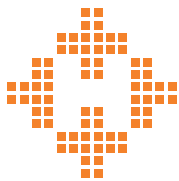# The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use

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THE MANITOBA CENTRE FOR HEALTH POLICY

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

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

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

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Introduction

Evidence-based decision-making requires provision of information to those who need to make those decisions. In planning for the needs of Manitoba's eleven[1] non-Winnipeg Regional Health Authorities (RHAs), policy makers, decision-makers, and planners all require population-based health information. This helps create a picture of the health status, burden of illness, and the way in which people use health care services.

Context

The Need To Know project is an opportunity whereby key people from three partners – Manitoba Centre for Health Policy (MCHP), Manitoba Health, and the non-Winnipeg RHAs – work collaboratively as a research, capacity-building, and knowledge translation team. This collaboration is funded through a five-year grant from the Canadian Institutes of Health Research (CIHR), and co-directed by Drs. Patricia Martens and Charlyn Black. This RHA indicators atlas is the first joint research project of *The Need To Know Team*.

Process and Methods

The purpose of this report is to provide information beneficial to the planning processes of Manitoba's RHAs. The first tasks of the Team were deciding upon a set of indicators, and useable subregional "districts," deemed useful to RHA planning. Indicators and districts also needed to meet research requirements from the perspective of MCHP – indicators that had been validated, adequate population sizes and number of years included to maintain stability of rates, and geographical areas that best showed the heterogeneity of population health status within each RHA. Fifty-one "districts" were defined through the collaborative process. After review and revision of a set of health and health care use indicators from a previous MCHP report (Black, Roos, Fransoo and Martens 1999), the team chose a set of 68 indicators. These encompassed the general areas of demographics, socioeconomic risk, overall health status, burden of illness, preventive care, child health, the use of health services (physicians, hospitals, surgical procedures), the use of home care and nursing homes, and pharmaceutical use.

For each indicator, rate comparisons were made between RHAs, within each RHA at the district level, and over two time periods. The time periods chosen for each indicator generally reflect a "pre-RHA" time between 1991 and 1996, and the "RHA" period between 1997 and 2001 (non-Winnipeg RHAs took effect April 1, 1997). All the RHA and district graphs are

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[1]Two of the 11 non-Winnipeg RHAs (South Westman and Marquette) merged as of July 1, 2002 to form the new Assiniboine RHA. The results in this report are given by the eleven, rather than the newer ten, non-Winnipeg RHAs.

ordered in the same way throughout the report, based upon the overall population health status of the area. This health status measure is the premature mortality rate (PMR), a standardized rate of death before the age of 75 years. PMR is considered one of the best overall health status measures, reflecting socioeconomic risk, overall illness burden, and self-rated health of the residents. Hence, PMR presumably indicates the population's underlying need for health care services. Each graph shows the RHAs in order of increasing PMR, so RHAs near the top of the graph have populations with better health status than those near the bottom of the graph.

The indicators are also based on a population-based perspective. This means that the "rate" is attributed to where a person lives, not where the treatment is received. For example, if a person lives in Nor-Man RHA but hospitalized in Winnipeg, the hospitalization is attributed back to the region. So the Nor-Man rate of hospitalizations (number per thousand residents) includes all hospitalizations of Nor-Man residents – those occurring both within the region and in other regions.

Findings

One of the many interesting findings of this report is the heterogeneity both between and within Manitoba's RHAs. For example, the range of PMR alone is dramatic amongst RHAs, from a "low" of 2.7 deaths per thousand in South Eastman to a "high" of 4.8 in Burntwood during the period 1996-2000. But within each RHA, districts also show interesting patterns of variation. In North Eastman, the district of Springfield has one of the lowest PMRs in the province at 2.7, in contrast to the district of Northern Remote having the highest in the province at 8.5 deaths per thousand. So the health care needs of people between RHAs, and subregional populations within one RHA, may be very different from the perspective of planners and policy-makers. When using this report, differences in the health status and the health care needs of populations even within the boundaries of one RHA should be examined and taken into consideration when planning appropriate services.

Although this report is designed for use mainly at the RHA and district levels, the following trends were noted at the provincial and larger aggregate regions of the province. "Rural South" refers to an aggregate of all southern and mid-province RHAs except the urban centres of Winnipeg and Brandon. "North" refers to an aggregate of the three northern RHAs (Burntwood, Churchill and Nor-Man).

Demographics

- Socioeconomic risk (as measured by the 'SEFI' score) is lower than the provincial average for the Rural South, and much higher in the North.
- In general, northern RHAs are much younger than the overall Manitoba population.

Health Status and Injury Mortality[2]

- The overall health status of Manitobans improved from the first half of the 1990s to the second half. Most regions either followed this trend or showed very little change, with no region showing statistically significant worsening of PMR. However, the overall health status of the North is much worse than the rest of the province, with a PMR of 4.7 deaths per thousand in 1996-2000 compared with 3.2 for the Rural South, 3.3 for Winnipeg, and 3.3 for Manitoba. Top causes of death in Manitoba were circulatory diseases (39%), and cancer (27%).
- Injury mortality rates increased provincially from 1990-1994 to 1995-1999, from 0.44 to 0.49 deaths per thousand. For 1995-1999, rates were higher in both the Rural South (0.54 deaths per thousand) and the North (0.98 deaths per thousand). In the Rural South, injuries account-ed for 6% of deaths, with the top causes being "motor and other vehi-cle" at 29%, followed by "falls" at 23% and "violence to self" (i.e., sui-cide) at 20%. In the North, injuries accounted for 18% of the deaths, with the top causes being "motor and other vehicle" at 20%, "violence to self" at 15%, and "drowning" at 13%.

Morbidity (illness)

- Provincially, heart attack rates (AMI) showed a slight decline over time, from 2.4 to 2.2 per thousand adults aged 20 or more (comparing 1991/92-1995/96 to 1996/97-2000/01). This trend was also observed in the Rural South (2.5 to 2.3) and in Winnipeg (2.2 to 2.1). But rates were the highest in the North (2.7 and 2.9 respectively), where there was no improvement over time. Similar trends are also seen with stroke rates.
- The percentage of people treated for respiratory diseases also declined in Manitoba, from 13.7% in 1994/95-1995/96 to 12.4% from 1999/00-2000/01.
- Cancer incidence rates (new cancer cases) were stable over time, at 5.6 new cases per thousand per year. In contrast, the percentage of people treated for diabetes increased provincially (4.6% in 1993/94-1995/96 to 5.6% in 1998/99-2000/01), in the Rural South (4.5% to 5.4%) and the North (8.6% to 11.1%). The increase in diabetes rates may be due in part to increasing surveillance efforts and changing diagnostic criteria.

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[2] In the MCHP report by Brownell et al. (2003), it was observed that PMR in the North (Burntwood, Churchill and Nor-Man) has not changed. In contrast, this report states that PMR has improved (that is, become lower). The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. PMR in the North was lower in the 1980s, increased in the first half of the 1990s, and then went back to the 1980s levels in the last half of the 1990s. Comparing the PMRs of the 1980s to the latter 1990s showed no difference, whereas compar-ing the PMRs of the first and last half of the 1990s showed a decrease in the North (that is, an improvement in health status). Discrepancies in findings for injury mortality and total mortali-ty are explained in the same way – the years chosen for the comparisons differ between reports.

Preventive Care

- Childhood immunization rates (a complete set of immunizations) at ages 1, 2 and 7 were similar to or better than the provincial average in the Rural South, but lower in the North. Provincially, there was a slight decline in overall immunization rates (84.5% to 83.0% at age 1; 71.5% to 70.7% at age 2; 82.6% to 73.3% at age 7). Immunization rates of 95% are considered the benchmark for Canadian children (refer to the child health report by Brownell, Martens, Kozyrskyj et al. 2001).
- In the year 2000/01, around 55% of adults age 65 or more were vaccinated for influenza, with slightly lower rates in the Rural South (53%) and much lower rates in the North (40%) compared with Winnipeg (56%).
- Breast cancer screening rates have increased substantially throughout the province from 1995/96-1996/97 to 1999/00-2000/01, from 50% to 63% of women age 50-69 years old receiving at least one mammogram in two years. Rates in the Rural South (67%) were higher than in Winnipeg (60%) for the years 1999/00-2000/01. The North has also shown substantial increase over time (26% to 55%), but is still lower than the provincial average.
- In contrast, cervical cancer screening rates in 1998/99-2000/01 were lower in the Rural South (65% of women age 18 through 69) and the North (51%), compared with Winnipeg (72%), with little change over time.

Child Health Indicators

- The per cent of babies born preterm increased from the early 1990s to the late 1990s (6.2% to 7.1%) in all areas of the province. In contrast, low birth weight rates were stable over time and in all areas, with most recent rates in the Rural South (4.6%) and North (4.7%) consistently lower than the provincial rate (5.1%), driven mainly by the high Winnipeg rate (5.6%). High birth weight rates were consistently greater in the Rural South (16.9%) and the North (19.6%) compared to Winnipeg (13.9%).
- The percentage of newborns breastfeeding at hospital discharge has increased provincially (76% to 80%), and in most regions of the province from the first half to the second half of the 1990s. In the North, only 65% of the newborns were breastfed.
- Infant mortality rates appear to be stable or decreasing in regions of the province, with the overall Manitoba rate at 6.9 deaths per thousand infants less than 1 year old.
- Teen pregnancy rates were slightly lower provincially from the first to the second half of the 1990s (from 63 to 61 pregnancies per thousand females ages 15 through 19), with lower rates in the Rural South (45), and higher rates in the North (121) in the most recent time period. Most RHAs showed either a stable rate or a slight decline.

Physician Services

- A high proportion of Manitobans (82%) saw a physician at least once during the year 2000/01. This varied only slightly by the area of the province, at 80% for the Rural South, 77% for the North, and 84% for Winnipeg and Brandon. The North rate may be underestimated due to missing information for some salaried physicians and for all nurse practitioner visits.
- The top "reasons" for physician visits in Manitoba has changed little from the mid-1990s to the year 2000/01, with "respiratory illnesses" being the largest category at around 15% of visits. This is relatively consistent throughout the province.
- The physician visit rate was 4.8 visits per person per year for 2000/01, with slightly higher rates in the two urban centres of Winnipeg and Brandon (5.1) and in the remote region of Churchill (5.4). Rural South and North rates are lower (4.3 and 4.5), but North rates may be underestimated.
- Physician visit rates vary considerably by age. For 0-4 year olds, the rate is around 6 visits per year. Male visit rates are lowest in ages 10 through 44 at around 3 visits per year. Female visit rates reflect reproductive-related increases, showing between 4 and 5 visits per year for ages 15 through 44. Both male and female visit rates show increases as aging occurs, with around 8 to 11 visits per year for ages 75 and older. Very little differences in visit rates occurred from the mid-1990s to 2000/01, with the exception of older adults where rates actually increased by almost 1 visit per year.
- Consult rates (rate of a first referral to another physician for a complex problem, mainly to specialists) showed little association with underlying health status of the regions. In general, urban area residents have higher rates – Brandon (0.29 visits per person per year) and Winnipeg (0.30) – with lower rates in the Rural South (0.23) and the North (0.24). One anomaly is the RHA of Churchill, which despite its remoteness has a substantially higher rate (0.47) than the Manitoba average (0.27). This may reflect the RHA's poorer health status. That being said, Nor-Man RHA's population has poorer health status but one of the lowest consult rates (0.19) provincially.
- For the Rural South, about 80% of visits to general practitioners/family practitioners, and about 12% of specialist visits, either occur within a person's "district" or elsewhere within their RHA of residence. For the North, about 90% of GP/FP and about 15% of specialist visits occur within their district or RHA. For Winnipeg, about 90% of GP/FP and 100% of specialist visits occur within their RHA.

Hospital Services

- Comparing the two-year periods of 1994/95-1995/96 and 1999/00-2000/01, the hospital bed supply in Manitoba decreased from 4.3 to 3.8 beds per thousand residents. This pattern was reflected in the Rural South, the North and Winnipeg. Some areas of the province, notably the western RHAs, had higher beds per thousand than the Manitoba average.

- Despite a drop in hospital beds per capita, hospital separation (discharge) rates remained steady at around 170 hospital separations per thousand residents. Both the Rural South (200) and the North (275) were higher than the provincial average (170) and Winnipeg (142) in 1999/00, although one would expect northern hospitalization rates to be higher due to the overall poorer health status of their residents.

- Hospital days used for stays less than 30 days (called "short stays") have dropped provincially over the time period, and this trend was also apparent in the Rural South, the North and Winnipeg. In 1999/00-2000/01, the Rural South (626 short stay days per thousand) and the North (849) had greater number of short stay hospital days per capita than Winnipeg (413). In contrast, days for long stays (30 days or more) were lower in the Rural South (388 long stay days per thousand) than in Winnipeg (514), Brandon (678), or the North (893). This may in part be an artifact of non-designated personal care home beds within some northern hospitals.

- Approximately 6% of total provincial hospitalizations were due to injury. This showed a decline for all regions of the province from the first half to the second half of the 1990s (11.2 to 9.9 hospitalizations per thousand). In 1996/97-2000/01, the highest injury hospitalization rates occurred in the North (26.8), at 2.7 times the Manitoba rate.

- Looking at where people went for hospitalization in Manitoba for the fiscal years 1999/00 to 2000/01, 85% of residents' hospital days were spent in a hospital within their own RHA. This varied substantially by region, from 64% in the North, 69% in the Rural South, 91% in Brandon, to 97% in Winnipeg.

- Looking at where RHA hospital patients came from in the year 2000/01, 83% of the hospital patient days in Manitoba were hospitalizations of the residents within the RHA as the hospital. This varied from a low of 66% in Brandon, to 81% in Winnipeg, 84% in the North, and 92% in the Rural South.

- Causes of hospitalization changed very little over time. In 1999/00 to 2000/01, the leading primary diagnosis of hospitalization was "pregnancy & delivery" at 12%, followed by "circulatory" at 10%, "cancer" at 10%, "digestive" at 9%, and "respiratory" at 7%. All regions of the province showed similar proportions with the exception of the North, where "pregnancy & delivery" was much higher (18%), cancer was lower (5%), and "injury and poisonings" was the second largest contributor (10%).

High Profile Procedures

- Cardiac catheterization, angioplasty and coronary artery bypass graft surgery rates have all shown substantial increases from the early 1990s to the late 1990s, in all regions of the province (Rural South, North, Winnipeg and Brandon). In general, rates are higher in Winnipeg, lower in the Rural South, and similar to the provincial average in the North.
- Hip replacement (0.55 to 0.71 per thousand) and knee replacement (0.47 to 0.86 per thousand) surgery rates showed an increase from 1991/92-1995/96 to 1996/97-2000/01. Increases were apparent in most RHAs of the province.
- Although cataract surgery rates have also increased over time (from 21 to 27 per thousand adults 50 or older), they were higher in Winnipeg (29 per thousand) and lower in the Rural South (23) and the North (22) in 1998/99-2000/01.
- CT Scan rates increased substantially from the baseline of 1998/99 to the following three years (45 to 54 scans per thousand). The highest rates for 1999/00-2001/02 were in Brandon (80), South Westman (64), and Winnipeg (54), with lower rates for the Rural South (45) and the North (44). Some areas have missing data, so it is highly recommended that the practice of diagnostic coding be examined to ensure that all CT Scans are entered into the administrative database system for future tracking of rates.
- Tonsillectomy/adenoidectomy rates have decreased from 1993/94-1995/96 to 1998/99-2000/01 (6.1 to 5.5 per thousand children ages 0-14), with most areas showing either decreases or stable rates.
- Hysterectomy rates have decreased provincially (5.3 to 5.0 per thousand women ages 20 or more) from 1991/92-1995/96 to 1996/97-2000/01. Similar trends are apparent in Winnipeg (5.0 to 4.5) and the North (5.6 to 4.9). However, the Rural South remained higher at both time periods (5.7 and 5.6 respectively), with two RHAs (Brandon and Parkland) showing increases counter to the rest of the province.
- Caesarian Section rates in Manitoba have increased from 1991/92-1995/96 to 1996/97-2000/01 (from 15% to 17% of all births), with similar rates in all areas of the province. There is little relationship between C-Section rates and the underlying health status of the population. Two similar Northern RHAs – Nor-Man (23%) and Burntwood (16%) – had very different rates in the most recent time period.

Home Care and Nursing Homes (Personal Care Homes)

- In 1994/95 to 1995/96, there were 10.5 new home care cases, 20.5 open home care cases, and 9.4 closed home care cases per thousand provincially. More cases were "coming in" than "being closed," implying that we would see increases in the number of open home care cases in the years after that. Indeed, the open home care cases went up to 25.5 per thousand by 1999/00 to 2000/01. In that time period, there were

10.6 new, 25.5 open, and 11.5 closed home care cases per thousand residents. Based upon this, one expects the open case rate to show a decrease. The average length of home care cases showed an increase from these two time periods (195 days to 209 days per case). So despite the potential for declines in the number of open cases (which despite declines could still be higher than the mid-1990s rate), the length of stay as a "case" appears to be increasing, putting a burden on existing home care program case loads.

- The supply of personal care home (PCH) beds remained stable from 1994/95-1995/96 to 1999/00-2000/01, at around 130 provincial beds per thousand residents aged 75 or older. Admission rates to PCHs increased over the same period of time (from 27 to 30 admissions per thousand), but the median overall length of stay of residents decreased from 2.55 to 2.30 years.
- The level of acuity of PCH residents upon admission showed a slight increase from 1994/95-1995/96 to 1999/00-2000/01, from 43.7% to 50.1% of residents at levels 3 and 4. The North showed the most dramatic shift over time, from 40.4% to 79.0% of admissions at levels 3 and 4.
- The median waiting times for PCH admission dropped from 1994/95-1995/96 to 1999/00-2000/01 in Winnipeg (14.3 to 7.6 weeks), Brandon (27.4 to 19.0 weeks), and the Rural South (11.4 to 8.7 weeks). In contrast, North Eastman showed an increase in waiting time (16.1 to 22.1 weeks), as did the North (8.0 to 19.9 weeks).

Pharmaceutical Use

- The proportion of residents with at least one prescription over two years has risen slightly over time, from 66% in 1996/97-1997/98 to 68% in 1999/00-2000/01. The average number of different drugs prescribed to those receiving at least one prescription has also risen, from 3.2 to 3.4 different drugs per person provincially. Patterns throughout the province are consistent. However, in the most recent time period the North residents used a greater number of different drugs per person (4) compared to the Rural South (3.4), Winnipeg (3.4) and Brandon (3.5), which may in part reflect the poorer overall health status of northern populations.
- The proportion of Manitobans with at least one prescription for an antibiotic in a two-year period was 39%, and remained stable in the two time periods of 1996/97-1997/98 and 1999/00-2000/01. For those on antibiotics, the average number of antibiotic prescriptions was 2 per person.
- The per cent of the population with two or more prescriptions for an antidepressant in a two-year period increased provincially (from 4.3% to 5.5%), and in all areas of the province from 1996/97-1997/98 to 1999/00-2000/01. In the most recent time period, the North had a lower rate of use at 3.8% compared with the Rural South (5.3%), Winnipeg (5.8%), and Brandon (6.1%).

In conclusion, the purpose of this report is to support the planning, policy making and decision-making processes both provincially and within the RHAs of Manitoba. Each RHA team member has taken on the task of ensuring that this report is disseminated and applied by planning groups with particular interest in certain health services areas. *The Need To Know Team* is making plans to facilitate this "knowledge transfer" process through a commitment to ensuring that these RHA indicators are understood, discussed, and integrated into regional and provincial health plans.

Note: All of the graphs in the report are available in Excel spreadsheet form at the MCHP website (www.umanitoba.ca/centres/mchp/), as well as further information about *The Need To Know* project.

Chapter 1: Introduction and Methods

1.1 Background of the Collaborative Network

Evidence-based decision-making requires provision of health information to those who need to make those decisions. In planning for the needs of Manitobans, provincial and Regional Health Authority (RHA) planners and decision-makers require population-based information to help create a picture of people's overall health status, their burden of illness, and the way in which people use health care services.

This report is designed to provide an overview of population-based indicators to assist in the planning and decision-making processes. This is also the first joint research project of a collaborative team called *The Need To Know Team*, co-directed by Drs. Patricia Martens and Charlyn Black. Through a grant provided by the Canadian Institutes of Health Research (CIHR), key people from the Manitoba Centre for Health Policy's academic unit, Manitoba Health, and high-level planners of each of the non-Winnipeg RHAs meet together on an ongoing basis. *The Need To Know* project enables capacity building, both for the academics on how to do research of relevance to rural and northern RHAs, and for team members on how to understand, interpret and apply research at the planning and decision-making level.

Through funding provided by Canadian Institutes of Health Research, **The Need to Know Team,** *comprised of academic researchers from the Manitoba Centre for Health Policy, and high-level planners from Manitoba Health and each of the non-Winnipeg RHAs, work together extensively to produce policy- and planning-relevant research.*

During the five-year CIHR grant, three collaborative research projects will be completed. This report, focusing on RHA indicators of health and health care use, is the first joint research project of the three partners. It has taken hard work on the part of all team members to produce a report designed to be beneficial to the community health assessment process of the RHAs. Please take the time to look at the Acknowledgements section at the front of this report. We are truly grateful to each team member who contributed to the project.

The Manitoba Centre for Health Policy (MCHP) is a unit of the Department of Community Health Sciences in the University of Manitoba. The mission of MCHP is "to provide accurate and timely information to health care decision-makers, analysts and providers, so they in turn can offer services which are effective and efficient in improving the health of Manitobans." Through funding and support from both Manitoba Health and CIHR, MCHP has worked collaboratively with *The Need To Know Team* to provide information in this RHA indicators "atlas" that provides timely information of benefit to planning processes of RHAs throughout Manitoba.

1.2   The Geographical Boundaries in This Report

In 1997, the government of Manitoba established eleven rural and northern RHAs outside the capital city of Winnipeg. Each RHA provides a governance structure for overseeing health services, both acute care and community-based care. Within each RHA, there is an appointed Board of Directors responsible for the overall planning and integration of services for a geographically-defined population. When this research project first began in 2001, there were eleven non-Winnipeg RHAs: Brandon, Burntwood, Central, Churchill, Interlake, Marquette, Nor-Man, North Eastman, Parkland, South Eastman, and South Westman. As of July 1, 2002, South Westman and Marquette merged to form the new Assiniboine RHA. Because most of the analyses were already completed, and the subregional district divisions had been decided upon, the decision was made to report the data by the original eleven RHA geographical boundaries.

Within this report, indicators are displayed by RHA, by subregions of each RHA called "districts", and over two time periods approximating pre- and post-RHA evolution.

Figure 1.1 illustrates each geographical boundary for the RHAs of Manitoba, and Figures 1.2 and 1.3 show the district divisions of each non-Winnipeg RHA. Municipalities (and postal codes where necessary) comprising each of the districts are listed in Appendix 4.

1.3   What's in This Report

The focus of this report is to give insight to policy makers, decision-makers and planners on health care issues concerning people residing in Manitoba's RHAs. The following issues were addressed:
- Demographic and socioeconomic factors (Chapter 3)
- Health status and mortality (Chapter 4)
- The burden of illness (Chapter 5)
- Preventive care measures (Chapter 6)
- Child health indicators (Chapter 7)
- The use of physician services (Chapter 8)
- The use of hospital services (Chapter 9)
- Surgical procedures (Chapter 10)
- The use of home care and nursing homes (personal care homes) (Chapter 11)
- Pharmaceutical use (Chapter 12)

Two geographical comparisons are given for most of the indicators:
- Comparison by RHA
- Comparison within each RHA by subregional "districts"

There was a great deal of interest in whether or not the population residing within the RHA boundaries had changed over time, especially from pre-

RHA (prior to 1997) to the time in which the RHA structure began (1997 and on). Therefore, two time periods are given for most of the indicators:

- The first reflects a "pre-RHA" period, with data for varying numbers of years between 1991 and 1996 depending upon the indicator.
- The second reflects a "post-RHA" period, with data for varying numbers of years between 1997 and 2001 depending upon the indicator.

This report is a population-based report. What does this mean? First, it means that the rates are based upon every single person living in Manitoba who has a provincial health card. These rates are not based upon smaller "samples," but rather the entire population. Then it also refers to how the rates are generated. *Where you live, not where you go for treatment, is how the information was generated for this report.* For example, a person living in a remote area may be hospitalized in Winnipeg for surgery, but the surgery is "attributed back" to the population living in that remote area. So if you look at the rate of hospitalization of the people in a region like Burntwood RHA, this includes all the hospitalizations of all the people who live in Burntwood, whether that hospitalization took place in a Burntwood hospital, or a hospital in another RHA like Winnipeg or Nor-Man. By doing this, the report offers insights into the health and health care use patterns of the population *within a geographical region*, no matter where the people of that region received the care.

Figure 1.1 Regional Health Authorities (RHAs) of Manitoba
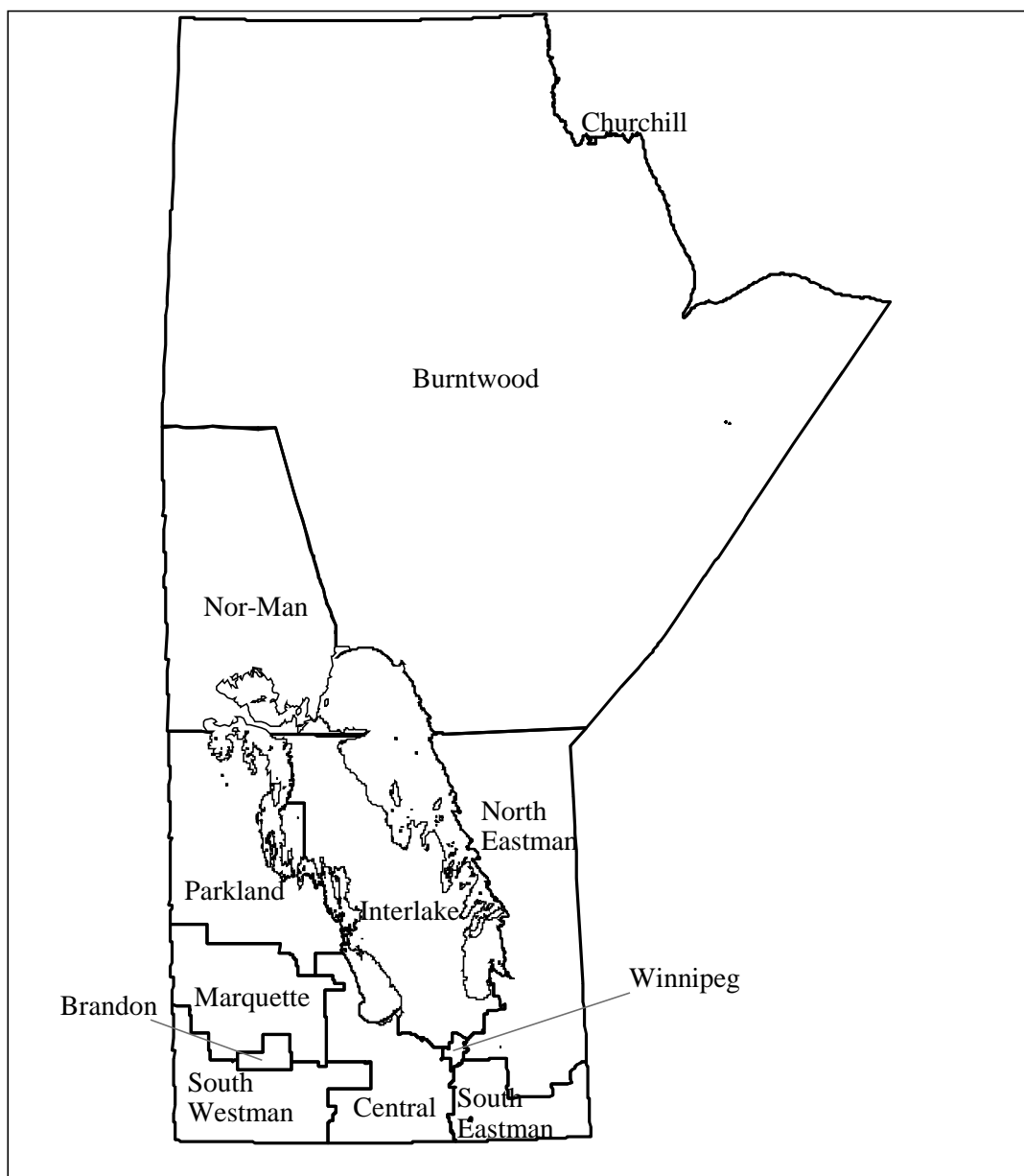
Note: South Westman and Marquette RHAs amalgamated as of July 1, 2002 to become Assiniboine RHA

1.4   Choosing the Districts and the Indicators

In several other research projects prior to this report, MCHP used subregional divisions of RHAs that were referred to as "Physician Service Areas" (PSAs). These were based upon geographical areas where general practitioners were providing their services and where residents were receiving services from these physicians. There were 50 non-Winnipeg PSAs, with most RHAs having between two and eight PSAs.

The use of these PSA boundary divisions gave a good indication of the variation of health status of the populations within RHAs (Black, Roos, Fransoo and Martens 1999). However, they did not necessarily correspond with the planning districts decided upon by the RHAs themselves. As well, some RHAs felt there were not sufficient numbers of PSAs in their region, or that the PSAs encompassed too wide an area to be of help for planning purposes.

Hence, starting in June 2001, the first task of *The Need To Know Team* was to decide upon useable subregional "districts." These districts needed to be of benefit from the RHA planning perspective, and at the same time needed to meet research requirements from the perspective of MCHP researchers. Researchers underscored the importance of adequate population sizes to maintain stability of rates, and the issue of separating out geographical subdivisions which best showed the heterogeneity of population health status within each RHA. MCHP suggested the following guidelines: (a) aim for three to six districts for most RHAs; (b) less than 2000 persons per district may be problematic and may result in data being suppressed; (c) aim to capture the heterogeneity of health status within the RHA. Through extensive consultation with RHA planners and decision-makers, and with Manitoba Health, the new districts were formed for use in this report. As far as possible, the requirements of the districts were met, and 51 non-Winnipeg districts were formed. Most of the non-Winnipeg RHAs have three to 11 subregional districts. Churchill RHA is an exception - with just over 1000 residents, its rates are only generated for the region, not for any subdivision of that region. For the purposes of separating out populations within a region that have very different underlying health needs, it was found that the new districts were able to detect heterogeneity similarly to the previously-used PSAs.

The Need to Know Team chose districts and indicators beneficial from the RHA planning perspective, while also acceptable for research purposes from the perspective of MCHP academics.

The Need To Know Team was also asked to review the set of indicators from the previous RHA indicators report (Black, Roos, Fransoo and Martens 1999). Most of the indicators were maintained in the current report, except in situations where there was considerable overlap with existing Manitoba Health reports to the RHAs. As well, some indicators of importance to RHA team members were added: causes of death; cancer rates; selected child health indicators; top five diagnoses for physician visits; information on home care use; and selected pharmaceutical use indicators.

Figure 1.2 Districts of Southern RHAs Used in This Report
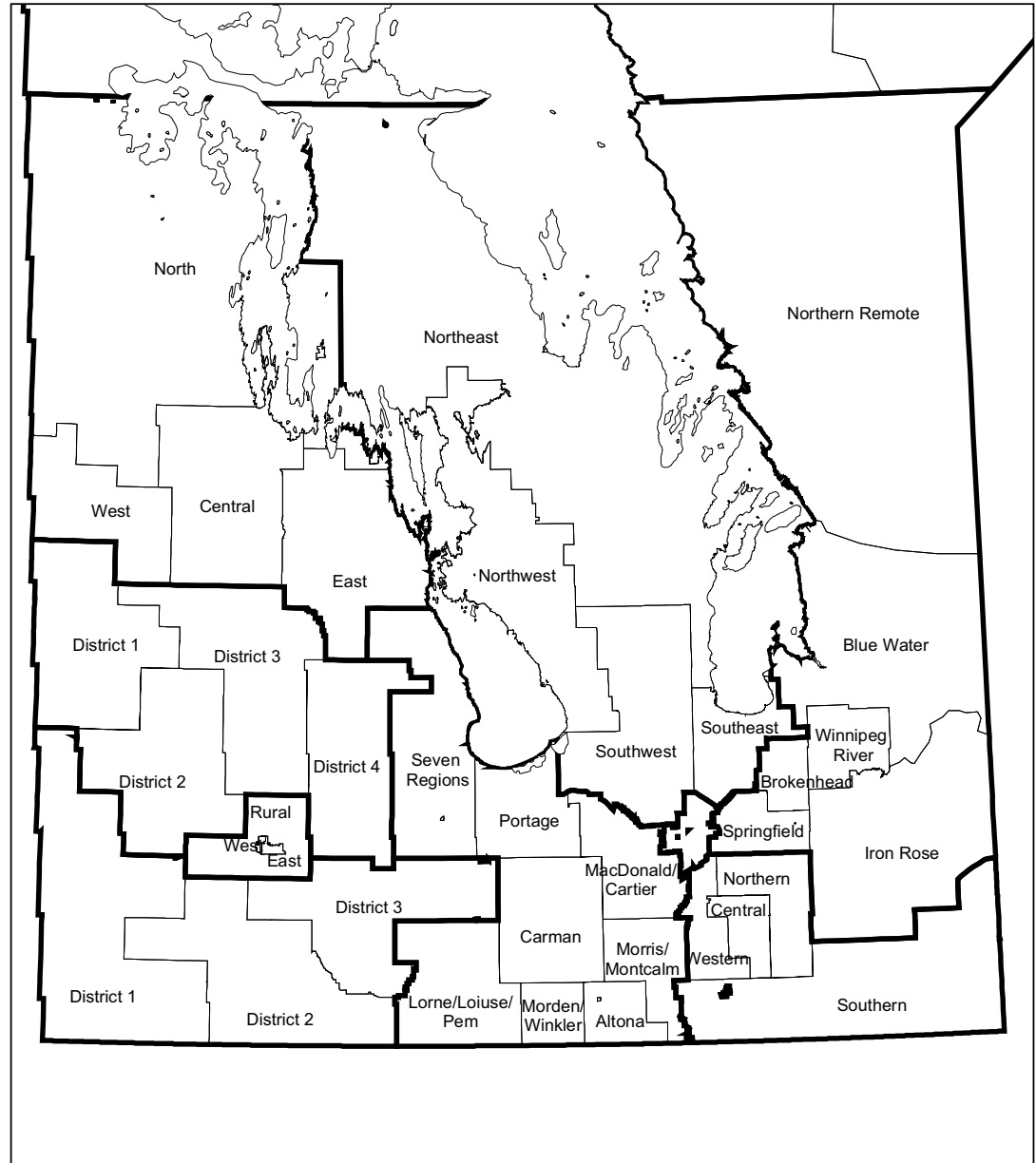
Figure 1.3 Districts of Northern RHAs Used in This Report
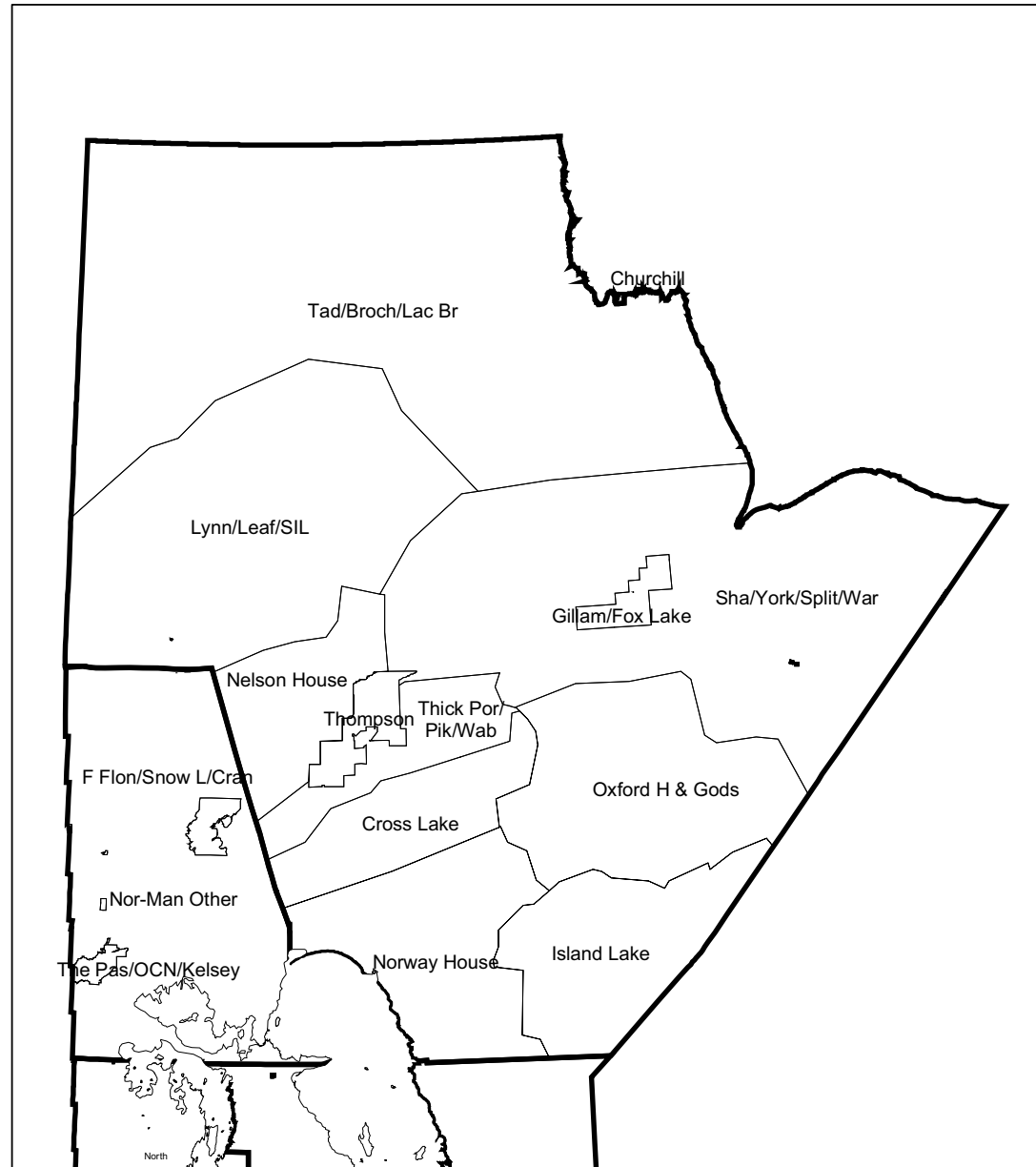
1.5   The Methods Used

Detailed information about the methods, as well as comprehensive definitions and descriptions of each indicator, can be found in the Appendix and Glossary of this report.

MCHP houses sets of data collectively referred to as the Population Health Research Data Repository. This contains anonymized information, and encompasses areas of key interest to health planners such as mortality and birth information, physician and hospital use, pharmaceutical use, and use of such services as home care and nursing homes (personal care homes).

The system used by MCHP to derive rates of health and health care use is called POPULIS (Population Health Information System). This system enables researchers to derive rates of specific conditions, or rates of health services use, for people living in certain geographical areas defined by municipal code or postal code. The POPULIS system also contains socioeconomic information from census data, like average income, or average educational level, based upon census areas.

The use of premature mortality rate (PMR) as a surrogate for the underlying health status of a group of people, and thus their need for health care, has proven to be an important framework for MCHP's analyses of health care use patterns.

Knowing that people living in areas of socioeconomic risk usually experience more health problems, MCHP looks not only at health care use rates but also on the relationship between these rates and the "need" for health care (Black et al. 1995; Roos 1999; Roos et al. 1999). Premature mortality rate (PMR), or death before the age of 75 years, is used as a "surrogate" for the underlying health status of a group of people, and thus their "need" for health care. PMR has proven to be an important framework for MCHP's analyses of health care use patterns (Black et al. 1999; Brownell et al. 2001; Martens et al. 2002a, Martens et al. 2002b). One would expect populations with poorer health status to require greater health care services. Refer to Chapter 2 for a further description of this framework.

Most of the indicators for this report were derived from MCHP's Population Heath Research Data Repository, with one exception. All cancer rates were generated separately by CancerCare Manitoba using their own administrative database system, and shared with MCHP as aggregate rates at the RHA and district levels. For purposes of this report, the following MCHP database files of the Population Health Research Data Repository were accessed:

- Hospital claims
- Medical claims
- Home care
- Personal care homes (nursing homes)
- Registry files
- Vital statistics

- Pharmaceutical claims (from the Drug Program Information Network)
- Immunization records (from the Manitoba Immunization Monitoring System)
- 1996 census files (for socioeconomic information at the neighbourhood level)

Rates are usually given as three-year rates (and sometimes up to five-year rates) to ensure stability when using districts with small population sizes. Depending upon the source of data, rates are generated for either fiscal years (for example, "1993/94 - 1995/96" represents the fiscal years April 1, 1993 to March 31, 1996) or calendar years (for example, 1991-95 means January 1, 1991 to December 31, 1995). Most physician and hospital use data are reported in fiscal years, whereas mortality data and newborn data are usually reported by calendar years. Generally, indicators were derived for a time period in the first half of the 1990s, and then in the second half. In some cases, such as the pharmaceutical data, different years were chosen depending upon the availability of data.

Most of the indicators are given as *standardized rates*. This means that the rate has been adjusted to create a fair comparison among regions with different age and sex population distributions. All rates are standardized to reflect what the rate would be if each area's population had the same age and sex distribution as the Manitoba population at December 31, 1996. See Chapter 2 (understanding your data) for a further explanation of standardized rates. Rates are suppressed (that is, not reported) where the counts upon which the rates are based represent five events or less. Throughout the report, the letter "s" in brackets beside the RHA name on the left-hand side of the graph indicates a suppressed rate.

Indicators are given as standardized rates in most graphs (standardized to 1996 Manitoba age and sex distributions), with crude rates provided in the Appendices.

Appendix 2 contains tables listing the *crude rates* (the actual count divided by the actual population), without any adjustment for age and sex distributions. These tables also include the 'observed' number of events for each indicator. This type of information is helpful in giving a realistic look at the effect of the population burden of illness on the region's health care system - in reality, what actual numbers of the regional population will require health care services for their illness or condition.

Most of the graphs contain information about *statistical comparisons*. This is also discussed in Chapter 2. Statistical comparison tests of age- and sex-standardized rates were done using t-test methodology developed by Carriere and Roos (1997). This simply gives an indication as to whether or not a rate is statistically higher or lower than the comparison group, or if the rate should be considered similar to the comparison group when no statistical difference is noted. In each graph, the notation provided in brackets beside the name of the RHA or district indicates statistical significance. "1" means

that the RHA's (or district's) first time period rate is significantly different than the overall Manitoba average rate at that first time period. A "2" means that the RHA's (or district's) second time period rate is significantly different than the Manitoba overall average rate at the second time period. A "t" means that there has been a statistically significant change over time (either increase or decrease) within that RHA or district. Please refer to Chapter 2 for further explanation and examples of the statistical notations.

Statistical testing is done in such a way that when you say a difference is "statistically significant", you will be at least 95% sure that the difference was not due to chance alone. So you expect to see "statistically significant" differences occurring about 5% of the time merely through chance. This is called a Type I error - finding a statistical difference when in reality there was no difference.

In situations where you keep doing statistical testing on the same data set, you could potentially have a much larger Type I error than the traditionally allowed 5%. To avoid much larger Type I error, one uses a Bonferroni correction factor whereby the traditional $p<.05$ (5%) level of significance is stiffened. This helps keep the overall level of Type I error at the allowable 5% level. So when we tested for differences between each RHA and the Manitoba overall average, the statistical criterion of $p<.01$ was applied for each single test, to give an approximate overall $p<.05$, or 5%, level of Type I error. Similarly, when testing for differences between each district and the Manitoba overall average, the criterion of $p<.005$ was applied to each single test. The standard statistical criterion of $p<.05$ was used for testing differences between the two time periods within each RHA. All data management, programming and analyses were performed using SAS® software.

MCHP obtained ethical approval from the University of Manitoba Faculty of Medicine's Human Research Ethics Board to access the Population Health Research Data Repository for purposes of this report.

1.6   Related Sources of Information

This report serves as only one source of information to assist the RHAs in planning and decision-making using population-based data. For those persons interested in more comprehensive information on selected indicators, Manitoba Health and MCHP both have key reports. Table 1.1, provided by the Community Health Assessment Unit (Dr. Shahin Shoostari), gives an overview of reports, surveys and ongoing summary tables provided by Manitoba Health to the RHAs. Many of these are also publicly available on the Manitoba Health website (www.gov.mb.ca/health).

Tables 1.1 and 1.2 list additional resources from Manitoba Health and from MCHP, with additional data on selected indicators included in the present report.

As well, Table 1.2 provides references to more comprehensive research findings of MCHP on selected topics. These are all publicly available in both a four-page summary and a complete report version at the MCHP website (www.umanitoba.ca/centres/mchp), or in hard copy upon request.

1.7 How to Use This Report

There are many graphs in this report, but each graph has been chosen to give information on a key indicator deemed helpful to regional health planning and decision-making. These graphs will enable RHAs to examine their overall health and health care use by geographical subregion and over two time periods. Chapter 2 is written to assist in the understanding and interpretation of the indicators, while providing suggestions for questions to ask about regional rates or patterns.

The Need To Know Team's hope is that this report will enable RHAs to gain a comparative picture of the health and health care use patterns of their residents. Moreover, our hope is that the information will be used by the RHAs, in conjunction with other data sources and with their own contextual understanding, to plan for the health needs of their population.

Table 1.1:   **Manitoba Health sources of comprehensive information on selected topics**

Major Source	Mechanism (Survey/Report/On-going Research Project)	Availability
Manitoba Health-Community Health Assessment Unit	Manitoba Health Provincial Health Indicators Document	available at the Manitoba Health web site.
	Post Partum Referral Form (PPRF) Database - CHA Unit has created the PPRF Database and the data entry for the year 1997 and 1998 is completed.	Aggregate data available to the RHAs through the Community Health Assessment Unit.
Manitoba Health - Health Information Management Branch	June 2000 (population report five-year age summaries)	Some of these reports are on MB Health Web site. The contact person for obtaining a hard copy of the reports is: Ms. Deborah Malazdrewicz (786-7169).
	RHA Population Variance Report	
	Provider of Service Report by Patient Municipality	
	Provider of Service Summary Table by RHA	
	Provider of Service Summary Table for the Province	
	Provider of Service Summary Table by District	
	Rural Manitoba Providers of Service by Municipality	
	Rural Manitoba Providers of Service by RHA	
	Rural Manitoba Providers of Service by District	
	Regional Health Authority Asthma Report	
	Regional Health Authority Cervical Screen Report	
	RHA Provincial Mammography Screening Program Report	
	RHA Diagnostic Mammography Report	
	Hospital Utilization Reports (Newborn Report by Sex, Birth Weight Report, Delivery Report, Pregnancy Report , Newborn Birth Weights by Mother's Age, RHA Hospital Utilization Data by Diagnostic Category, RHA Hospital Utilization Data by Age Break, Resident's Hospital Utilization)	
	CMG reports on hospital utilization	
	Vital Statistics Death Tables	
	Annual Statistical Report	
	June 2000 population and variance report	
	Non-residence runs for the Churchill and Nor-Man RHAs	

Manitoba Health-Public Health Branch - CDC Unit	Manitoba Health Statistical Update on HIV/AIDS 1985-2001	All of these reports are on MB Health web site. The contact person within Public Health Branch is: Ms. Carole Beaudoin (788-6715).
	Monthly Summary of Communicable Diseases	
	Annual Statistical Summary of Communicable Diseases - Calendar Year 2001	
	Notifiable Diseases Manitoba - CDC Unit Annual Review	
	Influenza in Manitoba	
	Influenza in Manitoba - 1999/2000 Season	
	Manitoba Immunization Monitoring System (MIMS) Annual Review 1997	
Manitoba Health Public Health Branch-Diabetes and Chronic Diseases Unit	Diabetes Burden of Illness Study	These reports are on MB Health web site. The contact person within the Diabetes and Chronic Diseases Unit is: Dr. Jane Griffith (788-6716).
	Epidemiologic Projections of Diabetes and Its Complications - Forecasting the Coming Storm	
	Manitoba's Regional Diabetes Profile - a statistical summary	
	Diabetes in Manitoba Review	
	Diabetes - A Manitoba Strategy	
Manitoba Health Public Health Branch-Environmental Health Unit	Community Water Fluoridation Program 2001/2002 (Annual Report)	MB Health web site
Manitoba Health Public Health Branch- EPI Unit	Manitoba Perinatal Surveillance Report (information on Feto-infant Mortality, Maternal Health, Maternal Care, Newborn Care, Infant Care)	All of these reports are on MB Health web site. The contact person within Public Health Branch is: Ms. Carole Beaudoin (788-6715).
	Updated Manitoba Perinatal Surveillance Report - The second report	
	Manitoba Injury Data Resource: Deaths and Hospitalizations	
	Cancer Incidence and Prevalence in The Manitoba Regional Health Authorities	
	Increasing Cancer Burden - Manitoba Projections 1999-2025	
Manitoba Health Public Health Branch-Epidemiology Unit and CancerCare Manitoba	Quest - Quary Epidemiological Statistics	The contact person is: Ms. Linda Venus (787-2148). linda.venus@cancercare.mb.ca

Table 1.2: MCHP reports (1999 to 2002) relating to key RHA indicators
(available on the MCHP website www.umanitoba.ca/centres/mchp)

Indicator	MCHP Reports: short title on website (see references for complete title, author and publication date)
Health Status and Mortality	The Health of Manitoba's Children (Brownell et al. 2001) Health and Health Care: Manitoba's First Nations (Martens et al. 2002) POPULIS: Providing Health Information to RHA Planners (Black et al. 1999) Manitoba Seniors: Living Longer; Living Healthier? (Menec et al. 2002) Health in Manitoba: Are We Doing Better? (Roos et al. 2001) Why Not Healthy Report (Brownell et al. 2003)
Injury and Illness Burden	The Health of Manitoba's Children (Brownell et al. 2001) Health and Health Care: Manitoba's First Nations (Martens et al. 2002) Why Not Healthy Report (Brownell et al. 2003) Manitoba Seniors: Living Longer; Living Healthier? (Menec et al. 2002) Influenza's Influence: Is an Early Warning System Possible? (Menec et al. 2001)
Prevention (immunization, cancer screening, breastfeeding)	The Health of Manitoba's Children (Brownell et al. 2001) Health and Health Care: Manitoba's First Nations (Martens et al. 2002) POPULIS: Providing Health Information to RHA Planners (Black et al. 1999)
Child Health	The Health of Manitoba's Children (Brownell et al. 2001) Health and Health Care: Manitoba's First Nations (Martens et al. 2002)
Physician Services, Hospital Services	The Health of Manitoba's Children (Brownell et al. 2001) Health and Health Care: Manitoba's First Nations (Martens et al. 2002) Manitoba Seniors: Living Longer; Living Healthier? (Menec et al. 2002) Hospital Beds in 2020: Will We Have Enough? (Stewart et al. 2002) Waiting Times for Surgery in Manitoba: A Second Look (DeCoster et al. 2000) Health in Manitoba: Are We Doing Better? (Roos et al. 2001) Comparing the Cost of Care in Manitoba's Hospitals (Finlayson et al. 2001) Assessing the Performance of Rural and Northern Hospitals (Stewart et al. 2000)
Home Care and Personal Care Homes	A Look at Home Care in Manitoba (Roos et al. 2001) Nursing Home Beds in 2020: More? Fewer? Just Enough? (Frohlich, DeCoster, Dik 2002) Manitoba Seniors: Living Longer; Living Healthier? (Menec et al. 2002)
Pharmaceutical Use	The Health of Manitoba's Children (Brownell et al. 2001) Manitoba Seniors: Living Longer; Living Healthier? (Menec et al. 2002) How Manitobans Use Prescription Drugs (Metge et al. 2000) Why Not Healthy Report (Brownell et al. 2003)

REFERENCES

Black C, Burchill CA, Roos LL. The Population Health Information System: Data Analysis and Software. *Medical Care* 1995; 33(12): DS127-131.

Black C, Roos N, Fransoo R, Martens P. Comparative Indicators of Population Health and Health Care Use for Manitoba's Regional Health Authorities: A POPULIS Project. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 1999.

Brownell M, Lix L, Ekuma O, Derksen S, De Haney S, Bond R, Franoo R, MacWilliam L, Bodnarchuk J. Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2003.

Brownell M, Martens P, Kozyrskyj A, Fergusson P, Lerfald J, Mayer T, Derksen S, Friesen D. Assessing the Health of Children in Manitoba: A Population-Based Study. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Carriere K, Roos LL. A method of comparison for standardized rates of low-incidence events. *Medical Care* 1997;35(1):57-69.

De Coster C, MacWilliam L, Walld R. Waiting Times for Surgery: 1997/98 and 1998/99 Update. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2000.

Finlayson G, Roos N, Jacobs P, Watson D. Using the Manitoba Hospital Management Information System: Comparing Average Cost Per Weighted Case and Financial Ratios of Manitoba Hospitals (1997/98). Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Frohlich N, De Coster C, Dik N. Estimating Personal Care Home Bed Requirements. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2002.

Martens PJ, Frohlich N, Brownell M, Carriere K, Derksen S. Embedding child health within a framework of regional health: Population health status and sociodemographic indicators. *Canadian Journal of Public Health* 93 (Supplement 2): S15-S20.

Martens P, Bond R, Jebamani L et al. The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2002.

Menec V, MacWilliam L, Soodeen RA, Mitchell L. The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time? Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2002.

Menec V, Black C, MacWilliam L, Aoki F, Peterson S, Friesen D. The Impact of Influenza-Like Illness on the Winnipeg Health Care System: Is an Early Warning System Possible? Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Metge C, Black C, Peterson S, Kozyrskyj A, Roos N, Bogdanovic B. Analysis of Patterns of Pharmaceutical Use in Manitoba, 1996: Key Findings. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2000.

Roos NP, Stranc L, Peterson S, Mitchell L, Bogdanovic B, Shapiro E. A Look at Home Care in Manitoba. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Roos N, Shapiro E, Bond R, Black C, Finlayson G, Newburn-Cook C et al. Changes in Health and Health Care Use by Manitobans, 1985-1998. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Roos NP. Establishing a population data-based policy unit. *Medical Care* 1999; 37(6):JS15-JS26.

Roos NP, Black C, Roos LL et al. Managing Health Services: How the Population Health Information System (POPULIS) works for policymakers. *Medical Care* 1999; 37(6):JS27-JS41.

Stewart D, Tate R, Finlayson G, MacWilliam L, Roos N. Projecting Hospital Bed Needs for 2020. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2002.

Stewart D, Black C, Martens P, Peterson S, Friesen D. Assessing the Performance of Rural and Northern Hospitals in Manitoba: A First Look. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2000.

Chapter 2: Interpreting the Data for Local Use

2.1 What's in This Chapter?

Chapter 2 focuses on how to interpret the graphs in this report, including:
- How the chapters are set up (Section 2.2)
- How the regions and sub-regions are defined and displayed (Section 2.3)
- Understanding the population structure of the RHAs (Section 2.4)
- Rates (adjusted and crude) and actual client numbers (Section 2.5)
- The meaning of the statistical notations (Section 2.6)

In other words, this chapter will take you through the process of finding information in the report, and figuring out what this information is telling you. It is based upon similar chapters found in the 1999 MCHP report for Regional Health Authorities (Black, Roos, Fransoo and Martens 1999) and the 2002 First Nations report (Martens, Bond, Jebamani et al. 2002).

2.2 How the Chapters Are Set Up

Chapter 1 gives you background information about the report, the way in which data are presented by region, sub-region and over time, the methods used, and a description of other sources of information on key indicators. This chapter (Chapter 2) is a "teaching section" on how to read and interpret the data. The rest of the report includes key indicators in the following areas:
- Demographic and socioeconomic indicators (Chapter 3)
- Health status and mortality (Chapter 4)
- Illness burden (Chapter 5)
- Preventive services (Chapter 6)
- Child health (Chapter 7)
- Use of physician services (Chapter 8)
- Use of hospital services (Chapter 9)
- Selected surgical procedures (Chapter 10)
- Use of home care and nursing homes (Chapter 11)
- Pharmaceutical use (Chapter 12).

The Appendices include more extensive information about the methods, as well as tables of crude rates and event numbers. The Glossary provides more detailed indicator definitions than are given in the short definitions accompanying the graphs.

This chapter is a "user manual", giving the reader the tools necessary to interpret the graphs properly and find other related information in the report.

Chapters 3 through 12 are set up like an "atlas" of indicators. First, there is a brief description of the indicators contained within the chapter, followed by an example and possible questions that people may wish to consider when using the indicators for RHA planning. Then each key indicator is listed, including a concise definition as well as graphs by region and by district.

2.3   How the Regions and Subregions are Defined and Displayed

Twelve Regional Health Authority (RHA) boundaries are used throughout this report. As of July 1, 2002, the RHAs of South Westman and Marquette merged to become Assiniboine RHA, but this report does not reflect the merged region. In Chapter 1, a map of the RHAs is given in Figure 1.1. As well, there are subregional boundaries called "districts", which were decided upon in consultation with The Need To Know team (see a description of the team in the Introduction, Section 1.1). The district boundaries are given in Figures 1.2 and 1.3 of Chapter 1, and further described in Appendix 4. For the key indicators in this report, rates are provided by RHA and by district level wherever possible.

Premature mortality rate (PMR) is a standardized rate of "premature" death, that is, death before the age of 75 years (see Section 2.5 for a discussion of the meaning of "standardized"). Chapter 4 (and Martens, Frohlich et al. 2002) includes a discussion on the use of PMR as a surrogate for the overall health status of a region's population. Figures 4.2.1 and 4.2.3 in Chapter 4 show the PMRs of the RHAs and districts respectively.[1]

All RHA graphs are ordered by decreasing regional population health status, as measured by the premature mortality rate (PMR). All district graphs are first grouped by RHA, and then ordered by decreasing PMR.

All the RHA and district graphs in this report are ordered in the same way throughout. This order is based upon the overall population health status of the area, as measured by the PMR of the area over a ten-year period of time (1991 through 2000).

Each regional graph shows the RHAs in order of increasing overall PMR. The RHAs having the lowest PMR, that is, the best health status, are at the top (South Eastman, South Westman, Brandon, Central). PMR increases as you go down the left-hand side, so the areas with the highest PMR, or poorest health status, are at the bottom (Burntwood, Churchill, and Nor-Man).

Figure 4.2.1: Premature Mortality Rates by RHA
Age- & sex-adjusted rate of deaths per 1000 aged 0-74
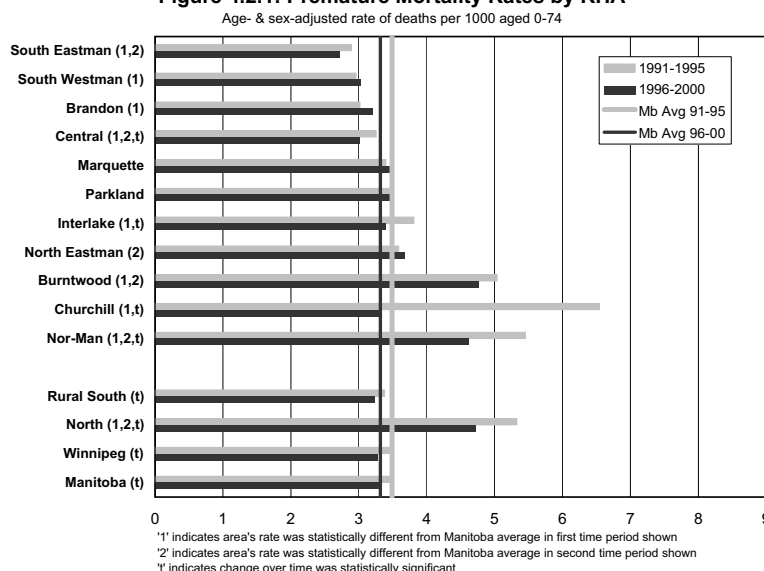
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

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[1]In the MCHP report by Brownell et al. (2003), it was observed that PMR in the North (Burntwood, Churchill and Nor-Man) has not changed. In contrast, this report states that PMR has improved (that is, become lower). The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. PMR in the North was lower in the 1980s, increased in the first half of the 1990s, and then went back to the 1980s levels in the last half of the 1990s.

In the district graphs, the same order of the RHAs is maintained. As well, the districts within each RHA have been ordered according to PMR, with the district having the lowest PMR (the best overall health status) listed first, with the others below it in order of increasing PMR (or worsening health status).

This report is highlighting the non-Winnipeg RHAs. Therefore Winnipeg is not included as one of the RHAs, except as a comparison at the bottom of the RHA graphs. The other comparison groups include: "**Rural South**" (defined as a combined rate of South Eastman, South Westman, Central, Marquette, Parkland, Interlake, and North Eastman RHAs); "**North**" (defined as a combined rate for Burntwood, Nor-Man and Churchill); and "Manitoba" (the provincial rate). The Manitoba rate is heavily weighted toward the Winnipeg rate, since over half the population of the province resides in Winnipeg RHA. Therefore the other groupings of the Rural South and the North were considered extremely useful comparisons for the non-Winnipeg RHAs.

2.4   Understanding the Population Structure of the RHAs

The two most basic ways to describe the people of a region are by age and by gender. This provides an indication of those health care resources that may be most needed to meet the needs of the population. Most planners would like to know approximately how many males and females, and of what age, are living within an area and are thus likely to "walk through the door" of the various types of health services.

Chapter 3 gives the age and gender information about each RHA in the form of a population pyramid, or population profile. The population pyramid of your region puts all of this information into a picture form, showing the percentage distribution of the whole population for each five-year age and gender group. If a graph looks more like a triangle, then the region has a "young" population. The more rectangular-looking a graph appears, the older the region's population. For example, Figure 3.3.11 of Chapter 3 (the population pyramid for Nor-Man RHA) appears triangular, meaning that Nor-Man has a relatively young population. In contrast, the population profile of South Westman RHA (Figure 3.3.2) is more rectangular, implying an older population.

To understand the concept of "adjusting" rates (standardizing rates) in Section 2.5, it is important to realize that the RHAs have varying age structures, some being similar to the Manitoba overall structure, and others being quite different (either older or younger regional populations).

Rates are adjusted (standardized) to reflect the rate an RHA or district would have if its population age and sex distribution were the same as the entire province of Manitoba as of December 31, 1996. For comparative purposes, aggregate groupings of RHAs include the "Rural South" (combined rate of South Eastman, South Westman, Central, Marquette, Parkland, Interlake and North Eastman) and the "North" (Burntwood, Nor-Man and Churchill).

2.5   Rates (adjusted and crude) and Actual Client Numbers

Most of the graphs in this report are *adjusted* or *standardized rates*, meaning that the rates have been adjusted to create a fair comparison among groups that differ in their age and sex distributions. The rates are "adjusted" to reflect the rate the RHA (or district) would have if its population age and sex distribution were the very same as the Manitoba population distribution on December 31, 1996.

Adjusted (standardized) rates do not necessarily tell you how many people are "walking through the door" for treatment. The adjusted rate could be used to calculate that number only if the area had the identical age/sex structure of the province. If an area has a very different population pyramid than the overall Manitoba population pyramid, the adjusted rate may give you an overestimate or underestimate of the actual number of people with the condition. In contrast to adjusted rates, *crude rates* are helpful in figuring out how many people are walking through the door for treatment.

But what's a *crude rate?* If you were to take the number of persons with a given condition, divided by the number of persons living in that area, and multiplied by 1000 to give a rate per thousand, you would end up with what's called a *crude rate*. Crude rates are given in tables in Appendix 2, as well as the actual numbers upon which these rates were based. The actual numbers give an estimate (usually an annual average over the two, three or five years upon which the rate was based) of how many events occurred in the region - in other words, how many people could potentially walk through the door with a given condition.

An important distinction needs to be made in understanding the difference between risk of a condition (that is, the rate), and the *number of persons* with the condition. Let's take the example of Disease X within two groups of people, Groups A and B.

The *number of people* with Disease X is higher in Group B than in Group A, at five versus two persons. So in a sense, the "burden" of illness for Group B is higher, that is, more people will walk through the door of a clinic in Area B compared to Area A. However, the *rate* of Disease X is *twice as high* in Group A. Two out of ten, or 20%, of Group A have Disease X, compared with five out of fifty, or 10% of Group B. So the *per capita risk* of having Disease X is far greater for Group A, even though *more actual people* in Group B have Disease X due to the greater population size in Group B.

GROUP A (10 people)   **GROUP B (50 people)**
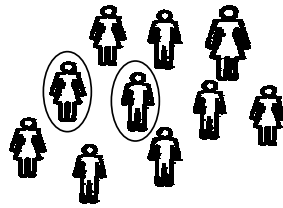
Rate of disease X
20% in group A
10% in group B

Burden of disease X
2 people in A
5 people in B
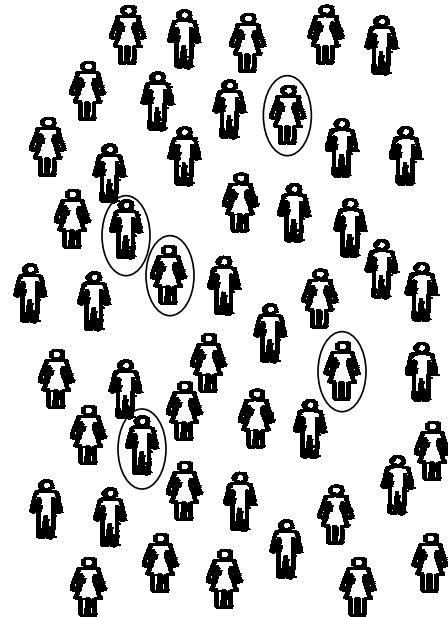
A rate reflects the per capita "risk" of an event or condition, whereas the actual number of people requiring health care services depends both upon the rate and the RHA's population size.

The graphs in this report point out *rate differences*, which is important in trying to understand why certain populations are at greater or less "risk" of a condition than other populations. However, Appendix 2 lists the *actual yearly average number of persons* with a condition in a geographical area, which is also important in trying to understand the health care services requirements.

Example: Central and Burntwood RHAs

Figure 5.5.1, found in Chapter 5, shows the age- and sex-adjusted rate of stroke per thousand population ages 20 and older. The adjusted rates in the 1996 to 2000 time period are as follows: 1.77 strokes per thousand for Central, and 3.20 for Burntwood. So the *rate* (ie, the "risk") for Burntwood people is almost double the rate for Central people. Strokes affect older adults moreso than younger adults, but Burntwood RHA has a younger population than Central RHA (see the corresponding RHA population pyramids in Chapter 3). The differing population dis-

tributions will be reflected in the difference between the adjusted rates and the crude rates. In Appendix 2, the crude rates for stroke are: 1.97 per thousand for Central RHA, and 1.52 for Burntwood. Note that Burntwood's crude rate dramatically "dropped" from its adjusted rate. The higher proportion of young people in Burntwood, compared to the Manitoba population, means that

Figure 5.5.1: Stroke Rates by RHA
Age- & sex-adjusted rate of stroke per 1000 residents age 20+

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

an age-adjustment for a disease which becomes more prevalent as one becomes older will "adjust" the rate upward. Crude rates are helpful to get an impression of the actual population numbers affected, but adjusted rates give fairer comparisons between RHAs having very different age structures.
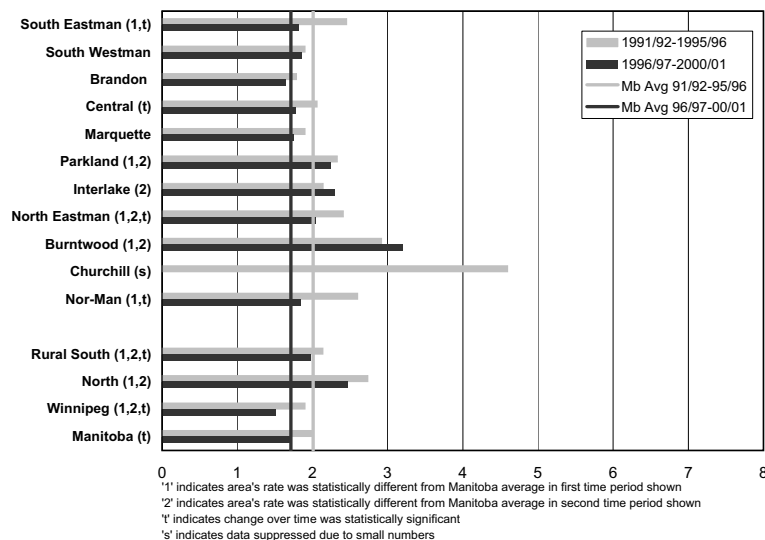
But how does that "translate" into *numbers* of persons in both RHAs who actually need care? Appendix 2 also gives the actual numbers of strokes (an annual average estimated over the five years of data used to derive the rate). For Central RHA during the years 1996 through 2000, the average number of strokes per year was 129, compared with 38 in Burntwood. So even though the personal risk of having a stroke is twice as high in Burntwood, the actual number of people requiring services for stroke is much smaller. This makes sense, since Central had more than twice as many people compared to Burntwood (97,865 versus 45,051 in the year 2000) and Burntwood had a much younger population compared to Central (for example, less than 1% of Burntwood's population is aged 70 through 74 years, compared with just over 3% of Central's population).

Therefore, the age/sex adjusted stroke rate is much higher in Burntwood than in Central RHA, but the actual numbers of persons requiring health services is almost three times as high in Central due to its larger overall population, and its comparatively larger population of older adults.

When looking at each graph and its corresponding crude rate table in the Appendices, health policy planners and decision-makers need to keep in mind the following:

- *What does the adjusted rate graph tell a region about its comparative rate to other regions, that is, the per capita risk of a certain condition?*
- *What does the crude rate, and the corresponding number of events, tell a region about the numbers of people requiring treatment?*

2.6   The Meaning of the Statistical Notations

Statistical significance describes how much confidence to put in the results. If a difference is "statistically significant," then this difference is large enough that we are confident it's not just due to chance. When you see a large difference that is NOT statistically significant, it is telling you that this rate is probably not different from the comparison rate, and that it could fluctuate greatly from year to year. This could be due to the rate being based on small numbers (either a small number of events, or a small underlying population), so it could change from year to year and may be higher, similar or lower than the comparison the next time it is measured.

Statistical significance describes whether a difference is large enough, and based upon enough people, to be considered "real" - that is, stable, and not just due to chance. Notations of "1", "2" and "t" in brackets beside the name of the RHA or district on the left-hand side of each graph are simply statistical significance test results.

Most of the graphs show the statistical significance testing in brackets beside the RHA or district name on the side of the graph. The "1" in the bracket means that the RHA rate given for the earlier years (1991 through 1995, or whatever the graph indicates) is statistically different than the overall Manitoba provincial rate for that time period. The "2" means that the RHA rate given for the later years (1996-2000, or whatever the graph indicates) is statistically different than the overall Manitoba provincial rate for that second time period. Finally, a "t" means that the rate within one RHA has changed significantly over the two time periods. The same notations apply at the district level graphs, comparing each district to the Manitoba overall rate for the two periods of time, and comparing the rate at the district level over time.

At times, you will notice a missing bar on the graph, and see an "s" notation alongside the RHA or district name. This means that the rate has been suppressed due to small numbers. We only report rates if they are based on more than five cases.

Example:

South Eastman's ambulatory physician visit rates are given in Chapter 8, Figure 8.3.1. Beside the name "South Eastman" is shown the bracketed information (1,2,t). This means that South Eastman's physician visit rate was statistically different (in this case, lower) than the provincial average at both the earlier time period of the fiscal year 1995/96 (as indicated by the "1"), and at the later time period of 2000/01 (as indicated by the "2"). The "t" indicates that the physician visit rate in South Eastman changed significantly from the earlier to the later time period (in this case, the change was an increase). The actual visit rates for South Eastman were 4.10 and 4.29 visits per person from the earlier to the later time period, compared to the Manitoba rates of 4.86 and 4.78 visits per persons in 1995/96 and 2000/01 respectively.

Figure 8.3.1: Ambulatory Visit Rates by RHA

Age & sex adjusted rate of visits to all physicians (annual average per resident)

South Eastman (1,2,t)	
South Western (1,2,t)	
Brandon (2,t)	
Central (1,2)	
Marquette (1,2,t)	1995/96
Parkland (1,t)	2000/01
Interlake (1,2,t)	Mb Avg 1995/96
North Eastman (1,2,t)	Mb Avg 2000/01
Burntwood (1,2,t)	
Churchill (2)	
Nor-Man	
Rural South (1,2)	
North (1,2,t)	
Winnipeg (1,2,t)	
Manitoba (t)	

0   1   2   3   4   5   6   7

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

South Eastman (1,2,t)

"t" = South Eastman earlier rate (shown in grey) is statistically different (lower) than the South Eastman later rate (shown in black).

"1" = South Eastman rate (shown in grey) for the early time period is statistically different (lower) than the Manitoba overall average rate for the early time period (shown as a grey vertical line on the graph).

"2" = South Eastman rate (shown in black) for the later time period is statistically different (lower) than the Manitoba overall average rate for the later time period (shown as a black vertical line on the graph).

Looking at Figure 8.3.2 (see Chapter 8), the rates for the four districts of South Eastman RHA are shown. There are similar statistical notations beside the district names of SE Northern, SE Central, SE Western, and SE Southern. For Northern and Central districts, the "t" indicates that the

ambulatory physician visit rates increased over time within those districts. In contrast, the Western and Southern district rates dropped over time.

When looking at each graph, health policy planners and decision-makers may wish to explore:

- *How does the RHA rate compare to the Manitoba overall rate, and to itself over time? If a region's rate is high or low, is it statistically higher/lower, or could it be expected to vary substantially from year to year?*
- *Do the districts within the RHA show similar or dissimilar patterns, and what contextual information may help explain the patterns?*
- *Does the RHA (and district) pattern "make sense" in terms of the ordering of the RHAs? In other words, knowing that the population health status becomes poorer as you go down the graph, does the corresponding rate increase or decrease as expected?*

2.7   Summary

There is a wealth of information contained in this report - information that we hope will prove useful to planners, decision-makers and policy-makers in the RHAs of Manitoba. The information can be used in many ways. A region can get an overview of the population it is serving, its health status and illness rates, preventive programs, child health indicators, use of health care services such as physicians and hospitals, procedure rates, use of home care and nursing homes, and its use of pharmaceuticals. Regions can also "cross-compare" their information with other regions and within their own districts, and look at their event numbers as well. Furthermore, regional planners will ask many questions about the context of their profiles - does this make sense, knowing the region and its people? We hope that this information will be a useful tool in the effort to improve the health of the entire population of Manitoba.

If you would like to access an electronic version of this report, which may help you in creating your own summary presentations, you will find this on the website of the Manitoba Centre for Health Policy, under Reports (complete reports).

Electronic versions of this report, as well as Excel spreadsheets of the graphs, are available at Manitoba Centre for Health Policy's website.

You will also find Excel spreadsheets for the graphs in this report (and graphs from other key reports of interest to RHA planners) by looking under the link called "RHA information."

The MCHP website address is **http://www.umanitoba.ca/centres/mchp/**

REFERENCES

Black C, Roos NP, Fransoo R, Martens P. Comparative Indicators of Population Health and Health Care Utilization for Regional Health Authorities. Winnipeg: *Manitoba Centre for Health Policy and Evaluation*, Department of Community Health Sciences, 1999.

Brownell M, Lix L, Ekuma O, Derksen S, De Haney S, Bond R, Fransoo R, MacWilliam L, Bodnarchuk J. Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans. Winnipeg, Manitoba: *Manitoba Centre for Health Policy, 2003*.

Martens PJ, Frohlich N, Brownell M, Carriere K, Derksen S. Embedding child health within framework of regional health: Population health status and sociodemographic indicators. *Canadian Journal of Public Health* 2002:93(Supplement 2): S15-S20.

Martens P, Bond R, Jebamani L, Burchill C, Roos N, Derksen S, Beaulieu M, Steinbach C, MacWilliam L, Walld R, Dik N, Sanderson D, Health Information and Research Committee (AMC), Tanner-Spence M, Leader A, Elias B, O'Neil J. *The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study*. Winnipeg, MB: Manitoba Centre for Health Policy, March 2002.

Chapter 3: Demographic and Socioeconomic Measures

3.1 What's in This Chapter?

Overall description, examples, and possible questions to pose.

This chapter presents information regarding RHA populations and their socioeconomic status. These characteristics are among the key determinants of population health status, and a population's underlying need for health care services. The two indicators are:

- Socioeconomic Factor Index (Section 3.2)
- Population Pyramids (Section 3.3)

Chapter 3 includes information about the socioeconomic well-being of the region and its districts. Social and economic conditions are known to have a strong influence on health status. The SEFI score (Socioeconomic Factor Index) is based on an index derived from Statistics Canada Census measures for labour force participation of women, age dependency ratio, per cent single parent households, per cent female single parent households, and two aggregated factors representing unemployment and education (Martens, Frohlich et al. 2002). Refer to the Methods section in Appendix 1 for further description.

SEFI is simply a way of describing an overall composite socioeconomic "risk" of a population in a given geographical area. SEFI values are area-level results: they represent averages for all residents living in geographically defined areas. The overall Manitoba score has been set to 0. Scores less than 0 indicate less socioeconomic risk, and scores greater than 0 indicate more socioeconomic risk. In general, the greater the socioeconomic risk, the poorer the regional overall health status and the more their need for health care services. No statistical testing is done with the SEFI score.

Example: Interlake RHA and its districts

In Figure 3.2.1, Interlake's SEFI scores from 1991 to 1996 (based upon the corresponding census of that year) showed a change from -.32 to -.09 overall. Knowing that the smaller the SEFI score is, the less the socioeconomic risk, Interlake RHA appears to have gone from a lower risk in 1991 to a risk score which is close to the Manitoba average in 1996 (that is, close to 0). However, looking at Figure 3.2.2, the district level shows quite distinct differences, with SW and SE districts having lower risk (-0.65 and -0.36 respectively), and NE and NW greater socioeconomic risk (+0.68 and +0.56 respectively) compared to the Manitoba overall score of 0. As well, SW and NW districts appear to

stay quite stable over time. But SE goes up noticeably in socioeconomic risk (from -0.67 to -0.36), as does NE (+0.23 to +0.68).

Chapter 3 also includes detailed information about the age and sex distribution of each RHA's population, both in comparison to the Manitoba population for the year 2000, and over time within the RHA comparing 1995 to 2000. Most indicators in this report are age and sex adjusted, so that they account for these differences in population structure by RHA and District. See Chapter 2, Sections 2.4 and 2.5, for a further explanation as to how the RHA population pyramid (profile) is related to the concept of an "adjusted" or age- and sex-standardized rate.

Example: Nor-Man RHA

A comparison of Nor-Man's and Manitoba's population pyramids for the year 2000 is given in Figure 3.3.11a. Nor-Man appears to be a "young" RHA, with a greater percentage of younger people, and smaller percentage of older people when compared to the Manitoba overall population. For example, the percentage of youth ages 0 through 19 years is 35.4% in Nor-Man, compared to 28.1% for the overall provincial population.

The second type of population pyramid shown for each RHA is the change over time within that RHA. Figure 3.3.11b of Chapter 3 shows a comparison of Nor-Man's 1995 and 2000 population pyramid. Looking at the 15-19 year olds, there was little change in the total numbers: 1,067 males in 1995 and 1,090 males in 2000; 1,036 females in 1995 and 1,029 females in 2000. This is quite different from the age bracket of 50-54 year olds, where the numbers of both males and females increased over time: 560 to 861 males, and 549 to 676 females.

Based upon the graphs of Chapter 3, some of the questions that health policy planners and decision-makers may wish to explore include:
- *Have socioeconomic conditions become better or worse over time, and how would this affect the regional or district health?*
- *How does the RHA's population pyramid compare to Manitoba's? To other RHAs?*
- *How is the region's population structure likely to impact the types of service delivery? For example, a young population, with possibly larger-than-average family size, may require more emphasis placed on such programs as pre-natal care, maternity services, pediatric services, and childhood immunization programs.*

3.2   Socioeconomic Factor Index (SEFI)

Definition: The SEFI is a composite index of several measures of social and economic conditions derived from Canadian Census data. Negative values indicate low risk, and positive values indicate high risk. In some areas of Burntwood and North Eastman, the data could not be defined to precisely match District boundaries, so the closest approximations are presented (see the Glossary for details). There is no statistical testing for the SEFI scores presented here.

Figure 3.2.1: SEFI Values by RHA

Socioeconomic factor index values, on standardized scale

Statistical testing was not done on SEFI values, due to the nature of their calcuation.
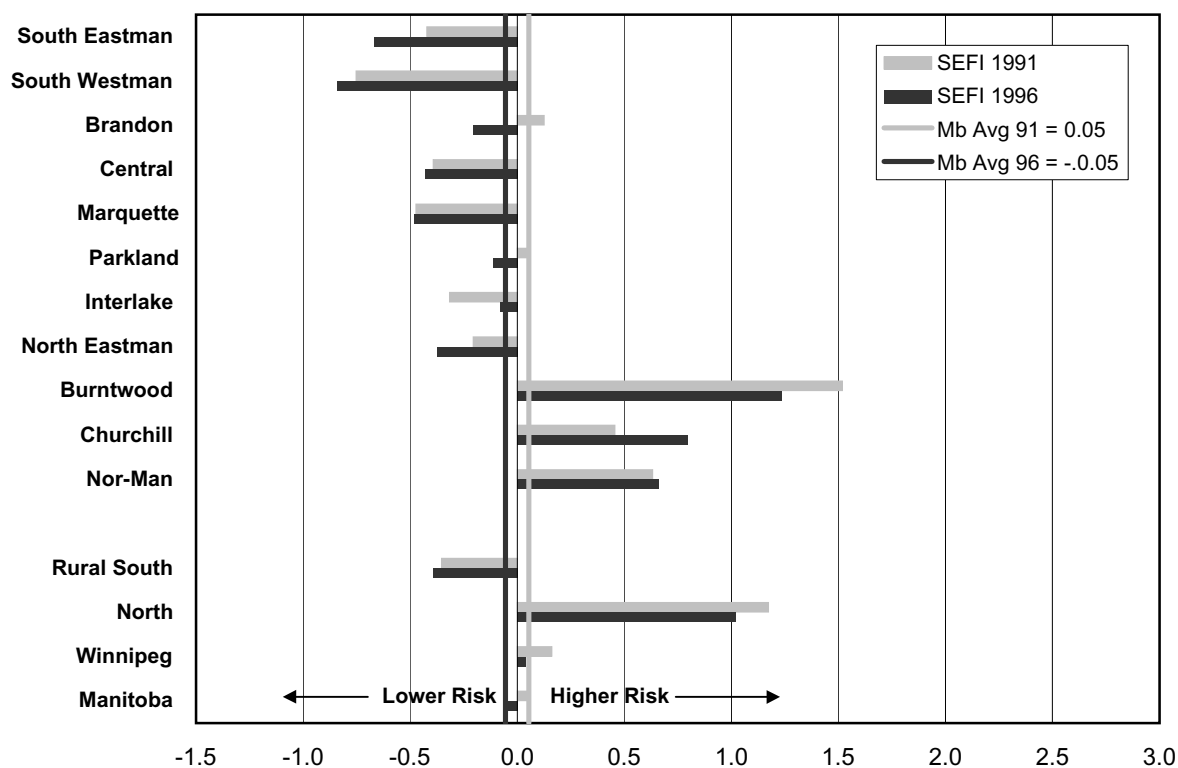
Figure 3.2.2: SEFI Values by District

Socioeconomic factor index values, on standardized scale

(#) indicates areas where an exact geographical match with Census data was not possible. See Appendix 1 for details.

Due to the nature of the calculation of the SEFI index, the values cannot be tested for statistically significant differences.

Legend:
- SEFI 1991
- SEFI 1996
- Mb Avg 91 = 0.05
- Mb Avg 96 = -0.05

Districts (top to bottom):
SE Northern, SE Central, SE Western, SE Southern, SW District # 3, SW District # 1, SW District # 2, Bdn West (#), Bdn Rural (#), Bdn East (#), MacDonald/Cartier, Morden/Winkler, Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage, MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North, IL Southwest, IL Southeast, IL Northeast, IL Northwest, Springfield (#), Winnipeg River (#), Brokenhead (#), Iron Rose (#), Blue Water (#), Northern Remote (#), Thompson, Oxford H & Gods (#), Cross Lake (#), Lynn/Leaf/SIL, Island Lake (#), Tad/Broch/Lac Br (#), Gillam/Fox Lake, Thick Por/Pik/Wab (#), Norway House (#), Sha/York/Split/War (#), Nelson House (#), Churchill, F Flon/Snow L/Cran (#), The Pas/OCN/Kelsey (#), Nor-Man Other (#)

x-axis: -1.5, -1.0, -0.5, 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0

3.3   Population Pyramids

Definition: A population pyramid is a graph showing the age and sex distribution of the population, shown for each of the RHAs. The percentage (or actual numbers) of the population within each five-year age group (such as 0-4, 5-9, 10-14, and so on, up to 90+ years old), is shown for both males (on the left side of the graph) and females (on the right side).

There are two types of population pyramids shown for each RHA:
(a) The first pyramid, designated by an "a", is a comparison between the RHA and the Manitoba overall population for the year 2000, showing the percentage of males and females in each five-year age category. All of these "bars" add up to 100%, meaning that every resident fits into one of these groupings.
(b) The second pyramid, designated by a "b", shows a comparison over time within each RHA. The RHA population from 1995 is compared with the RHA in the year 2000, showing the **actual** number of males and females in each five-year age category. Each bar shows the population size of the corresponding age category for males on the left, and females on the right. Thus all of these bars in each given year will add up to the total population size for the years 1995 and 2000 respectively.

The data required to create similar graphs for each district within the RHA are available through MCHP's website (www.umanitoba.ca/centres/mchp/).

Figure 3.3.1a: Age Profile of South Eastman, 2000
Population: 54,427
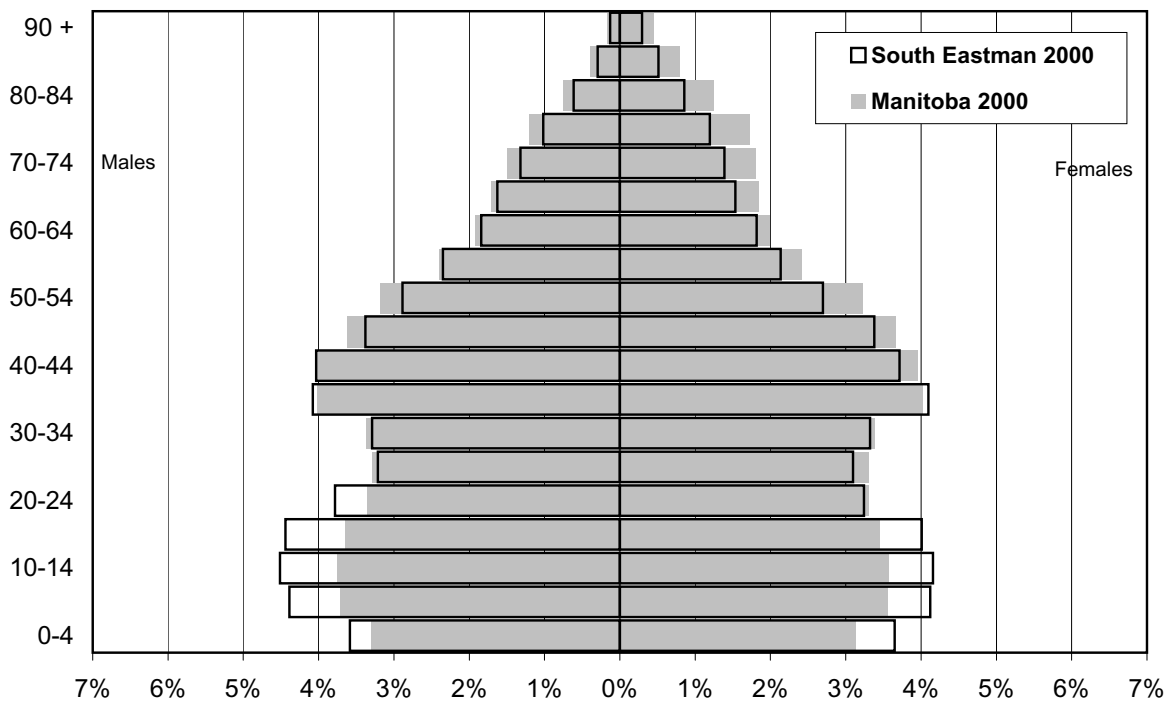
Figure 3.3.1b: Age Profile of South Eastman
Population 1995: 51,395
Population 2000: 54,427
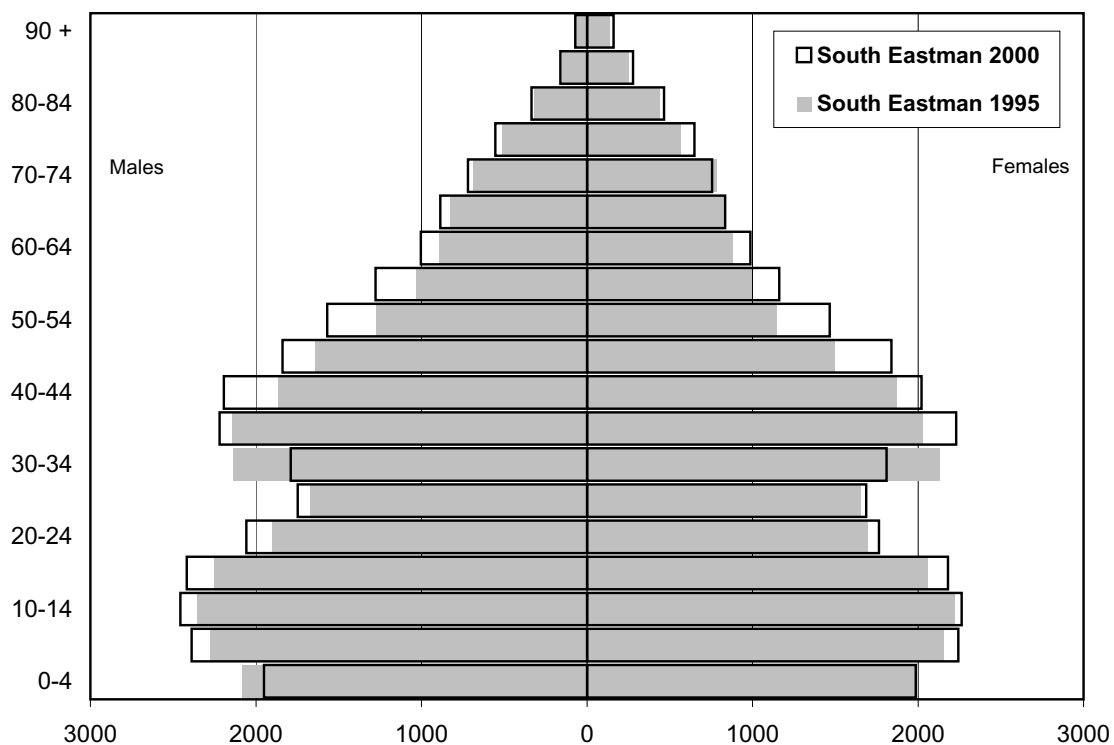
Figure 3.3.2a: Age Profile of South Westman, 2000
Population: 34,029

Males

Females

☐ South Westman 2000
▨ Manitoba 2000

| 90 + | 80-84 | 70-74 | 60-64 | 50-54 | 40-44 | 30-34 | 20-24 | 10-14 | 0-4 |

7%   6%   5%   4%   3%   2%   1%   0%   1%   2%   3%   4%   5%   6%   7%
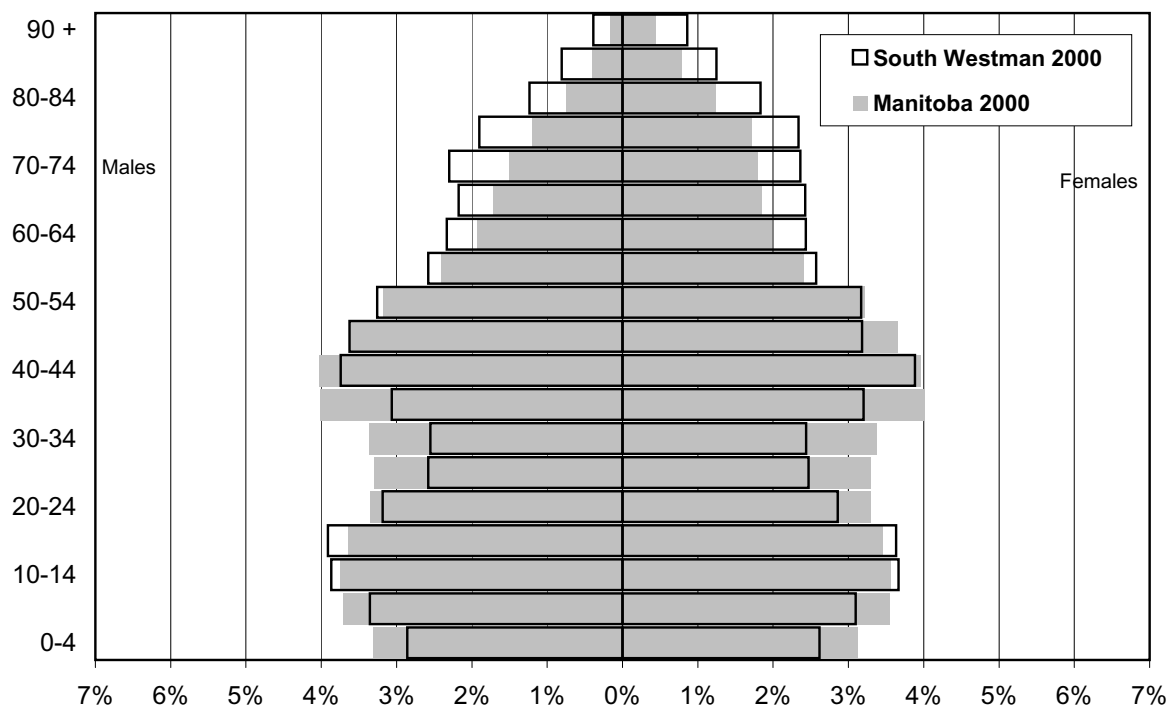
Figure 3.3.2b: Age Profile of South Westman
Population 1995: 35,441
Population 2000: 34,029

Males

Females

☐ South Westman 2000
▨ South Westman 1995

| 90 + | 80-84 | 70-74 | 60-64 | 50-54 | 40-44 | 30-34 | 20-24 | 10-14 | 0-4 |

2000   1500   1000   500   0   500   1000   1500   2000
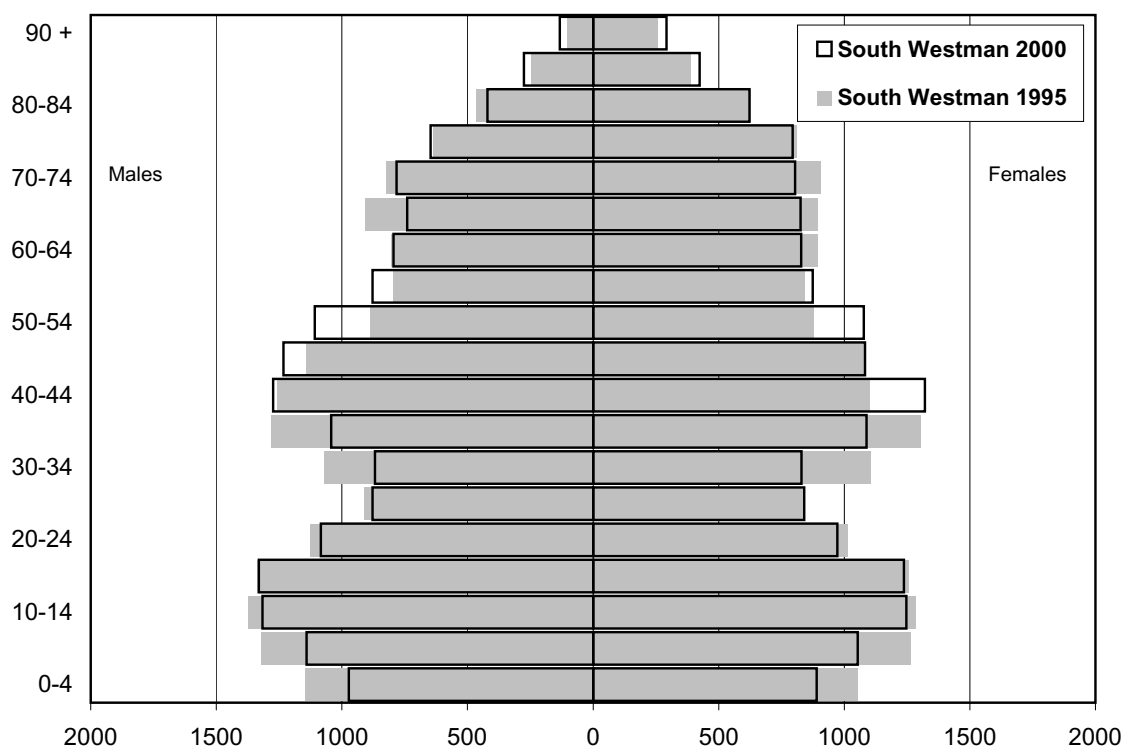
Figure 3.3.3a: Age Profile of Brandon, 2000
Population: 47,337
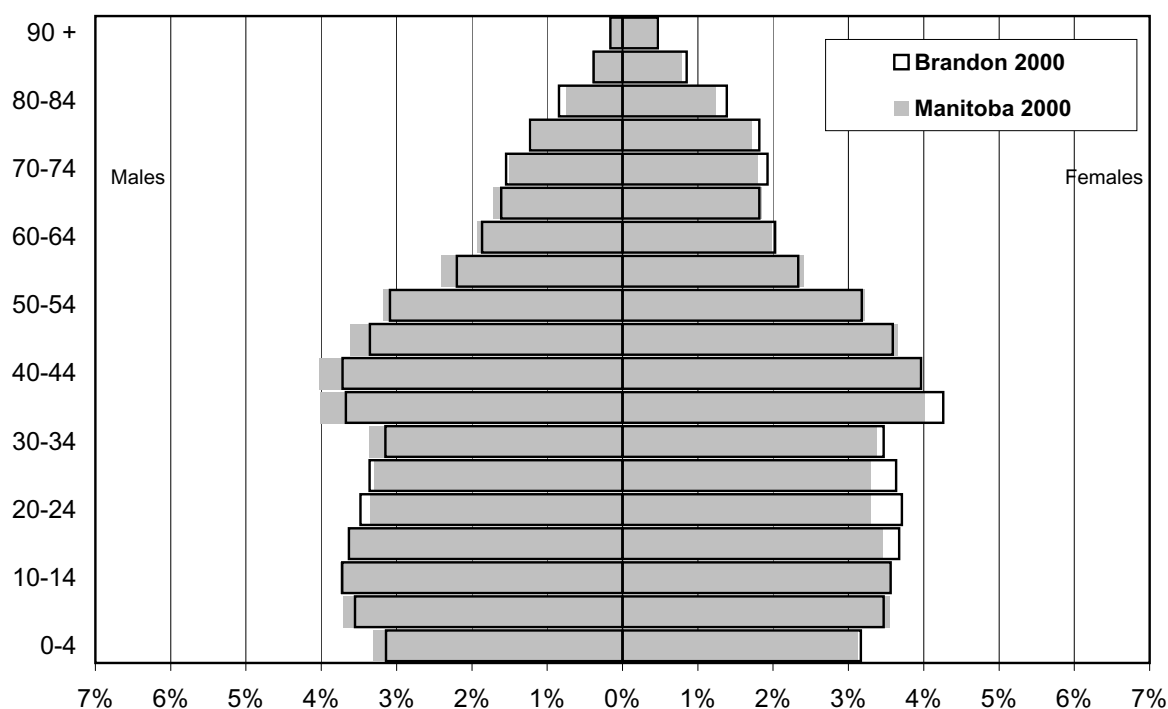
Figure 3.3.3b: Age Profile of Brandon
Population 1995: 46,863
Population 2000: 47,337
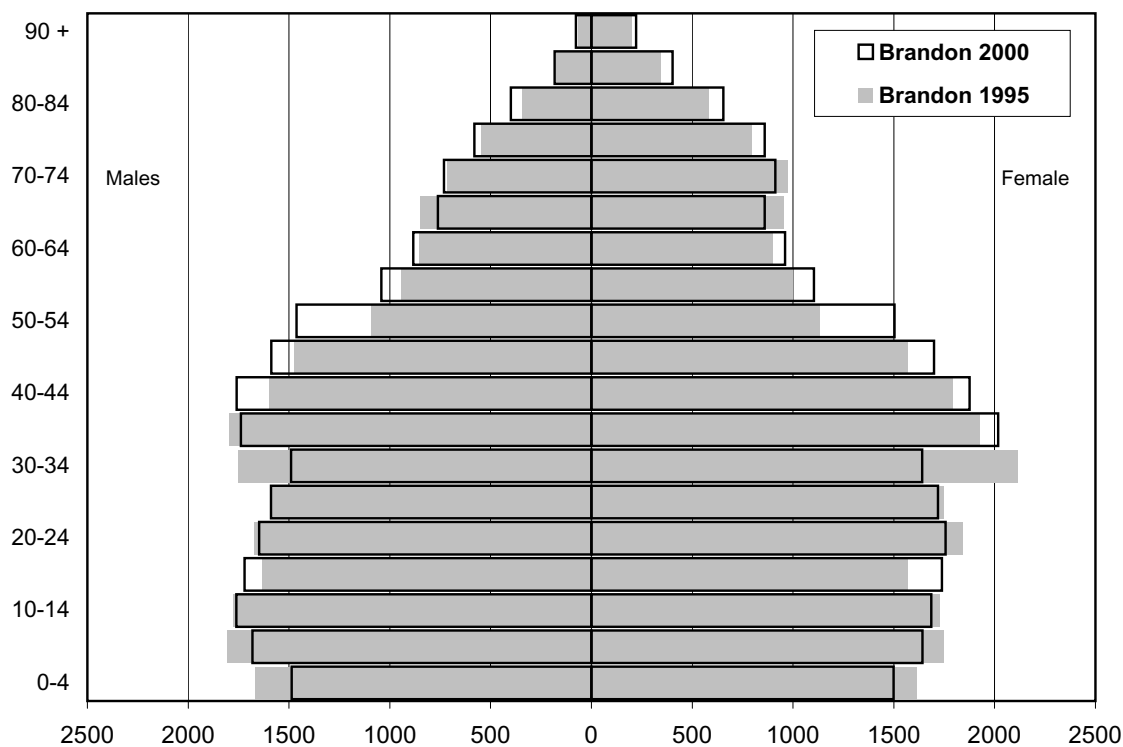
Figure 3.3.4a: Age Profile of Central, 2000
Population: 97,865
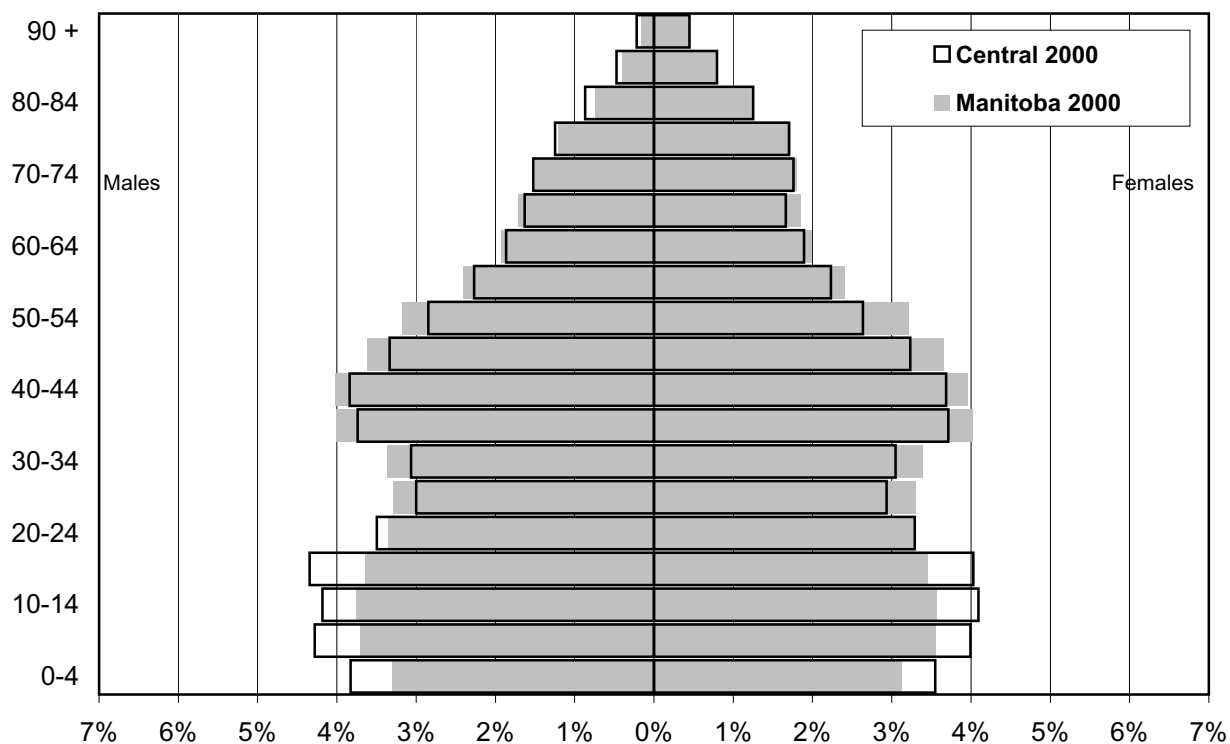
Figure 3.3.4b: Age Profile of Central
Population 1995: 96,152
Population 2000: 97,865
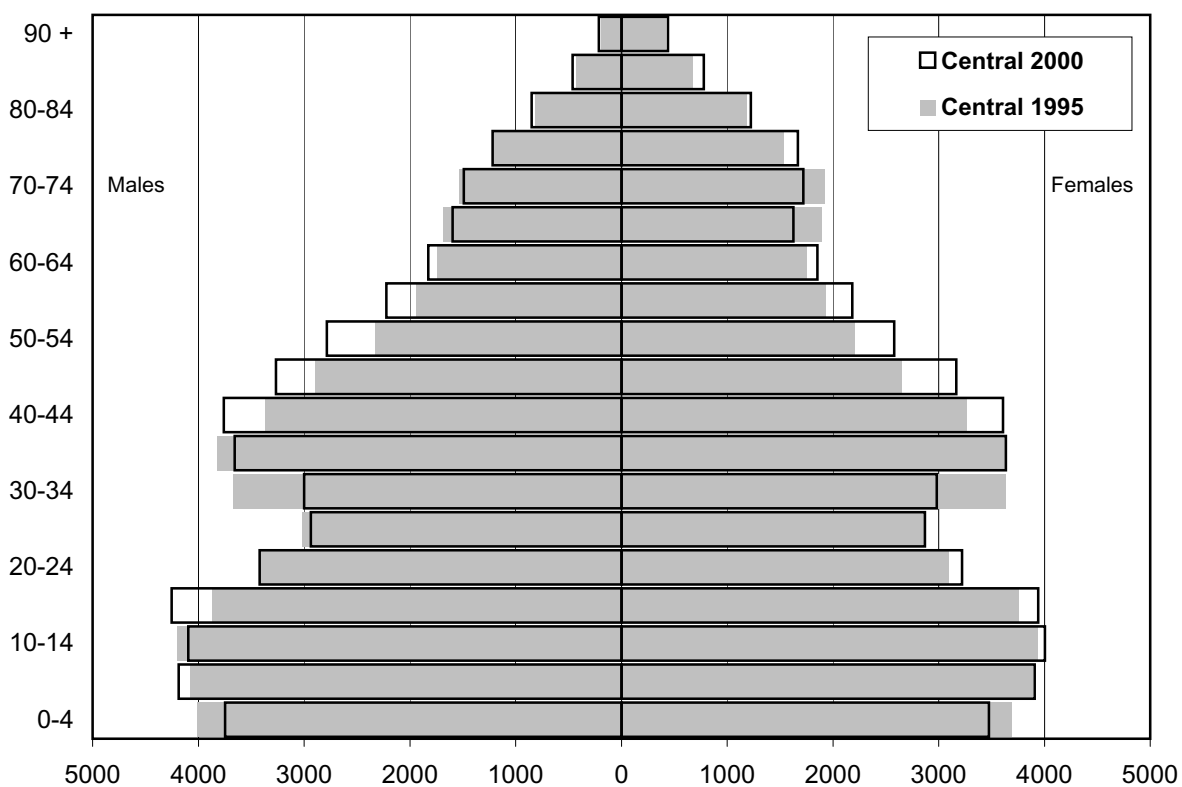
Figure 3.3.5a: Age Profile of Marquette, 2000
Population: 37,515
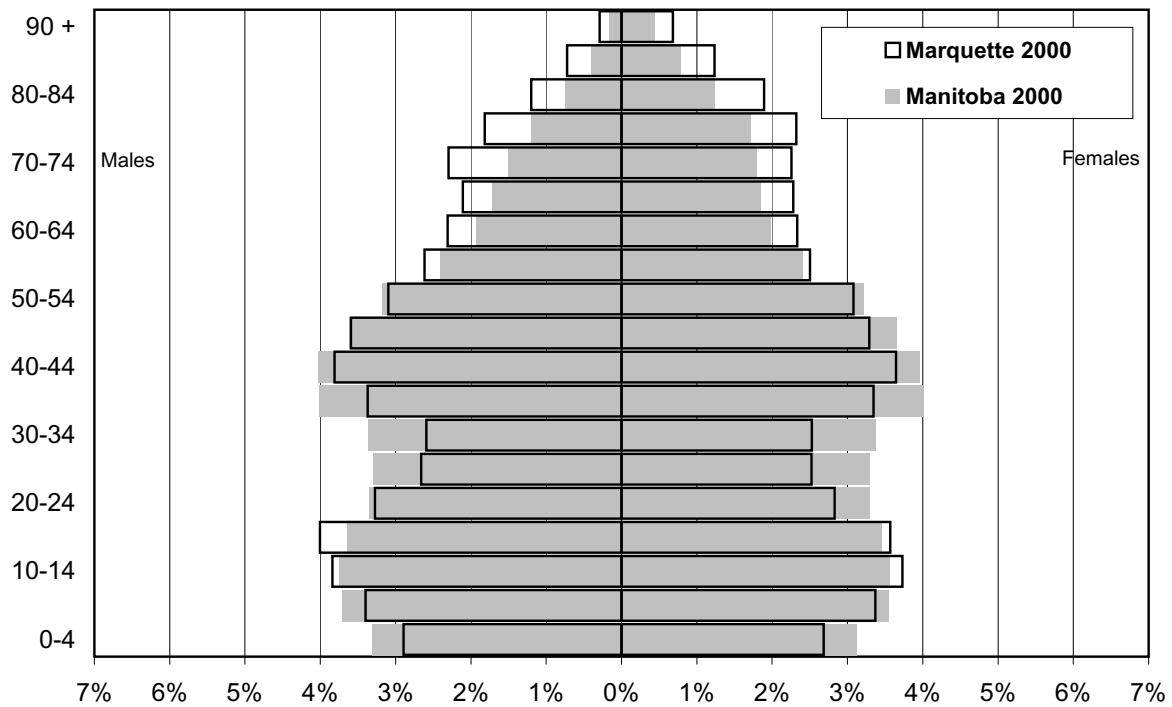
Figure 3.3.5b: Age Profile of Marquette
Population 1995: 37,941
Population 2000: 37,515
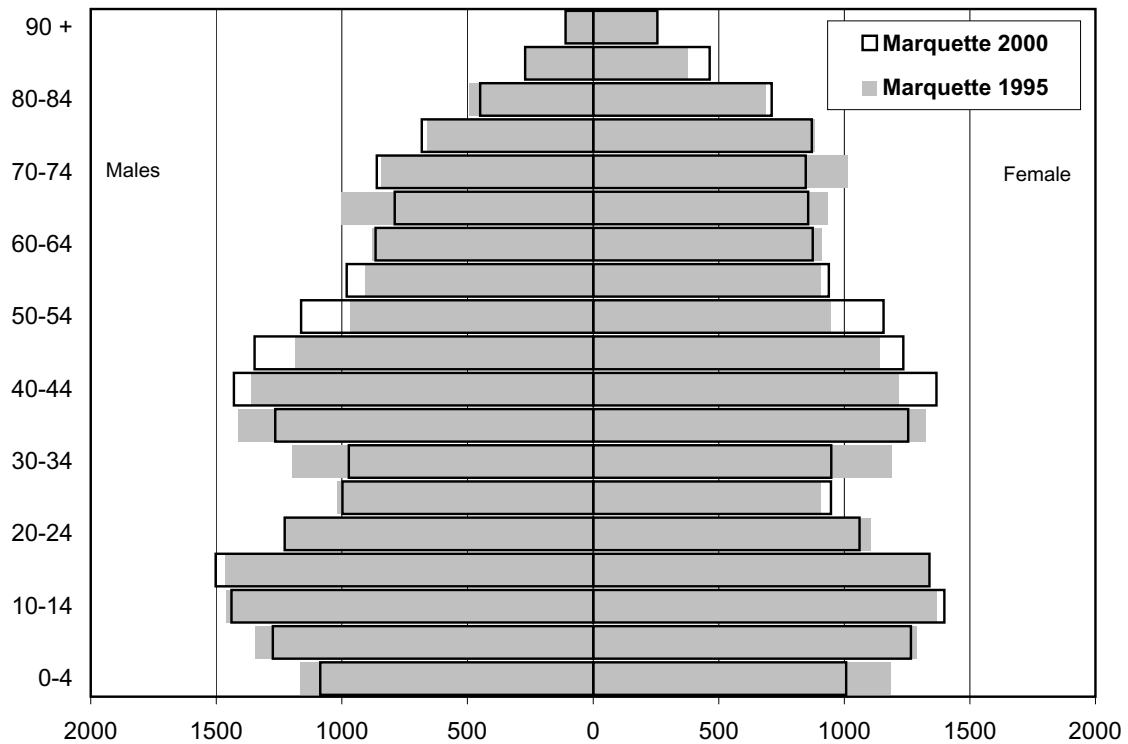
Figure 3.3.6a: Age Profile of Parkland, 2000
Population: 42,909
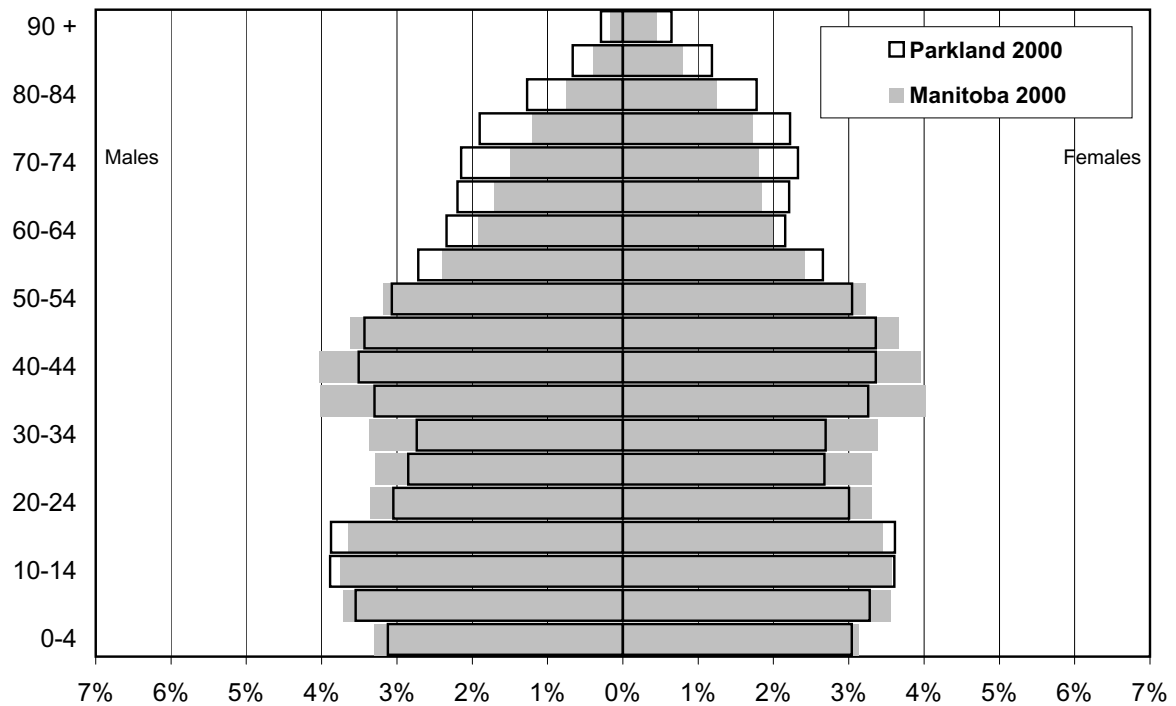
Figure 3.3.6b: Age Profile of Parkland
Population 1995: 44,090
Population 2000: 42,909
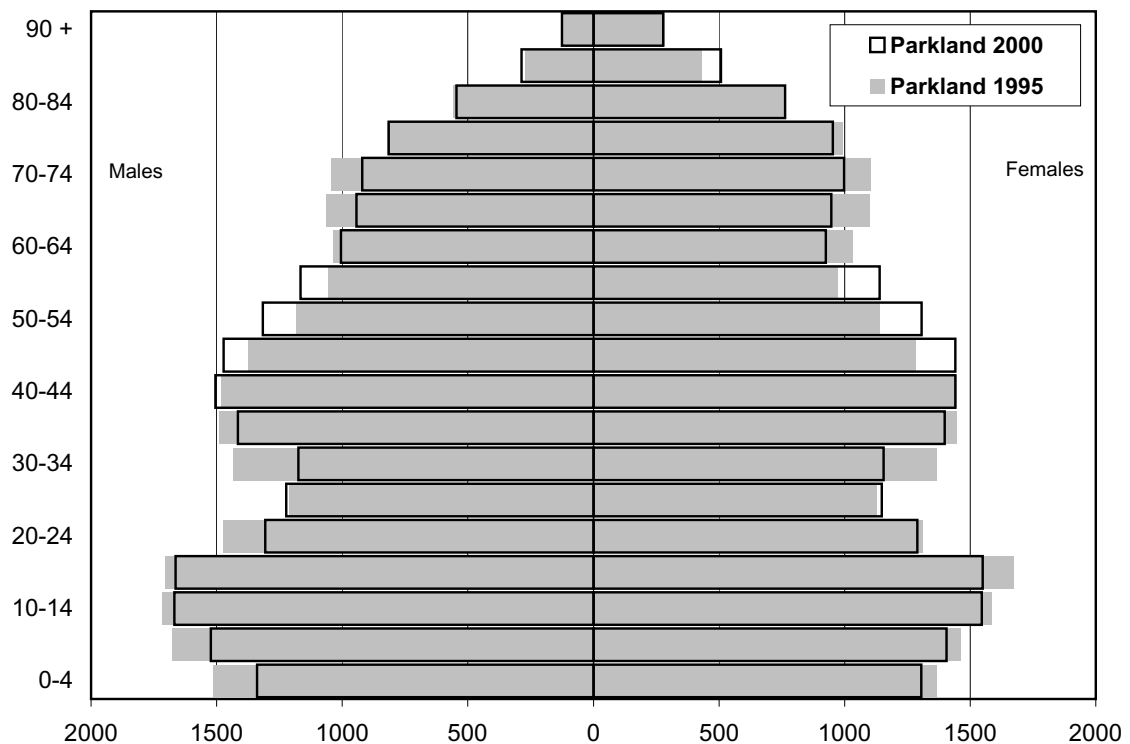
Figure 3.3.7a: Age Profile of Interlake, 2000
Population: 74,944

Males   Female

Legend:
□ Interlake 2000
■ Manitoba 2000

Age groups (top to bottom): 90 +, 80-84, 70-74, 60-64, 50-54, 40-44, 30-34, 20-24, 10-14, 0-4

X-axis: 7% 6% 5% 4% 3% 2% 1% 0% 1% 2% 3% 4% 5% 6% 7%
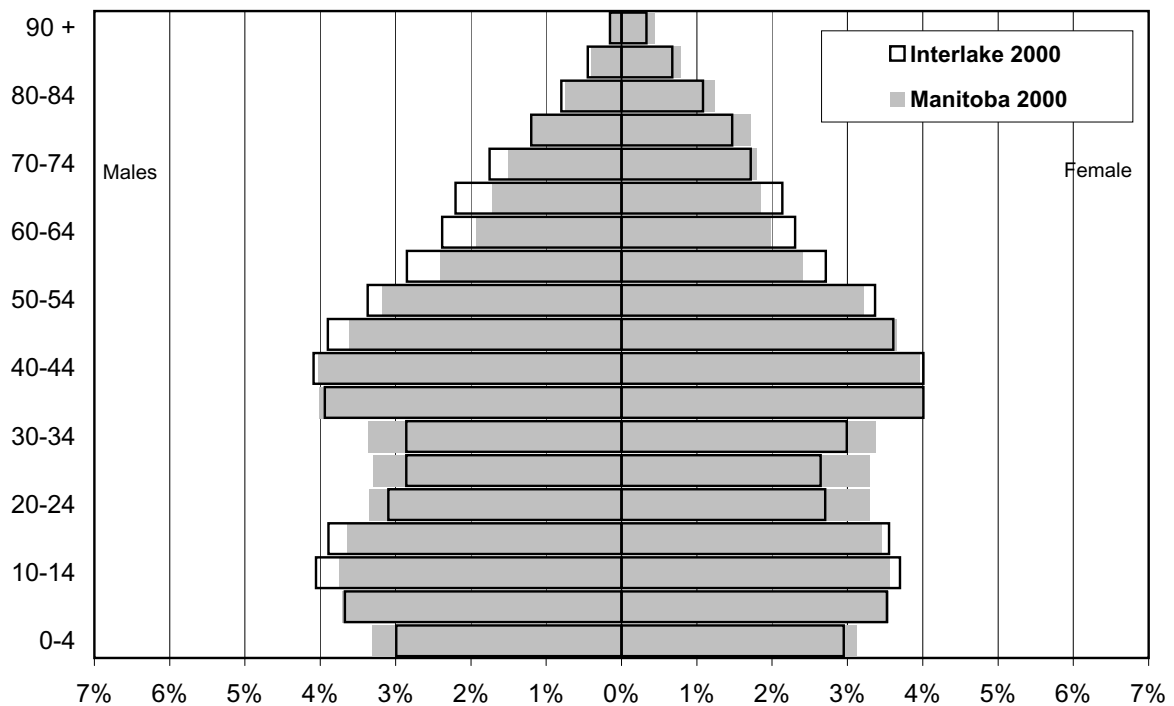
Figure 3.3.7b: Age Profile of Interlake
Population 1995: 73,338
Population 2000: 74,944

Males   Females

Legend:
□ Interlake 2000
■ Interlake 1995

Age groups (top to bottom): 90 +, 80-84, 70-74, 60-64, 50-54, 40-44, 30-34, 20-24, 10-14, 0-4

X-axis: 4000 3000 2000 1000 0 1000 2000 3000 4000
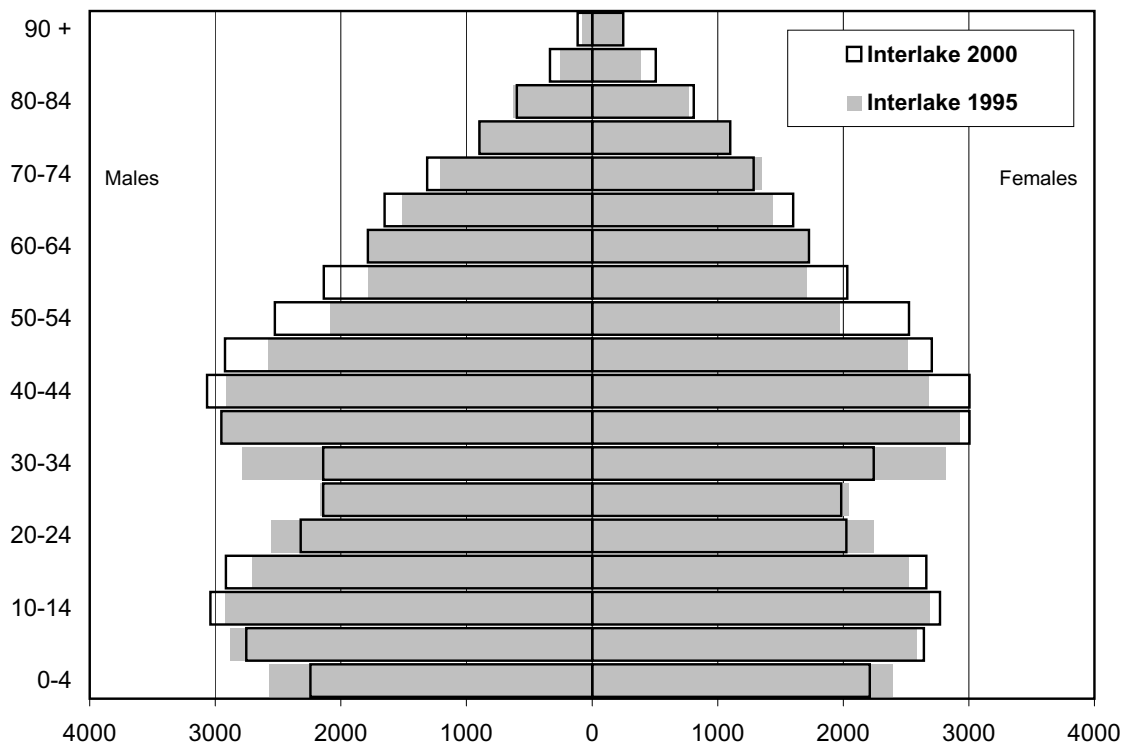
Figure 3.3.8a: Age Profile of North Eastman, 2000
Population: 39,369
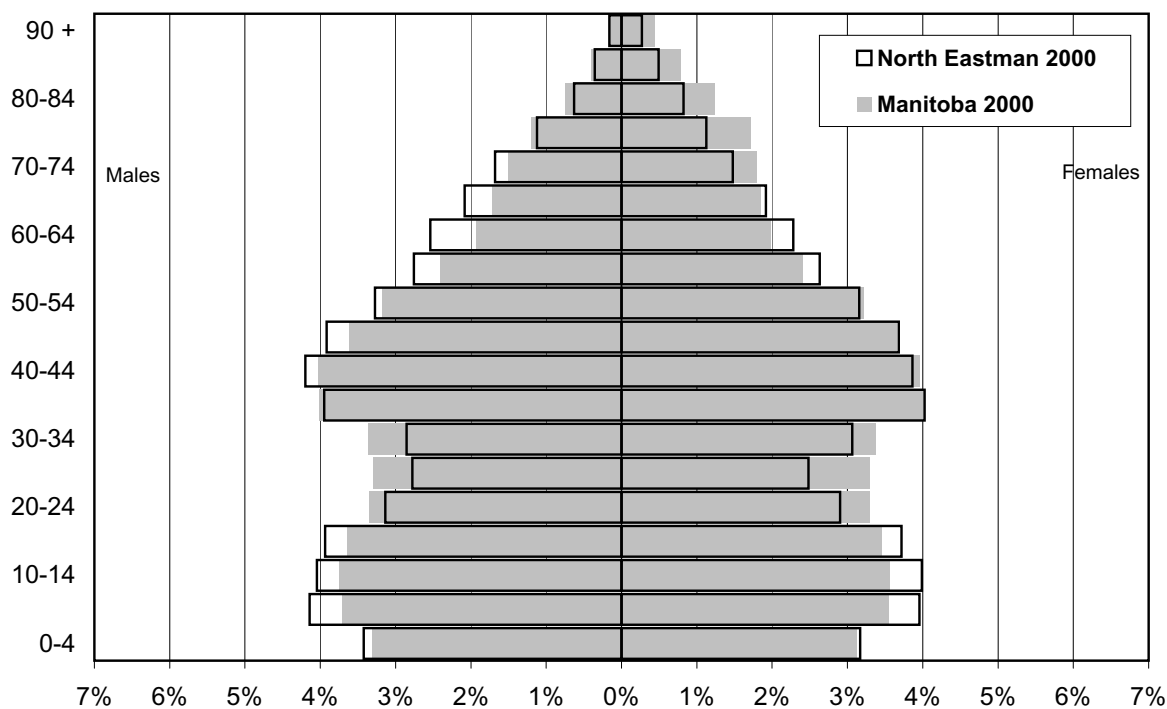
Figure 3.3.8b: Age Profile of North Eastman
Population 1995: 37,618
Population 2000: 39,369
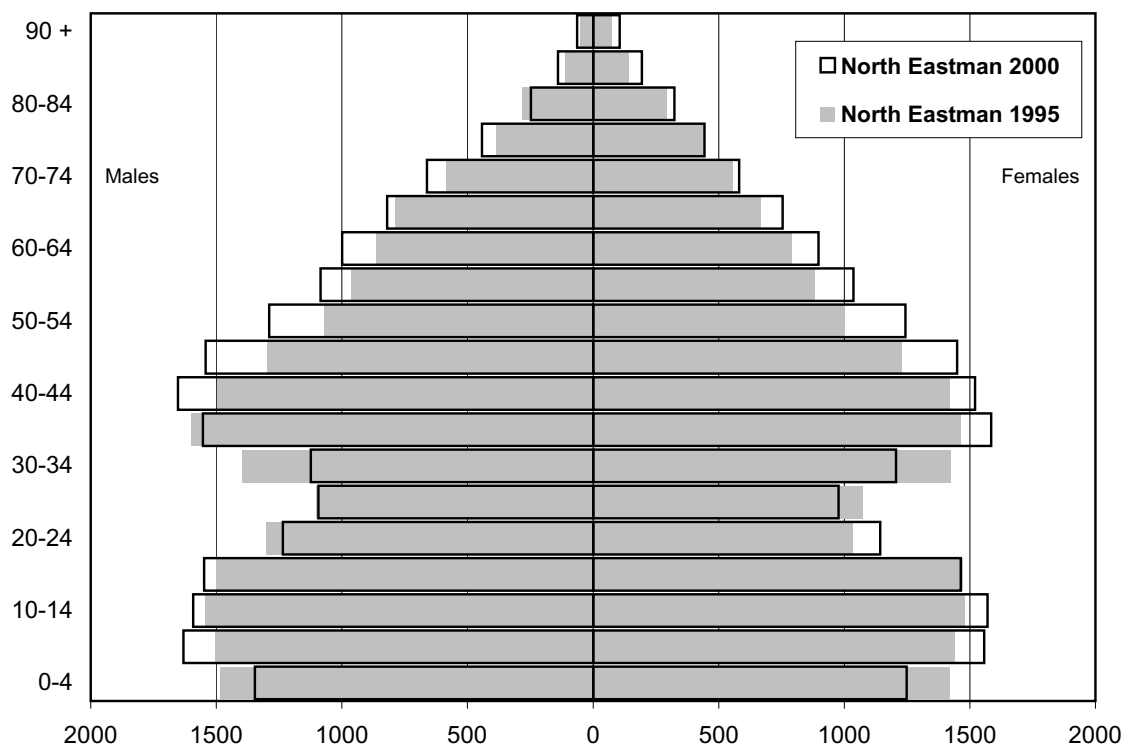
Figure 3.3.9a: Age Profile of Burntwood, 2000
Population: 45,051
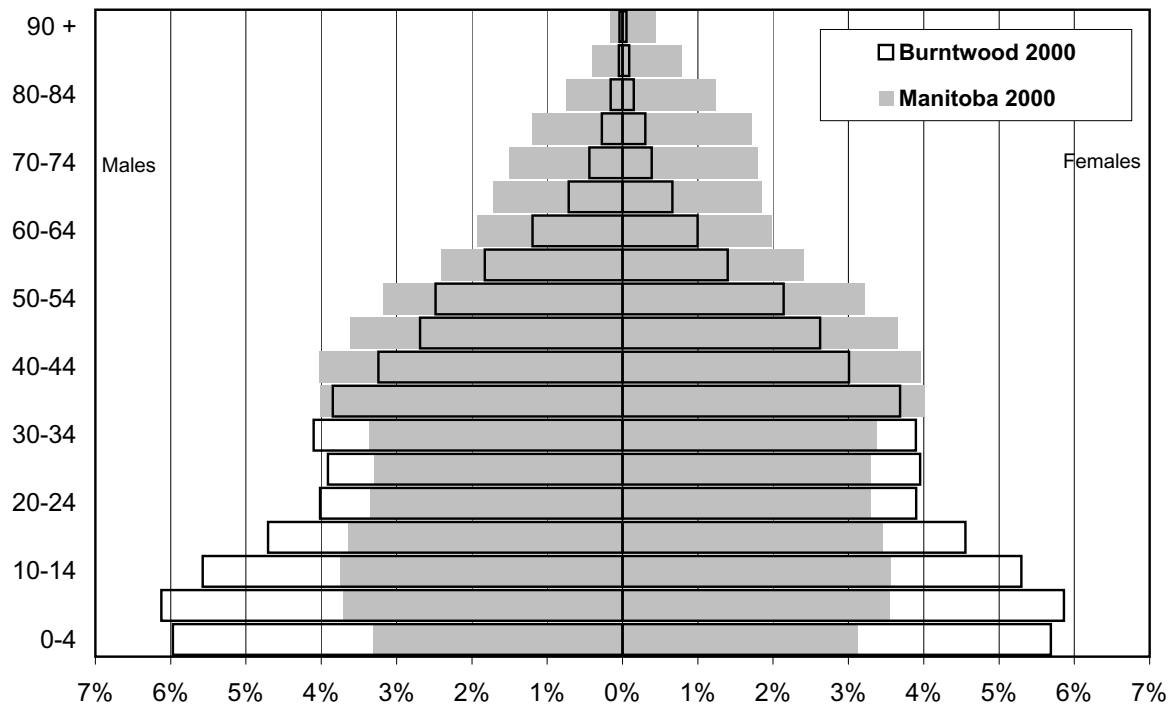
Figure 3.3.9b: Age Profile of Burntwood
Population 1995: 43,793
Population 2000: 45,051
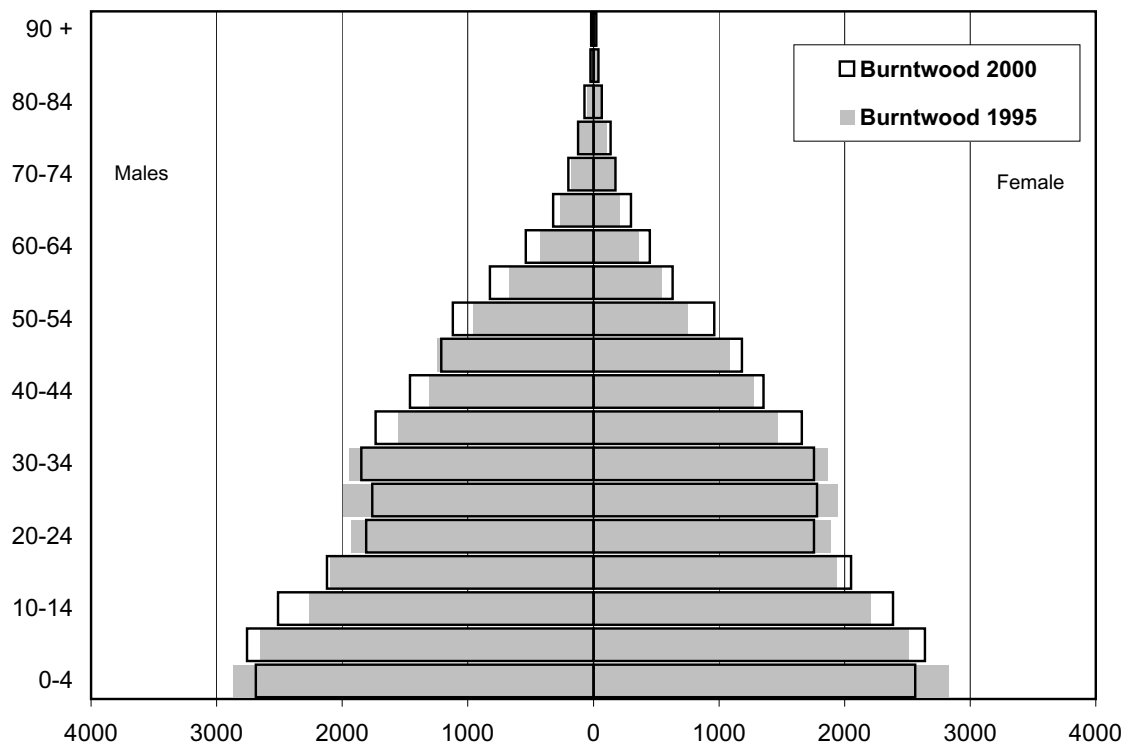
References

Martens PJ, Frohlich N, Carriere KC, Derksen S, Brownell M. Embedding child health within a framework of regional health. *Canadian Journal of Public Health* 2002;93(Supplement 2):S15-S20.

Figure 3.3.10a: Age Profile of Churchill, 2000
Population: 1,008
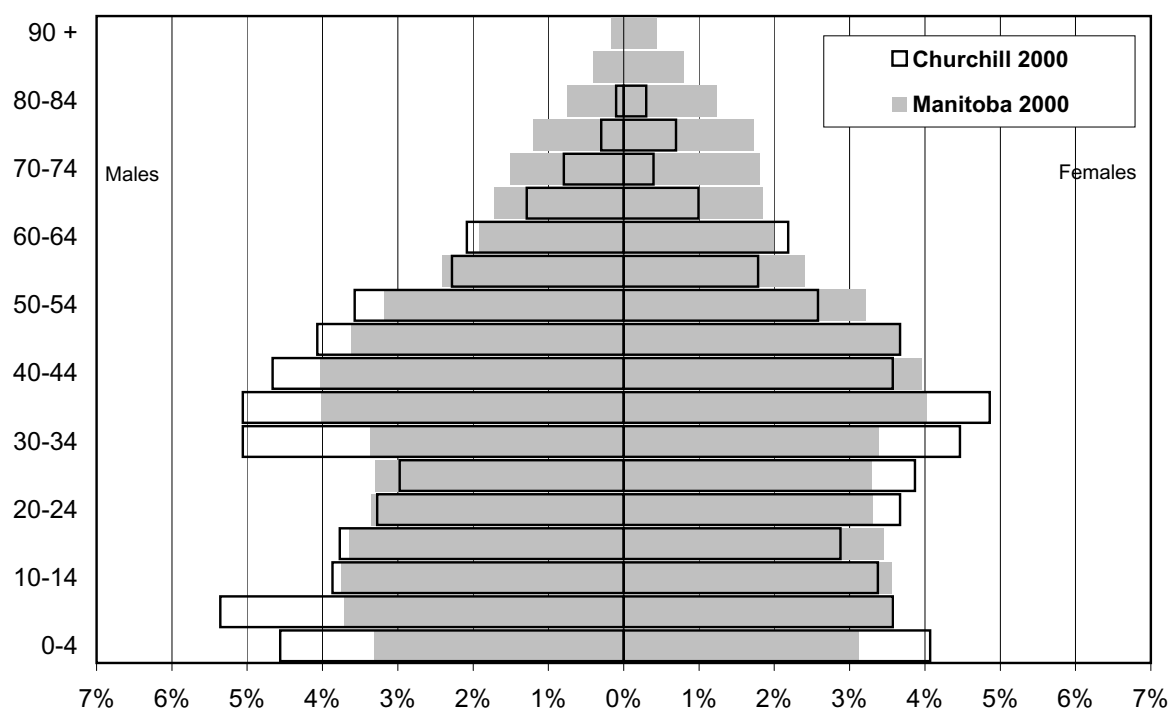
Figure 3.3.10b: Age Profile of Churchill
Population 1995: 1,115
Population 2000: 1,008
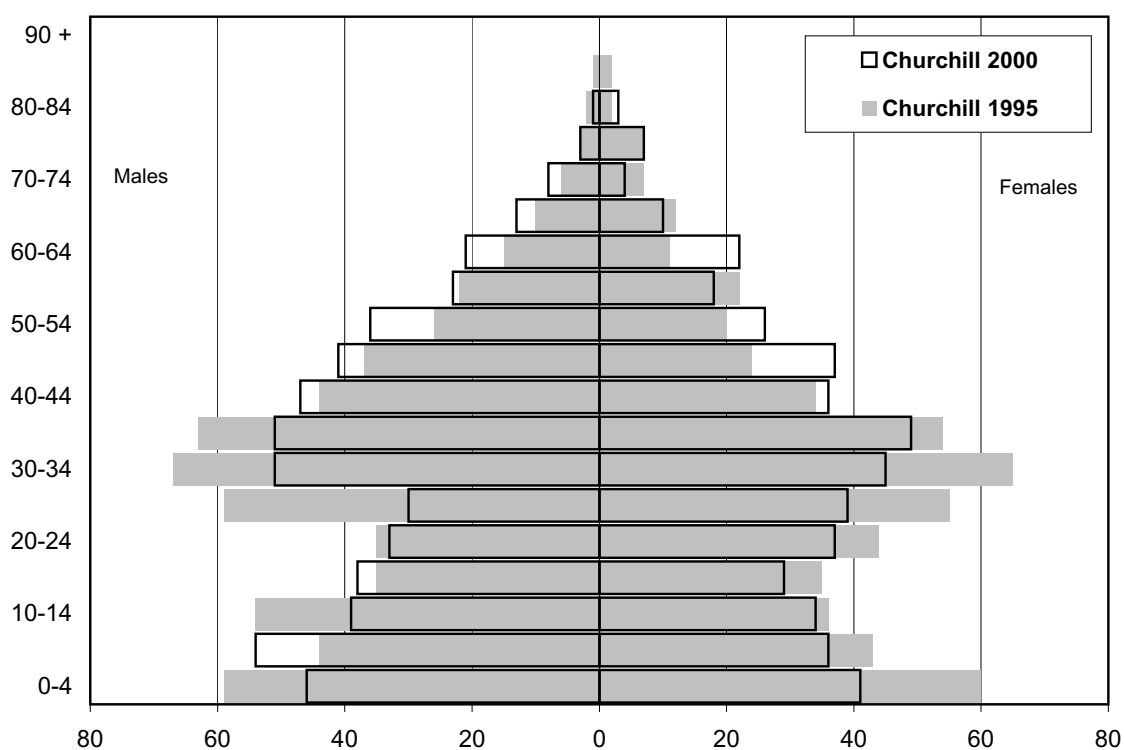
Figure 3.3.11a: Age Profile of Nor-Man, 2000
Population: 25,233
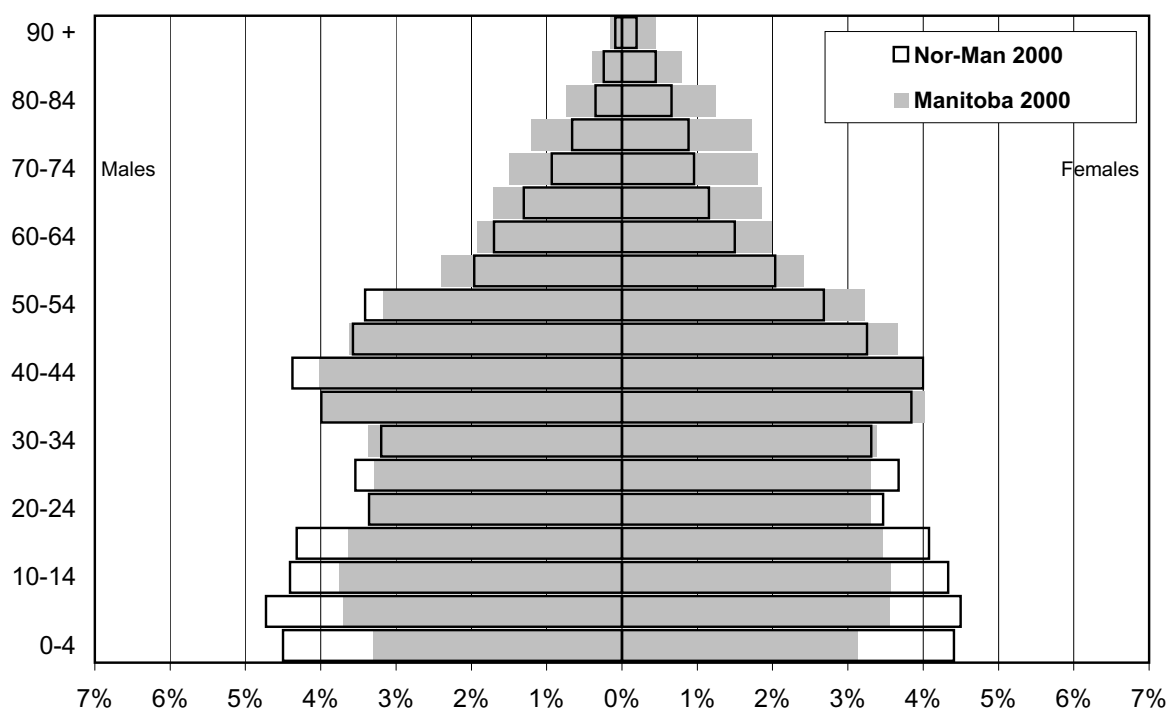
Figure 3.3.11b: Age Profile of Nor-Man
Population 1995: 25,117
Population 2000: 25,233
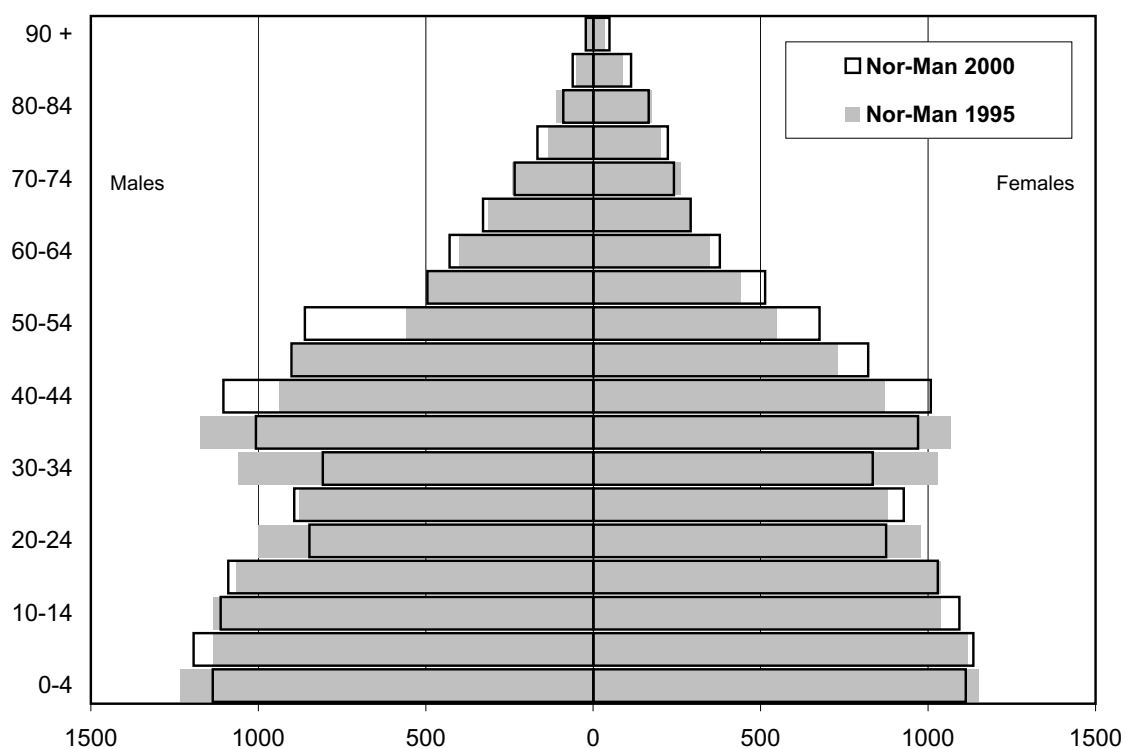
Chapter 4:   Health Status and Mortality

4.1 What's in This Chapter?
Overall description, examples, and possible questions to pose.

This chapter contains information on the overall health status of area residents, mortality rates and causes. The indicators are:
- Premature Mortality Rates (Section 4.2)
- Life Expectancy (Section 4.3)
- Potential Years of Life Lost (Section 4.4)
- Total Mortality Rates (Section 4.5)
- Injury Mortality Rates (Section 4.6)
- Top causes of deaths, and top causes of injury deaths (Section 4.7)

Premature mortality rate (PMR) is defined as the rate of death before the age of 75 years, age- and sex-adjusted (see Chapter 2, Section 2.5 for further explanation of adjusted rates). PMR is considered the best single measure to reflect the health status of a region's population. PMR is highly associated with morbidity, and with self-rated health (Carstairs and Morris 1991; Eyles et al. 1991; Eyles and Birch 1993; Reid et al. 2002), as well as with socioeconomic risk factors (Martens, Frohlich et al. 2002). This leads to the speculation that populations having a high PMR most likely require the use of more health care services, including preventive services[1].

The ordering of the RHAs (and districts) in each graph of this report reflects the overall PMR of the region. Those regions having a low PMR, that is, an overall good health status, are found at the top left-hand side (South Eastman, South Westman, Brandon and Central RHAs). Those regions having a high PMR are found at the bottom of the graph (Burntwood, Churchill and Nor-Man). See Chapter 2, Section 2.3 for a more detailed description of the ordering of the RHA and District graphs.

Other commonly-used indicators of health status are also given in this Chapter. Life expectancy at birth is based upon the mortality experience of the population. Potential Years of Life Lost (PYLL) is the years of life lost per thousand population ages one through 74 years. It is similar to PMR but gives greater weight to the death of a younger person, by adding up the number of years "lost" when a person dies before age 75 years. PYLL is large if there is a high death rate among young or middle-aged persons (often from injury), and small if most of the deaths in a population occur in later life (usually from conditions such as heart problems or chronic problems) (Young 1998).

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[1]In the MCHP report by Brownell et al. (2003), it was observed that PMR in the North (Burntwood, Churchill and Nor-Man) has not changed. In contrast, this report states that PMR has improved (that is, become lower). The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. PMR in the North was lower in the 1980s, increased in the first half of the 1990s, and then went back to the 1980s levels in the last half of the 1990s.

Total mortality rate shows the experience of the entire population[2]. A subset of total mortality rate is also given - the rate of death due to injury. This is the leading cause of death for children ages one through 19, and is especially high in rural and northern areas of the province (Brownell, Martens, Kozyrskyj et al. 2001). To give a more accurate picture of mortality for purposes of regional planning, the causes of death (as well as the causes of injury deaths) are given by aggregate regions of "North", "Rural South and Brandon", and "Manitoba" over two time periods[3].

Example: Interlake RHA

Looking at Figure 4.2.1, Interlake RHA had a higher Premature Mortality Rate (PMR) than the provincial rate in the first half of the 1990s (as indicated by the "1" in the margin), but this rate dropped significantly (as indicated by the "t" in the margin) over time to approximate the Manitoba average in the last half of the 1990s. The actual PMRs for Interlake were 3.8 deaths per thousand people ages 0 through 74 years old in the first half of the 1990s, and 3.4 in the last half. Manitoba's overall PMRs were 3.5 and 3.3 deaths per thousand people respectively. There are some RHAs that have lower PMRs (indicating populations with better health status) and some higher (populations with worse health status), with Interlake located about midway. The PMR graph for districts (Figure 4.2.2) shows that the statistically significant drop in PMR over time occurred in two subregions of Interlake: Northeast, and Northwest.

Another way of looking at the health status in this report is the life expectancy at birth. The life expectancy rates in this report do not have statistical testing. In the most recent time period, Interlake men at birth can expect to live, on average, to about 75 years; women to about 81 (see Figures 4.3.3 and 4.3.1) - very close to the Manitoba life expectancies. For Interlake RHA, male and female Potential Years of Life Lost (PYLLs) show a similar trend to PMR, with statistically significant decreases from the first half to the latter half of the 1990s (see Figures 4.4.3 and 4.4.5) and with the most recent data similar to Manitoba averages.

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[2] In the MCHP report by Brownell et al. (2003), it was observed that total mortality rates for the province had decreased. In contrast, this report states that total mortality rates have remained stable provincially. The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. Total mortality was higher in the 1980s, decreased in the first half of the 1990s, and then stayed the same in the last half of the 1990s.

[3] In the MCHP report by Brownell et al. (2003), it was observed that injury mortality rates for the province had not changed. In contrast, this report states that injury mortality rates have decreased. The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. Injury mortality was lower in the 1980s, increased in the first half of the 1990s, and then went back to the 1980s levels in the last half of the 1990s.

Interlake's overall mortality rate was 8.08 deaths per thousand in the last half of the 1990s (see Figure 4.5.1), with only a small portion of these attributable to injury deaths (0.54 deaths per thousand). Interlake's injury mortality rates (see Figure 4.6.1) have stayed very similar over the two time periods (0.57 and 0.54 deaths per thousand), even though the provincial injury mortality rates have increased significantly over the same time period (0.44 and 0.49 deaths per thousand).

Interlake is one of the RHAs in the aggregate grouping called "Rural South and Brandon." This area's top causes of death, and of injury death, are shown in Figures 4.7.1a and 4.7.1b. The top cause of death in the first half of the 1990s was due to circulatory diseases (41%), followed by cancer (26%) and respiratory illnesses (10%). Comparing the categories from the first half to the second half of the 1990s, very little changed in the major causes of death.

Injuries accounted for 6% of deaths. Within this category, "motor & other vehicle" deaths accounted for about one-third of the injury deaths (32%), followed by "violence to self" (that is, suicide) at 21%, and "falls" at 15%. In the deaths due to injury, there was a slight decrease in motor & other vehicle deaths (29% of the injury deaths), and an increase in deaths due to falls (23% of the injury deaths).

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *What is the relative overall health status (PMR) of the region and its districts compared to other regions or the province, and how will this affect the population's need for health care services?*
- *Do all three health status indicators (PMR, life expectancy, and PYLL) tell the same story? Does this make sense, and how could this be used in planning? For example, even though people may die prematurely (PMR), does the PYLL tell you that they are also dying at a young age?*
- *Are injury mortality rates a major concern for the RHA, and is there a trend to increasing or decreasing injury mortality rates over time?*
- *What are the leading causes of death, and have these changed over time?*
- *What are the leading causes of death due to injury, and have these changed over time?*
- *Are there differences between males and females as to each of the mortality indicators, and how would this affect planning of programs or services in the region?*

4.2   Premature Mortality Rates (PMR)

Definition: Deaths are considered 'premature' when they occur before age
75. The Premature Mortality Rate (PMR) indicates the number of prema-
ture deaths per thousand residents of the area. The PMR is often used as an
indicator of general health status, and the need for health care services. This
is age- and sex-adjusted to reflect the population of Manitoba[4].

Figure 4.2.1: Premature Mortality Rates by RHA
Age- & sex-adjusted rate of deaths per 1000 aged 0-74

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

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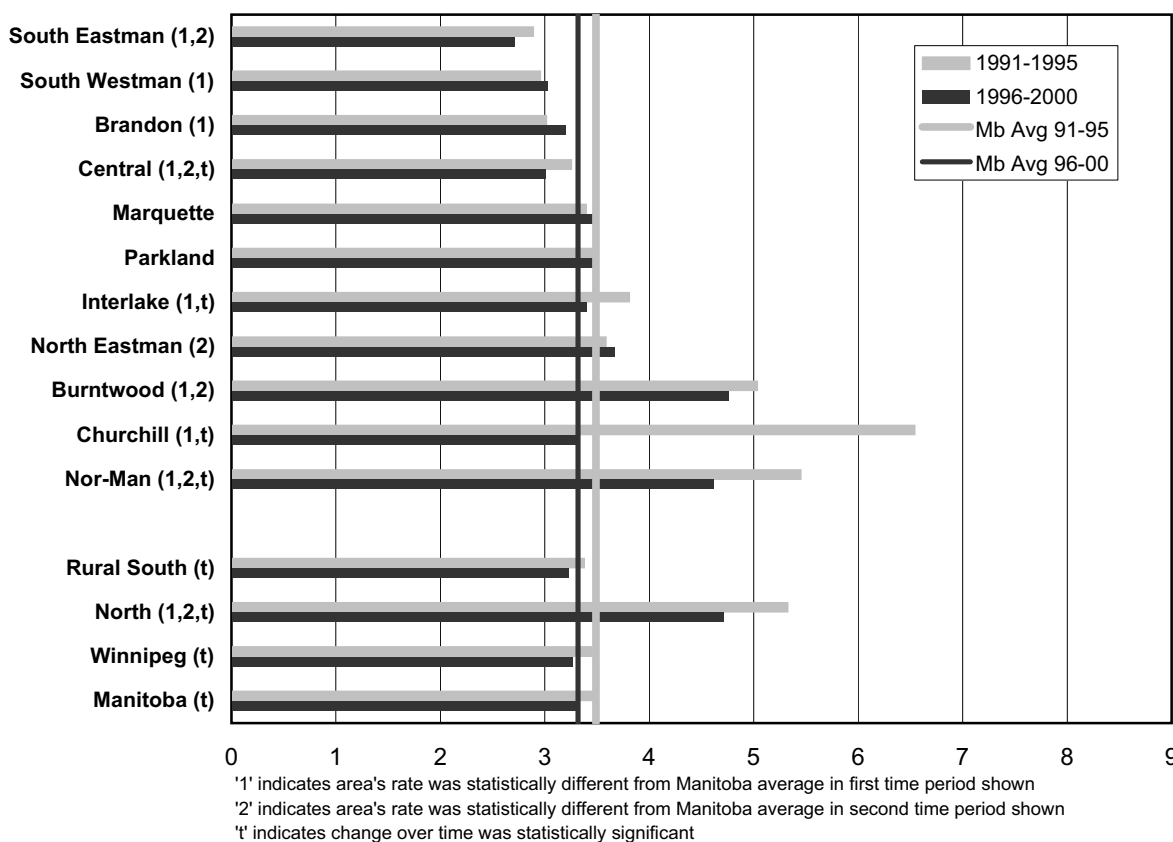
[4] In the MCHP report by Brownell et al. (2003), it was observed that PMR in the North
(Burntwood, Churchill and Nor-Man) has not changed. In contrast, this report states that
PMR has improved (that is, become lower). The apparent discrepancy in these statements is
explained by the different years of comparison. The Brownell et al. report compared the last
half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s
to the last half of the 1990s. PMR in the North was lower in the 1980s, increased in the first
half of the 1990s, and then went back to the 1980s levels in the last half of the 1990s.

Figure 4.2.2: Premature Mortality Rates by District

Age- & sex-adjusted rate of deaths per 1000 aged 0-74

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00

Districts (top to bottom):
SE Northern (1,2), SE Central (2), SE Western, SE Southern, SW District # 3 (1), SW District # 1, SW District # 2, Bdn West (1,2), Bdn Rural, Bdn East, MacDonald/Cartier (2,t), Morden/Winkler (1,2), Altona (2,t), Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage (1), MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North (2), IL Southwest, IL Southeast, IL Northeast (1,t), IL Northwest (1,t), Springfield, Winnipeg River, Brokenhead, Iron Rose, Blue Water (2), Northern Remote (1,2), Thompson, Oxford H & Gods (t), Cross Lake (2), Lynn/Leaf/SIL, Island Lake (2), Tad/Broch/Lac Br, Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House (1,2,t), Sha/York/Split/War (1,2), Nelson House (1,2), Churchill (1,t), F Flon/Snow L/Cran (1,t), The Pas/OCN/Kelsey (1,2), Nor-Man Other (1,2)

X-axis: 0 1 2 3 4 5 6 7 8 9

4.3   Life Expectancy

Definition: This is the expected length of life from birth, based on the mortality of the population using Provincial Vital Statistics records for a five-year period of time. Life expectancy values are the most commonly used indicator of population health status, especially for international comparisons.

Figure 4.3.1: Female Life Expectancy by RHA

Life expectancy (at birth) in years

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00
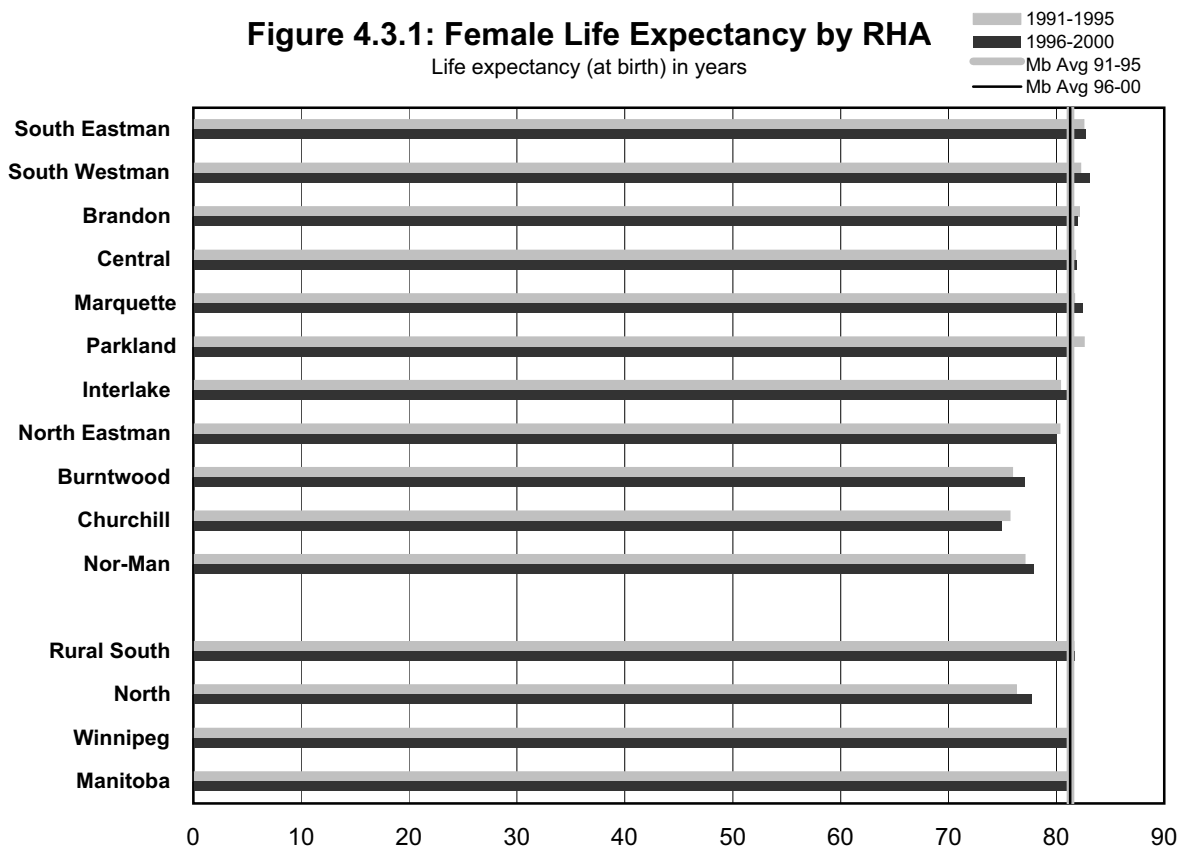
Statistical testing is not done on life expectancy values

Figure 4.3.2: Female Life Expectancy by District

Life expectancy (at birth) in years

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00

Figure 4.3.3: Male Life Expectancy by RHA

Life expectancy (at birth) in years

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00
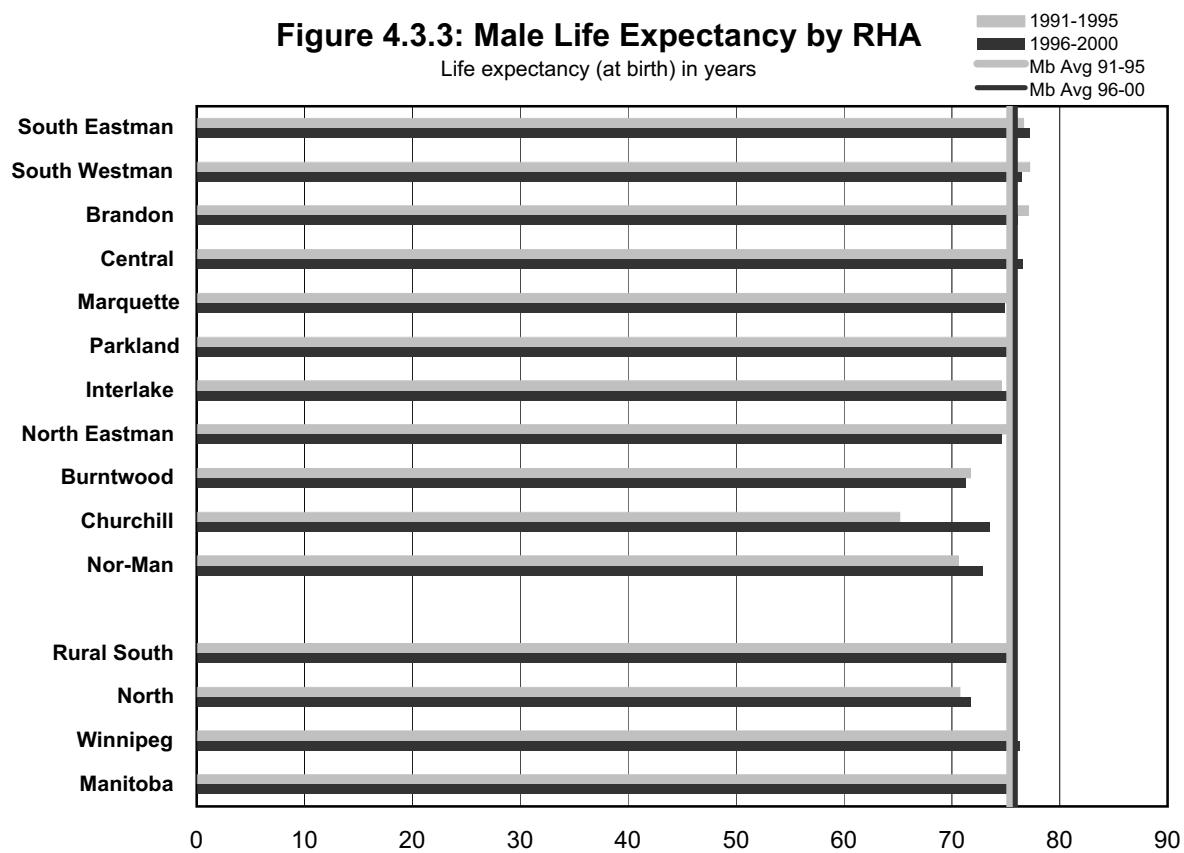
Statistical testing is not done on life expectancy values

Figure 4.3.4: Male Life Expectancy by District
Life expectancy (at birth) in years

1991-1995
1996-2000
Mb Avg 91-95
Mb Avg 96-00
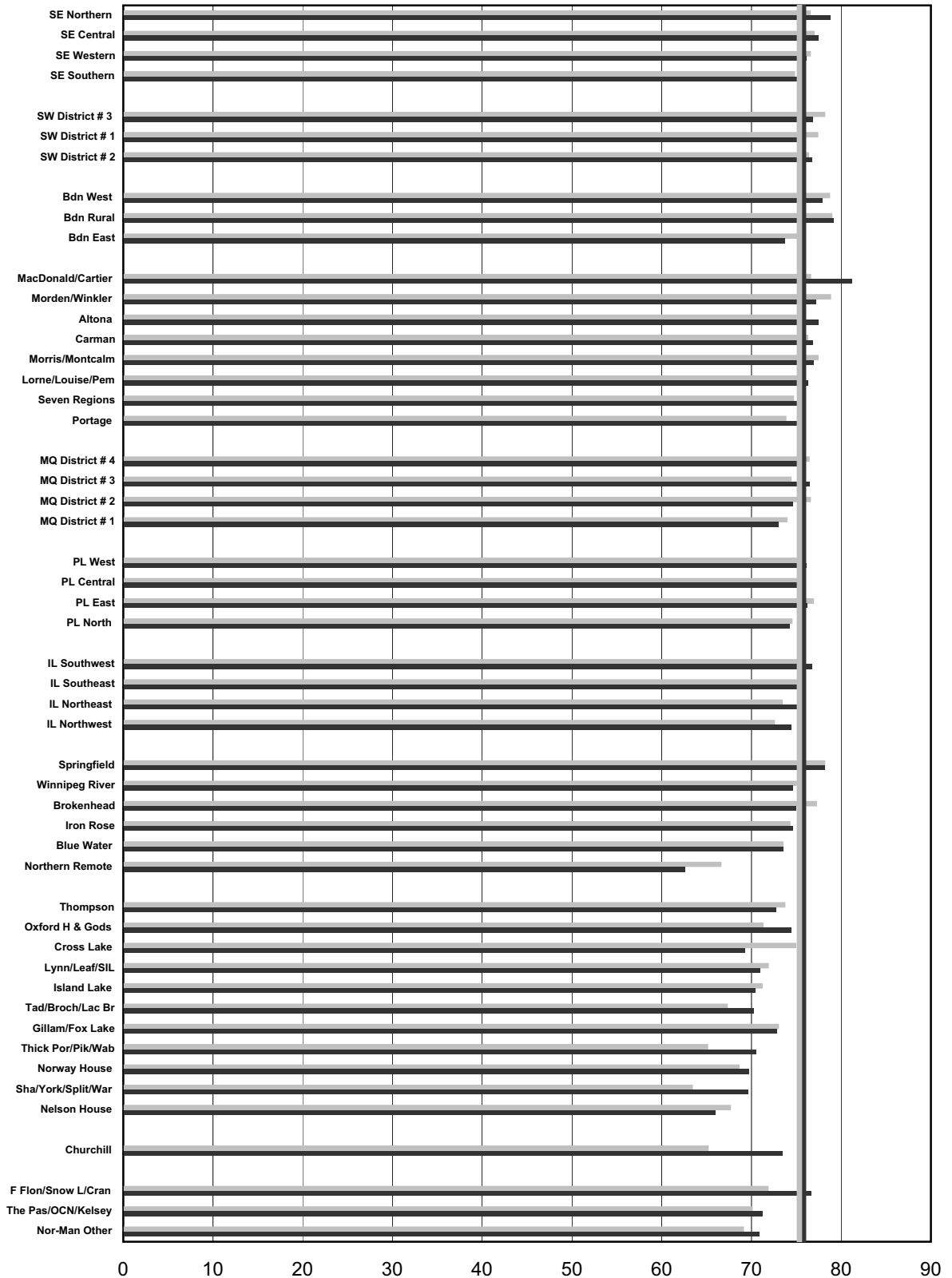
4.4 Potential Years of Life Lost (PYLL):

Definition: PYLL is an indicator of premature mortality (death before age 75, excluding infant deaths up to one year of age) which gives greater weight to a death occurring at a younger age than a death at a later age. The rate is given as "years per thousand", meaning years of life lost per thousand population. This is age- and sex-adjusted to reflect the population of Manitoba for the overall PYLL graph, and age-adjusted for the sex-specific graphs.

Figure 4.4.1: PYLL by RHA

Age- & sex-adjusted rate of PYLL per 1000 age 1-74

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
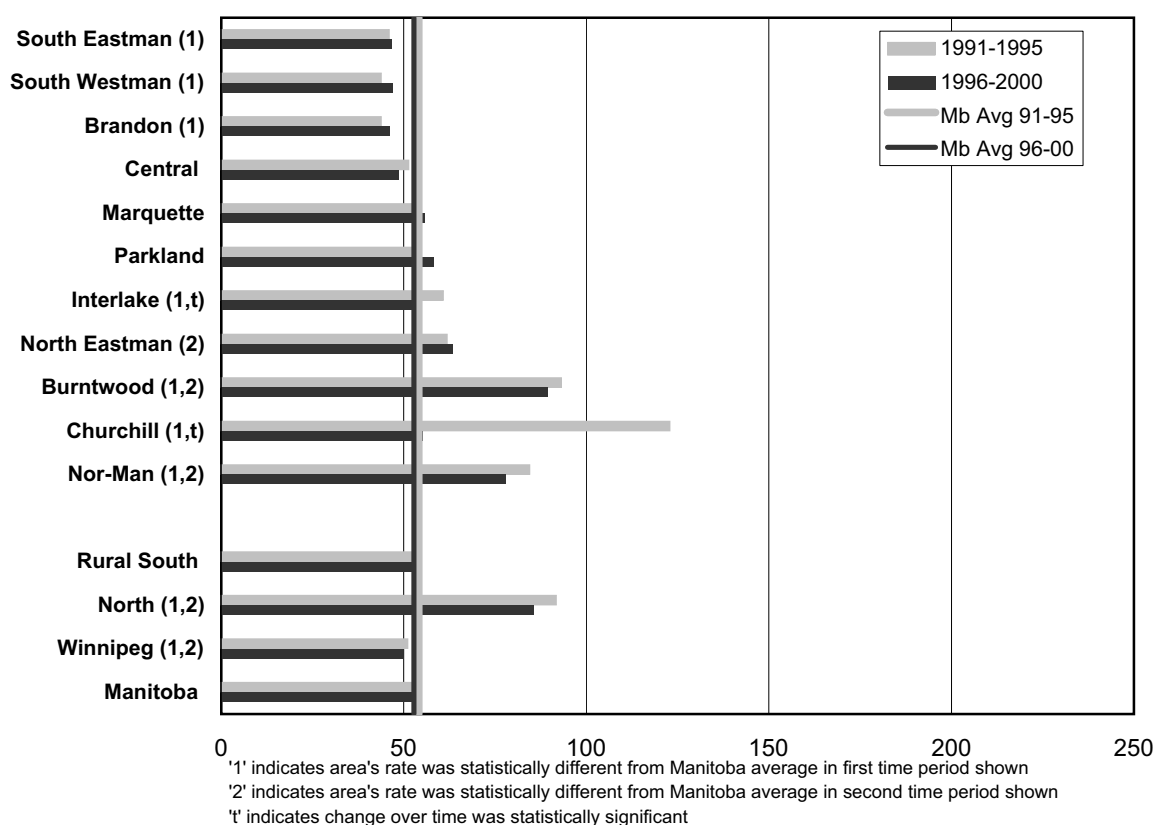
Figure 4.4.2: PYLL by District

Age- & sex-adjusted rate of PYLL per 1000 age 1-74

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00

Districts (top to bottom):
SE Northern (2), SE Central (2), SE Western, SE Southern (t), SW District # 3, SW District # 1, SW District # 2, Bdn West (1,2), Bdn Rural, Bdn East, MacDonald/Cartier, Morden/Winkler (1,2), Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage (1), MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North (2), IL Southwest, IL Southeast, IL Northeast, IL Northwest (1), Springfield (2), Winnipeg River, Brokenhead, Iron Rose, Blue Water (2), Northern Remote (1,2), Thompson, Oxford H & Gods (1,2), Cross Lake (2), Lynn/Leaf/SIL (1,2), Island Lake (1,2), Tad/Broch/Lac Br (1,2), Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House (1,2,t), Sha/York/Split/War (1,2), Nelson House (1,2), Churchill (1,t), F Flon/Snow L/Cran, The Pas/OCN/Kelsey (1,2), Nor-Man Other (1,2)

Figure 4.4.3: PYLL for Females by RHA

Age-adjusted rate of PYLL per 1000 females age 1-74

'1' indicates area's rate was statistically different from Manitoba average in first time period shown

'2' indicates area's rate was statistically different from Manitoba average in second time period shown

't' indicates change over time was statistically significant
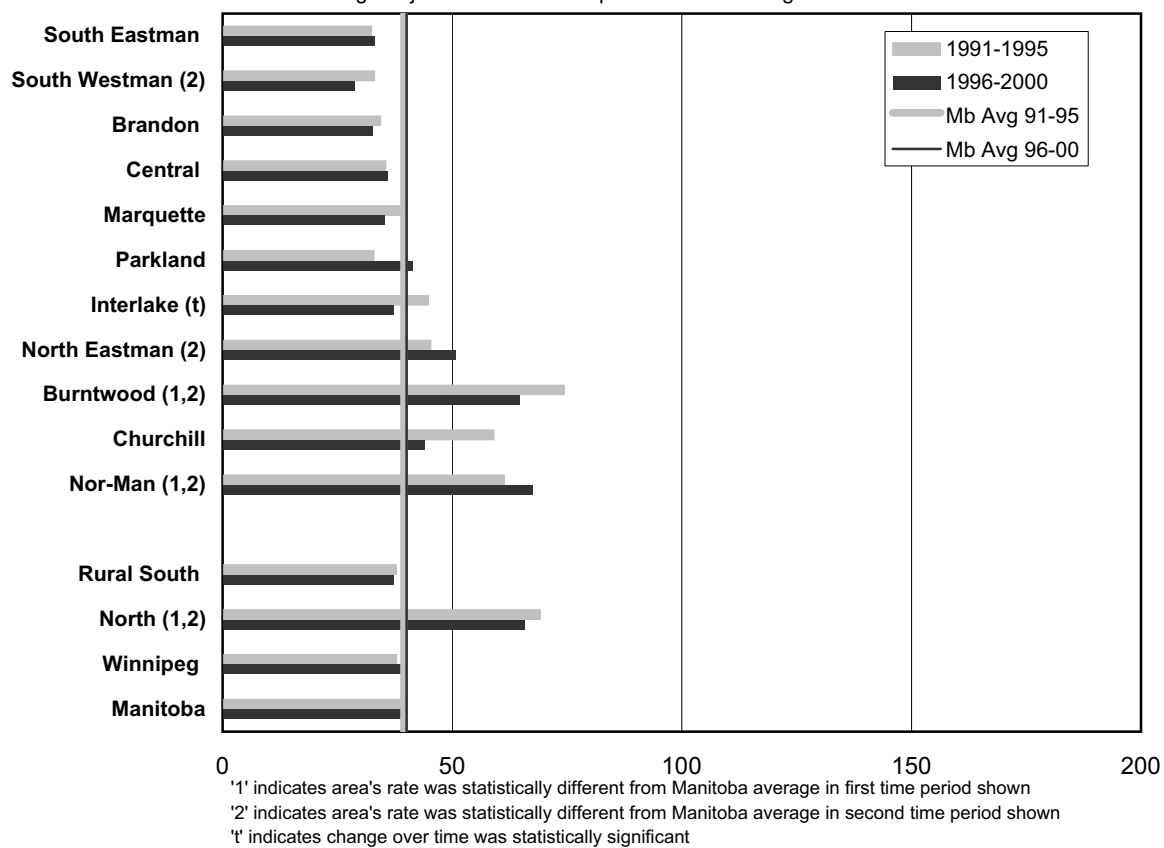
Figure 4.4.4: PYLL for Females by District

Age-adjusted rate of PYLL per 1000 females age 1-74
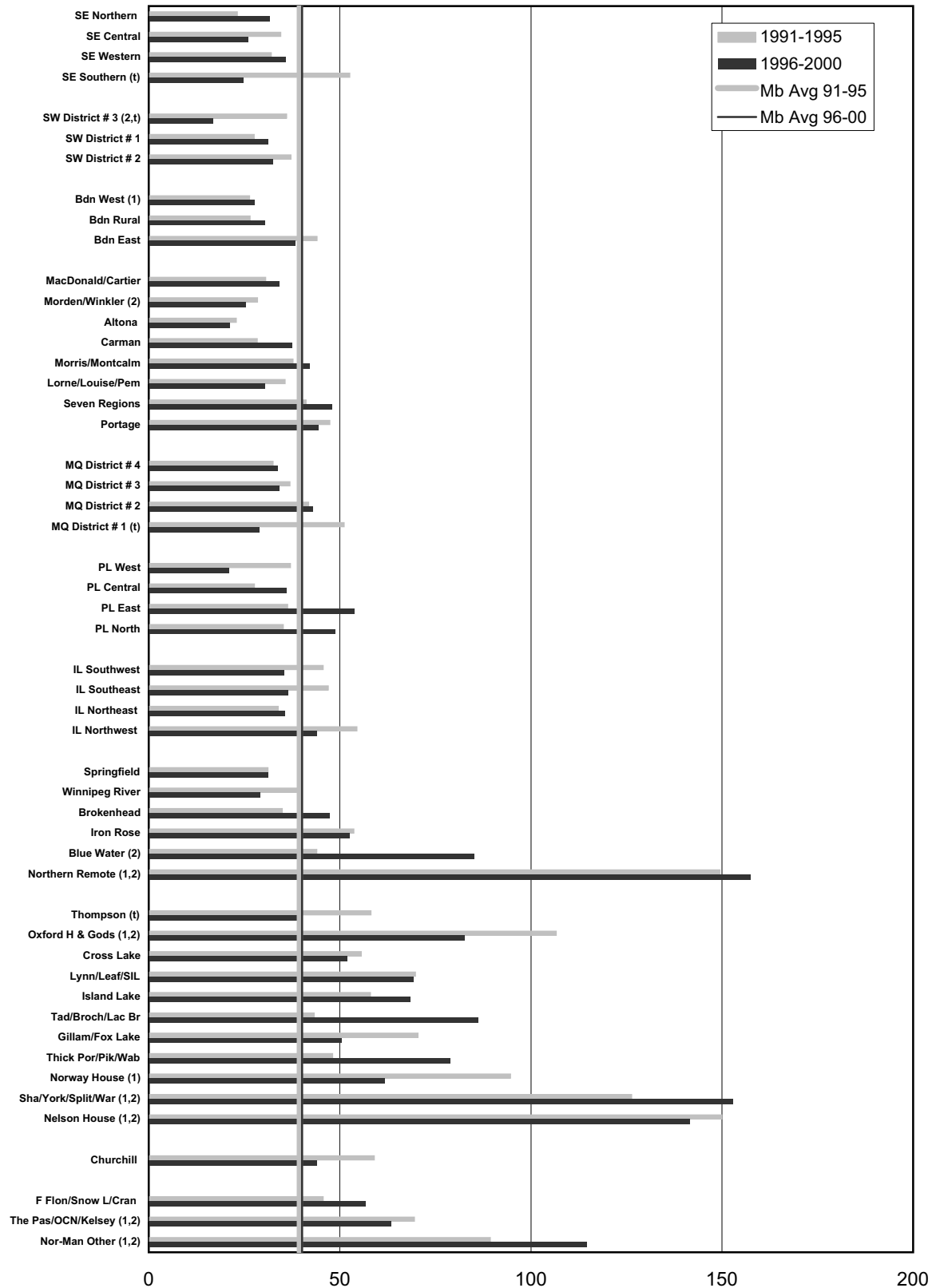
Figure 4.4.5: PYLL for Males by RHA

Age-adjusted rate of PYLL per 1000 males age 1-74
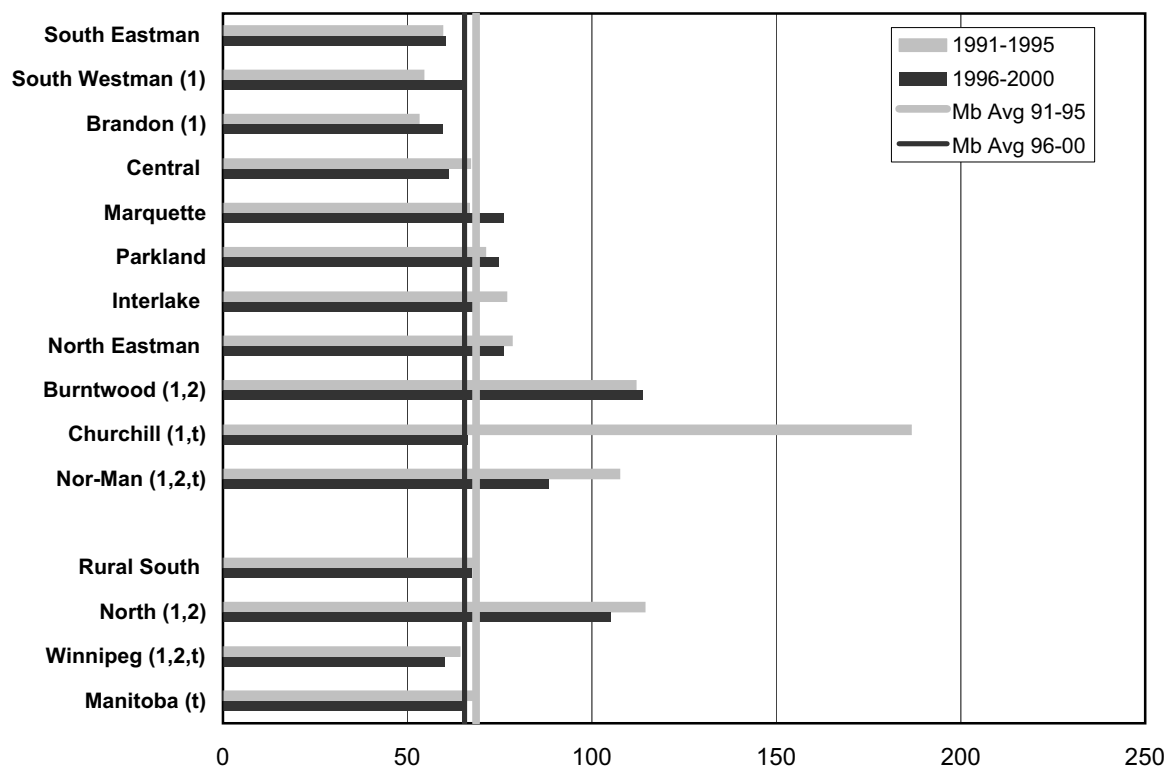
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 4.4.6: PYLL for Males by District

Age-adjusted rate of PYLL per 1000 males age 1-74

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00

Districts (top to bottom):
SE Northern (2), SE Central, SE Western, SE Southern, SW District # 3, SW District # 1, SW District # 2, Bdn West (1,2), Bdn Rural, Bdn East, MacDonald/Cartier, Morden/Winkler (1), Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage, MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North (2), IL Southwest, IL Southeast, IL Northeast (1), IL Northwest (1), Springfield, Winnipeg River, Brokenhead, Iron Rose, Blue Water, Northern Remote (1,2), Thompson (2), Oxford H & Gods (1), Cross Lake (2), Lynn/Leaf/SIL (1,2), Island Lake (1,2), Tad/Broch/Lac Br (1,2), Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House (1), Sha/York/Split/War (1,2), Nelson House (1,2), Churchill (1,t), F Flon/Snow L/Cran (t), The Pas/OCN/Kelsey (1,2), Nor-Man Other (1,2)

4.5 Total Mortality Rates

Definition: The Total Mortality Rate is the number of deaths per thousand area residents. This includes deaths among residents of all ages, and for all causes. This is age-adjusted to reflect the population of Manitoba. A breakdown of the major causes of death is given in Section 4.7.[5]

Figure 4.5.1: Total Mortality Rates by RHA
Age- & sex-adjusted rate of deaths per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

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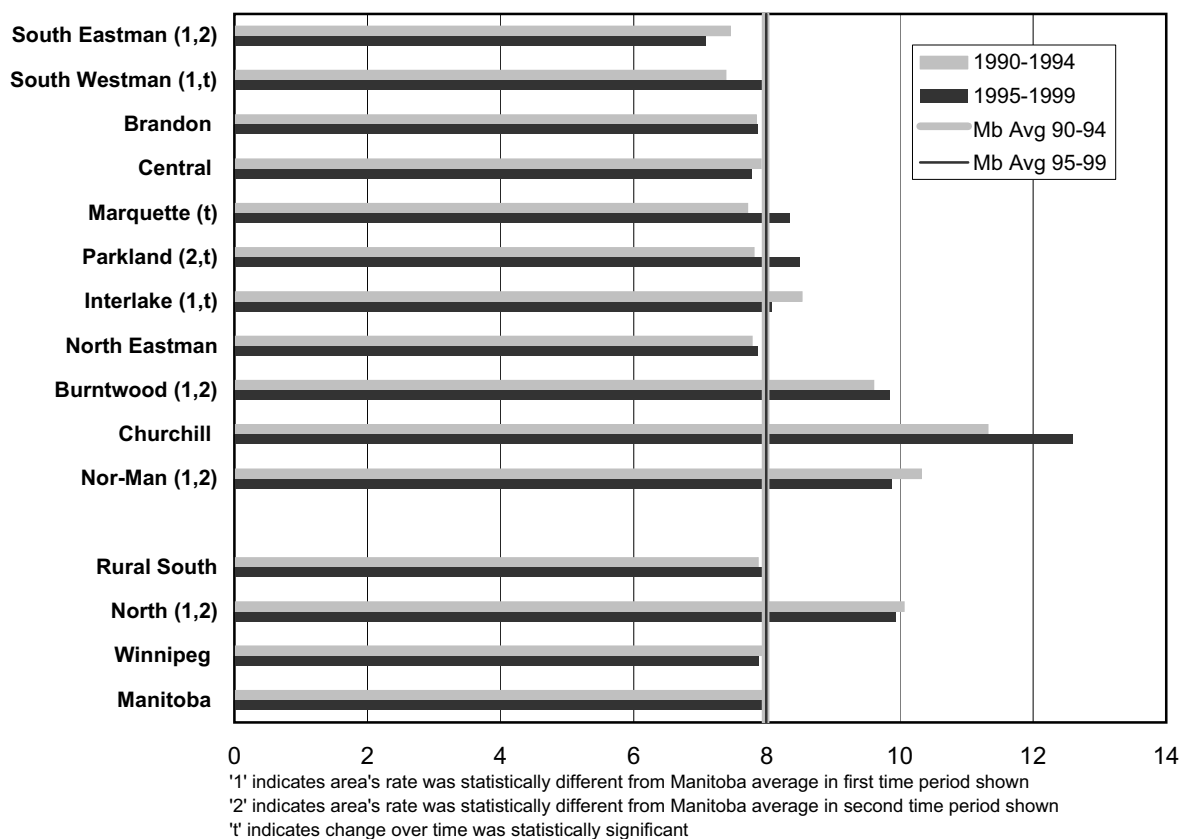
[5] In the MCHP report by Brownell et al. (2003), it was observed that total mortality rates for the province had decreased. In contrast, this report states that total mortality rates have remained stable provincially. The apparent discrepancy in these statements is explained by the different years of comparison. The Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This report compared the first half of the 1990s to the last half of the 1990s. Total mortality was higher in the 1980s, decreased in the first half of the 1990s, and then stayed the same in the last half of the 1990s.

Figure 4.5.2: Total Mortality Rates by District

Age- & sex-adjusted rate of deaths per 1000 residents
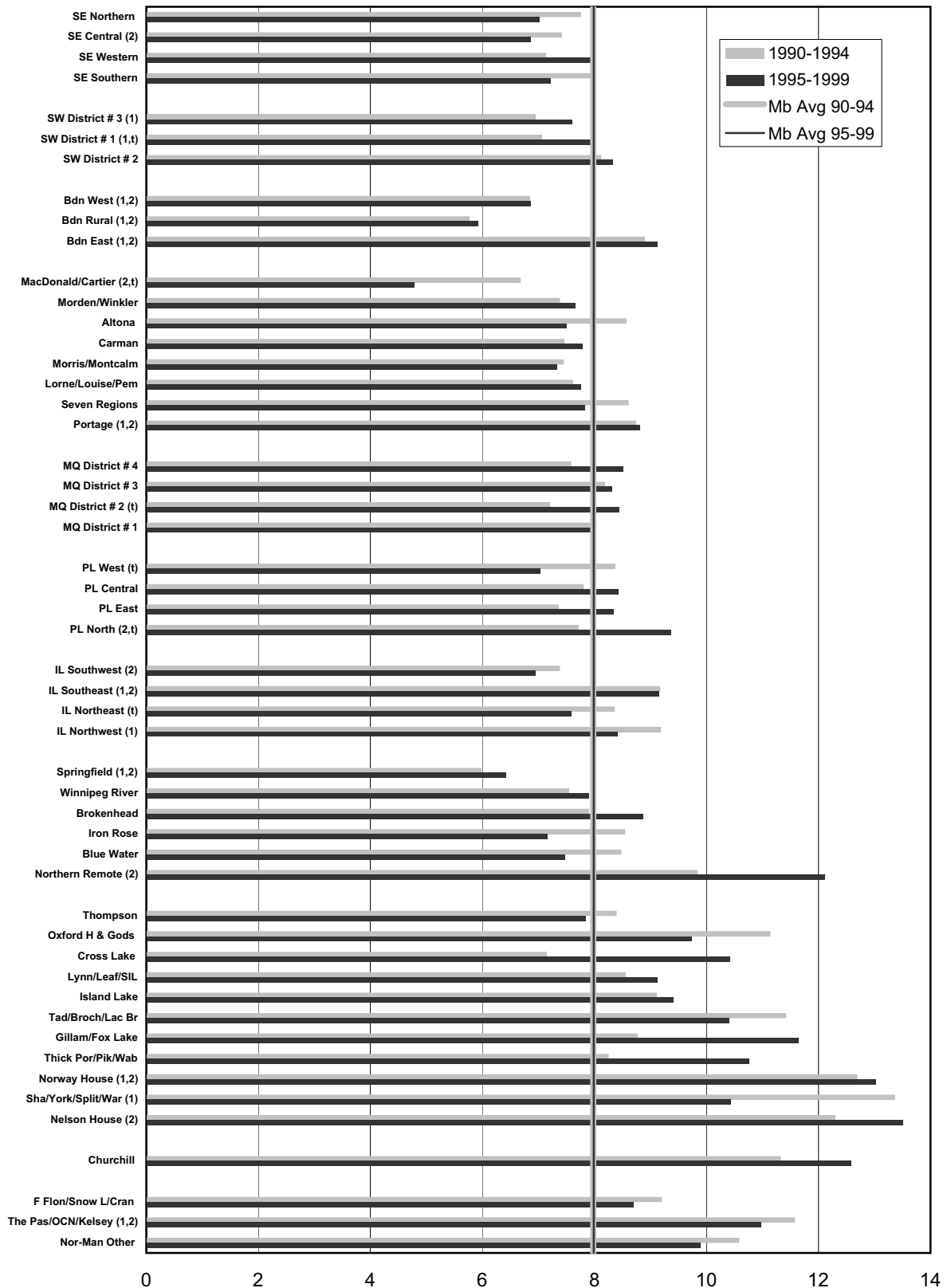
4.6   Injury Mortality Rates

Definition: The number of deaths per thousand residents that are due to
injury (all categories). This is age- and sex-adjusted to reflect the population
of Manitoba. Due to very small numbers resulting in suppression of data,
the injury mortality rates are given only for RHAs, not for districts. A break-
down of the most frequent causes of injury death is given in Section 4.7.[6]

Figure 4.6.1: Injury Mortality Rates by RHA
Age- & sex-adjusted rate of deaths from all injuries per 1000 residents

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

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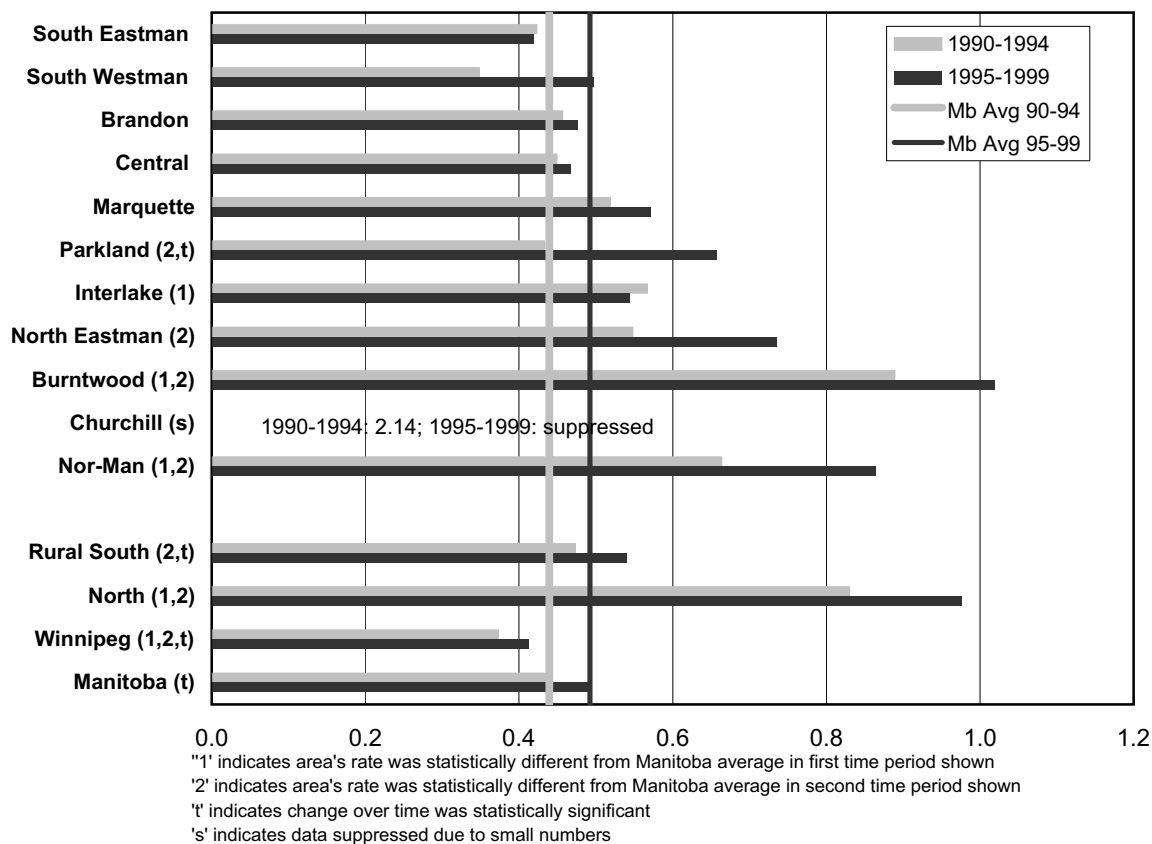
[6] In the MCHP report by Brownell et al. (2003), it was observed that injury mortality rates for the
province had not changed. In contrast, this report states that injury mortality rates have decreased.
The apparent discrepancy in these statements is explained by the different years of comparison. The
Brownell et al. report compared the last half of the 1980s to the last half of the 1990s. This the
1990s. report compared the first half of the 1990s to the last half of the 1990s. Injury mortality was
lower in the 1980s, increased in the first half of the 1990s, and then went back to the 1980s levels in
the last half of the 1990s.

4.7 Top Causes of Deaths and Injury Deaths

Definition: These are the causes of death that are registered by a physician on the official Death Certificate, kept by the Office of Vital Statistics. The pie charts show the proportion of deaths due to each of the top causes, for the entire province, for Winnipeg, and for two aggregate geographical areas - "North" (aggregating Burntwood, Churchill and Nor-Man), and "Rural South and Brandon" (aggregating all other RHAs excluding Winnipeg). These are shown for two time periods, representing the first half of the 1990s (1990 through 1994) and the second half (1995 through 1999). The injury graphs to the right show the categories of injuries which comprise the injury deaths appearing in the left graph.

Figure 4.7.1a: Top Causes of Death, Rural South & Brandon, 1990-1994

Top Injury Deaths, Rural South & Brandon, 1990-1994

Other 17%

Circulatory 41%

Injuries 6%

Respiratory 10%

Cancer 26%

Other 19%

Violence to Self 21%

Drowning 6%

Violence by Others 4%

Poisoning 3%

Falls 15%

Motor & Other Vehicle 32%
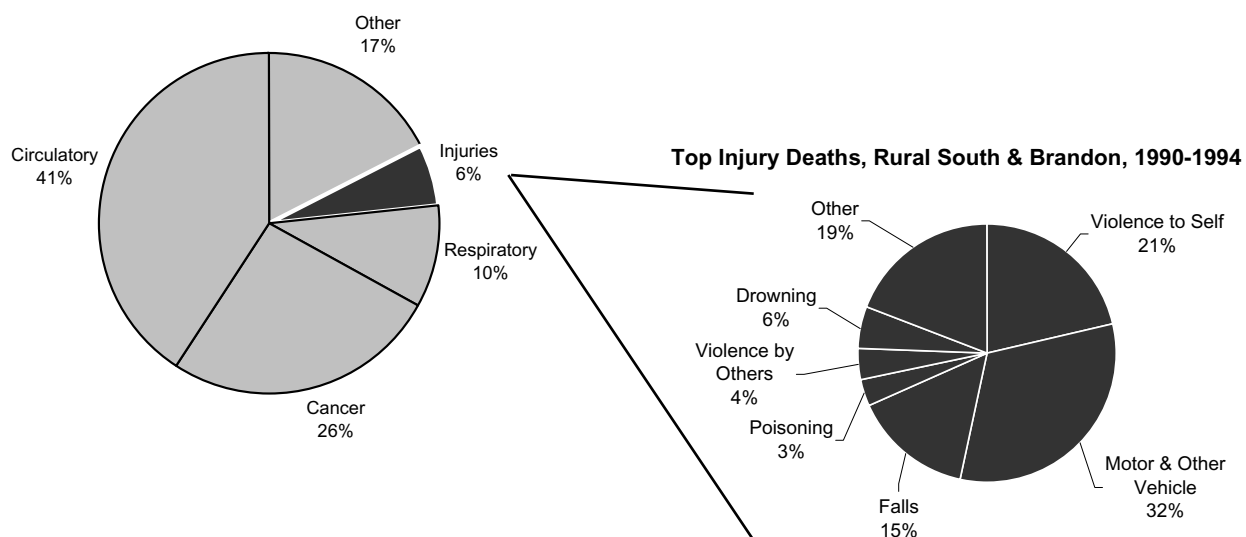
Figure 4.7.1b: Top Causes of Death, Rural South & Brandon, 1995-1999

Top Injury Deaths, Rural South & Brandon, 1995-1999

Other 18%

Circulatory 40%

Injuries 6%

Respiratory 10%

Cancer 26%

Other 19%

Violence to Self 20%

Drowning 3%

Violence by Others 3%

Poisoning 3%

Falls 23%

Motor & Other Vehicle 29%
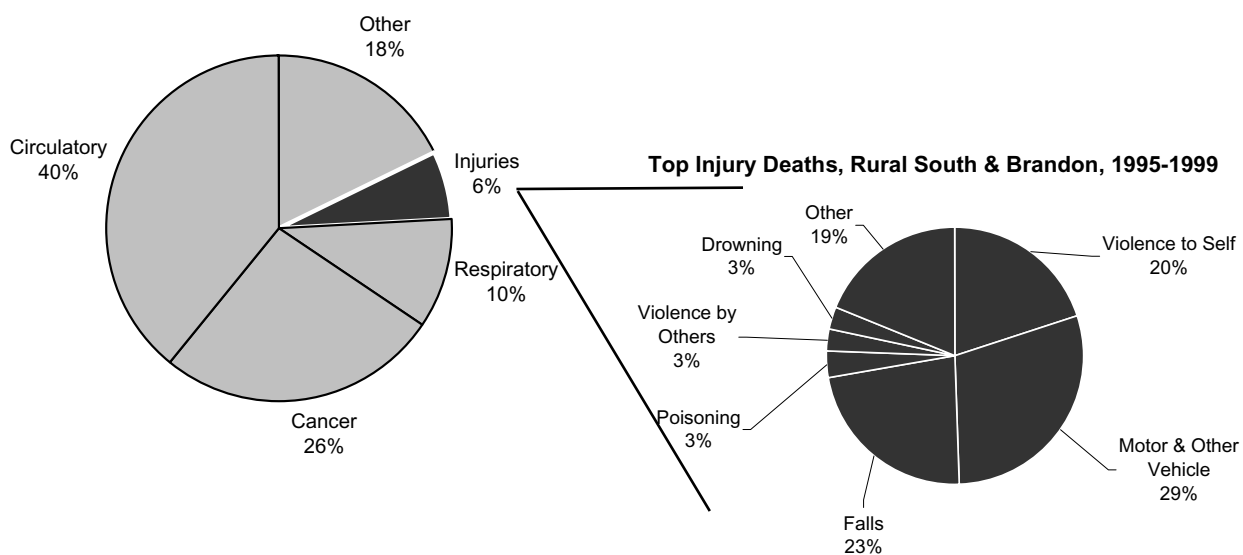
Figure 4.7.2a: Top Causes of Death, North, 1990-1994

Other
25%

Circulatory
29%

Injuries
17%

Cancer
20%

Respiratory
9%

Top Injury Deaths, North, 1990-1994

Violence to Self
19%

Other
27%

Motor & Other
Vehicle
23%

Drowning
11%

Falls
3%

Violence by
Others
11%

Poisoning
6%
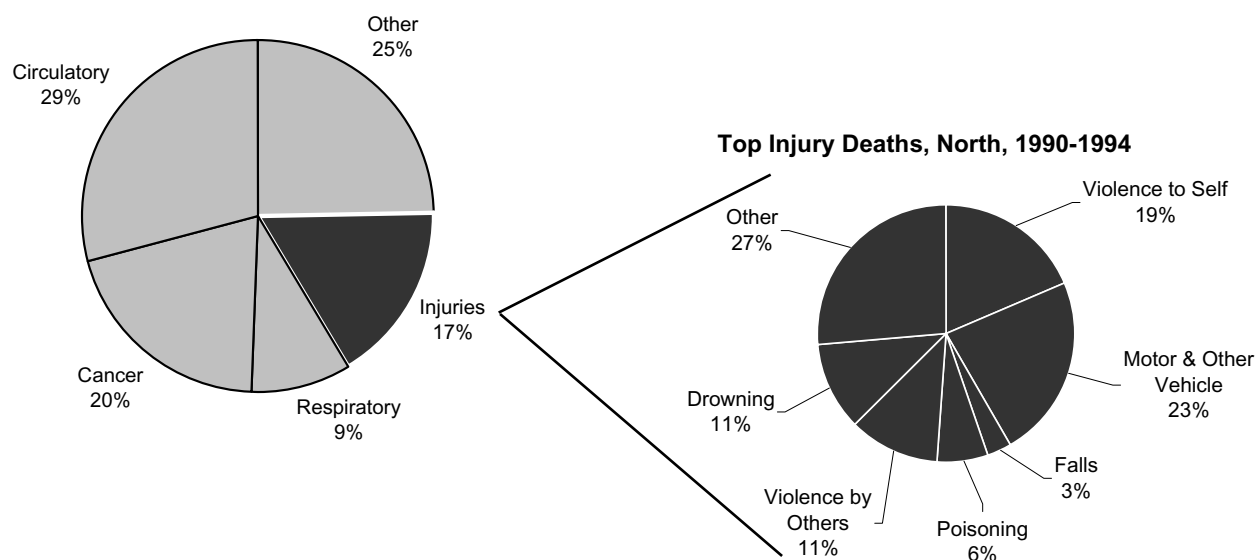
Figure 4.7.2b: Top Causes of Death, North, 1995-1999

Other
23%

Circulatory
30%

Injuries
18%

Cancer
21%

Respiratory
8%

Top Injury Deaths, North, 1995-1999

Violence to Self
15%

Other
38%

Motor & Other
Vehicle
20%

Falls
7%

Drowning
13%

Violence by
Others
5%

Poisoning
2%
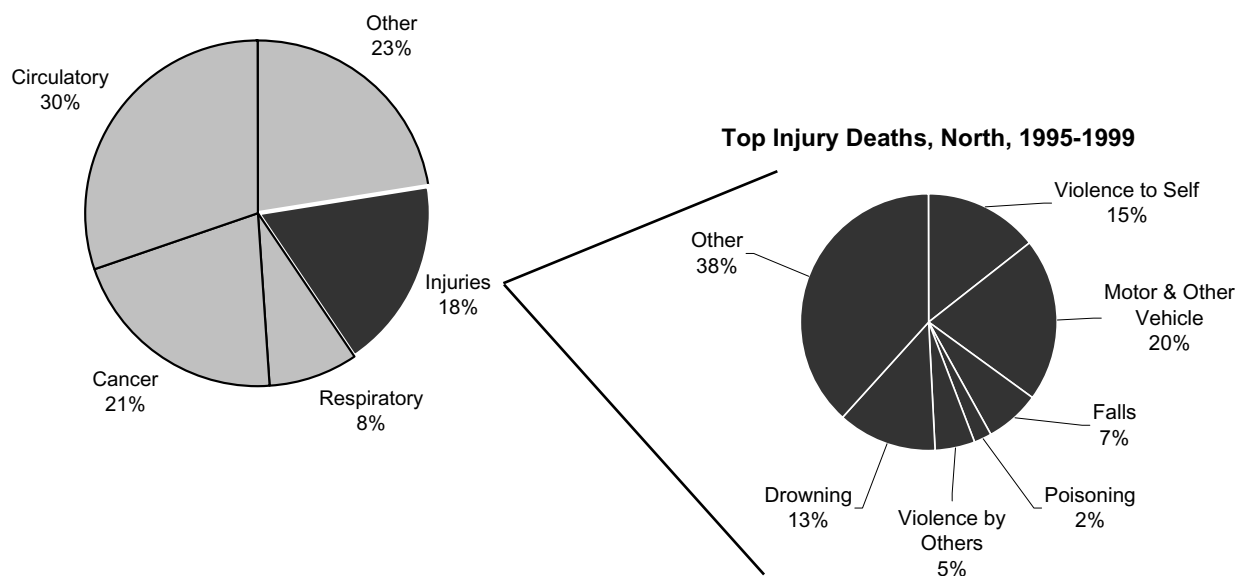
Figure 4.7.3a: Top Causes of Death, Winnipeg, 1990-1994

Other
18%

Circulatory
41%

Injuries
5%

Respiratory
8%

Cancer
28%

Top Injury Deaths, Winnipeg, 1990-1994

Other
14%

Drowning
4%

Violence by
Others
6%

Poisoning
7%

Violence to Self
31%

Motor & Other
Vehicle
20%

Falls
18%
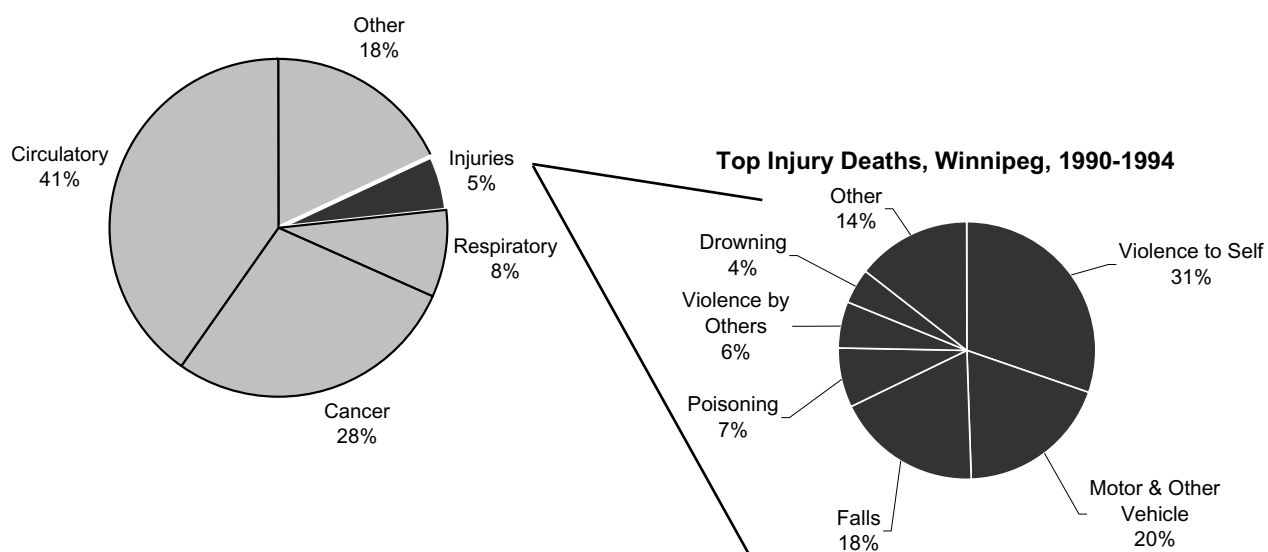
Figure 4.7.3b: Top Causes of Death, Winnipeg, 1995-1999

Other
18%

Circulatory
40%

Injuries
5%

Respiratory
9%

Cancer
28%

Top Injury Deaths, Winnipeg, 1995-1999

Other
14%

Drowning
3%

Violence by
Others
6%

Poisoning
9%

Violence to Self
25%

Motor & Other
Vehicle
16%

Falls
27%
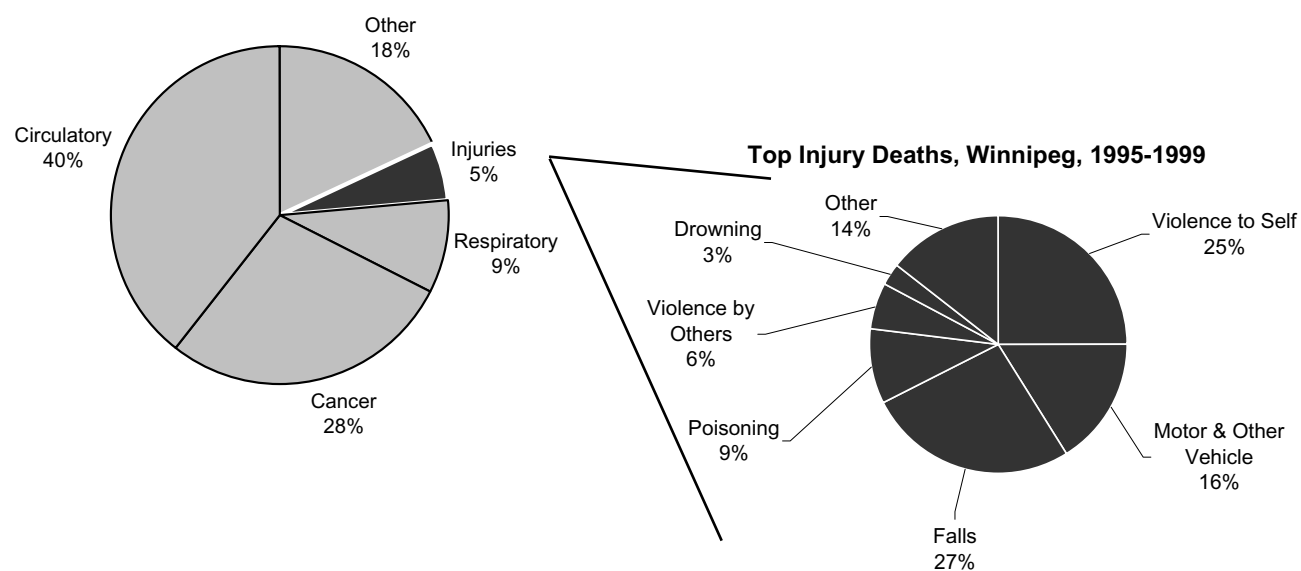
Figure 4.7.4a: Top Causes of Death, Manitoba, 1990-1994

Other
18%

Circulatory
40%

Injuries
6%

Respiratory
9%

Cancer
27%

Top Injury Deaths, Manitoba, 1990-1994

Other
18%

Drowning
6%

Violence by
Others
6%

Poisoning
6%

Violence to Self
24%

Motor & Other
Vehicle
25%

Falls
15%
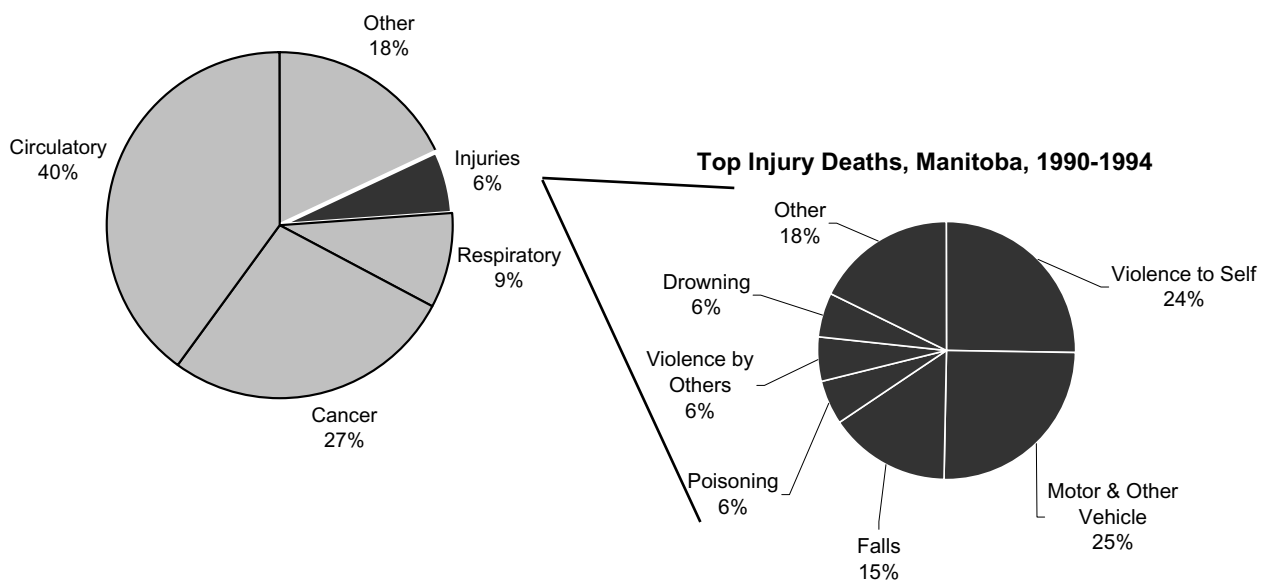
Figure 4.7.4b: Top Causes of Death, Manitoba, 1995-1999
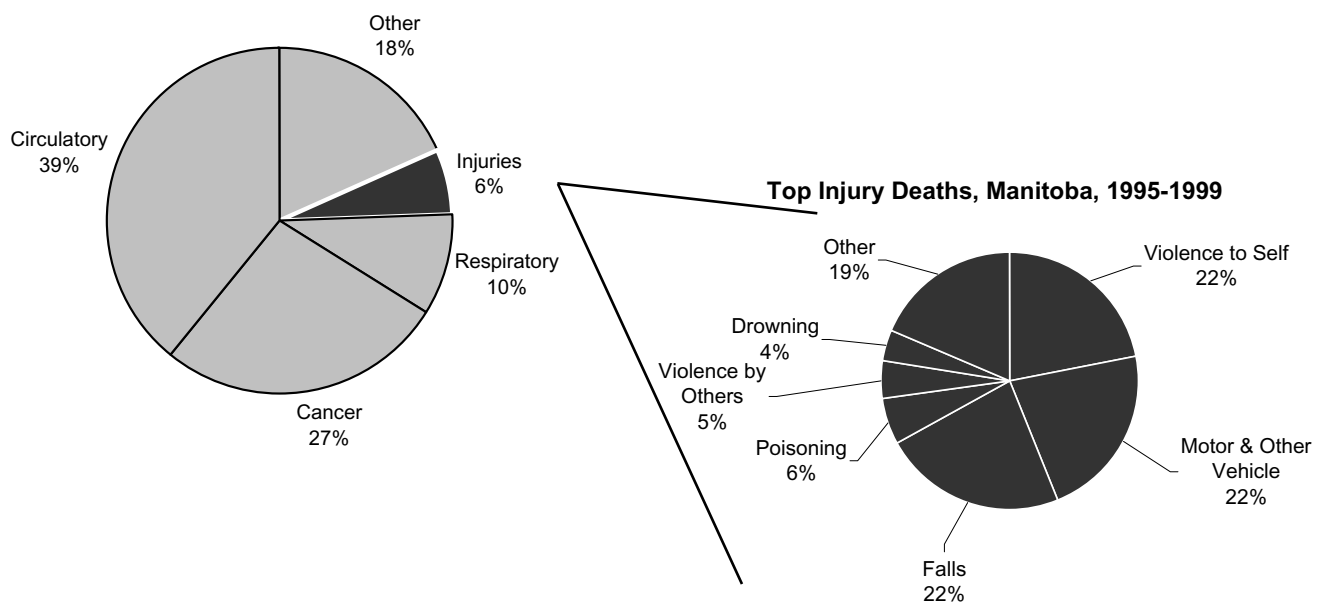
Other
18%

Circulatory
39%

Injuries
6%

Respiratory
10%

Cancer
27%

Top Injury Deaths, Manitoba, 1995-1999

Other
19%

Drowning
4%

Violence by
Others
5%

Poisoning
6%

Violence to Self
22%

Motor & Other
Vehicle
22%

Falls
22%

REFERENCES

Brownell M, Martens P, Kozyrskyj A, Fergusson P, Lerfald J, Mayer T, Derksen S, Friesen D. Assessing the Health of Children in Manitoba: A Population-Based Study. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, February 2001.

Brownell M, Lix L, Ekuma O, Derksen S, De Haney S, Bond R, Fransoo R, MacWilliam L, Bodnarchuk J. Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2003.

Carstairs V, Morris R. Deprivation and Health in Scotland. Aberdeen, Scotland: *Aberdeen University Press*, 1991.

Eyles J, Birch S, Chambers S, Hurley J, Hutchinson B. A needs-based methodology for allocating health care resources in Ontario, Canada: Development and an application. *Soc Sci Med* 1991;33(4):489-500.

Eyles J, Birch S. A population needs-based approach to health care resource allocation and planning in Ontario: A link between policy goals and practice. *Can J Public Health* 1993;84(2):112-117.

Martens PJ, Frohlich N, Brownell M, Carriere K, Derksen S. Embedding child health within framework of regional health: Population health status and sociodemographic indicators. *Canadian Journal of Public Health* 2002:93(Supplement 2): S15-S20.

Reid RJ, Roos NP, MacWilliam L, Frohlich N, Black C. Assessing population health care need using a claims-based ACG morbidity measure: A validation analysis in the province of Manitoba. *Health Services Research* 2002;37(5):1345-1364.

Young TK. Population Health: Concepts and Methods. Oxford: *Oxford University Press*, 1998.

Chapter 5: Illness Burden

5.1   What's in This Chapter?

Overall description, examples, and possible questions to pose.

This chapter contains information on the incidence or prevalence of common diseases and health problems. Indicators included in this chapter are:
- Diabetes treatment prevalence (Section 5.2)
- Hypertension treatment prevalence (Section 5.3)
- Acute Myocardial Infarction treatment prevalence (Section 5.4)
- Stroke treatment prevalence (Section 5.5)
- Cancer incidence (Section 5.6)
- Total Respiratory Morbidity treatment prevalence (Section 5.7)

Major diseases (diabetes, hypertension, and cancer) as well as heart-related conditions (acute myocardial infarction, stroke) are profiled in Chapter 5. Another overall indicator, called "Total Respiratory Morbidity treatment prevalence), combines several diagnoses of respiratory infections and conditions such as asthma, bronchitis, and pneumonia (see Glossary for a complete description). Some of these indicators are called 'treatment prevalence,' because they portray the use of health services related to a condition, as opposed to confirmed presence in a disease registry. These rates are all "adjusted" for age and sex, which allow for fair comparisons between regions.

Example: Brandon RHA

Figures 5.2.1 and 5.2.2 show information about diabetes treatment prevalence rates (see Glossary for further explanation about how diabetes rates are defined for purposes of this report). Brandon RHA shows an increase over time, consistent with the Manitoba increase. The most recent rate (based upon the three years of data 1998/99-2000/01) indicates Brandon rates being similar to the provincial average. The phrase "similar to" refers to the fact that the Brandon rate is not statistically different from the overall provincial rate shown at the bottom of the graph (a "2" in the bracket beside the RHA name would mean that the rate at the most recent time period would be deemed different - no "2" appears beside Brandon's name). However, looking at the three districts within Brandon for the most recent time period, Brandon West had a rate lower, Brandon Rural a rate similar to, and Brandon East a rate higher than the provincial average.

Brandon's hypertension treatment prevalence during the same time period appears lower than the provincial average (see Figure 5.3.1), but the

Acute Myocardial Infarction (heart attack) rates (Figure 5.4.1) were higher than the provincial rate in the latter half of the 1990s. Brandon East district once again shows an elevated rate of Heart Attack (see Figure 5.4.2) compared to the provincial rate, whereas the other two districts were similar to the provincial rate. Brandon's stroke rate appeared similar to the Manitoba average, and is stable over time (Figure5.5.1).

Over the 1990s, Brandon's cancer incidence rates were statistically higher than the Manitoba average, mainly driven by the very high rates in Brandon East district (see Figures 5.6.1 and 5.6.2). Brandon East had one of the highest cancer rates in the province (6.9 new cancer cases per thousand residents for Brandon East, compared with the provincial average of 5.6/1000, in the most recent time period). In contrast, the other two Brandon districts (West and Rural) had similar rates to the provincial average.

A significantly higher rate of Brandon people are treated for respiratory illnesses (see Figure 5.7.1) than the provincial average, although this appears to have declined over the 1990s (as indicated by the "t" beside the RHA name). The highest rates of respiratory illnesses were present in Brandon East district.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *How are the illness rates likely to influence the need for health care?*
- *Do the services of the area reflect the health needs of the population - both in the area of prevention and treatment?*
- *How have the rates of these selected illnesses or conditions changed over time?*
- *Are there contextual reasons that seem plausible for differences in illness rates by district?*

5.2   Diabetes Treatment Prevalence

Definition: This is the percentage of persons aged 20 to 79 years who, over a three-year period, had a diagnosis of diabetes in two or more physician visits or one hospitalization. It is expressed as a percentage because each resident is defined either as having been treated for diabetes, or not, in that period. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 5.2.1: Diabetes Treatment Prevalence by RHA

Age- & sex-adjusted percentage of population aged 20-79 treated for diabetes

Legend:
- 1993/94-1995/96
- 1998/99-2000/01
- Mb Avg 93/94-95/96
- Mb Avg 98/99-00/01

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
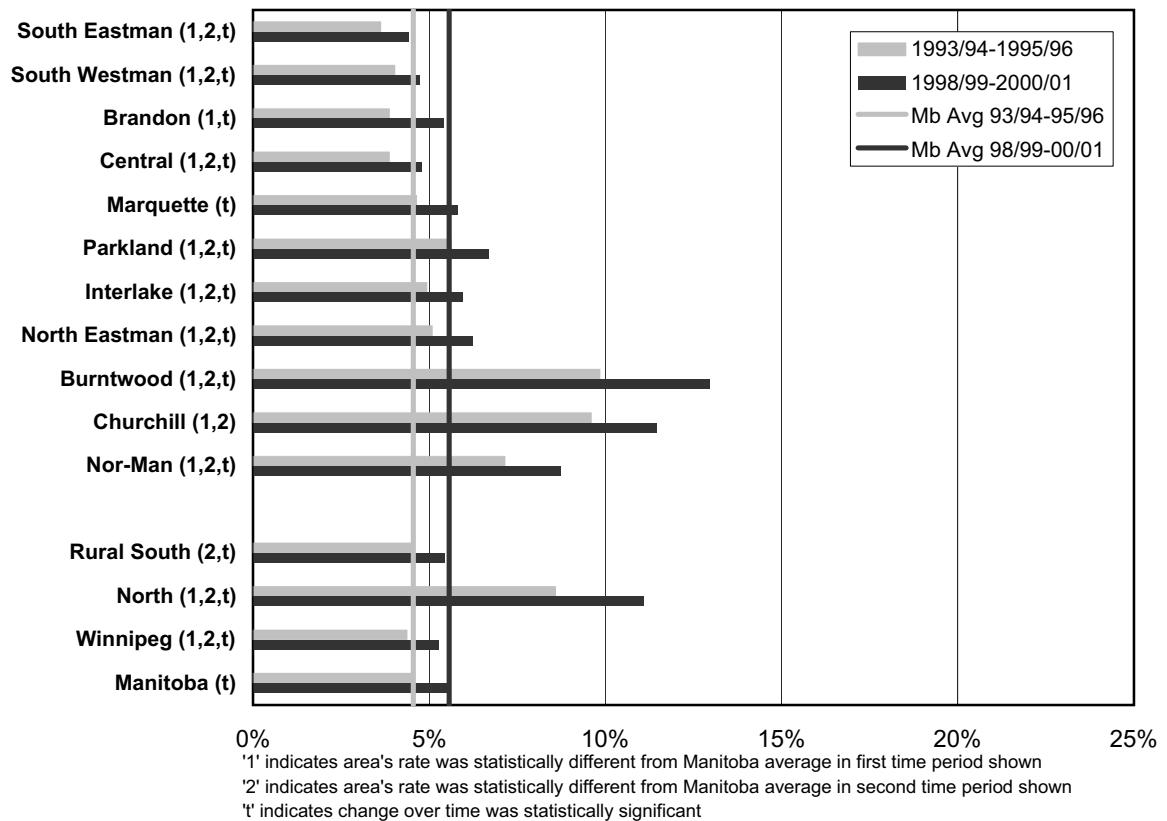
Figure 5.2.2: Diabetes Treatment Prevalence by District

Age- & sex-adjusted percentage of population aged 20-79 treated for diabetes
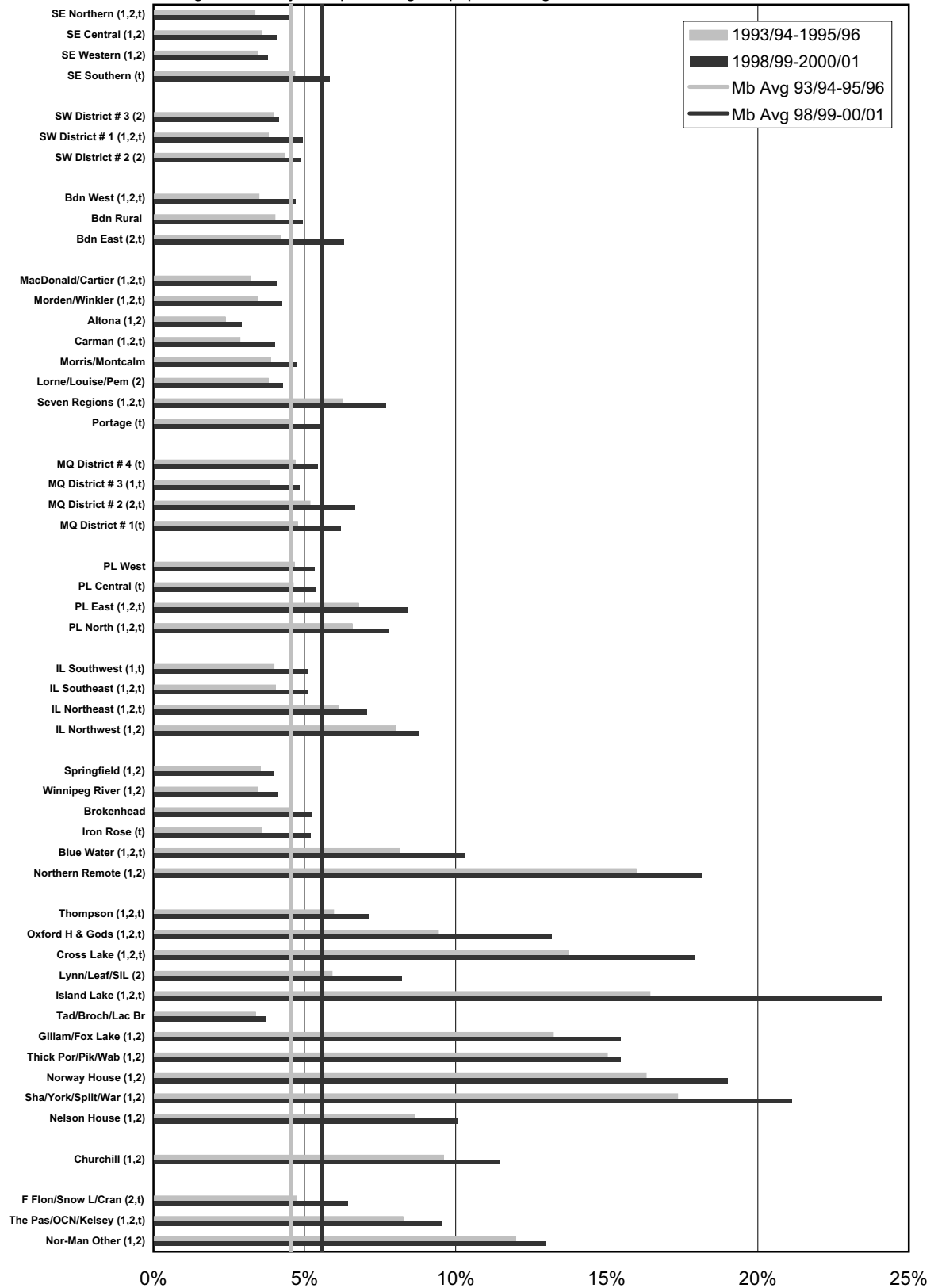
5.3 Hypertension Treatment Prevalence

Definition: This is the percentage of persons aged 25 or older who had at least one physician visit for hypertension in a three-year period. It is expressed as a percentage because each resident is defined either as having been treated for high blood pressure, or not, in that period. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 5.3.1: Hypertension Treatment Prevalence by RHA

Age- & sex-adjusted percent of residents aged 25+ treated for high blood pressure

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
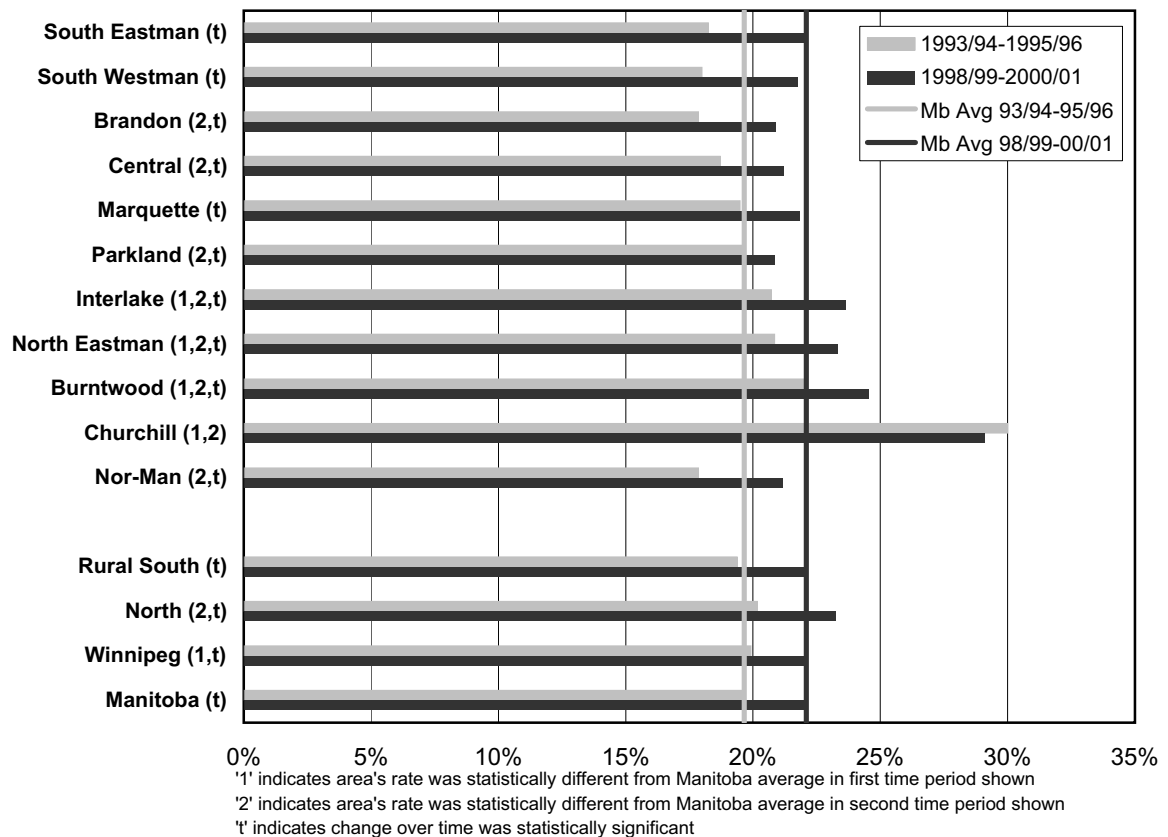
Figure 5.3.2: Hypertension Treatment Prevalence by District

Age- & sex-adjusted percent of residents aged 25+ treated for high blood pressure
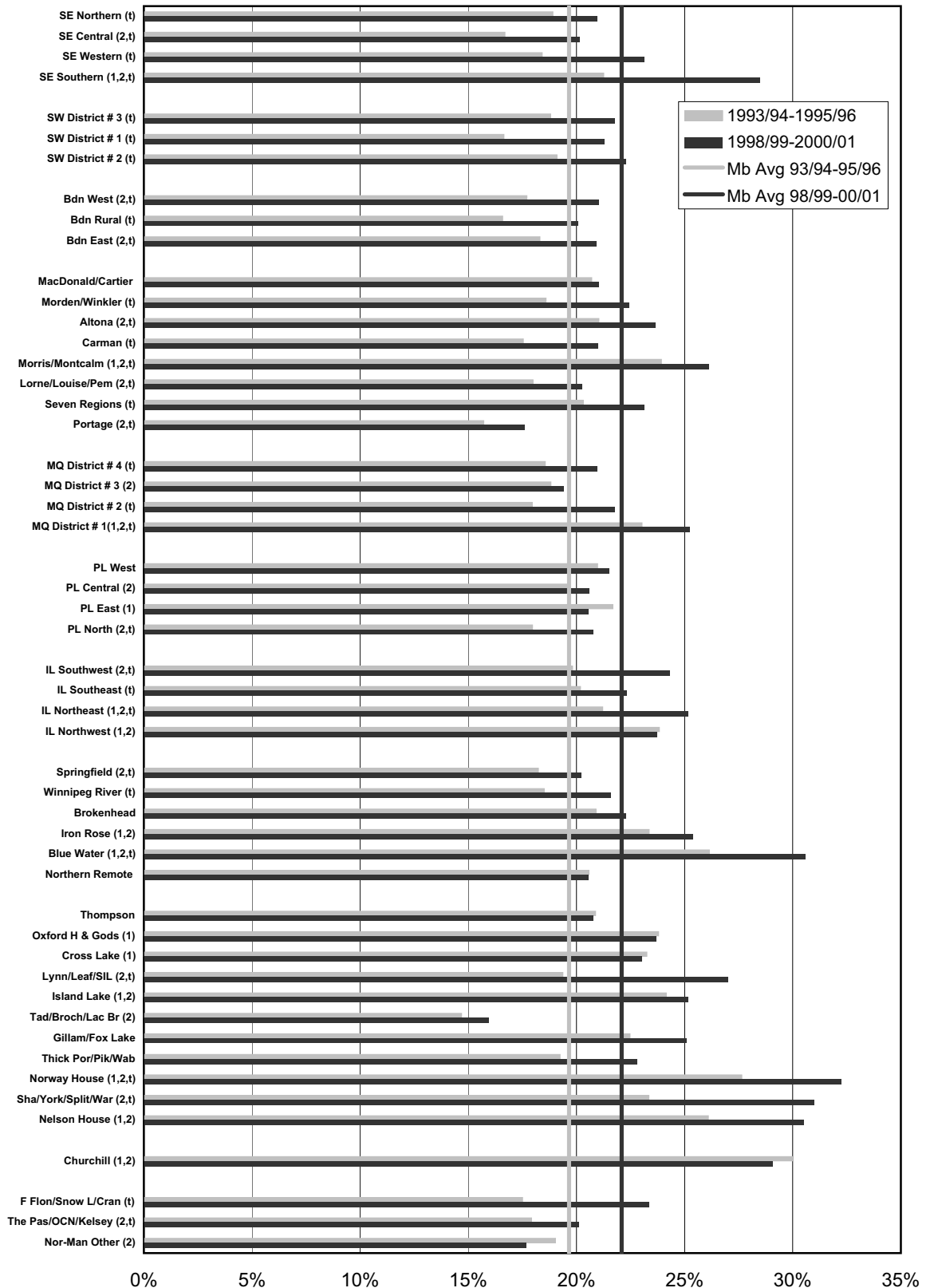
5.4 Acute Myocardial Infarction (AMI) Treatment Prevalence

Definition: This is the combined number of hospitalizations for acute myocardial infarction (heart attacks) experienced per thousand residents of the area aged 20 or older, averaged over the five-year period to give an annual rate. It is not a percentage, as an individual may suffer more than one heart attack in the 5-year period. Therefore, each heart attack is counted as a separate event. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 5.4.1: Heart Attack (AMI) Rates by RHA

Age- & sex-adjusted rate of hospitalization for AMI per 1000 residents age 20+

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
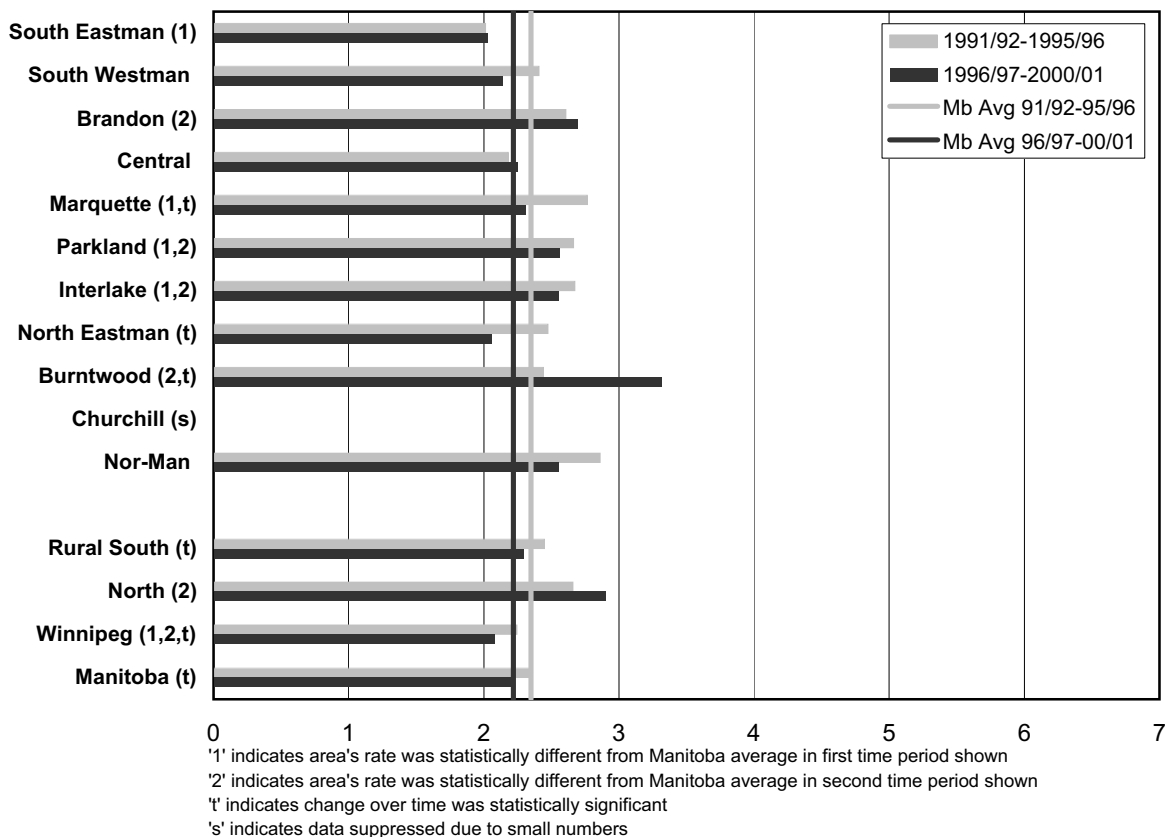
Figure 5.4.2: Heart Attack (AMI) Rates by District
Age- & sex-adjusted rate of hospitalization for AMI per 1000 residents age 20+
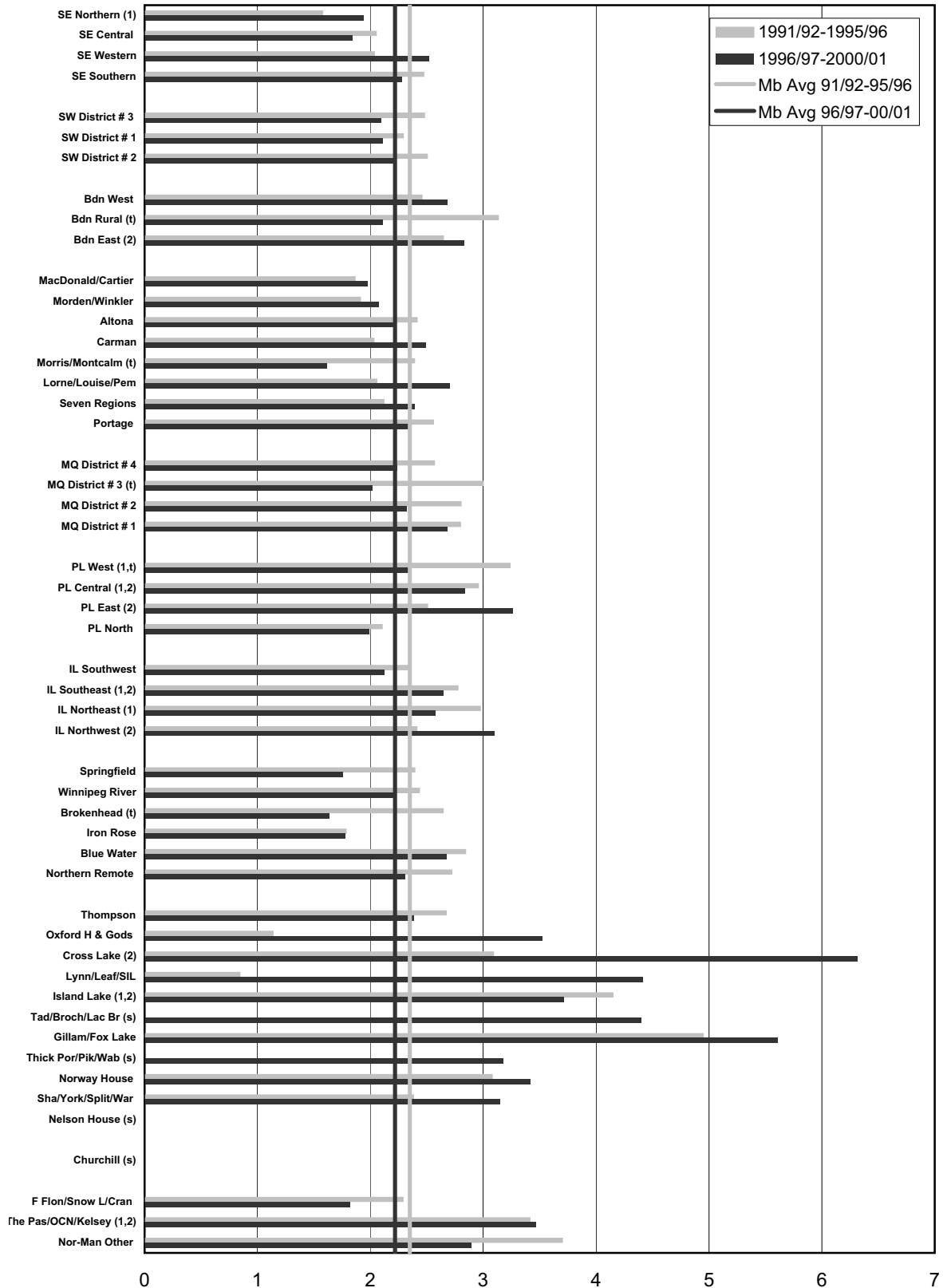
5.5   Stroke Treatment Prevalence

Definition: This is the combined number of hospitalizations for strokes experienced per thousand residents of the area aged 20 or older, averaged over the five-year period to give an annual rate. It is not a percentage, as an individual may suffer more than one stroke in the 5-year period. Therefore, each stroke is counted as a separate event. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 5.5.1: Stroke Rates by RHA

Age- & sex-adjusted rate of stroke per 1000 residents age 20+

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
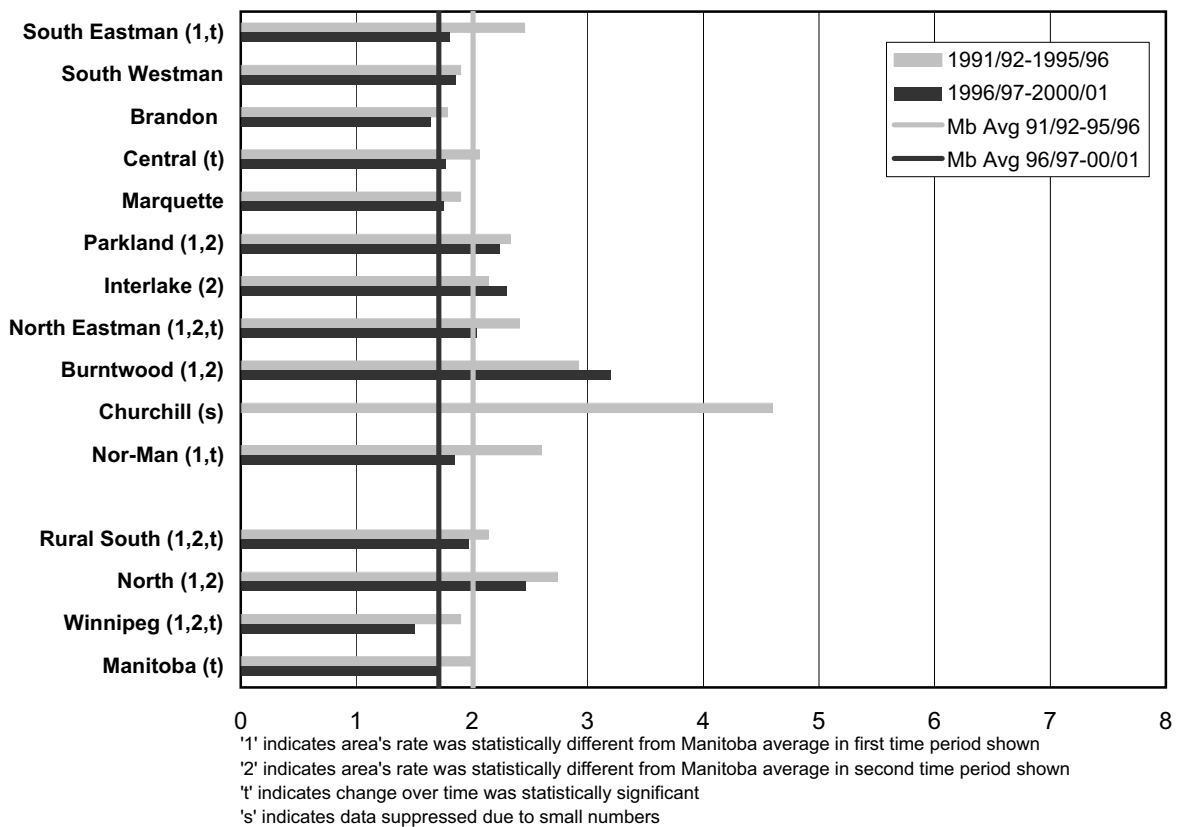
Figure 5.5.2: Stroke Rates by District

Age- & sex-adjusted rate of stroke per 1000 residents age 20+

Legend:
- 1991/92-1995/96
- 1996/97-2000/01
- Mb Avg 91/92-95/96
- Mb Avg 96/97-00/01

Districts:
SE Northern, SE Central (t), SE Western (t), SE Southern (1,t), SW District # 3, SW District # 1, SW District # 2, Bdn West, Bdn Rural, Bdn East, MacDonald/Cartier, Morden/Winkler, Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem (t), Seven Regions (1,t), Portage, MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West (2), PL Central, PL East, PL North (1,2), IL Southwest, IL Southeast (2), IL Northeast (2), IL Northwest (2), Springfield (t), Winnipeg River, Brokenhead, Iron Rose, Blue Water, Northern Remote, Thompson, Oxford H & Gods, Cross Lake (1,2), Lynn/Leaf/SIL (s), Island Lake (2), Tad/Broch/Lac Br (s), Gillam/Fox Lake (s), Thick Por/Pik/Wab (1,s), Norway House (1,2), Sha/York/Split/War (2), Nelson House (s), Churchill (s), F Flon/Snow L/Cran (t), The Pas/OCN/Kelsey (1), Nor-Man Other (t)

5.6   Cancer Incidence

Definition: This is the number of diagnoses of new cases of cancer per thousand residents of the area, averaged over the five-year period to give an annual rate. It is not a percentage, as an individual may suffer more than one new malignancy in the five-year period.[1] Therefore, each new diagnosis is counted as a separate event. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 5.6.1: Cancer Rates by RHA

Age- & sex-adjusted rate of new cancer cases reported per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Tumour counts provided by CancerCare Manitoba Registry; analysis by MCHP

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[1] Cancer Incidence Rates in this report are approximately 15-18% higher than those reported in Brownell et al (2003), because the analysis for this report included 'In Situ' tumours.

Figure 5.6.2: Cancer Rates by District

Age- & sex-adjusted rate of new cancer cases reported per 1000 residents

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00
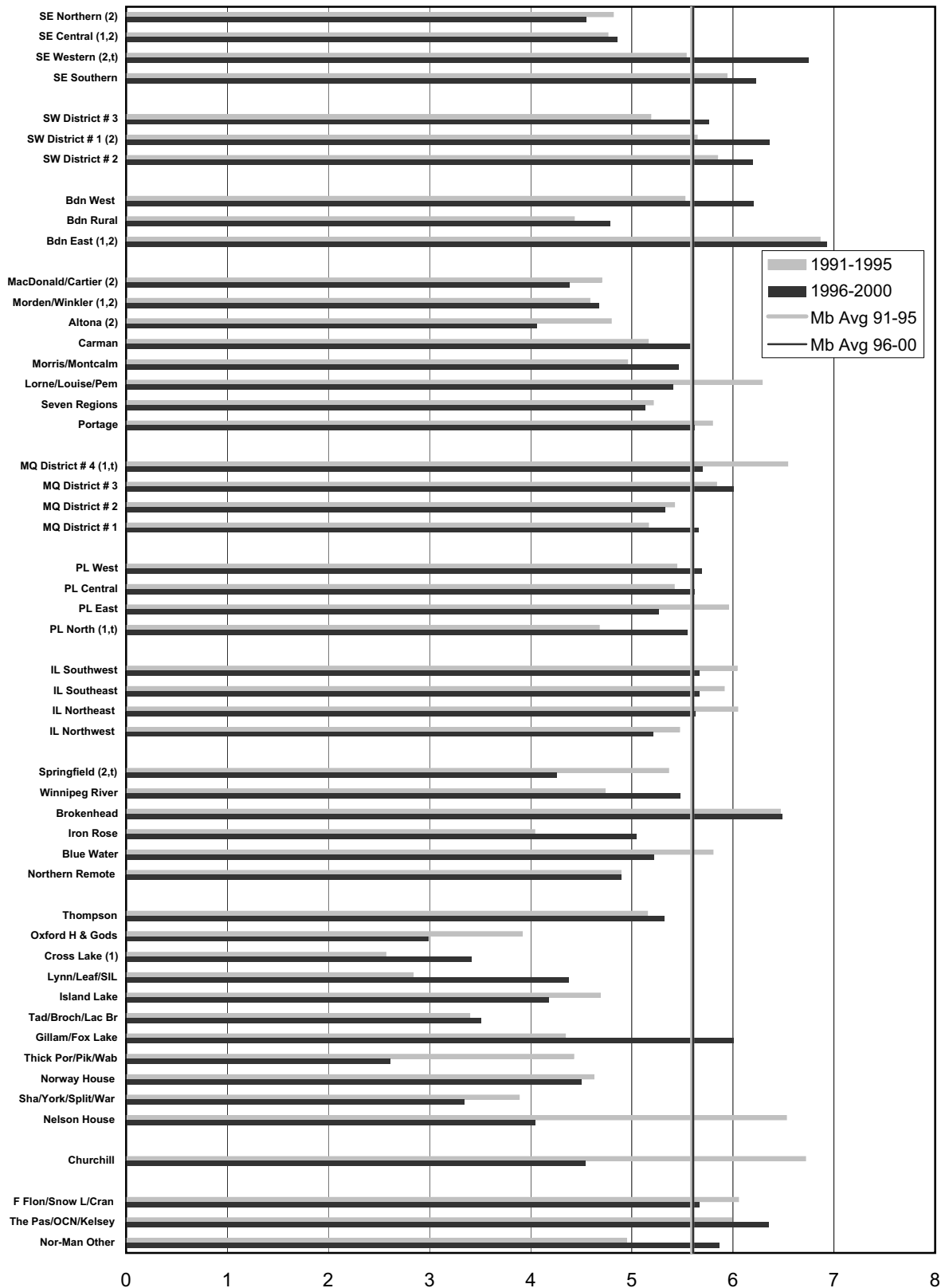
5.7   Total Respiratory Morbidity Treatment Prevalence

Definition: This is the percentage of persons having at least one physician visit or hospitalization for a respiratory disease within a two-year period. This is age- and sex-adjusted to reflect the population of Manitoba. See the Glossary for a listing of the ICD-9CM codes of respiratory illness included in this analysis.

Figure 5.7.1: Total Respiratory Morbidity Rates by RHA

Age- & sex-adjusted percent of residents treated for respiratory diseases

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
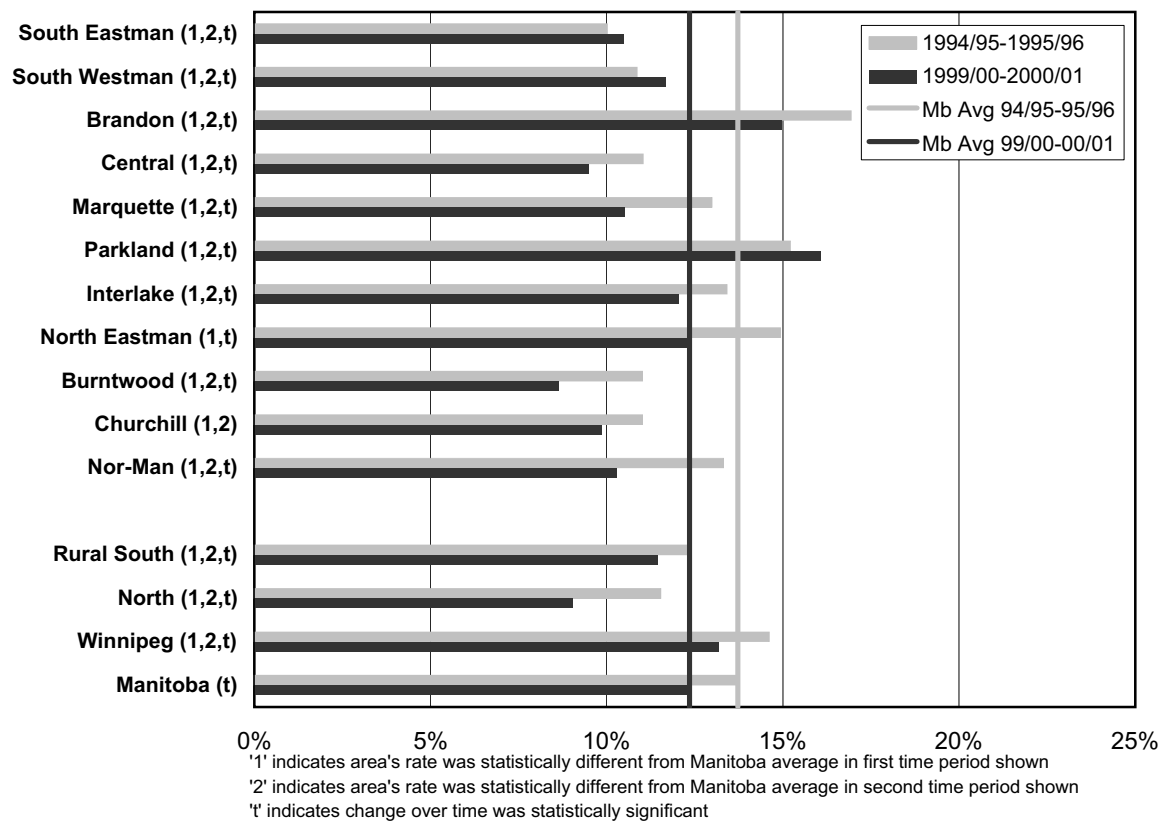
Figure 5.7.2: Total Respiratory Morbidity Rates by District

Age- & sex-adjusted percent of residents treated for respiratory diseases

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern (1), SE Central (1,2,t), SE Western (1,2), SE Southern (1,2), SW District # 3 (1,2), SW District # 1 (1,t), SW District # 2 (1,t), Bdn West (1,2,t), Bdn Rural (1,t), Bdn East (1,2,t), MacDonald/Cartier (1,2,t), Morden/Winkler (1,2,t), Altona (1,2,t), Carman (1,2,t), Morris/Montcalm (1,2,t), Lorne/Loiuse/Pem (1,2,t), Seven Regions (1,2,t), Portage (1,t), MQ District # 4 (1,2,t), MQ District # 3 (t), MQ District # 2 (t), MQ District # 1 (1,2,t), PL West (1,2,t), PL Central (1,2,t), PL East (1,2,t), PL North (1,2,t), IL Southwest (1,2,t), IL Southeast (1,2,t), IL Northeast (2,t), IL Northwest (1,t), Springfield (1,2,t), Winnipeg River (1,2), Brokenhead (1,2,t), Iron Rose (2,t), Blue Water (1,2), Northern Remote (1,2,t), Thompson (2,t), Oxford H & Gods (1,2), Cross Lake (1,2), Lynn/Leaf/SIL (2,t), Island Lake (1,2,t), Tad/Broch/Lac Br (1,2), Gillam/Fox Lake, Thick Por/Pik/Wab (2,t), Norway House (1,2,t), Sha/York/Split/War (1,2), Nelson House (1,t), Churchill (1), F Flon/Snow L/Cran (1,t), The Pas/OCN/Kelsey (1,2,t), Nor-Man Other (1,2,t)

X-axis: 0%, 5%, 10%, 15%, 20%, 25%

REFERENCES

Brownell M, Lix L, Ekuma O, Derksen S, De Haney S, Bond R, Fransoo R, MacWilliam L, Bodnarchuk J. Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2003.

Chapter 6: Preventive Care

6.1   What's in This Chapter?
Overall description, examples, and possible questions to pose.

This chapter contains information on the provision of preventive services. Indicators include:
*   Childhood Immunizations - one year (Section 6.2)
*   Childhood Immunizations - two years (Section 6.3)
*   Childhood Immunizations - seven years (Section 6.4)
*   Influenza Immunizations for Older Adults (Section 6.5)
*   Breast Cancer Screening Rates (Section 6.6)
*   Cervical Cancer Screening Rates (Section 6.7)

Preventive care programs are primary health care interventions - presumably preventing disease before it occurs, or detecting disease at a very early stage where curative rates are high. One measure of the "success" of childhood preventive health care programs is the immunization rate. We have included immunization rates at three ages, since these are often used in national and international comparisons - what percentage of children have a complete set of immunizations by 1, 2 and 7 years of age. For rates specific to First Nations children, refer to the First Nations report by the Manitoba Centre for Health Policy (Martens et al. 2002).

Our indicators for immunizations show the percentage of children who lived in the province for the entire period and had a complete set of immunizations at the time (1, 2, or 7 years). The definition of what constituted "complete set" has changed over time, so calculations were made on the basis of what was considered complete at the time of that child's immunization. Immunization data came from the Manitoba Immunization Monitoring System (MIMS), where physicians and nurses record immunizations given to residents of Manitoba. Data from federal nurses and First Nations community health nurses may be incomplete. See the Glossary for details as to immunization schedules.

For an adult focus, administrative claims data only recently began to record influenza immunization rates. The rate of "flu" immunizations given in this report is for the older adults (aged 65 or more), to reflect the group considered at the highest risk for flu-related hospitalizations (Menec et al. 2001).

Example: South Westman RHA (as of July 1, 2002, South Westman was incorporated into the new "Assiniboine" RHA)

In the most recent time period (Figures 6.2 through 6.4), South Westman has higher immunization rates than the provincial averages: aged one (89.5% versus 83.0%), two (82.0% versus 70.7%) and aged seven years (86.2% versus 73.3%). Most of South Westman's districts also follow this pattern. Similar to the entire province, South Westman rates appear to be declining in the one- and seven-year old children (a decline is also apparent with the two-year old rates, but it is not statistically significant).

South Westman's flu vaccination rates for older adults (aged 65 or more) are lower than the provincial rate (51.0% versus 54.7%), but this varies substantially by district within the region. Districts #1 and #2 have much lower rates (49.6 and 45.9% respectively), whereas District #3 has a higher rate at 61.3%.

Breast cancer screening rates for South Westman increased over time (See Figure 6.6.1 and 6.6.2), and are higher than provincial rates both regionally and within each district in the most recent time period. In contrast, cervical cancer screening rates are lower than the provincial average (see Figure 6.7.1).

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *How effective is the region in providing immunizations both to children and to adults?*
- *Is there a way to increase the immunization rates, and will this vary by district?*
- *What are the programs in the RHAs that have shown increases in immunization rates, and can these programs be implemented in other RHAs?*
- *Are the rates of breast cancer screening or cervical cancer screening acceptable, and does this vary by district within the region?*
- *Do regions with varying immunization or screening rates have different service delivery systems, or is this influenced by other factors?*

6.2   Childhood Immunizations - One Year

Definition: This is the percentage of one-year-old children with the complete set of recommended immunizations (children must have lived in Manitoba for the entire period). There may be under-recording of immunizations into the Manitoba Immunization Monitoring System (MIMS) for some remote northern communities and First Nations communities, which may result in slightly lower rates.

Figure 6.2.1: One-Year Immunization Rates by RHA

Per cent of children with complete immunization schedules at age one year
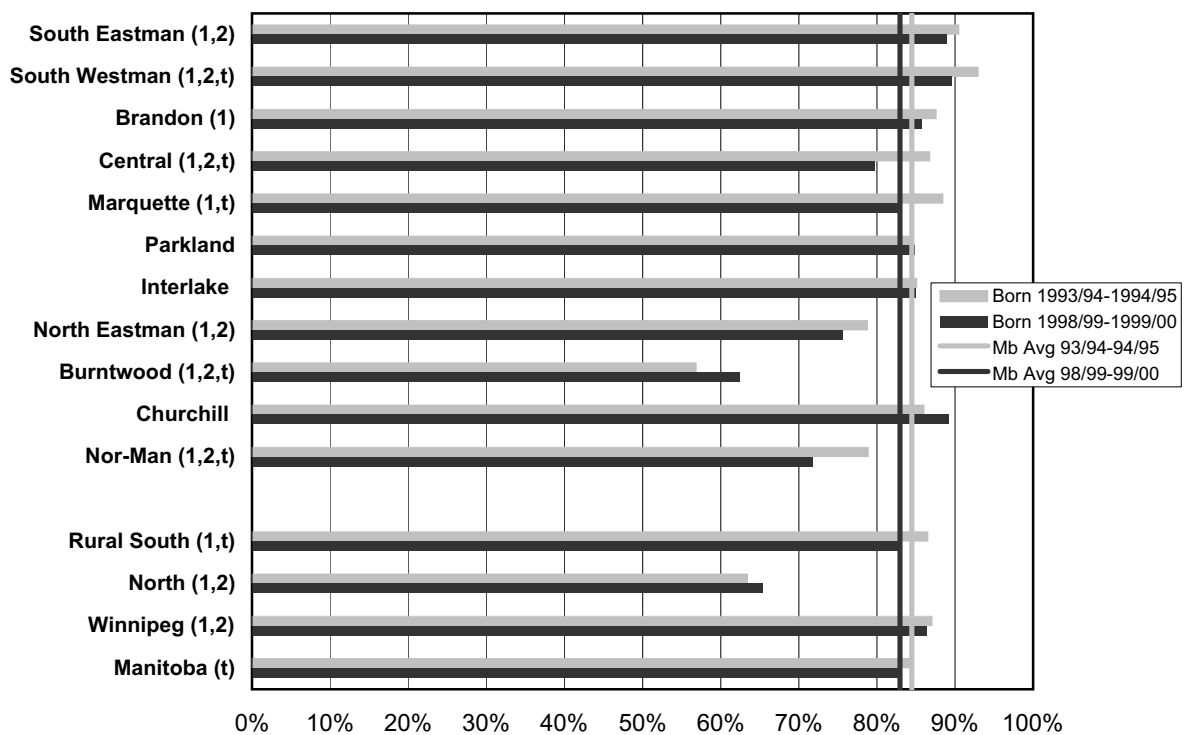
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Manitoba Immunization Monitoring System (MIMS)

Figure 6.2.2: One-Year Immunization Rates by District

Per cent of children with complete immunization schedules at age one year
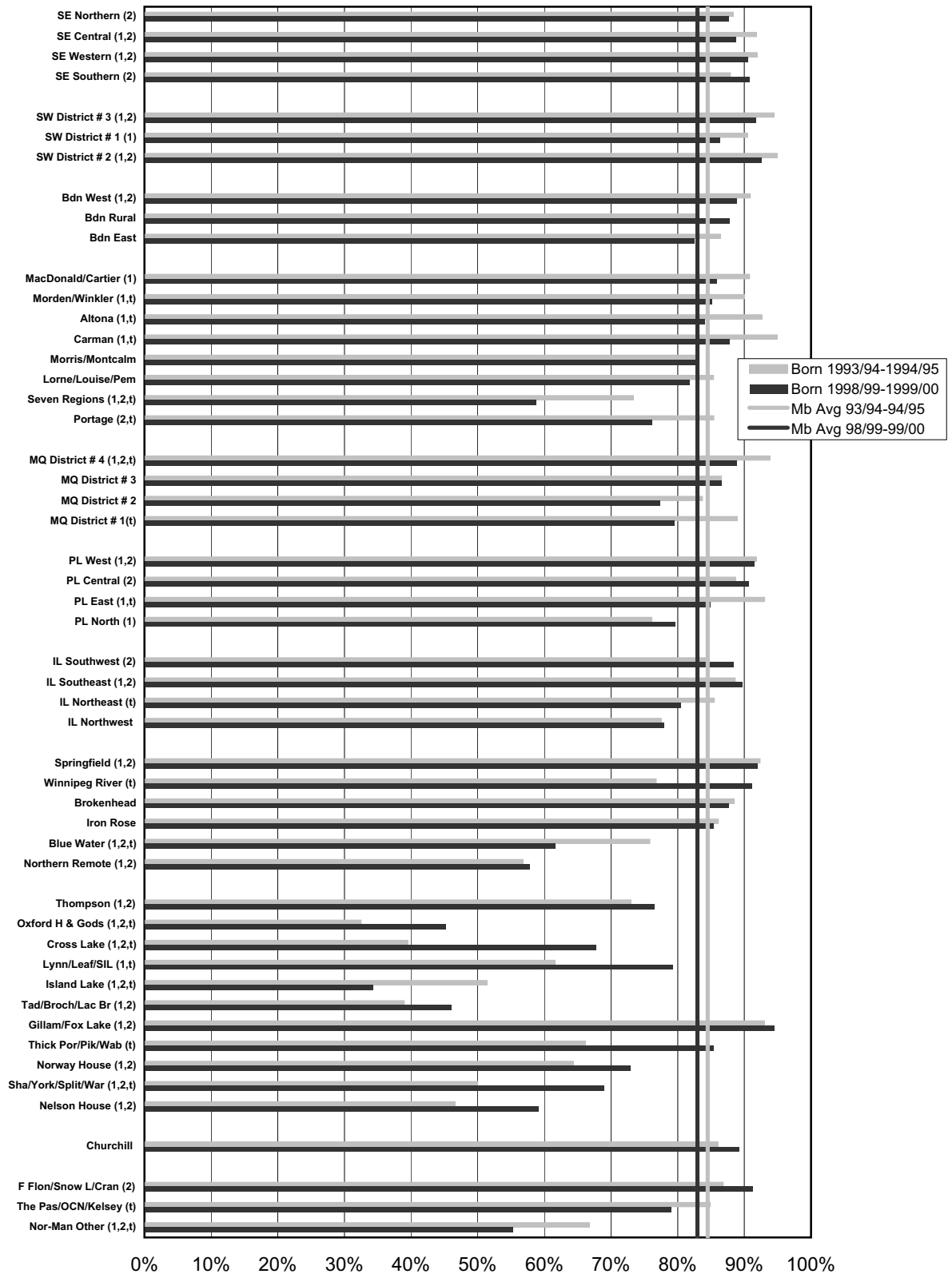
6.3   Childhood Immunizations - Two Years

Definition: This is the percentage of two-year-old children with the complete set of recommended immunizations (children must have lived in Manitoba for the entire period). There may be under-recording of immunizations into the Manitoba Immunization Monitoring System (MIMS) for some remote northern communities and First Nations communities, which may result in slightly lower rates.

Figure 6.3.1: Two-Year Immunization Rates by RHA

Per cent of children with complete immunization schedules at age two years
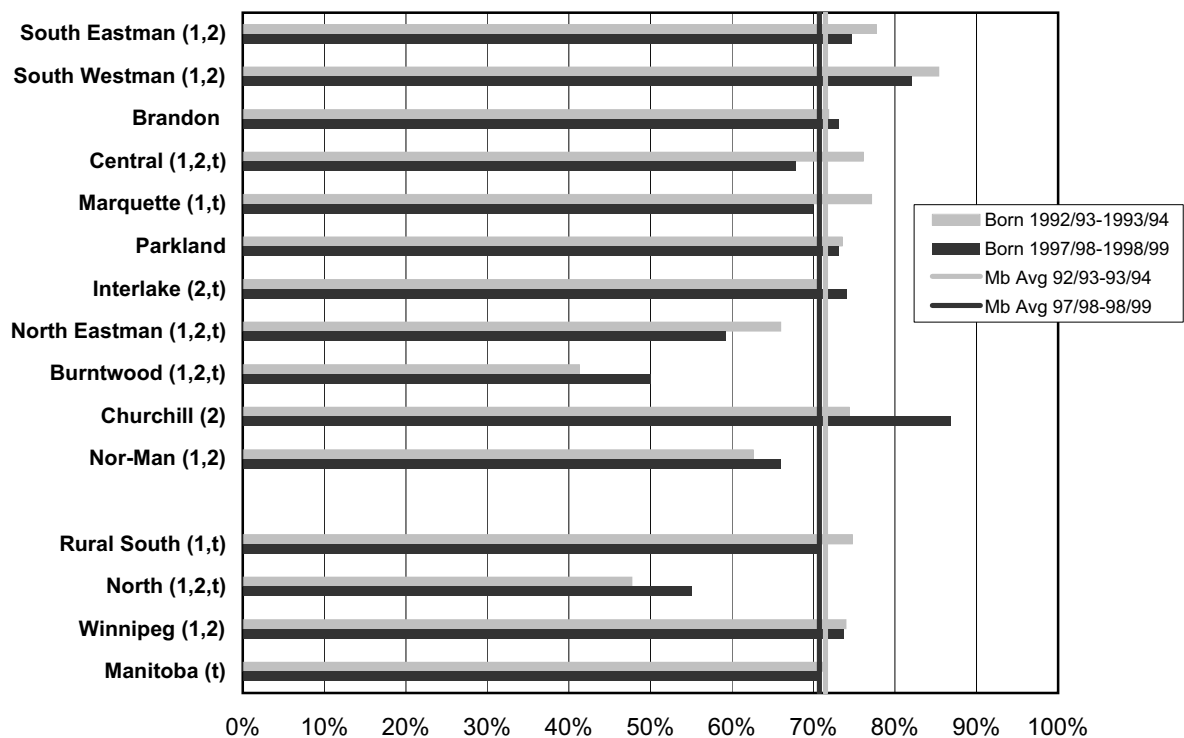
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Manitoba Immunization Monitoring System (MIMS)

Figure 6.3.2: Two-Year Immunization Rates by District

Per cent of children with complete immunization schedules at age two years
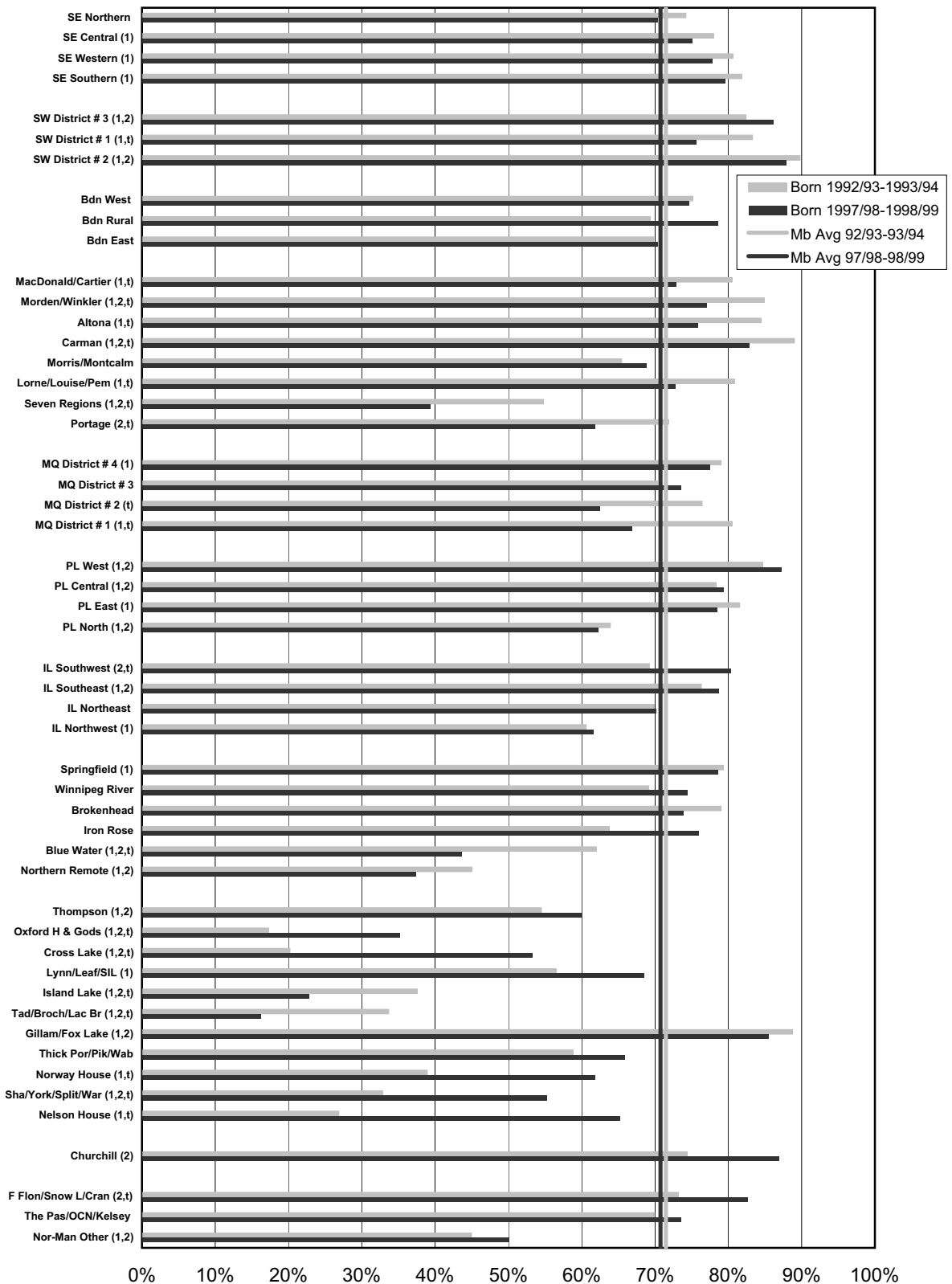
6.4   Childhood Immunizations - Seven Years

Definition: This is the percentage of seven-year-old children with the complete set of recommended immunizations (children must have lived in Manitoba for the entire period). There may be under-recording of immunizations into the Manitoba Immunization Monitoring System (MIMS) for some remote northern communities and First Nations communities, which may result in slightly lower rates.

Figure 6.4.1: Seven-Year Immunization Rates by RHA
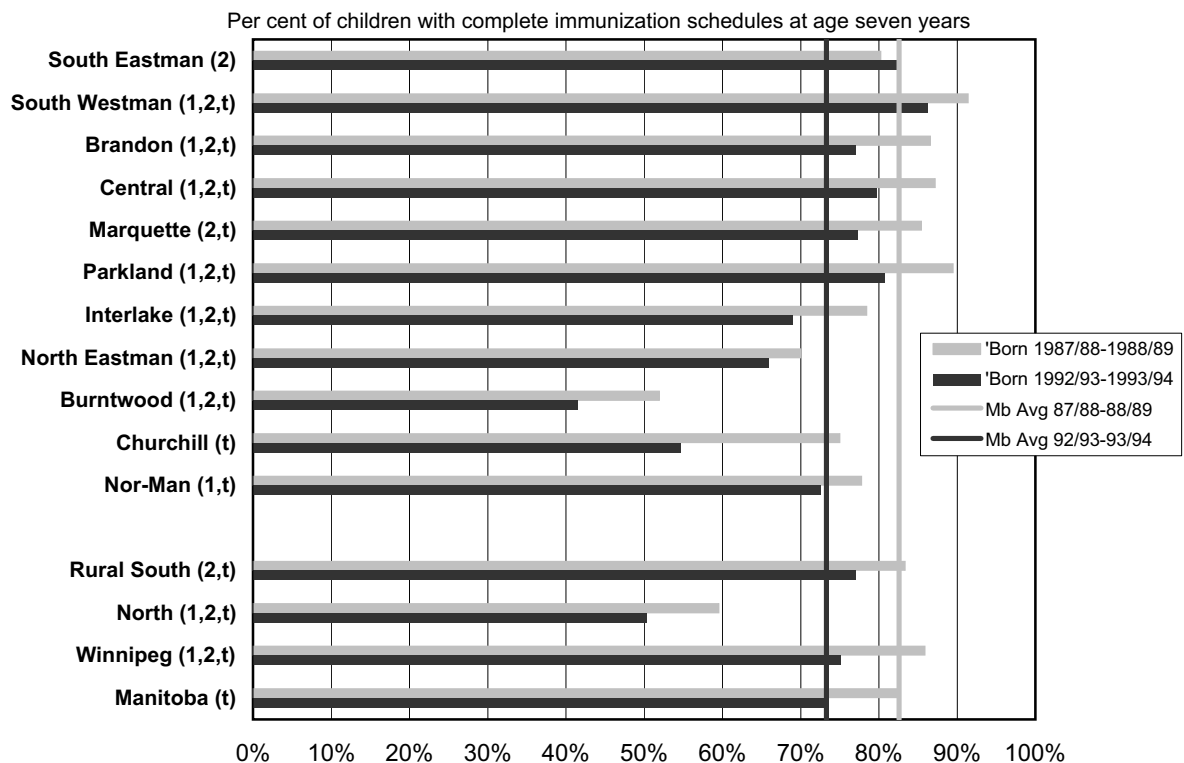
Per cent of children with complete immunization schedules at age seven years

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Manitoba Immunization Monitoring System (MIMS)

Figure 6.4.2: Seven-Year Immunization Rates by District

Per cent of children with complete immunization schedules at age seven years
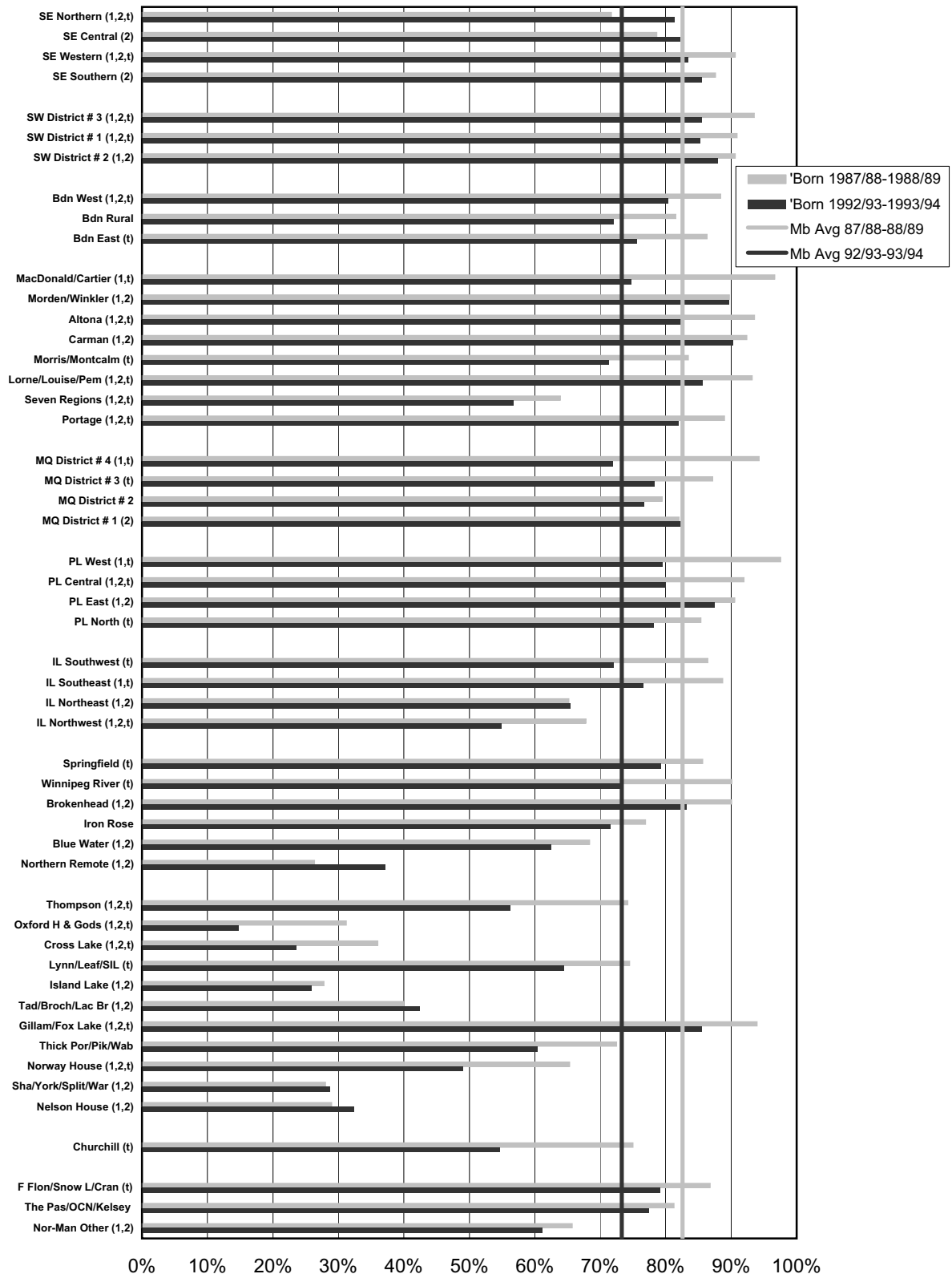
6.5 Influenza Immunization Rates for Older Adults

Definition: This is the percentage of adults aged 65 or older who received a flu shot during the 2000/01 fiscal year. Comparative data are not available for the 1995 period. This is age- and sex-adjusted to reflect the population of Manitoba (aged 65 or more).

Figure 6.5.1: Influenza Vaccination Rates by RHA
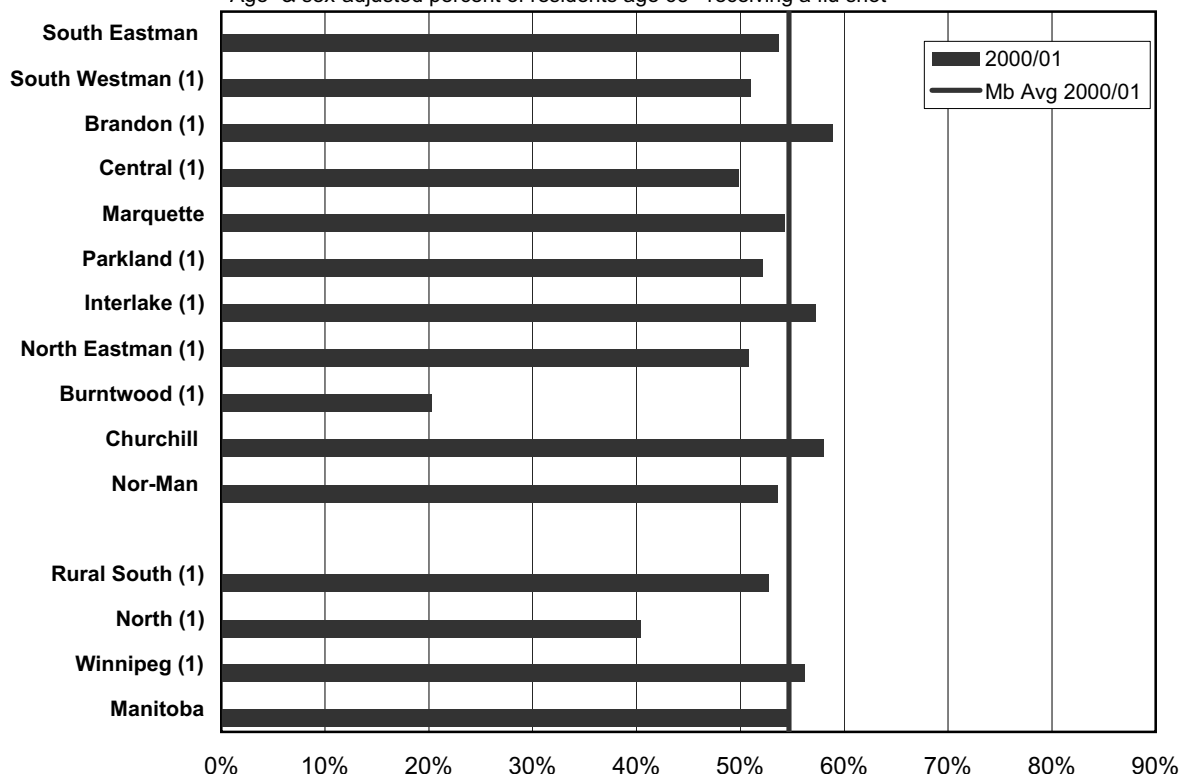
Age- & sex-adjusted percent of residents age 65+ receiving a flu shot

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS)

Figure 6.5.2: Influenza Vaccination Rates by District
Age- & sex-adjusted percent of residents age 65+ receiving a flu shot
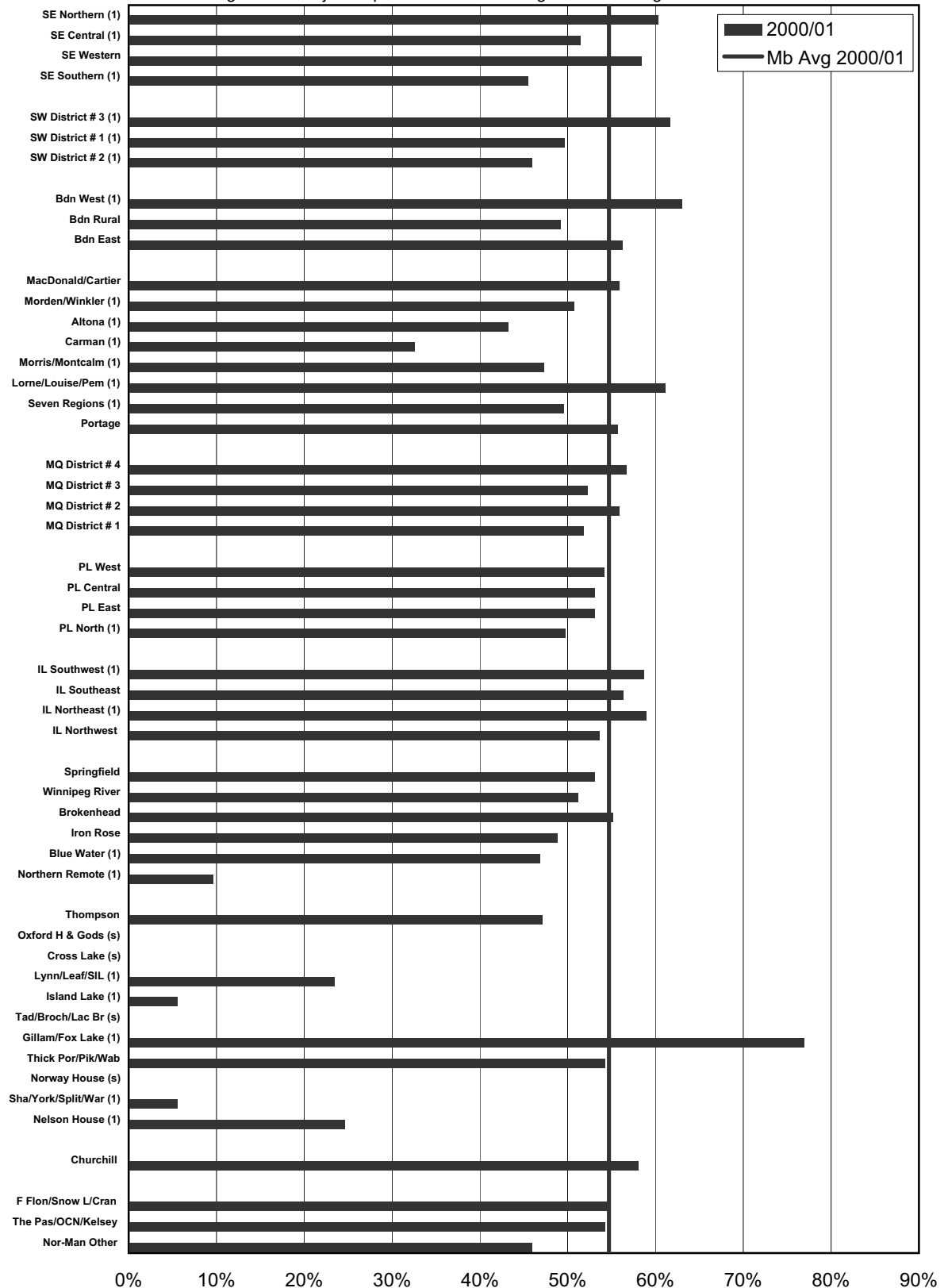
6.6   Breast Cancer Screening Rates

Definition: This is the percentage of women ages 50 through 69 who had at least one mammogram in a two-year period (the schedule recommended by the Manitoba Breast Screening Program). This is age-adjusted to reflect the female population of Manitoba (ages 50 to 69).

Figure 6.6.1: Breast Cancer Screening Rates by RHA

Age-adjusted percentage of women age 50-69 receiving at least one mammogram in two years
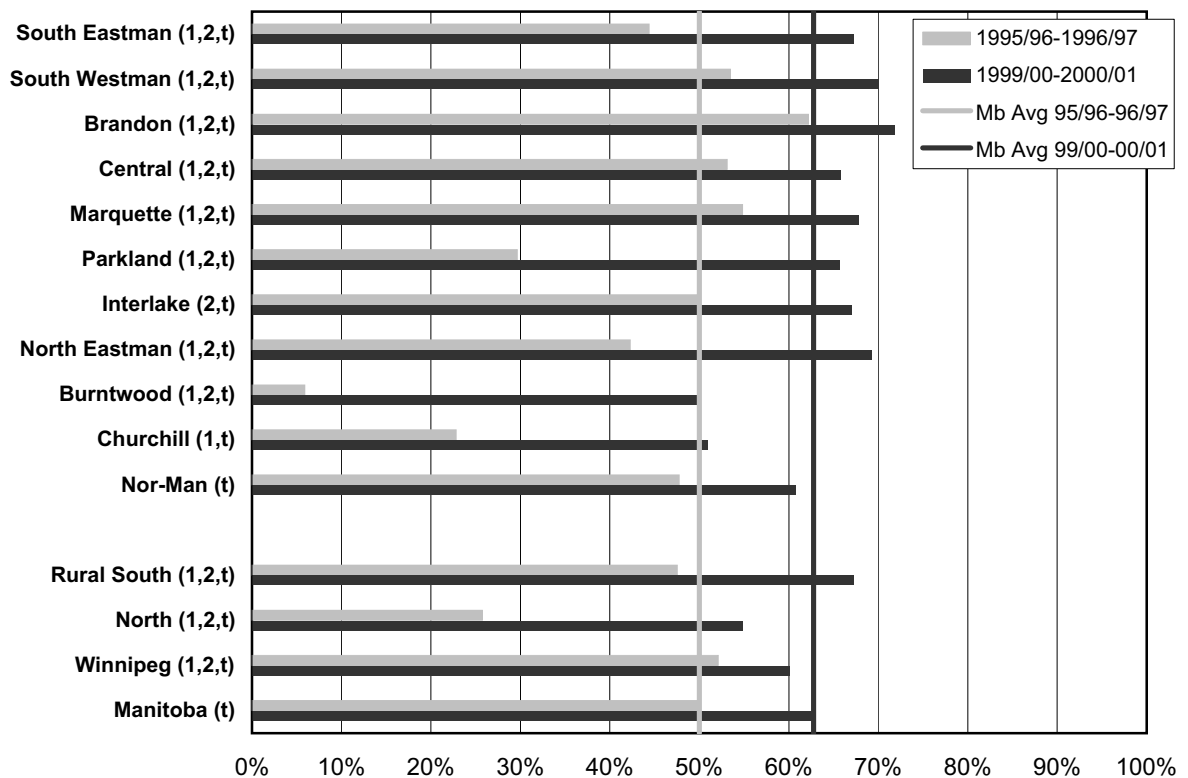
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Figure 6.6.2: Breast Cancer Screening Rates by District

Age-adjusted percentage of women age 50-69 receiving at least one mammogram in two years

Legend:
- 1995/96-1996/97
- 1999/00-2000/01
- Mb Avg 95/96-96/97
- Mb Avg 99/00-00/01
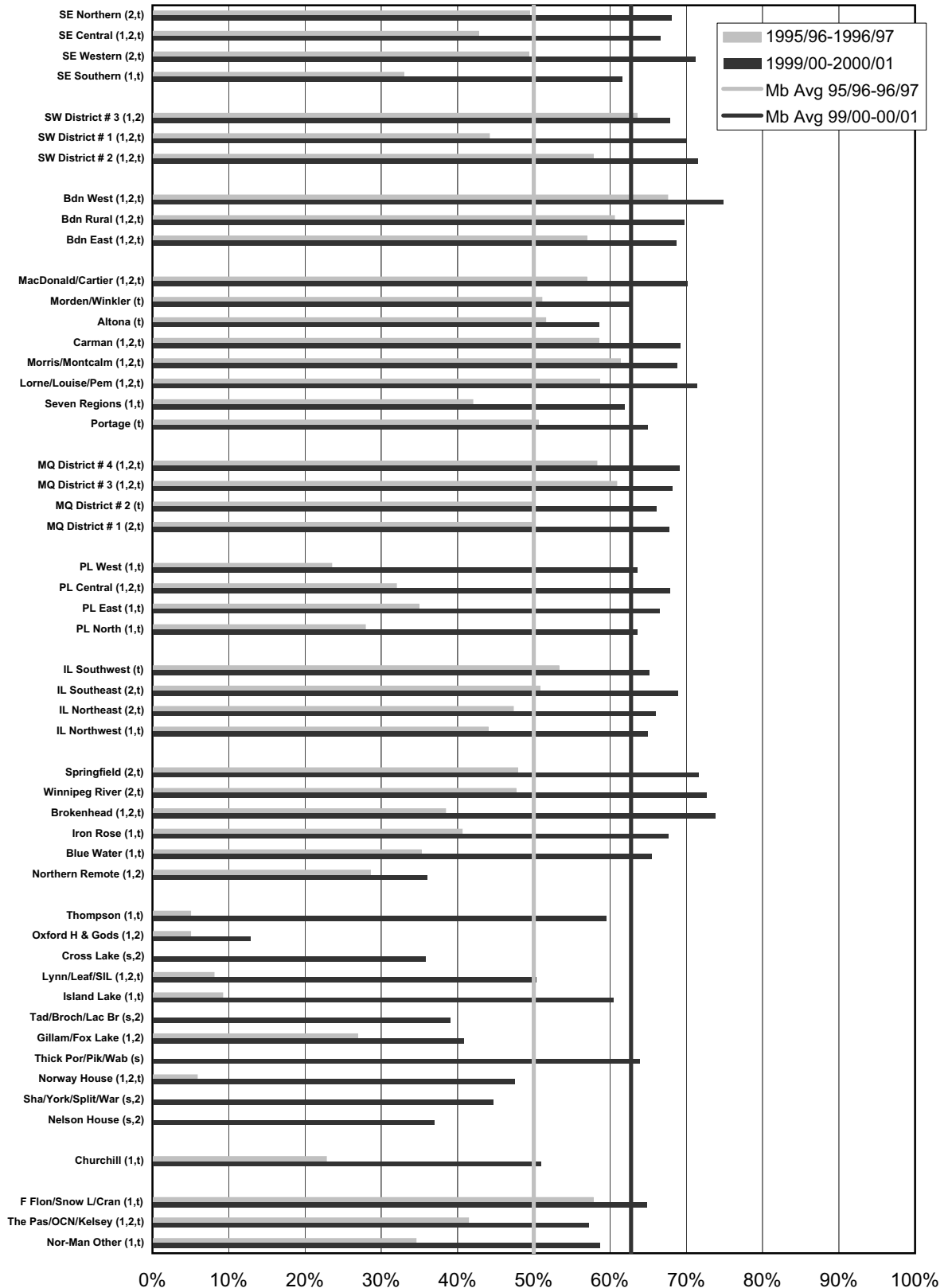
6.7   Cervical Cancer Screening Rates

Definition: This is the percentage of women ages 18 through 69 who had at least one Papanicolau (Pap) smear within a three-year period. This is age-adjusted to reflect the female population of Manitoba (ages 18 to 69).

Figure 6.7.1: Cervical Cancer Screening Rates by RHA

Age-adjusted percentage of women age 18-69 with one or more PAP smears in three-year period

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
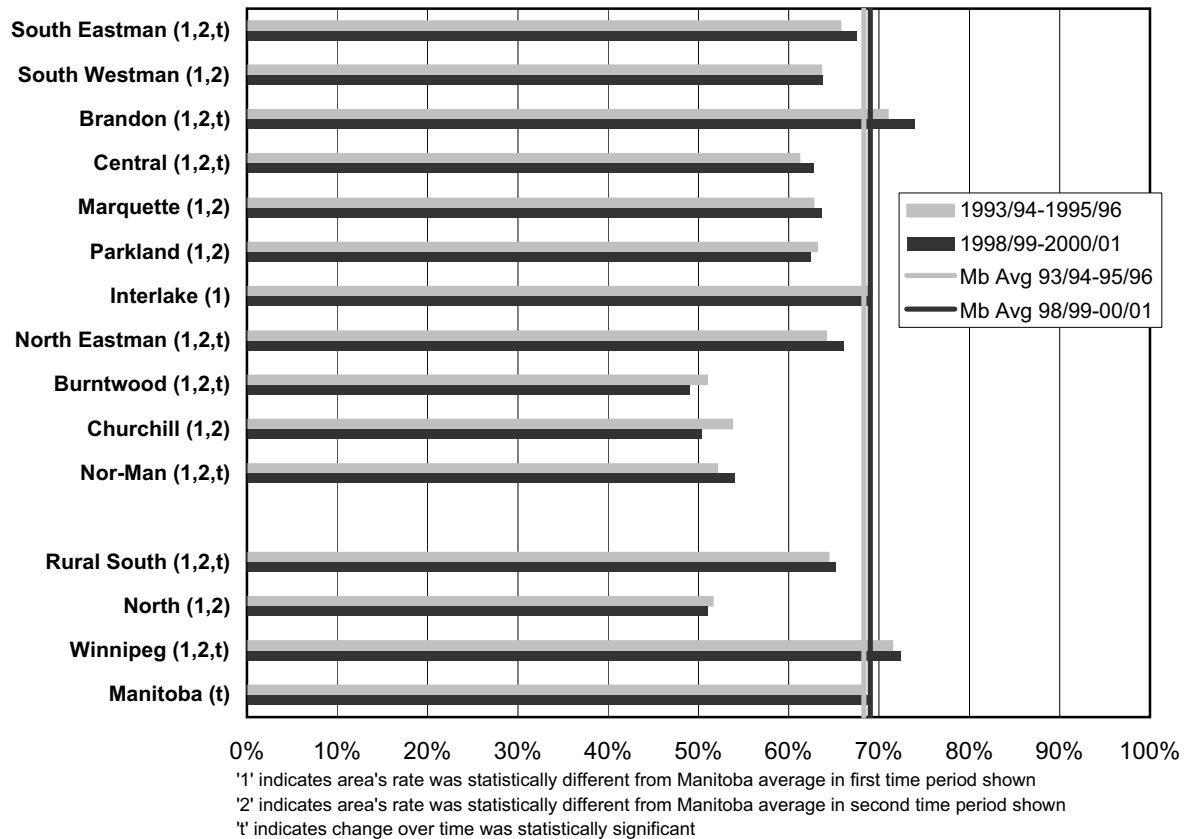
Figure 6.7.2: Cervical Cancer Screening Rates by District

Age-adjusted percentage of women age 18-69 with one or more PAP smears in three-year period

Legend:
- 1993/94-1995/96
- 1998/99-2000/01
- Mb Avg 93/94-95/96
- Mb Avg 98/99-00/01

Districts (top to bottom):
- SE Northern (2,t)
- SE Central (1,2)
- SE Western
- SE Southern (1,2)
- SW District # 3 (1,2)
- SW District # 1 (1,2)
- SW District # 2 (2)
- Bdn West (1,2,t)
- Bdn Rural (1,2)
- Bdn East (2,t)
- MacDonald/Cartier (1,2)
- Morden/Winkler (1,2)
- Altona (1,2,t)
- Carman (1,t)
- Morris/Montcalm (1,2)
- Lorne/Louise/Pem
- Seven Regions (1,2)
- Portage (1,2,t)
- MQ District # 4 (1)
- MQ District # 3 (1)
- MQ District # 2 (1,2)
- MQ District # 1 (1,2)
- PL West (1,2)
- PL Central (1)
- PL East (2)
- PL North (1,2)
- IL Southwest (t)
- IL Southeast (1,2)
- IL Northeast (2,t)
- IL Northwest (1,2,t)
- Springfield (1,2,t)
- Winnipeg River
- Brokenhead (1,t)
- Iron Rose (1,2)
- Blue Water (1,2)
- Northern Remote (1,2)
- Thompson (1,2)
- Oxford H & Gods (1,2)
- Cross Lake (1,2,t)
- Lynn/Leaf/SIL (1,2,t)
- Island Lake (1,2)
- Tad/Broch/Lac Br (1,2,t)
- Gillam/Fox Lake
- Thick Por/Pik/Wab
- Norway House (1,2)
- Sha/York/Split/War (1,2)
- Nelson House (1,2,t)
- Churchill (1,2)
- F Flon/Snow L/Cran (1,2,t)
- The Pas/OCN/Kelsey (1,2,t)
- Nor-Man Other (1,2)

References

Martens P, Bond R, Jebamani L et al. The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study. Winnipeg, Manitoba: *Manitoba Centre for Health Policy*, 2002.

Menec V, Black C, MacWilliam L, Aoki F, Peterson S, Friesen D. The Impact of Influenza-Like Illness on the Winnipeg Health Care System: Is an Early Warning System Possible? Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Chapter 7: Child Health

7.1 What's in This Chapter?
Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of child health:
- Preterm Births (Section 7.2)
- Low Birthweight (Section 7.3)
- High Birthweight (Section 7.4)
- Breastfeeding Initiation Rates (Section 7.5)
- Infant Mortality (Section 7.6)
- Teen Pregnancy (Section 7.7)

A more extensive report on child health was completed by the Manitoba Centre for Health Policy in 2001 (Brownell et al. 2001), to which readers may wish to refer. The six child health indicators in this chapter have been chosen by *The Need To Know Team* members as a short list of key planning and program issues for children in rural and northern regional health authorities (see Chapter 1, Section 1.1 for a description of the Team).

Example: North Eastman RHA

North Eastman's percentages of children born preterm, or of low or high birth weight, are about the same as the provincial average (see Figures 7.2 through 7.4). Looking at the districts within North Eastman, they are ordered by health status, with health status becoming poorer as you go down the group (refer to Chapter 2, Section 2.3 for discussion concerning this order). This makes sense in terms of the three indicators of child health - preterm, low and how birth weight rates all show increases as the overall district health status becomes poorer. However, all these rates are based upon relatively small numbers of people living in these districts, so the rates could fluctuate from year to year. Most district rates are not considered statistically different than the provincial averages for the given time period.

Breastfeeding rates in North Eastman are substantially lower than the provincial average (69% versus 80% in the most recent time period), although there appears to be a small increase over time from 64% in the first half to 69% in the second half of the 1990s. The variability within the region is particularly evident at the district level, with a high breast-feeding rate in Springfield (88%) and Winnipeg River (87%), an average rate in Brokenhead (77%) and Iron Rose (83%), and a substantially lower rate in Blue Water (63%) and Northern Remote (38%) districts.

Infant mortality (Figures 7.6.1 and 7.6.2) appears to be higher in North Eastman than the provincial rate, although this is not statistically significant and could fluctuate highly. However, the district of Northern Remote shows one of the highest infant mortality rates in the province at 19 deaths per thousand infants in the first half of the 1990s, compared with the provincial average at the time of 6.9/1000.

Looking at Figures 7.7.1 and 7.7.2, North Eastman's teen pregnancy rate (65 pregnancies per thousand females ages 15 through 19) appears to be similar to the provincial rate of 61 per thousand. However, the district rates are highly variable, with four showing rates half or less the provincial average (Springfield, Winnipeg River, Brokenhead, Iron Rose), and two showing substantially higher rates (Blue Water and Northern Remote). In the most recent time period, Northern Remote district had a teen pregnancy rate of 197 per thousand, one of the highest in the province.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *What is the pattern of preterm, low and high birth weight rates for the children of the region and the districts therein? Are these rates following the provincial patterns over time?*
- *Are there prenatal programs in the region which may address these concerns (for example, gestational diabetes screening, smoking cessation programs)?*
- *Are breastfeeding rates, a key determinant of childhood health, lower than one would expect? Are programs and policies in place to protect, support and promote breastfeeding, especially in high risk populations?*
- *Are teen pregnancy rates a concern, or are the high rates deemed culturally acceptable? Are reproductive health issues being addressed in regions with high rates (access to birth control or reproductive education)?*
- *Where child health indicator rates are optimal, what regional programs, policies or strategies are in place, and can other regions benefit from implementing these?*

7.2   Preterm Births

Definition: This is the percentage of live born babies who were delivered before 37 weeks gestation.

Figure 7.2.1: Preterm Births by RHA

Per cent of babies born preterm (less than 37 weeks gestational age)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
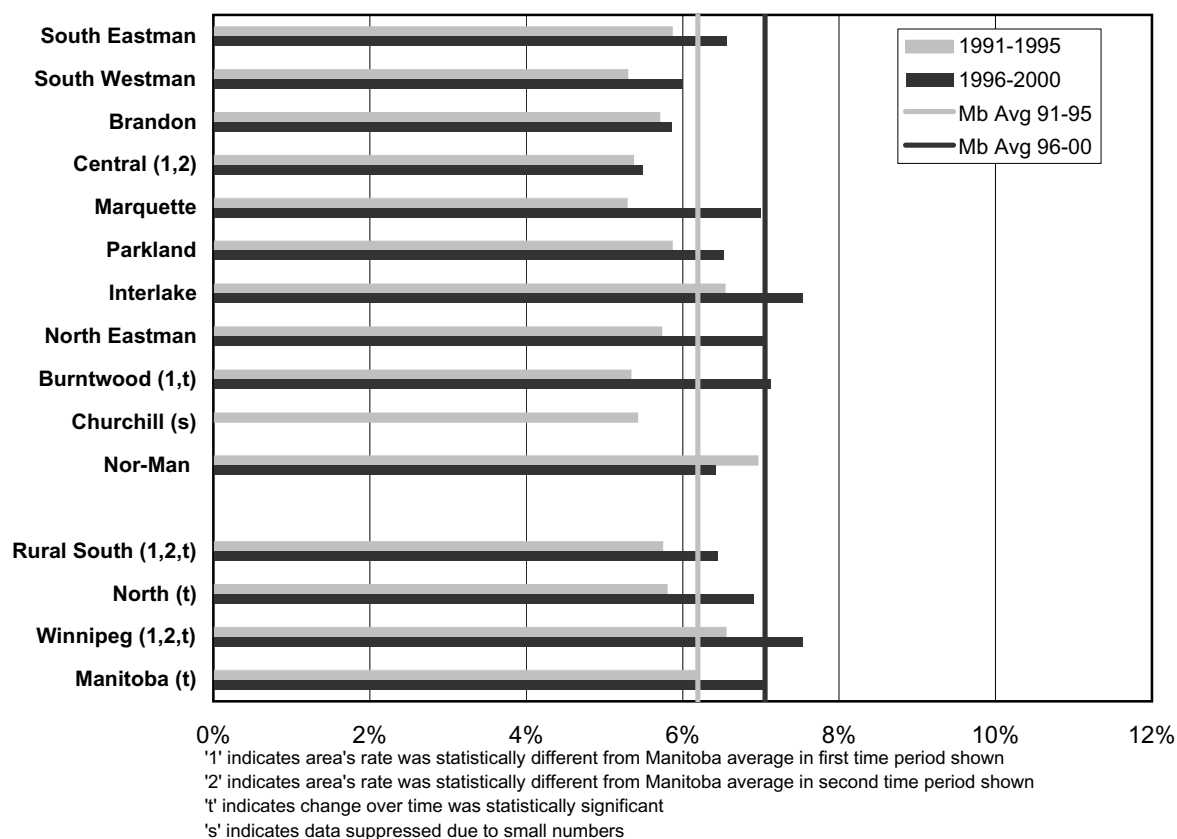
Figure 7.2.2: Preterm Births by District
Per cent of babies born preterm (less than 37 weeks gestational age)
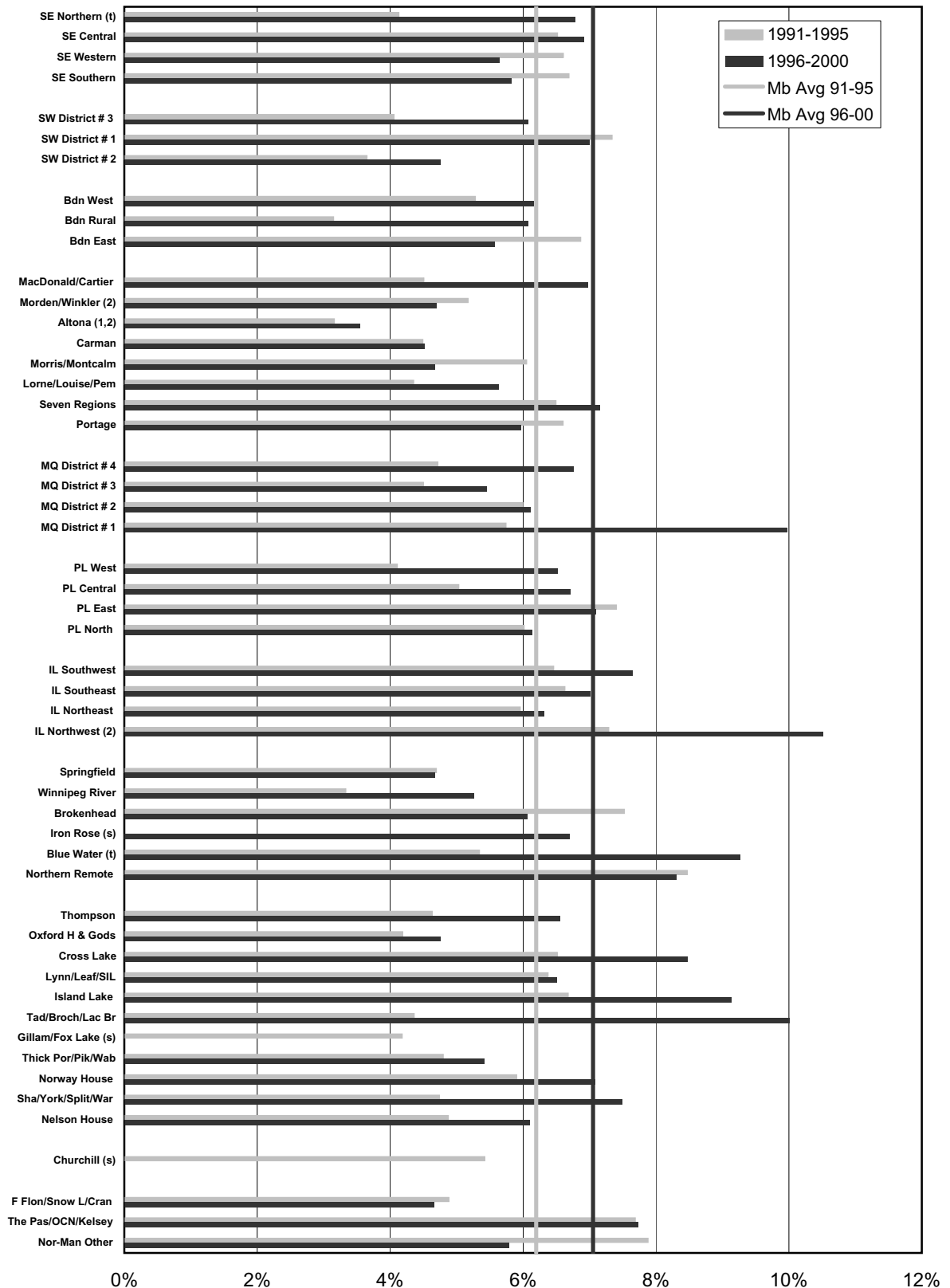
7.3 Low Birth Weight

Definition: This is the percentage of live born babies who had a birth weight of less than 2500 grams.

Figure 7.3.1: Low Birth Weight Births by RHA

Per cent of babies born with low birth weights (less than 2500 grams)
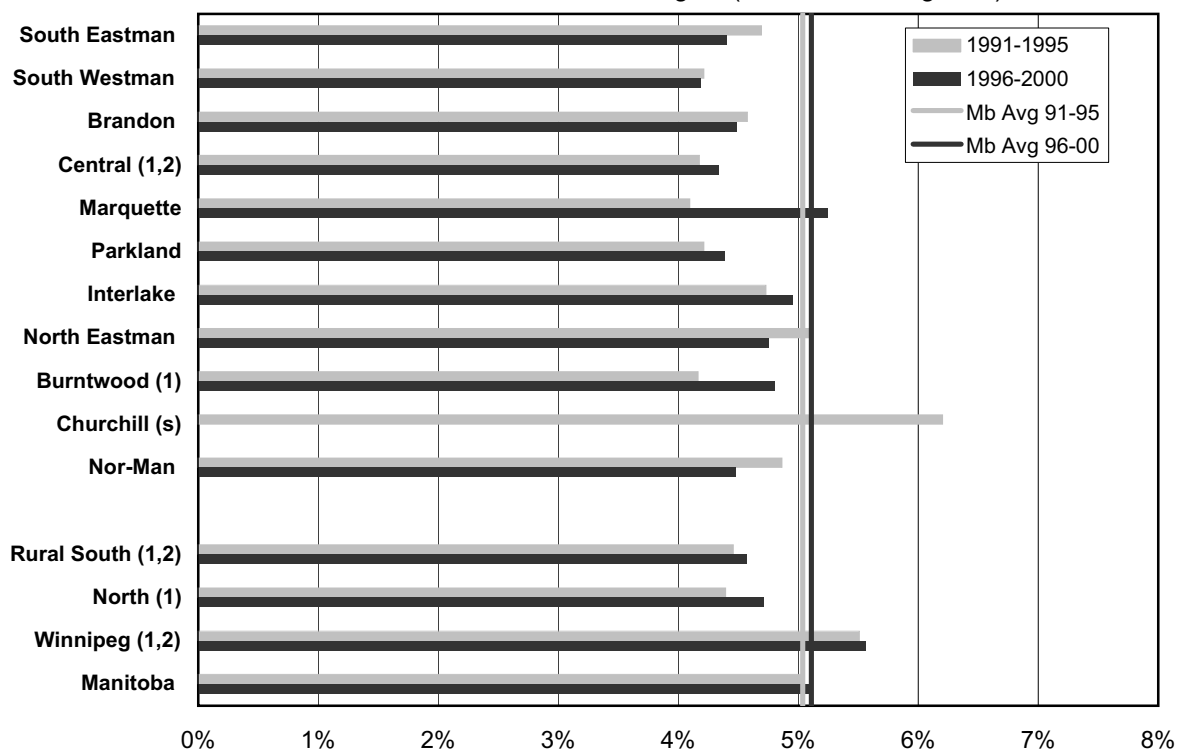
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Figure 7.3.2: Low Birth Weight Births by District

Per cent of babies born with low birth weights (less than 2500 grams)

Legend:
- 1991-1995
- 1996-2000
- Mb Avg 91-95
- Mb Avg 96-00

Districts (top to bottom):
SE Northern, SE Central, SE Western, SE Southern, SW District # 3, SW District # 1, SW District # 2, Bdn West, Bdn Rural, Bdn East, MacDonald/Cartier (1), Morden/Winkler, Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage, MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North, IL Southwest, IL Southeast, IL Northeast, IL Northwest, Springfield, Winnipeg River, Brokenhead (t), Iron Rose, Blue Water, Northern Remote, Thompson, Oxford H & Gods (2,t), Cross Lake, Lynn/Leaf/SIL, Island Lake, Tad/Broch/Lac Br, Gillam/Fox Lake (s), Thick Por/Pik/Wab, Norway House, Sha/York/Split/War, Nelson House, Churchill (s), F Flon/Snow L/Cran, The Pas/OCN/Kelsey, Nor-Man Other (t)

7.4   High Birth Weight

Definition: This is the percentage of live born babies who had a birth weight of more than 4000 grams.

Figure 7.4.1: High Birth Weight Births by RHA
Per cent of babies born with high birth weights (greater than 4000 grams)
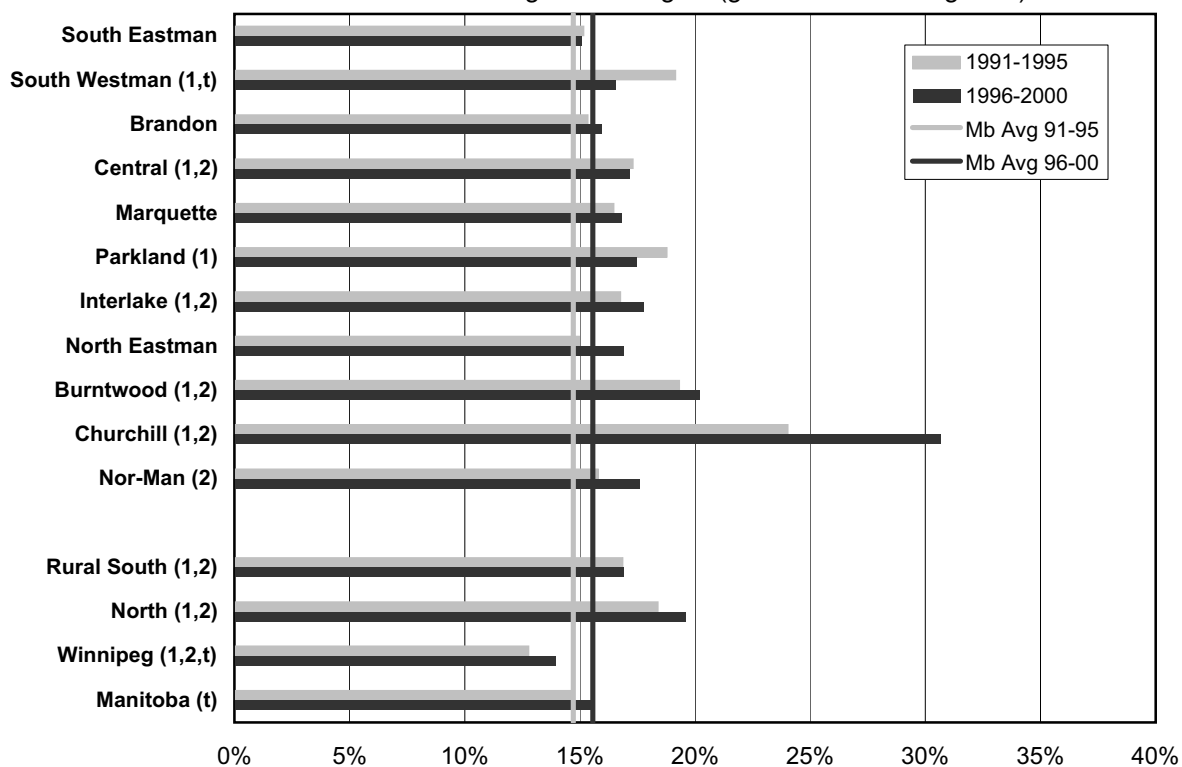
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 7.4.2: High Birth Weight Births by District

Per cent of babies born with high birth weights (greater than 4000 grams)
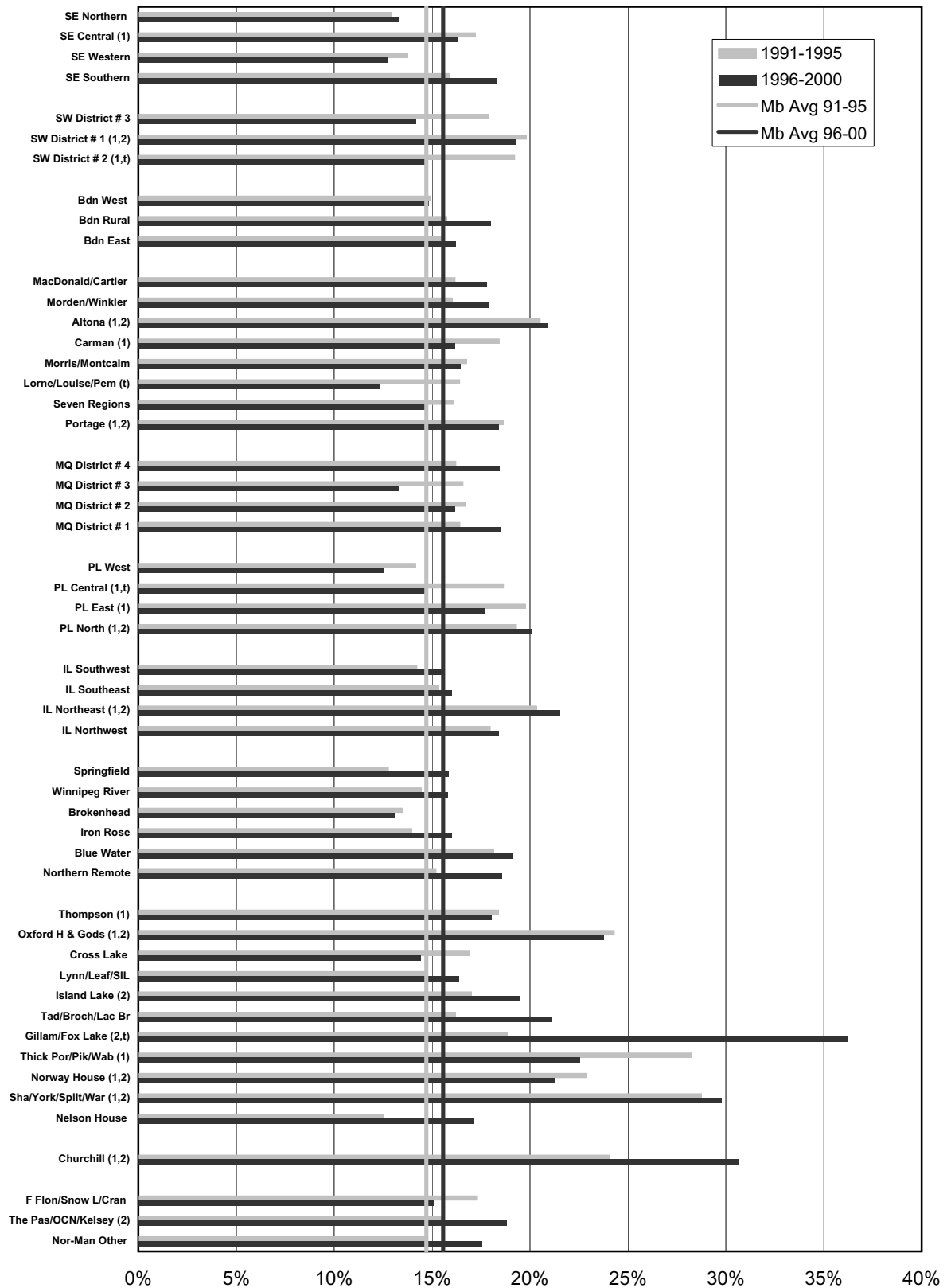
7.5   Breastfeeding Initiation Rates

Definition: This is the percentage of live born babies who were exclusively or partially breastfed at hospital discharge (i.e., who "initiated" breastfeeding in hospital). Babies with missing hospital discharge feeding information were excluded from the calculation (see MCHP's child health report, by Brownell et al. 2001, for more information as to the degree of missing data by RHA).

Figure 7.5.1: Breastfeeding Initiation Rates by RHA

Per cent of newborns breastfeeding at hospital discharge
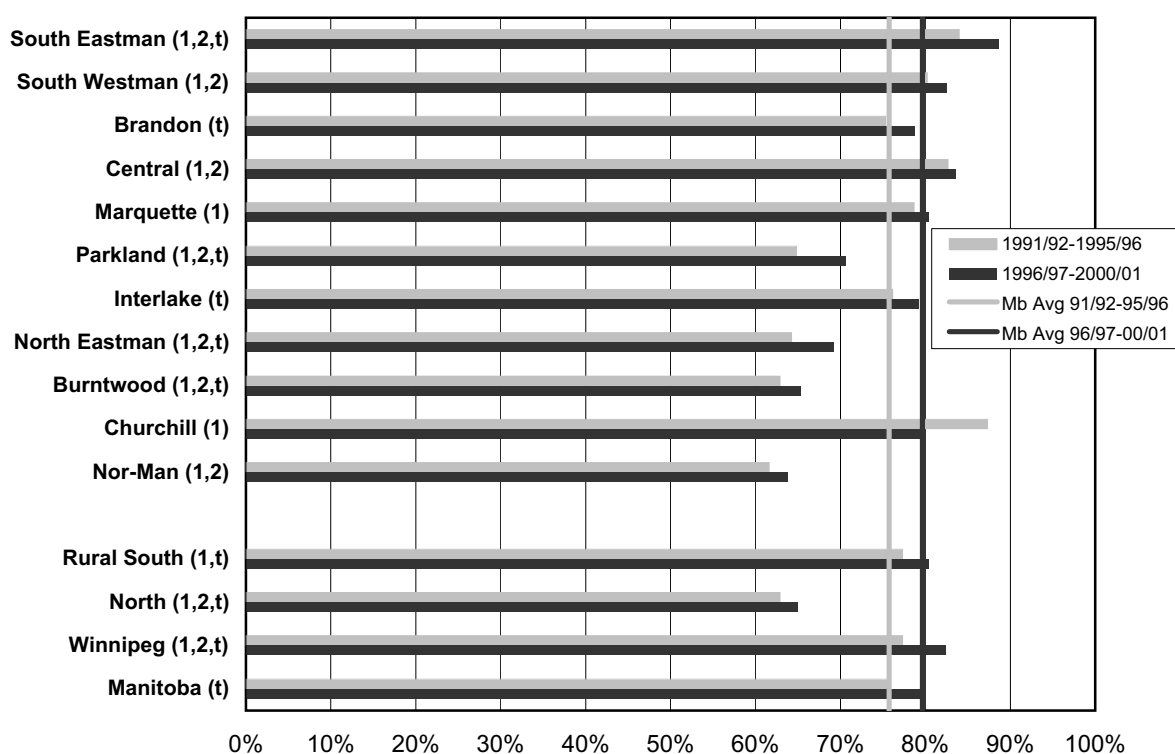
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 7.5.2: Breastfeeding Initiation Rates by District

Per cent of newborns breastfeeding at hospital discharge
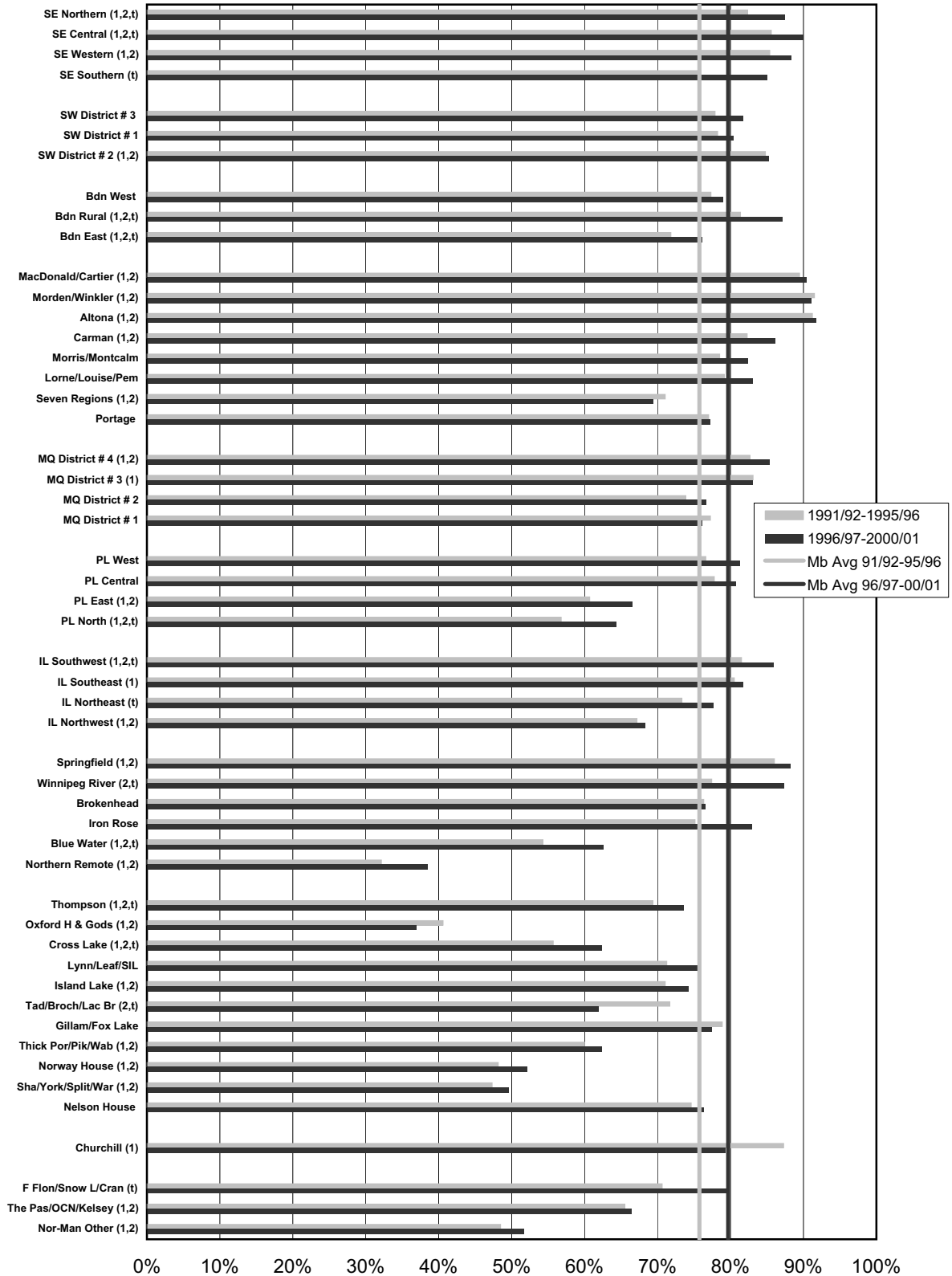
7.6   Infant Mortality Rate

Definition: This is the number of deaths among infants under one year of age, per thousand live births.

Figure 7.6.1: Infant Mortality Rates by RHA
Rate of deaths per 1000 infants (age less than one year)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
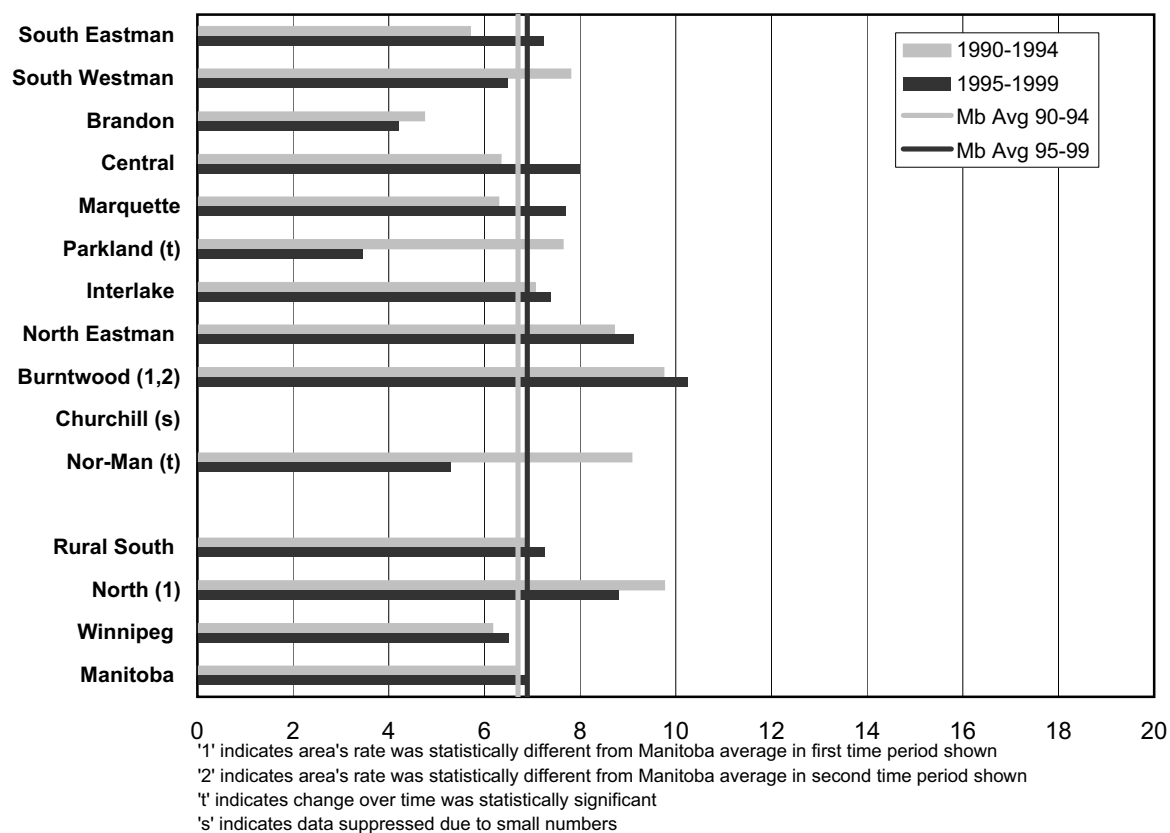
Figure 7.6.2: Infant Mortality Rates by District

Rate of deaths per 1000 infants (age less than one year)
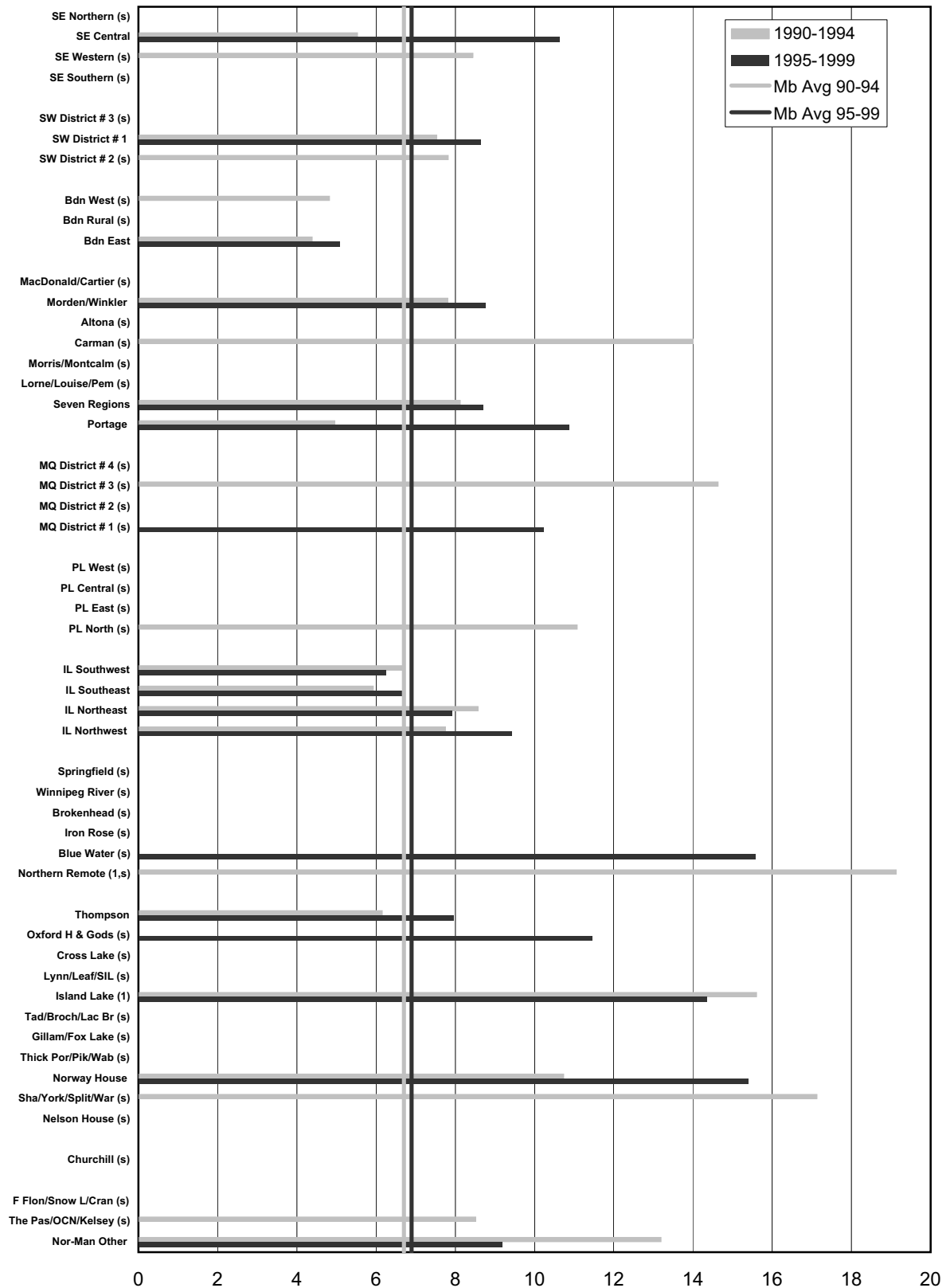
7.7 Teen Pregnancy Rate

Definition: This is the number of pregnancies per thousand females aged 15-19. "Pregnancies" includes live births, stillbirths, abortions, and ectopic pregnancies.

Figure 7.7.1: Teen Pregnancy Rates by RHA
Rate of teen pregnancies per 1000 females aged 15-19 years

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
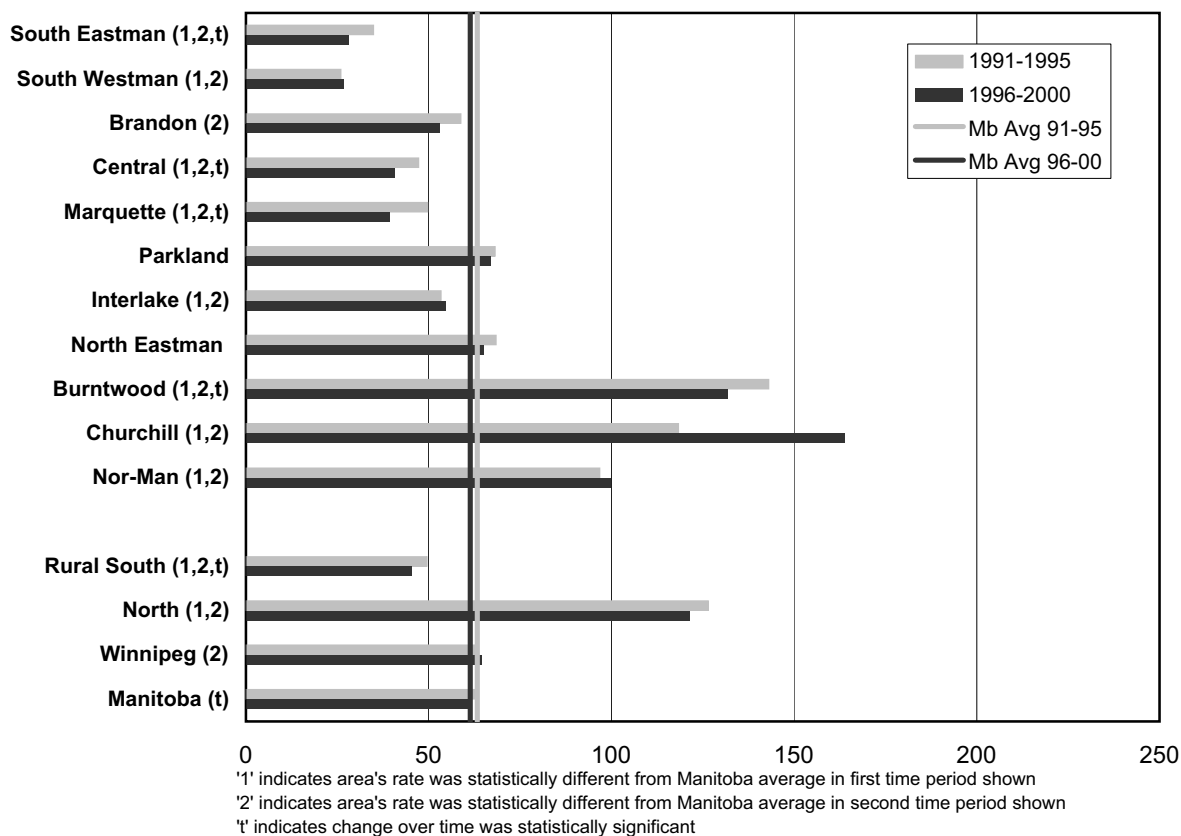
Figure 7.7.2: Teen Pregnancy Rates by District

Rate of teen pregnancies per 1000 females aged 15-19 years
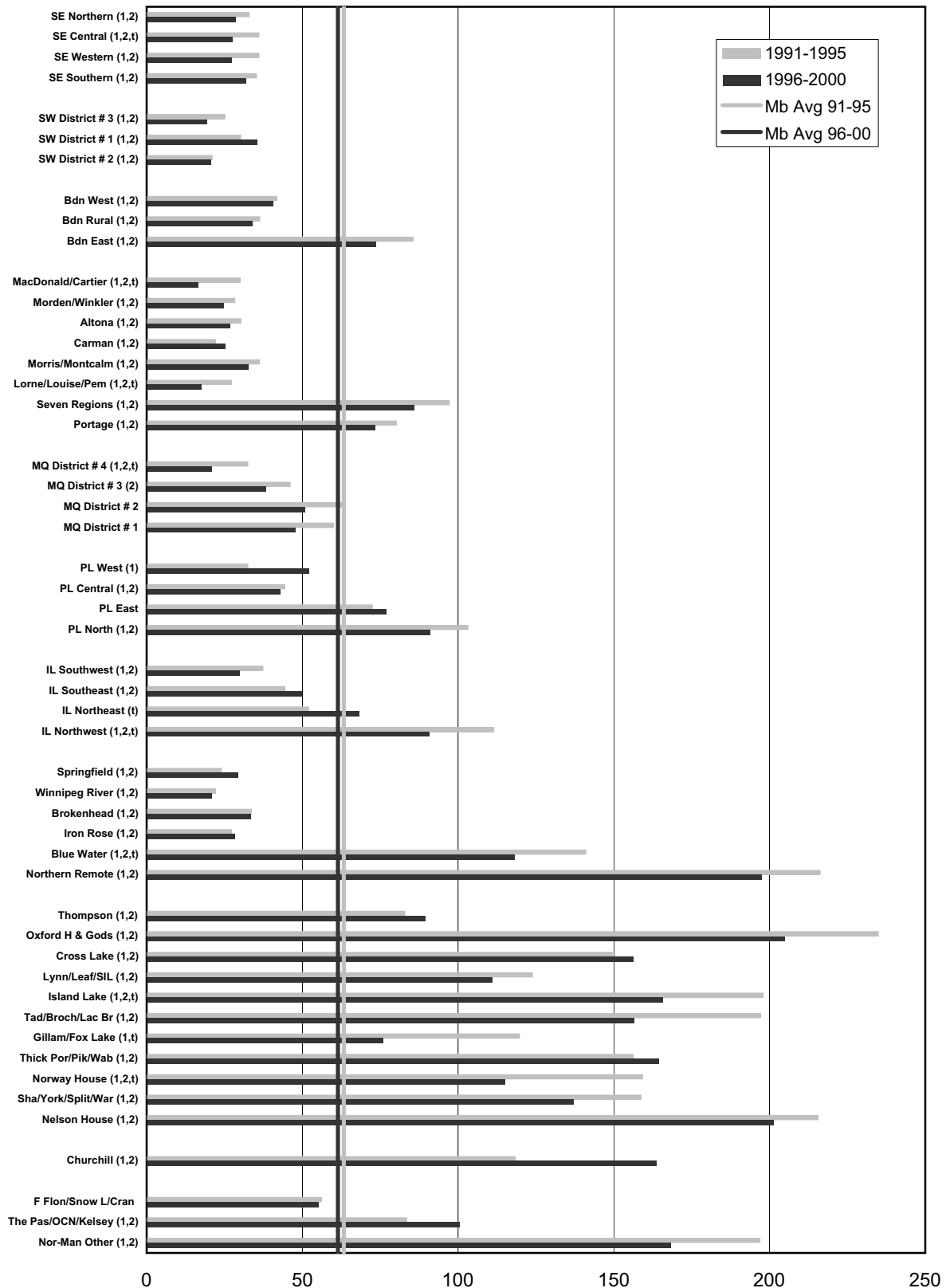
REFERENCES

Brownell M, Martens P, Kozyrskyj A, Fergusson P, Lerfald J, Mayer T, Derksen S, Friesen D. Assessing the Health of Children in Manitoba: A Population-Based Study. Winnipeg, Manitoba: *Manitoba Centre for Health Policy and Evaluation*, 2001.

Chapter 8: Physician Services

8.1   What's in This Chapter?
Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of physician service use:
- Use of Physicians (Section 8.2)
- Ambulatory Visit Rates (Section 8.3)
- Ambulatory Consultation Rates (Section 8.4)
- Per cent of Visits to GP/FPs (Section 8.5)
- Visit Rates by Age & Gender (Section 8.6)
- Location of Visits to GP/FPs (Section 8.7)
- Location of Visits to Specialists (Section 8.8)
- 'Causes' of Physician Visits (Section 8.9)

MCHP's definition of 'ambulatory visits' captures virtually all contacts with physicians, except visits to hospitalized patients. It includes office visits, home visits, personal care home (nursing home) visits, and visits to outpatient departments and some emergency rooms (where data are available - see Methods in Appendix 1 for details). Most physicians in the province are paid through fee-for-service. In order to receive payment for their services, they record the reason (diagnosis) for the visit. There are some physicians, especially in northern remote areas, who are paid a salary. Many of these physicians still "shadow bill" the government, that is, they fill out an evaluation claim so that the diagnosis code is still recorded for the visit. However, we realize that the evaluation claims are not as complete as the fee-for-service billings, since there is less incentive for the physician to complete the forms. As well, many northern and remote communities have access to nurse practitioner services for basic illness care. Nurses in these situations do not record their services through the fee-for-service billing system, so these visits are not included in the report. Thus our rate of general practitioner use may be undercounted for some northern/remote areas. This is not a problem with specialist visits, since all specialists are paid through fee-for-service billing claims. Thus rural and remote area consult visit rates are considered valid.

'Consultations' are a subset of ambulatory visits: they occur when one physician refers a patient to another (usually a specialist or surgeon) because of the complexity, obscurity or seriousness of the condition, or when the patient requests a second opinion. A consultation is the first visit to the specialist, after which the patient often returns to their general practitioner or family practitioner (GP/FP) for continuing care. The rate of consultations is considered a good measure of access to specialist care. People in urban

areas often have much higher overall rates of specialist care, since they may continue to go to see the specialist rather than being referred back to their GP/FP. That is why the consult, rather than the overall specialist rate, is used as an indicator for access to specialist care.

As with most of the indicators in this report, visits to physicians were allocated to the area of residence of the patient, not the location where the visit took place. To provide information as to where the visit took place, Sections 8.7 and 8.8 provide information as to the RHA residents' location of visits, either within their district or RHA, in another RHA, or in Winnipeg. All out-of-province visits to physicians are considered GP/FP visits, since the Manitoba Health data do not obtain a specialty coding on out-of-province visits. Although not included in the graphs, out-of-province physician visit rates are described in Appendix 3.

Example: Central RHA

Central RHA is considered one of the regions having a population with good overall health status when compared to other RHAs - that is, you find Central near the top of each graph (refer to Chapter 2, Section 2.3 as to the ordering of the graphs according to premature mortality rates). Thus one would expect to see a gradient in the physician visit graphs, whereby a "healthier" population would require fewer visits to physicians compared to less healthy populations. Although slightly lower than the provincial average of 82%, and probably no surprise given the overall good health status, 79% of Central RHA residents had at least one physician visit in the fiscal year 2000/2001 (See Figure 8.2.1). However, this varies by district within Central (see Figure 8.2.2). Generally, the poorer the health status of the district, the higher the percentage of people seeing a physician within the year, from a low of 75% in Morden/Winkler to a high of 82% in Portage. Interestingly, the district of MacDonald/Cartier, in close proximity to Winnipeg, tends to reflect the higher visit rate of Winnipeggers. Similar trends are seen in the average number of visits per year for Central residents (See Figure 8.3.1 and 8.3.2) - around 4 visits per person for 2000/2001, but varying substantially within the region.

Of all the southern RHAs, Central has the lowest consult rate (first visit to a specialist), lower than the provincial average at both time periods. However, the consult rate has increased over time from 0.18 to 0.21 visits per person per year (Figure 8.6.1). Another way of saying this is that for every 100 people in Central, 21 consult visits were made during the fiscal year 2000/2001. There appears to be very little correlation between the health status of the districts within Central and their consult rates (see Figure 8.4.2), with the rates being driven more by proximity to Winnipeg and thus reflecting the patterns of Winnipeg residents.

Graphs showing average number of physician visits by age categories and by gender are given by aggregate regions (North, Winnipeg, South Rural/Brandon). In Figure 8.6.3, the graph for "Rural South and Brandon", the patterns are similar for males and females 0 through 14 years old, with between five and six visits per year of the very young, down to between 2 and 3 visits per year of the younger teens. Reproductive health issues (pregnancy, birthing, other related gynaecology visits) become obvious with elevated visit rates for females in the reproductive years. In the older adults aged 65+, visit rates once again increase dramatically, to at least eight visits per person per year. As well, there appears to be an increase in visit rate from the 1995/96 to the 2000/01 time periods for the elderly, contrary to the younger peoples' rates that have stayed very similar over time. For males ages 80-84, for example, the visit rates increased over time from 8.4 to 9.3 visits per person per year. Females also showed a similar increase, from 8.2 to 8.9 visits per person per year.

Figure 8.5.1 shows that 84% of Central residents' physician visits are to general/family practitioners, thus only 16% of the visits are to specialists (this 16% would include both the first, or consult, visit and all subsequent visits). Provincially, 74% of visits are to GP/FPs, with 26% to specialists - the provincial rates are mainly driven by Winnipeg visit patterns. The location of Central residents' physician visits has changed very little over time (see Figure 8.7.1 and the accompanying table), with about two-thirds (67%) of GP/FP visits in their district, and only 15% in Winnipeg. Visits to specialists mostly occurred in Winnipeg (79% in the first time period, 81% in the second time period).

Why do people go to the physician? In Figure 8.9.1, the top nine diagnoses have changed very little over time, with the major reason being "respiratory illness" as the primary diagnosis for 20% of the physician visits in 1995/96, and 18% in 2000/01, for the "Rural South & Brandon" areas.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Does a lower/higher physician visit rate make sense because of the health status of the population in an area, or does it reflect "under/over-servicing"?*
- *Are there groups of people within the region with high need (poor health status), and do they have good access to physician services? Are there "contradictory findings" that could be explained by local factors?*
- *Why do some regions use GP/FPs more extensively, whereas others use specialists? Is this explained by disease patterns, or proximity to major centers, or other regional factors?*
- *Are there patterns of usage of "within RHA" or "outside RHA" ambulatory visits (for both GP/FPs and for specialists) which could or should be altered?*

8.2   Use of Physicians

Definition: This is the percentage of area residents who had at least one ambulatory visit to a physician during the fiscal year. This includes visits for any reason, to any type of physician (including GP/FPs and specialists). This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 8.2.1: Use of Physicians by RHA

Age- & sex-adjusted per cent of residents with at least one ambulatory visit per year

Legend:
- 1995/96
- 2000/01
- Mb Avg 1995/96
- Mb Avg 2000/01

Categories:
South Eastman (1,2,t)
South Westman (1,2)
Brandon (1,2,t)
Central (1,2,t)
Marquette (2,t)
Parkland (1,t)
Interlake (1,2,t)
North Eastman (1,2,t)
Burntwood (1,2,t)
Churchill (2)
Nor-Man (1,2,t)

Rural South (1,2,t)
North (1,2,t)
Winnipeg (1,2,t)
Manitoba (t)

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

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 8.2.2: Use of Physicians by District

Age- & sex-adjusted per cent of residents with at least one ambulatory visit per year

Legend:
- 1995/96
- 2000/01
- Mb Avg 1995/96
- Mb Avg 2000/01

Districts (top to bottom):
- SE Northern (1)
- SE Central (1,2)
- SE Western (2,t)
- SE Southern (1,2,t)
- SW District # 3 (t)
- SW District # 1 (1,2,t)
- SW District # 2 (1,2,t)
- Bdn West (1,2,t)
- Bdn Rural (1)
- Bdn East (1,2,t)
- MacDonald/Cartier (1,2,t)
- Morden/Winkler (1,2,t)
- Altona (1,2,t)
- Carman (1,2,t)
- Morris/Montcalm (2,t)
- Lorne/Louise/Pem (t)
- Seven Regions (1,2,t)
- Portage (1)
- MQ District # 4 (2,t)
- MQ District # 3 (2,t)
- MQ District # 2 (t)
- MQ District # 1 (t)
- PL West (1,2,t)
- PL Central (1,2)
- PL East (2)
- PL North (1,2,t)
- IL Southwest (1,2,t)
- IL Southeast (1,2,t)
- IL Northeast (2,t)
- IL Northwest (1,t)
- Springfield (1,2,t)
- Winnipeg River (t)
- Brokenhead (t)
- Iron Rose (1,2,t)
- Blue Water (2,t)
- Northern Remote (1,2,t)
- Thompson (t)
- Oxford H & Gods (1,2)
- Cross Lake (1,2)
- Lynn/Leaf/SIL (1)
- Island Lake (1,2,t)
- Tad/Broch/Lac Br (1,2)
- Gillam/Fox Lake (2)
- Thick Por/Pik/Wab (1,2,t)
- Norway House
- Sha/York/Split/War (1,2,t)
- Nelson House (1,2)
- Churchill (2)
- F Flon/Snow L/Cran (2)
- The Pas/OCN/Kelsey (t)
- Nor-Man Other (1,2)

X-axis: 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

8.3   Ambulatory Visits

Definition: This is the average number of ambulatory visits to all physicians (including GP/FPs and specialists) per area resident in a fiscal year. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 8.3.1: Ambulatory Visit Rates by RHA

Age- & sex-adjusted rate of visits to all physicians (annual average per resident)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
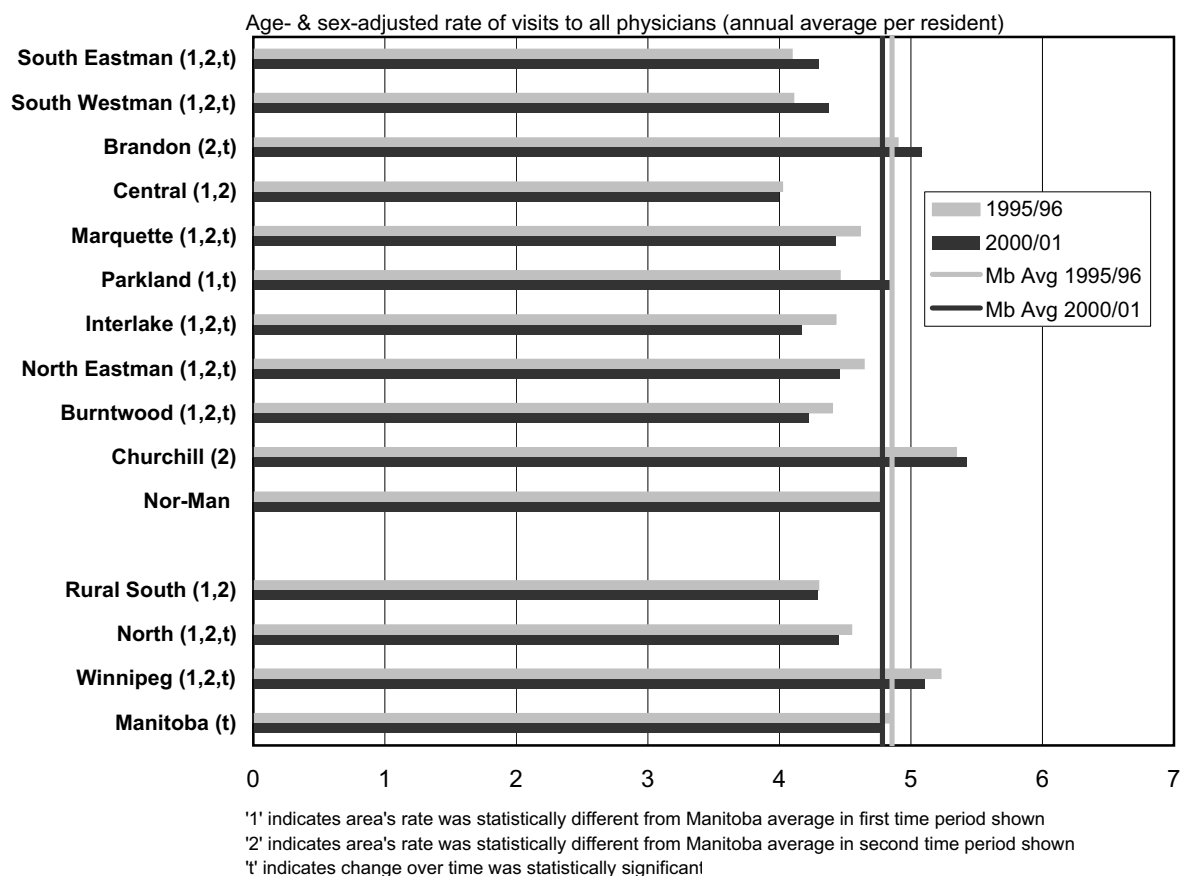
Figure 8.3.2: Ambulatory Visit Rates by District

Age- & sex-adjusted rate of visits to all physicians (annual average per resident)
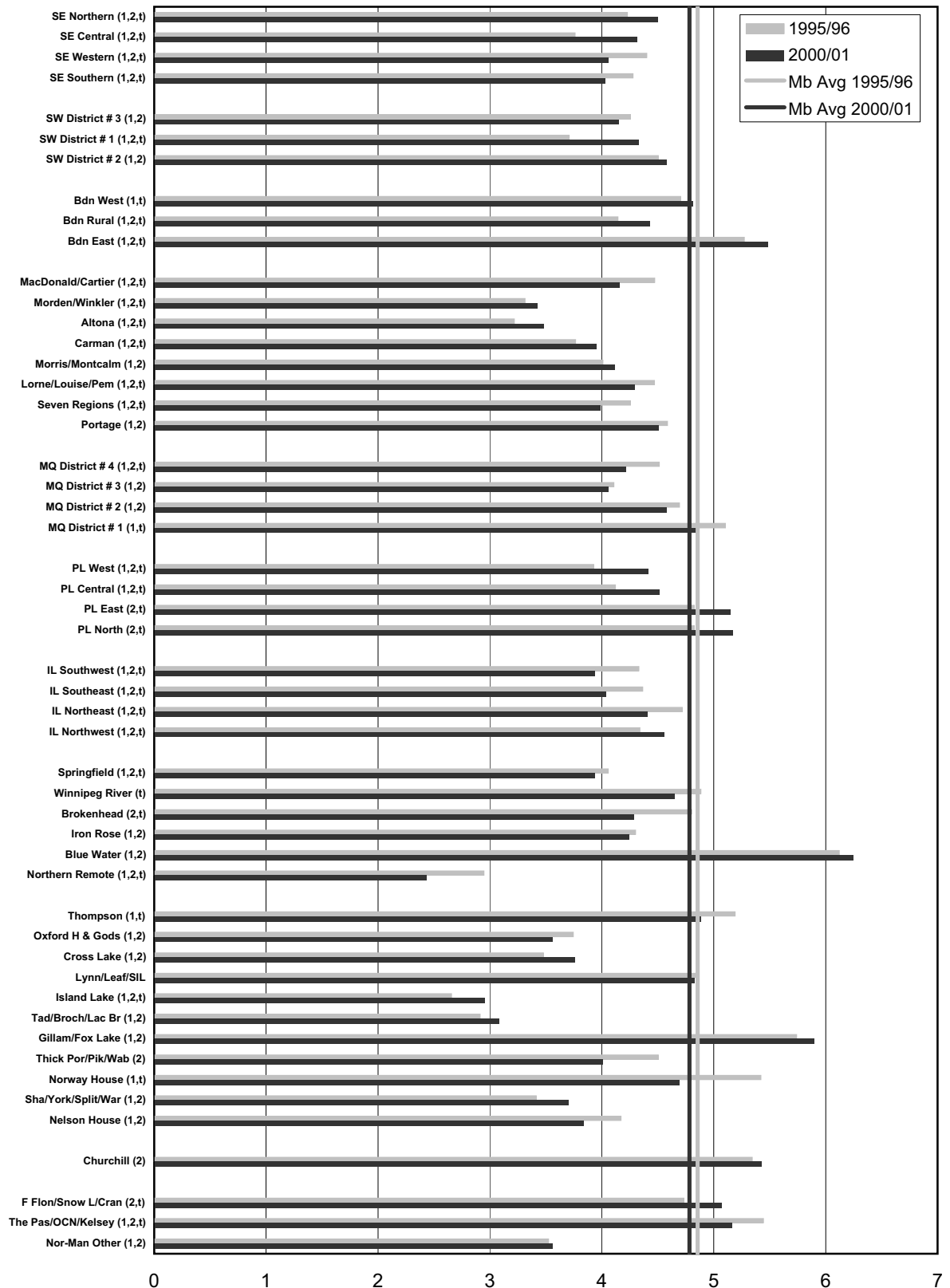
8.4   Ambulatory Consultations

Definition: This is the average number of ambulatory consults to physicians per resident of the area, in the fiscal year. This is age- and sex-adjusted to reflect the population of Manitoba. Consultations occur when one physician refers a patient to another physician - usually a specialist. A consultation is only the first visit to a specialist, and is considered the best overall measure of access to specialist care.

Figure 8.4.1: Ambulatory Consultation Rates by RHA
Age- & sex-adjusted rate of consultations to physicians (annual average per resident)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
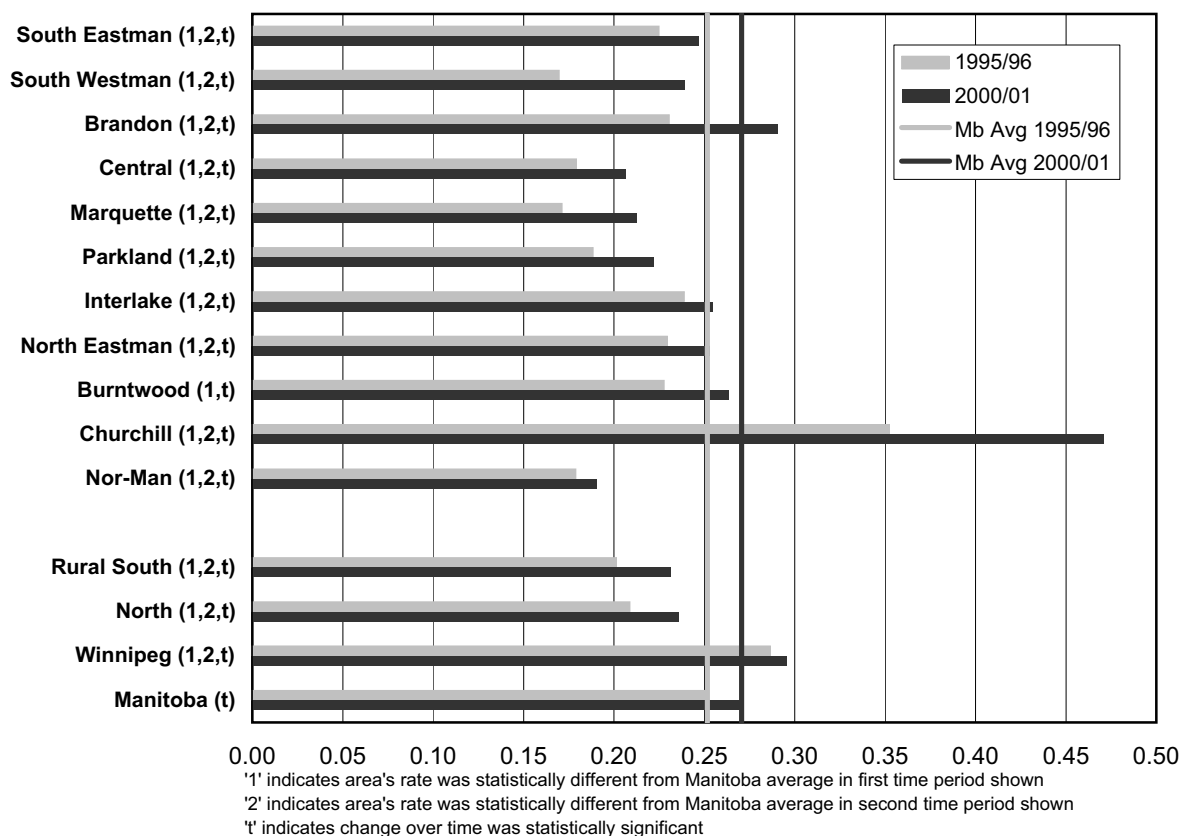
Figure 8.4.2: Ambulatory Consultation Rates by District

Age- & sex-adjusted rate of consultations to physicians (annual average per resident)

▨	1995/96
▰	2000/01
—	Mb Avg 1995/96
—	Mb Avg 2000/01

District labels (top to bottom):
SE Northern (1,2)
SE Central (1,2,t)
SE Western (t)
SE Southern (1,t)

SW District # 3 (1,2,t)
SW District # 1 (1,2,t)
SW District # 2 (1,t)

Bdn West (1,2,t)
Bdn Rural (1,t)
Bdn East (1,2,t)

MacDonald/Cartier
Morden/Winkler (1,2,t)
Altona (1,2,t)
Carman (1,2,t)
Morris/Montcalm (1,2,t)
Lorne/Louise/Pem (1,2,t)
Seven Regions (1,2,t)
Portage (1,2,t)

MQ District # 4 (1,2,t)
MQ District # 3 (1,2,t)
MQ District # 2 (1,2,t)
MQ District # 1 (1,2,t)

PL West (1,2)
PL Central (1,t)
PL East (t)
PL North (1,2,t)

IL Southwest (1,2,t)
IL Southeast (1)
IL Northeast (1,2,t)
IL Northwest (1,t)

Springfield (1,t)
Winnipeg River (1,2)
Brokenhead (1,2)
Iron Rose (1,2,t)
Blue Water (2,t)
Northern Remote (1,2,t)

Thompson (1,t)
Oxford H & Gods (1,t)
Cross Lake (2)
Lynn/Leaf/SIL
Island Lake
Tad/Broch/Lac Br
Gillam/Fox Lake (1,2)
Thick Por/Pik/Wab (1)
Norway House (2,t)
Sha/York/Split/War (1)
Nelson House (1,2)

Churchill (1,2,t)

F Flon/Snow L/Cran (1,2,t)
The Pas/OCN/Kelsey (1,2)
Nor-Man Other (2)

x-axis: 0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50

8.5　Visits to General and Family Practitioners (GP/FPs)

Definition: This is the percentage of all ambulatory visits that were to General and Family Practitioners, as opposed to specialists or surgeons. This includes all visits to GP/FPs. In the out-of-province category, all visits to any type of physician are included under GP/FP visits, due to the inability of the billing claims data to distinguish out-of-province physician visits as either GP/FP or specialist.

Figure 8.5.1: Visits to GP/FPs by RHA

Per cent of total ambulatory visits provided by general practitioners
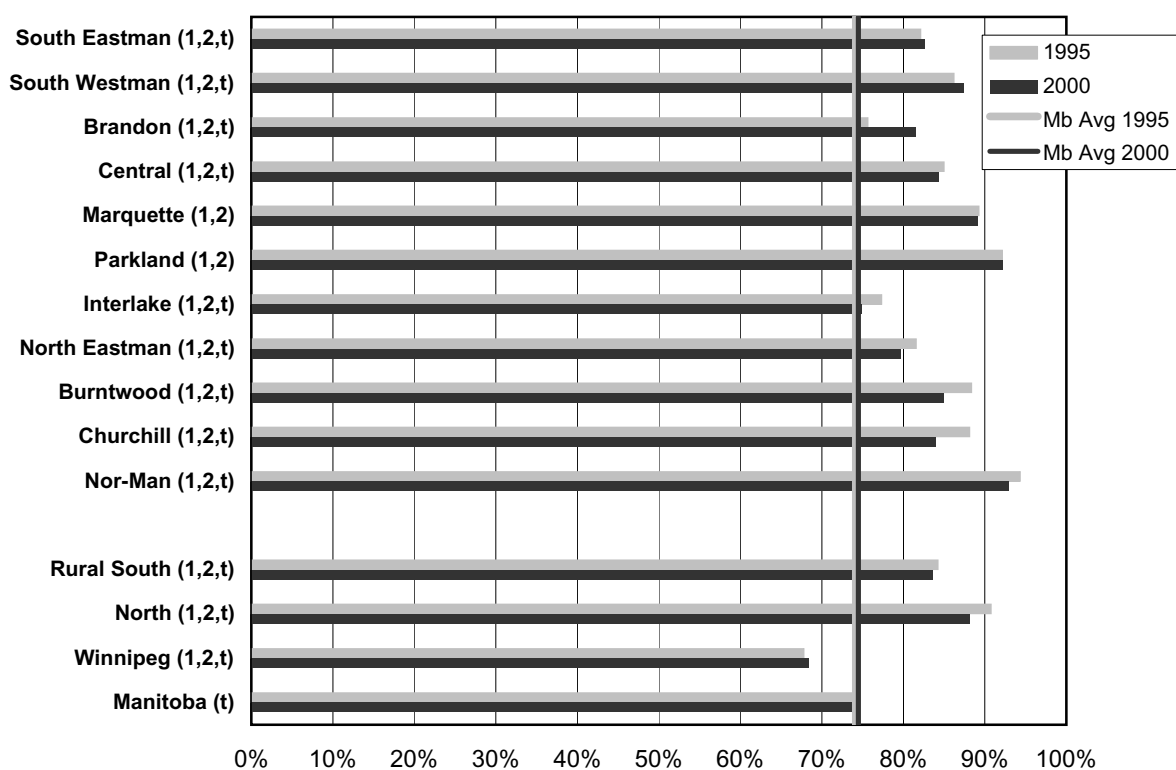
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 8.5.2: Visits to GP/FPs by District

Per cent of total ambulatory visits provided by general practitioners

	1995
	2000
	Mb Avg 1995
	Mb Avg 2000

SE Northern (1,2,t)
SE Central (1,2)
SE Western (1,2,t)
SE Southern (1,2,t)

SW District # 3 (1,2,t)
SW District # 1 (1,2,t)
SW District # 2 (1,2,t)

Bdn West (2,t)
Bdn Rural (1,2,t)
Bdn East (1,2,t)

MacDonald/Cartier (1,2,t)
Morden/Winkler (1,2,t)
Altona (1,2,t)
Carman (1,2,t)
Morris/Montcalm (1,2,t)
Lorne/Louise/Pem (1,2,t)
Seven Regions (1,2,t)
Portage (1,2)

MQ District # 4 (1,2,t)
MQ District # 3 (1,2,t)
MQ District # 2 (1,2,t)
MQ District # 1(1,2,t)

PL West (1,2,t)
PL Central (1,2)
PL East (1,2,t)
PL North (1,2)

IL Southwest (1,t)
IL Southeast (1,2,t)
IL Northeast (1,2,t)
IL Northwest (1,2,t)

Springfield (1,2,t)
Winnipeg River (1,2,t)
Brokenhead (1,2,t)
Iron Rose (1,2,t)
Blue Water (1,2,t)
Northern Remote (1,2,t)

Thompson (1,2,t)
Oxford H & Gods (1,2,t)
Cross Lake (1,2)
Lynn/Leaf/SIL (1,2)
Island Lake (1,2,t)
Tad/Broch/Lac Br (1,2)
Gillam/Fox Lake (1,2,t)
Thick Por/Pik/Wab (1,2,t)
Norway House (1,2,t)
Sha/York/Split/War (1,2)
Nelson House (1,2,t)

Churchill (1,2,t)

F Flon/Snow L/Cran (1,2,t)
The Pas/OCN/Kelsey (1,2,t)
Nor-Man Other (1,2,t)

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

8.6   Visit Rates by Age and Gender

Definition: These graphs show the general patterns of physician visit use
(all physician visits, including GP/FP and specialist visits) across the lifespan
for males and females. The data represent the average annual visit rate for
each age group, by gender, for the years 1995/96 and 2000/01. Graphs are
shown separately for Manitoba, Winnipeg, the North (that is, Burntwood,
Churchill and Nor-Man RHAs aggregated), and Rural South/Brandon (that
is, all other RHAs aggregated).

**Figure 8.6.1: Visit Rates by Age and Sex,
Rural South & Brandon**

Average annual number of visits to all physicians, per resident
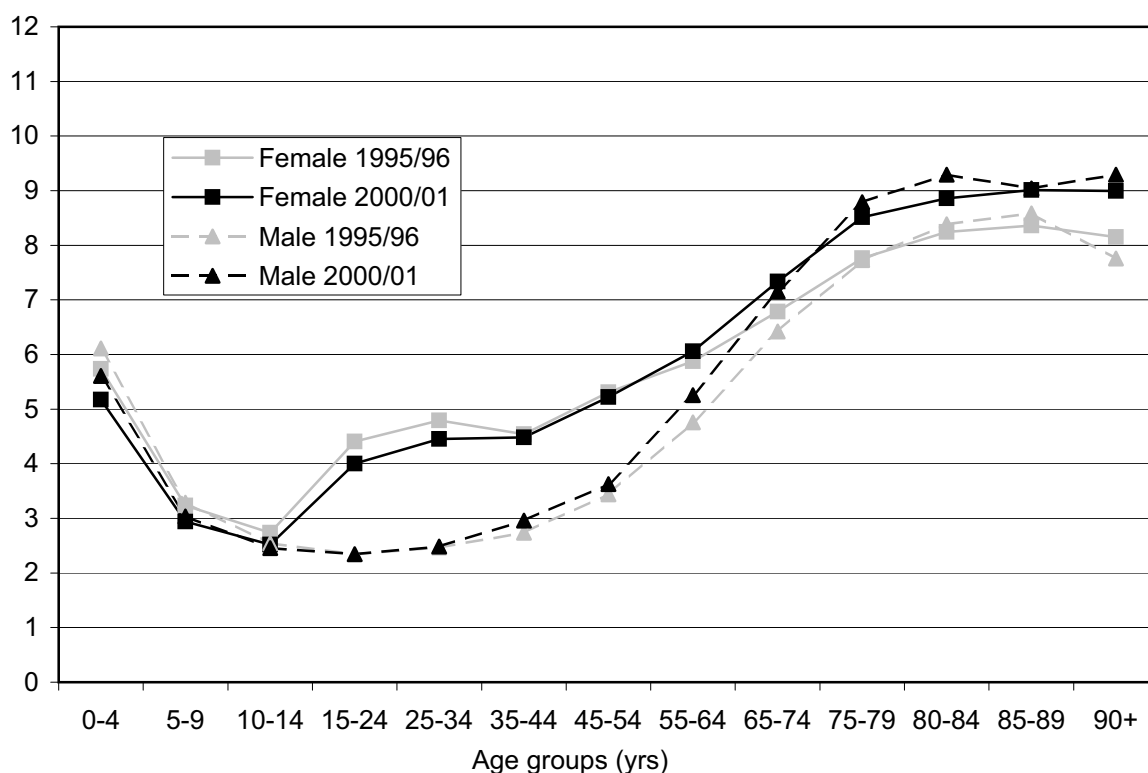
Figure 8.6.2: Visit Rates by Age and Sex, North

Average annual number of visits to all physicians, per resident
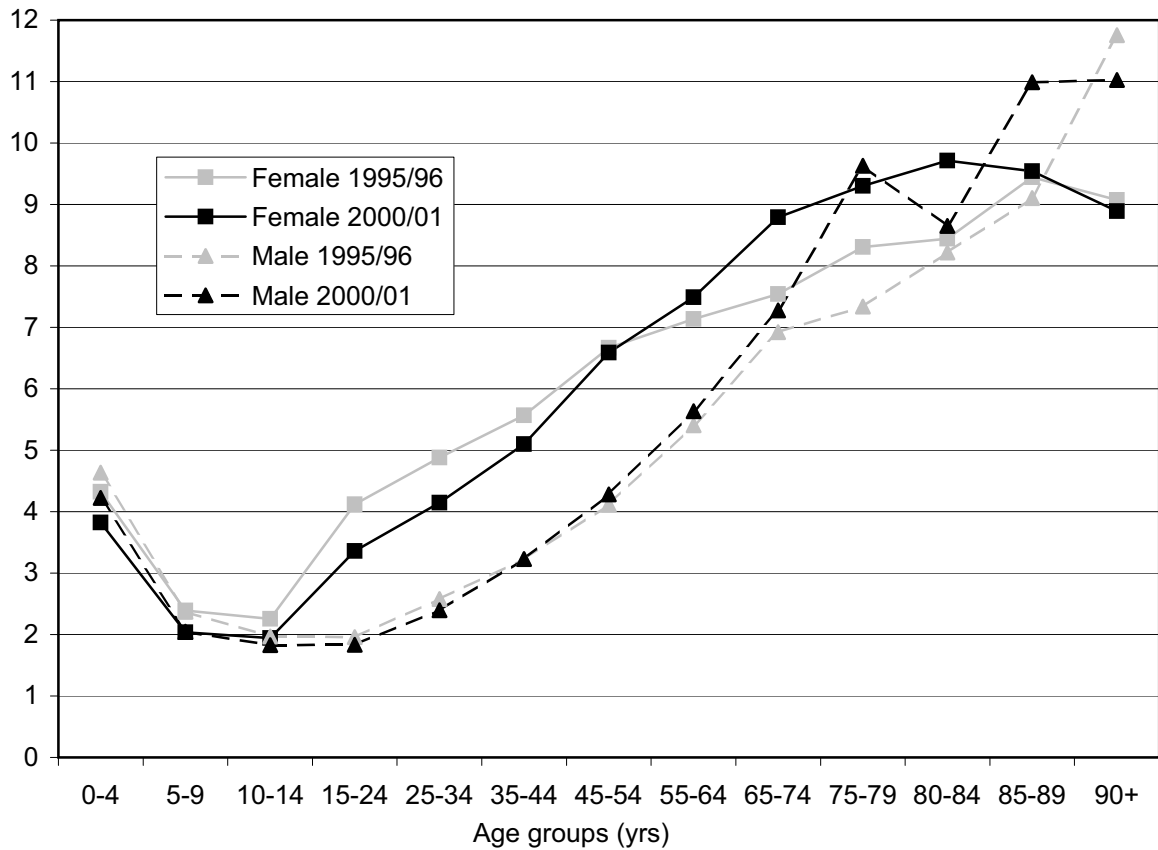
Figure 8.6.3: Visit Rates by Age and Sex, Winnipeg

Average annual number of visits to all physicians, per resident
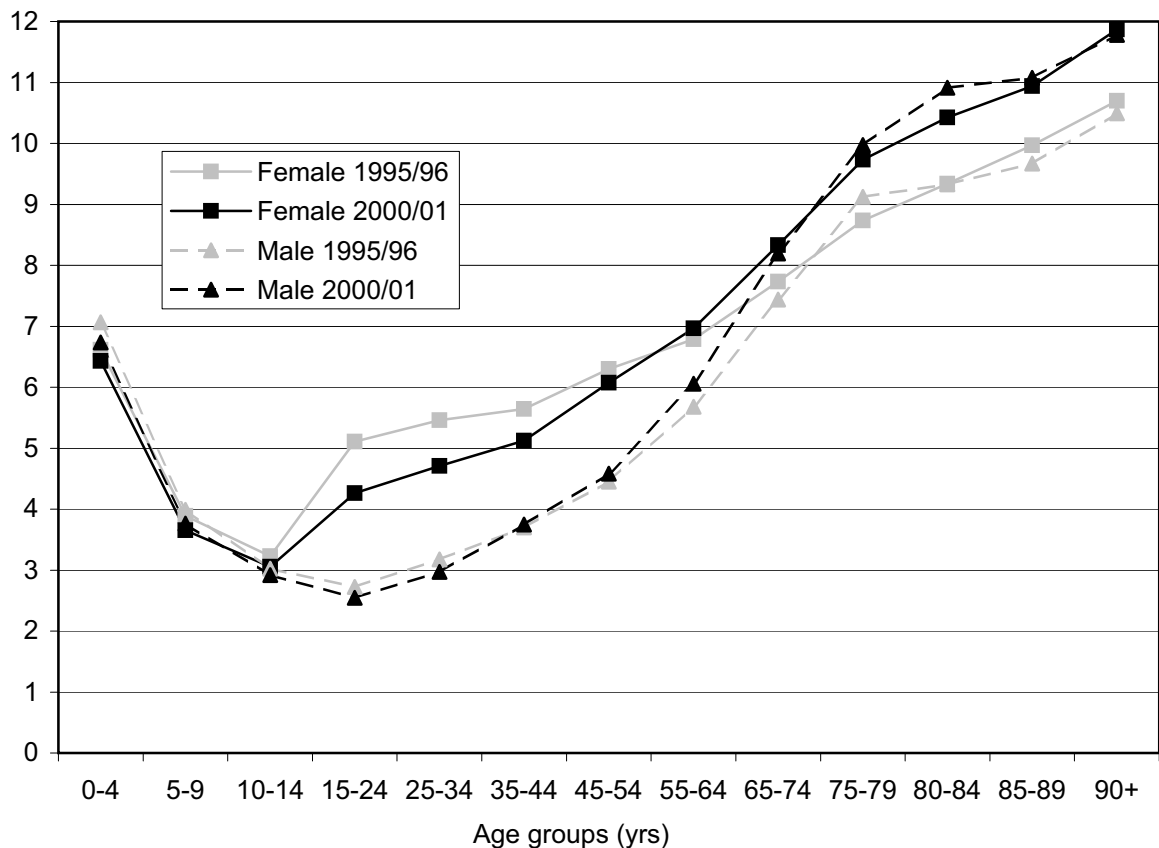
Figure 8.6.4: Visit Rates by Age and Sex, Manitoba

Average annual number of visits to all physicians, per resident
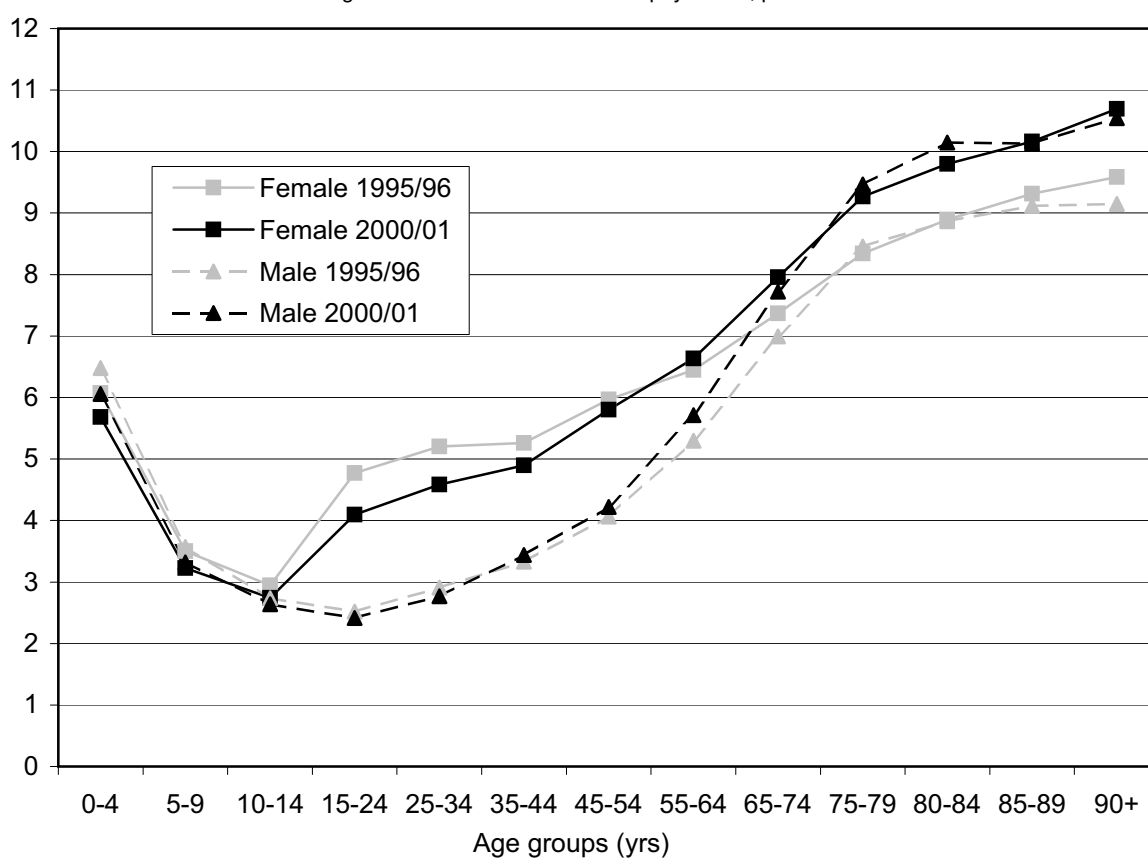
8.7   Location of Visits to GP/FPs

Definition: The table below and 'stack-bar' graph opposite reveal where visits to General and Family Practitioners (GP/FPs) took place. They show what percentage of all visits by regional residents occurred within their district or RHA, or outside their RHA, or in Winnipeg. Only a small percentage of visits occur outside the province. Refer to Appendix 1, page 257, for information about out-of-province ambulatory visits. District-level results are provided in Appendix 3.

Table 8.7.1: Location of visits to GP/FPs, 1995/96 & 2000/01 (percentages)

RHA	% In District	% Elsewhere in RHA	% To Other RHA	% To Winnipeg
South Eastman 95	56.3%	14.0%	2.7%	27.0%
South Eastman 00	60.4%	15.5%	3.1%	21.0%
South Westman 95	78.4%	5.1%	14.5%	2.0%
South Westman 00	76.3%	5.2%	15.6%	3.0%
Brandon 95	46.6%	46.4%	5.1%	1.9%
Brandon 00	48.2%	44.9%	5.0%	1.9%
Central 95	66.8%	12.9%	5.1%	15.2%
Central 00	67.1%	12.4%	5.2%	15.3%
Marquette 95	80.4%	5.8%	12.0%	1.8%
Marquette 00	76.3%	6.1%	15.6%	2.0%
Parkland 95	81.4%	12.3%	3.9%	2.5%
Parkland 00	81.7%	12.2%	3.7%	2.4%
Interlake 95	68.2%	4.3%	2.3%	25.2%
Interlake 00	61.7%	4.3%	2.8%	31.2%
North Eastman 95	59.8%	9.5%	5.5%	25.1%
North Eastman 00	55.5%	11.5%	6.7%	26.4%
Burntwood 95	75.9%	12.4%	4.8%	6.9%
Burntwood 00	70.5%	16.8%	5.0%	7.7%
Churchill 95	89.5%		6.3%	4.2%
Churchill 00	85.6%		8.6%	5.8%
Nor-Man 95	82.7%	10.3%	3.9%	3.1%
Nor-Man 00	82.0%	9.9%	4.7%	3.3%
Rural South 95	69.8%	9.4%	5.9%	14.8%
Rural South 00	68.2%	9.9%	6.7%	15.3%
North 95	79.0%	11.3%	4.4%	5.3%
North 00	75.7%	13.5%	4.9%	5.8%
Winnipeg 95	97.9%		2.1%	
Winnipeg 00	97.8%		2.2%	
Manitoba 95	85.1%	5.8%	3.7%	5.4%
Manitoba 00	84.2%	6.3%	4.0%	5.6%

Figure 8.7.1: Where RHA Residents Went for Visits to GP/FPs

■ % In District ⊟ % Elsewhere in RHA ☐ % To Other RHA ▨ % To Winnipeg
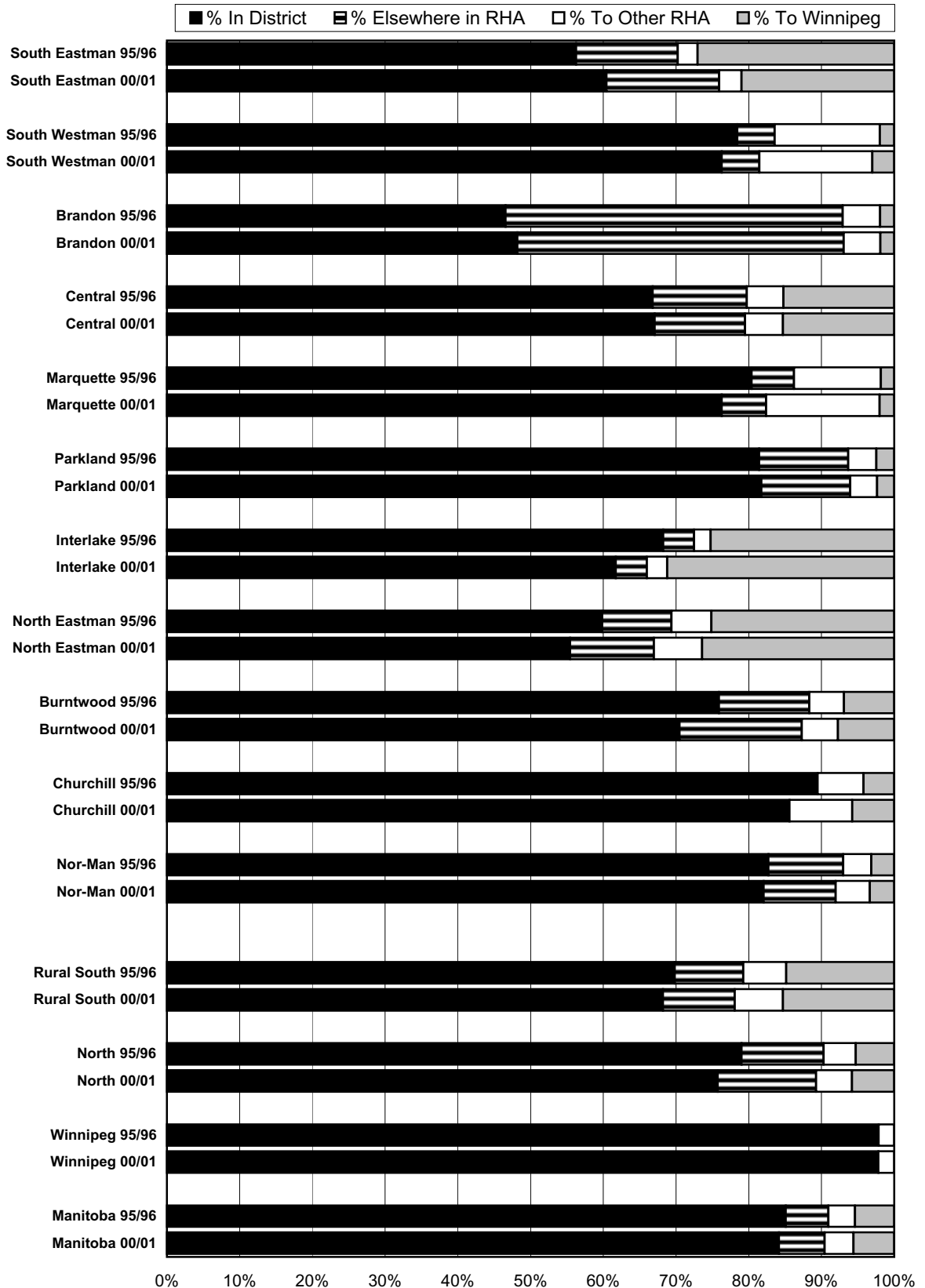
8.8   Location of Visits to Specialists

Definition: The table below and 'stack-bar' graph opposite reveal where vis-
its to specialist physicians took place. They show what percentage of all visits
by regional residents occurred within their district or RHA, outside their
RHA, or in Winnipeg, District-level results are provided in Appendix 3.

**Table 8.8.1: Location of visits to specialists, 1995/96 & 2000/01, by RHA
(percentages)**

RHA	% In District	% Elsewhere in RHA	% To Other RHA	% To Winnipeg
South Eastman 95	4.0%	2.7%	0.8%	92.5%
South Eastman 00	6.2%	4.6%	1.5%	87.8%
South Westman 95	10.5%	0.8%	63.9%	24.7%
South Westman 00	0.1%	0.1%	69.8%	30.0%
Brandon 95	45.0%	44.5%	0.9%	9.6%
Brandon 00	41.8%	43.2%	1.3%	13.7%
Central 95	13.7%	4.4%	2.7%	79.2%
Central 00	12.3%	4.1%	3.0%	80.6%
Marquette 95	0.2%	0.4%	68.8%	30.7%
Marquette 00	0.3%	1.2%	64.4%	34.1%
Parkland 95	14.4%	11.1%	17.3%	57.2%
Parkland 00	16.4%	13.3%	15.0%	55.3%
Interlake 95	15.3%	1.2%	0.3%	83.2%
Interlake 00	13.6%	2.0%	0.6%	83.8%
North Eastman 95	0.7%	0.2%	6.4%	92.7%
North Eastman 00	0.5%	0.1%	6.7%	92.6%
Burntwood 95	3.9%	1.1%	1.8%	93.2%
Burntwood 00	11.2%	5.2%	1.4%	82.3%
Churchill 95	47.9%		1.0%	51.1%
Churchill 00	49.4%		1.1%	49.4%
Nor-Man 95	1.9%	0.0%	3.2%	94.9%
Nor-Man 00	4.4%	1.6%	3.7%	90.2%
Rural South 95	9.9%	2.5%	13.3%	74.2%
Rural South 00	8.8%	3.1%	12.6%	75.6%
North 95	4.5%	0.8%	2.1%	92.6%
North 00	10.6%	4.2%	1.9%	83.3%
Winnipeg 95	99.8%		0.2%	
Winnipeg 00	99.7%		0.3%	
Manitoba 95	79.7%	2.2%	2.7%	15.4%
Manitoba 00	78.5%	2.1%	2.7%	16.7%

Figure 8.8.1: Where Residents Went for Visits to Specialists

Legend: ■ % In District   ⊟ % Elsewhere in RHA   □ % To Other RHA   ▨ % To Winnipeg
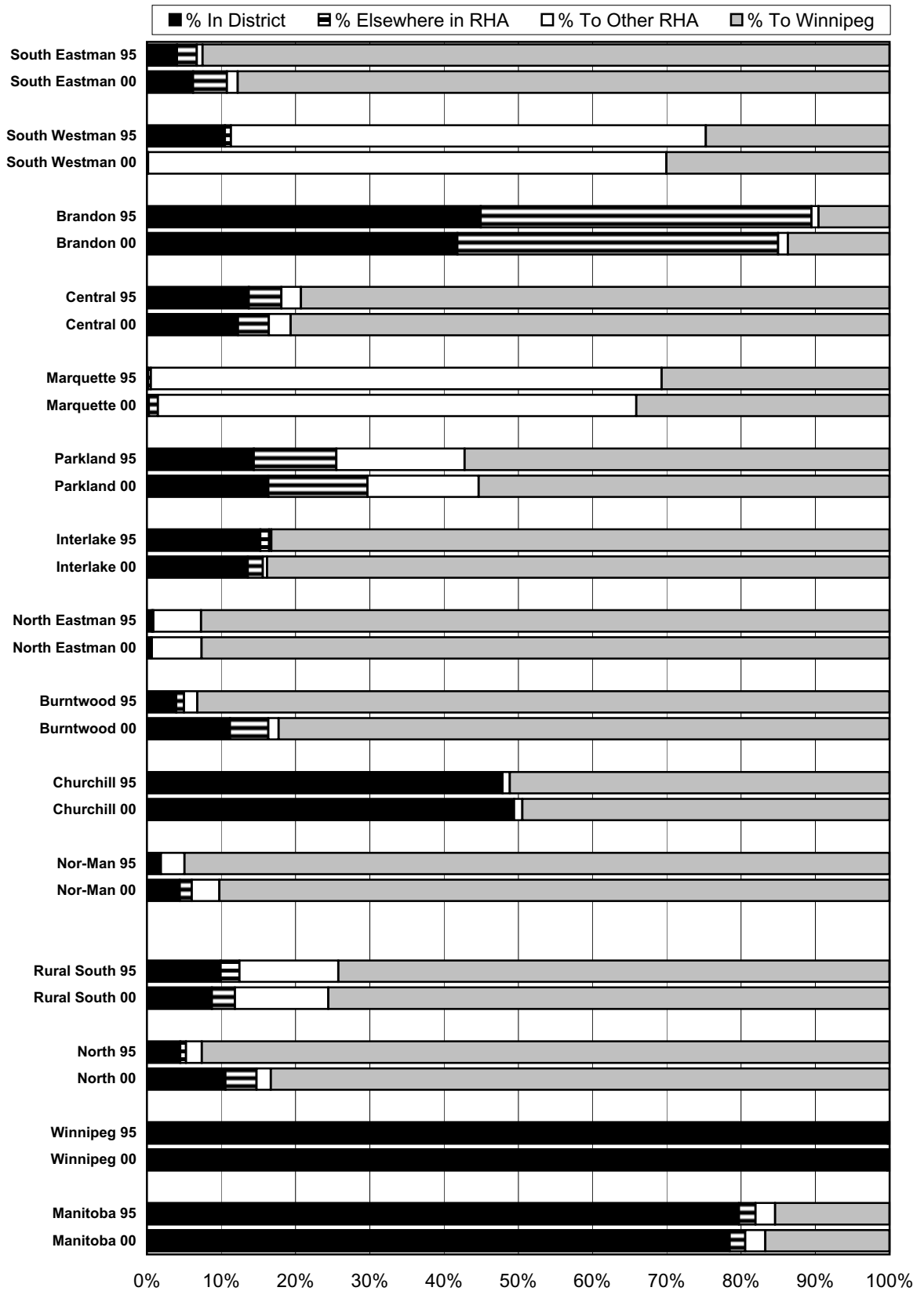
8.9   'Causes' of Physician Visits

Definition: The following pie graphs illustrate what proportion of all physician visits (including both GP/FP and specialist visits) were coded for which diseases, showing the top nine categories for the province and for the aggregate areas of the Manitoba, Winnipeg, the North (Burntwood, Churchill and Nor-Man aggregated), and the Rural South/Brandon (all other RHAs aggregated).

Figure 8.9.1a: Top Diagnoses on Physician Visits, Rural South and Brandon, 1995/96
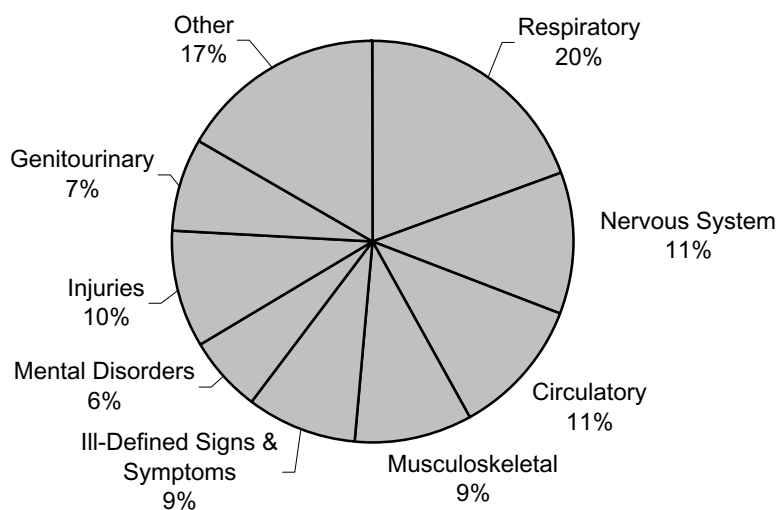
Figure 8.9.1b: Top Diagnoses on Physician Visits, Rural South and Brandon, 2000/01
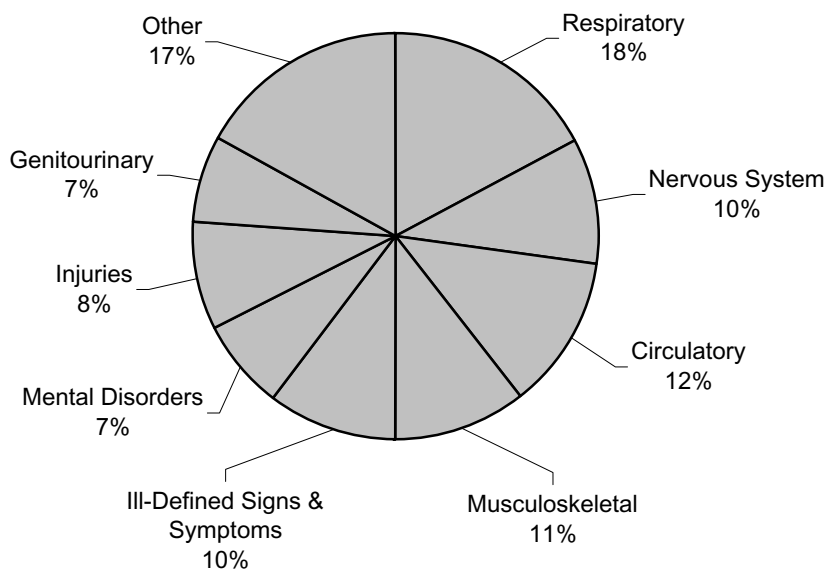
Figure 8.9.2a: Top Diagnoses on Physician Visits, North, 1995/96
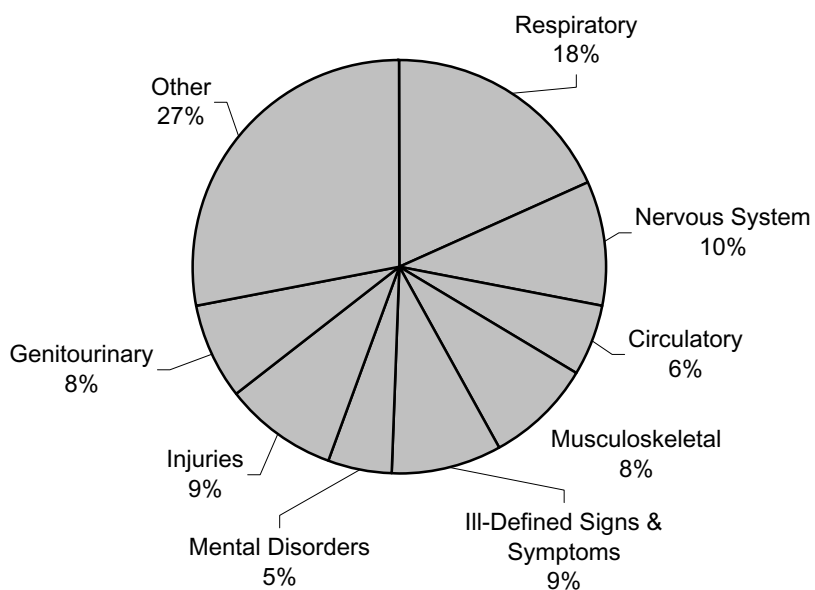
Figure 8.9.2b: Top Diagnoses on Physician Visits, North, 2000/01
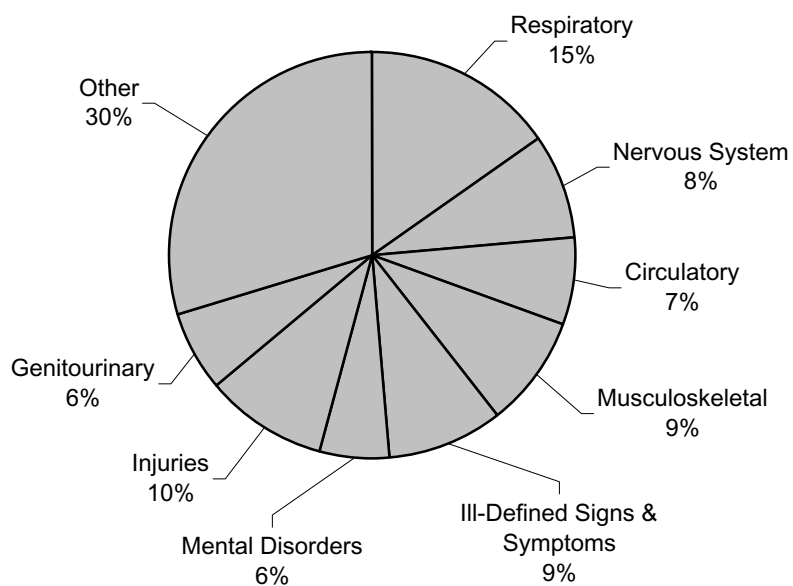
Figure 8.9.3a: Top Diagnoses on Physician Visits, Winnipeg, 1995/96
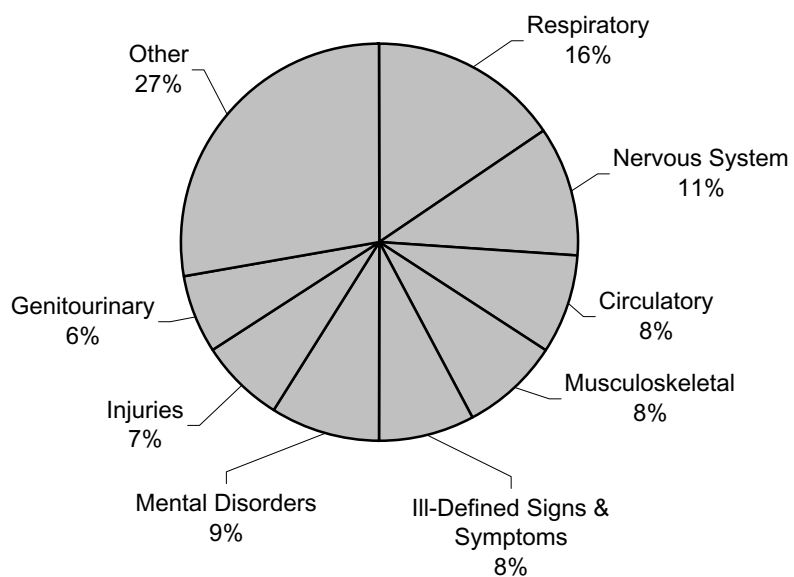
Figure 8.9.3b: Top Diagnoses on Physician Visits, Winnipeg, 2000/01
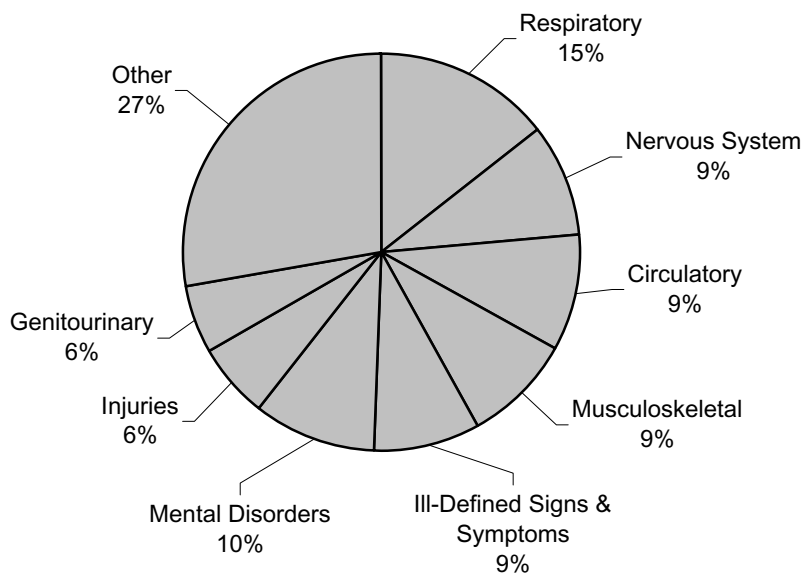
Figure 8.9.4a: Top Diagnoses on Physician Visits, Manitoba, 1995/96

Respiratory
16%

Other
29%

Nervous System
10%

Circulatory
8%

Genitourinary
6%

Musculoskeletal
8%

Injuries
8%

Mental Disorders
7%

Ill-Defined Signs &
Symptoms
8%
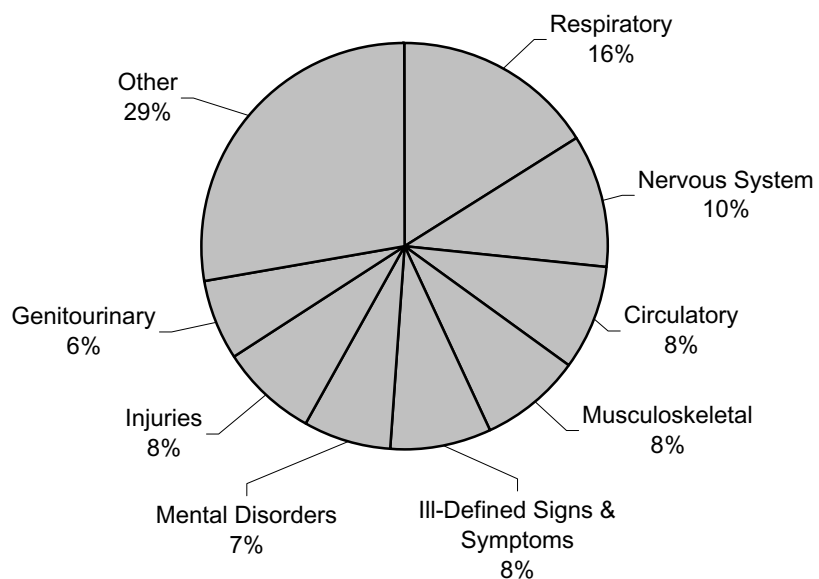
Figure 8.9.4b: Top Diagnoses on Physician Visits, Manitoba, 2000/01

Respiratory
15%

Other
27%

Nervous System
9%

Circulatory
10%

Genitourinary
6%

Musculoskeletal
9%

Injuries
7%

Mental Disorders
8%

Ill-Defined Signs &
Symptoms
9%
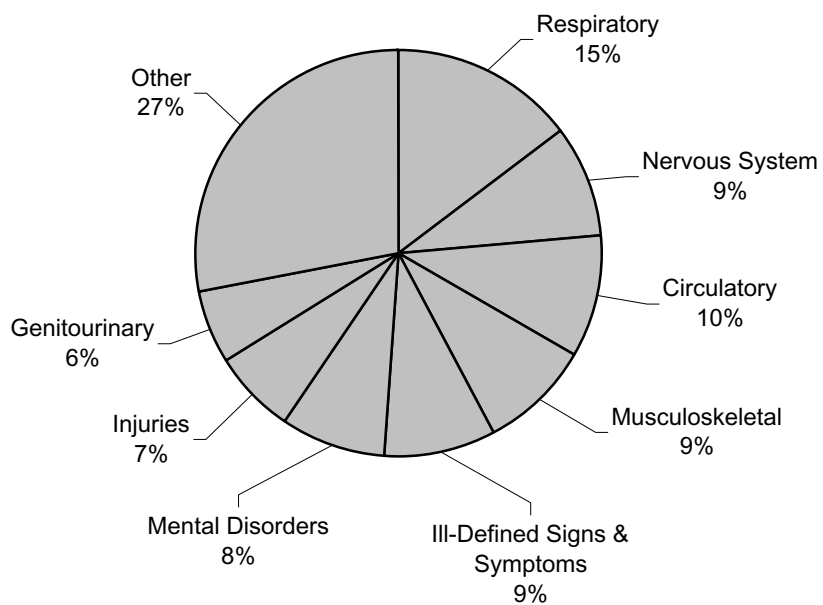
Chapter 9: Hospital Services

9.1 What's in This Chapter?
Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of hospital use, including:
- Supply of hospital beds (Section 9.2)
- Separation rates (Section 9.3)
- Days used for short stays (Section 9.4)
- Days used for long stays (Section 9.5)
- Hospitalization rates for injuries (Section 9.6)
- Locations: where did area residents go for hospitalization (Section 9.7)
- Catchments: whose residents did this RHA's hospitals serve? (Section 9.8)
- Causes of hospitalization (Section 9.9)

Chapter 9 provides information on hospitals, including the hospital bed supply, the "separation rates" (this term refers to the people discharged from hospitals), days of stay in hospital, and location of hospitalizations. Because of the interest of the rural and northern RHAs in injury rates, a rate of hospitalization due to injury has also been included. Once again, the rates have been age- and sex-adjusted, so that an area's adjusted rate would be the rate if that area had the same population distribution as the overall Manitoba population (see Chapter 2, Section 2.5, for a discussion of adjusted rates, and Chapter 3 for a discussion of population profiles). Crude rates and actual annual counts for each of the indicators are also given in Appendix 2. For Churchill, these data include use by those considered to be PCH patients (because the datafiles do not recognize a separate PCH in Churchill).

Example: Burntwood RHA

In Burntwood RHA, the hospital bed supply has been relatively consistent over time according to Manitoba Health's Bed Map (see Figure 9.2.1). This was very close to the Manitoba average in the 2000/2001 fiscal year, at around 3.8 beds per thousand residents. The residents of Burntwood are hospitalized at a much higher rate, however, than the provincial average, at 298 versus 169 "separations" per thousand during the most recent year of data. We refer to hospital "separation" rates, since the hospital record is filled out at discharge, or separation, from a hospital. Discharge occurs when a person is discharged to home or another institution, or the person dies. This in some ways reflects the much poorer overall health status of Burntwood residents, as indicated by a high premature mortality rate (see Chapter 4, Figure 4.2.1 as well

as the discussion in Section 4.1). Every district within Burntwood also has higher hospital separation rates than the Manitoba average (Figure 9.3.2). Although hospital separation rates for Burntwood RHA have not declined significantly over time, the hospital days for both short stays (less than 30 days) and long stays (30 or more days) have decreased over time, reflecting the Manitoba overall trend (see Figures 9.4.1 and 9.5.1).

As shown in Figure 9.6.1, Burntwood has one of the highest injury hospitalization rates in the province, a rate that has consistently been maintained over the earlier and later time period (31.6/1000, 31.5/1000). This is in contrast to the overall Manitoba trend of decreasing injury hospitalization rates (11.2/1000 in the first half of the 1990s, 9.9 in the second half). Some of Burntwood's district rates are four times or greater than the provincial rate (see Figure 9.6.2) - Oxford House and Gods Lake, Cross Lake, Tadoule Lake/Brochet/Lac Brochet, Shamattawa/York Factory/Split Lake/War Lake, and Nelson House.

The actual average number of hospitalizations per year in the 1999/00 to 2000/01 time period was 10,214 per year for Burntwood residents (see Appendix 2), with 26,022 short stay days (less than 30 days) and 6,680 long stay days (30 days or more). The number of events is useful in figuring out the "real world" of persons in hospital beds, whereas the adjusted rate gives a fairer comparison between groups of people with very different patterns of age distribution.

Burntwood RHA showed little change over time as to where its residents were hospitalized (see Figure 9.7.1 and the corresponding table). Half its residents' days in hospital occurred within an RHA hospital, and almost half (47%) of the days in a Winnipeg hospital. Of all the hospitalized people in Burntwood hospitals in 2000/01, 90% came from Burntwood RHA (see Figure 9.8.1 and the corresponding table). This pattern has changed very little over time, and is higher than the corresponding percentages in the two other northern RHAs of Churchill (65%) and Nor-Man (83%).

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Do hospital use levels make sense given the health status of residents of the region and the districts within the region?*
- *Does a higher "separation rate," that is, more frequent use of hospitals, reflect poorer health of local residents, a higher than average number of hospital beds, or something else related to the use of hospitals?*
- *Do residents of the high-use regions or districts have poorer access to other facilities, such as personal care (nursing) homes? If so, what policy and planning strategies in certain regions have enabled efficient use of hospital beds?*
- *Is the location of hospitalization a problem for some areas of the province, when people are hospitalized far away from home?*
- *From which areas are the people coming who are hospitalized in the region's hospitals?*

9.2 Supply of Hospital Beds

Definition: This is the number of hospital beds per thousand residents of the RHA. Information on number of beds was taken from the 'Setup Beds' category in the Manitoba Health Bed Map, and reported as an average over the two fiscal years for each time period.

Figure 9.2.1: Hospital Bed Supply by RHA

Number of hospital beds (acute + other) per 1000 residents (source: Manitoba Health bed map)

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 1994/95-95/96
- Mb Avg 1999/00-00/01

Churchill: 27.8 beds per 1000 residents in both time periods
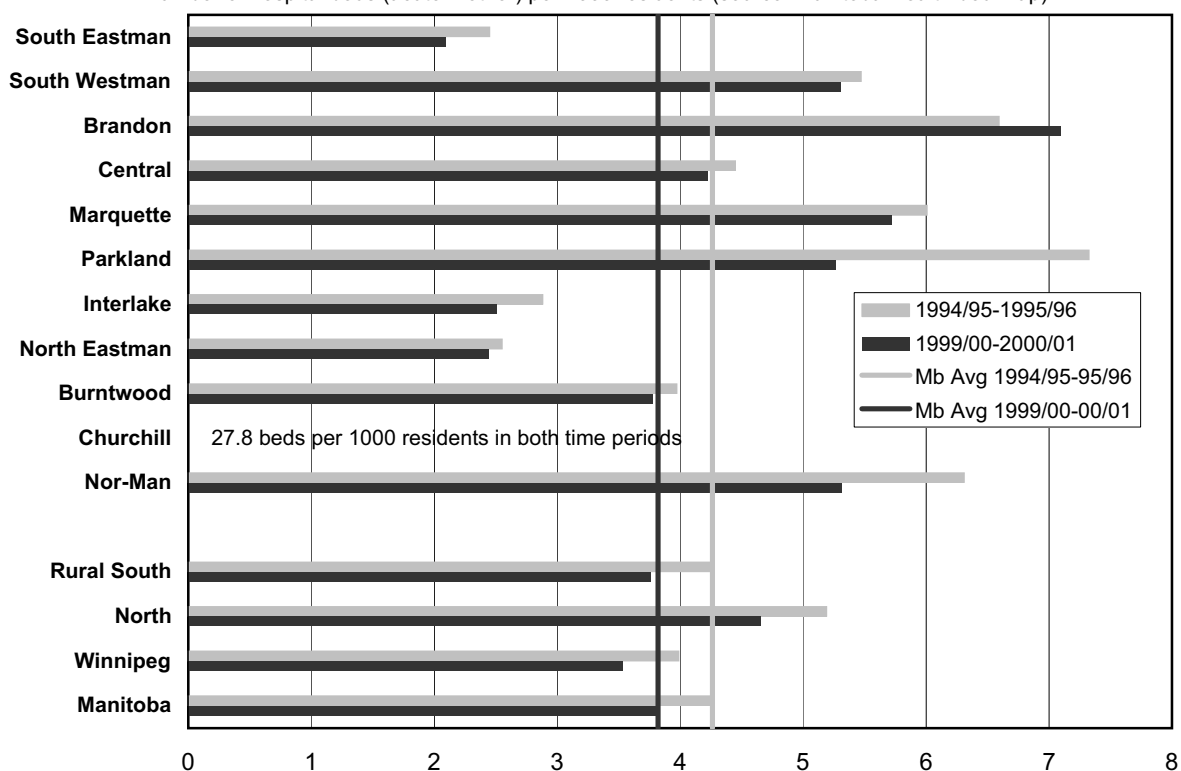
9.3   Separation Rates

Definition: This is the number of hospitalizations per thousand residents of the area, counting both inpatient and outpatient hospitalizations, regardless of the location of the hospital. Multiple admissions for a single person are counted as separate events. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 9.3.1: Hospital Separation Rates by RHA
Age- & sex-adjusted rate of hospital separations per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
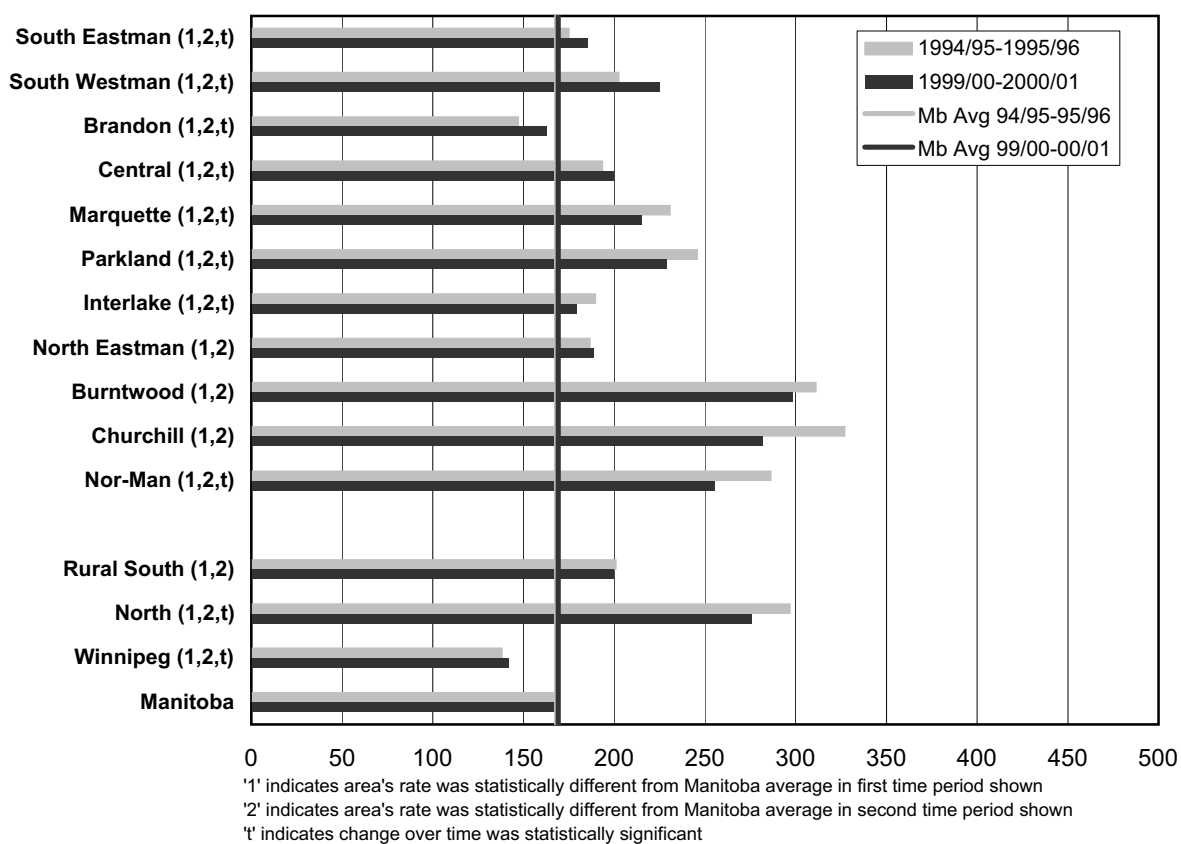
Figure 9.3.2: Hospital Separation Rates by District

Age- & sex-adjusted rate of hospital separations per 1000 residents

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern
SE Central (1,2)
SE Western (t)
SE Southern (2,t)

SW District # 3 (1,2)
SW District # 1 (1,2,t)
SW District # 2 (1,2,t)

Bdn West (1,2,t)
Bdn Rural (1)
Bdn East (t)

MacDonald/Cartier (1,2)
Morden/Winkler (2,t)
Altona
Carman (1,2,t)
Morris/Montcalm (1,2)
Lorne/Louise/Pem (1,2)
Seven Regions (1,2)
Portage (1,2)

MQ District # 4 (1,2)
MQ District # 3 (1)
MQ District # 2 (1,2)
MQ District # 1 (1,2,t)

PL West (1,2)
PL Central (1,2,t)
PL East (1,2)
PL North (1,2,t)

IL Southwest
IL Southeast (2,t)
IL Northeast (1,2,t)
IL Northwest (1,2,t)

Springfield (1,2)
Winnipeg River
Brokenhead (2)
Iron Rose (t)
Blue Water (1,2,t)
Northern Remote (1,2,t)

Thompson (1,2)
Oxford H & Gods (1,2)
Cross Lake (1,2)
Lynn/Leaf/SIL (1,2)
Island Lake (1,2)
Tad/Broch/Lac Br (1,2)
Gillam/Fox Lake (1,2)
Thick Por/Pik/Wab (1,t)
Norway House (1,2)
Sha/York/Split/War (1,2,t)
Nelson House (1,2,t)

Churchill (1,2)

F Flon/Snow L/Cran (1,2,t)
The Pas/OCN/Kelsey (1,2)
Nor-Man Other (1,2,t)

x-axis: 0, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500

9.4   Days Used for Short Stays

Definition: This is the number of days used per thousand residents for
short stays, regardless of hospital location. Short stays are defined as stays
less than 30 days. This is age- and sex-adjusted to reflect the population of
Manitoba.

Figure 9.4.1: Hospital Days Used in Short Stays by RHA
Age- & sex-adjusted rate (per 1000) of hospital days used in stays of less than 30 days

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
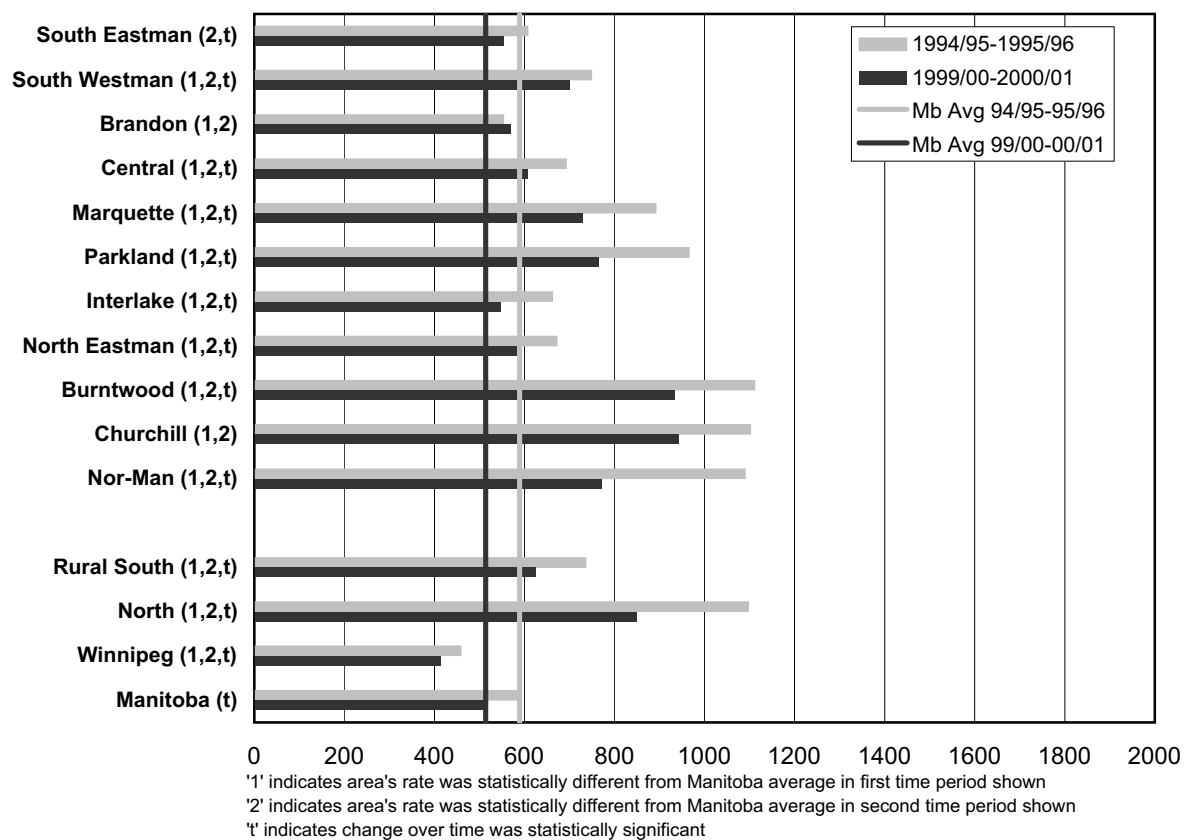
Figure 9.4.2: Hospital Days Used in Short Stays by District

Age- & sex-adjusted rate (per 1000) of hospital days used in stays of less than 30 days

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern
SE Central (t)
SE Western
SE Southern (1,2)

SW District # 3 (1,2)
SW District # 1 (1,2)
SW District # 2 (1,2)

Bdn West (1)
Bdn Rural
Bdn East (2)

MacDonald/Cartier (1,2)
Morden/Winkler (t)
Altona (t)
Carman (2)
Morris/Montcalm (1,2,t)
Lorne/Louise/Pem (1,2,t)
Seven Regions (1,2,t)
Portage (1,2,t)

MQ District # 4 (1,2,t)
MQ District # 3 (1,2,t)
MQ District # 2 (1,2,t)
MQ District # 1 (1,2,t)

PL West (1,2)
PL Central (1,2,t)
PL East (1,2)
PL North (1,2,t)

IL Southwest (t)
IL Southeast (t)
IL Northeast (1,2,t)
IL Northwest (1,2)

Springfield (1,2,t)
Winnipeg River
Brokenhead
Iron Rose
Blue Water (1,2)
Northern Remote (1,2,t)

Thompson (1,2)
Oxford H & Gods (1,2,t)
Cross Lake (1,2)
Lynn/Leaf/SIL (1,2)
Island Lake (1,2)
Tad/Broch/Lac Br (1,2,t)
Gillam/Fox Lake (1,2,t)
Thick Por/Pik/Wab (1,2)
Norway House (1,2)
Sha/York/Split/War (1,2,t)
Nelson House (1,2)

Churchill (1,2)

F Flon/Snow L/Cran (1,2,t)
The Pas/OCN/Kelsey (1,2,t)
Nor-Man Other (1,2,t)

X-axis: 0, 200, 400, 600, 800, 1000, 1200, 1400, 1600, 1800, 2000

9.5   Days Used for Long Stays

Definition: This is the number of days per thousand residents for long stays, regardless of hospital location. Long stays are defined as stays 30 days or longer. For Churchill, these data include long stay days used by those considered to be PCH patients (because the datafiles do not recognize a separate PCH in Churchill). This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 9.5.1: Hospital Days Used in Long Stays by RHA

Days used in hospital stays of 30 days or more, per 1000 residents
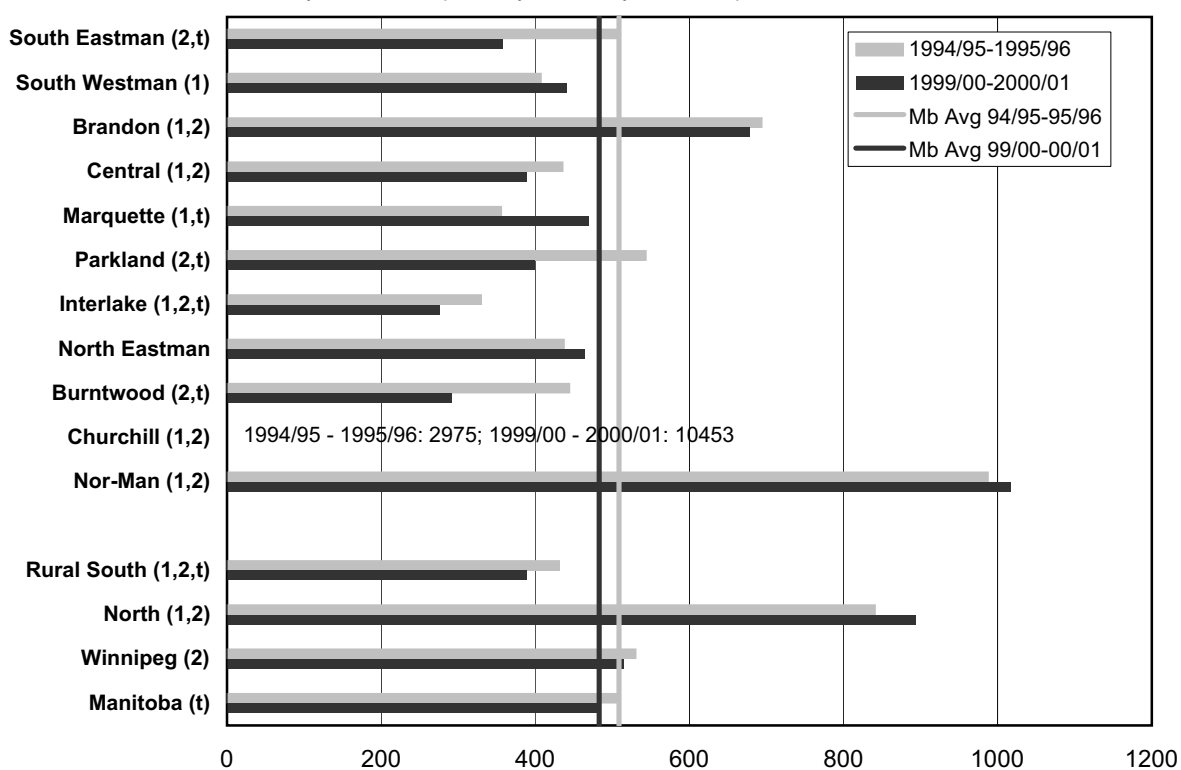
Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Churchill (1,2)   1994/95 - 1995/96: 2975; 1999/00 - 2000/01: 10453

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 9.5.2: Hospital Days Used in Long Stays by District

Days used in hospital stays of 30 days or more, per 1000 residents
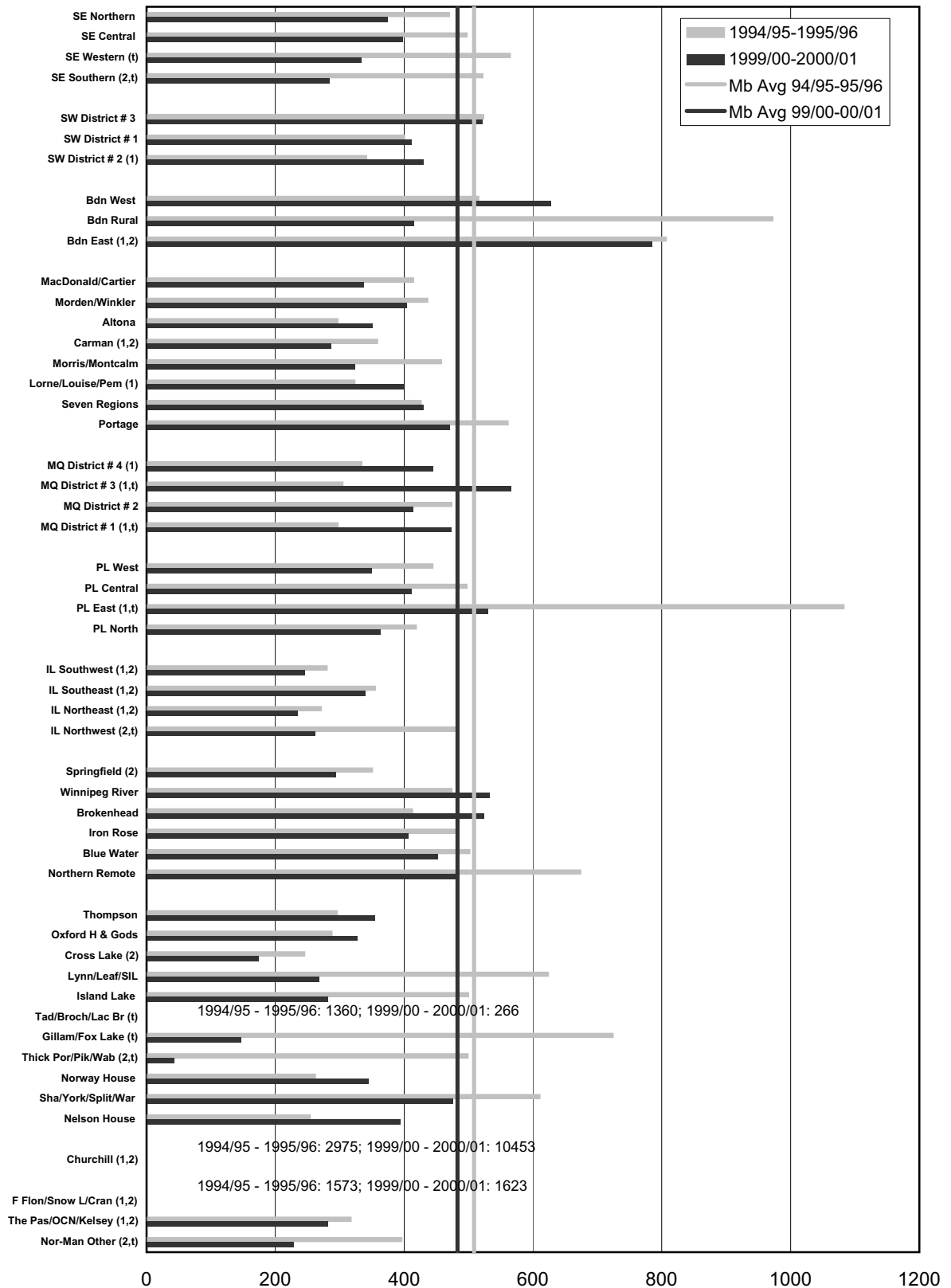
9.6 Hospitalization Rates for Injuries

Definition: This is the number of hospitalizations per thousand residents for which any 'injury' code is listed as the 'primary diagnosis' on the hospital discharge abstract. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 9.6.1: Injury Hospitalization Rates by RHA

Age- & sex-adjusted rate of hospitalizations for injury per 1000 residents

Legend:
- 1991/92-1995/96
- 1996/97-2000/01
- Mb Avg 91/92-95/96
- Mb Avg 96/97-00/01

Categories:
South Eastman (t)
South Westman (1,2,t)
Brandon (1,2)
Central (1,2,t)
Marquette (1,2,t)
Parkland (1,2,t)
Interlake (t)
North Eastman (1,2,t)
Burntwood (1,2)
Churchill (1,2)
Nor-Man (1,2,t)
Rural South (1,2,t)
North (1,2,t)
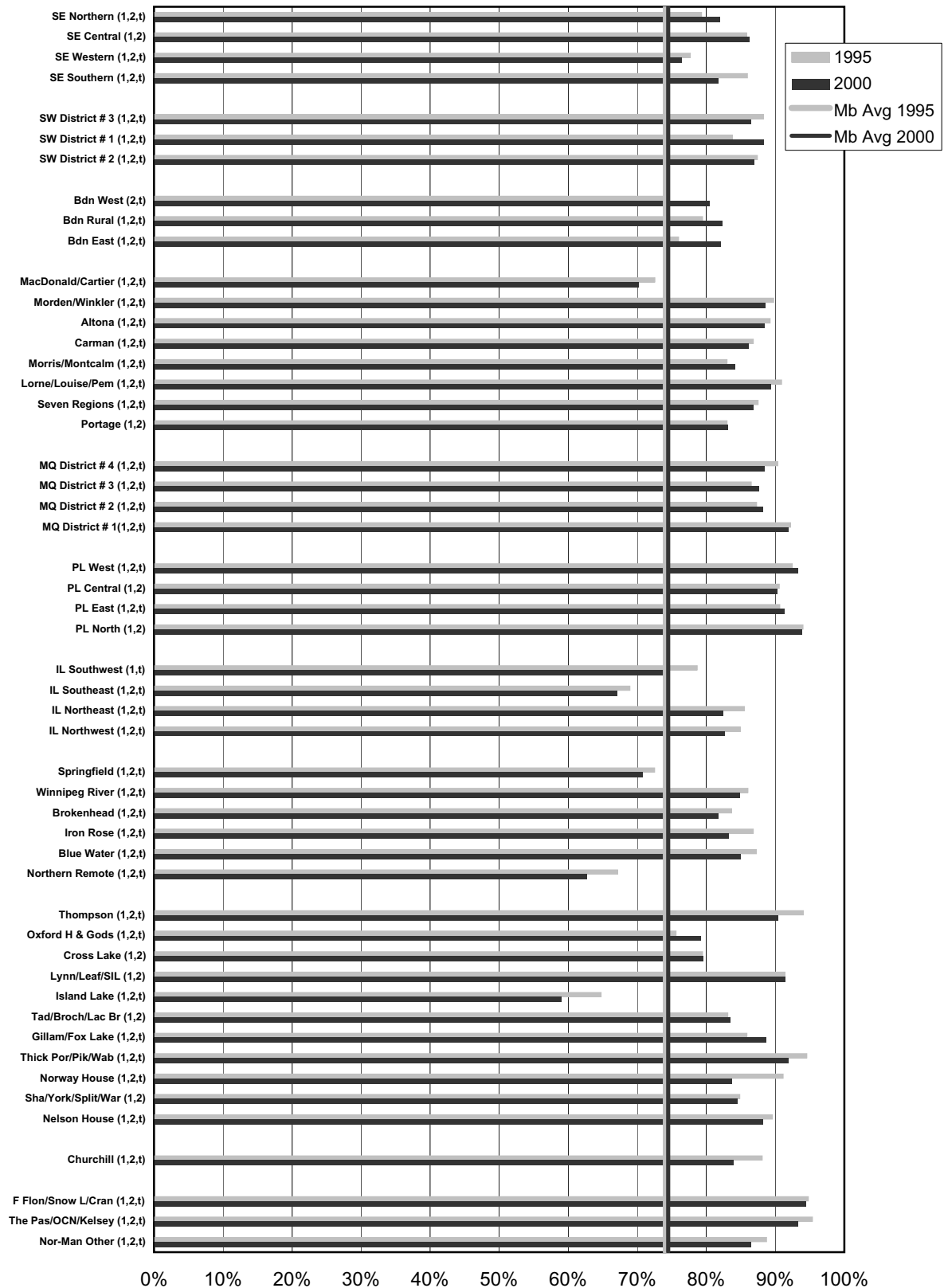Winnipeg (1,2,t)
Manitoba (t)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 9.6.2: Injury Hospitalization Rates by District

Age- & sex-adjusted rate of hospitalizations for injury per 1000 residents
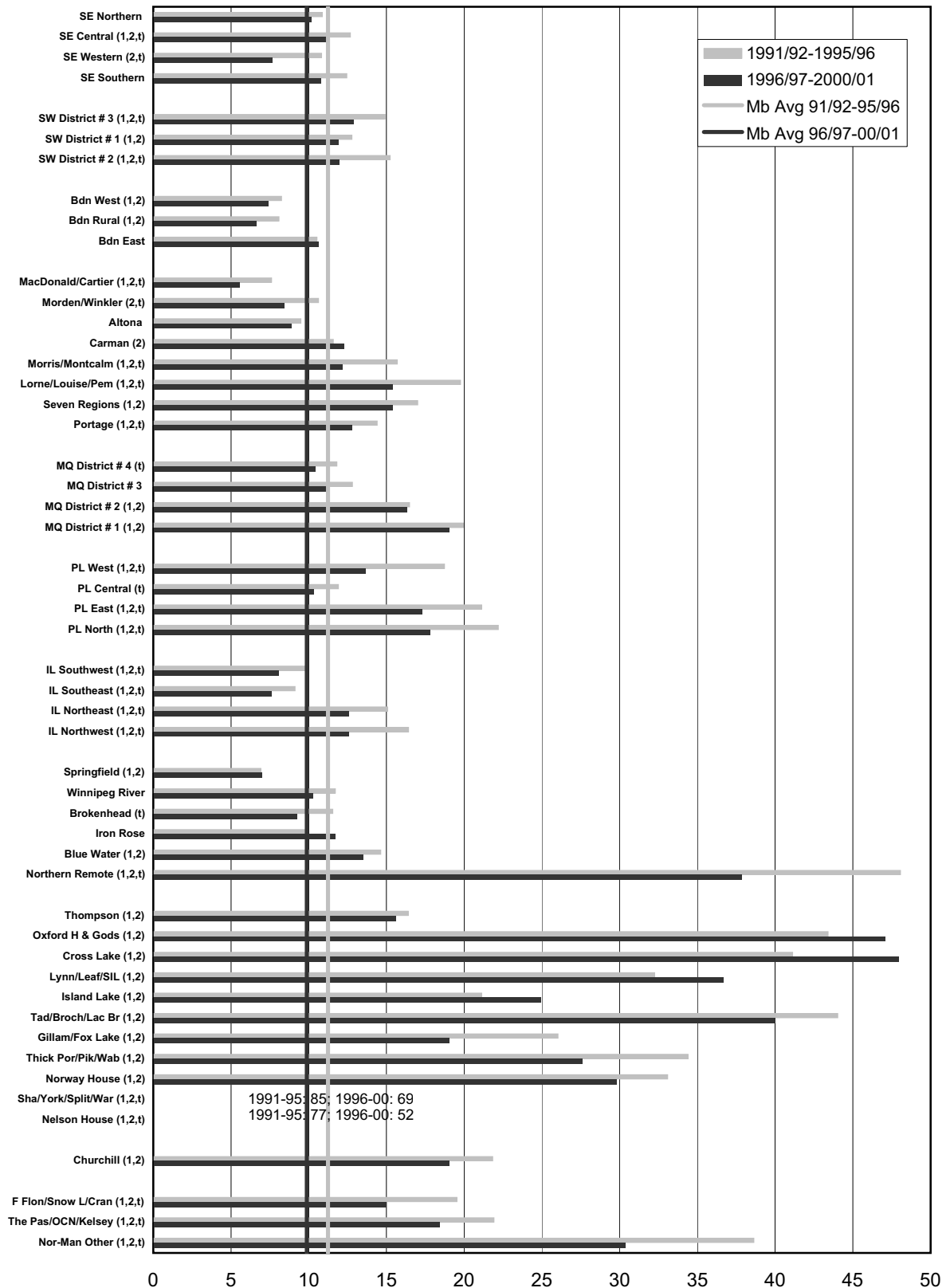
9.7 Locations: Where did RHA Residents Go for Hospitalization?

9.7.1 Where RHA Residents Went for Hospital Separations

Definition: Of all hospital separations used by area residents, this shows what proportion of the separations occurred in various locations (within the RHA, in another non-Winnipeg RHA, in Winnipeg, or out-of-province).

Table 9.7.1: Where RHA residents went for hospital separations 1994/95-1995/96 and 1999/00-2000/01

RHA	Total Separations Used by RHA Residents	RHA Hospital	Other RHA Hospital	Winnipeg Hospital	Out of Province Hospital
South Eastman 95	16,449	53.2%	2.3%	42.9%	1.6%
South Eastman 00	17,930	55.7%	2.4%	40.5%	1.4%
South Westman 95	16,451	58.9%	27.8%	10.0%	3.3%
South Westman 00	17,370	52.9%	33.5%	10.9%	2.7%
Brandon 95	14,060	80.8%	5.4%	12.0%	1.8%
Brandon 00	15,156	80.6%	5.2%	12.5%	1.8%
Central 95	37,137	66.1%	4.8%	28.1%	1.0%
Central 00	37,680	64.3%	5.1%	29.7%	0.9%
Marquette 95	19,822	65.2%	22.2%	9.7%	3.0%
Marquette 00	17,850	60.8%	25.8%	10.6%	2.8%
Parkland 95	23,984	77.2%	4.7%	12.4%	5.7%
Parkland 00	21,163	76.8%	5.2%	13.2%	4.8%
Interlake 95	27,647	48.7%	2.1%	48.3%	0.9%
Interlake 00	26,413	45.7%	2.4%	50.8%	1.0%
North Eastman 95	13,339	38.1%	8.1%	52.8%	1.0%
North Eastman 00	13,756	37.6%	8.1%	53.2%	1.1%
Burntwood 95	20,526	65.0%	2.9%	31.2%	1.0%
Burntwood 00	19,432	64.0%	2.4%	32.9%	0.8%
Churchill 95	521	54.1%	9.6%	34.7%	1.5%
Churchill 00	443	47.9%	9.7%	41.5%	0.9%
Nor-Man 95	12,802	78.6%	3.6%	16.2%	1.7%
Nor-Man 00	11,060	72.6%	4.1%	21.2%	2.0%
Rural South 95	168,889	61.8%	8.7%	27.3%	2.2%
Rural South 00	167,318	59.7%	9.8%	28.5%	2.0%
North 95	33,849	69.9%	3.3%	25.5%	1.3%
North 00	30,935	66.8%	3.1%	28.9%	1.2%
Winnipeg 95	180,743	96.2%	2.1%		1.7%
Winnipeg 00	178,926	96.4%	2.0%		1.7%
Manitoba 95	383,481	78.7%	5.1%	14.3%	1.9%
Manitoba 00	377,179	77.7%	5.5%	15.0%	1.8%

Figure 9.7.1: Where RHA Residents Went for Hospital Separations

"95" reflects fiscal years 1994/95-1995/96; "00" reflects fiscal years 1999/00-2000/01
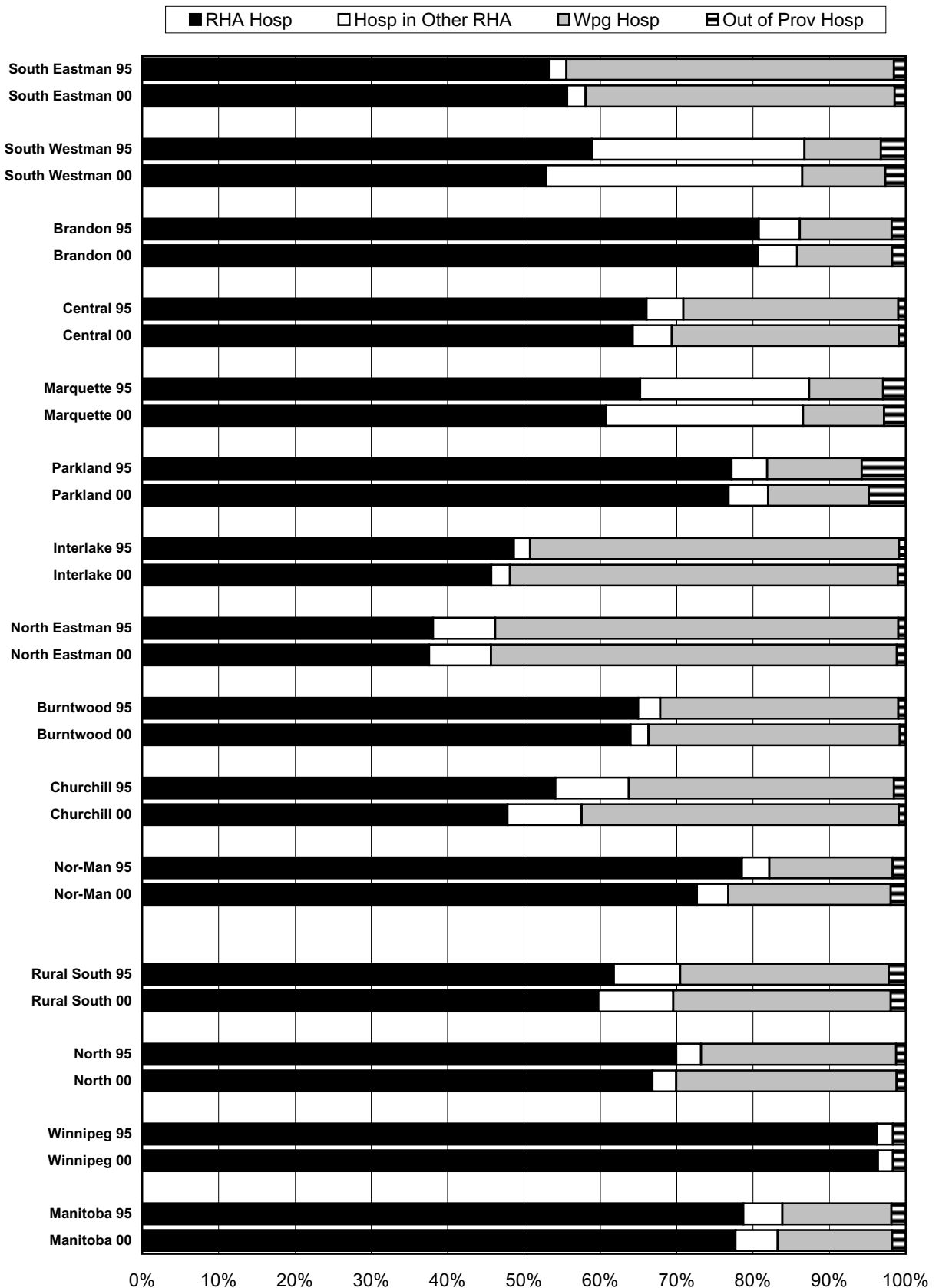
9.7.2 Where RHA Residents Went for Hospital Days

Definition: Of all hospital days used by area residents, this shows what proportion of the days occurred in various locations (within the RHA, in another non-Winnipeg RHA, in Winnipeg, or out-of-province).

Table 9.7.2: Where RHA residents went for hospital days 1994/95-1995/96 and 1999/00-2000/01

RHA	Total Days of Care Used by Residents	RHA Hospital	Other RHA Hospital	Winnipeg Hospital	Out of Province Hospital
South Eastman 95	95,474	64.5%	3.1%	31.1%	1.3%
South Eastman 00	85,801	64.0%	2.7%	32.2%	1.1%
South Westman 95	111,145	69.8%	20.1%	7.0%	3.1%
South Westman 00	107,226	65.4%	23.7%	8.2%	2.8%
Brandon 95	119,715	85.6%	6.5%	6.5%	1.4%
Brandon 00	125,382	90.8%	2.1%	5.7%	1.3%
Central 95	223,104	75.2%	3.8%	20.0%	1.0%
Central 00	204,179	74.1%	5.2%	19.7%	0.9%
Marquette 95	122,612	70.5%	18.8%	8.2%	2.5%
Marquette 00	119,671	68.8%	21.1%	8.1%	2.0%
Parkland 95	169,869	82.1%	3.6%	10.1%	4.3%
Parkland 00	127,778	80.5%	5.1%	10.9%	3.5%
Interlake 95	144,062	55.2%	2.0%	41.7%	1.1%
Interlake 00	127,062	53.6%	2.3%	43.1%	1.0%
North Eastman 95	75,477	45.4%	7.0%	46.6%	1.0%
North Eastman 00	74,804	51.8%	5.4%	42.0%	0.9%
Burntwood 95	75,655	48.6%	3.6%	46.3%	1.5%
Burntwood 00	65,514	50.1%	2.0%	46.7%	1.1%
Churchill 95	4,702	78.4%	4.2%	16.9%	0.5%
Churchill 00	6,990	87.4%	1.9%	10.5%	0.2%
Nor-Man 95	72,938	78.1%	2.2%	17.8%	1.9%
Nor-Man 00	63,625	74.9%	3.3%	20.1%	1.7%
Rural South 95	866,266	70.7%	7.6%	19.5%	2.2%
Rural South 00	771,717	68.6%	9.5%	20.1%	1.8%
North 95	153,295	63.5%	3.0%	31.8%	1.7%
North 00	136,129	63.6%	2.6%	32.4%	1.3%
Winnipeg 95	1,264,714	97.0%	1.5%		1.5%
Winnipeg 00	1,256,449	97.0%	1.5%		1.4%
Manitoba 95	2,284,275	84.8%	3.9%	9.5%	1.8%
Manitoba 00	2,164,295	84.8%	4.4%	9.2%	1.6%

Figure 9.7.2: Where RHA Residents Went for Hospital Days

"95" reflects fiscal years 1994/95-1995/96; "00" reflects fiscal years 1999/00-2000/01
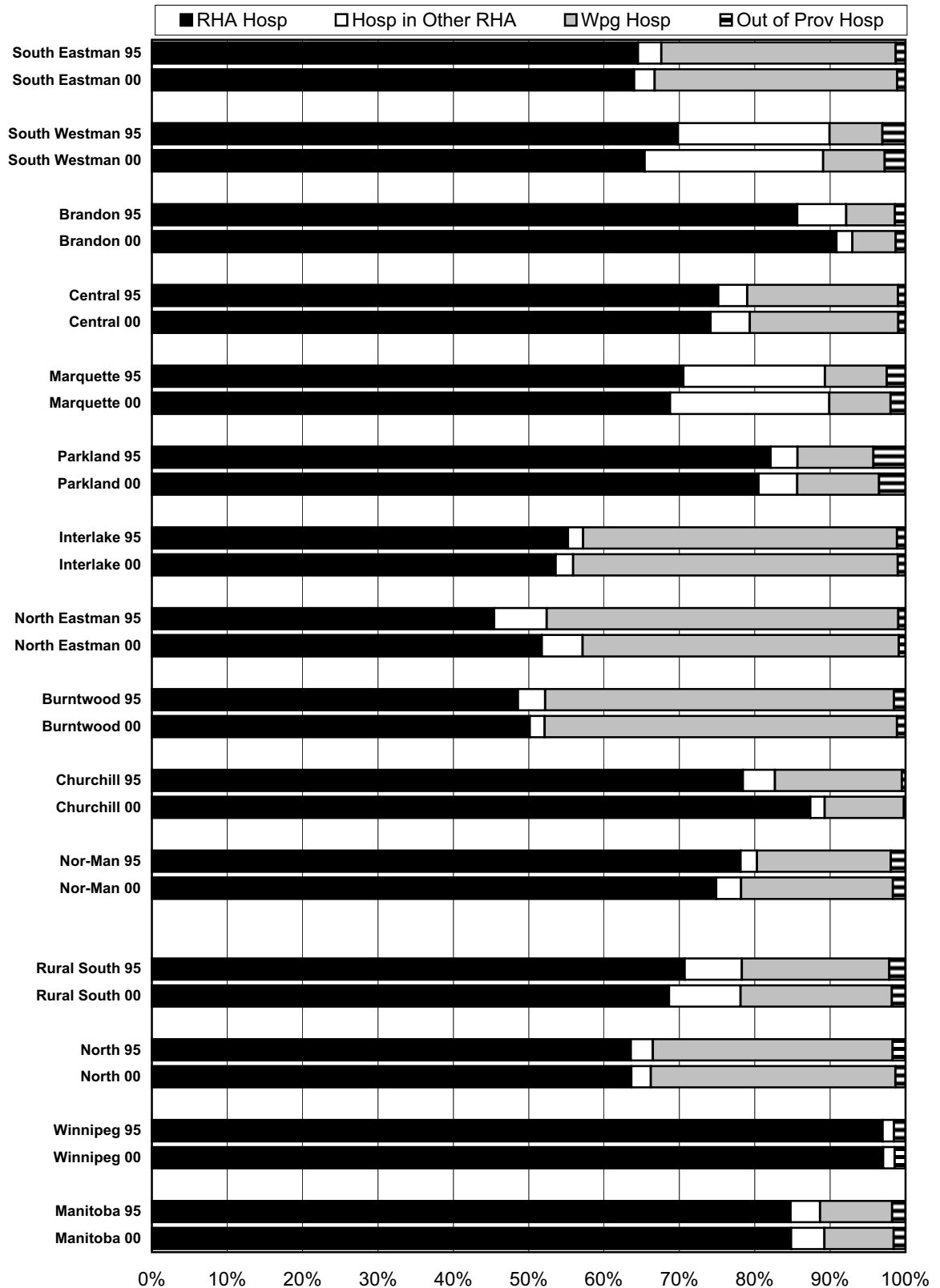
9.8   Catchments: Whose Residents Did this RHA's Hospitals Serve?

9.8.1 Where RHA Hospital Patients Came From, Based on Separations

Definition: Of all separations from all hospitals in a region, this shows what proportion were associated with residents of the region, Winnipeg residents, residents of other RHAs, or out-of-province residents.

Table 9.8.1: Where RHA hospital patients came from: Separations 1994/95-1995/96 and 1999/00-2000/01

RHA	Total Separations Provided by RHA Hospitals	RHA Residents	Residents of Other RHAs	Residents of Winnipeg	Non-Manitobans
South Eastman 95	9,514	92.1%	4.4%	2.7%	0.9%
South Eastman 00	10,928	91.3%	4.8%	2.8%	1.1%
South Westman 95	10,378	93.4%	4.6%	0.7%	1.3%
South Westman 00	9,920	92.7%	5.5%	0.7%	1.1%
Brandon 95	21,133	53.7%	41.4%	1.1%	3.8%
Brandon 00	23,535	51.9%	43.8%	1.1%	3.2%
Central 95	26,757	91.7%	5.4%	2.0%	1.0%
Central 00	26,493	91.4%	5.8%	2.0%	0.8%
Marquette 95	14,717	87.8%	8.8%	1.3%	2.1%
Marquette 00	12,462	87.0%	10.0%	1.1%	1.8%
Parkland 95	20,559	90.1%	5.7%	2.3%	1.9%
Parkland 00	18,177	89.4%	6.8%	1.9%	1.8%
Interlake 95	15,383	87.5%	6.0%	5.6%	0.9%
Interlake 00	13,882	87.0%	6.3%	5.7%	1.0%
North Eastman 95	5,781	87.9%	4.0%	7.0%	1.1%
North Eastman 00	5,894	87.7%	3.6%	7.4%	1.3%
Burntwood 95	14,376	92.8%	3.1%	2.8%	1.3%
Burntwood 00	13,532	91.8%	3.3%	3.2%	1.7%
Churchill 95	1,763	16.0%	1.9%	0.5%	81.6%
Churchill 00	1,169	18.1%	1.8%	0.9%	79.1%
Nor-Man 95	14,192	70.9%	4.3%	2.2%	22.6%
Nor-Man 00	11,048	72.7%	4.0%	1.8%	21.5%
Rural South 95	124,222	84.0%	11.8%	2.4%	1.8%
Rural South 00	121,291	82.4%	13.6%	2.4%	1.6%
North 95	30,331	78.0%	3.6%	2.4%	16.0%
North 00	25,749	80.3%	3.5%	2.5%	13.7%
Winnipeg 95	238,392	73.0%	23.0%		4.0%
Winnipeg 00	239,929	71.9%	23.6%		4.6%
Manitoba 95	392,945	76.8%	18.0%	1.0%	4.2%
Manitoba 00	386,969	75.7%	19.1%	0.9%	4.2%

Figure 9.8.1: Where RHA Hospital Patients Came From: Separations

"95" reflects fiscal years 1994/95-1995/96; "00" reflects fiscal years 1999/00-2000/01

Legend: ■ RHA Residents □ Residents of Other RHAs ▨ Residents of Wpg ⊞ Non-Manitobans
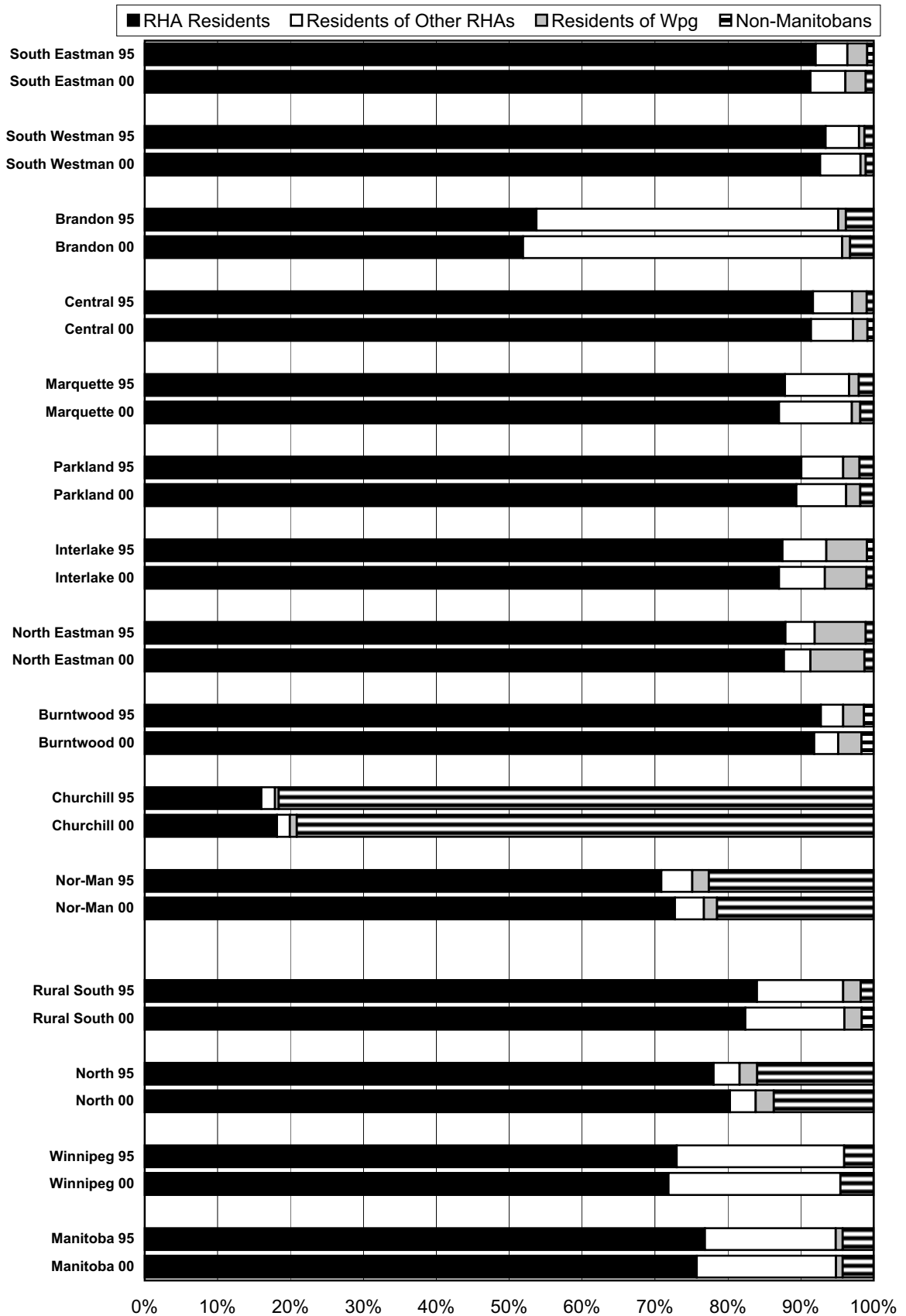
9.8.2 Where RHA Hospital Patients Came From, Based on Days

Definition: Of all days of care provided by all hospitals in a region, this shows what proportion were used by residents of the region, Winnipeg residents, residents of other RHAs, or out-of-province res idents.

Table 9.8.2: Where RHA hospital patients came from: Days 1994/95-1995/96 and 1999/00-2000/01

RHA	Total Days of Care Provided by RHA Hospitals	RHA Residents	Residents of Other RHAs	Residents of Winnipeg	Non-Manitobans
South Eastman 95	65,857	93.5%	3.3%	2.9%	0.3%
South Eastman 00	59,011	93.1%	3.8%	2.6%	0.6%
South Westman 95	81,202	95.6%	2.7%	1.2%	0.5%
South Westman 00	74,686	93.9%	4.5%	1.0%	0.6%
Brandon 95	151,340	67.7%	29.3%	1.2%	1.8%
Brandon 00	172,771	65.9%	31.1%	1.4%	1.7%
Central 95	179,496	93.4%	4.6%	1.5%	0.4%
Central 00	162,252	93.3%	4.0%	2.3%	0.5%
Marquette 95	98,561	87.8%	10.3%	0.9%	1.0%
Marquette 00	89,345	92.1%	5.9%	1.0%	0.9%
Parkland 95	150,409	92.7%	4.2%	2.0%	1.0%
Parkland 00	111,346	92.4%	4.5%	1.6%	1.5%
Interlake 95	87,514	90.9%	4.6%	4.1%	0.4%
Interlake 00	76,484	89.1%	3.8%	6.3%	0.8%
North Eastman 95	37,639	91.1%	4.7%	3.8%	0.4%
North Eastman 00	41,622	93.0%	2.7%	3.8%	0.5%
Burntwood 95	39,783	92.4%	3.5%	3.0%	1.1%
Burntwood 00	36,657	89.6%	5.8%	3.2%	1.3%
Churchill 95	8,959	41.2%	7.2%	0.2%	51.4%
Churchill 00	9,325	65.5%	1.7%	0.5%	32.3%
Nor-Man 95	72,967	78.1%	2.9%	1.9%	17.2%
Nor-Man 00	57,667	82.6%	1.8%	1.0%	14.6%
Rural South 95	700,678	92.3%	5.0%	2.1%	0.7%
Rural South 00	614,746	92.5%	4.3%	2.4%	0.8%
North 95	121,709	80.0%	3.4%	2.1%	14.4%
North 00	103,649	83.6%	3.2%	1.7%	11.5%
Winnipeg 95	1,536,494	79.8%	17.0%		3.2%
Winnipeg 00	1,502,546	81.1%	15.8%		3.0%
Manitoba 95	2,510,221	82.6%	13.7%	0.8%	2.9%
Manitoba 00	2,393,712	83.1%	13.4%	0.8%	2.7%

Figure 9.8.2: Where RHA Hospital Patients Came From: Days

"95" reflects fiscal years 1994/95-1995/96; "00" reflects fiscal years 1999/00-2000/01
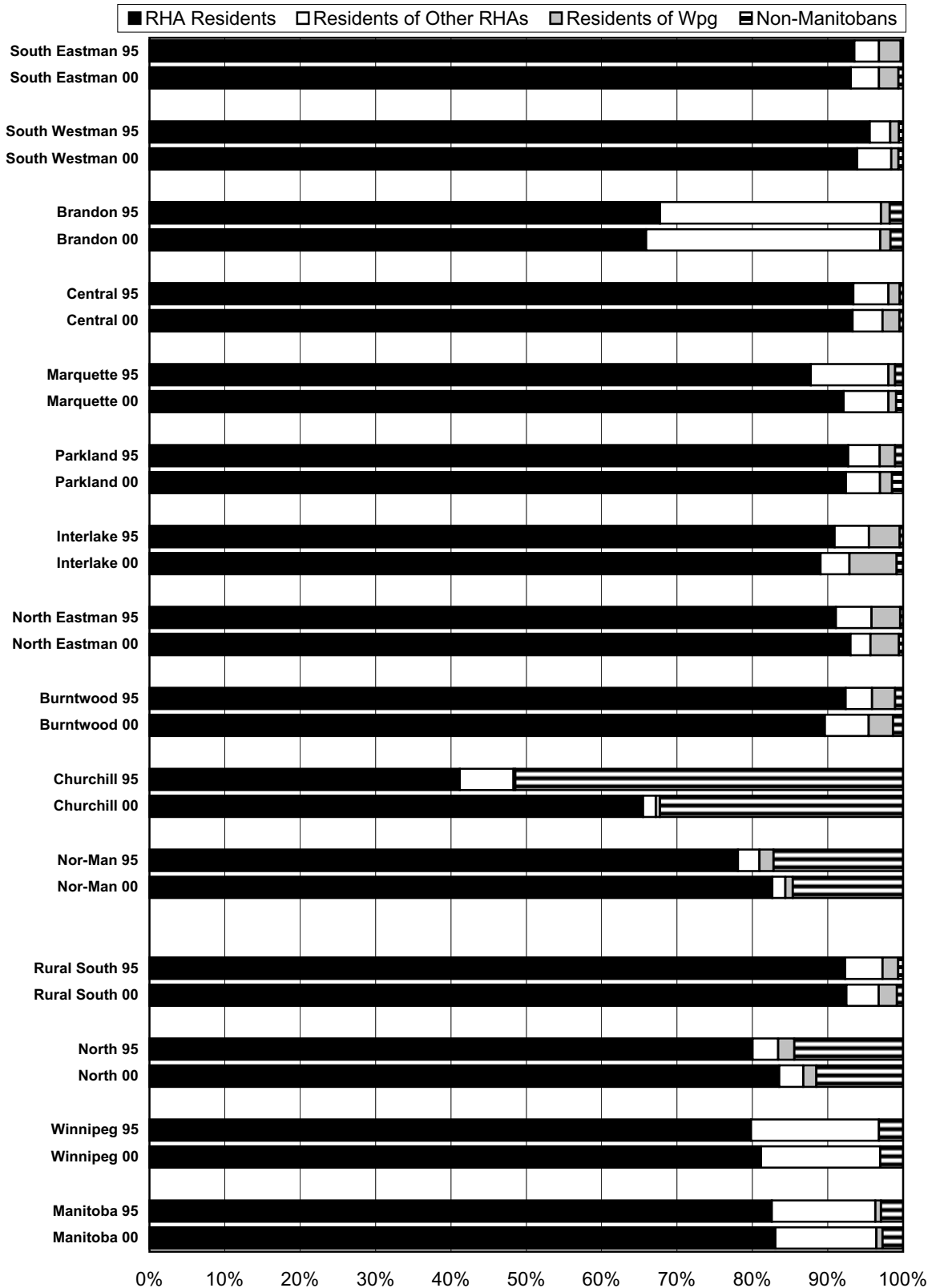
9.9 Causes of Hospitalization

Definition: This is the percentage of hospital separations by cause ('primary diagnosis'), listing the most frequent causes across the province.

Figure 9.9.1a: Causes of Hospitalization, Rural South and Brandon, 1994/95-1995/96

Pregnancy & Delivery 11%
Circulatory 11%
Cancer 9%
Digestive 10%
Respiratory 10%
Genitourinary 7%
Nervous 6%
Injury & Poisoning 7%
All Other 29%
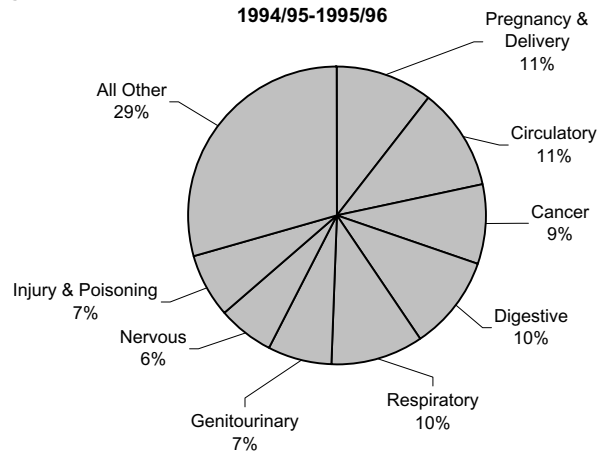
Figure 9.9.1b: Causes of Hospitalization, Rural South and Brandon, 1999/00-2000/01

Pregnancy & Delivery 9%
Circulatory 11%
Cancer 10%
Digestive 10%
Respiratory 8%
Genitourinary 7%
Nervous 7%
Injury & Poisoning 6%
All Other 32%
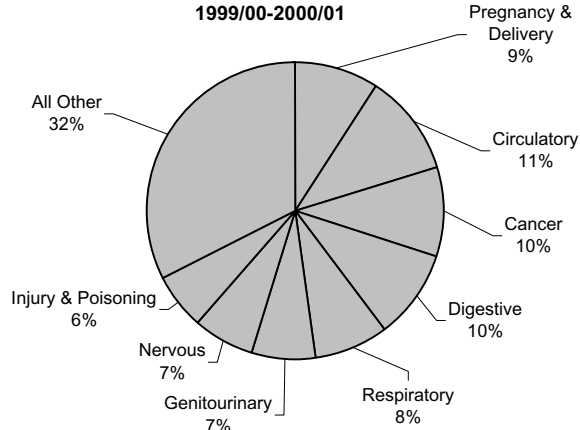
Figure 9.9.2a: Causes of Hospitalization, North, 1994/95-1995/96

Pregnancy & Delivery 18%
Circulatory 6%
Cancer 5%
Digestive 9%
Respiratory 13%
Genitourinary 6%
Nervous 4%
Injury & Poisoning 10%
All Other 29%
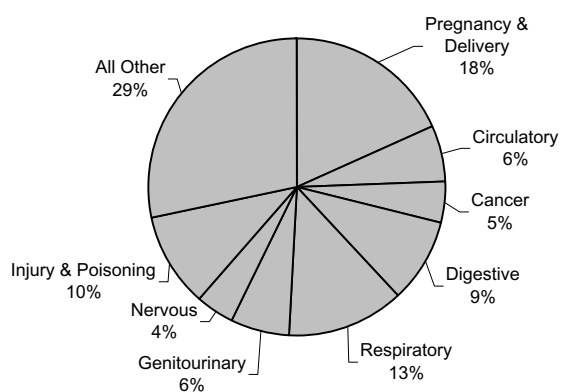
Figure 9.9.2b: Causes of Hospitalization, North, 1999/00-2000/01

Pregnancy & Delivery 18%
Circulatory 7%
Cancer 5%
Digestive 8%
Respiratory 9%
Genitourinary 6%
Nervous 4%
Injury & Poisoning 10%
All Other 33%
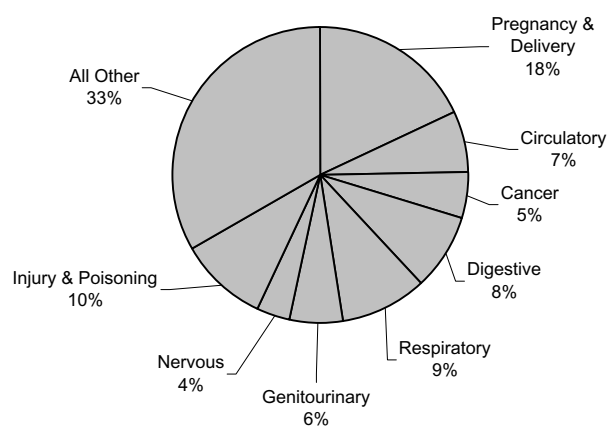
Figure 9.9.3a: Causes of Hospitalization, Winnipeg, 1994/95-1995/96

Pregnancy & Delivery 17%
Circulatory 9%
Cancer 11%
Digestive 9%
Respiratory 7%
Genitourinary 9%
Nervous 8%
Injury & Poisoning 6%
All Other 24%
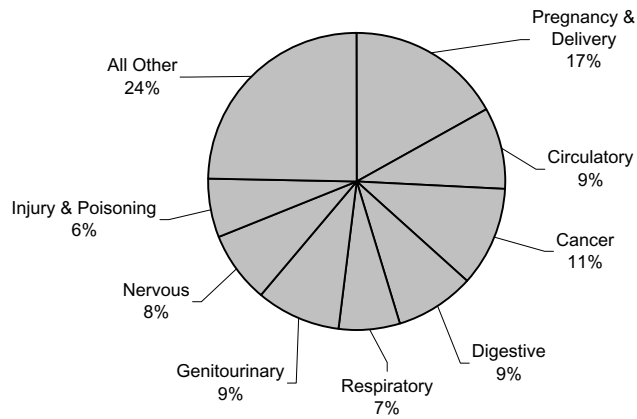
Figure 9.9.3b: Causes of Hospitalization, Winnipeg, 1999/00-2000/01

Pregnancy & Delivery 14%
Circulatory 9%
Cancer 11%
Digestive 9%
Respiratory 6%
Genitourinary 8%
Nervous 8%
Injury & Poisoning 5%
All Other 30%
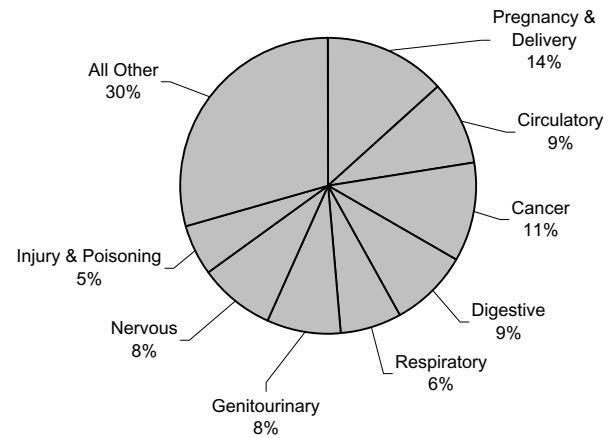
Figure 9.9.4a: Causes of Hospitalization, Manitoba, 1994/95-1995/96

Pregnancy & Delivery 14%
Circulatory 10%
Cancer 9%
Digestive 9%
Respiratory 9%
Genitourinary 8%
Nervous 7%
Injury & Poisoning 7%
All Other 27%
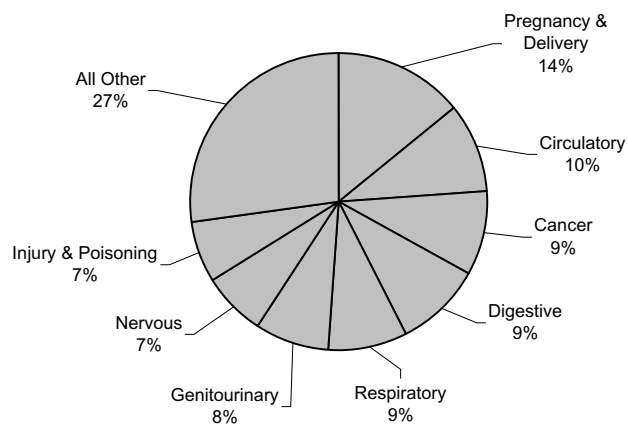
Figure 9.9.4b: Causes of Hospitalization, Manitoba, 1999/00-2000/01

Pregnancy & Delivery 12%
Circulatory 10%
Cancer 10%
Digestive 9%
Respiratory 7%
Genitourinary 7%
Nervous 7%
Injury & Poisoning 6%
All Other 32%
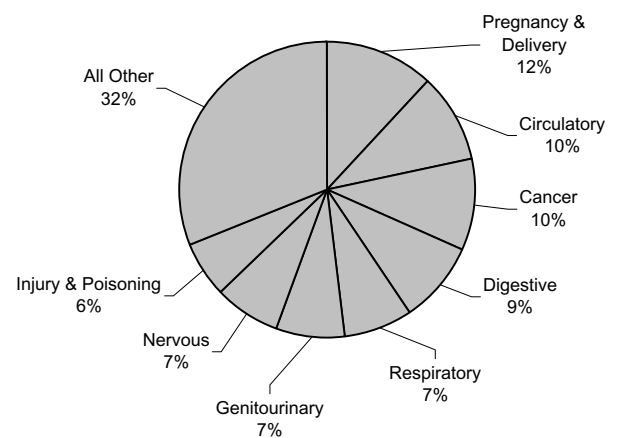
Chapter 10: High Profile and Discretionary Surgical Procedures

10.1 What's in This Chapter?

Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of high profile surgical and diagnostic procedures, as well as high variation ("discretionary") procedures, including:

High Profile Procedures:
- Cardiac Catheterizations (Section 10.2)
- Angioplasty (Section 10.3)
- Coronary Artery Bypass Graft Surgery (Section 10.4)
- Hip Replacement (Section 10.5)
- Knee Replacement (Section 10.6)
- Cataract Surgery (Section 10.7)
- Computed Tomography (CT) Scans (Section 10.8)

High Variation (Discretionary) Procedures:
- Tonsillectomy (Section 10.9)
- Hysterectomy (Section 10.10)
- Caesarean Section (Section 10.11)

Chapter 10 focuses on surgical and diagnostic procedures, with all rates adjusted for age and sex. This is an interesting and eclectic mix of procedures, including those focusing on children, middle-aged or older adults, and some focussing on procedures affecting mostly males or females.

"High profile" procedures are those that are often talked about in the media. Cardiac catheterization, angioplasty, and coronary artery bypass graft surgery are the prominent heart procedure indicators. Also included are rates for hip and knee replacements and cataract surgeries, because they are high profile procedures associated with major improvements in quality of life.

"Discretionary" surgical procedures have been the subject of critical reviews in the research literature because of potential overuse and wide variation in rates. Three indicators are provided here: tonsillectomy/adenoidectomy, hysterectomy, and Caesarean section surgeries.

Example: Parkland RHA

Since Parkland RHA residents have average health status (see the discussion in Chapter 2, Section 2.3), we would expect Parkland residents to be receiving health care services at or near the provincial rates. Figure 10.2.1 shows that people living in Parkland RHA did receive cardiac catheterizations at rates very close to the provincial average, in both time periods. They also experienced a significant increase in rates over time, as did residents of the entire province. So at the RHA level, Parkland is consistently close to the provincial average, as expected. However, the district-level results in Figure 10.2.2 reveal a more interesting story: in the more recent time period (1998/99 - 2000/01), three of the four districts have rates very near the provincial average, and the only significant difference was the high rate in the Central district. But in the earlier time period (1993/94 - 1995/96), the districts' rates were considerably more disparate (though only the North district was significantly low). So while cardiac catheterization rates increased in all districts, the increase was greater in the districts that had the lower rates earlier on, which is an encouraging finding.

Cardiac catheterization is the precursor for angioplasty or bypass surgery. For angioplasty (Figures 10.3.1 and 10.3.2), rates for Parkland residents are similar to the provincial average, and have experienced a significant increase over time - much like the RHA's overall results for catheterizations. At the district level, there is more variation in rates, though none of those differences reached statistical significance.

Bypass surgery rates (known as "cardiac artery bypass graft surgery) among Parkland residents were also close to the provincial average, and experienced a significant increase over time (see Figures 10.4.1 and 10.4.2). District-level results revealed great variation in rates (which is expected for relatively rare events such as this).

Hip and knee replacement rates are similar to provincial averages (see Figures 10.5.1 and 10.6.1). However, access to cataract surgery appears low for Parkland residents: during both time periods, rates were significantly lower than the provincial average. District-level results mirror this finding for all but the East district. This suggests that Parkland RHA planners may want to inquire about referral and surgical patterns for their residents.

The low and declining rates of CT scans for Parkland residents shown in Figure 10.8.1 is not an accurate indicator. This finding is the result of a data problem, in that CT scans done in Dauphin hospital are not individually billed to Manitoba Health as at other facilities. As a result,

MCHP files cannot determine the recipient of the scans, and therefore cannot attribute them to their area of residence. So the true CT scan rate for Parkland residents cannot be accurately determined at this time (and this problem may also affect residents of nearby RHAs, most likely the former Marquette, and Nor-Man).

Examples where average to low rates probably represent good practice include hysterectomy, Caesarean section, and tonsillectomy/adenoidectomy - these are called "discretionary procedures" due to the high degree of fluctuation seen within the province that may be more related to physician practice patterns. In Parkland, Figure 10.9.1 reveals a high but falling tonsillectomy rate; Figure 10.10.1 shows a high and rising hysterectomy rate; and Figure 10.11.1 shows a high Caesarean section rate at both time periods. In each case, there is significant variation at the district level.

Some of the questions that health policy planners and decision-makers may wish to explore include:
- *Compared to other regions, does the RHA have a high or low rate?*
- *Within the RHA, what does the district-level data show?*
- *Are rates related to the proximity of the area to major health centres?*
- *Where rates of cardiac procedures are low, do local physicians have good referral links to relevant surgeons, or could these links be improved?*
- *What does a "low" or a "high" rate mean - is it an appropriate response to real need, or does it mean under- or over-servicing?*
- *Are diagnostic procedures being properly recorded to provide accurate rates? If not, what can be done to improve the situation? This is especially important where CT scanners have recently been installed.*
- *Where rates of the "discretionary" procedures are high, does this reflect potential over-servicing of residents, or are there local factors which explain the high rates?*

High Profile Procedures:

10.2 Cardiac Catheterizations

Definition: This is the number of cardiac catheterizations performed per thousand residents, regardless of location of provision. This is age- and sex-adjusted to reflect the population of Manitoba. Cardiac catheterization is a diagnostic procedure for identifying the exact location and severity of coronary artery disease.

Figure 10.2.1: Cardiac Catheterization Rates by RHA
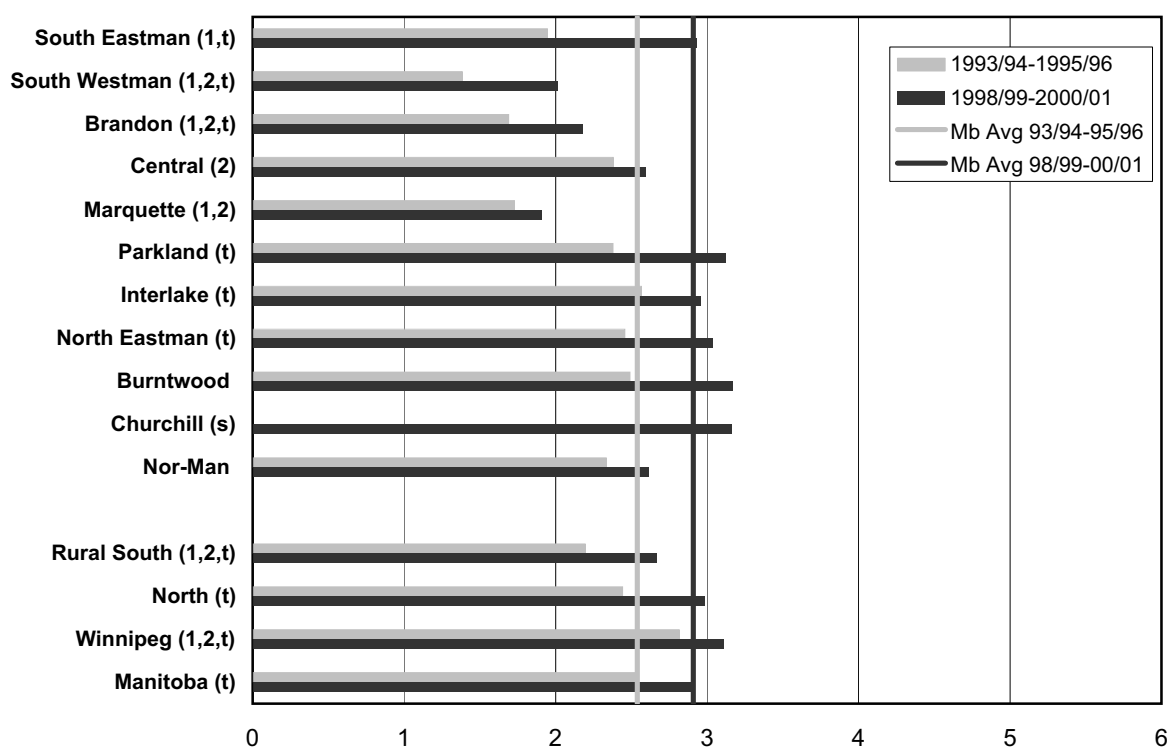
Age- & sex-adjusted cardiac catheterization rates per 1000 residents

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

Figure 10.2.2: Cardiac Catheterization Rates by District

Age- & sex-adjusted cardiac catheterization rates per 1000 residents

Legend:
- 1993/94-1995/96
- 1998/99-2000/01
- Mb Avg 93/94-95/96
- Mb Avg 98/99-00/01

Districts (top to bottom):
SE Northern (t), SE Central (1), SE Western (t), SE Southern, SW District # 3, SW District # 1 (1,2,t), SW District # 2 (1), Bdn West (1,2), Bdn Rural, Bdn East (1,2), MacDonald/Cartier, Morden/Winkler, Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem (2), Seven Regions, Portage, MQ District # 4, MQ District # 3, MQ District # 2 (1,2), MQ District # 1 (1), PL West, PL Central (1,2), PL East, PL North (1,t), IL Southwest, IL Southeast, IL Northeast, IL Northwest (2,t), Springfield, Winnipeg River, Brokenhead, Iron Rose, Blue Water (2,t), Northern Remote, Thompson, Oxford H & Gods, Cross Lake, Lynn/Leaf/SIL, Island Lake (1,2), Tad/Broch/Lac Br (s), Gillam/Fox Lake (s), Thick Por/Pik/Wab, Norway House, Sha/York/Split/War (s), Nelson House (1,s), Churchill (s), F Flon/Snow L/Cran, The Pas/OCN/Kelsey, Nor-Man Other

10.3 Angioplasty

Definition: This is the number of angioplasty procedures performed per thousand residents, regardless of location of provision. This is age- and sex-adjusted to reflect the population of Manitoba. Angioplasy is a procedure that uses a balloon-tipped catheter to enlarge a narrowing in a coronary artery.

Figure 10.3.1: Angioplasty Rates by RHA

Age- & sex-adjusted angioplasty rates per 1000 residents
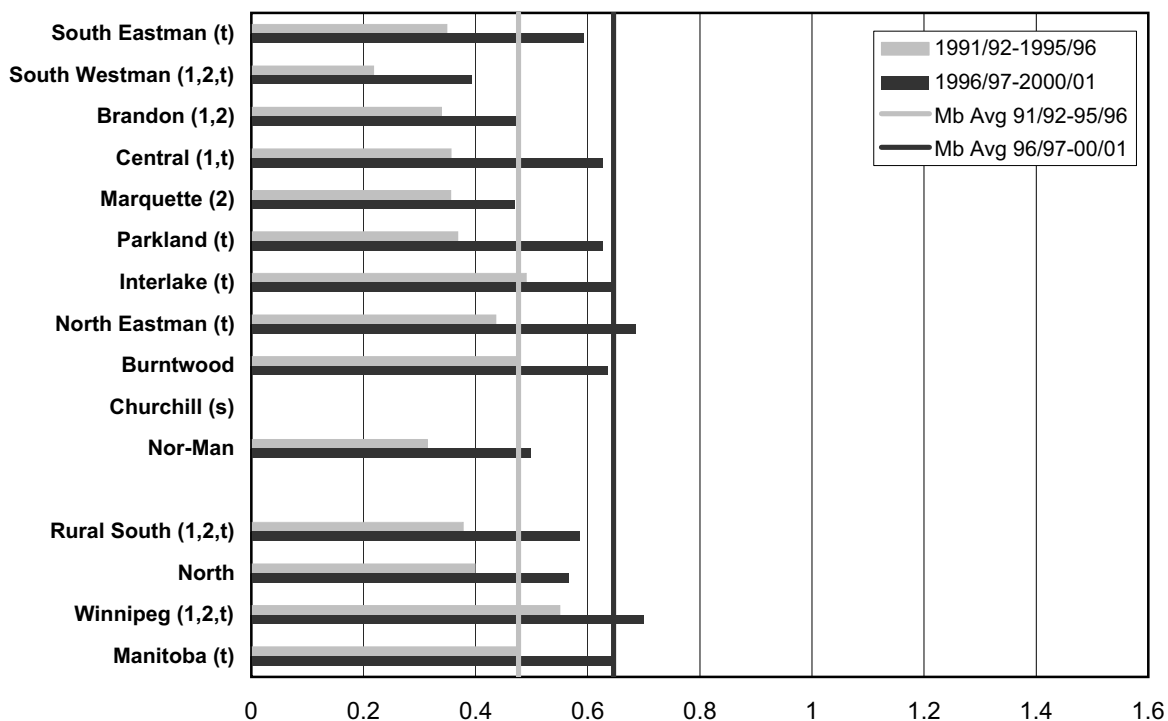
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Figure 10.3.2: Angioplasty Rates by District

Age- & sex-adjusted angioplasty rates per 1000 residents
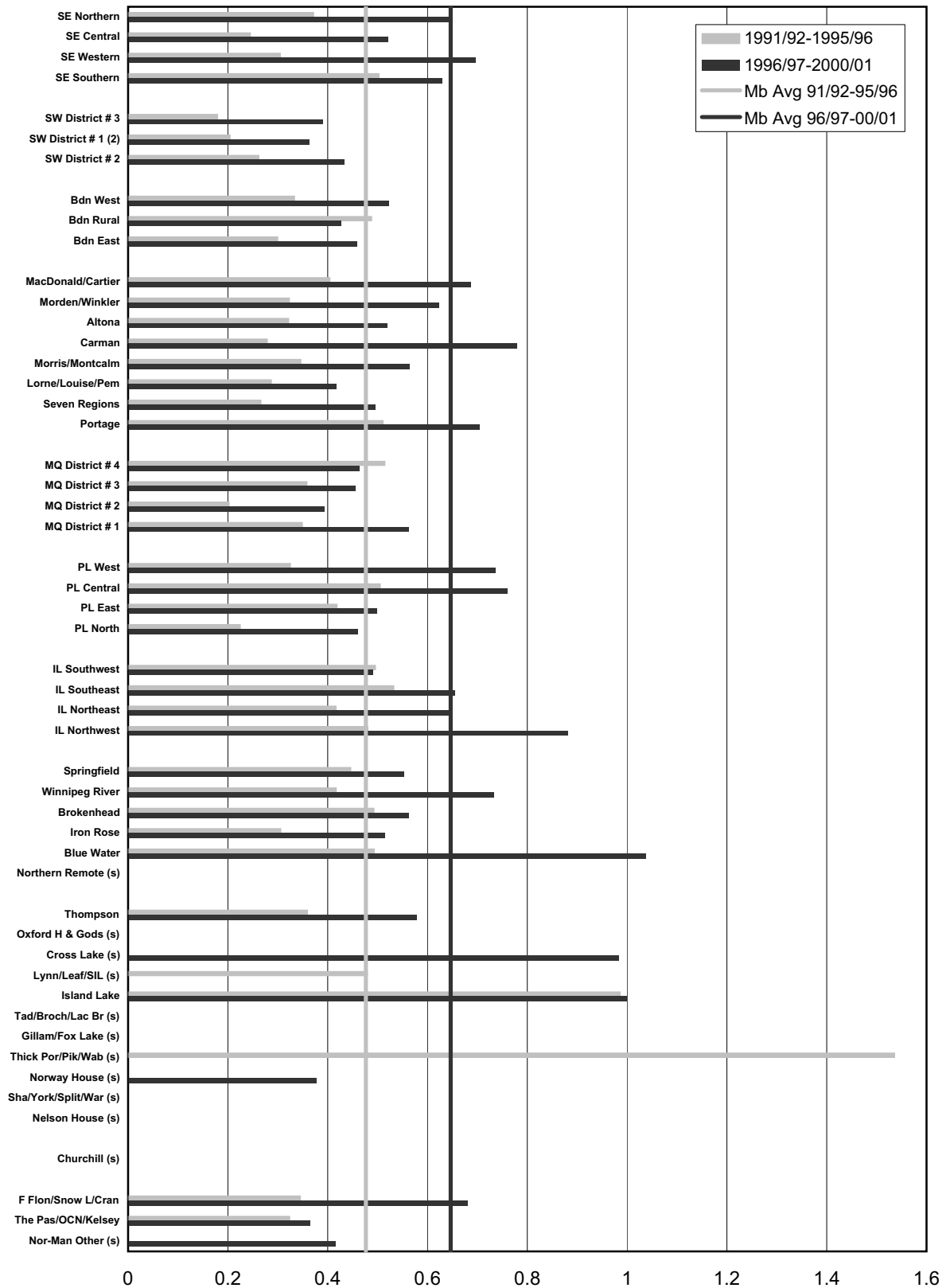
10.4 Coronary Artery Bypass Graft Surgery

Definition: This is the number of bypass surgeries performed per thousand residents, regardless of location of provision. This is age- and sex-adjusted to reflect the population of Manitoba. Coronary artery bypass graft surgery creates new routes around narrowed and blocked arteries (caused by coronary artery disease) so that more blood can flow to the heart.

Figure 10.4.1: Coronary Artery Bypass Rates by RHA

Age- & sex-adjusted coronary artery bypass graft surgery rates per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
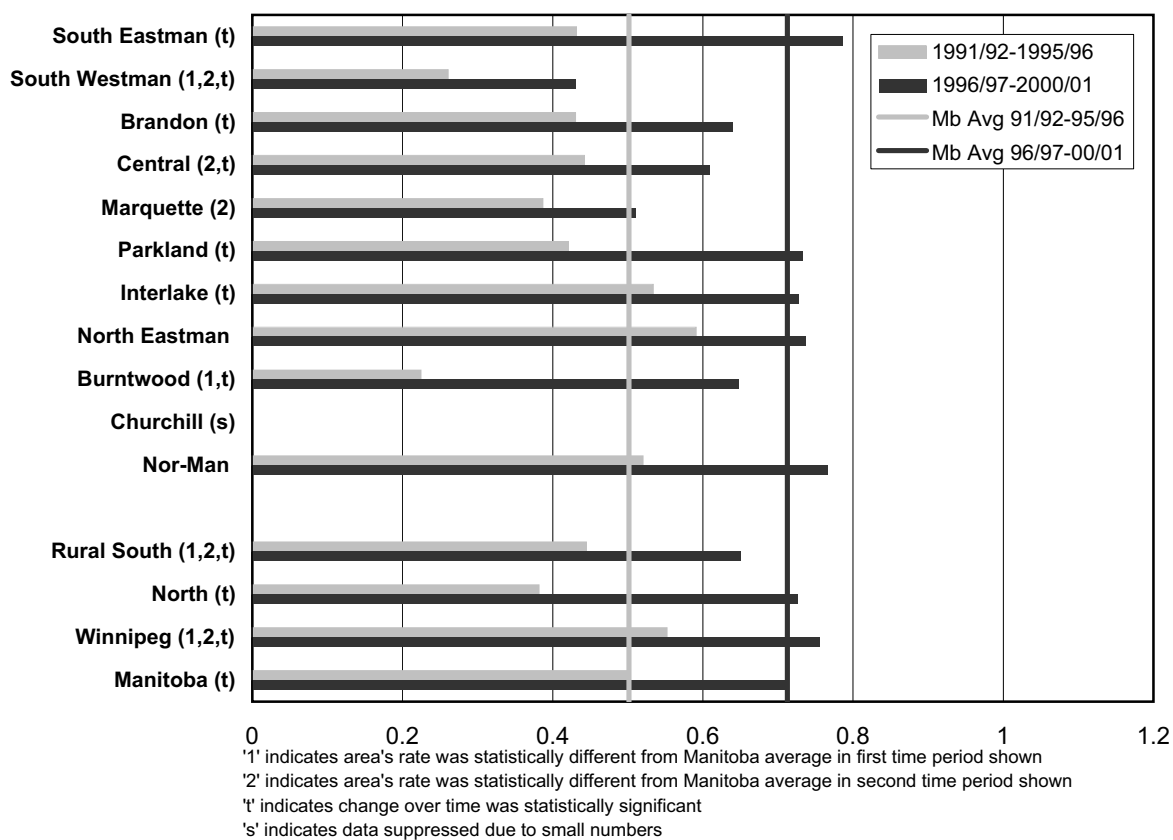
Figure 10.4.2: Coronary Artery Bypass Rates by District

Age- & sex-adjusted coronary artery bypass graft surgery rates per 1000 residents

Legend:
- 1991/92-1995/96
- 1996/97-2000/01
- Mb Avg 91/92-95/96
- Mb Avg 96/97-00/01

Districts (top to bottom):
SE Northern, SE Central, SE Western (2,t), SE Southern, SW District # 3, SW District # 1 (1,2), SW District # 2 (1,2), Bdn West, Bdn Rural, Bdn East, MacDonald/Cartier, Morden/Winkler, Altona, Carman, Morris/Montcalm, Lorne/Louise/Pem, Seven Regions, Portage (t), MQ District # 4, MQ District # 3, MQ District # 2, MQ District # 1, PL West, PL Central, PL East, PL North (1,t), IL Southwest, IL Southeast (t), IL Northeast, IL Northwest, Springfield, Winnipeg River, Brokenhead, Iron Rose, Blue Water, Northern Remote (s), Thompson, Oxford H & Gods (s), Cross Lake (s), Lynn/Leaf/SIL (s), Island Lake (s), Tad/Broch/Lac Br (s), Gillam/Fox Lake (s), Thick Por/Pik/Wab (s), Norway House (s), Sha/York/Split/War (s), Nelson House (s), Churchill (s), F Flon/Snow L/Cran, The Pas/OCN/Kelsey, Nor-Man Other

10.5 Hip Replacement

Definition: This is the number of total hip replacements performed per thousand residents, regardless of location of provision. This is age- and sex-adjusted to reflect the population of Manitoba. Total hip replacement is performed when hip joints have degraded (usually because of advanced arthritis), and have been shown to provide major improvements in mobility and quality of life.

Figure 10.5.1: Hip Replacement Rates by RHA

Age- & sex-adjusted rate of hip replacements per 1000 residents

Legend:
- 1991/92-1995/96
- 1996/97-2000/01
- Mb Avg 91/92-95/96
- Mb Avg 96/97-00/01

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
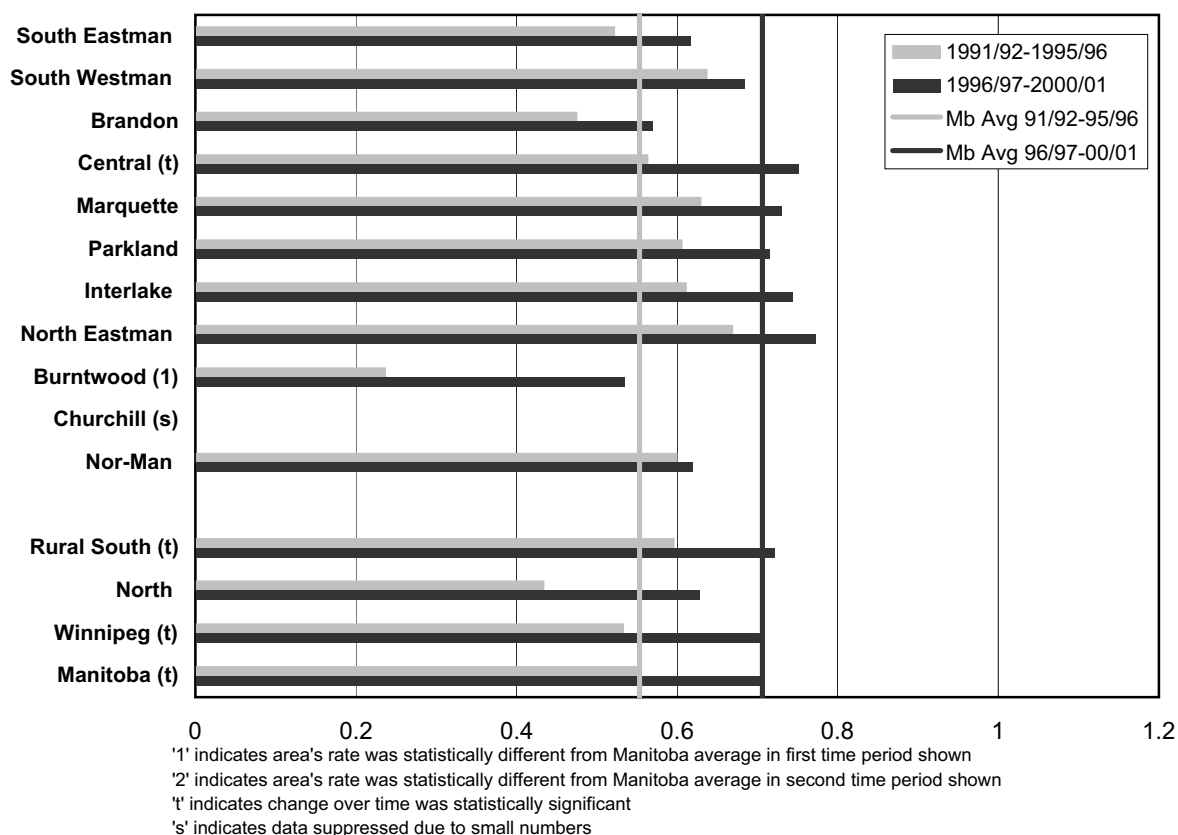
Figure 10.5.2: Hip Replacement Rates by District

Age- & sex-adjusted rate of hip replacements per 1000 residents

Legend:
- 1991/92-1995/96
- 1996/97-2000/01
- Mb Avg 91/92-95/96
- Mb Avg 96/97-00/01

Island Lake (2) 1991-1995: 0.54; 1996-2000: 1.79
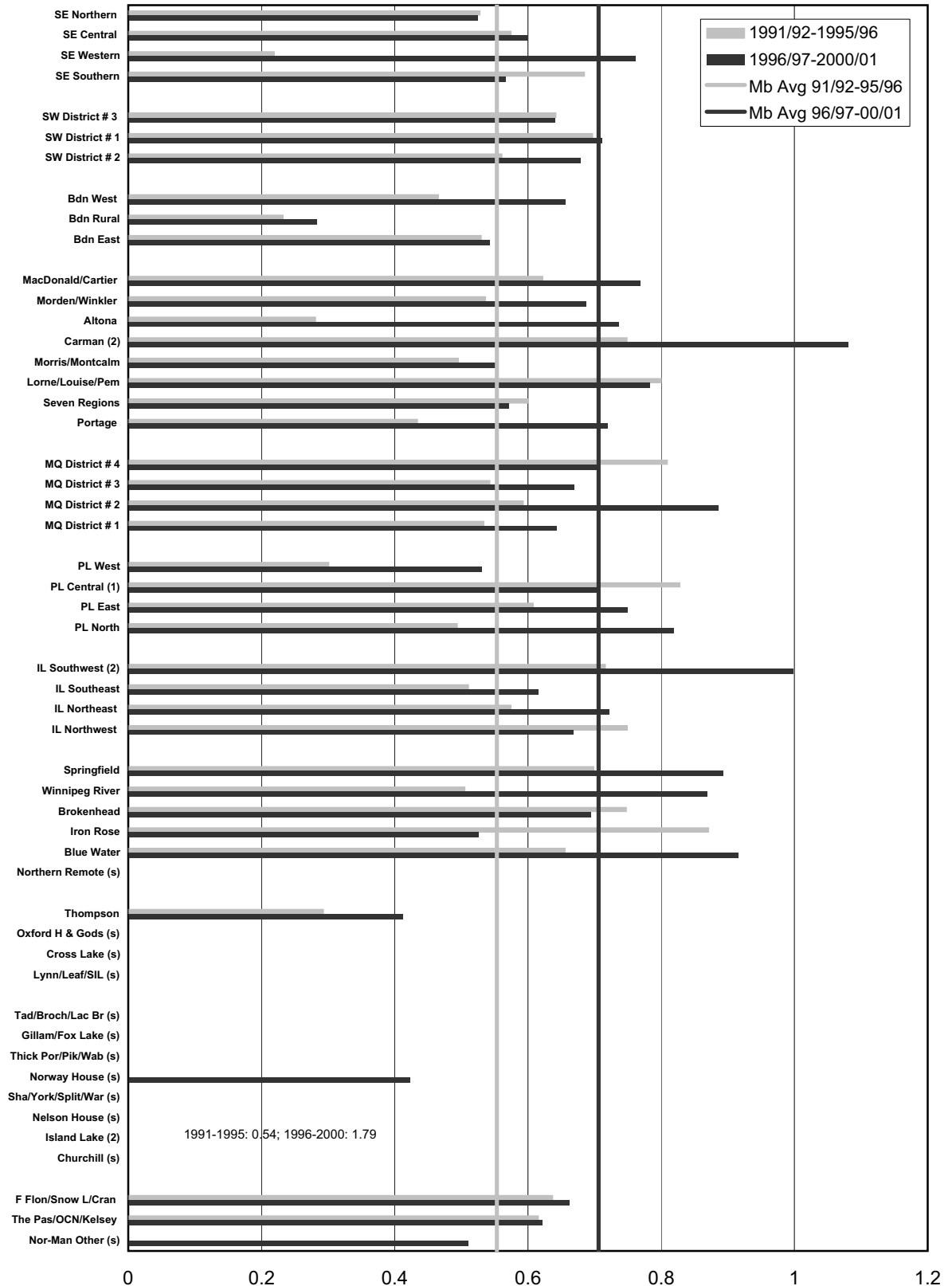
10.6 Knee Replacement

Definition: This is the number of total knee replacements performed per thousand residents, regardless of location of provision. This is age- and sex-adjusted to reflect the population of Manitoba. Total knee replacement is performed when knee joints have degraded (usually because of advanced arthritis), and have been shown to provide major improvements in mobility and quality of life.

Figure 10.6.1: Knee Replacement Rates by RHA

Age- & sex-adjusted rate of knee replacements per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
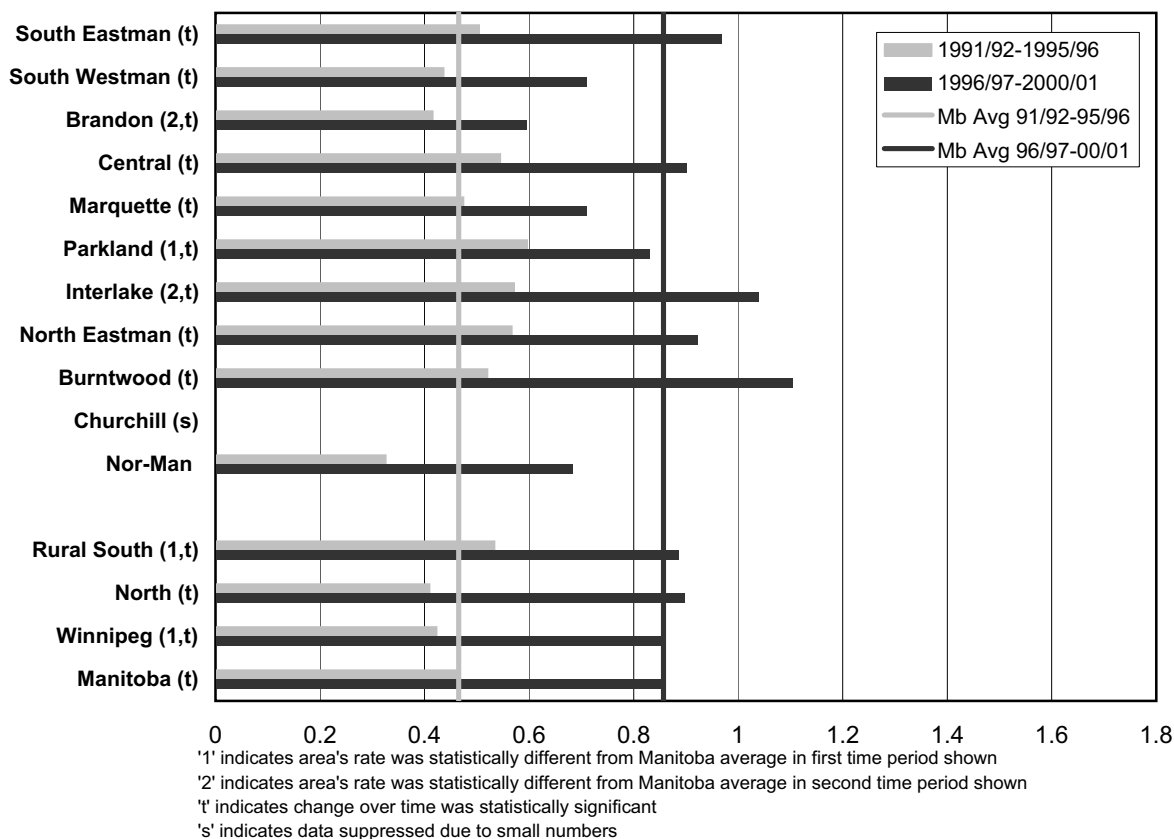
Figure 10.6.2: Knee Replacement Rates by District

Age- & sex-adjusted rate of knee replacements per 1000 residents
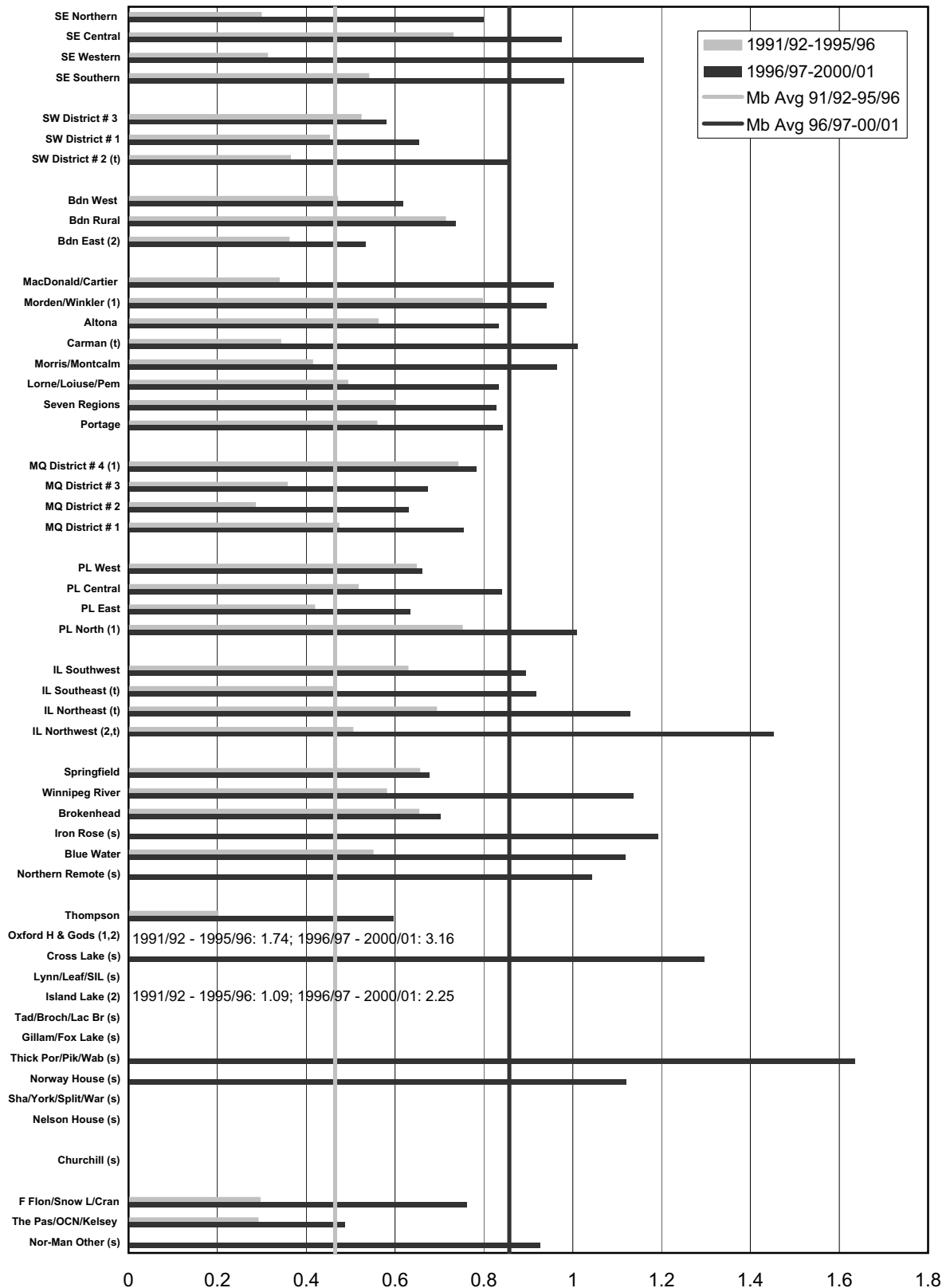
10.7 Cataract Surgery

Definition: This is the number of cataract replacements performed per thousand residents aged 50 years or older, regardless of location of provision. This is age and sex adjusted to reflect the population of Manitoba (50+). A cataract is when the lens of the eye becomes opaque, obscuring vision. In surgery, this opaque lens is removed and replaced by a clear one, resulting in major improvements in vision and quality of life.

Figure 10.7.1: Cataract Surgery Rates by RHA
Age- & sex-adjusted rate of cataract surgery per 1000 residents age 50+
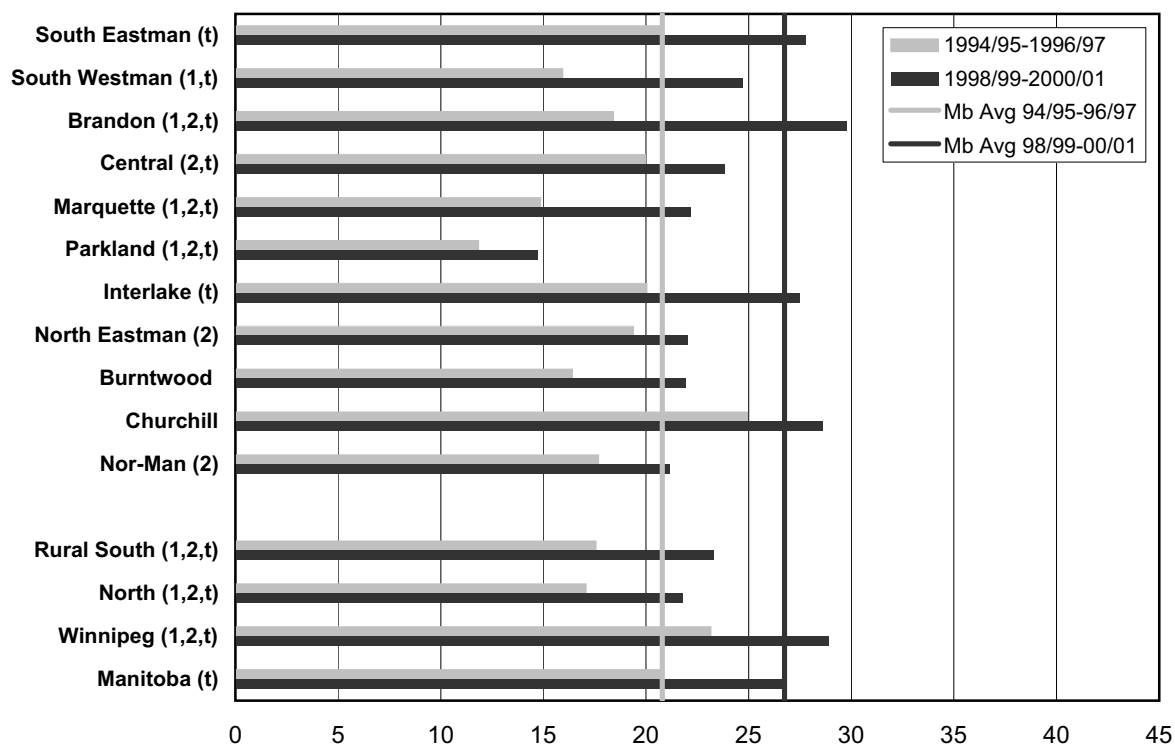
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Figure 10.7.2: Cataract Surgery Rates by District

Age- & sex-adjusted rate of cataract surgery per 1000 residents age 50+

Legend:
- 1994/95-1996/97
- 1998/99-2000/01
- Mb Avg 94/95-96/97
- Mb Avg 98/99-00/01

Districts (top to bottom):
SE Northern
SE Central (t)
SE Western
SE Southern (t)

SW District # 3
SW District # 1 (1,t)
SW District # 2 (1,t)

Bdn West (2,t)
Bdn Rural
Bdn East (t)

MacDonald/Cartier
Morden/Winkler (2)
Altona (2)
Carman (2)
Morris/Montcalm
Lorne/Louise/Pem (2)
Seven Regions
Portage (2,t)

MQ District # 4 (1,2,t)
MQ District # 3 (1,t)
MQ District # 2 (1,t)
MQ District # 1 (1,2)

PL West (1,2)
PL Central (1,2,t)
PL East
PL North (1,2)

IL Southwest
IL Southeast (t)
IL Northeast (t)
IL Northwest (t)

Springfield (2)
Winnipeg River
Brokenhead
Iron Rose
Blue Water
Northern Remote

Thompson
Oxford H & Gods
Cross Lake
Lynn/Leaf/SIL
Island Lake
Tad/Broch/Lac Br
Gillam/Fox Lake
Thick Por/Pik/Wab (s)
Norway House
Sha/York/Split/War
Nelson House (s)

Churchill

F Flon/Snow L/Cran (2)
The Pas/OCN/Kelsey
Nor-Man Other

X-axis: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45

10.8 Computed Tomography (CT) Scans

Definition: This is the number of CT scans performed, per thousand residents, regardless of location of provision. This rate counts person-visits to the CT suite, so if multiple body parts are scanned, this is counted as only one 'episode.' Scans done at the Dauphin Hospital do not have individual-level claims associated with them, so we cannot include them in this analysis (because we do not know to whom they were provided). This markedly affects rates for Parkland residents, and may affect rates for residents of neighbouring RHAs as well.

Figure 10.8.1: CT Scan Rates by RHA
Age- & sex-adjusted rate of CT Scans per 1000 residents
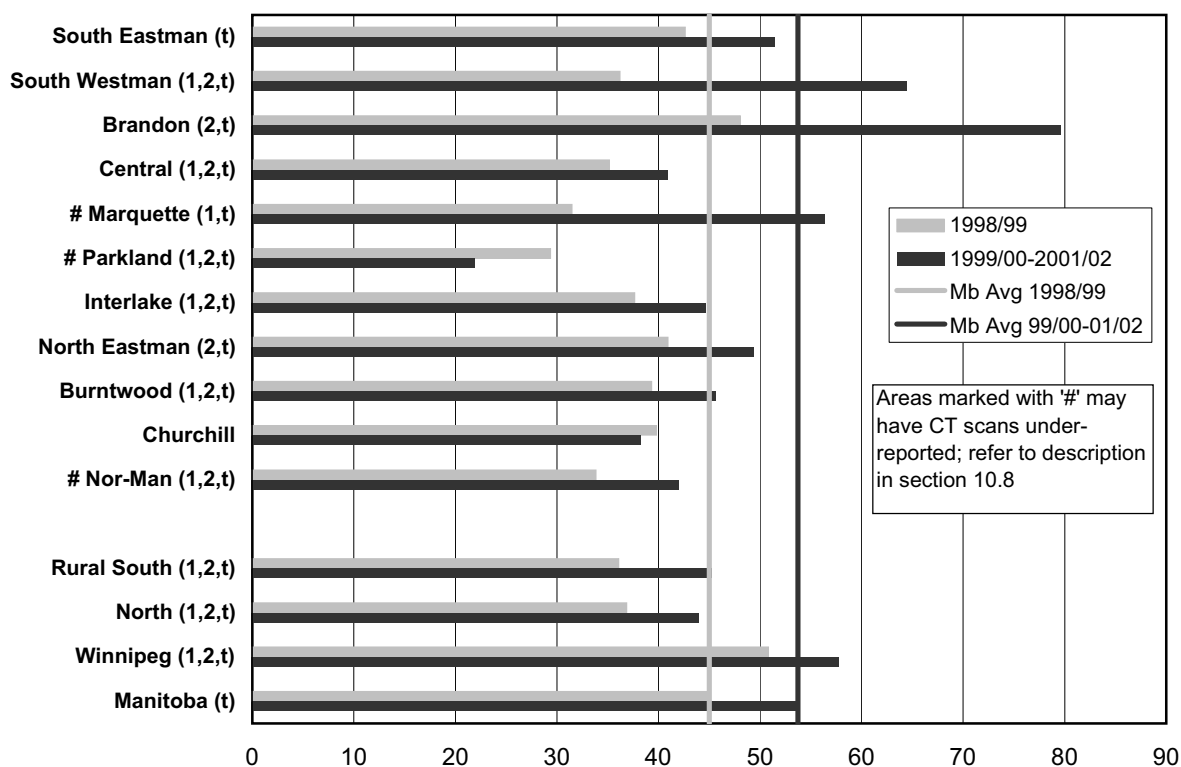
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 10.8.2: CT Scan Rates by District
Age- & sex-adjusted rate of CT Scans per 1000 residents

Legend:
- 1998/99
- 1999/00-2001/02
- Mb Avg 1998/99
- Mb Avg 99/00-01/02

Districts (top to bottom):
SE Northern, SE Central (t), SE Western, SE Southern (t), SW District # 3 (1,t), SW District # 1 (2,t), SW District # 2 (1,2,t), Bdn West (2,t), Bdn Rural (2,t), Bdn East (1,2,t), MacDonald/Cartier, Morden/Winkler (1,2), Altona (1,2), Carman (2), Morris/Montcalm (1,t), Lorne/Loiuse/Pem (1,2,t), Seven Regions (1,t), Portage (1,2), # MQ District # 4 (1,t), # MQ District # 3 (1,t), # MQ District # 2 (1,2,t), # MQ District # 1 (1,t), # PL West (1,2,t), # PL Central (1,2,t), # PL East (2), # PL North (1,2), IL Southwest (1,2,t), IL Southeast (2), IL Northeast (1,2,t), IL Northwest (1,t), Springfield, Winnipeg River (2), Brokenhead (2), Iron Rose, Blue Water (t), Northern Remote, Thompson (1,t), Oxford H & Gods, Cross Lake, Lynn/Leaf/SIL, Island Lake, Tad/Broch/Lac Br, Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House, Sha/York/Split/War, Nelson House, Churchill, # F Flon/Snow L/Cran (1,2), # The Pas/OCN/Kelsey (t), # Nor-Man Other

Areas marked with '#' may have CT scans under-reported; refer to description in section 10.8

High Variation (Discretionary) Procedures:

10.9 Tonsillectomy/Adenoidectomy

Definition: This is the number of tonsillectomy and/or adenoidectomy pro-
cedures performed per thousand residents aged 0-14 years, regardless of
location of provision. This is age- and sex-adjusted to reflect the population
of Manitoban ages 0 through 14.

Figure 10.9.1: Tonsillectomy/Adenoidectomy Rates by RHA

Age- & sex-adjusted tonsillectomy/adenoidectomy rates per 1000 children age 0-14 years

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
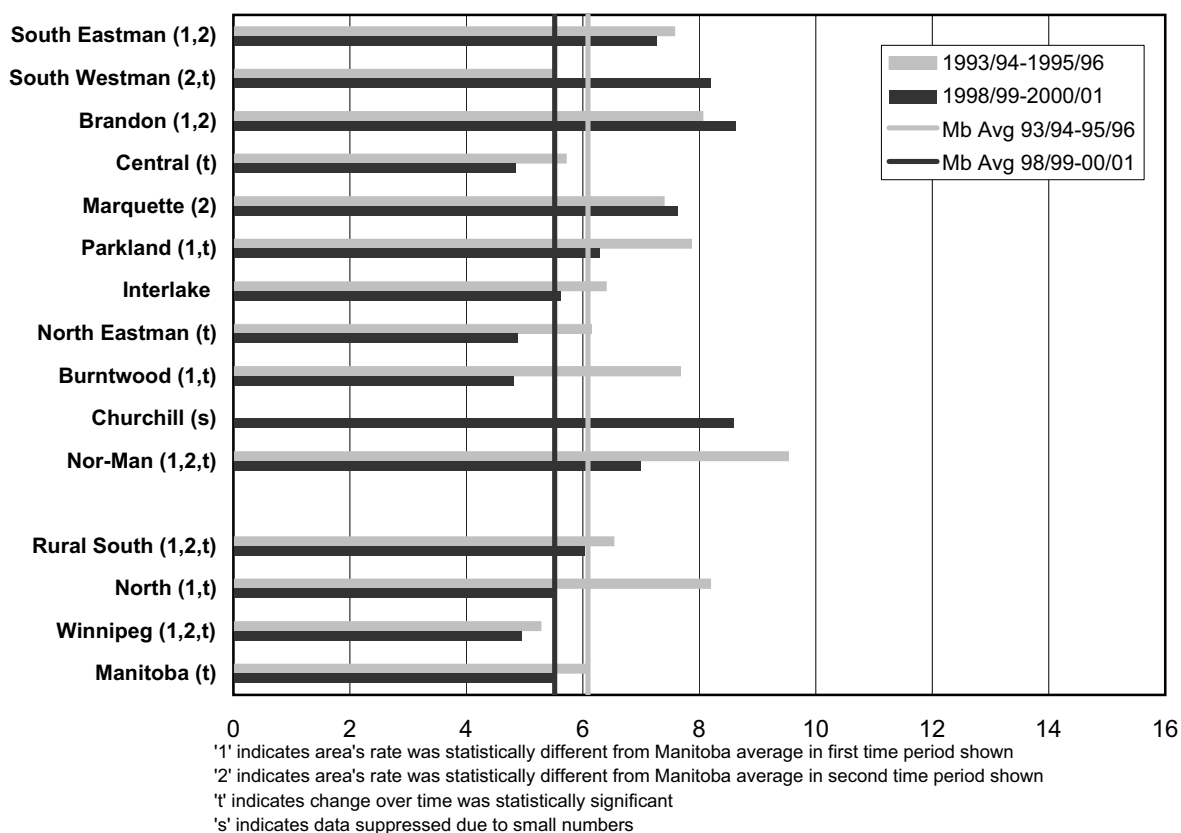
Figure 10.9.2: Tonsillectomy/Adenoidectomy Rates by District

Age- & sex-adjusted tonsillectomy/adenoidectomy rates per 1000 children age 0-14 years
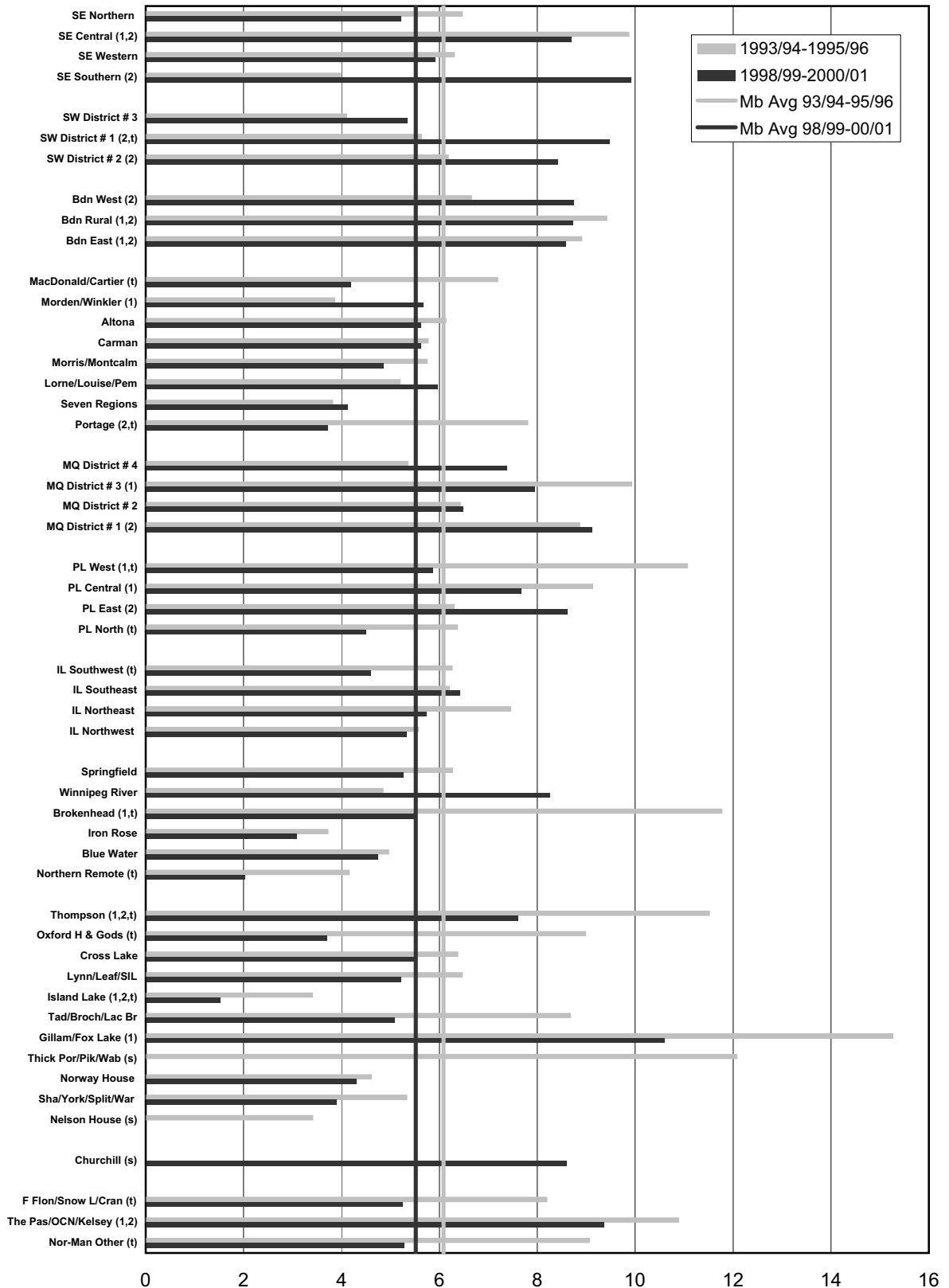
10.10 Hysterectomy

Definition: This is the number of hysterectomies performed per thousand women aged 25 or older, regardless of location of provision. This is age-adjusted to reflect the female population of Manitoba aged 25 or older. Hysterectomy is a surgical operation to remove a woman's uterus (subtotal hysterectomy), or uterus and cervix (total hysterectomy).

Figure 10.10.1: Hysterectomy Rates by RHA
Age-adjusted hysterectomy rates per 1000 women age 25+

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
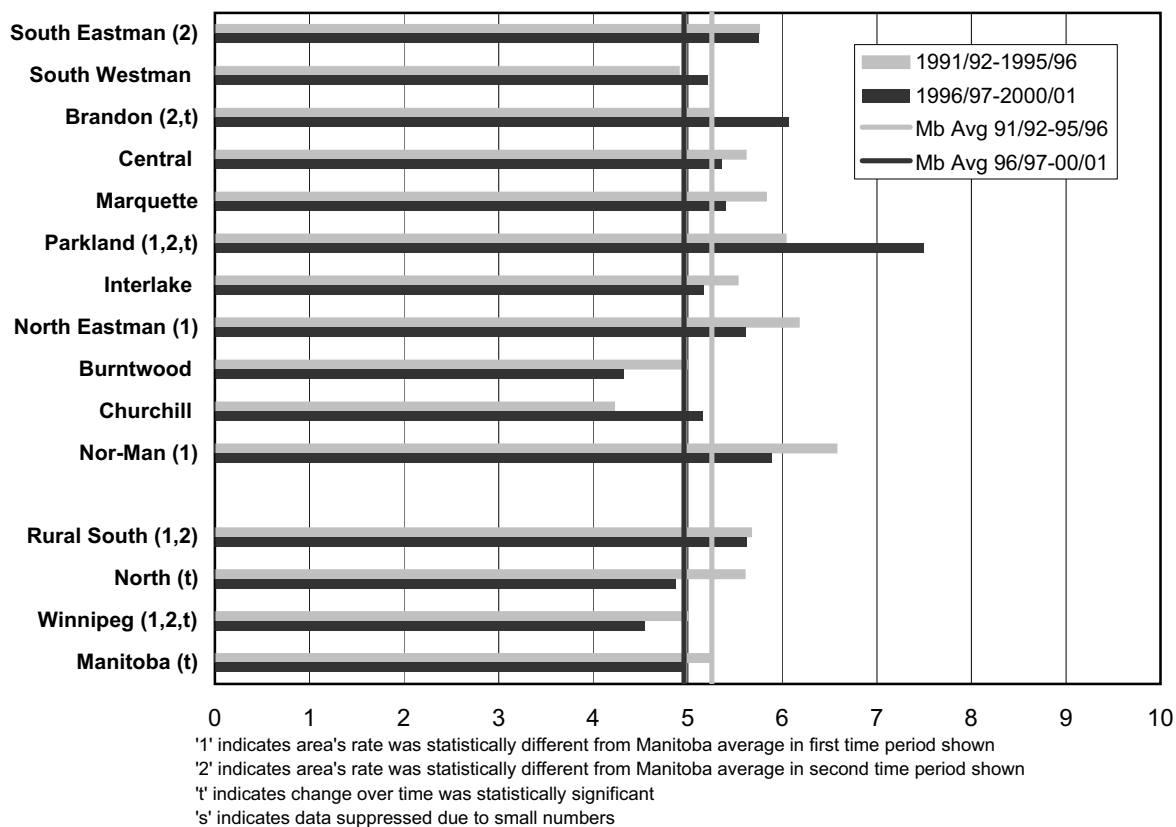
Figure 10.10.2: Hysterectomy Rates by District

Age-adjusted hysterectomy rates per 1000 women age 25+
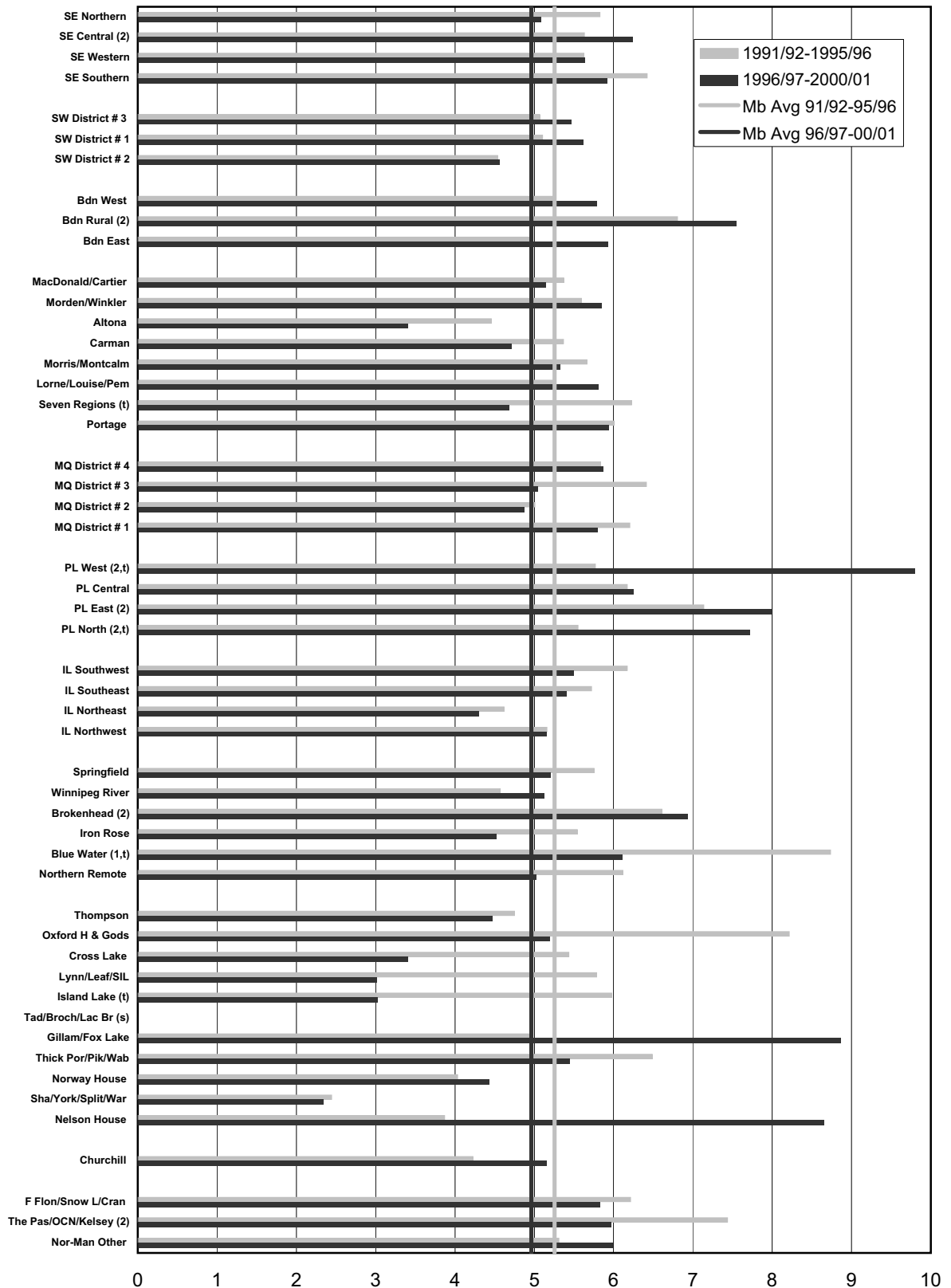
10.11 Caesarean Section (C-Section)

Definition: This is the percentage of all births delivered by Caesarean Section, regardless of location of provision. This is age-adjusted to reflect the age distribution of mothers giving birth, as the risk of C-section is known to increase with maternal age.

Figure 10.11.1: C-Section Rates by RHA

Age-adjusted percentage of births delivered by Caesarian Section

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
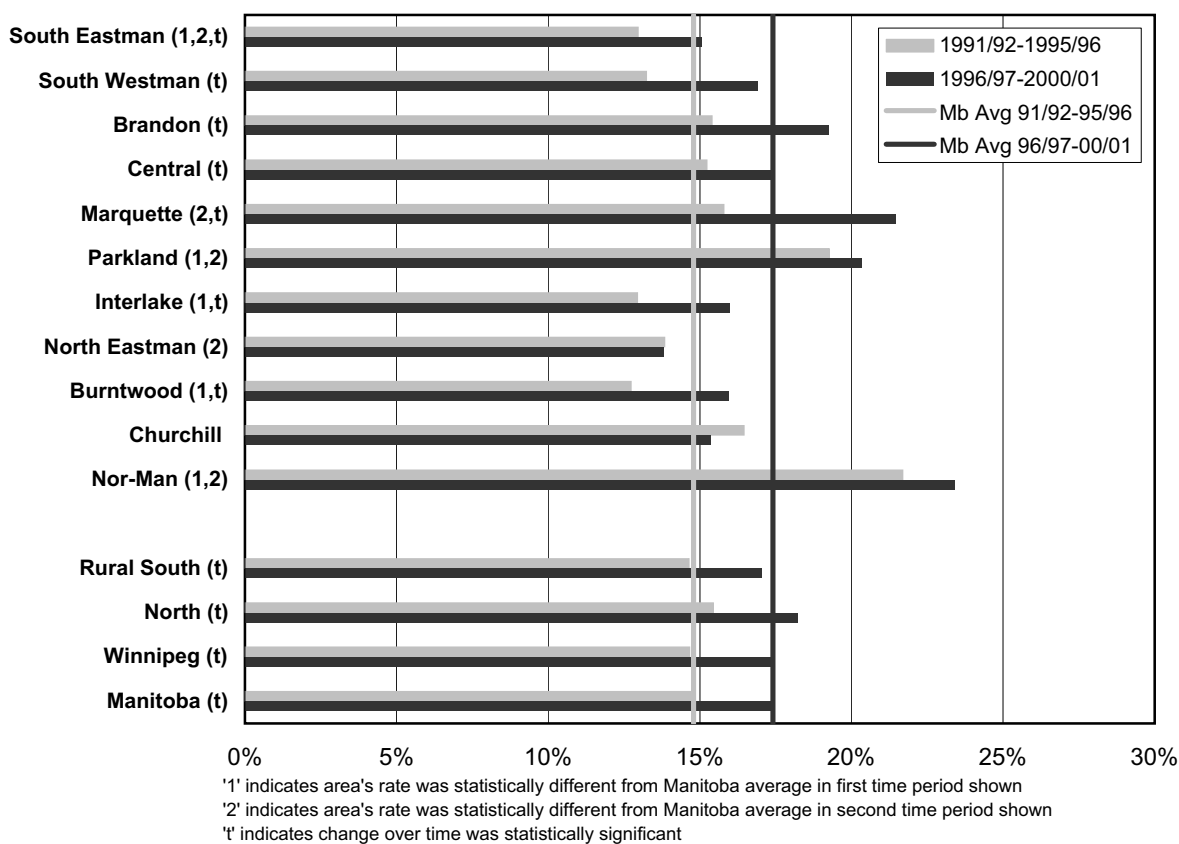
Figure 10.11.2: C-Section Rates by District

Age-adjusted percentage of births delivered by Caesarian Section
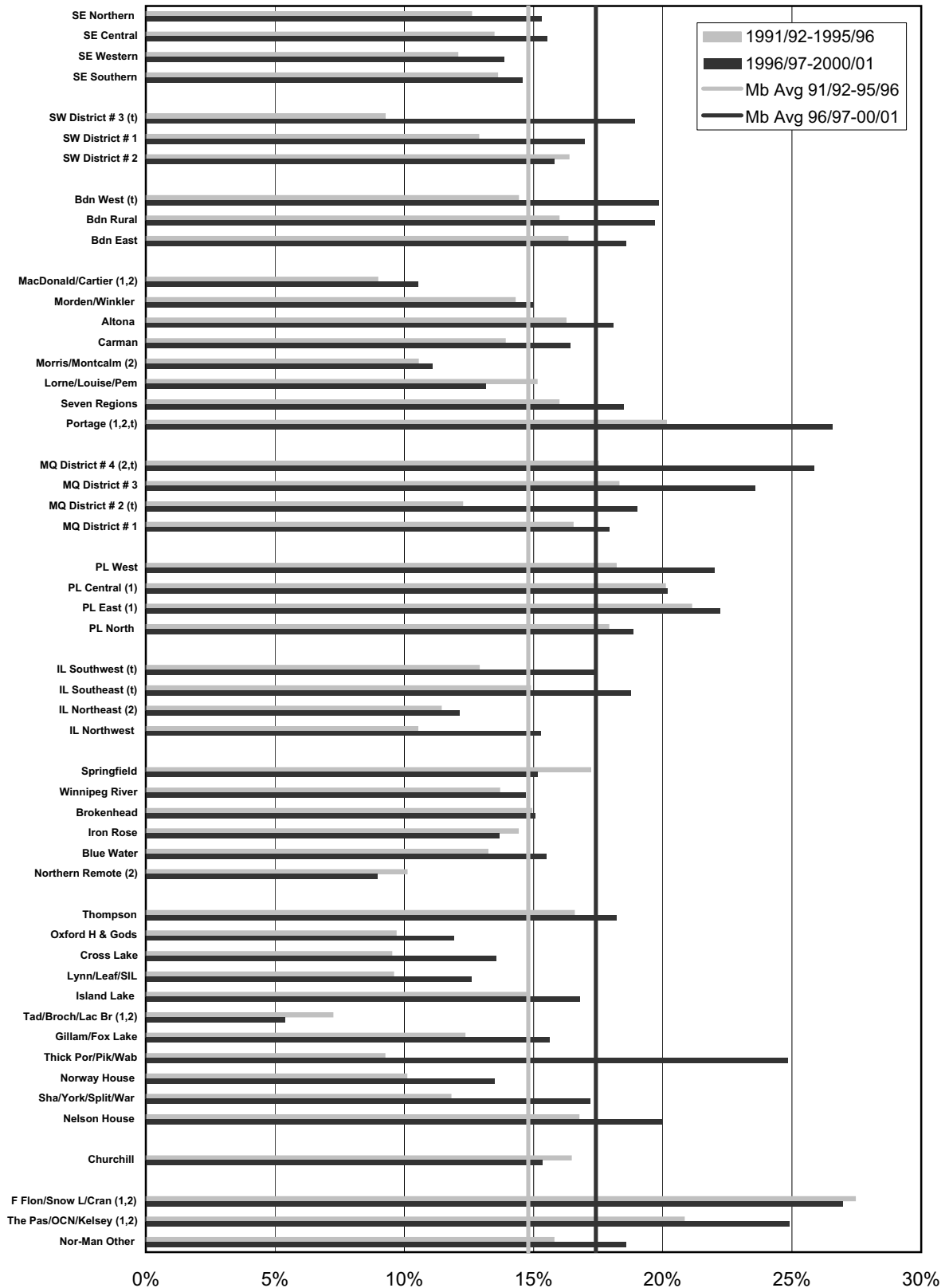
Chapter 11: Home Care and Nursing Homes

11.1   What's in This Chapter?

Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of use of home care services and Provincial Personal Care Homes (PCH). There are also several 'Federal' nursing homes in Manitoba. These facilities are included in the bed map, to ensure accurate representation of total capacity, but since utilization data are not available, the federal facilities could not be included in the other analyses.

Home Care: Our analyses of Home Care service use included clients of all ages. Since individuals can receive more than one 'episode' of home care support over the two-year periods used, each opened and closed episode is counted as a separate case. For all home care analyses, residents of all ages were used. The Home Care indicators include:

- New Home Care cases (Section 11.2)
- Open Home Care cases (Section 11.3)
- Home Care cases closing (Section 11.4)
- Average length of Home Care case (Section 11.5)

Personal Care Homes: All PCH analyses were performed using the client's location of residence as of December 31 of the year preceding admission, so that they reveal the usage patterns of persons 'formerly' resident in the region. Our analyses of PCH use included only residents aged 75 and over. Parallel analyses were done using the population 65+, and the entire population, and the trends were virtually identical. PCH indicators include:

- Supply of PCH Beds (provincial and federal) (Section 11.6)
- Admissions to PCH (Section 11.7)
- Residents (Section 11.8)
- Median Wait for Admission (Section 11.9)
- Level of Care on Admission (Section 11.10)
- Median Length of Stay by Level of Care at Admission (Section 11.11)

Example: Marquette RHA

The former Marquette RHA was a region of average health status, with a population profile showing a greater proportion of older adults. However, the service use rates we present are adjusted to account for the age and sex structure of local populations. Therefore, we would expect average use of both home care services and personal care homes.

Figure 11.2.1 shows 'admissions' to the home care program, and the Marquette values are significantly lower than the provincial averages (both time periods). This graph shows only admissions - not 'total' number of home care cases open (that's in the next section). So this lower than expected admission rate might be understandable if there were a relatively large number of residents with cases already open. But, surprisingly, Figure 11.3.1 shows just the opposite: Marquette RHA residents have a lower than average rate of receipt of home care services. The rate of case 'closings' shown in Figure 11.4.1 also shows low values for Marquette residents, though their average length of open cases is about average (Figure 11.5.1). So it appears that, compared to the provincial averages, residents of Marquette receive less home care service.

Perhaps some illumination for this perplexing situation is provided by the results of the Personal Care Home (PCH) analyses. Marquette residents experience near-average rates of admission and placement in personal care homes, and lower than average waiting times (Figures 11.7, 11.8 and 11.9, respectively). However, Figure 11.10 reveals that Marquette (along with the former South Westman) has a considerably higher rate of PCH placements at Levels 1 or 2 (lower acuity). That is, among Marquette residents, over 66% of admissions were at Level 1 or 2, whereas the provincial average was 50% (citing the more recent time period).

Taken together, these home care and PCH analyses suggest that there might be some room for expansion of the home care program, thereby avoiding some Level 2 admissions to PCHs. This may become particularly important if future demand for Level 3 placements increases.

Closer Examination of Home Care Data
The information provided regarding home care use, especially over the two time periods, may seem difficult to 'put together' at first. The following example is meant to help clarify the situation, again using Marquette RHA as the example. The analogy of water flowing into and out of a storage tank is used to illustrate the data and its interpretation.

In the first time period, around 1995, the 'incidence' rate (number of new cases of home care) was about 8 per 1000 residents - this is represented by the 'inflow' rate in the diagram below. The 'prevalence' or number of open cases at that time was about 16 per 1000, represented by the level of water in the tank. The 'closing' rate, represented by the 'outflow' in the figure, was just below 7 per 1000 residents. Since the inflow is greater than outflow rate, we would expect that the level would be rising thereafter.

The data for the second time period reflect exactly that finding: the prevalence (level of water in the tank) is now up to 21 open cases per 1000 residents. The inflow rate is still higher than the outflow rate in 2000, so we can predict that the water level in the tank (the prevalence of open cases) will continue to rise. This will only stabilize or reverse when the case closing rate (outflow) catches up to or exceeds the incidence rate (inflow).
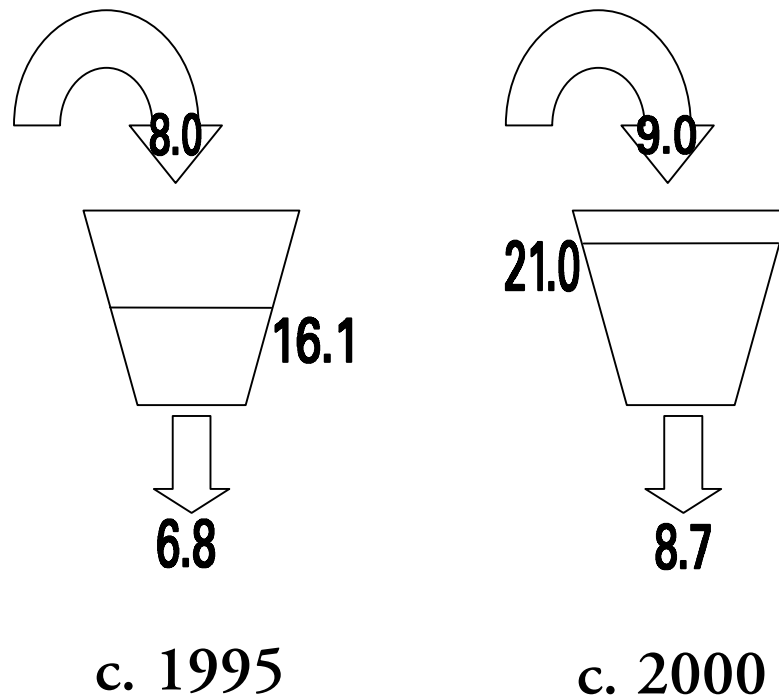
8.0   9.0

16.1   21.0

6.8   8.7

c. 1995   c. 2000

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *How many home care cases are open in your RHA, and how does this compare to other regions?*
- *If home care use is high, is this because of long stays, high admissions, or few closings? If this is low, is your rate of PCH use higher than average, or less acute than average?*
- *What is your PCH bed supply in relationship to other RHAs? How does this influence your regional use of PCH days or your home care patterns?*
- *What is the average acuity level of PCH residents? Has the level of acuity in PCHs changed in your region over time? How does that compare with other regions?*
- *How would you "draw" the picture of your home care rates in terms of a water tank (inflow rate, level in the tank, and outflow rate) like in the example given for Marquette's home care data above? Does this make sense from the earlier to the later time period for your RHA, and what predictions would you make for the future?*

11.2 New Home Care Cases ('incidence')

Definition: This is the number of new home care cases being opened per thousand residents. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 11.2.1: New Home Care Cases by RHA

Age- & sex-adjusted rate of new home care cases being opened per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
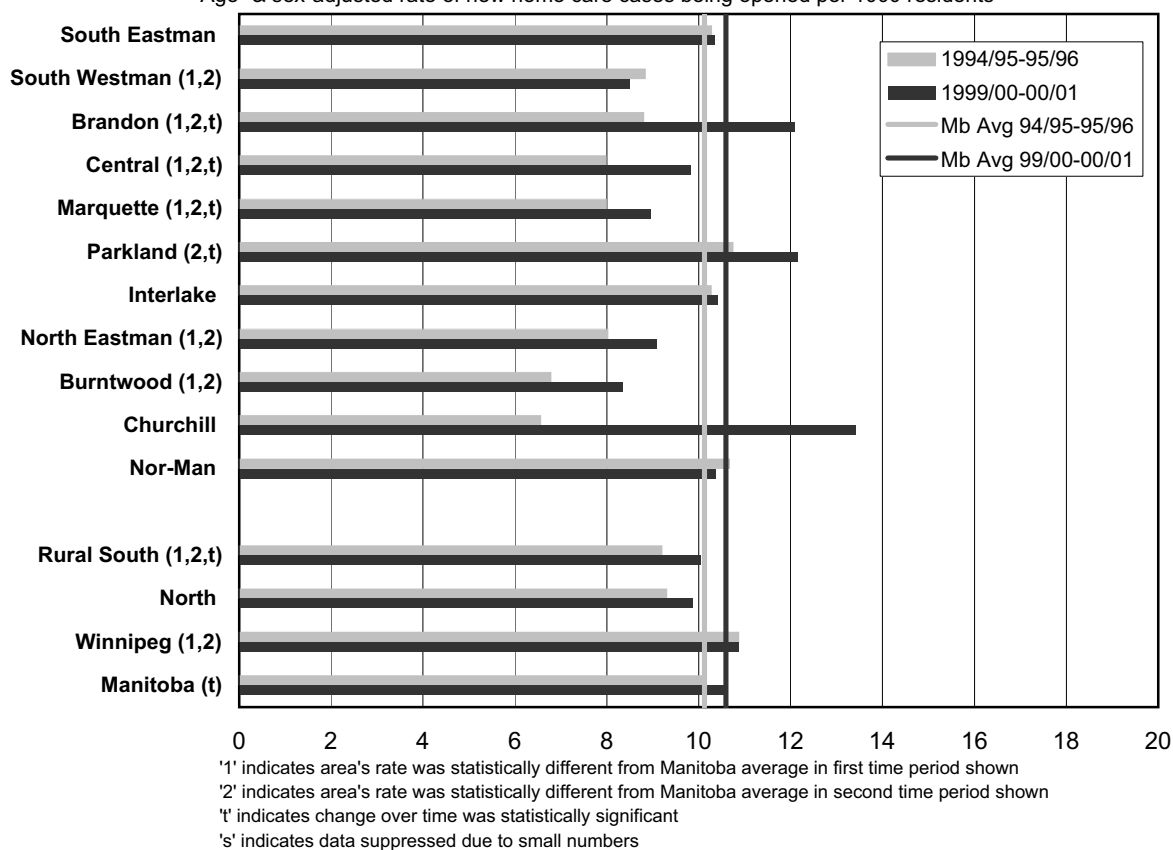
Figure 11.2.2: New Home Care Cases by District

Age- & sex-adjusted rate of new home care cases being opened per 1000 residents

Legend:
- 1994/95-95/96
- 1999/00-00/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern, SE Central, SE Western, SE Southern, SW District # 3 (2,t), SW District # 1 (2), SW District # 2 (1,2), Bdn West (1,t), Bdn Rural, Bdn East (2,t), MacDonald/Cartier (1,t), Morden/Winkler (1), Altona (1,2), Carman (1,t), Morris/Montcalm, Lorne/Louise/Pem (1,t), Seven Regions (1,2,t), Portage, MQ District # 4, MQ District # 3 (1,2), MQ District # 2 (1,t), MQ District # 1 (1,2), PL West, PL Central (2,t), PL East (1,t), PL North (2,t), IL Southwest, IL Southeast, IL Northeast, IL Northwest, Springfield, Winnipeg River (1,t), Brokenhead, Iron Rose, Blue Water (1,2), Northern Remote, Thompson (2), Oxford H & Gods, Cross Lake (2), Lynn/Leaf/SIL, Island Lake (1,2), Tad/Broch/Lac Br (s), Gillam/Fox Lake, Thick Por/Pik/Wab (1), Norway House, Sha/York/Split/War, Nelson House (s), Churchill, F Flon/Snow L/Cran, The Pas/OCN/Kelsey, Nor-Man Other

Thick Por/Pik/Wab (1): 1994/95 - 1995/96: 29

X-axis: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

11.3 Open Home Care Cases ('prevalence')

Definition: This is the total number of open cases of home care per thousand residents. This is age- and sex-adjusted to reflect the population of Manitoba. A resident could have more than one 'episode' of home care in the two-year period, and these will both be counted as separate cases.

Figure 11.3.1: Open Home Care Cases by RHA

Age- & sex-adjusted rate of open home care cases over period (prevalence) per 1000 residents
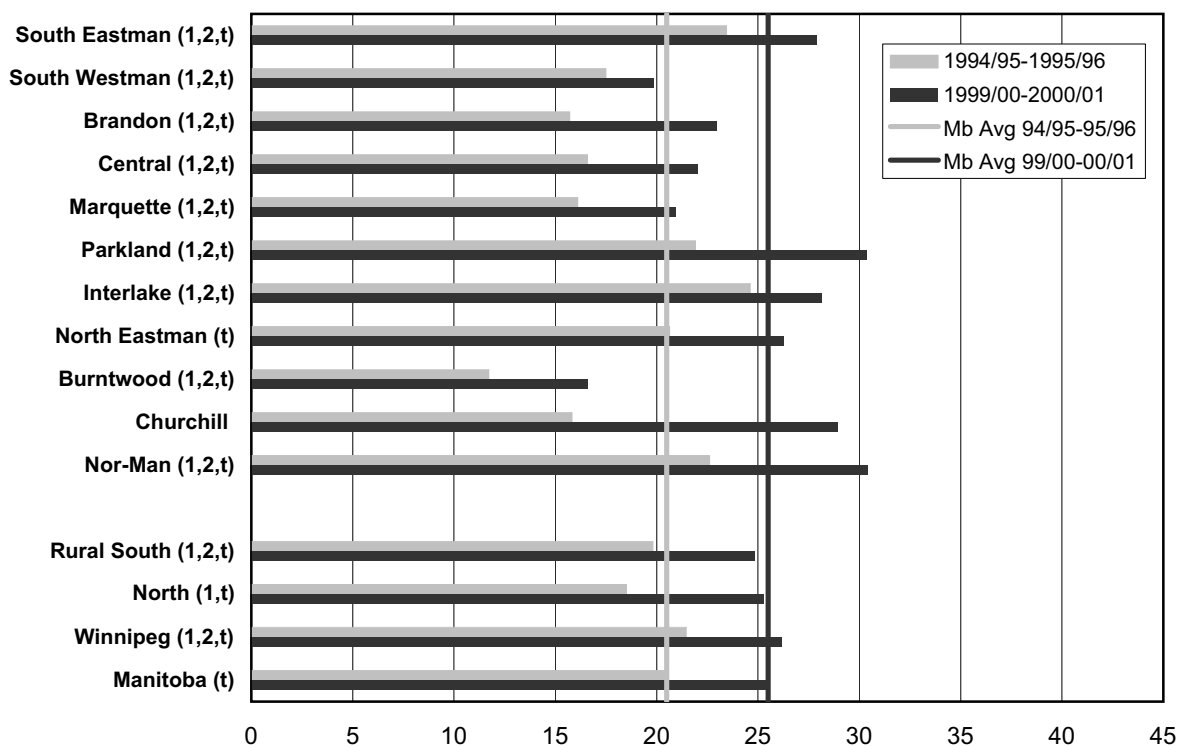
"1' indicates area's rate was statistically different from Manitoba average in first time period shown
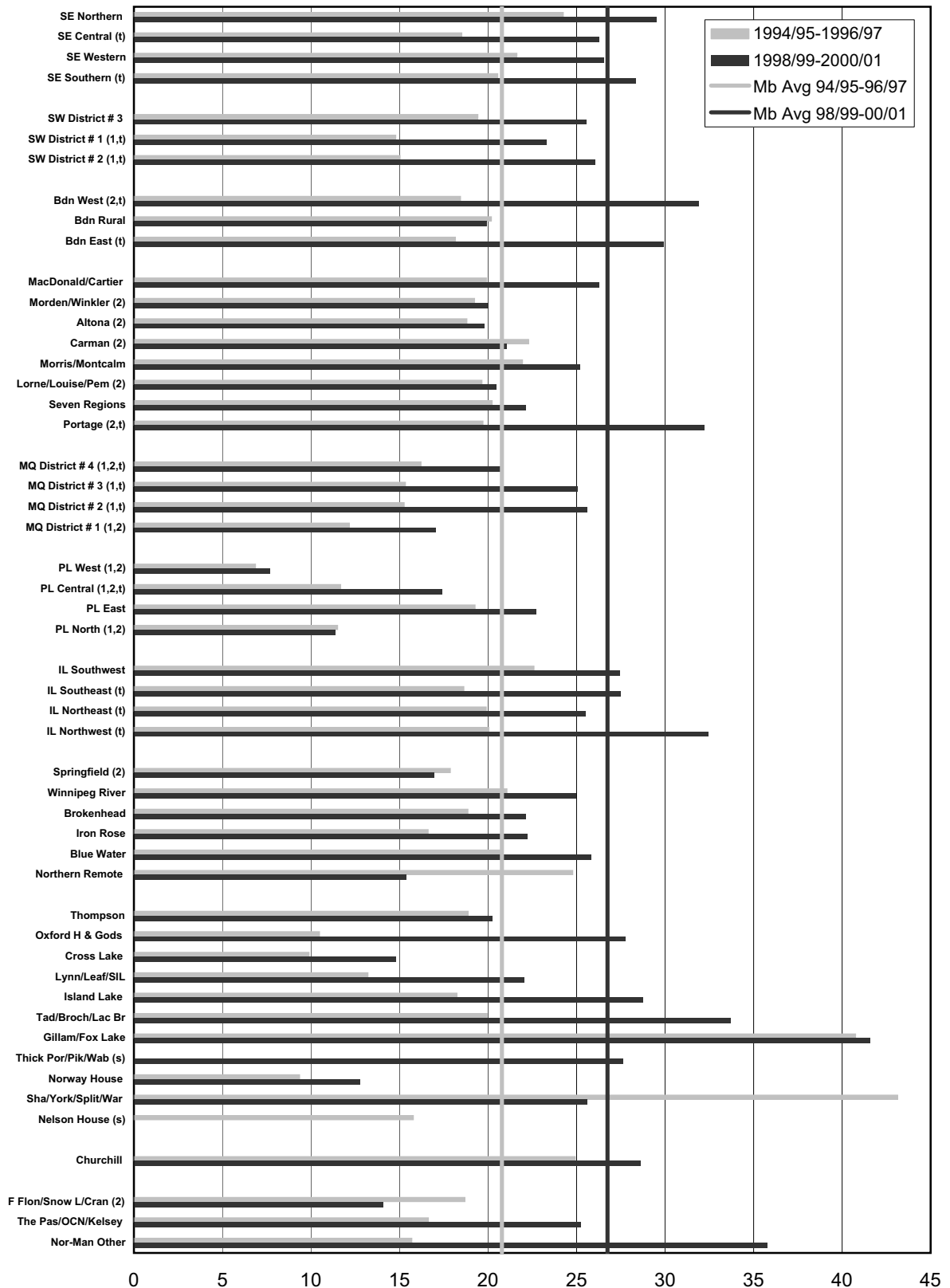'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Figure 11.3.2: Open Home Care Cases by District

Age- & sex-adjusted rate of open home care cases over period (prevalence) per 1000 residents

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern (2,t), SE Central (1,t), SE Western (t), SE Southern (1,2), SW District # 3 (2), SW District # 1 (1,2,t), SW District # 2 (1,2,t), Bdn West (1,2,t), Bdn Rural (1,2), Bdn East (1,t), MacDonald/Cartier (1,t), Morden/Winkler (1,2,t), Altona (1,2), Carman (1,t), Morris/Montcalm (1,t), Lorne/Louise/Pem (1,t), Seven Regions (1,2,t), Portage (1,2,t), MQ District # 4 (1,t), MQ District # 3 (1,2,t), MQ District # 2 (1,2,t), MQ District # 1 (1,2,t), PL West (1,t), PL Central (1,2,t), PL East (1,2,t), PL North (2,t), IL Southwest (1,2), IL Southeast (1,2,t), IL Northeast (2), IL Northwest (2,t), Springfield (t), Winnipeg River (1,t), Brokenhead (1), Iron Rose (t), Blue Water, Northern Remote (1,2), Thompson (1,2), Oxford H & Gods (1,2), Cross Lake (1,2), Lynn/Leaf/SIL (1,2), Island Lake (1,2), Tad/Broch/Lac Br, Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House (1,2), Sha/York/Split/War, Nelson House (s), Churchill, F Flon/Snow L/Cran (1,2,t), The Pas/OCN/Kelsey (2,t), Nor-Man Other (2)

11.4 Closing Home Care Cases

Definition: This is the number of home care cases closed per thousand residents. This is age- and sex-adjusted to reflect the population of Manitoba.

Figure 11.4.1: Home Care Case Closing Rates by RHA
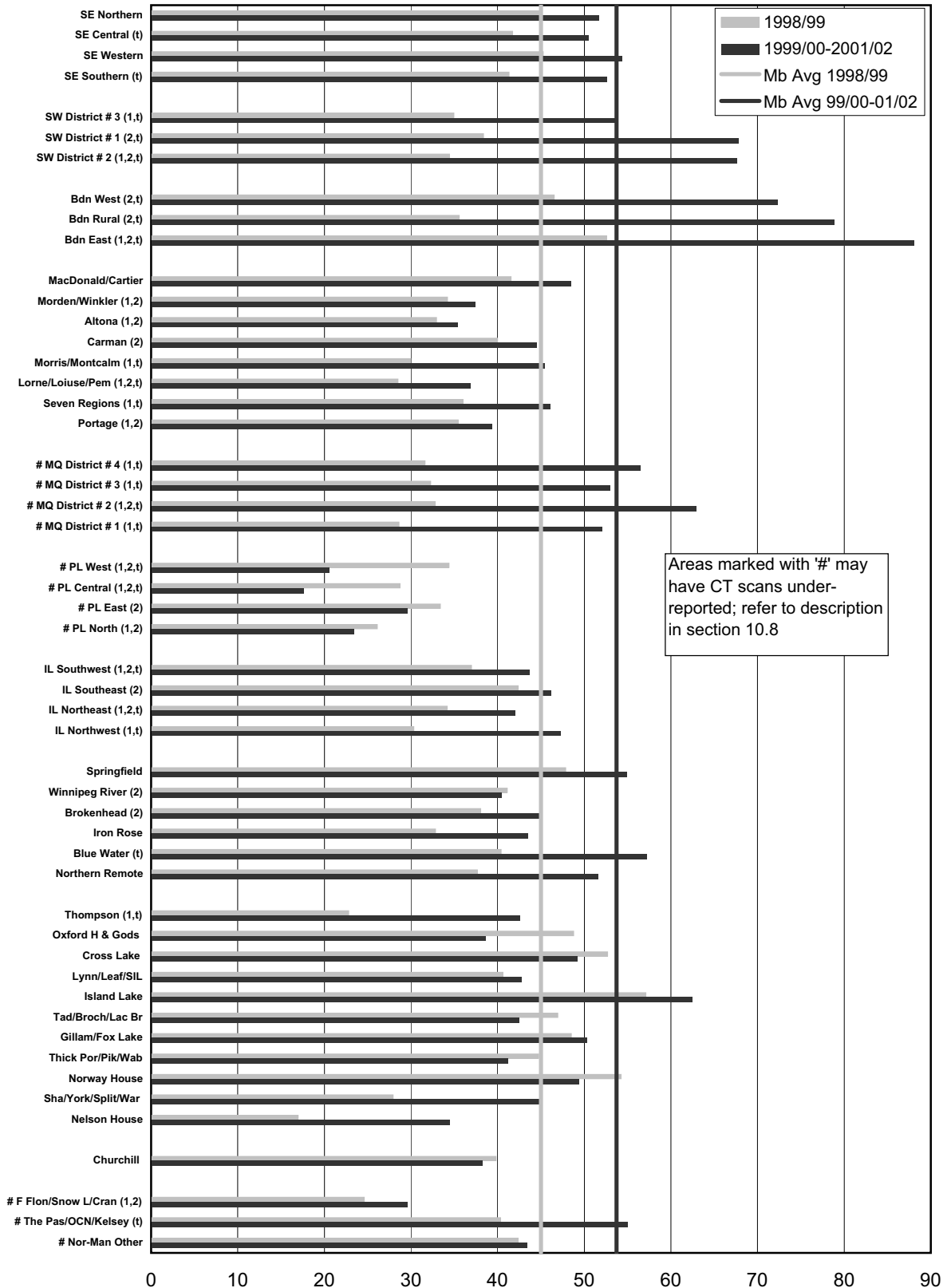Age- & sex-adjusted rate of home care case closures over period per 1000 residents

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
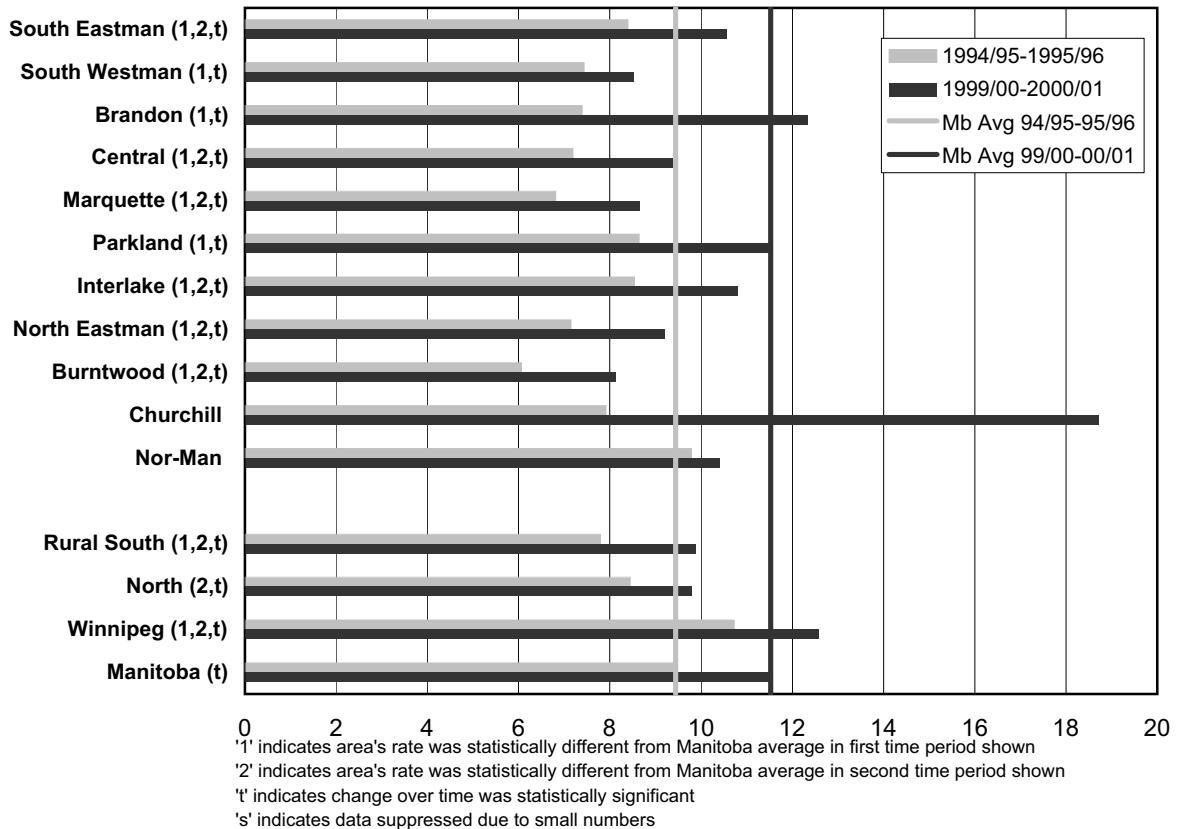
Figure 11.4.2: Home Care Case Closing Rates by District

Age- & sex-adjusted rate of home care case closures over period per 1000 residents

Legend:
- 1994/95-1995/96
- 1999/00-2000/01
- Mb Avg 94/95-95/96
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern (t), SE Central (t), SE Western (t), SE Southern, SW District # 3 (2), SW District # 1 (1,2,t), SW District # 2 (1,2,t), Bdn West (1,t), Bdn Rural, Bdn East (2,t), MacDonald/Cartier (1,t), Morden/Winkler (1,2,t), Altona (1,2), Carman (1,t), Morris/Montcalm, Lorne/Louise/Pem (1,t), Seven Regions (1,2,t), Portage, MQ District # 4 (2,t), MQ District # 3 (1,2), MQ District # 2 (1,2,t), MQ District # 1 (1,2), PL West, PL Central (2,t), PL East, PL North (1,t), IL Southwest (t), IL Southeast (t), IL Northeast (1,2,t), IL Northwest (1,t), Springfield (1,t), Winnipeg River (1,t), Brokenhead, Iron Rose (2), Blue Water (1,2), Northern Remote, Thompson (2), Oxford H & Gods, Cross Lake (2), Lynn/Leaf/SIL, Island Lake (2), Tad/Broch/Lac Br (s), Gillam/Fox Lake (s), Thick Por/Pik/Wab, Norway House, Sha/York/Split/War, Nelson House (s), Churchill, F Flon/Snow L/Cran, The Pas/OCN/Kelsey, Nor-Man Other (2)

11.5 Average Length of Home Care Cases

Definition: This is the average number of days of home care received per case. (Note: we also analyzed the 'median' in addition to the 'mean,' and found the values and trends to be virtually identical to each other.)

Figure 11.5.1: Average Length of Home Care Cases by RHA

Age- & sex-adjusted mean length of home care cases (days)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
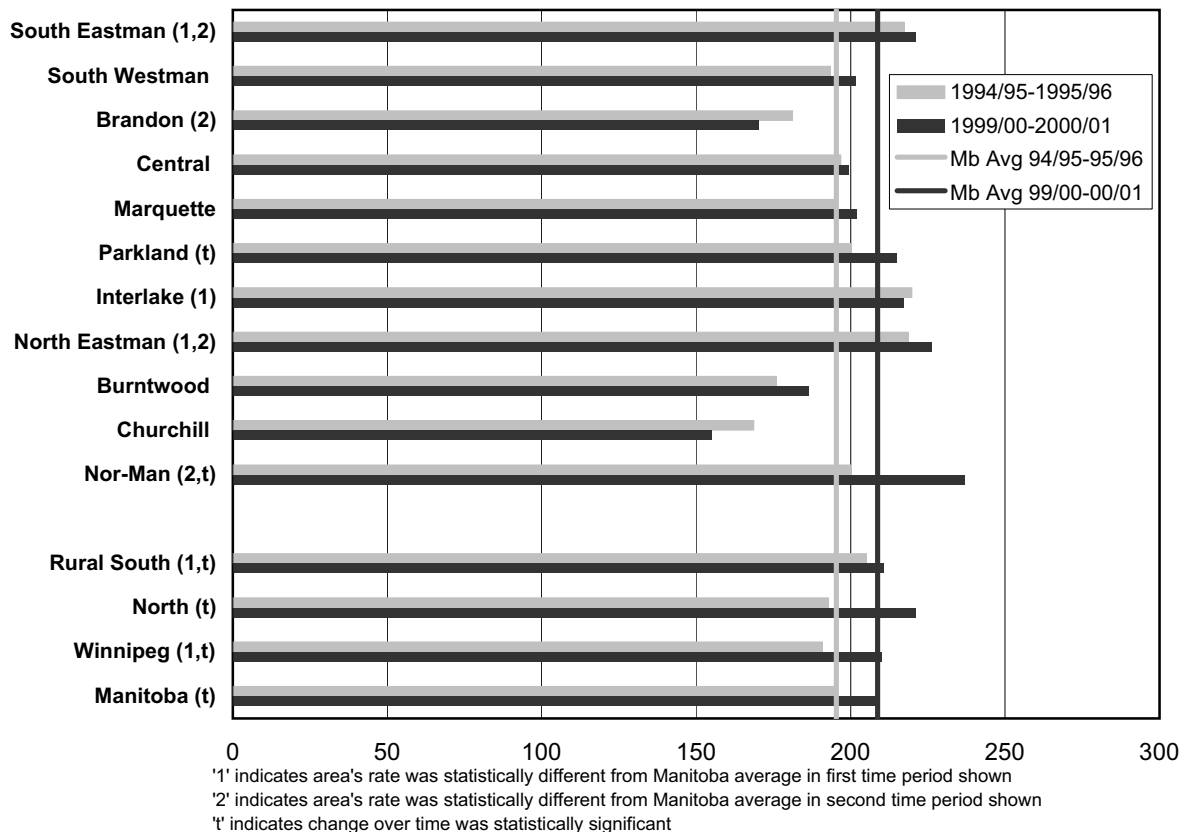
Figure 11.5.2: Average Length of Home Care Cases by District
Age- & sex-adjusted mean length of home care cases (days)
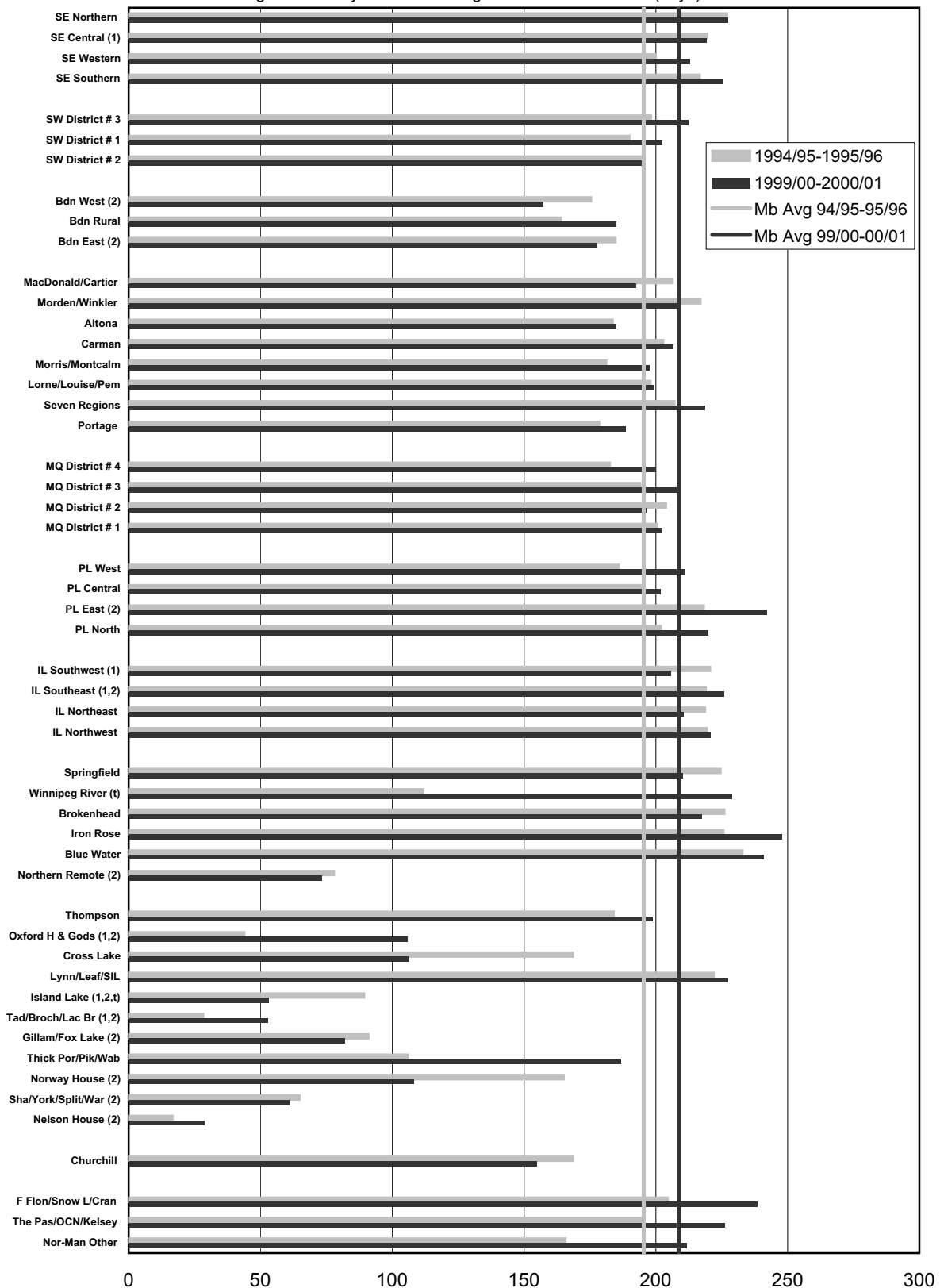
11.6 Supply of Personal Care Home (PCH) Beds (provincial and federal)

Definition: This is the number of PCH beds per thousand residents aged 75+. Provincial bed counts were taken from the Manitoba Health Bed Map. Federal bed counts were provided by Health Canada (local office).

Figure 11.6.1: Supply of Personal Care Home Beds by RHA

"95" reflects data from 1994/95-1995/96; "00" refelcts data from 1999/00-2000/01

PCH beds per 1000 residents aged 75+
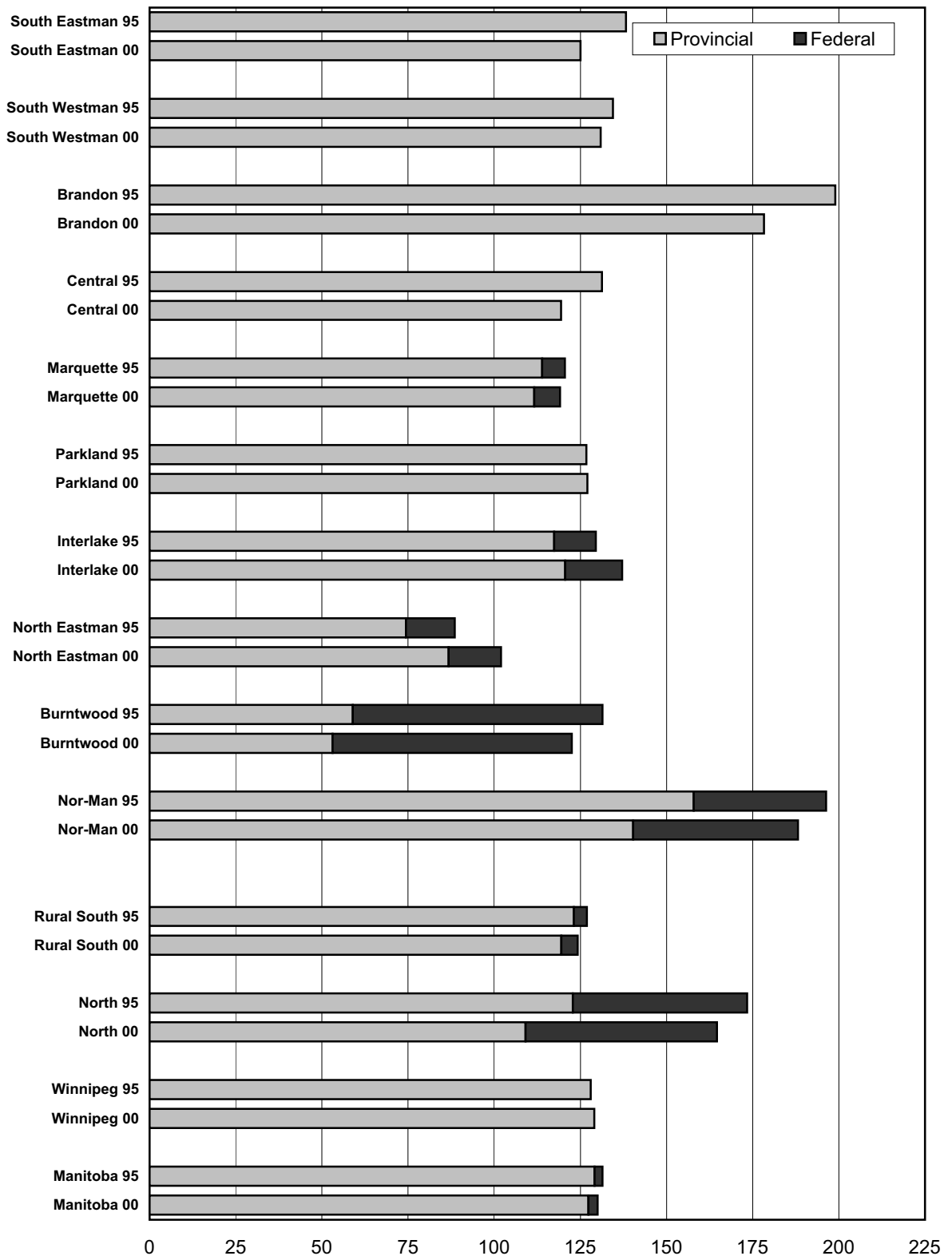
11.7   Admissions to Personal Care Homes (PCH)

Definition: This is the number of residents aged 75+ admitted to PCH for the first time, per thousand residents aged 75+. This is age- and sex-adjusted to reflect the population of Manitoba (75+). This only includes provincial PCH beds, not federal beds, due to lack of information on federal bed use in the provincial database.

Figure 11.7.1: Admissions to Personal Care Homes

Age- & sex-adjusted rate of provincial PCH admissions for residents aged 75+,
by region of residence prior to PCH admission (per 1000 RHA residents aged 75+)
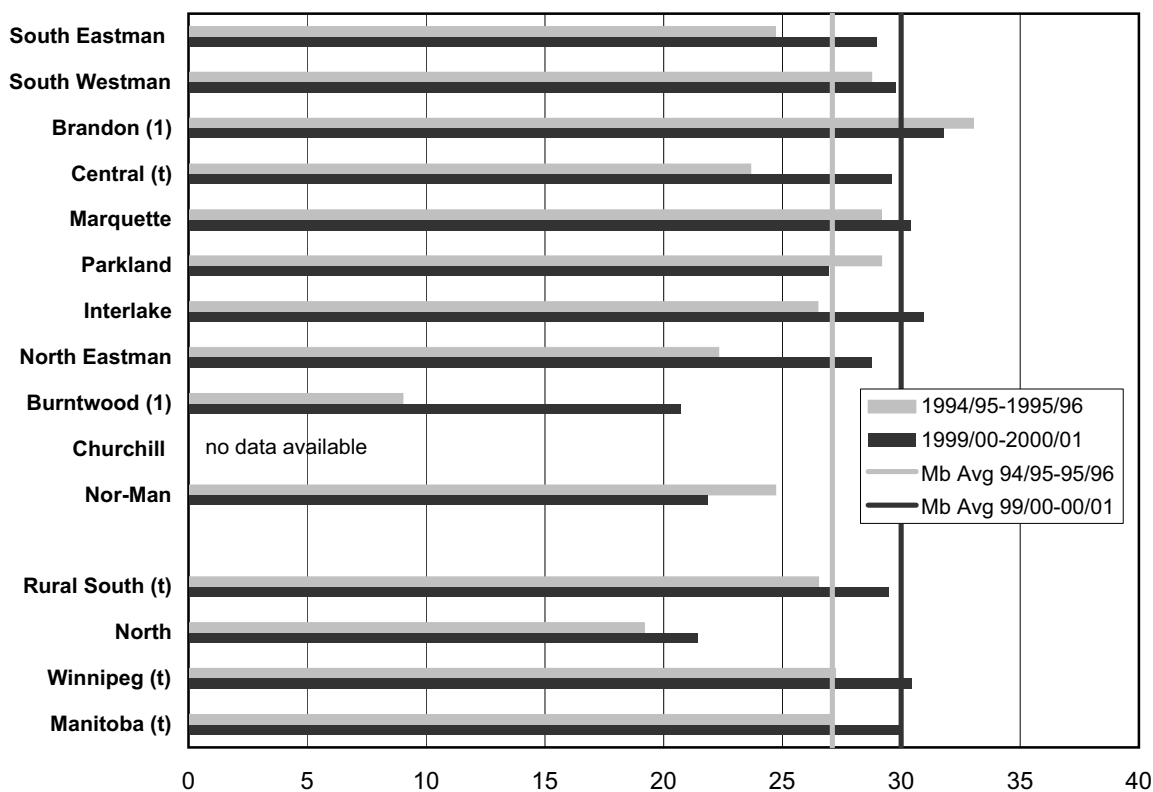
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

11.8 Personal Care Home (PCH) Residents

Definition: This is the number of residents aged 75+ who were in a provincial PCH for at least one day, per thousand residents aged 75+. This is age- and sex-adjusted to reflect the population of Manitoba (75+). This only includes provincial PCH beds, not federal beds, due to lack of information on federal bed use in the provincial database.

Figure 11.8.1: Residents in Personal Care Homes

Age- & sex-adjusted rate of residents aged 75+ living in a provincial PCH, by region of residence prior to PCH admission (per 1000 RHA residents aged 75+)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

11.9 Median Wait for Admission to Personal Care Homes (PCH)

Definition: The median waiting time for PCH admission is the amount of time it took for 1/2 of all residents to be admitted, after being assessed as requiring PCH placement. For example, in Manitoba in 1994/95-1995/96, the median was 14 weeks, so half of all PCH admittants waited less than 14 weeks from assessment to placement, while half waited longer. This only includes provincial PCH beds, not federal beds, due to lack of information on federal bed use in the provincial database.

Figure 11.9.1: Median Waiting Times for PCH Admission

Median # weeks from assessment to admission, by residence prior to admission, per 1000 age 75+

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
Statistical testing for changes over time could not be performed on these 'medians' with the method we used.

11.10 Level of Care on Admission to Personal Care Home (PCH)

Definition: This shows the percentage distribution of levels of care assigned to PCH residents upon first admission. This is age- and sex-adjusted to reflect the population of Manitoba (75+). This only includes provincial PCH beds, not federal beds, due to lack of information on federal bed use in the provincial database.

Figure 11.10.1: Level of Care on Admission to PCH Age 75+

"95" reflects 1994/95-1995/96; "00" reflects 1999/00-2000/01
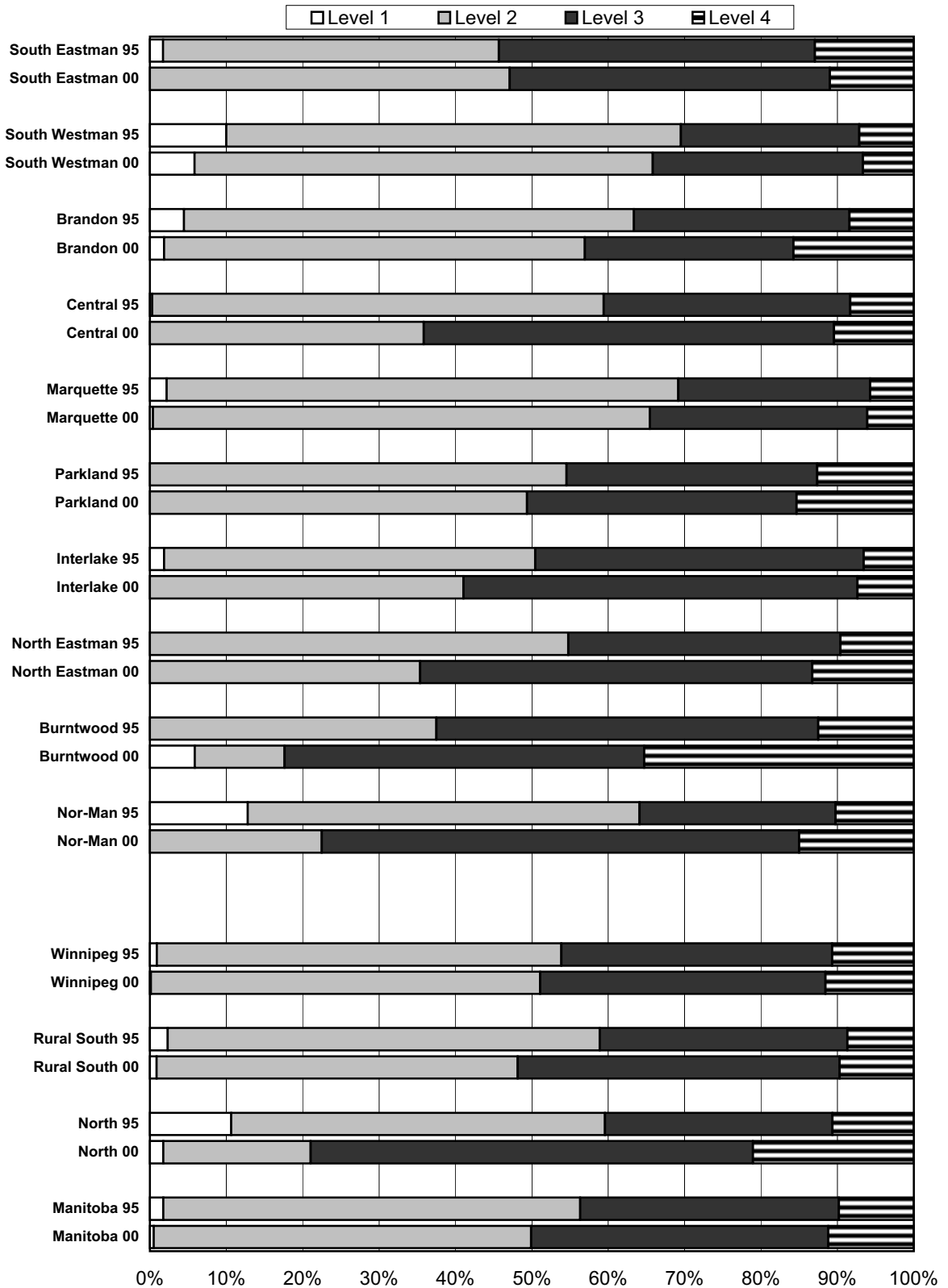
11.11 Median Length of Stay by Level of Care at Admission to Personal Care Home (PCH)

Definition: This table documents the median total length of stay (in years) of PCH residents, according to their level of care on admission. The median length of stay for PCH residents is the amount of time which half of all residents stayed. For example, in Manitoba in 1994/95-1995/96, the median was 2.55 years overall, though the medians vary dramatically by level of care. This only includes provincial PCH beds, not federal beds, due to lack of information on federal bed use in the provincial database.

Table 11.11: Median length of stay (years) by level of care at admission to PCH (empty cells: data suppressed due to small numbers)

"95" reflects data from 1994/95-1995/96; "00" reflects data from 1999/00-2000/01

	All	1	2	3	4
South Eastman 95	2.63		3.09	1.09	1.79
South Eastman 00	2.71		3.13	1.72	2.17
South Westman 95	2.56	6.71	2.28	1.79	2.97
South Westman 00	2.73	5.13	2.88	1.84	2.51
Brandon 95	3.25	13.24	3.44	1.54	2.20
Brandon 00	2.53	9.36	2.88	2.10	1.40
Central 95	2.69	7.52	2.98	1.99	1.22
Central 00	2.49		3.27	1.59	1.41
Marquette 95	2.21	5.83	2.28	1.41	0.30
Marquette 00	2.06		2.37	1.43	1.04
Parkland 95	2.61		2.87	1.95	0.76
Parkland 00	2.16		2.75	2.01	1.30
Interlake 95	2.55	9.66	2.87	1.67	1.14
Interlake 00	2.10	4.10	2.27	1.97	1.18
North Eastman 95	2.47		2.64	1.78	0.47
North Eastman 00	2.01		3.12	1.79	0.61
Burntwood 95	3.94	1.22			
Burntwood 00	1.51			1.01	
Nor-Man 95	3.30	1.58	2.12	4.10	2.64
Nor-Man 00	3.58		3.88	2.29	2.89
Rural South 95	2.54	7.50	2.72	1.79	1.41
Rural South 00	2.35	5.15	2.89	1.82	1.35
North 95	3.30	1.58	2.12	4.49	3.12
North 00	3.25	9.50	3.95	1.62	2.51
Winnipeg 95	2.48	8.21	2.75	2.06	1.24
Winnipeg 00	2.25	9.53	2.60	1.94	1.58
Manitoba 95	2.55	8.09	2.75	1.92	1.29
Manitoba 00	2.30	7.26	2.79	1.87	1.53

Chapter 12: Pharmaceutical Use

12.1 What's in This Chapter?

Overall description, examples, and possible questions to pose.

This chapter contains information on several indicators of use of pharmaceuticals, including:

- Proportion of residents with at least one prescription (Section 12.2)
- Average number of prescriptions per user (Section 12.3)
- Proportion of residents using antibiotics (Section 12.4)
- Number of antibiotic prescriptions dispensed (Section 12.5)
- Proportion of residents using antidepressants (Section 12.6)

Example: South Eastman RHA

South Eastman RHA has the best average health status in Manitoba (see Chapter 2, Section 2.3), so we expect to find lower health service use. According to Figure 12.2.1, drug use is less common among South Eastman residents than Manitobans as a whole. That is, a lower proportion of South Eastman residents were provided with one or more prescriptions, compared to the provincial average. Over time, there was an increase in these percentages among both South Eastman residents and Manitobans as a whole. Figure 12.2.2 shows relatively little variation among South Eastman's Districts, with the Southern district having the lowest rate.

South Eastman residents also had a lower average number of drugs used: Figure 12.3.1 shows that among those who got at least one prescription, the number of different drugs used was lower than the provincial average (though both increased over time). The district level results reveal an interesting finding, that while residents of the Southern District were slightly less likely to receive any prescriptions, those 'users' seem to get a higher average number of different drugs.

As seen in Figures 12.4.1 and 12.4.2, antibiotic use is also low among South Eastman residents, and again, reasonably similar across districts. The last indicator, antidepressant use, is the only one of the drug use indicators in which South Eastman residents have values right at the provincial average (see Figure 12.6.1).

Given the common concerns about over-use of prescription medications and multi-pharmacy, these results suggest South Eastman has achieved responsible use of prescription drugs, which should be reinforced in order to maintain these trends.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Describe the overall pharmaceutical use of the residents of your region (that is, percentage of residents with at least one prescription, and number of different drugs used by those taking medication). Does this differ from other regions? How has it changed over time?*

- *Knowing that antibiotic use is a common concern, is your regional (district) rate different than the average, and how so? Is this driven by underlying health status, or is the pattern showing potential over-use? How is the pattern changing over time?*

- *Are antidepressant rates in your region (districts) high or low? Is this a surrogate for mental health issues, or physician practice patterns?*

12.2 Proportion of Residents With at Least One Prescription

Definition: This is the per cent of all residents who received at least one prescription medication during the two-year period shown. This is age- and sex-adjusted to reflect the population of Manitoba. Note that prescription use in northern RHAs (Burntwood, Churchill and Nor-Man) may be higher than reported, due to incomplete recording of pharmaceutical dispensing in nursing stations.

Figure 12.2.1: Pharmaceutical Use by RHA

Age- & sex-adjusted per cent of residents with at least one prescription over two years
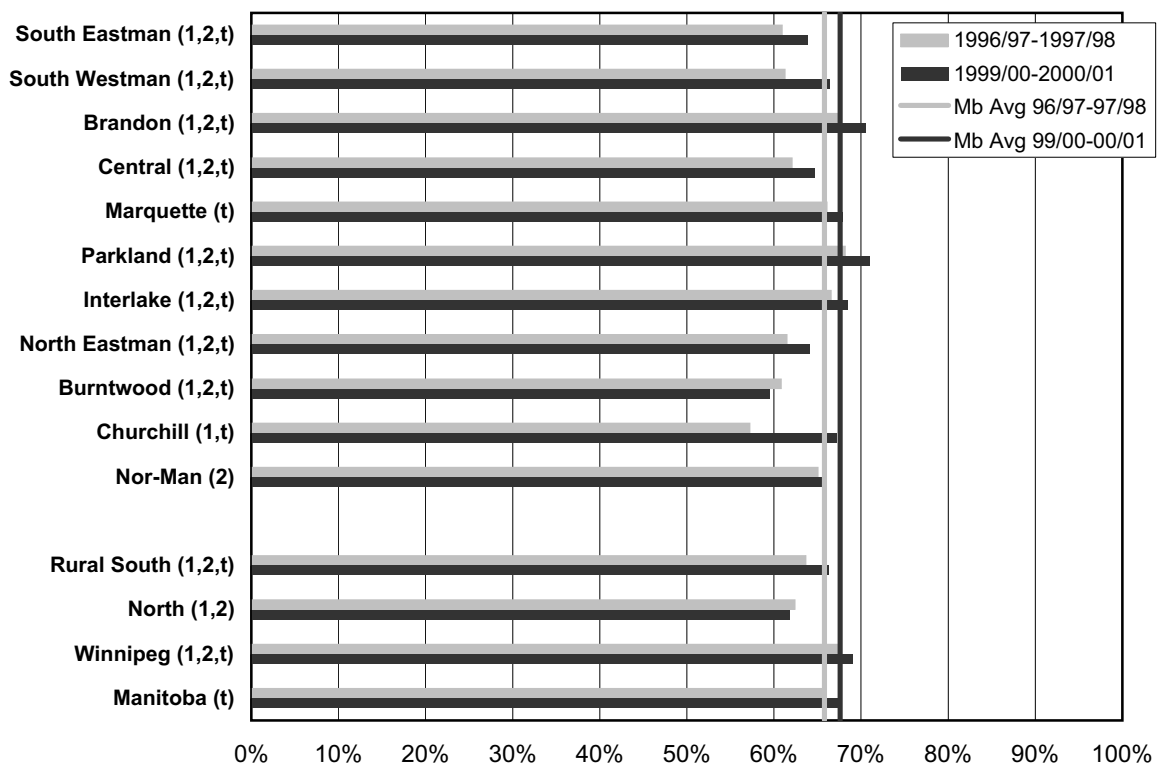
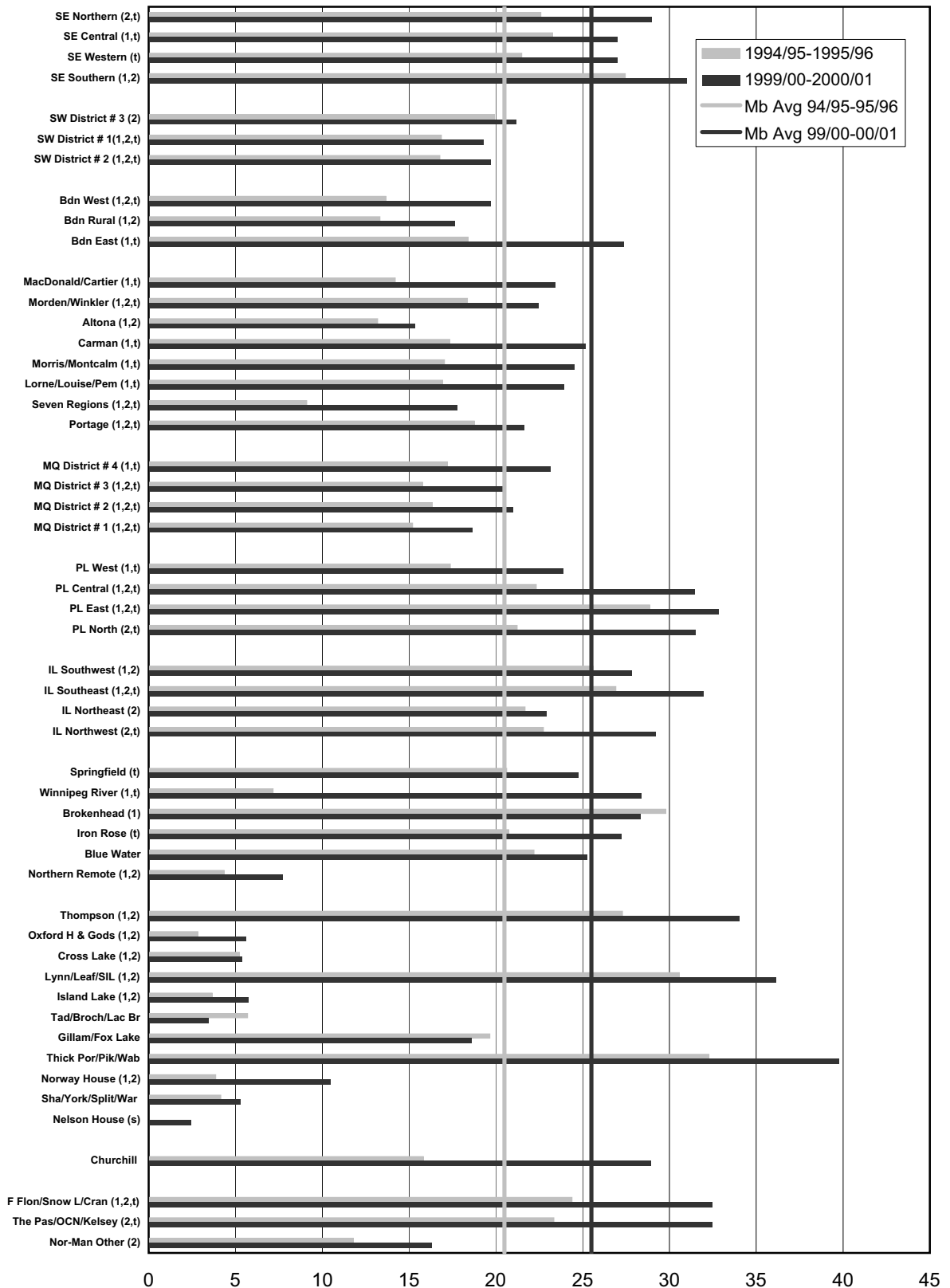'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 12.2.2: Pharmaceutical Use by District

Age- & sex-adjusted per cent of residents with at least one prescription over two years

Legend:
- 1996/97-1997/98
- 1999/00-2000/01
- Mb Avg 96/97-97/98
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern (1,2,t), SE Central (1,2,t), SE Western (1,2,t), SE Southern (1,2,t), SW District # 3 (1,2,t), SW District # 1 (1,t), SW District # 2 (1,2,t), Bdn West (1,2,t), Bdn Rural (t), Bdn East (1,2,t), MacDonald/Cartier (1,2,t), Morden/Winkler (1,2,t), Altona (1,2,t), Carman (1,2), Morris/Montcalm (1,2,t), Lorne/Louise/Pem (1,2,t), Seven Regions (1,2), Portage (2,t), MQ District # 4 (2), MQ District # 3 (1,2,t), MQ District # 2 (t), MQ District # 1(1,2,t), PL West (1,2,t), PL Central (2,t), PL East (1,2,t), PL North (1,2,t), IL Southwest (1,2,t), IL Southeast (1,2,t), IL Northeast (1,t), IL Northwest (1,2,t), Springfield (1,2,t), Winnipeg River, Brokenhead (1), Iron Rose (1,t), Blue Water (1,t), Northern Remote (1,2,t), Thompson (1,2), Oxford H & Gods (1,2,t), Cross Lake (1,2,t), Lynn/Leaf/SIL, Island Lake (1,2,t), Tad/Broch/Lac Br (1,2,t), Gillam/Fox Lake (1,2), Thick Por/Pik/Wab, Norway House (1,2,t), Sha/York/Split/War (1,2,t), Nelson House (1,2), Churchill (1,t), F Flon/Snow L/Cran, The Pas/OCN/Kelsey (1,2), Nor-Man Other (1,2)

12.3 Number of Different Drugs per User

Definition: This is the average number of different medications dispensed to those who received at least one prescription during the two-year period. This is age- and sex-adjusted to reflect the population of Manitoba. Note that prescription use in northern RHAs (Burntwood, Churchill and Nor-Man) may be higher than reported, due to incomplete recording of pharmaceutical dispensing in nursing stations.

Figure 12.3.1: Number of Different Drugs Used by RHA

Average number of different drugs prescribed to those receiving at least one prescription in a two-year period
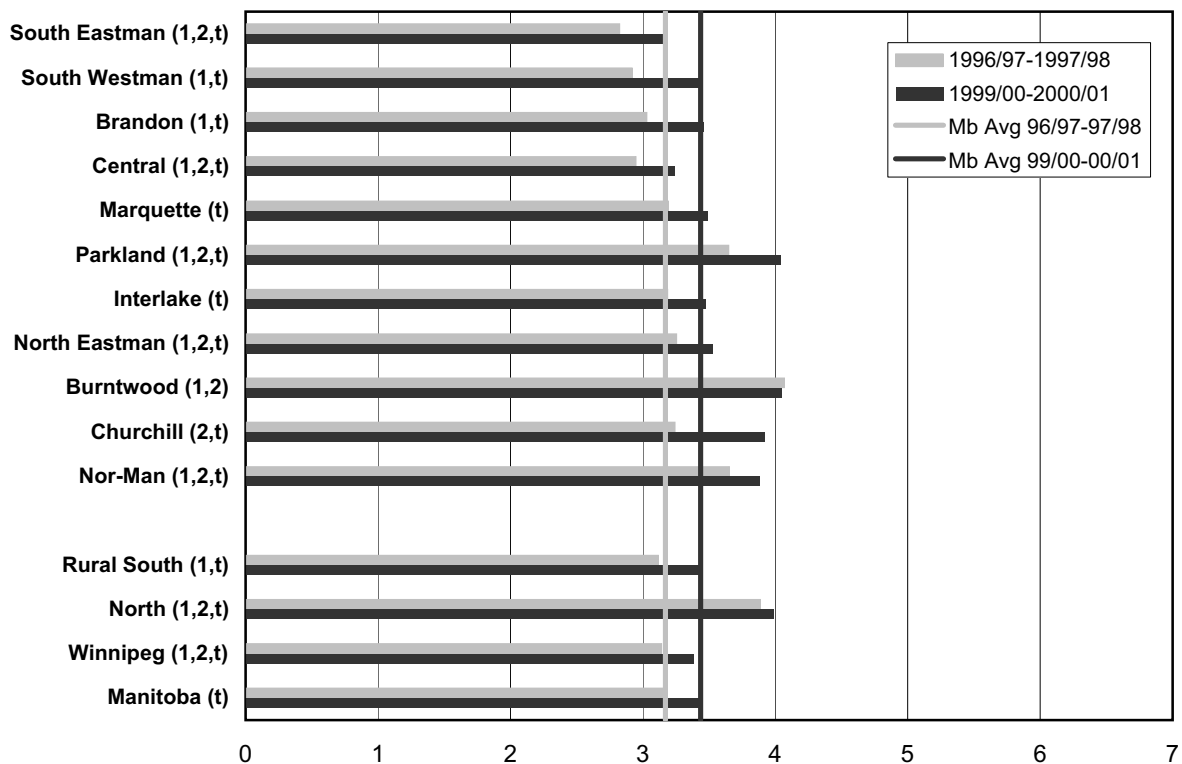
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 12.3.2: Number of Different Drugs Used by District

Average number of different drugs prescribed to those receiving at least one prescription in a two-year period
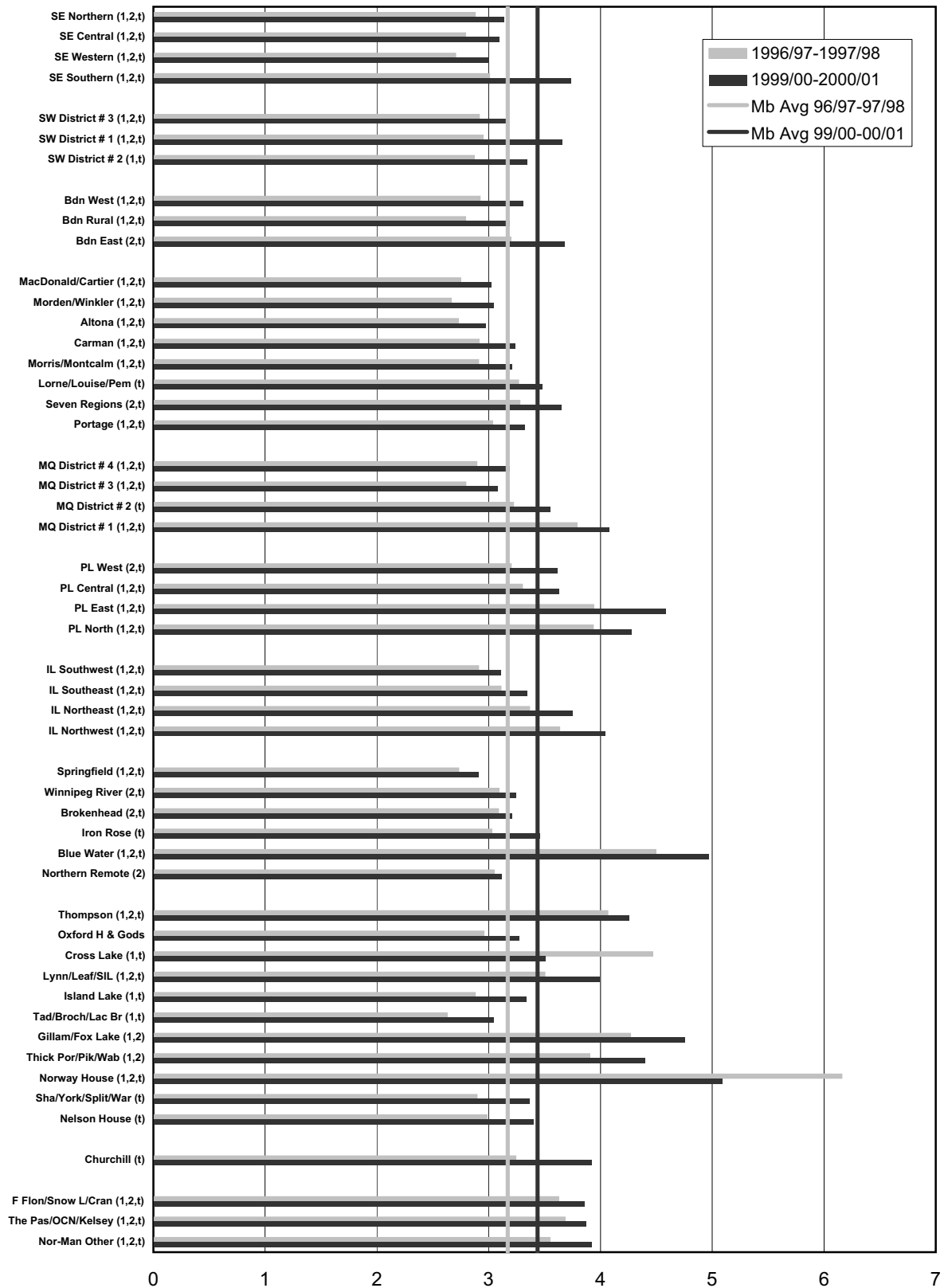
12.4 Proportion of Residents Using Antibiotics

Definition: This is the percentage of all residents receiving at least one prescription for an antibiotic during the two-year period. This is age- and sex-adjusted to reflect the population of Manitoba. Note that prescription use in northern RHAs (Burntwood, Churchill and Nor-Man) may be higher than reported, due to incomplete recording of pharmaceutical dispensing in nursing stations.

Figure 12.4.1: Antibiotic Use by RHA

Adjusted per cent of residents filling at least one antibiotic prescription in a two-year period

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
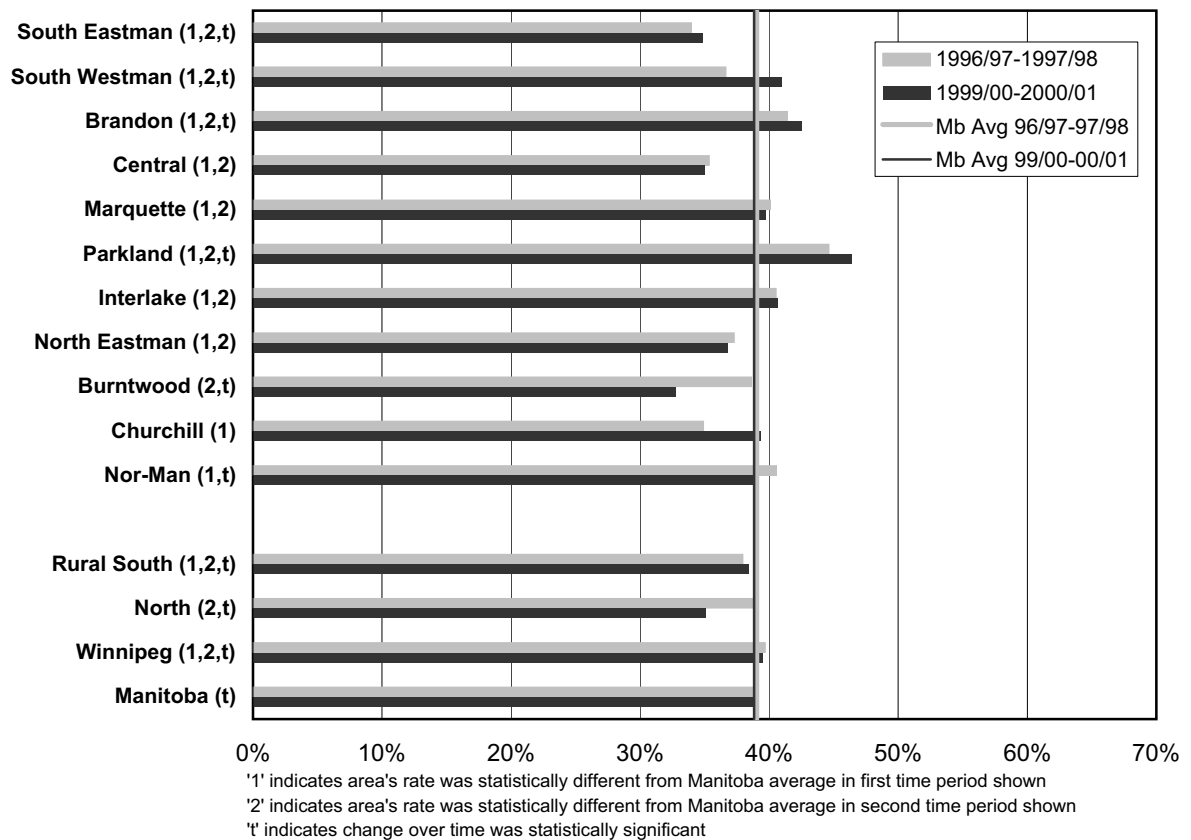
Figure 12.4.2: Antibiotic Use by District

Adjusted per cent of residents filling at least one prescription for antibiotics in a two-year period

Legend:
- 1996/97-1997/98
- 1999/00-2000/01
- Mb Avg 96/97-97/98
- Mb Avg 99/00-00/01
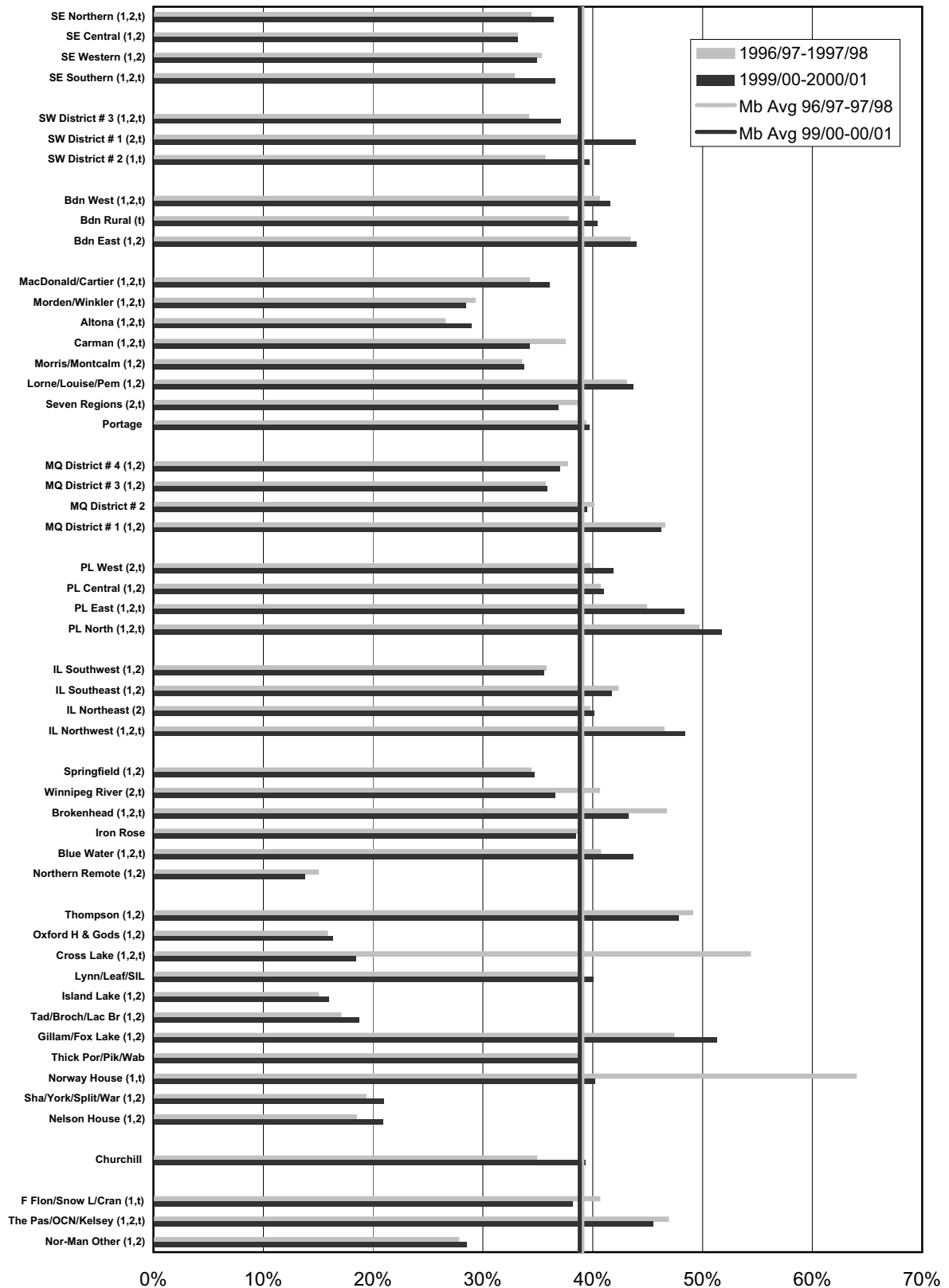
12.5 Number of Antibiotic Prescriptions Dispensed

Definition: This is the average number of antibiotic prescriptions dispensed to those who received at least one antibiotic prescription during the two-year period. This is age- and sex-adjusted to reflect the population of Manitoba. Note that prescription use in northern RHAs (Burntwood, Churchill and Nor-Man) may be higher than reported, due to incomplete recording of pharmaceutical dispensing in nursing stations.

Figure 12.5.1: Number of Antibiotic Prescriptions by RHA

Average number of antibiotic prescriptions in a two-year period (among those with at least one)

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
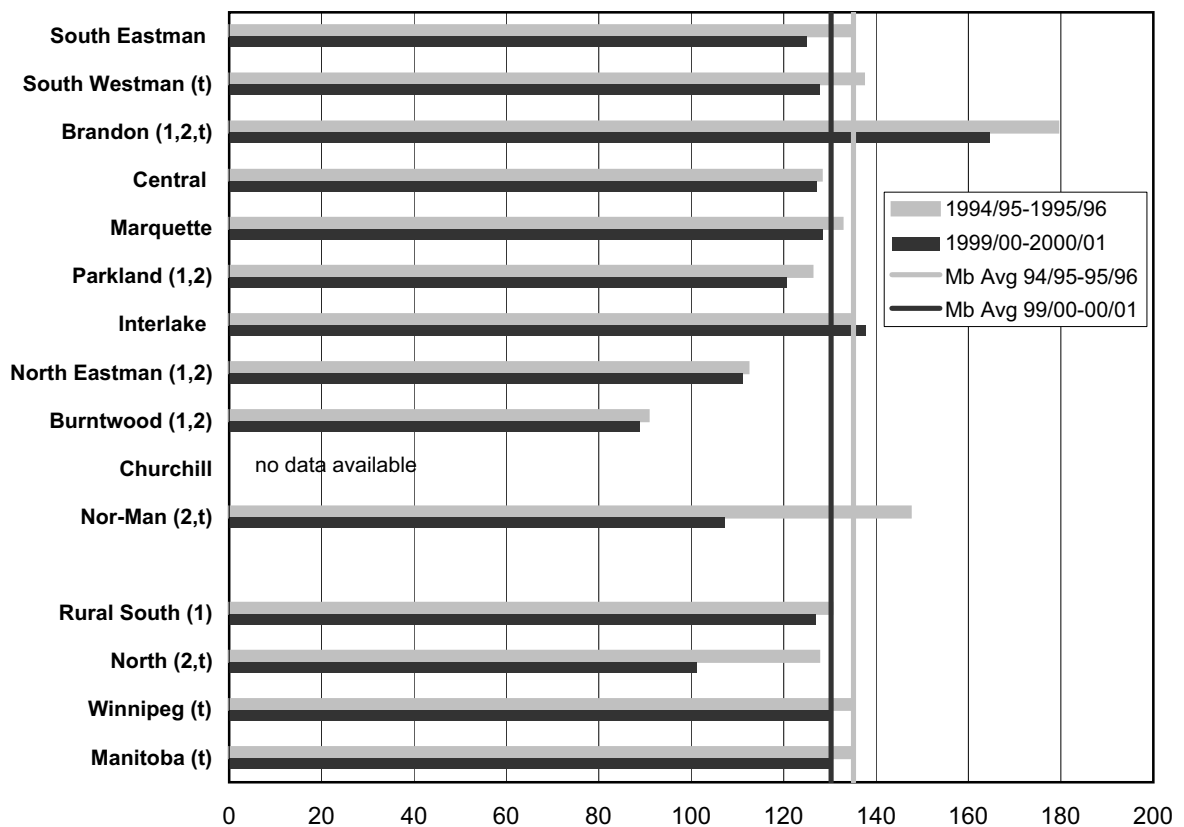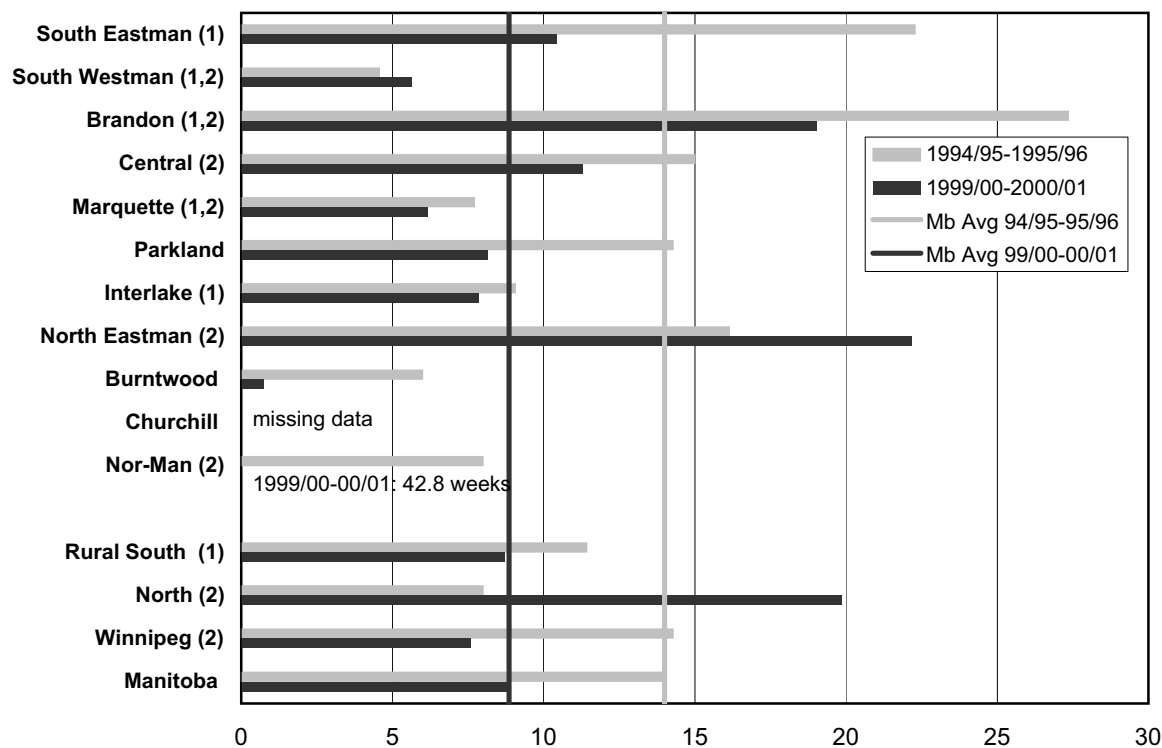't' indicates change over time was statistically significant
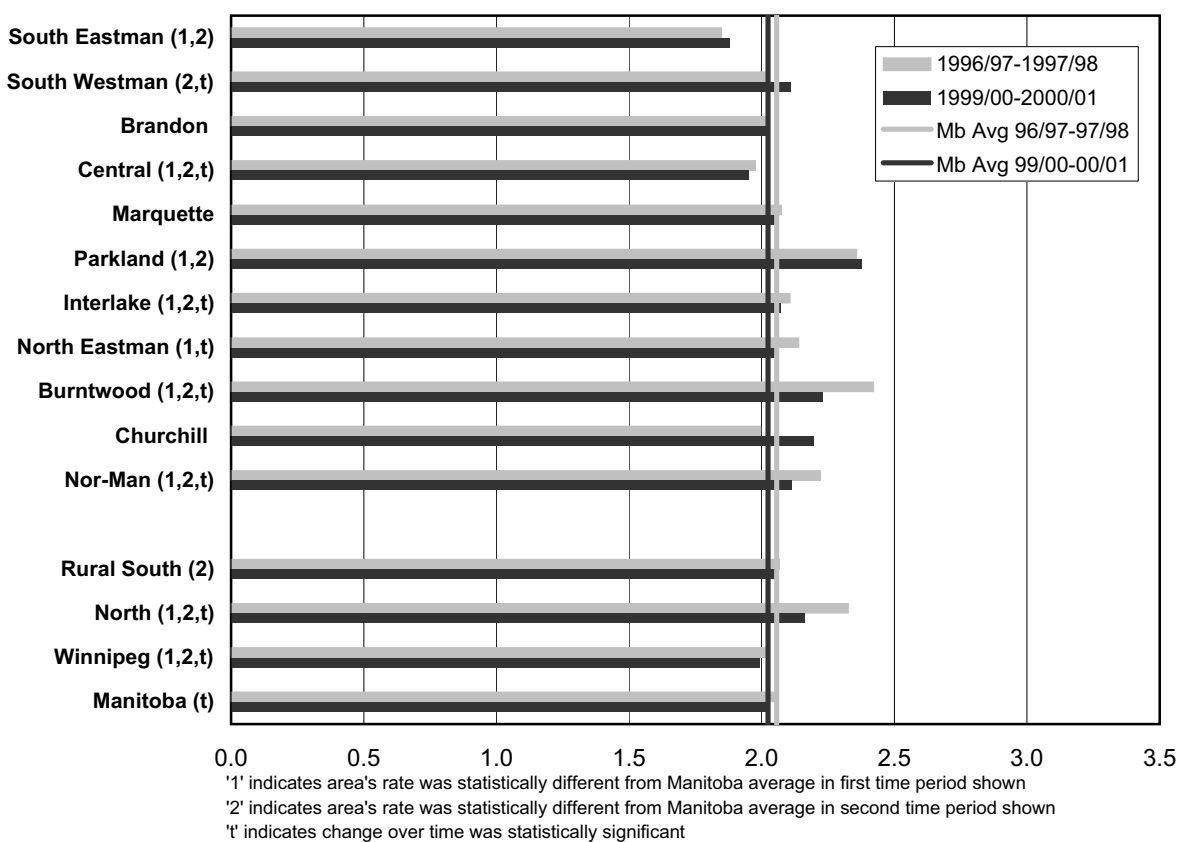
Figure 12.5.2: Number of Antibiotic Prescriptions by District

Average number of antibiotic prescriptions in a two-year period (among those with at least one)

Legend:
- 1996/97-1997/98
- 1999/00-2000/01
- Mb Avg 96/97-97/98
- Mb Avg 99/00-00/01

Districts:
SE Northern (1,2)
SE Central (1,2)
SE Western (1,2)
SE Southern (1,t)

SW District # 3 (1)
SW District # 1 (2,t)
SW District # 2

Bdn West (1,2)
Bdn Rural (1,2)
Bdn East (2)

MacDonald/Cartier (1,2)
Morden/Winkler (1,2)
Altona (1,2)
Carman (1,2,t)
Morris/Montcalm (1,2)
Lorne/Louise/Pem
Seven Regions
Portage

MQ District # 4 (1,2)
MQ District # 3
MQ District # 2 (2)
MQ District # 1 (1,2)

PL West
PL Central (2)
PL East (1,2)
PL North (1,2)

IL Southwest (1,2)
IL Southeast (1,t)
IL Northeast (2)
IL Northwest (1,2)

Springfield (1,2)
Winnipeg River (2,t)
Brokenhead (1,t)
Iron Rose
Blue Water (1,2)
Northern Remote

Thompson (1,2)
Oxford H & Gods
Cross Lake (1,2,t)
Lynn/Leaf/SIL
Island Lake (1)
Tad/Broch/Lac Br
Gillam/Fox Lake (2)
Thick Por/Pik/Wab
Norway House (1,2,t)
Sha/York/Split/War (2,t)
Nelson House

Churchill

F Flon/Snow L/Cran (t)
The Pas/OCN/Kelsey (1,2,t)
Nor-Man Other

12.6 Proportion of Residents Using Antidepressants

Definition: This is the proportion of all residents receiving two or more prescriptions for antidepressants during the two-year period. This is age- and sex-adjusted to reflect the population of Manitoba. Note that prescription use in northern RHAs (Burntwood, Churchill and Nor-Man) may be higher than reported, due to incomplete recording of pharmaceutical dispensing in nursing stations.

Figure 12.6.1: Antidepressant Use by RHA

Per cent of population with two or more prescriptions for antidepressants in a two-year period
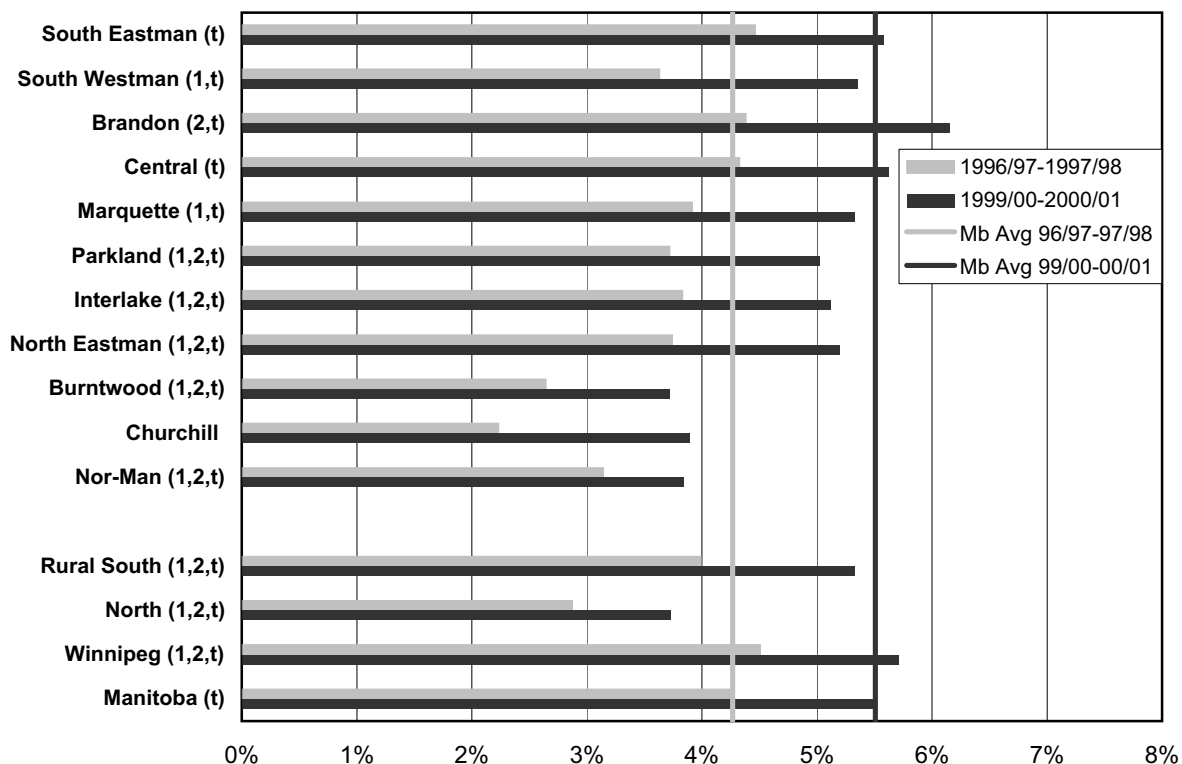
'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant

Figure 12.6.2: Antidepressant Use by District

Per cent of population with two or more prescriptions for antidepressants in a two-year period

Legend:
- 1996/97-1997/98
- 1999/00-2000/01
- Mb Avg 96/97-97/98
- Mb Avg 99/00-00/01

Districts (top to bottom):
SE Northern (t), SE Central (1,2,t), SE Western (t), SE Southern (1,t), SW District # 3 (1,t), SW District # 1 (1,t), SW District # 2 (t), Bdn West (t), Bdn Rural (1,t), Bdn East (1,2,t), MacDonald/Cartier (1,2,t), Morden/Winkler (1,2,t), Altona (1,2,t), Carman (2,t), Morris/Montcalm (t), Lorne/Louise/Pem (1), Seven Regions (1,2,t), Portage (1,2,t), MQ District # 4 (t), MQ District # 3 (t), MQ District # 2 (2,t), MQ District # 1 (1,2,t), PL West (1,2,t), PL Central (t), PL East (1,t), PL North (1,2,t), IL Southwest (t), IL Southeast (t), IL Northeast (1,2,t), IL Northwest (1,t), Springfield (2,t), Winnipeg River (t), Brokenhead (t), Iron Rose (t), Blue Water (1,2,t), Northern Remote (1,2), Thompson (1,2,t), Oxford H & Gods (1,2), Cross Lake (1,2), Lynn/Leaf/SIL, Island Lake (1,t), Tad/Broch/Lac Br, Gillam/Fox Lake, Thick Por/Pik/Wab, Norway House, Sha/York/Split/War (1,2), Nelson House (2), Churchill, F Flon/Snow L/Cran (1,2,t), The Pas/OCN/Kelsey (1,2), Nor-Man Other (2)

GLOSSARY

Acute Myocardial Infarction (AMI)

Also known as a heart attack, a myocardial infarction occurs when the heart muscle (the myocardium) experiences sudden (acute) deprivation of circulating blood. The interruption of blood is usually caused by narrowing of the coronary arteries leading to a blood clot. The clogging frequently is initiated by cholesterol piling up on the inner wall of the blood vessels that distribute blood to the heart muscle. For the purposes of the current report, AMI was defined as the presence of ICD-9-CM 41.0 in the diagnosis.

Age Calculations

Age calculations differ for numerators and denominators. Age for the numerator can be age at the time of the claim date, hospital admission date, or initial drug prescription date. Age for the denominator is calculated as the age at the end of December of the year, e.g., for fiscal year 1995/96, Age = 1995 - birth year.

Ambulatory (walk-in) Consultations

Any contact with a physician to whom the patient was referred by another physician. A consultation can be with either a GP/FP or a specialist.

Ambulatory (walk-in) Visits

Any contact with a physician which occurs while the patient is not a hospital in-patient. Physician visits to residents of personal care homes (identified by hospital number) are counted as ambulatory visits, as are physician services received in hospital emergency rooms and outpatient departments. Ambulatory visits include consultative and non-consultative care. Consultative Care includes ambulatory visits in which the patient is referred by one physician seeking the opinion of another physician because of "complexity, obscurity, or seriousness" of a patient's illness, or because a second opinion is requested either by the patient or another person acting on the patient's behalf. After the consultation, the patient is usually returned to the care of the referring physician. Consultation visits are usually provided by specialist physicians, but may occasionally be provided by general practitioners. Non-Consultative Care refers to all other ambulatory visits. It includes complete or regional histories and examinations and subsequent visits in which the progress of the patient's condition is monitored. Non-Consultative Care also includes physician services received in hospital emergency rooms and out-patient departments. It is provided by both general and specialist physicians. Contact with patients who are in hospital and for some salaried physicians are not included. However, most salaried physicians put in a "shadow" billing claim, and are therefore included. In this report, an analysis of ambulatory visit rates by age and gender was also included.

Angioplasty
Also called Percutaneous Transluminal Coronary Angioplasty (PTCA), angioplasty is a procedure using a balloon-tipped catheter to enlarge a narrowing in a coronary artery. In this report, PTCA was defined as any hospitalization occurring in a teaching hospital with ICD-9-CM codes of 36.01, 36.02, or 36.05 present in any procedure field.

At-Risk Birth Weight
Either low or high birth weight. See Low Birth Weight and High Birth Weight for actual weights used in definitions.

Breastfeeding Initiation Rate
The ratio of live born babies who were exclusively or partially breastfed, to the number of births within the same time period. In this report, breastfeeding was defined as any hospitalization with ICD-9-CM codes V30 to V39.

CABGS (Coronary Artery Bypass Graft Surgery)
Coronary artery disease develops because of hardening of the arteries (atherosclerosis) that supply blood to the heart muscle. CABG surgery is performed on patients with significant narrowings and blockages of the heart arteries (coronary artery disease) to create new routes around narrowed and blocked arteries, permitting increased blood flow to deliver oxygen and nutrients to the heart muscles. The bypass graft for a CABG can be a vein from the leg or an inner chest wall artery. In this report, CABG was defined as any hospitalization occurring in a teaching hospital with ICD-9-CM codes within the range of 36.1 to 36.16 or 36.19 present in any procedure field.

Caesarean Section (C-Section)
A procedure in which a baby, rather than being born vaginally, is surgically extracted (removed) from the uterus. In this report, maternal birth records were first selected using ICD-9-CM 'V27'. C-section was defined using ICD-9-CM codes of 74.0, 74.1, 74.2, 74.4, or 74.9, which could be present in any procedure field.

Calendar Year
A calendar year runs from January 1 to December 31.

Cancer Rates
Cancer is an abnormal growth of cells which tend to proliferate in an uncontrolled way and, in some cases, to metastasize (spread). Cancer can involve any tissue of the body and have many different forms in each body area. Most cancers are named for the type of cell or organ in which they start. Cancer accounts for about one-quarter of all deaths in Manitoba, with lung cancer, breast cancer and cancer of the colon accounting for the most

cases and deaths. For this report, cancer rate was defined as the rate of new cases of cancer diagnosed each year, excluding non-malignant skin cancers.

Cardiac Catheterization
The most accurate method (the "gold standard") for evaluating and defining coronary artery disease (CAD), cardiac catheterization is used to identify the exact location and severity of CAD. During cardiac catheterization, a small catheter (a thin hollow tube with a diameter of 2-3 mm) is inserted through the skin into an artery in the groin or the arm. Guided with the assistance of a fluoroscope (a special x-ray viewing instrument), the catheter is then advanced to the opening of the coronary arteries, the blood vessels supplying blood to the heart. When the catheter is used to inject radiographic contrast (a solution containing iodine, which is easily visualized with x-ray images) into each coronary artery, the cardiac catheterization is termed coronary angiography. Coronary angiography is usually performed in conjunction with cardiac catheterization. The images that are produced are called the angiogram. Angiographic images accurately reveal the extent and severity of all coronary arterial blockages. For this report, cardiac catheterization was defined as any hospitalization occurring in a teaching hospital with ICD-9-CM codes of 37.22, 37.23, or 88.53 - 88.57 present in any procedure field.

Cataract Surgery
Cataracts occur when the lens of the eye becomes cloudy and normal vision is impaired. There are many causes of cataracts including (but not limited to) cortisone medication, trauma, diabetes, and aging. The symptoms of cataracts include double or blurred vision and unusual sensitivity to light and glare. The clouded (cataractous) lens is removed in its entirety by surgery and replaced with an intraocular lens (IOL) made of plastic, an operation that takes about an hour and usually does not need hospitalization. For this report, cataract surgery was defined as any of the ICD-9-CM codes of 13.11, 13.19, 13.2, 13.3, 13.41, 13.43, 13.51, or 13.59 present on the hospital record.

Causes of Death
For this report, the frequency of the top four causes of death was reported. Injury, one of the top causes of death, was examined in further detail (see Injury Mortality).

Causes of Hospitalizations/Physician Visits
For this report, the frequency of the top eight causes of hospitalizations and physician visits were reported. Hospitalization and physician visit causes were analyzed separately.

Cervical Cancer Screening
Also called a Pap (Papanicolau) test, cervical cancer screening is based on the

examination of cells collected from the cervix to reveal premalignant (before cancer) and malignant (cancer) changes as well as changes due to noncancerous conditions such as inflammation from infections. For this report, cervical cancer screening was defined as the presence of any of the tariff codes 9795, 8498, 8470, 8495, or 8496.

CT Scans

Computerized tomography (CT) scans are pictures of structures within the body created by a computer that takes the data from multiple X-ray images and turns them into pictures on a screen. The CT scan can reveal some soft-tissue and other structures that cannot even be seen in conventional X-rays. Using the same dosage of radiation as that of an ordinary X-ray machine, an entire slice of the body can be made visible with about 100 times more clarity with the CT scan. For this report, CT scans were defined the presence of as any of the tariff codes 7112-7115 or 7221-7230.

Data Suppression

Data was suppressed when the cell count was less than five.

Days of Hospital Care

The total number of days of hospital care used by all residents of a given region within a given fiscal year. Analysis in this report was separated into short-stay days and long-stay days; stays less than 30 days were considered short stays, while stays of 30 days or more were considered long stays.

Diabetes

Diabetes mellitus is a chronic condition in which the pancreas no longer produces enough insulin (Type I Diabetes) or when cells stop responding to the insulin that is produced (Type II Diabetes), so that glucose in the blood cannot be absorbed into the cells of the body. The most common endocrine disorder, Diabetes Mellitus affects many organs and body functions, especially those involved in metabolism, and can cause serious health complications including renal failure, heart disease, stroke, and blindness. Symptoms include frequent urination, fatigue, excessive thirst, and hunger. Type I Diabetes begins most commonly in childhood or adolescence and is controlled by regular insulin injections. The more common form of diabetes, Type II, occurs in approximately 3-5 per cent of Americans under 50 years of age, and increases to 10-15 per cent in those over 50. It can usually be controlled with diet and oral medication. Another form of diabetes called gestational diabetes can develop during pregnancy and generally resolves after the baby is delivered. For this report, diabetes was defined as the occurrence of at least two physician visits or one hospitalization with a diabetes diagnosis ("250" ICD-9-CM) in a three-year period.

Fiscal Year
The fiscal year starts on April 1 and ends the following March 31. For example, the 1999/00 fiscal year would be April 1, 1999 to March 31, 2000, inclusive.

General Practitioner/Family Practitioner (GP/FP)
A physician who operates a general or family practice and provides ambulatory care.

High Birth Weight Rate
The number of live born babies with a birth weight of more than 4000 grams divided by the total number of live born babies.

Hip Replacement
During hip replacement surgery, the ball and socket of the hip joint are completely removed and replaced with artificial materials. A metal ball with a stem (a prosthesis) is inserted into the femur (thigh bone) and an artificial plastic cup socket is placed in the acetabulum (a "cup-shaped" part of the pelvis). The prosthesis may be fixed in the central core of the femur with cement. Alternatively, a "cementless" prosthesis is used which has microscopic pores that allow bony ingrowth from the normal femur into the prosthesis stem. The "cementless" hip lasts longer and is especially an option for younger patients. For this report, hip replacement was defined as the presence of either ICD-9-CM codes 81.51 or 81.53.

Home Care
The Manitoba Home Care Program, established in 1974, is the oldest comprehensive, province-wide, universal home care program in Canada. Home Care is provided to Manitobans of all ages assessed as having inadequate informal resources to return home from hospital or to remain at home in the community. Home care services are provided free-of-charge. Reassessments at pre-determined intervals are the basis for decisions by case managers to discharge individuals from the Program or to change the type or amount of services delivered by the Home Care Program.

Home Care Use: Open Cases, Closed Cases, New Cases, Average LOS
Open cases was defined as the per cent of residents who were open in the Home Care program, that is, the per cent of residents who were registered with the Home Care program for at least one day during the time period. Closed cases was defined as the proportion of residents who were taken out of the Home Care program over the time period. New cases was defined using the number of home care clients with a start date in the home care program after April 1st (i.e. after the fiscal year start). Average LOS (length of stay) was defined as the number of days "open" in the Home Care program, using registration and termination dates.

Hospital Bed Supply
For this report, hospital bed supply is defined as the number of hospital beds (acute and other) per 1000 residents, based on Manitoba Health bed map data.

Hospital Separation(s)
A separation from a health care facility occurs anytime a patient (or resident) leaves because of death, discharge or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions, are used because hospital abstracts for inpatient care are based on information gathered at the time of discharge. In this report, both inpatient hospital stays and surgical outpatient records are included. The words 'separation', 'discharge', and 'stay' are used inter-changeably.

Hypertension
Primary hypertension is often referred to as high blood pressure. The "tension" in hypertension describes the vascular tone of the smooth muscles in the artery and arteriole walls. It accounts for over 90 per cent of all cases of hypertension in the U.S. and develops without apparent causes. Hypertension is a major health problem, especially because it often has no symptoms. If left untreated, hypertension can lead to heart attack, stroke, enlarged heart, or kidney damage. In this report, hypertension was defined as the occurrence of at least one visit for hypertension (ICD-9-CM 401 or 402) in a three-year period.

Hysterectomy
A surgical operation to remove the uterus and, sometimes, the cervix. Removal of the body of the uterus without removing the cervix is referred to as a subtotal hysterectomy. Removal of the entire uterus and the cervix is referred to as a total hysterectomy. In this report, hysterectomy was defined as any hospitalization with ICD-9-CM codes of 68.4, 68.5 or 68.9 present in any of the procedure fields.

Immunization
An intervention to initiate or increase resistance against infectious disease. The recommended immunization schedule for children under two years of age includes:
(a) Four Diphtheria, tetanus, pertussis (DTP or DTaP) shots. These are given at two, four, six, and 18 months of age. Prior to 1997 the DPT vaccine used whole cell pertussis, and after that, the vaccine used acellular pertussis (DPaT)
(b) Three to four inactivated Polio (IPV) shots. These are given at two, four, and 18 months of age, with an optional shot at six months of age
(c) Four Haemophilus influenzae type b (Hib) shots. These are given at

two, four, six, and 18 months of age (Hib is only required for children born after May 1, 1992)

(d) The Hepatitus B (Hep B) vaccine may be given. The recommended schedule for Hep B consists of three doses at zero, one, and six month intervals, where the second dose is given at least one month after the first, and the third dose is given at least four months after the first and two months after the second.

In this report, both 1-year and 2-year rates were calculated for the following:

1-year (365-day) required doses: 3 DTP, 2 IPV, 3 HIB

2-year (730-day) required doses: 4 DTP, 3 IPV, 1 MMR, 4 HIB

7-year (2557-day) required doses: 5 DTP, 4 OPV, 1 MMR (Time Period1), 5 DTP, 4 OPV, 2 MMR, 4 HIB (Time Period 2)

Incidence

Incidence is the number of new cases of a given event over a specified time period. The incidence rate uses new cases in the numerator; individuals with a history of a condition are not included. The denominator for incidence rates is the population at risk. Even though individuals who have already developed the condition should be excluded from the denominator, incidence rates are often expressed based on the average population rather than the population at risk. In the case of chronic conditions, where most people appear to be at risk, the distinction between populations at risk and the whole population appears to be less critical.

Infant Mortality Rate

The number of deaths among infants under one year of age (at December 31) per 1000 live births, for a given period of time. Infant mortality is considered a useful indicator of the level of health within a community.

Influenza Vaccinations

Influenza vaccinations are the most effective preventive measure to prevent influenza and the complications arising from it in high-risk populations, such as seniors. The Canadian National Advisory Committee on Immunization (1999) recommends influenza vaccination for people at high risk. This includes people aged 65 and above, adults and children with certain chronic medical conditions, nursing home residents, health care workers who are in contact with people in the high-risk groups, and household contacts of people at risk who either cannot be vaccinated or may respond inadequately to vaccination. Influenza vaccination is available free of charge in Manitoba for the target groups identified by the National Advisory Committee on Immunization. For this report, influenza vaccinations were defined as the presence of any of ICD-9-CM 87.91, 87.92, or 87.99 in the diagnosis field.

Injury Hospitalizations

Hospitalizations lasting one day or longer that resulted from an injury as indicated by the presence of one of the ICD-9-CM E-Codes listed in Table G.1 on the hospital record. Newborn hospitalizations with E-Codes are excluded, as are brain deaths. E-codes are used to define environmental events, circumstances and conditions as the cause of injury, poisoning, and other adverse effects related to injury hospitalizations and mortality. Injury episodes were defined from the hospital discharge abstracts using class codes '01'-'09','12'-'17', and '19-23' and diagnosis beginning with "E". The ICD-9-CM E-code on the hospital claim may be in any one of the 16 diagnosis codes and the first one found going from one to 16 is used. Excluded from Table G.1 and from our definition of injuries are injuries resulting from misadventures during surgical or medical care, and adverse drug reactions.

Injury Mortality

Rate of death resulting from an injury as indicated by the presence of one of the ICD-9 E-Codes listed in Table G.1 on the vital statistics record. Newborn deaths with E-Codes are excluded, as are brain deaths. Injury episodes were defined from the hospital discharge abstracts using class codes '01'-'09','12'-'17', and '19-23' and diagnosis beginning with "E". The ICD-9-CM E-code on the hospital claim may be in any one of the 16 diagnosis codes and the first one found going from one to 16 is used. Excluded from Table G.1 and from our definition of injuries are injuries resulting from misadventures during surgical or medical care, and adverse drug reactions.

Table G.1: ICD-9-CM/ICD-9 External Cause of Injury Codes (E-codes)

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Motor Vehicle	E810: Motor vehicle traffic accident involving collision with train
	E811: Motor vehicle traffic accident involving re-entrant collision with another vehicle
	E812: Other motor vehicle traffic accident involving collision with motor vehicle
	E813: Motor vehicle traffic accident involving collision with other vehicle
	E814: Motor vehicle traffic accident involving collision with pedestrian
	E815: Other motor vehicle traffic accident involving collision on the highway
	E816: Motor vehicle traffic accident due to loss of control, without collision on the highway
	E817: Noncollision motor vehicle traffic accident while boarding or alighting
	E818: Other noncollision motor vehicle traffic accident
	E819: Motor vehicle traffic accident of unspecified nature
	E822: Other motor vehicle nontraffic accident involving collision with moving object
	E823: Other motor vehicle nontraffic accident involving collision with stationary object
	E824: Other motor vehicle nontraffic accident while boarding and alighting
	E825: Other motor vehicle nontraffic accident of other and unspecified nature
Other Vehicle	E820: Nontraffic accident involving motor-driven snow vehicle
	E821: Nontraffic accident involving other off-road motor vehicle
	E826: Pedal cycle accident

	E827: Animal-drawn vehicle accident
	E828: Accident involving animal being ridden
	E829: Other road vehicle accident
	E831: Accident to watercraft causing other injury
	E833: Fall on stairs or ladders in water transport
	E834: Other fall from one level to another in water transport
	E835: Other and unspecified fall in water transport
	E836: Machinery accident in water transport
	E837: Explosion, fire, or burning in watercraft
	E838: Other and unspecified water transport accident
	E840: Accident to powered aircraft at takeoff or landing
	E841: Accident to powered aircraft, other and unspecified
	E842: Accident to unpowered aircraft
	E843: Fall in, on, or from aircraft
	E844: Other unspecified air transport accidents
	E845: Accident involving spacecraft
	E846: Accidents involving powered vehicles used solely within the buildings and premises of industrial or commercial establishment
	E847: Accidents involving cable cars not running on rails
	E848: Accidents involving other vehicles, not elsewhere classified
Poisoning	E850: Accidental poisoning by analgesics, antipyretics, and antirheumatics
	E851: Accidental poisoning by barbiturates
	E852: Accidental poisoning by other sedatives and hypnotics
	E853: Accidental poisoning by tranquilizers
	E854: Accidental poisoning by other psychotropic agents
	E855: Accidental poisoning by other drugs acting on central and autonomic nervous system
	E856: Accidental poisoning by antibiotics
	E857: Accidental poisoning by other anti-infectives
	E858: Accidental poisoning by other drugs

Table G.1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Poisoning (Continued)	E860: Accidental poisoning by alcohol, not elsewhere classified
	E861: Accidental poisoning by cleansing and polishing agents, disinfectants, paints, and varnishes
	E862: Accidental poisoning by petroleum products, other solvents and their vapors, not elsewhere classified
	E863: Accidental poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant food and fertilizers
	E864: Accidental poisoning by corrosives and caustics, not elsewhere classified
	E865: Accidental poisoning from poisonous foodstuffs and poisonous plants
	E866: Accidental poisoning by other and unspecified solid and liquid substances
	E867: Accidental poisoning by gas distributed by pipeline
	E868: Accidental poisoning by other utility gas and other carbon monoxide
	E869: Accidental poisoning by other gases and vapors
	E980: Poisoning by solid or liquid substance, undetermined whether accidentally or purposely inflicted
	E981: Poisoning by gases in domestic use, undetermined whether accidentally or purposely inflicted
	E982: Poisoning by other gases, undetermined whether accidentally or purposely inflicted
Falls	E880: Fall on or from stairs or steps
	E881: Fall on or from ladders or scaffolding
	E882: Fall from or out of building or other structure

	E883: Fall into hole or other opening in surface
	E884: Other fall from one level to another
	E885: Fall on same level from slipping, tripping, or stumbling
	E886.9: Fall on same level from collision, pushing, or showing, by or with other person - Other and unspecified
	E887: Fracture, cause unspecified
	E888: Other and unspecified fall
Fire and Flames	E890: Conflagration in private dwelling
	E891: Conflagration in other and unspecified building or structure
	E892: Conflagration not in building or structure
	E893: Accident caused by ignition of clothing
	E894: Ignition of highly flammable material
	E895: Accident caused by controlled fire in private dwelling
	E896: Accident caused by controlled fire in other and unspecified building or structure
	E897: Accident caused by controlled fire not in building or structure
	E898: Accident caused by other specified fire and flames
	E899: Accident caused by unspecified fire
Natural and Environment-al Factors	E900: Excessive heat
	E901: Excessive cold
	E902: High and low air pressure and changes in air pressure
	E903: Travel and motion

Table G.1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Natural and Environment-al Factors (Continued)	E904: Hunger, thirst, exposure and neglect E905: Venomous animals and plants as the cause of poisoning and toxic reactions E906: Other injury caused by animals E907: Lightning E908: Cataclysmic storms, and floods resulting from storms E909: Cataclysmic earth surface movements and eruptions E928.1: Other and unspecified environmental and accidental causes - Prolonged stay in weightless environment: E928.2: Other and unspecified environmental and accidental causes - Exposure to noise
Drowning	E830: Accident to watercraft causing submersion E832: Other accidental submersion or drowning in water transport accident E910: Accidental drowning and submersion
Suffocation and Choking	E911: Inhalation and ingestion of food causing obstruction of respiratory tract or suffocation E912: Inhalation and ingestion of other object causing obstruction of respiratory tract or suffocation E913: Accidental mechanical suffocation
Sports	E886.0: Fall on same level from collision, pushing, or shoving, by or with other person - in sports E917.0: Striking against or struck accidentally by objects or persons – in sports
Late Effects	E929: Late effects of accidental injury E989: Late effects of injury, undetermined whether accidentally or

	purposely inflicted
Violence to Self	E950: Suicide and self-inflicted poisoning by solid or liquid substances
	E951: Suicide and self-inflicted poisoning by gases in domestic use
	E952: Suicide and self-inflicted poisoning by other gases and vapors
	E953: Suicide and self-inflicted injury by hanging, strangulation, and suffocation
	E954: Suicide and self-inflicted injury by submersion [drowning]
	E955: Suicide and self-inflicted injury by firearms and explosions
	E956: Suicide and self-inflicted injury by cutting and piercing instrument
	E957: Suicide and self-inflicted injuries by jumping from high places
	E958: Suicide and self-inflicted injury by other and unspecified means
	E959: Late effects of self-inflicted injury
Violence by Others	E960: Fight, brawl, rape
	E961: Assault by corrosive or caustic substance, except poisoning
	E962: Assault by poisoning
	E963: Assault by hanging and strangulation
	E964: Assault by submersion [drowning]
	E965: Assault by firearms and explosives
	E966: Assault by cutting and piercing instrument
	E967: Child and adult battering and other maltreatment
	E968: Assault by other and unspecified means
	E969: Late effects of injury purposely inflicted by other person
	E970: Injury due to legal intervention by firearms
	E971: Injury due to legal intervention by explosions
	E972: Injury due to legal intervention by gas
	E973: Injury due to legal intervention by blunt object
	E974: Injury due to legal intervention by cutting and piercing instrument

Table G.1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Violence by Others (Continued)	E975: Injury due to legal intervention by other specified means E976: Injury due to legal intervention by unspecified means E977: Late effects of injuries due to legal intervention E978: Legal execution
Other	E914: Foreign body accidentally entering eye and adnexa E915: Foreign body accidentally entering other orifice E916: Struck accidentally by falling object E917.1: Striking against or struck accidentally by objects or persons - caused by crowd, by collective fear or panic E917.2: Striking against or struck accidentally by objects or persons – in running water E917.9: Striking against or struck accidentally by objects or persons - other E918: Caught accidentally between objects E919: Accidents caused by machinery E920: Accidents caused by cutting and piercing instruments or objects E921: Accident caused by explosion of pressure vessel E922: Accident caused by firearm missile E923: Accident caused by explosive material E924: Accident caused by hot substance or object, caustic or corrosive material, and steam E925: Accident caused by electric current E926: Exposure to radiation E927: Overexertion and strenuous movements E928.0: Other and unspecified environmental and accidental causes - prolonged stay in weightless environment

Other (Continued)	E928.8: Other and unspecified environmental and accidental causes - other
	E928.9: Other and unspecified environmental and accidental causes - unspecified accident
	E990: Injury due to war operations by fires and conflagrations
	E991: Injury due to war operations by bullets and fragments
	E992: Injury due to war operations by explosion of marine weapons
	E993: Injury due to war operations by other explosion
	E994: Injury due to war operations by destruction of aircraft
	E995: Injury due to war operations by other and unspecified forms of conventional warfare
	E996: Injury due to war operations by nuclear weapons
	E997: Injury due to war operations by other forms of unconventional warfare
	E998: Injury due to war operations but occurring after cessation of hostilities
	E999: Late effect of injury due to war operations
Undetermined	E983: Hanging, strangulation, or suffocation, undetermined whether accidentally or purposely inflicted
	E984: Submersion [drowning], undetermined whether accidentally or purposely inflicted
	E985: Injury by firearms and explosives, undetermined whether accidentally or purposely inflicted
	E986: Injury by cutting and piercing instruments, undetermined whether accidentally or purposely inflicted
	E987: Falling from high place, undetermined whether accidentally or purposely inflicted
	E988: Injury by other and unspecified means, undetermined whether accidentally or purposely inflicted

Knee Replacement
In knee replacement surgery, parts of the knee joint are replaced with artificial parts. The surgery is done by separating the muscles and ligaments around the knee to expose the inside of the joint. The ends of the thigh bone (femur) and the shin bone (tibia) are removed as is often the underside of the kneecap (patella). The artificial parts are then cemented into place. The new knee typically has a metal shell on the end of the femur, a metal and plastic trough on the tibia, and sometimes a plastic button in the kneecap. For this report, knee replacement was defined as the presence of either ICD-9-CM codes 81.54 or 81.55.

Life Expectancy
Expected years of life from birth, based on the mortality experience of a given population over a given number of years. Life expectancy at birth for males and females is a commonly accepted indicator of population health. This indicator has the advantage of describing the experience of all people in the population, not just those 0-74 (as for the premature mortality measure). Statistics are not typically used to identify differences in life expectancy rates. The methodology for calculating life expectancy for this report was based on "Users Guide to 40 Community Health Indicators" published by the Community Health Division, Health Services & Promotion Branch, Health & Welfare Canada, 1992.

Location of Ambulatory Visits
The location of where an ambulatory physician visit took place, based on the location of the physician. There are four categories: In District, Out of District: In Region, Out of Region: Not Winnipeg, and Out of Region: Winnipeg. Analysis was conducted separately for both GPs/FPs and specialists.

Location of Hospitalization
Location of hospitalizations was calculated two different ways. First, the location of hospitals' patients, based on their residence information (that is, where RHAs' hospital patients came from). Second, the hospitalization location of RHAs' residents, based on the hospital location (that is, where RHAs' residents went for hospitalization). There are five categories: In Region, Out of Region: Brandon, Out of Region: Winnipeg, Out of Region: Other, and Out of Province.

Low Birth Weight Rate
The number of live born babies with a birth weight of less than 2500 grams divided by the total number of live born babies.

Mammography

Mammography is a procedure to determine if a woman has breast cancer; it is commonly used for breast cancer screening. Mammograms can show most breast cancer 2-3 years before it can be detected through self-exams. Manitoba has a province-wide breast screening program operated by the Manitoba Breast Screening Program. The goal of the Manitoba Breast Screening Program is to screen 70% of Manitoba women age 50-69 every two years, approximately 33,000 women per year. It is recommended that all women between 50 and 69 years of age be screened every two years for breast cancer. In this report, five tariff codes were used to define mammography: 7098, 7099, 7104, 7110, 7111.

Mortality Rates

The number of deaths in a population, divided by the number of residents. The rate is age- and sex-standardized to account for differences in populations. A five-year mortality rate was calculated for this report.

North

"North" is an aggregate geography which includes all of the northern RHAs; that is, Nor-Man, Burntwood, and Churchill.

Pap Smears

See Cervical Cancer Screening

Personal Care Homes

Personal care homes are residential facilities for persons with chronic illness or disability, particularly older people who have mobility and eating problems. In Manitoba, personal care homes can be proprietary (for profit) or non-proprietary. Non-proprietary homes can be secular or ethnocultural (associated with a particular religious faith or language other than English) as well as either freestanding or juxtaposed with an acute care facility.

Personal Care Home Use: Beds, Residents, Admissions, Waiting Times, Days

Personal care home residents are people who live in a personal care home in Manitoba. Bed supply is the number of available personal care home beds per 1000 residents age 75 and up. Admissions are only those admitted to a personal care home in Manitoba during the relevant time period. Waiting times indicate the median waiting time for admission to a personal care home. Days are the total number of days occupied by residents of personal care homes. For the purposes of this report, federal personal care home residents are not included, except in bed supply.

Pharmaceutical Drug Use
General pharmaceutical drug use was examined two ways. First, an analysis was conducted on the proportion of residents with at least one prescription over two years. Among that population, a further analysis was conducted on the average number of different drugs prescribed over the same two-year period. Analysis was also conducted on the use of two specific groups of drugs: antibiotics and antidepressants. Antibiotic use was examined similarly to general pharmaceutical use: first an analysis of the proportion of residents with at least one antibiotic prescription, and the average number of antibiotic prescriptions among that population. Antidepressant use was examined through an analysis of the proportion of the population with at least two prescriptions for antidepressants.

Physician Access
For this report, physician access was defined as the proportion of the population with at least one ambulatory visit to a physician in a one-year period.

Physician Specialties
Physicians are classified into seven categories: general practice (including family practice), and the six specialties: psychiatry, paediatrics, obstetrics and gynaecology, medical specialists, general surgeons, and surgical specialists.

Physician Visits
Any contact between a patient and physician at one of the following locations: physician's office, outpatient or emergency department, clinic, Personal Care Home, the patient's home, or northern / remote nursing station. Unless specified, physician visits include consultative and non-consultative care. Contact with patients who are in hospital are not included. Most salaried physicians put in a "shadow" billing claim, and are therefore included.

Population Pyramid (Population Profile)
A picture showing the age and sex distribution of a population. The percentage of the population within each five-year age bracket (such as 0-4, 5-9, 10-14, and so on, up to 100+ years old), is shown for both males (on the left side of the graph) and females (on the right side). All of these "bars" add up to 100%, meaning the entire population fits into one of these groupings. Most developing countries of the world will have a population pyramid triangular in shape, indicating a very young population, with few people in the oldest age brackets. Most industrial countries have a population pyramid that looks more rectangular, with the young and middle-aged people representing similar and smaller percentages of the population, and many more elderly people in the "top part" of the pyramid.

Potential Years of Life Lost (PYLL)

PYLL is a measure of premature mortality which gives greater weight to deaths occurring at a younger age than to those at later ages. The Statistics Canada definition of PYLL (under age 75) is "the number of years of life 'lost' when a person dies 'prematurely' - before age 75." Statistics Canada reports age-standardized potential years of life lost for males and females, for all causes and for selected preventable causes. PYLL is calculated by subtracting the actual age of death from 75 in each age group, and dividing the total potential years of life lost by the total population under age 75. A person dying at age 25, for example, has lost 50 years of life (75-25=50 PYLL). By emphasizing the loss of life at an early age, PYLL focuses attention on the need to deal with the major causes of such early deaths - cancer, injuries and cardiovascular disease - in order to improve health status. PYLL has also been found to vary with characteristics such as sex, socioeconomic status and place of residence. For this report, PYLL was calculated as (75 - age at death). Deaths before age one and after age 75 were excluded. Demographic information was assigned as of date of death. All data was adjusted for age, and output separately by sex.

Premature Birth Rate

The ratio of live-born babies born in a Manitoba hospital with a Manitoba postal code or municipality code with a gestation of less than 37 weeks to the number of live-born babies born in a Manitoba hospital with a Manitoba postal code or municipality code.

Premature Mortality Rate (PMR)

The number of deaths of people aged 0-74 years, divided by the number of residents between age 0 and 74 in the area. The values are standardized to account for age/sex differences in populations. It is an important indicator of the general health of a population, with high premature mortality rates indicating poor health. In this report, five years of deaths are combined in the numerator and five years of population are combined in the denominator, yielding a yearly PMR rate based on five years of data.

Prevalence

The measure of a condition in a population at a given point in time is referred to as point prevalence. A second type of prevalence is called period prevalence. Over a period of time, such as one year, this measures the number of individuals with a particular condition in the population during that time period. Period prevalence is the most common measure of prevalence used in MCHP studies. Prevalence data provide an indication of the extent of a condition and may have implications for the provision of services needed in a community. Both measures of prevalence are proportions - as such, they do not describe changes over time and should not be described as rates.

Rates and Standardization of Rates

Unless otherwise noted, rates were standardized for age and gender using the direct method of standardization. This procedure mathematically removes the effects of different population structures that may influence overall rates of use of health care. For most of the analyses in this report, the age groups used for standardization were: 00-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, 85-89, and 90+ years. When numerators were less than five cases, rates were suppressed due to instability.

Rural South

"Rural South" is an aggregate geography which includes all of the RHAs in the south and the mid-province of Manitoba except the two urban centres of Winnipeg and Brandon. Those RHAs include: South Eastman, Central, South Westman and Marquette (now called Assiniboine as of July 1, 2002), Interlake, North Eastman, and Parkland.

Socioeconomic Factor Index (SEFI)

A municipality-level indicator of socioeconomic status, SEFI was designed on the basis of sociodemographic variables in publicly available census data. From 12 possible variables, principal component analysis was used to reduce the number of indicators to six demographic and economic characteristics: labour force participation of women, age dependency ratio, per cent single parent households, per cent female single parent households, unemployment, and education level. The derivation of the SEFI was based on municipal level data from the 289 municipalities in Manitoba in 1996.

Stroke

A stroke occurs when there is a sudden death of brain cells due to a lack of oxygen when the blood flow to the brain is impaired by blockage or rupture of an artery to the brain. Symptoms of a stroke depend on the area of the brain affected. The most common symptom is weakness or paralysis of one side of the body with partial or complete loss of voluntary movement or sensation in a leg or arm. Other common symptoms include speech problems, weak face muscles, numbness and tingling. A stroke involving the base of the brain can affect balance, vision, swallowing, breathing and consciousness. For this report, stroke was defined as any of ICD-9-CM 431, 434, or 436 present in the diagnosis field.

Teen Pregnancy Rate

The ratio of pregnancies in teenagers aged 15-19 in a given period (including live births, stillbirths, abortions, and ectopic pregnancies), to the total female population ages 15-19 at mid-period.

Tonsillectomy/Adenoidectomy
The surgical removal of tonsils and/or adenoids. A tonsillectomy may be performed in cases of recurrent tonsillitis, or to treat sleep apnea and some speech disorders. Adenoids are masses of lymphoid tissue in the upper part of throat behind the nose. Tonsils are small masses of lymphoid tissue at the back of the throat, on either side of the throat. In this report, tonsillectomy/adenoidectomy was defined as any hospitalization with ICD-9-CM codes of 28.2, 28.3, or 28.6 present in any of the procedure fields.

Total Respiratory Morbidity
The rate of residents suffering respiratory-related illness. Respiratory-related illness can include asthma, bronchitis, emphysema, chronic airway obstruction, and chronic obstructive pulmonary disease. For this report, total respiratory morbidity was defined as the presence of any of ICD-9-CM 490, 491, 492, 493, 496, 466 in the diagnosis field.

Appendix 1: Methods

Data Preparation

Several sources of data were used for the analyses: hospital discharge abstracts, physician claims, registry data, and vital statistics. Two exclusions were typically made for all analyses:

Public Trustee postal codes for both Winnipeg and Brandon were excluded.

1. The Office of the Public Trustee is responsible for individuals unable to care for themselves. Their location of residence information contains the location of the Public Trustee's office, so we cannot determine their actual area of residence. Since all analyses are based on where people lived, these residents cannot be properly assigned to any district. There is a high turnover among individuals registered with the Office of the Public Trustee.

2. Non-Manitoba residents were defined using a combination of postal code and municipal code identification, and subsequently excluded from analyses.

Three additional exclusions were typically made for hospital discharge abstracts data:

1. Duplicate records were removed from analyses using hospital discharge abstracts.

2. Dates outside the fiscal year (or set of fiscal years) of study were removed. For multi-year analyses comparing utilization by year, dates outside the fiscal year were removed for each year to ensure comparability. When years were combined for analyses, only the dates outside of the multi-year period were removed.

3. Newborns/brain deaths are excluded for overall utilization analyses. As newborns typically have identical records to their mothers, they are eliminated to avoid double-counting. With brain deaths, death occurs prior to admission. Since these individuals are taken directly to the morgue, their records are eliminated because they bypass the usual kinds of resource utilization.

Assignment of Residence Information

Virtually all analyses in this report allocate health service use to the area where the patient who received the service lived, regardless of where the service was provided. For example, if a resident of Interlake RHA travels to Winnipeg for a physician visit, that visit contributes to the visit rate for Interlake residents.

With claims-based analyses, more than one record per person is possible. The residence information on the first-occurring record for a given year was generally used. For individual-based analyses (selecting one record per per-

son; e.g., Diabetes and Hypertension), the most frequently-occurring residence information from the combined time period was used. If there was a tie, the first-occurring record was used.

The Rural Municipality of Headingley seceded from Winnipeg in 1993. Before that time, residents of the area were assigned to Winnipeg, whereas after that time, they were assigned to Central RHA (district of Macdonald/Cartier). We analyzed the data to determine the effect of assigning those residents to Central RHA for the entire time period, and the premature mortality rate changed less than 2%. As a result, all analyses in this report 'left' Headingley residents in Winnipeg for 1991 and 1992, and assigned them to Central RHA from 1993 onward.

Denominator

The Manitoba population as of December 31 was used for any given year. Standard exclusions to prepare the population denominators consisted of non-MB residents and public trustee postal codes. Eligibility criteria applied to the numerator were also generally applied to the denominator. For adjusted rate analyses, unless otherwise stated, the standard population was always the 1996 Manitoba population.

Study Years

For this study, various time periods are used - one-year rates for physician visits, multi-year rates for less common events (two-year, three-year, five-year). Two time periods are compared. For two-year rates, fiscal years 1994/95-1995/96 are usually used for the first time period, and 1999/2000-2000/01 are usually used for the second time period. For the five-year rates, fiscal years 1991/92-1995/96 are usually used for the first time period, while 1996/97-2000/01 are usually used for the second time period. In some instances, calendar years are used, as designated by notation such as 1991-1995, or 1996-2000. See specific categories of analysis for more details on study years.

Age Groups for Standardization

For most of the analyses in this report, the age groups used for standardization were: 00-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, 85-89, and 90+ years. Where different age groups for standardization were used, a note is made in the specific sections, below.

Analysis

We have used a T-squared statistic as proposed by K.C. Carriere and L.L. Roos in both "Comparing standardized rates of events", Am J Epidemiology 1994; 140:472 and "A method of comparison for standardized rates of low-incidence events", Medical Care 1997; 35:57-69. It is a generalization of the

traditional chi-square test - the two are asymptotically equivalent, especially for the non-standardized rates of binomial or Poisson events as well as for standardized rates of low-incidence, nonrecurring events. Also, this method is approximately correct for comparing recurrent events, if the repeated events are rare (less than 100 per 100,000 persons). We have employed a logarithmic transformation of the T-squared statistic (see page 59 of the Medical Care article) as is recommended to adjust for the skewness in the distribution of standardized rates in the case of very rare events and small populations. (Both of these situations are likely to occur with many of the measures we will examine for this project.) For a very large population or relatively high incidence rates, the transformed T-squared statistic will lead to the same conclusion as the (non-transformed) T-squared statistic.

1.   Overall Physician Utilization Analyses

Physician analyses used 1995/96 and 2000/01 claims data, with the Manitoba population from December 31, 1995 and 2000 as the denominator (except for location of physician visits, see below). Age was calculated as of December 31. Data were restricted to ambulatory visits for in-province services by Manitoba physicians. All data were adjusted for age and sex. Visits to physicians practicing outside of Manitoba were excluded after analysis revealed that such visits accounted for less than 1% of all visits provided to Manitoba residents[1].

1.1 Ambulatory visits
   Both GP/FP and specialist visits were selected.

1.2 Ambulatory consultations
   Both GP/FP and specialist consultations were selected.

1.3 Ambulatory visits by age and gender
   Ambulatory visits to GPs/FPs and specialists were selected. The age group used for standardization was 0-4, 5-9, 10-14, 15-25, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, 85-89, 90+.

1.4 Physician access
   Physician access was defined as the proportion of people with at least one ambulatory physician visit in a year. Ambulatory visits to GPs/FPs and specialists were selected. The age group used for standardization was the same as for ambulatory visits by age and gender.

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[1]As expected, this percentage does not apply consistently across the province. The most affected district was District 1 in South Westman, where just under 7.5% of visits were to Saskatchewan physicians. Residents of the West District in Parkland RHA received just under 5% of their visits from Saskatchewan physicians. In all other districts, visits provided by non-Manitoba physicians never accounted for more than 2.5% of total visits (this analysis examined Saskatchewan and Ontario physician claims).

1.5 Location of ambulatory visits: GPs/FPs vs Specialists (same vs different RHA)

The denominator was total ambulatory visits, and proportions (not rates) were calculated. Physician location was assigned to one of four categories:

- Within the individual's district of residence
- Outside the district of residence, but within RHA of residence
- Outside RHA of residence: non-Winnipeg
- In Winnipeg

With location of visits to GPs, the denominator was the total number of visits to GPs. The data included only services to Manitobans within Manitoba, which may lead to undercounting of physician visits in some districts where a significant number of residents receive care out-of-province. When assigning physician numbers to a region, some physician numbers associated with hospital ERs could not be assigned. In these cases, physician location was calculated using hospital number. In/out of RHA comparisons were made between residence RHA on the first record of the time period and physician RHA as per any given record.

2.   Overall Hospital Utilization Analyses

Hospital analyses used 1994/95, 1995/96, 1999/00, and 2000/01 data, with the corresponding Manitoba population as the denominator (except injury hospitalizations - see below). Federal hospitals, nursing stations, and out-of-province hospitals were included; personal care homes and long-term care facilities were excluded. Age was calculated as of December 31. Region was assigned as of the last-occurring hospitalization for each given year. All data were adjusted for age and sex.

2.1 Separations

These consist of inpatient hospital stays and surgical outpatient (day surgery) records. Stays less than 30 days were considered short stays; stays 30 days or more were considered long stays.

2.2 Days

Stays less than 30 days were considered short stays; stays 30 days or more were considered long stays. For records where days were greater than 365 days, the original length of stay (LOS) variable was truncated to 365 days (i.e., within the 98/99 year of data being used, there could be discharges where the stay was longer than one year, e.g., spanning 97/98 and 98/99). Other stays spanning the two fiscal years but less than a year would thus be counted as the full number of days.

2.3 Location of hospitalization

The comparisons of hospital in/out of resident RHA were done using the RHA of the first-occurring PHIN. Rates of hospitalization by location were grouped into the following four categories:

- In RHA
- Other RHA
- In Winnipeg
- Out-of-province

Hospital catchments (where each RHA's hospitals' patients came from) were also calculated, using the same four categories.

2.4 Injury hospitalizations

Five years of hospital discharge abstracts were used (1991/92-1995/96 and 1996/97-2000/01); the denominator was taken from five years of population files (corresponding to the years of the numerator data). Transfers were excluded. Transfers were defined as any hospitalization which falls completely within another hospitalization (these are cases where a patient is transferred to another hospital to receive a special test like the MRI and then is sent back to the original hospital) or when the admission date of the second hospitalization is equal to the discharge date of the first hospitalization. Age was calculated as of December 31 for each given year. Region was assigned as of the last-occurring hospitalization for each given year.

2.5 Bed supply

Two years of data were used (1995-1996 and 2000-2001); denominator was the Manitoba population from the same years. Acute beds were included. Age was calculated as of December 31 for each given year. Region was assigned as of the last-occurring hospitalization for each given year. Manitoba Health bed map data, a snapshot of the province's bed supply as of March 31 of each year, was used.

3. Disease Prevalence Analyses

3.1 Diabetes

Physician visits and hospital abstracts from 1993/94 - 1995/96 and 1998/99 - 2000/01 were used. The denominator used was the 1994 population for the first time period, 1999 for the second. Analysis was restricted to individuals aged 20 to 79 as of December 31 of the denominator year. Region of residence was assigned using most frequent RHA, or last known RHA. Where both hospital and physician data are present, demographic information from the hospital data is used.

3.2 Hypertension

Physician visits from 1993/94 to 1995/96 and 1998/99 to 2000/01 were used. The denominator was the 1994 population for the first time period, and 1999 for the second time period. Analysis was restricted to individuals aged 25 or greater as of December 31 of the denominator year. Region was assigned based on region of the most frequently occurring record.

3.3 Cancer

Five calendar years of CancerCare Manitoba data were used (1991-1995 and 1996-2000), with the denominator being the Manitoba population from the same years. Age and region of residence were assigned by CancerCare Manitoba. Cases were defined as ICD codes 140-208, plus 230-239 ('In Situ' cancers), but excluding ICD 173 (non-malignant skin cancer). Metastases are not included as incident cases: only new 'primaries' are counted. The age groups for standardization were 0-24, 25-44, 45-64, 65-74, 75+. All rates were adjusted for age and sex.

3.4 Acute Myocardial Infarction

Five years of data were used (1991/92-1995/96 and 1996/97-2000/01), with the denominator being the Manitoba population age 20 and up from the same years. Eligibility was restricted to those aged 20 or older. Age was calculated as of December 31 of each year. Region of residence was assigned as of the most frequently occurring record. The age groups for standardization were 20-44, 45-64, 65-74, 75+. All data were adjusted for age and sex.

3.5 Stroke

Methods were the same as for AMI, above.

3.6 Respiratory Disease

Two years of data (1994/95-1995/96 and 1999/2000-2000/01) were used, with the denominator being the Manitoba population from the same years. Age was calculated as of December 31 for each year. Region of residence was assigned as of the most frequently occurring record. All data were adjusted for age and sex.

4.   Rates of Procedures

4.1 Discretionary Procedures

Caesarean Section
Maternal birth records were selected using ICD-9-CM 'V27' from five years of hospital discharge abstracts (1991/92-1995/96 and 1996/97-

2000/01). The denominator consisted of the number of women giving birth during the five-year period. Age was calculated as of December 31 for each given year, and region was assigned as of the first occurring record for each given year.

Hysterectomy
Five years of data were selected from hospital discharge abstracts (1991/92-1995/96 and 1996/97-2000/01). Long-term care hospitals were excluded, as were records with age less than 25 at date of admission. Age was calculated as of December 31 for each given year, and region was assigned as of the first occurring record for each given year.

Tonsillectomy/Adenoidectomy
Three years of data were selected from hospital discharge abstracts (1993/94-1995/96 and 1998/99-2000/01). Long-term care hospitals and records with age greater than 14 at date of admission were excluded. Age was calculated as of December 31 for each given year, and region was assigned as of the first occurring record for each given year.

4.2 High-Profile Procedures

Cardiac Catheterization
Three years of hospital data (1993/94-1995/96 and 1998/99-2000/01) were used. The denominator was the Manitoba population from the same years. Only teaching hospitals were included in the analysis. Age was calculated as of December 31 for each year, and region of residence was assigned as of the first-occurring record. Data were adjusted for age and sex. Age groups for standardization were 0-19, 20-39, 40-59, 60-74, 75+.

Angioplasty
Five years of hospital data (1991/92-1995/96 and 1996/97-2000/01) were used, with the denominator being the Manitoba population from the same years. Only teaching hospitals were included in the analysis. Age was calculated as of December 31 for each year, and region of residence was assigned as of the first-occurring record. Data were adjusted for age and sex. Age groups for standardization were 0-39, 40-59, 60-74, 75+.

Coronary Artery Bypass Graft Surgery (CABGS)
Methods were the same as for Angioplasty, above.

Hip Replacement
Five years of hospital data (1991/92-1995/96 and 1996/97-2000/01) were used. The denominator was the 1994-1995 and 1999-2000 population for Manitoba. Age was calculated as of December 31 for each

year, and region of residence was assigned as of the first-occurring record. Data were adjusted for age and sex. Age groups for standardization were 0-39, 40-59, 60-74, 75+.

Knee Replacement

Five years of hospital data (1991/92-1995/96 and 1996/97-2000/01) were used, with the denominator being the Manitoba population from the same years. Age was calculated as of December 31 for each year, and region of residence was assigned as of the first-occurring record. All data were adjusted for age and sex. Age groups for standardization were 0-39, 40-59, 60-74, 75+.

Cataract Surgery

Manitobans age 50 and up were selected from three years of hospital data (1994/95-1996/97 and 1998/99-2000/01). The denominator was the Manitoba population age 50 and older from the same years. Age was calculated as of December 31 for each year, and region of residence was assigned as of the first-occurring record. Data were adjusted for age and sex. Age groups for standardization were 0-19, 20-39, 40-59, 60-74, 75+.

4.3 Preventive Procedures

Childhood Immunization

Manitoba Immunization Monitoring System (MIMS) data were used, with children born in those years used as the denominator. One-year, two-year, and seven-year immunization schedules were examined. For one-year, children born 1993/94-1994/95 and 1998/99-1999/2000 were selected. For two-year, children born 1992/93-1993/94 and 1997/98-1998/99 were selected. For seven-year, children born 1987/88-1988/89 and 1992/93-1993/94 were selected. The data were not sex- or age-adjusted.

Mammography

Females age 50 to 69 as of service date were selected from two years of physician claims (1995/96 to 1996/97 and 1999/2000 to 2000/01). The denominator consisted of females age 50 to 69 in the 1995 Manitoba population for the first time period, and the 1999 Manitoba population for the second time period. Region of residence was calculated as of the service date. All data were adjusted for age.

Cervical Cancer Screening

Females age 18 to 69 as of service month were selected from three years of physician claims (1993/94-1995/96 for time period 1, 1998/99-2000/01 for time period 2). The denominator consisted of females age 18 to 69 in the Manitoba 1994 population for the first time period, the

1999 Manitoba population for the second time period. Region of residence was assigned as of service month. All data were adjusted for age.

Adult Flu Vaccinations
Manitobans age 65 and over as of December 31, 2000 were selected from one year of physician claims (2000/01). There were no data available for the earlier time period. The denominator consisted of the Manitoba population age 65 and over from the same time period. Region of residence was calculated as of the first-occurring record. All data were adjusted for age and sex.

5.   Population Breakdowns

Population pyramids: by gender, 5-year age groupings from 0-4 to 95-99 and then 100+. These were done using the December 1995 and 2000 population files.

6.   Health Status and Mortality

Vital Statistics data are used for life expectancy, PMR, and PYLL. Five calendar years of data (1991-1995, 1996-2000) were used in order to obtain a more stable rate.

6.1 Life expectancy (at birth)

The methodology for calculating life expectancy is based on "Users Guide to 40 Community Health Indicators" published by the Community Health Division, Health Services & Promotion Branch, Health & Welfare Canada, 1992. Age and residence were calculated as of date of death. Five-year age groupings were used (1-4, 5-10, 11-15, 16-20, 21-25 . . . 91-95, 96-100, 101-105, 106+) - this is different from the standard age grouping used for this project.

6.2 Premature mortality (PMR)

All individuals in the population ages 0 to 74 (except public trustees and non-Manitobans) are kept. Age is defined as of month end of date of death.

6.3 Potential years of life lost (PYLL)

PYLL is calculated as (75 - age at death). A person dying at age 25, for example, has lost 50 years of life (75-25=50 PYLL)" (from "Users Guide to 40 Community Health Indicators", see under Life Expectancy). Deaths aged 0 and 75+ are excluded. Age and residence were assigned as of date of death.

6.4 Socioeconomic Factor Index (SEFI)

The SEFI is an index which combines information from several variables in the Canadian census to measure regional socioeconomic status. A

large number of variables were analyzed, and principal component analysis was used to reduce the number of indicators to the following demographic and economic characteristics: labour force participation rate of women, age dependency ratio, per cent single parent households, per cent female single parent households, unemployment rates, and education level. The derivation of the SEFI was based on municipal level data from the 289 municipalities in Manitoba in 1996. As a result, there some areas in Burntwood and North Eastman where the geographic units used do not match precisely with the District boundaries, and so the best approximations are used. We used the SEFI 91 for Time Period 1, and SEFI 96 for Time Period 2. See Martens et al, 'Embedding Child Health Within a Framework of Regional Health.' Canadian Journal of Public Health 2002; Volume 93, Supplement 2: S15-S20.

6.5 Mortality

Mortality measures include all-cause mortality rates, top five causes of mortality, and injury mortality rates. Five years of data were used (1990-1994 and 1995-1999). Age and region of residence were assigned as of date of death. Age grouping for standardization was 0-19, 20-39, 40-59, 60-74, 75+. All data were adjusted for age and sex.

7.   Home Care/PCH

For all Home Care and Personal Care Home (PCH) analyses, two years of data were used (1994/95-1995/96 and 1999/2000-2000/01), with the population from the same years as the denominator (see specific categories for exceptions). In preparation for analyses done for the RHA 2002 deliverable, considerable effort was invested in determining whether some reasonable results could be presented for PCH residents in Churchill. In past studies, Churchill is either excluded altogether or included with Burntwood for PCH analyses. The conclusion was that reliable results could not be produced, so Churchill was excluded from PCH analyses altogether (for this report).

Talking to representatives of the Churchill RHA revealed that the Churchill Health Centre has a 'virtual' PCH: there are seven beds in the facility which are operated and funded as PCH beds, even though it is not a separate building, and does not have its own PCH facility number. As a result, these patients do not show up as admitted or resident in a PCH, and their level of care is always coded as '8', which means 'In hospital, awaiting PCH placement.'

One consequence of this is that we cannot distinguish the seven persons occupying the 'virtual PCH' beds from others in acute beds awaiting placement in PCH. Therefore, the analysis was dropped for the RHA 2002 deliv-

erable (rationale: this was getting too detailed and exceptional for such a broad-based report).

Analyses regarding Personal Care Homes (PCH) were conducted at the RHA level only, not the district level, due to small numbers. Churchill is excluded because the statistical files used at MCHP do not contain accurate records for 'virtual' PCH beds in the Churchill Health Centre. However, residents of Churchill are included in the cross-tabulation of where RHA residents went for PCH admission (in RHAs other than Churchill).

The results shown for PCH Admission rates are quite different from previously reported values for Burntwood and North Eastman (June 1999 RHA report). This is due to an error in programming used for previous analyses - current results show corrected values.

7.1 PCH Residents

Only population age 75+ are included. Churchill residents and companion care are excluded. Age was defined as of December 31 of each year in PCH. Age groups used for standardization were 0-64, 65-74, 75-79, 80-84, 85-89, 90+ - note that this is different from the standard age grouping. Residence was assigned as of prior to admission to PCH.

7.2 PCH Admissions

Only population age 75+ are included. Churchill residents and companion care are excluded. Age was defined as of date of admission. Age groups for standardization were 0-64, 65-74, 75-79, 80-84, 85-89, 90+ - note that this is different from the standard age grouping. Residence was assigned as of prior to admission to PCH.

8.   Pharmaceutical Data

Drug Programs Information Network (DPIN) Data, which includes pharmaceutical data from Pharmacare, non-adjudicated, nursing home, and Family Services data, was used for this study's pharmaceutical use analyses. Years of data used were 1996/97-1997/98 (Time Period 1) and 1999/2000-2000/01 (Time Period 2). Age was defined as of December 31 for any given year. Residence was defined as of the first record for any given year.

9.   Child Health

9.1 High/Low Birthweight Babies

Five-year rates (1991-1995 and 1996-2000) were used for this analysis. Eligibility was restricted to newborns born in Manitoba facilities, birth weight between 500g and 9000g inclusive. High birth weight was

defined as greater than 4000 grams; low birth weight was defined as less than 2500 grams.

9.2 Infant Mortality
The years of data for this measure were 1990-1994 (Time Period 1) and 1995-1999 (Time Period 2). Eligibility was restricted to newborns born in Manitoba facilities.

9.3 Breastfeeding Initiation Rates
Five years of data (1991/92-1995/96 and 1996/97-2000/01) were used. Breastfeeding was defined as either exclusive breastfeeding or some breastfeeding. Eligibility was restricted to newborns born in Manitoba facilities. Records missing breastfeeding data were counted and noted, but excluded from the graphical analysis.

9.4 Teen Pregnancy Rates
Five years of data (1991-1995 and 1996-2000) were used. Pregnancy was defined as live birth, stillbirth, abortion, or ectopic pregnancy. Only women age 15-19 were included.

9.5 Preterm Birth Rates
A preterm baby is one born at less than 37 gestational weeks. Five years of data (1991-1995 and 1996-2000) were used. Eligibility was limited to newborns born in Manitoba facilities. Babies with gestation period <20 or =99 weeks were excluded.

APPENDIX 2: TABLES OF CRUDE RATES AND OBSERVED NUMBERS OF EVENTS

Notes:
1) These tables provide crude rates and the observed numbers of events which went into the calculation of the age- and sex-adjusted rates shown in the report (see Glossary).
2) Where the indicator requires more than one year of data to define, the observed numbers are the total number of people with that characteristic in that whole period. For example, Table 2.4 shows that there were 1,590 diabetics in Burntwood in the first three-year period (1993/94-1995/96).
3) Privacy concerns require that MCHP suppress data when five or fewer events occurr. In the tables of this Appendix, some entries of 5 or lower are shown. This is due to the fact that the observed number shown is an 'annual average' based on more than one year of information (and more than 5 events occurred in the time frame analyzed). For example, in Churchill in 1996-2000, there were 13 premature deaths, or 2.6 per year, as shown in Table 2.1.

Appendix Table 2.1: Premature mortality, SEFI

	Population		SEFI		Premature Mortality			
			Socioeconomic Factor Index Values (standardized)		Age 0-74		Age 0-74	
					Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	Population		SEFI					
	1995	2000	1991	1996	1991-1995		1996-2000	
South Eastman	51,395	54,427	-0.42	-0.67	123	2.57	125	2.47
South Westman	35,441	34,029	-0.75	-0.84	122	3.81	116	3.74
Brandon	46,863	47,337	0.13	-0.20	131	2.96	141	3.22
Central	96,152	97,865	-0.39	-0.43	285	3.26	266	2.94
Marquette	37,941	37,515	-0.47	-0.48	149	4.34	145	4.29
Parkland	44,090	42,909	0.05	-0.11	179	4.44	161	4.12
Interlake	73,338	74,944	-0.32	-0.08	279	4.07	261	3.73
North Eastman	37,618	39,369	-0.21	-0.37	126	3.60	141	3.82
Burntwood	43,793	45,051	1.52	1.24	123	2.87	129	2.89
Churchill	1,115	1,008	0.46	0.79	5.4	4.71	2.6	2.54
Nor-Man	25,117	25,233	0.63	0.66	101	4.09	88	3.61
Rural South	375,975	381,058	-0.35	-0.39	1,263	3.65	1,215	3.45
North	70,025	71,292	1.17	1.02	229	3.34	220	3.14
Winnipeg	647,552	649,012	0.16	0.04	2,093	3.42	1,996	3.31
Manitoba	1,140,415	1,148,699	0.06	-0.06	3,715	3.47	3,571	3.34

Appendix Table 2.2: Life expectancy, total mortality

	Life Expectancy				Total Mortality Rate			
	MALE		FEMALE		Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	Total Years		Total Years					
	1991-1995	1996-2000	1991-1995	1996-2000	1990-1994		1995-1999	
South Eastman	76.7	77.2	82.6	82.7	293	5.90	310	5.92
South Westman	77.2	76.5	82.3	83.1	381	10.69	410	11.73
Brandon	77.1	76.1	82.1	82.0	361	7.64	387	8.27
Central	76.0	76.6	81.8	81.9	763	8.22	793	8.19
Marquette	75.4	74.9	81.7	82.5	415	10.92	455	12.06
Parkland	75.3	75.3	82.6	81.2	477	10.70	521	11.93
Interlake	74.6	75.5	80.4	81.1	604	8.36	614	8.30
North Eastman	75.1	74.6	80.3	80.0	245	6.75	275	7.14
Burntwood	71.7	71.2	75.9	77.1	157	3.66	170	3.81
Churchill	65.2	73.5	75.7	74.9	6	4.88	6	5.29
Nor-Man	70.6	72.9	77.1	77.9	169	6.63	162	6.40
Rural South	75.7	75.9	81.6	81.7	3,178	8.61	3,378	8.94
North	70.7	71.7	76.3	77.7	332	4.77	338	4.75
Winnipeg	75.6	76.3	81.4	81.3	4,792	7.38	5,137	7.96
Manitoba	75.4	75.9	81.3	81.3	8,664	7.63	9,241	8.09

Appendix Table 2.3: Potential years of life lost

	Combined				Male				Female			
	Age 1-74 Number Observed per Year	CRUDE Rate per 1000	Age 1-74 Number Observed per Year	CRUDE Rate per 1000	Age 1-74 Number Observed per Year	CRUDE Rate per 1000	Age 1-74 Number Observed per Year	CRUDE Rate per 1000	Age 1-74 Number Observed per Year	CRUDE Rate per 1000	Age 1-74 Number Observed per Year	CRUDE Rate per 1000
	1991-1995		1996-2000		1991-1995		1996-2000		1991-1995		1996-2000	
South Eastman	2,081	43.4	2,047	43.5	1,388	56.6	1,357	55.9	693	29.6	691	30.3
South Westman	1,525	47.6	1,572	50.6	949	58.4	1,091	69.3	576	36.4	481	31.4
Brandon	1,866	42.2	2,021	46.3	1,113	51.7	1,283	60.6	753	33.2	738	32.8
Central	4,357	49.8	4,328	47.8	2,889	65.2	2,765	60.1	1,468	34.0	1,563	35.1
Marquette	1,985	57.9	2,065	61.0	1,266	72.3	1,429	82.7	719	42.8	636	38.4
Parkland	2,285	56.8	2,405	61.4	1,574	76.3	1,570	78.5	711	36.3	835	43.6
Interlake	4,319	63.1	3,909	56.0	2,787	79.3	2,570	71.9	1,532	46.0	1,339	39.3
North Eastman	2,199	62.7	2,594	64.4	1,442	79.5	1,585	77.0	757	44.7	1,009	51.1
Burntwood	3,586	83.9	3,578	80.5	2,306	104.5	2,365	103.5	1,281	62.0	1,213	56.2
Churchill	133	115.9	53	52.3	115	191.5	35	65.0	18	32.9	18	38.1
Nor-Man	1,875	76.2	1,757	71.7	1,239	97.9	1,019	81.0	635	53.3	738	61.9
Rural South	18,751	54.3	18,919	53.8	12,295	69.7	12,366	68.9	6,456	38.2	6,553	38.1
North	5,594	81.7	5,388	77.0	3,660	103.6	3,419	95.0	1,934	58.4	1,969	57.9
Winnipeg	31,037	50.7	30,822	51.1	19,306	63.9	18,418	61.6	11,731	37.9	12,404	40.7
Manitoba	57,248	53.5	57,150	53.5	36,373	67.9	35,485	66.3	20,875	39.0	21,665	40.6

Appendix Table 2.4: Diabetes, hypertension, cancer

	Diabetes - Age 20-79				Hypertension - Age 25+				Cancer			
	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1993/94-1995/96		1998/99-2000/01		1993/94-1995/96		1998/99-2000/01		1991-1995		1995-2000	
South Eastman	1,091	3.4%	1,453	4.2%	5,077	17.0%	6,785	21.1%	217	4.32	246	4.65
South Westman	1,134	4.9%	1,300	5.7%	5,056	21.7%	6,081	26.5%	262	7.37	277	8.00
Brandon	1,205	3.8%	1,750	5.5%	5,323	17.9%	6,564	21.5%	280	5.93	312	6.64
Central	2,392	4.0%	3,032	4.9%	11,164	19.4%	13,093	22.1%	495	5.28	498	5.13
Marquette	1,384	5.5%	1,692	6.7%	5,819	23.1%	6,550	26.2%	280	7.39	274	7.28
Parkland	1,890	6.5%	2,177	7.6%	6,639	23.2%	6,947	24.5%	297	6.70	305	7.02
Interlake	2,551	5.2%	3,263	6.4%	9,930	21.2%	12,114	24.7%	436	6.01	438	5.90
North Eastman	1,268	5.1%	1,708	6.5%	4,681	20.2%	5,860	23.6%	184	4.99	201	5.17
Burntwood	1,590	6.6%	2,411	9.6%	2,979	14.7%	3,869	17.8%	90	2.08	104	2.31
Churchill	46	6.3%	66	9.6%	144	21.8%	144	22.7%	4.8	4.13	4.0	3.85
Nor-Man	946	6.0%	1,228	7.7%	2,103	14.9%	2,666	18.3%	104	4.11	111	4.39
Rural South	11,712	4.8%	14,625	5.9%	48,371	20.6%	57,431	23.8%	2,171	5.85	2,239	5.91
North	2,582	6.4%	3,705	8.9%	5,226	14.9%	6,679	18.1%	199	2.86	219	3.07
Winnipeg	19,281	4.2%	24,009	5.3%	83,220	19.4%	96,528	22.1%	3,550	5.47	3,755	5.81
Manitoba	34,780	4.5%	44,089	5.7%	142,139	19.5%	167,202	22.4%	6,200	5.45	6,525	5.71

Appendix Table 2.5: Respiratory morbidity, AMI, stroke

	Total Respiratory Morbidity				AMI				Stroke			
	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Age 20+ Number Observed per Year	CRUDE Rate per 1000	Age 20+ Number Observed per Year	CRUDE Rate per 1000	Age 20+ Number Observed per Year	CRUDE Rate per 1000	Age 20+ Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1991/92-1995/96		1996/97-2000/01		1991/92-1995/96		1996/97-2000/01	
South Eastman	10,199	10.0%	11,173	10.4%	60	1.83	68	1.91	70	2.12	57	1.60
South Westman	8,085	11.4%	8,353	12.2%	82	3.22	73	2.90	70	2.77	70	2.79
Brandon	16,003	17.1%	14,142	15.0%	84	2.54	94	2.78	59	1.77	58	1.73
Central	21,401	11.2%	18,652	9.6%	147	2.33	159	2.43	143	2.28	129	1.97
Marquette	10,124	13.3%	8,110	10.8%	99	3.63	85	3.10	73	2.69	68	2.50
Parkland	13,789	15.6%	14,097	16.3%	110	3.52	104	3.35	101	3.22	97	3.12
Interlake	19,677	13.4%	18,172	12.1%	141	2.76	146	2.74	109	2.13	126	2.37
North Eastman	11,133	14.8%	9,663	12.3%	60	2.41	55	2.06	54	2.16	51	1.91
Burntwood	7,894	9.0%	6,243	6.9%	32	1.33	49	1.95	27	1.14	38	1.52
Churchill	208	9.3%	191	9.3%	0	0.00	0	0.00	1.2	1.58	0	0.00
Nor-Man	6,605	13.1%	5,045	10.0%	36	2.19	34	2.07	30	1.83	22	1.33
Rural South	94,408	12.6%	88,220	11.6%	700	2.73	690	2.61	621	2.42	598	2.26
North	14,707	10.5%	11,479	8.0%	68	1.66	83	1.97	58	1.42	61	1.43
Winnipeg	187,528	14.5%	170,082	13.1%	991	2.08	985	2.06	832	1.75	715	1.49
Manitoba	312,646	13.7%	283,923	12.4%	1,843	2.28	1,851	2.26	1,570	1.95	1,431	1.75

Appendix Table 2.6: Immunization

	Child Immunization - 1 Year				Child Immunization - 2 Year				Child Immunization - 7 Year			
	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent
	Born 1993/94-1994/95		Born 1998/99-1999/00		Born 1992/93-1993/94		Born 1997/98-1998/99		Born 1987/88-1988/89		Born 1992/93-1993/94	
South Eastman	1,316	90.5%	1,235	88.9%	1,127	77.7%	1,037	74.7%	1,063	80.2%	1,131	82.4%
South Westman	738	92.9%	633	89.5%	718	85.4%	570	82.0%	819	91.4%	689	86.2%
Brandon	1,050	87.6%	852	85.6%	814	71.8%	730	73.0%	1,007	86.6%	788	77.0%
Central	2,425	86.8%	2,133	79.6%	2,059	76.1%	1,805	67.7%	2,348	87.2%	2,059	79.7%
Marquette	759	88.5%	680	82.8%	677	77.1%	547	69.9%	780	85.4%	642	77.3%
Parkland	931	84.6%	842	84.8%	768	73.5%	715	73.1%	955	89.5%	790	80.6%
Interlake	1,543	85.1%	1,379	84.9%	1,288	70.4%	1,176	74.1%	1,436	78.4%	1,202	68.9%
North Eastman	854	78.8%	744	75.5%	706	66.0%	558	59.2%	677	70.0%	666	65.9%
Burntwood	1,304	56.8%	1,343	62.3%	924	41.3%	1,030	50.0%	1,006	52.0%	866	41.5%
Churchill	37	86.0%	33	89.2%	29	74.4%	33	86.8%	30	75.0%	18	54.5%
Nor-Man	718	78.9%	638	71.8%	566	62.6%	551	65.9%	599	77.8%	589	72.4%
Rural South	8,566	86.5%	7,646	83.1%	7,343	74.8%	6,408	70.9%	8,078	83.3%	7,179	77.0%
North	2,059	63.4%	2,014	65.3%	1,519	47.7%	1,614	55.0%	1,635	59.5%	1,473	50.2%
Winnipeg	15,067	87.1%	12,649	86.4%	12,586	74.0%	10,713	73.7%	13,253	85.9%	11,824	75.1%
Manitoba	26,742	84.5%	23,161	83.0%	22,262	71.5%	19,465	70.7%	23,973	82.6%	21,264	73.3%

Appendix Table 2.7: Adult flu, mammograms, PAP tests

	Adult Flu		Mammograms				PAP Tests			
	Age 65+ Number Observed in Year	CRUDE Per Cent	Age 50-69 Number Observed in Period	CRUDE Per Cent	Age 50-69 Number Observed in Period	CRUDE Per Cent	Age 18-69 Number Observed in Period	CRUDE Per Cent	Age 18-69 Number Observed in Period	CRUDE Per Cent
	2000/01		1995/96-1996/97		1999/00-2000/01		1993/94-1995/96		1998/99-2000/01	
South Eastman	3,135	53.4%	1,708	44.4%	2,917	67.5%	10,179	66.6%	11,027	67.4%
South Westman	3,515	52.0%	1,861	53.1%	2,502	69.9%	6,511	62.4%	6,433	62.5%
Brandon	3,926	59.1%	2,473	62.0%	3,130	71.9%	11,203	71.6%	11,597	73.9%
Central	6,753	50.8%	4,127	53.0%	5,359	65.9%	17,189	61.3%	18,065	62.5%
Marquette	3,967	55.3%	2,013	54.5%	2,566	67.7%	6,809	61.4%	6,977	62.4%
Parkland	4,288	53.1%	1,231	29.0%	2,810	65.6%	8,023	62.4%	7,882	61.5%
Interlake	5,940	56.8%	3,402	49.8%	5,150	67.1%	15,753	68.6%	16,177	68.2%
North Eastman	2,372	49.6%	1,415	42.4%	2,647	69.2%	7,264	63.7%	7,976	65.4%
Burntwood	311	20.8%	119	6.4%	1,178	51.6%	6,705	55.9%	6,481	51.5%
Churchill	31	63.3%	15	23.1%	36	49.3%	213	59.8%	178	51.9%
Nor-Man	1,054	53.1%	788	48.3%	1,102	61.5%	4,108	54.1%	4,191	54.8%
Rural South	29,970	53.1%	15,757	47.4%	23,951	67.3%	71,728	64.0%	74,537	64.5%
North	1,396	39.5%	922	25.9%	2,316	55.8%	11,026	55.3%	10,850	52.7%
Winnipeg	50,112	56.3%	29,786	52.0%	37,395	60.2%	158,079	71.9%	157,697	72.2%
Manitoba	85,404	54.9%	48,938	49.9%	66,792	62.9%	252,036	68.6%	254,681	68.8%

Appendix Table 2.8: Low birth weight, high birth weight, infant mortality

	Low Birth Weight				High Birth Weight				Infant Mortality			
	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1991-1995		1996-2000		1991-1995		1996-2000		1990-1994		1995-1999	
South Eastman	35	4.7%	31	4.4%	113	15.2%	105	15.1%	4.4	5.7	5.2	7.2
South Westman	17	4.2%	15	4.2%	78	19.2%	58	16.6%	3.4	7.8	2.4	6.5
Brandon	30	4.6%	25	4.5%	100	15.4%	88	15.9%	3.2	4.8	2.4	4.2
Central	60	4.2%	59	4.3%	249	17.3%	235	17.2%	9.2	6.3	11.2	8.0
Marquette	17	4.1%	19	5.2%	68	16.5%	61	16.8%	2.8	6.3	3.2	7.7
Parkland	22	4.2%	21	4.4%	97	18.8%	82	17.5%	4.4	7.6	1.8	3.5
Interlake	44	4.7%	41	5.0%	157	16.8%	147	17.8%	6.6	7.1	6.4	7.4
North Eastman	28	5.1%	23	4.8%	83	15.0%	83	16.9%	4.8	8.7	4.6	9.1
Burntwood	48	4.2%	51	4.8%	222	19.3%	215	20.2%	11.4	9.8	11.2	10.2
Churchill	1.6	0.1	0.0	0.0%	6.2	0.2	5.4	30.7%	0.0	0.0	0.0	0.0
Nor-Man	23	4.9%	20	4.5%	73	15.8%	78	17.6%	4.4	9.1	2.4	5.3
Rural South	223	4.5%	209	4.6%	845	16.9%	771	16.9%	36	6.9	35	7.3
North	72	4.4%	72	4.7%	301	18.4%	299	19.6%	16	9.8	14	8.8
Winnipeg	495	5.5%	423	5.6%	1,150	12.8%	1,059	13.9%	57	6.2	51	6.5
Manitoba	821	5.0%	728	5.1%	2,396	14.7%	2,217	15.6%	112	6.7	102	6.9

Appendix Table 2.9: Breastfeeding initiation, teen pregnancy, preterm

	Breastfeeding Initiation				Teen Pregnancy				Preterm			
	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent
	1991/92-1995/96		1996/97-2000/01		1991-1995		1996-2000		1991-1995		1996-2000	
South Eastman	625	84.0%	613	88.6%	72	35.0	59	28.1	44	5.9%	46	6.6%
South Westman	279	80.2%	276	82.4%	33	26.0	33	26.6	22	5.3%	21	6.0%
Brandon	482	75.3%	437	78.6%	92	58.9	87	53.0	37	5.7%	32	5.9%
Central	1,187	82.7%	1,124	83.5%	171	47.3	157	40.7	77	5.4%	75	5.5%
Marquette	288	78.7%	247	80.3%	67	49.8	52	39.1	22	5.3%	25	7.0%
Parkland	332	64.8%	330	70.6%	117	68.2	106	66.8	30	5.9%	31	6.5%
Interlake	597	76.1%	598	79.1%	141	53.4	142	54.6	61	6.5%	62	7.5%
North Eastman	337	64.2%	328	69.1%	97	68.5	95	65.1	32	5.7%	35	7.0%
Burntwood	720	62.9%	691	65.2%	288	143.1	263	131.6	61	5.3%	76	7.1%
Churchill	22	87.3%	13	79.3%	5.4	118.4	5.4	163.6	1.4	5.4%	0.0	0.0%
Nor-Man	284	61.6%	279	63.7%	107	96.8	101	99.8	32	7.0%	28	6.4%
Rural South	3,645	77.3%	3,517	80.3%	699	49.6	644	45.4	288	5.7%	295	6.5%
North	1,026	62.9%	983	64.9%	401	126.5	369	121.4	95	5.8%	105	6.9%
Winnipeg	6,910	77.3%	6,211	82.3%	1,293	63.3	1,289	64.3	590	6.6%	573	7.5%
Manitoba	12,063	75.8%	11,148	79.7%	2,485	63.3	2,389	61.4	1,010	6.2%	1,006	7.1%

Appendix Table 2.10: Ambulatory visits, ambulatory consults

	Ambulatory Visits				Ambulatory Consults			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1995/96		2000/01		1995/96		2000/01	
South Eastman	203,347	3.96	225,965	4.15	10,978	0.21	12,784	0.23
South Westman	155,863	4.40	161,321	4.74	6,378	0.18	8,699	0.26
Brandon	232,758	4.95	244,949	5.17	10,860	0.23	14,043	0.30
Central	387,649	4.03	391,777	4.00	16,915	0.18	19,993	0.20
Marquette	185,037	4.88	177,461	4.73	6,868	0.18	8,534	0.23
Parkland	205,274	4.66	218,141	5.08	8,721	0.20	10,143	0.24
Interlake	325,936	4.44	319,177	4.26	17,619	0.24	19,712	0.26
North Eastman	171,898	4.57	175,738	4.46	8,515	0.23	9,977	0.25
Burntwood	159,684	3.65	154,094	3.42	8,108	0.19	9,394	0.21
Churchill	5,179	4.64	5,152	5.08	343	0.31	431	0.43
Nor-Man	111,660	4.45	110,505	4.38	4,098	0.16	4,367	0.17
Rural South	1,635,004	4.35	1,669,580	4.38	75,994	0.20	89,842	0.24
North	276,523	3.95	269,751	3.78	12,549	0.18	14,192	0.20
Winnipeg	3,385,113	5.23	3,364,413	5.18	186,861	0.29	197,069	0.30
Manitoba	5,529,398	4.85	5,548,693	4.83	286,264	0.25	315,146	0.27

Appendix Table 2.11: Hospital separations, injury hospitalizations

	Hospital Separations				Injury Hospitalization			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1991/92-1995/96		1996/97-2000/01	
South Eastman	8,215	160.6	9,299	172.3	533	10.6	492	9.3
South Westman	8,246	232.4	8,845	258.3	571	16.1	497	14.4
Brandon	7,014	149.5	7,834	166.2	434	9.2	420	9.0
Central	18,569	194.0	19,493	199.7	1,249	13.3	1,113	11.5
Marquette	9,877	259.8	9,113	242.8	637	16.8	605	16.1
Parkland	11,970	270.7	10,828	251.0	859	19.4	687	15.8
Interlake	13,814	188.7	13,594	181.7	825	11.4	699	9.4
North Eastman	6,639	176.8	7,123	181.3	478	13.0	450	11.6
Burntwood	10,214	234.1	10,217	226.8	1,246	28.9	1,246	27.7
Churchill	258	231.4	227	221.4	23	19.4	17	16.6
Nor-Man	6,396	254.5	5,780	228.9	580	22.9	455	18.0
Rural South	77,329	206.0	78,294	205.7	5,153	13.9	4,544	12.0
North	16,867	241.4	16,223	227.4	1,849	26.5	1,719	24.1
Winnipeg	90,299	139.3	92,956	143.5	5,235	8.1	4,711	7.3
Manitoba	191,508	167.9	195,306	170.3	12,671	11.1	11,395	10.0

Appendix Table 2.12: Hospital days used in short stays and long stays

	Hospital Days Used in Short Stays				Hospital Days Used in Long Stays			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1994/95-1995/96		1999/00-2000/01	
South Eastman	27,026	528	26,391	489	20,676	404	16,452	305
South Westman	33,721	951	30,982	905	21,812	615	22,567	659
Brandon	26,265	560	27,873	591	33,411	712	34,622	735
Central	67,408	704	60,598	621	44,109	461	41,350	424
Marquette	41,718	1097	33,945	904	19,509	513	25,758	686
Parkland	50,404	1140	39,697	920	34,402	778	24,041	557
Interlake	48,428	662	42,039	562	23,463	320	21,412	286
North Eastman	23,216	618	21,581	549	14,416	384	15,810	403
Burntwood	30,255	693	26,022	578	7,547	173	6,680	148
Churchill	714	642	637	622	3,266	1,467	5,716	2,794
Nor-Man	21,964	874	15,847	628	14,449	575	15,902	630
Rural South	291,919	778	255,232	671	178,385	475	167,388	440
North	52,933	757	42,505	596	23,629	338	25,440	357
Winnipeg	296,226	457	275,534	425	334,496	516	350,510	541
Manitoba	667,342	585	601,143	524	569,920	500	577,959	504

Appendix Table 2.13: Cardiac catheterizations, angioplasty, bypass surgery, cataracts

	Cardiac Catheterizations				Angioplasty				Bypass Surgery				Cataracts			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1993/94-1995/96		1998/99-2000/01		1991/92-1995/96		1996/97-2000/01		1991/92-1995/96		1996/97-2000/01		1994/95-1996/97		1998/99-2000/01	
South Eastman	88	1.72	144	2.68	15	0.31	29	0.54	19	0.38	38	0.71	226	19.1	327	25.1
South Westman	59	1.67	90	2.61	10	0.27	17	0.50	12	0.34	20	0.58	224	18.4	342	27.9
Brandon	77	1.64	104	2.22	15	0.33	23	0.48	20	0.42	30	0.65	238	19.0	407	30.4
Central	223	2.34	253	2.59	33	0.35	61	0.63	42	0.44	59	0.61	534	21.0	651	24.7
Marquette	85	2.24	88	2.35	17	0.46	22	0.57	19	0.51	25	0.67	221	16.9	328	24.9
Parkland	128	2.90	162	3.74	20	0.44	32	0.74	24	0.53	40	0.92	196	13.1	237	15.9
Interlake	198	2.71	246	3.29	37	0.52	53	0.71	41	0.57	61	0.82	398	19.0	570	25.1
North Eastman	93	2.49	125	3.19	16	0.45	28	0.72	22	0.61	30	0.78	168	16.8	209	18.8
Burntwood	60	1.37	82	1.81	12	0.28	16	0.36	5	0.11	16	0.36	49	9.9	79	13.5
Churchill	0		3	2.92	0		0		0		0		3	16.3	4	19.2
Nor-Man	45	1.80	51	2.00	6	0.24	10	0.41	9	0.37	14	0.57	72	15.3	88	16.9
Rural South	874	2.34	1,107	2.91	148	0.40	241	0.64	179	0.48	273	0.72	1,967	18.1	2,665	23.5
North	106	1.52	135	1.90	18	0.26	27	0.37	14	0.20	31	0.43	124	12.6	170	15.2
Winnipeg	1,793	2.76	2,069	3.20	346	0.53	463	0.72	347	0.53	493	0.76	3,991	23.1	5,257	28.4
Manitoba	2,851	2.50	3,416	2.98	528	0.46	754	0.66	560	0.49	827	0.72	6,320	20.8	8,499	26.3

Appendix Table 2.14: Hip replacement, knee replacement, CT scan

	Hip Replacement				Knee Replacement				CT Scan			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1991/92-1995/96		1996/97-2000/01		1991/92-1995/96		1996/97-2000/01		1998/1999		1999/00-2000/01	
South Eastman	22	0.43	28	0.53	21	0.41	43	0.82	2,077	39.4	2,570	47.6
South Westman	31	0.87	31	0.89	22	0.61	34	0.99	1,446	41.7	2,528	73.8
Brandon	22	0.48	28	0.59	20	0.42	29	0.61	2,315	49.6	3,868	82.1
Central	53	0.57	73	0.75	52	0.56	88	0.91	3,366	34.7	3,943	40.4
Marquette	31	0.83	37	0.98	25	0.66	36	0.95	1,401	37.2	2,426	64.6
Parkland	33	0.75	40	0.92	36	0.81	48	1.11	1,430	33.0	1,029	23.8
Interlake	46	0.63	59	0.80	43	0.60	82	1.11	2,940	39.5	3,528	47.2
North Eastman	23	0.63	29	0.74	19	0.51	35	0.89	1,581	40.8	1,947	49.6
Burntwood	5	0.13	13	0.29	8	0.19	18	0.41	1,133	25.2	1,349	29.9
Churchill									36	34.7	36	35.2
Nor-Man	11	0.44	11	0.43	6	0.22	11	0.45	705	27.8	901	35.7
Rural South	240	0.65	297	0.78	217	0.59	367	0.97	14,241	37.6	17,969	47.2
North	17	0.25	25	0.35	14	0.20	31	0.43	1,874	26.3	2,285	32.0
Winnipeg	338	0.52	470	0.73	271	0.42	565	0.87	33,665	52.3	38,876	60.0
Manitoba	618	0.54	820	0.72	522	0.46	991	0.87	52,095	45.7	62,998	54.9

Appendix Table 2.15: Tonsillectomy/adenoidectomy, hysterectomy, C-Section

	Tonsillectomy/Adenoidectomy				Hysterectomy				% Births by C-Section			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent
	1993/94-1995/96		1998/99-2000/01		1991/92-1995/96		1996/97-2000/01		1991/92-1995/96		1996/97-2000/01	
South Eastman	99	7.5	96	7.3	84	5.7	93	5.9	96	12.8%	106	15.2%
South Westman	41	5.5	56	8.1	57	4.8	61	5.2	56	13.5%	60	16.8%
Brandon	85	8.1	83	8.5	81	5.1	99	6.1	98	15.2%	106	18.9%
Central	135	5.7	115	4.9	158	5.5	161	5.4	218	15.1%	239	17.4%
Marquette	59	7.5	57	7.7	72	5.7	68	5.3	69	15.7%	83	21.2%
Parkland	74	7.9	57	6.3	82	5.7	103	7.2	100	18.2%	100	19.4%
Interlake	103	6.4	89	5.6	130	5.6	131	5.4	118	12.7%	131	16.0%
North Eastman	54	6.1	45	5.0	70	6.3	71	5.9	74	13.5%	66	13.5%
Burntwood	113	7.5	74	4.8	49	5.1	44	4.2	134	11.5%	153	14.3%
Churchill	0		2	7.6	2	5.1	2	5.4	4	15.7%	3	17.1%
Nor-Man	64	9.3	48	7.0	47	6.8	45	6.3	94	20.2%	97	21.5%
Rural South	564	6.5	515	6.1	652	5.6	688	5.7	732	14.4%	785	16.9%
North	178	8.0	124	5.5	98	5.8	90	5.1	232	14.0%	253	16.4%
Winnipeg	686	5.2	626	5.0	1,102	4.9	1,052	4.6	1,334	14.8%	1,344	17.8%
Manitoba	1,513	6.1	1,349	5.6	1,933	5.2	1,929	5.0	2,396	14.6%	2,489	17.4%

Appendix Table 2.16: Home care (open and new cases)

	Open Cases				New Cases			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1994/95-1995/96		1999/00-2000/01	
South Eastman	964	18.8	1,253	23.2	436	8.5	474	8.8
South Westman	915	25.8	1,053	30.7	456	12.9	439	12.8
Brandon	760	16.2	1,165	24.7	425	9.0	608	12.9
Central	1,682	17.6	2,315	23.7	807	8.4	1,016	10.4
Marquette	888	23.3	1,165	31.0	432	11.4	480	12.8
Parkland	1,360	30.8	1,843	42.7	656	14.8	704	16.3
Interlake	1,703	23.3	2,099	28.1	732	10.0	786	10.5
North Eastman	607	16.2	882	22.5	251	6.7	319	8.1
Burntwood	201	4.6	328	7.3	136	3.1	192	4.3
Churchill	8	6.7	19	18.6	4	3.1	9	8.3
Nor-Man	346	13.8	505	20.0	168	6.7	179	7.1
Rural South	8,117	21.6	10,609	27.9	3,769	10.0	4,216	11.1
North	555	7.9	852	11.9	307	4.4	379	5.3
Winnipeg	13,517	20.8	17,843	27.5	6,867	10.6	7,305	11.3
Manitoba	22,948	20.1	30,468	26.6	11,367	10.0	12,507	10.9

Appendix Table 2.17: Home care (average length of stay and closings)

	Average Length of Stay				Closings			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1994/95-1995/96		1999/00-2000/01	
South Eastman	206,294	214.1	275,261	219.8	354	6.9	485	9.0
South Westman	179,353	196.1	216,511	205.6	391	11.0	447	13.0
Brandon	138,250	181.9	196,876	169.0	357	7.6	625	13.3
Central	334,848	199.1	466,471	201.5	731	7.6	982	10.1
Marquette	177,948	200.5	239,569	205.7	372	9.8	473	12.6
Parkland	276,463	203.3	403,502	218.9	536	12.1	683	15.8
Interlake	370,622	217.6	450,811	214.8	602	8.2	815	10.9
North Eastman	131,025	215.9	198,547	225.1	221	5.9	321	8.2
Burntwood	28,217	140.4	50,795	154.9	116	2.7	179	4.0
Churchill	1,541	205.4	3,756	197.7	3	2.7	11	10.3
Nor-Man	67,262	194.4	116,909	231.5	153	6.1	180	7.1
Rural South	1,676,551	206.5	2,250,670	212.2	3,205	8.5	4,204	11.0
North	97,019	175.0	171,460	201.2	272	3.9	369	5.2
Winnipeg	2,582,177	191.0	3,755,704	210.5	6,745	10.4	8,539	13.2
Manitoba	4,493,996	195.8	6,374,709	209.2	10,578	9.3	13,736	12.0

Appendix Table 2.18: PCH residents, PCH admissions

	PCH Residents				PCH Admissions			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000
	1994/95-1995/96		1999/00-2000/01		1994/95-1995/96		1999/00-2000/01	
South Eastman	310	129.3	332	125.0	58	24.2	78	29.2
South Westman	518	146.7	530	146.8	105	29.7	120	33.2
Brandon	549	183.3	564	169.0	101	33.7	108	32.4
Central	844	131.6	905	132.9	157	24.4	211	30.9
Marquette	512	137.5	522	136.4	114	30.5	123	32.1
Parkland	545	129.6	545	127.1	127	30.1	121	28.1
Interlake	539	125.6	621	135.7	107	24.9	143	31.1
North Eastman	172	98.1	213	108.4	37	20.9	57	28.8
Burntwood	38	85.0	39	78.7	4	9.1	9	17.4
Churchill	0	0.0	0	0.0	0	0.0	0	0.0
Nor-Man	114	141.1	95	108.4	20	24.2	20	22.8
Rural South	3,439	130.7	3,668	132.3	703	26.7	851	30.7
North	151	121.2	134	97.7	24	18.9	29	20.9
Winnipeg	5,171	134.5	5,837	133.3	1,041	27.1	1,347	30.7
Manitoba	9,309	135.0	10,202	133.8	1,868	27.1	2,334	30.6

Appendix Table 2.19: Prescriptions - Part 1

	Per Cent of Population With at Least One Prescription				Number of Different Drugs per User				Per Cent of Population Using Antibiotics			
	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent	Number Observed Per Year	CRUDE Rate per 1000	Number Observed Per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Per Cent	Number Observed per Year	CRUDE Per Cent
	1996/97-1997/98		1999/00-2000/01		1996/97-1997/98		1999/00-2000/01		1996/97-1997/98		1999/00-2000/01	
South Eastman	31,021	59.5%	33,755	62.5%	91,362	2.95	112,221	3.32	17,694	33.9%	18,760	34.8%
South Westman	22,178	63.3%	23,431	68.4%	74,585	3.36	93,939	4.01	12,958	37.0%	14,051	41.0%
Brandon	31,875	68.0%	33,505	71.1%	103,132	3.24	125,590	3.75	19,503	41.6%	20,077	42.6%
Central	59,797	61.8%	62,871	64.4%	188,088	3.15	219,487	3.49	34,460	35.6%	34,295	35.1%
Marquette	25,630	67.8%	26,073	69.5%	91,311	3.56	102,245	3.92	15,098	40.0%	14,745	39.3%
Parkland	30,476	69.6%	31,220	72.4%	121,327	3.98	139,026	4.45	19,563	44.7%	19,898	46.1%
Interlake	49,274	66.7%	51,529	68.9%	167,209	3.39	194,075	3.77	29,818	40.4%	30,132	40.3%
North Eastman	23,412	60.9%	25,077	63.8%	79,866	3.41	94,430	3.77	14,270	37.1%	14,346	36.5%
Burntwood	25,087	56.0%	23,863	53.0%	93,683	3.73	90,607	3.80	16,790	37.5%	14,162	31.4%
Churchill	575	54.6%	672	65.6%	1,790	3.11	2,558	3.81	361	34.3%	404	39.5%
Nor-Man	15,955	62.8%	16,121	63.8%	57,422	3.60	62,426	3.87	10,301	40.5%	9,807	38.8%
Rural South	241,786	64.0%	253,955	66.7%	813,747	3.37	955,421	3.76	143,859	38.1%	146,226	38.4%
North	41,617	58.4%	40,655	57.0%	152,894	3.67	155,591	3.83	27,452	38.5%	24,373	34.2%
Winnipeg	436,016	67.6%	449,937	69.5%	1,446,816	3.32	1,636,358	3.64	254,630	39.5%	253,680	39.2%
Manitoba	751,293	65.8%	778,051	67.8%	2,516,588	3.35	2,872,959	3.69	445,443	39.0%	444,356	38.7%

Appendix Table 2.20: Prescriptions - Part 2

	Number of Prescription Antibiotics				Per Cent of Population Using Antidepressants			
	Number Observed Per Year	CRUDE Rate per 1000	Number Observed Per Year	CRUDE Rate per 1000	Number Observed in Period	CRUDE Per Cent	Number Observed in Period	CRUDE Per Cent
	1996/97-1997/98		1999/00-2000/01		1996/97-1997/98		1999/00-2000/01	
South Eastman	33,025	1.9	35,427	1.9	2,092	4.0%	2,776	5.1%
South Westman	26,934	2.1	30,498	2.2	1,393	4.0%	2,025	5.9%
Brandon	40,109	2.1	41,314	2.1	2,095	4.5%	3,005	6.4%
Central	69,231	2.0	67,569	2.0	4,026	4.2%	5,336	5.5%
Marquette	31,860	2.1	30,715	2.1	1,644	4.3%	2,186	5.8%
Parkland	47,258	2.4	48,241	2.4	1,694	3.9%	2,268	5.3%
Interlake	64,030	2.1	63,567	2.1	2,853	3.9%	3,947	5.3%
North Eastman	30,862	2.2	29,950	2.1	1,378	3.6%	2,019	5.1%
Burntwood	40,096	2.4	30,413	2.1	868	1.9%	1,160	2.6%
Churchill	719	2.0	888	2.2	20	1.9%	37	3.6%
Nor-Man	22,955	2.2	20,683	2.1	696	2.7%	866	3.4%
Rural South	303,198	2.1	305,965	2.1	15,078	4.0%	20,556	5.4%
North	63,769	2.3	51,984	2.1	1,583	2.2%	2,062	2.9%
Winnipeg	520,178	2.0	509,648	2.0	30,135	4.7%	39,017	6.0%
Manitoba	927,254	2.1	908,910	2.0	48,891	4.3%	64,640	5.6%

APPENDIX 3: LOCATION OF PHYSICIAN VISITS

Appendix Table 3.1: Location of visits to GP/FPs, 1995, by district (percentages)

District	Per Cent in District	Per Cent Elsewhere in RHA	Per Cent to Other RHA	Per Cent to Winnipeg
SE Northern	44.2%	18.3%	1.2%	36.3%
SE Central	77.8%	11.2%	0.9%	10.1%
SE Western	35.6%	9.4%	2.1%	52.9%
SE Southern	53.7%	19.8%	12.3%	14.2%
SW District 3	70.2%	4.9%	22.0%	2.8%
SW District 1	80.2%	4.4%	13.8%	1.7%
SW District 2	82.0%	6.0%	10.3%	1.7%
Bdn West	34.0%	60.0%	3.6%	2.3%
Bdn Rural	0.0%	89.8%	8.7%	1.5%
Bdn East	67.8%	24.9%	5.6%	1.7%
MacDonald/Cartier	9.6%	5.2%	1.4%	83.9%
Morden/Winkler	93.6%	2.1%	0.9%	3.4%
Altona	74.8%	19.3%	0.9%	5.0%
Carman	67.9%	19.4%	1.3%	11.4%
Morris/Montcalm	59.3%	13.7%	4.2%	22.8%
Lorne/Loiuse/Pem	77.2%	15.7%	3.6%	3.6%
Seven Regions	21.3%	45.0%	29.4%	4.3%
Portage	85.7%	3.7%	2.3%	8.3%
MQ District 4	89.2%	0.6%	8.6%	1.6%
MQ District 3	76.8%	7.1%	14.0%	2.1%
MQ District 2	66.1%	14.0%	18.2%	1.7%
MQ District 1	87.8%	2.2%	7.9%	2.0%
PL West	83.4%	9.5%	4.8%	2.3%
PL Central	86.5%	7.8%	3.3%	2.4%
PL East	72.2%	19.5%	5.6%	2.7%
PL North	80.3%	14.0%	3.3%	2.4%
IL Southwest	59.3%	7.2%	1.8%	31.6%
IL Southeast	58.3%	3.3%	2.9%	35.5%
IL Northeast	86.0%	2.4%	1.3%	10.3%
IL Northwest	74.0%	5.2%	3.2%	17.7%
Springfield	16.7%	13.1%	6.9%	63.3%
Winnipeg River	69.9%	12.4%	3.0%	14.7%
Brokenhead	79.7%	3.0%	5.4%	11.9%
Iron Rose	42.4%	30.5%	11.1%	16.0%
Blue Water	81.9%	3.7%	3.8%	10.7%
Northern Remote	56.3%	4.7%	9.3%	29.7%
Thompson	91.3%	1.5%	3.6%	3.6%
Oxford H & Gods	31.5%	43.4%	11.1%	14.1%
Cross Lake	68.6%	18.6%	4.3%	8.4%
Lynn/Leaf/SIL	78.8%	12.9%	4.6%	3.7%
Island Lake	56.0%	6.4%	5.7%	31.9%
Tad/Broch/Lac Br	44.0%	32.4%	17.9%	5.7%
Gillam/Fox Lake	82.0%	6.5%	6.3%	5.2%
Thick Por/Pik/Wab	0.0%	88.5%	7.5%	4.0%
Norway House	90.8%	2.9%	1.9%	4.3%
Sha/York/Split/War	36.2%	43.9%	9.9%	10.0%
Nelson House	28.1%	49.9%	2.5%	19.4%
Churchill	89.5%	0.0%	6.3%	4.2%
F Flon/Snow L/Cran	91.8%	3.5%	2.3%	2.4%
The Pas/OCN/Kelsey	93.7%	0.6%	3.0%	2.7%
Nor-Man Other	4.5%	75.1%	13.1%	7.3%

Appendix Table 3.2: Location of visits to GP/FPs, 2000, by district (percentages)

District	Per Cent In District	Per Cent Elsewhere in RHA	Per Cent To Other RHA	Per Cent To Winnipeg
SE Northern	54.2%	20.6%	1.0%	24.3%
SE Central	82.5%	9.5%	0.9%	7.0%
SE Western	27.8%	15.7%	2.6%	53.8%
SE Southern	42.4%	24.4%	17.5%	15.7%
SW District 3	60.8%	3.7%	27.5%	7.9%
SW District 1	80.2%	5.2%	13.1%	1.5%
SW District 2	80.8%	6.0%	11.4%	1.8%
Bdn West	47.0%	47.1%	3.8%	2.1%
Bdn Rural	0.2%	88.8%	9.3%	1.7%
Bdn East	59.2%	33.8%	5.3%	1.7%
MacDonald/Cartier	0.0%	4.6%	1.5%	93.8%
Morden/Winkler	92.2%	2.7%	1.0%	4.0%
Altona	72.9%	20.7%	1.3%	5.2%
Carman	75.6%	14.2%	1.6%	8.6%
Morris/Montcalm	61.9%	15.4%	3.8%	18.9%
Lorne/Loiuse/Pem	72.1%	18.8%	4.6%	4.5%
Seven Regions	18.0%	46.3%	31.5%	4.1%
Portage	87.1%	2.5%	2.6%	7.8%
MQ District 4	82.5%	1.4%	14.0%	2.1%
MQ District 3	76.8%	6.1%	14.6%	2.5%
MQ District 2	61.4%	13.2%	24.0%	1.4%
MQ District 1	84.8%	3.7%	9.5%	2.1%
PL West	83.4%	10.0%	4.6%	1.9%
PL Central	89.8%	5.4%	2.7%	2.1%
PL East	73.8%	18.3%	5.5%	2.5%
PL North	77.8%	16.2%	3.4%	2.6%
IL Southwest	51.7%	7.0%	2.3%	39.0%
IL Southeast	46.0%	3.7%	3.9%	46.5%
IL Northeast	81.2%	3.3%	1.6%	13.9%
IL Northwest	74.9%	3.4%	3.5%	18.3%
Springfield	13.2%	12.8%	8.6%	65.4%
Winnipeg River	60.1%	23.9%	2.2%	13.8%
Brokenhead	78.7%	1.2%	5.8%	14.3%
Iron Rose	32.3%	35.4%	15.5%	16.8%
Blue Water	80.9%	3.4%	3.1%	12.6%
Northern Remote	26.5%	3.6%	33.2%	36.7%
Thompson	88.5%	2.0%	4.2%	5.3%
Oxford H & Gods	11.6%	55.6%	19.1%	13.7%
Cross Lake	62.6%	25.7%	4.0%	7.6%
Lynn/Leaf/SIL	79.6%	12.5%	4.4%	3.5%
Island Lake	58.8%	3.5%	5.8%	31.9%
Tad/Broch/Lac Br	50.0%	36.9%	6.3%	6.8%
Gillam/Fox Lake	82.6%	6.8%	5.1%	5.5%
Thick Por/Pik/Wab	0.0%	87.2%	8.3%	4.6%
Norway House	86.3%	4.8%	2.9%	5.9%
Sha/York/Split/War	27.0%	64.9%	2.3%	5.7%
Nelson House	22.8%	65.6%	2.4%	9.2%
Churchill	85.6%	0.0%	8.6%	5.8%
F Flon/Snow L/Cran	93.2%	2.2%	2.4%	2.1%
The Pas/OCN/Kelsey	91.9%	1.0%	3.9%	3.3%
Nor-Man Other	6.7%	70.2%	15.5%	7.6%

Appendix Table 3.3: Location of visits to specialists, 1995, by district (percentages)

District	Per Cent in District	Per Cent Elsewhere in RHA	Per Cent to Other RHA	Per Cent to Winnipeg
SE Northern	0.1%	3.9%	0.4%	95.5%
SE Central	14.1%	0.8%	1.3%	83.8%
SE Western	0.0%	1.9%	0.4%	97.8%
SE Southern	0.0%	6.0%	1.9%	92.2%
SW District 3	0.0%	1.2%	53.8%	44.9%
SW District 1	21.3%	0.7%	63.6%	14.4%
SW District 2	2.2%	0.8%	70.3%	26.6%
Bdn West	34.6%	54.2%	1.1%	10.2%
Bdn Rural	0.0%	89.2%	0.7%	10.0%
Bdn East	63.0%	27.3%	0.9%	8.9%
MacDonald/Cartier	0.0%	0.6%	0.2%	99.2%
Morden/Winkler	13.0%	0.1%	0.5%	86.4%
Altona	0.0%	5.3%	0.0%	94.6%
Carman	0.0%	5.2%	0.8%	94.0%
Morris/Montcalm	0.0%	1.9%	0.7%	97.4%
Lorne/Loiuse/Pem	0.0%	13.9%	8.6%	77.5%
Seven Regions	0.0%	27.7%	15.6%	56.7%
Portage	41.4%	0.1%	1.7%	56.9%
MQ District 4	0.0%	0.4%	59.7%	39.9%
MQ District 3	0.0%	0.3%	73.2%	26.5%
MQ District 2	0.5%	0.3%	79.3%	19.9%
MQ District 1	0.0%	0.5%	57.2%	42.4%
PL West	0.0%	32.9%	22.7%	44.4%
PL Central	35.9%	0.7%	16.3%	47.2%
PL East	0.0%	21.4%	19.7%	58.9%
PL North	0.5%	9.2%	14.7%	75.6%
IL Southwest	0.0%	1.7%	0.4%	97.9%
IL Southeast	28.3%	0.1%	0.1%	71.6%
IL Northeast	1.2%	4.4%	0.7%	93.7%
IL Northwest	0.0%	0.8%	0.8%	98.4%
Springfield	0.0%	0.0%	2.5%	97.5%
Winnipeg River	0.0%	0.0%	5.9%	94.1%
Brokenhead	0.0%	0.0%	17.2%	82.8%
Iron Rose	0.0%	0.0%	4.2%	95.7%
Blue Water	0.0%	0.2%	6.8%	93.0%
Northern Remote	8.9%	2.3%	4.9%	83.9%
Thompson	0.8%	0.3%	2.3%	96.6%
Oxford H & Gods	0.0%	1.5%	0.4%	98.2%
Cross Lake	0.0%	0.6%	0.6%	98.8%
Lynn/Leaf/SIL	3.6%	2.1%	6.5%	87.8%
Island Lake	1.9%	0.1%	0.4%	97.6%
Tad/Broch/Lac Br	0.0%	0.0%	3.8%	96.1%
Gillam/Fox Lake	0.0%	0.0%	3.5%	96.5%
Thick Por/Pik/Wab	0.0%	0.0%	0.0%	100.0%
Norway House	26.4%	1.4%	2.2%	70.0%
Sha/York/Split/War	8.0%	6.1%	1.3%	84.7%
Nelson House	11.3%	4.5%	0.9%	83.3%
Churchill	48.0%	0.0%	0.0%	51.2%
F Flon/Snow L/Cran	0.0%	0.0%	3.2%	96.8%
The Pas/OCN/Kelsey	0.0%	0.0%	2.2%	97.6%
Nor-Man Other	7.8%	0.0%	4.6%	87.6%

Appendix Table 3.4: Location of visits to specialists, 2000, by district (percentages)

District	Per Cent in District	Per Cent Elsewhere in RHA	Per Cent to Other RHA	Per Cent to Winnipeg
SE Northern	0.0%	6.5%	1.3%	92.1%
SE Central	13.6%	2.2%	2.0%	82.2%
SE Western	0.0%	2.9%	0.6%	96.4%
SE Southern	15.6%	9.3%	2.0%	73.1%
SW District 3	0.0%	0.0%	52.9%	47.0%
SW District 1	0.2%	0.1%	76.8%	22.9%
SW District 2	0.0%	0.0%	72.5%	27.4%
Bdn West	44.6%	40.6%	1.3%	13.6%
Bdn Rural	0.0%	84.0%	1.8%	14.2%
Bdn East	47.6%	37.5%	1.3%	13.7%
MacDonald/Cartier	0.0%	0.4%	0.2%	99.4%
Morden/Winkler	17.6%	0.3%	0.9%	81.2%
Altona	0.0%	6.4%	0.7%	92.8%
Carman	0.0%	6.9%	1.5%	91.6%
Morris/Montcalm	0.0%	3.9%	3.0%	93.1%
Lorne/Loiuse/Pem	0.0%	12.1%	7.7%	80.2%
Seven Regions	0.0%	22.9%	17.4%	59.7%
Portage	36.1%	0.3%	1.7%	62.0%
MQ District 4	0.1%	1.8%	57.4%	40.7%
MQ District 3	0.0%	0.9%	65.2%	34.0%
MQ District 2	0.7%	0.7%	73.8%	24.8%
MQ District 1	0.0%	1.7%	59.0%	39.3%
PL West	0.0%	40.8%	18.1%	41.1%
PL Central	39.5%	0.2%	14.4%	45.9%
PL East	0.0%	24.2%	20.8%	55.0%
PL North	0.3%	14.1%	10.8%	74.8%
IL Southwest	0.0%	2.4%	0.5%	97.2%
IL Southeast	27.3%	0.8%	0.2%	71.8%
IL Northeast	0.8%	5.7%	0.9%	92.7%
IL Northwest	0.9%	1.0%	2.1%	95.9%
Springfield	0.0%	0.0%	3.4%	96.6%
Winnipeg River	0.0%	0.0%	7.3%	92.6%
Brokenhead	0.0%	0.0%	16.0%	83.9%
Iron Rose	0.0%	1.5%	4.9%	93.6%
Blue Water	0.0%	0.0%	5.7%	94.2%
Northern Remote	7.9%	0.5%	7.4%	84.3%
Thompson	24.8%	1.3%	2.2%	71.7%
Oxford H & Gods	0.0%	5.4%	0.7%	93.9%
Cross Lake	0.3%	7.8%	0.7%	91.2%
Lynn/Leaf/SIL	0.0%	17.5%	1.7%	80.7%
Island Lake	9.5%	0.2%	0.8%	89.5%
Tad/Broch/Lac Br	0.0%	13.3%	1.3%	85.4%
Gillam/Fox Lake	0.0%	6.4%	3.3%	90.1%
Thick Por/Pik/Wab	0.0%	33.2%	0.0%	65.2%
Norway House	18.9%	6.1%	1.6%	73.4%
Sha/York/Split/War	6.8%	11.1%	0.5%	81.6%
Nelson House	0.0%	15.2%	1.7%	83.1%
Churchill	49.4%	0.0%	1.1%	49.4%
F Flon/Snow L/Cran	0.0%	3.2%	3.8%	93.0%
The Pas/OCN/Kelsey	9.9%	0.0%	3.8%	86.3%
Nor-Man Other	0.0%	2.7%	3.4%	93.8%

APPENDIX 4: MANITOBA REGIONAL HEALTH AUTHORITIES - DISTRICTS

Twelve Regional Health Authorities (RHA) have been defined within Manitoba. The RHAs have the responsibility for providing for the delivery and administration of health services in specified geographic areas. The specific area definitions, and responsibilities are outlined in The Regional Health Authorities Act (L.M. 1996 c. 53 - Chap. R34).

The following document provides an overview of the RHA districts. There is a brief description of the consultation and development of the districts along with some notes regarding limitations and district assignment. Each RHA district has been listed along with the assigned municipal areas and, where necessary, postal codes.

Andrea Zajac (Manitoba Health, Regional Support Services) provided initial district definitions June 5, 2000. The initial districts were created in consultation between Regional Support Services and each RHA during 1999/2000. Further clarifications of districts, especially for RHAs with unorganized territories were made during the summer and fall of 2001. Final discussions happened as part of the Need to Know meeting September 18, 2001. The use of these areas prior to 1996/97 fiscal may not be valid, or should be used with some caution. Users should also be aware of changes to postal codes over time - additions, retirement and movement. The definitions of districts based on postal codes will need to be confirmed each year.

MCHP assigns districts for the regional health authorities using the following process:

1. Assign districts initially based on municipal code as provided by Manitoba Health. First Nations (A-code municipal areas) are assigned based on postal/muncode combination,
2. Within some areas districts are based on six-digit postal code. It is important to understand that postal codes alone can only be used where there is a clear distinction between communities and it is unlikely that individuals will use postal boxes from other communities or live on rural routes that are outside of the district.

Because of the potential cross over between districts only communities in unorganized territories of Burntwood, Nor-Man and North Eastman have been assigned by postal code. Districts within Brandon and Winnipeg are also defined based on postal code since the error associated with rural routes and postal centres is minimized because of the population size.

Out-of-Manitoba postal codes are generally excluded. It is possible to be registered with Manitoba Health with an out-of-province postal code and a Manitoba municipal code. If necessary these individuals can still be included with limited error unless they are assigned to an unorganized territory or other municipal area that is defined by postal code (e.g. Brandon).

Further Notes:

1. The assignment of communities that fall within the unorganized territories of Burntwood are assigned by postal code. Some of these are assigned back to municipal code defined areas.
2. Assignment of Brandon districts (municipal area 026) is based on six-digit postal code. The division follows the provincial electoral boundary - north along 18th Street to the Assiniboine River, east along the Assiniboine River to 1st Street, north along 1st Street to boundary of the City of Brandon.
3. Assignment of unorganized territories and First Nations communities based on six-digit postal code in North Eastman.
4. In Nor-Man, Cranberry Portage is divided from Kelsey by postal code.

Definitions of Districts within each RHA:

Central RHA
Altona
Rhineland
Altona Town
Gretna Village

Carman
Dufferin RM
Carman Town
Grey RM
Roland RM
Thompson RM
St. Claude Village
Notre Dame Des Lourdes Village

Lorne/Louise/Pembina
Lorne RM
Louise RM
Crystal City Village
Pilot Mound Village
Pembina RM
Manitou Village
Somerset Village
Swan Lake First Nation

MacDonald/Cartier
Cartier RM
MacDonald RM
St Francois Xavier
Headingly

Morden/Winkler
Plum Coulee Village
Stanley RM
Morden Town
Winker Town

Morris/Montcalm
Montcalm RM
Emerson Town
Morris RM
Morris Town
Roseau River First Nation

Portage
Portage La Prairie RM
Portage La Prairie City
Macgregor Village
Long Plain First Nation
Dakota Plains First Nation
Dakota Tipi First nation

Seven Regions
Lakeview RM
North Norfolk RM
Westbourne RM
Gladstone Town
Alonsa LGD
Sandy Bay First Nation

North Eastman RHA
Reminder: postal codes are used only when they fall into the Unorganized
Territories or First Nations communities.

Bluewater
Powerview Village
Victoria Beach RM
Alexander LGD
Pine Falls Town
Sagkeeng (Fort Alexander) First Nation
Little Black River First Nation
Hollow Water First Nation
Include the following communities based on postal code. 'R0E1M0' - Pine
Falls, 'R0E0J0' - Bissett, 'R0E0P0' - Fort Alexander, 'R0E0E0' - Belair,
'R0E1K0' - Black River, 'R0E1E0' - Manigotagan, 'R0E2A0' - Traverse Bay,
'R0E2E0' - Wanipagow

Brokenhead
Brokenhead
Beausejour Town
Garson Village
Include the following communities bassed on postal code: 'R0E1X0' -
Seddon's Corner

Iron Rose
Reynolds RM
Whitemouth RM
Include the following communities based on postal code: 'R0E2G0' -
Whitemouth, 'R0E2H0' - Whiteshell, 'R0E1R0' - Rennie, 'R0E1Y0' -
Seven Sisters Falls, 'R0E0X0' - Hadashville

Springfield
Springfield RM

Northern Remote
Unorganized Territories
Unorganized Territories (see note on SE prior to 1997)
Poplar River First Nation
Bloodvein First Nation
Berens River First Nation
Little Grand Rapids First Nation
Include the following communities based on postal code: 'R0B0A0' -
Berrens River FN, 'R0B0V0' - Little Grand Rapids FN, 'R0C0J0' -
Bloodvein First Nation, 'R0B0Z0' - Poplar River First Nation, 'R0C2P0' -
Princes Harbour, 'R0C1X0' - Loon Straits, R0B2G0 - Pauingassi

Winnipeg River
Lac Du Bonnet RM,
Lac Du Bonnet Village
Pinawa LGD
Include the following communities based on postal code: 'R0E1N0' - Pointe
du Bois, 'R0E1A0' - Lac du Bonnet

South Eastman RHA

Central
Hanover RM
Steinbach Town

Northern
La Broquerie RM
Ste Anne RM
Tache RM
Ste Anne Village

South East
Franklin RM
Piney LGD
Stuartburn LGD
Unorganized Territories
Buffalo Point First Nation

Western
De Salaberry RM
St. Pierrie Jolys Village
Ritchot RM
Niverville Village

Interlake RHA

Northeast
Bifrost RM
Riverton Village
Gimli RM
Gimli Town
Dunnottar Village
Winnipeg Beach Town
Fisher LGD
Arborg Village

Unorganized Territories
Peguis First Nation
Fisher River
Jackhead First Nation

Northwest
Coldwell RM
Eriksdale RM
St. Laurent RM
Siglunes RM
Grahamdale LGD
Lake Manitoba First Nation
Fairford Fisrst Nation
Little Saskatchewan First Nation
Lake St. Martin First Nation
Dauphin River First Nation

Southeast
St. Andrews RM
Selkirk Town
St. Clements RM
Brokenhead Ojibway Nation

Southwest
Rockwood RM
Stonewall Town
Teulon Village
Rosser RM
Woodlands RM
Armstrong LGD

Nor-Man RHA

Flin Flon, Snow Lake, Cranberry
Snow Lake Town
Flin Flon City
Include Cranberry Portage based on postal code R0B0H0

The Pas, OCN, Kelsey
The Pas Town
Kelsey RM (Consol LGD)
Opaskwayak Cree Nation
Cranberry Portage is split from The Pas/OCN/Kelsey using postal code
R0B0H0 into the Flin Flon, Snow Lake, Cranberry District

Nor-Man Other (Sherridon, Cormorant, Grand Rapids, Moose Lake, Easterville, Pukatawagan)
Unorganized Territories
Grand Rapids LGD
Grand Rapids First Nation
Mosakahiken Cree Nation
Chemahawin First Nation
Mathias Colomb Cree Nation

Parkland RHA

Central District
Dauphin RM
Dauphin Town
Ethelbert RM
Ethelbert Town
Gilbert Plains RM
Gilbert Plains Village
Mossey River RM
Winnipegosis Village

East District
Lawrence RM
McCreary RM
Ochre River RM
Ste Rose RM
Ste Rose Du Lac Village
McCreary Village
Alonsa LGD
Waterhen First Nation
Ochi-Chak-Ko-Sipi (Crane River) First Nation
Ebb & Flow First nation

North District
Minitonas RM
Minitonas Village
Swan River RM
Swan River Town
Benito Village
Bowsman Village
Mountain LGD North
Mountain LGD South
Unorganized Territories
Sapotaweyak Cree Nation

Pine Creek First Nation
Wuskwi Sipihk (Indian Birch) First Nation

West District
Grandview RM
Grandview Town
Hillsburg RM
Shell River RM
Robin Town
Park LGD North
Tootinaowaziibeeng Treaty Reserve (Valley River) First Nation

Churchill RHA

Churchill
Churchill

Burntwood RHA

Reminder: Postal codes are used only when they fall into the Unorganized
Territories or First Nations communities.
Much of Burntwood Unorganized is divided into seven areas based on postal
code.

Thompson
Thompson City

Lynn Lake, Leaf Rapids, South Indian Lake
Lynn Lake LGD
Leaf Rapids Town
Include the communities based on postal code:
'R0B0W0','R0B1W0','R0B1N0'

Gillam, Fox Lake
Gillam LGD
Fox Lake First Nation
Include the communities based on postal code: '
R0B0L0','R0B1Y0','R0B2A0'

Nelson House
Nelson House First Nation
Include the communities based on postal code: 'R0B1A0'

Norway House
Norway House Cree Nation
Include the communities based on postal code: 'R0B1B0'

Cross Lake
Cross Lake First Nation
Include the communities based on postal code: 'R0B0J0'

Island Lake
Garden Hill First Nation
Red Sucker Lake First Nation
St. Theresa Point First Nation
Wasagamack First Nation
Include the communities based on postal code:
'R0B0T0','R0B1H0','R0B1J0','R0B2H0','R0B1Z0'

Thicket Portage, Pikwitonei, Wabowden
Include the communities based on postal code:
'R0B1R0','R0B1E0','R0B1S0','R0B0X0'

Tadoule Lake, Brochet, Lac Brochet
Sayisi Dene (Tadoule Lake) First Nation
Barren Lands (Brochet) First Nation
Northlands (Lac Brochet) First Nation
Include the communities based on postal
code:'R0B1G0','R0B2E0','R0B2C0','R0B0B0', 'R0B0E0', 'R0B0P0'

Oxford House, Gods Lake
Oxford House First Nation
Gods Lake First Nation
Gods River First Nation
Include the communities based on postal
code:'R0B0M0','R0B0N0','R0B1C0'

Shamattawa, York Factory, Split Lake, War Lake
Shamattawa First Nation
York Factory First Nation
Split Lake Cree Nation
War Lake First Nation
Include the communities based on postal code:
R0B0S0','R0B1K0','R0B1P0','R0B2B0','R8N0L0'

South Westman RHA

District 1
Albert RM
Archie RM
Arthur RM
Melita Town
Brenda RM
Waskada Village
Edward RM
Pipestone RM
Sifton RM
Oak Lake Town
Wallace RM
Virden Town
Elkhorn Village
Winchester RM
Deloraine Town
Canupawakpa Dakota (Oak Lake) First Nation

District 2
Cameron RM
Hartney Town
Glenwood RM
Souris Town
Morton RM
Boissevain Town
Riverside RM
Roblin RM
Cartwright Village
Turtle Mountain RM
Killarney Town
Whitewater RM

District 3
Argyle RM
Oakland RM
Wawanesa Village
South Cypress RM
Glenboro Village
South Norfolk
Treherne Village
Strathcona RM
Victoria RM

Marquette RHA

District 1
Birtle RM
Birtle Town
Boulton RM
Ellice RM
St. Lazare Village
Rossburn RM
Rossburn Village
Russell RM
Russell Town
Binscarth Village
Shellmouth RM
Silver Creek RM
Gamblers First Nation
Waywayseecappo First Nation Treaty Four 1874

District 2
Blanshard RM
Daly RM
Rivers Town
Hamiota RM
Hamiota Village
Miniota RM
Shoal Lake RM
Shoal Lake Village
Strathclair RM
Woodworth RM
Birdtail Sioux First Nation
Keeseekooweniin First Nation
Sioux Valley First Nation

District 3
Clanwilliam RM
Erickson Village
Harrison RM
Minto RM
Minnedosa Town
Odanah RM
Saskatchewan RM
Rapid City Town
Park LGD South
Rolling River First Nation

District 4
Glenella RM
Langford RM
Neepawa Town
Lansdowne RM
North Cypress RM
Carberry Town
Rosedale RM

Brandon RHA

Brandon Rural
Whitehead RM
Cornwallis RM
Elton RM

Brandon East
Brandon West
Brandon City
Brandon city is divided into two parts based on provincial electoral boundaries. See http://www.elections.mb.ca/test/English/brandoneast.html.
Generally, the division between Brandon East and Brandon West follows the provincial electoral boundary - north along 18th Street to the Assiniboine River, east along the Assiniboine River to 1st Street, north along 1st Street to boundary of the City of Brandon. This is based on six-digit postal code but is approximated by Forward Sortation Aarea. Full postal codes are not provided here.
Brandon West
R7B, R7C, R7A (some)
Brandon East
R7A (most)

Winnipeg RHA

Winnipeg
Winnipeg is further divided based on postal code into 12 Community Areas and 23 Neighbourhood clusters. There are separate formats for each of these. Winnipeg groupings are not part of this document.