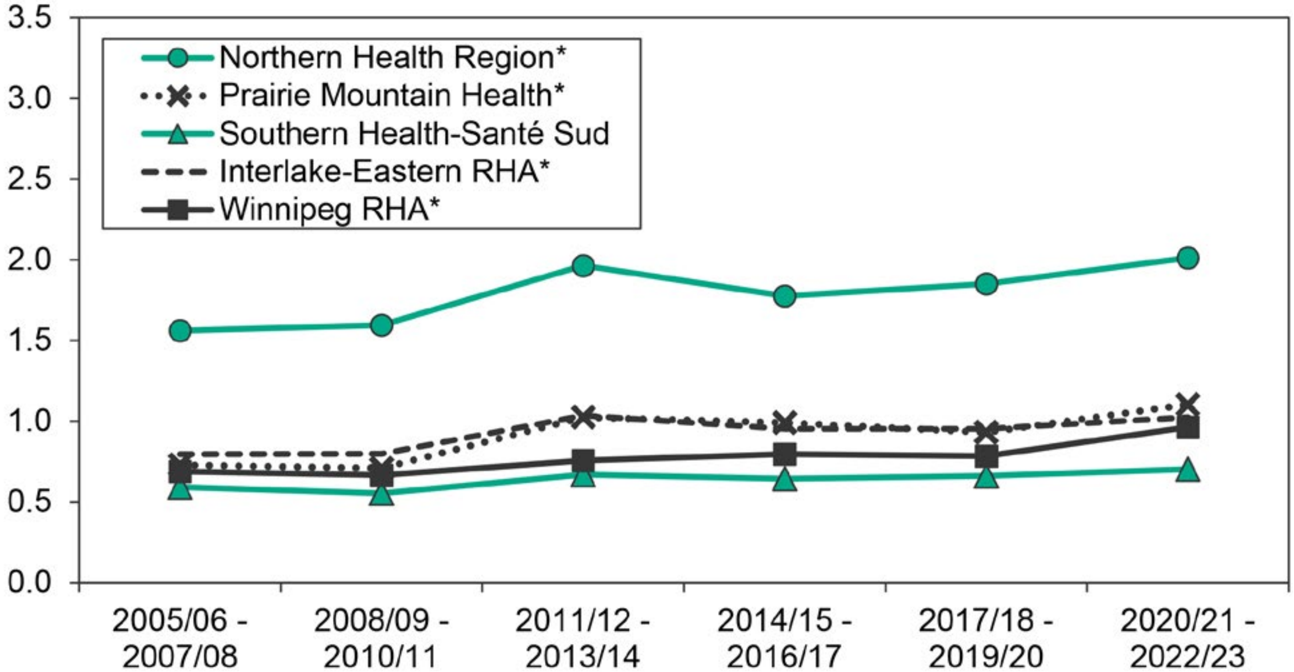
Figure 4.9: Incidence of Diabetes by Health Region, 2010/11-2012/13, 2015/16-2017/18, and 2020/21-2022/23

Age- and sex-adjusted incidence rate per 100 person-years at risk for residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.10: Incidence of Diabetes by Health Region, 2005/06-2007/08 to 2020/21-2022/23
Age- and sex-adjusted incidence rate per 100 person-years at risk among residents (all ages)



* statistically significant linear trend over time.

4.6 Total Respiratory Morbidity (TRM) Prevalence

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

- One or more hospitalizations:
  - ICD-9-CM codes 466, 490, 491, 492, 493, 496
  - ICD-10-CA codes J20, J21, J40-J45, or
- One or more physician visits:
  - ICD-9-CM codes 466, 490, 491, 492, 493, 496

Time period analysis: Prevalence was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Prevalence was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 4.11)

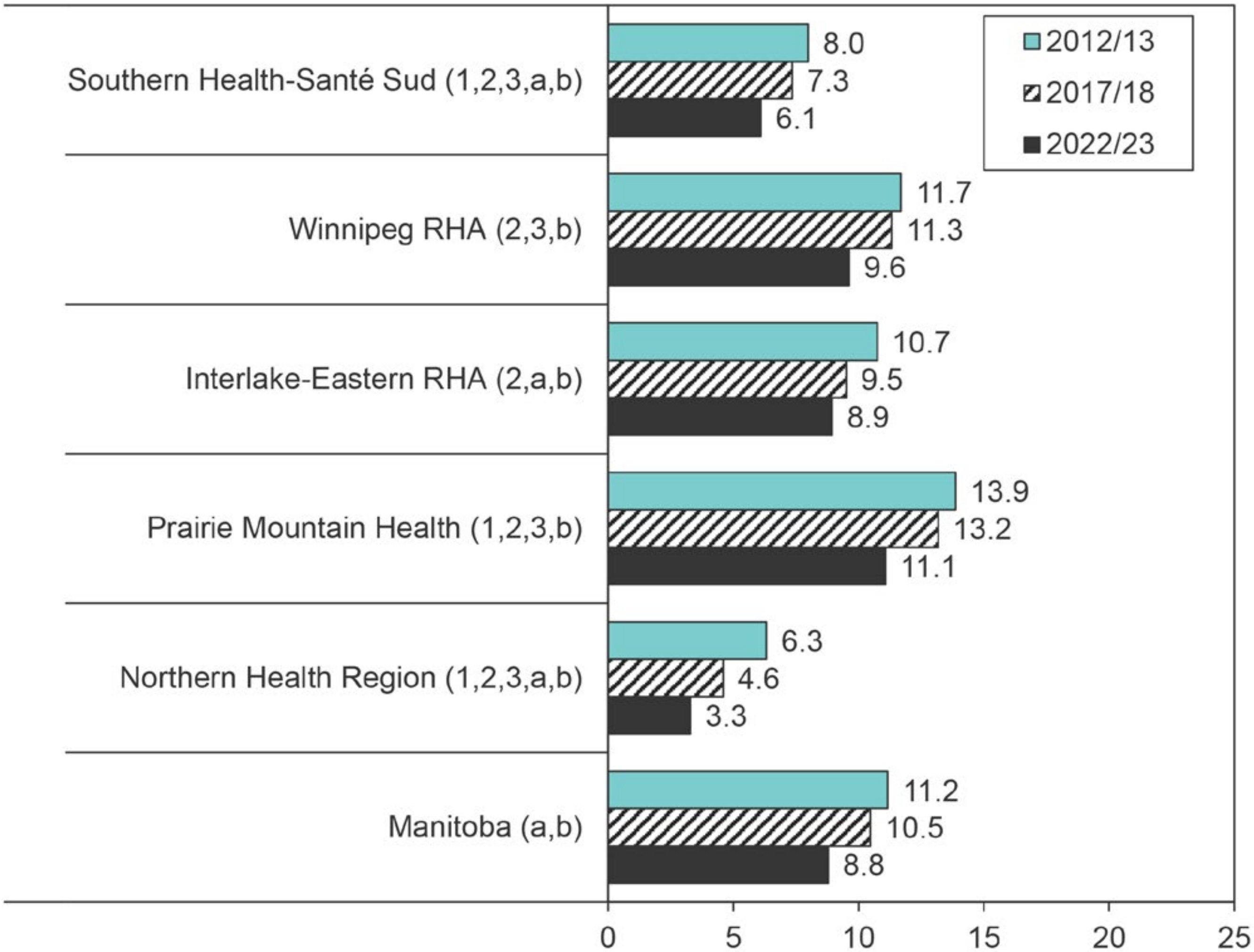
- In Manitoba, TRM prevalence decreased significantly in Manitoba from 11.2% of the population in TP1 to 10.5% in TP2 to 8.8% in TP3. Despite the decreased prevalence, the actual number of people living with TRM had increased from 134,679 people in TP1 to 137,113 people in TP2 (online supplement).
- This decreasing pattern in prevalence also existed in each region, which were significant between all three periods in Southern Health-Santé Sud, Interlake-Eastern RHA, and Northern Health Region, while they were only significant between TP2 and TP3 in the Winnipeg RHA and Prairie Mountain Health region.
- Prairie Mountain Health had the highest prevalence in all three periods, which were significantly higher than those in Manitoba. The prevalence in Southern Health-Santé Sud and the Northern Health Region were significantly lower than the Manitoba prevalence in each period.
- Associations with income were different among urban and rural residents (see online supplement). In urban areas, there was a strong relationship with higher prevalence among residents of lower income areas in all three periods. In rural areas, the relationship was significant in TP1 and TP2 (with higher prevalence in lower income areas), but not in TP3.

Trend Analysis (Figure 4.12)

- TRM prevalence decreased over time in Manitoba and in each region. A noticeable drop in the prevalence occurred between 2019/20 and 2020/21 before returning to 2019/20 levels by 2022/23.

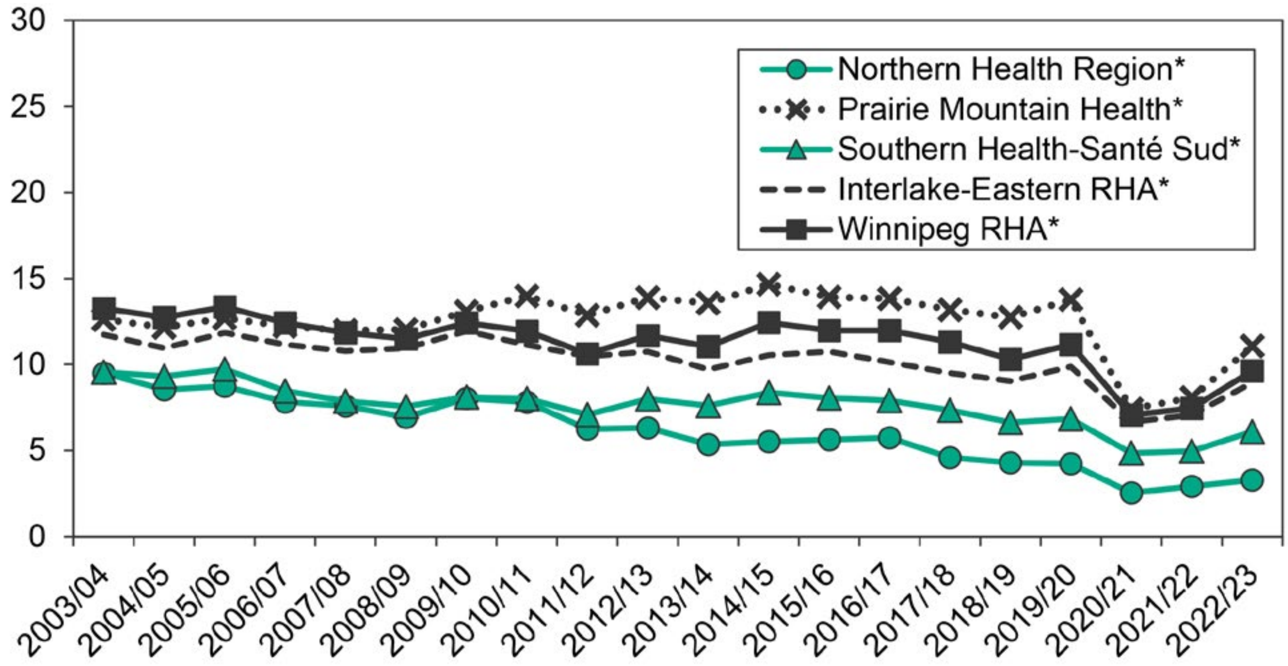
Figure 4.11: Prevalence of Total Respiratory Morbidity by Health Region, 2012/13, 2017/18, and 2022/23

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



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.12: Prevalence of Total Respiratory Morbidity by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (all ages) diagnosed with disorder



* statistically significant linear trend over time.

4.7 Ischemic Heart Disease (IHD) Prevalence

Definition: The percentage of residents aged 19 years and older with IHD in a five-year period as defined by any of the following:

- One or more hospitalizations:
  - ICD-9-CM codes 410-414
  - ICD-10-CA codes I20-I22, I24, I25, or
- Two or more physician visits:
  - ICD-9-CM codes 410-414, or
- One physician visit:
  - ICD-9-CM codes 410-414 and two or more dispensations of medications used to treat IHD (see online supplement file to see drug codes used to identify dispensations)

Time period analysis: Prevalence was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 19 years and older in TP3.

Trend analysis: Prevalence was calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 19 as of December 31, 2020 (midpoint year of the five-year time period).

Key Findings

Time Period Analysis (Figure 4.13)

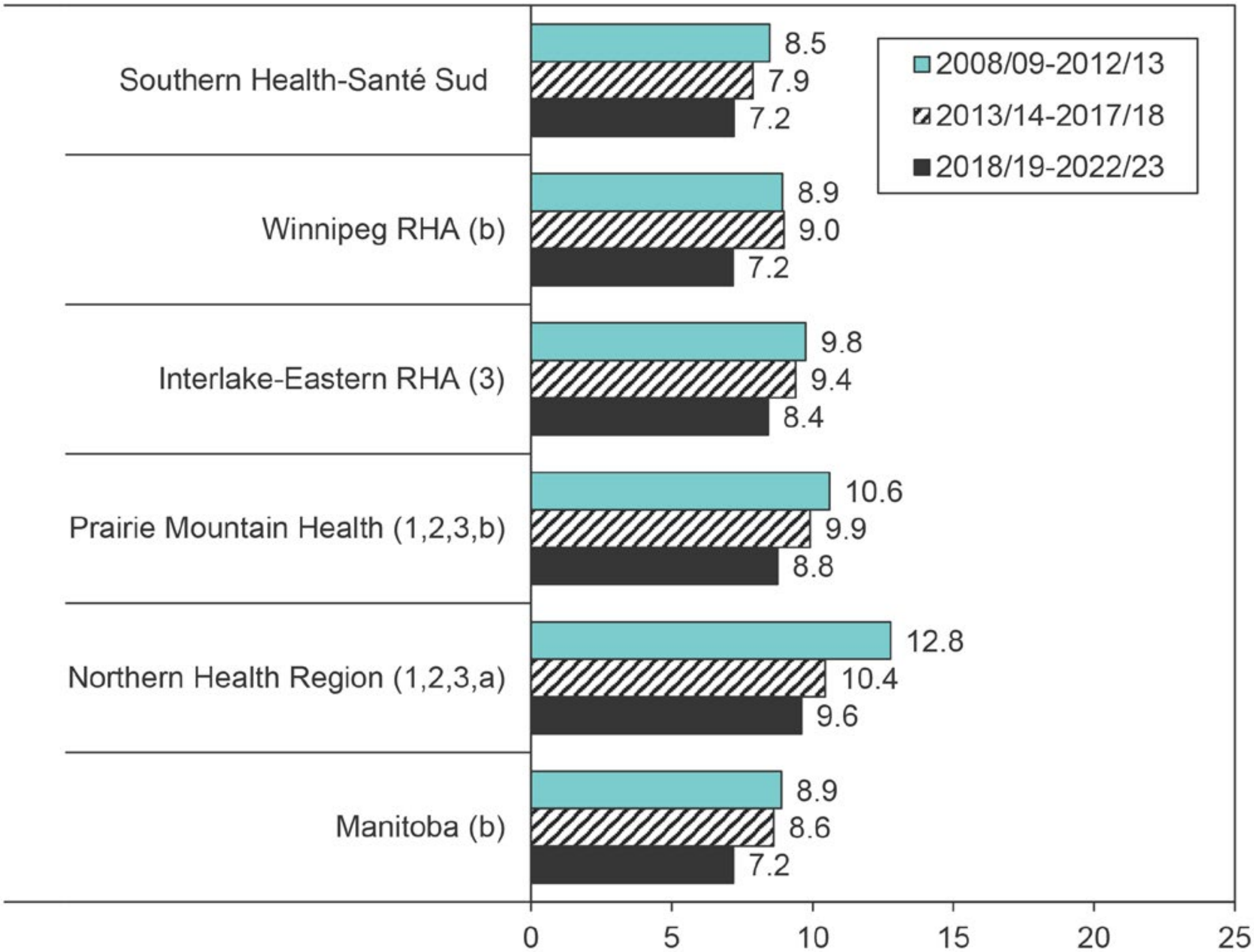
- In Manitoba, IHD prevalence decreased slightly from 8.9% of the population 19 years or older in TP1 to 8.6% in TP2 to 7.2% in TP3. The decrease between TP2 and TP3 was significant. This is also reflected in the number of people living with IHD, where the 76,248 identified in TP3 was the lowest among the three periods (online supplement).
- Prevalence decreased in each of the regions, which were significant decreases between TP2 and TP3 in Winnipeg RHA and Prairie Mountain Health. There was also a significant decrease between TP1 and TP2 in the Northern Health Region.
- Prairie Mountain Health and Northern Health Region had the highest prevalence in each of period, which were significantly higher than the those in Manitoba.
- IHD prevalence appears to be related to health status as the prevalence increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between income and prevalence in urban and rural areas in all three time periods (see online supplement). The prevalence was higher among residents of lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in both urban and rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.14)

- IHD prevalence has decreased over time in Manitoba and in all regions.

Figure 4.13: Prevalence of Ischemic Heart Disease by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

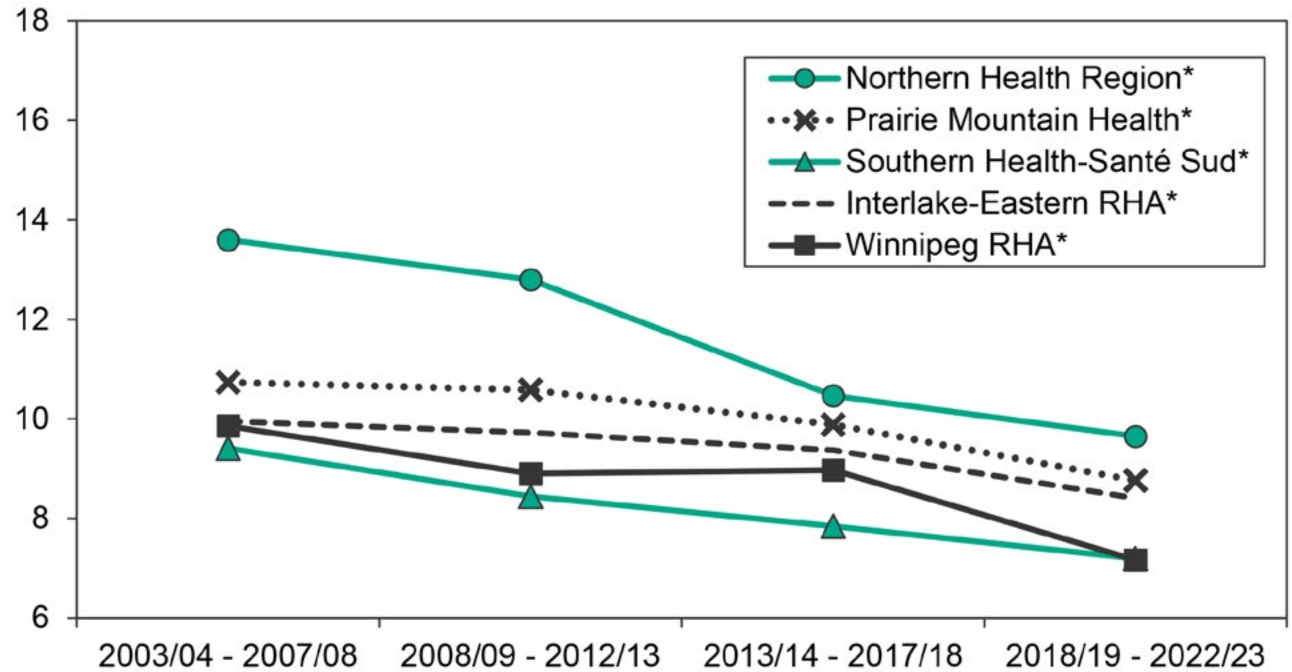
Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.14: Prevalence of Ischemic Heart Disease by Health Region, 2003/04-2007/08 to 2018/19-2022/23

Age- and sex-adjusted percent of residents (age 19+) diagnosed with disorder



* statistically significant linear trend over time.

4.8 Ischemic Heart Disease (IHD) Incidence

Definition: The average number of new cases of IHD among residents aged 19 years and older per 100 person-years at risk. A five-year washout period was used for each time period to identify and remove any prevalent cases of IHD. IHD was identified among those at risk using the definition in section 4.7.

Time period analysis: Incidence was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population at risk aged 19 and older in TP3.

Trend analysis: Incidence was calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population at risk aged 19 and older as of December 31, 2020 (midpoint year of the five-year time period).

Key Findings

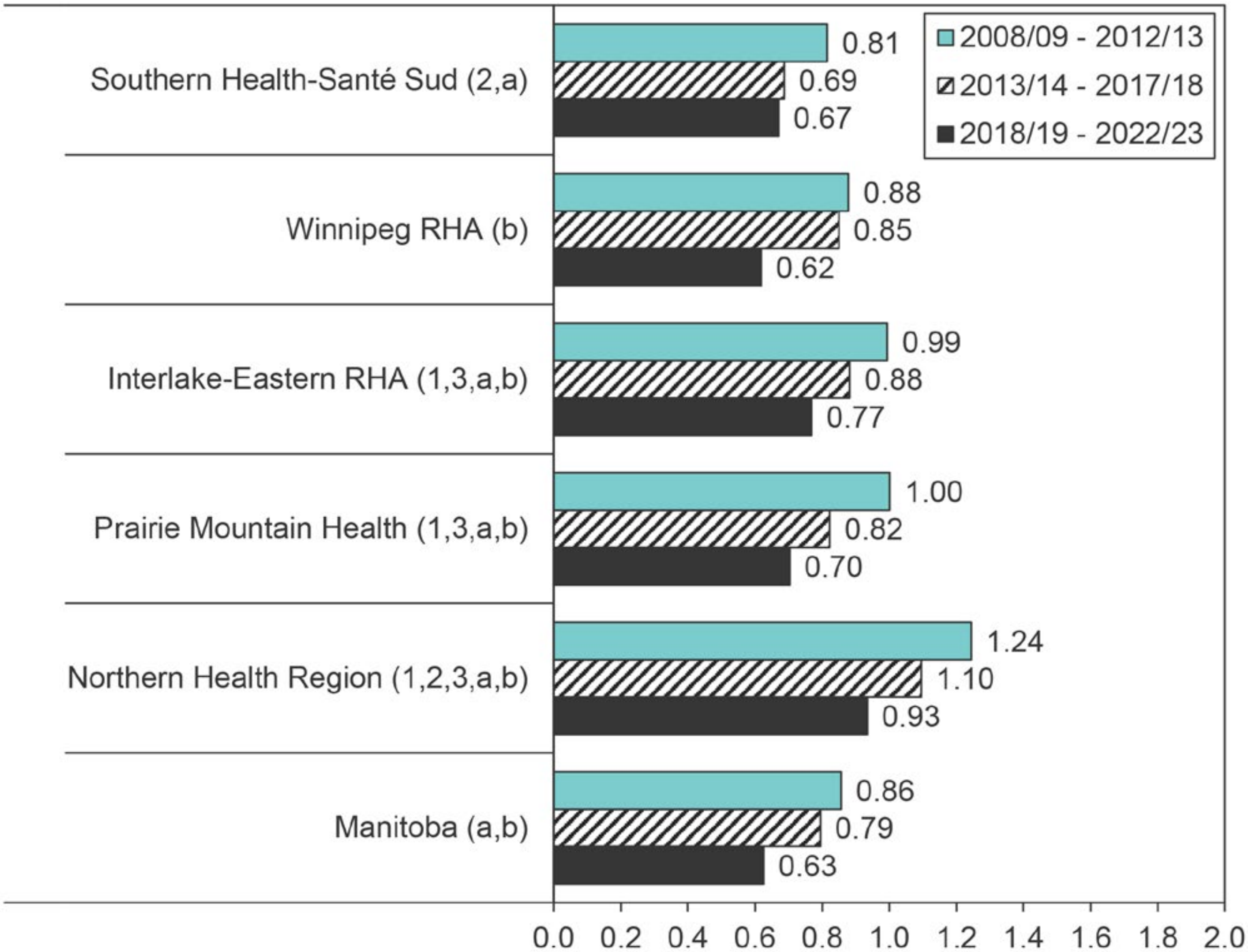
Time Period Analysis (Figure 4.15)

- IHD incidence decreased significantly in Manitoba from 0.86 cases per 100 person-years at risk in TP1 to 0.79 in TP2 to 0.63 in TP3. Despite the increased size of the population across the time periods, the number of new IHD cases has decreased from 25,049 in TP1 to 24,177 in TP2 to 21,747 in TP3 (online supplement).
- Significant decreases in the incidence were observed between each period in all regions except in the Winnipeg RHA where it was only significant between TP2 and TP3, and in the Southern Health-Santé Sud region where it was only significant between TP1 and TP2.
- The Northern Health Region had the highest incidence rates in each period, which were significantly higher than those in Manitoba. Interlake-Eastern RHA and Prairie Mountain Health also had higher incidence rates than Manitoba but were only significant in TP1 and TP3.
- IHD incidence appears to be related to health status as the rate increases across the regions from the Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between income and incidence in urban areas in all three time periods (see online supplement). The incidence was higher among residents of lower income areas. In rural areas, incidence was higher in lower income areas in TP1 and TP2, while no significant relationship existed in TP3. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.16)

- IHD incidence has decreased over time in Manitoba and in all regions.

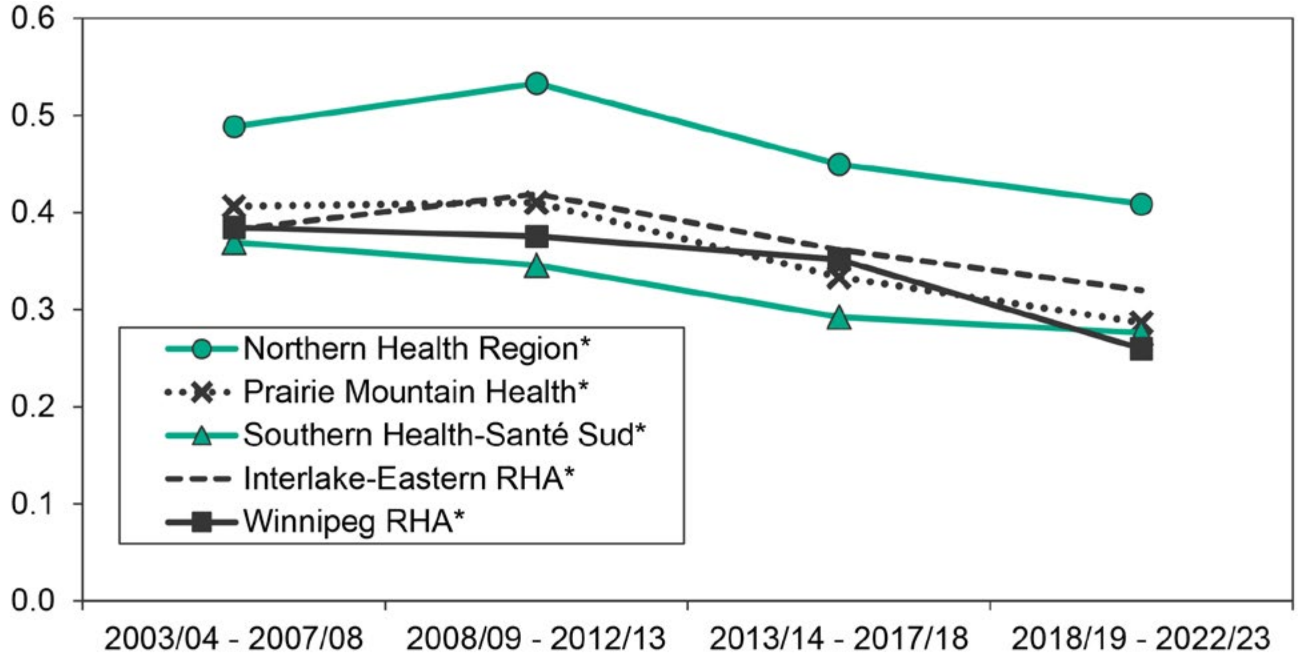
Figure 4.15: Incidence of Ischemic Heart Disease by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23
Age- and sex-adjusted incidence rate per 100 person-years at risk for residents (age 19+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.16: Incidence of Ischemic Heart Disease by Health Region, 2003/04-2007/08 to 2018/19-2022/23

Age- and sex-adjusted incidence rate per 100 person years at risk among residents (age 19+)



* statistically significant linear trend over time.

4.9 Osteoporosis Prevalence

Definition: The percentage of residents aged 50 years and older with osteoporosis in a one-year period as defined by any of the following:

- One or more hospitalizations:
  - ICD-9-CM code 733.0
  - ICD-10-CA code M80, M81, or
- One or more physician visits:
  - ICD-9-CM code 733
  - ICD-10-CA code M80, M81, or
- One or more dispensations of medications used to treat osteoporosis (see online supplement file to see drug codes used to identify dispensations).

Time period analysis: Prevalence was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population age 50 and older in TP3.

Trend analysis: Prevalence was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 50 and older as of December 31, 2022.

Key Findings

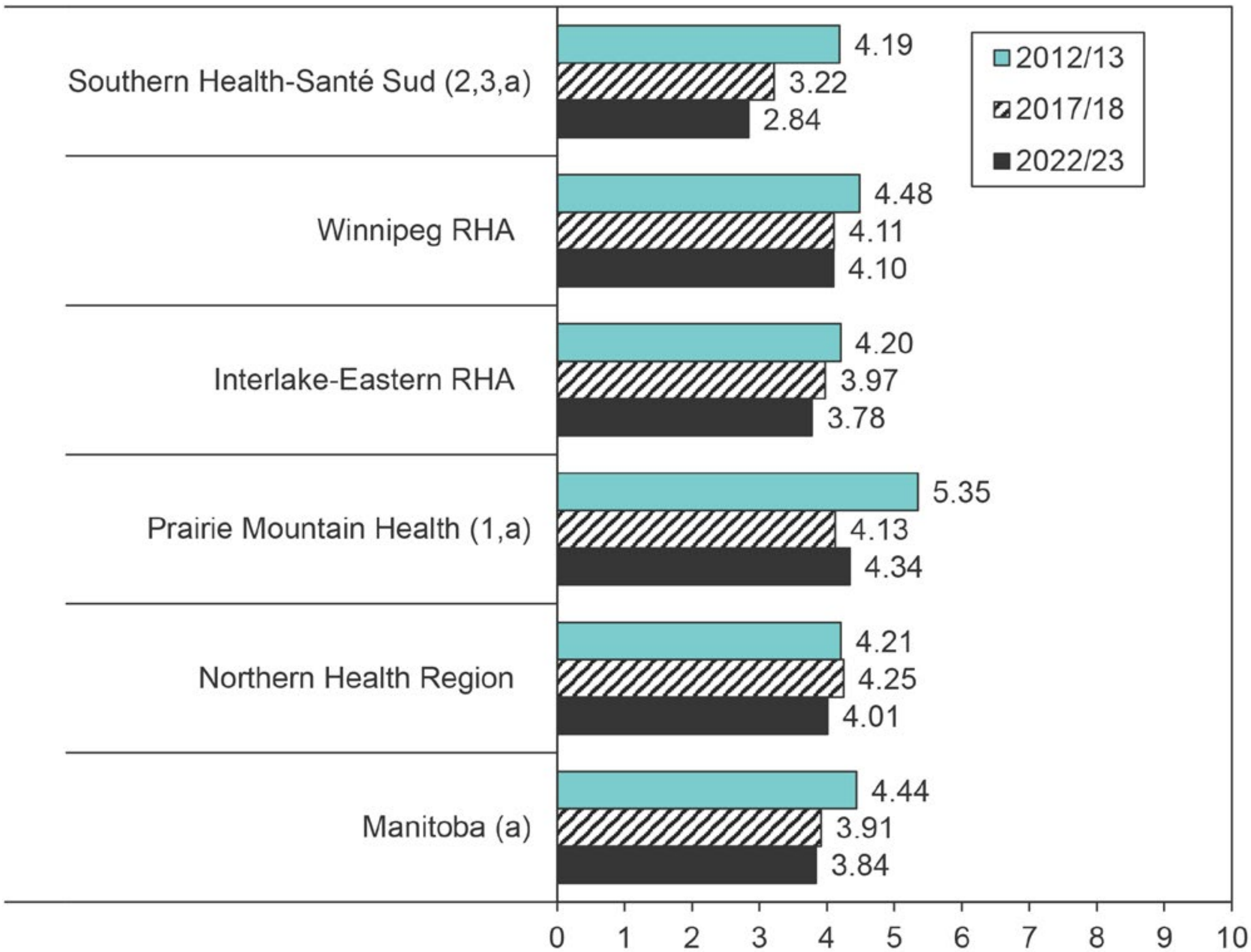
Time Period Analysis (Figure 4.17)

- In Manitoba, osteoporosis prevalence decreased from 4.4% of the population 50 years and older in TP1 to 3.9% in TP2 to 3.8% in TP3. The decrease was only significant between TP1 and TP2. However, the number of people living with osteoporosis increased from 17,267 in TP2 to 19,347 in TP3 (online supplement).
- Prevalence decreased significantly in the Southern Health-Santé Sud and Prairie Mountain Health regions, while there were no significant differences between any of the periods in any of the other regions.
- The Southern Health-Santé Sud region had the lowest prevalence in each time period, which were significantly lower than the prevalence in Manitoba for TP2 and TP3. Prairie Mountain Health had a significantly higher prevalence than Manitoba in TP1.
- There were no significant associations between income and osteoporosis prevalence among urban or rural residents (see online supplement).

Trend Analysis (Figure 4.18)

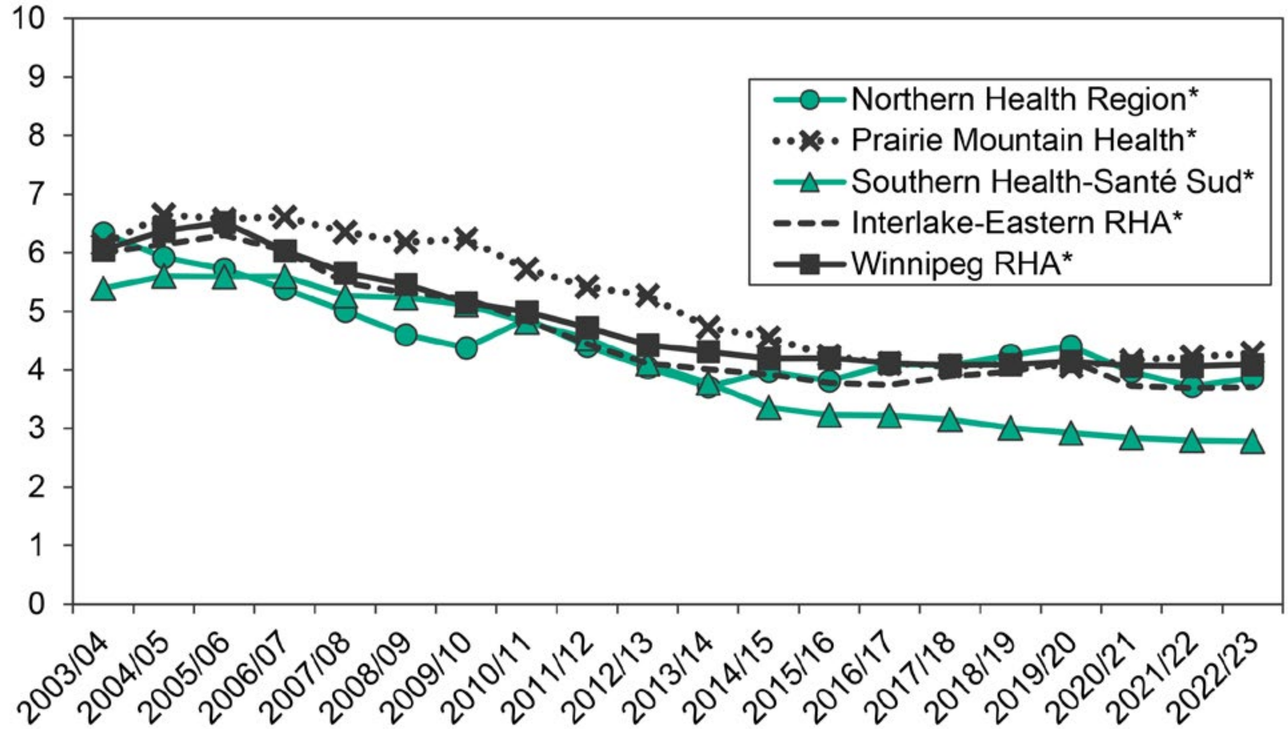
- Osteoporosis prevalence decreased over time in Manitoba and in all regions. The decrease appears most dramatic between 2005/06 and 2014/15 before settling into a more gradual decrease (Southern Health-Santé Sud) or plateau (all other regions).

Figure 4.17: Prevalence of Osteoporosis by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (age 50+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.18: Prevalence of Osteoporosis by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (age 50+) diagnosed with disorder



* statistically significant linear trend over time.

4.10 Congestive Heart Failure (CHF) Prevalence

Definition: The percentage of residents aged 40 and older with CHF in a one-year period as defined by either of the following:

- One or more hospitalizations:
  - ICD-9-CM code 428
  - ICD-10-CA code I50, or
- Two or more physician visits:
  - ICD-9-CM code 428

Time period analysis: Prevalence was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population age 40 and older in TP3.

Trend analysis: Prevalence was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 4.19)

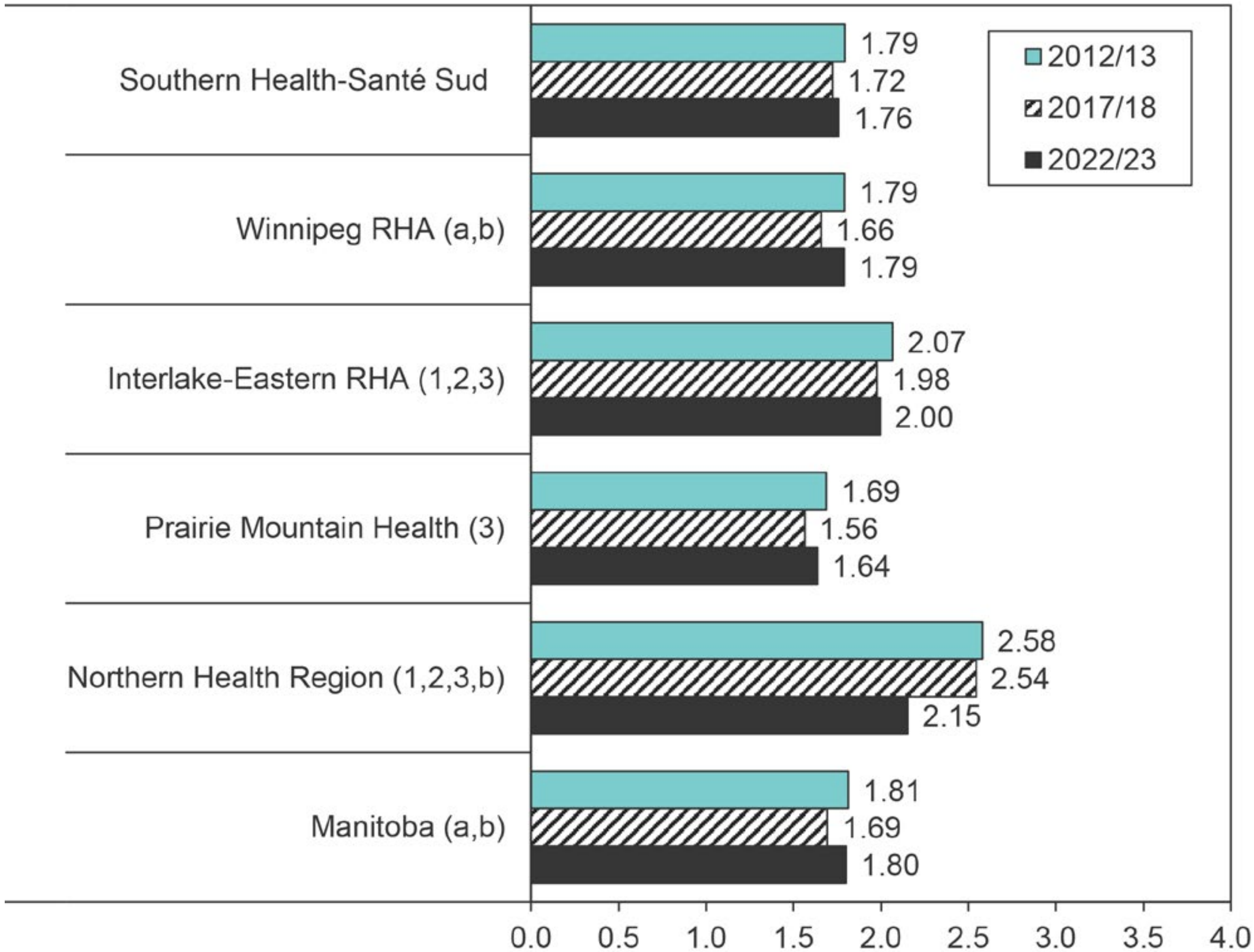
- In Manitoba, CHF prevalence fluctuated over the three periods significantly decreasing from 1.8% of the population 40 years and older in TP1 to 1.7% in TP2, and then significantly increasing back to 1.8% in TP3. Indeed, the 12,319 people living with CHF in TP3 was 1,817 more than in TP2 (online supplement).
- A similar pattern was observed in the Winnipeg RHA, while all other regions had stable prevalence estimates across the periods, with the exception of the Northern Health Region where a significant decrease occurred between TP2 and TP3.
- Northern Health Region and Interlake-Eastern RHA had the highest prevalence in each of the periods, which were all significantly higher than those in Manitoba.
- There were significant associations between income and CHF prevalence in urban and rural residents in all three periods (see online supplement). The prevalence was higher among lower income residents. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.20)

- CHF prevalence decreased over time in Manitoba and in all the regions. The decrease appears to be the most dramatic in the Northern Health Region where the prevalence was highest in the earliest years and decreased to a prevalence closer to that of the other regions in the latter years.

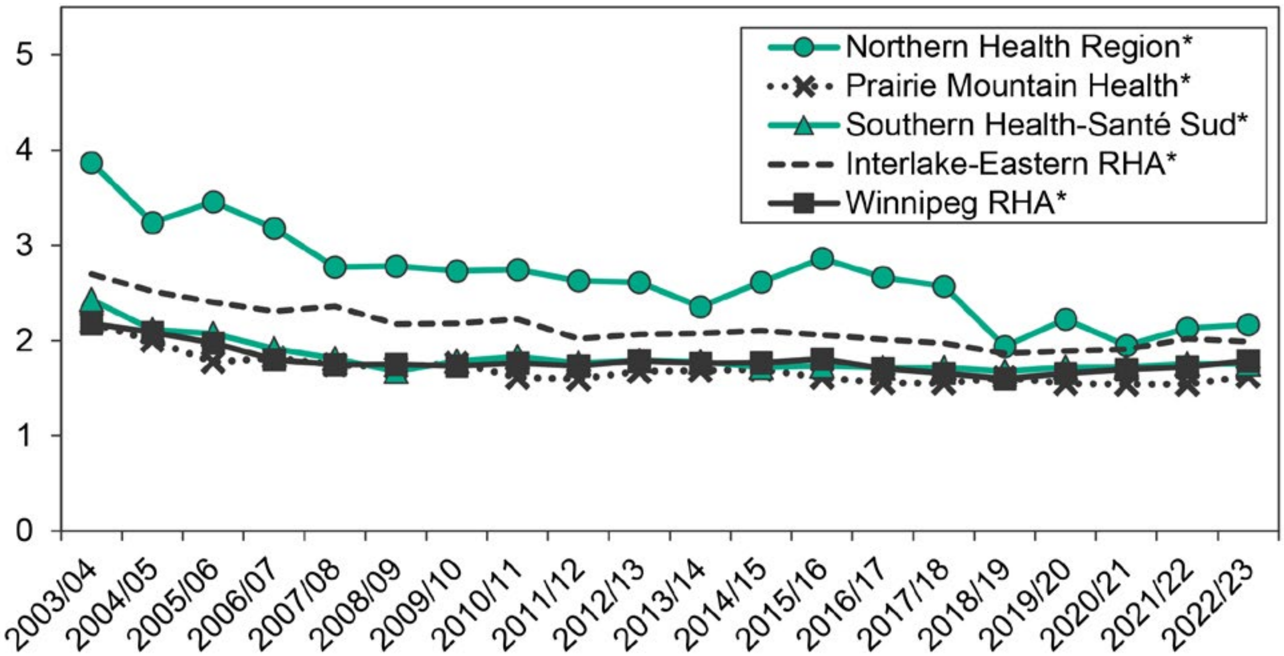
Figure 4.19: Prevalence of Congestive Heart Failure by Health Region, 2012/13, 2017/18, and 2022/23

Age- and sex-adjusted percent of residents (age 40+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.20: Prevalence of Congestive Heart Failure by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (age 40+) diagnosed with disorder



* statistically significant linear trend over time.

4.11 Dementia Prevalence

Definition: The percentage of residents aged 55 and older with dementia (including organic psychotic conditions, cerebral degenerations, and senility) in a five-year period as defined by either of the following:

- One or more hospitalizations:
  - ICD-9-CM codes 290, 291.1, 291.2, 292.82, 294, 331, 797
  - ICD-10-CA codes F00, F01, F02, F03, F04, F05.1, F06.5, F06.6, F06.8, F06.9, F09, F10.7, F11.7, F12.7, F13.7, F14.7, F15.7, F16.7, F17.7, F18.7, F19.7, G30, G31.0, G31.1, G31.9, G32.8, G91, G93.7, G94, R54, or
- One or more physician visits:
  - ICD-9-CM codes 290, 294, 331, or 797

Time period analysis: Prevalence was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 55 and older in 2022/23.

Trend analysis: Prevalence was calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 55 and older as of December 31, 2020 (midpoint year of the five-year time period).

Key Findings

Time Period Analysis (Figure 4.21)

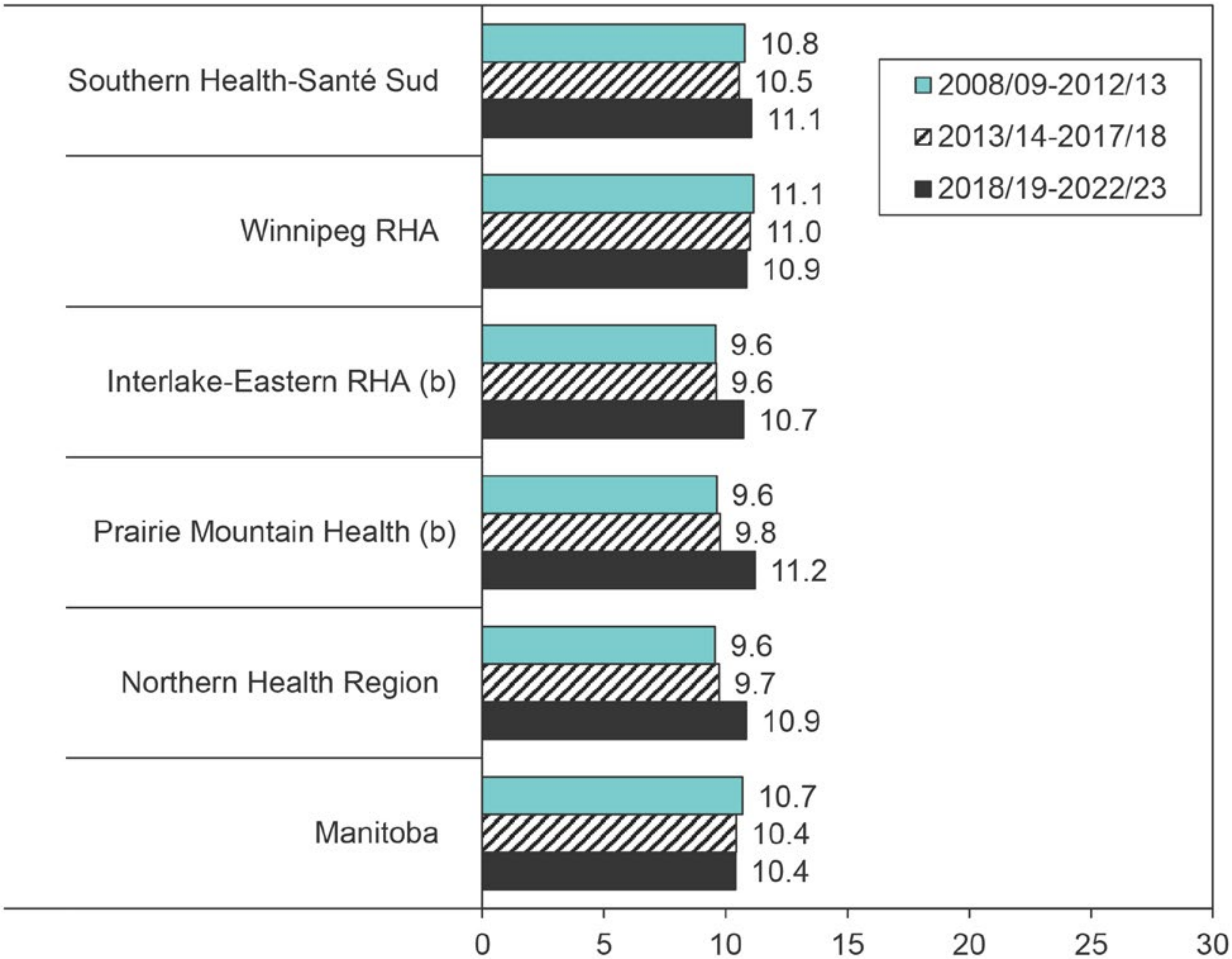
- In Manitoba, dementia prevalence was stable across the periods at 10.7% of the population aged 55 and older in TP1, 10.4% in TP2 and TP3. However, the number of people living with dementia between TP2 and TP3 has increased by 5,448, which represents a 14.8% increase (online supplement).
- The prevalence was stable during the first two periods in all regions; however, it increased between TP2 and TP3 in the Interlake-Eastern RHA and Prairie Mountain Health region.
- Prevalence was higher in the Winnipeg RHA and Southern Health-Santé Sud region than the Manitoba prevalence in all three periods, though these differences did not reach statistical significance. In each of the other regions the prevalences were lower in TP1 and TP2 and higher in TP3 compared to those in Manitoba, although none were significant differences.
- Dementia prevalence does not appear to be related to PMR at the regional level.
- Dementia prevalence was strongly associated to income levels for urban and rural residents in both time periods (see online supplement). The prevalence was higher among residents of lower income areas.

Trend Analysis (Figure 4.22)

- Dementia prevalence remained stable over time in Manitoba and in all regions except the Winnipeg RHA where it significantly decreased owing to a very high prevalence in the 2003/04-2007/08 period.

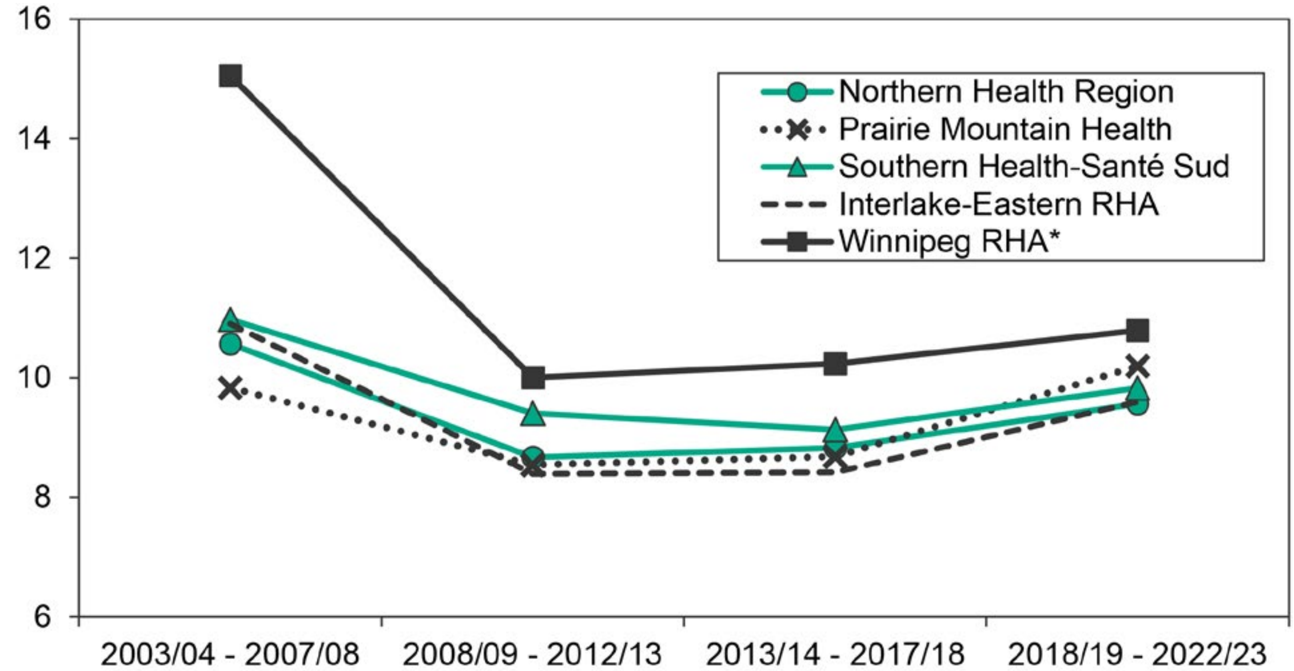
Figure 4.21: Dementia Prevalence by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted percent of residents (age 55+) diagnosed with disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.22: Dementia Prevalence by Health Region, 2003/04-2007/08 to 2018/19-2022/23
Age- and sex-adjusted percent of residents (age 55+) diagnosed with disorder



* statistically significant linear trend over time.

Section B: Adverse Health Events

4.12 Acute Myocardial Infarction (AMI) Rate

Definition: The number of hospitalizations or deaths due to AMI (also known as heart attack) per 1,000 residents aged 40 years and older in a five-year period. AMI was defined by either of the following:

- A hospitalization with a most responsible diagnosis code for AMI:
    - ICD-9-CM code 410; ICD-10-CA code I21 and a length of stay of at least three days (unless the patient died from the AMI, in which case they are included regardless of length of stay), or
- AMI listed as the cause of death in Vital Statistics Mortality Registry.

Time period analysis: Average annual rates were calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and were age- and sex-adjusted to the Manitoba population age 40 and older in TP3.

Trend analysis: Rates were calculated for each one-year period from 2003 to 2022 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 4.23)

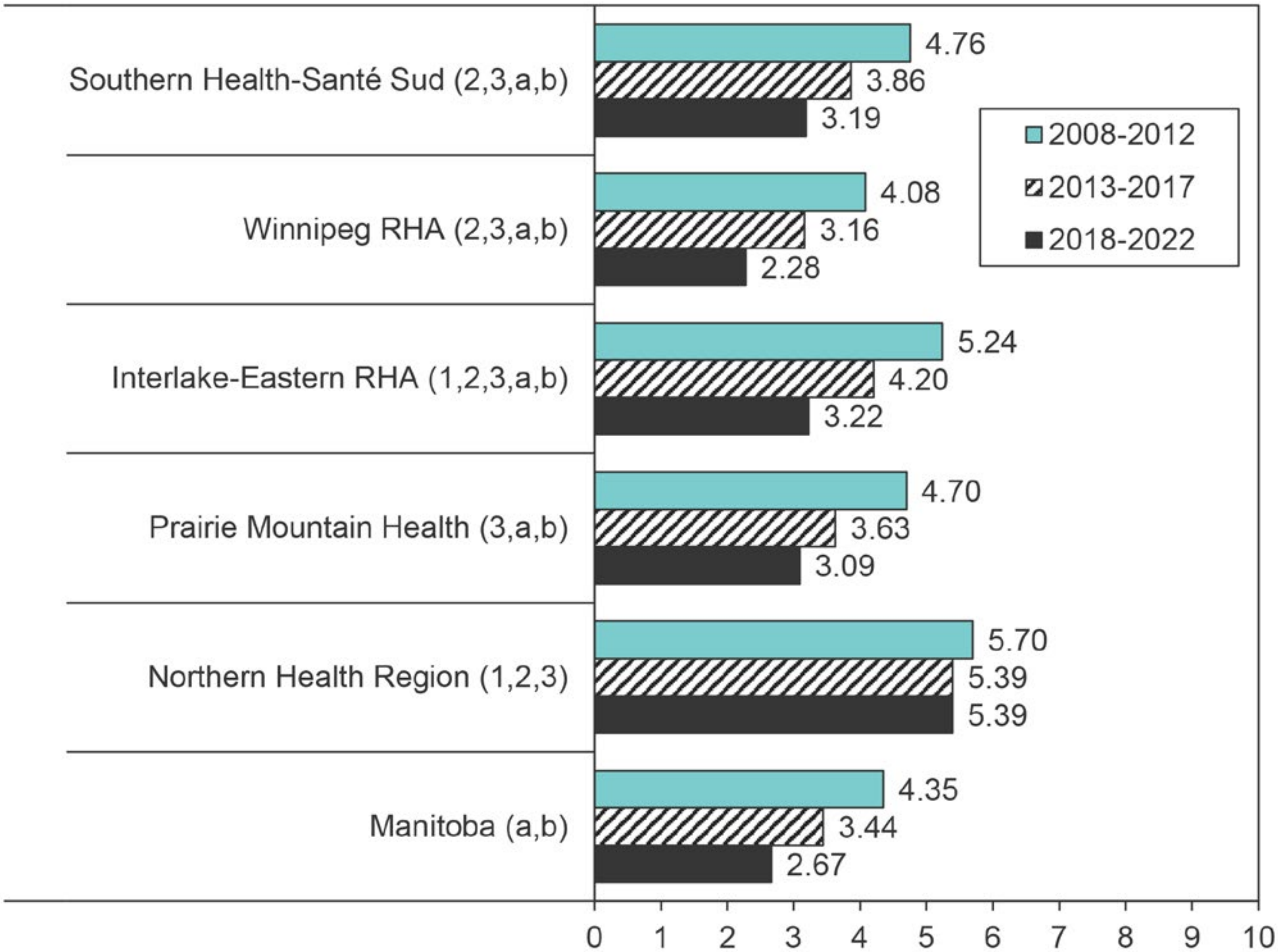
- In Manitoba, AMI rates decreased significantly from 4.4 events per 1,000 residents aged 40 years and older in TP1 to 3.4 in TP2 to 2.7 in TP3. There were also approximately 300 fewer AMIs that occurred in each subsequent time period (online supplement).
- A similar pattern existed within each region except the decreases in the Northern Health Region did not reach the level of significance.
- The Northern Health Region and Interlake-Eastern RHA had the highest rates in each period, which were significantly higher than the rates in Manitoba. Meanwhile, the Winnipeg RHA had the lowest rates, which were significantly lower than the rates in Manitoba for TP2 and TP3.
- AMI rates were strongly associated to income levels for urban and rural residents in all three time periods (see online supplement). Rates were higher among residents in lower income areas.

Trend Analysis (Figure 4.24)

- AMI rates decreased over time in Manitoba and in all the regions. The decrease appears to be most dramatic in the Winnipeg RHA.

Figure 4.23: Acute Myocardial Infarction (AMI) Rates by Health Region, 2008-2012, 2013-2017, and 2018-2022

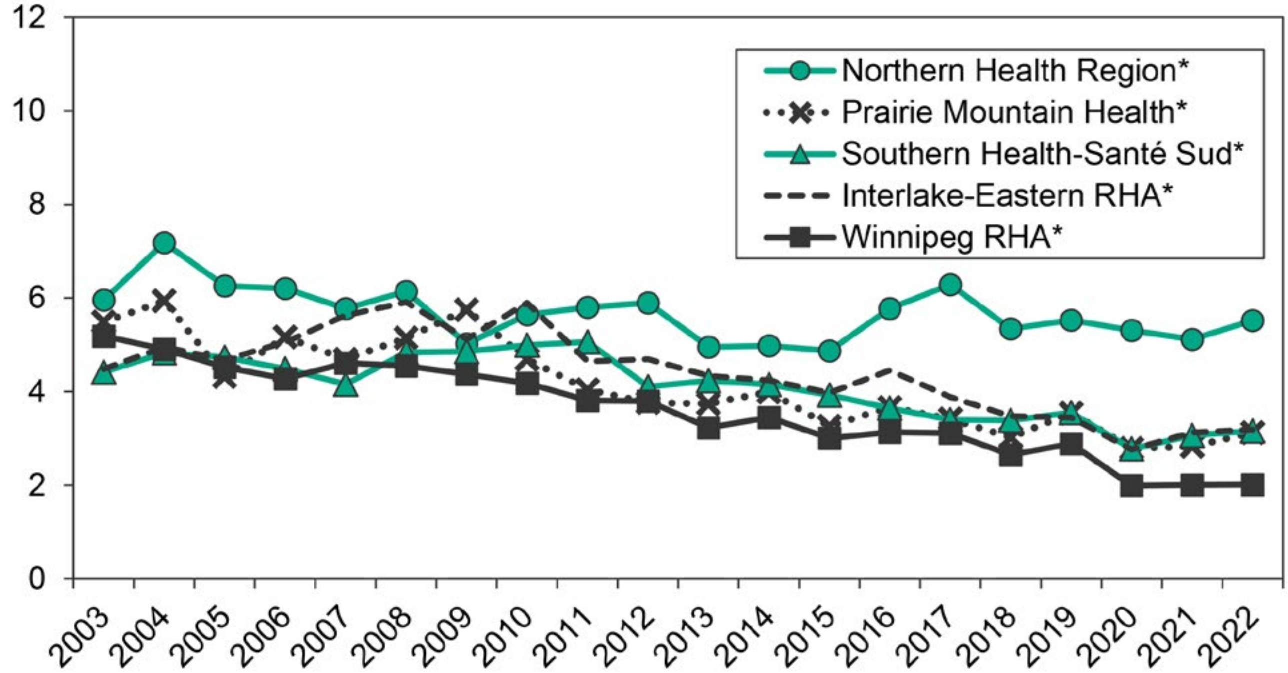
Age- and sex-adjusted average annual rate of death or hospitalization for AMI per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.24: Acute Myocardial Infarction (AMI) Rates by Health Region, 2003 to 2022

Age- and sex-adjusted average annual rate of death or hospitalization for heart attack per 1,000 residents (age 40+)



* statistically significant linear trend over time.

4.13 Stroke Rate

Definition: The number of hospitalizations or deaths due to stroke per 1,000 residents aged 40 years and older in a five-year period. Stroke was defined by either of the following:

- A hospitalization with a most responsible diagnosis code for stroke:
  - ICD-9-CM codes 431, 434, 436
  - ICD-10-CA codes I61, I63, I64 with a length of stay greater than or equal to one day (unless the patient died from the stroke, in which case they are included regardless of length of stay), or
- Stroke listed as the cause of death in Vital Statistics files.

Time period analysis: Average annual rates were calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and were age- and sex-adjusted to the Manitoba population age 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Rates were calculated for each one-year period from 2003 to 2022 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 4.25)

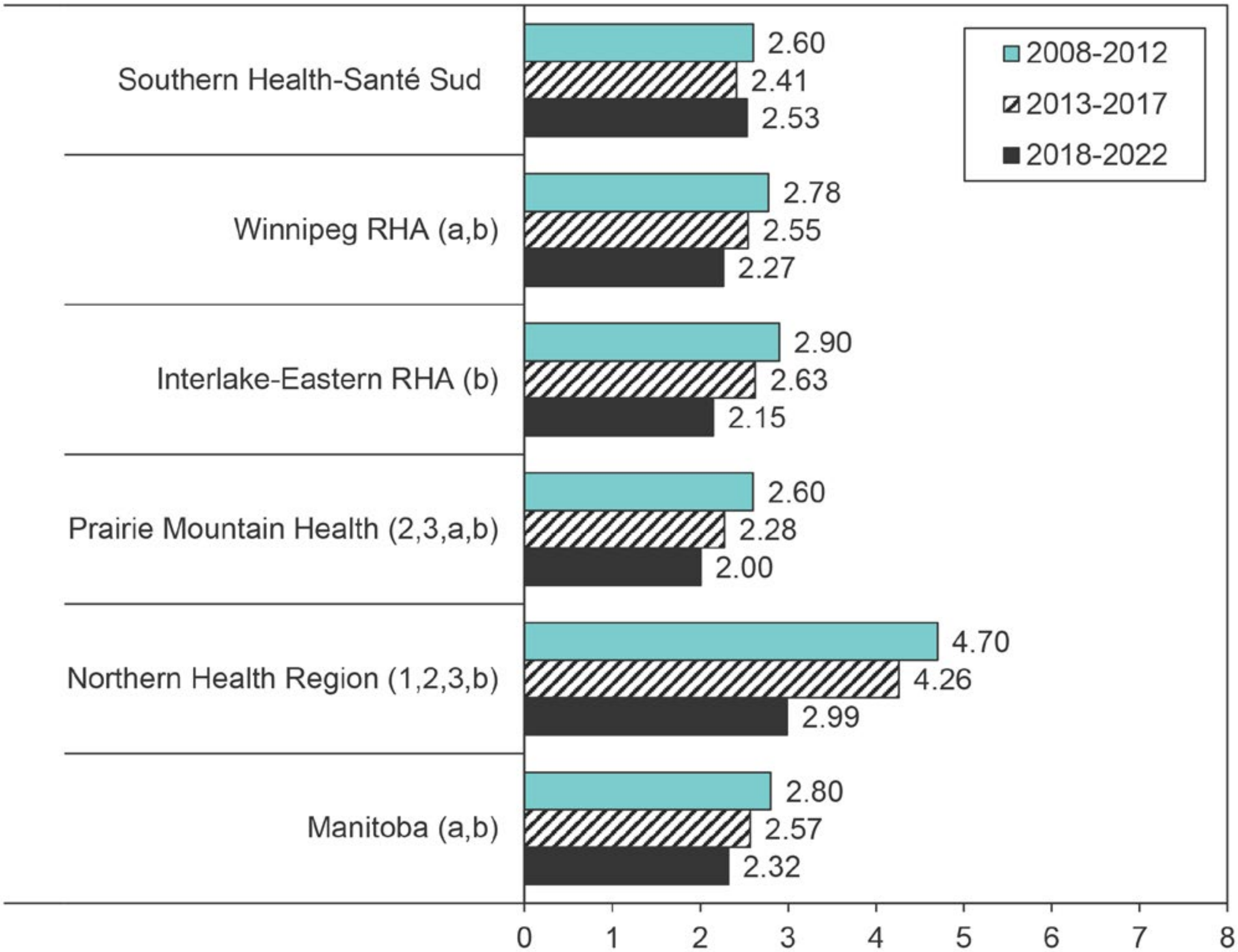
- In Manitoba, stroke rates decreased significantly from 2.8 events per 1,000 residents aged 40 years and older in TP1 to 2.6 in TP2 to 2.3 in TP3. The number of strokes in each period was remarkably stable at approximately 1550 (online supplement).
- A similar pattern existed within each region except for the Southern Health-Santé Sud region where the rates across the periods were not significantly different.
- The Northern Health Region had the highest rates in each period, which were significantly higher than the rates in Manitoba. Meanwhile, the Prairie Mountain Health region had the lowest rates, which were significantly lower than the rates in Manitoba for TP2 and TP3.
- Stroke rates were strongly associated to income levels for urban and rural residents in all three time periods (see online supplement). Rates were higher among residents in lower income areas.

Trend Analysis (Figure 4.26)

- Stroke rates decreased over time in Manitoba and in all the regions. There was greater variation in the Northern Health Region rates than the other regions.

Figure 4.25: Stroke Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022

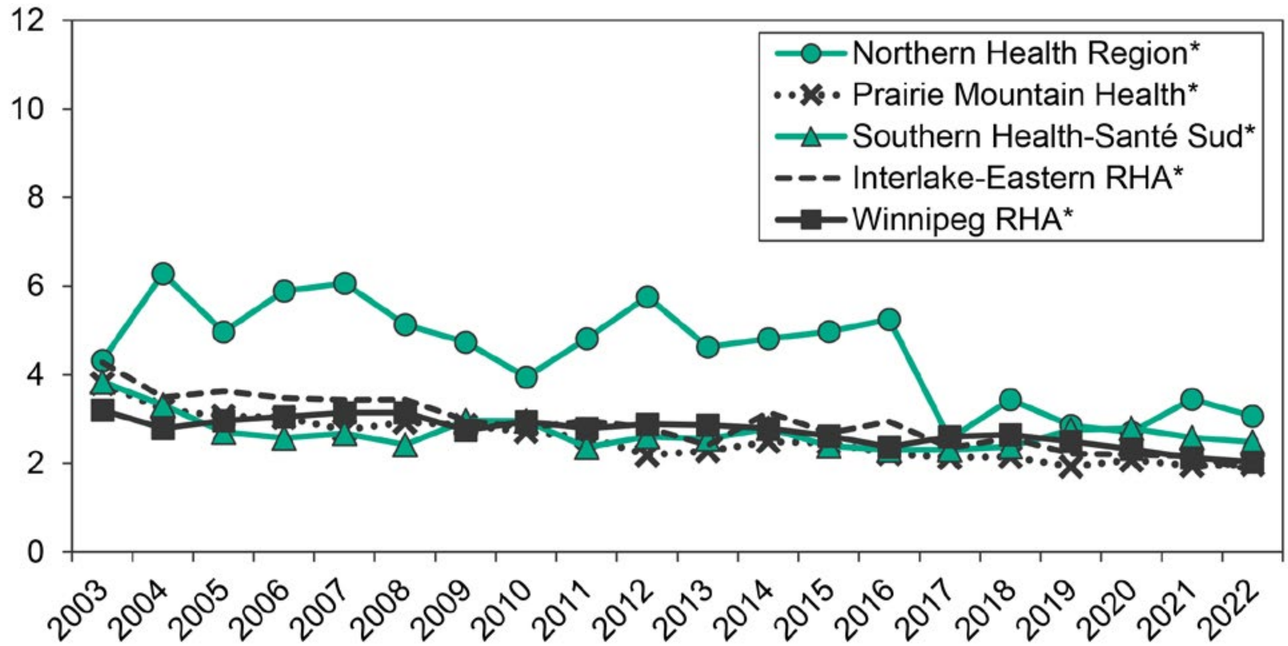
Age- and sex-adjusted average annual rate of death or hospitalization for stroke per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.26: Stroke Rates by Health Region, 2003 to 2022

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



* statistically significant linear trend over time.

4.14 Lower Limb Amputation Among Residents with Diabetes

Definition: The percentage of residents aged 19 and older with diabetes who had a lower limb amputation (below or including the knee) in a five-year period as defined by the following:

- Surgical procedure code:
  - ICD-9-CM codes 84.10–84.17, or
  - CCI codes 1.VC.93, 1.VG.93, 1.VQ.93, 1.WA.93, 1.WE.93, 1.WJ.93, 1.WK.93, 1.WM.93, or 1.WN.93.

Manitoba residents with diabetes were defined using the case definition for diabetes prevalence in Section 4.4. Amputations associated with injury were excluded.

Time period analysis: Percentages were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population with diabetes age 19 and older in TP3.

Trend analysis: Percentages were calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population with diabetes aged 19 and older as of December 31, 2021.

Key Findings

Time Period Analysis (Figure 4.27)

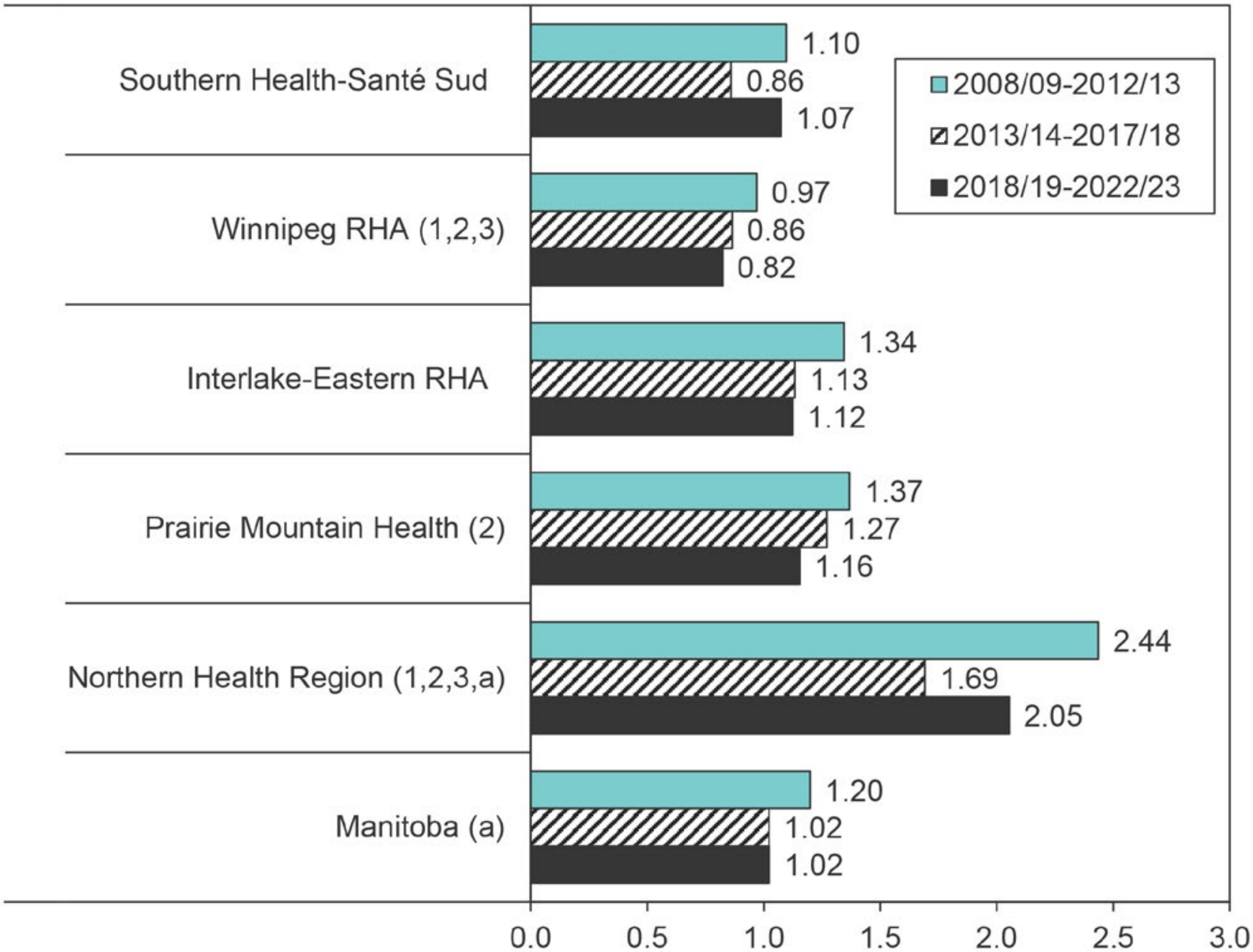
- In Manitoba, lower limb amputation rates decreased significantly from 1.2% of diabetic population 19 years and older in TP1 to 1.0% in TP2 and TP3. Despite the decreased rates, the number of amputations has increased across the time periods from 1,101 in TP1 to 1,241 in TP2 to 1,424 in TP3 (online supplement). The percentages fluctuated across the periods within the regions.
- There was only one significant decrease between periods, which occurred in the Northern Health Region between TP1 and TP2.
- The Northern Health Region had the highest percentage of amputations in all three periods, which were all significantly higher than the percentages in Manitoba. The Winnipeg RHA had the lowest percentages, which were all significantly lower than the percentages in Manitoba.
- The percentage of lower limb amputations among individuals with diabetes appears to be related to health status as the percentage increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Lower limb amputations were strongly associated to income levels for urban and rural residents in all three time periods (see online supplement). The percentage of amputations were higher among residents from lower income areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 4.28)

- The percentage of people with diabetes 19 years or older who received a lower limb amputation decreased over time in Manitoba and in all the regions except Prairie Mountain Health where it remained stable.

Figure 4.27: Lower Limb Amputation among Residents with Diabetes by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

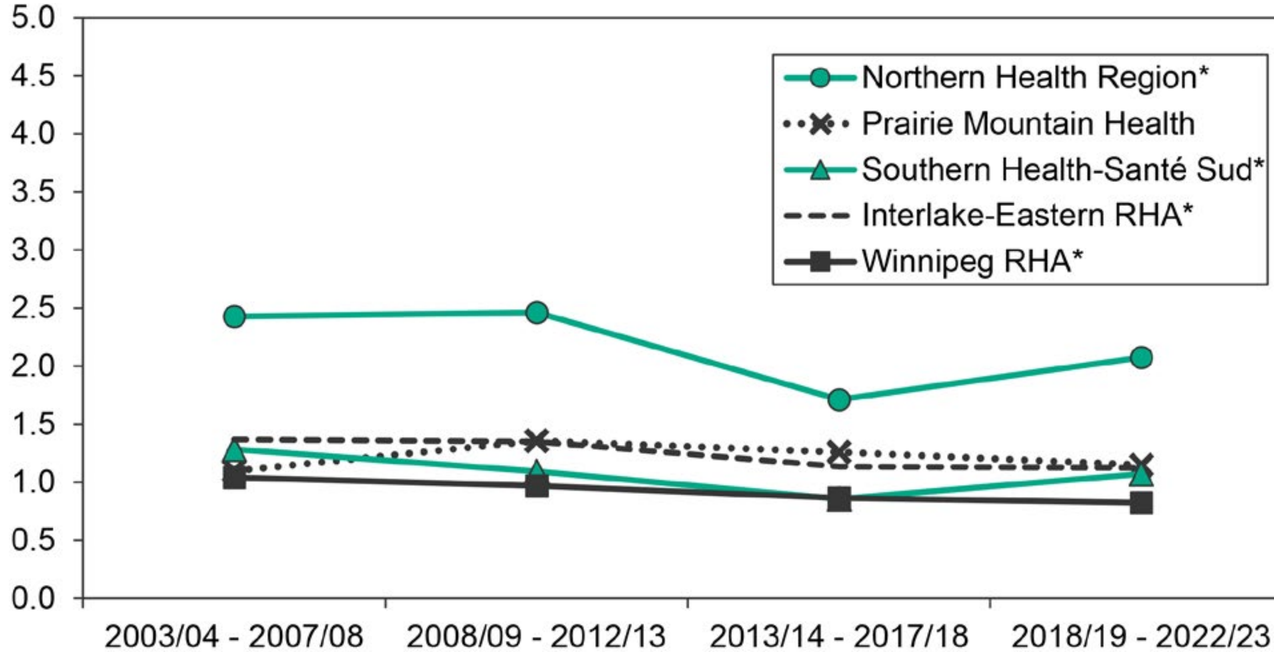
Age- and sex-adjusted percent of residents with diabetes (age 19+) who had an amputation



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 4.28: Lower Limb Amputation among Residents with Diabetes by Health Region, 2003/04-2007/08 to 2018/19-2022/23

Age- and sex-adjusted percent of residents with diabetes (age 19+) who had an amputation



* statistically significant linear trend over time.

Chapter 5:
Mental Illness

Key Findings in Chapter 5

- The results reveal that the prevalence of mood and anxiety disorders significantly increased over the 20-year period, which may be due to more people being diagnosed in more recent years as evidenced by the increase observed from the second time period (25.2%) to the third period (28.7%).
- Substance use disorder prevalence significantly decreased over the 20-year period but did not change between second (4.6%) and third (4.9%) periods suggesting that the diagnosed population may have plateaued. Individuals receive care in the community setting of which data is not available – therefore, the true prevalence is likely higher than reported.

Introduction

This chapter contains indicators of the prevalence of two mental health disorders. The definitions used to identify each disorder uses a combination of data from physician visits, hospitalizations, and prescription drug dispensations, which cover the entire Manitoba population. Hospital claims are coded using the ICD-9-CM system prior to April 1, 2004, and the ICD-10-CA system thereafter. Physician claims use the ICD-9-CM system. Prescription drug dispensations are identified in the drug program information network. The codes used in each system are listed in the definition for each indicator. Given that patients need to access care in order to be identified with the administrative data definitions, and that the Repository does not contain data for services provided in the community (e.g., psychologists, substance use treatment/community programs), the prevalence estimates likely underestimate the true prevalence of these disorders.

5.1 Mood and Anxiety Disorders Prevalence

Definition: The percentage of residents aged 10 years and older with mood and anxiety disorders. Mood and anxiety disorders include depression, episodic mood disorders (bipolar disorder, manic episode), anxiety (anxiety disorders, phobic disorders, obsessive-compulsive disorders), dissociative and somatoform disorders, or adjustment reaction. These were identified in a five-year period using the following definition:

- One or more hospitalizations:
  - ICD-9-CM codes 296.1-296.8, 300.0, 300.2-300.4, 300.7
  - ICD-10-CA codes F31, F32, F33, F34.1, F38.0, F38.1, F40, F41.0-F41.3, F41.8, F41.9, F42, F43.1, F43.2, F43.8, F45.2, F53.0, F93.0, or
- One or more physician visits:
  - ICD-9-CM codes 296, 311, or
- One hospitalization or physician visit:
  - ICD-9-CM code 300
  - ICD-10-CA codes F32, F34.1, F40, F41, F42, F44, F45.0, F45.1, F48, F68.0, F99 and one or more dispensation for mood and anxiety disorder medications (ATC codes N05AN01, N05BA, N06A), or
- Three or more physician visits:
  - ICD-9-CM codes 300, 309

Time period analysis: Prevalence was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2003/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was age- and sex–adjusted to the Manitoba population aged 10 and older in TP3.

Trend analysis: Prevalence was calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 10 and older as of December 31, 2020 (midpoint year of the five-year time period).

Key Findings

Time Period Analysis (Figure 5.1)

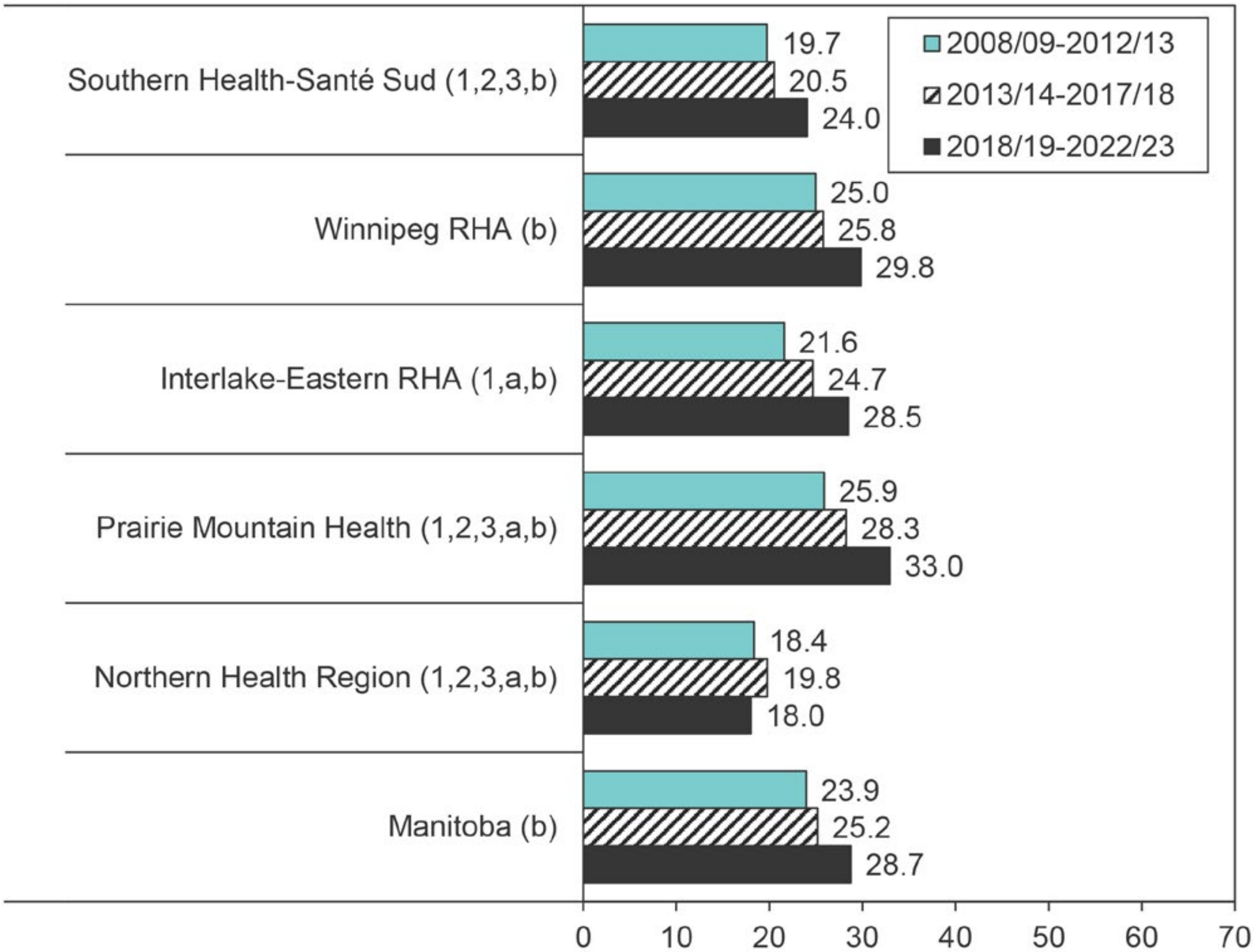
- In Manitoba, mood and anxiety disorders prevalence increased from 23.9% of the population 10 years or older in TP1 to 25.2% in TP2 and 28.7% in TP3. The increase between TP2 and TP3 was significant. The total number of people identified as living with a mood or anxiety disorder has increased from 256,950 in TP1 to 290,174 in TP2 to 349,460 in TP3 (online supplement). The difference between TP2 and TP3 represents a 20.4% increase.
- The pattern of prevalence across the periods in the province held within all regions except for the Northern Health Region where there was a significant increase between TP1 and TP2 and a significant decrease between TP2 and TP3.
- The prevalence in the Southern Health-Santé Sud and Northern Health Regions in all three periods were significantly lower than those in Manitoba, while they were significantly higher in Prairie Mountain Health region.
- Mood and anxiety disorders prevalence appears related to health status at the regional level even though the prevalence was lowest in the Northern Health Region. There is an issue with medical claims data for Northern residents where districts may receive primary care services from “non–physician” providers, which is not captured in the data. Therefore, the Northern Health Region prevalence is most likely to be an underestimate.
- Mood and anxiety disorders prevalence was significantly associated to income in urban areas in all three periods, with higher prevalence among residents of lower income areas (see online supplement). Among rural areas, there was no relationship with income in TP3 and a statistically significant but modest relationship in TP1 and TP2. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 5.2)

- Mood and anxiety disorder prevalence increased over time in Manitoba and in all regions except the Northern Health Region, where it remained stable.

Figure 5.1: Prevalence of Mood and Anxiety Disorders by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

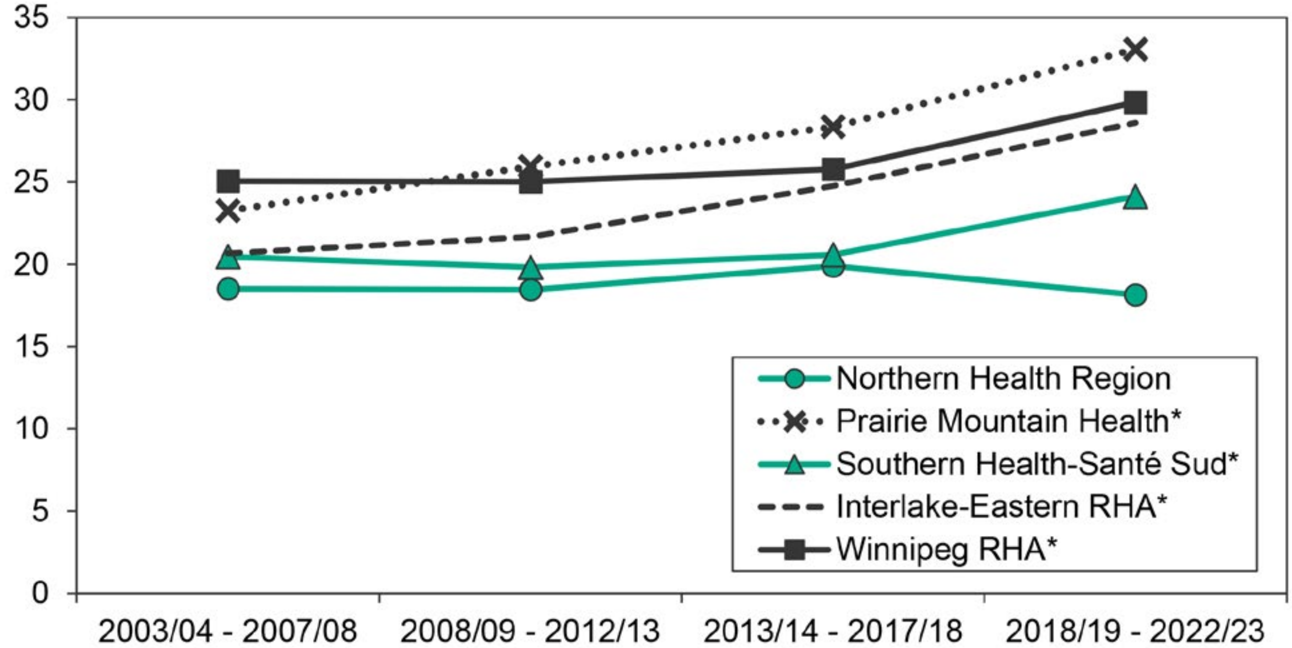
Age- and sex-adjusted percent of residents (age 10+) diagnosed with a disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 5.2: Prevalence of Mood and Anxiety Disorders by Health Region, 2003/04-2007/08 to 2018/19-2022/23

Age- and sex-adjusted percent of residents (age 10+) diagnosed with a disorder



* statistically significant linear trend over time.

5.2 Substance Use Disorder Prevalence

Definition: The percentage of residents aged 10 years and older with a substance use disorder. Substance use disorder includes alcoholic or drug psychoses, alcohol or drug dependence, or nondependent abuse of drugs. These were identified in a five-year period using the following definition:

- One or more hospitalizations:
  - ICD-9-CM codes 291, 292, 303, 304, 305
  - ICD-10-CA codes F10–F19, F55, or
- One or more physician visits:
  - ICD-9-CM code
  - 291, 292, 303, 304, 305

Time period analysis: Prevalence was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2003/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was age- and sex–adjusted to the Manitoba population aged 10 and older in TP3.

Trend analysis: Prevalence was calculated for 4 five-year periods starting from 2003/04-2007/08 and ending at 2018/19-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 10 and older as of December 31, 2020 (midpoint year of the five-year time period).

Key Findings

Time Period Analysis (Figure 5.3)

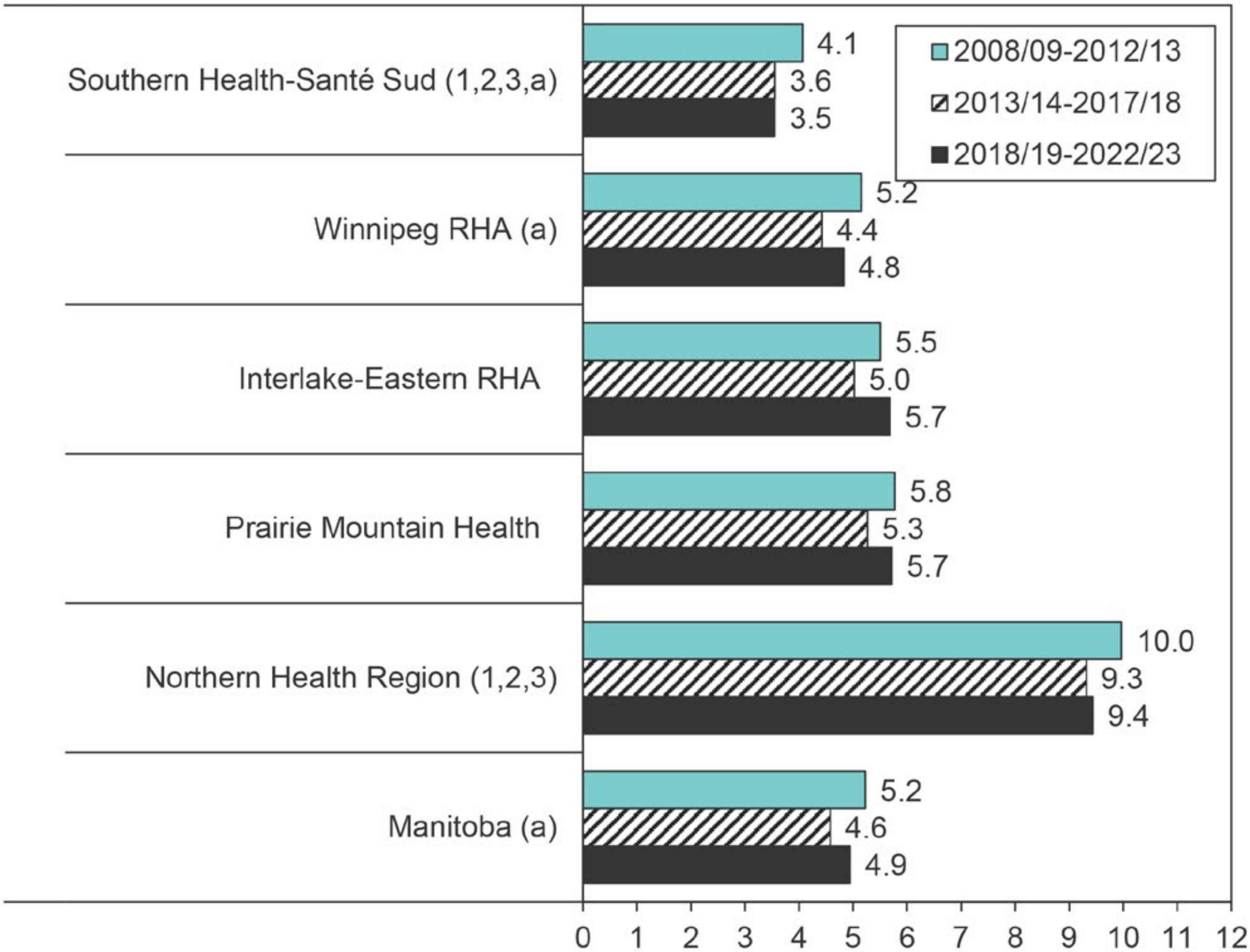
- In Manitoba, substance use disorder prevalence decreased from 5.2% of the population 10 years or older in TP1 to 4.6% in TP2 and then increased to 4.9% in TP3. The decrease between TP1 and TP2 was significant. The actual number of people living with a substance use disorder has remained relatively stable across the three periods.
- The prevalence pattern in Southern Health-Santé Sud and Winnipeg RHA were similar to that of the province overall. There were no significant differences between the time periods in any of the other regions.
- The Northern Health Region had the highest prevalence in all three periods, which were significantly higher than those in Manitoba. The Southern Health-Santé Sud region had the lowest prevalence in each period, which were significantly lower than the prevalence in Manitoba.
- Substance use disorder prevalence appears to be related to health status as the prevalence increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Substance use disorder prevalence was significantly associated to income in urban and rural areas in all three periods, with higher prevalence among residents of lower income areas (see online supplement).

Trend Analysis (Figure 5.4)

- Substance use disorder prevalence decreased over time in Manitoba and in the Winnipeg RHA and Northern Health Region, while it remained stable in the other regions.

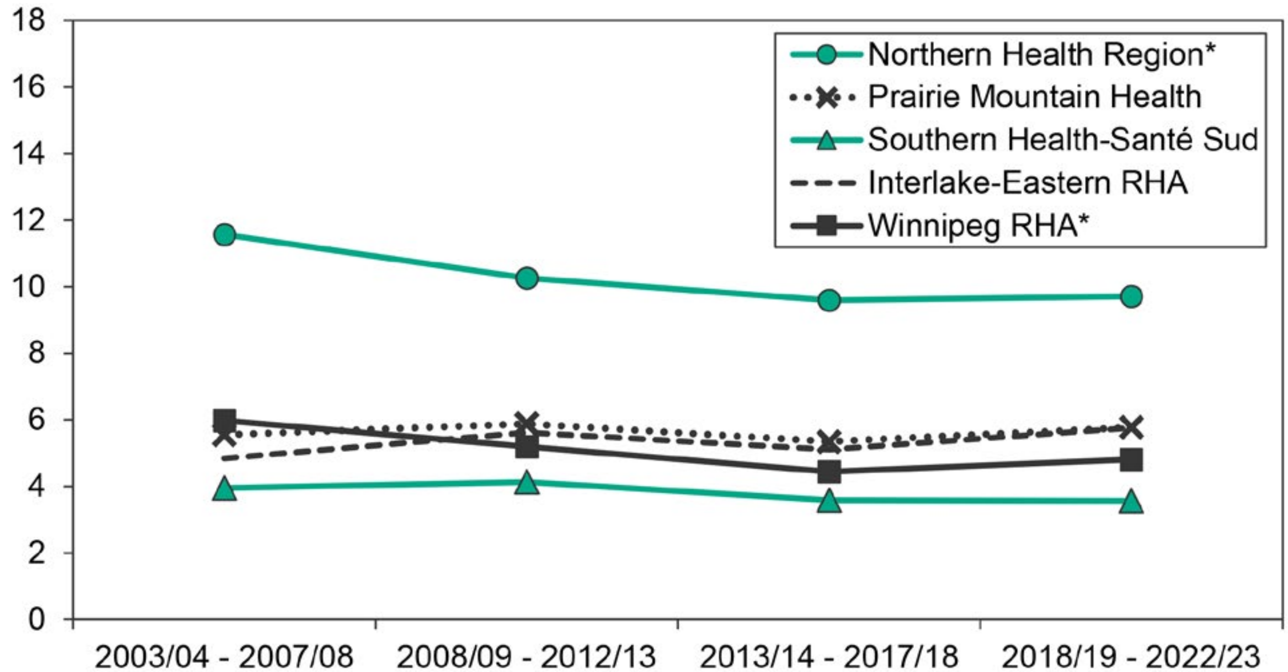
Figure 5.3: Prevalence of Substance Use Disorder by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted percent of residents (age 10+) diagnosed with a disorder



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 5.4: Prevalence of Substance Use Disorder by Health Region, 2003/04-2007/08 to 2018/19-2022/23
Age- and sex-adjusted percent of residents (age 10+) diagnosed with a disorder



* statistically significant linear trend over time.

Chapter 6:
Physician and Nurse Practitioner Services

Key Findings in Chapter 6

- Most of the indicators show relatively stable rates of physician and nurse practitioner services use over time.
- The percentage of the population having at least one visit with a physician or nurse practitioner in a given year decreased significantly between the second and third time periods. This indicator also had a significantly decreasing trend over the 20-year period. Perhaps an impact of the COVID-19 pandemic.
- The average rate of visits to physicians and nurse practitioners increased slightly between each time period, but these changes were not statistically significant.
- The rate of consultations with specialists also increased slightly (but not significantly) over the three periods. However, the rates did show a significantly increasing trend over the 20-year period.
- Continuity of care increased significantly between the second and third time periods indicating that more recently there were more people who visited a smaller number of different primary care providers.

Introduction

This chapter provides results for a number of indicators of the use of physician and nurse practitioner services by residents of Manitoba. In this report, service use is allocated to the area of a patient's residence, regardless of where the service was provided. For example, if a resident of Northern Health Region visits a physician in the Winnipeg RHA, it would be counted as a visit for a Northern resident. Similarly, if a nurse practitioner normally based in the Winnipeg RHA provides services in Prairie Mountain Health, these are counted as services provided to Prairie Mountain Health residents.

The primary indicator of visits to physicians and nurse practitioners is called ‘ambulatory visits’; it captures the vast majority of all contacts with physicians and nurse practitioners. Ambulatory visits include visits to providers’ offices/clinics, visits to walk–in clinics, home visits, nursing home visits, visits provided in outpatient departments of hospitals, and visits for prenatal care. The only exclusions are visits provided while a patient is admitted to hospital and emergency department visits (because of limitations in the data system).

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

The indicators in this chapter include visits to all licensed medical doctors and nurse practitioners for which claims were submitted to Manitoba Health (via the usual fee-for-service claims or shadow billing claims). Most physicians working under alternative payment schemes (e.g., salary) are encouraged to submit shadow billing claims, but because these data may not be complete, our results may underestimate true visit rates. Analyses in a previous MCHP report suggest that shadow billings appear to be missing for about one-third of all visits provided by salaried physicians.[12]

Residents of some First Nation communities (primarily but not exclusively in the Northern Health Region) often have ambulatory visit rates that are lower than expected because local nursing stations provide the majority of their primary care visits, which is not tracked in the medical claims database. Therefore, the ambulatory visit rate is an underestimate of the total amount of care received by these residents.

6.1 Use of Physician and Nurse Practitioner Services

Definition: The percentage of residents (all ages) who had at least one ambulatory visit with a physician or a nurse practitioner in a fiscal year. Ambulatory visits include virtually all contacts with physicians and nurse practitioners, except during inpatient hospitalization and emergency department visits.

Time period analysis: The percentage of the population with one or more ambulatory visits to a physician or nurse practitioner was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The percentage of the population with one or more ambulatory visits to a physician or nurse practitioner was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 6.1)

- In Manitoba, the percentage of residents with at least one visit to a physician or nurse practitioner was 80.4% in TP1 and TP2 and then decreased to 77.4% in TP3. The change between TP2 and TP3 was statistically significant. The actual count increased slightly each period from 1,018.083 to 1,092,380 to 1,113,263 people who visited a provider (online supplement).
- This trend was reflected in all regions, although the decreases from TP2 to TP3 did not reach the level of statistical significance in the Winnipeg RHA and Interlake-Eastern RHA. The Northern Health Region also experienced a significant decrease between TP1 and TP2.
- The Northern Health Region had the lowest percentage of residents who saw a primary care provider in each period, which was significantly lower than those for Manitoba. Higher percentages than Manitoba were observed for the Southern Health-Santé Sud region in TP1 and TP3, while they were higher in the Winnipeg RHA in TP2 and TP3.
- Use of physician and nurse practitioner services was only significantly related to income in rural areas in TP2 where the percentage of residents with at least one visit was lower for residents of lower

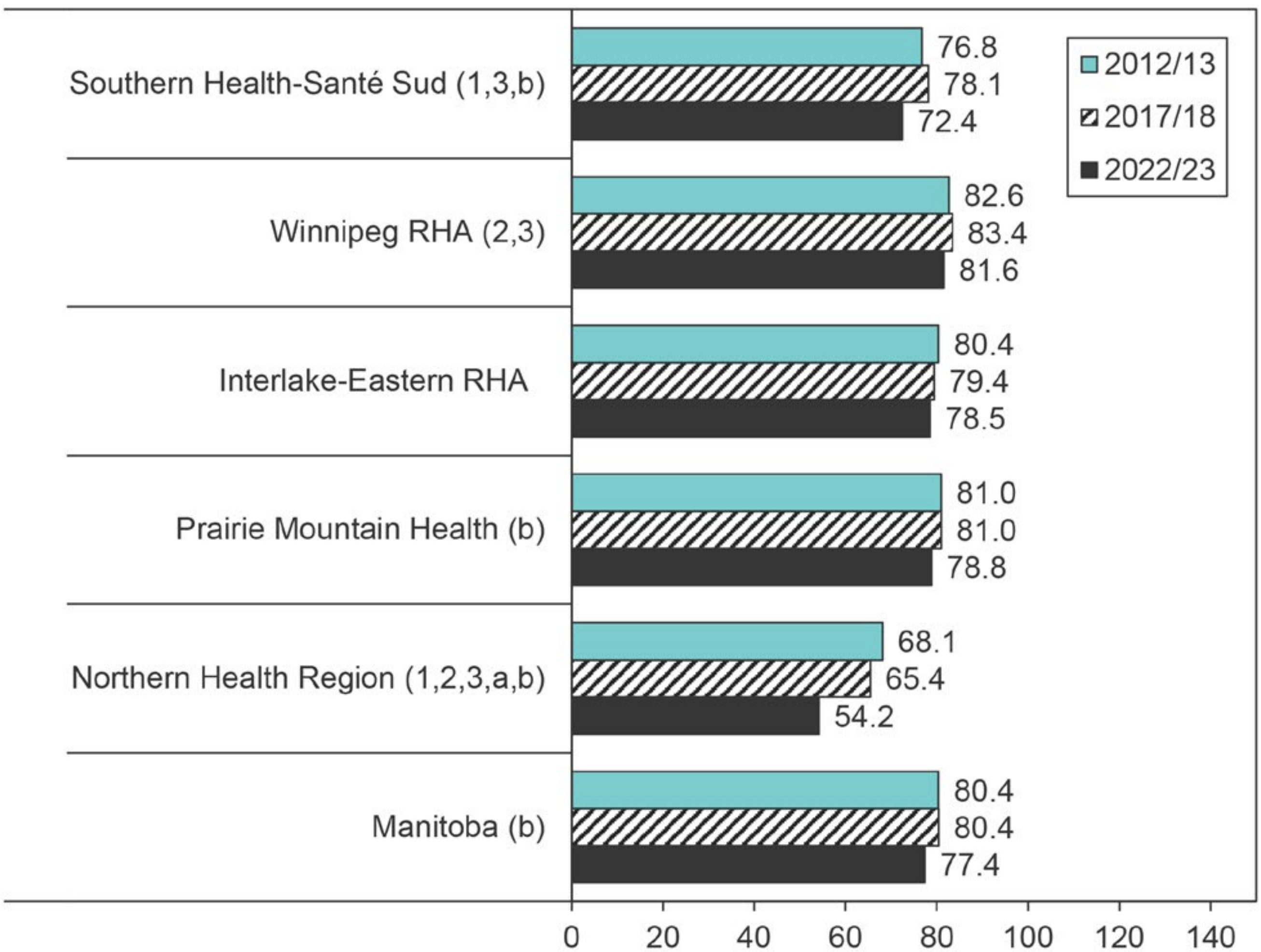
income areas (see online supplement). A similar trend appeared in TP1, but it was not statistically significant. In urban areas, there was no relationship between income and the percentage of residents who made at least one visit to physicians and nurse practitioners.

Trend Analysis (Figure 6.2)

- A downward trend over time in Manitoba and in all regions are driven by the dramatic decrease that occurred between 2019/20 and 2020/21. The percentages slowly increase after 2020/21.

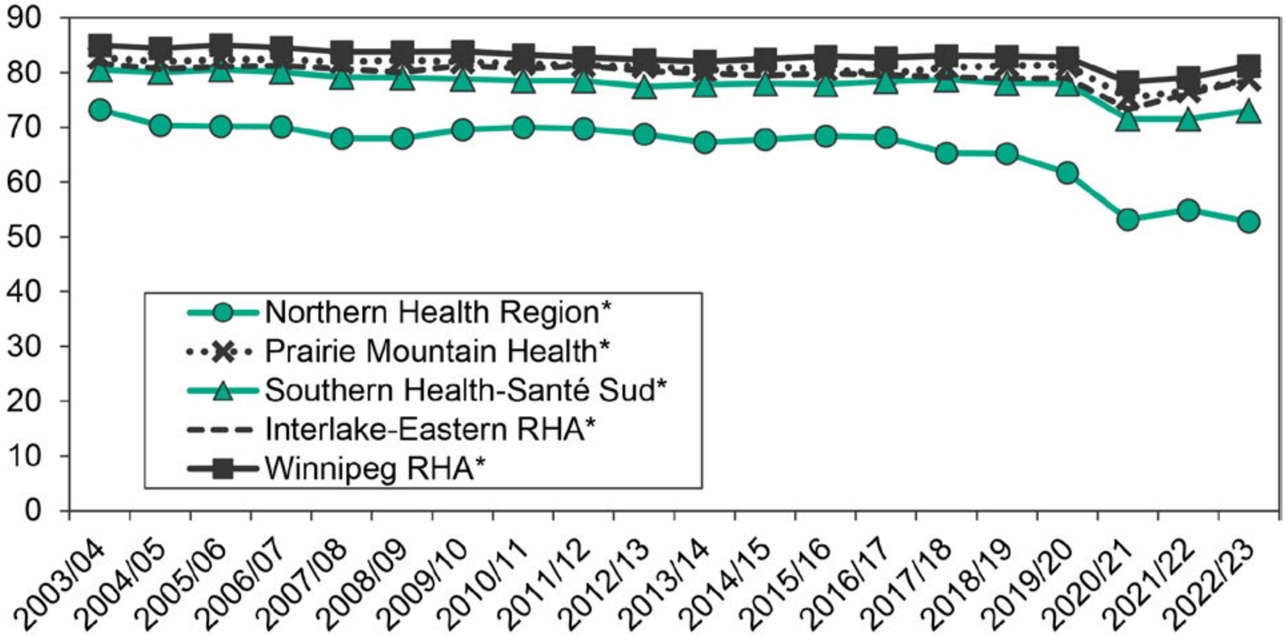
Figure 6.1: Use of Physician and Nurse Practitioner Services by Health Region, 2012/13, 2017/18, and 2022/23

Age- and sex-adjusted percent of residents (all ages) with at least one ambulatory visit in a year



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 6.2: Use of Physician and Nurse Practitioner Services by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (all ages) with at least one ambulatory visit in the year



* statistically significant linear trend over time.

6.2 Ambulatory Visits to Physicians and Nurse Practitioners

Definition: The average number of visits to physicians and nurse practitioners per resident (all ages) in a given year. Ambulatory visits include almost all contacts with nurse practitioners and physicians (family physicians and specialists): regular office visits, walk-in clinic visits, home visits, nursing home visits, and visits to outpatient departments. Services provided to patients while admitted to hospital and emergency department visits are excluded.

Time period analysis: The average number of physician and nurse practitioner visits per resident were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The average number of physician and nurse practitioner visits per resident were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 6.3)

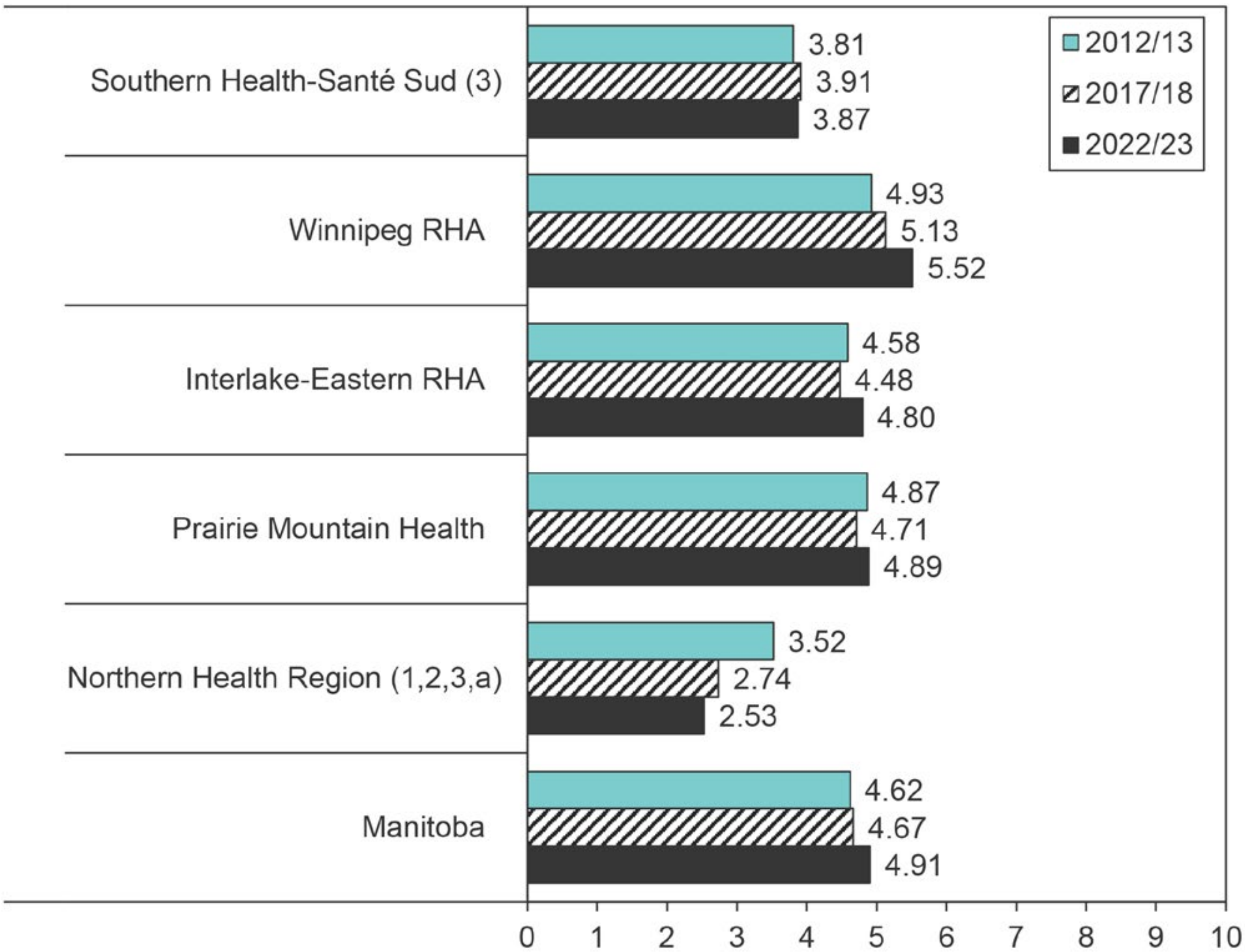
- Overall, the rate of ambulatory visits increased slightly but not significantly from 4.6 visits per person per year in TP1 to 4.7 in TP2 to 4.9 in TP3. The number of visits increased steadily from 5,827,782 in TP1 to 6,422,599 in TP2 to 7,054,762 in TP3 (online supplement).
- Some regions had small increases and others had small decreases but the only change that was significant was the decrease between TP1 and TP2 in the Northern Health Region.
- The Northern Health Region had the lowest rates in each period, which were significantly lower than those for Manitoba. The highest rates were observed for the Winnipeg RHA, Interlake-Eastern RHA, and Prairie Mountain Health, although they were not different from the Manitoba rates.
- Visit rates were significantly associated to income in rural areas in TP2 and TP3 where the rates were lower for residents of lower income areas (see online supplement). A similar trend appeared in TP1, but it was not statistically significant. In urban areas, there was no association between income and visit rates to physicians and nurse practitioners.

Trend Analysis (Figure 6.4)

- There was a decreasing trend observed in the Southern Health-Santé Sud region and the Northern Health Region, while it has been stable over time in the other regions and Manitoba overall. We see a smaller drop that occurred between 2019/20 and 2020/21 than we do for the percentage of residents who made at least one visit.

Figure 6.3: Ambulatory Visit Rate by Health Region, 2012/13, 2017/18, and 2022/23

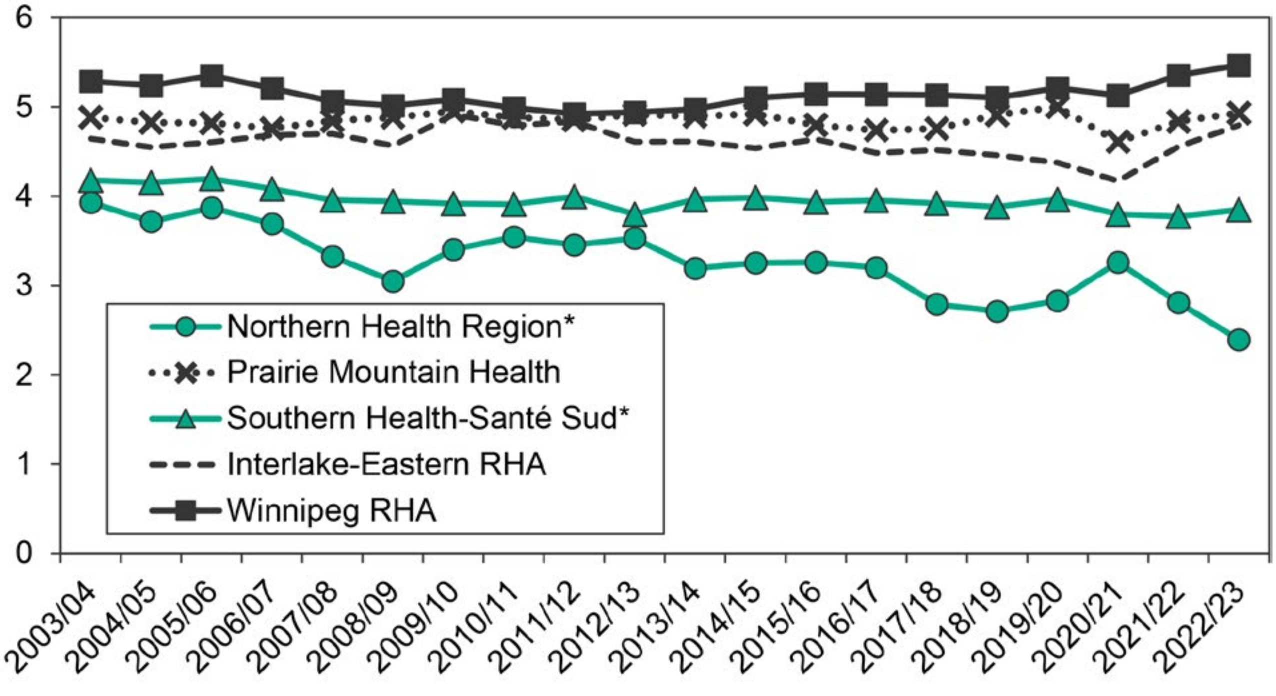
Age- and sex-adjusted rate of ambulatory visits to physicians and nurse practitioners per resident (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 6.4: Ambulatory Visit Rate by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted rate of ambulatory visits to physicians and nurse practitioners per residents (all ages)



* statistically significant linear trend over time.

6.3 Ambulatory Visits by Age and Sex

Definition: The average number of visits to physicians and nurse practitioners by age and sex.

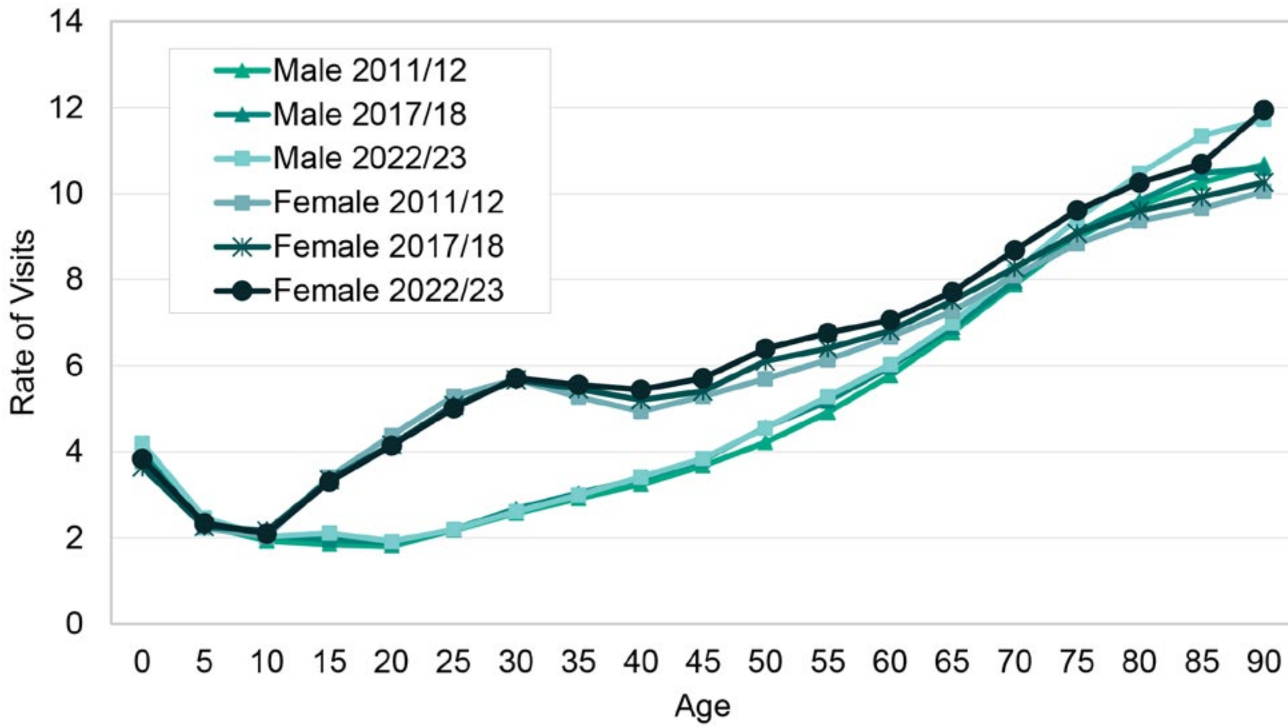
Time period analysis: Crude physician and nurse practitioner visit rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

Key Findings

Time Period Analysis (Figure 6.5)

- For males, visit rates in all three periods years were elevated for infants and young children (0 to 4 years), then decreased as the children entered later childhood and young adulthood. From age 20 onward, visit rates increased steadily with age to their peak among the oldest age groups.
- For females, visit rates in all three periods were elevated for infants and young children, decreased in middle childhood, but then increased sharply in adolescence and into the child-bearing years. Rates decreased slightly from age 30 to 40, then gradually increased with age, reaching their peak in the oldest age groups.

Figure 6.5: Ambulatory Visit Rates by Age and Sex in Manitoba, 2012/13, 2017/18, and 2022/23
Crude annual rate of ambulatory visits to physicians and nurse practitioners per resident



6.4 Reasons for Ambulatory Physician and Nurse Practitioner Visits

Definition: The most common reasons for ambulatory visits to physicians and nurse practitioners. Each visit has only one diagnosis code recorded as the 'reason' for the visit, and these diagnoses were grouped by ICD-9-CM chapter. The percent of visits by ICD-9-CM chapter in Manitoba between 2022/23 were calculated and the top ten highest were determined and used to set the order for each region.

Notes regarding two key groups of causes:

- Health status and contact: the majority of visits in this category were for general physical examinations but also include a number of other issues like well-baby care, contraceptive management, and other examinations. For these visits, patients usually were not presenting for a problem related to a specific disease or condition.
- Ill-defined conditions: the majority of visits in this category were for chest and respiratory symptoms, abdominal and pelvic symptoms, and general symptoms. For most of these visits, the patient was experiencing a specific problem, but it could not be assigned to a specific disease category.

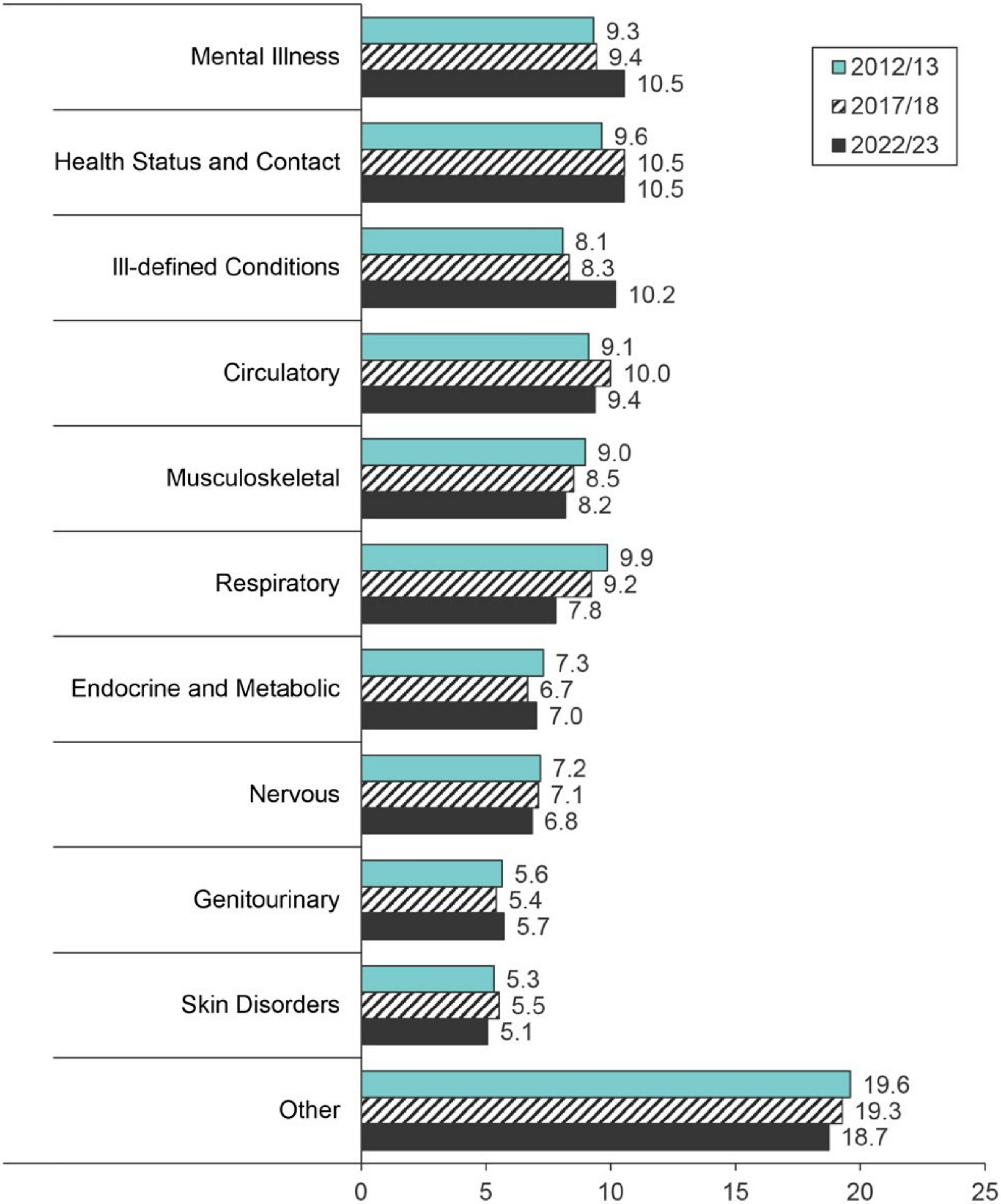
Time period analysis: The average annual crude percentage for the ten most common reasons for physician visits in Manitoba were calculated for each region for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3). The number of visits used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

Key Findings

Time Period Analysis (Figures 6.6 – 6.11)

- The diagnoses made during physician and nurse practitioner visits were spread across many diseases at nearly equal percentages for the top five conditions. Therefore, even though the rankings appear different across regions and time periods, few major differences were found.
- Visits for mental health disorders and ill-defined conditions increased between TP2 and TP3. Meanwhile, there were decreases for circulatory, musculoskeletal, and respiratory conditions.
- Endocrine and metabolic disorders had higher rankings in the Northern Health Region during TP1 and TP2, but it was only their sixth ranked reason for visits.
- The Northern Health Region rankings are strongly impacted by primary care delivered in nursing stations, and most of those services are not entered into the medical claims database.
- In all time periods, visits for mental illness were higher-ranking in Winnipeg RHA than in any other region. Part of this could be related to the fact that some patients with severe mental illness move to Winnipeg to be close to essential services.

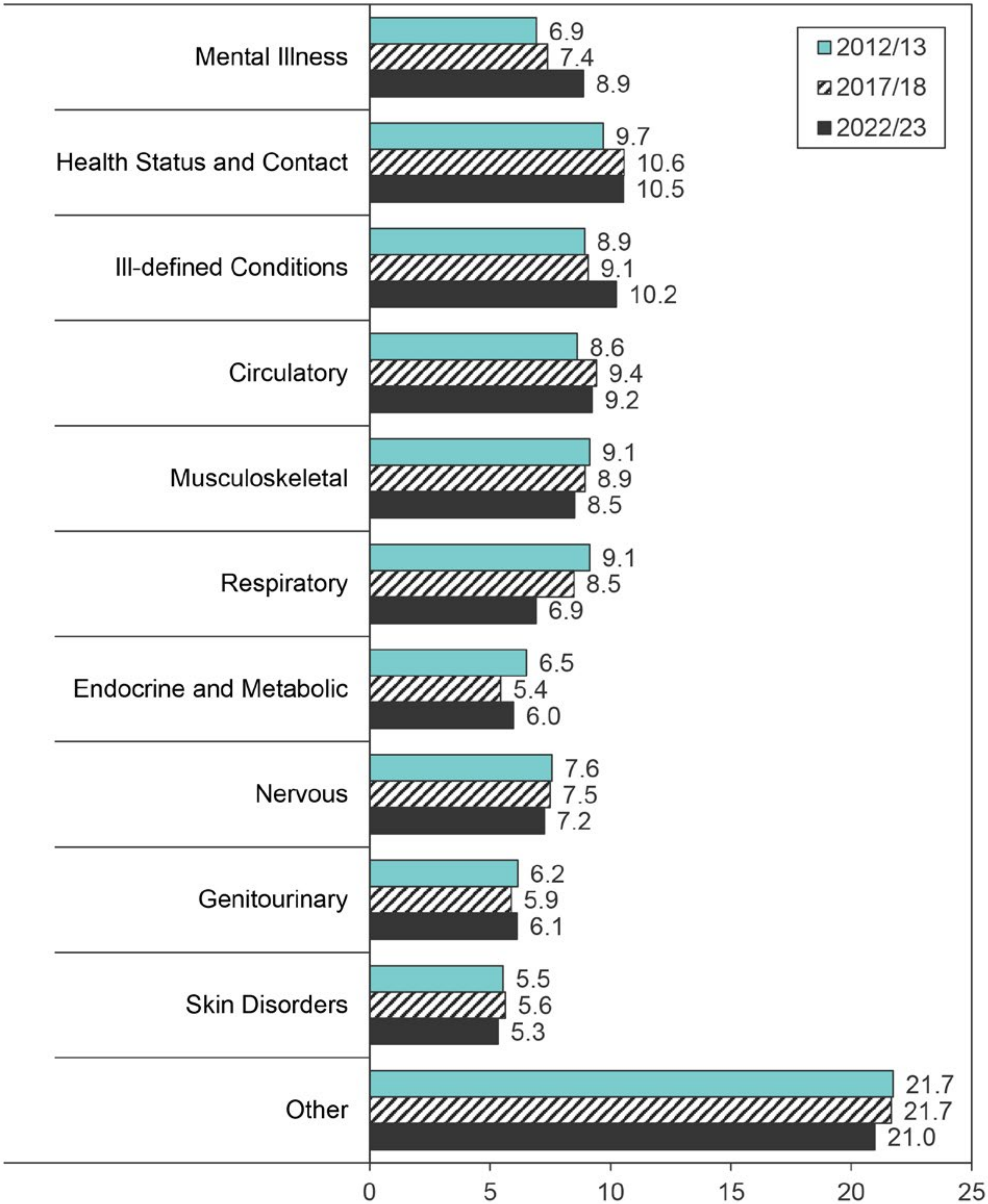
Figure 6.6: Most Common Reasons for Ambulatory Physician Visits in Manitoba, 2012/13, 2017/18, and 2022/23
Percent* of all visits to physicians and nurse practitioners (all ages)



s data suppressed due to small numbers
* denominators: T1 = 5,827,443; T2 = 6,422,304; T3 = 7,012,426

Figure 6.7: Reasons for Ambulatory Physician Visits in Southern Health-Santé Sud, 2012/13, 2017/18, and 2022/23

Percent* of all visits to physicians and nurse practitioners (all ages)

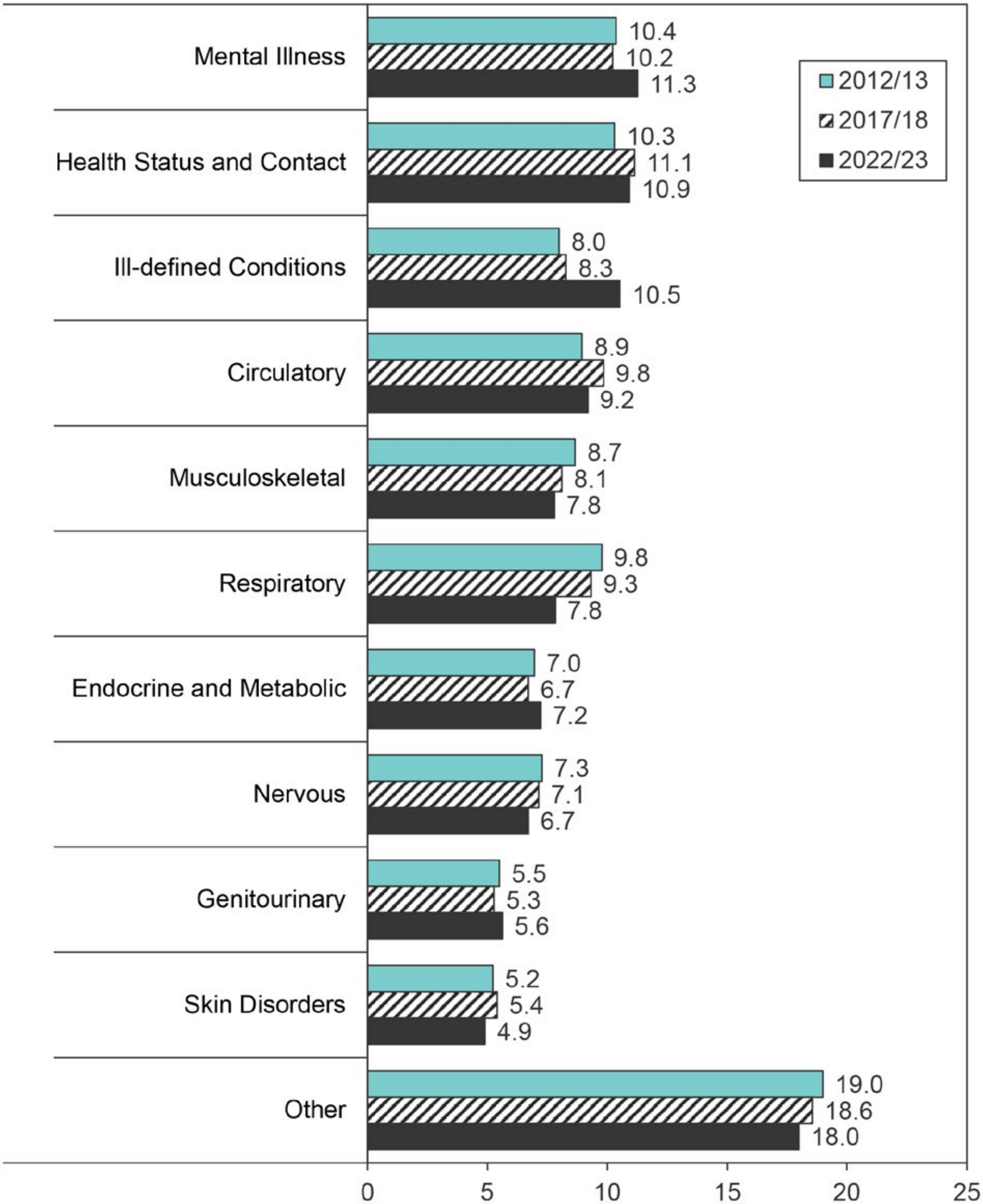


s data suppressed due to small numbers

* denominators: T1 = 662,342; T2 = 771,809; T3 = 823,767

Figure 6.8: Reasons for Ambulatory Physician Visits in the Winnipeg RHA, 2012/13, 2017/18, and 2022/23

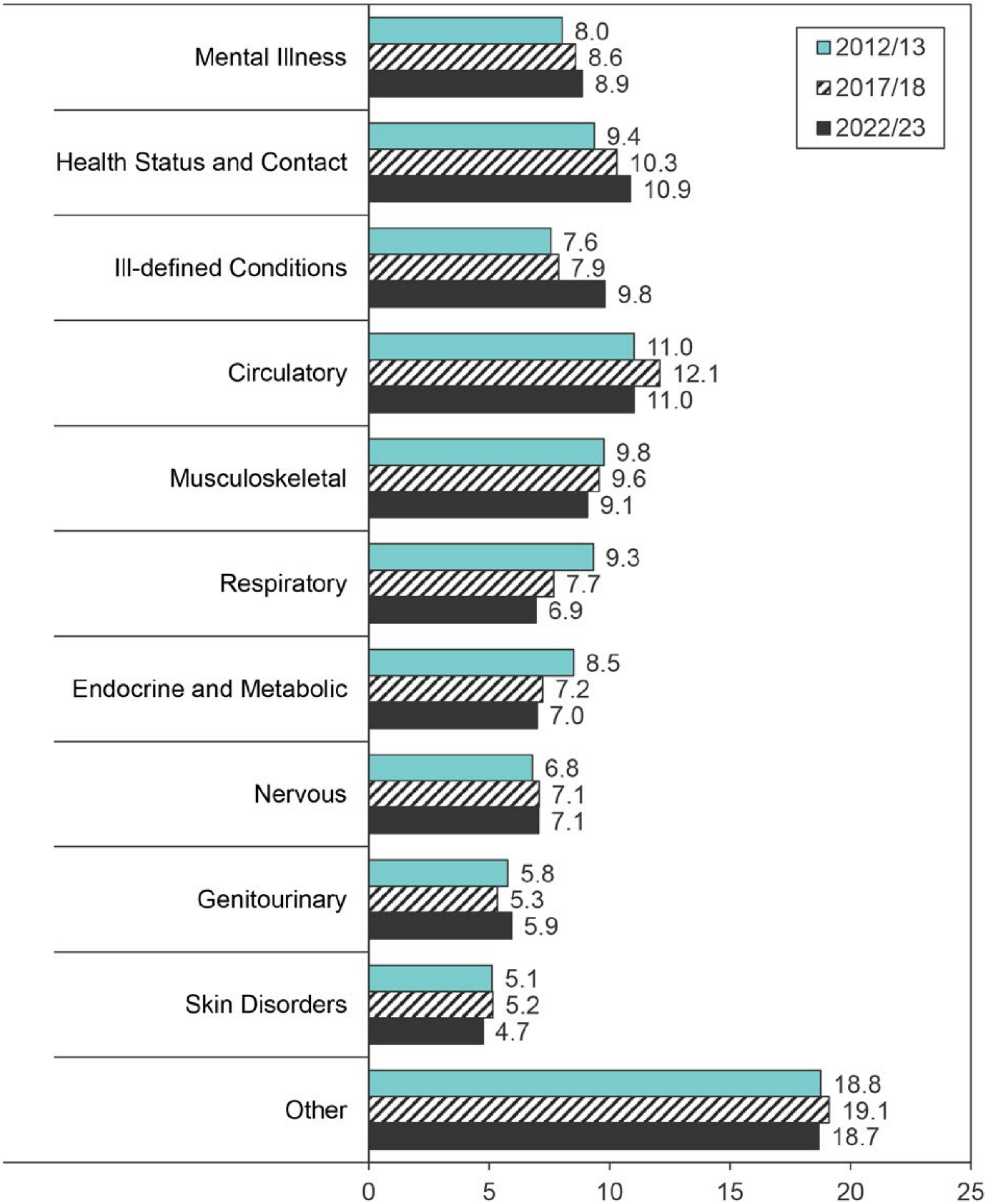
Percent* of all visits to physicians and nurse practitioners (all ages)



s data suppressed due to small numbers

* denominators: T1 = 3,522,080; T2 = 4,009,649; T3 = 4,471,206

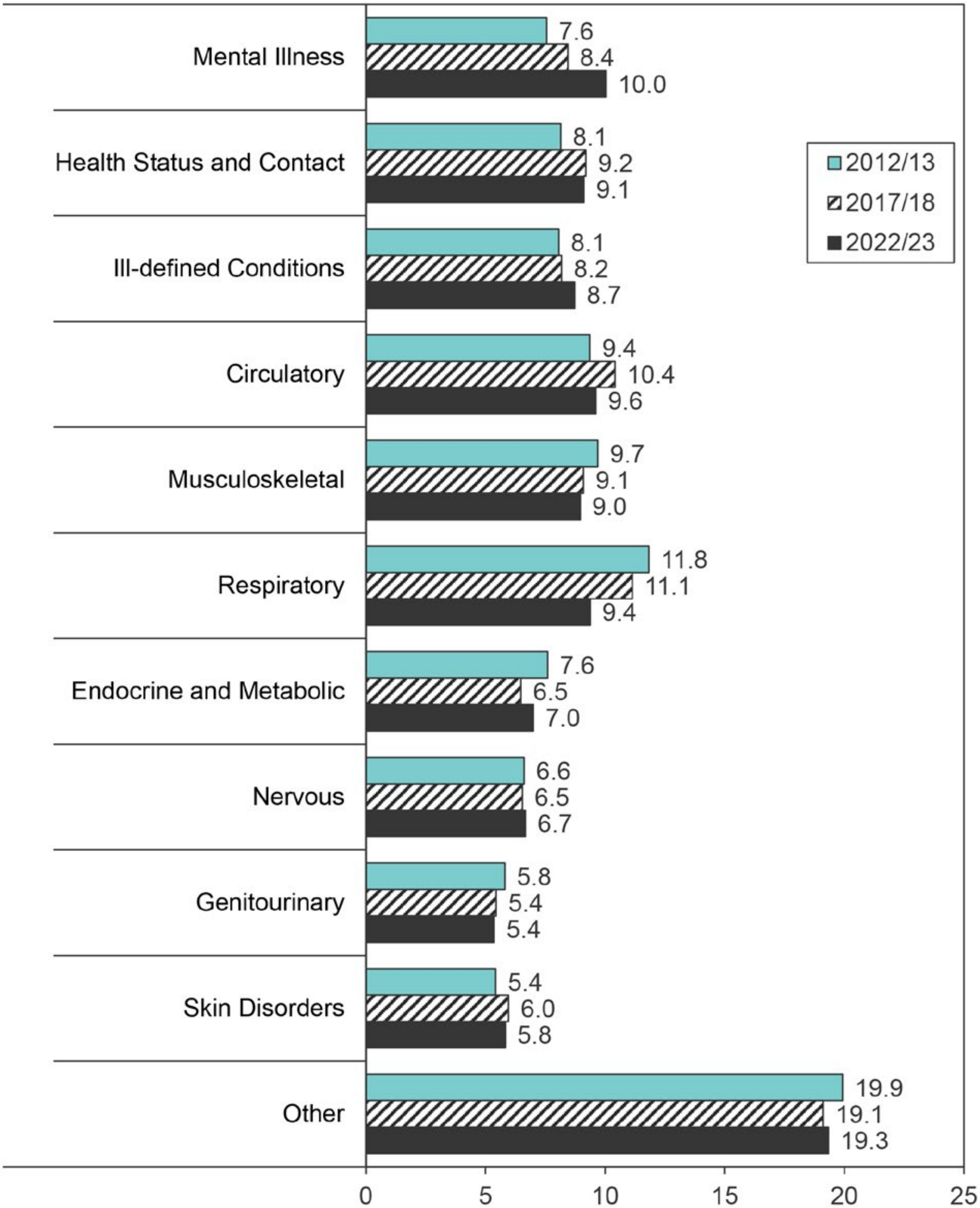
Figure 6.9: Reasons for Ambulatory Physician Visits in the Interlake-Eastern RHA, 2012/13, 2017/18, and 2022/23
Percent* of all visits to physicians and nurse practitioners (all ages)



s data suppressed due to small numbers
* denominators: T1 = 567,846; T2 = 594,321; T3 = 676,261

Figure 6.10: Reasons for Ambulatory Physician Visits in Prairie Mountain Health, 2012/13, 2017/18, and 2022/23

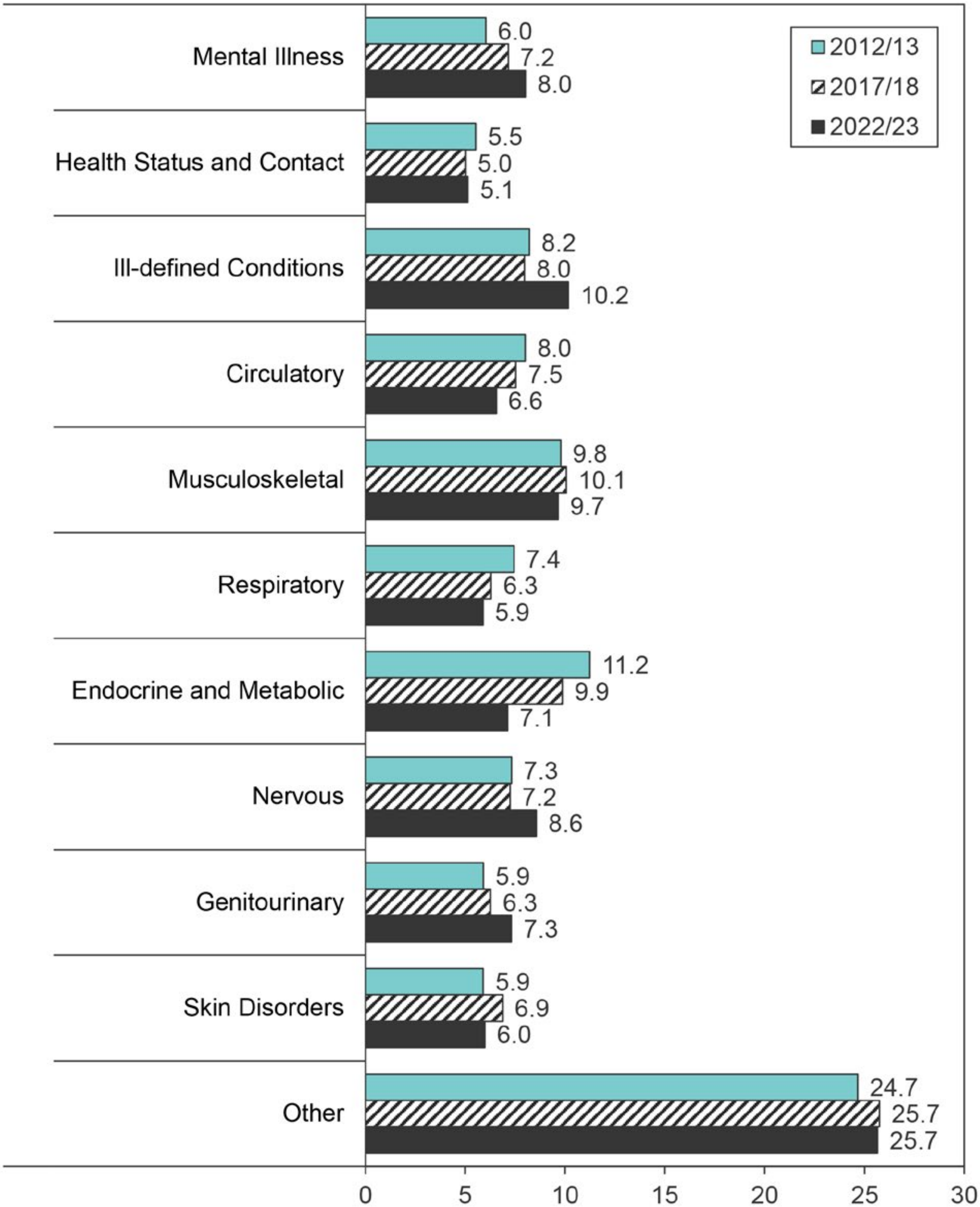
Percent* of all visits to physicians and nurse practitioners (all ages)



s data suppressed due to small numbers
* denominators: T1 = 824,377; T2 = 842,043; T3 = 894,998

Figure 6.11: Reasons for Ambulatory Physician Visits in the Northern Health Region, 2012/13, 2017/18, and 2022/23

Percent* of all visits to physicians and nurse practitioners (all ages)



s data suppressed due to small numbers

* denominators: T1 = 212,569; T2 = 194,324; T3 = 140,361

6.5 Ambulatory Consultations

Definition: The average number of ambulatory consultations per resident (all ages) in a given year. Consultations are a subset of ambulatory visits: they occur when one provider refers a patient to another provider (usually a specialist or surgeon) because of the complexity, obscurity, or seriousness of the patient's condition or when the patient requests a second opinion. Referrals can originate from physicians, nurses, or other allied health professionals, and can be to physicians or nurse practitioners. The consult rate is the best indicator of access to specialty care.

Time period analysis: The average number of ambulatory consultation visits per resident were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Ambulatory consultation rates were calculated for one-year periods from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

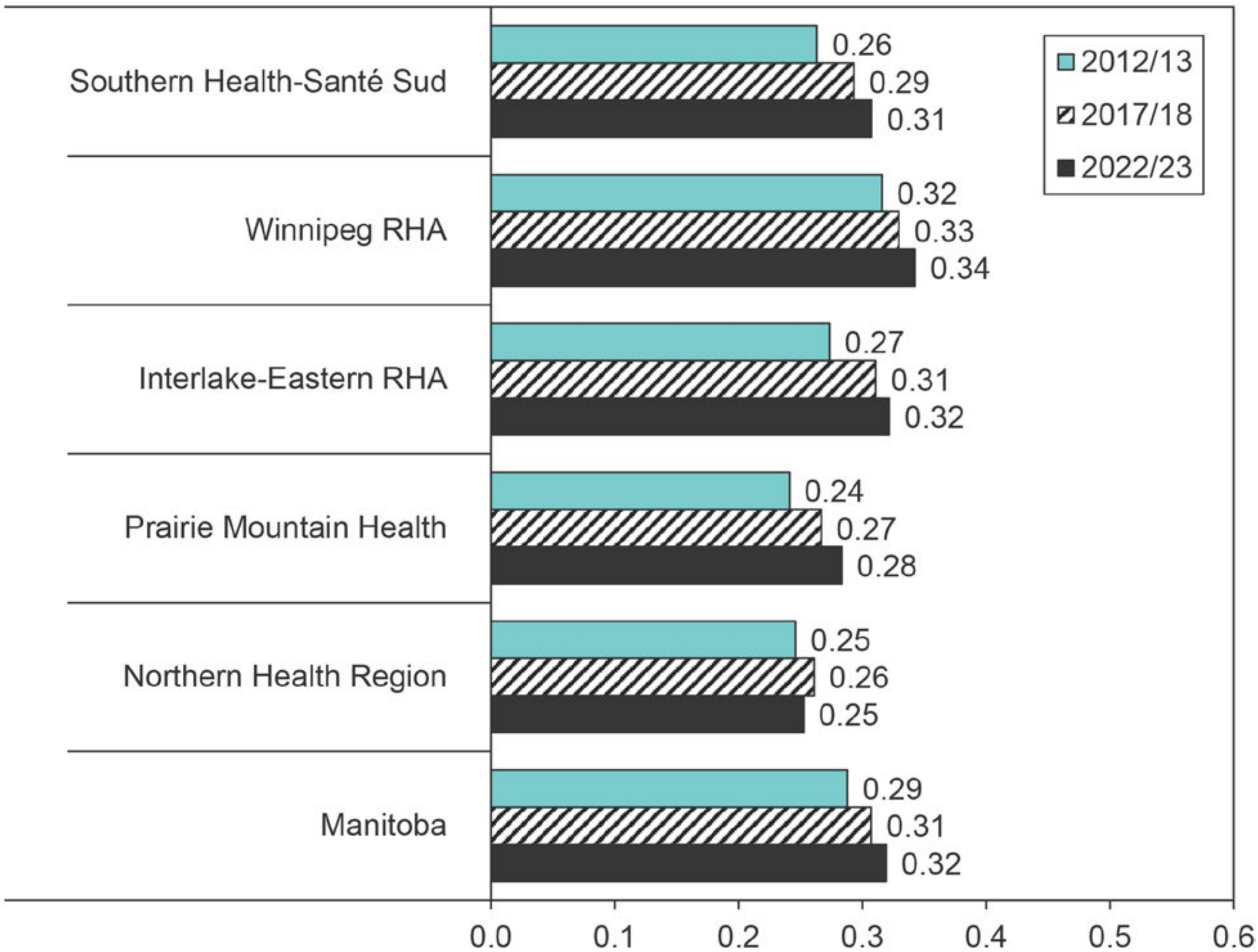
Time Period Analysis (Figure 6.12)

- In Manitoba, the average number of consultations per resident per year increased slightly, but the difference did not reach statistical significance. The total number of consultations was 91,856 in TP3, which was 9.2% higher than in TP2 (online supplement). This is a lower rate of increase than the 14.4% that occurred between TP1 and TP2.
- A similar pattern was seen in all regions except the Northern Health Region, where the rates decreased from TP2 to TP3, although not significantly.
- Rates were highest in the Winnipeg RHA, and lowest in the Northern Health Region, although they were not significantly different from the rates in Manitoba across the three periods.
- Consultation rates were significantly associated to income in rural areas in TP3 where residents of lower income areas had fewer consultations than those in higher income areas (see online supplement). The rates were not significantly associated to income in either of the earlier two time periods in the rural areas and in each time period in the urban areas.

Trend Analysis (Figure 6.13)

- There was an increasing trend observed in Manitoba and in all regions except the Northern Health Region. There were noticeable decreases that occurred between 2019/20 and 2020/21 before the rates returned to typical levels by 2022/23.

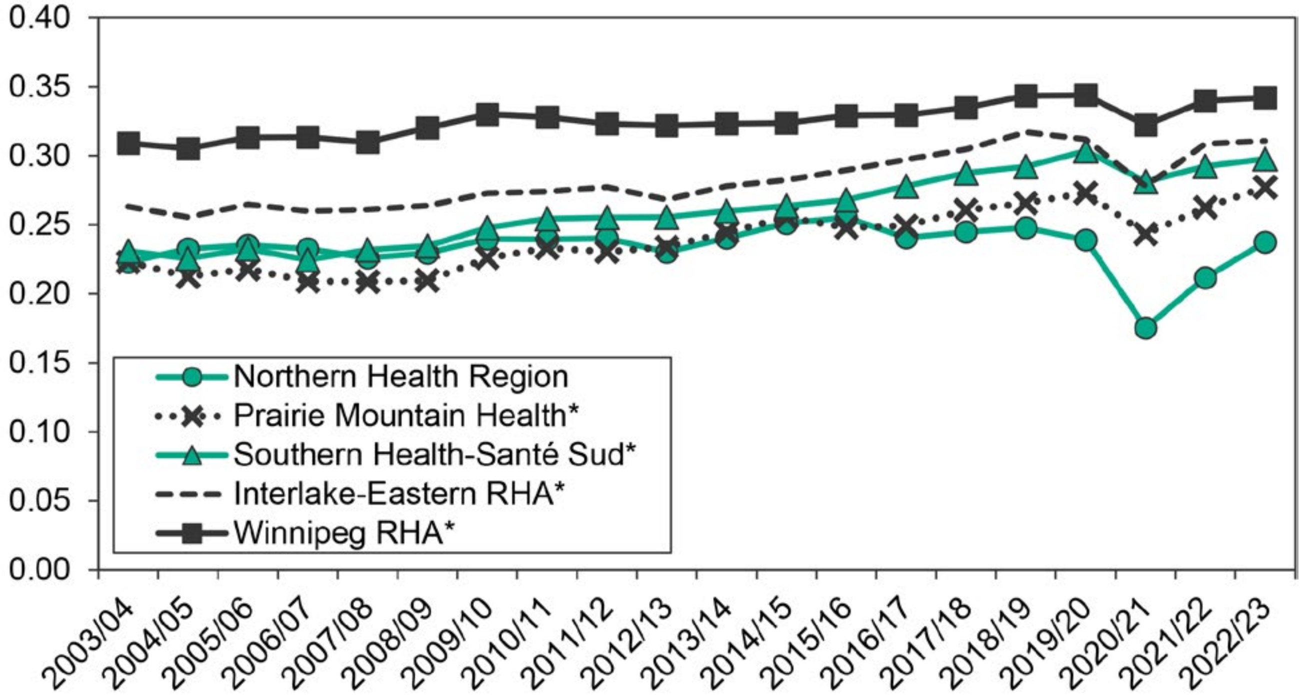
Figure 6.12: Ambulatory Consultation Rate by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate of ambulatory consultations per resident (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 6.13: Ambulatory Consultation Rate by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted rate of ambulatory consultations per resident (all ages)



* statistically significant linear trend over time.

6.6 Continuity of Care Index

Definition: The Continuity of Care Index weighs both the frequency of ambulatory visits to primary care providers (which includes both family physicians and nurse practitioners) and the dispersion of visits among different providers. The possible index values range from zero (if all visits are made to different providers) to one (if all visits are made to a single provider). Residents with fewer than three ambulatory visits over the three-year period were excluded.

Time period analysis: Continuity of care index scores were calculated for 3 three-year periods: 2010/11-2012/13 (TP1), 2015/16-2017/18 (TP2), and 2020/21-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

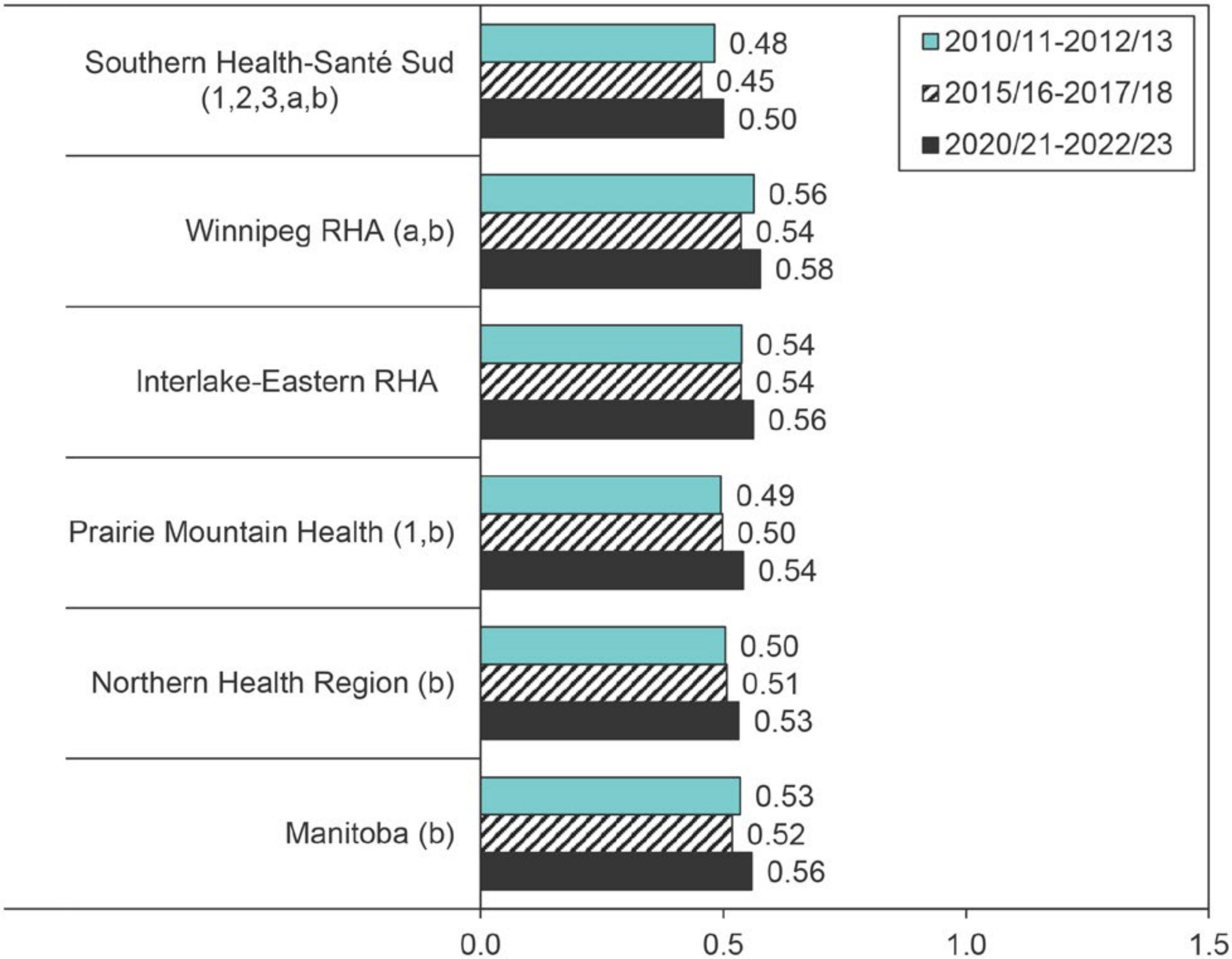
Key Findings

Time Period Analysis (Figure 6.14)

- In Manitoba, continuity of care values decreased from 0.53 in TP1 to 0.52 in TP2, and then significantly increased to 0.56 in TP3. All regions showed a similar pattern in which the continuity of care was highest in TP3.
- Continuity of care was highest in the Winnipeg RHA and Interlake-Eastern RHA, although not significantly higher than the Manitoba values. It was lowest in the Southern Health-Santé Sud region, which was significantly lower than Manitoba in each period.
- Continuity of care was significantly associated to income in rural areas in all three period where the rates were lower for residents of lower income areas (see online supplement). In urban areas, there was no association between income and continuity of care.

Figure 6.14: Continuity of Care Index by Health Region, 2010/11-2012/13, 2015/16-2017/18, and 2020/21-2022/23

Age- and sex-adjusted index values for residents with 3+ visits in the time period (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

6.7 Location of Ambulatory Visits to Physicians and Nurse Practitioners

Definition: The percentage of ambulatory visits made by residents to family physicians or nurse practitioners in the patient's home RHA district ('in district'), elsewhere in their home RHA, in another RHA, or in Winnipeg. For each month, every family physician and nurse practitioner in Manitoba is assigned to the area (RHA district) from which the majority of their patients came. Each visit they had that month is then deemed to have taken place in that area. For Winnipeg residents, all visits received within the city were called 'in district.' Only visits made by Manitoba residents within Manitoba were included.

Time period analysis: The crude percentage for each visit location category was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

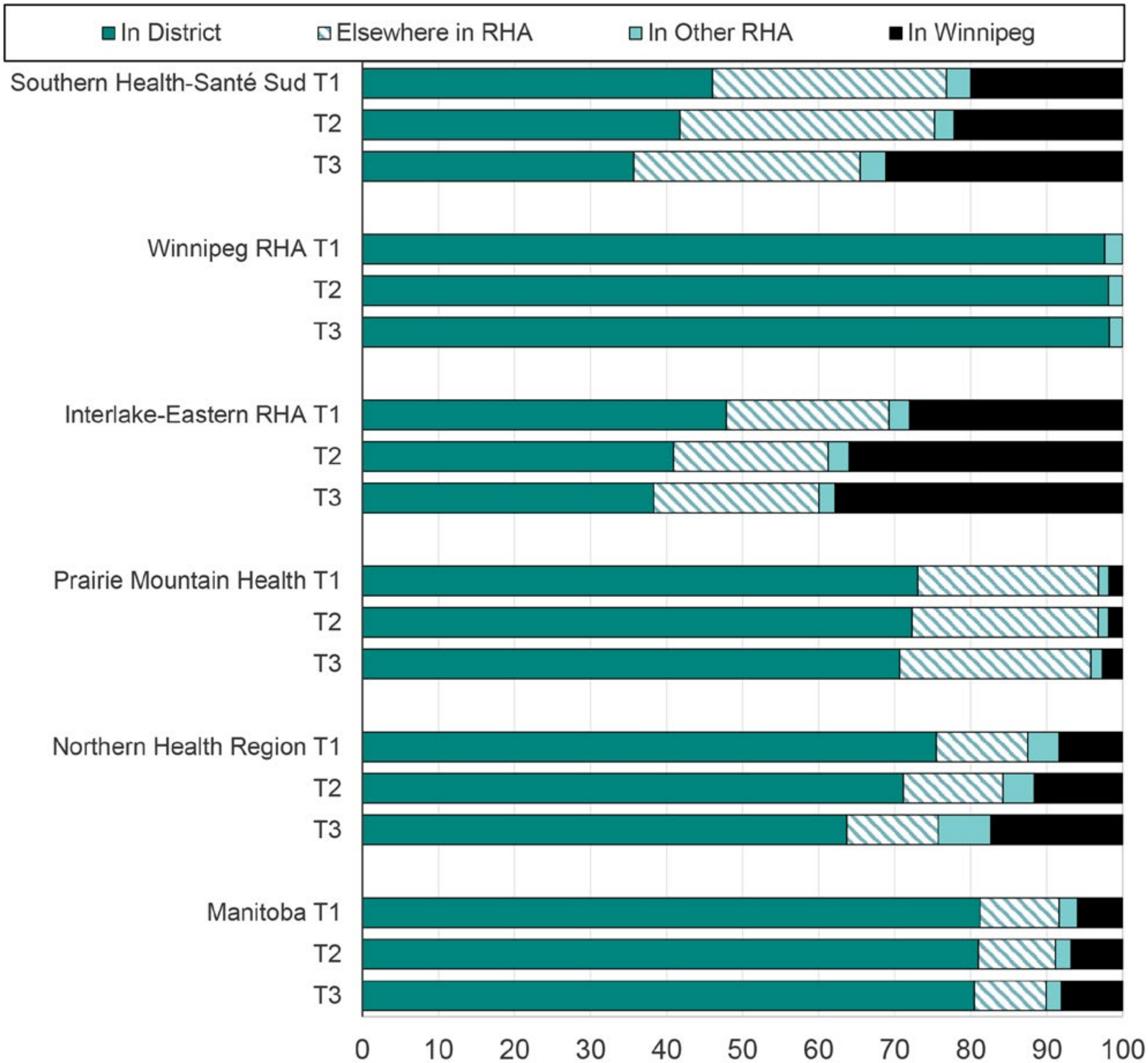
Key Findings

Time Period Analysis (Figure 6.15)

- For Manitoba, over 80% of all visits in all three time periods occurred in the district where the patient lived, though this was strongly affected by the high values (>97%) for the Winnipeg RHA.
- Residents in each non-Winnipeg RHA have had increases in the percentage of visits received in Winnipeg. The most prominent increase from TP2 to TP3 was in the Southern Health-Santé Sud region and the Northern Health Region. Prairie Mountain Health residents had the lowest percentage of visits in Winnipeg.
- Results varied dramatically across regions, though there were similarities between Southern Health-Santé Sud and Interlake-Eastern RHA residents: Southern Health-Santé Sud and Interlake-Eastern RHA residents made under 50% of their visits within their home district with a significant portion outside their home district but within the RHA. Winnipeg was a major influence for residents of both regions, likely reflecting the fact that many residents of these regions get care in the city because they live close to, work in, or regularly visit the city.
- Residents of Prairie Mountain Health and Northern Health Region received approximately 70% of their visits in their home district, but there was a considerable decrease in the Northern Health Region from 71.2% in TP2 to 63.7% in TP3. This decrease appears to be the result of a shift in the percentage of visits made outside of their region (primarily in the Winnipeg RHA).

Figure 6.15: Location of Visits to Family Physicians and Nurse Practitioners by Region, 2012/13, 2017/18, and 2022/23

Percent of visits by location.



T1 = 2012/13 T2 = 2017/18 T3 = 2022/23

6.8 Location of Visits to Specialists

Definition: The percentage of visits made by residents to specialists in the patient's home RHA district ('in district'), elsewhere in their home RHA, in another RHA, or in Winnipeg. For each month, every specialist in Manitoba is assigned to the area (RHA district) from which the majority of their patients came. Each visit they had that month is then deemed to have taken place in that area. For Winnipeg residents, all visits received within the city were called 'in district.' Only visits made by Manitoba residents within Manitoba were included.

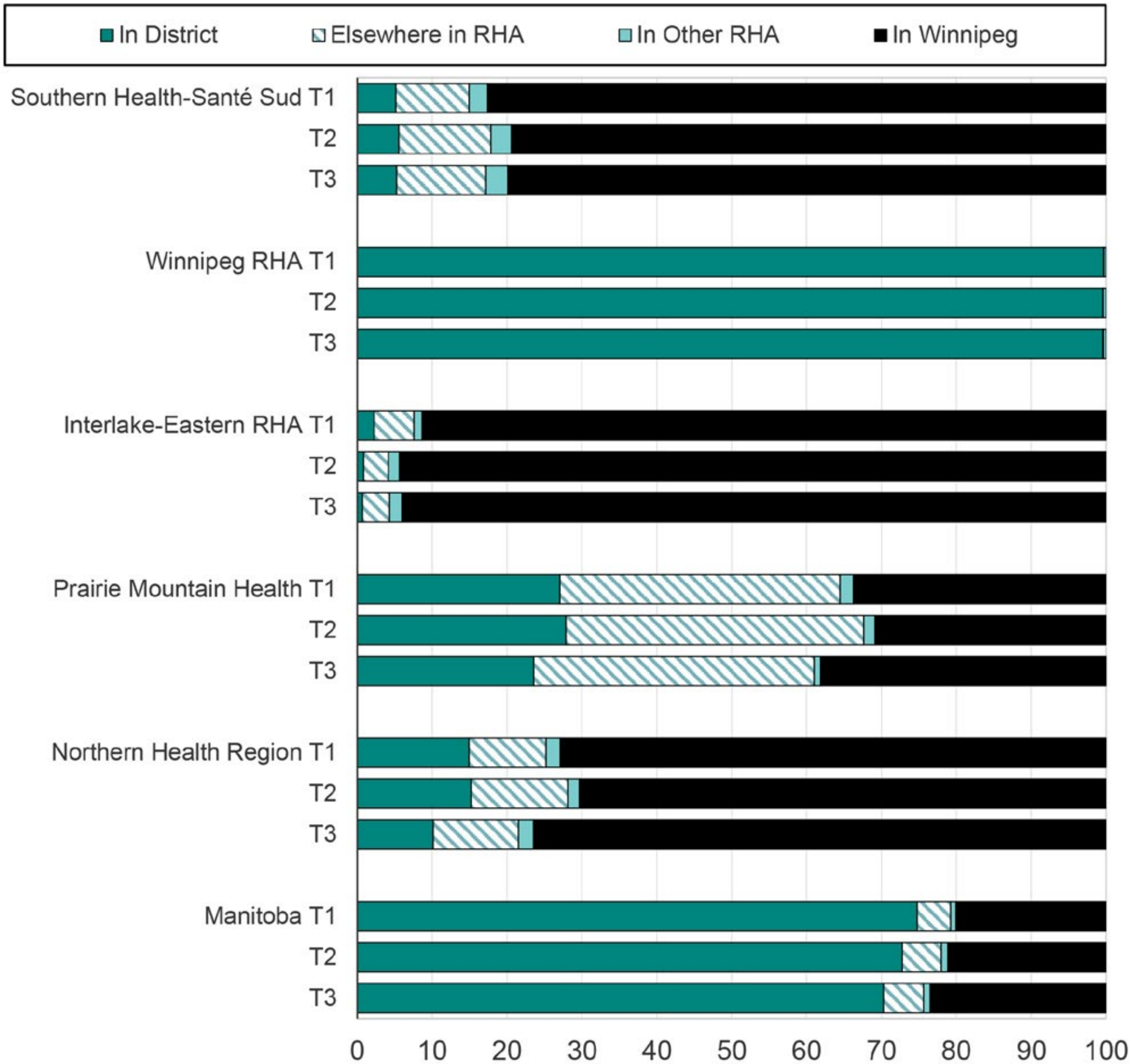
Time period analysis: The crude percentage for each specialist visit location category was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

Key Findings

Time Period Analysis (Figure 6.16)

- For Manitoba, approximately 70% of all specialist visits in all three time periods occurred in the district where the patient lived, though this was strongly affected by the high values (>99%) for the Winnipeg RHA. Approximately 65% of all specialist visits made by residents of Prairie Mountain Health were in their own region (either in the resident's district or elsewhere in the region).
- Residents in Prairie Mountain Health and the Northern Health Region had increases in the percentage of visits received in the Winnipeg RHA between TP2 and TP3, while there was no real change observed for the Southern Health-Santé Sud and Interlake-Eastern RHA.
- Results varied dramatically across regions where very few Interlake-Eastern RHA residents saw specialists in their own region, followed by the Southern Health-Santé Sud region, and then the Northern Health Region.
- These results reflect the distribution of the location of specialists across the province.

Figure 6.16: Location of Visit to Specialists by Region, 2012/13, 2017/18, and 2022/23
Percent of visits by location.



T1 = 2012/13   T2 = 2017/18   T3 = 2022/23

Chapter 7:
Hospital Services

Key Findings in Chapter 7

- Many of the indicator results show a significant decrease in the use of hospitals from the second to third time periods. Only the rate of acute hospital days increased between those periods, although it was not a statistically significant increase. The indicators also show a decreasing trend over the 20-year period, except for the rate of ALC days, which had a non-significant increase. Combined, these results reflect the impact that the COVID-19 pandemic had on the access and use of hospitals. The trend figures illustrate sharp decreases for most indicators beginning in 2020/21 and returning to expected levels by 2022/23.
- Most days of hospital care provided to Manitobans are for acute care: 84.3% of the more than 1.1 million patient-days of hospital care in 2022/23 were coded as acute care. This proportion was higher than that in the two previous periods.
- The most common causes of inpatient hospitalization were spread across many disease categories and did not change much over time. Pregnancy and birth were the leading causes in all regions, followed by either circulatory diseases or digestive disorders, depending on the region. Analysis of the causes of hospital days used for acute care revealed a different order of rankings. Mental illnesses were responsible for the greatest proportion of days, while pregnancy and birth were ranked tenth (this is expected as hospitalization for childbirth is common, but usually a very short number of days).
- Results for all indicators show that hospital care continues to be responsive to need where rates are higher in areas where population health status and income are lower.
- Analyses of the ‘location’ of hospitalization of regional residents and the ‘catchment’ of regional hospitals show good and stable results. Over 75% of all hospitalizations

happen in the patient's home region, along with over 85% of their days of care. Similarly, over 75% of the hospitalizations, and over 85% of the days of hospital care provided by regional hospitals are to patients from that region.

Introduction

This chapter provides a number of indicators of the use of acute care hospital services by residents of Manitoba including the number of hospitalizations, the number of hospital days, and the reasons for hospitalization. For most indicators, service use is allocated to the area of residence of the patient, regardless of the location of the hospital. For example, if a resident of Southern Health-Santé Sud uses a Winnipeg hospital, it would be counted as a hospitalization for a Southern Health-Santé Sud resident. However, the report does include detailed results regarding where residents of each region were hospitalized.

Many of the indicators in this chapter are based on information taken from hospital discharge abstracts, which are created for each admission to hospital and day surgery procedure performed in Manitoba. The results may be driven by the number of hospitals in the regions, and the analyses exclude care provided in nursing stations, personal care homes, and long-term care facilities (e.g., Deer Lodge Centre and Riverview Health Centre in Winnipeg, and Rehabilitation Centre for Children and Adolescent Treatment Centre). These should be considered when reviewing the results.

Indicators related to hospital days include the use of hospital days for acute care, and use of hospital days for ALC. Patients designated as ALC by a physician occupy an acute care hospital bed but are no longer acute care. Previous reports attempted to estimate acute vs non-acute days using semi-arbitrary cut offs intended to distinguish acute vs non-acute services (e.g., in the 2013 Atlas, stays less than 14 days were considered acute, sometimes called 'short stays', while stays 14 days or longer were considered chronic).[1] However, the new system is more accurate in that many patients who experience long stays in hospital are truly acute at first (which itself can extend for many days in some cases) and only become non-acute later in their stay. That said, many still worry that not all days that patients spend as ALC actually get correctly documented by clinical staff and coded into the data system. Therefore, the rate of ALC days shown in this report likely underestimates the true level of use of hospital resources by ALC patients, to the extent that such care is not fully documented.

Note: During 2005-2012, the Norway House hospital was not truly functioning as an acute care hospital because of changes in physician staffing. Therefore, it was excluded from the analyses in this chapter (as was done in the 2013 and 2019 Atlases).

7.1 Use of Hospitals

Definition: The percentage of residents who were admitted to an acute care hospital at least once in a fiscal year. Note that this is a person-based measure (i.e., not a visit-based measure) and patients receiving day surgery are not included.

Time period analysis: The percentage of the population with one or more hospitalizations was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3. Counts and crude percents by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: The percentage of the population with one or more hospitalizations was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 7.1)

- The percentage of residents hospitalized at least once each year decreased from 6.7% in TP1 to 6.3% in TP2 to 5.3% in TP3. The decrease between TP2 and TP3 was significant. The actual count of individuals increased from 80,483 people in TP1 to 82,655 in TP2 before it decreased to 75,836 people in TP3 (online supplement).
- All regions had decreasing percentages across the periods, and the decrease between TP2 and TP3 were significant in all regions except the Northern Health Region. Southern Health-Santé Sud region was the only region where the decrease between TP1 and TP2 was significant.
- The highest percentages were seen in the Northern Health Region and Prairie Mountain Health, which were significantly higher percentages than Manitoba in all three periods.

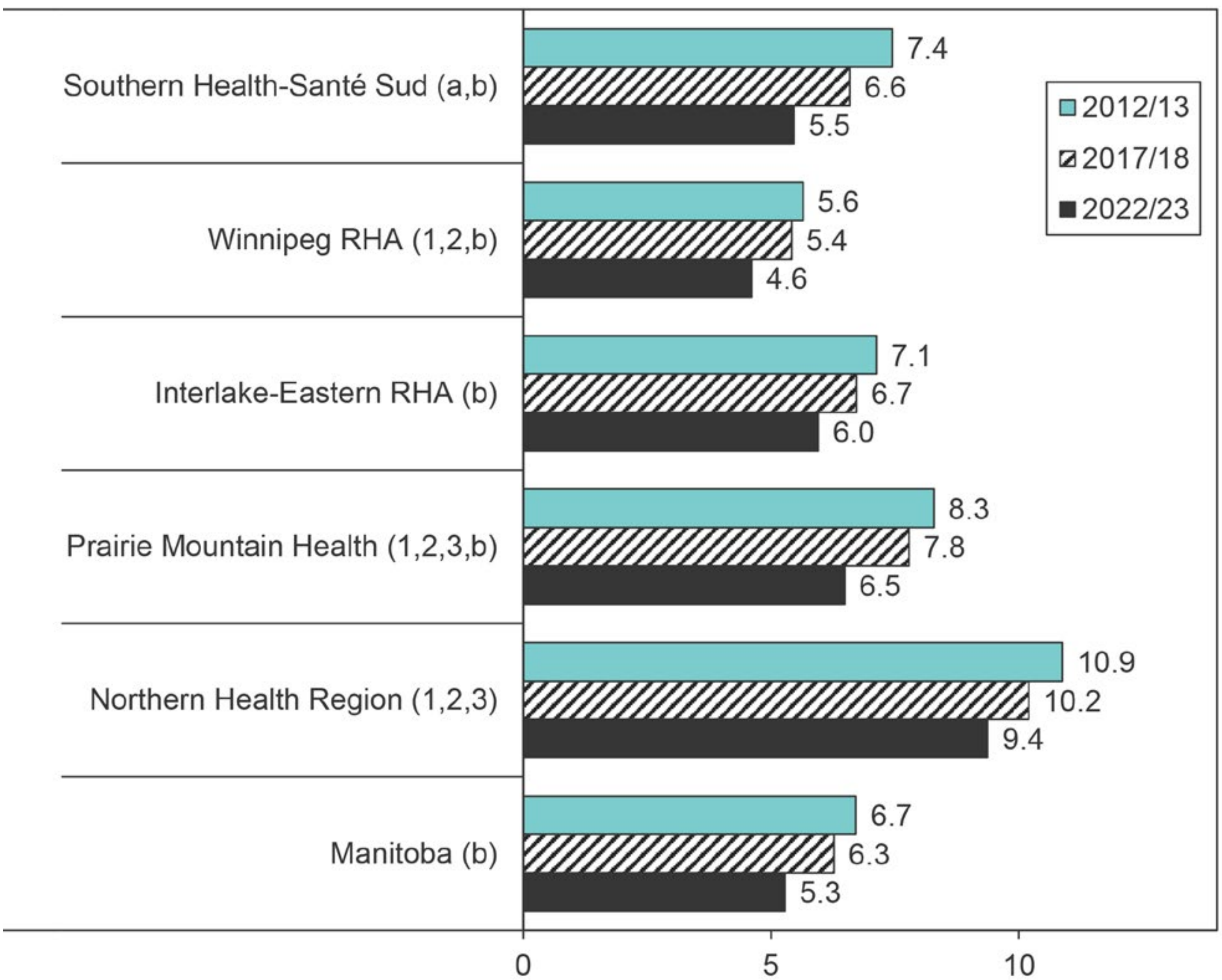
The lowest percentages were in the Winnipeg RHA, with significantly lower percentages than Manitoba in TP1 and TP2, but not TP3.

- Hospital use appears to be related to health status as the percentage of residents with at least one hospitalization increased across the regions from Southern Health-Santé Sud to the Northern Health Region. However, the Winnipeg RHA had lower values than the Southern Health-Santé Sud region, which may reflect differences in hospital capacity between these regions.
- The percentage of residents hospitalized at least once in a given year was significantly associated to income in urban and rural areas in all three periods, with higher percentages among residents of lower income areas (see online supplement).

Trend Analysis (Figure 7.2)

- Hospital use decreased steadily over time in Manitoba and in all regions.

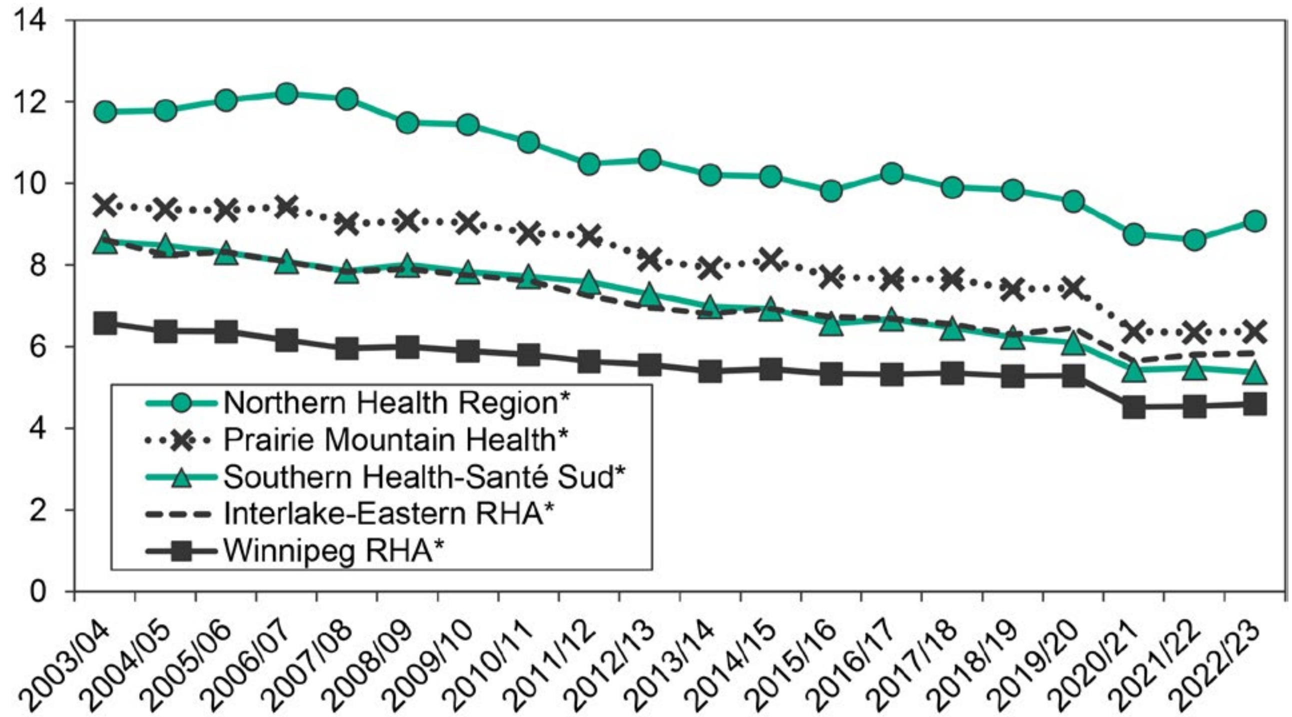
Figure 7.1: Use of Hospitals by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (all ages) with at least one inpatient hospitalization stay in the year



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.2: Use of Hospitals by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted percent of residents (all ages) with at least one inpatient hospitalization



* statistically significant linear trend over time.

7.2 Inpatient Hospitalizations

Definition: The total number of inpatient hospital separations per 1,000 residents per year. In any given period, a resident could be hospitalized more than once, so this indicator shows the total number of hospitalizations from acute care facilities by all residents of the area.

Time period analysis: Hospitalization rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Hospitalization rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

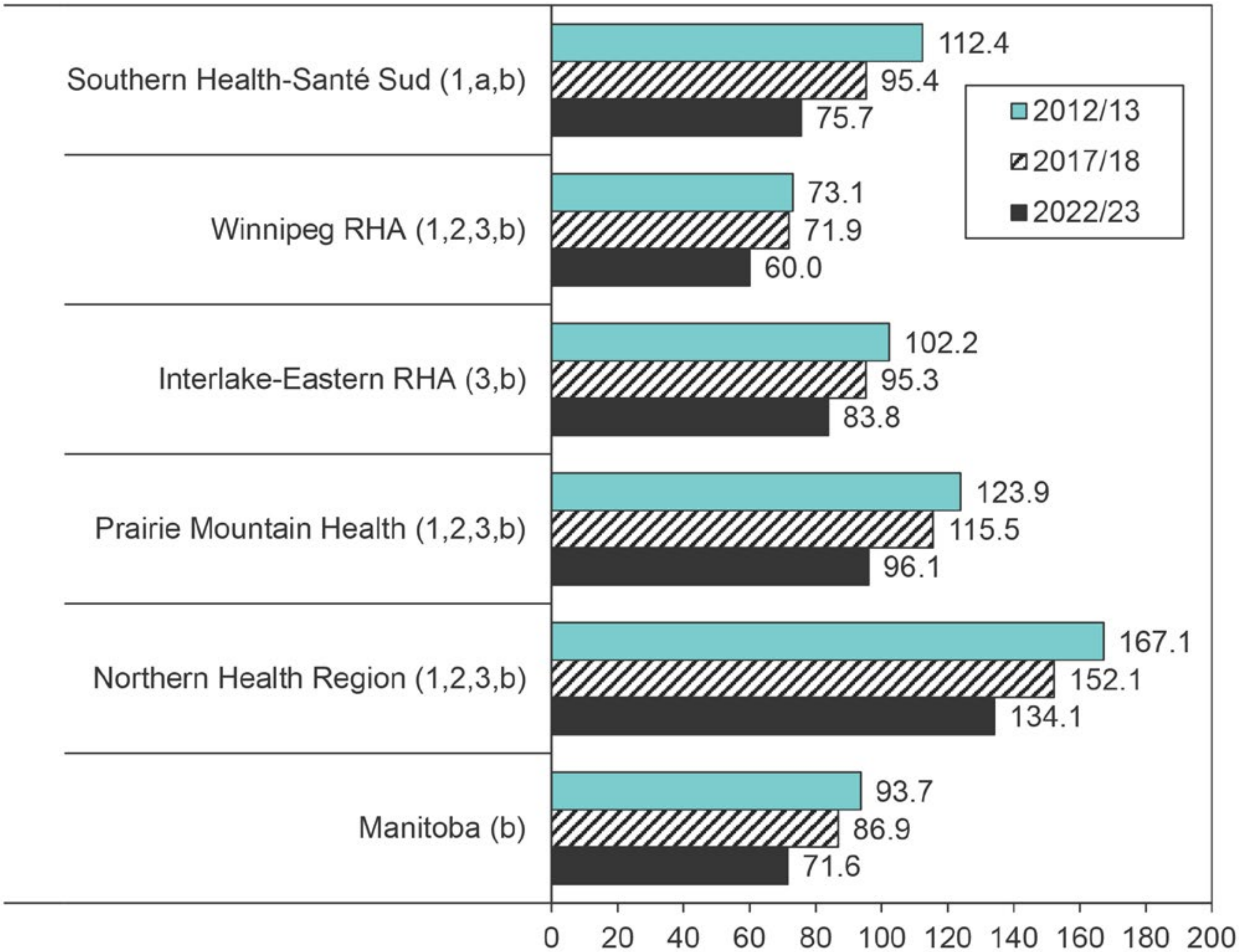
Time Period Analysis (Figure 7.3)

- The inpatient hospitalization rate in Manitoba decreased from 93.7 per 1,000 residents per year in TP1 to 86.9 in TP2 to 71.6 in TP3. The decrease between TP2 and TP3 was significant. The number of hospitalizations were 102,971 in TP3, which was 9.5% lower than in TP2 (online supplement).
- All regions had decreasing rates with significant decreases between TP2 and TP3. The Southern Health-Santé Sud region was the only region where the decrease between TP1 and TP2 was significant.
- The highest rates were seen in the Northern Health Region and Prairie Mountain Health region, which had significantly higher rates than Manitoba in all three periods. The lowest percentages were in the Winnipeg RHA which had significantly lower percentages than Manitoba in all three periods.
- Hospital rates appear to be related to health status as the rate increases across the regions from the Southern Health-Santé Sud to the Northern Health Region. However, the Winnipeg RHA had lower values than the Southern Health-Santé Sud region, which may reflect differences in hospital capacity between these regions.
- The hospital rates were significantly associated to income in urban and rural areas in all three periods, with higher rates among residents of lower income areas (see online supplement).

Trend Analysis (Figure 7.4)

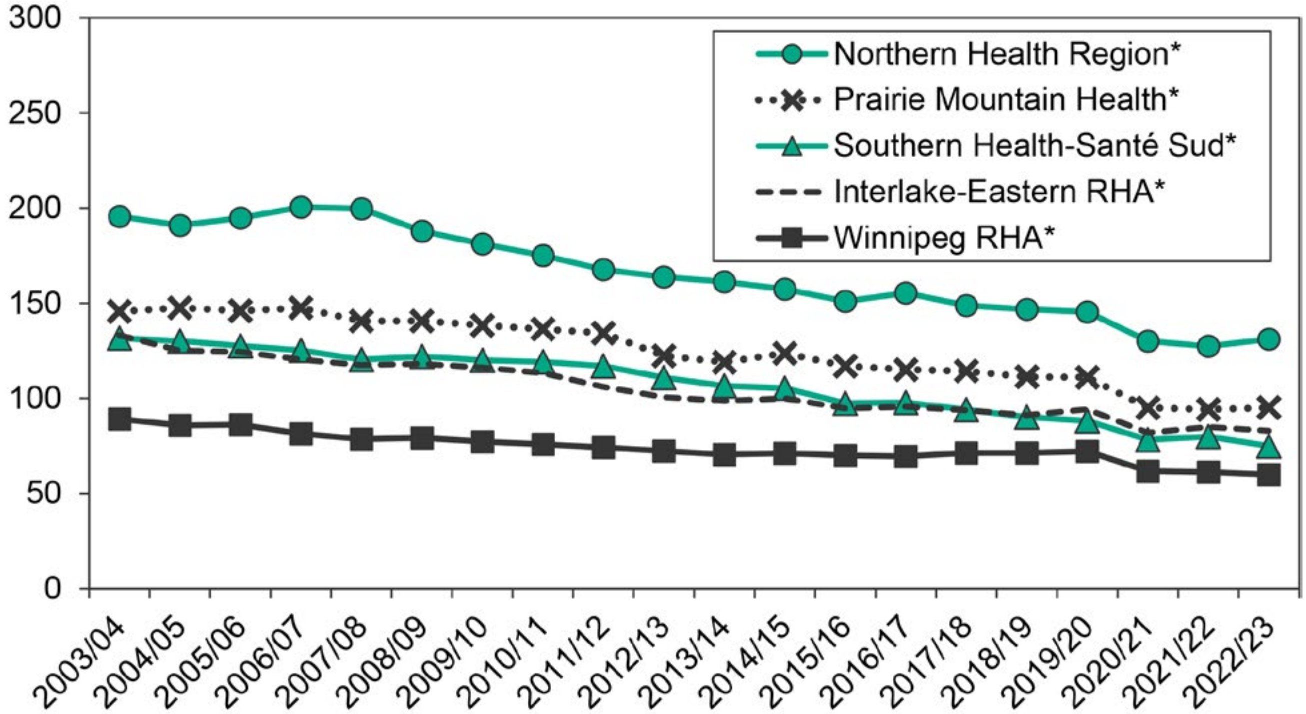
- Hospital rates decreased steadily over time in Manitoba and in all regions.

Figure 7.3: Inpatient Hospitalization Rate by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate of hospitalizations per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.4: Inpatient Hospitalization Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rate of hospitalizations per 1,000 residents (all ages)



* statistically significant linear trend over time.

7.3 Reasons for Inpatient Hospitalizations

Definition: The most common reasons for inpatient hospitalization in acute care facilities. Each hospital abstract has a 'most responsible' diagnosis - the diagnosis that describes the most significant condition of a patient which required the hospital stay (and which may not be the same as the admitting diagnosis) were identified and grouped by ICD-10-CA chapter. The ICD-10-CA chapters with the most hospitalizations in Manitoba in 2022/23 were used to set the order for each region.

Notes regarding two key groups of reasons:

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

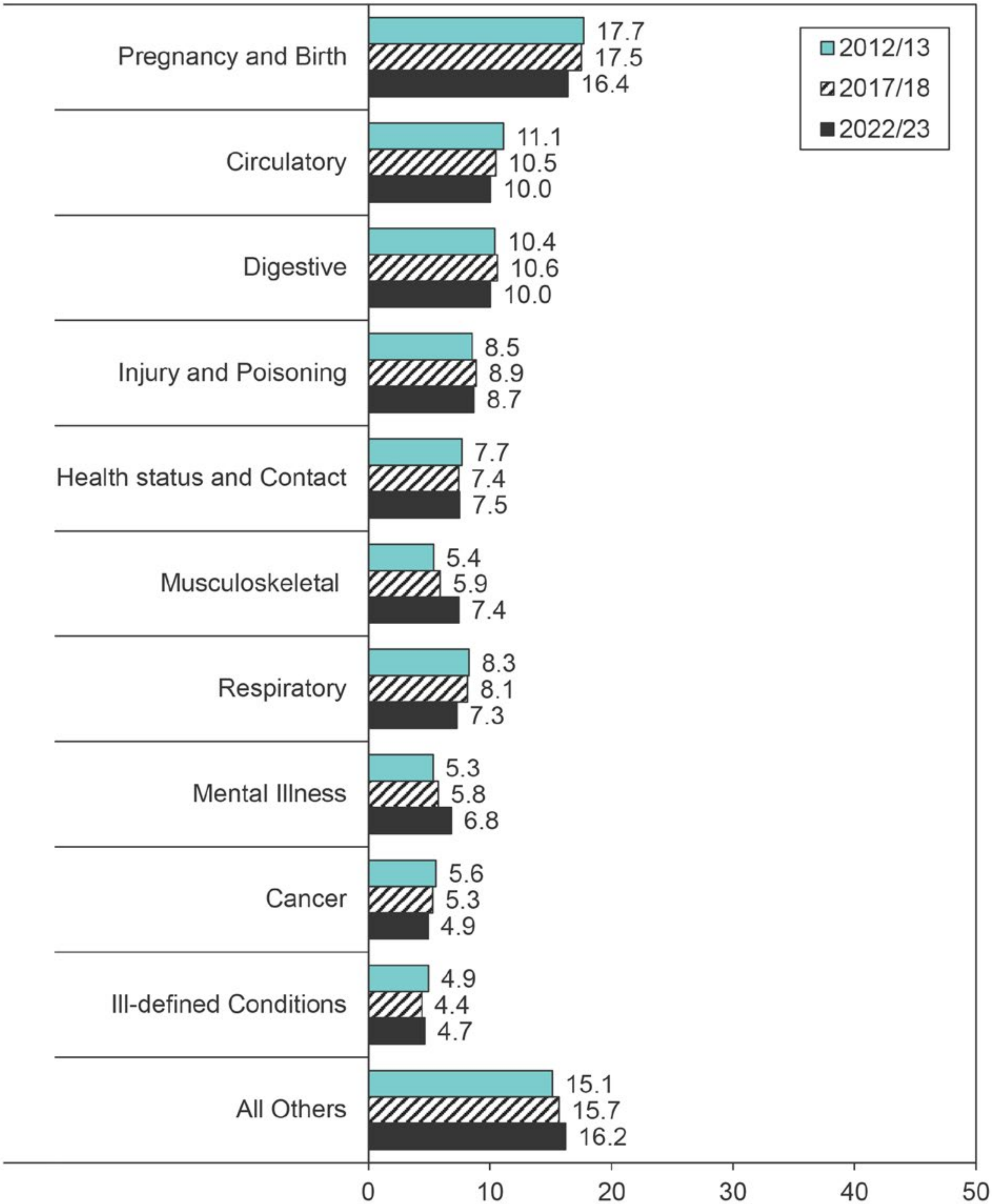
Time period analysis: The annual crude percent of all inpatient hospitalizations by ICD-10-CA chapter in each region were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3). The number of hospitalizations used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

Key Findings

Time Period Analysis (Figures 7.5 – 7.10)

- The most common reasons for hospitalization were spread across many categories, and did not change much over time. Pregnancy and birth were the leading reasons in all regions, followed by circulatory diseases, or digestive disorders (depending on the region). The proportion of hospitalizations for musculoskeletal reasons increased each period in each region, which was most noticeable between TP2 and TP3. Other leading reasons were injury & poisoning, health status & contact, and respiratory diseases.

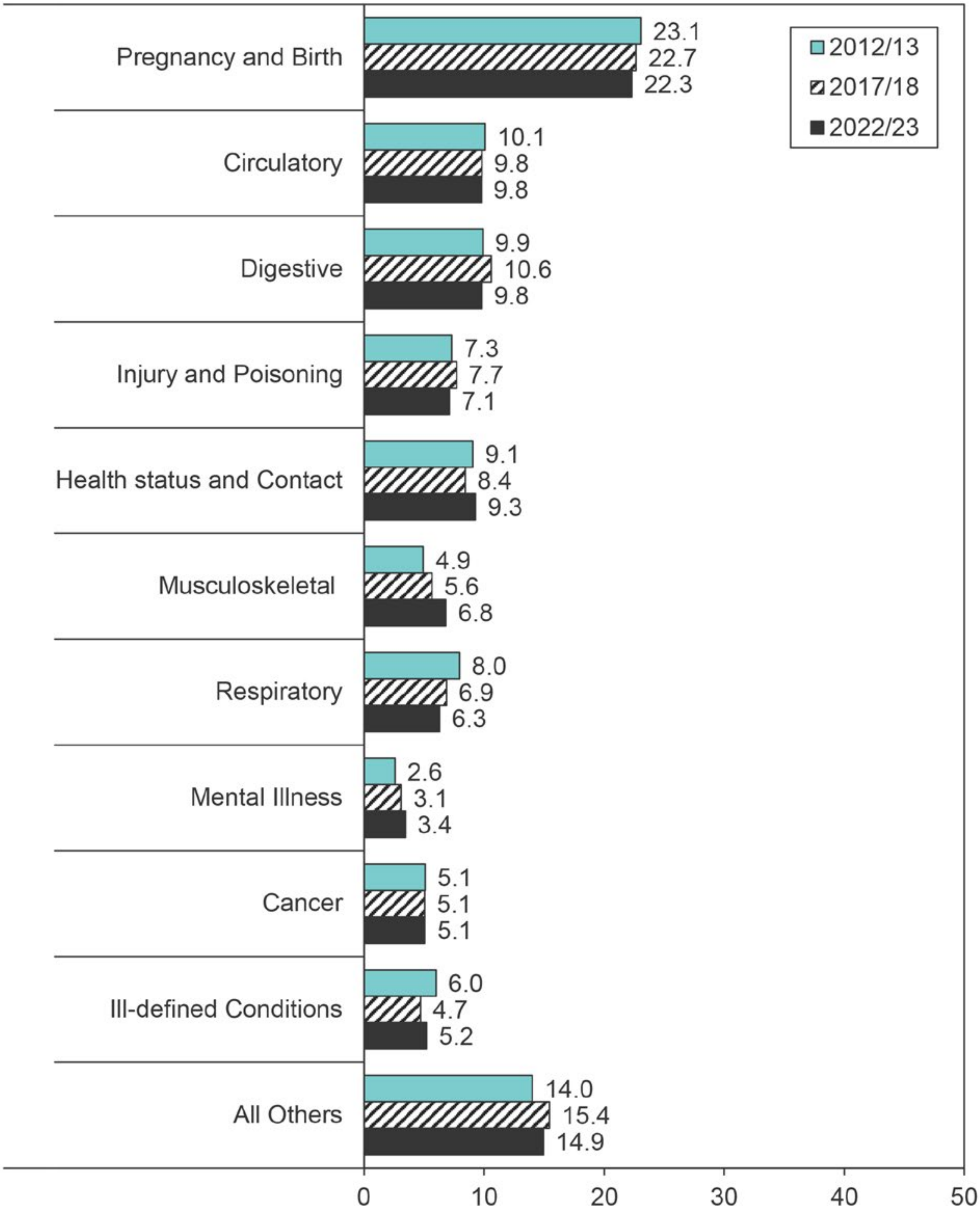
Figure 7.5: Most Common Reasons for Inpatient Hospitalizations in Acute Care Facilities in Manitoba, 2012/13, 2017/18, and 2022/23
Annual crude percent* of all hospitalizations (all ages)



s data suppressed due to small numbers
* denominators: T1 = 110,879; T2 = 113,781; T3 = 102,971

Figure 7.6: Reasons for Inpatient Hospitalizations in Acute Care Facilities in Southern Health-Santé Sud, 2012/13, 2017/18, and 2022/23

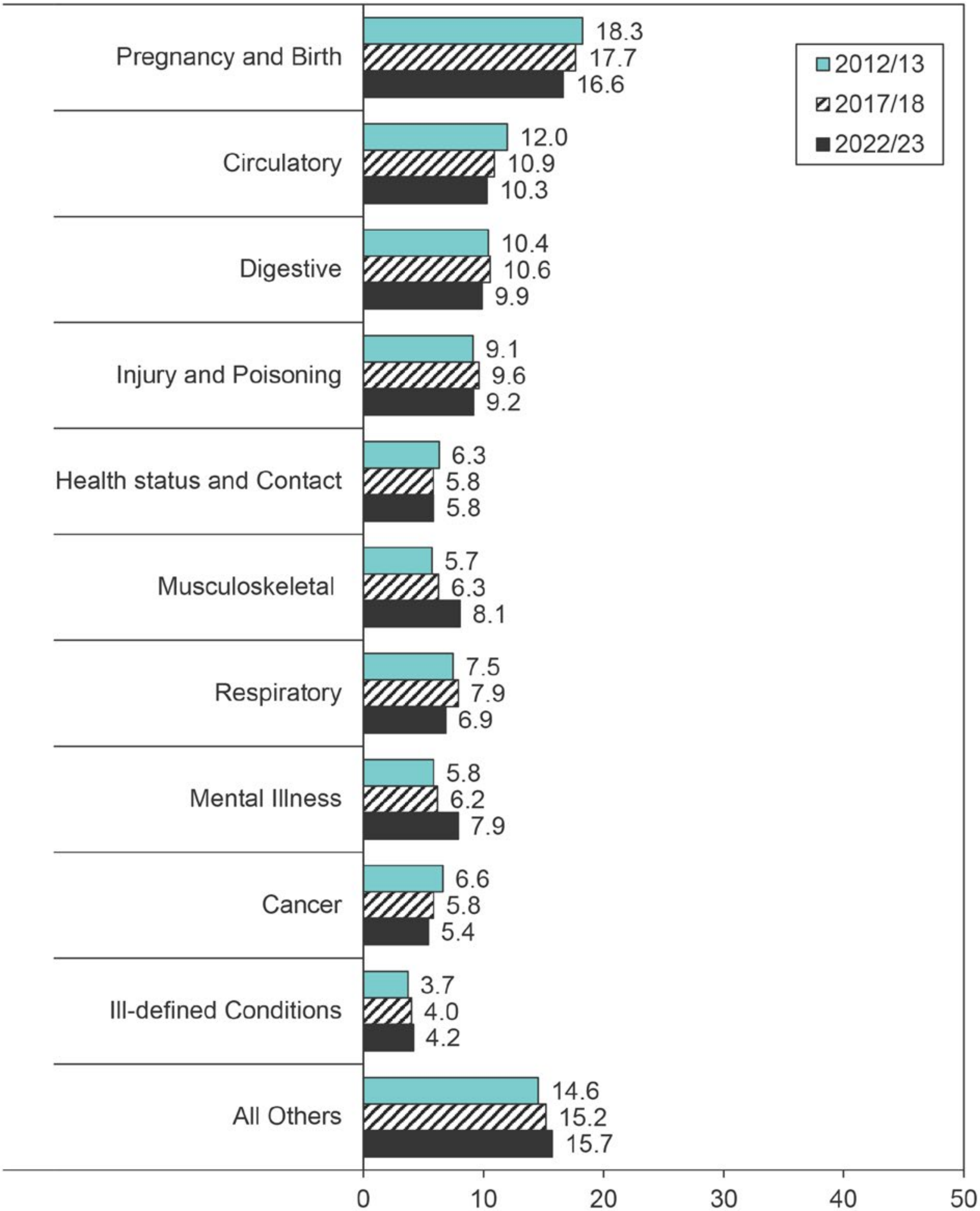
Annual crude percent* of all hospitalizations (all ages)



s data suppressed due to small numbers

* denominators: T1 = 17,357; T2 = 16,790; T3 = 14,711

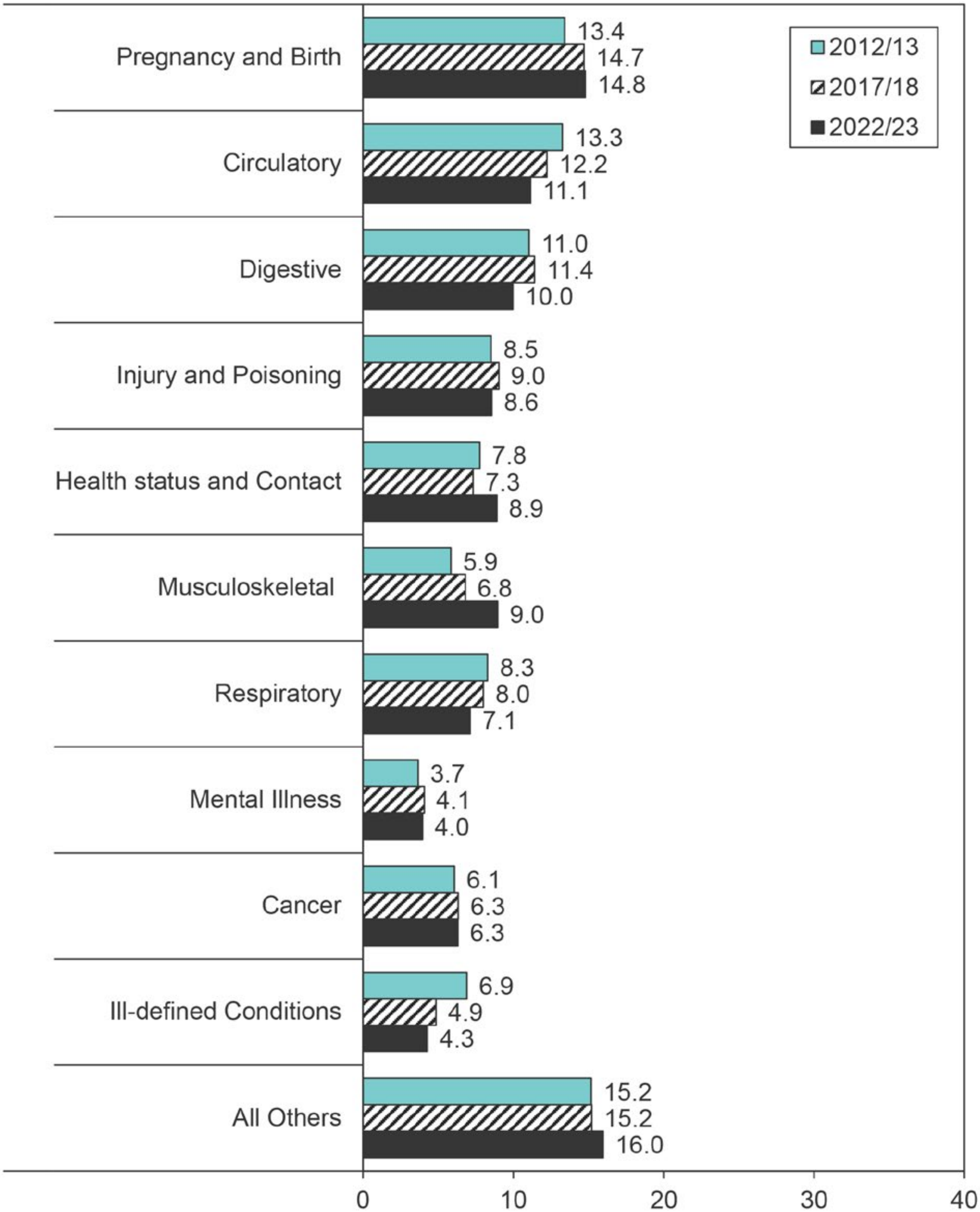
Figure 7.7: Reasons for Inpatient Hospitalizations in Acute Care Facilities in the Winnipeg RHA, 2012/13, 2017/18, and 2022/23
Annual crude percent* of all hospitalizations (all ages)



s data suppressed due to small numbers
* denominators: T1 = 50,168; T2 = 54,852; T3 = 49,779

Figure 7.8: Reasons for Inpatient Hospitalizations in Acute Care Facilities in the Interlake-Eastern RHA, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all hospitalizations (all ages)

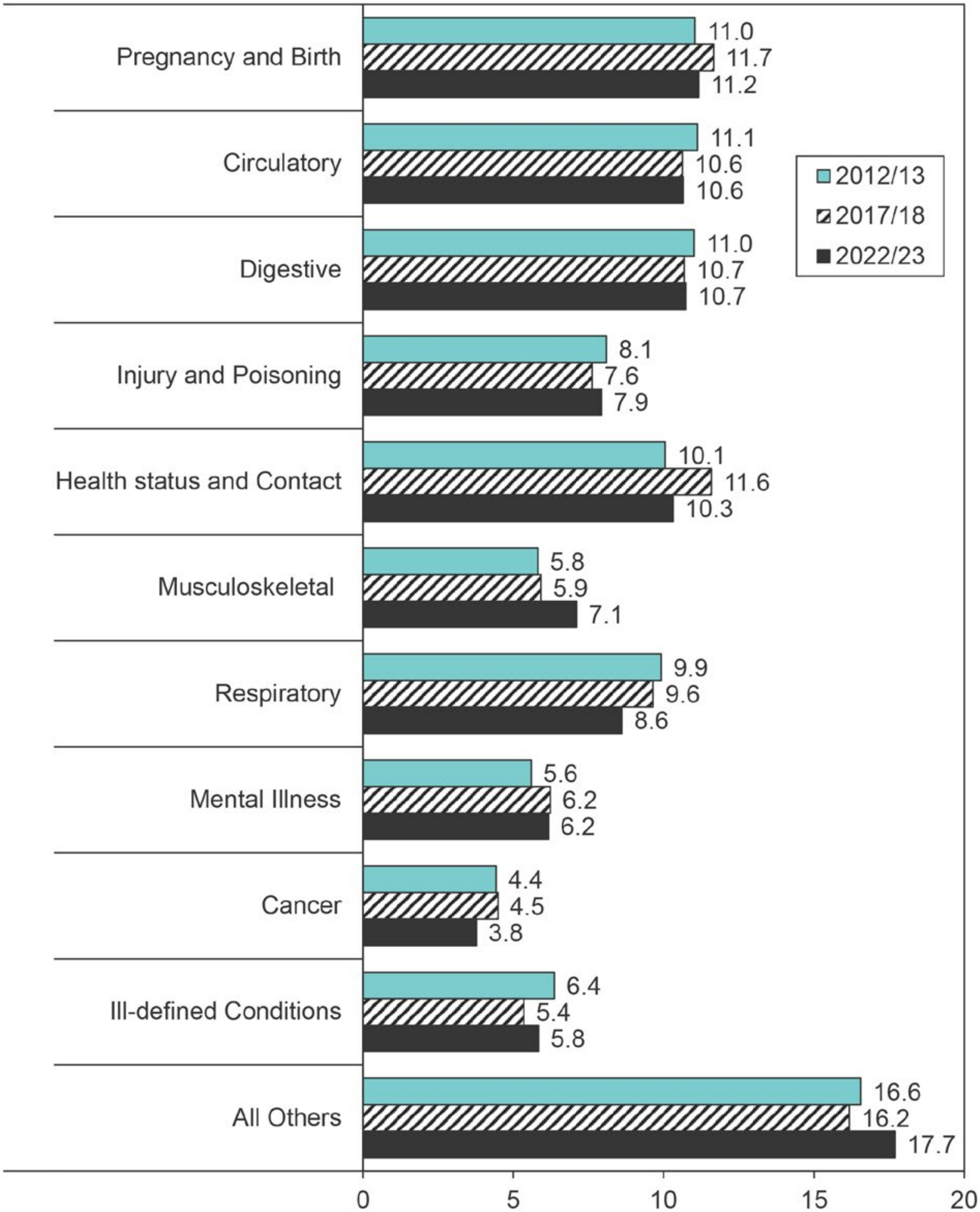


s data suppressed due to small numbers

* denominators: T1 = 11,820; T2 = 11,773; T3 = 11,049

Figure 7.9: Reasons for Inpatient Hospitalizations in Acute Care Facilities in Prairie Mountain Health, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all hospitalizations (all ages)

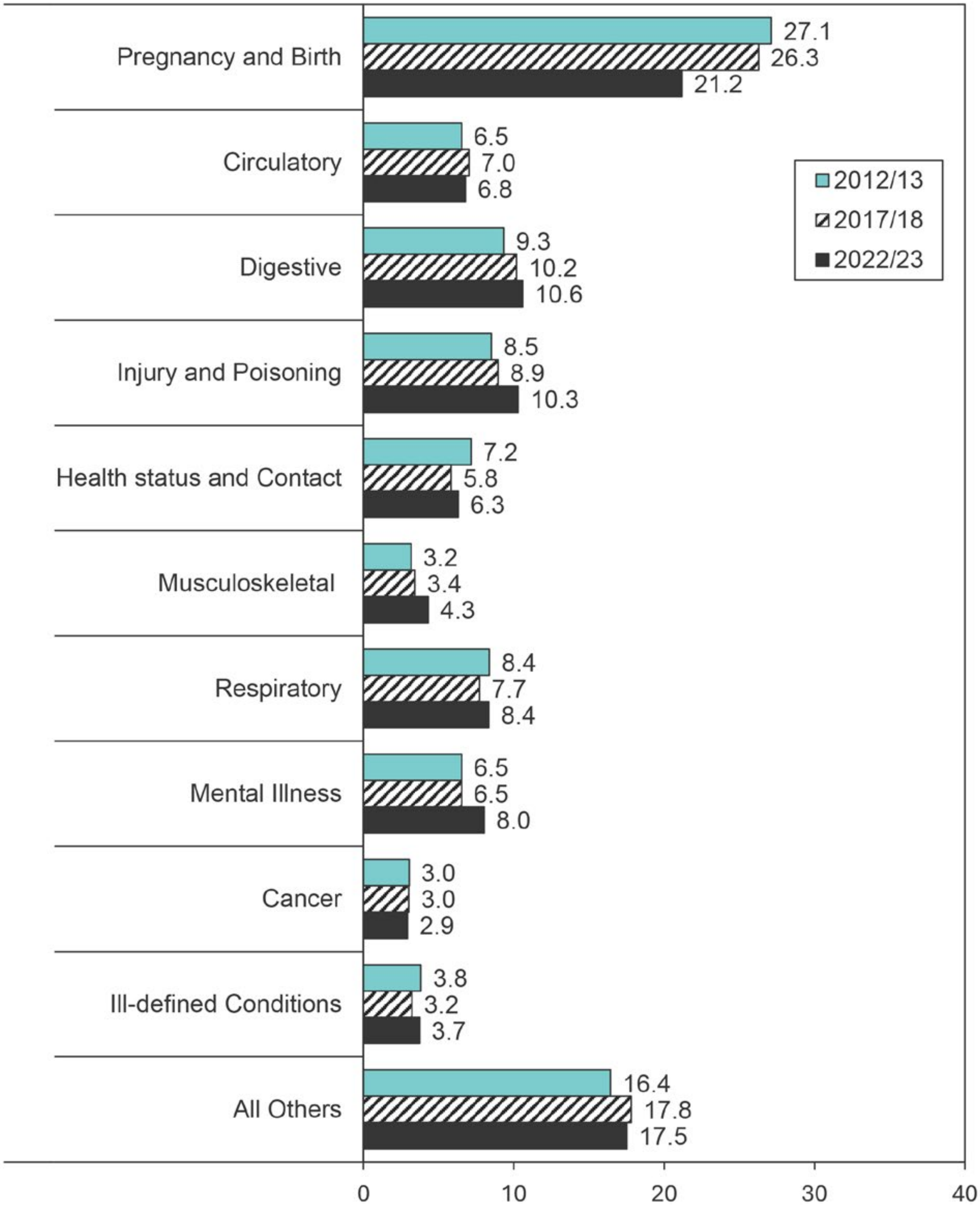


s data suppressed due to small numbers

* denominators: T1 = 21,060; T2 = 20,033; T3 = 17,606

Figure 7.10: Reasons for Inpatient Hospitalizations in Acute Care Facilities in the Northern Region, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all hospitalizations (all ages)



s data suppressed due to small numbers

* denominators: T1 = 9,287; T2 = 8,953; T3 = 8,173

7.4 Day Surgery Hospitalizations

Definition: The number of hospitalizations for day surgery procedures per 1,000 residents in a given year. This includes surgeries and procedures for which patients do not typically stay overnight, as defined by the Canadian Institute for Health Information (CIHI).[4] Since a person could receive multiple surgeries in a year, this indicator shows the total number of procedures provided to all residents.

Time period analysis: Day surgery rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Day surgery rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

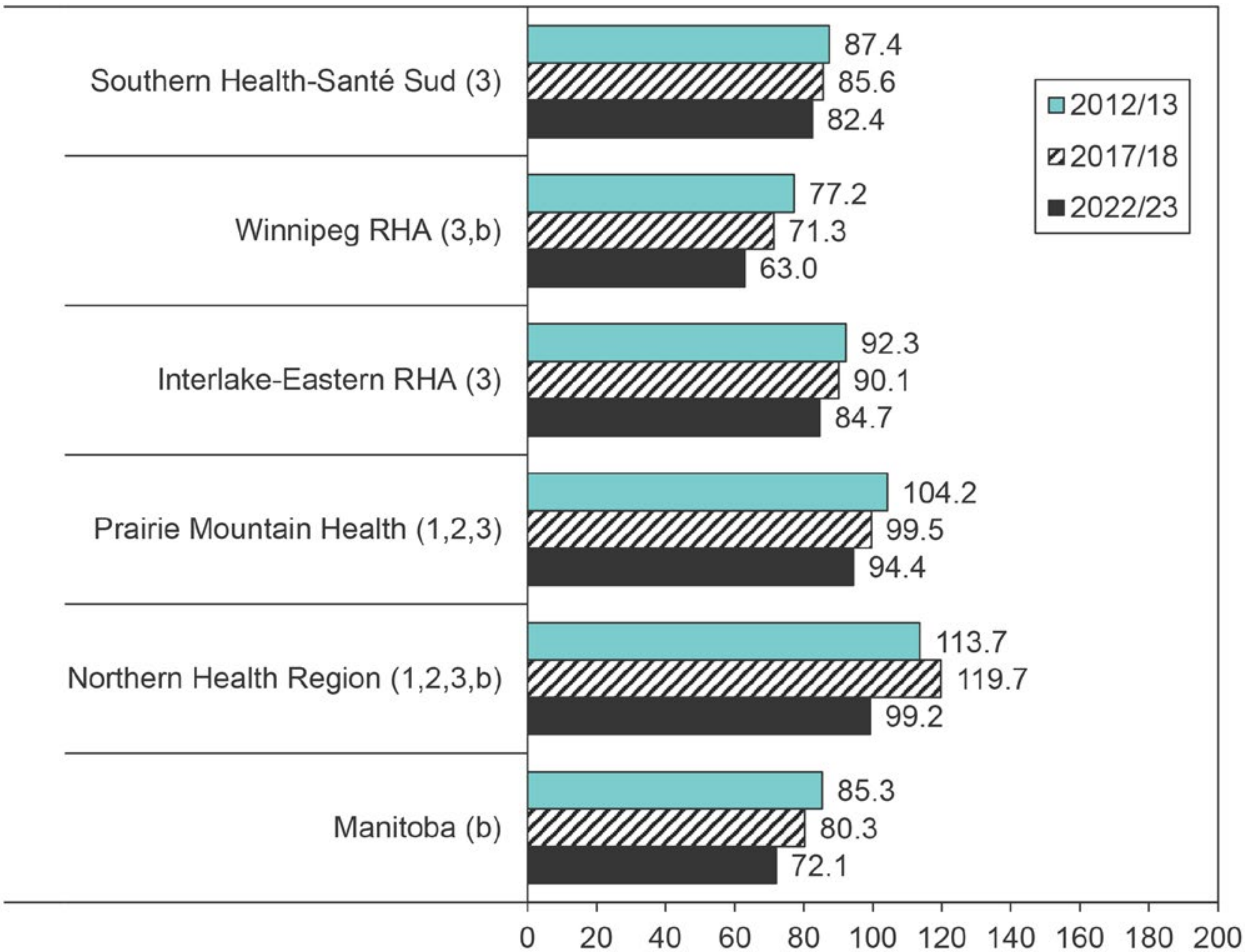
Time Period Analysis (Figure 7.11)

- The day surgery rate in Manitoba decreased from 85.3 per 1,000 residents per year in TP1 to 80.3 in TP2 to 72.1 in TP3. The decrease between TP2 and TP3 was significant. While the adjusted rate decreased across time periods, the number of day surgery hospitalizations increased from 95,696 in TP1 to 102,852 in TP3 to 103,605 in TP3 (online supplement).
- All regions had decreasing rates across the periods except for Northern Health Region, which had a non-significant increase between TP1 and TP2 before significantly decreasing between TP2 and TP3. The Winnipeg RHA was the only other region where there was a significant decrease between TP2 and TP3.
- The highest rates were seen in the Northern Health Region and Prairie Mountain Health, which had significantly higher rates than Manitoba in all three periods. The lowest rates were in the Winnipeg RHA and their TP3 rate was significantly lower than the Manitoba rate for that period. All other regions had significantly higher rates in TP3 than the Manitoba rate.
- Day surgery rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region. However, the Winnipeg RHA had lower values than the Southern Health-Santé Sud region, which may reflect differences in hospital capacity between these regions.
- Day surgery rates were associated to income in rural areas in all three periods (see online supplement). Residents from lower income rural areas had higher rates of day surgery than residents from higher income rural areas. The rates were not related to income in urban areas.

Trend Analysis (Figure 7.12)

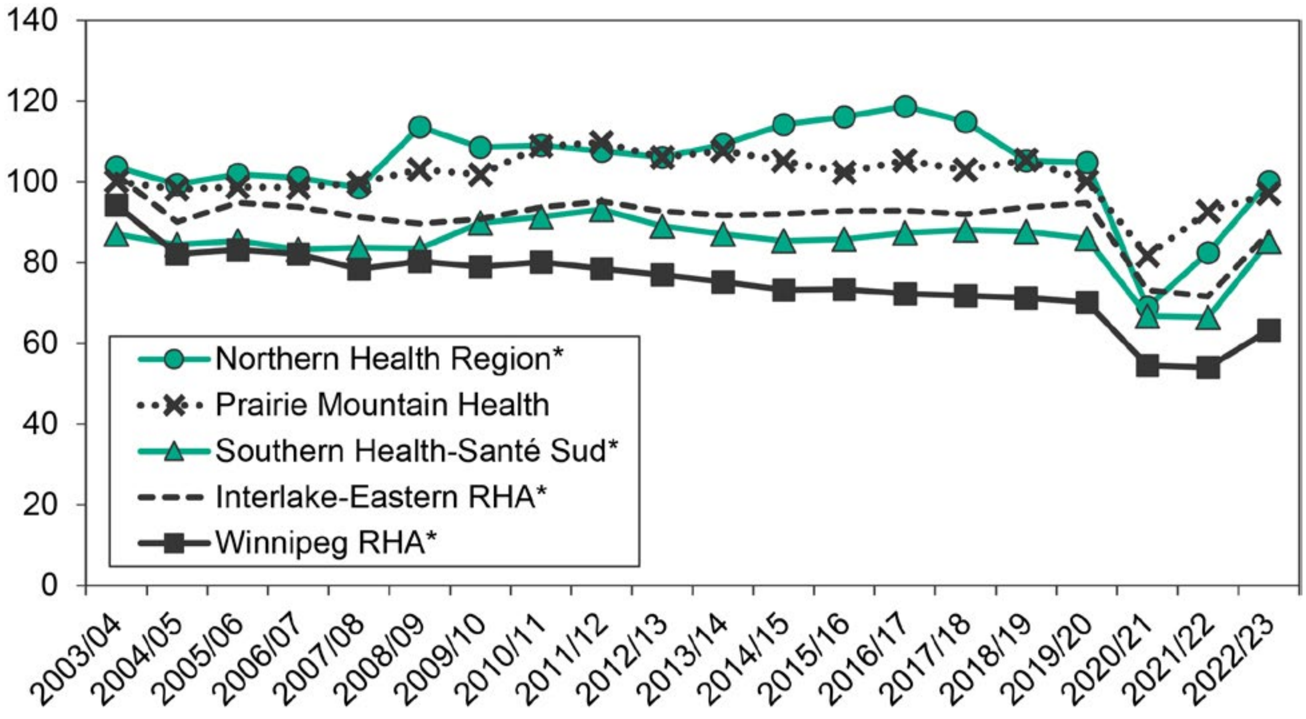
- Day surgery rates decreased significantly in Manitoba and in all regions except Prairie Mountain Health where no trend was observed. All regions had dramatic decreases in the rates between 2019/20 and 2020/21, which were returning to expected rates by 2022/23.

Figure 7.11: Day Surgery Rates by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate of day surgeries per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.12: Hospitalization Rate for Day Surgery by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rate of day surgeries per 1,000 residents (all ages)



* statistically significant linear trend over time.

7.5 Reasons for Day Surgery Hospitalizations

Definition: The most frequent reasons for day surgery, defined as surgical services received on an outpatient basis in acute care facilities. Each day surgery abstract has a 'most responsible' diagnosis - the diagnosis that describes the most significant condition of the patient who required day surgery. These diagnoses were grouped by ICD-10-CA chapter. The ICD-10-CA chapters with the most day surgery hospitalizations in Manitoba in 2022/23 were used to set the order for each region.

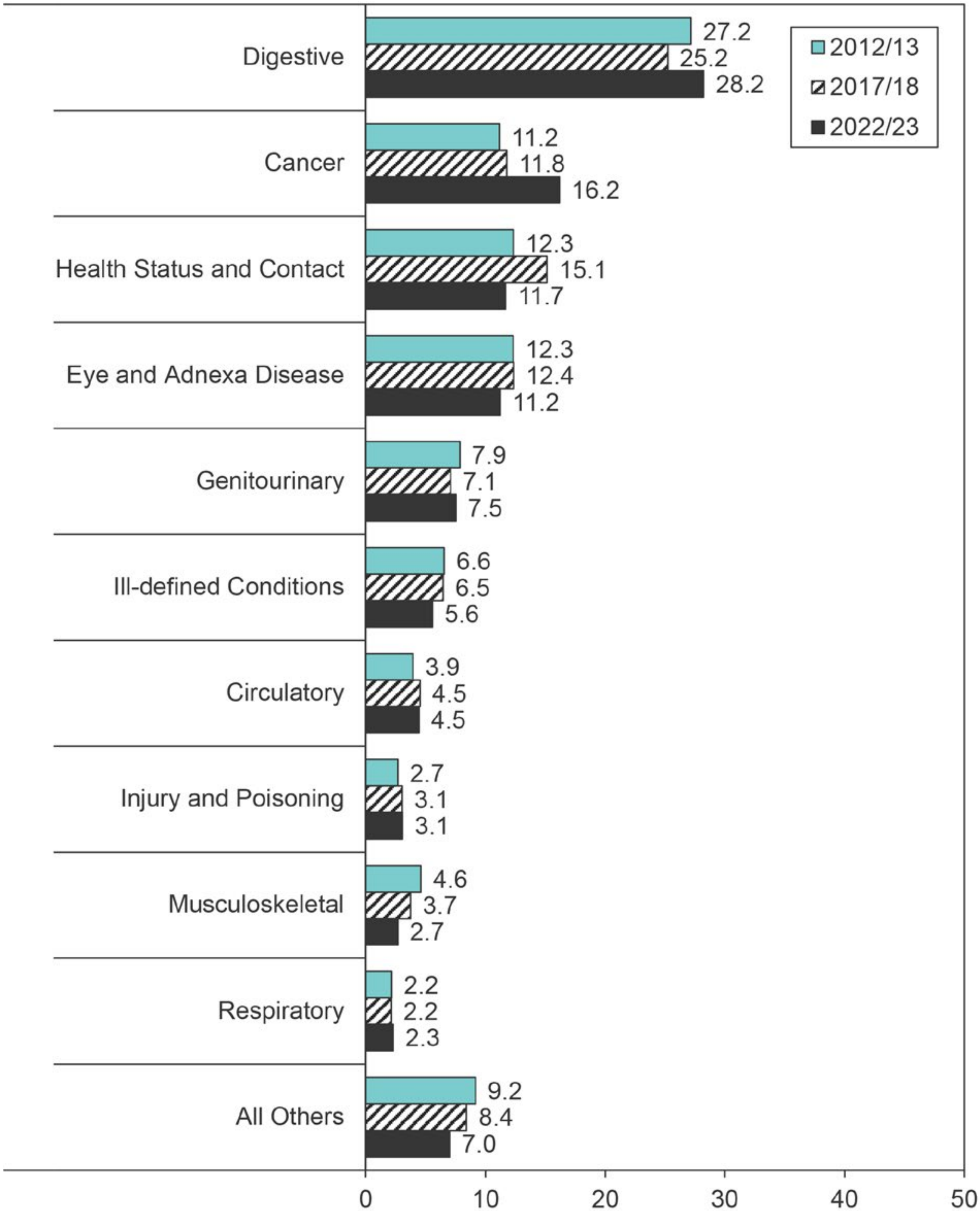
Time period analysis: The annual crude percent of all day surgery hospitalization by ICD-10-CA chapter in each region were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3). The number of hospitalizations used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

Key Findings

Time Period Analysis (Figures 7.13 – 7.18)

- The most prominent reasons for day surgery in Manitoba and in each region were for digestive disorders. Among the digestive disorder surgeries, dental caries were the most common in TP2 and colon polyp surgery were the most common in TP3.
- Cancer was the second leading reason for day surgery, which showed a considerable increase between TP2 and TP3 in the province and each region. Previously, the second and third leading causes were for health status and contact and eye disorders reasons.
- There were decreases across the periods in the percentage of day surgeries for musculoskeletal conditions and in all other reasons category.

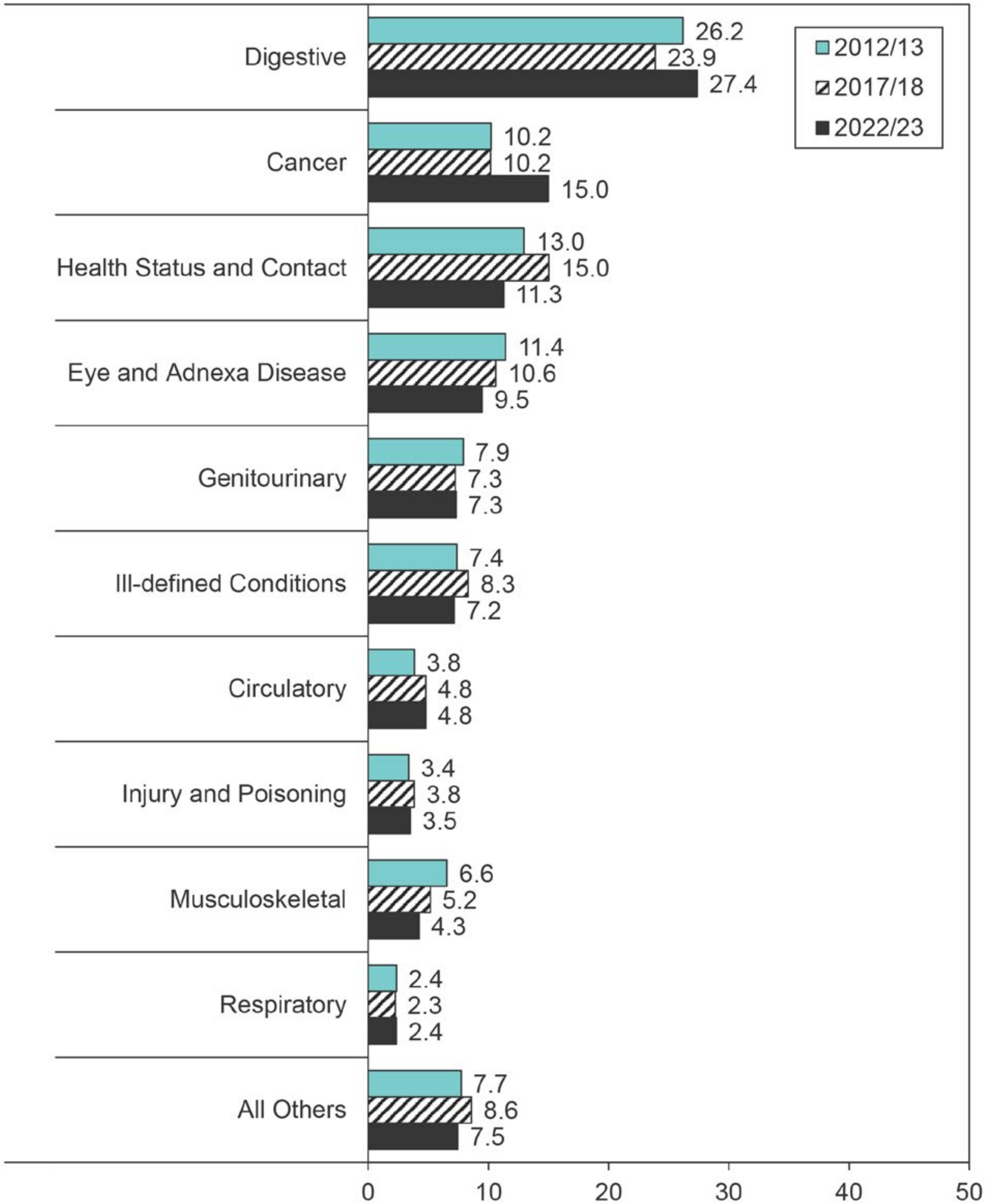
Figure 7.13: Most Common Reasons for Day Surgery Hospitalizations in Manitoba, 2012/13, 2017/18, and 2022/23
Annual crude percent* of all day surgery hospitalizations (all ages)



s data suppressed due to small numbers
* denominators: T1 = 95,406; T2 = 102,713; T3 = 103,540

Figure 7.14: Reasons for Day Surgery Hospitalizations in Southern Health-Santé Sud, 2012/13, 2017/18, and 2022/23

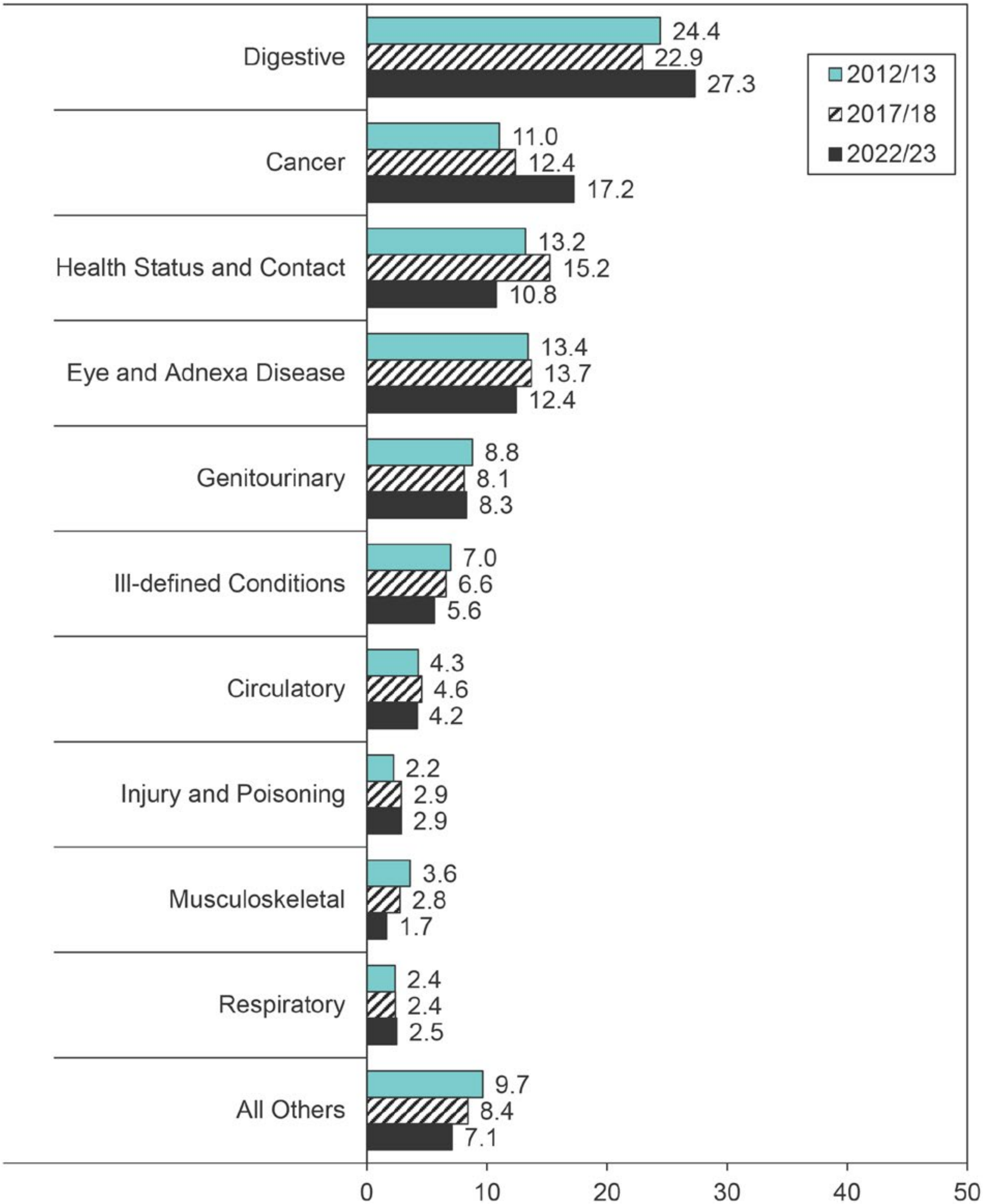
Annual crude percent* of all day surgery hospitalizations (all ages)



s data suppressed due to small numbers

* denominators: T1 = 13,175; T2 = 15,013; T3 = 16,412

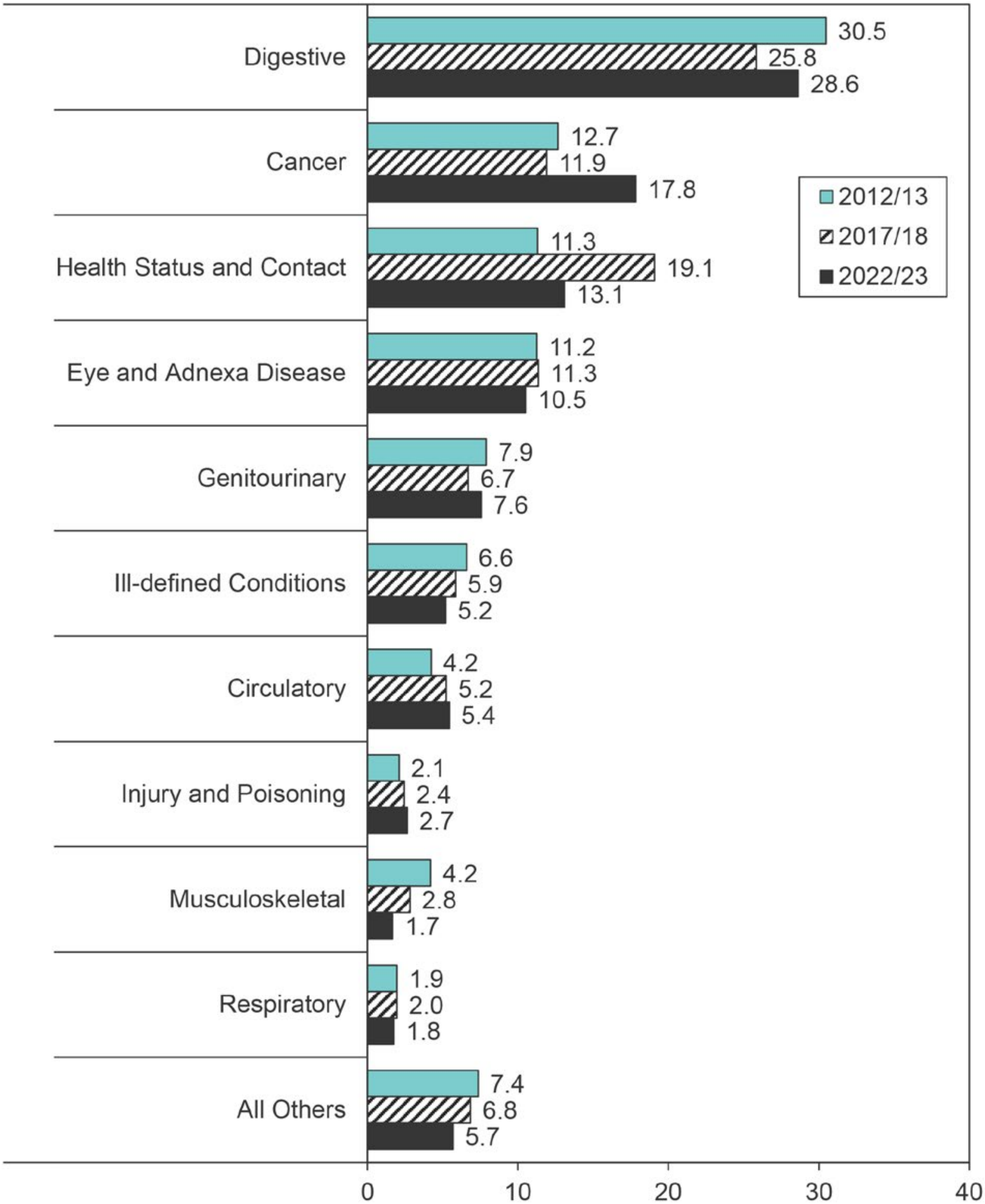
Figure 7.15: Reasons for Day Surgery Hospitalizations in the Winnipeg RHA, 2012/13, 2017/18, and 2022/23
Annual crude percent* of all day surgery hospitalizations (all ages)



s data suppressed due to small numbers
* denominators: T1 = 49,787; T2 = 52,752; T3 = 51,898

Figure 7.16: Reasons for Day Surgery Hospitalizations in the Interlake-Eastern RHA, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all day surgery hospitalizations (all ages)

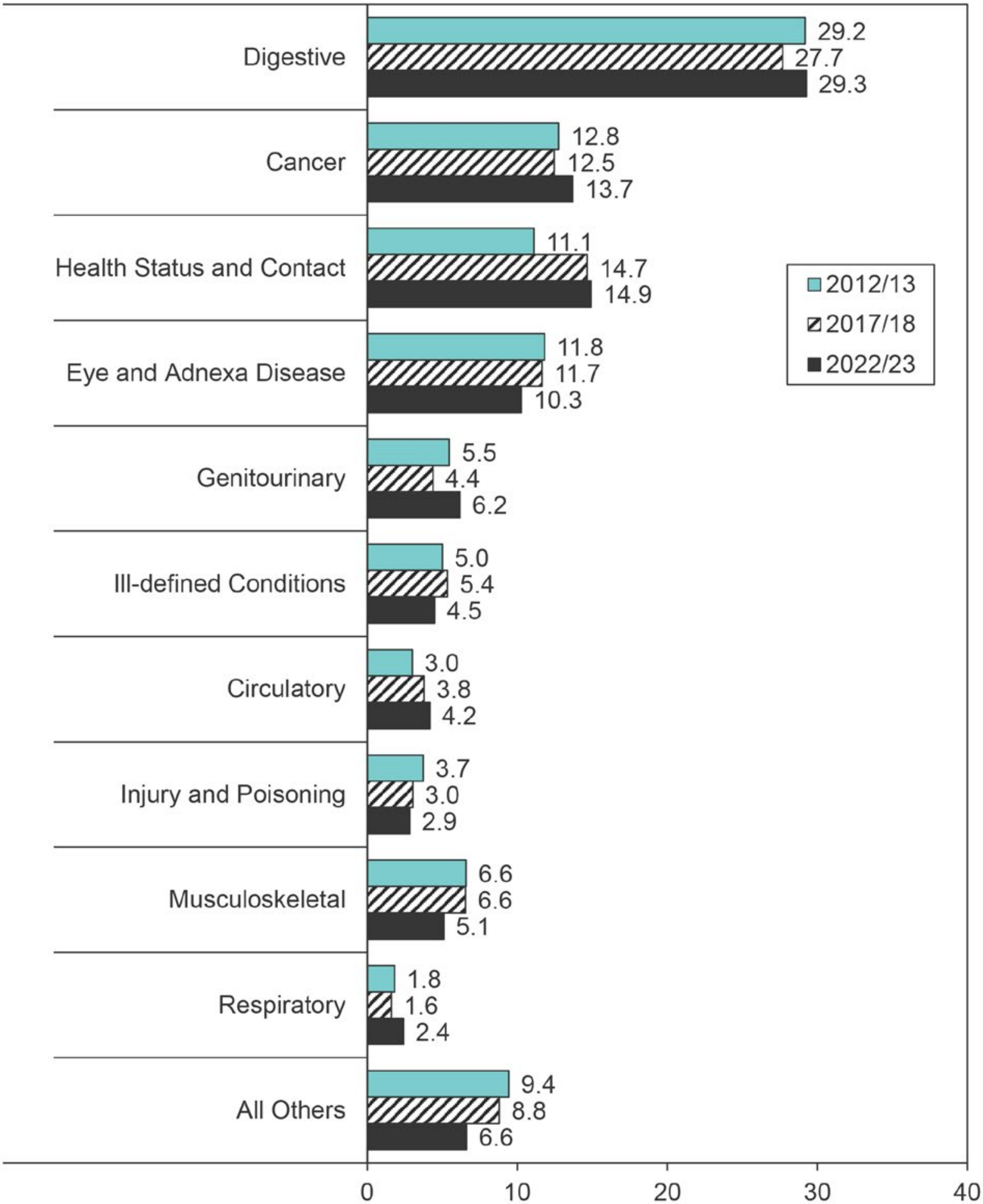


s data suppressed due to small numbers

* denominators: T1 = 10,513; T2 = 11,665; T3 = 12,446

Figure 7.17: Reasons for Day Surgery Hospitalizations in Prairie Mountain Health, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all day surgery hospitalizations (all ages)

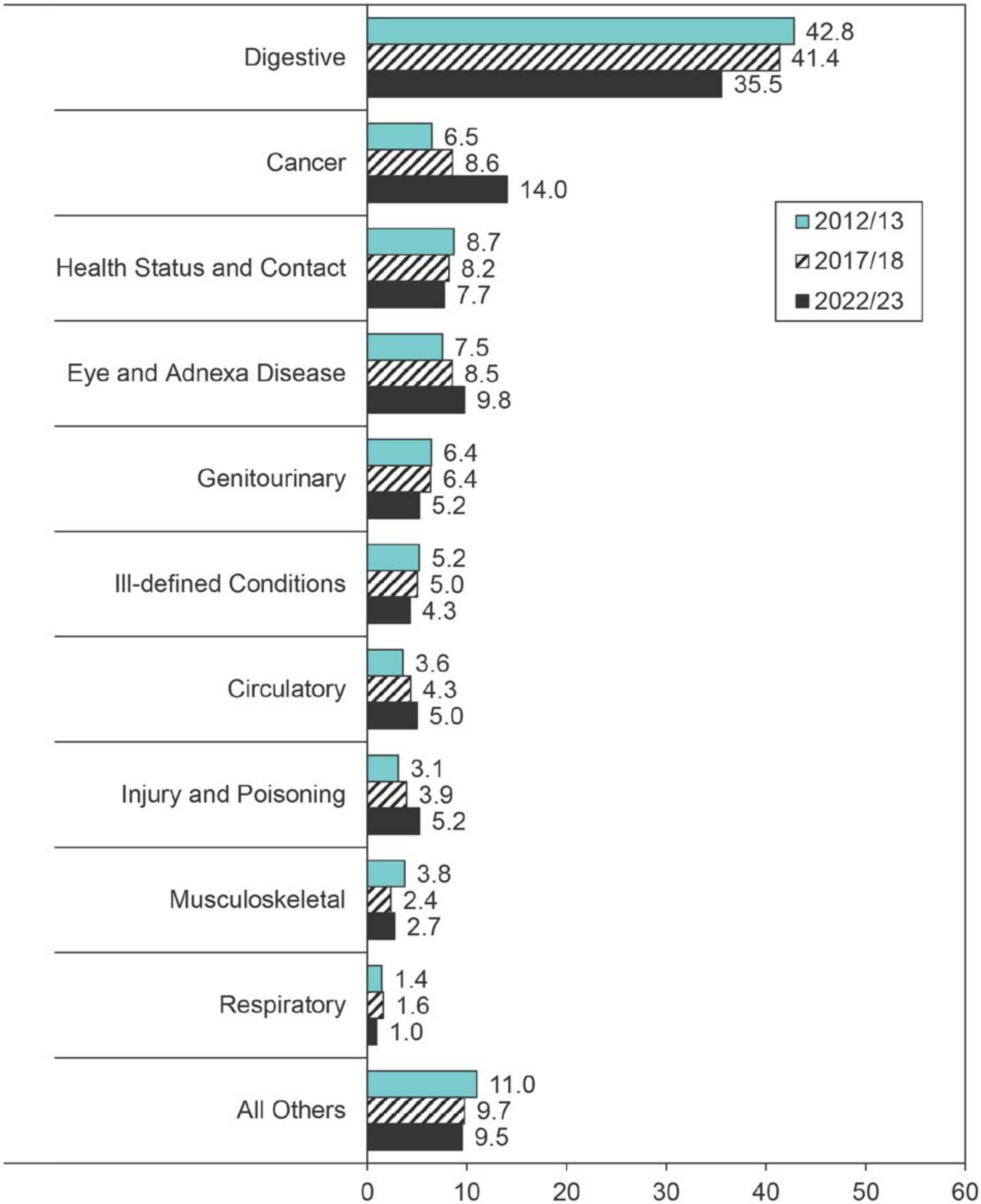


s data suppressed due to small numbers

* denominators: T1 = 16,685; T2 = 17,295; T3 = 17,189

Figure 7.18: Reasons for Day Surgery Hospitalizations in Northern Health Region, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all day surgery hospitalizations (all ages)



s data suppressed due to small numbers

* denominators: T1 = 4,931; T2 = 5,655; T3 = 5,261

7.6 Hospital Days for Acute Care

Definition: The number of hospital days coded as being for acute care per 1,000 residents. A hospital stay could have both acute and ALC days. This indicator only includes acute care days. Residents could have had more than one acute care hospitalization in a year, and the acute days used in all hospitalizations were summed.

Time period analysis: Hospital days for acute care rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Hospital days for acute care rates were calculated for each one-year period from 2004/05 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

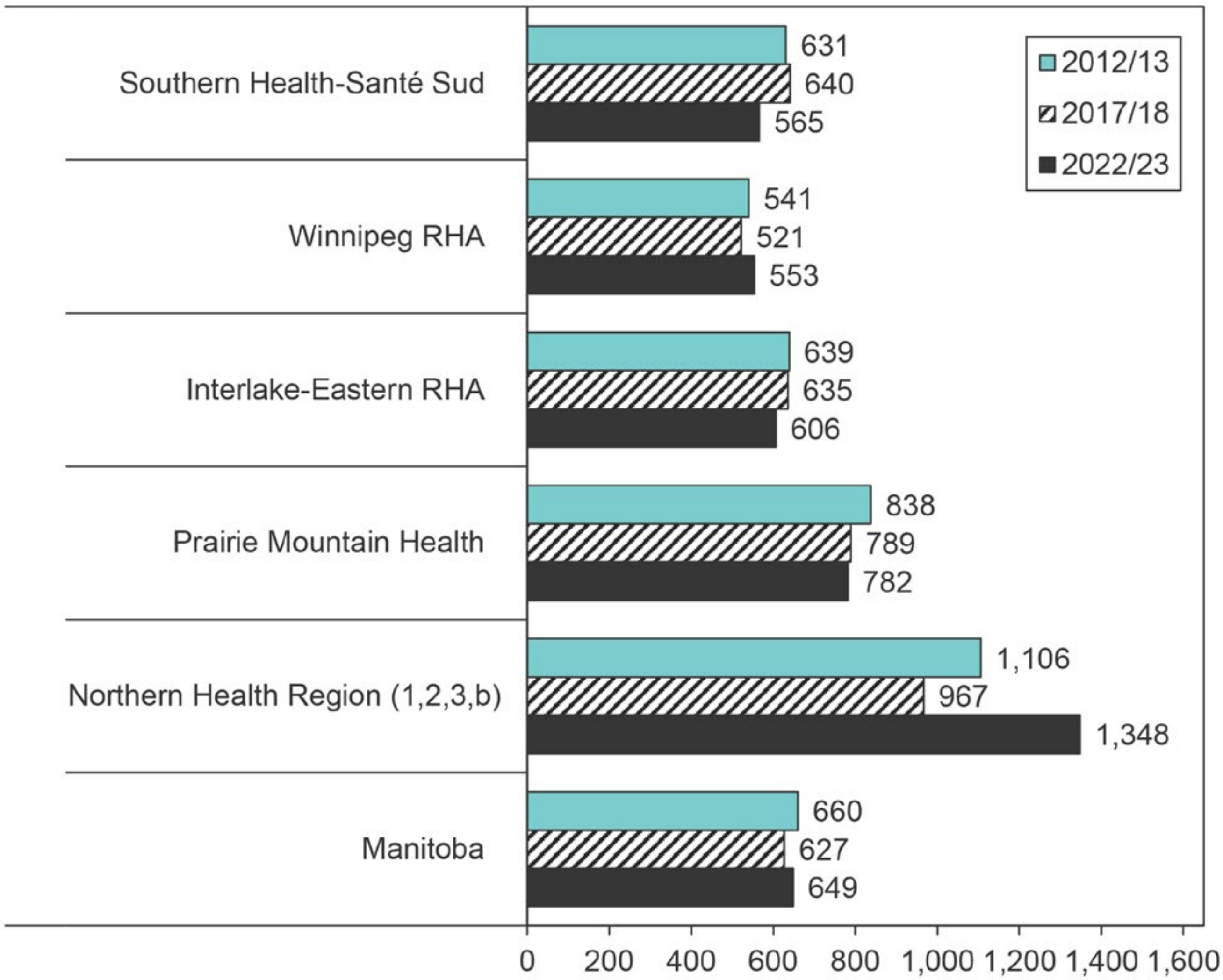
Time Period Analysis (Figure 7.19)

- The rate of acute care days for acute care was stable across the periods for Manitoba. However, the number of hospital days have increased, which totalled 933,288 days in TP3, an increase of 5.3% from TP2 (online supplement).
- Most regions had just slight changes, and only the Northern Health Region had a significant change where the rate increased between TP2 and TP3.
- The highest rates were seen in the Northern Health Region, which had significantly higher rates than Manitoba in all three periods.
- Rates of acute care days appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region. However, the Winnipeg RHA had lower rates than the Southern Health-Santé Sud region, which may reflect differences in hospital capacity between these regions.
- Rates of acute care days was strongly associated to income in urban and rural areas in both time periods (see online supplement). Residents from lower income areas had much higher rates than residents from higher income areas.

Trend Analysis (Figure 7.20)

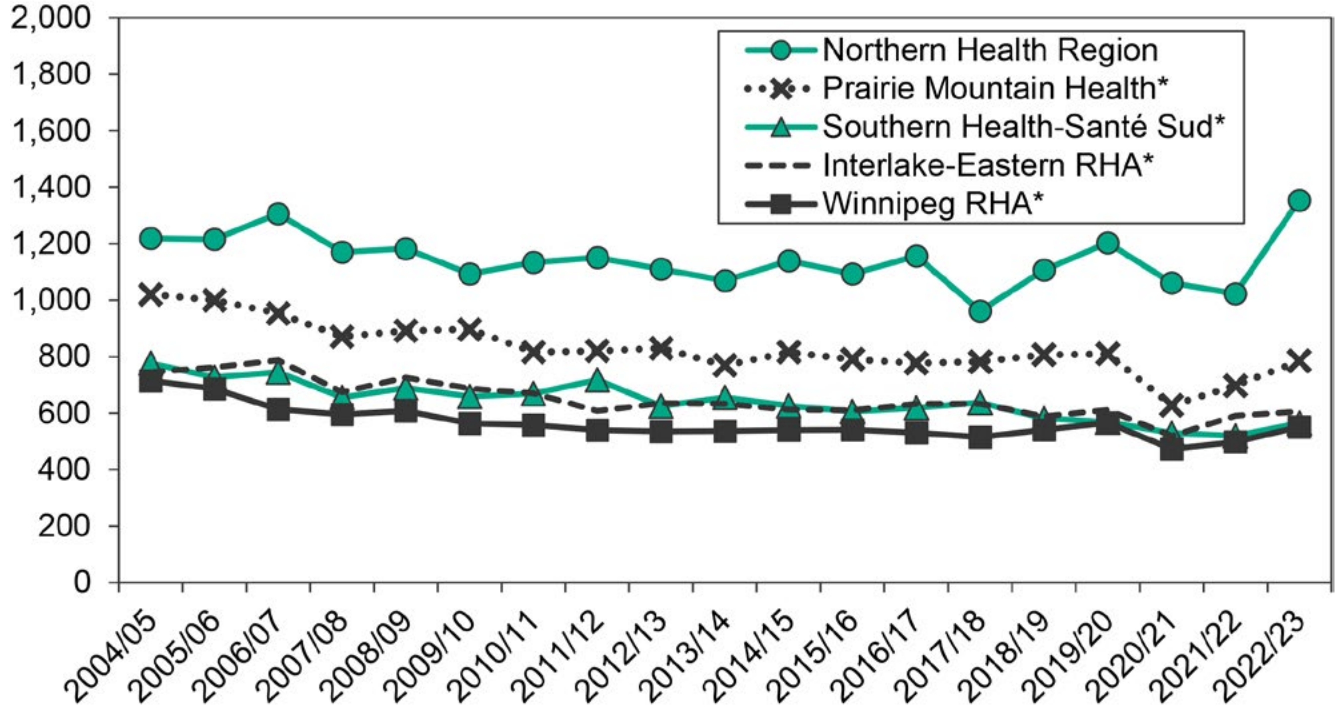
- Rates of acute care days decreased significantly over time in Manitoba and in all regions except Northern Health Region where no trend was observed. All regions had a sharp decrease in rates between 2019/20 and 2020/21, which were back on the rise by 2021/22.

Figure 7.19: Acute Care Hospital Days by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rates of hospital days per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.20: Acute Care Hospital Days by Health Region, 2004/05 to 2022/23
Age- and sex-adjusted rate of hospital days per 1,000 residents (all ages)



* statistically significant linear trend over time.

7.7 Reasons for Acute Care Hospital Days

Definition: The most common reasons for hospital days coded only as acute care (i.e., no ALC days) during inpatient hospitalizations. Each hospital abstract has a 'most responsible' diagnosis - the diagnosis that describes the most significant condition of a patient that contributed to their days in hospital. Diagnoses were grouped by ICD-10-CA chapter. The ICD-10-CA chapters with the most acute care hospital days in Manitoba in 2022/23 were used to set the order for each region.

Notes regarding two key groups of reasons:

- Health status and contact: hospitalizations in this broad category included a large number of issues not necessarily connected to a specific diagnosis or disease, including people awaiting placement in personal care homes, palliative care, rehabilitation and other services.
- Ill-defined conditions: for hospitalizations in this category, the patient was experiencing a specific problem (including malaise and fatigue, tendency to fall, and other unspecified pain), but it could not be assigned to a specific disease category.

Time period analysis: The annual crude percent of all acute care hospital days by ICD-10-CA chapter in each region were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3). The number of hospital days used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

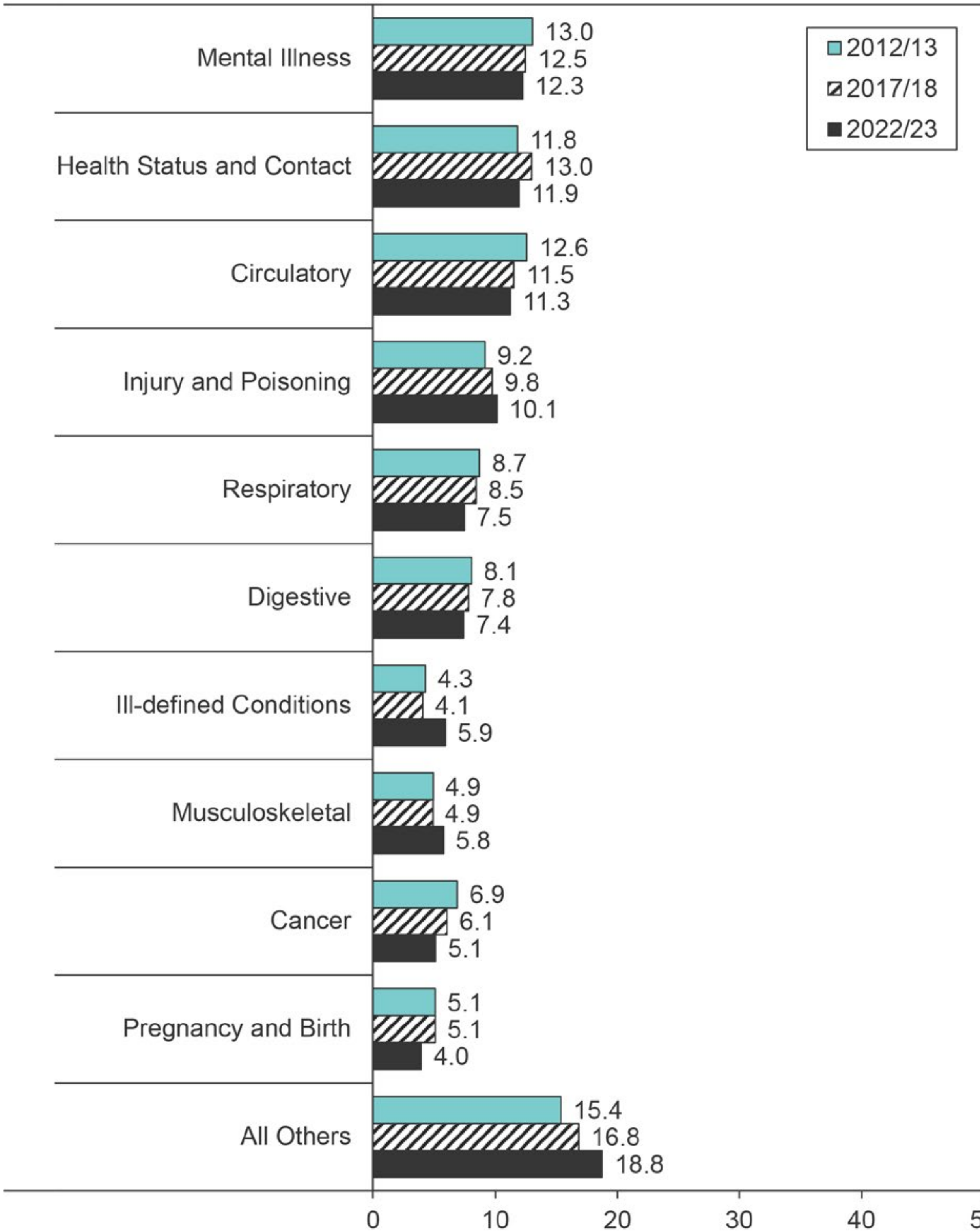
Key Findings

Time Period Analysis (Figures 7.21 – 7.26)

- The most prominent reasons of acute care hospital days by Manitobans were mental illness, health status and contact, and circulatory diseases. For Manitoba overall, the rankings did not change much over time, while they varied considerably by region.
- Reasons of acute care days show a distinctly different distribution than the reasons of hospitalization because length of stay varied by reason. For example, childbirth was the most common reason for hospitalization but ranked much lower in terms of days used because most stays for this reason are typically quite short.

Figure 7.21: Most Common Reasons for Acute Care Hospital Days in Manitoba, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all acute care hospital days (all ages)

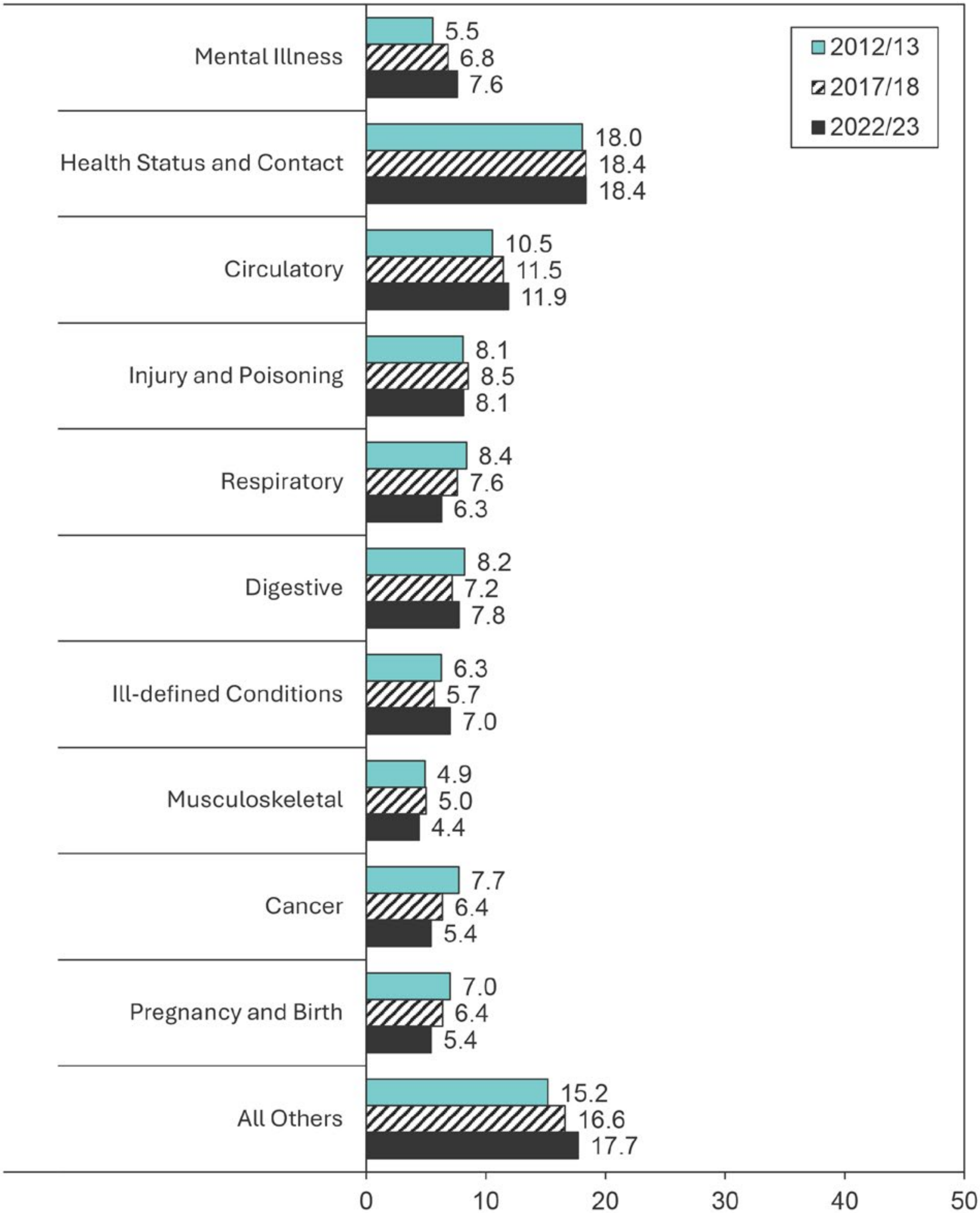


s data suppressed due to small numbers

* denominators: T1 = 857,522; T2 = 886,161; T3 = 933,288

Figure 7.22: Reasons of Acute Care Hospital Days in Southern Health-Santé Sud, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all acute care hospital days (all ages)

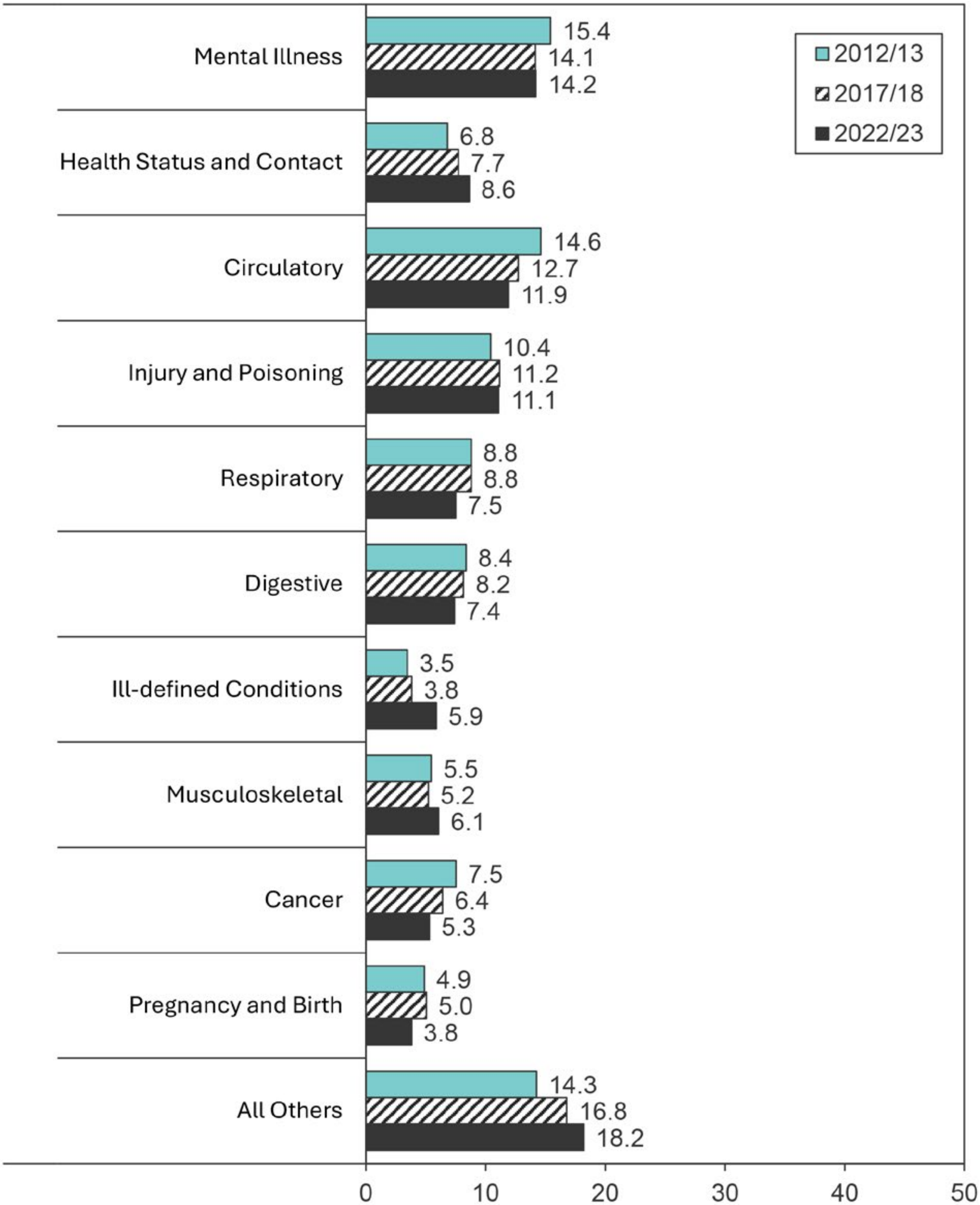


s data suppressed due to small numbers

* denominators: T1 = 109,018; T2 = 114,998; T3 = 113,442

Figure 7.23: Reasons of Acute Care Hospital Days in the Winnipeg RHA, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all acute care hospital days (all ages)

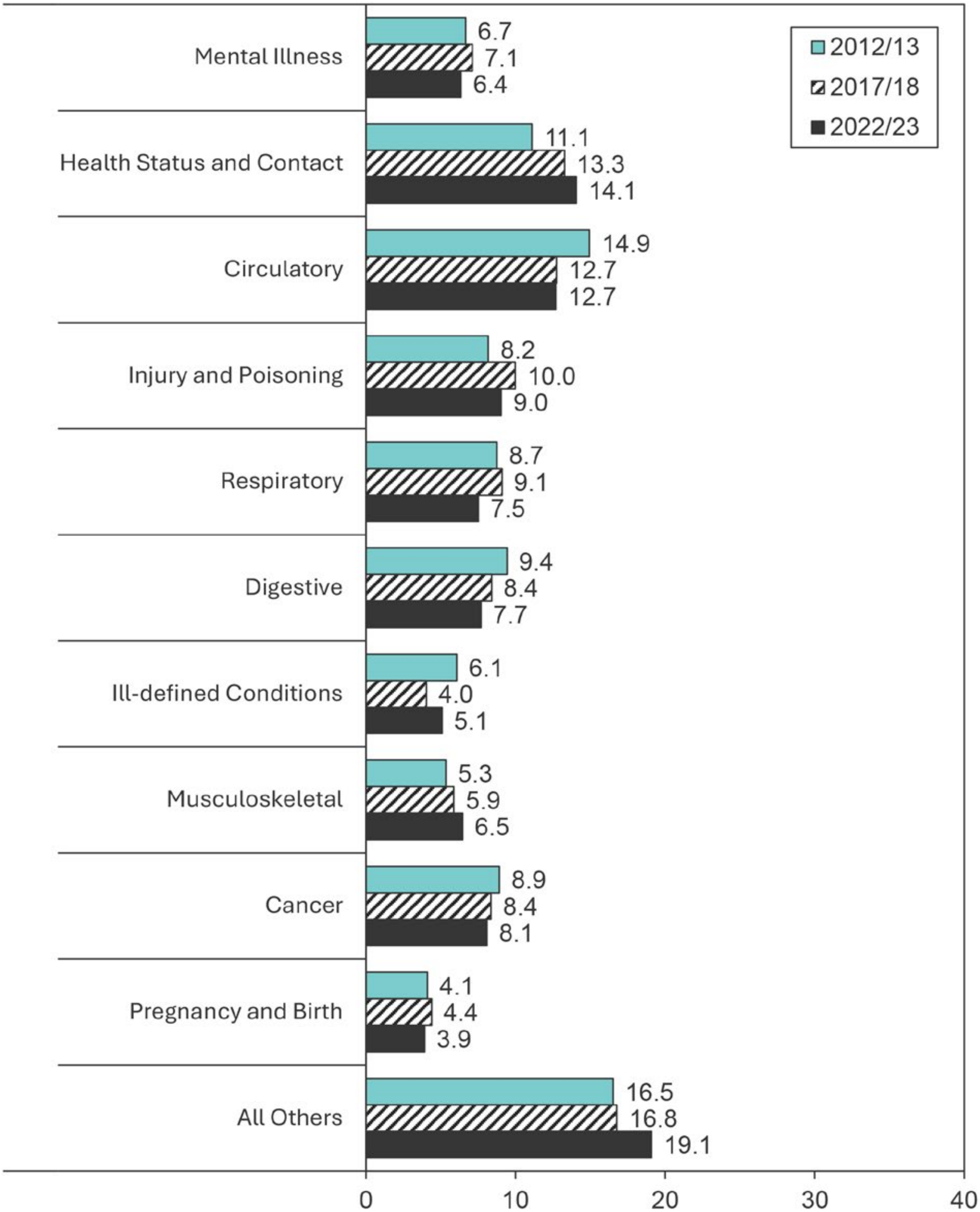


s data suppressed due to small numbers

* denominators: T1 = 417,428; T2 = 442,392; T3 = 478,921

Figure 7.24: Reasons of Acute Care Hospital Days in the Interlake-Eastern RHA, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all acute care hospital days (all ages)

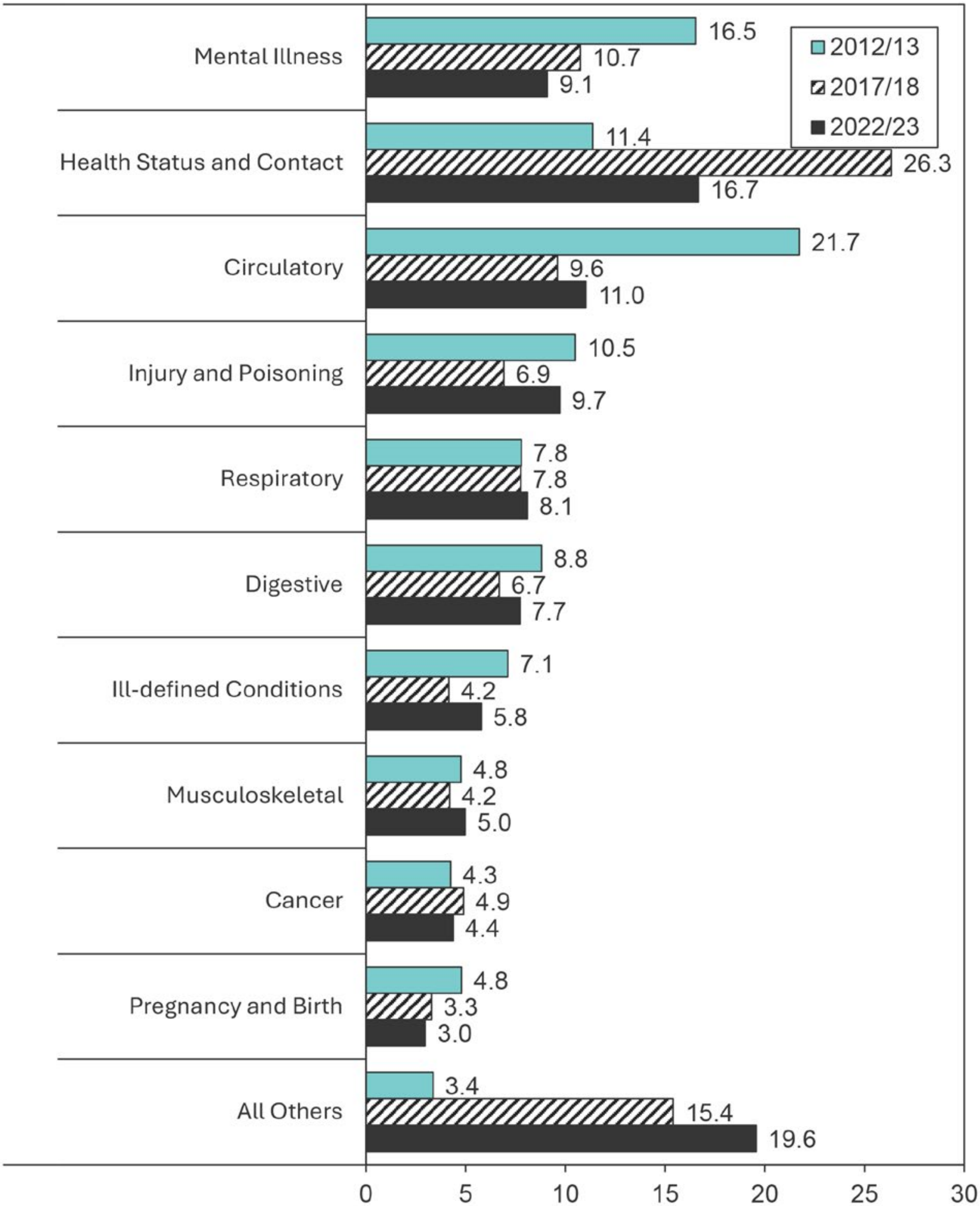


s data suppressed due to small numbers

* denominators: T1 = 83,994; T2 = 86,565; T3 = 86,384

Figure 7.25: Reasons of Acute Care Hospital Days in Prairie Mountain Health, 2012/13, 2017/18, and 2022/23

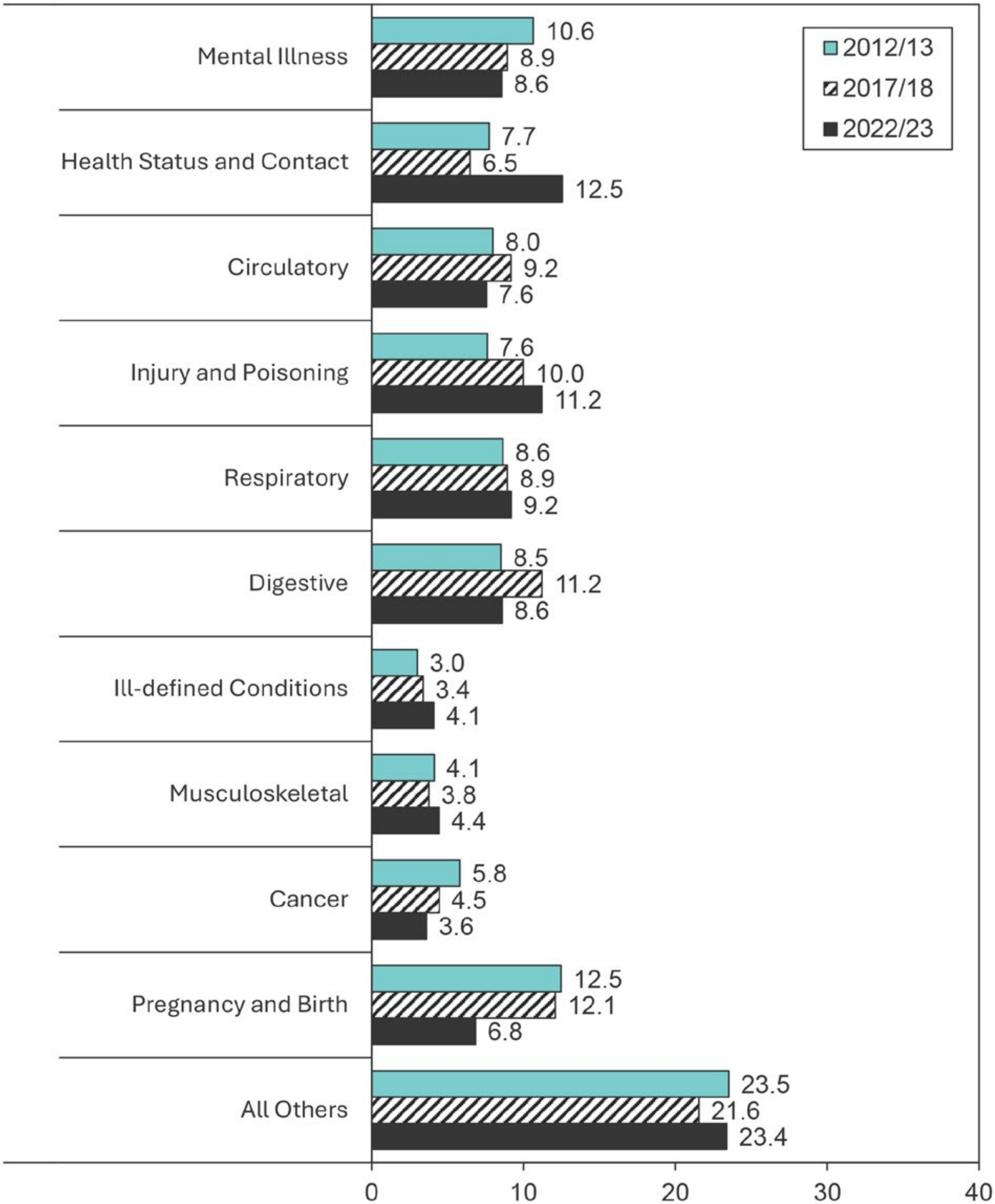
Annual crude percent* of all acute care hospital days (all ages)



s data suppressed due to small numbers
* denominators: T1 = 169,998; T2 = 162,024; T3 = 146,727

Figure 7.26: Reasons of Acute Care Hospital Days in the Northern Health Region, 2012/13, 2017/18, and 2022/23

Annual crude percent* of all acute care hospital days (all ages)



s data suppressed due to small numbers

* denominators: T1 = 51,891; T2 = 52,658; T3 = 68,007

7.8 Hospital Days for Alternative Level of Care (ALC)

Definition: The number of hospital days coded as being for ALC (as opposed to being for acute care) per 1,000 residents. Most patients with ALC days were admitted to hospital for acute reasons (e.g., stroke), but then became designated as ALC later in their stay. A hospital stay could have both acute and non-acute (ALC) days, in which case only ALC days were included. The majority of ALC days in hospital are used by patients who are either being assessed for potential placement in nursing homes, or have been assessed and are awaiting placement, but there are many other ALC reasons. Residents could have had ALC days in more than one hospitalization in a year, so the ALC days used in all hospitalizations were summed.

Time period analysis: Rates of hospital days for ALC were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Rates of hospital days for ALC were calculated for each one-year period from 2004/05 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 7.27)

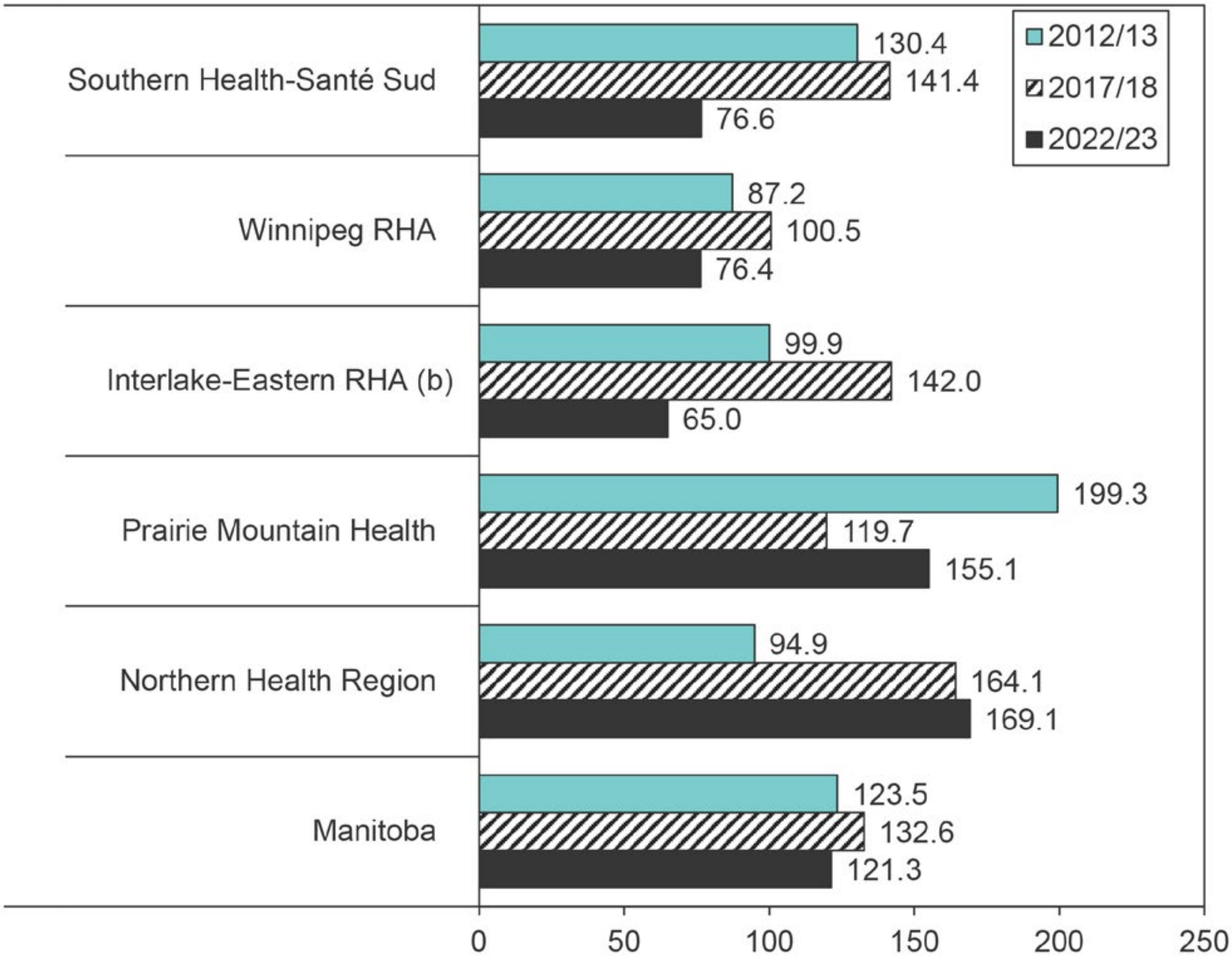
- The rate of hospital days for ALC increased between TP1 and TP2 for Manitoba and in every region except Prairie Mountain Health where it decreased. Rates decreased between TP2 and TP3 in the province and in Southern Health-Santé Sud, Winnipeg RHA, and the Interlake-Eastern RHA, while it increased in Prairie Mountain Health and the Northern Health Region. The only significant change between periods was the decrease observed from TP2 to TP3 in Interlake-Eastern RHA.
- The total number of ALC days decreased from 220,731 days in TP2 to 174,412 days in TP3.
- The highest rates were seen in the Northern Health Region and Prairie Mountain Health, while the lowest were in the Winnipeg RHA. None were significantly different from the Manitoba rates.
- Rates of ALC days was associated to income in urban areas in all three periods, and rural areas in TP1 and TP3 (see online supplement). Residents of lower income areas had higher rates than residents of higher income areas.

Trend Analysis (Figure 7.28)

- There was a lot of variation in the rates over time in each of the regions. The trend has increased significantly in the Interlake-Eastern RHA, Prairie Mountain Health, and the Northern Health Region, while it decreased in the Winnipeg RHA. There was no trend observed for Manitoba overall.

Figure 7.27: Hospital Days for Alternative Level of Care Stays by Health Region, 2012/13, 2017/18, and 2022/23

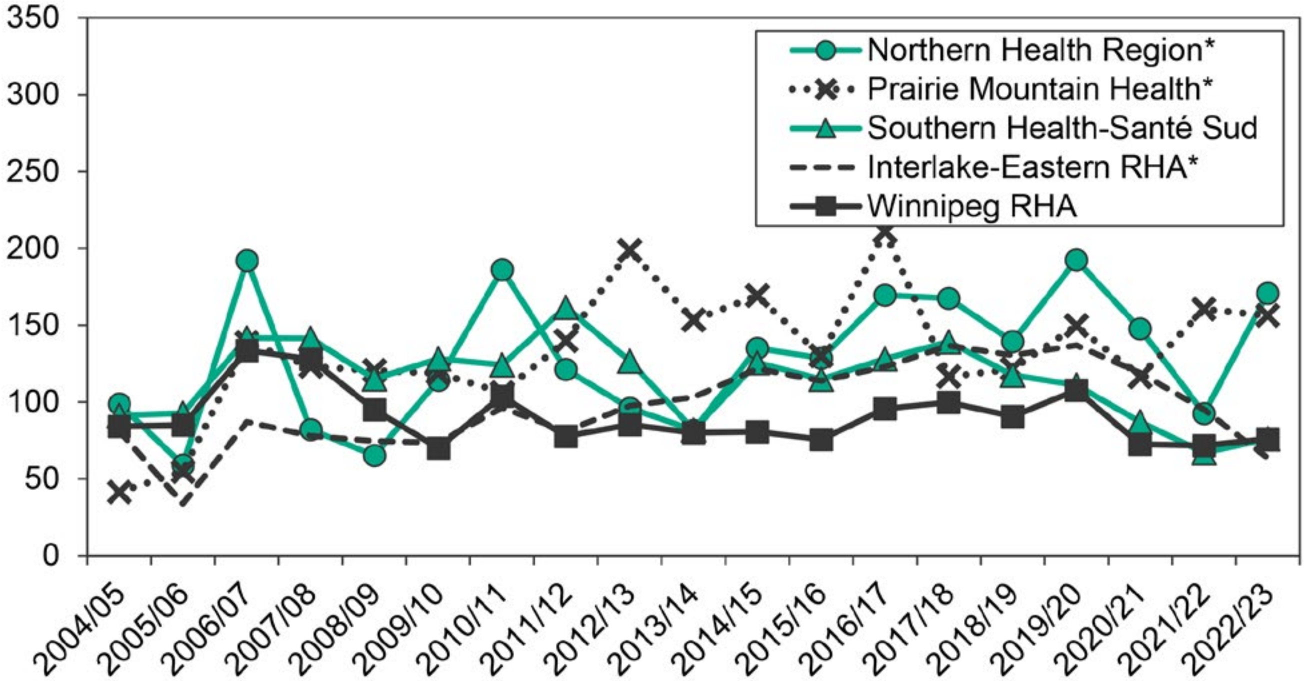
Age- and sex-adjusted rates of hospital days per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.28: Hospital Days for Alternative Level of Care Stays by Health Region, 2004/05 to 2022/23

Age- and sex-adjusted rate of hospital days per 1,000 residents (all ages)



* statistically significant linear trend over time.

7.9 Hospital Readmission

Definition: The percentage of hospital episodes after which the patient was readmitted to any hospital within 1-30 days of the preceding discharge. Only unplanned inpatient readmissions were counted, defined by admission category 'U' for urgent/emergent admissions. Hospital episodes combine multiple inpatient admissions by the same person to create a single continuous stay in the hospital system, linking transfers between hospitals. Readmissions less than 24 hours after discharge were considered to be part of the same hospital episode.

Time period analysis: Hospital readmission percentages were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3. Counts and crude percentages by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Hospital readmission percentages were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

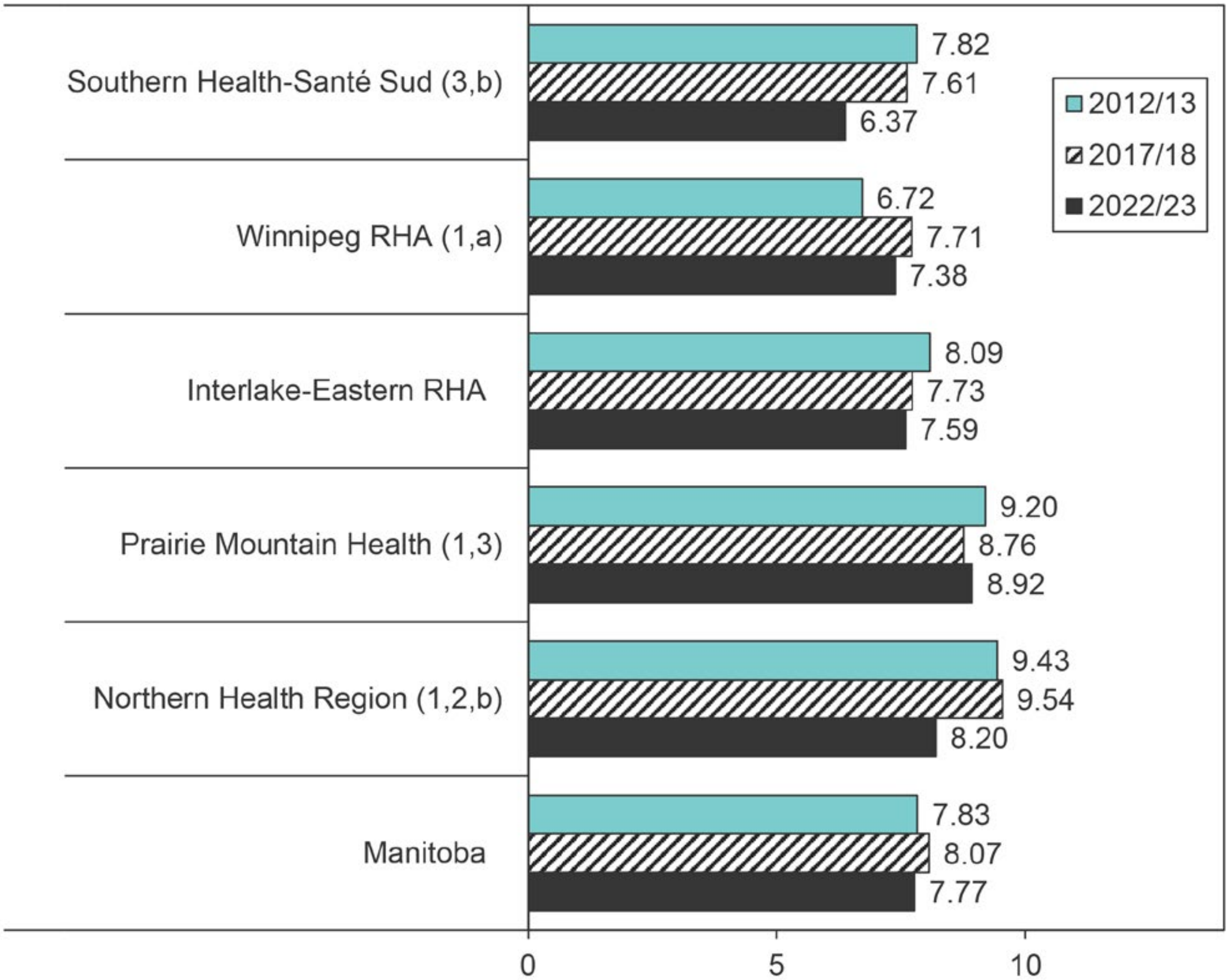
Time Period Analysis (Figure 7.29)

- In Manitoba, hospital readmissions within 30 days did not change significantly across the periods. However, among the regions, the percentage of readmissions decreased significantly between TP2 and TP3 in Southern Health-Santé Sud and the Northern Health Region, while they increased between TP1 and TP2 in the Winnipeg RHA.
- The percentages were highest in the Northern Health Region and Prairie Mountain Health region, where both had significantly higher percentages in TP1 than the Manitoba percentage. The Northern Health Region also had a higher percentage in TP2 than Manitoba and Prairie Mountain Health had a higher percentage in TP3.
- Hospital readmissions appear to be related to health status as the percentage increased across the regions from the Southern Health-Santé Sud to the Northern Health Region.
- Hospital readmissions were associated to urban and rural income (see online supplement). Residents of lower income areas had higher percentages of readmissions than residents of higher income areas.

Trend Analysis (Figure 7.30)

- There was a significant decreasing trend observed in Manitoba and in all regions except for the Winnipeg RHA where trends increased (particularly around 2014/15).

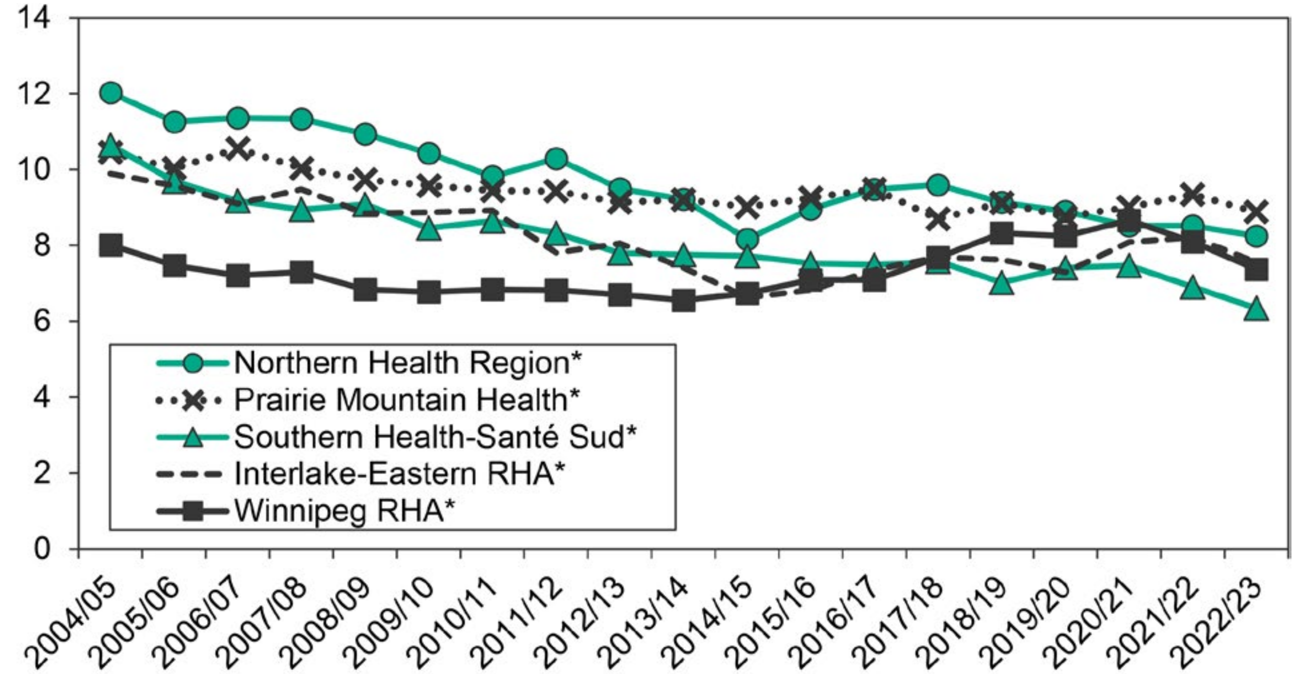
Figure 7.29: Hospital Readmission by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of hospital episodes with a readmission within 30 days of discharge (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.30: Hospital Readmission by Health Region, 2004/05 to 2022/23

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



* statistically significant linear trend over time.

7.10 Hospitalizations for Ambulatory Care Sensitive (ACS) Conditions

Definition: The number of inpatient hospital separations for ACS conditions per 1,000 residents aged 0-74 in a given year. ACS conditions are a group of 25 diseases and diagnoses for which it is thought that timely and effective outpatient care can reduce the risk of hospitalization. These conditions include asthma, angina, gastroenteritis, and congestive heart failure. The grouping was created by Billings and colleagues[13,14] but has been revised over time.

Time period analysis: Hospitalization rates for ACS conditions were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Hospitalization rates for ACS conditions were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 7.31)

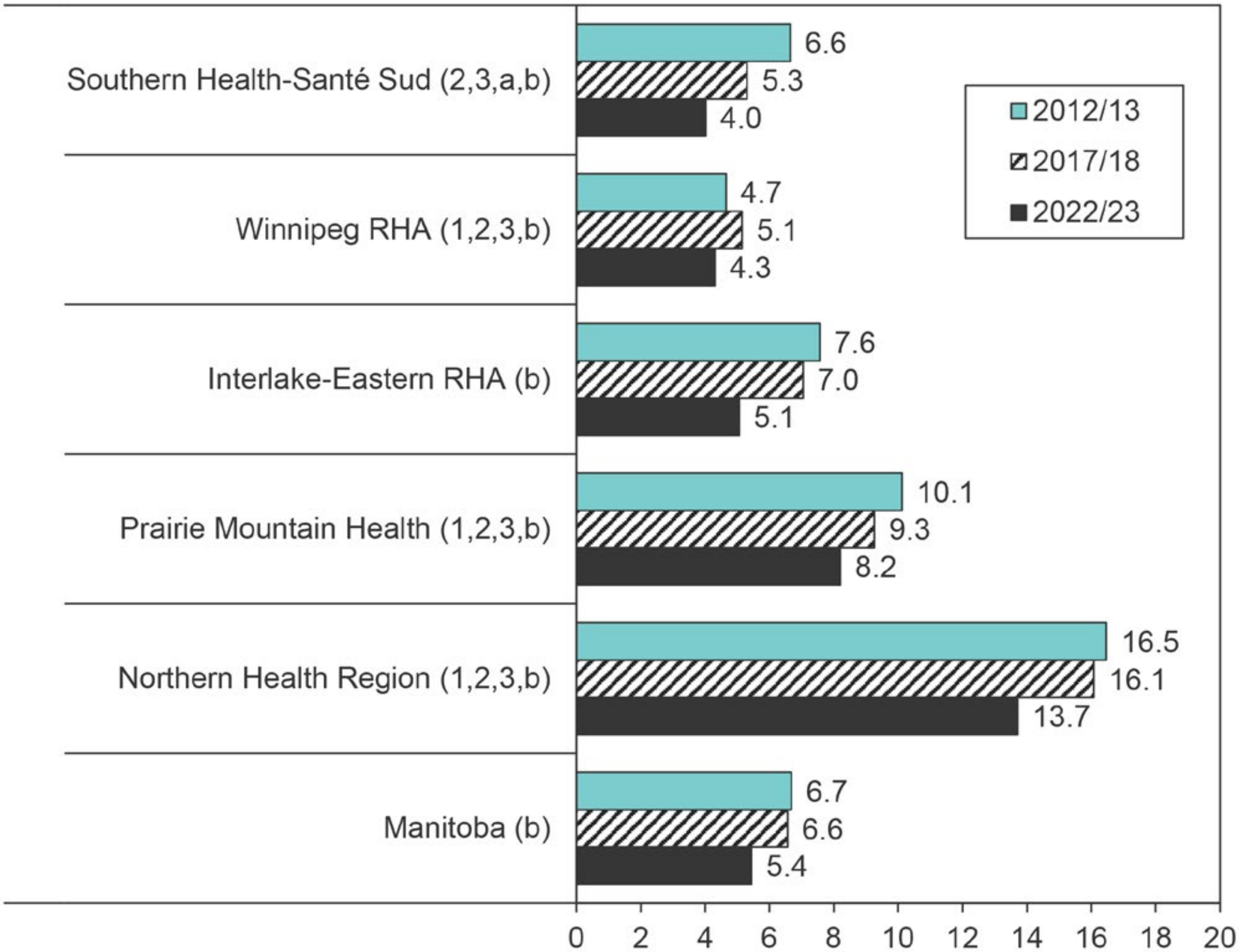
- In Manitoba, hospitalization rates for ACS conditions were similar in TP1 and TP2 at 6.7 per 1,000 residents (0-74 years) and then significantly decreased to 5.4 in TP3. The total number of ACS condition hospitalizations decreased from 8,587 in TP2 to 7,241 in TP3 (online supplement).
- Similar patterns existed in the regions where there was a significant decrease between TP2 and TP3. However, there was also a decrease between TP1 and TP2 in Southern Health-Santé Sud while rates increased in the Winnipeg RHA.
- The rates were highest in the Northern Health Region and Prairie Mountain Health, which were significantly higher than the Manitoba rates in each period. The Winnipeg RHA had the lowest rates, which were lower than the Manitoba rates. The Southern Health-Santé Sud region also had lower rates than Manitoba in TP2 and TP3.
- Hospitalization rates for ACS conditions appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Rates were strongly associated to income in urban and rural areas in all three periods (see online supplement). Rates for residents of lower income areas were higher than those for residents of higher income areas.

Trend Analysis (Figure 7.32)

- Rates have decreased over time in Manitoba and in all regions.

Figure 7.31: Hospitalization Rate for Ambulatory Care Sensitive Conditions by Health Region, 2012/13, 2017/18, and 2022/23

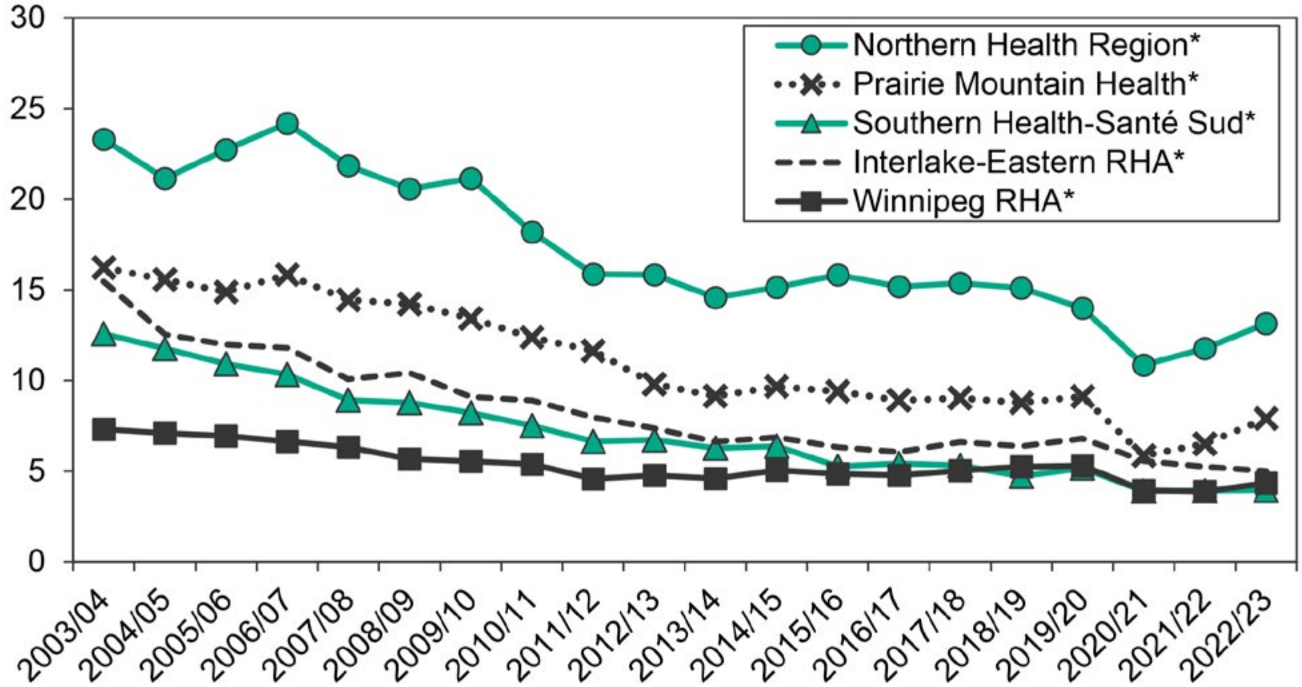
Age- and sex-adjusted rate of hospitalizations per 1,000 residents (age 0-74)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.32: Hospitalization Rate for Ambulatory Care Sensitive Conditions by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted rate of hospitalizations per 1,000 residents (age 0-74)



* statistically significant linear trend over time.

7.11 Injury Hospitalizations

Definition: The number of residents with an inpatient hospitalization for injury per 1,000 residents. In any given period, a resident could be hospitalized for injury more than once, so this measure indicates the total number of injury-related separations from acute care facilities by all residents of the area. This definition encompasses injuries by all reasons (including self-inflicted). Transfers between hospitals were tracked and only hospital episodes were counted, not individual separations, to reduce double–counting injuries. Newborn birth injuries or deaths, stillbirths and brain deaths were excluded.

Hospitalizations were defined as:

- Any inpatient hospitalization with an external cause of injury diagnosis code:
  - ICD-9-CM codes E800-E999
  - ICD-10-CA codes V01-Y89.

Excluded from the count of hospitalizations due to injury are those related to medical error or drug complications, as follows:

- Misadventures during surgical or medical care:
  - ICD-9-CM codes E870-E876
  - ICD-10-CA codes Y60-Y69, Y88.1
- Reactions or complications due to medical care:
  - ICD-9-CM codes E878-E879
  - ICD-10- CA codes Y70-Y84, Y88.2, Y88.3
- Adverse effects due to drugs:
  - ICD-9-CM codes E930-E949
  - ICD-10-CA codes Y40-Y59, Y88.0
- Late effects of injury:
  - ICD-9-CM code E29.9
- Location of Injury:
  - ICD-9-CM code E84.9
- Supplementary factors related to causes of morbidity and mortality classified elsewhere:
  - ICD-10-CA codes Y90-Y98

Time period analysis: Injury hospitalization rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Injury hospitalization rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

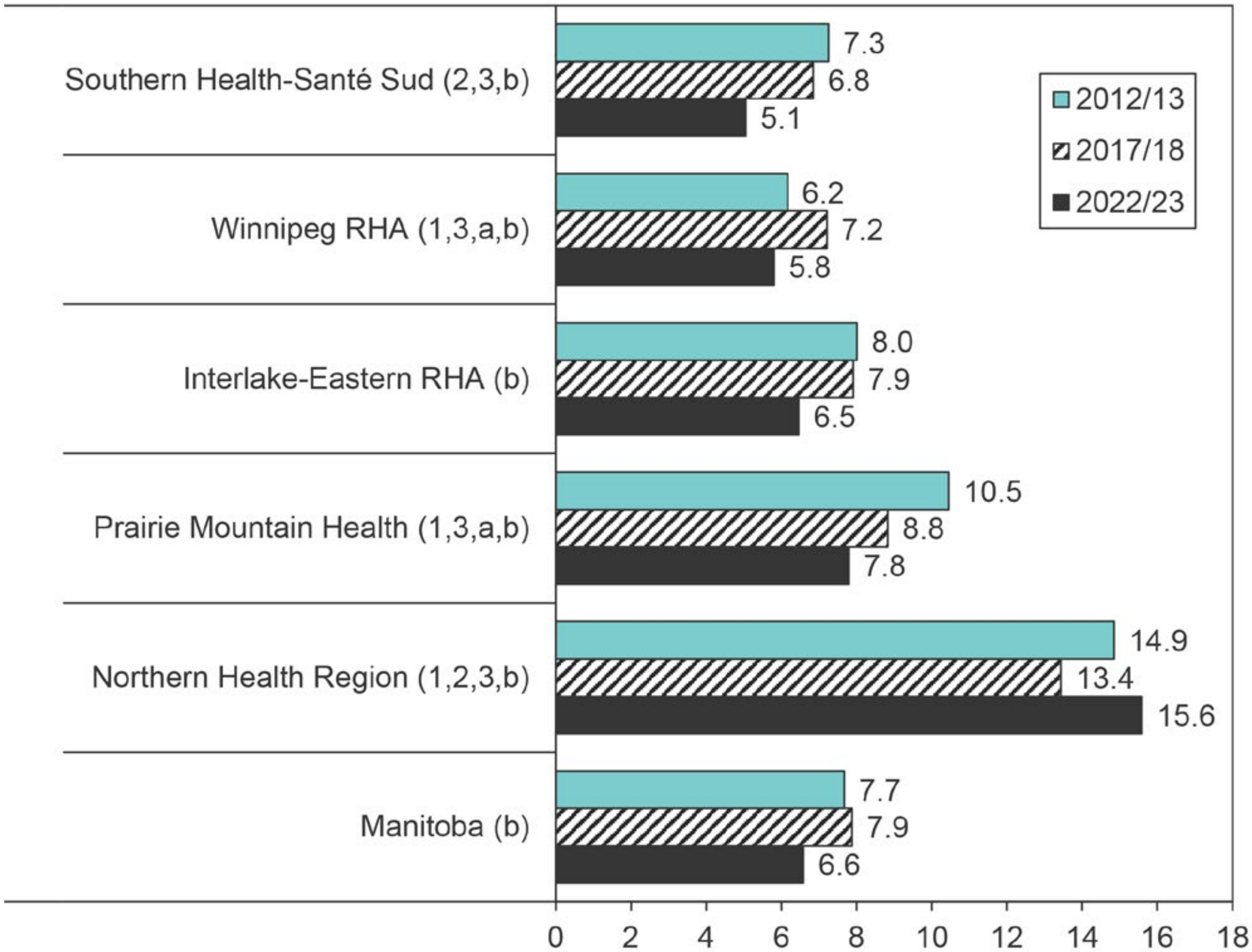
Time Period Analysis (Figure 7.33)

- In Manitoba, the hospitalization rate for injury increased from 7.7 per 1,000 residents in TP1 to 7.9 in TP2 and then significantly decreased to 6.6 in TP3. This was also the pattern observed for the numbers of injury hospitalizations where 9,044 occurred in TP1, 10,286 in TP2, and 9,475 in TP3 (online supplement).
- The change in rates was variable in the regions. All regions showed a significant decrease between TP2 and TP3 except Northern Health Region where there was a significant increase.
- The highest rates were in the Northern Health Region, which were significantly higher than the Manitoba rates in all three periods. Prairie Mountain Health also had higher rates in TP1 and TP3 than Manitoba. The Winnipeg RHA had significantly lower rates than Manitoba in TP1 and TP3, while rates in Southern Health-Santé Sud were lower in TP2 and TP3.
- Injury hospitalization rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Rates were strongly associated to income in urban and rural areas in all three periods (see online supplement). Rates for residents of lower income areas were higher than those for residents of higher income areas.

Trend Analysis (Figure 7.34)

- Rates have decreased over time in Manitoba and in all regions.

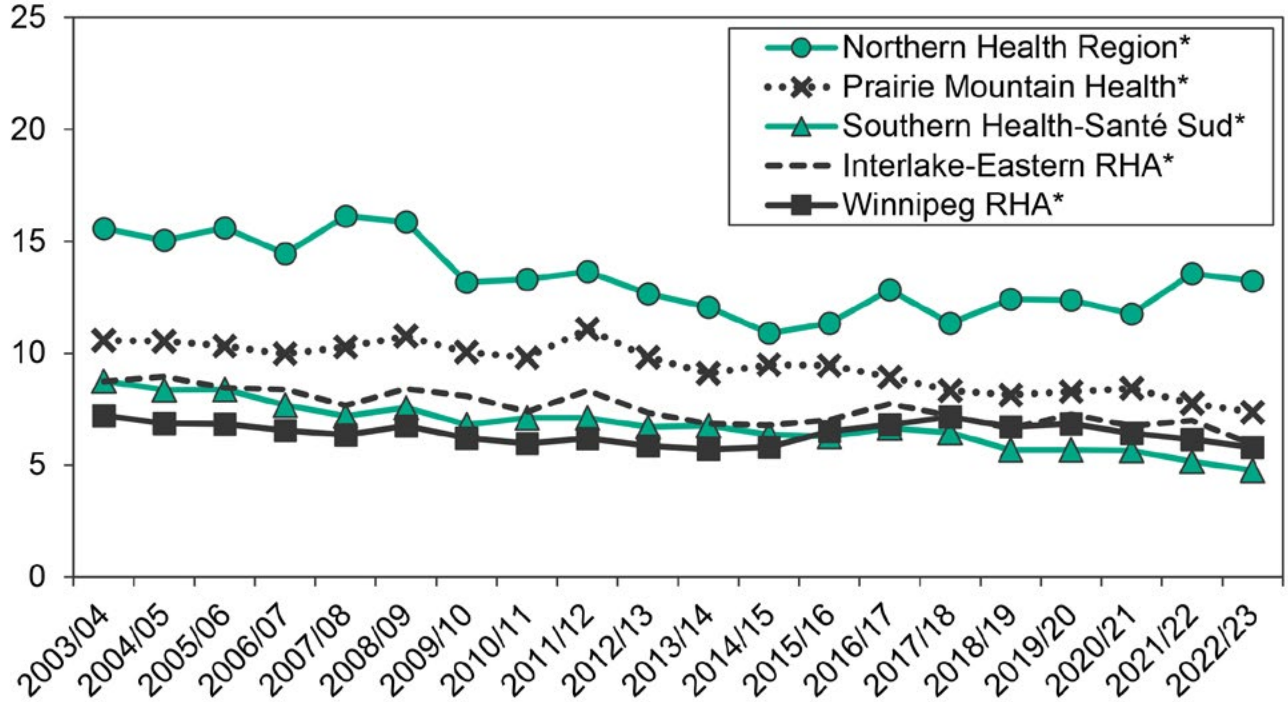
Figure 7.33: Hospitalization Rate for Injury by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate of hospitalizations per 1,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.34: Hospitalization Rate for Injury by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted rate of hospitalizations per 1,000 residents (all ages)



* statistically significant linear trend over time.

7.12 Reasons for Injury Hospitalizations

Definition: The most common reasons for injury hospitalization in acute care facilities. Any hospital abstracts with an external cause of injury diagnosis code (as identified in section 7.11) was included. If a hospital abstract had more than one injury coded, the first one was used. These diagnoses were grouped by type of injury and the ten most common reasons in Manitoba between 2018/19-2022/23 were used to set the order of the reasons for each of the regions.

Time period analysis: The average annual crude percentage for the ten most common reasons of inpatient hospitalization for injury in Manitoba were calculated for each region for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3). The number of injury hospitalizations used as the denominators in the percentage calculations for each time period are provided in the footnote for each figure.

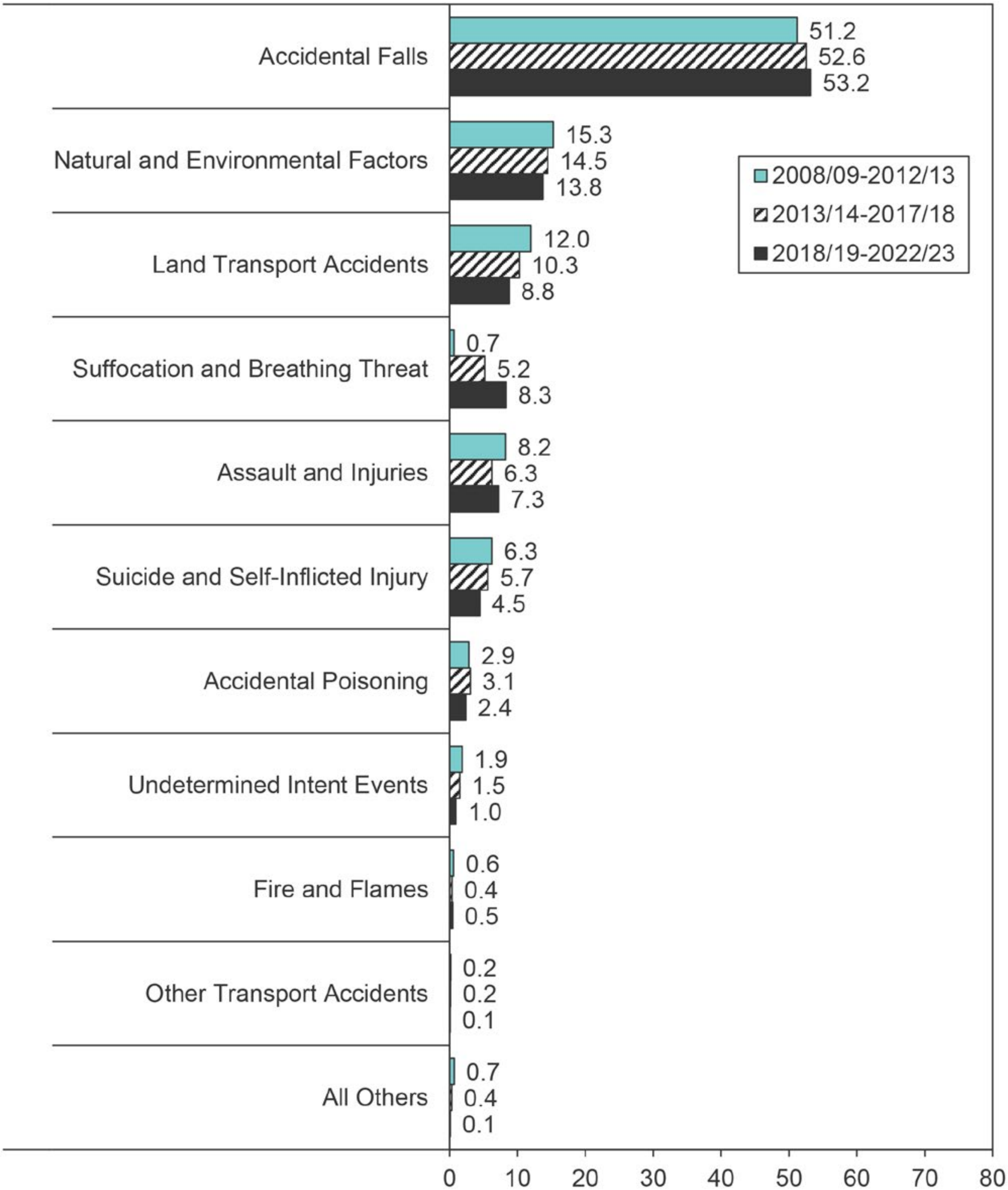
Key Findings

Time Period Analysis (Figures 7.35 – 7.40)

- Accidental falls are the most common reasons of injury hospitalizations in Manitoba and each region. In TP3 accidental falls were responsible for 53.2% of all injury hospitalizations, while natural and environmental factors were the second most common (13.8%), and land transport accidents were third (8.8%).
- Injury hospitalizations as a result of accidental falls showed small incremental increases across the time periods, while natural and environmental factors, and land transport accidents decreased. Suffocation and breathing threat hospitalizations showed the greatest increases.
- The rankings in each health region followed a similar pattern as in the province overall except for the Northern Health Region where the second ranked reason was assault and injuries and the fourth ranked was suicide and self-inflicted injuries.

Figure 7.35: Most Common Reasons for Injury Hospitalization in Manitoba, 2012/13, 2017/18, and 2022/23

Average annual crude percent* of hospitalization (all ages)

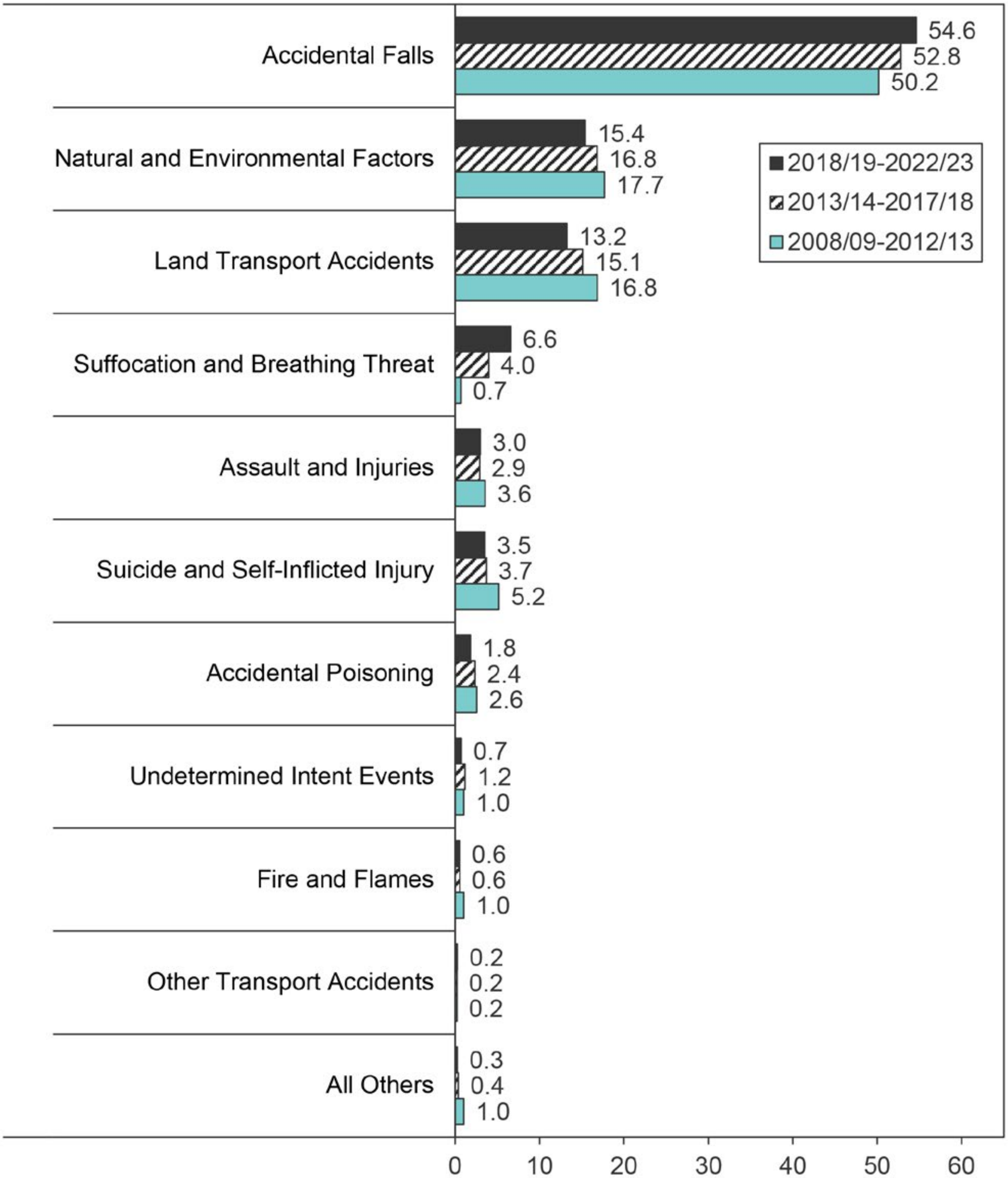


s data suppressed due to small numbers

* denominators: T1 = 45,768; T2 = 47,930; T3 = 49,358

Figure 7.36: Reasons for Injury Hospitalization in Southern Health-Santé Sud, 2012/13, 2017/18, and 2022/23

Average annual crude percent* of hospitalization (all ages)

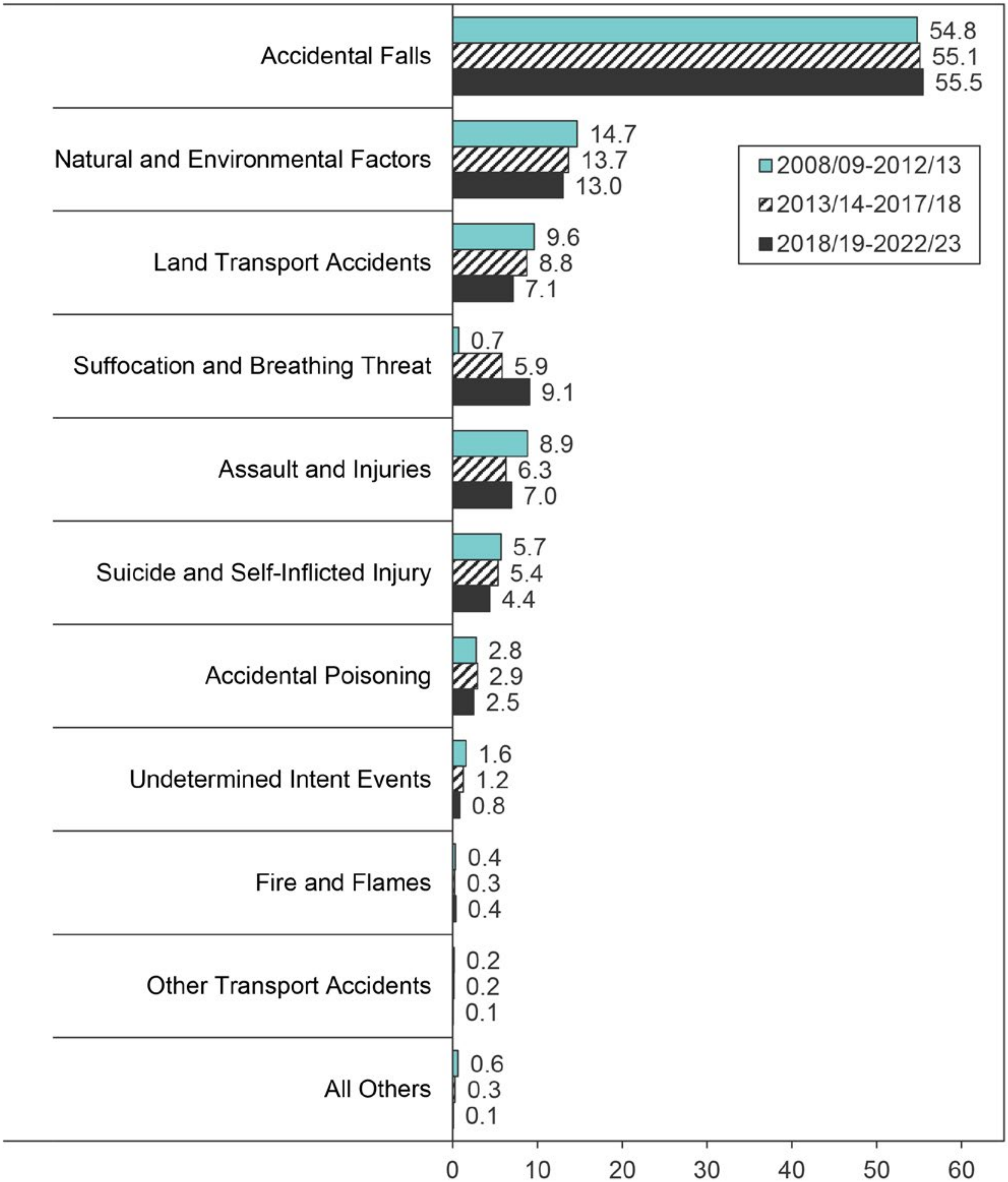


s data suppressed due to small numbers

* denominators: T1 = 5,909; T2 = 6,021; T3 = 5,505

Figure 7.37: Reasons for Injury Hospitalization in the Winnipeg RHA, 2012/13, 2017/18, and 2022/23

Average annual crude percent* of hospitalization (all ages)

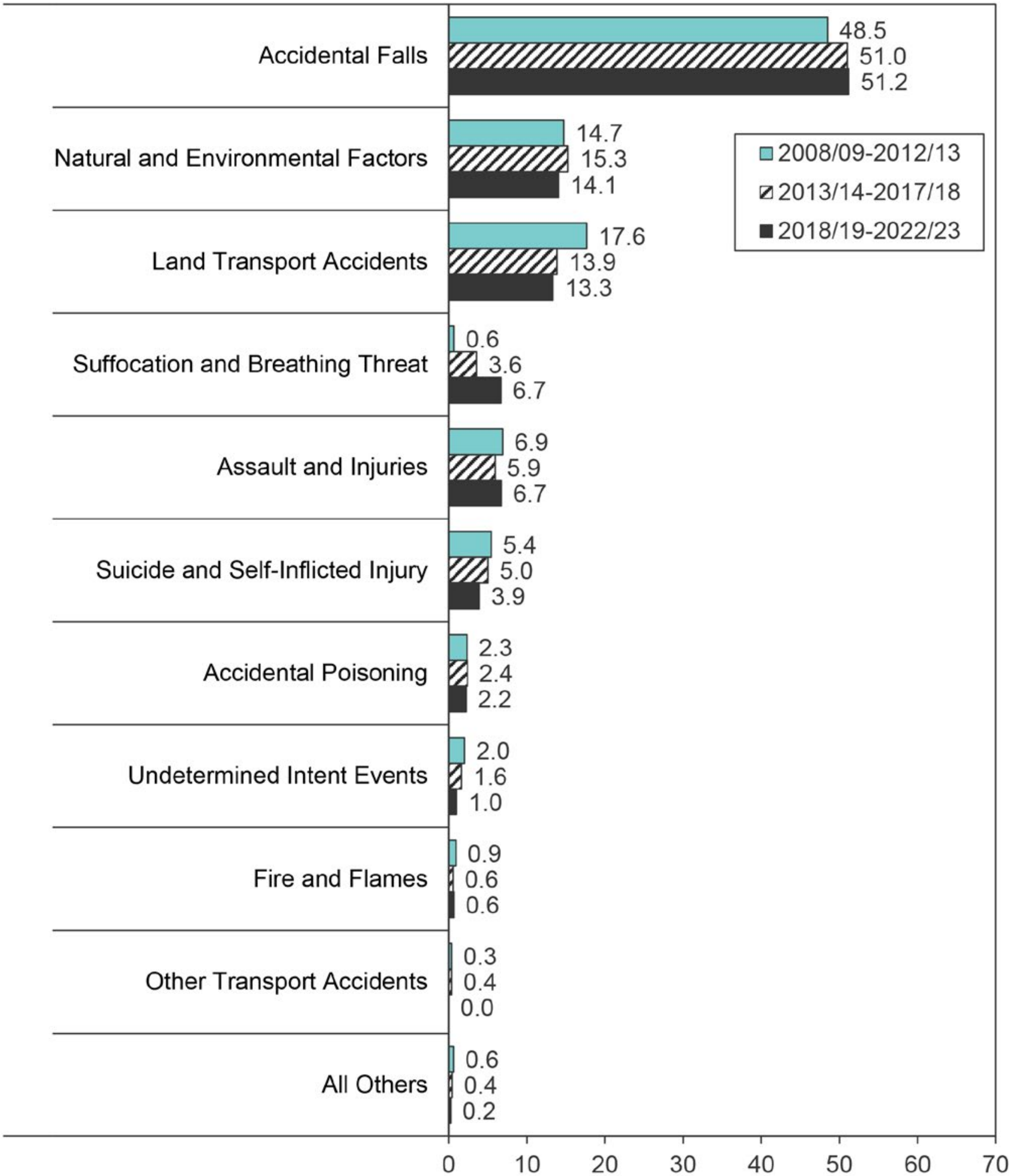


s data suppressed due to small numbers

* denominators: T1 = 21,403; T2 = 24,198; T3 = 25,864

Figure 7.38: Reasons for Injury Hospitalization in the Interlake-Eastern RHA, 2012/13, 2017/18, and 2022/23

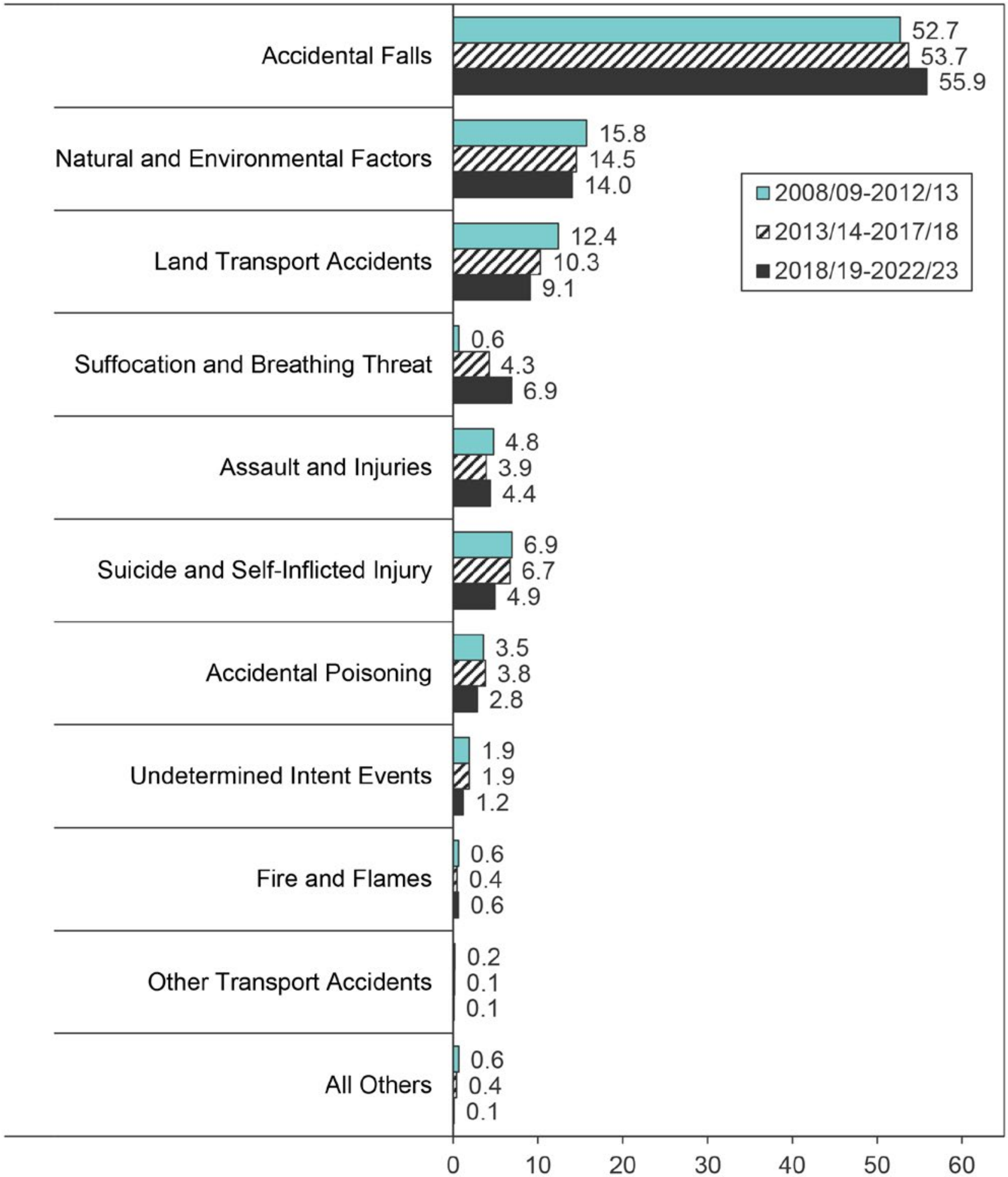
Average annual crude percent* of hospitalization (all ages)



s data suppressed due to small numbers

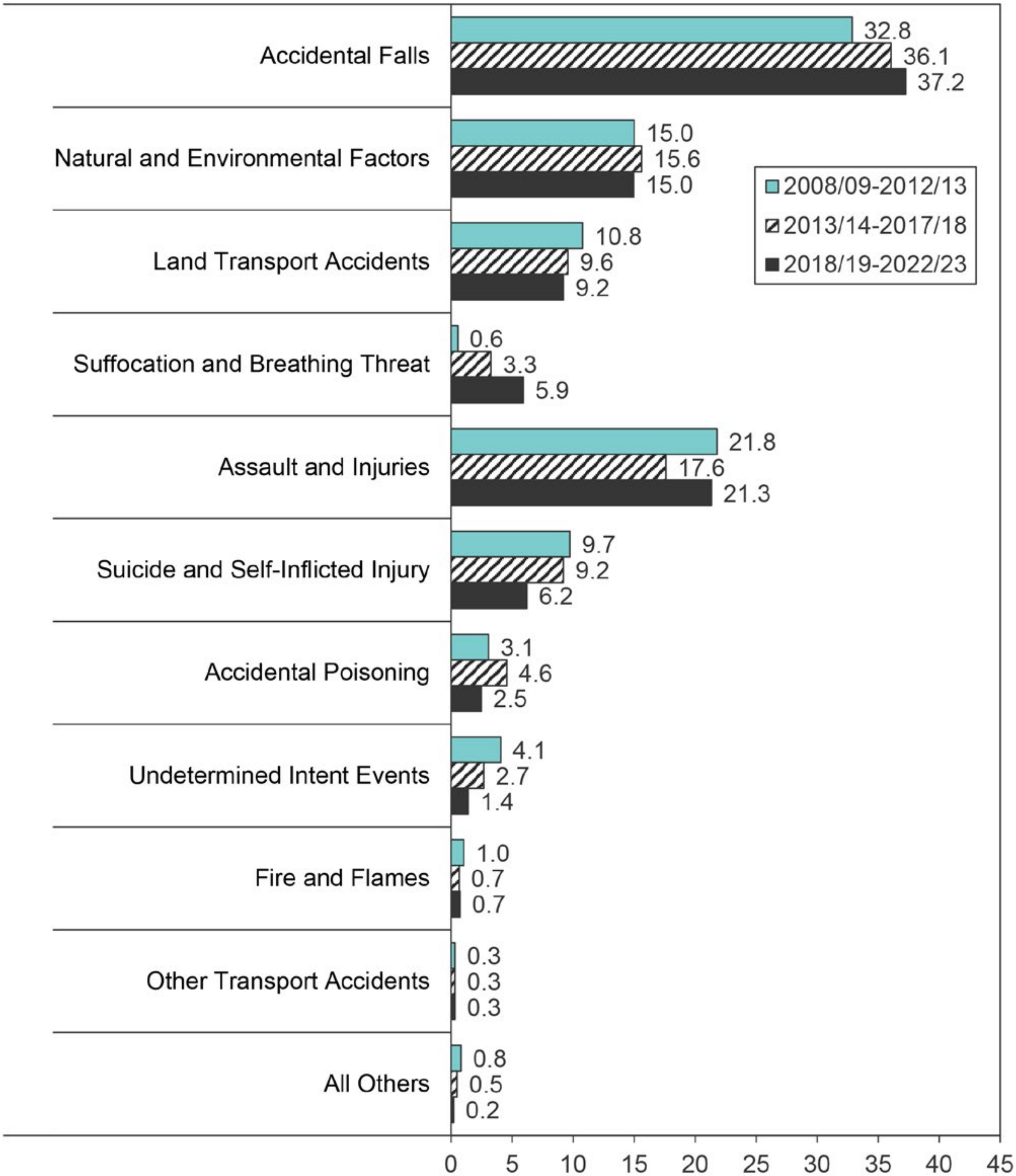
* denominators: T1 = 4,723; T2 = 4,727; T3 = 4,865

Figure 7.39: Reasons for Injury Hospitalization in Prairie Mountain Health, 2012/13, 2017/18, and 2022/23
Average annual crude percent* of hospitalization (all ages)



s data suppressed due to small numbers
* denominators: T1 = 9,044; T2 = 8,454; T3 = 7,733

Figure 7.40: Reasons for Injury Hospitalization in the Northern Health Region, 2012/13, 2017/18, and 2022/23
Average annual crude percent* of hospitalization (all ages)



s data suppressed due to small numbers
* denominators: T1 = 3,967; T2 = 3,639; T3 = 4,119

7.13 Self-Inflicted Injury Hospitalizations

Definition: The number of inpatient hospitalizations for self-inflicted injury per 100,000 residents. In any given period, a resident could be hospitalized for this type of injury more than once, so this measure indicates the total number of self-inflicted injury-related hospitalizations from acute care facilities by all residents of the area. Transfers between hospitals were tracked and only hospital episodes were counted, not individual separations, to reduce double-counting injuries.

Self-inflicted injury was identified by:
- ICD-9-CM codes E95.0-E95.9
- ICD-10-CA codes X60-X84

Hospitalizations with a diagnosis code for accidental poisoning, and injury or poisoning with undetermined intent are also included in the rate of self-inflicted injury, but only if there was also a mental illness diagnosis on the same hospital record.

- Accidental poisoning diagnosis codes:
  - ICD-9-CM: E85.0-E85.4, E85.8, E86.2, E86.8
  - ICD-10-CA: X44, X46, X47
- Poisoning with undetermined intent diagnosis codes:
  - ICD-9-CM: E98.0-E98.2
  - ICD-10-CA: Y10-Y19
- Injury with undetermined intent diagnosis codes:
  - ICD-9-CM: E98.3-E98.8
  - ICD-10-CA: Y20-Y34
- Poisoning by drugs, meds and biological substances diagnosis codes:
  - ICD-9-CM: 965, 967, 969, 977.9, 986
  - ICD-10-CA: T39, T40, T42.3, T42.4, T42.7, T43, T50.9, T58
- Mental illness diagnoses include entire mental health chapter:
  - ICD-9-CM: 290-319
  - ICD-10-CA: F00-F99

Time period analysis: Average annual rates of self-inflicted injury hospitalizations were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Rates of self-inflicted injury hospitalizations were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 7.41)

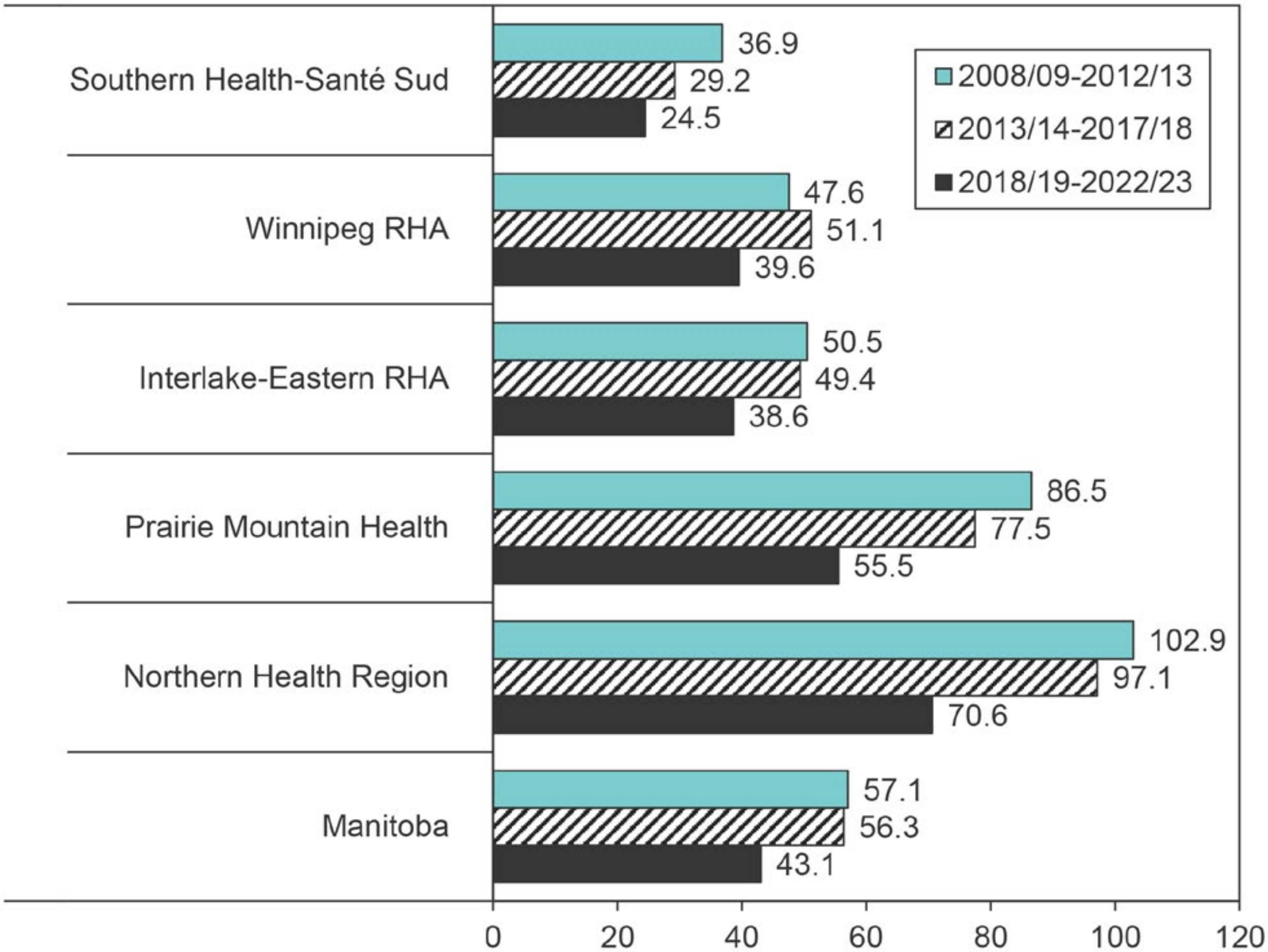
- In Manitoba, the hospitalization rate for self-inflicted injury decreased from 57.7 per 100,000 residents in TP1 to 56.3 in TP2 to 43.1 in TP3. The total number of these hospitalizations also decreased over all time periods from 751 in TP1, 730 in TP2, and 602 in TP3 (online supplement).
- A similar pattern was observed for each of the regions except the Winnipeg RHA where there was a slight increase between TP1 and TP2. None of the changes in the province or regions reached the level of statistical significance.
- The highest rates were in the Northern Health Region, and the lowest were in the Southern Health-Santé Sud region. However, these rates were not significantly different than the Manitoba rates across each time period.
- Self-inflicted injury hospitalization rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Rates were strongly associated to income in urban and rural areas in all three periods (see online supplement). Rates for residents of lower income areas were higher than those for residents of higher income areas.

Trend Analysis (Figure 7.42)

- Rates decreased over time in Manitoba and in all regions except the Winnipeg RHA where no trend was observed.

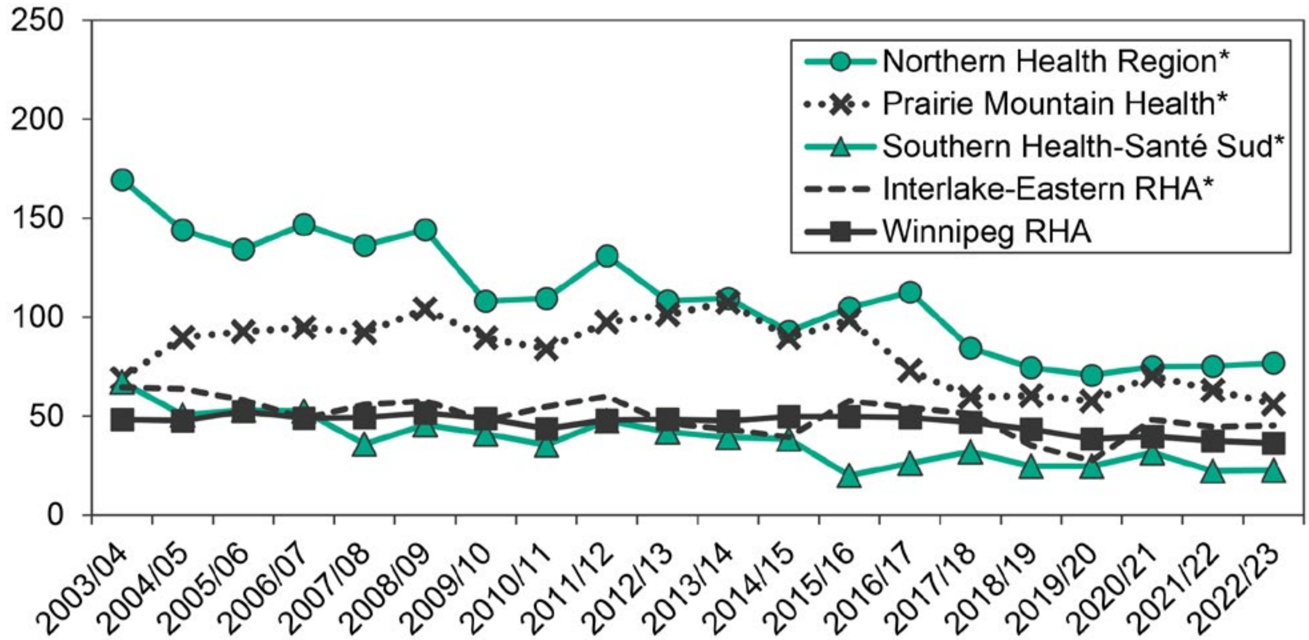
Figure 7.41: Hospitalization Rate for Self-Inflicted Injury by Health Region, 2012/13, 2017/18, and 2022/23

Age- and sex-adjusted average annual rate of hospitalizations per 100,000 residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 7.42: Hospitalization Rate for Self-Inflicted Injury by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rates of self-inflicted injury hospitalizations per 100,000 residents (all ages)



* statistically significant linear trend over time.

7.14 Hospital Location: Where RHA Residents Were Hospitalized (Hospitalizations)

Definition: The proportion of all hospital separations for residents of each region that occurred in a hospital within their (home) region, another region, in Winnipeg, or out-of-province. If a patient was transferred between hospitals, each stay was counted as a separate event and was attributed to the appropriate location. Area of residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization.

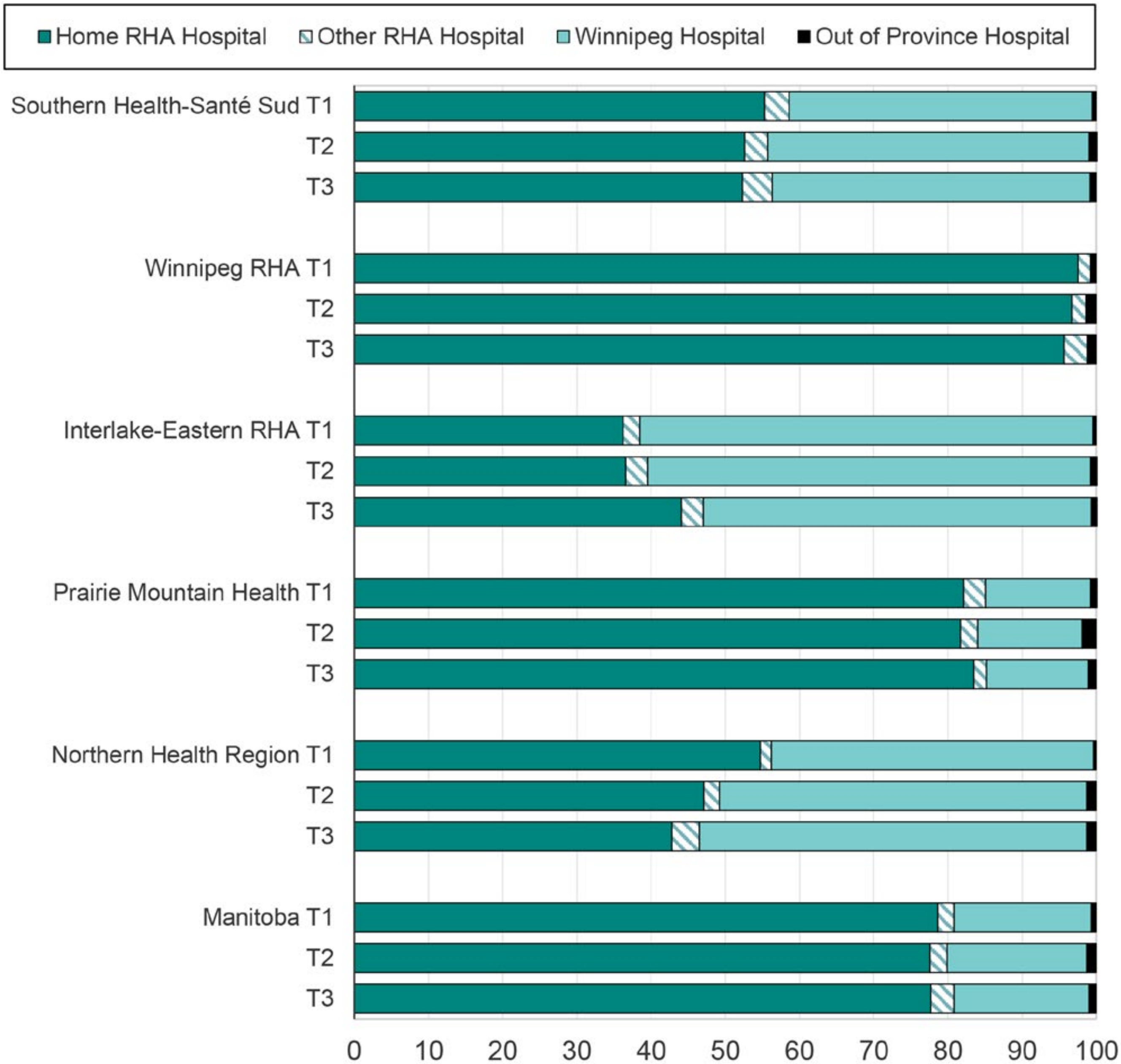
Time period analysis: The crude percentage for each hospital location category was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2021/22 (TP3). Note that TP3 is 2021/22 (not 2022/23) because out-of-province hospital claims data was only available until 2021/22.

Key Findings

Time Period Analysis (Figure 7.43)

- Most hospitalizations of Manitoba residents occurred either in their home region or in Winnipeg, and this has remained stable over time.
- The distribution of hospitalizations varied substantially by region (2021/22 values cited):
  - Winnipeg RHA residents had the highest percentage of hospitalizations in their home regions in TP3 at 95.6%. The percentage decreased over time for Winnipeg RHA residents.
  - Prairie Mountain Health residents had 83.5% of their hospitalizations in their home region (slight increase between TP2 and TP3) and 13.7% in the Winnipeg RHA (stable over time).
  - Southern Health-Santé Sud residents had 52.3% of their hospitalizations in their home region (decreased over time) and 42.8% in Winnipeg (stable between TP2 and TP3).
  - Interlake-Eastern RHA residents had 44.1% of their hospitalizations in their home region (increased over time) and 52.3% in the Winnipeg RHA (decreased over time).
  - Northern Health Region residents had 42.8% of their hospitalizations in their home region (decreased over time) and 52.2% in the Winnipeg RHA (increased over time).
- Out-of-province hospitalizations were uncommon among Manitoba residents of all regions. Northern Health Region residents had the highest percentage at 1.3%.

Figure 7.43: Hospital Location: Where Residents were Hospitalized by Region, 2012/13, 2017/18, and 2021/22



T1 = 2012/13   T2 = 2017/18   T3 = 2021/22

7.15 Hospital Location: Where RHA Residents Were Hospitalized (Days in Hospital)

Definition: The proportion of all hospital days used by the residents of each region that occurred in a hospital within their (home) region, another region, in Winnipeg, or out-of-province. If a patient was transferred between hospitals, each stay was counted as a separate event and the days spent in each hospital were attributed to that hospital's location. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization.

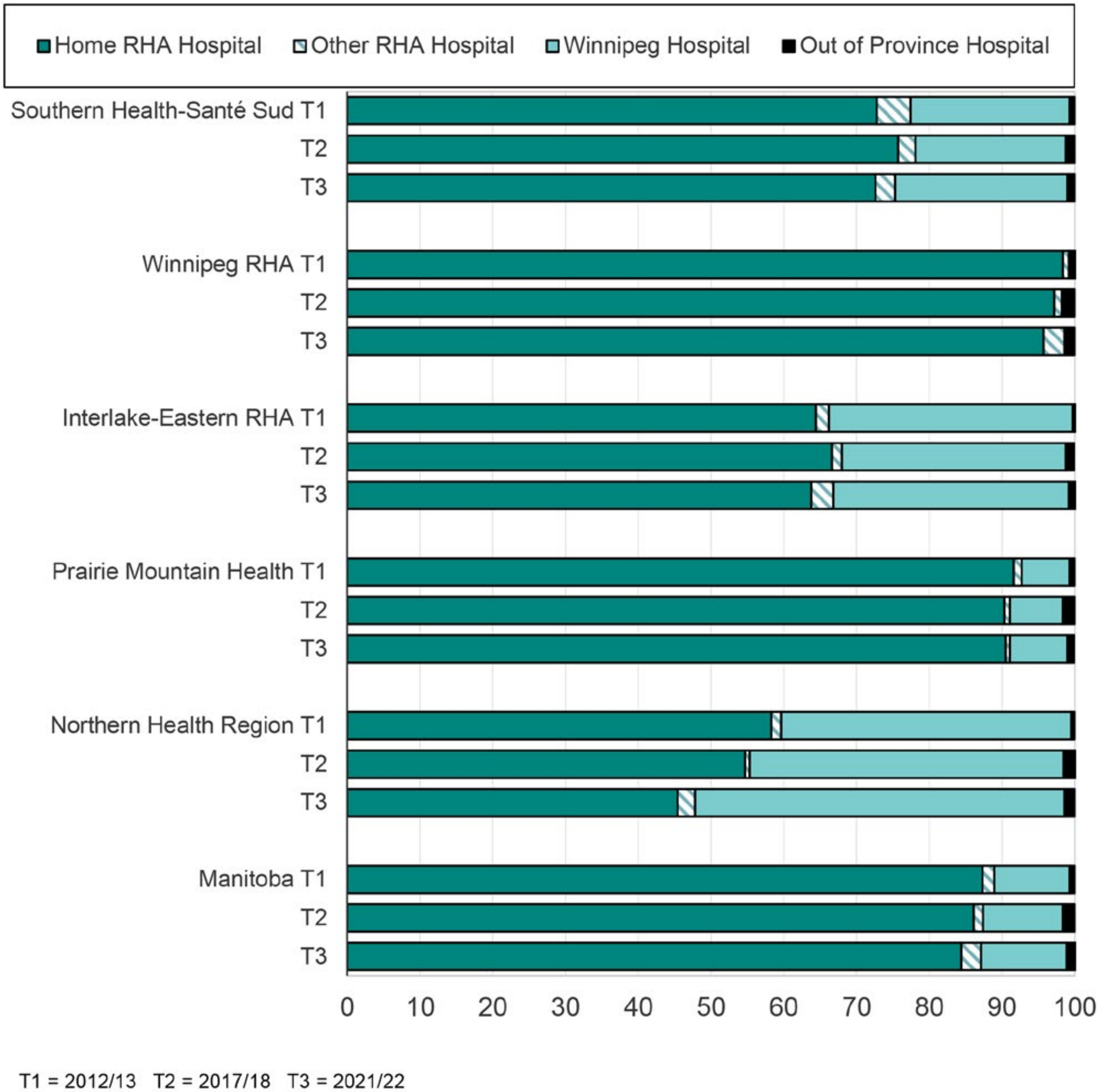
Time period analysis: The crude percentage for each hospital location category was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2021/22 (TP3). Note that TP3 is 2021/22 (not 2022/23) because out-of-province hospital claims data was only available until 2021/22.

Key Findings

Time Period Analysis (Figure 7.44)

- Most hospital days used by Manitoba residents were either in their home region (87%) or in Winnipeg (10-11%), and this has remained stable over time.
- The percentages varied substantially by region (2021/22 values cited):
  - Winnipeg RHA residents had the highest percentage of hospital days in their home regions in TP3 at 95.7%. The percentage decreased over time for Winnipeg RHA residents.
  - Prairie Mountain Health residents had 90.5% of their hospital days in their home region (stable over time) and 7.9% in the Winnipeg RHA (increased over time).
  - Southern Health-Santé Sud residents had 72.6% of their hospital days in their home region (decreased over time) and 23.7% in the Winnipeg RHA (increased between TP2 and TP3).
  - Interlake-Eastern RHA residents had 63.8% of their hospital days in their home region (decreased between TP2 and TP3) and 32.4% in the Winnipeg RHA (stable over time).
  - Northern Health Region residents had 45.4% of their hospital days in their home region (decreased over time) and 50.8% in the Winnipeg RHA (increased over time).
- Out-of-province hospital days were uncommon among Manitoba residents of all regions. The Northern Health Region residents had the highest percentage at 1.4%.

Figure 7.44: Hospital Location: Where Patients Spent Days in Hospital by Region, 2012/13, 2017/18, and 2021/22



7.16 Hospital Catchment: Where Patients Using RHA Hospitals Came From (Hospitalizations)

Definition: The proportion of all hospital separations by all hospitals in each region that were provided to residents of the (home) RHA, another RHA, Winnipeg, or out-of-province residents. If a patient was transferred between hospitals, each stay was counted as a separate event and was attributed to the appropriate hospital. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization.

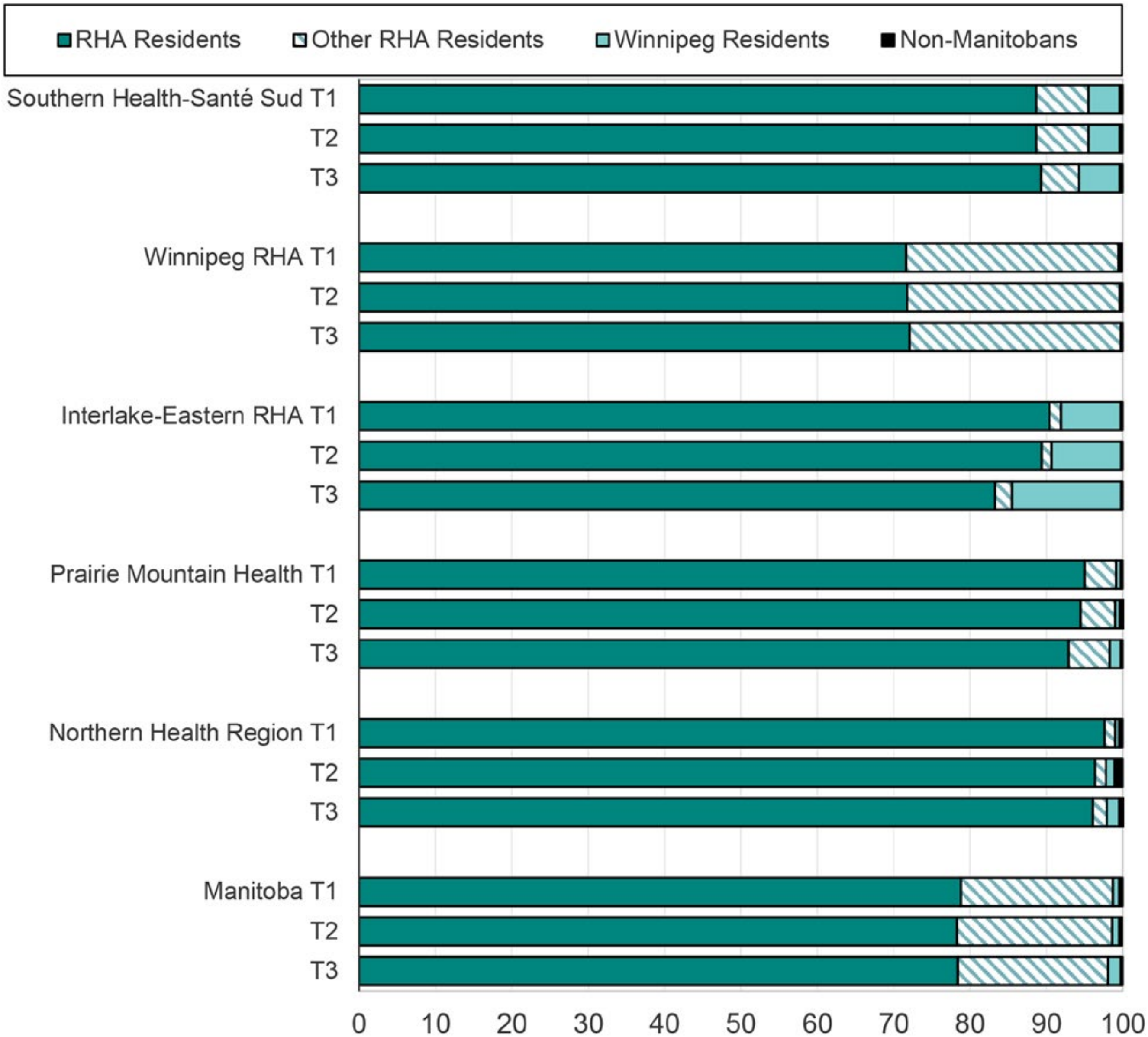
Time period analysis: The crude percentage for each hospital catchment category was calculated for three one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2021/22 (TP3). Note that TP3 is 2021/22 (not 2022/23) because out of province hospital claims data was only available until 2021/22.

Key Findings

Time Period Analysis (Figure 7.45)

- In every health region in Manitoba, most hospitalizations in that region's hospitals (72-96%) were for residents of that region. This finding has remained stable over time.
- The Winnipeg RHA has a unique profile. It provides hospital care for residents of all other regions because many services and procedures are only available in Winnipeg hospitals.
- Among rural regions (2021/22 results cited):
    - Interlake-Eastern RHA provided the highest percentage of hospitalizations to residents of Winnipeg at about 14.3%. This region has been providing hospital care to an increasingly greater percentage of Winnipeg residents across the time periods.
    - Prairie Mountain Health region provided the highest percentage of hospitalizations to residents from other regions at about 5.4%.
- Manitoba hospitals also provided care to non-Manitoba residents, though this was limited at 0.3% of all hospitalizations, with a maximum of 0.6% for hospitals in the Northern Health Region.

Figure 7.45: Hospital Catchment: Where Hospital Patients Came From (Hospitalizations) by Region, 2012/13, 2017/18, and 2021/22



T1 = 2012/13 T2 = 2017/18 T3-2021/22

7.17 Hospital Catchment: Where Patients Using RHA Hospitals Came From (Days in Hospital)

Definition: The proportion of all days of care in the hospitals in each region that were provided to residents of the (home) RHA, another RHA, in Winnipeg, or out-of-province residents. If a patient was transferred between hospitals, each stay was counted as a separate event and the days spent in each hospital were attributed to that hospital's catchment. Area residence was assigned based on the patient's postal code provided in the hospital abstract at the time of hospitalization.

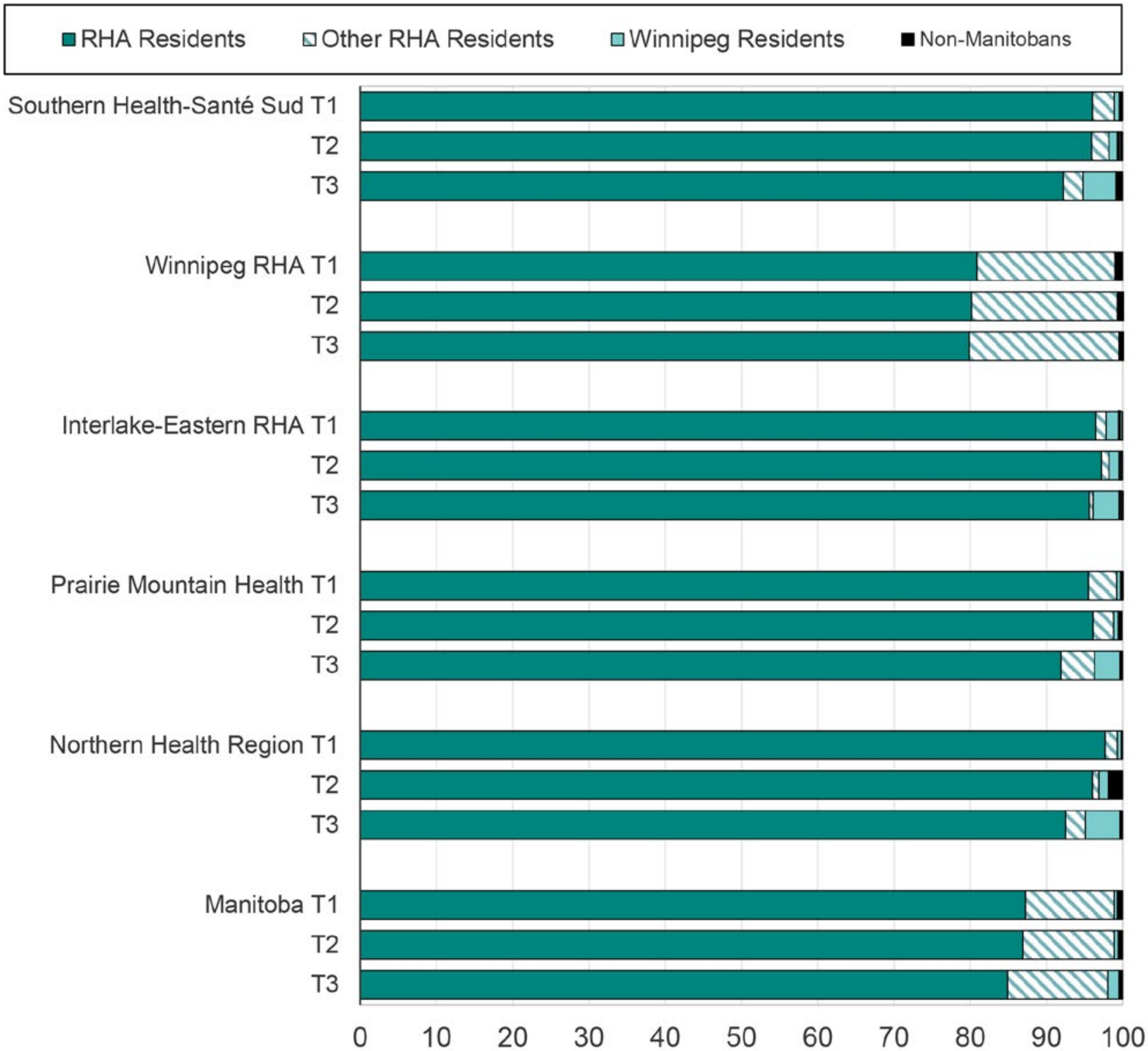
Time period analysis: The crude percentage for each hospital catchment category was calculated for three one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2021/22 (TP3). Note that TP3 is 2021/22 (not 2022/23) because out of province hospital claims data was only available until 2021/22.

Key Findings

Time Period Analysis (Figure 7.46)

- In every health region in Manitoba, most hospital days provided by that region's hospitals were provided to residents of that region. These findings have remained stable over time.
- The Winnipeg RHA has a unique profile. It provides hospital care for residents of all other regions because many services and procedures are only available in Winnipeg hospitals. However, the percentage of days of care provided to non-Winnipeg residents was lower than the percentage of hospitalizations.
- Among rural regions (2021/22 results cited):
    - The Northern Health Region provided the highest percentage of hospital days to residents of Winnipeg at 4.5%.
    - Prairie Mountain Health provided the highest percentage of hospitalizations to residents from other regions at 4.4%.
    - Manitoba hospitals also provide some care to non-Manitoba residents, though this was limited at 0.5% overall, with a maximum of 0.9% for hospitals in the Southern Health-Santé Sud region.

Figure 7.46: Hospital Catchment: Where Hospital Patients Came From (Days in Hospital) by Region, 2012/13, 2017/18, and 2021/22



T1 = 2012/13 T2 = 2017/18 T3-2021/22

Chapter 8:

High Profile Surgical and Diagnostic Services

Key Findings in Chapter 8

The indicators in this chapter reveal a mix of results across all the services analysed.

- Cardiac catheterization (diagnostic angiography) rates decreased slightly across the time periods, but not significantly, whereas they have had an increasing trend over the 20-year period.
- Coronary artery bypass surgery rates decreased significantly across the time periods and the 20-year period. Meanwhile, no significant changes in percutaneous coronary intervention (PCI, i.e., angioplasty and/or coronary stent insertion) rates occurred between the periods, but they have increased significantly over the 20-year period suggesting a gradual increase over time.
- Hip and knee replacement rates increased slightly between the second and third periods, but not significantly. For hip replacements only, there was a statistically significant increase in the long-term trend.
- Cataract surgery rates only increased significantly between the second and third periods, which was also the case for computed tomography (CT) scans.
- Magnetic resonance imaging (MRI) scan rates increased significantly between the first and second periods, but not between the second and third periods. The 20-year trend showed that it has significantly increased over time.
- COVID-19 appeared to affect the rates of cataract surgeries, CT scans, and MRI scans with noticeable decreases occurring in 2020/21.

Introduction

This chapter includes indicators of a number of high-profile surgical and diagnostic procedures that MCHP has tracked in previous Atlas reports. Most of the procedures are services that a resident could receive more than once in a given period, so the indicators count each event and reflect the sum of all such services to area residents, regardless of the location of service provision. For example, if a resident of Southern Health-Santé Sud receives a service in Brandon, it is attributed to the rate for the Southern Health-Santé Sud region.

MRI and CT scans were counted differently than the other procedures because separate records are kept for individual scans of different body sites, even if the scans are performed during the same scanning session. Therefore, our indicators count the number of ‘person-visits’ to the imaging service each day. So, if a resident has an MRI scan of the head and the neck, we count these as one use of the MRI service for that person that day.

Note regarding incomplete data: MRI and CT scan data are not complete for children, so the indicators include only residents aged 20 and older. Furthermore, individual-level data are incomplete for adult MRI and CT scans done in some hospitals, though the data are improving over time. Therefore, rates likely underreport actual scan rates to some extent. CT results are shown only for the more recent years, as earlier results were deemed too incomplete.

8.1 Cardiac Catheterizations (Diagnostic Angiograms)

Definition: The number of cardiac catheterizations performed per 1,000 residents aged 40 and older. This included CCI code 3.IP.10 in any intervention field in a hospital abstract. Cardiac catheterizations were only performed at the two tertiary hospitals in Manitoba (St. Boniface General Hospital and Health Sciences Centre); ‘out-of-hospital’ interventions were excluded to avoid double-counting.

Time period analysis: Average annual cardiac catheterization rates were calculated for 3 three-year periods: 2010/11-2012/13 (TP1), 2015/16-2017/18 (TP2), and 2020/21-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Cardiac catheterization rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.1)

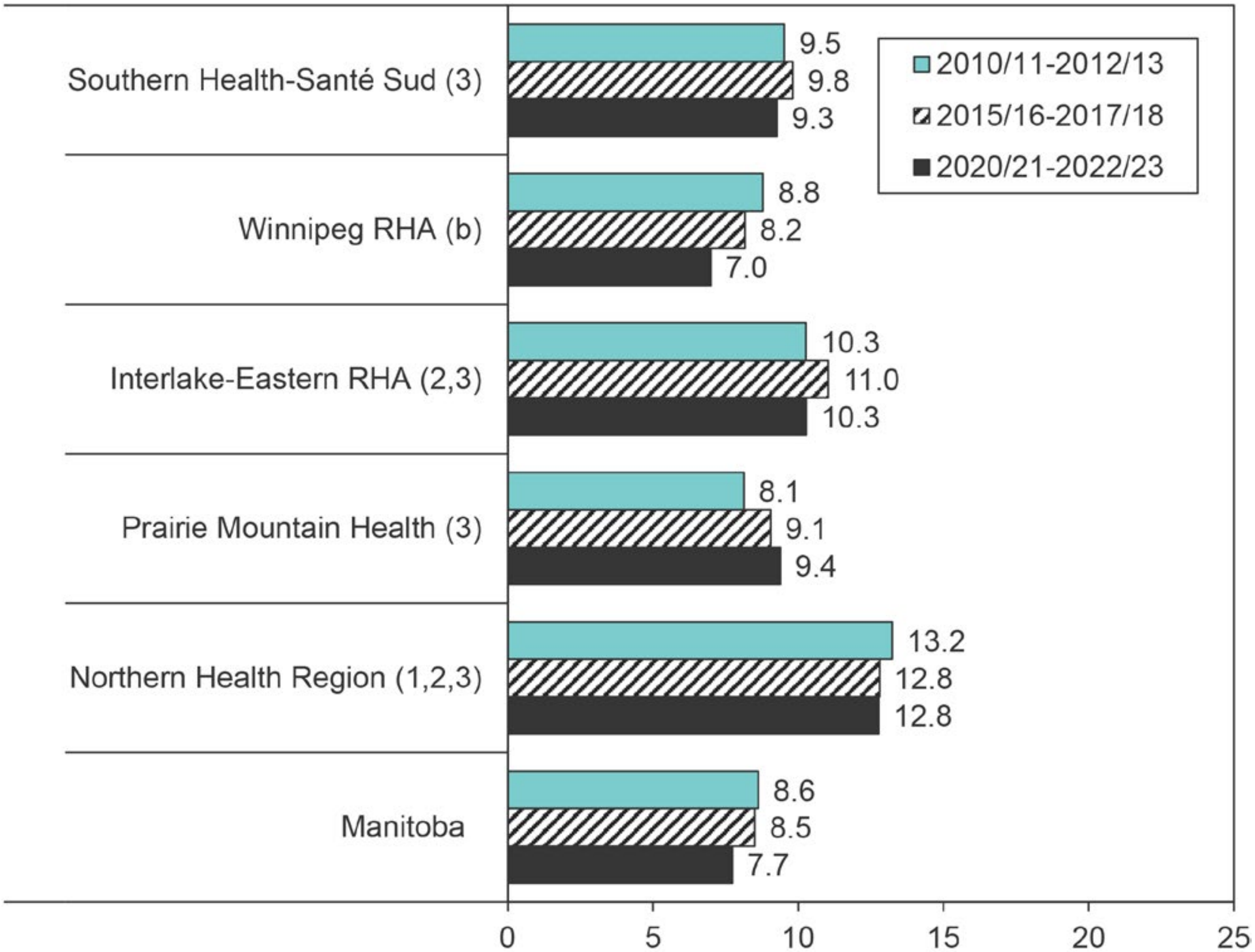
- The rate of cardiac catheterizations decreased slightly but not significantly in Manitoba from 8.6 per 1,000 residents aged 40 or older in TP1 to 8.5 in TP2 to 7.7 in TP3. The total number of catheterizations were similar between TP2 and TP3 at slightly more than 5,200 (online supplement).
- Rates decreased across the three periods in the Winnipeg RHA and was significant between TP2 and TP3. Prairie Mountain Health rates increased each period, although not significantly. The other regions showed some variation in their rates across the three periods.
- The Northern Health Region had the highest rates in all three periods, which were significantly higher than those in Manitoba. The Southern Health-Santé Sud, Interlake-Eastern RHA, and Prairie Mountain Health region all had significantly higher rates than Manitoba in TP3.
- Cardiac catheterization rates were significantly associated to income in urban areas in TP2 and TP3 where the rates were higher for residents of lower income areas (see online supplement). In rural areas, the association was only significant in TP2.

Trend Analysis (Figure 8.2)

- There was a significant increasing trend observed in Manitoba and in all regions except the Winnipeg RHA, which remained stable over time. There was a dramatic decrease that occurred between 2019/20 and 2020/21 in all regions before the rates returned to more typical levels by 2022/23.

Figure 8.1: Cardiac Catheterization Rate by Health Region, 2010/11-2012/13, 2015/16-2017/18, and 2020/21-2022/23

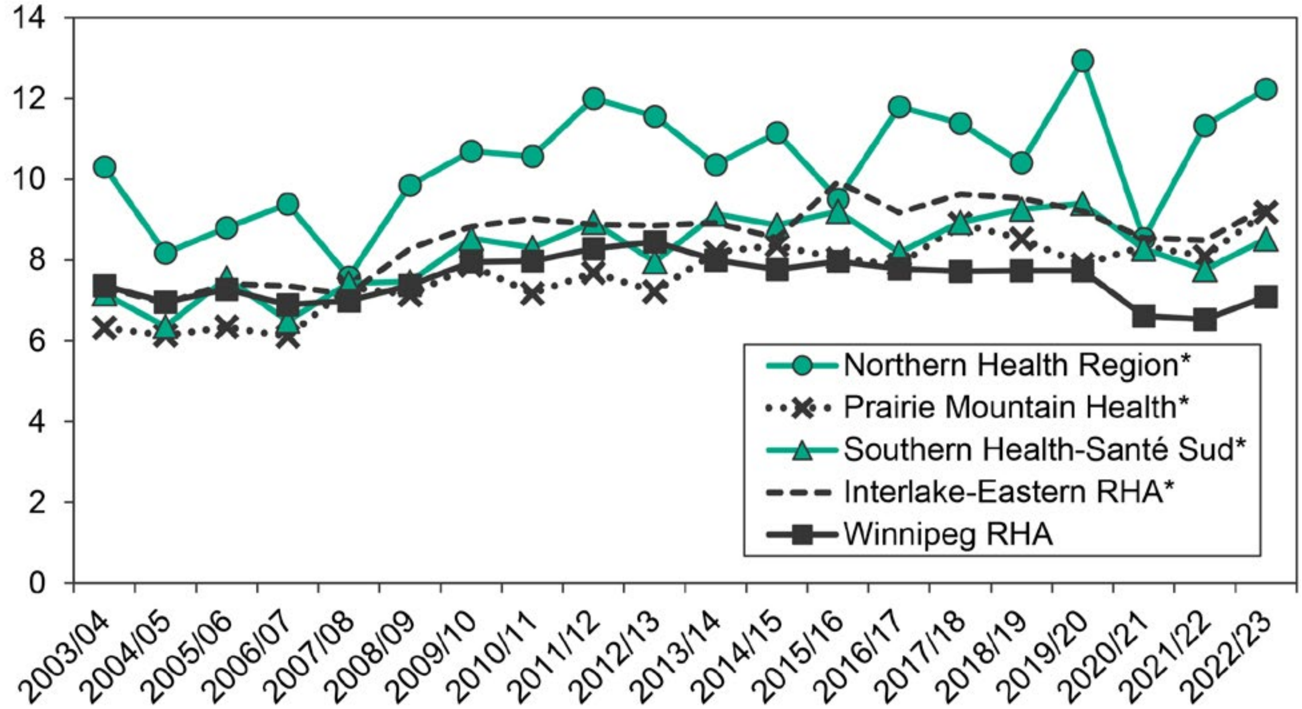
Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.2: Cardiac Catheterization Rate by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted rate per 1,000 residents (age 40+)



* this area's rate has a statistically significant change over time.

8.2 Percutaneous Coronary Interventions (PCI)

Definition: The number of PCIs (angioplasty with or without stent insertion) performed per 1,000 residents aged 40 and older. This included CCI codes 1.IJ.50 and 1.IJ.57 in any intervention field in a hospital abstract. PCIs were performed only at the two tertiary hospitals in Manitoba (St. Boniface General Hospital and Health Sciences Centre); 'out- of-hospital' interventions were excluded to avoid double counting.

Time period analysis: Average annual PCI rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: PCI rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.3)

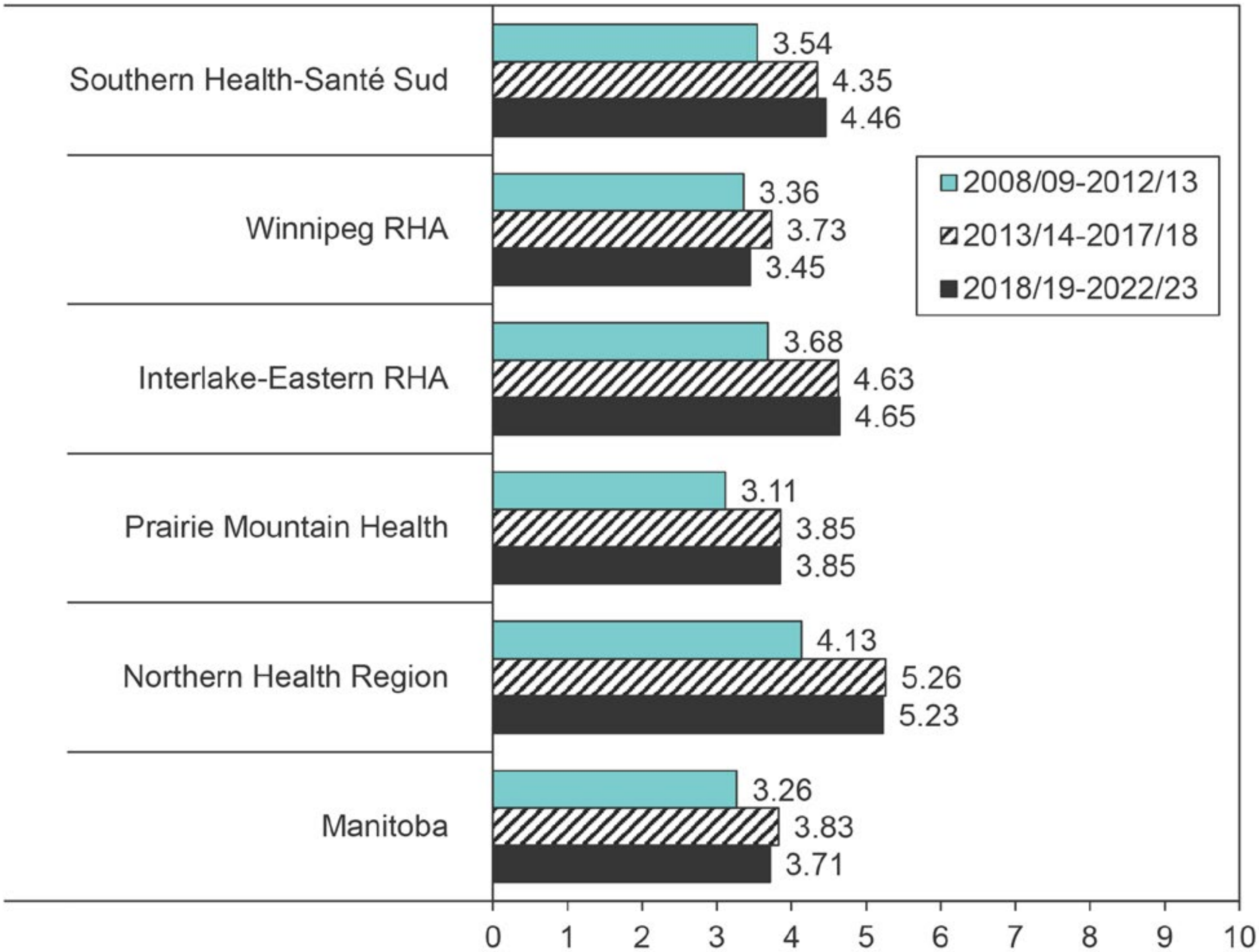
- The average annual PCI rate in Manitoba increased from 3.26 procedures per 1,000 residents aged 40 and older in TP1 to 3.83 in TP2 and then decreased to 3.71 in TP3 per year. None of these changes were significant. The number of PCIs increased from 1,885 in TP1 to 2,413 in TP2 to 2,470 in TP3 (online supplement).
- Similar patterns were observed in most regions.
- The highest rates were in the Northern Health Region, and lowest in the Winnipeg RHA. No significant differences between the rates in any of the regions and Manitoba for any of the periods were observed.
- PCI rates were significantly associated to income in rural and urban areas in TP2 and TP3, with the rates higher for residents of lower income areas (see online supplement). The association was not significant in TP1.

Trend Analysis (Figure 8.4)

- There was a significant increasing trend observed in Manitoba and in all regions. There was a steep increase that began around 2008/09 and plateaued around 2013/14. The previous Atlas noted that PCI rates increased in the 2007/08-2011/12 time period from the previous 5-year period due to changes in clinical practice where PCI were becoming the recommended primary treatment for heart attack over coronary bypass surgery. The results in both the time period and trend analyses suggest that this change appears to have been fully adopted by 2013/14.

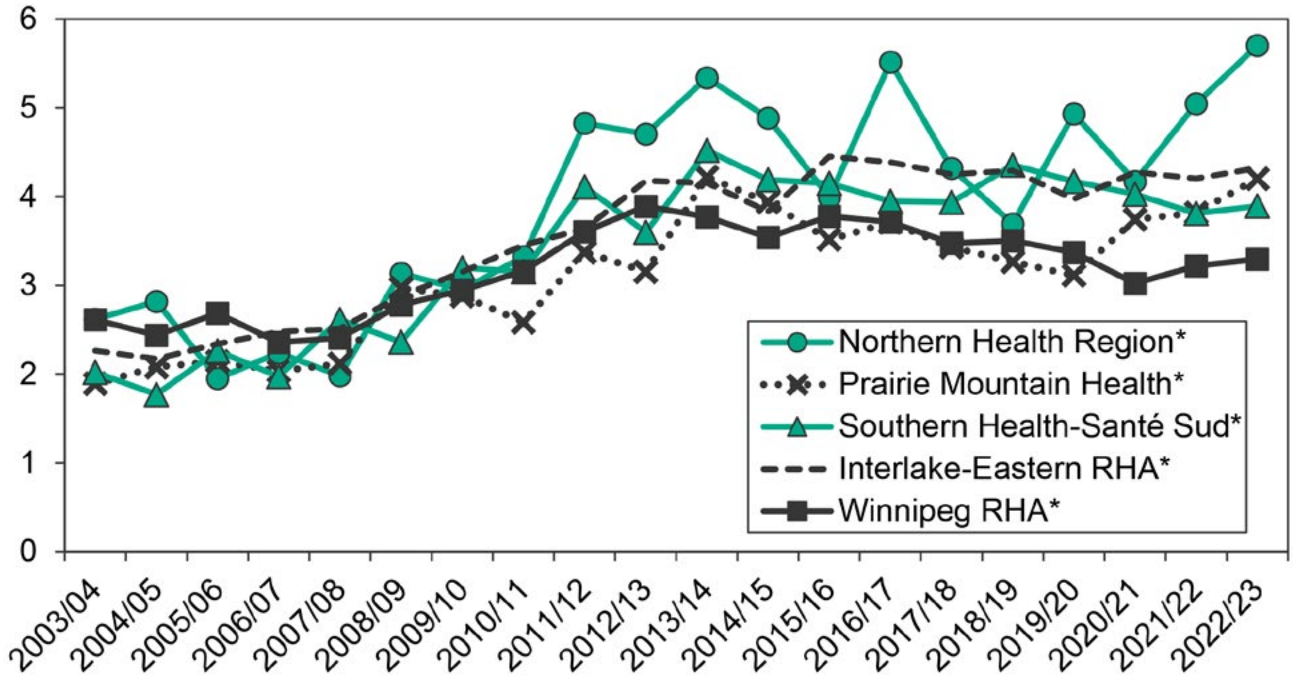
Figure 8.3: Percutaneous Coronary Intervention Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.4: Percutaneous Coronary Intervention Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rate per 1,000 residents (age 40+)



* statistically significant linear trend over time.

8.3 Coronary Artery Bypass Graft Surgeries (CABG)

Definition: The number of bypass surgeries performed per 1,000 residents aged 40 and older. Bypass surgery was defined by CCI code 1.IJ.76 in any intervention field in a hospital abstract. These surgeries were performed only at the two tertiary hospitals in Manitoba (St. Boniface General Hospital and Health Sciences Centre). 'Out-of-hospital' interventions were excluded to avoid double-counting.

Time period analysis: Average annual CABG rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: CABG rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.5)

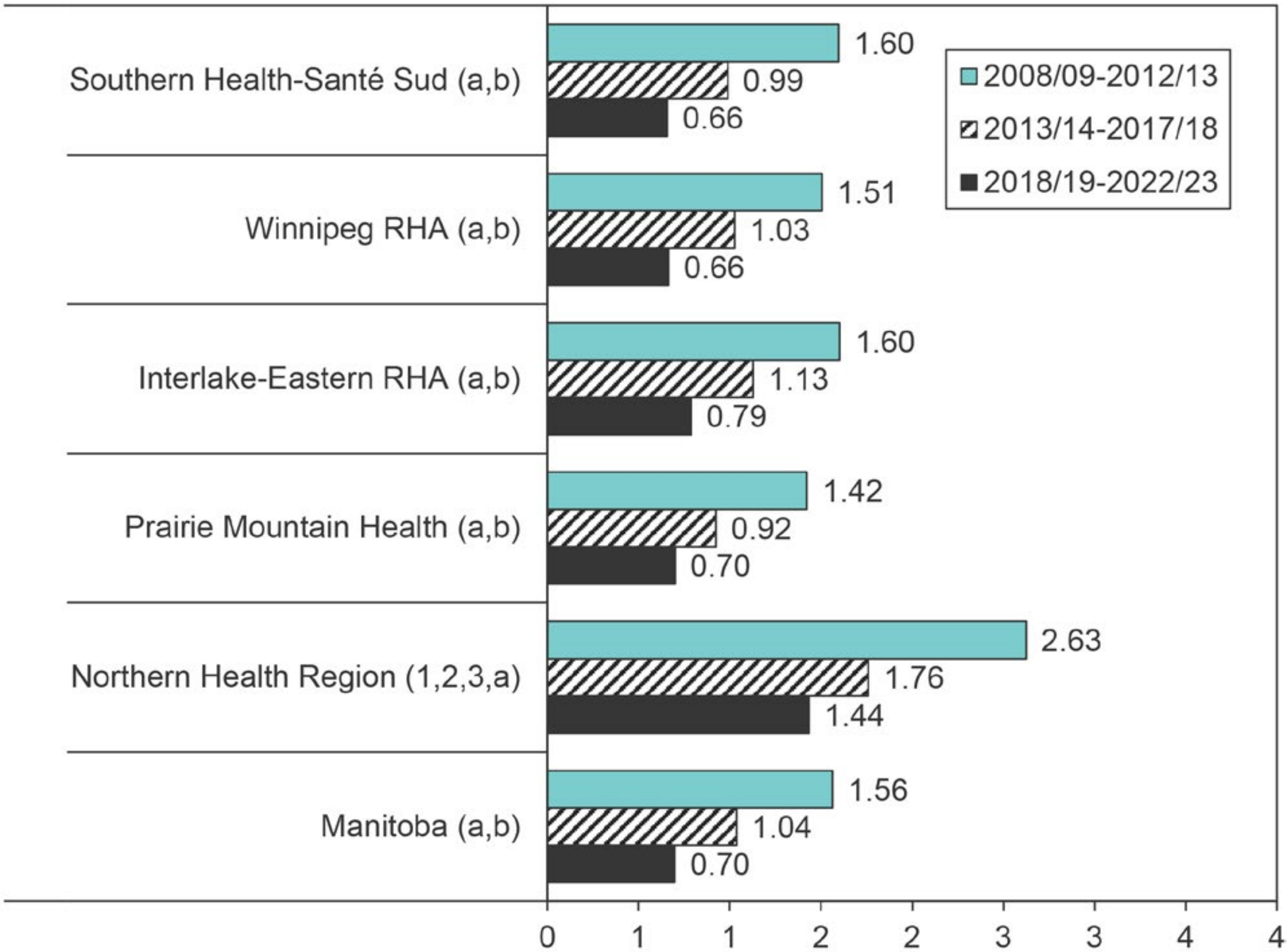
- The rate of CABG surgery in Manitoba decreased significantly over time from 1.56 surgeries per 1,000 residents in TP1 to 1.04 in TP2 to 0.70 in TP3. The number of surgeries steadily decreased across the time periods with 464 being performed in TP3 (online supplement).
- This pattern in rates was reflected in all regions except in the Northern Health Region, where rates decreased between TP2 and TP3 and did not reach the level of statistical significance.
- The Northern Health Region had the highest rates of bypass surgeries in all three periods, which were significantly higher than the rates in Manitoba. All other regions did not have significantly different rates from the Manitoba rates.
- CABG rates were significantly associated to income in rural and urban areas in TP2 and TP3 where the rates were higher for residents of lower income areas (see online supplement). The association was not significant in TP1.

Trend Analysis (Figure 8.6)

- CABG rates showed a steady decreasing trend in Manitoba and in all regions.

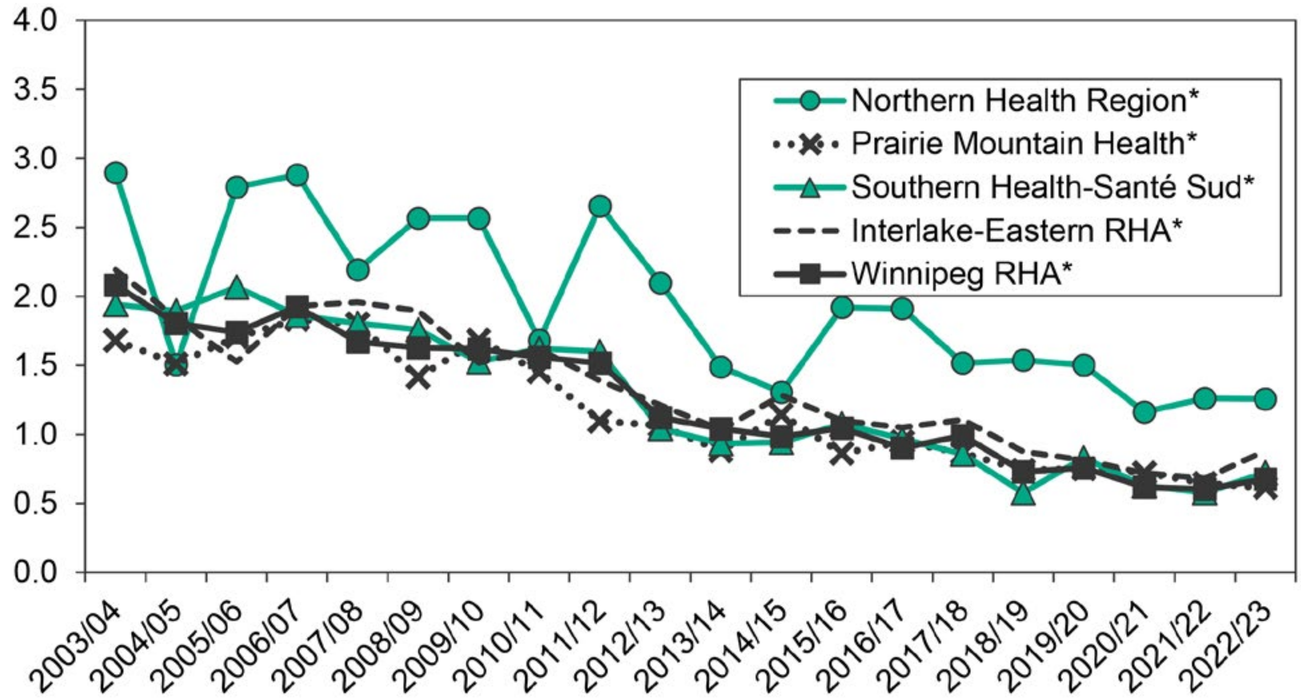
Figure 8.5: Coronary Artery Bypass Surgery Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.6: Coronary Artery Bypass Surgery Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



* statistically significant linear trend over time.

8.4 Total Hip Replacements

Definition: The number of hip replacements (complete removal and replacement of joint) performed per 1,000 residents aged 40 and older. Hip replacements were defined by ICD-9-CM codes 81.50, 81.51, and 81.53 or CCI codes 1.VA.53.LA-PN and 1.VA.53. PN-PN in any intervention field in a hospital abstract. 'Out-of-hospital' procedures were excluded to avoid double-counting.

Time period analysis: Average annual hip replacement rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Hip replacement rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.7)

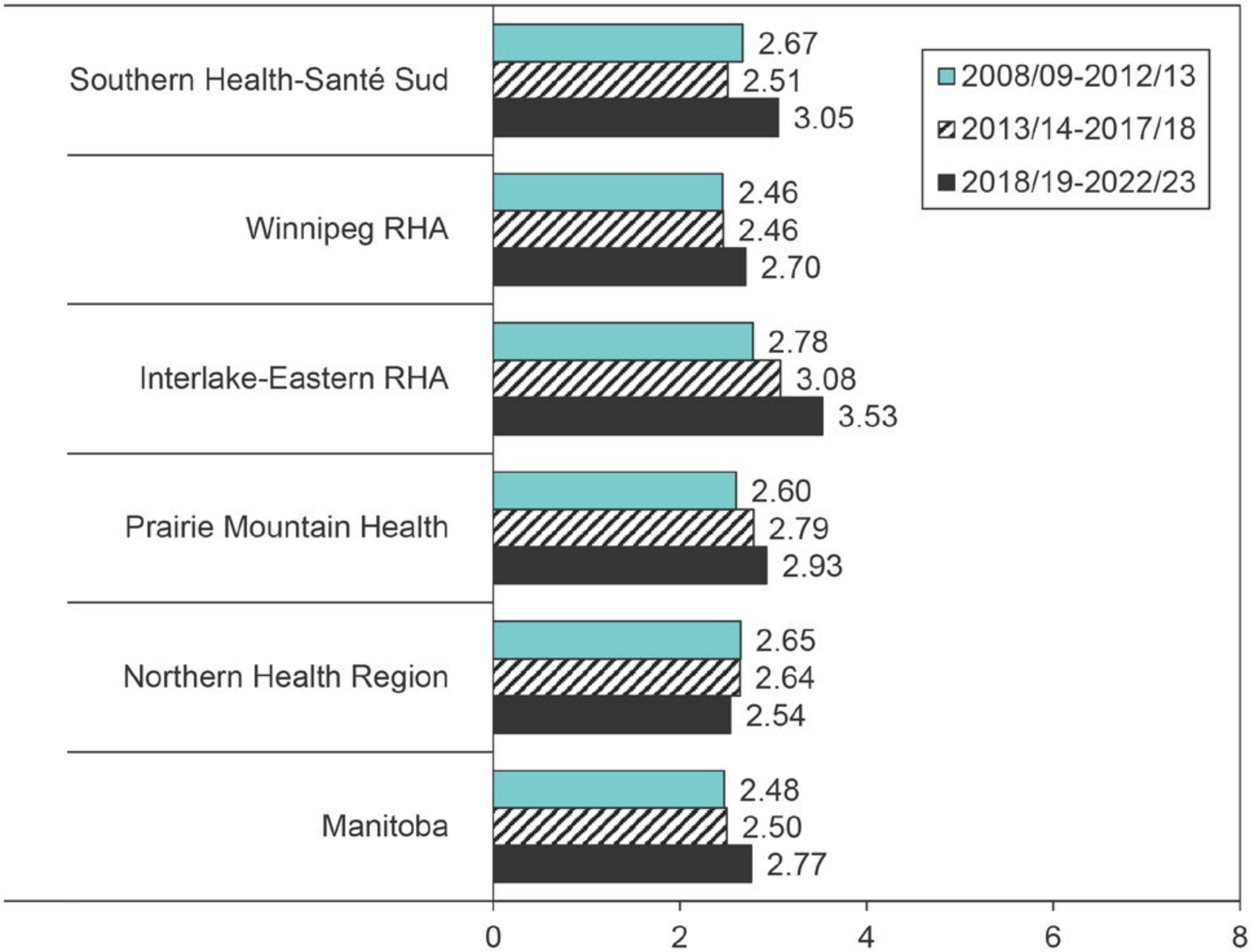
- The rate of hip replacements increased slightly but not significantly over time from 2.48 procedures per 1,000 residents aged 40 years and older in TP1 to 2.50 in TP3 to 2.77 in TP3. The number of replacements also increased across the periods with 1,842 performed in TP3 (online supplement).
- The changes over time varied by health region with some slight increases and some slight decreases between TP1 and TP2. All regions had non-significant increases from TP2 to TP3 except the Northern Health Region, which slightly decreased.
- The highest rates were in the Interlake-Eastern RHA, and the lowest in the Winnipeg RHA. There were no significant differences in the rates in any of the regions compared to rates in Manitoba.
- Hip replacement rates were significantly associated to income in rural and urban areas in TP2 and TP3 where the rates were higher for residents of higher income areas (see online supplement). The association was not significant in TP1.

Trend Analysis (Figure 8.8)

- Hip replacement rates increased significantly over time in Manitoba and in all regions except the Northern Health Region. Rates appeared to increase between 2018/19 and 2019/20 before dropping dramatically in 2020/21. The rates sharply increased after that in all regions.

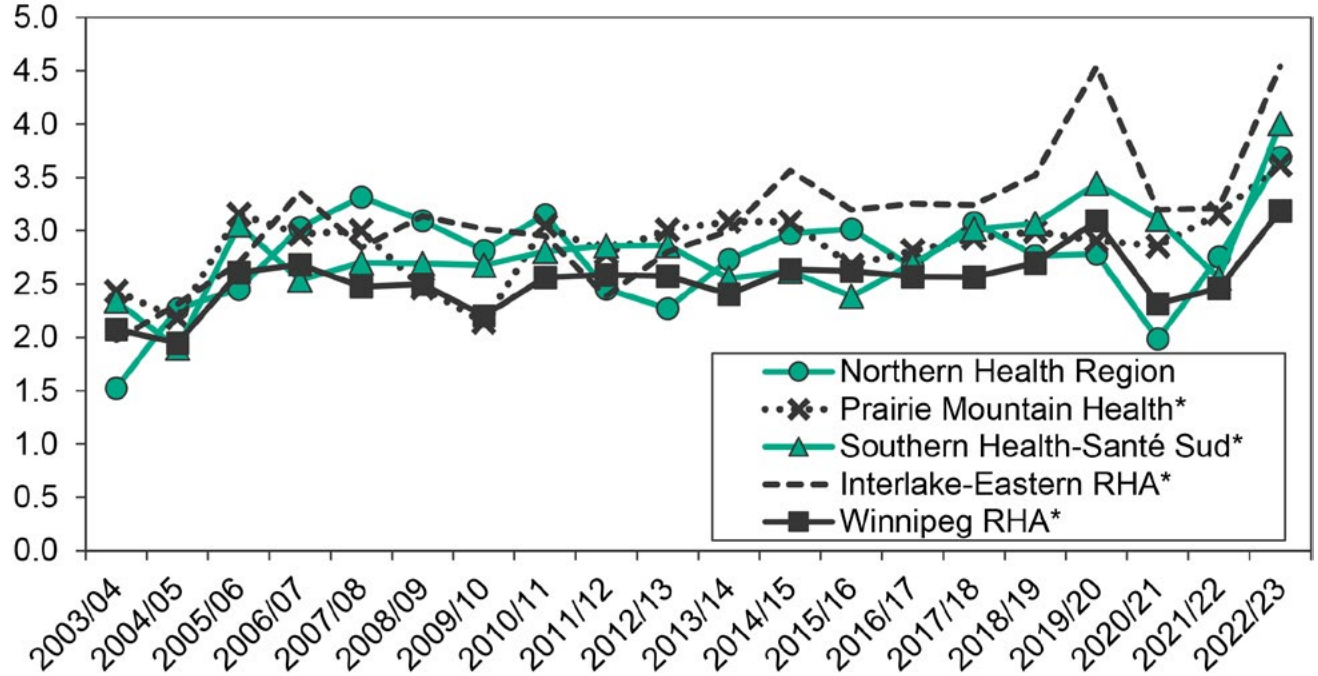
Figure 8.7: Hip Replacement Surgery Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.8: Hip Replacement Surgery Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rate per 1,000 residents (age 40+)



* statistically significant linear trend over time.

8.5 Total Knee Replacements

Definition: The number of knee replacement surgeries (complete removal and replacement of joint) performed per 1,000 residents aged 40 and older. Knee replacements were defined by ICD-9-CM codes 81.54 and 81.55 or CCI codes 1.VG.53.LA-PN and 1.VG.53. LA-PP in any intervention field in a hospital abstract. 'Out-of-hospital' procedures were excluded to avoid double-counting.

Time period analysis: Average annual knee replacement rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: Knee replacement rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.9)

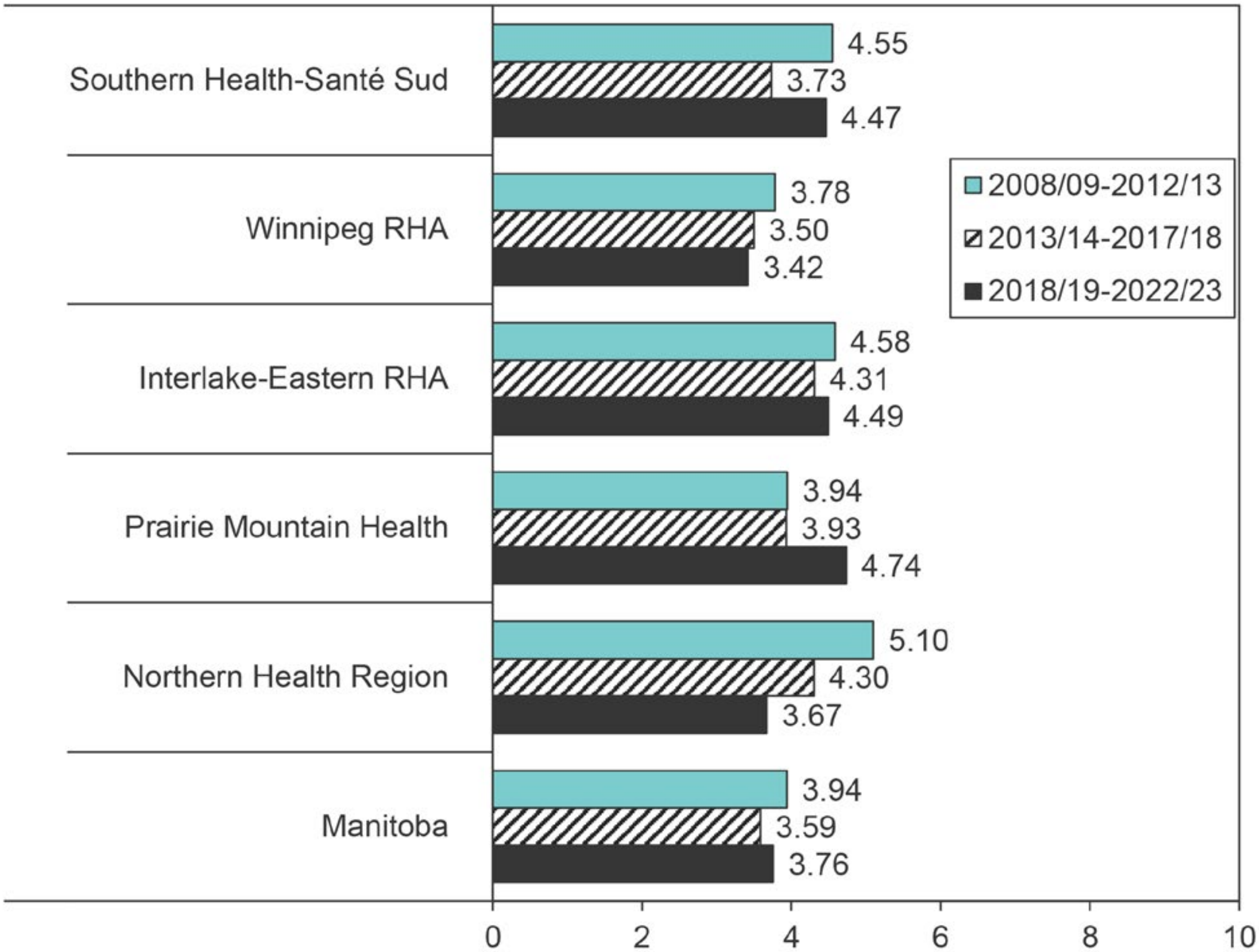
- The rate of knee replacements in the province decreased slightly from 3.94 procedures per 1,000 residents aged 40 years and older in TP1 to 3.59 and then increased to 3.76 in TP3. None of the changes between periods were significant. The number of replacements also increased across the periods with 2,501 performed in TP3 (online supplement).
- All regions showed non-significant decreases between TP1 and TP2, while the changes from TP2 to TP3 varied (either increased or decreased non-significantly).
- The lowest rates were in the Winnipeg RHA; however, they were not significantly different than rates in Manitoba.
- Knee replacement rates were only significantly associated to income in urban areas in TP2: the rates were higher for residents of higher income areas (see online supplement). The association was not significant in any of the other time periods or in rural areas.

Trend Analysis (Figure 8.10)

- Knee replacement rates increased significantly over time in only the Prairie Mountain Health region. In all regions, the rates decreased sharply between 2019/20 and 2020/21 before increasing to 2022/23. There was no trend observed for Manitoba overall.

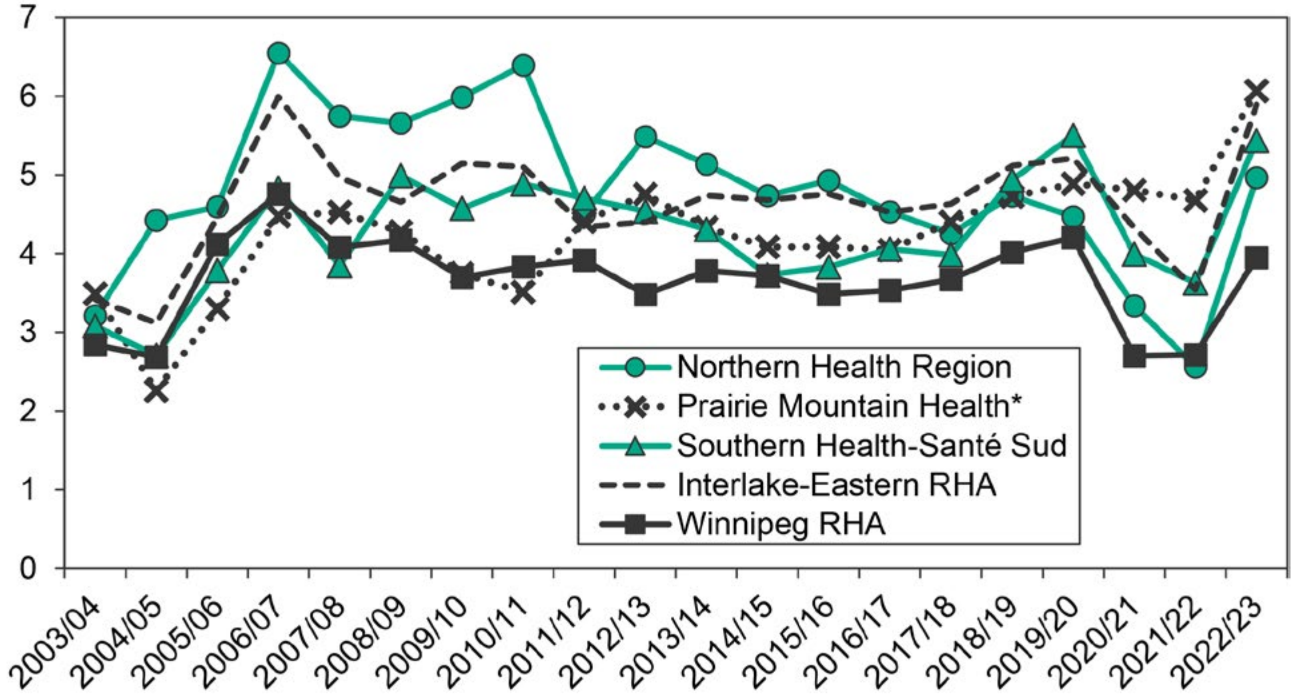
Figure 8.9: Knee Replacement Surgery Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.10: Knee Replacement Surgery Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted per 1,000 residents (age 40+)



* statistically significant linear trend over time.

8.6 Cataract Surgeries

Definition: The number of cataract surgeries performed per 1,000 residents aged 50 and older. Cataract surgery was defined by a physician service claim with tariff codes 5611, 5612 and tariff prefix ‘2’ (surgery); or a hospital abstract with ICD–9–CM procedure codes 13.11, 13.19, 13.2, 13.3, 13.41, 13.42, 13.43, 13.51, or 13.59; or CCI code 1.CL.89. Additional cataract surgeries for Manitoba residents were added from medical reciprocal claims for out-of-province procedures, including Alberta (tariff code 27.72) and Saskatchewan (tariff codes 135S, 136S, 226S, and 325S).

Time period analysis: Cataract surgery rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 50 and older in TP3.

Trend analysis: Cataract surgery rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 50 and older as of December 31, 2022.

Key Findings

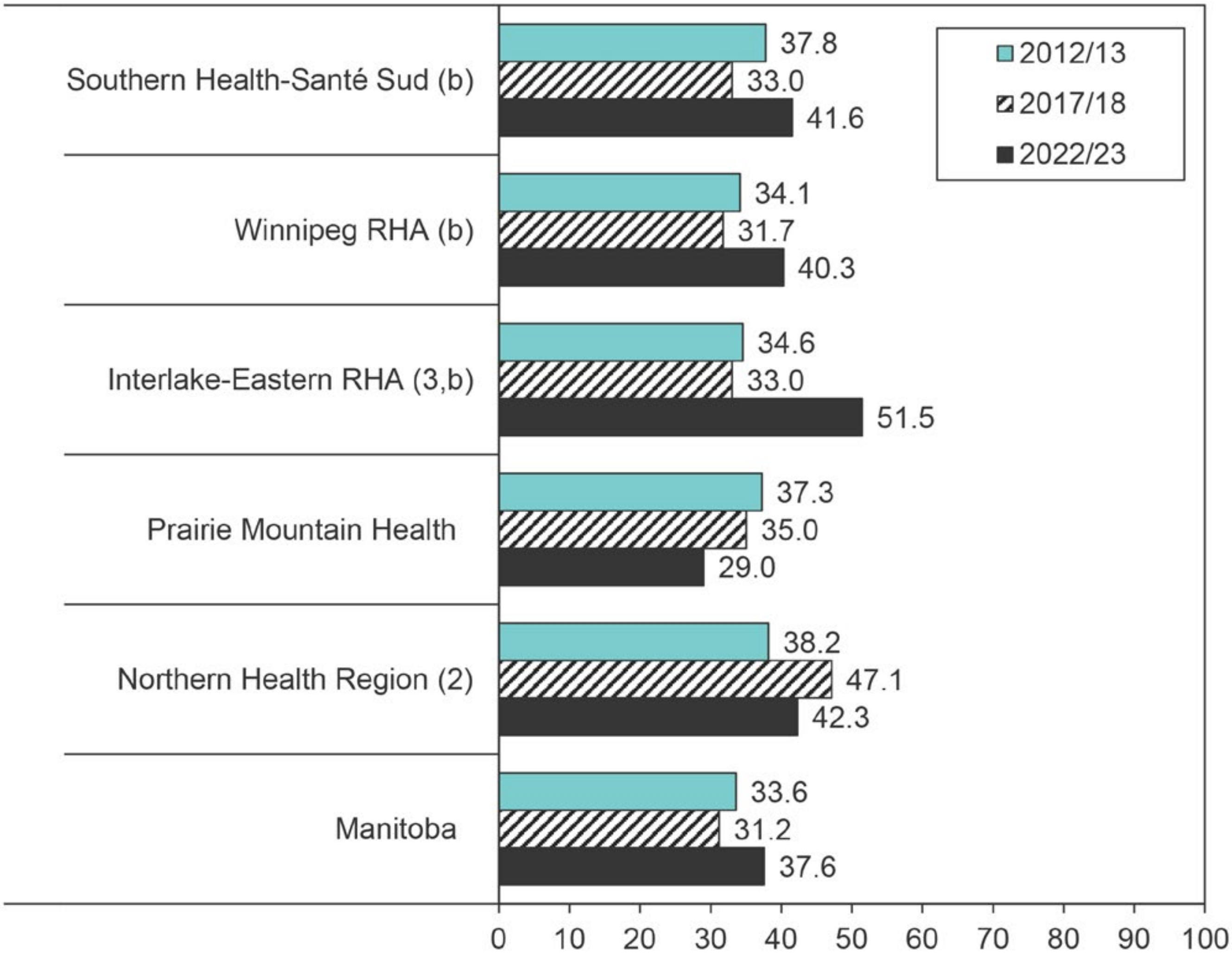
Time Period Analysis (Figure 8.11)

- The rate of cataract surgeries decreased from 33.6 surgeries per 1,000 residents aged 50 and older in TP1 to 31.2 in TP2 and then increased to 37.6 in TP3, though these did not reach statistical significance. However, the 18,908 surgeries performed in TP3 were considerably higher than the 12,769 in TP2 (online supplement).
- This pattern was observed in the Southern Health-Santé Sud, Winnipeg RHA, and Interlake-Eastern RHA and the increase from TP2 to T P3 were statistically significant. In Prairie Mountain Health, the rates decreased over the three periods, while they increased between TP1 and TP2 in the Northern Health Region.
- The highest rate was seen in the Interlake-Eastern RHA (51.5 surgeries) in TP3, which was significantly higher than the Manitoba rate for that period. The Northern Health Region in TP2 was the only other instance where there was a significantly higher rate than Manitoba’s overall rate.
- There were no associations between cataract surgery rates and income in urban or rural areas in any period (see online supplement).

Trend Analysis (Figure 8.12)

- Cataract surgery rates decreased significantly over time in only the Prairie Mountain Health region. In all regions, the rates decreased sharply between 2019/20 and 2020/21 before increasing in 2022/23; however, this was not as prominent in the Prairie Mountain Health region. There was no trend observed for Manitoba overall.

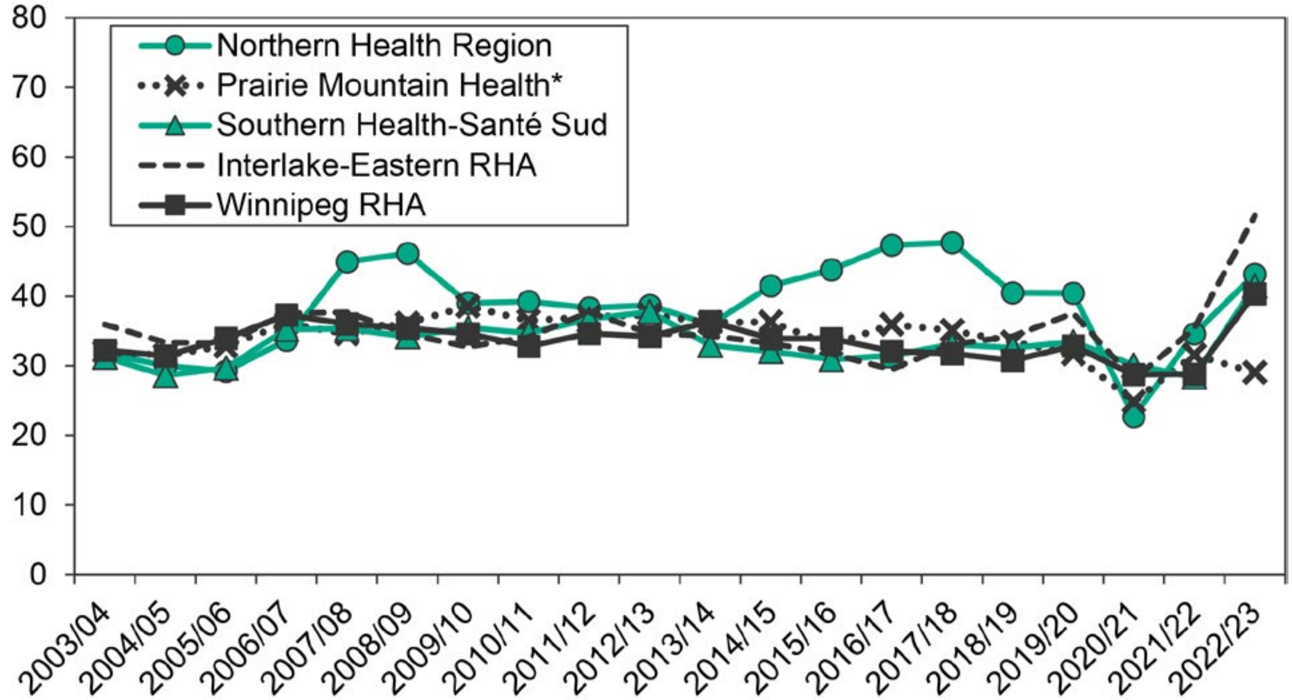
Figure 8.11: Cataract Surgery Rate by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate per 1,000 residents (age 50+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.12: Cataract Surgery Rate by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 50+)



* statistically significant linear trend over time.

8.7 Computed Tomography (CT) Scans

Definition: The number of CT scans performed per 1,000 residents aged 20 and older. CT scans were defined by a physician claim with tariff codes 7112-7115 or 7221-7230. Residents with multiple claims for CT scans in a day (e.g., multiple body parts scanned) were assigned only one scan for that day. The CT scan rates shown in this report underestimate the 'true' rates, as individual-level information regarding CT scans performed in some rural hospitals is incomplete.

Time period analysis: CT scan rates were calculated for 2 one-year periods: 2017/18 (TP1) and 2022/23 (TP2) and were age- and sex-adjusted to the Manitoba population aged 20 and older in TP2. Individual-level data for previous years are known to be incomplete, therefore only two time periods were used. Counts and crude rates by age and sex for TP1 and TP2 are provided in the online supplement.

Trend analysis: CT scan rates were calculated for each one-year period from 2013/14 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 20 and older as of December 31, 2022.

Key Findings

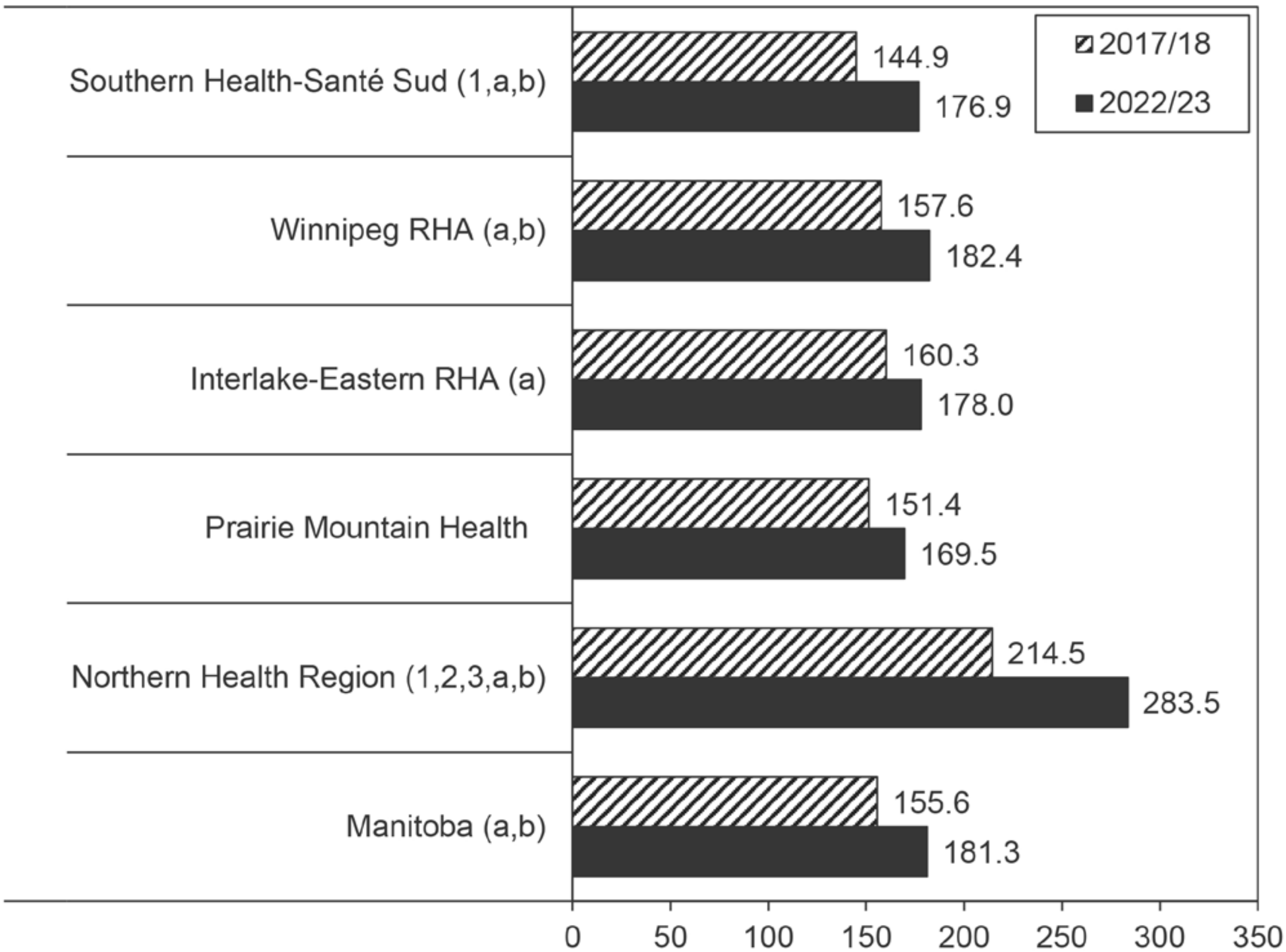
Time Period Analysis (Figure 8.14)

- The CT scan rate in Manitoba increased significantly from 155.6 scans per 1,000 residents aged 20 and older in TP1 to 181.3 in TP2. The 196,544 scans in TP2 were 41,879 more than the number of scans in TP1 (online supplement).
- The rates also significantly increased in each of the regions expect Prairie Mountain Health, where the increase did not reach the level of statistical significance.
- CT scan rates were highest in both periods in the Northern Health Region, which were significantly higher than the Manitoba rates.
- CT scan rates were associated to income in urban or rural areas in both periods (see online supplement). The rates were lower among those with higher incomes.

Trend Analysis (Figure 8.15)

- CT scan rates showed a significantly increasing trend over the 10-year span in Manitoba and in each region.

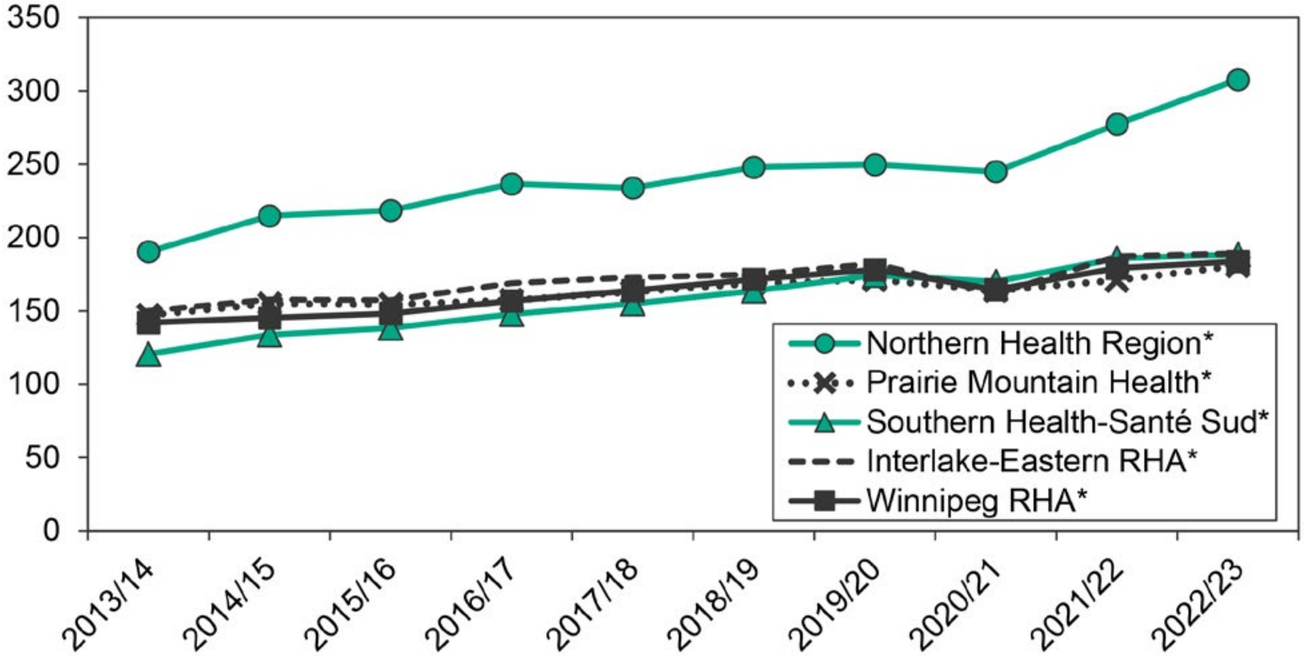
Figure 8.13: Computed Tomography (CT) Scan Rate by Health Region 2017/18, and 2022/23
Age- and sex-adjusted rate per 1,000 residents (age 20+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.14: Computed Tomography (CT) Scan Rate by Health Region, 2013/14 to 2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 20+)



* statistically significant linear trend over time.

8.8 Magnetic Resonance Imaging (MRI) Scans

Definition: The number of magnetic resonance imaging (MRI) scans performed per 1,000 residents aged 20 and older. MRI scans were defined by physician claims with tariff codes 7501-7528. Residents with multiple claims for MRI scans in one day (e.g., multiple body parts scanned) were assigned only one scan for that day.

Time period analysis: MRI scan rates were calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 20 and older in TP3. Counts and crude rates by age and sex for TP2 and TP3 are provided in the online supplement.

Trend analysis: MRI scan rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 20 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 8.15)

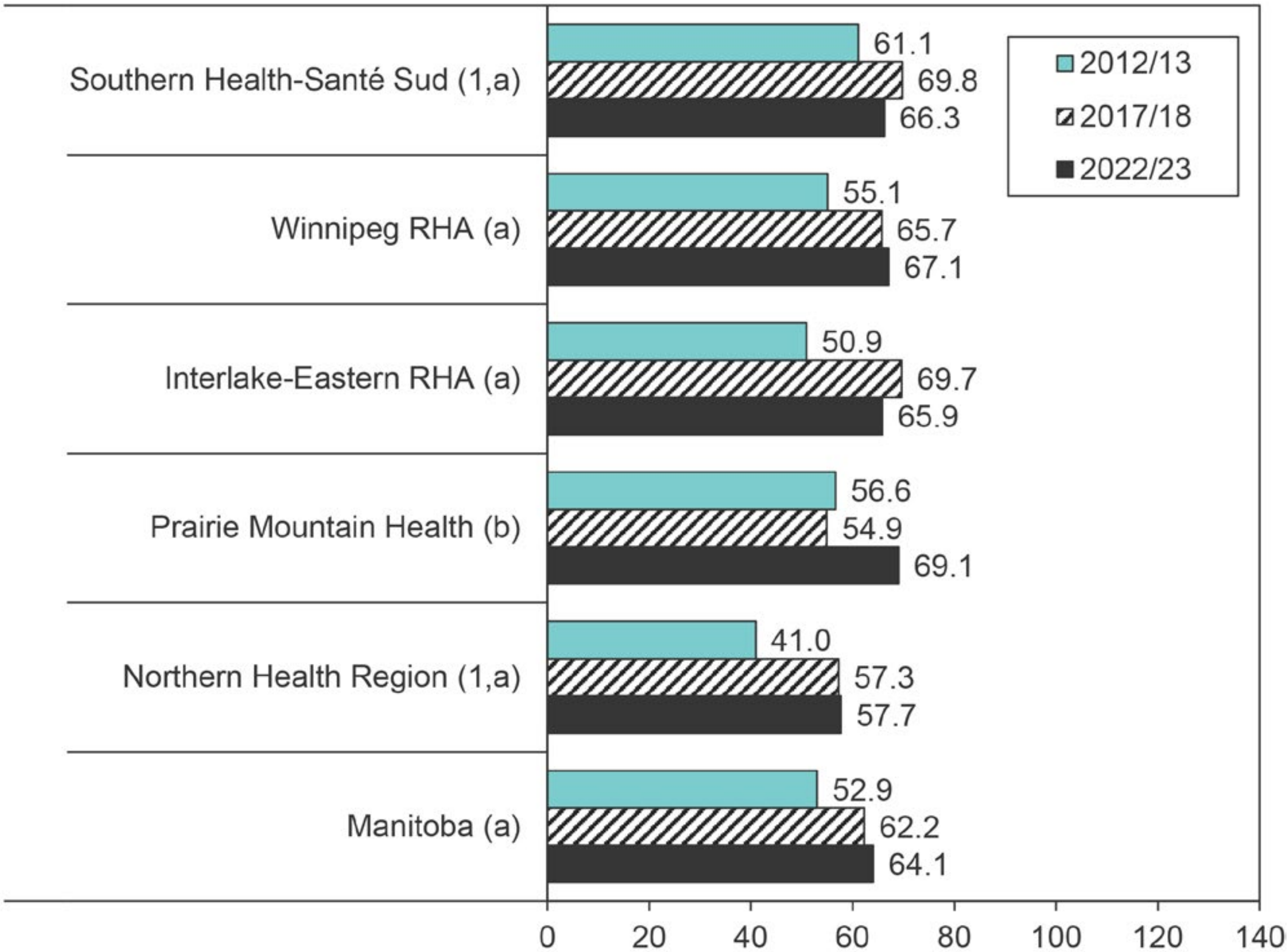
- The rate of MRI scans increased significantly from 52.9 scans per 1,000 Manitoba residents aged 20 and older in TP1 to 62.2 in TP2 and then non-significantly to 64.1 in TP3. The number of MRIs performed increased from 51,219 in TP1 to 64,679 in TP2 to 69,462 in TP3 (online supplement).
- Rates increased between TP1 and TP2 in all areas except the Prairie Mountain Health region, where there was no change. However, Prairie Mountain Health was the only region to see significant increase between TP2 and TP3, whereas all the other regions did not change.
- Rates across the regions were similar, however, the TP1 rates in the Southern Health-Santé Sud region were significantly higher than the Manitoba rate, and the TP1 rate in the Northern Health Region was significantly lower.
- MRI scan rates were only significantly associated to income in urban areas in TP2 and TP3: the rates were higher for residents of higher income areas (see online supplement). The association was only significant in rural areas in TP2. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 8.16)

- MRI scan rates showed a significant increase over time in Manitoba and in each region. The increase was steady from 2003/04 to 2018/19 where it appears to have stabilized. However, in all regions, the rates decreased sharply between 2019/20 and 2020/21 before returning to 2018/19 levels by 2022/23.

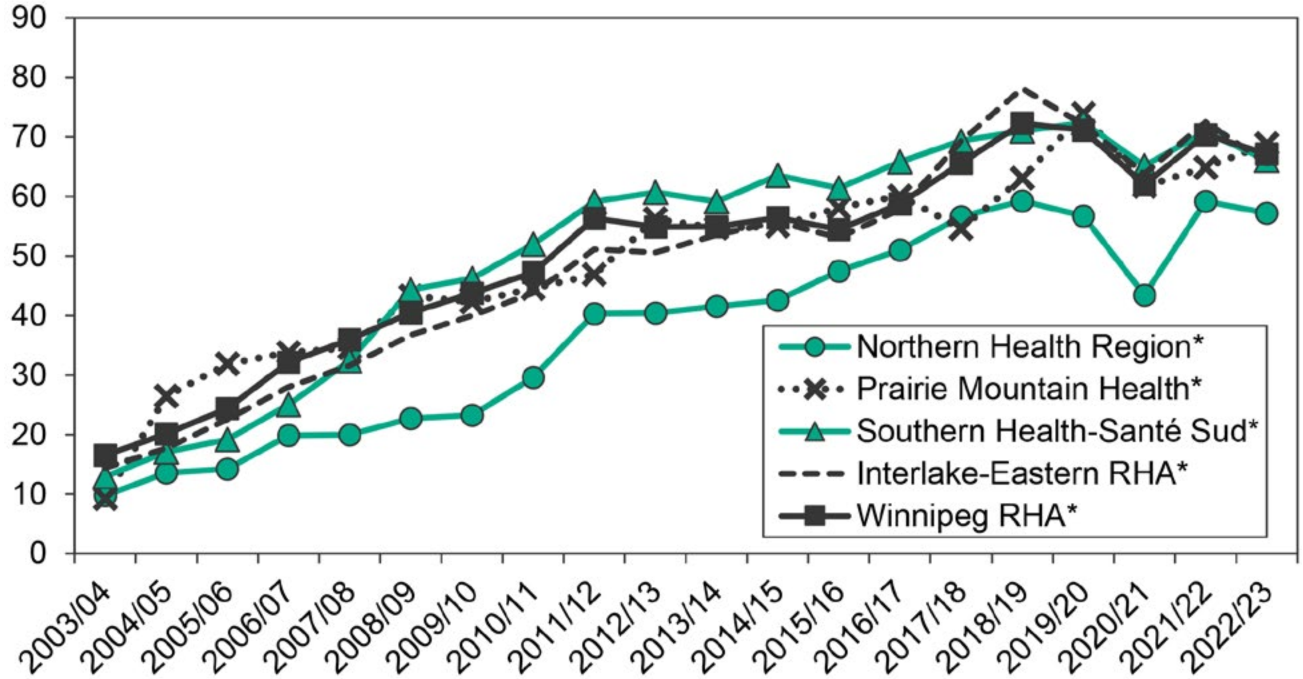
Figure 8.15: Magnetic Resonance Imaging (MRI) Scan Rate by Health Region, 2012/13, 2017/18, and 2022/23

Age- and sex-adjusted rate per 1,000 residents (age 20+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 8.16: Magnetic Resonance Imaging (MRI) Scan Rate by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted rate per 1,000 residents (age 20+)



* statistically significant linear trend over time.

Chapter 9: Maternal and Child Health

Key Findings in Chapter 9

The results in this chapter show a mixed but overall positive picture of changes in maternal and child health indicators over time:

- The birth rate decreased slightly in Manitoba, which was observed in both the time period and the trend analysis.
- The percentage of women receiving inadequate prenatal care significantly increased over the 20-year period and from the second to third time periods (i.e., more recently). However, the increased percentages in the last time period and during the last three years in the trend analysis may have been affected by the COVID-19 pandemic. Including virtual visits attenuated the increase observed during this time.
- The percentage of preterm births among all live births significantly increased over the 20-year period and from the second to third time periods (i.e., more recently).
- The percentage of small for gestational age births among all live births increased, though this appears to be plateauing. Those born large for gestational age have decreased significantly over time.
- The percentage of Caesarean sections among live and still births increased over time, while the percentage of vaginal births among women with a prior Caesarean section decreased.
- There was stability in the location of births in Manitoba overall: the vast majority occurred in a designated maternity hospital in the mother's home region or in Winnipeg. Among three of the regions, there were notable changes that occurred from the second and third periods. Prairie Mountain Health had an increased proportion of births in their home region, while the proportion in the Winnipeg RHA decreased. The opposite occurred in the Southern Health-Santé Sud and the Northern Health Region where the proportion of births in their home regions decreased, while the proportion in the Winnipeg RHA increased.

- The percentage of live births where breastfeeding initiation occurred in hospital increased significantly over the 20-year period; however, there was a significant decrease from the second to third time periods.
- The infant mortality rate (0-12 months) decreased significantly over the 20-year span, which appears to be attributable to the decrease in the earlier years based on the time period analysis results, i.e., non-significant decrease between the second and third periods.
- The child mortality rate (1-19 years) decreased significantly over the 20-year span and was lower in the third period compared to the second period, though not significantly. External causes (i.e., injury and poisoning) has and continues to be the dominant cause of child deaths.
- The rate of surgery for the extraction of teeth affected by dental caries among children aged 0-5 decreased significantly over time, most notably in the Northern Health Region.
- The prevalence of asthma among children and youth (age 5-19) increased significantly from the first to second periods but decreased from the second to third period. Over the 20-year period, prevalence decreased, although not significantly.
- For many of the indicators in this chapter, there were significant associations with health status (e.g., premature mortality rate) and area-level income: those from regions with worse health status and from lower income areas had significantly poorer outcomes.

Introduction

A chapter on maternal and child health first appeared in the 2019 Atlas. The choice of indicators to include in that Atlas was informed by decisions from the Community Health Assessment Network and the research team and appear in previous MCHP reports, including “How are Manitoba’s Children Doing?”[15] and “Perinatal Services and Outcomes in Manitoba”[16]. This current Atlas updates the same indicators used in the 2019 Atlas. Many of the indicator rates are based on the population of women and it should be noted that women are identified in the Provincial Health Insurance Registry, which lists an individual’s sex at birth and not their gender.

9.1 Birth Rate

Definition: The number of live births per 1,000 women aged 15-45. Births were defined as live births coded in Manitoba hospital abstracts with ICD-10-CA codes Z37.0, Z37.2, Z37.3, or Z37.5. Note that home births and those occurring at the birth centre in Winnipeg are coded into the hospital abstract data system, so they were included in this analysis even if no hospital care is involved.

Time period analysis: The birth rate was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age adjusted to the Manitoba female population aged 15-45 in TP3.

Trend analysis: The birth rate was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba female population aged 15-45 as of December 31, 2022.

Key Findings

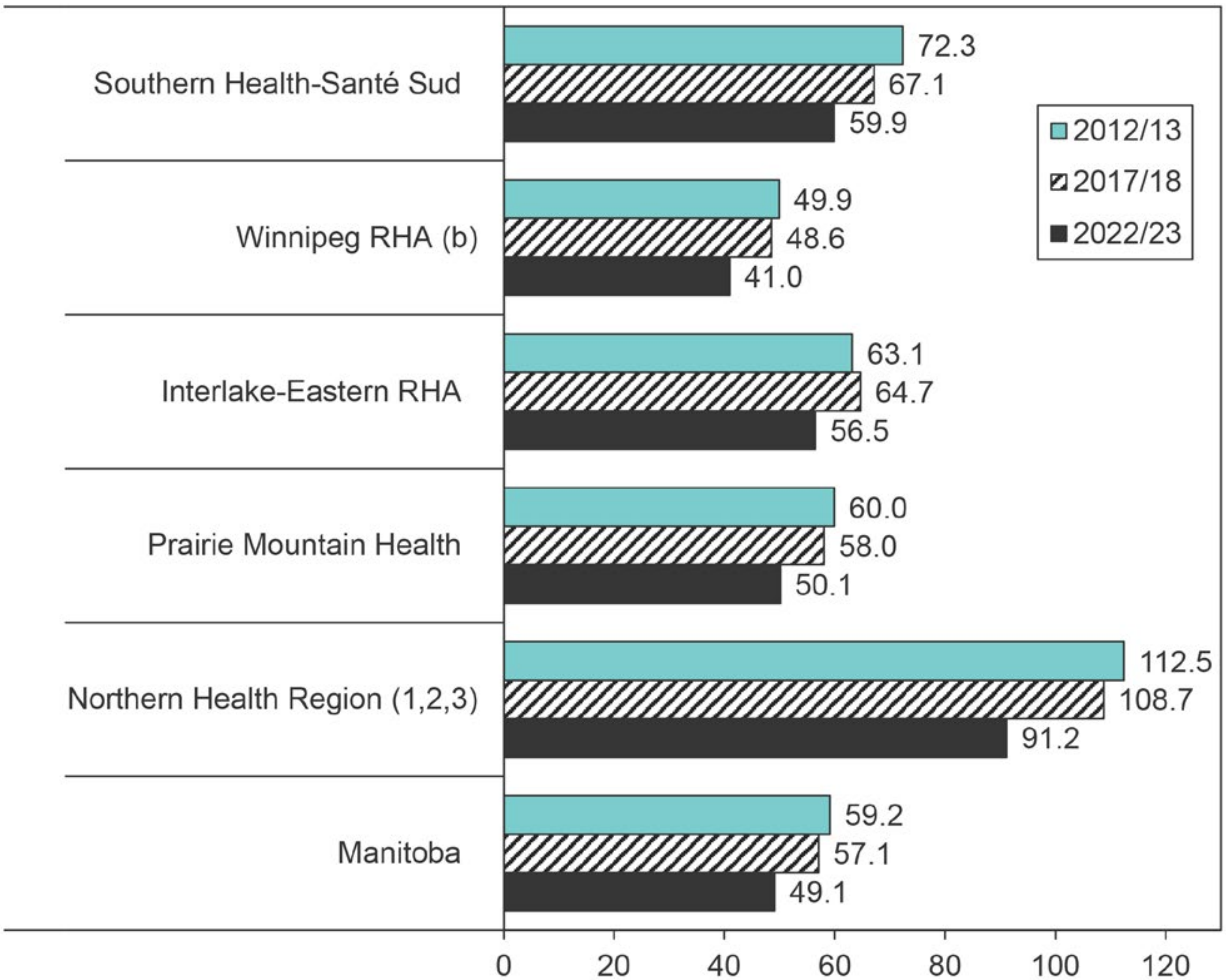
Time Period Analysis (Figure 9.1)

- The birth rate in Manitoba decreased from 59.2 births per 1,000 women aged 15-45 in TP1 to 57.1 in TP2 to 49.1 in TP3, although none of the differences were statistically significant. The birth rates decreased across the time periods in each of the regions, except the Interlake-Eastern RHA, which saw a slight increase from TP1 to TP2. The only significant difference between time periods was in the Winnipeg RHA when the birth rate decreased from 48.6 in TP2 to 41.0 in TP3.
- The highest birth rates were in the Northern Health Region, which were significantly higher than the Manitoba birth rates in each corresponding time period.
- There were strong associations between income and birth rates in rural and urban areas in each period. Rates were higher among residents of lower income areas (see online supplement).

Trend Analysis (Figure 9.2)

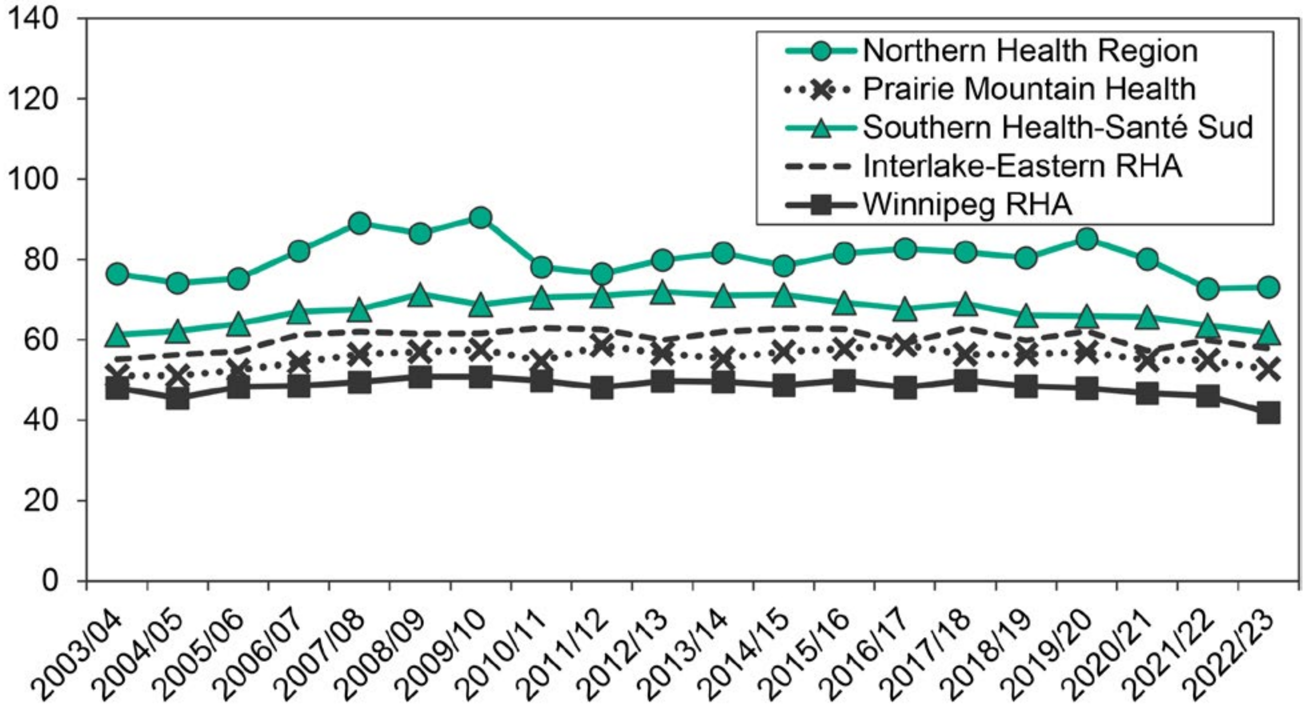
- Birth rates were relatively stable over time with no significantly increasing or decreasing trends observed. Slight decreasing trend appears to occur around 2013/14 in each region except the Northern Health Region, which was more variable.

Figure 9.1: Birth Rate by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted rate of live births per 1,000 females (age 15-45)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.2: Birth Rate by Health Region, 2003/04 to 2022/23
Age-adjusted rate of live births per 1,000 females (age 15-45)



* statistically significant linear trend over time.

9.2 Inadequate Prenatal Care

Definition: The percentage of mothers of singleton live births who received inadequate, or no prenatal care based on their R-GINDEX (Revised-Graduated Prenatal Care Utilization Index) score.[17] The denominator included all singleton live births coded in Manitoba hospital abstracts with ICD-10-CA codes Z38.0, Z38.1, Z38.2 where the mother had Manitoba Health Insurance coverage for the entire gestation period. Stillbirths and records with gestational age missing, less than 20 weeks, or greater than 45 weeks were excluded.

The ICD-9-CM tariffs used to identify a prenatal care visit were 8400 and 8401. If a diagnosis of pregnancy was also recorded on the medical claim, then ICD-9-CM tariffs 8501, 8507, 8509, 8529, 8530, 8540, and 8550 were also used. The ICD-9-CM diagnosis codes used to identify a prenatal care visit were 640-669, V22, and V23.

Note that the definition used is the same as in previous Atlas reports. However, due to the changes to provision in care because of the COVID-19 pandemic, a definition that also includes virtual visits was also used. The results using the revised definition are available in the online supplement.

Time period analysis: The average annual percentage of inadequate prenatal care was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to live born singletons in TP3.

Trend analysis: The percentage of inadequate prenatal care was calculated for each one-year period from 2003/04 to 2022/23 and maternal age-adjusted to the Manitoba population of women who gave birth to live born singletons in 2022/23.

Key Findings

Time Period Analysis (Figure 9.3)

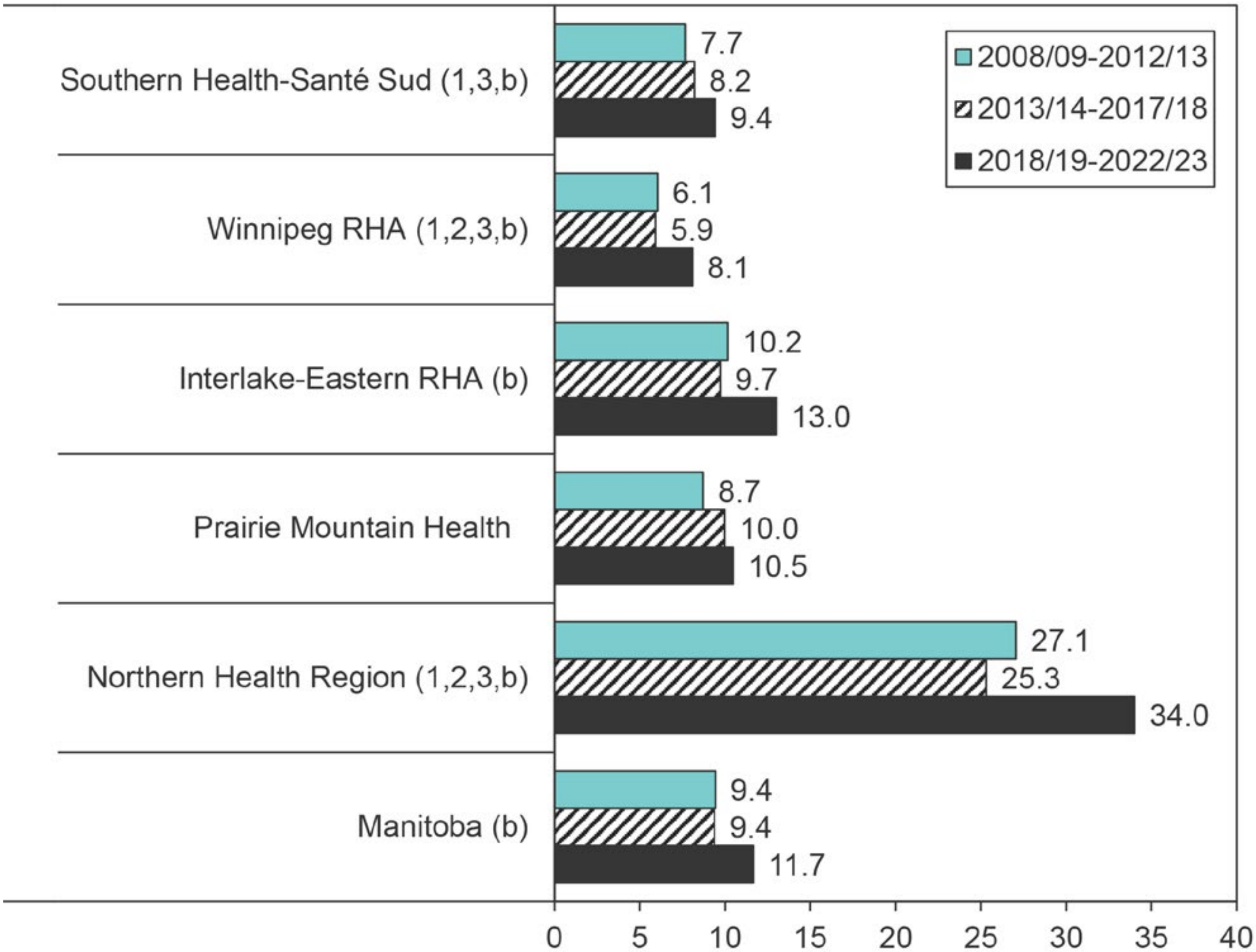
- Overall, the percentage of inadequate prenatal care was 9.4% in the first two time periods and significantly increased to 11.7% in TP3. Percentages were significantly higher in TP3 compared to TP2 in each region except Prairie Mountain Health (higher but not statistically significant). Including virtual visits attenuated the amount of increase observed in TP3, though it was still significantly higher in the third period than in the second period in Manitoba and the Winnipeg RHA, Interlake-Eastern RHA, and the Northern Health Region.
- Percentages in the Winnipeg RHA and Southern Health-Santé Sud were significantly lower than the provincial average in TP1 and TP3 (Winnipeg RHA was also lower in TP2), while they were significantly higher in the Northern Health Region for all three periods.
- Inadequate prenatal care appears to be related to health status as the percentage of mothers with inadequate care increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Inadequate prenatal care percentages were significantly associated with income in urban and rural areas in each time period, with women in lower income areas having rates that were 2-3 times higher than women in higher income areas (see online supplement). The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 9.4)

- Inadequate prenatal care percentages increased significantly over time in Manitoba and each region. There was a dramatic increase beginning in 2019/20 and plateauing afterwards in each region. However, the increase is lessened by adding virtual visits and the increasing trends in the Winnipeg RHA and Interlake-Eastern RHA that were seen when virtual visits were not included were no longer significant.

Figure 9.3: Inadequate Prenatal Care Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

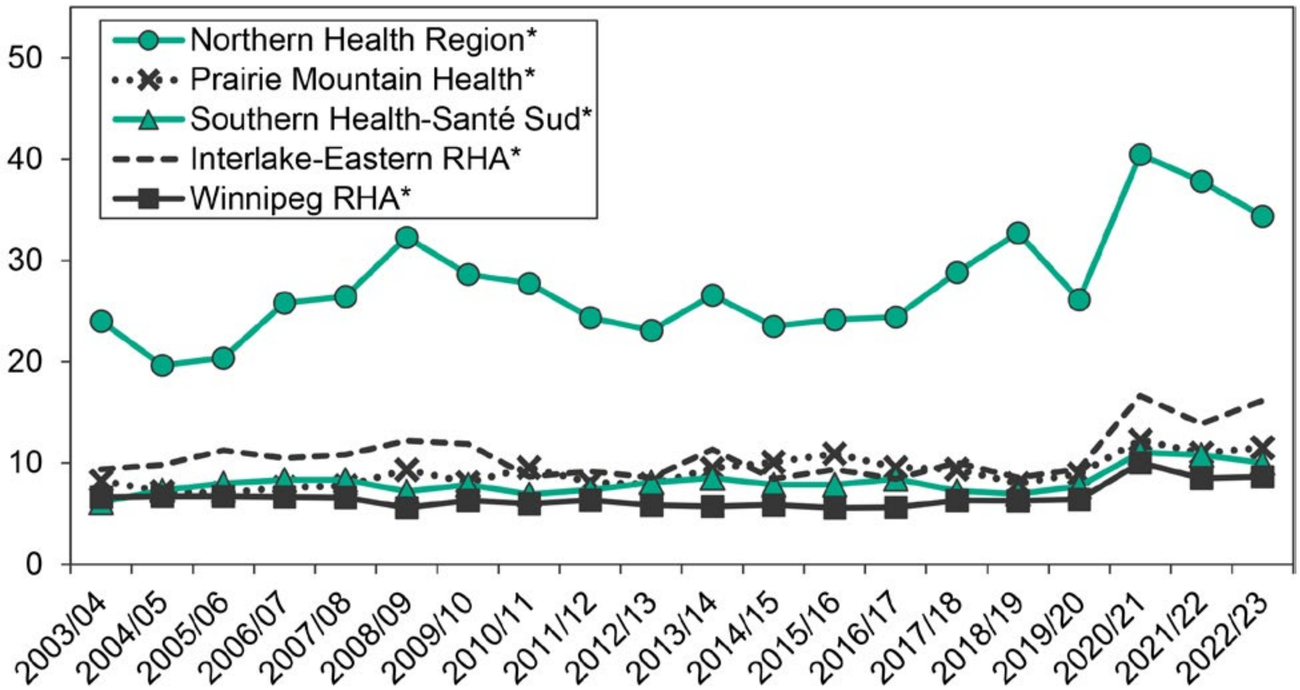
Maternal age-adjusted average annual percent of singleton live in-hospital births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.4: Inadequate Prenatal Care Rate by Health Region, 2003/04 to 2022/23

Maternal age-adjusted annual percent of singleton live in-hospital births



* statistically significant linear trend over time.

9.3 Preterm Birth

Definition: The percentage of live singleton births with a gestational age of less than 37 completed weeks out of all live births coded in Manitoba hospital abstracts with ICD-10-CA code Z38. Records with gestational age missing, less than 20 weeks, or greater than 45 weeks were excluded.

Note that the definition used in previous atlases included all live births. The definition used in the current atlas limits the denominator to only live singleton births.

Time period analysis: The average annual percentage of preterm births was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in TP3.

Trend analysis: The percentage of preterm births was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in TP3.

Key Findings

Time Period Analysis (Figure 9.5)

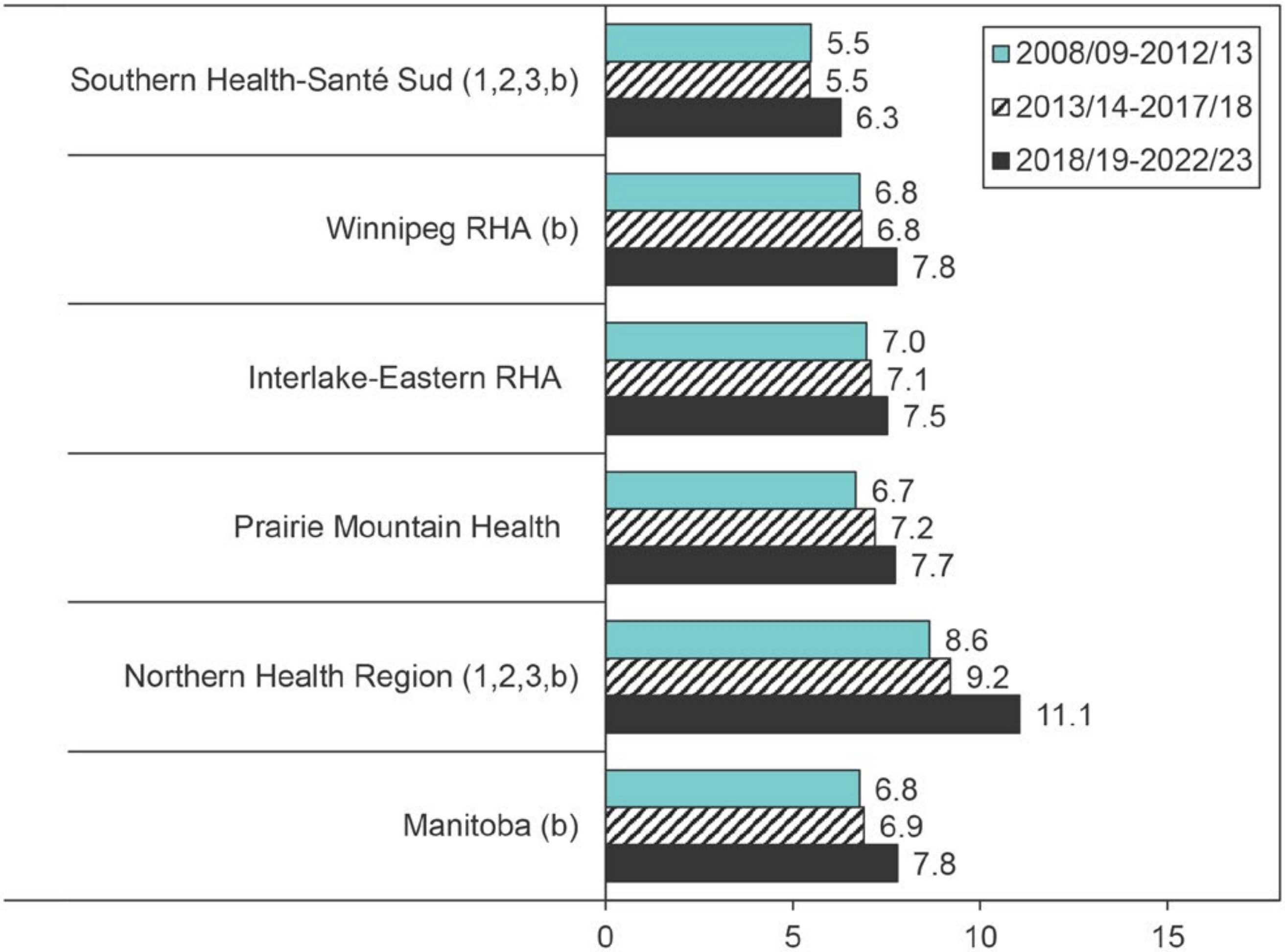
- Overall, the percentage of preterm births (before 37 weeks) was stable in Manitoba at 6.8% in TP1 and 6.9% in TP2; however, it significantly increased to 7.8% in TP3. There were no significant differences between TP1 and TP2 in any of the regions either. Significant increases from TP2 to TP3 occurred in the Southern Health-Santé Sud region, the Winnipeg RHA, and the Northern Health Region.
- Percentages in Southern Health-Santé Sud were significantly lower than the provincial average, while those in the Northern Health Region were significantly higher.
- Preterm birth rates appear to be related to health status as the rate increases across the regions from the Southern Health-Santé Sud to the Northern Health Region.
- Preterm birth percentages were significantly associated with income in urban and rural areas in all three time periods, with women in lower income areas having higher rates (see online supplement).

Trend Analysis (Figure 9.6)

- The percentage of preterm births increased significantly over time in Manitoba and each region except the Interlake-Eastern RHA. A steeper increase appears to occur beginning in 2017/18 in the Northern Health Region.

Figure 9.5: Preterm Births by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

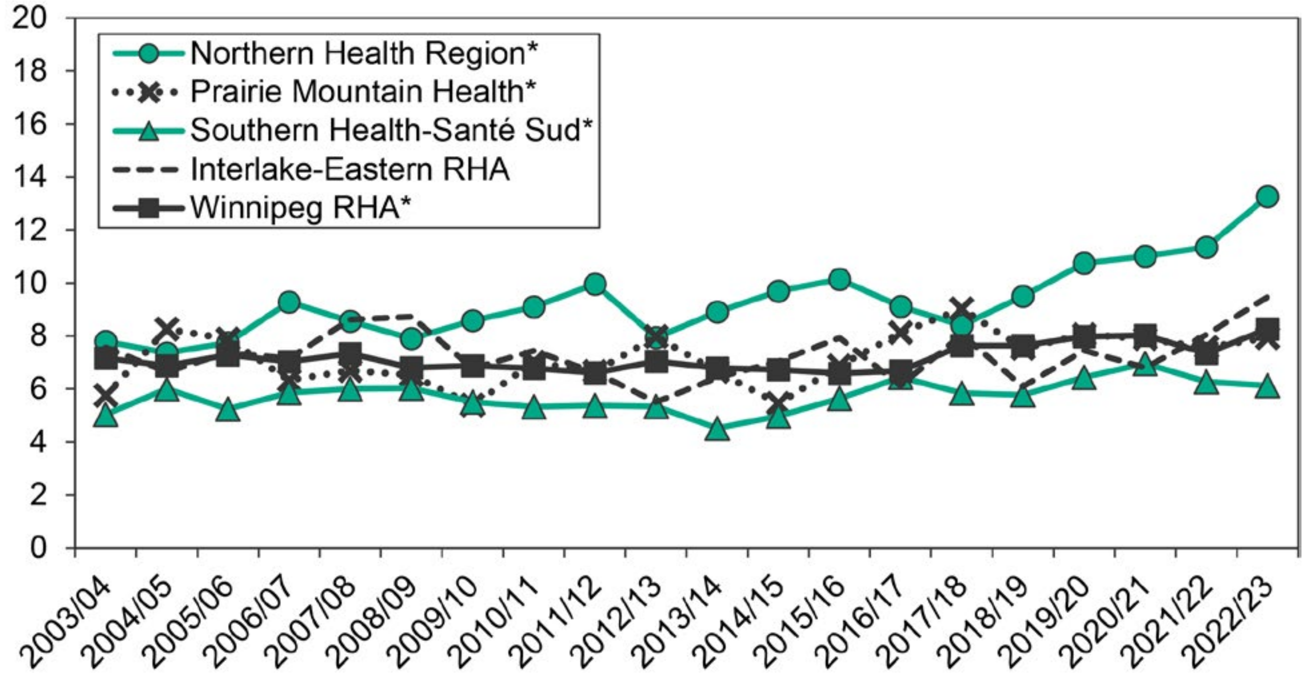
Maternal age-adjusted average annual percent of preterm births among live in-hospital singleton births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.6: Preterm Births by Health Region, 2003/04 to 2022/23

Maternal age-adjusted average annual percent of live in-hospital singleton births



* statistically significant linear trend over time.

9.4 Small for Gestational Age (SGA) Birth

Definition: The percentage of SGA births out of all live singleton births coded in Manitoba hospital abstracts ICD-10-CA code Z37.0, Z37.2, Z37.3, Z37.5. Records with gestational age missing, less than 22 weeks, or greater than 43 weeks or birth weight missing, less than 300g or greater than 9kg were excluded.

Note that the definition used in the previous Atlas included births between 20 and 45 weeks. The current Atlas only includes births between 22 and 43 weeks to be consistent with the definition used by the Canadian Perinatal Surveillance System[18]. In addition, the definition used in previous Atlases included all live births, whereas the current atlas limits the denominator to only live singleton births.

Time period analysis: The average annual percentage of SGA births was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in TP3.

Trend analysis: The percentage of SGA births was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in TP3.

Key Findings

Time Period Analysis (Figure 9.7)

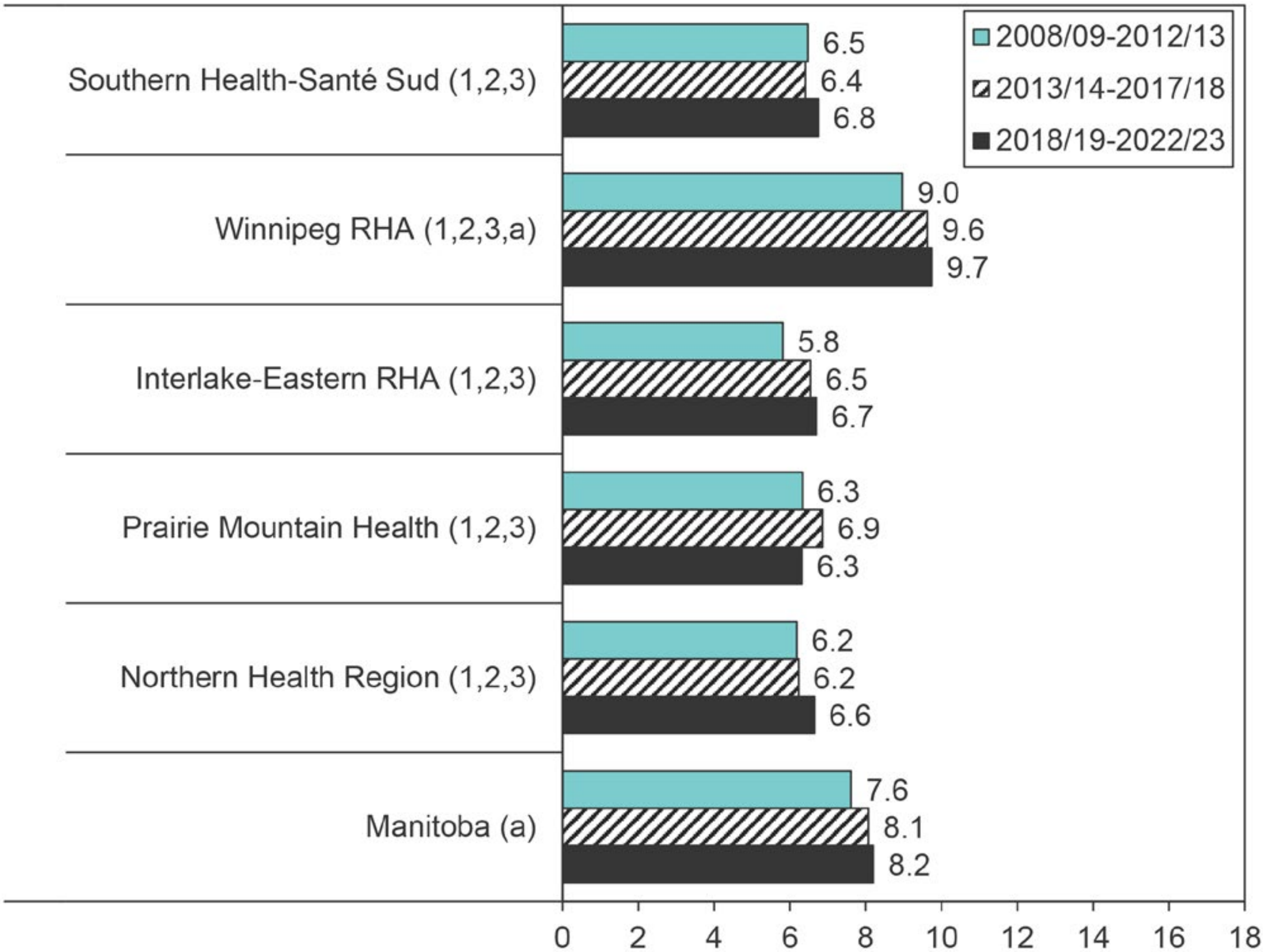
- Overall, the percentage of infants born SGA increased significantly from 7.6% in TP1 to 8.1% in TP2. The percentage increased to 8.2% in TP3, though not statistically significant. This pattern also occurred in the Winnipeg RHA.
- Percentages in the Winnipeg RHA in each period were significantly higher than the provincial average, while those in all other regions were significantly lower.
- SGA birth percentages were significantly associated with income in urban but not rural areas in all three time periods (see online supplement). Lower income urban residents had higher percentages of SGA births.

Trend Analysis (Figure 9.8)

- The percentage of SGA births was relatively stable over time in the regions. However, there has been an increasing trend over time in the Winnipeg RHA.

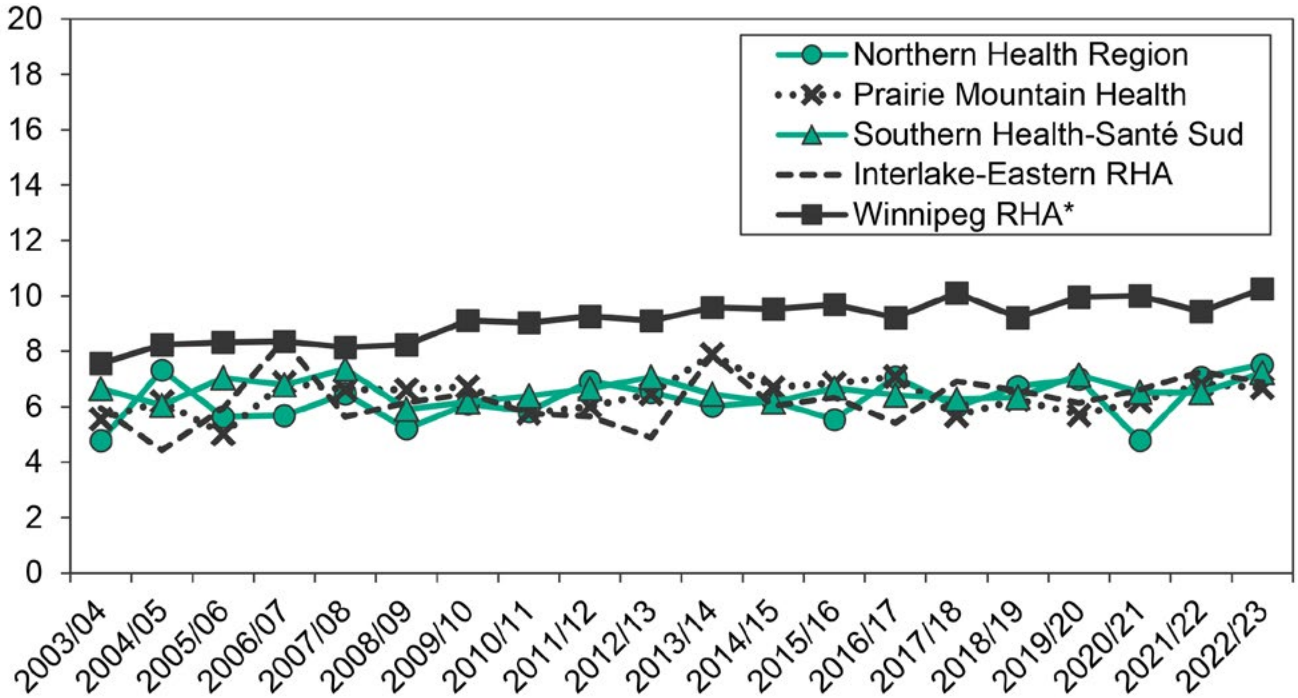
Figure 9.7: Small for Gestational Age Births by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Maternal age-adjusted average annual percent of live in-hospital singleton births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.8: Small for Gestational Age Births by Health Region, 2003/04 to 2022/23
Maternal age-adjusted average annual percent of live in-hospital singleton births



* statistically significant linear trend over time.

9.5 Large for Gestational Age (LGA) Birth

Definition: percentage of LGA births out of all live singleton births coded in Manitoba hospital abstracts with ICD-10-CA code Z37.0, Z37.2, Z37.3, Z37.5. Records with gestational age missing, less than 22 weeks, or greater than 43 weeks or birth weight missing, less than 300g or greater than 9kg were excluded.

Note that the definition used in the previous Atlas included births between 20 and 45 weeks. The current Atlas only includes births between 22 and 43 weeks to be consistent with the definition used by the Canadian Perinatal Surveillance System. In addition, the definition used in previous Atlases included all live births, whereas the current atlas limits the denominator to only live singleton births.

Time period analysis: The average annual percentage of LGA births was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in TP3.

Trend analysis: The percentage of LGA births was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth to live born infants in 2022/23.

Key Findings

Time Period Analysis (Figure 9.9)

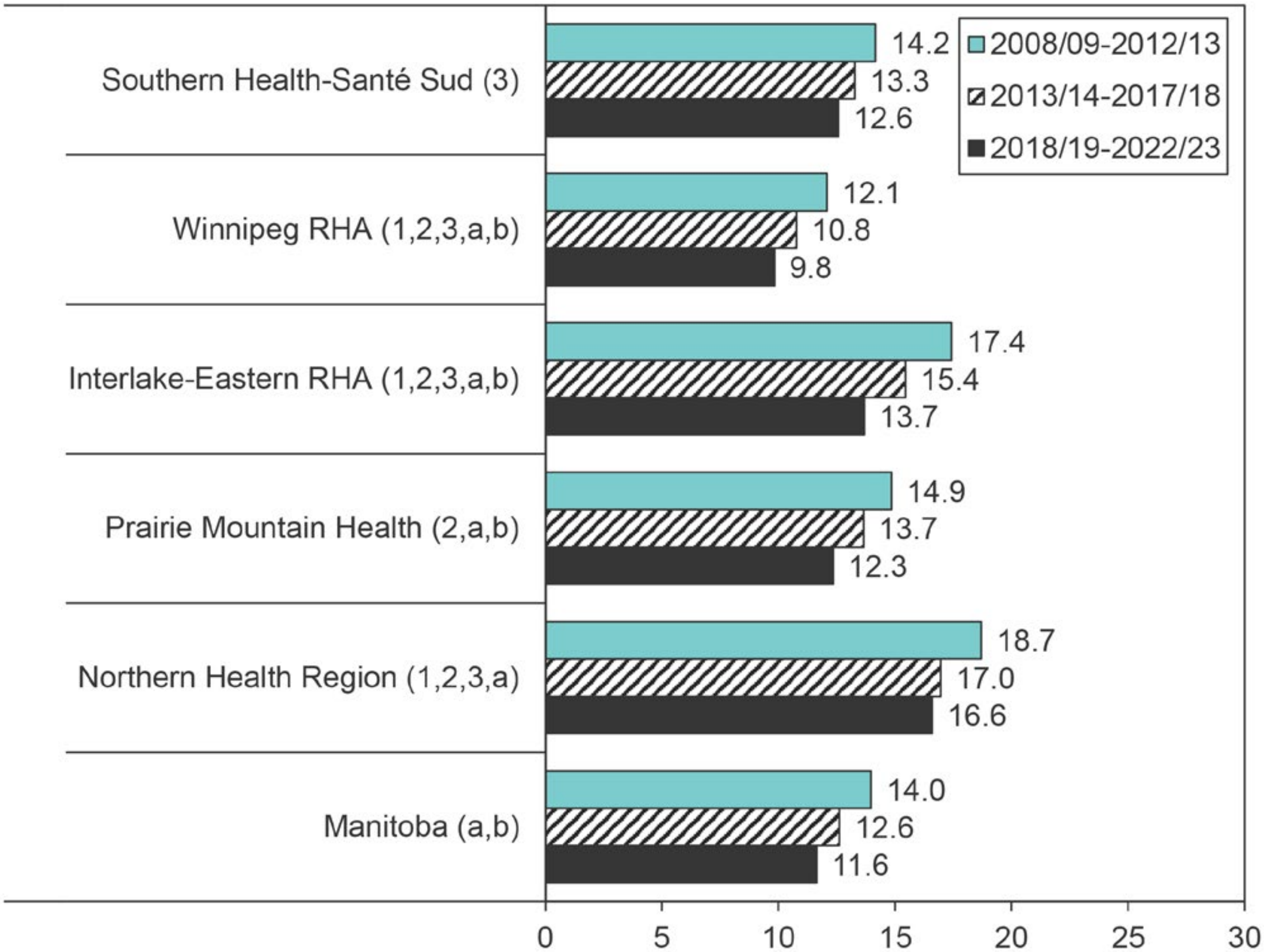
- Overall, the percentage of LGA births decreased significantly from 14.0% in TP1 to 12.6% in TP2 to 11.6% in TP3. Rates decreased across each period in all regions and were statistically significant in the Winnipeg RHA, Interlake-Eastern RHA, and Prairie Mountain Health. The decreases in the Northern Health Region only reached the level of statistical significance between TP1 and TP2.
- Percentages in the Winnipeg RHA in each period were significantly lower than the provincial average, while those in the Interlake-Eastern RHA and Northern Health Region were significantly higher than average.
- LGA birth percentages were significantly associated with income in rural areas in all three time periods, with women in lower income areas having higher LGA birth percentages (see online supplement). The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 9.10)

- The percentage of LGA births decreased over time in Manitoba and each region. The slope of the decrease was similar across the regions.

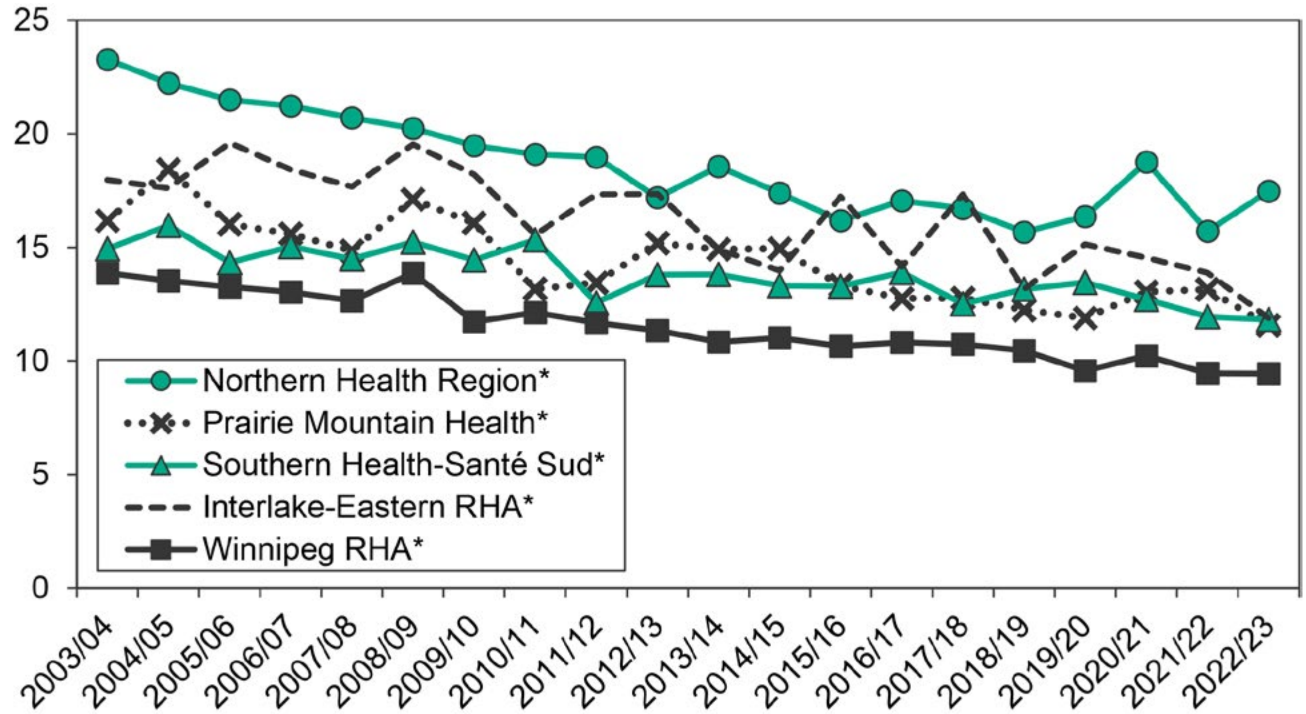
Figure 9.9: Large for Gestational Age Births by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Maternal age-adjusted average annual percent of live in-hospital singleton births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.10: Large for Gestational Age Births by Health Region, 2003/04 to 2022/23
Maternal age-adjusted average annual percent of live in-hospital singleton births



* statistically significant linear trend over time.

9.6 Caesarean Section

Definition: The percentage of Caesarean sections out of all live and still births coded in Manitoba hospital abstracts with ICD-10-CA code Z37. Caesarean delivery was defined by an obstetric hospitalization in a Manitoba hospital with CCI code 5.MD.60.

Time period analysis: The average annual percentage of Caesarean sections was calculated for three two-year periods from 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth in TP3. Counts and crude rates by maternal age group for TP2 and TP3 are provided in the online supplement.

Trend analysis: The percentage of Caesarean sections was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth in 2022/23.

Key Findings

Time Period Analysis (Figure 9.11)

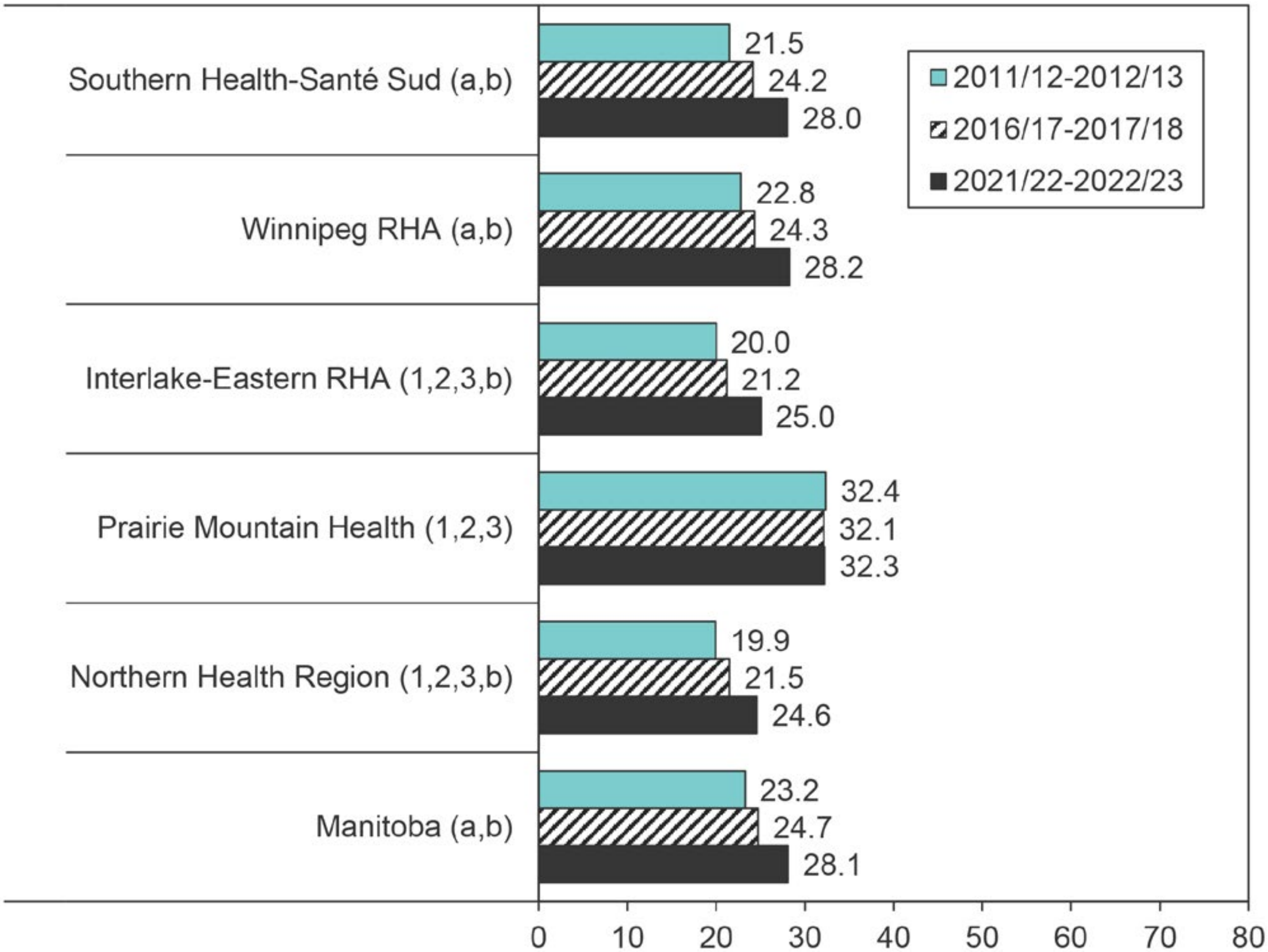
- Overall, the percentage of Caesarean sections increased from 23.2% in TP1 to 24.7% in TP2 to 28.1% in TP3. Percentages increased in all regions except Prairie Mountain Health. Only the increases in Southern Health-Santé Sud and the Winnipeg RHA were statistically significant across each period, while Interlake-Eastern RHA and the Northern Health Region had significantly higher in TP3 compared to TP2.
- Percentages in each period in Prairie Mountain Health were above the Manitoba average and below average in Northern Health Region and Interlake-Eastern RHA.
- There were no associations between Caesarean sections and income in urban or rural areas in TP3 (see online supplement). There was a significant association in rural areas in TP1 and in urban areas in TP2.

Trend Analysis (Figure 9.12)

- The percentage of Caesarean sections steadily increased over time in Manitoba and each region.

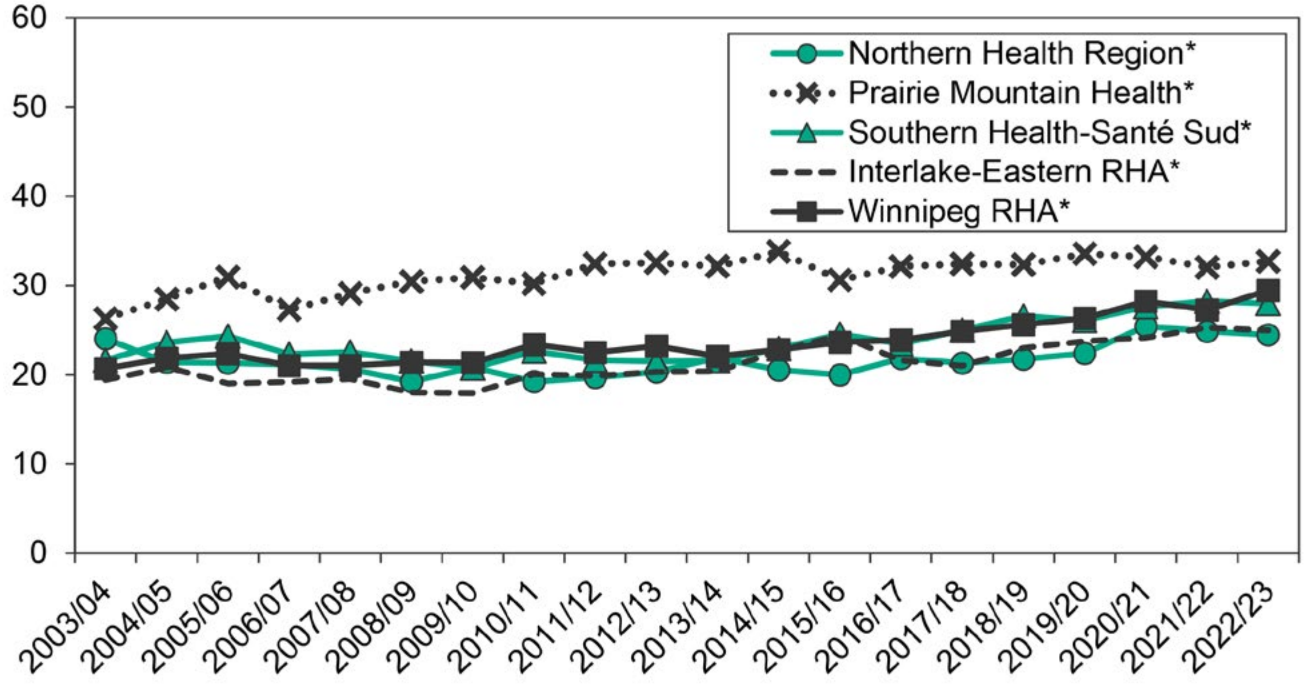
Figure 9.11: Caesarean Sections by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Maternal age-adjusted average annual percent of in-hospital births



1,2,3	statistically significant difference from the Manitoba average in the first, second or third time period
a	statistically significant difference between the first and second time period
b	statistically significant difference between the second and third time period
s	data suppressed due to small numbers

Figure 9.12: Caesarean Sections by Health Region, 2003/04 to 2022/23
Maternal age-adjusted average annual percent of in-hospital births



* statistically significant linear trend over time.

9.7 Vaginal Birth after Caesarean Section (VBAC)

Definition: The percentage of VBACs among females with a previous Caesarean Section. VBACs were defined as a:

- Obstetric hospitalization with a diagnosis of vaginal birth (ICD-9-CM V27 or ICD-10-CA code Z37) in the absence of a Caesarean section (CCI code 5.MD.60) and with a previous hospitalization for a Caesarean section (ICD-9-CM diagnosis code 654.2, or ICD-10-CA diagnosis code O34.20, or ICD-9-CM procedure codes 74.0, 74.1, 74.2, 74.4, 74.9 or CCI code 5.MD.60), or
- Obstetric hospitalization with a diagnosis for vaginal birth and a diagnosis for vaginal birth after Caesarean section (ICD-10-CA code O75.7).

The denominator for the percentage calculation includes all females who ever had a previous Caesarean section delivery and had a subsequent delivery during the five-year time period (or fiscal year for trend analysis) in Manitoba hospitals. Live births and stillbirths are included. If women had more than one delivery, one is randomly chosen to only count women once per time period (or fiscal year).

Time period analysis: The average annual percentage of VBAC was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth in TP3.

Trend analysis: The percentage of VBAC was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth in TP3.

Key Findings

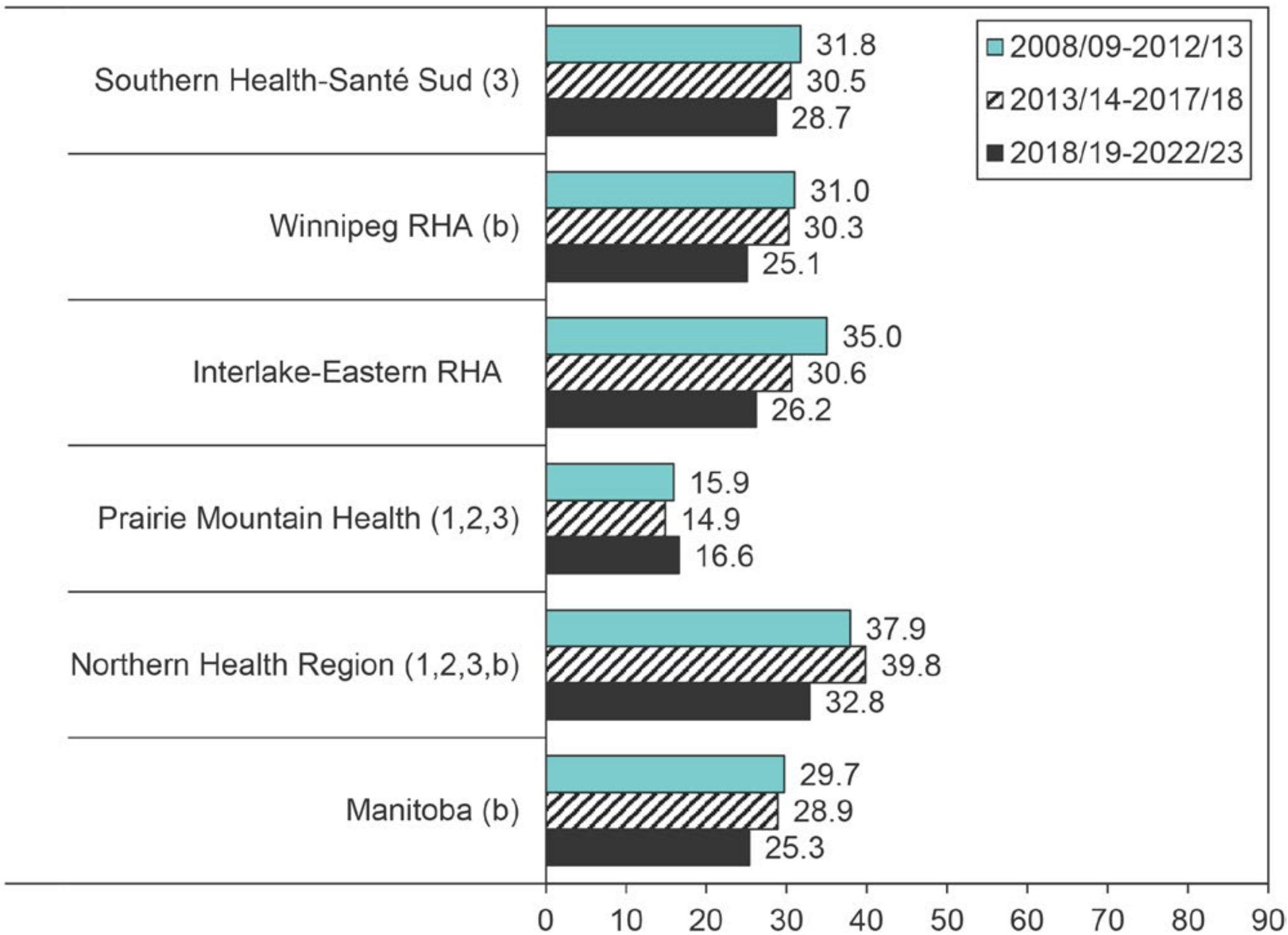
Time Period Analysis (Figure 9.13)

- Overall, the percentage of VBACs decreased from 29.7% in TP1 to 28.9% in TP2 to 25.3% in TP3, though the decrease was only significant between TP2 and TP3. All regions, except the Northern Health Region, had non-significant decreases between TP1 and TP2. Significant decreases between TP2 and TP3 occurred in the Winnipeg RHA and Northern Health Region.
- Percentages in Prairie Mountain Health in each period were significantly lower than the provincial average, while those in the Northern Health Region were significantly higher.
- VBAC percentages were significantly associated with income in rural areas in only the third period, while in urban areas, the association was only significant in the first period (see online supplement). Where significant associations existed, VBAC percentage was higher among those from lower income areas.

Trend Analysis (Figure 9.14)

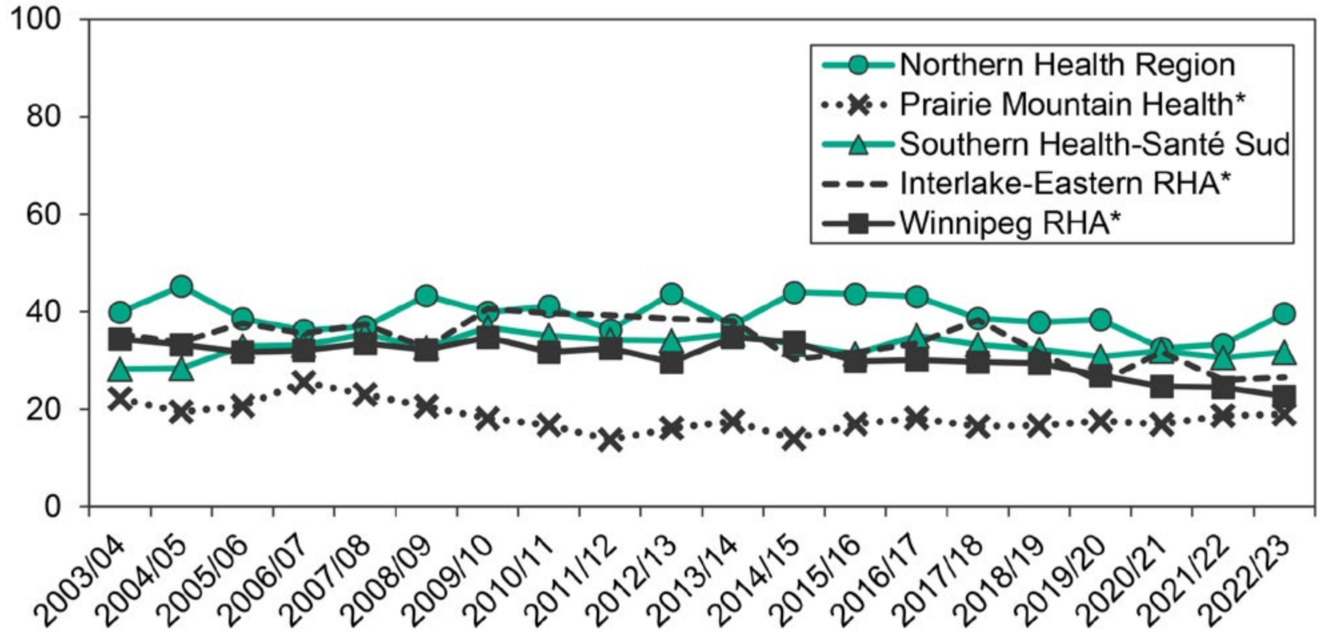
- Percentage of VBACs steadily decreased over time in Manitoba and each region except Southern Health-Santé Sud and the Northern Health Region.

Figure 9.13: Vaginal Birth After Prior Caesarean Section by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23
Maternal age-adjusted average annual percent of births among females (all ages) with previous Caesarean Section



1,2,3	statistically significant difference from the Manitoba average in the first, second or third time period
a	statistically significant difference between the first and second time period
b	statistically significant difference between the second and third time period
s	data suppressed due to small numbers

Figure 9.14: Vaginal Birth After Prior Caesarean Section by Health Region, 2003/04 to 2022/23
Maternal age-adjusted percent of births among females (12-55 years) with previous Caesarean section



* statistically significant linear trend over time.

9.8 Traveling to Give Birth

Definition: Information regarding where women went to give birth by the following categories:

- Percentage delivered at a maternity hospital in their home region,
- Percentage delivered at a maternity hospital in another region,
- Percentage delivered in a Winnipeg maternity hospital, and
- Percentage delivered in a non-maternity hospital.

This indicator included live births and stillbirths coded in Manitoba hospital abstracts with ICD10-CA code Z37.

Time period analysis: The crude percentage of births by location of delivery categories was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3).

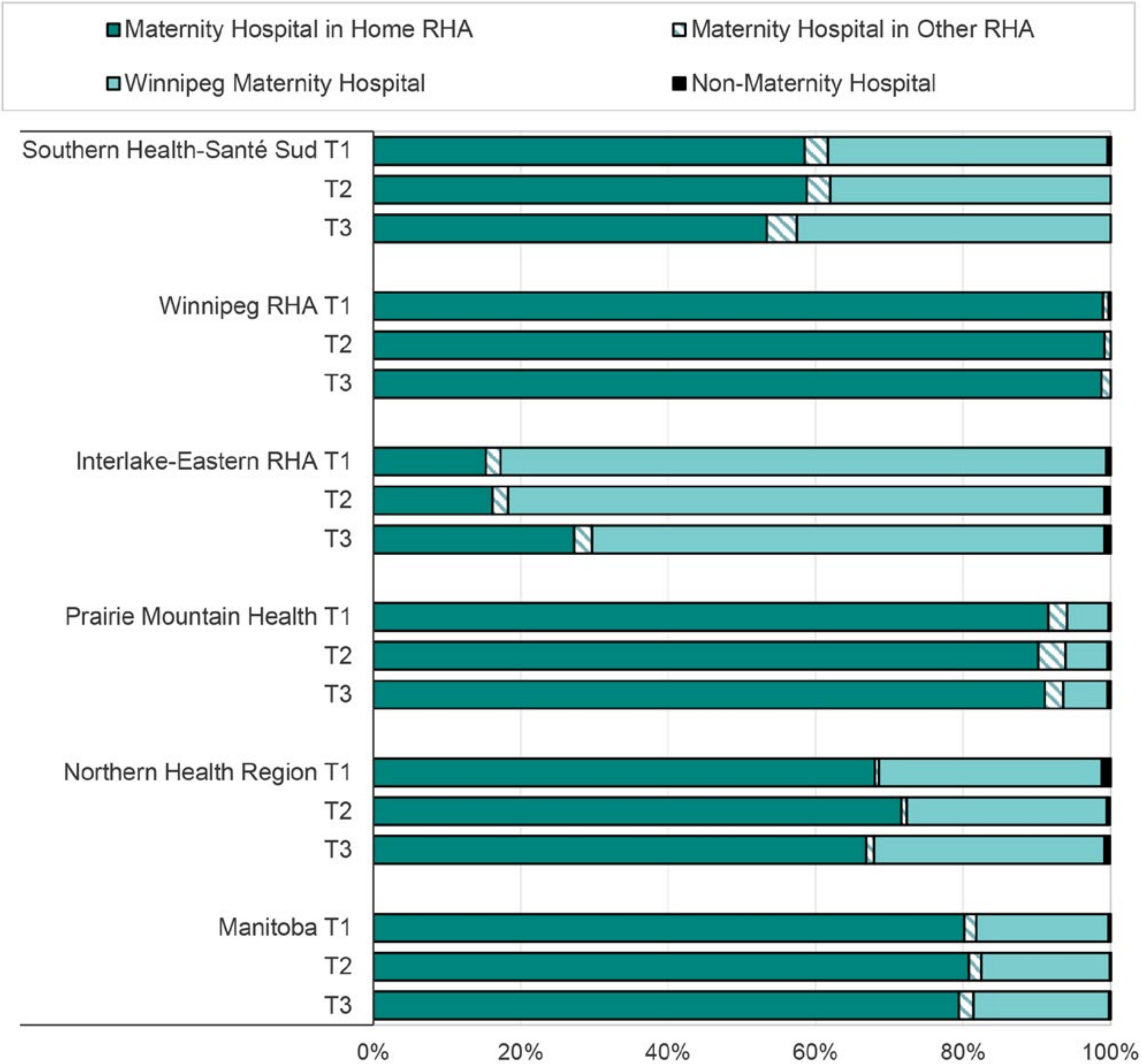
Key Findings

Time Period Analysis (Figure 9.15)

- For Manitoba overall and within most regions, the distribution of locations of birth was very stable over time. However, there was an increase in the proportion of birth in the home region for Prairie Mountain Health from 16.2% in TP2 to 27.3% in TP3. This increase resulted from less births occurring in Winnipeg hospitals by women from Prairie Mountain Health. The opposite occurred in the Southern Health-Santé Sud region and the Northern Health Region, albeit not as markedly. In these regions, the proportion of births in the home region decreased, while those in the Winnipeg RHA increased.
- Results varied markedly across regions, related mostly to the percentage of births happening in the Winnipeg RHA. Those rates were highest for the Interlake-Eastern RHA (70-80%), but also substantial for Southern Health-Santé Sud and the Northern Health Region (27-43%).
- Very few births occurred in 'non-maternity' hospitals in Manitoba (0.2%).

Figure 9.15: Location of Births by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Percent of in-hospital births



T1 = 2011/12-2012/13 T2 = 2016/17-2017/18 T3 = 2021/22-2022/23

9.9 Breastfeeding Initiation

Definition: The percentage of live births where breastfeeding initiation occurred in hospital, defined as exclusive or partial breastfeeding at hospital discharge. The denominator included all live births coded in Manitoba hospital abstracts with ICD-10-CA code Z38. Stillborn births and records with missing breastfeeding initiation were excluded.

Time period analysis: The percentage of live births where breastfeeding was initiated was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to liveborn infants in TP3.

Trend analysis: The percentage of live births where breastfeeding was initiated was calculated for each one-year period from 2003/04 to 2022/23 and was maternal age-adjusted to the Manitoba population of women who gave birth to liveborn infants in 2022/23.

Key Findings

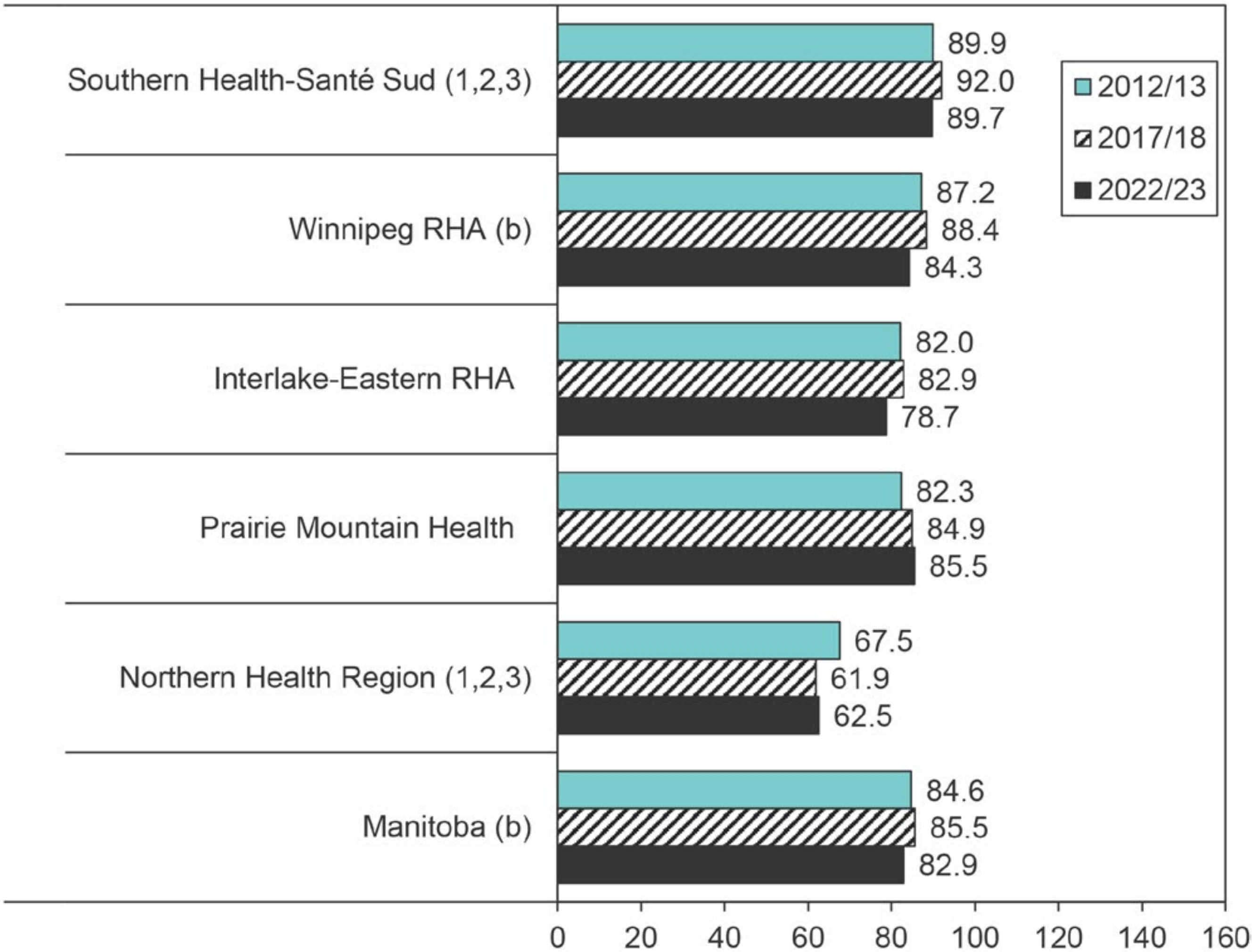
Time Period Analysis (Figure 9.16)

- Overall, the percentage of breastfeeding initiation in hospital increased from 84.6% in TP1 to 85.5% in TP2 before significantly decreasing to 82.9% in TP3. Percentages increased in every region from TP1 to TP2, though none of the regional increases were statistically significant. The percentage in the Winnipeg RHA significantly decreased from TP2 to TP3, while changes in all other regions varied non-significantly.
- Percentages in each period were highest in the Southern Health-Santé Sud region, which were significantly higher than the provincial average, while those in the Northern Health Region were lowest and significantly lower than Manitoba in each period.
- Breastfeeding initiation appears to be related to health status as the percentage of mothers who initiate breastfeeding in hospital decreases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Breastfeeding initiation percentages were significantly associated with income in urban and rural areas in each time period, with women in lower income areas having lower percentages of initiation (see online supplement).

Trend Analysis (Figure 9.17)

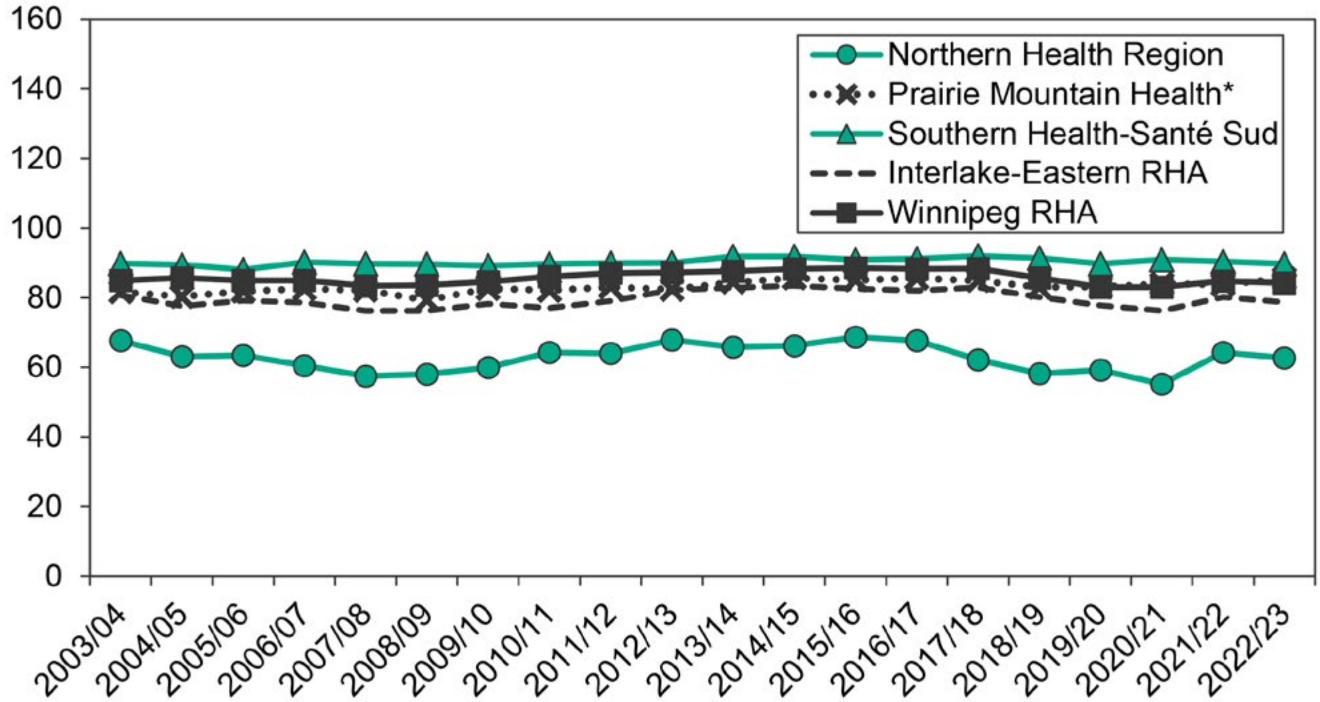
- Percentage of breastfeeding initiation was stable over time in Manitoba and each region, except Prairie Mountain Health, which significantly increased.

Figure 9.16: Breastfeeding Initiation by Health Region, 2012/13, 2017/18, and 2022/23
Maternal age-adjusted percent of live in-hospital births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.17: Breastfeeding Initiation by Health Region, 2003/04 to 2022/23
Maternal age-adjusted percent of live in-hospital births



* statistically significant linear trend over time.

9.10 Infant Mortality Rate

Definition: The number of deaths per 1,000 infants (aged 0-364 days).

Time period analysis: The average annual infant mortality rate was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was maternal age-adjusted to the Manitoba population of women who gave birth to liveborn infants in TP3.

Trend analysis: The infant mortality rate was calculated for each one-year period from 2003 to 2022 and was maternal age-adjusted to the Manitoba population of women who gave birth to liveborn infants in 2022.

Key Findings

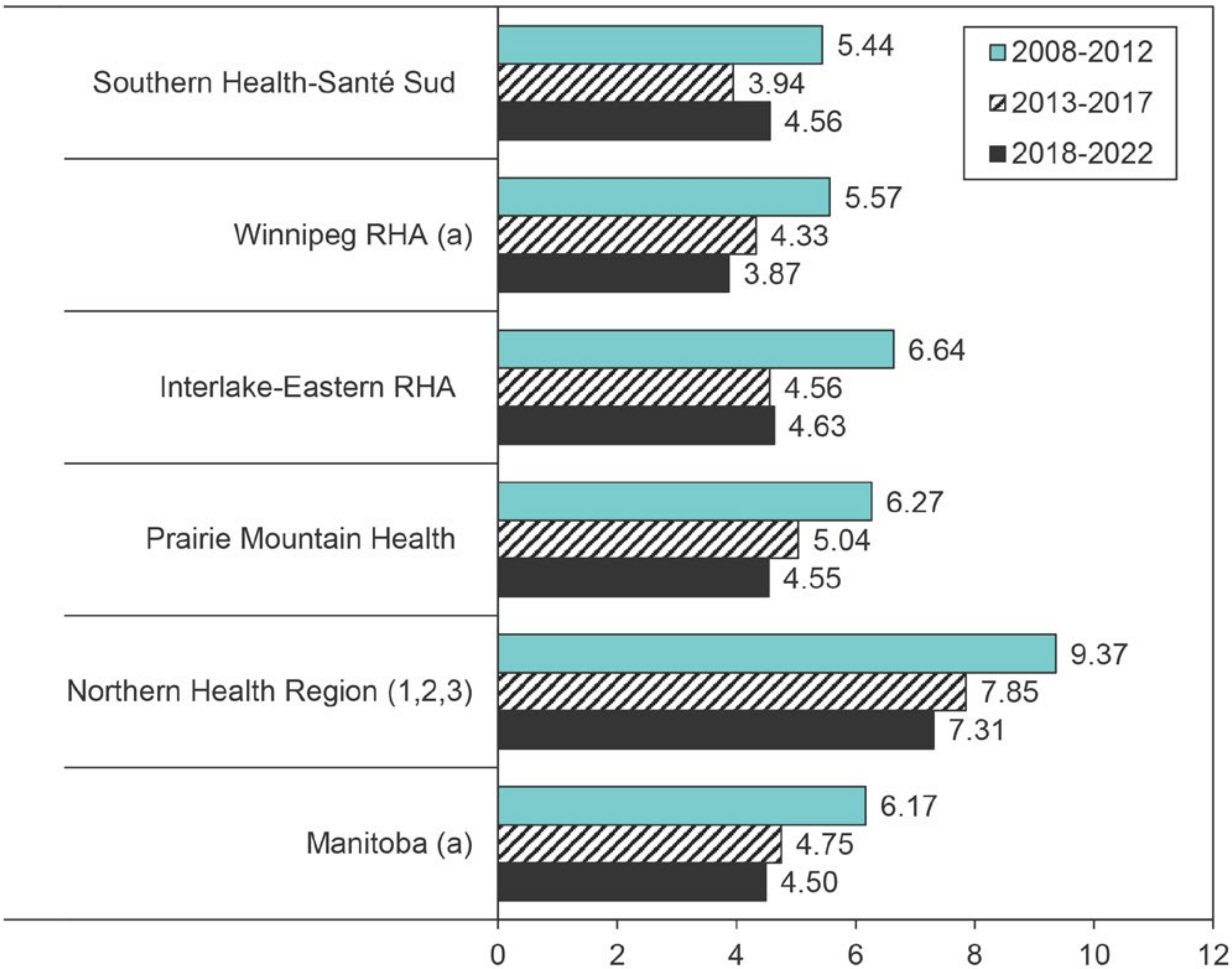
Time Period Analysis (Figure 9.18)

- The infant mortality rate in Manitoba decreased significantly from 6.2 per 1,000 live births in TP1 to 4.8 in TP2. The rate decreased to 4.5 in TP3, though this was not significantly different from the rate in TP2. Rates decreased between the first two periods in all regions, though only the decrease in the Winnipeg RHA reached statistical significance. The crude rates, which can be used to compare against other provinces and nationally, were similar to the adjusted rates.
- Rates were highest in the Northern Health Region in each period, which were significantly higher than the provincial rates for the corresponding period.
- Infant mortality appears to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Infant mortality rates were significantly associated with income in rural areas in all three time periods, while it was only associated in the last two periods in urban areas (see online supplement). Infant mortality rates were higher in lower income areas.

Trend Analysis (Figure 9.19)

- The infant mortality rate decreased significantly over time in Manitoba and in the Winnipeg RHA. There were years in the Interlake-Eastern RHA that were suppressed because the count of infant deaths was five or less. The figure shows this occurring in 2006, 2014, 2015, 2017, 2019, and 2020.

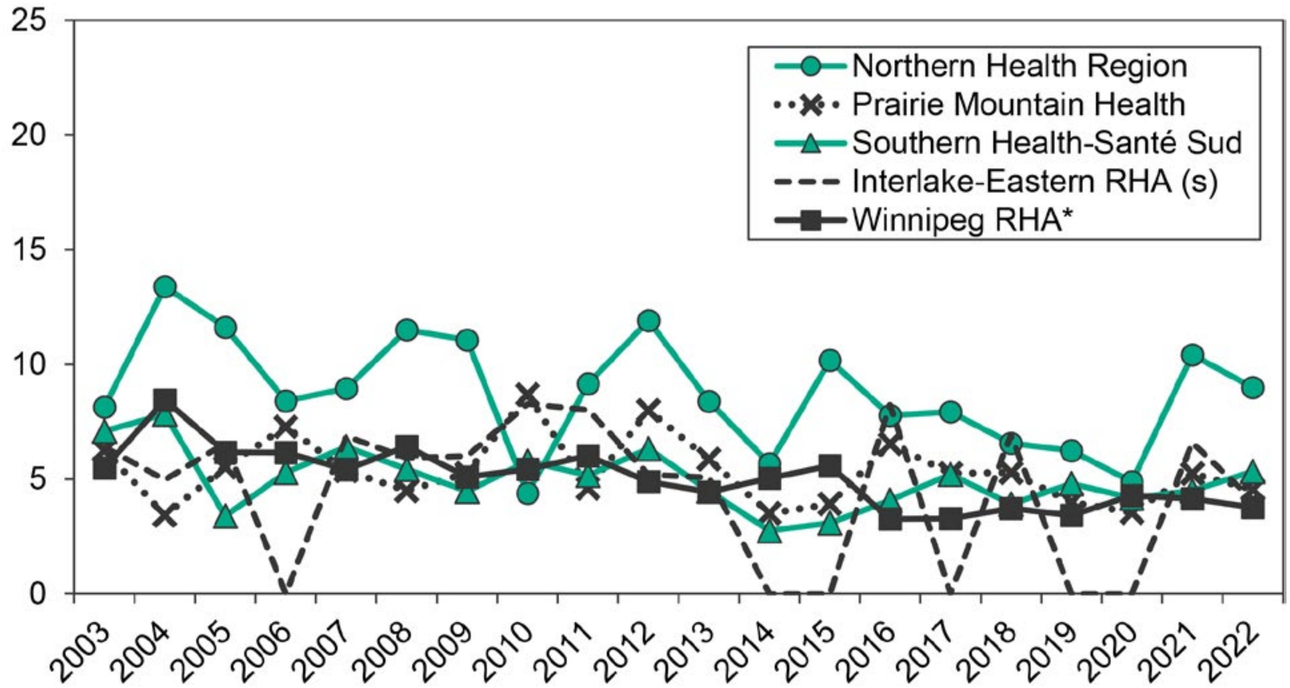
Figure 9.18: Infant Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022
Maternal age-adjusted average annual rate of death in first 364 days per 1,000 live births



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.19: Infant Mortality Rate by Health Region, 2003 to 2022

Maternal age-adjusted rate of deaths in first 364 days per 1,000 live births



* statistically significant linear trend over time.

s data suppressed because the number of deaths were between 1-5 for one or more years.

9.11 Child Mortality Rate

Definition: The number of deaths per 1,000 children (aged 1-19 years). The denominator includes all Manitoba children as of December 31 of each year.

Time period analysis: The average annual child mortality rate was calculated for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3) and was age- and sex-adjusted to the Manitoba population aged 1-19 in TP3.

Trend analysis: The child mortality rate was calculated for each one-year period from 2003 to 2022 and was age- and sex-adjusted to the Manitoba population aged 1-19 as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 9.20)

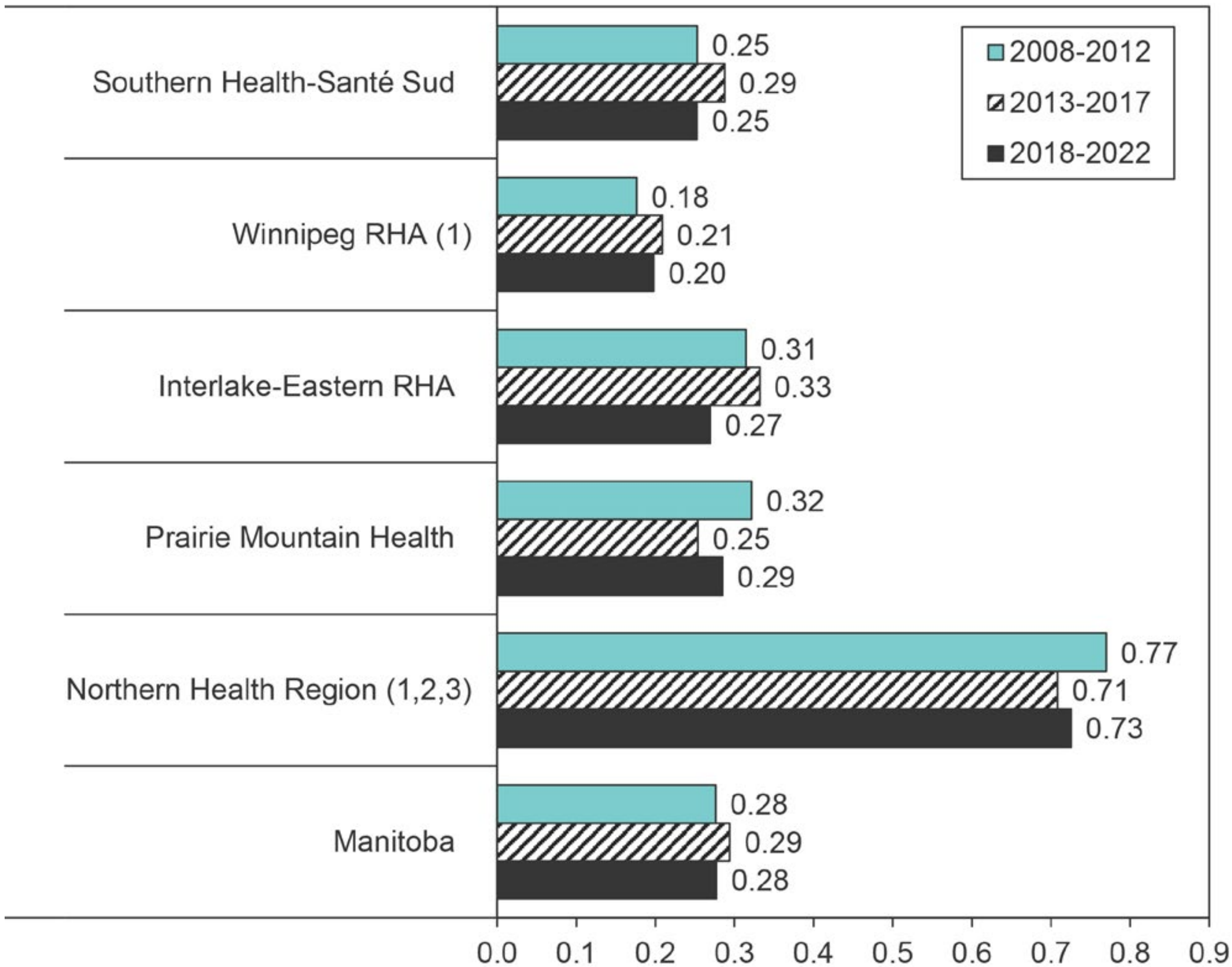
- For Manitoba overall, the child mortality rate was basically stable across the periods around 0.28 per 1,000 residents aged 1-19. Rates and changes over time varied markedly by region, but none of the regional changes were statistically significant.
- Rates in each period in the Northern Health Region were significantly higher than the provincial average, while the rates in the Winnipeg RHA were lowest but only significantly lower than the Manitoba rate in TP1.
- Child mortality appears to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Child mortality rates were strongly associated with income in urban and rural areas in all three time periods, with children in lower income areas having higher mortality rates (see online supplement).

Trend Analysis (Figure 9.21)

- The child mortality rate has been relatively stable over time in Manitoba and each region except the Interlake-Eastern RHA, which saw a significantly decreasing trend. There were years in the Interlake-Eastern RHA that were suppressed because the count of child deaths was 5 or less. The figure shows this occurred in 2020 and 2022.

Figure 9.20: Child Mortality Rate by Health Region, 2008-2012, 2013-2017, and 2018-2022

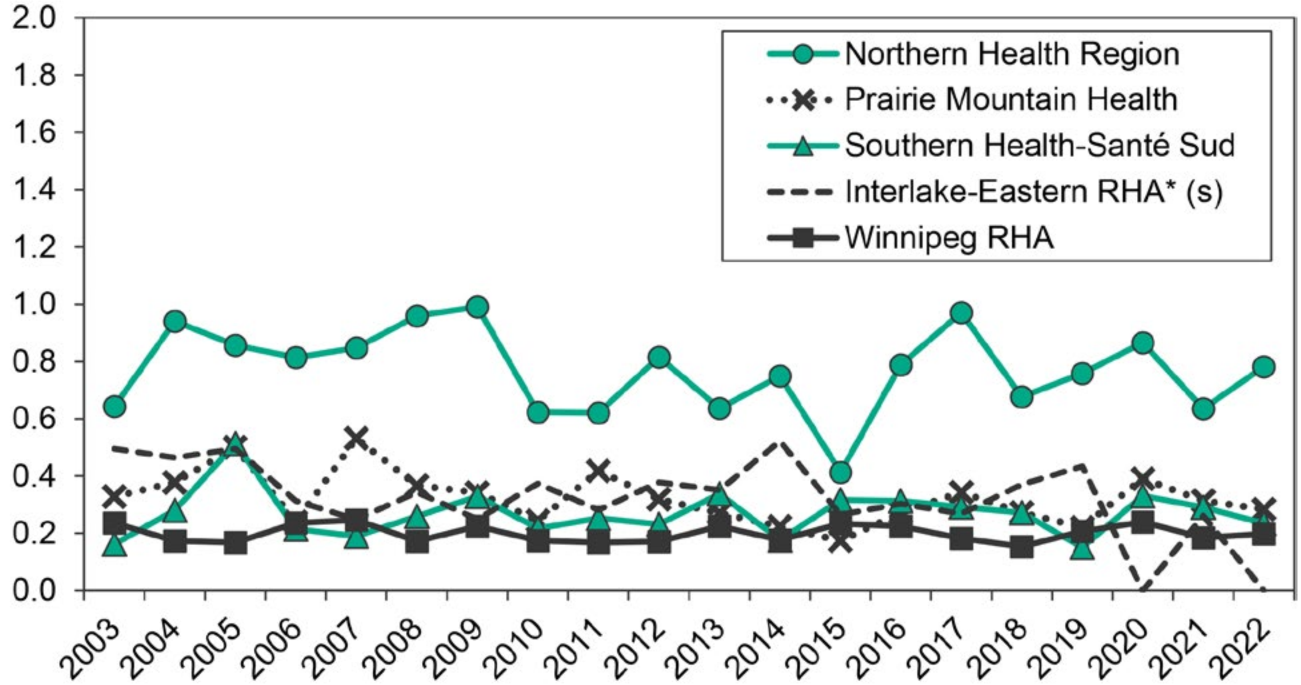
Age- and sex-adjusted average annual rate of death per 1,000 residents (age 1-19)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.21: Child Mortality Rate by Health Region, 2003 to 2022

Age- and sex-adjusted rate of death per 1,000 residents (1-19 years)



* statistically significant linear trend over time.

s data suppressed because the number of deaths were between 1-5 for one or more years.

9.12 Causes of Child Mortality

Definition: The percentage of all deaths for Manitobans (aged 1-19) by the cause of death obtained from the Vital Statistics death records and grouped by ICD-10 chapter.

Note: IICD-10 Chapter 18 (Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified) includes the code R99 for ‘Other ill-defined and unspecified causes of mortality’, which appeared in very high frequency in 2017 and 2018. This code was treated the same as a missing cause of death and moved to the “All other causes” category. This chapter also includes the code R69 for ‘Unknown and unspecified causes of morbidity’, which only appeared in 2020 and was the cause of death of 8.3% deaths in that year. This code was also moved to the “All other causes” category. The five most common causes of death in Manitoba between 2018-2022 were used to set the order of the causes.

Time period analysis: The average annual crude percentage of all deaths among children (age 1-19) by cause were identified for 3 five-year periods: 2008-2012 (TP1), 2013-2017 (TP2), and 2018-2022 (TP3). The number of deaths used as the denominators in the percentage calculations for each time period are provided in the footnote of the figure.

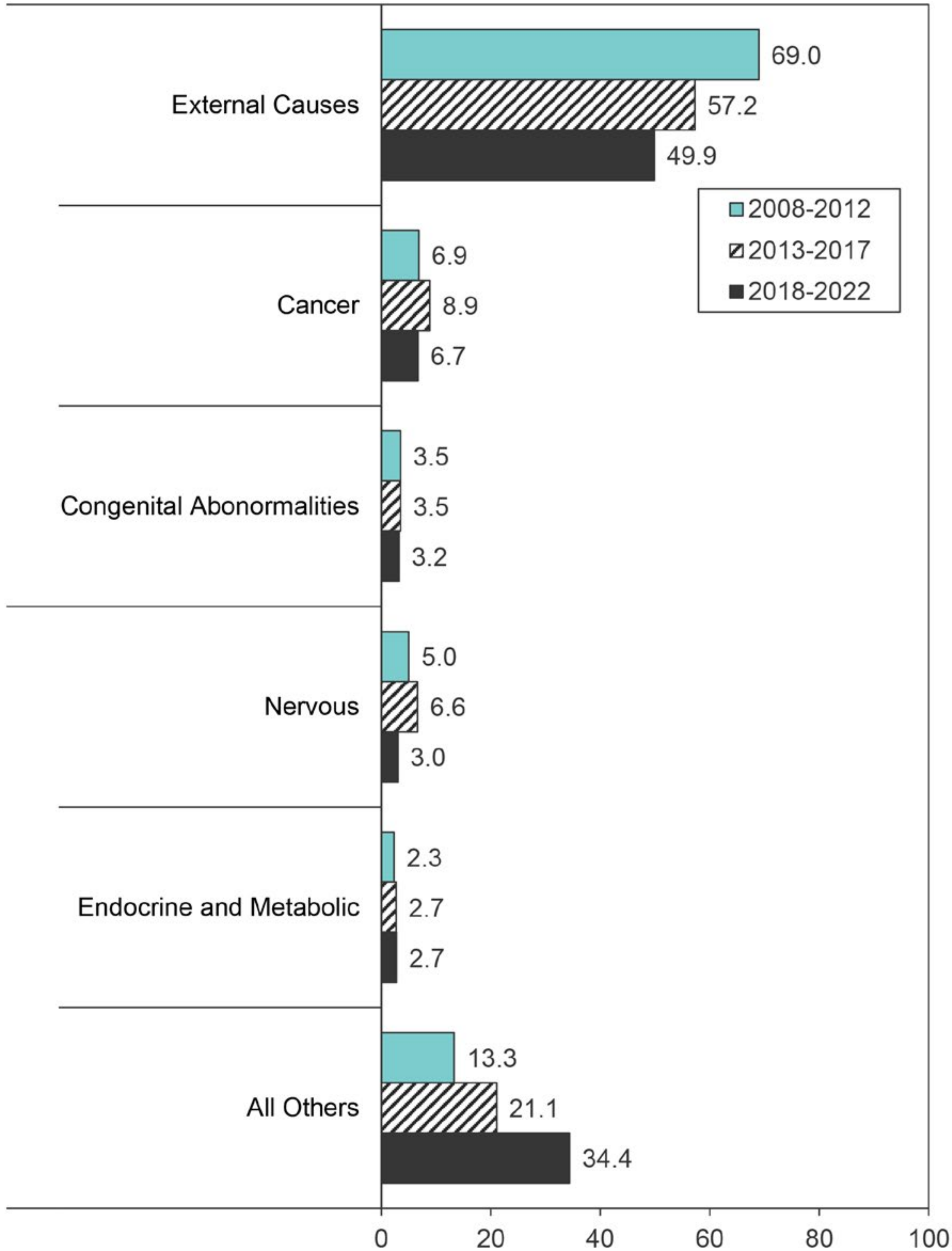
Key Findings

Time Period Analysis (Figure 9.22)

- Child mortality is a relatively rare outcome, so many of the values for specific causes were suppressed at the regional level. The values for Manitoba give the most meaningful indication of the distribution of causes of child mortality and they show a few changes over time. There were 480 child deaths in TP1, 484 in TP2, and 401 in TP3 (online supplement).
- For Manitoba overall and for every region, external causes (e.g., injury & poisoning) was by far the most common cause of mortality for children in TP3 (49.9%). This has decreased across each time period. Cancer was the second most common, which decreased from TP2 to TP3. Nervous system disorders decreased from 6.6% in TP2 to 3.0% in TP3, which allowed congenital abnormalities (3.2%) to move up to the third most common cause. All other causes category increased dramatically from 21.1% of deaths in TP2 to 34.4% in TP3.

Figure 9.22: Most Common Causes of Child Death in Manitoba, 2008-2012, 2013-2017, and 2018-2022

Average annual crude percent* of Mortality (age 1-19)



s data suppressed due to small numbers

* denominators: T1 = 480; T2 = 484; T3 = 401

9.13 Dental Extraction Surgery Among Children

Definition: The number of dental extraction surgeries per 1,000 residents aged 0-5 years. Dental extractions were defined by a hospitalization with an ICD-9-CM procedure code of 23.01, 23.09, 23.11, or 23.19 or a CCI code of 1.FE.57 or 1.FE.89. We did not have data for pediatric dental extractions performed outside of hospitals (e.g., in dentists' offices) and so the rates reported here may underestimate the extent of severe early childhood tooth decay.

Time period analysis: The average annual dental extraction rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba population aged 0-5 in TP3.

Trend analysis: The dental extraction rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba population aged 0-5 as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 9.23)

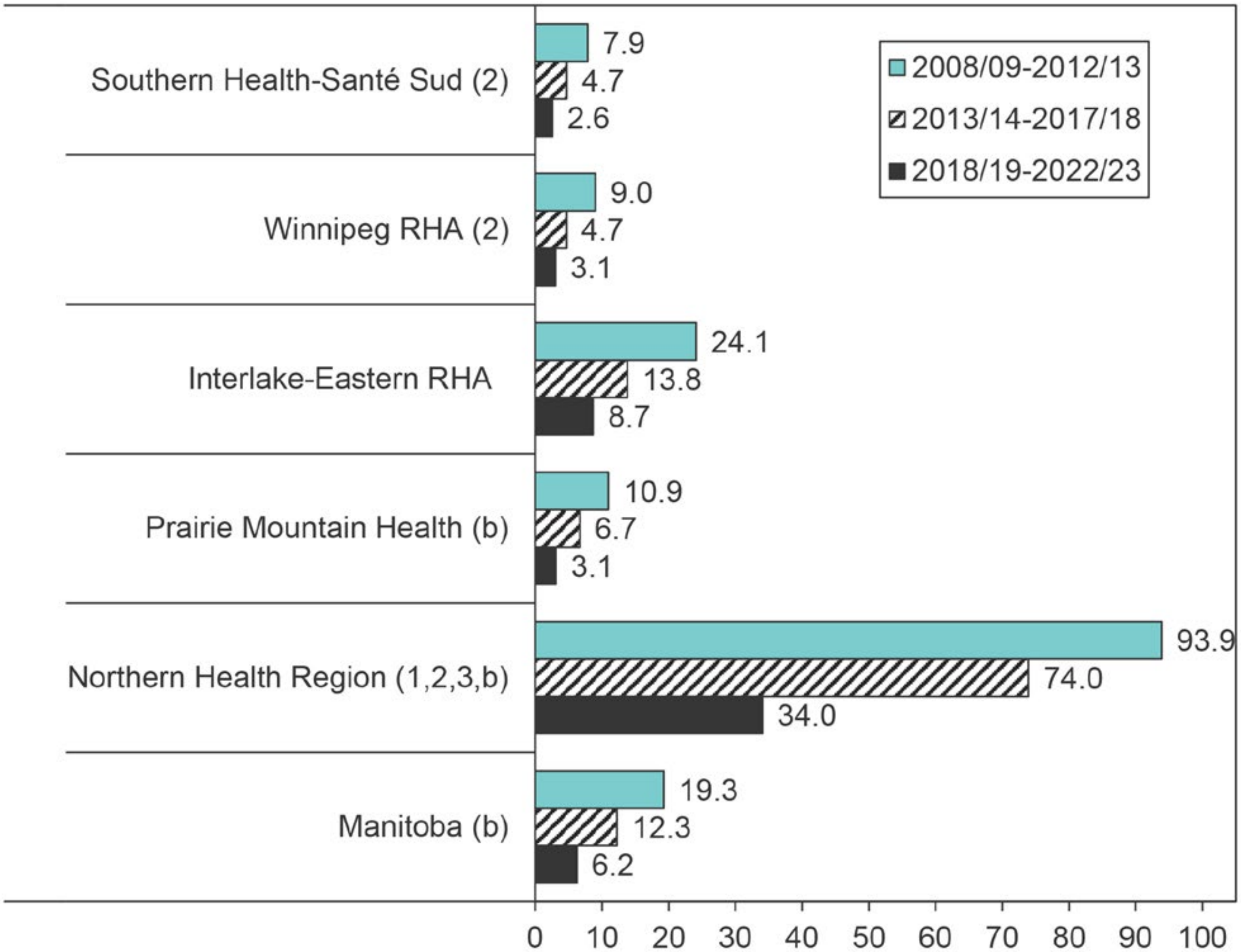
- Overall, the rate of surgery for dental caries decreased from 19.2 per 1,000 children under age 6 in TP1 to 11.8 in TP2 to 6.1 in TP3. Rates decreased in all regions over time and significantly from TP2 to TP3 in the Northern Health Region.
- Rates in the Northern Health Region were above the provincial average. The Winnipeg RHA and Southern Health-Santé Sud had the lowest rates in each period, but only the rates in TP2 were significantly lower than the Manitoba rate for that period.
- Dental surgery rates were strongly associated with income in urban and rural areas in all three time periods with children in lower income areas having higher rates of surgery (see online supplement).

Trend Analysis (Figure 9.24)

- The rate of dental extraction surgeries significantly decreased over time in the province and in each region. A dramatic decrease occurred in the Northern Health Region beginning around 2010/11. The rates in the Northern Health Region are still the highest among the regions, but that gap has narrowed considerably.

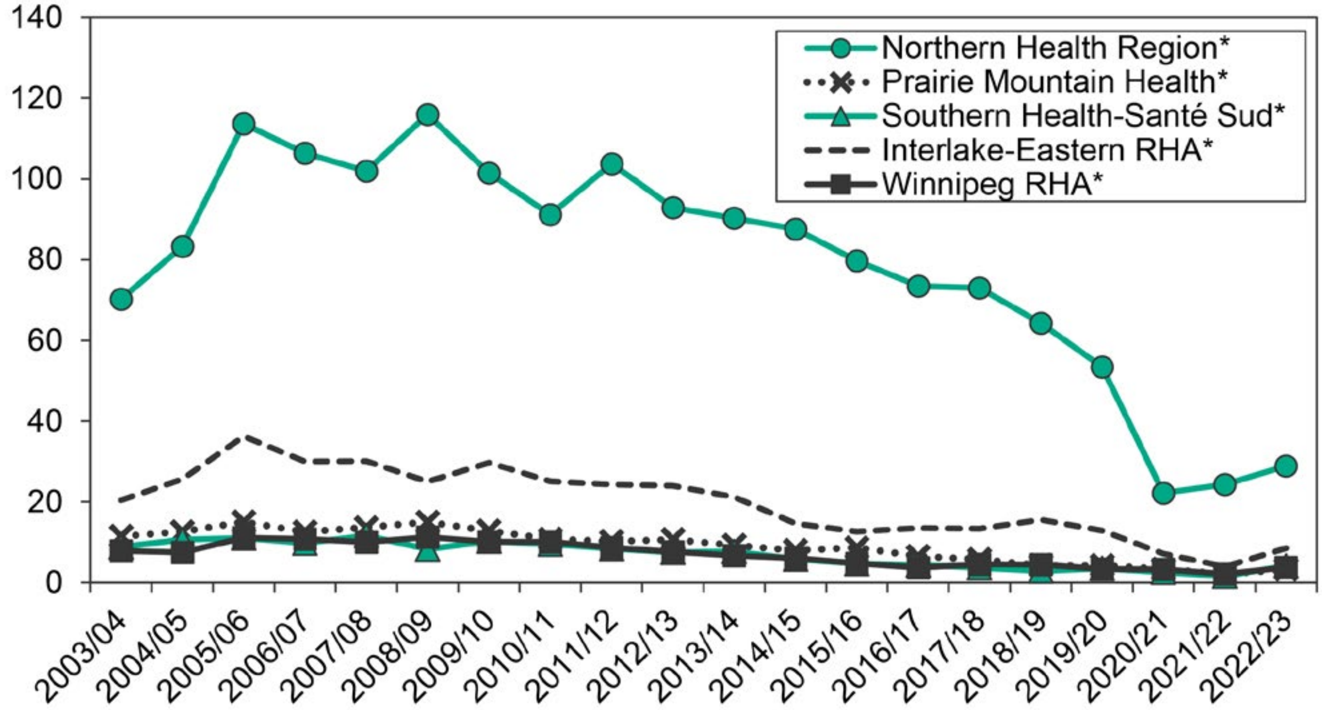
Figure 9.23: Dental Extraction Surgery Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age- and sex-adjusted average annual rate per 1,000 residents (age 0-5)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.24: Dental Extraction Surgery Rate by Health Region, 2003/04 to 2022/23
Age-adjusted annual rate per 1,000 residents (age 0-5)



* statistically significant linear trend over time.

9.14 Asthma Prevalence

Definition: The percentage of residents aged 5-19 diagnosed with asthma in a two-year period as defined by any of the following:

- One or more hospitalizations: ICD-9-CM codes 493; ICD-10-CA codes J45, or
- One or more physician visits: ICD-9-CM codes 493, or
- One or more dispensations of medications to treat asthma (see online supplement)

Time period analysis: Prevalence was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) periods and was age- and sex-adjusted to the Manitoba population aged 5-19 in TP3.

Trend analysis: Prevalence was calculated for 10 two-year periods starting from 2003/04-2004/05 and ending at 2021/22-2022/23. All periods were age- and sex-adjusted to the Manitoba population aged 5-19 as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 9.25)

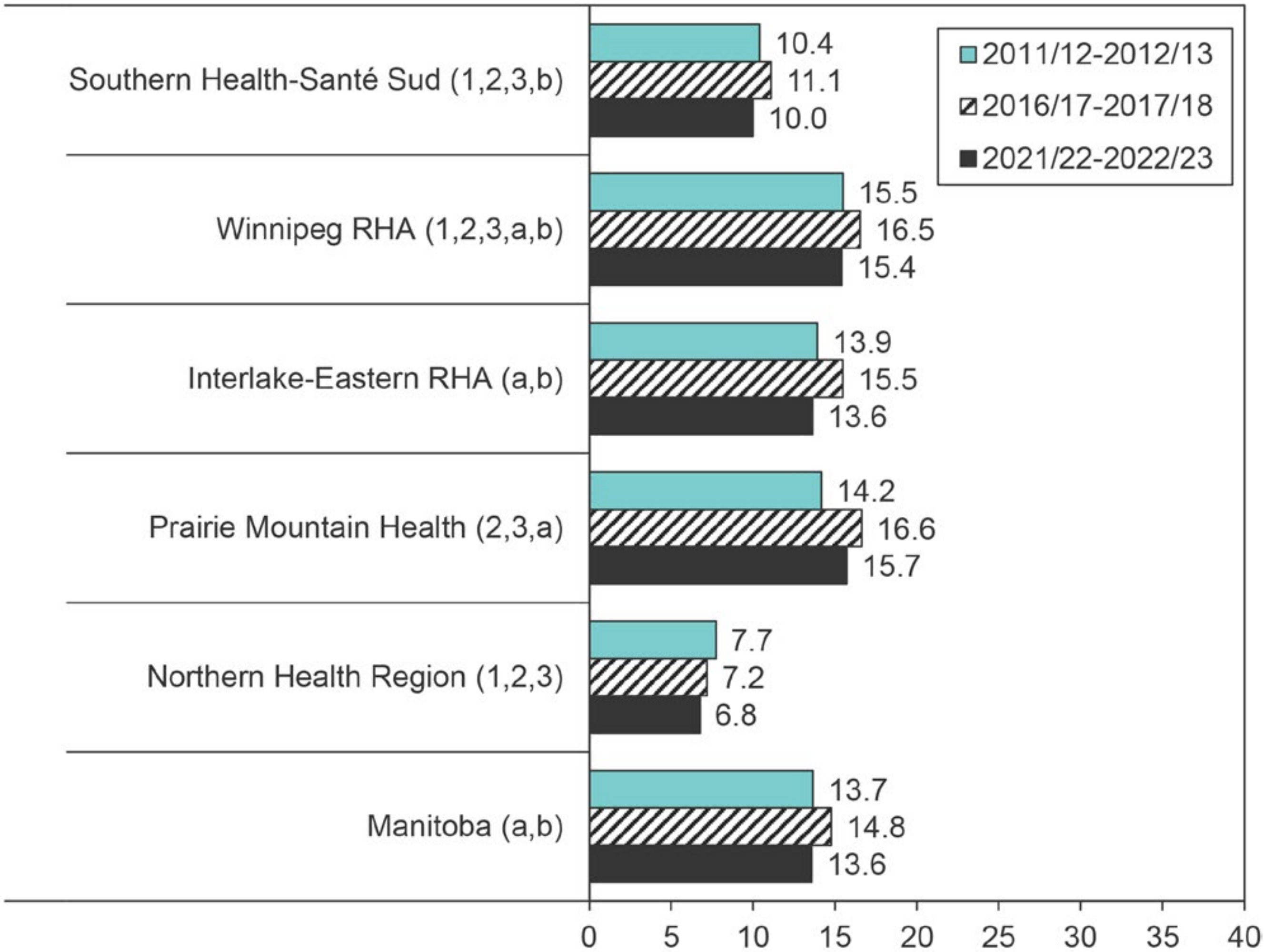
- Overall, the prevalence of asthma among children and youth increased from 13.7% in TP1 to 14.8% in TP2 before significantly decreasing to 13.6% in TP3. Rates increased from TP1 to TP2 in all regions except the Northern Health Region, and the change was significant in the Winnipeg RHA, Interlake-Eastern RHA, and Prairie Mountain Health region. The rates decreased from TP2 to TP3 in all regions, and the change was significant in Southern Health-Santé Sud, Winnipeg RHA, and Interlake-Eastern RHA.
- Rates in the Northern Health Region and Southern Health-Santé Sud were significantly lower than the provincial average, while those in the Winnipeg RHA were significantly higher. Rates in Prairie Mountain Health were above average in the second and third time periods, but not in the first time period.
- Recall that rates for the Northern Health Region may be underestimated because primary care provided by nurses in nursing stations are not included in the medical claims data system.
- The prevalence of asthma in children and youth was significantly associated with income in rural areas, but less so in urban areas (see online supplement). Perhaps more interestingly, the trends were in opposite directions: in rural areas, those in higher income areas had higher rates, whereas in urban areas, those in higher income areas had lower rates (though the trend was only significant in the last time period). Asthma prevalence was somewhat higher for urban than rural children and youth, though this may be partly attributable to the higher rate of visits to physicians and nurse practitioners among those in urban areas. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 9.26)

- Asthma prevalence has slightly decreased over time in Manitoba and in each region except in Prairie Mountain Health, where it has increased. All trends were statistically significant.

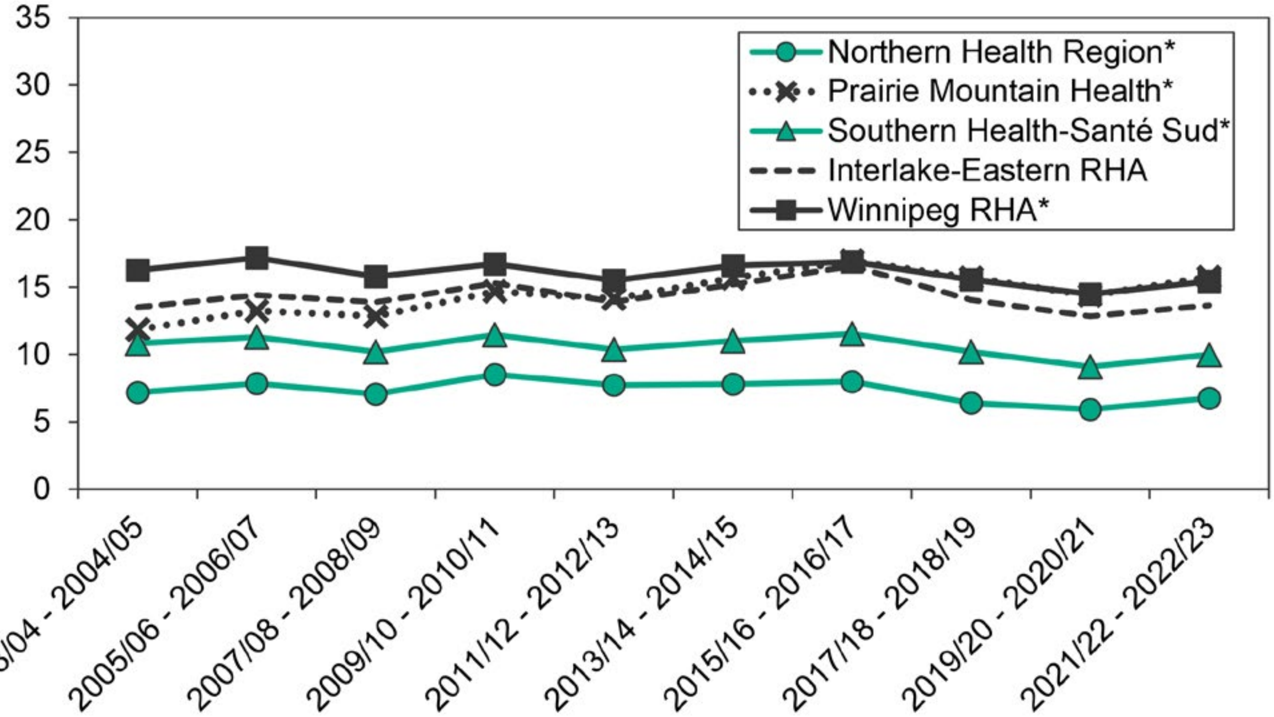
Figure 9.25: Asthma Prevalence by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Age- and sex-adjusted percent of residents (age 5-19)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.26: Asthma Prevalence by Health Region, 2003/04-2004/05 to 2021/22-2022/23
Age- and sex-adjusted annual percent among residents (age 5-19)



* statistically significant linear trend over time.

9.15 Teen Pregnancy Rate

Definition: The number of pregnancies per 1,000 females aged 15-19. This included live births, still births, ectopic pregnancies, abortions and miscarriages, and was defined by a hospitalization in Manitoba with ICD-9-CM diagnosis codes V27, 632, 633, 634, 635, 636, 637, 656.4, ICD-10-CA diagnosis codes Z37, O00, O02.1, O03, O04, O05, O07, O08, or O36.4, ICD-9-CM intervention codes 66.62, 69.01, 69.51, 72.x, 73.x, 74.x, 75.x, or CCI codes 5.CA.xx, 5.MD.5, or 5.MD.60. Note that abortions performed in private clinics were not included in the count of teen pregnancies.

Time period analysis: The average annual teen pregnancy rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba female population aged 15-19 in TP3.

Trend analysis: The teen pregnancy rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba female population aged 15-19 as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 9.27)

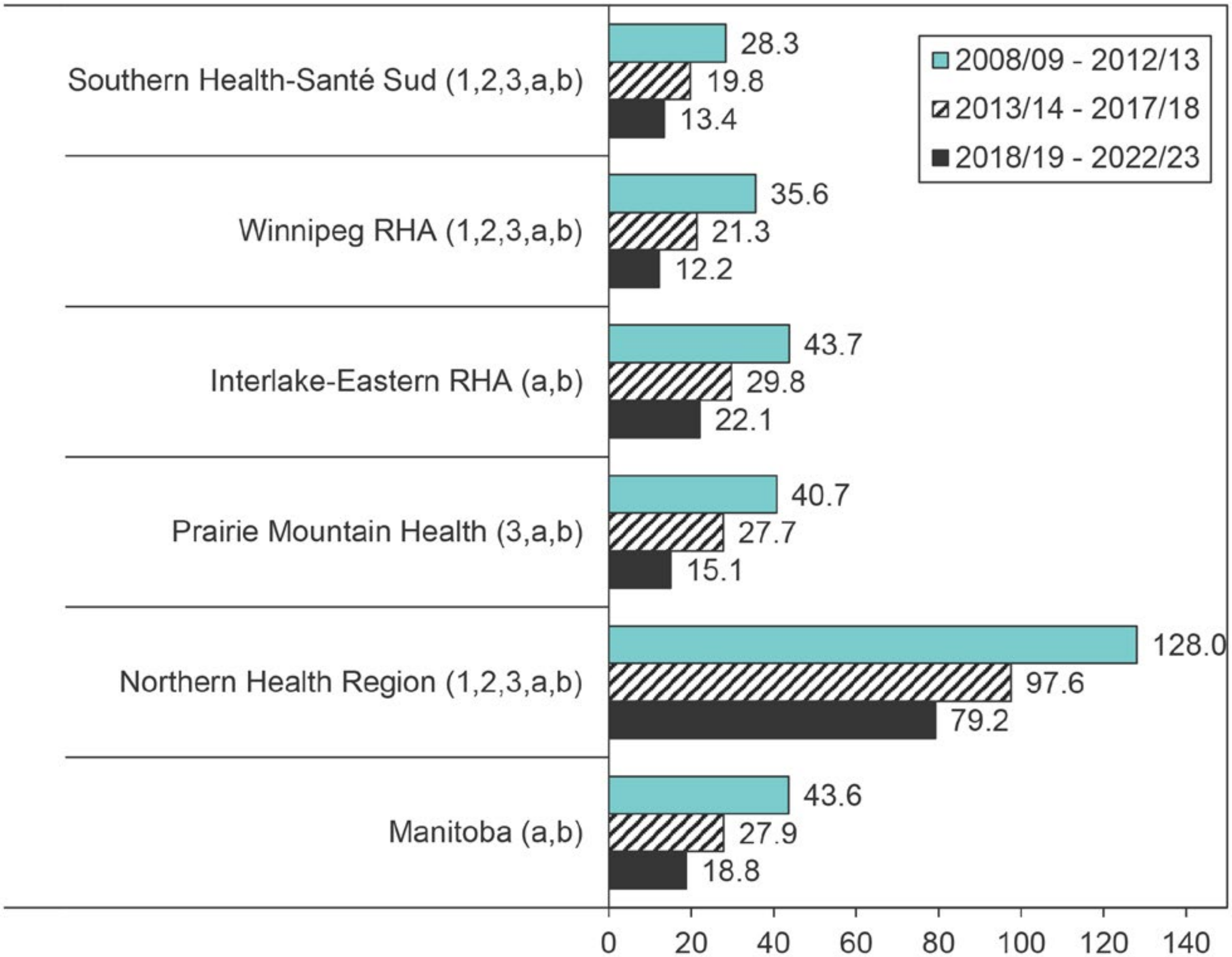
- The teen pregnancy rate decreased dramatically from 43.6 pregnancies per 1,000 females aged 15-19 in TP1 to 27.9 in TP2 to 18.8 in TP3. A similar decreasing pattern was observed in every region.
- In all time periods, rates in the Winnipeg RHA and Southern Health-Santé Sud were significantly lower than the provincial average, while those in the Northern Health Region were significantly higher.
- Teen pregnancy rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Teen pregnancy rates were associated with income in urban and rural areas in all three time periods, with higher rates among residents of lower income areas (see online supplement). The slope of the income gradient was reduced in the third period compared to the second period in the urban areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 9.28)

- Teen pregnancy rates have decreased significantly over time in Manitoba and each region. There was an increase that occurred in 2019/20 in the Northern Health Region, which returned to its normal decrease immediately afterwards.

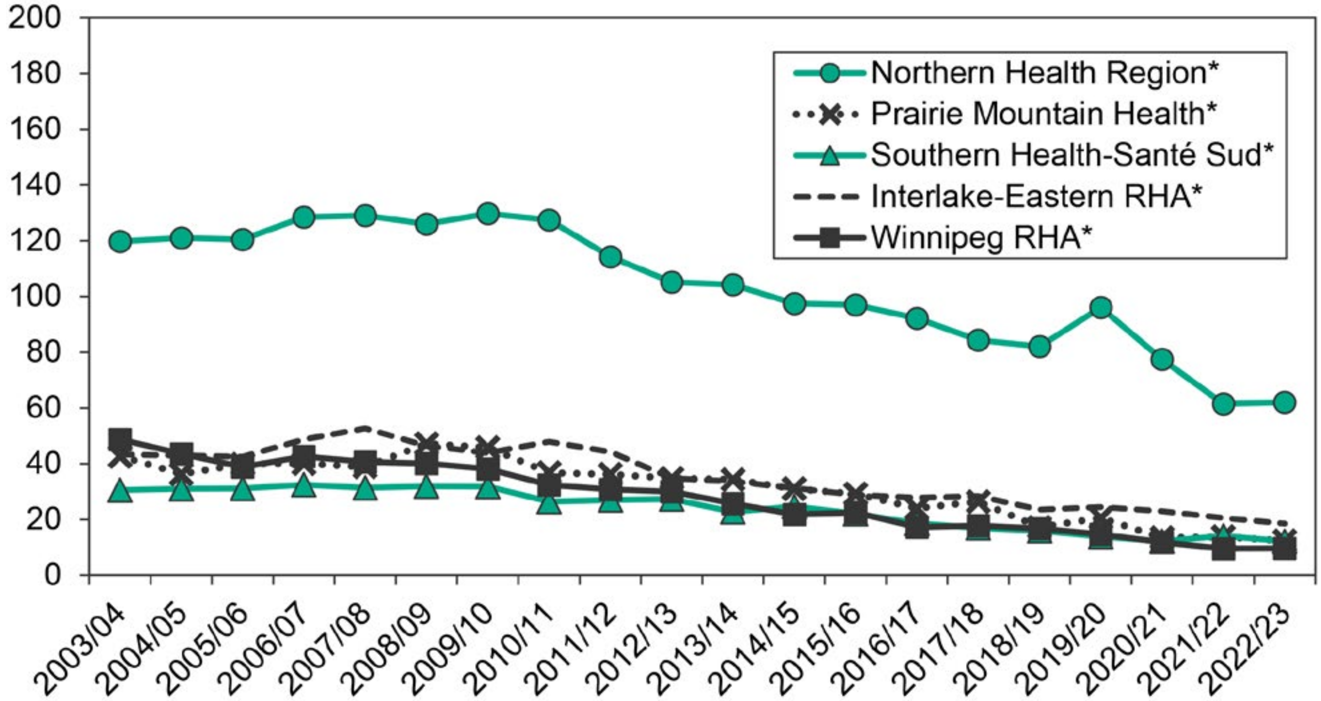
Figure 9.27: Teen Pregnancy Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age-adjusted annual average rate per 1,000 females (age 15-19)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.28: Teen Pregnancy Rate by Health Region, 2003/04 to 2022/23
Age-adjusted rate per 1,000 females (age 15-19)



* statistically significant linear trend over time.

9.16 Teen Birth Rate

Definition: The number of births per 1,000 females aged 15-19. Births were defined as live births in Manitoba hospitals with ICD-9-CM diagnosis codes V27.0, V27.2, V27.3, V27.5, V27.6, or ICD-10-CA diagnosis CA codes Z37.0, Z37.2, Z37.3, Z37.5.

Time period analysis: The average annual teen birth rates were calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3) and were age- and sex-adjusted to the Manitoba female population aged 15-19 in TP3.

Trend analysis: The teen birth rates were calculated for each one-year period from 2003/04 to 2022/23 and were age- and sex-adjusted to the Manitoba female population aged 15-19 as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 9.29)

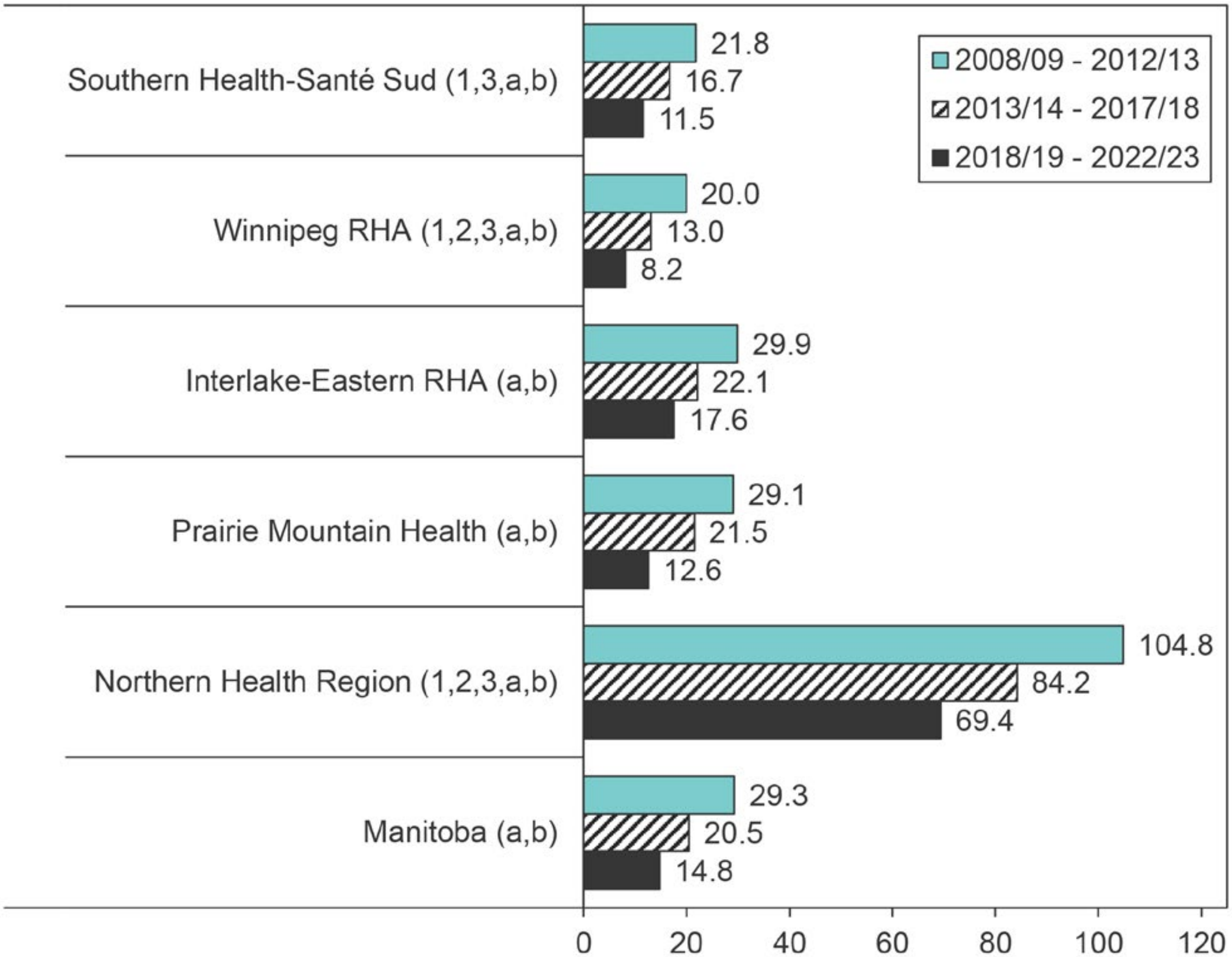
- The teen birth rate decreased dramatically from 29.3 per 1,000 females aged 15-19 in TP1 to 20.5 in TP2 to 14.8 in TP3. A similar decreasing pattern was observed in every region.
- Rates in each period in the Winnipeg RHA were significantly lower than the provincial average, while those in the Northern Health Region were significantly higher.
- Teen birth rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Teen birth rates were very strongly associated with income in urban and rural areas in all three time periods, with higher rates among residents of lower income areas (see online supplement).

Trend Analysis (Figure 9.30)

- Teen birth rates have decreased significantly over time in Manitoba and each region. There was an increase that occurred in 2019/20 in the Northern Health Region, which returned to its normal decrease immediately afterwards.

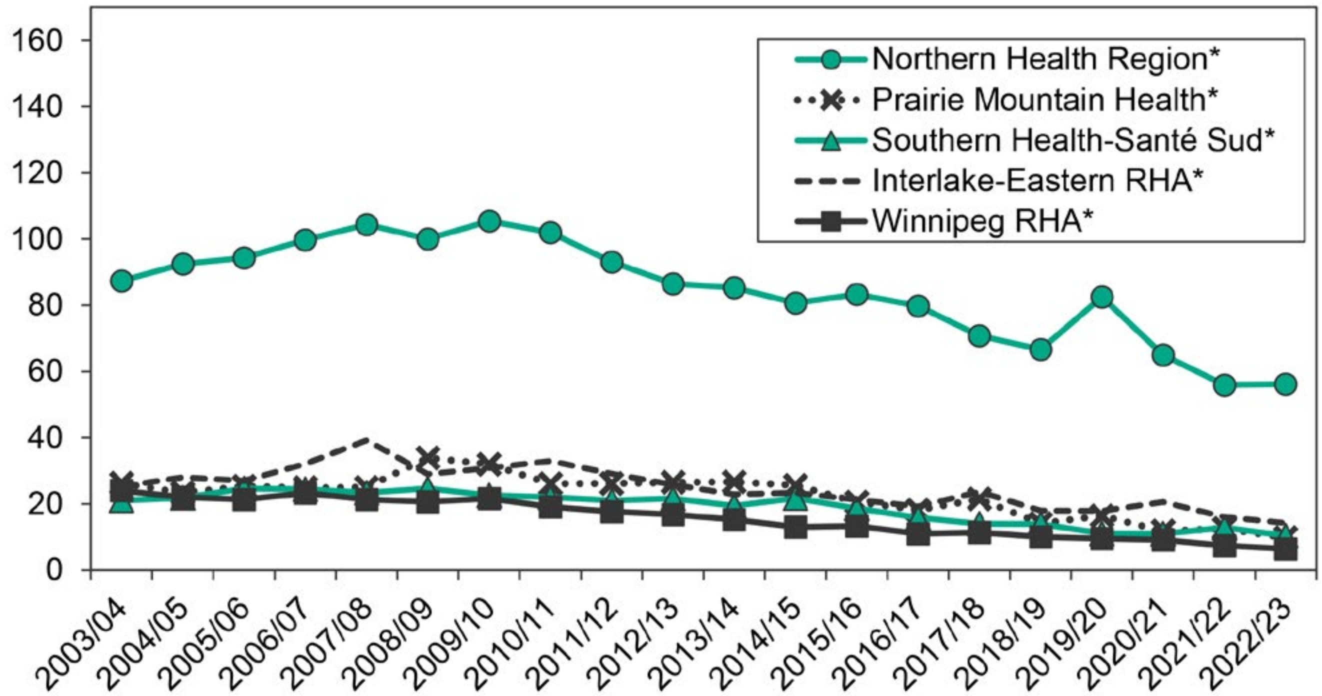
Figure 9.29: Teen Birth Rate by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Age-adjusted annual average rate per 1,000 females (age 15-19)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 9.30: Teen Birth Rate by Health Region, 2003/04 to 2022/23
Age-adjusted rate per 1,000 females (age 15-19)



* statistically significant linear trend over time.

Chapter 10: Quality of Primary Care

Key Findings in Chapter 10

The results in this chapter reveal a mixed picture regarding the quality of primary care received by Manitobans:

- The percentage of residents who met the recommended physician follow-up after new prescriptions for antidepressants increased from the second to third periods following a decrease from the first to second periods.
- The percentage of residents receiving appropriate asthma care significantly decreased between the more recent time periods. This continues from the decrease (non-significant) percentage observed from the first to second period.
- The percentage of residents with diabetes undergoing eye examinations and the percentage of heart attack patients dispensed appropriate beta-blocker medications both decreased over time and significantly from the second to third period.
- Potentially inappropriate use of benzodiazepines among older adults decreased significantly across time periods, both among those living in personal care homes and those living in community settings.

Introduction

This chapter contains a number of indicators of the quality of primary care received by Manitoba residents. The indicators are the same as those used in the 2019 Atlas, which were adapted from MCHP's 2004 report "Using Administrative Data to Develop Indicators of Quality in Family Practice".[12] Although all of the indicators in this chapter relate to quality of care, we present crude rates rather than adjusted rates; good quality care should be provided to all patients who meet the criteria for treatment, regardless of age.

10.1 Antidepressant Prescription Follow-Up

Definition: The percentage of residents (all ages) with a new diagnosis of depression (ICD-9-CM codes 296 or 311) and a new dispensation of antidepressants (ATC class N06A) who had at least three family physician or nurse practitioner visits within four months of the prescription being filled. A new diagnosis of depression includes a 2-year washout period with no prescription for antidepressants or a physician visit with diagnosis of depression.

Time period analysis: The crude percentage of antidepressant dispensation physician or nurse practitioner follow-up visits were calculated for 3 five-year periods: 2008/12-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3).

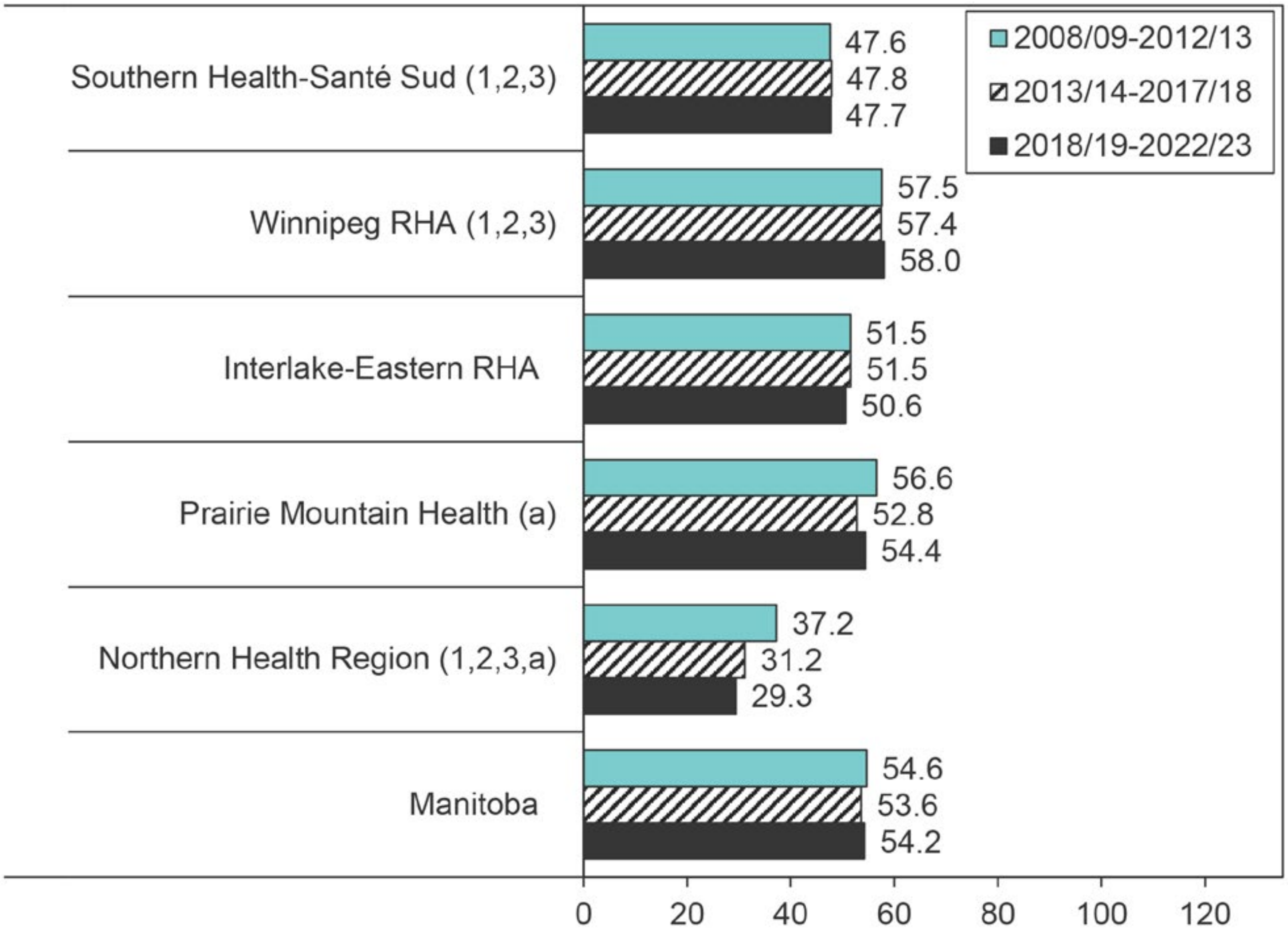
Key Findings

Time Period Analysis (Figure 10.1)

- The percentage of antidepressant prescription follow-up decreased over time from 54.6% in TP1 to 53.6% in TP2 and then increased to 54.2% in TP2. However, none of these changes were statistically significant. Percentages in Prairie Mountain Health and the Northern Health Region significantly decreased between TP1 and TP2, while there was no change between those periods in the other regions. There were no significant differences between TP2 and TP3 in any of the regions.
- The Winnipeg RHA had the highest percentages in each time period, which were all significantly higher than the corresponding percentages for Manitoba.
- The Northern Health Region had the lowest percentages of follow-up, but this finding should be interpreted with caution given previously mentioned challenges with data regarding primary care visits for residents of Northern Health Region. The Southern Health-Santé Sud region also had significantly lower percentages than the Manitoba percentages during all three periods.
- There were no associations with income, though in rural areas there were significantly higher percentages of follow-up among residents of higher income areas in each time periods (see online supplement). Follow-up percentages were higher among urban areas at each of the income quintiles.

Figure 10.1: Antidepressant Prescription Follow-Up by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Crude percent of residents (all ages) with a diagnosis of depression and a new dispensation of antidepressants who visited a primary care provider 3+ times within four months of the prescription being filled



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

10.2 Asthma Care: Controller Medication Use

Definition: The percentage of residents (all ages) being treated for asthma and receiving medications recommended for long-term control of their disease. Asthma was defined by two or more dispensations of beta 2-agonists (ATC codes R03AA, R03AB, or R03AC). Recommended long-term controller medications included inhaled corticosteroids (ATC R03BA), leukotriene modifiers (ATC code R03DC), or adrenergic and other drugs for obstructive airway diseases (ATC code R03AK). Patients receiving ipratropium bromide (ATC codes R01AX03, R03AK04, or R03BB01) were excluded as likely chronic obstructive pulmonary disease patients.

Time period analysis: The crude percentage of patients with asthma receiving controller medications was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

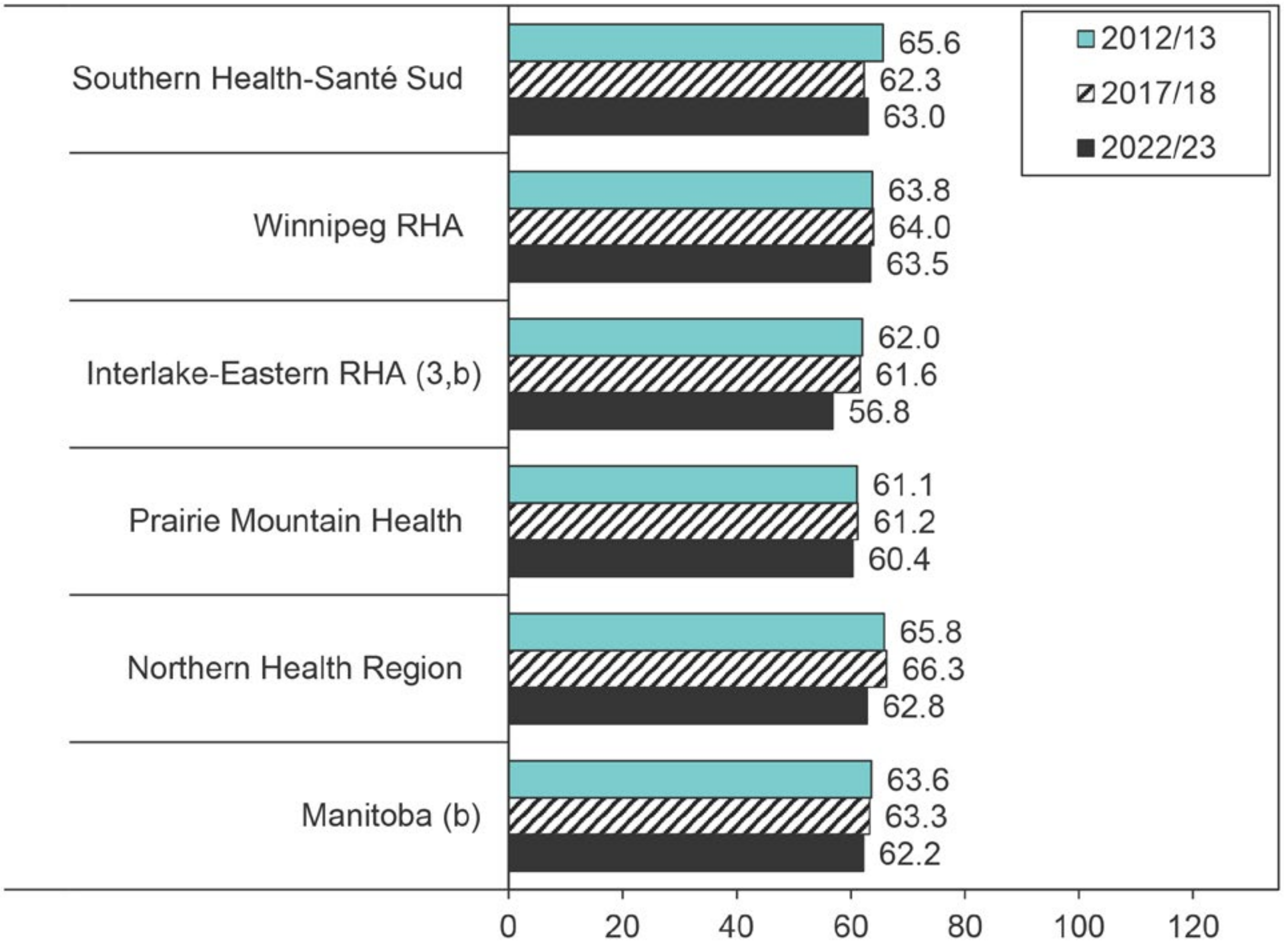
Key Findings

Time Period Analysis (Figure 10.2)

- There was no change in the percentage of Manitoba residents with asthma filling the prescriptions recommended for long-term control between TP1 and TP2, but a significant decrease occurred between TP2 (63.3%) and TP3 (62.2%). This was also reflected in the Interlake-Eastern RHA. All other regions were stable over the three periods.
- There was remarkably little variation across regions.
- There were significant associations with income in all three time periods in rural and urban areas where residents of higher income areas had higher percentages of recommended care (see online supplement).

Figure 10.2: Asthma Care: Controller Medication Dispensations by Health Region, 2012/13, 2017/18, and 2022/23

Crude percent of residents (all ages) treated for asthma who filled at least one dispensation of inhaled steroids



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

10.3 Diabetes Care: Eye Examinations

Definition: The percentage of residents aged 19 and older with diabetes who had an eye exam in a given year, as defined by a visit to an ophthalmologist or an optometrist. Diabetes was defined as described in Chapter 4.

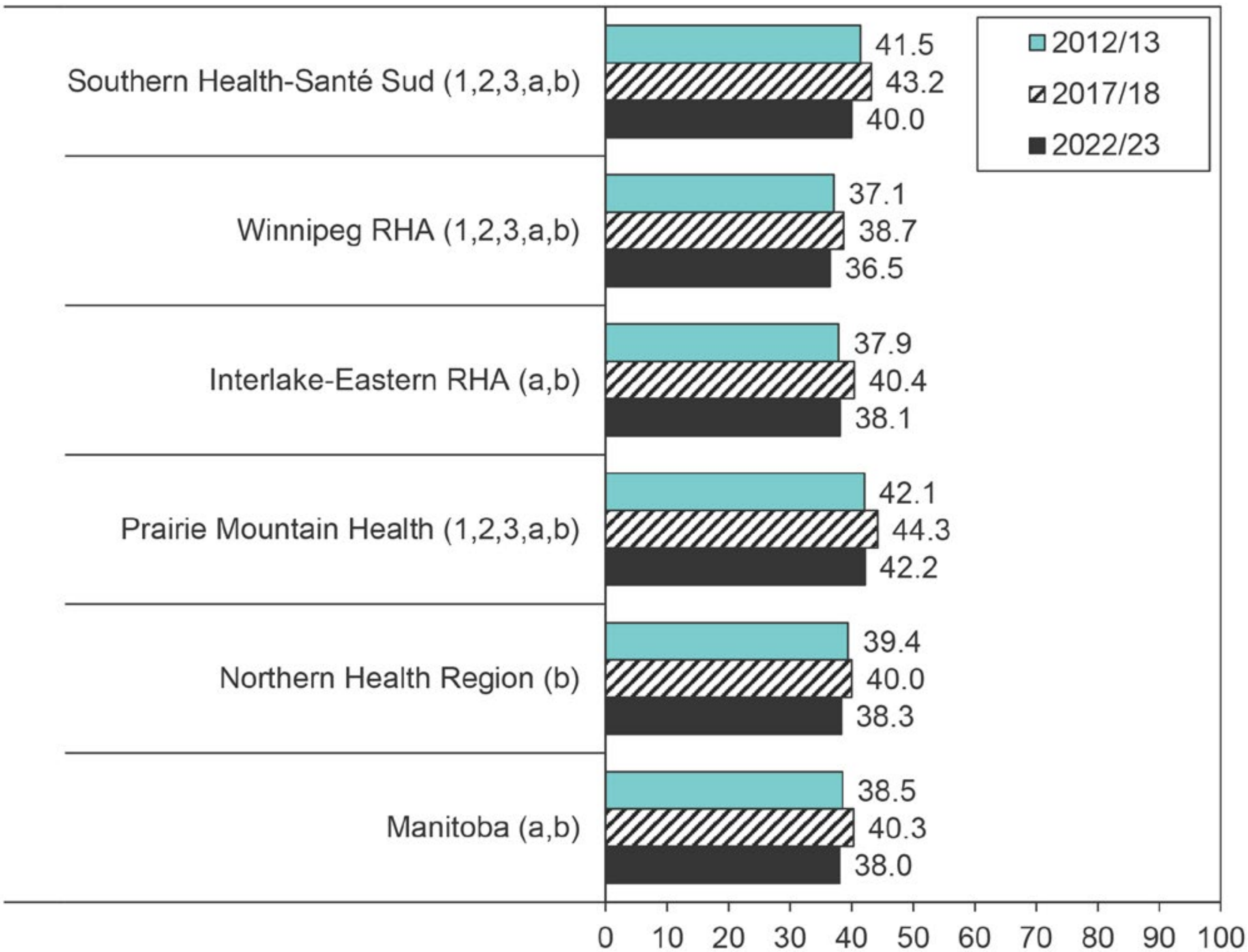
Time period analysis: The crude percentage of eye examinations among residents with diabetes was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3).

Key Findings

Time Period Analysis (Figure 10.3)

- The percentage of residents with diabetes receiving an eye exam significantly increased from 38.5% in TP1 to 40.3% in TP2 and then significantly decreased to 38.0% in TP3. This was reflected in each region, except the increase between TP1 and TP2 in the Northern Health Region was not statistically significant.
- Associations with income existed for urban areas in all three periods and for rural areas in only the first two periods (see online supplement). Residents of lower income areas had lower eye exam rates. The differences are modest, but these results warrant further investigation, as they may signal problems with access to medical care among lower-income residents with diabetes.

Figure 10.3: Diabetes Care: Eye Examinations by Health Region, 2012/13, 2017/18, and 2022/23
Crude percent of residents (age 19+) with diabetes who had an eye exam



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

10.4 Post-Acute Myocardial Infarction (AMI) Care: Beta-Blocker Dispensations

Definition: The percentage of residents aged 20 and older hospitalized for AMI (ICD-9-CM code 410; ICD-10-CA code I21) who filled at least one prescription for a beta-blocker (ATC C07AA, C07AB) within four months of hospital discharge. Patients with a hospitalization for an AMI in the three years prior to the index AMI hospitalization were excluded. Patients with a diagnosis of asthma, chronic obstructive pulmonary disease, or peripheral vascular disease were also excluded, because beta-blockers should not be used by those patients.

Time period analysis: The crude percentage of people who were dispensed beta blocker post AMI was calculated for 3 five-year periods: 2008/09-2012/13 (TP1), 2013/14-2017/18 (TP2), and 2018/19-2022/23 (TP3).

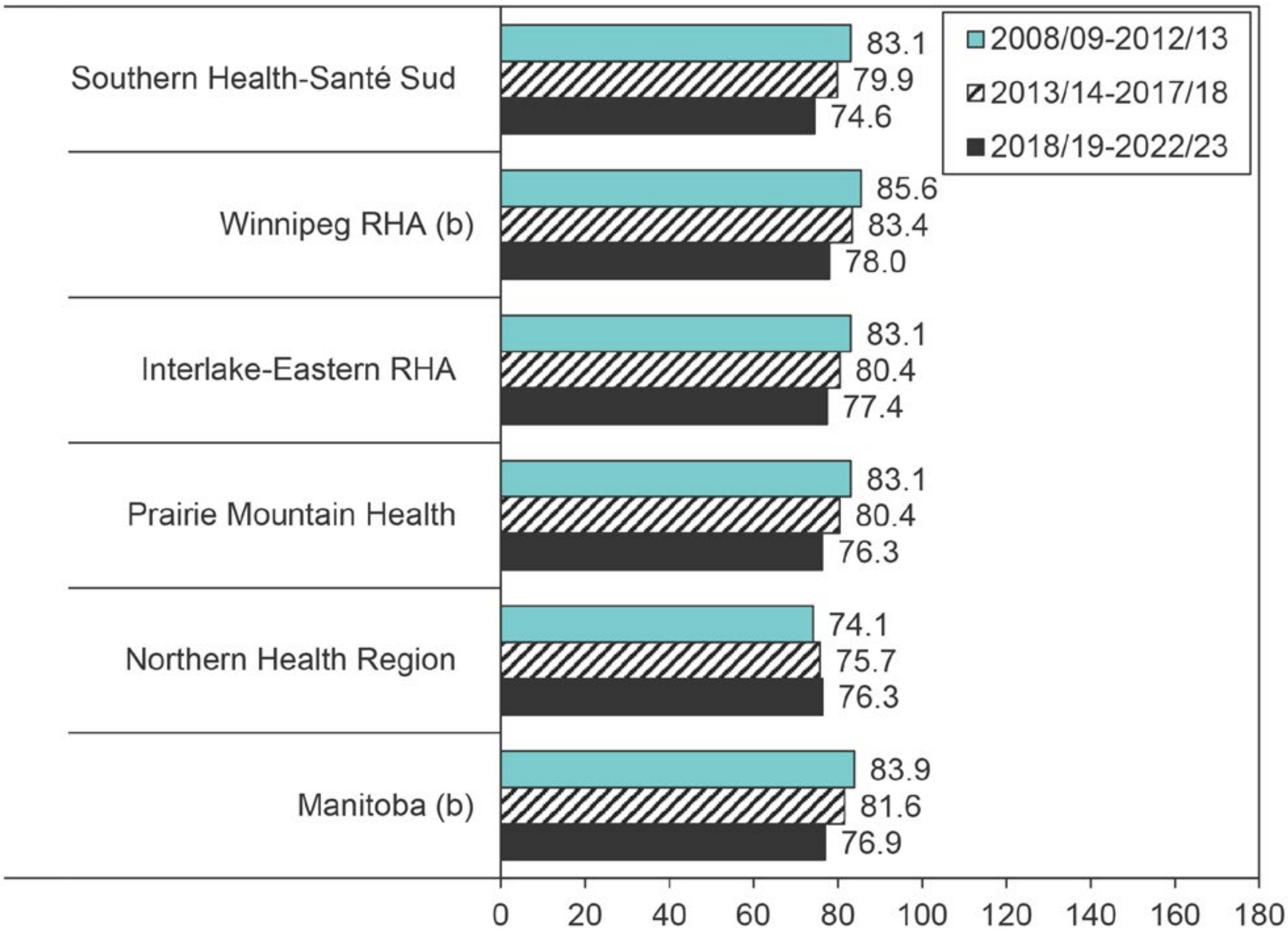
Key Findings

Time Period Analysis (Figure 10.4)

- The percentage of AMI patients receiving recommended beta-blocker dispensations decreased from 83.9% in TP1 to 81.6% and significantly further to 76.9% in TP3. This was also reflected in the Winnipeg RHA. All other regions decreased across the three periods, though none of the decreases were statistically significant.
- There were no associations between beta-blocker dispensation rates and income in urban or rural areas, though residents of lower income urban areas had somewhat lower rates than higher income urban residents in the third time period (see online supplement).

Figure 10.4: Post-AMI Care: Beta-Blocker Dispensations by Health Region, 2008/09-2012/13, 2013/14-2017/18, and 2018/19-2022/23

Crude percent of residents (age 20+) with a hospitalization for AMI who filled a prescription for a beta-blocker within four months



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

10.5 Benzodiazepine Dispensations for Community-Dwelling Older Adults

Definition: The percentage of residents aged 75 and older living in the community (i.e., not in a personal care home) who filled at least two prescriptions for benzodiazepines (ATC codes N05BA, N05CD, N05CF, and N03AE01) or at least one dispensation of benzodiazepines with a greater than 30-day supply dispensed. Use of benzodiazepines is not recommended for older adults, so lower rates are considered better.

Time period analysis: The percentage of older adults in community dispensed benzodiazepines was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3).

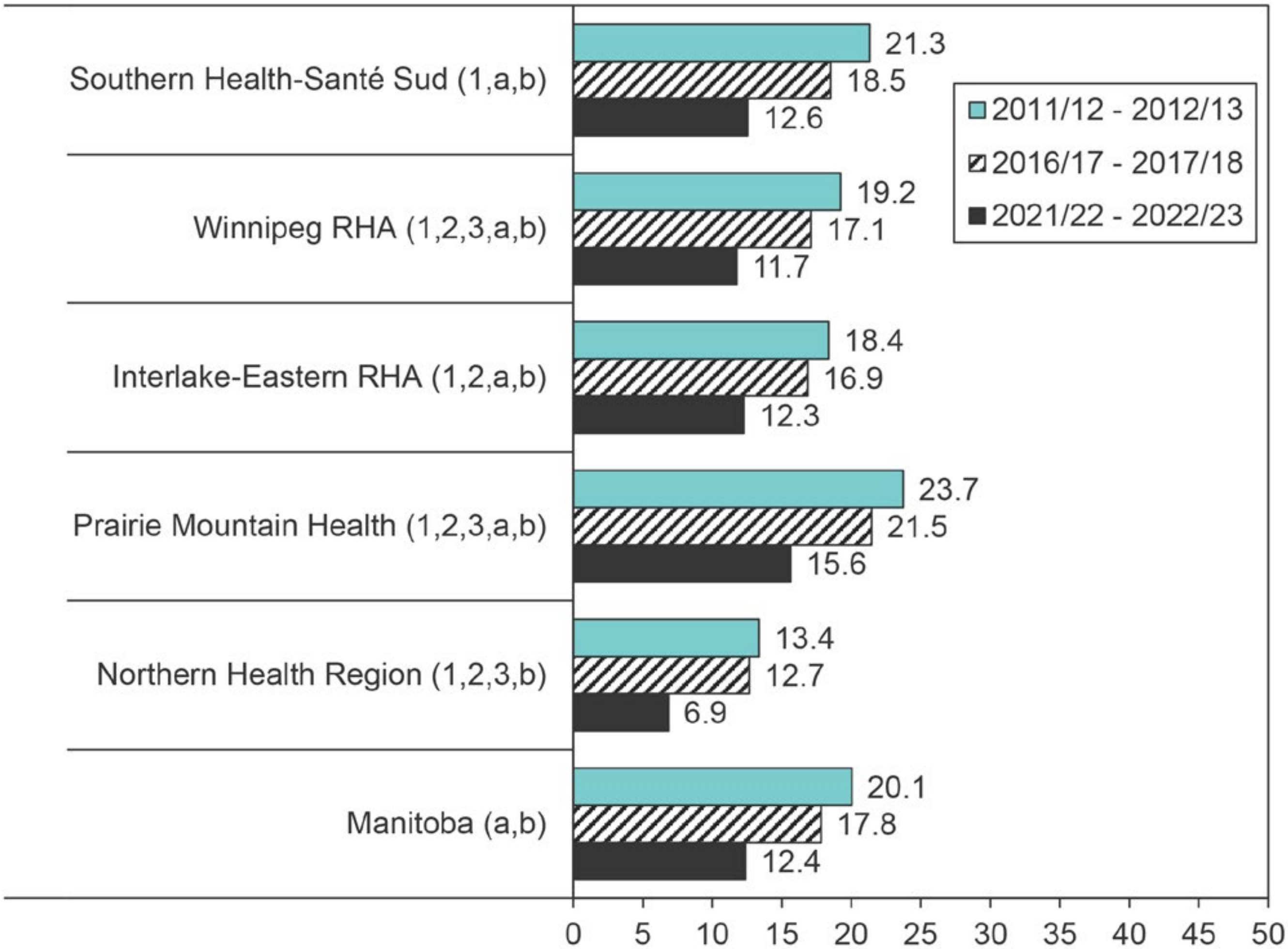
Key Findings

Time Period Analysis (Figure 10.5)

- Overall, the percentage of community-dwelling older adults (aged 75 and older) using benzodiazepines decreased significantly from 20.1% in TP1 to 17.8% in TP2 to 12.4% in TP3. Decreases were seen in all regions across the time periods, though the decrease between TP1 and TP2 in the Northern Health Region was the only one not to reach the level of statistical significance.
- There were no associations between benzodiazepine use and income in both urban and rural areas (see online supplement).

Figure 10.5: Benzodiazepine Dispensations for Community-Dwelling Older Adults by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Crude percent of residents (age 75+) not living in a PCH with 2 dispensations or more than a 30-day supply



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

10.6 Benzodiazepine Dispensations for Residents of Personal Care Homes (PCH)

Definition: The percentage of PCH residents aged 75 and older who filled at least two prescriptions for benzodiazepines (ATC codes N05BA, N05CD, N05CF, and N03AE01) or at least one dispensation of benzodiazepines with a greater than 30-day supply dispensed. PCHs with hospital-based pharmacies are excluded from this analysis as their prescription data were unavailable. Use of benzodiazepines is not recommended for older adults, so lower rates are considered better.

Time period analysis: The percentage of older adults in PCHs dispensed benzodiazepines was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3).

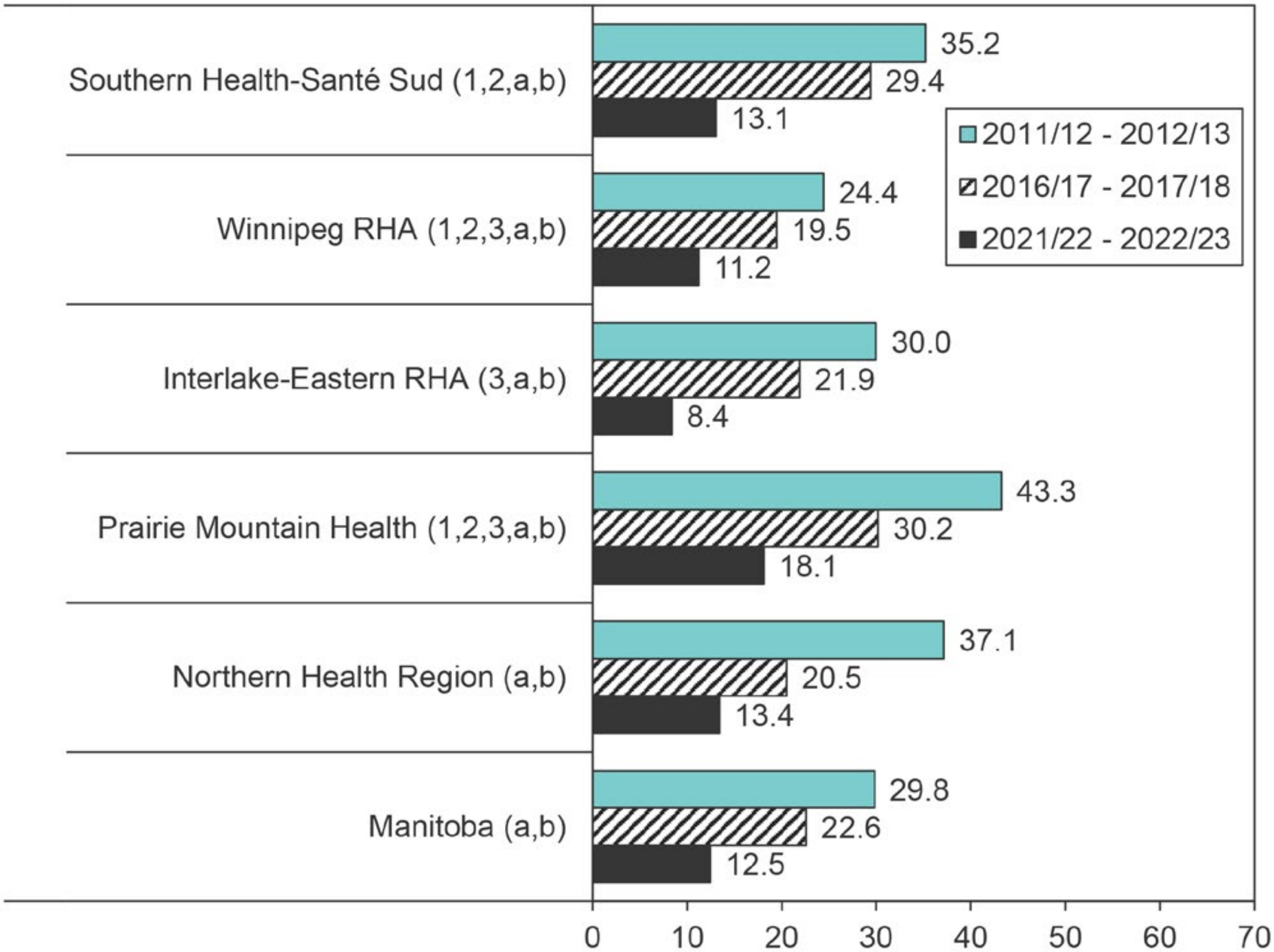
Key Findings

Time Period Analysis (Figure 10.6)

- Overall, the percentage of PCH residents aged 75 and older receiving benzodiazepines decreased significantly from 29.8% in TP1 to 22.6% in TP2 to 12.5% in TP3. Decreases were seen in all regions.
- Percentages varied across regions: the Winnipeg RHA had lower than average percentages, whereas Prairie Mountain Health and Southern Health-Santé Sud regions had higher than average percentages.

Figure 10.6: Benzodiazepine Dispensations for Residents of Personal Care Homes by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Crude percent of residents (age 75+) living in a PCH with 2 dispensations or more than a 30-day supply



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Chapter 11:
Use of Personal Care Homes (PCHs)

Key Findings in Chapter 11

The results in this chapter indicate continued decreases in the rate at which Manitobans (aged 75 and older) use personal care homes:

- There have been significant decreases in the percentage of older adults (aged 75 and older) admitted and residing in PCHs over time.
- The median wait times to PCH admission have also decreased among patients panelled in hospital and among those panelled in community settings.
- The level of care of PCH residents at the time of admission increased over time. The data shows a major shift in the proportion of admissions that were Level 3N from 47.1% in the second period to 86.8% in the third period. This resulted in decreases in the proportion of all admissions from the other levels of care. Given the decrease in the number of admissions, this indicates a reduction in the number of admissions with higher and lower acuity. These results may reflect a data error and should be interpreted with caution.
- The median length of stay for PCH residents increased slightly between the first and second periods, while it decreased from the second to third period.

Introduction

This chapter contains a number of indicators of the use of PCHs (also known as nursing homes) in Manitoba. PCHs are residential facilities for people (predominantly older adults) living with significant chronic disease or disability. Indicators in this chapter are based on Manitobans aged 75 years and older, as they comprise the vast majority of all PCH residents in Manitoba. In addition, the rates have all been age- and sex-adjusted (within the 75+ population) to enable a fair comparison of regions within Manitoba that have different age and sex compositions. Most indicators are reported according to the region where the PCH is located because once a person is admitted to a PCH, they become a resident of that region. Analyses were not done by income quintile because income data in the census are not collected for institutionalized persons.

Data issues: Complete individual-level data are not available for all PCH services in Manitoba. There are facilities in First Nation communities in several regions that are operated by the federal government or through federal transfer agreements. Individual-level data on PCH bed use are not available from these facilities, which means that they cannot be included in the indicators in this report. Consequently, the results shown in this report underestimate the use of PCH beds in those regions to some degree. The discrepancy is largest in the Northern Health Region.

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

11.1 Admissions to Personal Care Homes (PCHs)

Definition: The percentage of residents aged 75 and older who were admitted to a PCH for the first time ever in a given year. Area of residence was assigned based on where people lived prior to first PCH admission.

Time period analysis: The average annual percentage of residents admitted to PCHs was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 75 and older in TP3.

Trend analysis: The percentage of residents admitted to PCHs was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 75 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 11.1)

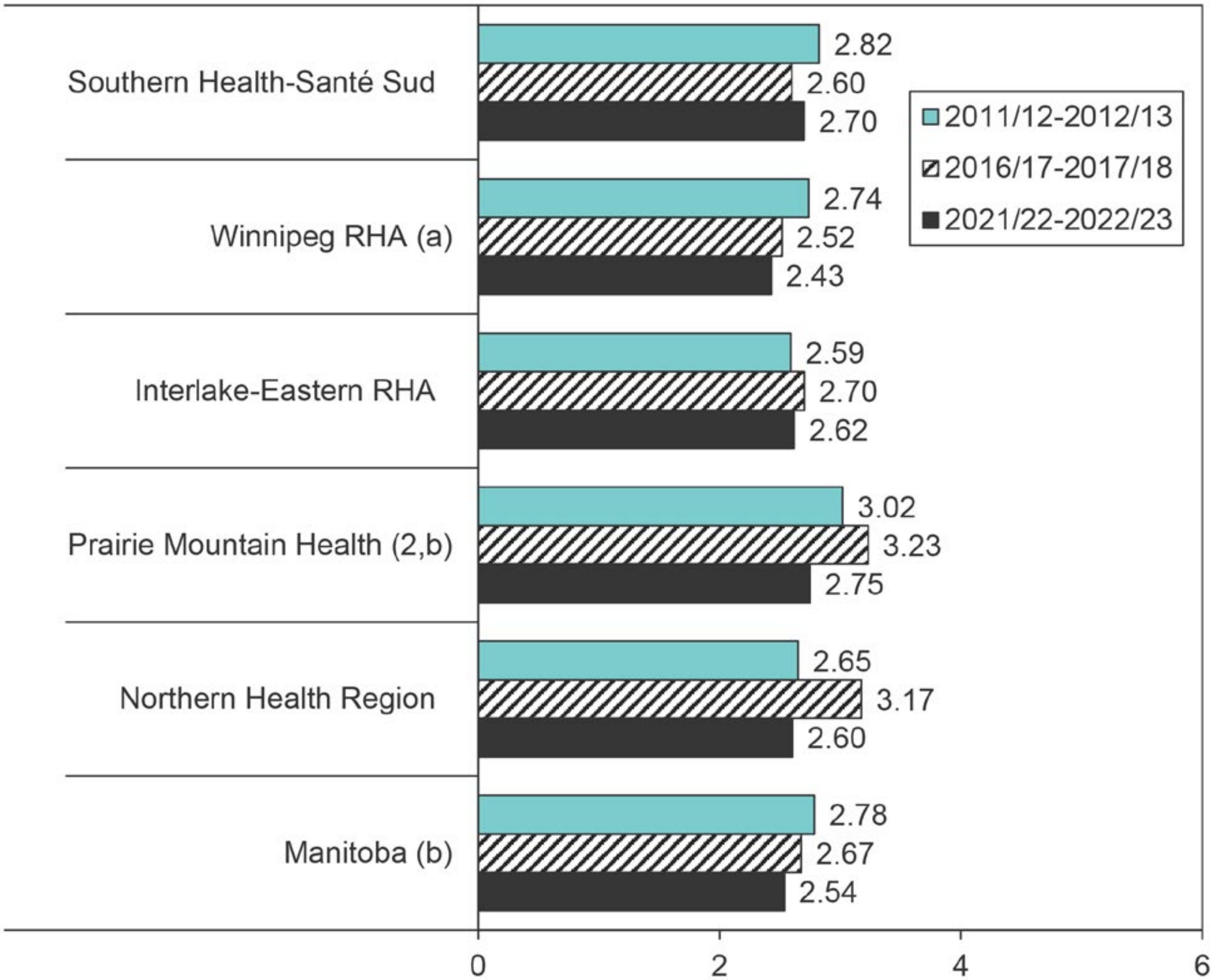
- Overall, in the percentage of Manitoba residents aged 75 and older admitted to a PCH decreased from 2.8% in TP1 to 2.7% in TP2 to 2.5% in TP3, though only the difference between TP2 and TP3 was statistically significant. Despite the significant difference, the total number of people admitted increased from 5,022 in TP2 to 5,246 in TP3 (online supplement).
- The rates decreased across each period in the Winnipeg RHA, though only significantly between TP1 and TP2. The rates in the Prairie Mountain Health region significantly decreased between TP2 and TP3.

Trend Analysis (Figure 11.2)

- Admissions to PCHs has decreased over time in Manitoba and each region. The Northern Health Region had the most variability and showed a dramatic decrease between 2010/11 and 2015/16 before sharply increasing in 2016/17.

Figure 11.1: Admission to Personal Care Homes by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

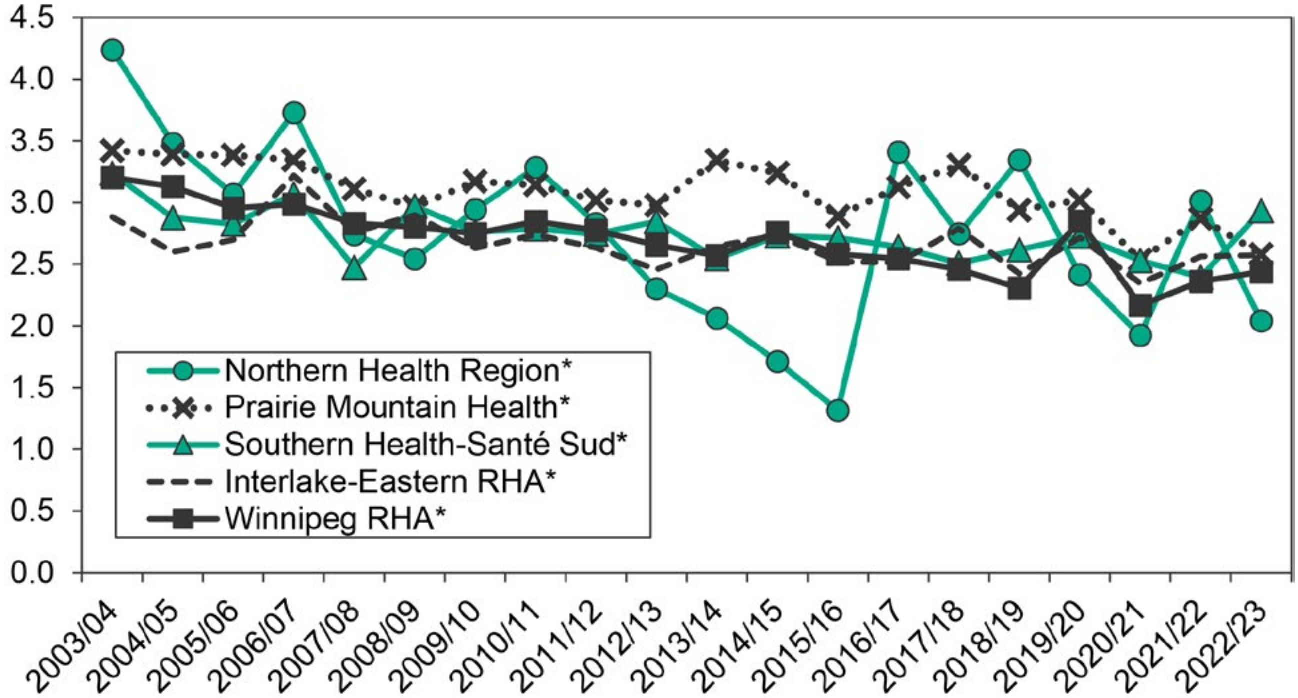
Age- and sex-adjusted average annual percent of residents (age 75+) admitted to a PCH



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 11.2: Admission to Personal Care Homes by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted percent of residents (age 75+) admitted to a PCH



* statistically significant linear trend over time.

11.2 Residents of PCHs

Definition: The percentage of residents aged 75 and older who lived in a PCH for at least one day in a given year. Area of residence was assigned based on the postal code of the PCH.

Time period analysis: The average annual percentage of residents living in PCHs was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 75 and older in TP3.

Trend analysis: The average annual percentage of residents living in PCHs was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 75 and older as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 11.3)

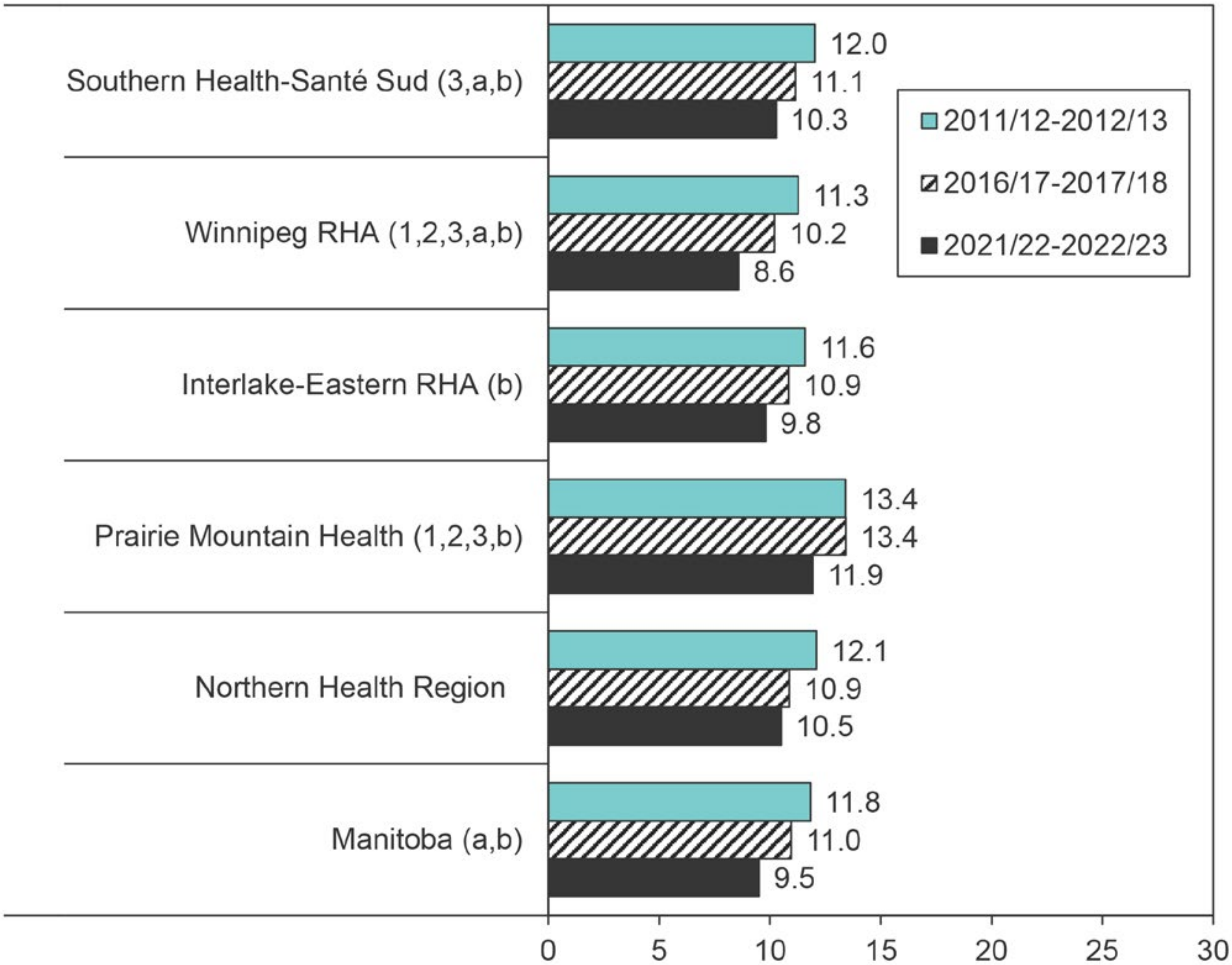
- Overall, there were significant decreases in the percentage of the population aged 75 and older who were PCH residents from 11.8% in TP1 to 11.0% in TP2 to 9.5% in TP3. The number of residents across the three periods was stable at approximately 20,000 people (online supplement).
- Decreases were seen in all regions. Significant decreases were observed across all periods in Southern Health-Santé Sud and Winnipeg RHA, while they were significant between only TP2 and TP3 in the Interlake-Eastern RHA and Prairie Mountain Health.

Trend Analysis (Figure 11.4)

- The percentage of residents in PCHs has steadily decreased in Manitoba and each region. Prairie Mountain Health has consistently had the highest percentage of residents in PCHs.

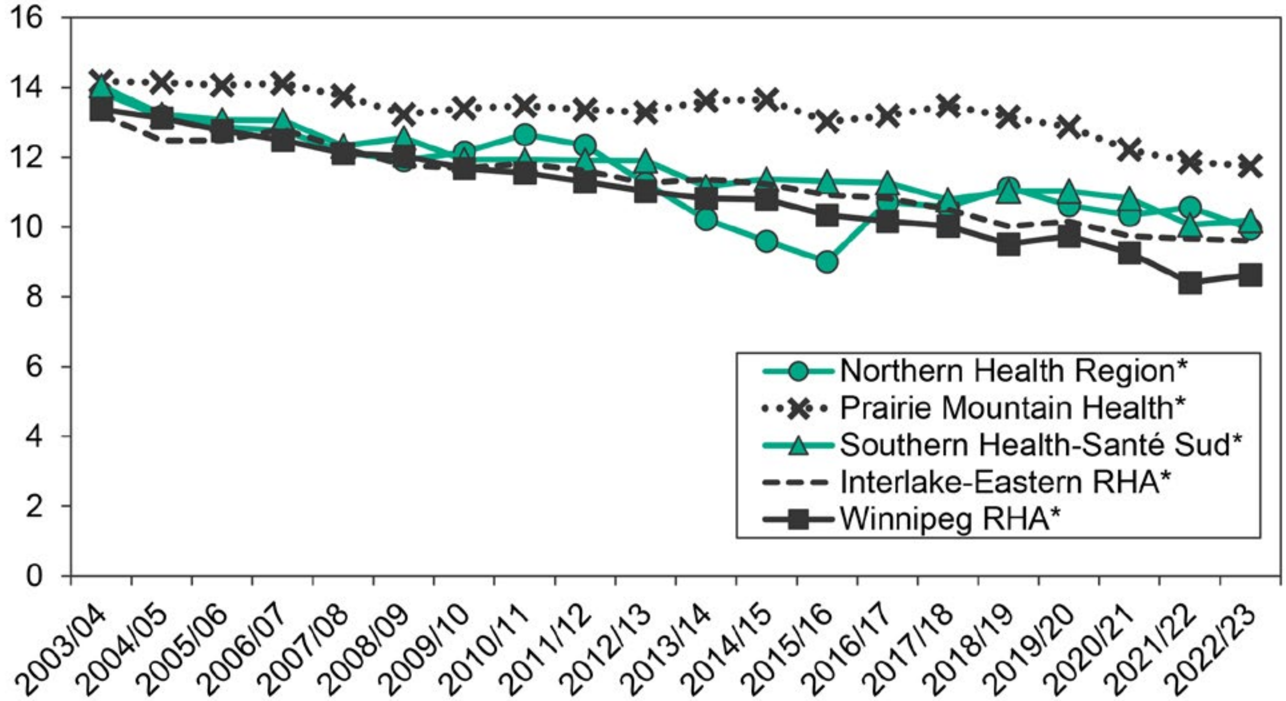
Figure 11.3: Residents of Personal Care Homes by Health Region, 2011/12-2012/13, 2016/17-2017/18, 2021/22-2022/23

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



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 11.4: Residents of Personal Care Homes by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted percent of residents (age 75+) living in a PCH



* statistically significant linear trend over time.

11.3 Wait Time for PCH Admission from Hospital

Definition: The wait time (in weeks) experienced by those admitted to a PCH from a hospital. Area of residence was assigned based on where people lived prior to PCH admission (not where they were hospitalized).

Time period analysis: The median wait time (i.e., half of the population waited less than this amount of time, and half waited longer) for PCH admission from the hospital was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) and was adjusted for age, sex, RHA, and time period.

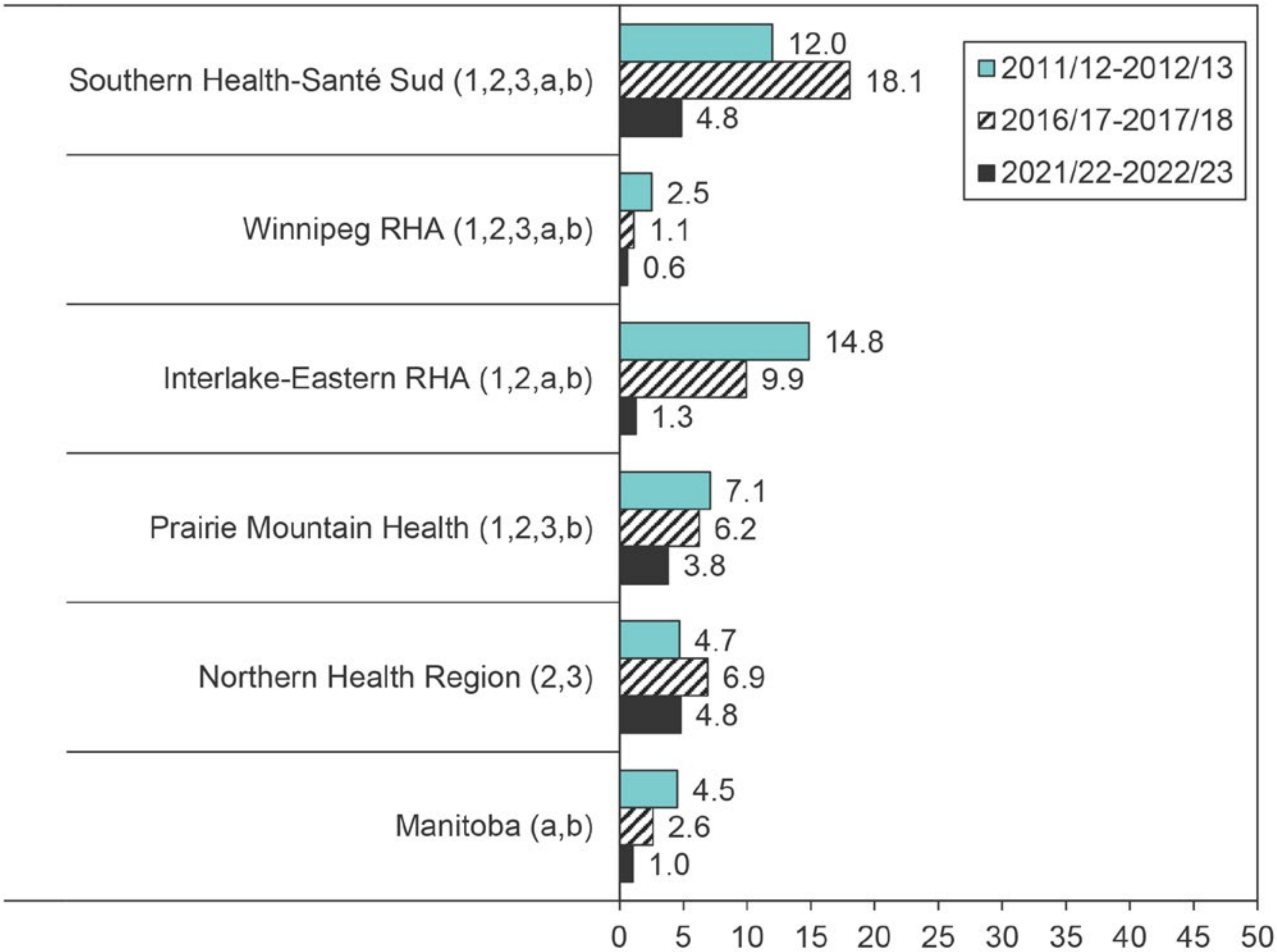
Key Findings

Time Period Analysis (Figure 11.5)

- There was a significant decrease in median wait times for PCH admission from hospital in Manitoba from 4.5 weeks in TP1 to 2.6 in TP2 to 1.0 in TP3. However, RHAs varied markedly: Southern Health-Santé Sud and the Northern Health Region had significant increases between TP1 and TP2 and then significantly decreased between TP2 and TP3; Winnipeg RHA and Interlake-Eastern RHA had significant decreases across all periods, while Prairie Mountain Health decreased across periods, though only significantly between TP2 and TP3.

Figure 11.5: Wait Time for Personal Care Home Admission from Hospital by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Age- and sex-adjusted median number of weeks from assessment to admission into a PCH by residence prior to admission per 1,000 residents (age 75+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

11.4 Wait Time for PCH Admission from the Community

Definition: The wait time (in weeks) experienced by those admitted to a PCH from a community setting (i.e., not a hospital). Area of residence was assigned based on where people lived prior to admission.

Time period analysis: The median wait time (i.e., half of the population waited less than this amount of time, and half waited longer) for PCH admission from the community was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3) and was adjusted for age, sex, RHA, and time period.

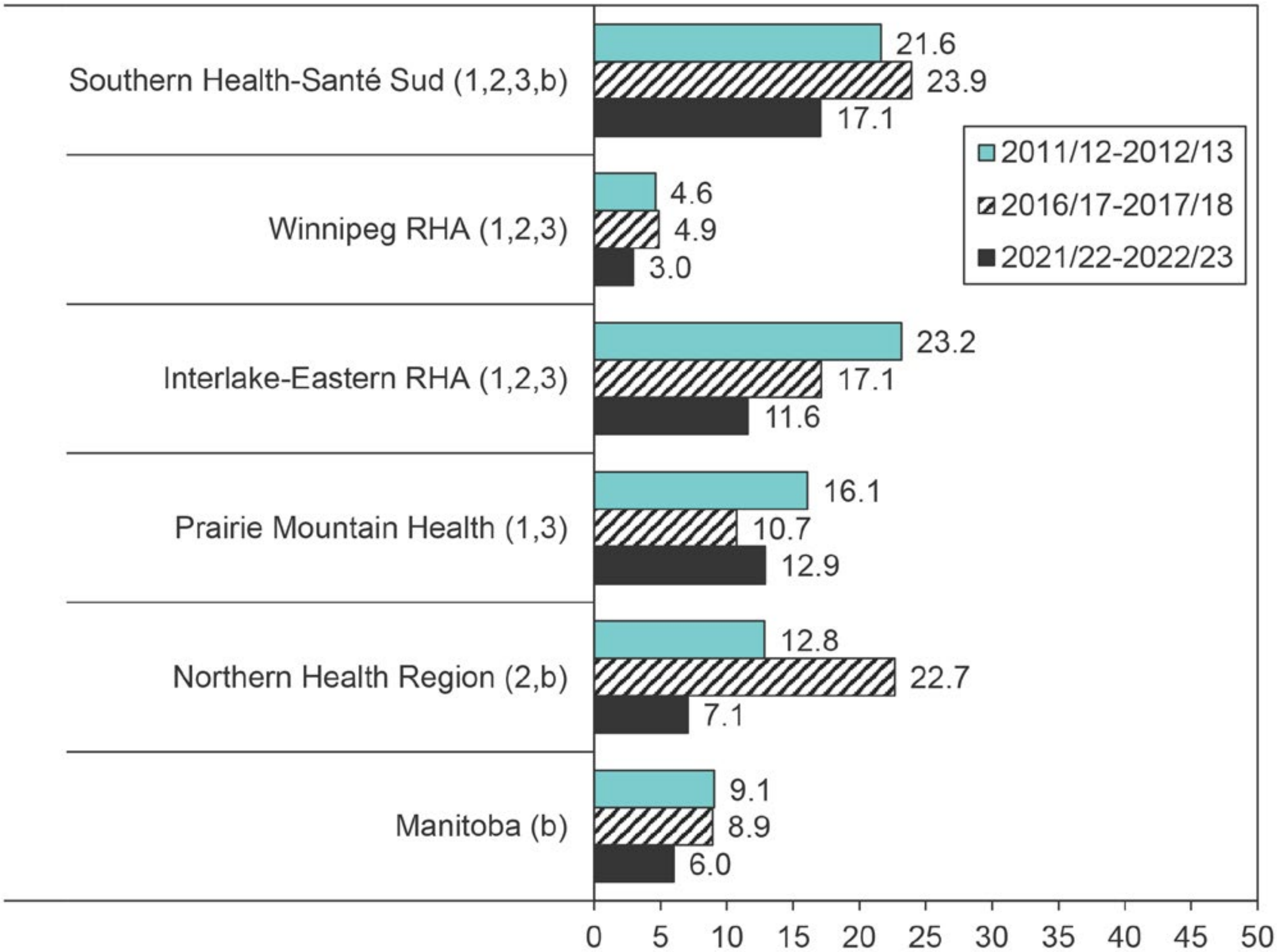
Key Findings

Time Period Analysis (Figure 11.6)

- Overall, median wait times for PCH admission from the community did not change between TP1 and TP2 but significantly decreased from 8.9 weeks in TP2 to 6.0 in TP3. Significant decreases between TP2 and TP3 also existed in Southern Health-Santé Sud and the Northern Health Region.
- The longest wait times were in the Southern Health-Santé Sud and Interlake-Eastern RHA, which had significantly longer wait times than the Manitoba average during each period.
- The lowest wait times in each period were in the Winnipeg RHA, which were all significantly lower than the Manitoba average.

Figure 11.6: Wait Time for Personal Care Home Admission from Community by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Age- and sex-adjusted median number of weeks from assessment to admission into a PCH by residence prior to admission per 1,000 residents (age 75+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

11.5 Level of Care on Admission to PCH

Definition: The level of care assigned to PCH residents who were age 75 and older at the time of their admission. Level 1 represents the lowest level of need and Level 4 represents the highest. Levels 2 and 3 were stratified into residents whose assessment indicated a need for close supervision due to possible behavioural issues (2Y or 3Y) and residents who did not require close supervision (2N or 3N). There were less than six residents assigned to Level 1 at admission during the 20-year study period, and these records were grouped with Level 2N. Area of residence was assigned based on where people lived prior to PCH admission.

Time period analysis: The distribution of levels of care assigned to PCH residents who were age 75 and older at the time of their admission was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3).

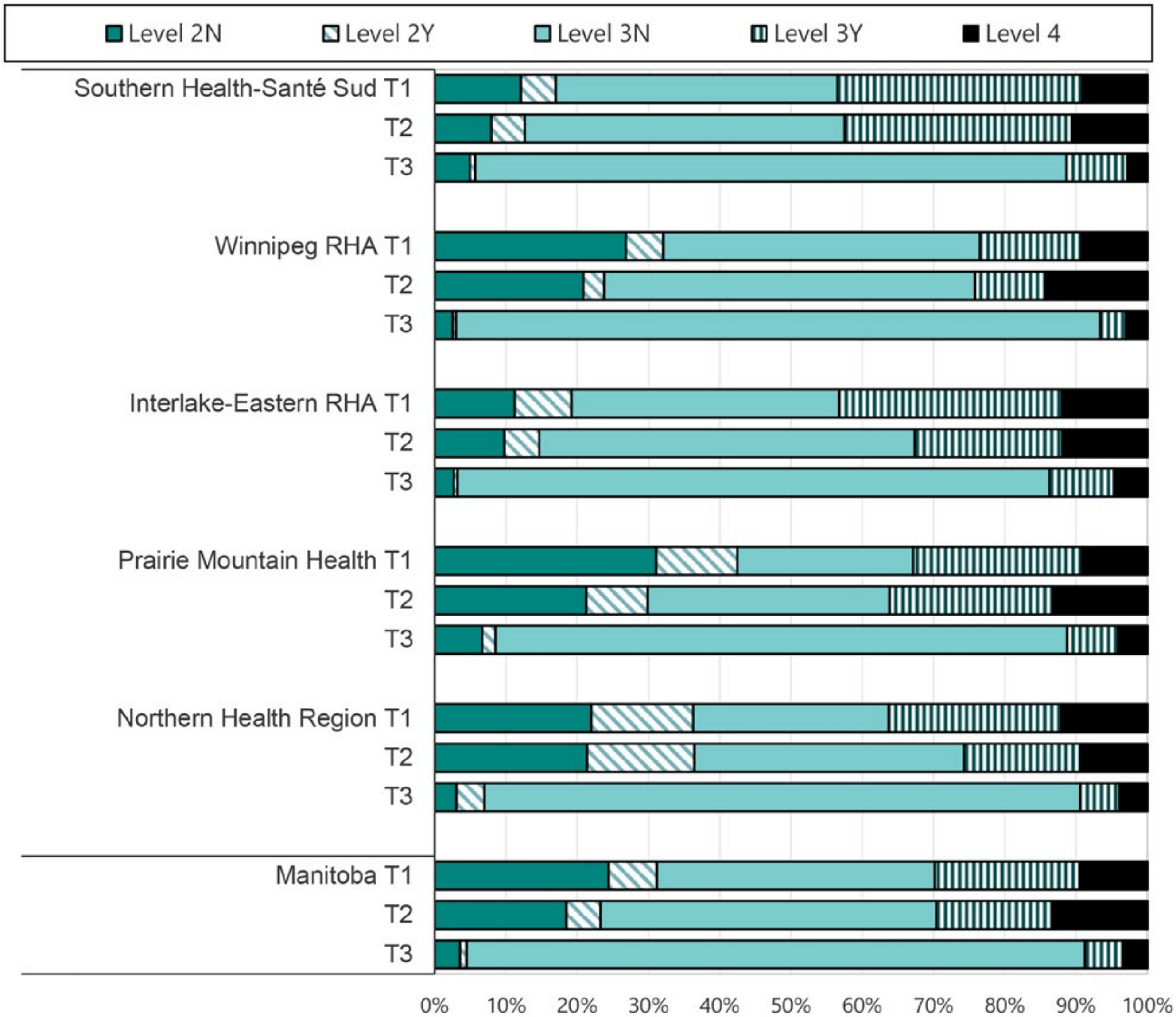
Key Findings

Time Period Analysis (Figure 11.7)

- Across the time periods, there was an increase in the level of care on admission to PCHs in Manitoba with a reduction in Level 2 admissions and an increase in Level 3 and 4 admissions. This overall increase was reflected in all regions except the Northern Health Region, though values and changes over time varied considerably by region. There was a considerable increase in the Level 3N admissions in TP3, which was observed in each region.
- Between TP2 and TP3 in Manitoba:
  - Level 2 admissions not requiring close supervision (2N) decreased from 18.5% to 3.6%.
  - Level 2 admissions requiring close supervision (2Y) decreased from 4.8% to 0.9%.
  - Level 3 admissions not requiring close supervision (3N) increased from 47.1% to 86.8%. Note. Interpret with caution as this may reflect a data error.
  - Level 3 admissions requiring close supervision (3Y) decreased from 16.3% to 5.4%.
  - Level 4 admissions decreased from 13.3% to 3.3%.

Figure 11.7: Level of Care on Admission to Personal Care Homes by Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Crude average annual percent of residents age 75+ admitted to a PCH



Y Indicates requirement for close supervision
N Indicates no requirement for close supervision

T1 = 2011/12-2012/13 T2 = 2016/17-2017/18 T3 = 2021/22-2022/23

11.6 Length of Stay in PCH by Level of Care on Admission

Definition: The length of time (in years) that all PCH residents aged 75 and older spent in PCHs before leaving the facility, according to their level of care on admission. Level 1 represents the lowest level of need and Level 4 represents the highest. Levels 1, 2 and 3 are stratified into residents whose assessment indicated a need for close supervision due to possible behavioural issues (1Y, 2Y or 3Y) and those who did not (1N, 2N or 3N).

Time period analysis: The median length of stay (i.e., half of PCH residents spent less than this amount of time in the PCH, and half spent longer) for PCH residents was calculated for 3 two-year periods: 2011/12-2012/13 (TP1), 2016/17-2017/18 (TP2), and 2021/22-2022/23 (TP3).

Key Findings

Time Period Analysis (Tables 11.1-11.6)

- Overall, the length of time Manitobans aged 75 and older spent in PCHs significantly decreased from a median of 2.22 years in TP1 to 2.17 in TP2 to 1.98 in TP3, which may reflect the much lower percentage of Level 2 admissions, and higher Level 3 admissions observed for indicator 11.5.
- The length of stay significantly increased between TP1 and TP2 and significantly decreased between TP2 and TP3 for those admitted at Level 3N. Meanwhile the length of stay significantly increased across each period for those admitted at Level 3Y. Those admitted at Level 4 had significantly shorter lengths of stay in TP2 compared to TP1, but significantly longer stays in TP3 compared to TP2.
- Changes over time varied by RHA, and by level of care within regions. Significant differences across periods existed for those admitted at Level 1N, 2N, 3N, and 3Y in the Southern Health-Santé Sud and Winnipeg RHA. Prairie Mountain Health saw significant differences across the periods for those admitted at Levels 1Y, 2 Y, and 3N. Interlake-Eastern RHA had significantly decreased lengths of stay across all periods, which appears to be driven by those admitted at Level 3N.

Table 11.1: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Southern Health-Santé Sud, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.32	4.10 (t)	3.14	1.99 (t)	2.10 (t)	1.75
2016/17-2017/18	2.23	4.66 (t)	4.07	1.92 (t)	2.22 (t)	1.48
2021/22-2022/23	1.98	2.38 (t)	3.08	1.01 (t)	3.13 (t)	2.66

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Table 11.2: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Winnipeg RHA, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.12 (t)	2.88 (t)	4.12	1.64 (t)	2.29 (t)	1.52
2016/17-2017/18	2.06 (t)	2.54 (t)	3.30	1.77 (t)	2.96 (t)	1.08
2021/22-2022/23	1.83 (t)	4.47 (t)	3.68	1.13 (t)	2.75 (t)	2.32

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Table 11.3: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Interlake-Eastern RHA, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23

Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.42 (t)	4.34 (t)	2.79	2.50 (t)	2.41	1.80
2016/17-2017/18	2.17 (t)	2.32 (t)	4.19	1.67 (t)	2.58	1.40
2021/22-2022/23	1.89 (t)	3.91 (t)	4.82	1.16 (t)	3.01	1.81

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Table 11.4: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Prairie Mountain Health, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23
Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission.

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.31	3.11	2.09 (t)	1.84 (t)	2.05	1.69
2016/17-2017/18	2.43	3.20	3.10 (t)	1.92 (t)	2.37	0.96
2021/22-2022/23	2.42	3.87	3.61 (t)	1.13 (t)	2.85	2.25

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Table 11.5: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Northern Health Region, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23
Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission.

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.44	2.63	2.43	1.68	2.68	1.55
2016/17-2017/18	1.62	2.55	4.01	1.04	2.31	1.44
2021/22-2022/23	1.96	3.27	3.52	1.17	2.16	3.15

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Table 11.6: Median Length of Stay (years) in Personal Care Homes by Level of Care at Admission in Manitoba, 2011/12-2012/13, 2016/17-2017/18, and 2021/22-2022/23
Median number of years spent in a PCH by residents (age 75+) and level of care requirement for close supervision* assessed at admission

Time Period	All Levels	Level 1N & 2N	Level 1Y & 2Y	Level 3N	Level 3Y	Level 4
2011/12-2012/13	2.22 (t)	3.09 (t)	2.93	1.75 (t)	2.23 (t)	1.60 (t)
2016/17-2017/18	2.17 (t)	2.77 (t)	3.51	1.79 (t)	2.57 (t)	1.12 (t)
2021/22-2022/23	1.98 (t)	4.08 (t)	3.56	1.12 (t)	2.86 (t)	2.27 (t)

* indicates requirement (Y) or no requirement (N) for close supervision
t indicates change over time was statistically significant for that area

Chapter 12:

Immunization and Prescription Drug Use

Key Findings in Chapter 12

- The proportion of Manitobans receiving influenza immunizations increased over time, which was reflected in both the time period and trend analyses. The proportion of Manitobans aged 65 and older receiving pneumococcal immunizations has also increased over time and between the two more recent time periods.
- Influenza immunization rates were significantly higher among higher income residents in both urban and rural areas in the second and third periods, but not the first. For pneumococcal immunizations, there was a significant gradient in rural areas in all three periods, but not in any of the periods in urban areas.
- The number of different types of drugs dispensed per user increased significantly over the 20-years and increased non-significantly across the periods. This indicates a slight by steady increase over time. This indicator was related to income in both rural and urban areas, where residents of lower income areas received more types of drugs. This may be appropriate given their demonstrated higher burden of illness.
- The percentage of residents dispensed at least one antidepressant has increased significantly over time, while the percentage dispensed an opioid has decreased.
- The percentage of residents dispensed an opioid was related to income in both rural and urban areas, while the percentage dispensed an antidepressant was only related to income in urban areas. Higher percentages of residents of lower income areas received these types of drugs.

Introduction

This chapter includes two indicators of immunizations and three indicators of prescription drug use. The immunization indicators are derived from the immunization data provided by the MIMS defunct as of June 2016, and its successor, the Manitoba Immunization Registry data stored in the PHMIS. In Manitoba, the publicly funded influenza vaccine policy was expanded in 2010 to provide vaccines to all registered Manitobans at least six months of age. The pharmaceutical use indicators are derived from the Drug Program Information Network (DPIN) data. These data include records for all prescriptions dispensed from community-based pharmacies in Manitoba. Data for drugs provided to patients while in hospital are not included, nor are drugs provided to PCH residents living in facilities serviced by hospital pharmacies. Data for prescriptions dispensed from nursing stations improved dramatically in late 2004, as a result of improvements in information systems. However, this does not guarantee that all prescriptions provided to all residents served by these facilities are entered into the data system.

12.1 Influenza Immunization

Definition: The percentage of residents (all ages) who received an influenza immunization ("flu shot") in a given year. Flu shots were defined by physician tariff codes 8791, 8792, 8793, or 8799 in the MIMS data, and equivalent Systematized Nomenclature of Medicine – Clinical Terms (SNOMED) codes in the Manitoba Immunization Registry data from PHIMS.

Note that the previous Atlas only included residents aged 65 and older. The current Atlas includes all residents.

Time period analysis: The percentage of residents with a flu shot was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: The percentage of residents with a flu shot was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

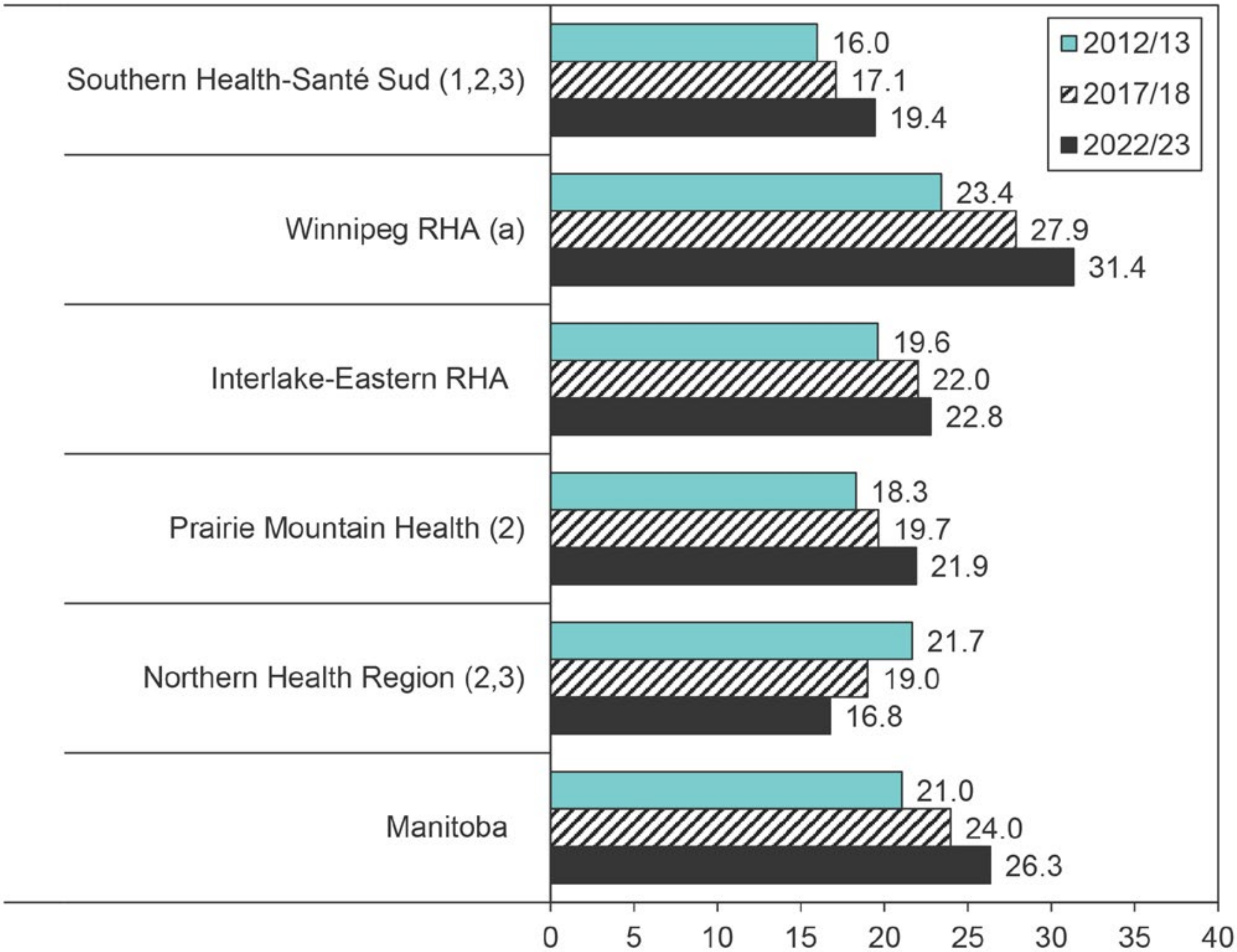
Time Period Analysis (Figure 12.1)

- The proportion of Manitoba residents receiving a flu shot increased from 21.0% in TP1 to 24.0% in TP2 to 26.3% in TP3, though these changes were not statistically significant. Increases were seen in all regions except the Northern Health Region, which saw a decrease in each period. The only significant change was the increase from TP1 to TP2 in the Winnipeg RHA.
- The lowest percentages were observed in the Southern Health-Santé Sud region, which had significantly lower than the Manitoba percentages in each corresponding period. The Northern Health Region also had significantly lower percentages in TP2 and TP3 compared to Manitoba; however, it is possible that the low rates shown in some districts of the Northern Health Region may be related to data capture issues.
- There were significant associations between flu shot percentages and income among urban and rural residents in TP2 and TP3, while no relationship was present for TP1 (see online supplement). In the two more recent periods, residents of lower income areas had lower influenza vaccination percentages.

Trend Analysis (Figure 12.2)

- The percentage of the population who received the flu shot has increased over time in Manitoba and each region. There was a dramatic increase in 2009/10 as a result of the H1N1 pandemic. There was also an increase in each region in 2020/21, which gradually decreased afterwards, as a result of the COVID-19 pandemic.

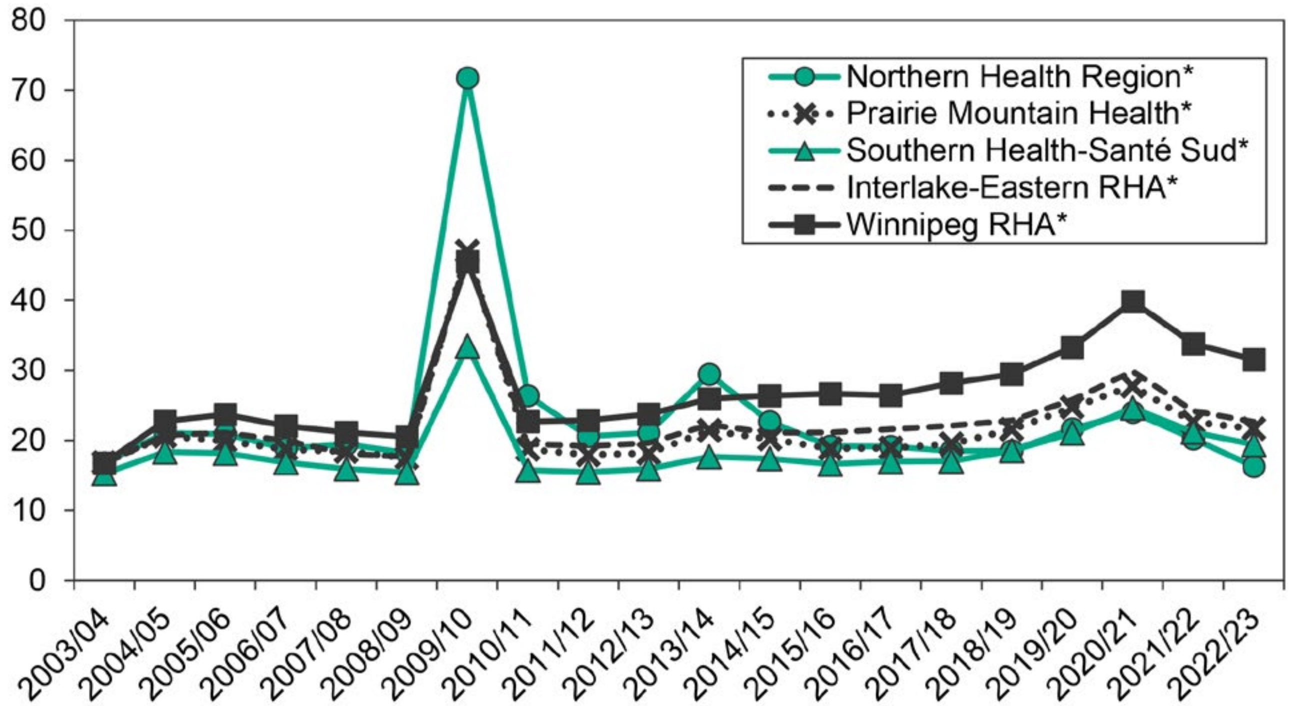
Figure 12.1: Influenza Immunization by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 12.2: Influenza Immunization by Health Region, 2003/04 to 2022/23

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



* statistically significant linear trean over time.

12.2 Pneumococcal Immunization

Definition: The percentage of residents aged 65 and older who received an immunization for pneumonia. The figures show the cumulative percentage of residents who ever had a pneumococcal vaccination, as this immunization is considered a once-in-a-lifetime event for most seniors. Pneumococcal vaccination was defined by physician tariff codes 8681-8684 or 8961 in MIMS data, and equivalent SNOMED codes in the Manitoba Immunization Registry data from PHIMS.

Time period analysis: The percentage of residents with a pneumococcal shot was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population aged 65 years and older in TP3.

Trend analysis: The percentage of residents with a pneumococcal shot was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population aged 65 and older as of December 31, 2022.

Key Findings

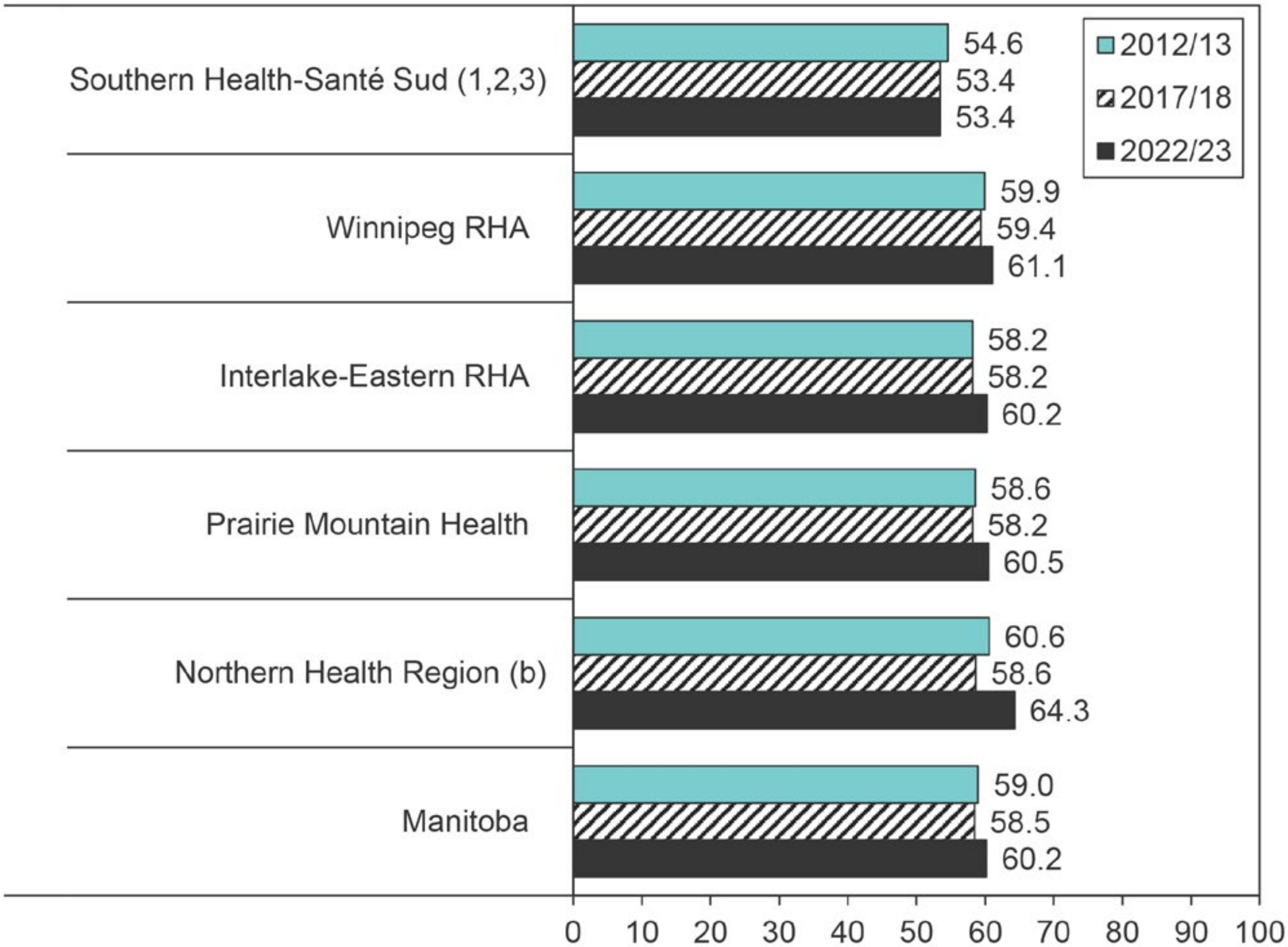
Time Period Analysis (Figure 12.3)

- The cumulative percentage of residents aged 65 and older receiving a pneumococcal vaccination was stable across the time periods in Manitoba and all other regions. There was particularly low variation across regions. The Northern Health Region did have a significantly higher percentage in TP3 compared to TP2.
- There were significant associations between pneumococcal vaccinations and income in rural areas in all three time periods with residents of lower income areas having lower vaccination (see online supplement). In urban areas, there was no association between pneumococcal vaccination rates and income.

Trend Analysis (Figure 12.4)

- Pneumococcal immunizations increased over time in Manitoba and each region, although it has remained stable since 2006/07.

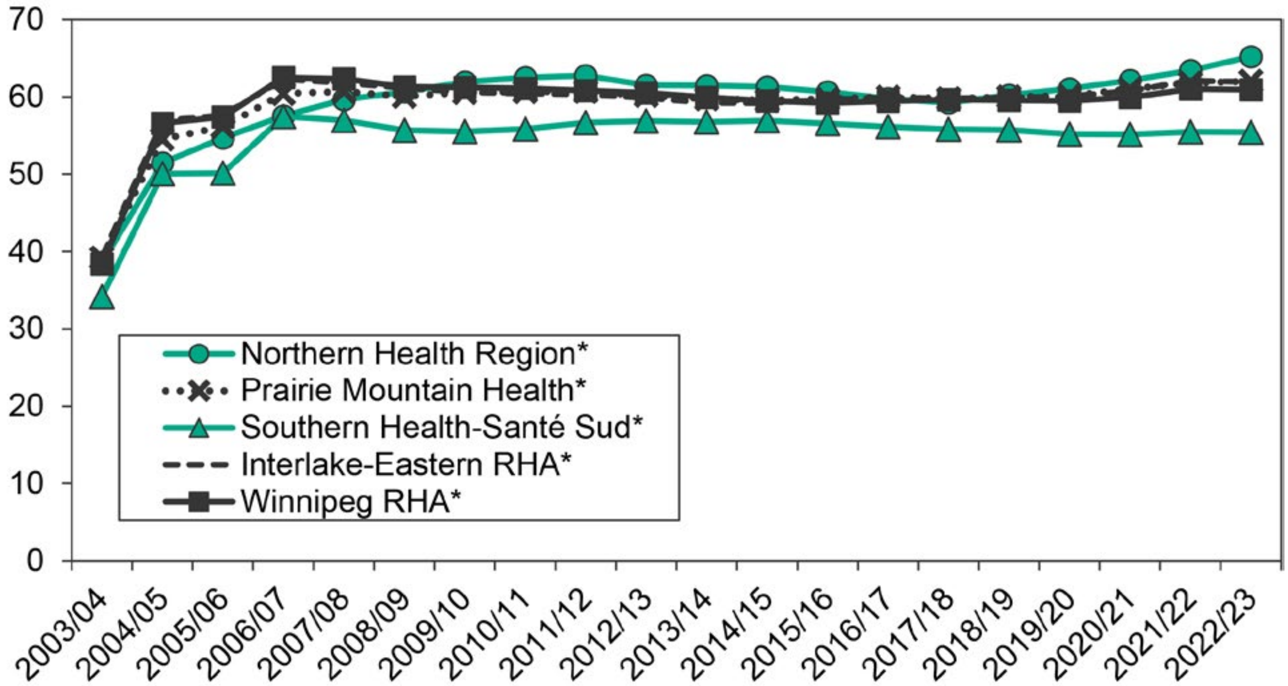
Figure 12.3: Pneumococcal Immunization by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (age 65+) who received a Polysaccharide (PPV-23) vaccination



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 12.4: Pneumococcal Immunization by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted percent of residents (age 65+)



* statistically significant linear trend over time.

12.3 Number of Different Types of Drugs Dispensed per User

Definition: The number of different types of drugs dispensed to each resident (all ages) who had at least one prescription in a given year. Each pharmaceutical agent that falls under a different fourth-level Anatomic Therapeutic Chemical (ATC) class is counted as a “different” drug. This ATC level separates drugs used for different health problems. A person who has several prescriptions for drugs in the same fourth-level ATC class is considered as having one drug type in that year. Using antidepressants an example, the ATC system identifies 5 fourth-level codes (N06AA, N06AB, N06AF, N0AG, and N06AX). If a person who has multiple antidepressant dispensations and they all fall under one fourth-level code, they would only have one type of drug dispensed. However, if they had dispensations that fall under two different fourth-level codes, they would have two types of drugs dispensed.

Time period analysis: The rate of number of different drugs dispensed per user was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population with one or more prescription dispensations in TP3.

Trend analysis: The rate of number of different drugs dispensed per user was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population with one or more prescription dispensations in 2022/23.

Key Findings

Time Period Analysis (Figure 12.5)

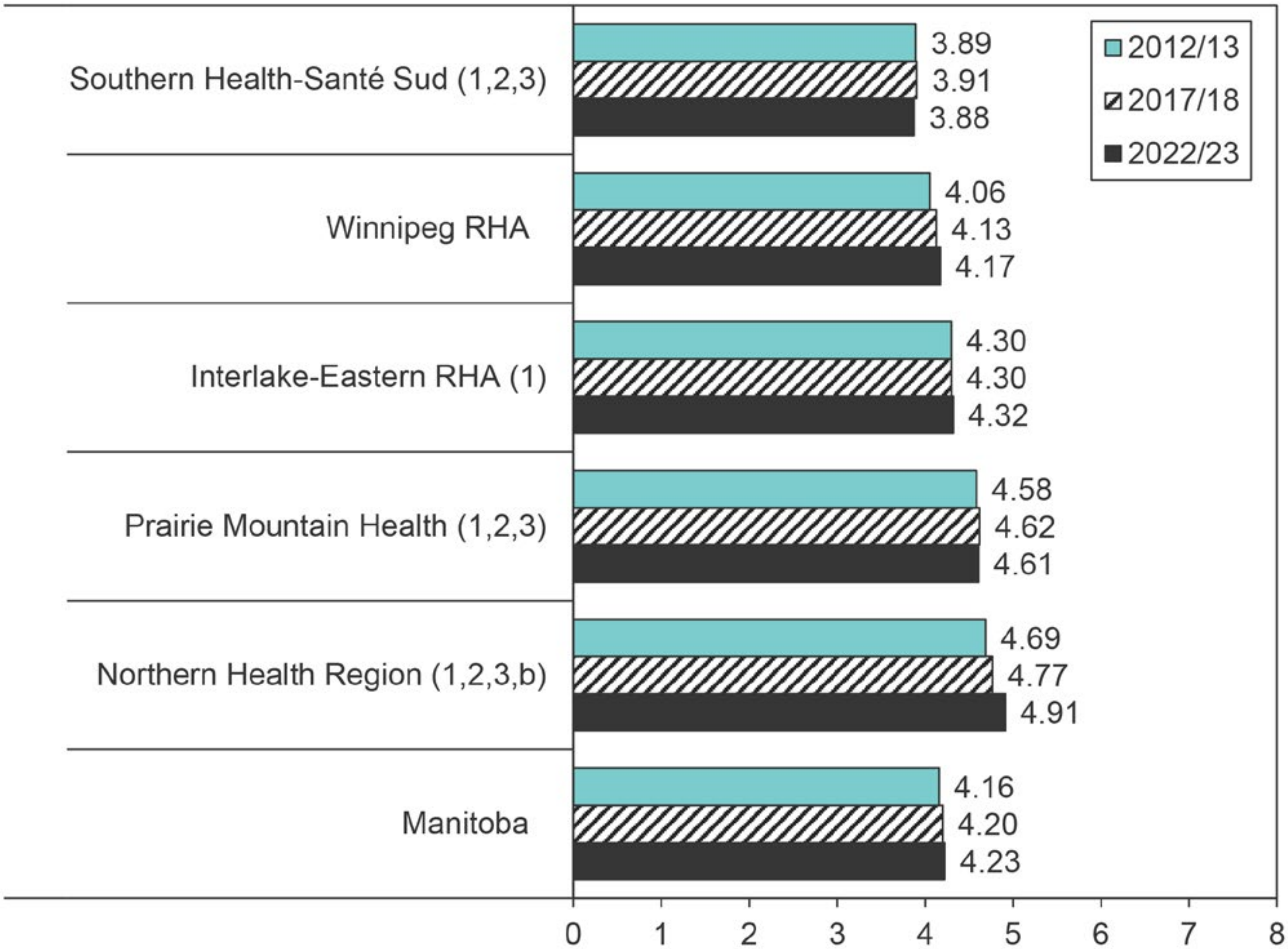
- The number of different drug types dispensed per user was stable overall: the slight increases from 4.16 in TP1 to 4.20 in TP2 to 4.23 in TP3 were not statistically significant. Rates in each region were stable, where the only significant change was the increase from 4.77 in TP2 to 4.91 in TP3 in the Northern Health Region.
- The Southern Health-Santé Sud region had the lowest number of drug types dispensed in all three periods, which were significantly lower than the Manitoba averages. Prairie Mountain Health and Northern Health Region both had significantly higher numbers of different drugs dispensed than the Manitoba average.
- The number of different drug types dispensed per user appears to be related to health status as the number per user increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- The number of different drug types dispensed was associated to income in urban and rural areas in both time periods: residents of lower income areas used a higher number of different drug types (see online supplement). This is consistent with their presumed higher need for health care given their poorer overall health status. The high rates among residents of the lowest income quintiles suggest that the provincial drug program, which is based on the total family income, appears to be working. Without coverage, we would expect lower income residents to have low prescription drug use rates. The slope of the income gradient was reduced in the third period compared to the second period in the rural areas representing a decrease in the gap between the highest and lowest income quintiles.

Trend Analysis (Figure 12.6)

- The number of different types of drugs dispensed among those who were dispensed at least one drug increased steadily over time in Manitoba and each region. All regions showed a slight decrease in 2020/21, which increased afterwards.

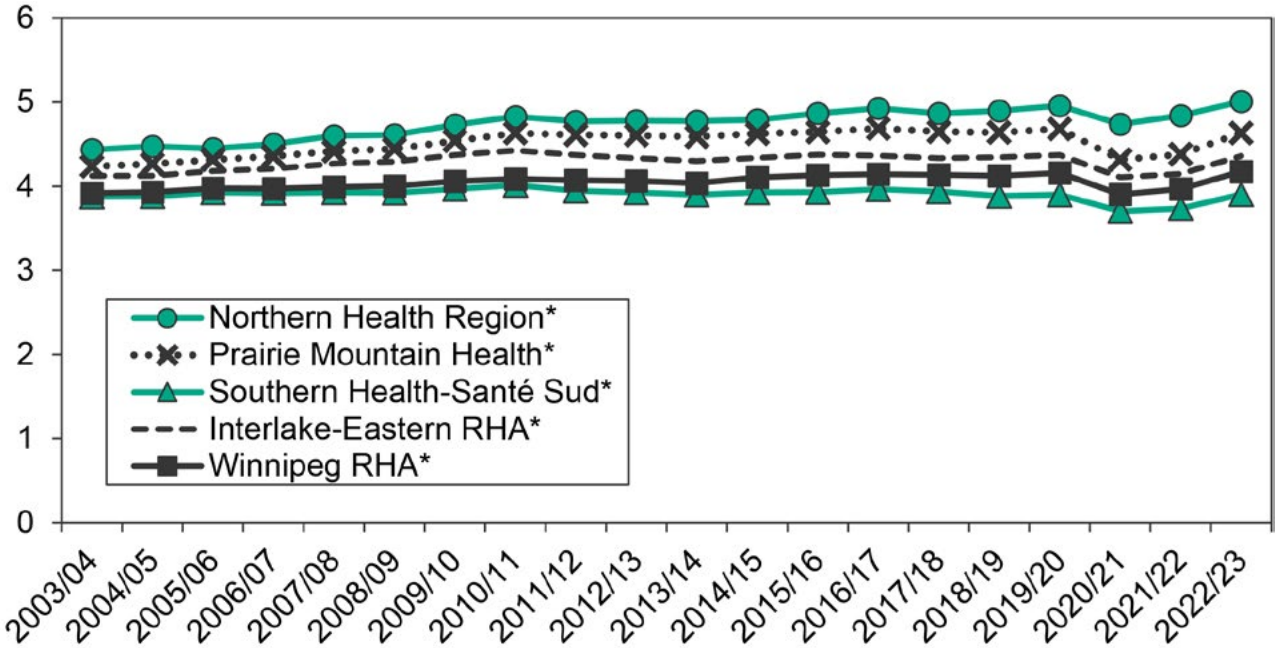
Figure 12.5: Number of Different Types of Drugs Dispensed by Health Region, 2012/13, 2017/18, and 2022/23

Age- and sex-adjusted average number of different drugs dispensed per resident with at least one prescription dispensed (all ages)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 12.6: Number of Different Types of Drugs Dispensed by Health Region, 2003/04 to 2022/23
Age- and sex-adjusted average number of different drugs dispensed per resident with at least one prescription dispensed (all ages)



* statistically significant linear trend over time.

12.4 Antidepressant Use

Definition: The percentage of residents who were dispensed an antidepressant drug at least once in a fiscal year.

Time period analysis: Percentage of residents with one or more dispensations for antidepressants was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Percentage of residents with one or more dispensations for antidepressants was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

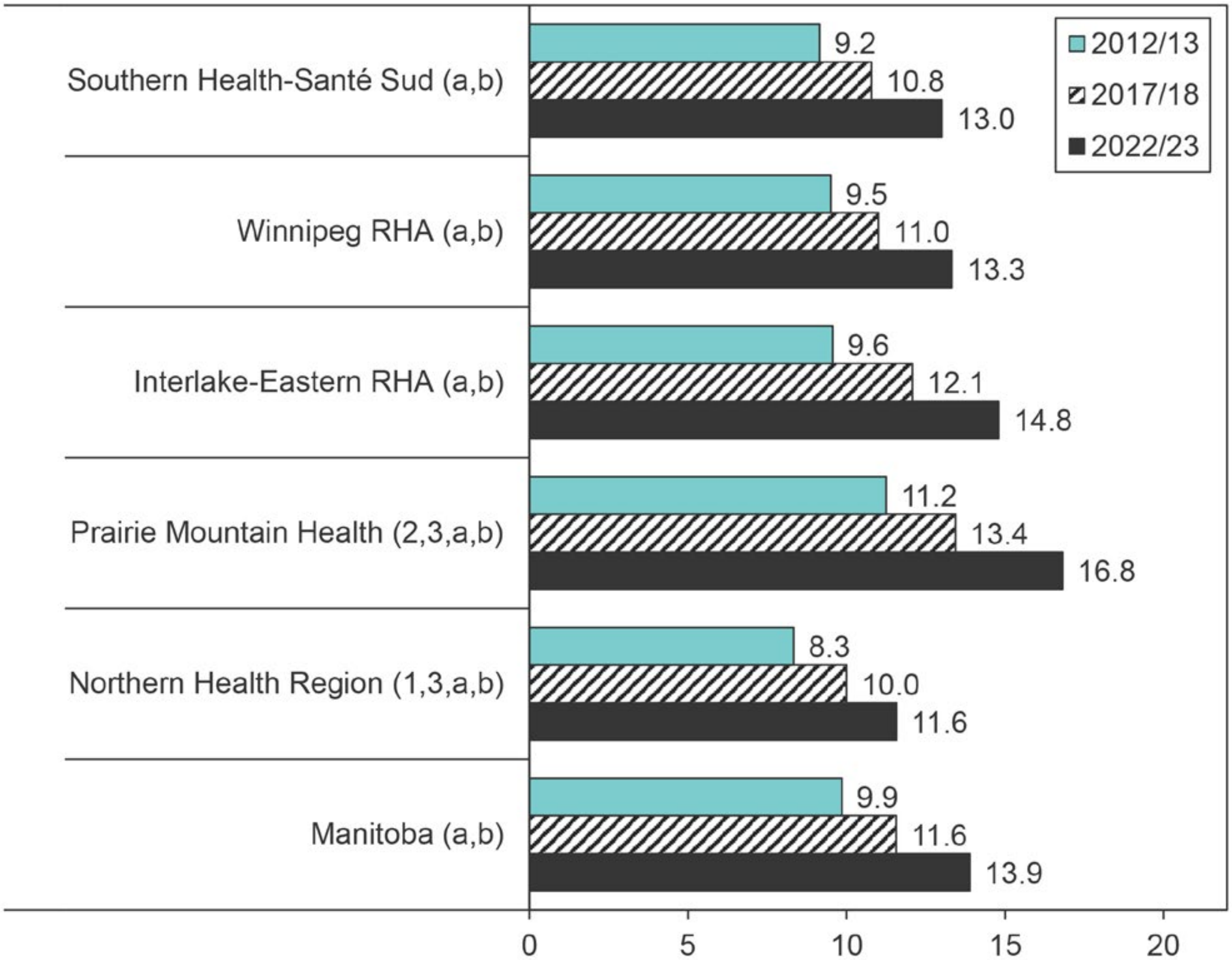
Time Period Analysis (Figure 12.7)

- In the province overall, the percentage of residents who were dispensed at least one antidepressant in the year has increased significantly from 9.9% in TP1 to 11.6% in TP2 to 13.9% in TP3. Indeed, the number of people who were dispensed an antidepressant at least once increased by 21.7% from TP1 to TP2 and 23.7% from TP2 to TP3 (online supplement). Significant increases were observed in each region and there was little variation between the regions.
- There were significant associations between antidepressant use and income in urban areas in all three time periods with residents of lower income areas having higher percentages (see online supplement). In rural areas, there were no associations between antidepressant use and income.

Trend Analysis (Figure 12.8)

- The percentage of residents who were dispensed an antidepressant increased over time in Manitoba and each region. The steepest amount of increase appears to occur between 2013/14 and 2020/21. Prairie Mountain Health consistently has the highest percentages.

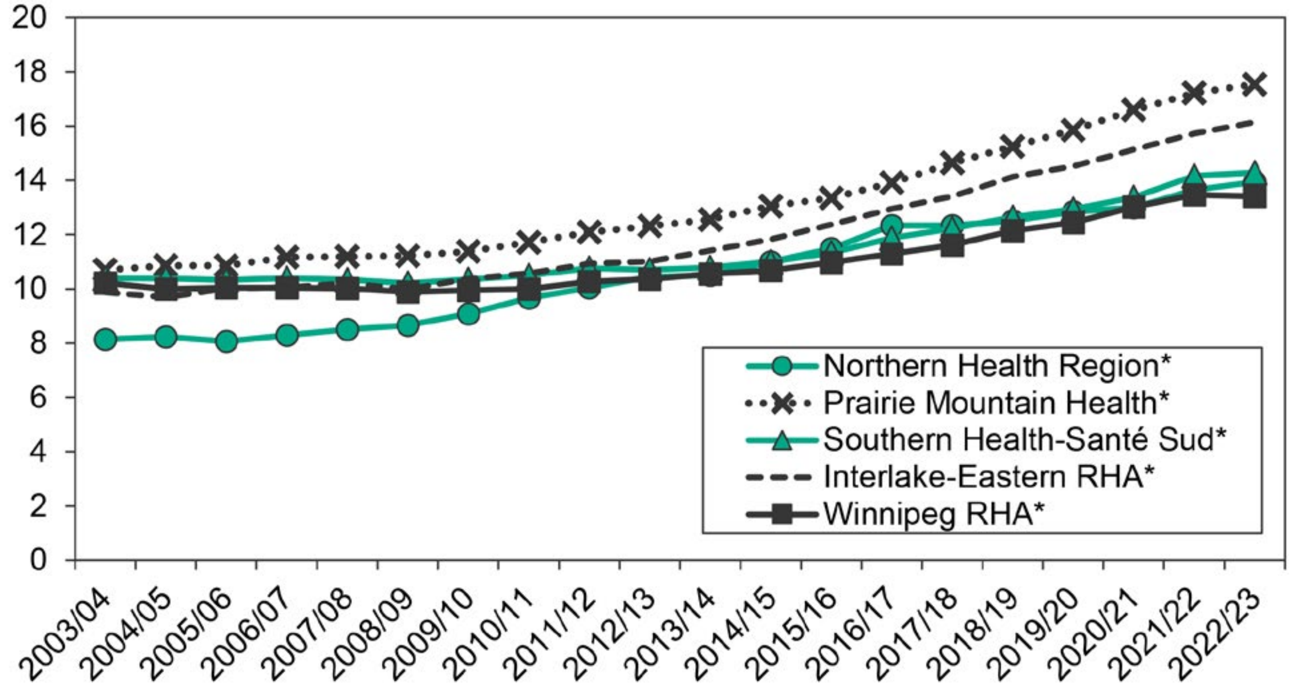
Figure 12.7: Antidepressant Use by Health Region, 2012/13, 2017/18, and 2022/23
Age- and sex-adjusted percent of residents (all ages) with at least one antidepressant dispensation



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 12.8: Antidepressant Use by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted percent of residents (all ages) with at least one antidepressant dispensation



* statistically significant linear trend over time.

12.5 Opioid Use

Definition: The percentage of residents who were dispensed an opioid drug at least once in a fiscal year. All prescription opioids were included, and dispensations were identified with ATC code N02A.

Note that the administrative data captures prescription opioid dispensations and not illicit opioid use. Therefore, the results for this indicator should not be interpreted as the overall opioid use within the province and regions.

Time period analysis: Percentage of residents with one or more dispensations for opioids was calculated for 3 one-year periods: 2012/13 (TP1), 2017/18 (TP2), and 2022/23 (TP3) and was age- and sex-adjusted to the Manitoba population in TP3.

Trend analysis: Percentage of residents with one or more dispensations for opioids was calculated for each one-year period from 2003/04 to 2022/23 and was age- and sex-adjusted to the Manitoba population as of December 31, 2022.

Key Findings

Time Period Analysis (Figure 12.9)

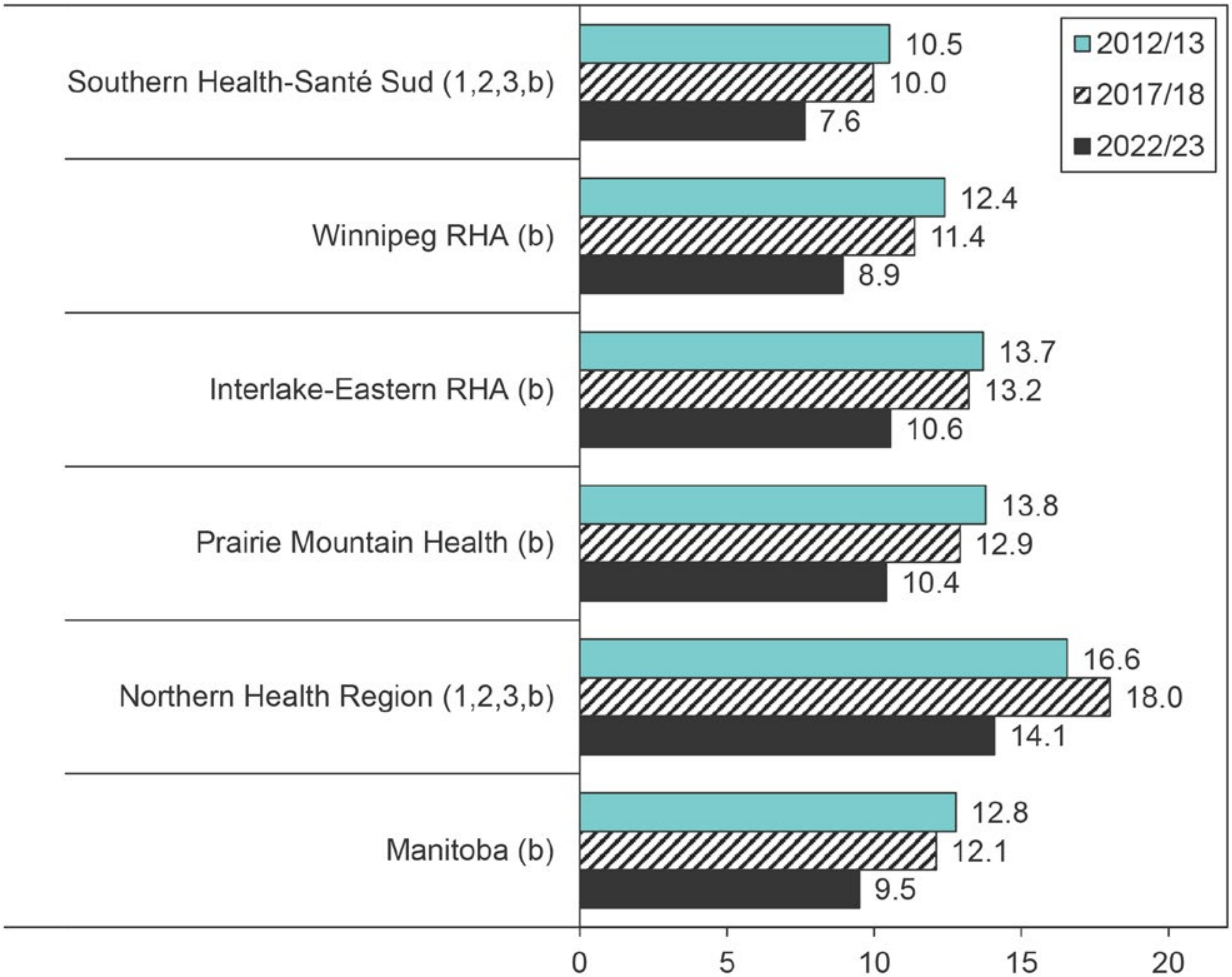
- In the province overall, the percentage of residents who were dispensed at least one opioid in the year has decreased from 12.8% in TP1 to 12.1% in TP2 to 9.5% in TP3. The change between TP2 and TP3 was significant. The number of people dispensed a prescription opioid decreased from 162,564 in TP2 to 136,617 in TP3 (online supplement). A similar pattern was observed in each region with significant decreases occurring between TP2 and TP3. There was little variation between the regions.
- In Southern Health-Santé Sud and the Northern Health Region, the percentages in each period were significantly lower and higher, respectively, from the Manitoba percentages in each corresponding period.
- The percentage dispensed an opioid appears to be related to health status as the percentage increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- There were significant associations between opioid use and income in rural and urban areas in all three time periods with residents of lower income areas having higher percentages (see online supplement).

Trend Analysis (Figure 12.10)

- The percentage of residents with at least one opioid dispensation has decreased over time in Manitoba and each region except for the Northern Health Region. The percentage in the Northern Health Region increased between 2003/04 to 2016/17 before starting to decrease.

Figure 12.9: Opioid Use by Health Region, 2012/13, 2017/18, and 2022/23

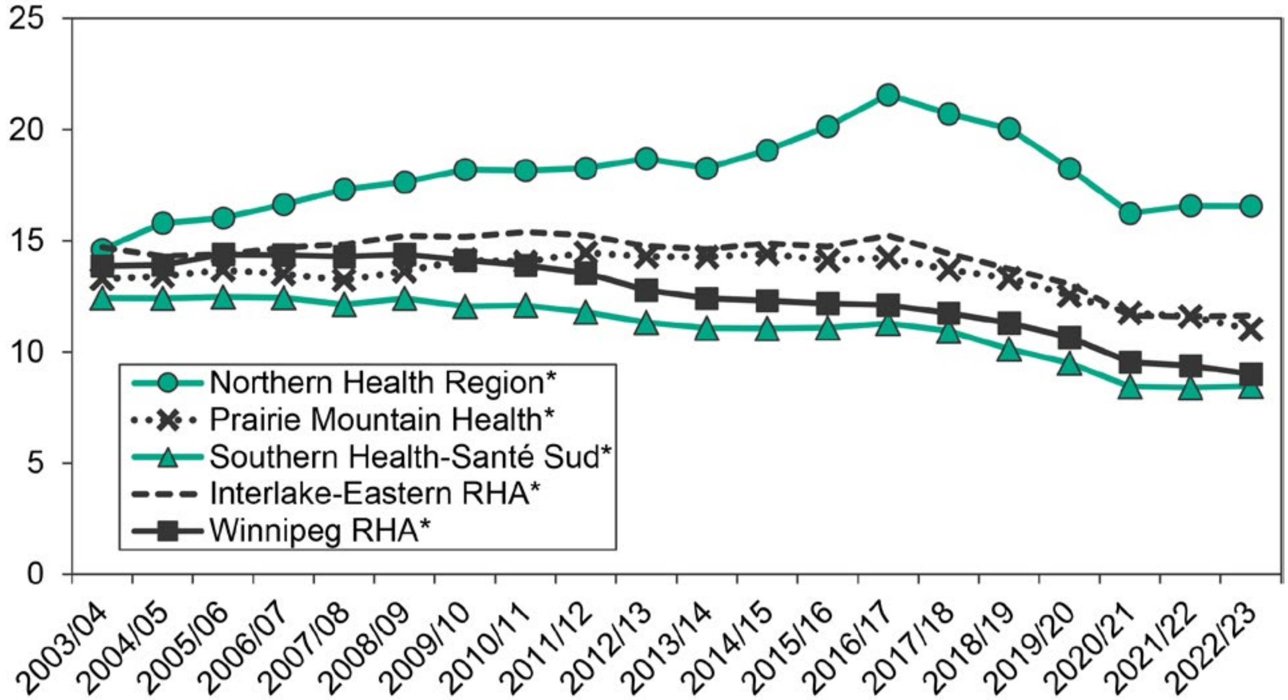
Age- and sex-adjusted percent of residents (all ages) with at least one opioid dispensation



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 12.10: Opioid Use by Health Region, 2003/04 to 2022/23

Age- and sex-adjusted percent of residents (all ages) with at least one opioid dispensation



* statistically significant linear trend over time.

Chapter 13:
Lab Tests

Key Findings in Chapter 13

Three lab tests were examined in this new chapter. These included the urine albumin to creatinine ratio (ACR) tests, estimated glomerular filtration rate (eGFR) tests, and hemoglobin A1C (HbA1c) tests.

- The rates of each test have increased over the 20-year period. Within the rural regions, the most dramatic increases occurred between 2010/11 and 2015/16 when more facilities began recording data in the provincial laboratory system. These increases in the Winnipeg RHA were relatively steady compared to those in the rural regions.
- There were significant increases from the first to second time period for each test, while it only increased from the second to third period for ACR tests. There were non-significant decreases for eGFR and HbA1c tests from the second to third periods.
- The Atlas also looked at the prevalence and incidence of diabetes, which the HbA1c tests is intended to help determine. We saw that diabetes incidence significantly increased from the second to third period and prevalence increased non-significantly. The fact that HbA1c tests increased from the first to second period may support the idea that these tests could provide information to help planners predict future burden. The test rates decreased in the third period; therefore, it will be interesting to see if the diabetes prevalence and incidence responds accordingly.

Introduction

The three indicators in this chapter are new to the Atlas and are intended to get a sense of the number of lab tests that are being conducted for certain conditions. These tests are used to screen or help diagnose these conditions and provide information for planners to predict the potential burden of these conditions. The three tests are:

- Urine albumin to creatinine ratio (ACR) test, which measures the amount of protein in urine and is used to determine the function of an individual's kidneys.
- Estimated glomerular filtration rate (eGFR) test, which is a blood test to measure kidney function and determine kidney disease stage.
- Hemoglobin A1C (HbA1c) test measures the average blood sugar level over the past two to three months and this is used to diagnose diabetes.

Changes in the rates of these tests may indicate that the incidence and prevalence of a condition may also be changing and allow planners to anticipate the appropriate level of services that are or will be required.

Note about the data: The lab test data was obtained from SHDS, which is Manitoba's public sector laboratory and diagnostic imaging provider. This includes services formerly provided by Diagnostic Services Manitoba. The SHDS data held in the Repository only includes laboratory data; it does not include data related to imaging services and non-invasive cardiac tests and is available in the Repository since May 2005; however, there are different start dates for the collection of data at different facilities. As such, more and more facilities are recording data in the SHDS database over time. Lastly, data from private laboratories is not included leading to gaps in the number of tests conducted.

13.1 Urine Albumin to Creatinine Ratio (ACR) Test Rate

Definition: The total number of ACR lab tests per 1,000 residents (aged 40 and older). In any given period, a resident could have had more than one ACR test.

Time period analysis: ACR test rates were calculated for 3 one-year periods: 2011/12 (TP1), 2016/17 (TP2), and 2021/22 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3

Trend analysis: ACR test rates were calculated for each one-year period from 2006/07-2021/22 and were age- and sex-adjusted to the Manitoba population in aged 40 and older as of December 31, 2021.

Key Findings

Time Period Analysis (Figure 13.1)

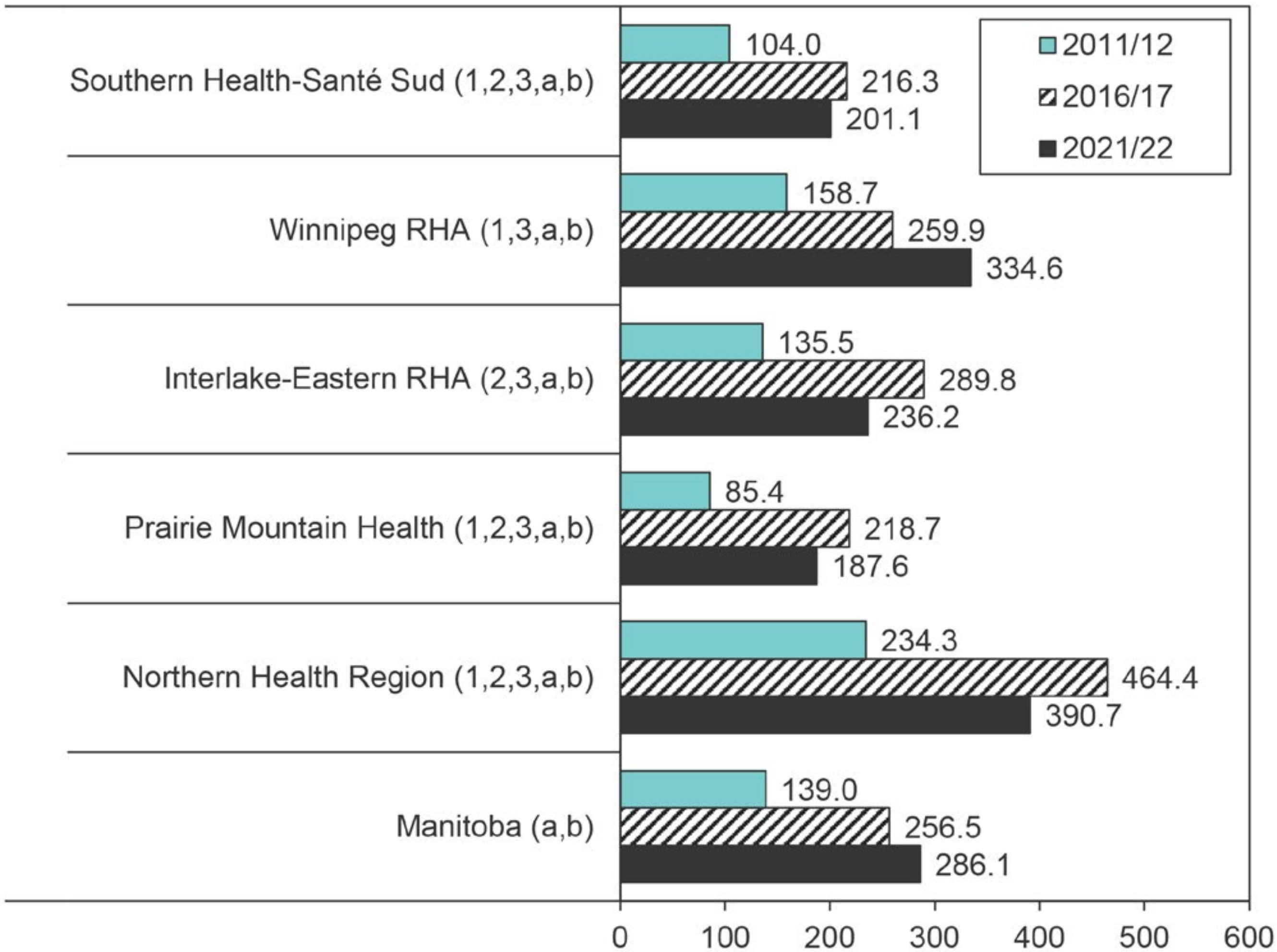
- Overall, the rate of ACR tests significantly increased from 139.0 per 1,000 residents aged 40 and older in TP1 to 256.5 in TP2 to 286.1 in TP3. A similar pattern existed in the Winnipeg RHA, while the rates significantly decreased from TP2 to TP3 in the other regions.
- The highest rates in each period were in the Northern Health Region, which were significantly higher than the Manitoba rates. The lowest rates were in the Southern Health-Santé Sud and Prairie Mountain Health regions, which were significantly lower than the Manitoba rates.

Trend Analysis (Figure 13.2)

- ACR test rates have increased over time in Manitoba and each region. A dramatic increase began in 2010/11 in all regions, though it was more gradual in the Winnipeg RHA. Rates evened out around 2013/14.

Figure 13.1: Urine Albumin to Creatinine Ratio (ACR) Lab Test Rate by Health Region, 2011/12, 2016/17, and 2021/22

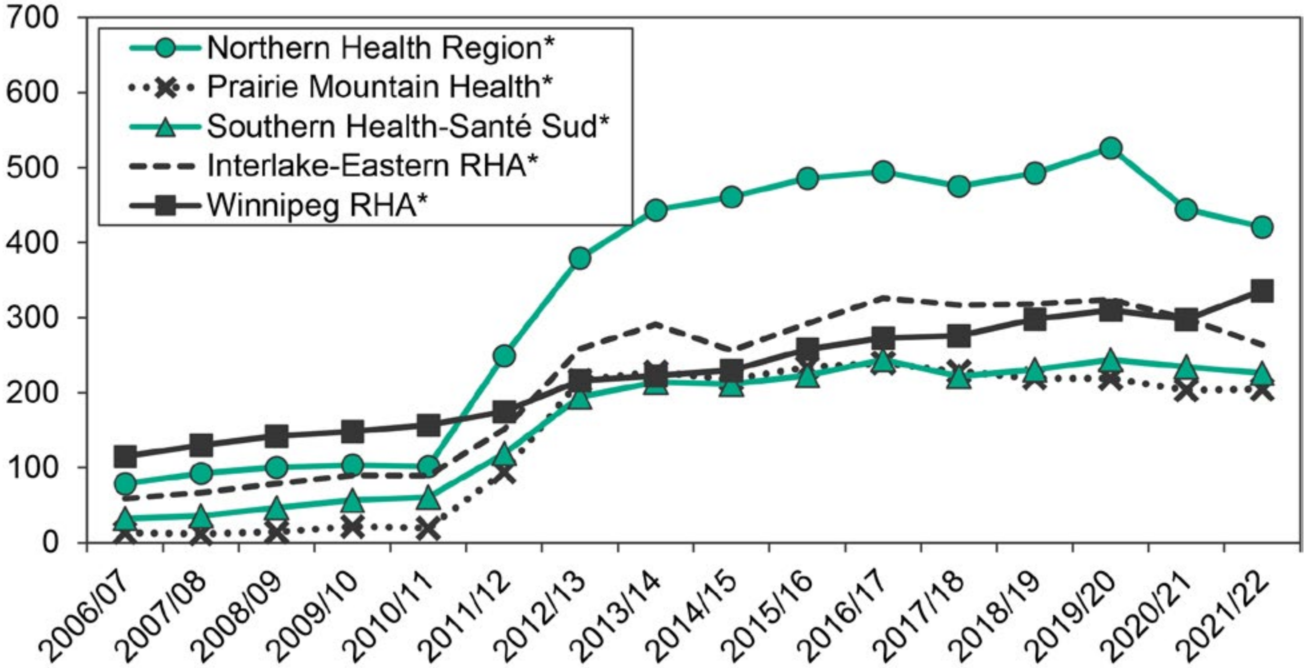
Age- and sex-adjusted rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 13.2: Urine Albumin to Creatinine Ratio (ACR) Lab Test Rate by Health Region, 2006/07 to 2021/22

Age- and sex-adjusted rates per 1,000 residents (age 40+)



* statistically significant linear trend over time.

13.2 Estimated Glomerular Filtration Rate (eGFR) Test Rate

Definition: The total number of eGFR lab tests per 1,000 residents (aged 40 and older). In any given period, a resident could have had more than one eGFR test.

Time period analysis: eGFR test rates were calculated for 3 one-year periods: 2011/12 (TP1), 2016/17 (TP2), and 2021/22 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3.

Trend analysis: eGFR test rates were calculated for each one-year period from 2006/07-2021/22 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2021.

Key Findings

Time Period Analysis (Figure 13.3)

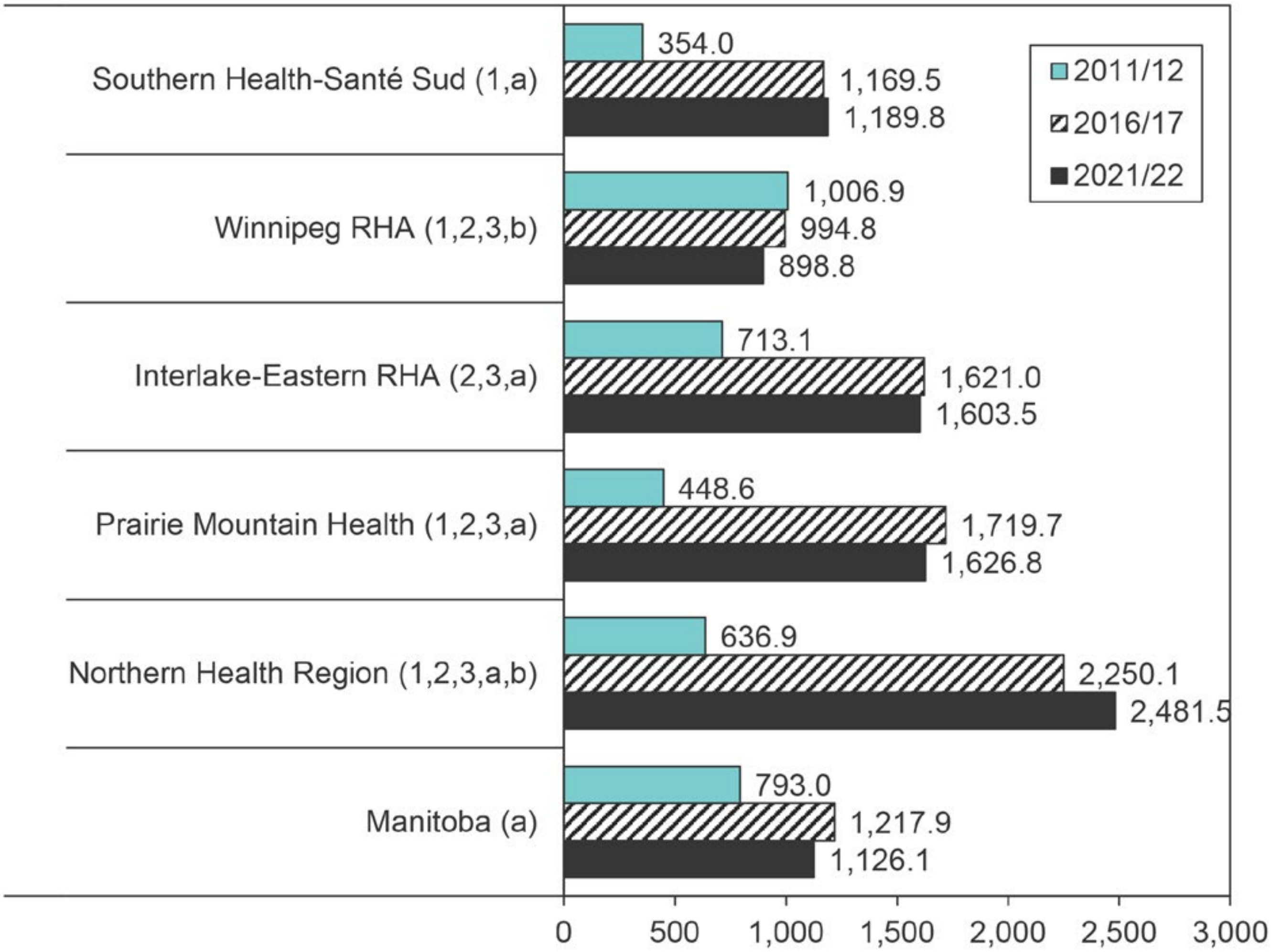
- Overall, the rate of eGFR tests significantly increased from 793.0 per 1,000 residents aged 40 and older in TP1 to 1,217.9 in TP2 and then decreased to 1,126.1 in TP3. The patterns varied across the regions. Southern Health-Santé Sud, Interlake-Eastern RHA, and Prairie Mountain Health region all showed a significant increase from TP1 to TP2, which did not change in TP3. The Winnipeg RHA decreased across periods with the change from TP2 to TP3 being significant, while the rates in the Northern Health Region significantly increased across the periods.
- The highest rates in the second and third periods were in the Northern Health Region, while they were the lowest in the Winnipeg RHA.
- The rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Rates were associated to income in urban areas in all three periods where residents from lower income areas had higher rates of tests (see online supplement). The rates in rural areas were associated to income in the second and third periods.

Trend Analysis (Figure 13.4)

- eGFR test rates have increased over time in Manitoba and each region except the Winnipeg RHA. A dramatic increase began in 2010/11 in Southern Health-Santé Sud, Interlake-Eastern RHA, and Prairie Mountain Health region, and in 2013/14 in the Northern Health Region. Rates began to plateau around 2016/17.

Figure 13.3: Estimated Glomerular Filtration Rate (eGFR) Lab Test Rate by Health Region, 2011/12, 2016/17, and 2021/22

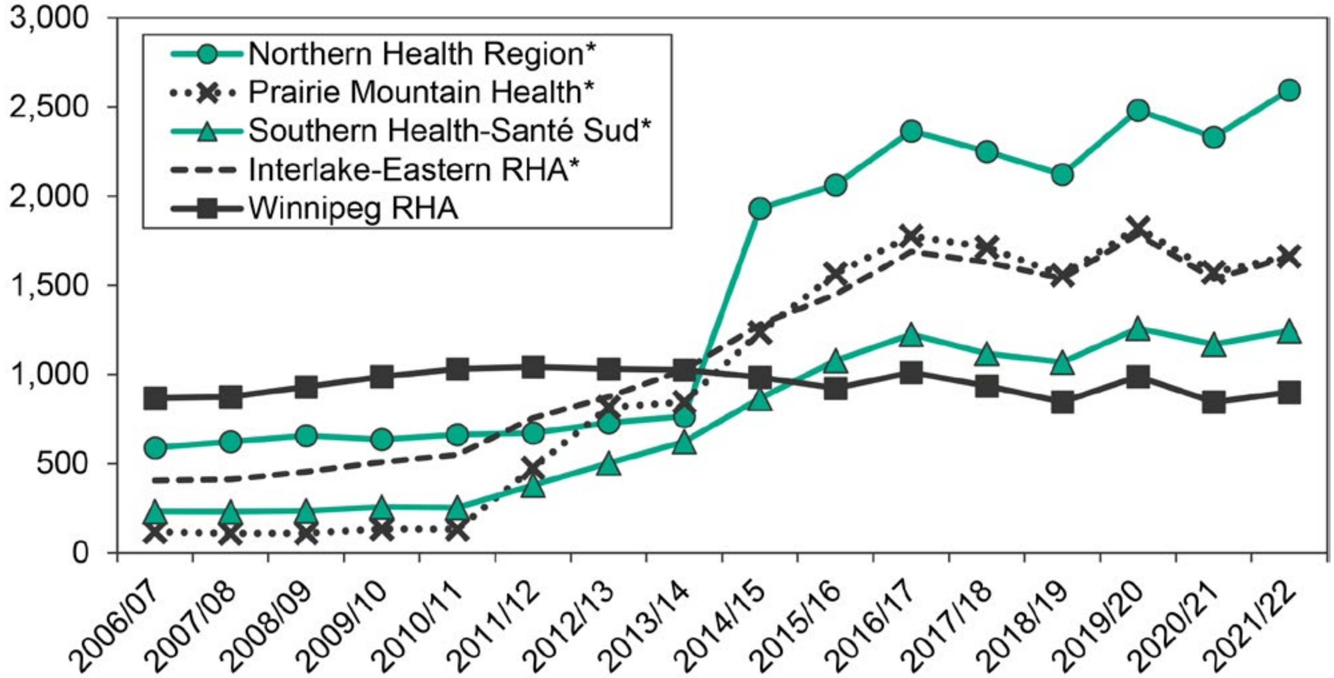
Age- and sex-adjusted rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
a statistically significant difference between the first and second time period
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 13.4: Estimated Glomerular Filtration Rate (eGFR) Lab Test Rate by Health Region, 2006/07 to 2021/22

Age- and sex-adjusted rate of tests per 1,000 residents (age 40+)



* statistically significant linear trend over time.

13.3 Hemoglobin A1C (HbA1c) Test Rate

Definition: The total number of HbA1c lab tests per 1,000 residents (aged 40 and older). In any given period, a resident could have had more than one HbA1c test.

Note on the data: Caution should be used when interpreting these results as the number of tests are undercounted in the SHDS data because most of the HbA1c testing is done in private labs.

Time period analysis: HbA1c test rates were calculated for 3 one-year periods: 2011/12 (TP1), 2016/17 (TP2), and 2021/22 (TP3) and were age- and sex-adjusted to the Manitoba population aged 40 and older in TP3.

Trend analysis: HbA1c test rates were calculated for each one-year period from 2006/07-2021/22 and were age- and sex-adjusted to the Manitoba population aged 40 and older as of December 31, 2021.

Key Findings

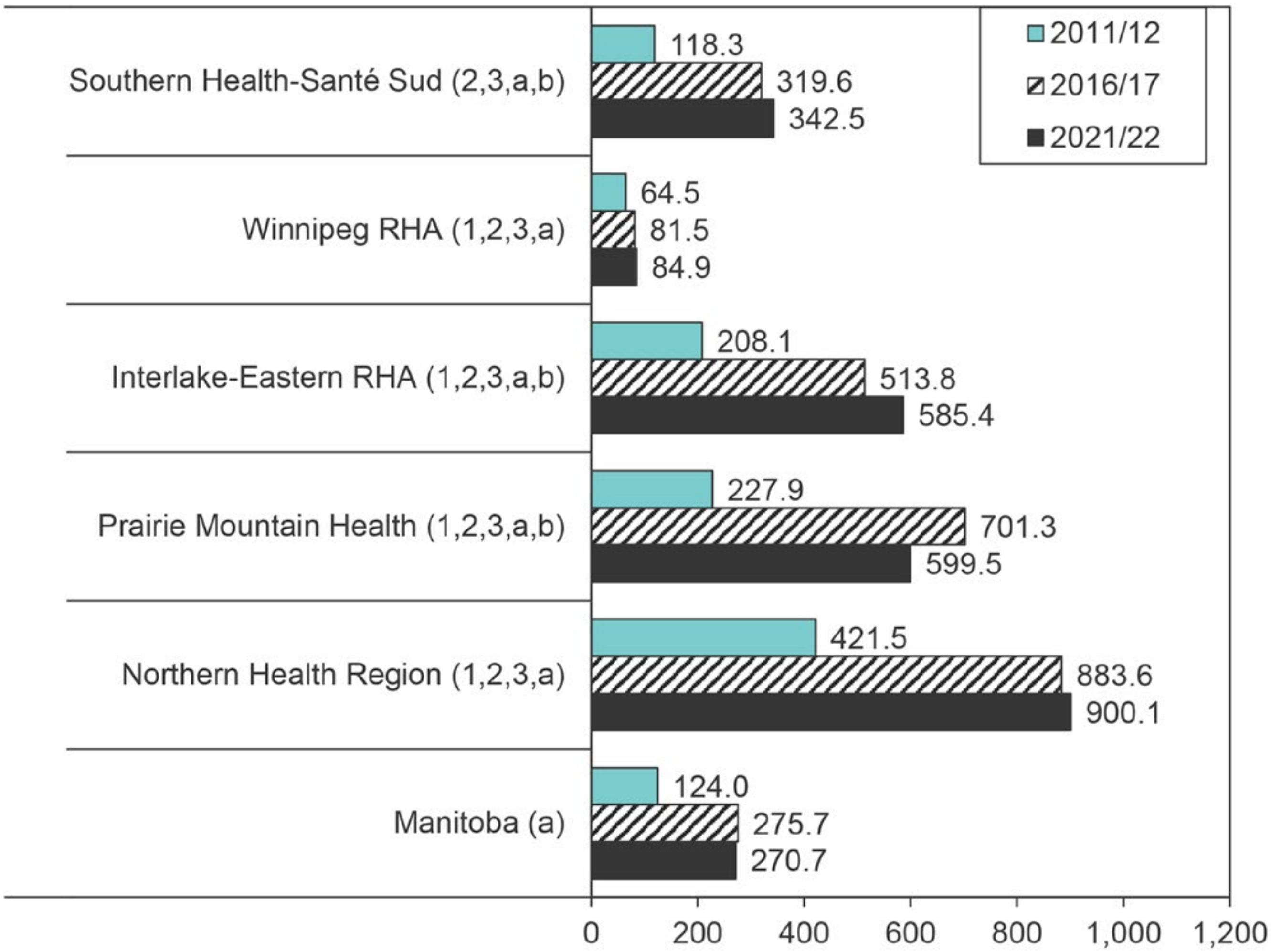
Time Period Analysis (Figure 13.5)

- Overall, the rate of HbA1c tests significantly increased from 124.0 per 1,000 residents aged 40 and older in TP1 to 275.7 in TP2 and then decreased to 270.7 in TP3. The patterns varied across the regions. The Southern Health-Santé Sud region and Interlake-Eastern RHA both showed a significant increase across the periods, the Winnipeg RHA and the Northern Health Region increases across each period, but only significantly between TP2 and TP3, and Prairie Mountain Health had significantly increased and then significantly decreased.
- The highest rates in all three periods were in the Northern Health Region, while they were the lowest in the Winnipeg RHA. The rates in the Northern Health Region were significantly higher than the Manitoba rates, while the rates in the Winnipeg RHA were significantly lower.
- The rates appear to be related to health status as the rate increases across the regions from Southern Health-Santé Sud to the Northern Health Region.
- Rates were associated to income in rural and urban areas in all three periods where residents from lower income areas had higher rates of tests (see online supplement).

Trend Analysis (Figure 13.6)

- HbA1c test rates have increased over time in Manitoba and each region. The amount of increase in the rural regions was related to health status where the increase was greatest in the Northern Health Region and lowest in the Southern Health-Santé Sud region. A dramatic increase began in 2010/11 in regions, except the Winnipeg RHA which was relatively stable. Rates began to plateau around 2016/17.

Figure 13.5: Hemoglobin A1C (HbA1c) Test Rate by Health Region, 2011/12, 2016/17, and 2021/22
Age- and sex-adjusted rate per 1,000 residents (age 40+)



1,2,3 statistically significant difference from the Manitoba average in the first, second or third time period
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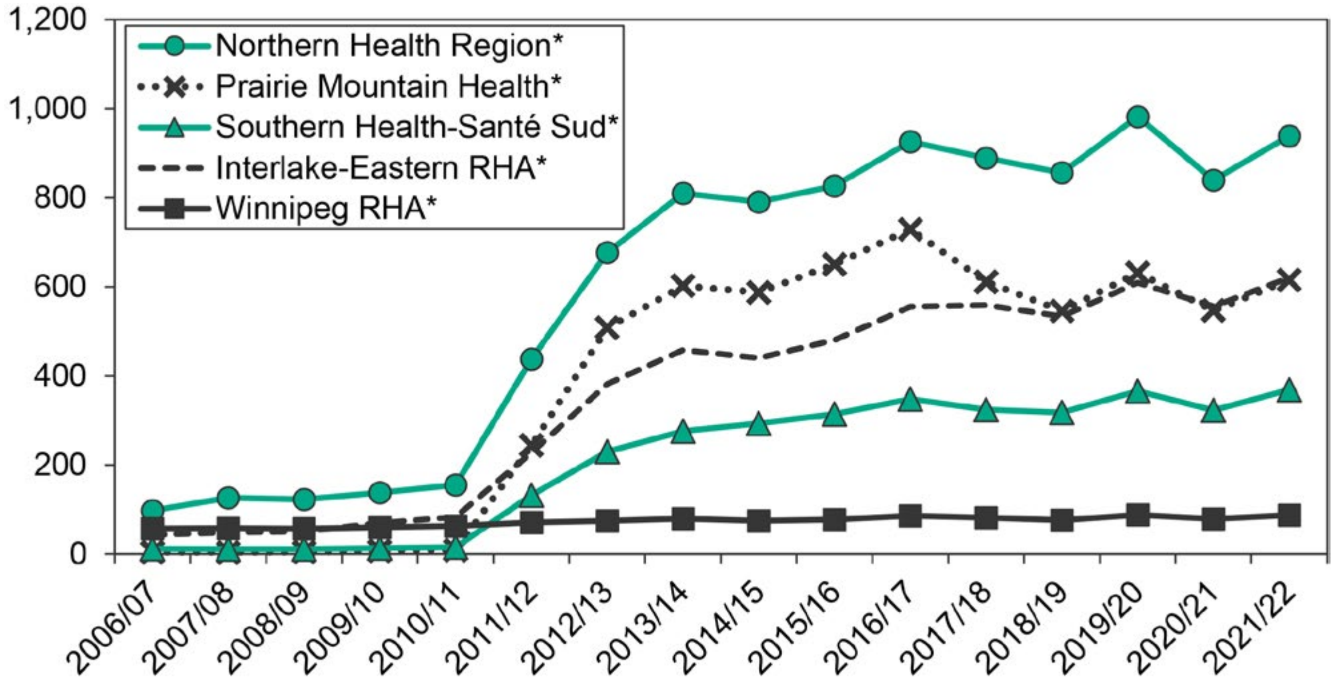
b statistically significant difference between the second and third time period
s data suppressed due to small numbers

Figure 13.6: Hemoglobin A1C (HbA1c) Test Rate by Health Region, 2006/07 to 2021/22
Age- and sex-adjusted rates per 1,000 residents (age 40+)



* statistically significant linear trend over time.

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Appendix: Online Supplement (Data Extras)

Two types of analyses were conducted for most indicators in the 2024 RHA Atlas. A time period analysis in which indicators were measured over three periods, and a trend analysis in which indicators were measured annually over a 20-year period. Figures and tables for the two types of analyses were created where possible and are available in the online supplement as data extras. For some indicators, the length of time periods, the type of measures, and/or the measurement levels (e.g., geographical area) were altered according to how frequently it occurred. The output and all figures and tables generated from these analyses are contained in Microsoft Excel files.

Secondary analysis for select indicators was conducted that produced rates stratified by age (5-year age groups) and sex. The output from this analysis is contained in tables generated in Microsoft Excel.

The periods, measures, and measurement levels for each type of analysis, along with the figures & tables generated from the analysis that are included in the online files are provided below.

Time Period Analysis

- **Periods:** 2012/13, 2017/18, 2022/23
- **Measures:** Count, Crude Rate, Adjusted Rate
- **Measurement Level:** Manitoba, RHAs, Winnipeg Community Areas, Winnipeg Neighbourhood Clusters, Rural RHA Zones, Rural RHA Districts, Income Quintile
- **Figures:**
    1. Manitoba and RHAs (adjusted rate measures only)
    2. Income Quintile (adjusted rate measures only)
- **Tables**:
    1. Manitoba and RHAs (all measures)
    2. Winnipeg Community Areas (all measures)
    3. Winnipeg Neighbourhood Clusters (all measures)
    4. Southern Zones or Districts (all measures)
    5. Interlake-Eastern Zones or Districts (all measures)
    6. Prairie Mountain Zones or Districts (all measures)
    7. Northern Zones or Districts (all measures)
    8. Income Quintile (adjusted rate measures only)

Trend Analysis

- **Period:** 2003/04 to 2022/23
- **Measures:** Count, Crude Rate, Adjusted Rate
- **Measurement Level:** Manitoba, RHAs
- **Figure:**
    1. RHA (adjusted rates)
- **Tables:**
    1. Manitoba and RHAs (counts)
    2. Manitoba and RHAs (crude rates)
    3. Manitoba and RHAs (adjusted rates)

Age and Sex Stratified Analysis

- **Periods:** 2017/18, 2022/23
- **Measures:** Count, Crude Rate
- **Measurement Level:** Manitoba
- **Indicators:**
    - Diabetes Incidence
    - Diabetes Prevalence
    - Hypertension Incidence
    - Hypertension Prevalence
    - Hospitalization Use (% of population with at least one hospitalization)
    - Hospital Readmissions (30-day)
    - Hospitalization Rate
    - Acute Hospital Days Rate
    - Ambulatory Care Sensitive Conditions Hospitalization Rate
    - Coronary Artery Bypass Graft Surgery Rate
    - Cardiac Catheterization Rate
    - Computed Tomography (CT) Scan Rate
    - Hip Replacement Surgery Rate
    - Knee Replacement Surgery Rate
    - Magnetic Resonance Imaging (MRI) Rate
    - Percutaneous Coronary Intervention (PCI) Rate
    - Caesarean Section Rate
    - Stroke Rate

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