

Comparative Indicators of Population Health and Health Care Use for Manitoba's Regional Health Authorities

A POPULIS Project

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Health Policy and Evaluation**
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The results and conclusions are those of the authors and no official endorsement by Manitoba Health was intended or should be implied. This report was prepared at the request of Manitoba Health as part of the contract between the University of Manitoba and Manitoba Health.

Tutorial

Readers who would like to proceed directly to the section that describes how one might apply the information found in this document are encouraged to go directly to section 4: Interpreting the Data for Local Use, on page 20.

THE MANITOBA CENTRE FOR HEALTH POLICY AND EVALUATION

The Manitoba Centre for Health Policy and Evaluation (MCHPE) is a unit within the Department of Community Health Sciences, Faculty of Medicine, University of Manitoba. MCHPE is active in health services research, evaluation and policy analysis, concentrating on using the Manitoba Health database to describe and explain patterns of care and profiles of health and illness.

Manitoba has one of the most complete, well-organized and useful databases in North America. The database provides a comprehensive, longitudinal, population-based administrative record of health care use in the province.

Members of MCHPE 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 and its exceptional database, uniquely position MCHPE to contribute to improvements in the health policy process.

MCHPE undertakes several major research projects, such as this one, every year under contract to Manitoba Health. In addition, MCHPE researchers secure major funding through the competitive grants process. Widely published and internationally recognized, they collaborate with a number of highly respected scientists from Canada, the United States and Europe.

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EXECUTIVE SUMMARY

In April 1997, Manitoba established eleven new Regional Health Authorities (RHAs) as governance structures for northern and rural health services. Each RHA has an appointed board of directors and is responsible for the overall planning and integration of services for a geographically defined population. Therefore, RHAs require information for planning and monitoring performance of health services. Manitoba Health and the regions themselves gather a wealth of information regarding their residents and services. But comparative information across all RHAs is needed to permit planners and decision-makers to learn from each other's experience. This report will assist that effort by providing a variety of health and health service indicators both within and among RHAs.

The Manitoba Centre for Health Policy and Evaluation's (MCHPE) mission 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 improving the health of Manitobans. MCHPE has developed the Population Health Information System (POPULIS), which is designed to focus on the link between health and health care utilization, and thereby facilitate rational decision-making.

The population-based approach

POPULIS can compare the health status of residents of different regions and sub-regions, as well as the supply and utilization of health care resources (hospital beds, physicians, and personal care home beds). Because people often travel for care, local availability or supply does not necessarily determine use patterns. POPULIS tracks *all* use by area residents, regardless of where the use occurred. This "population-based" approach therefore describes the total utilization profile of all residents of each region, no matter where the care was provided. POPULIS also provides census information on socioeconomic status, which has been linked to health outcomes and need for health care. In general, the lower the socioeconomic status, the poorer the health status and the greater the need for health care.

The usefulness of this information for decision-makers and for the public

POPULIS provides information to assess and respond to questions like the following:

- ✓ What are the levels of health in different regions?
- ✓ Are high-risk populations poorly served by the health care system, or do they have poor health outcomes despite high use patterns? Similarly, do areas with low health care use have poor access to care, or is this reflective of a healthy population?
- ✓ Do residents receive care in their area, or do they travel for care?
- ✓ Does high use of hospitals represent overuse, or use related to high health needs?
- ✓ Do patterns of surgery vary according to health needs of the regions?
- ✓ Do areas with fewer nursing home beds make more use of hospital beds for chronic care?

POPULIS information included in this report

This report begins with a review of the comparative health status of residents in each RHA, using a measure called Premature Mortality (death before age 75). Premature mortality is considered the best single indicator for assessing the need for health care, since populations that have higher premature mortality rates are also more likely to report their health to be poor, to report a higher number of symptoms, and to report being sick more often.

Summary “profile” graphs for each RHA provide an overview of key pieces of information, including the need for health care, and basic supply and use rates of physicians, acute care hospitals, long-term care for the elderly (age 75 and over).

Then a series of analyses provide a closer examination of rates of specific indicators, both between and within RHAs. The indicators include: demographic and socioeconomic characteristics, life expectancy, rates of common chronic diseases, provision of preventive care, aspects of physician, hospital and long-term care supply and use, and access to high profile and “discretionary” surgical procedures. Sub-region rates are presented through

subdivision of each RHA into 2 to 8 smaller “physician service areas” (PSAs). This enables RHAs to understand variability within each region.

Overall comparisons are also included in most figures – provincial rates, Winnipeg rates, and non-Winnipeg rates. The RHA profile graphs use a “rural average”, to avoid comparison to a provincial average which is often driven by Winnipeg and Brandon.

How to understand the POPULIS information

Most of the information in this report has been generated from fiscal years 1995/1996 and 1996/1997. The perspective therefore provides an understanding of the characteristics of RHAs just prior to their implementation. This represents a baseline assessment before RHAs started to make changes to their health care delivery systems. Future reports would give decision-makers a window into the regional effects of policy or program decisions made as the RHAs re-organize health services regionally.

In order to stress the importance of health status, all figures in this report present the RHAs and sub-region PSAs in the same order, starting with the “healthiest” region or sub-region at the top, and ending with the least healthy region or sub-region at the bottom. This assists in an understanding of the link (or lack thereof) between the use of health care services and the health of the population. **The authors have not focused on providing a detailed understanding of the differences, since we believe that much of this interpretation should come from the RHA perspective, based on an understanding of local circumstances.**

A section focussing on interpreting these data for local use has been included at the beginning, so that decision-makers using this report may confirm their understanding of the information provided. This section may also be conducive to generating questions during discussions involving the RHA data.

How the reader can help MCHPE improve this kind of information

An evaluation form is included on the next page. In order to assist regional decision-makers, MCHPE would like feedback from readers of this report. Please send your comments so that we can continue to make POPULIS reports useable and pertinent.

Note: an electronic version of this report is available at the website of the Manitoba Centre for Health Policy and Evaluation:

<http://www.umanitoba.ca/centres/mchpe>

**Comparative Profiles of Health and Health Care Use
For Manitoba's Regional Health Authorities**

EVALUATION FORM

1. Which section or sections of this report did you find the most useful to you?

2. Which section or sections of this report did you find the least useful? Explain briefly.

3. Is there information that you believe to be useful to you, but missing in this report?

4. Is there information in this report that you would like in a different format?

5. Overall, the information in this report was (circle response):
 - 1) very useful;
 - 2) somewhat useful
 - 3) not useful

6. Overall, the way in which information was presented made it:
 - 1) easy to understand
 - 2) moderately understandable
 - 3) difficult to understand

THANK YOU FOR YOUR INPUT.

Please return this by mail to the address below, or by fax at (204) 789-3910

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1. INTRODUCTION

1.1 The Regional Health Authorities

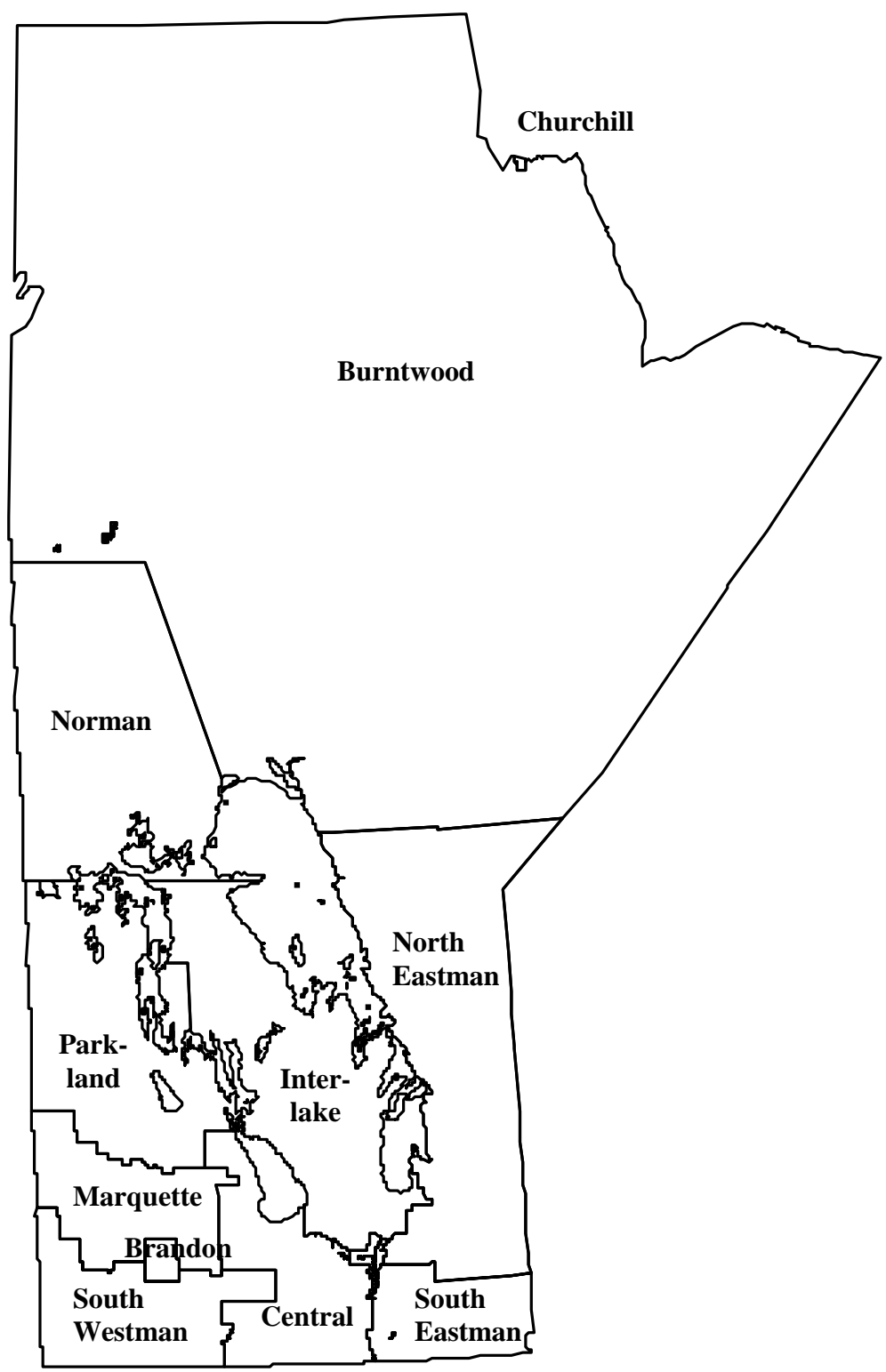
In 1997, Manitoba established eleven new Regional Health Authorities (RHAs) as governance structures for northern and rural health services. Each RHA has an appointed board of directors and is responsible for the overall planning and integration of services for a geographically defined population (Figure 1). The RHAs have a requirement for information that can be used for planning, and in time, for monitoring of performance. Manitoba Health has provided RHAs with information specific to each for the development of needs assessments, and regions themselves have gathered a wealth of information about their residents and health services. But there is also a requirement for comparative information across all RHAs that will permit planners and decision-makers to learn from each other's experience in order to plan and monitor service provision.

1.2 POPULIS

The Manitoba Centre for Health Policy and Evaluation's (MCHPE) mission 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 improving the health of Manitobans. As part of its responsibilities, MCHPE has developed the Population Health Information System (POPULIS), which is designed to focus on the link between health and health care utilization. This makes it possible to examine how effectively and efficiently health care services produce health in the population.

Critical assessments of medical care typically focus on the clinical outcomes of individual treatments and quality of care delivered by providers and institutions, not on the health of populations. Historically, allocations for hospital services have been made in response to demands stemming from population growth, increases in intensity of use, technological imperatives and political pressure. Moreover, there has been no systematic plan to match the

Figure 1: Manitoba's Regional Health Authorities



numbers and specialties of physicians and their practice locations to the health needs of populations. The Manitoba Centre for Health Policy and Evaluation developed POPULIS in the hope of facilitating rational decision making and, ultimately, shifting discussions from a focus on the demand for health care to the demand for health.

POPULIS focuses first and foremost on the health of the population as the starting point for making sense of all other information. POPULIS makes it possible to compare the health status of residents of different areas, as well as the supply and utilization of health care resources (hospital beds, physicians, and personal care home beds). Because people often travel for care, local availability or supply does not necessarily determine use patterns. Therefore, POPULIS tracks *all* use by residents, regardless of where the use occurred. This population-based approach describes the total utilization profile of all residents of each region, rather than examining care provided by specific providers or facilities. POPULIS also links data from census files to describe socioeconomic status, which has long been linked to health outcomes and need for health care. In general, the lower the socioeconomic status, the poorer the health status and the greater the need for health care.

1.3 Comparative Information for Regional Health Authorities

POPULIS provides decision-makers and the public with information to assess and respond to questions like the following:

- What are the levels of health in different regions?
- Are high-risk populations poorly served by the health care system or do they have poor health outcomes despite high use patterns?
- To what extent do residents receive their care in area or do they travel for care?
- Do areas with patterns of low use of physicians have poor access to care, or do they reflect usage patterns of healthy populations?
- Does high use of hospitals represent overuse or use related to high health needs?
- Do patterns of surgery vary according to the health needs of area residents?
- Do areas with fewer nursing home beds make more use of hospitals for chronic care stays?

How to understand the POPULIS information

As a basis for understanding the information presented, this report first reviews the comparative health status of residents of the regional health authorities, using a measure called the Premature Mortality Rate. This measure emphasizes relative differences in health status and need for health care. The report presents a broad range of indicators, including demographic and socioeconomic characteristics, disease prevalence rates and indicators of supply and use of health care resources. To continually stress the importance of health status, all figures in this report present the regions ranked by health status – that is, starting with the healthiest RHA and ending with the least healthy RHA. This ordering is intended to strengthen the reader’s understanding of the link (or lack thereof) between use of health care services and health of RHA populations.

The first section focuses on interpreting these data for local use, to enable decision-makers to work through practical examples and scenarios. Possible questions to elicit further discussion at the regional level are also provided.

Summary graphs for each RHA have also been developed to provide an overview of key pieces of information. These RHA “profiles” examine how residents’ health status and use of health care services compare to the rural average, which has been calculated for residents living in nine of the eleven RHAs. Brandon and Churchill were excluded from this rural average – Brandon because use patterns for its residents typically reflect a more urban pattern of health care use, and Churchill because data are incomplete for some services.

This is followed by a closer examination of specific indicators, both across and within regional health authorities, presented as a series of detailed graphs. The comparative information in this report includes a variety of measures:

- The demographic and socioeconomic characteristics of residents
- Health characteristics of area residents, including life expectancy and rates of common chronic diseases
- Measures of the provision of preventive care to area residents, including immunization rates for children and rates of mammography screening for women

- Aspects of physician use: in-area supply, visits & consultations received, provider type (GP/FP vs. specialist) and location of visits (in/out of region)
- Acute care hospitals: supply of beds, admissions and days used, location of hospitalizations
- Long-term care: supply and use of personal care homes, days of chronic care (stays of 45 days or more in acute hospitals or chronic care institutions)
- Access to high profile procedures that usually are provided in specialized settings, such as specialized cardiac and orthopedic procedures, and cataract surgery
- Use of “discretionary” surgical procedures, which in other research, have demonstrated considerable variability, not usually related to population need

General approach

In general, two graphs are presented for each indicator. The first focuses on comparing rates *across* the regional health authorities; the second shows rates both *across and within* the regional health authorities. This reflects our perspective that, while it is important to understand average values for indicators for an RHA, it is also critically important to understand the degree of variability for sub-populations within an RHA. In this report, we have subdivided the RHAs into smaller areas, referred to as “Physician Service Areas” (PSAs), which MCHPE has found useful for describing patterns of medical care (Figures 2 and 3). MCHPE developed these geographic areas by grouping communities within RHAs according to how they use physicians, with some consideration of health status. The resulting PSAs typically consist of the towns in which physicians practice, plus the smaller nearby communities and districts whose residents seek care from these physicians. Each RHA has been subdivided into two to eight PSAs, with the exception of Churchill (which has not been subdivided). While we recognize that our PSA boundaries differ from the administrative boundaries that the RHAs may currently be using, we believe that these analyses nonetheless provide important information, and may draw attention to previously undetected patterns.

Another important feature of these analyses is that almost all rates in this report have been age and sex-adjusted. This allows us to control for differences in utilization that are attributable to different population compositions of RHAs and PSAs. Since the elderly use a

greater amount of health care, areas that have a higher proportion of older persons will use higher levels of health care services. Therefore, comparing “crude” rates can be misleading, particularly when comparing old regions to young regions. By age- and sex-adjusting our data, we have provided “adjusted” rates – those that would occur if each area had the same composition (the composition of the Manitoba population). Age- and sex-adjusted rates are used in this report because they allow us to make valid comparisons across areas. For those interested, crude rates for a variety of measures are also provided, in Appendix 2.

There are three areas where age- and sex-adjustment have not been used in this report. The first is for measures of supply (for example, hospital beds and physician supply), where rates are given as simple per capita values. The second is for age-specific analyses, where instead of an adjusted rate, the actual rate for a certain age group is presented (for example, immunization rates for children). The third is for analyses which describe the location of service provision (e.g. within region, in Winnipeg, etc).

Figure 2: Northern Manitoba

Regional Health Authorities (RHAs) and Physician Service Areas (PSAs)

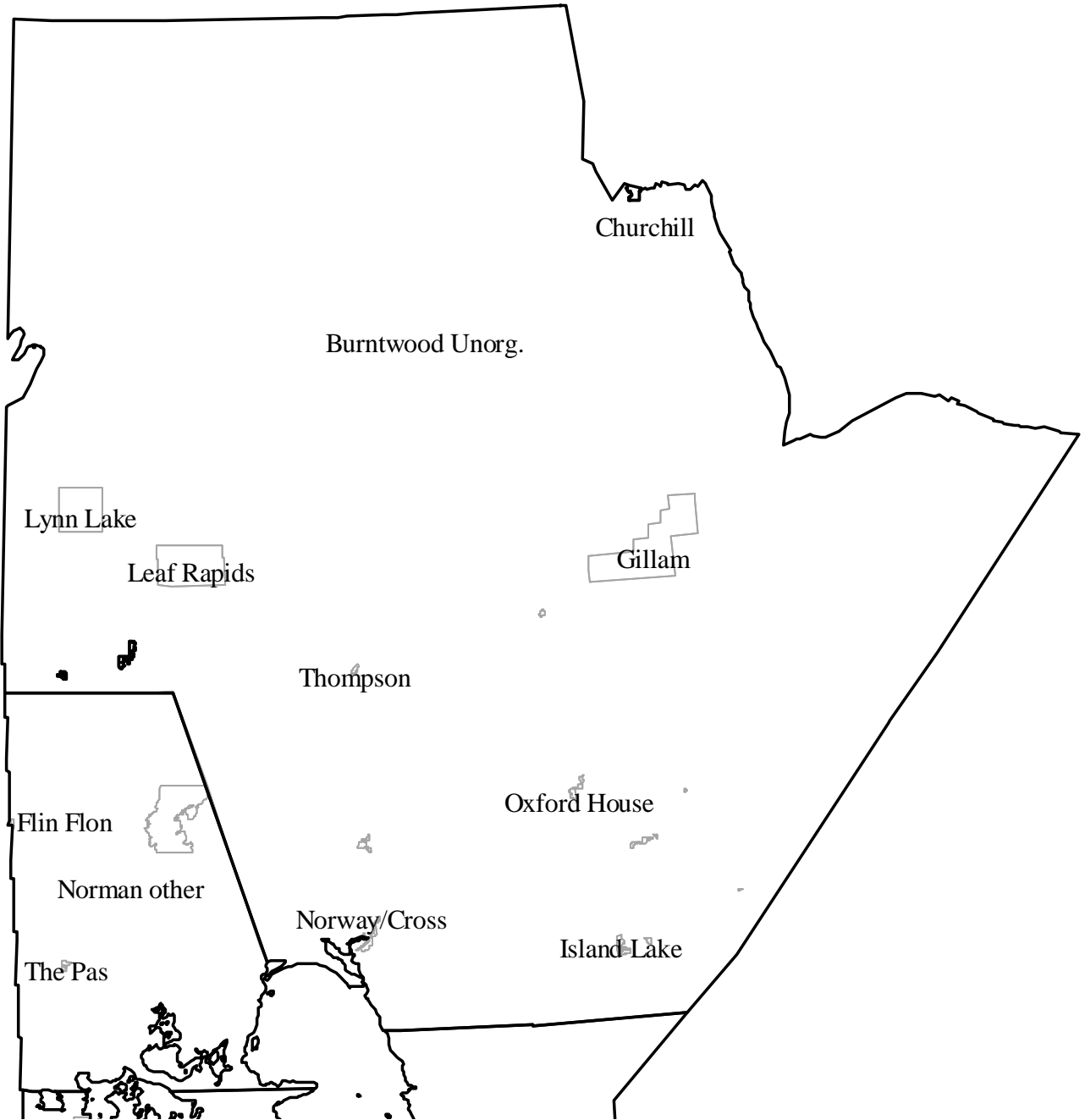
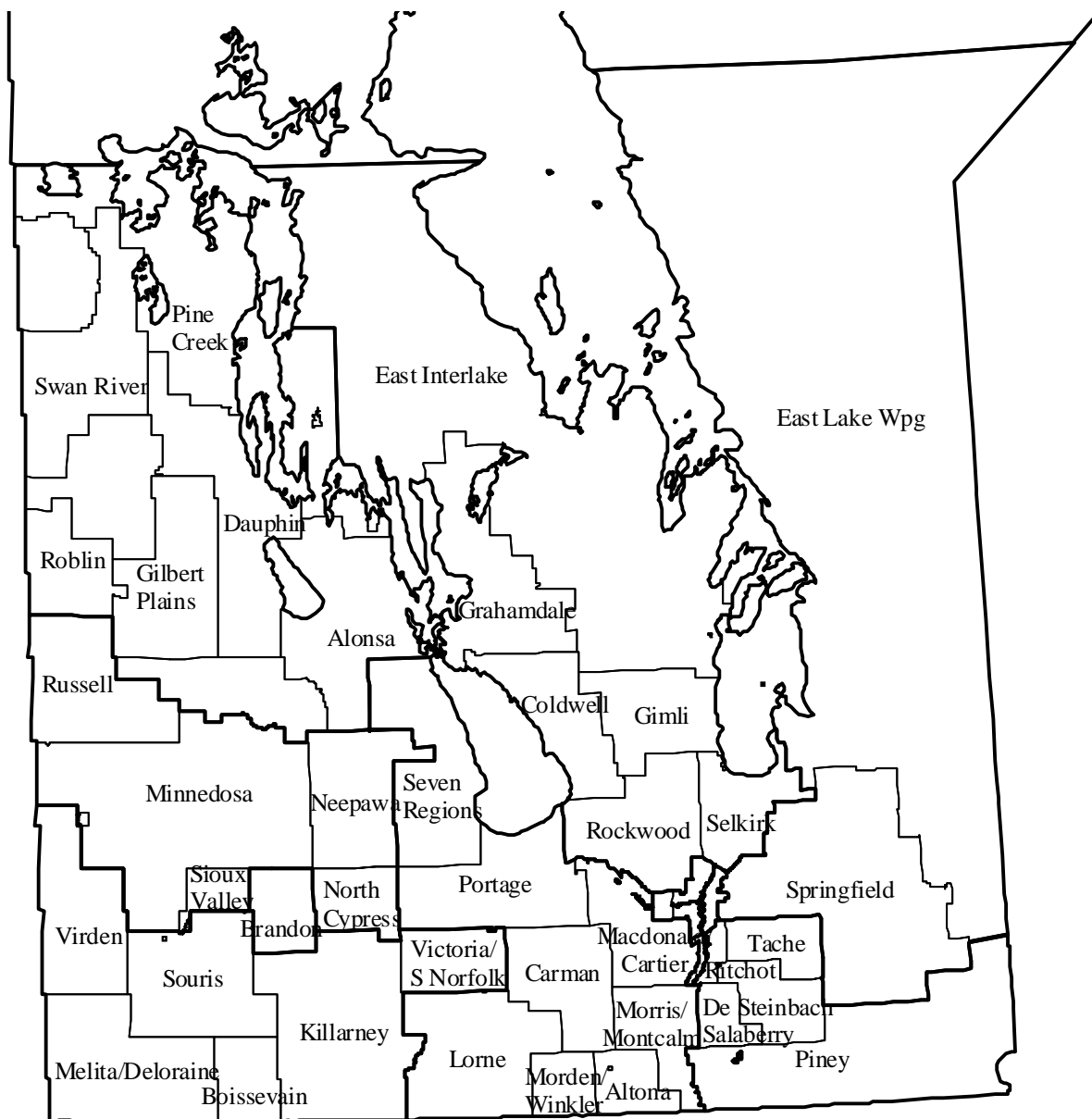


Figure 3: Southern Manitoba

**Regional Health Authorities (RHA)
and Physician Service Areas (PSA)**



The major focus of this report has been on providing a comprehensive set of indicators, rather than on extensive statistical testing for patterns. But whenever possible, we used statistical techniques to identify values that are significantly different (i.e. unlikely to be due to chance) from relevant averages, using 95% confidence intervals. Rates significantly above or below the average referred to in the graph are marked with an asterisk (*). These statistical tests were only calculated for utilization variables and health status indicators, not supply variables (i.e. number of physicians, hospital beds, and PCH beds). Because small numbers of people produce highly variable rates from year to year, rates that appear much higher or lower than the average sometimes do not have an asterisk beside them. This may reflect the small population used to calculate the rate, which could in fact be close to the average value over time. Unless a consistent trend of “higher” or “lower” rates is seen over time, it may be incorrect to assume that the rate is truly different from the average when it is not “statistically” different.

In developing this report, we were faced with some unique challenges in presenting a complete set of indicators for the RHA of Churchill. Churchill is a regional health authority serving a very small local population (approximately 1092 residents), but also providing services to residents of the larger Kivalliq region of Nunavut. With such a small population within the RHA, indicators of health and health care use can be influenced by a small number of cases, even when based on several years of data. In addition, we have routinely found physician claims for Churchill residents to be under-reported, making analyses based on these claims unreliable (see Figure 49 which shows the very low rate of physician contact captured by the reporting system). In this report we provide rates based on the data we have, flagging the figures that we know to be based on unreliable data.

Finally, with the exception of some sections of this report (the health status of RHA residents and the summary profiles), we have focused on graphical presentation of indicators, with less emphasis on detailed interpretation of these graphs. For each indicator, we have provided some background about why the indicator is important, an explanation as to how it was calculated, and some discussion about how to interpret differences. We have not focused on providing a detailed write-up of our understanding of the differences, because we believe that

much of this interpretation should come from the RHA perspective, based on an understanding of local circumstances.

A first step

It is our hope that the information provided in this report will generate considerable interest and debate among decision-makers and the public. We recognize that it represents only a first step in providing information relevant to the RHAs and to Manitoba Health, and hope that it is complementary to information that Manitoba Health has already provided. We also recognize that the information represents patterns in existence at the time just before the RHAs came into existence. We fully expect that we will find ways to improve the information we provide to RHAs over time, and to monitor some of the effects of regionalization. Nonetheless, we see this as an important step in developing a capability for providing information to the regional health authorities, one that builds on the strength of an emphasis on population health.

2. METHODS

Appendix 1 describes all the measures and how they were calculated. Information is presented for all Regional Health Authorities (RHAs) of Manitoba (see Figure 1) and for the Physician Service Areas (PSAs) into which the RHAs were divided. (Figures 2 and 3).

Most analyses for this report were based on database information from fiscal year 1995/96, except the RHA Summary Profiles (updated to 1996/97) and the various multi-year analyses (using 3-, 5-, and 10-year rates). All residents of Manitoba, including Treaty First Nations persons, were included in the study. However, approximately 30-40% of Treaty First Nations persons are not identified as such in our database, so our analyses underestimate their numbers. Those who are identified as Treaty First Nations persons are assigned to RHAs by postal code, rather than simply to the reserve to which they are affiliated.

Most figures include a comparison to the provincial rate, the Winnipeg rate, and the “non-Winnipeg” rate. The RHA profile graphs use a “rural average” to avoid comparison to the provincial average which is largely driven by Winnipeg and Brandon. This “rural average” was calculated for residents living in nine of the eleven RHAs. Brandon and Churchill were excluded – Brandon because use patterns typically reflects a more urban pattern, and Churchill because data are incomplete for some services.

Most rates are age- and sex-adjusted to control for differences attributable to different population compositions of RHAs and PSAs (the adjusted rate is that which would occur if the area had an age/sex composition identical to the overall Manitoba population). The three exceptions are: supply, such as physicians or hospital beds, where the rates are simple per capita values; analyses based on specific age groups (e.g. immunizations for children), and analyses of the location of service provision (e.g. Within RHA, to Wpg, etc). Appendix 2 includes the *crude* rates by region, which reflect the rates calculated using each RHA’s raw data. The actual number of persons with a certain condition can be calculated by taking the population of that region multiplied by the *crude* rate for the condition of interest.

3. THE FOCAL POINT: HEALTH STATUS OF RHA RESIDENTS

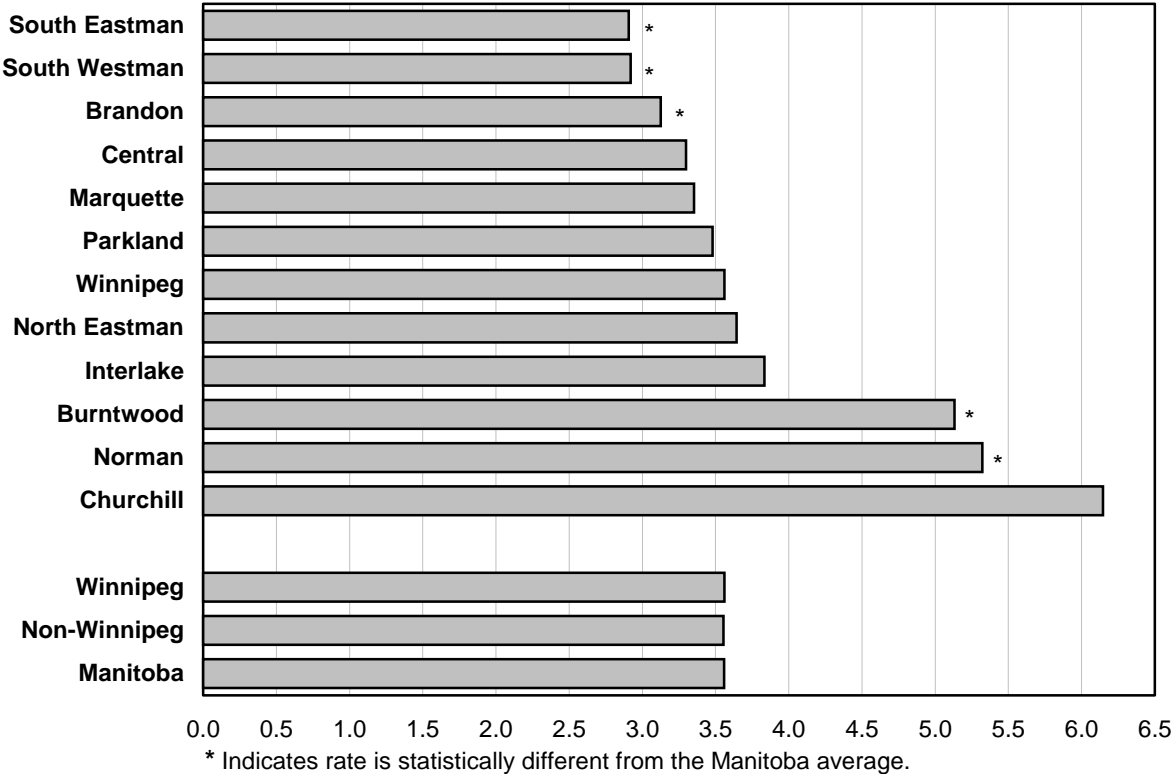
Researchers in the population health field (Eyles et al., 1991; Carstairs and Morris 1991; Eyles et al., 1994) have advocated the use of a single measure – premature mortality (death before age 75) – as the best single indicator of health status capturing the need for health care. This measure is used in the British formula for allocating funds to regional health authorities. It has been shown to be strongly associated with most of the self-reported health status indicators and physical measures used in the Health and Lifestyle Survey, including self-assessed health, number of symptoms, self reported rheumatism and temporary sickness (Mays et al., 1992). In short, populations that have higher premature mortality rates are also more likely to report their health to be poor, to report a higher number of symptoms and to report being sick more often.

There is considerable variation in the rate of premature mortality *across* RHAs (Figure 4). Rates for three areas (South Eastman, South Westman and Brandon) are significantly lower than the Manitoba average, indicating that residents of these areas have better than average health status. Rates for two northern RHAs (Burntwood and Norman) are significantly higher than the Manitoba average, indicating that residents of these areas have much poorer than average health status. In spite of the tremendous variability across RHAs, the overall rates for Winnipeg, non-Winnipeg and Manitoba populations are very similar. These premature mortality rates (and most other rates in this report) have been age- and sex-adjusted to allow fair comparisons across regions, even though some RHAs have younger or older populations than others.

When premature mortality is calculated for the physician service areas (PSAs), it is evident that there is also considerable variation *within* RHAs (Figure 5). For some RHAs, this variation is relatively small, in that only one or two PSAs appear substantially different (i.e. PSAs in South Eastman, South Westman, or Parkland). For other RHAs, there is a marked gradient across sub-populations (i.e. Central and Interlake). This phenomenon is most pronounced for Burntwood, where the premature mortality rate for the healthiest PSA (Leaf Rapids) is among the lowest in the province, and the rate for the poorest health PSA (Burntwood Unorganized) is the highest in the province.

Figure 4: Premature Mortality Rates, 1991-1995

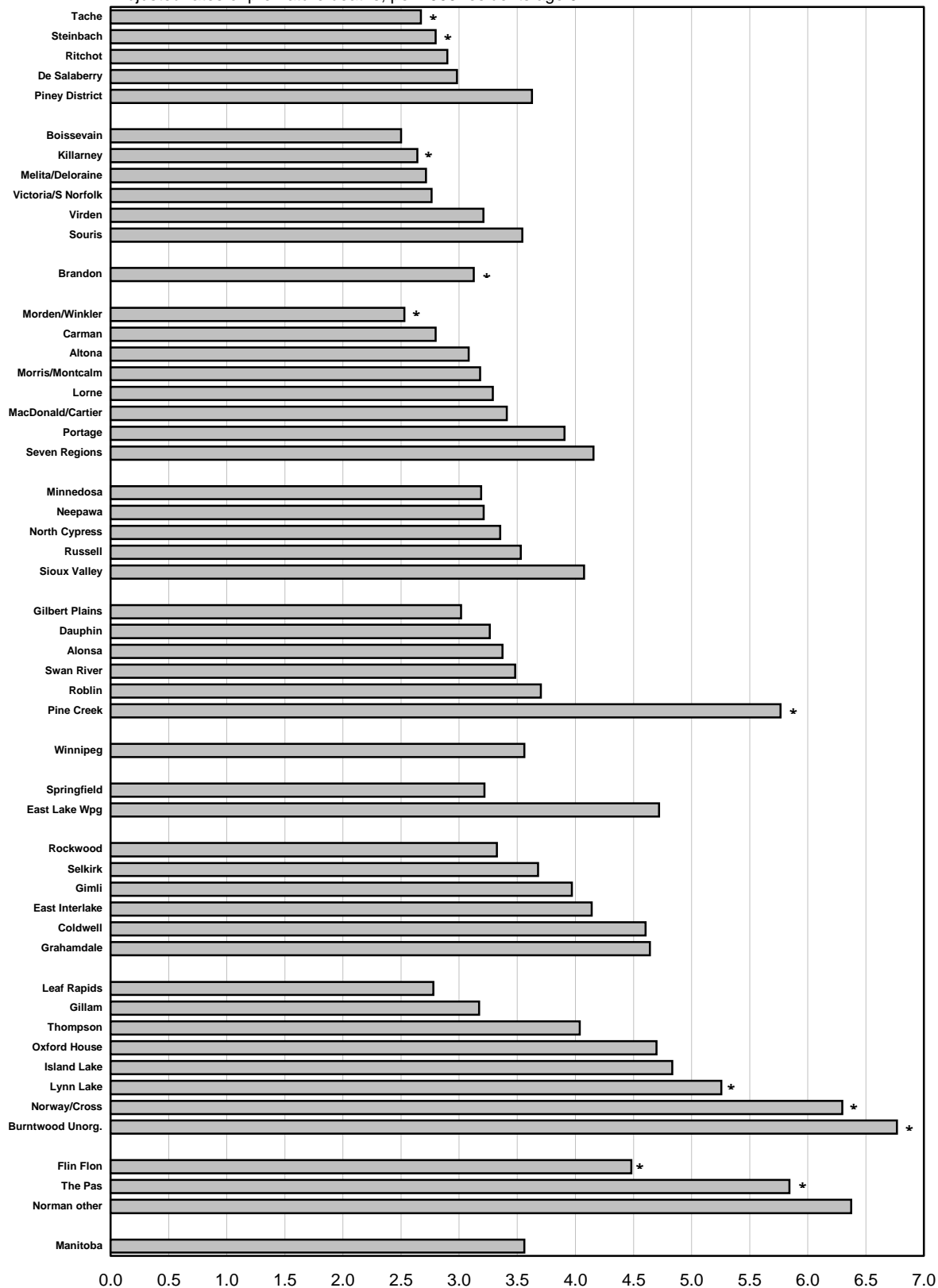
Adjusted rates of premature deaths, per 1000 residents age 0-74



To continually emphasize the central importance of premature mortality as an indicator of health status and relative need for health care, all figures in this report show the RHAs in order of increasing premature mortality rate. Accordingly, South Eastman is always listed first since its residents are healthiest, while Churchill is listed last since its residents are least healthy. Similarly, figures showing data for the Physician Service Areas (PSAs) are also sorted by premature mortality with RHAs (Figure 5). Assuming that poor health indicates a greater need for medical care, ordering the RHAs in this manner means that they are also listed in order of increasing need for health services.

Figure 5: Premature Mortality Rates, 1991-1995

Adjusted rates of premature deaths, per 1000 residents age 0-74



* Indicates rate is statistically different from the Manitoba average.

4. INTERPRETING THE DATA FOR LOCAL USE

or

How to get an overall view of your RHA from this report

Information by region, and by sub-region, is given in this report. This information includes measures of demographic/socioeconomic conditions, health status, disease burden, provision of preventive care, use of physician and hospital services, use of personal care (nursing) homes, plus rates of “high profile” and “discretionary” procedures. In order to benefit from this information, this section focuses on how to interpret these measures to understand circumstances in your RHA. This section gives examples and poses questions that may arise. This is meant to help RHAs get an overall view of their region.

4.1 The people of your region

The two most basic ways to describe the people of your region would be by age and by gender. This gives you an indication of those resources which may be most needed. In other words, compared to other RHAs, how many people are likely to “walk through the door” of the various types of health services. The “population pyramid” of your region is a summary of all this information in one picture. It shows what percentage of the whole population is distributed in each five-year age and gender group.

Example: Burntwood region (Figures 28a and 28b)

The shape of the population pyramid for Burntwood is like a triangle, with the largest “bulk” of the population being younger. In fact, 13% of Burntwood’s population is aged 0-4 years, and only 1% is aged 75 or older. This is in contrast to the Manitoba population, which has the bulk of its population in the middle-aged group, with only 7% aged 0-4, and 6% aged 75 or older. Burntwood also has a higher proportion of Treaty First Nations residents within the RHA (as shown by the lighter grey areas in the pyramid). For any given age group category, persons with Treaty status represent at least half of the region’s residents.

Burntwood planners could calculate actual numbers of people in different age categories. For example, Figure 28a shows that the total population is 44,535 (in 1995/96). Females of child-bearing age (ages 15-44) comprise about 24% of the population (calculated by adding up the right, or female, side of the bars for the age categories from 15 to 44 years old). So actual clients in that age are 10,688 females (0.24 multiplied by 44,535). Exact percentages for age brackets are included in Appendix 2.

Planners from this and other regions may ask such questions as:

- 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 prenatal care, maternity services, pediatric services, and immunization programs.
- How many people could possibly "walk through the door" for any given service?

4.2 The healthiness indicators of your region

It is important to know whether or not you have a "healthy" region in comparison with the rest of the province. It is also helpful for planners to know how healthy the people are in different parts of their region. Three measures of healthiness are included in this report – the Premature Mortality Rate (PMR), the Socio-Economic Risk Index (SERI), and Life Expectancy.

Example: North Eastman

North Eastman's population has a similar PMR (3.7/1000 residents aged 0-74) to Manitoba (about 3.6/1000). Figure 4 shows an adjusted rate, which means that the rate is given as if the North Eastman population pyramid looked like the Manitoba pyramid, with the same proportion of persons in each of the five-year age and gender categories. There are some regions that have lower PMRs (indicating a *healthier* population) and some higher (a *less*

healthy population), with North Eastman located about midway. But there are very different rates within the region itself – Springfield sub-region is actually lower (3.3/1000) than the provincial rate, and the East Lake Winnipeg area (4.7/1000) is slightly higher. But this rate does not have a * beside it, meaning that even though the rate *looks* higher than the Manitoba rate, this may be due to the relatively small population in the area, and the rate could fluctuate quite a bit from year to year. Regional planners may want to look at this rate over time, to see if there is a consistently higher PMR indicating a “less healthy” population.

Another “look” at the healthiness of North Eastman residents is the SERI score (Socio-Economic Risk Index), shown in Figures 31 and 32. The SERI is based on characteristics of communities derived from six Census variables (unemployment in two age groups, families headed by single females, educational levels, females in the work force, and average home values). North Eastman is at slightly higher risk (0.19) than the overall Manitoba population (0), but at less risk than non-Winnipeg residents as a whole (0.31). Looking within the region, Springfield is at lower risk than the Manitoba population (-0.30, similar to Winnipeg residents), but East Lake Winnipeg is at very high risk (1.7). The higher the unemployment, the more families headed by single females, the lower the education, the fewer females in the workforce, and the lower the average value of homes, the higher the community’s score would be on this index.

The final “window” of healthiness in this report is the life expectancy at birth. North Eastman *men* live, on average, to about 75 years old; *women* live to about 80. In comparison, Manitoba men live to about 75, and women live to about 81. But the picture looks slightly different within the region. The Springfield area life expectancy for men is about 77 years, and for women about 82 years. In contrast, the East Lake Winnipeg area has an average life expectancy of only 72 years for men and 77 for women.

Health planners in regions may ask such questions as:

- Do all three “windows” of healthiness tell the same story? Does this make sense?
- Are there differences between the sub-regions?

- Will people who are less healthy have greater needs for health care delivery?
- What do these indicators of healthiness suggest about the health of the RHA's population? In general, is the population in the RHA more or less healthy in comparison to other RHAs?

4.3 Major disease profiles of your region

Three major diseases – diabetes, hypertension, and cancer – are profiled in Figures 37 to 42. These are “adjusted” rates, which allow for fair comparisons between regions. The adjusted rate would be the rate seen if the area had the same age and gender composition as the entire population of Manitoba. This is important because if one region had more young persons and less older persons than the Manitoba average, then we would expect to see fewer residents with a diagnosis of cancer (or fewer people with hypertension) from this region. “Age/gender adjustment” mathematically removes the effects of different population structures that would affect overall rates of use of health care.

Example: Norman

Norman RHA has a higher rate of diabetes (85/1000) than Manitoba (56/1000), but a lower rate of hypertension (175/1000 versus 190/1000) and roughly the same rate of new cases of cancer (5.4/1000 versus 5.2/1000). But subdividing the region into sub-regions gives even more information. Diabetes rates in Flin Flon are about the same as Manitoba (60/1000), but the rate for The Pas is 1½ times (90/1000) and the rate for “Norman other” is twice (125/1000) the provincial rate.

Some of the questions that policy planners may ask include:

- Why are the sub-region and region rates so different from the Manitoba average?
- Do the services of the area reflect the health needs of the population – both in the area of prevention and treatment?
- How are these differences likely to influence the need for health care?

Although this information points to specific health problems in the region and sub-regions and provides information for comparisons to other RHAs, this does not tell you “how many people are walking in the door” for treatment. The adjusted rate would give you that information only if the RHA has the identical age/gender structure of the province. Since the adjusted rate may give you a slight overestimate or underestimate of the actual number of people with a disease, depending on the RHA population pyramid, you can find the actual rates (sometimes called the *crude rates*) in Appendix 2. These crude rates can be multiplied by the regional population to get an estimate of how many people in the region have a given condition or diagnosis.

4.4 Are preventive programs “working”?

One measure of the “success” of a childhood preventive health care program is immunization rates (see Figures 43 and 44.). This is an age-specific rate, reported as the percent of one-year olds and two-year olds that have received the complete immunization schedule. A second preventive program measure is the rate of mammography screening for women aged 50-69. This is also an age-specific rate, given by region and sub-region (Figures 45 and 46). Since both of these measures are age-specific, the rates have not been adjusted.

Example: South Eastman

In South Eastman, about 93% of one-year olds and 81% of two-year olds have complete immunizations, compared to provincial averages of 86% of one-year olds and 75% of two-year olds. Throughout South Eastman Region, the sub-regions have fairly consistent rates for one-year olds (92-95%), with a slightly wider range for two-year olds (78-86%).

Mammography rates (45% of women ages 50-69) for South Eastman are similar to the non-Winnipeg average (46%), but slightly lower than the overall Manitoba average (50%).

Within the region, Piney PSA has the lowest rate, at about 35%.

Planners from this and other regions may ask such questions as:

- How effective is the region in providing immunizations and mammography?
- Is there a way to increase the immunization rates for the two-year olds?
- Why are only half of the women (or less) receiving mammography screening?
- Do regions with varying immunization or mammography rates have different service delivery systems, or is this influenced by other factors? Can regions learn from each other?

4.5 How do people in your region use physician services?

Figures 47 to 58 describe the way in which residents of the RHAs and sub-regions utilize physicians and specialists. Measures include “in-area” physician supply; “ambulatory” visit rate; types of providers (general practice/family practice or specialists); and location of visits (in or out of area and region). Ambulatory visits with physicians include regular office visits, consultations (which are usually with specialists or surgeons), outpatient department and emergency room visits, and visits to patients in PCHs or in their own homes.

Example: South Westman

South Westman is considered one of the healthiest regions using the three “healthiness” indicators (PMR, SERI, and life expectancy). South Westman has a higher *in-area supply* of general/family practitioners (0.76/1000) than the Manitoba average (0.70/1000). But this region has a lower visit rate (3.9 per resident) than the Manitoba average (4.5 per resident). Most sub-regions of South Westman are consistent with this pattern, with some exceptions. Virden has a low in-area physician supply (Figure 48), and low ambulatory visits to physicians (Figure 50), despite average “healthiness” as shown by the premature mortality rate (Figure 34). In Boissevain, although the residents score well on the healthiness indicators (with an average SERI, an average to low PMR, and an average to high life expectancy), they have a higher than average rate of ambulatory visits.

South Westman residents visit GP/FPs for about 86% of their physician visits, compared with the provincial rate of 77%. Over 80% of these visits are “in-region”, similar to the non-Winnipeg average. But this varies considerably by sub-region – in Souris only 69% of the visits to a GP/FP are “in region”, but in Deloraine/Melita almost all (93%) are “in region”. Very few (2%) of the “outside region” visits are in Winnipeg.

Comparing *specialist* physician supply and visit rate, South Westman has a much lower in-area supply of specialists (0.02 per 1000 residents) than the Manitoba average (0.56 per 1000); it is also lower than the non-Winnipeg average (0.06 per 1000). Visit rates to specialists can be measured by consultation rates. Consultations are visits in which one physician refers the patient to another, usually because of the complexity, obscurity, or seriousness of a patient’s illness. These visits are usually with specialist physicians (93%). The South Westman adjusted rate for consultations, no matter where they took place, is 160/1000, much lower than the non-Winnipeg (180/1000), Manitoba (220/1000), or Winnipeg rate (240/1000). In the sub-regions, Boissevain’s consultation rate is around the provincial average, but the rest of the sub-regions are lower. Very few *specialist* visits are made in the South Westman RHA (10%), with most going to specialists in other RHAs (71%) or in Winnipeg (19%).

Planners may want to consider such questions as:

- Does a lower physician visit rate make sense because of the healthiness of the population in an area, or does it reflect “under-servicing”?
- Are there sub-regions within the region with high need (poor health status) populations, 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” GP/FPs and specialists which should be altered?

4.6 How do people in your region use hospital services?

Several figures (59 to 65) provide information on hospitals, including the supply of hospital beds, “separation rates” (frequency of use), days of stay in hospital, and location of hospitalizations.

Example: Central

Central RHA is reasonably “healthy” and has a population pyramid similar to Manitoba. Most of its sub-regions also have premature mortality rates similar to the Manitoba average of 3.5/1000, except Morden/Winkler which is lower (2.5/1000), indicating a healthier population. Central RHA has about 4.5 hospital beds per 1000 residents (unadjusted), which is right at the non-Winnipeg average, and slightly higher than the Manitoba average (4.2/1000). The region has a higher hospital separation rate (189/1000) than the Manitoba average (167/1000), but lower than the non-Winnipeg average (202/1000). Rates vary considerably by sub-region, with two being notably higher (Seven Regions and Lorne) and one lower (Macdonald/Cartier) than the provincial rate, as indicated on Figure 61.

Total days of hospital use for the Central RHA population (adjusted rate 1032 days/1000) is lower than the Manitoba average (1142/1000). And the length of stay is different – more days used in “short stays” (727/1000 versus 660/1000), and fewer days used in “long stays” (306/1000 versus 481/1000). About two-thirds of the hospitalizations occur within the region, with most of the rest in Winnipeg (29%). But there are very different sub-region patterns within Central RHA. As might be expected, residents of Morris and Macdonald/Cartier are much more likely to use a Winnipeg hospital, with 43% and 94% of hospitalizations respectively occurring in Winnipeg.

Note that the hospital days and hospital separation rates are “adjusted”. Since the population pyramids of Central RHA and Manitoba are very similar, the adjusted rates are similar to the crude rates (listed in Appendix 2). The supply of hospital beds and the location of hospitalizations are not adjusted rates. So knowing that Central RHA has about 4.5 beds/1000, and knowing from the population pyramid that there are 95,960 people, this

means that there are just over 400 hospital beds (i.e. 4.5 times 95,960 divided by 1000 = 431) in the region. Most of these are acute care beds, with some being long-term care beds.

Planners may want to consider these facts, and ponder such questions as:

- Do hospital use levels make sense given the health status of residents of the region?
- Does a higher “separation rate”, that is, more frequent use of hospitals, reflect poorer health of local residents, or a higher than average number of hospital beds?
- Are there reasons why residents of some regions have more “long stay” days in hospital than other regions? Does this mean that people are discharged differently?
- Do residents of the high-use regions have poorer access to other facilities, such as nursing homes? If so, what policy and planning strategies in certain regions have enabled efficient use of hospital beds, and could we learn from each other about this?

4.7 How do people of your region use nursing home (personal care home) services?

Information on the use of Personal Care Homes (PCHs) is given in Figures 66-70. This includes: the number of beds in each region, the number of residents in PCH, the number of admissions per year, the total days of care, and the waiting times for admission. Although federally funded PCH beds are included in the “supply” graph (Figure 66), the rest of the PCH analyses do not include federal beds, because we have no data on their utilization. Note also that all PCH analyses were done on persons aged 75+ only, so not all users of PCHs are included in the analyses (Appendix 2 includes a table showing what proportion of PCH residents are aged 75+ in each region). Finally, PCH analyses were done at the RHA level and not the PSA level, as there are too few persons.

Example: Marquette

In Marquette RHA, there is a lower supply of PCH beds for the elderly population (114 beds per 1000 persons age 75 or over) in comparison to the provincial (128/1000), non-Winnipeg

(134/1000) and Winnipeg averages (122/1000). This may be somewhat surprising, considering the population pyramid for Marquette shows an “elderly” distribution: 20% of the population is 65 or older, and 10% is 75 or older, compared with the provincial averages of 14% and 6% respectively (see Figure 23 and Appendix 2).

For every 1000 Marquette residents aged 75 or older, about 138 live in a personal care home. (This will be an underestimate of the total number of persons in PCHs, since some PCH residents are below the age of 75: about 9% in Marquette). The PCH admission rate indicates how many new patients enter nursing homes each year. For Marquette residents, the admission rate is about 36/1000 RHA residents 75 years or older, just slightly higher than the provincial rate (32/1000), but the difference is not “statistically significant” (there is no * on the Marquette bar). The median waiting time for Marquette residents to enter a personal care home was 70 days, much shorter than Manitoba (101 days), non-Winnipeg (88 days) or Winnipeg (114 days) average waiting times. Once again, this may seem surprising considering the lower number of PCH beds. What these data show is that Marquette residents have higher than average access to PCH services despite the lower bed supply (in other words, they use PCH beds in other regions).

Planners may consider such questions as the following:

- Compared to other regions, does the RHA have a higher or lower proportion of elderly persons?
- Do the PCH facilities in the region reflect the needs of the population at present?
- Do the PCH facilities in the region reflect upcoming needs in the next 10 years, looking at the population pyramids?
- Why do some regions have a much shorter waiting time for admission – is this related to greater number of beds, different criteria for placement, different admission processes, or other factors?

4.8 What level of access do residents of your region have to “high profile” procedures?

There are some procedures that are often talked about in the press and media. Cardiac catheterization, angioplasty, coronary artery bypass, hip and knee replacement, and cataract surgery are discussed here because they are high profile procedures associated with major improvements in quality of life.

Other procedures (sometimes called “discretionary”), including tonsillectomy, hysterectomy, and Caesarian section, have been the subject of critical reviews in the research literature because of potential overuse. Prostatectomy is a procedure whose rate has been falling somewhat in recent years, as alternative procedures and drug therapies become available.

This is an interesting and eclectic mix of procedures, including some for the young, middle-aged and elderly, and some for males and females only. Figures 71-81 provide rates of these procedures for each region, using one-year, three-year and five-year averages. The five-year rates are more stable, and help prevent over-interpreting sudden increases or decreases from year to year. Comparing the five-year, three-year, and one-year rates allows one to determine whether the rate of a given procedure is increasing or decreasing over time. These procedures are analyzed at the RHA level only, as there are too few cases to report reliable rates at the PSA level.

Example: Interlake and Brandon

The Interlake cardiac catheterization five-year rate (2.7/1000) is about the same as the provincial (2.4/1000) and Winnipeg rate (2.7/1000), but higher than the non-Winnipeg rate (2.0/1000). This trend is also true for coronary artery bypass surgery rates, and for angioplasty rates – all are similar to Winnipeg and provincial rates, but higher than non-Winnipeg rates. Looking at procedures of importance to the elderly, the Interlake five-year hip replacement rate (0.61/1000) is about the same as that for Manitoba (0.54/1000), Winnipeg (0.53/1000) and non-Winnipeg (0.56/1000). The RHA rate does not have a * beside it, meaning that even though the rate looks higher, it could be due to chance.

Similarly, the knee replacement rate (0.60/1000) is close to the provincial (0.46/1000) and non-Winnipeg rates (0.52/1000), but may be higher than the Winnipeg rate (0.42/1000). For cataract surgery, Interlake rates are similar to provincial rates (18/1000), suggesting good access to this procedure.

Examples where average to low rates represent good practice include hysterectomy, caesarian section, tonsillectomy, and prostatectomy. The five-year Brandon hysterectomy rate (5.0/1000) for women aged 25 years or older is similar to provincial (5.2/1000) and Winnipeg (4.9/1000) rates, but lower than the non-Winnipeg rate (5.6/1000). The Brandon caesarian section rate is identical to the provincial, Winnipeg and non-Winnipeg rates (160/1000 births, or 16%). Five-year adjusted prostatectomy rates for Brandon are lower (2.0/1000 males) than the provincial (2.4/1000) or Winnipeg (2.5/1000) rates, and may be lower than the non-Winnipeg rate (2.3/1000). Brandon has a high tonsillectomy rate for children ages 0-14 years (9.2/1000), compared to the provincial (6.2/1000), Winnipeg (5.5/1000) and non-Winnipeg rate (7.0/1000). The Brandon data suggest it would be useful to review the tonsillectomy guidelines with local physicians.

Planners may want to explore such questions as:

- Compared to other regions, does the RHA have a high or low rate of the procedure?
- Are surgery rates related to the proximity of the region to major health centers?
- Where rates of hip and knee replacement, cardiac surgery or cataract surgery 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 real need, or does it mean under- or over-servicing?
- 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?
- What are the trends over the past five years? If the five-year rate is lower than the three-year rate, which in turn is lower than the one-year rate, rates are probably increasing.

4.9 A snapshot profile of your region, using a “regional” yardstick

Most of the figures in this report have three “comparison guidelines” – Winnipeg, non-Winnipeg, and Manitoba. But the *Manitoba* rates are largely driven by rates for the bulk of the population – those people living in Winnipeg. And the *non-Winnipeg* rates are often influenced by the Brandon rates. Churchill data are also problematic because the population is so small that the rates are unstable, and physician claims are known to be incomplete. Therefore, we developed the “rural average” to provide a more meaningful yardstick for the rural RHAs to compare themselves to. A snapshot profile for each region is given in Figures 6 to 17 of this report, using the “rural average” for comparison. This rural average excluded Winnipeg, Brandon and Churchill residents. The profiles contain key information for four areas – health status/need, physicians, acute care, and long-term care for those 75 or older.

Example: Parkland (Figure 11)

Parkland’s healthiness (measured by the PMR, or premature mortality rate) or “need”, is about the same as the rural average. Visits to physicians and consultation rates are near the rural average, even though there are 40% more “in-area” physicians. Parkland has 65% more hospital beds than the rural average, which may be related to the fact that Parkland residents are admitted to hospitals more often (short stay separation rates 14% higher), and spend more time in hospitals (short stay days 18% higher) than the rural average.

Planners may want to discuss such questions as:

- Does the overall profile “make sense” in terms of local need, supply, and use of health services?
- Does the overall profile “make sense” in terms of the geographic location of the RHA, when looking at profiles of other RHAs?

4.10 Closing comments

There is a wealth of information contained in this report – information that we hope will prove useful to planners and policy-makers in the RHAs of Manitoba. The information can be used in many ways. A region can get an overview of the make-up, healthiness, health service utilization, and procedure rates for their population. Regions can also “cross-compare” their information with other regions, the province, Winnipeg, non-Winnipeg and rural averages. And regional planners can 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 population of Manitoba.

If you would like to access an electronic version of this report, which may help you in creating your own RHA summary presentations, you will find this on the website of the Manitoba Centre for Health Policy and Evaluation:

<http://www.umanitoba.ca/centres/mchpe>

PLEASE help us produce useful and practical information. We would be grateful if you would TAKE A FEW MINUTES to fill in the evaluation form in the front of this report.

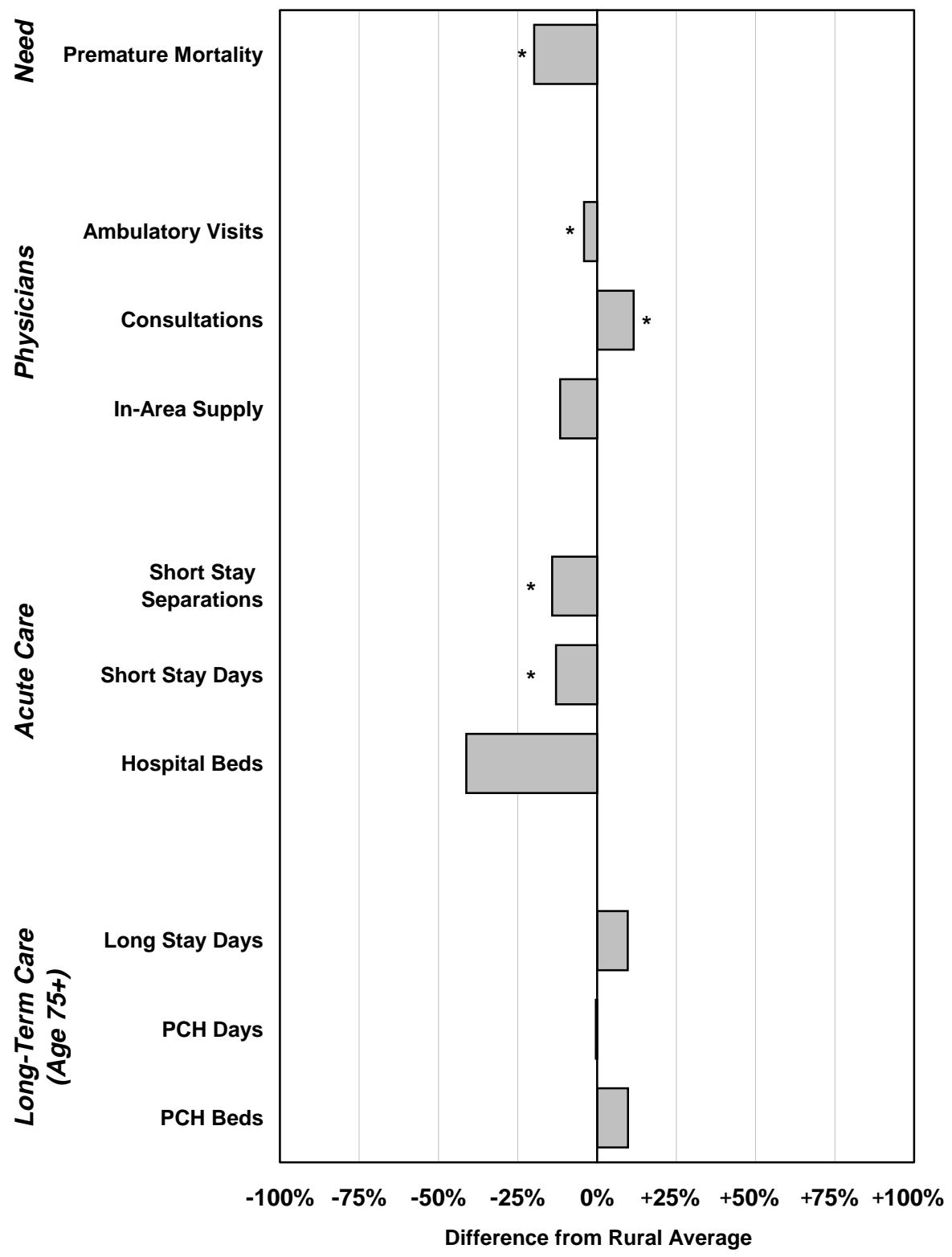
5. REGIONAL HEALTH AUTHORITY SUMMARY PROFILES

Individual profiles were created for each RHA to provide a summary of key indicators. Initially, these indicators were compared to the Manitoba average, but it quickly became clear that the provincial average was not the best “yardstick” to use, since some values are driven largely by Winnipeg and Brandon (e.g. physician supply). Therefore, a “rural average” (i.e. excluding Winnipeg, Brandon and Churchill) was calculated for each of the key indicators. A profile was then created for each RHA, indicating how its results compare to results for this “rural average” on each indicator. The profiles were initially created using 1995/96 data (as in the rest of the report), but were subsequently updated to show 1996/97 data. In general, the profiles looked very similar for both years. The premature mortality rates use 1992/93 through 1996/97 data to ensure stability. Directly standardized rates (age and sex adjusted) were used for all utilization data. Long term care utilization and supply variables were calculated per population age 75+. Unadjusted per capita values were used for supply variables (physicians, and hospital & PCH beds).

5.1 South Eastman

South Eastman is the RHA with the healthiest population in the province, as reflected by its low premature mortality rate (20% below the rural average). Its lower than average rate of ambulatory visits (4% below the rural average) and in-area supply of physicians (12% below the rural average) are consistent with the low health care needs of a healthy population. However, South Eastman residents’ consultation rate is 12% higher than the average, likely reflecting access to Winnipeg specialists. Residents of this region have achieved a lower reliance on hospitals in comparison to other rural residents. Both separations and total days of care spent in acute care facilities (this includes all hospitalizations of South Eastman residents regardless of where the hospitalization occurs) are lower than the rural average, by 14% and 13% respectively. Because of residents’ lower health needs and a reliance on Winnipeg hospitals to provide a portion of their care, South Eastman is able to maintain an in-region hospital bed supply that is substantially (41%) below the rural average.

Figure 6: Profile of South Eastman, 1996/97
Relative to Rural Average



* Indicates rate is statistically different from the Rural Average.

Elderly (75+) South Eastman residents' use of hospitals for long stays is somewhat (10%) higher than the rural average. Use of personal care homes is close to the rural average, even though PCH bed supply is 10% higher than average.

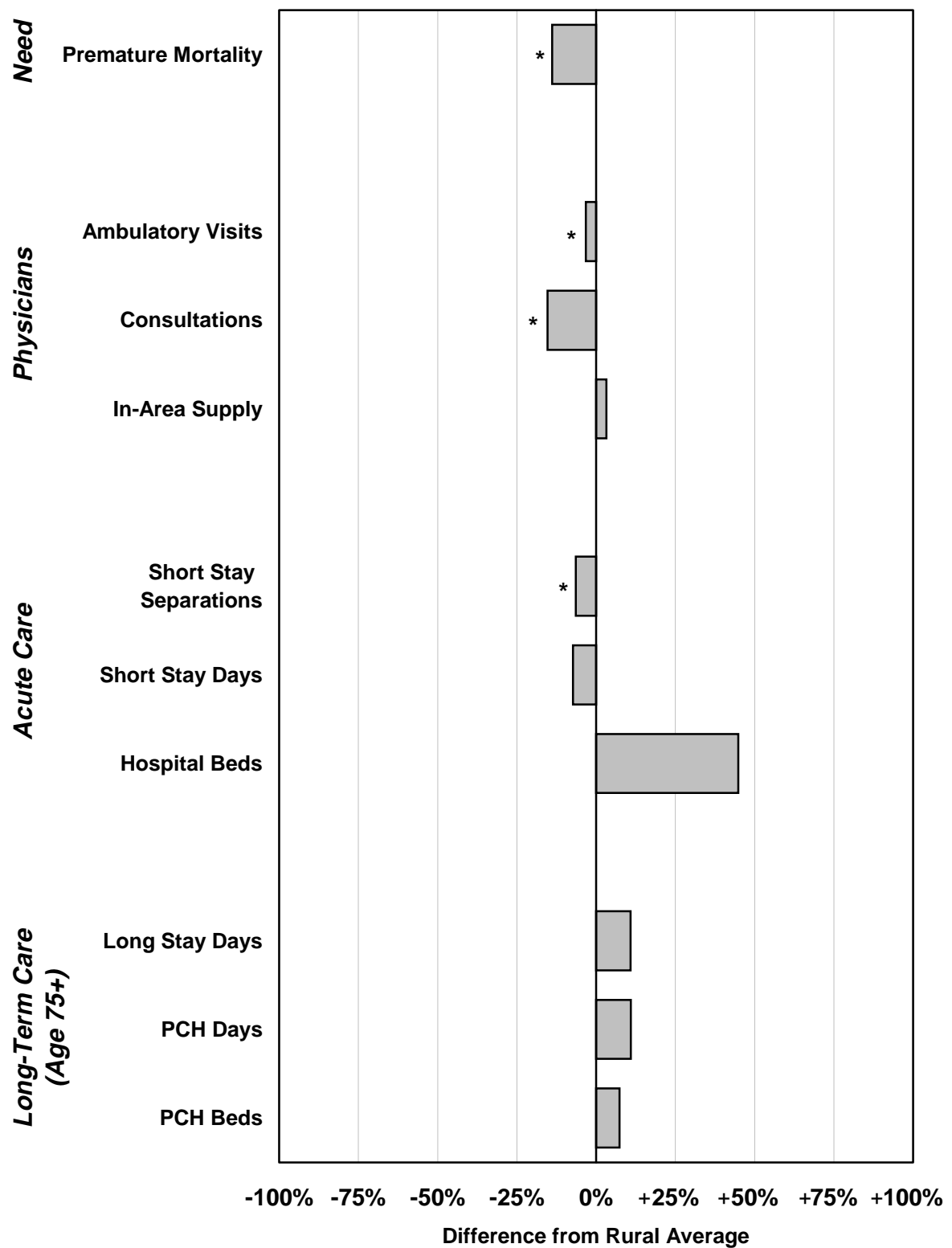
5.2 South Westman

South Westman residents are also much healthier than the rural average, with a premature mortality rate that is 14% lower than the rural average. Consistent with the low needs of this healthy population, ambulatory visit rates are slightly (3%) lower than average. In contrast to South Eastman, consultation rates are low (15% below the average). This relatively low use of ambulatory physician services is not related to problems with physician availability: the in-area supply of physicians is 3% above average. In comparison to the average for rural RHAs, South Westman has a large excess (45%) of hospital beds. Utilization rates for acute care, measured in separations and total days of care, are below average (6% and 7% respectively). But utilization for long stays (i.e. stays of 45 days or longer in any acute or chronic care hospital) is above average, though this is not statistically significant. The supply and utilization of personal care homes are also above average, by 7% and 11% respectively. South Westman is one of the five RHAs which also has a federal nursing home run by Indian and Northern Affairs. The supply becomes somewhat higher when the federal nursing home beds are added in, but the difference is small. (Note that the utilization of these federal beds is not included in our analyses; see Appendix 1.)

5.3 Brandon

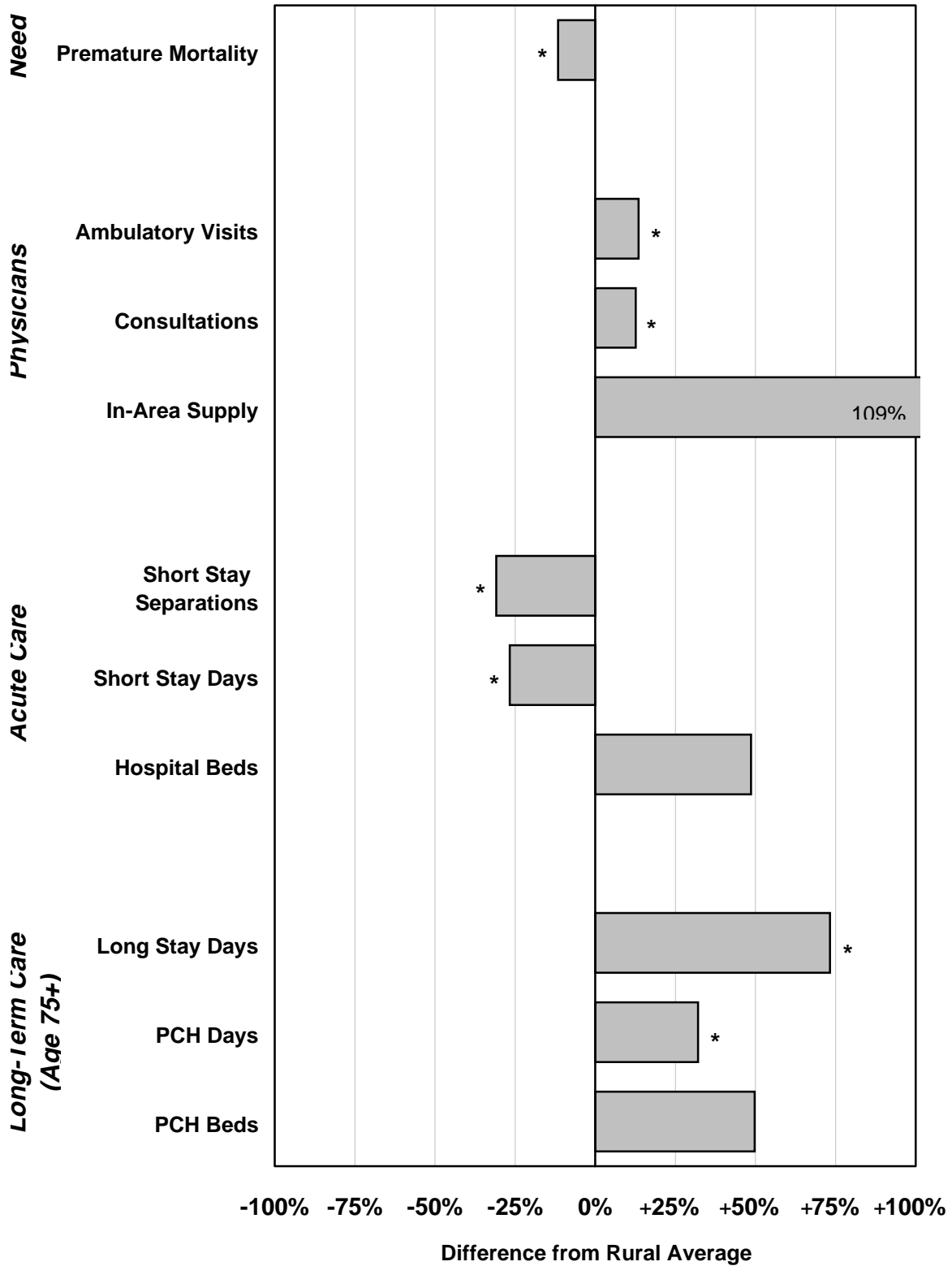
Brandon is very different from the rural RHAs, but comparison of key indicators of health and health care to the rural average provides some understanding of these differences. Brandon residents are very healthy, with a premature mortality rate that is 12% below the rural average. Compared to rural RHAs, Brandon's in-region physician supply is very high, at 109% of the rural average (i.e. more than double). Even though the population is healthy, implying a lower need for health care, this high availability of physicians may account for the region's relatively high use of ambulatory visits and consultations (14% and 13%

**Figure 7: Profile of South Westman, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

**Figure 8: Profile of Brandon, 1996/97
Relative to Rural Average**



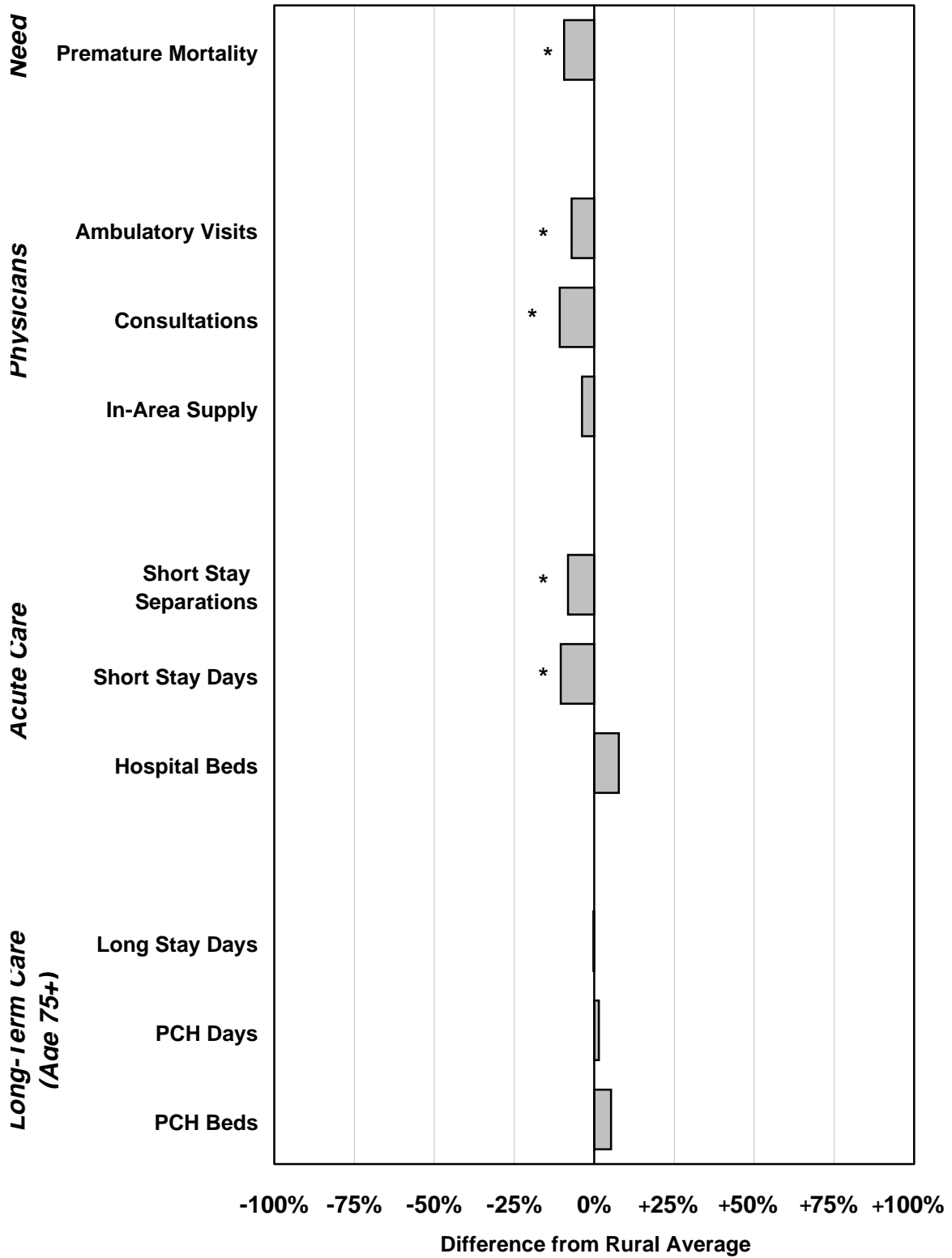
* Indicates rate is statistically different from the Rural Average.

above the rural average, respectively). Compared to the rural average, Brandon residents have much lower rates of acute hospital use (31% fewer separations and 27% fewer days for acute care), consistent with a healthier and more urban population. This lower rate of acute hospital use occurs in spite of a supply of hospital beds that is 49% higher than the rural average. However, while short stay utilization is low, hospital use by the elderly for long stays is significantly (73%) higher than the rural average. In addition, personal care home use by the elderly is high (32% above the rural average), consistent with the high supply of personal care home beds (50% higher than the rural average).

5.4 Central

Central residents are significantly healthier than average, reflected in a premature mortality rate that is 9% below the rural average. Consistent with this indication of relatively low need for medical care, both regular ambulatory visits to physicians and consults are lower than the rural averages (7% and 11% lower respectively). The in-area supply of physicians is just 4% below the rural average. Hospital use (both separations and days) is also below the rural average, even though the supply of hospital beds is 8% above the rural average. Patterns of long term care use in both hospitals and personal care homes are close to the rural average. The supply of PCH beds is 5% above the average for rural RHAs.

**Figure 9: Profile of Central, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

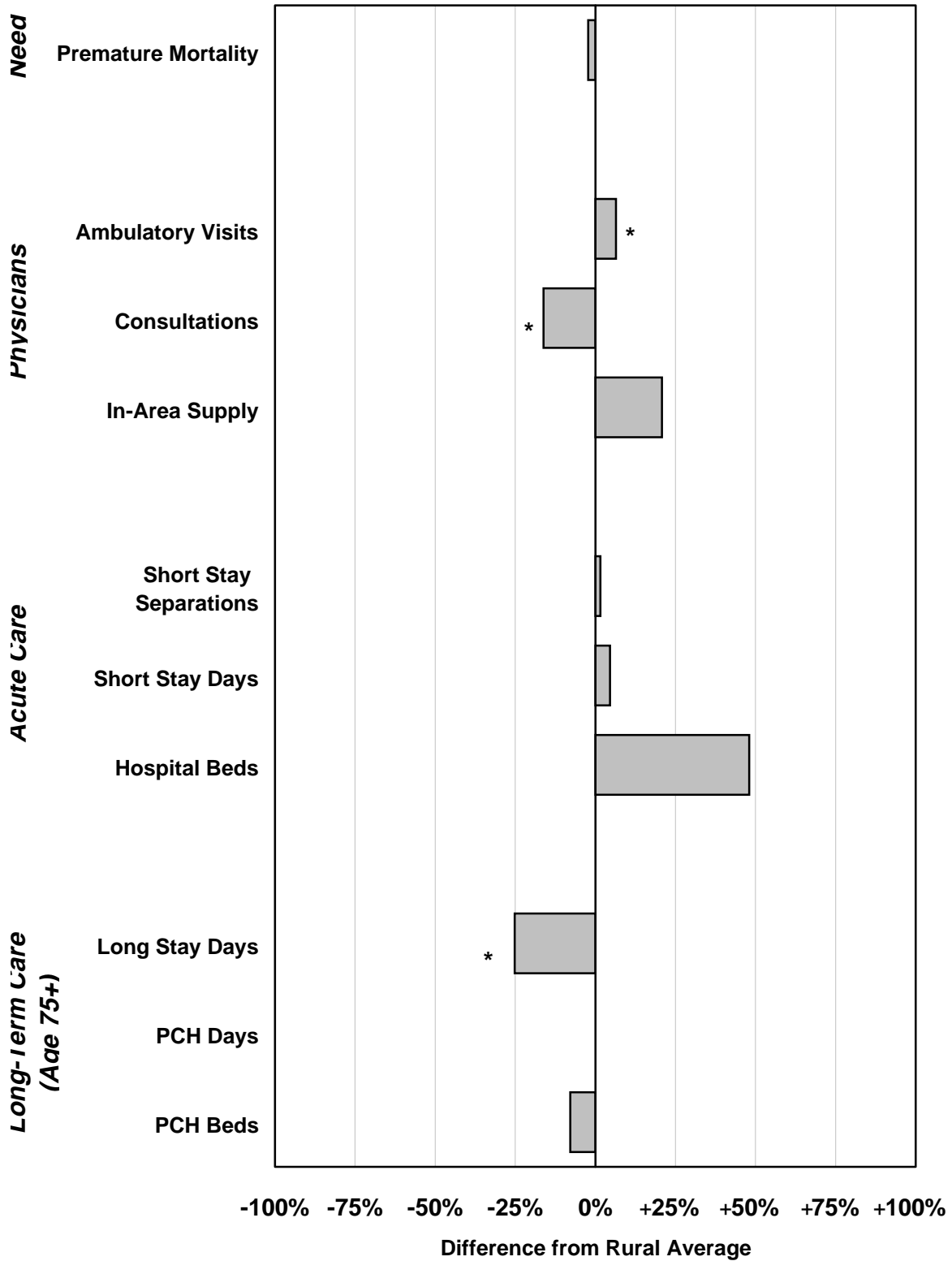
5.5 Marquette

Marquette residents are slightly healthier than the rural average: their premature mortality rate is just 2% below the rural average. The in-area physician supply is 21% higher than the rural average, and ambulatory physician use is 6% higher than average; however, consultation rates are 16% below the average. In spite of a very high supply of hospital beds, use of acute hospital care is only slightly higher than average: hospital separations are 2% higher and days of care are 5% higher than the rural average. Moreover, elderly residents use considerably (25%) fewer than average days in long hospital stays. The supply of personal care home beds is somewhat (8%) low, but elderly persons' utilization of these facilities is right at the rural average.

5.6 Parkland

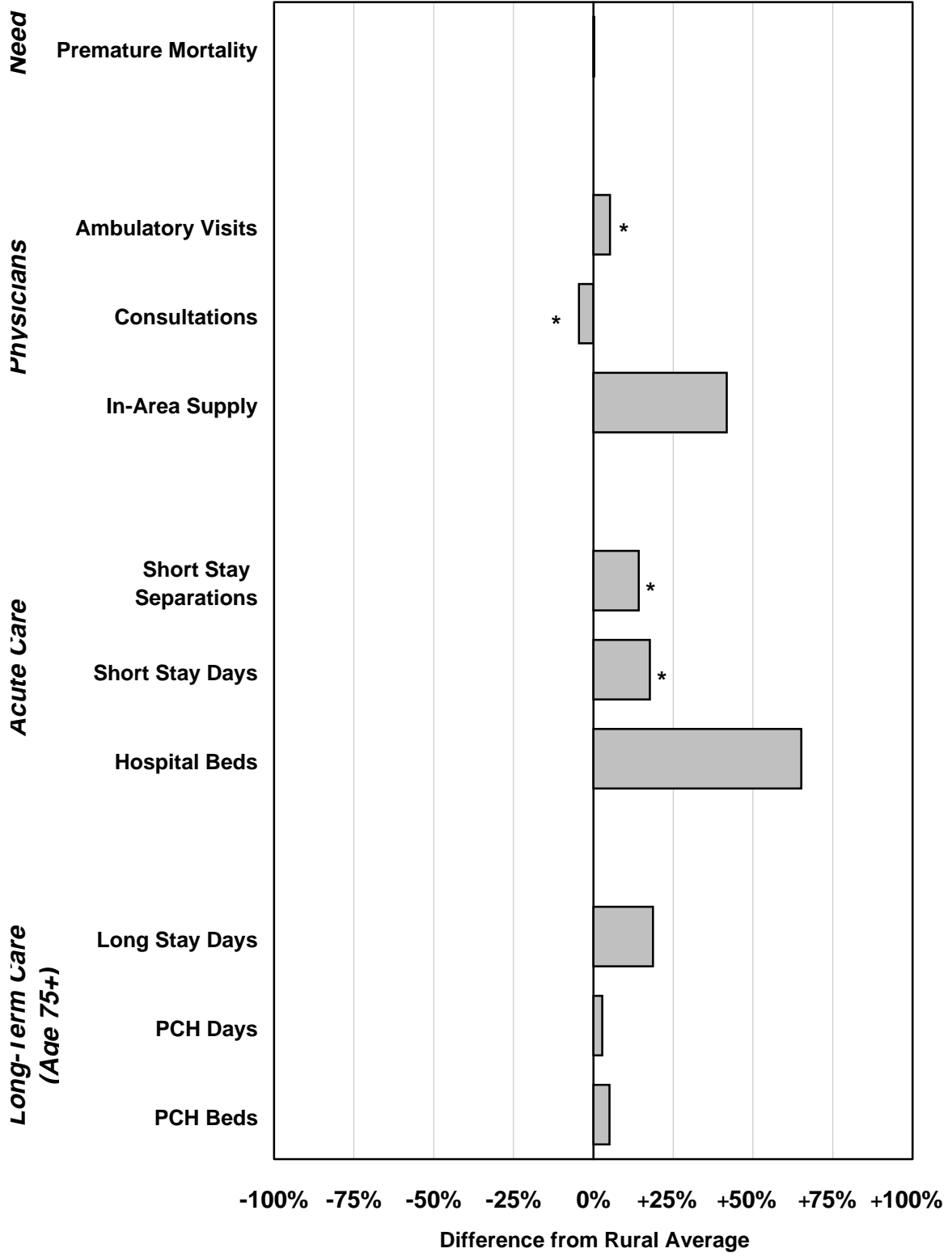
Parkland residents' health status is very close to the rural average. The supply of physicians is substantially (42%) higher than the rural average, though the visit rate for residents is only 5% above average. In contrast, consultation rates are slightly (4%) below the rural average. After Churchill, Parkland has the highest number of hospital beds per population, at 65% above the rural average. Even though their health status is average, residents are hospitalized 14% more frequently and for 18% more days than the rural average. In addition, elderly residents' use of hospitals for long stays is 19% above the rural average. Personal Care Home supply and use are both slightly above average, at 5% and 3% respectively.

**Figure 10: Profile of Marquette, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

**Figure 11: Profile of Parkland, 1996/97
Relative to Rural Average**



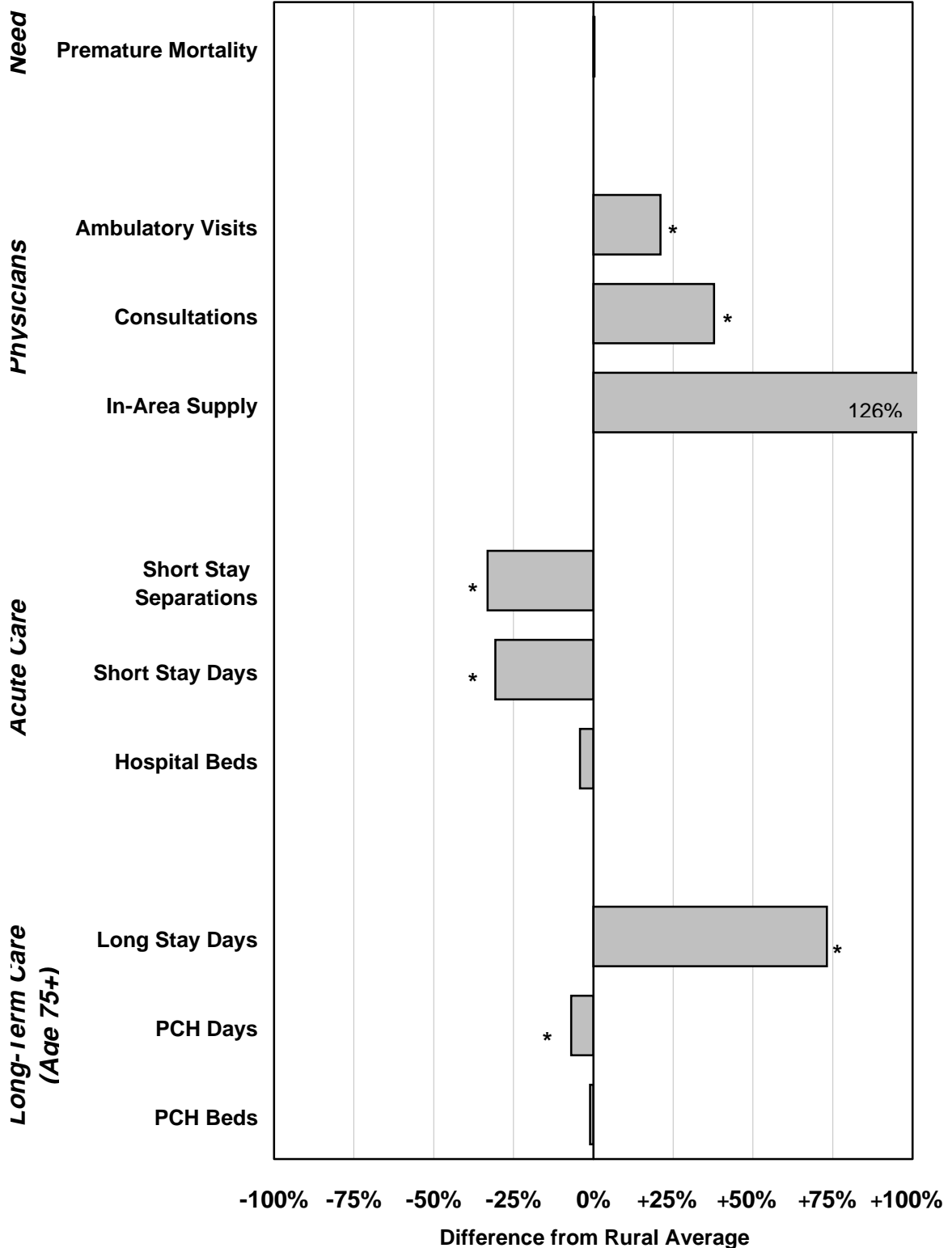
* Indicates rate is statistically different from the Rural Average.

5.7 Winnipeg

Though this report focuses on the rural RHAs, Winnipeg is included for comparative purposes and because its many health care resources are used extensively by non-Winnipeg residents. Winnipeg is a densely populated area with a health care system markedly different from that of the RHAs. Home of the medical school and most of the specialist physicians in the province, as well as the tertiary care hospitals, there are many reasons for differences in the availability of health care resources. However, to maintain consistency in profiles, Winnipeg's supply and utilization rates are compared to the rural average.

Winnipeg residents' health status is equivalent to the rural average, but both the supply and utilization of physicians are far higher, with more than twice as many physicians per capita, a 21% higher visit rate, and a 38% higher consultation rate. These values contrast sharply with Winnipeg residents' hospital use, which is more than 30% below the rural average. Patterns of acute hospital utilization are similar to those for Brandon residents – both have rates of separations and use of short stay hospital days that are approximately 30% lower than the average for rural RHAs – but Winnipeg has a much lower supply of hospital beds. The total supply of hospital beds per capita for Winnipeg is actually 4% *below* the average for rural RHAs, while Brandon's supply is 49% higher than the rural average. For every 1000 Winnipeg residents there are 3.9 hospital beds, of which a significant proportion are used to provide care to residents from other regions. This compares to an average of 4.1 beds per 1000 for the rural RHAs and 6.5 for Brandon (Figure 59). In contrast, elderly Winnipeg residents have much higher use of hospitals for long stay admissions (73% higher than the rural average). Winnipeg's supply of personal care home beds for its elderly population is average, but utilization is 7% lower than the rural average.

**Figure 12: Profile of Winnipeg, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average

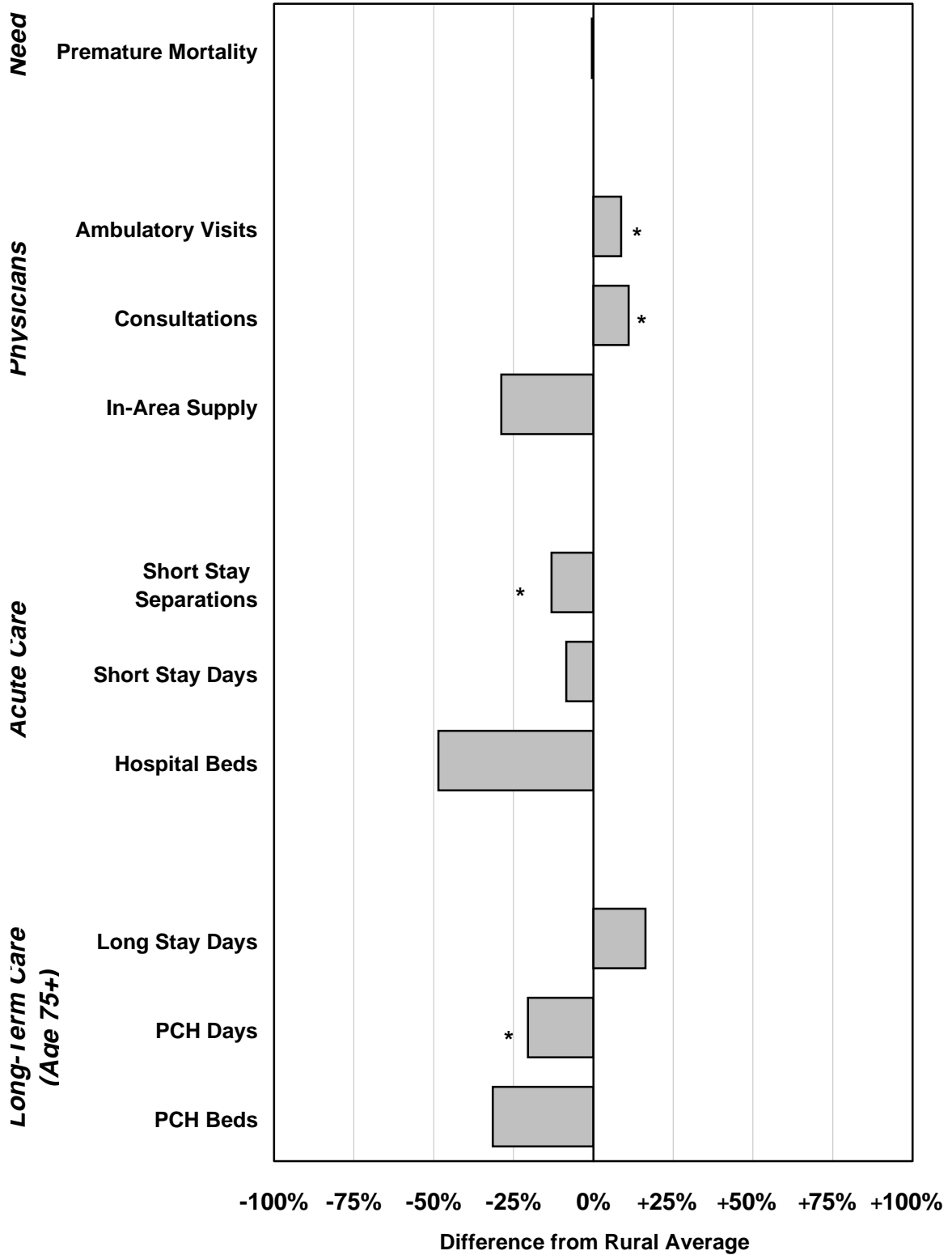
5.8 North Eastman

North Eastman residents are right at the rural average in terms of health status, even though there are 29% fewer physicians and almost 50% fewer hospital beds. Yet despite the low physician supply, the physician visit rate and consultation rate are both higher than the rural average (9% and 11% respectively). This is related to the proximity of many North Eastman residents to Winnipeg (see Figure 55). Their hospitalization rates show a similar trend of being influenced by Winnipeg: even with 50% fewer hospital beds, North Eastman residents are admitted to hospital only 13% less frequently than other rural residents, and they spend only 8% fewer days in hospital. Fifty-five percent of their hospitalizations occur in Winnipeg (see Figure 64). North Eastman also has substantially fewer (32%) provincial personal care home beds than other rural areas, and even when the area's one federal nursing home is added in, the supply is still 24% lower. Compared with other rural residents, elderly residents from North Eastman use 21% fewer days in provincial nursing homes, but 16% more days in long stay hospital admissions.

5.9 Interlake

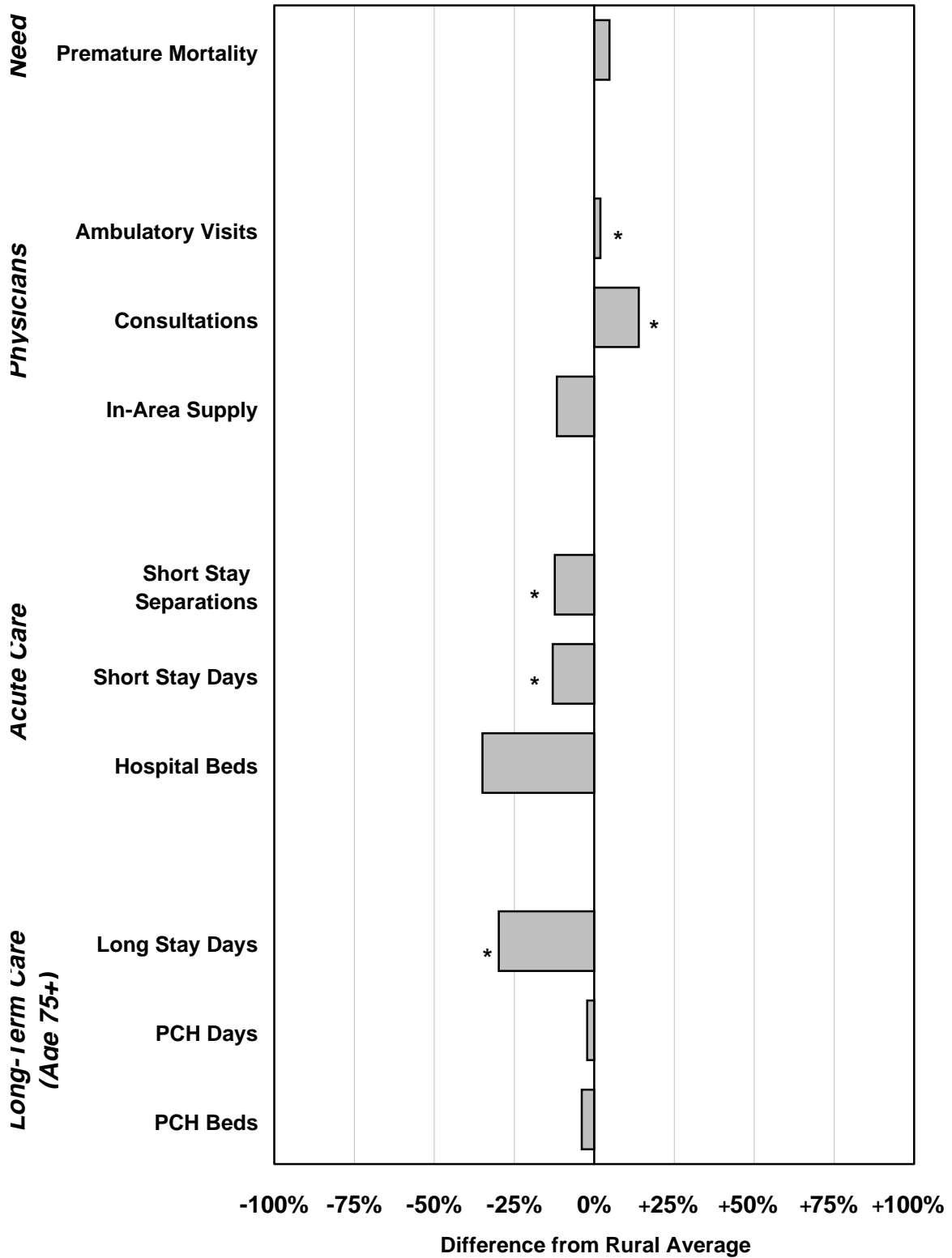
Interlake residents have slightly poorer than average health status. Their premature mortality rate is 5% above the rural average, but this difference is not statistically significant. Interlake has 12% fewer physicians and 35% fewer hospital beds than other rural RHAs. However, because of their proximity to Winnipeg, residents have slightly higher (2%) than average contacts with physicians, and are referred for consultations much more frequently than other rural residents (14% higher). Interlake has a relatively low bed supply at 35% below the rural average, but this is compensated for by extensive use of Winnipeg hospitals. Over 50% of Interlake residents' hospitalizations occur in Winnipeg (Figure 64). Similar to other regions that rely on Winnipeg hospitals, Interlake residents are admitted to hospital less frequently than other rural residents (12% lower rate of separations) and use fewer days of care in short stay

**Figure 13: Profile of North Eastman, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

**Figure 14: Profile of Interlake, 1996/97
Relative to Rural Average**



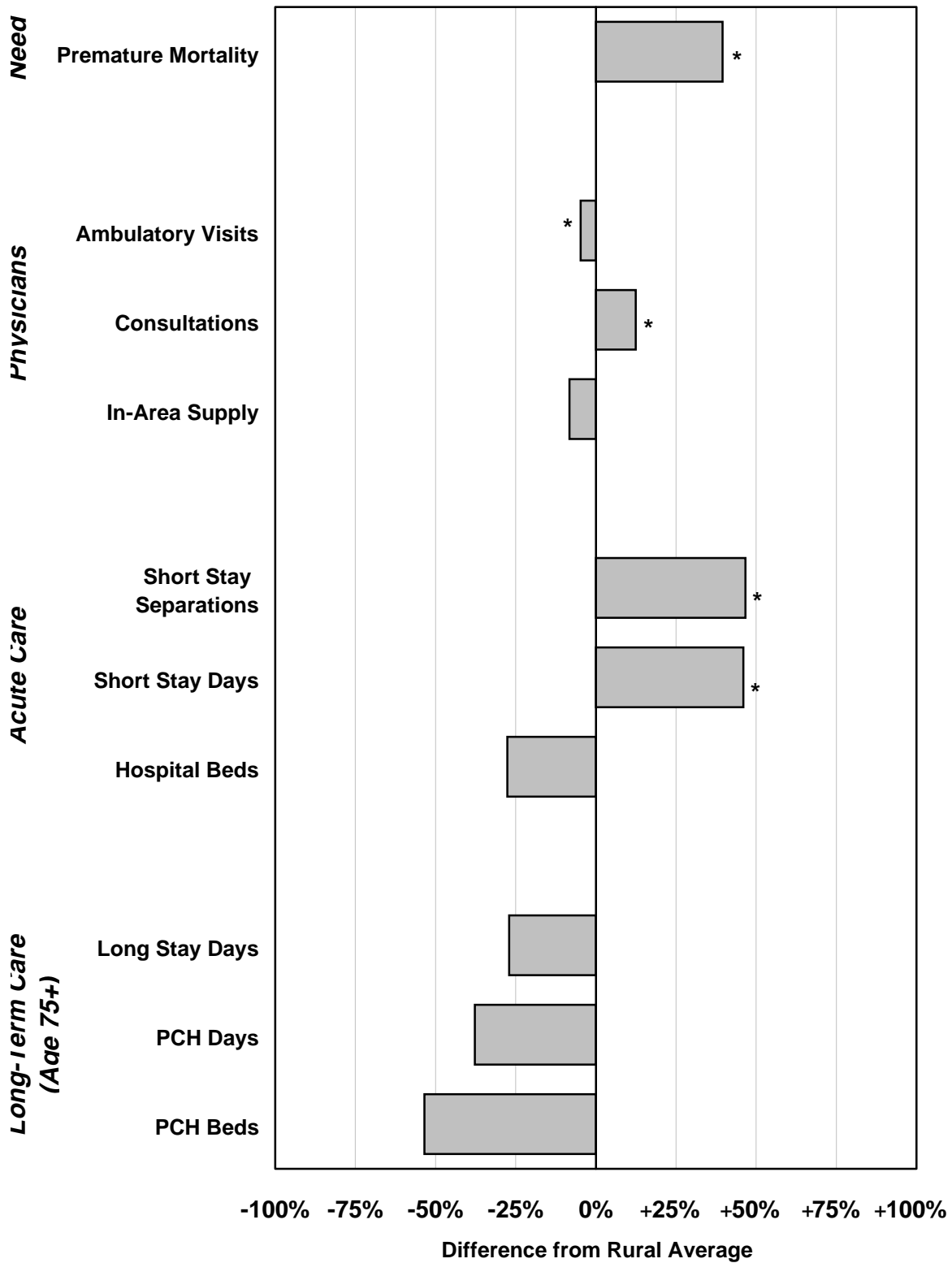
* Indicates rate is statistically different from the Rural Average

hospitalizations (13% lower than average). Interlake's supply of provincial personal care home beds is just 4% below the rural average, but when federal beds are added in, the supply reaches the average. Utilization of provincial personal care home beds by elderly Interlake residents is average, though they use 31% fewer days in long hospital stays.

5.10 Burntwood

Burntwood is one of the three RHAs whose residents are *much* less healthy than other rural residents, with a premature mortality rate that is 40% higher than the rural average. Burntwood residents suffer not just higher rates of premature death, but also higher rates of chronic diseases including diabetes and hypertension, resulting in a much lower life expectancy (these data are presented later in this report). Yet despite residents' poor health status and high need for health care, Burntwood has 8% fewer physicians and 28% fewer hospital beds than the rural average. Similarly, the rate of contact with physicians is 5% below the rural average, though residents receive 13% more consultations than average. Both of these are low given the population's poor health status and higher relative need for care. In contrast, hospitalization rates are very high: Burntwood residents are hospitalized 47% more frequently than other rural residents, and spend 46% more days in hospital. Given the relatively low supply of hospital beds in Burntwood, it is not surprising that 47% of residents' hospitalizations take place outside the RHA, including 33% in Winnipeg (see Figure 64). Burntwood has few elderly residents (469 in 1995/96), which makes it somewhat difficult to get the personal care home supply "right." With just one provincially run personal care home (in Norway House), bed supply is calculated to be 54% below average. However, when combined with the federal nursing home in Oxford House, the in-area personal care home bed supply is just below the rural average. Elderly persons' use of personal care home days is very low, but this calculation is based on the provincial facility alone. Rates of use of long stay hospital days, at 27% below the rural average, are also low.

**Figure 15: Profile of Burntwood, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average

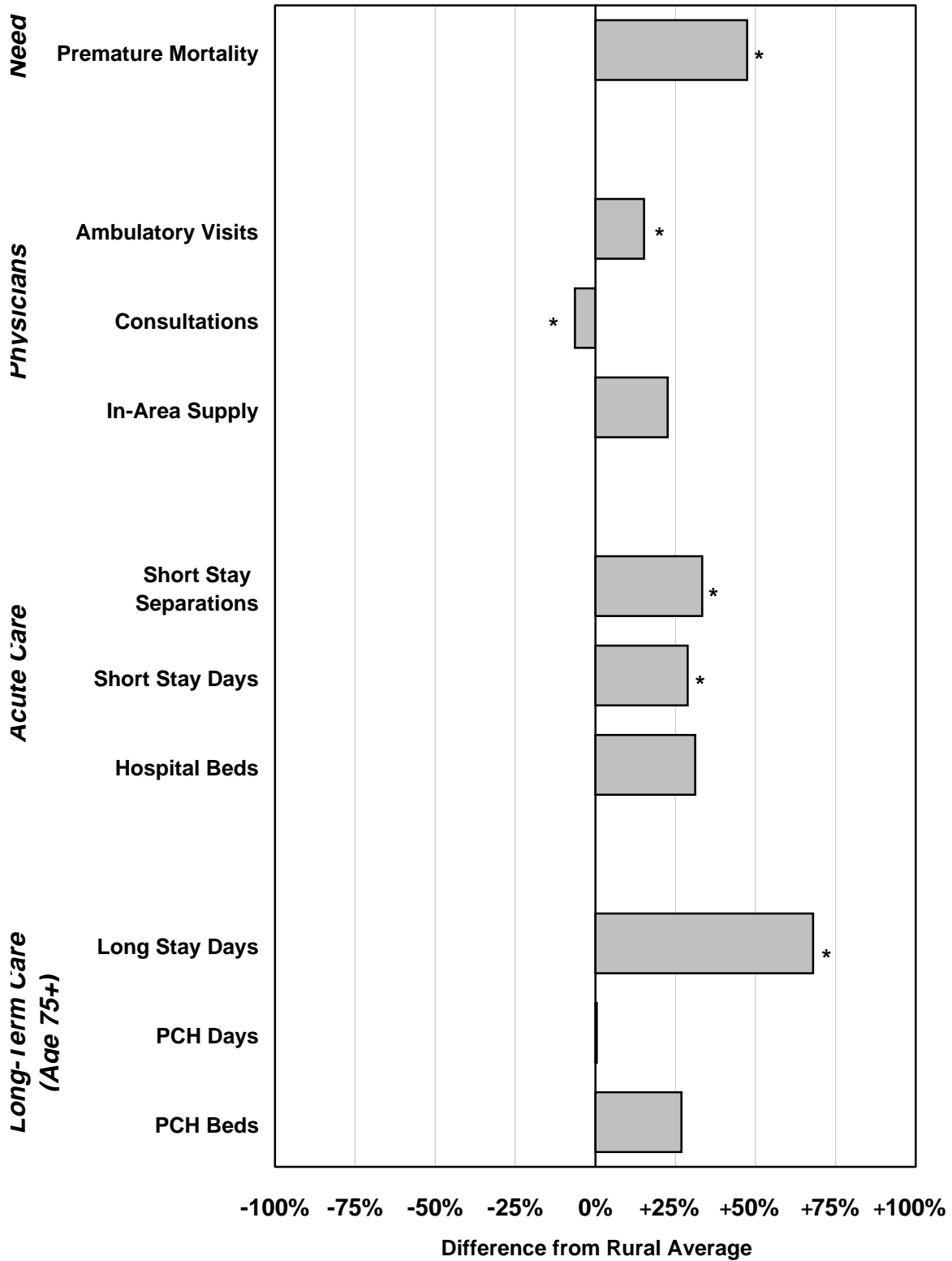
5.11 Norman

Norman residents are also among the least healthy in the province, with a premature mortality rate almost 50% higher than the rural average. Norman's 23% higher than average supply of physicians and 31% higher hospital bed supply should be viewed in this light. While Norman residents' physician visit rate is 15% above the rural average, their consultation rate to specialists is 6% below average. Given their relatively poor health status, both of these measures are likely low. Residents are hospitalized 33% more often and use 29% more hospital days than the rural average – probably appropriate considering their health status. The supply of personal care home beds is considerably higher (27%) than average, but residents' use is very close to the average. However, elderly Norman residents spend 68% more days in long hospital stays than residents of other rural areas.

5.12 Churchill

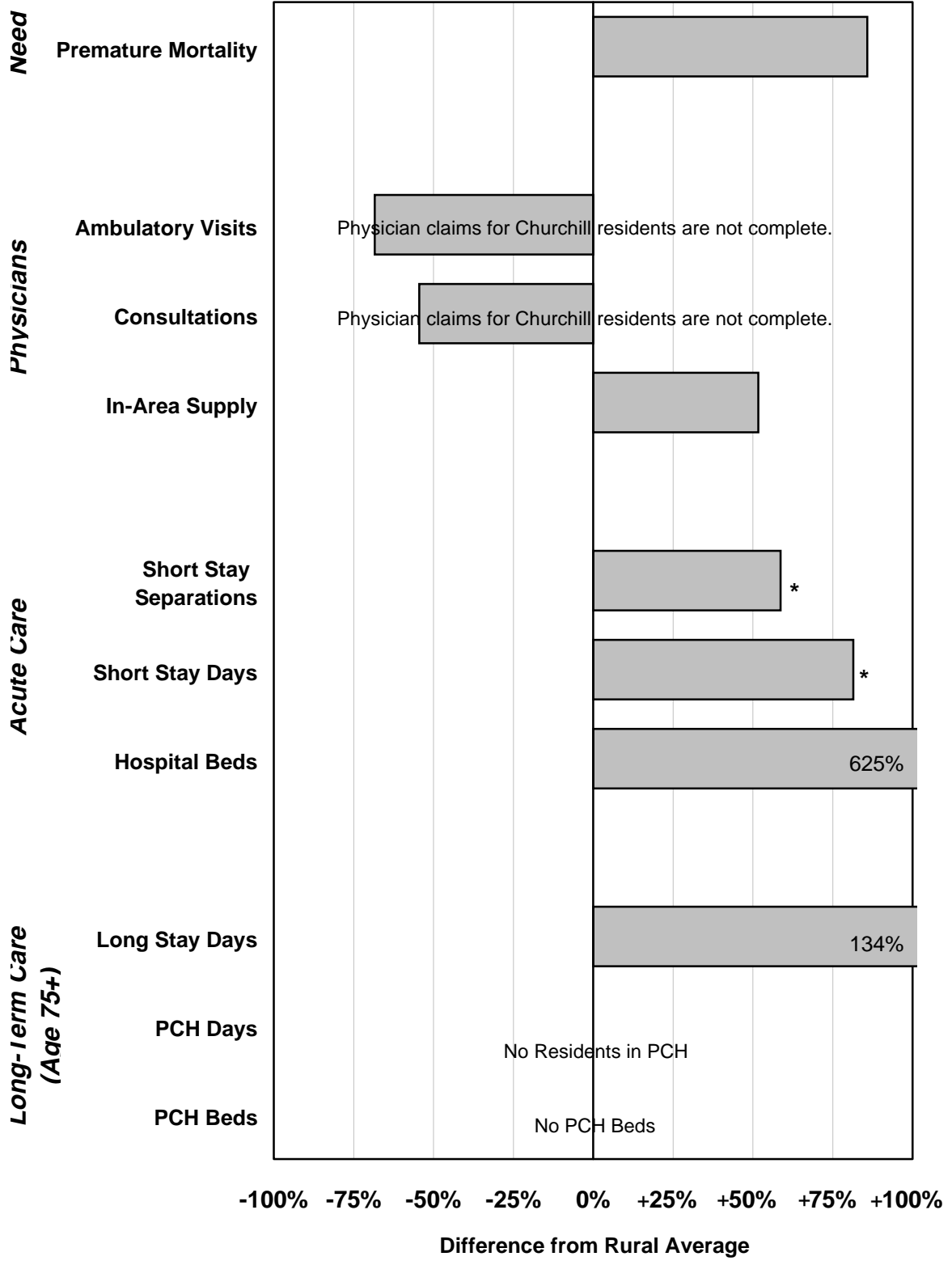
Judging by the premature mortality rate, Churchill's population is the *least* healthy in the province: residents of this RHA have a premature death rate that is 86% higher than the rural average, although this difference is not statistically significant because it is based on a very small population. The in-area physician supply appears very high (52% above the rural average), and the hospital bed supply extraordinarily high (626% above average). However, these measures are difficult to interpret since many of these resources are dedicated to serving people from the Kivalliq region of Nunavut, and some of the hospital beds function as personal care home beds. The utilization data indicate under-use of physicians (68% lower physician visit rate and 54% fewer consults than average), but these data are known to be unreliable and may just reflect under-reporting of physician services. Acute care hospital utilization is very high, with 59% more separations and 82% more days of care than the rural average, but this may not be excessive considering residents' poor health status. There are extremely few Churchill residents aged 75 years or older (17 in 1995/96), and there are no personal care homes in the region. In contrast, their use of hospitals for long stays is very high, at 134% higher than average.

**Figure 16: Profile of Norman, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

**Figure 17: Profile of Churchill, 1996/97
Relative to Rural Average**



* Indicates rate is statistically different from the Rural Average.

6. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

6.1 Population Pyramids

The age structure of a population is important since it reveals the more vulnerable groups (the very young and the very old), as well as the proportion of the population in the middle years who are financially and otherwise responsible for the care of the other two groups. The pattern of illness can also be expected to vary according to the distribution of the population. For example, in a region with more young residents, the influence of injuries will be more pronounced, whereas in an older region there will be more deaths and disability associated with chronic diseases. In addition, the age and sex structure of a population has important implications for health care utilization. The very young and the elderly use more health care resources than those in middle age, and women use more resources than men, largely in relation to services for reproductive health (Mustard et al. 1998).

The effects of three factors that influence population – births, deaths and migration – can be shown pictorially by a figure known as a population pyramid. Population pyramids present the population of an area in terms of its composition by age and sex at an identified point in time. The pyramid consists of a series of bars, each drawn in proportion to the contribution of each age-sex group to the total population; that is, the total area of the bars represents 100 percent of the population. It is called a pyramid because, traditionally, the graphical representation of the population distribution revealed the greatest share of the population at the youngest ages and a diminishing relative population share at increasing ages. The shape of the pyramid reflects the major influences on births and deaths, plus any changes due to migration, over the three or four generations preceding the date of the pyramid (Mausner and Bahn, 1985; p 245).

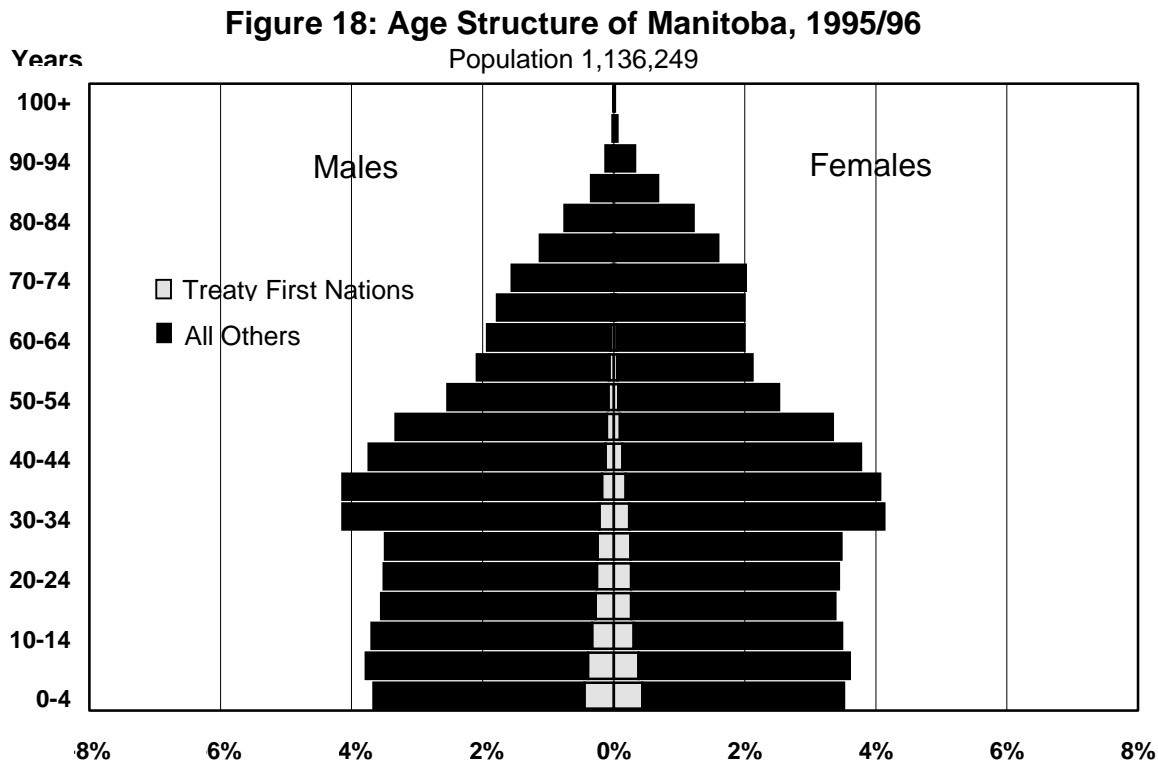
In this section, we present population pyramids for the Manitoba population and for each of the RHAs. For each population pyramid, the total population is printed at the top. The number of persons in each of the five-year age groups is graphed separately for males (on the left of each chart) and for females (on the right of each chart). Younger age groups are at the

bottom and elderly age groups are at the top. A percentage scale has been used, so each bar shows the percentage of the total RHA population represented by a particular gender and age category.

Besides the distribution of the young and the old, the population pyramids use shading to show the distribution of the Treaty First Nations population within the population of each RHA. It is widely recognized that Canada's aboriginal people have the poorest overall health status of any identifiable group: they have seven years less life expectancy and almost twice as many infant deaths than the overall Canadian population (Report on the Health of Canadians p. 30). We recognize that it would be useful to identify the entire aboriginal population (i.e. Treaty- and Non-Treaty First Nations, Métis and Inuit, as defined by the Canadian Constitution Act of 1982). However, Treaty First Nations (also known as Registered First Nations) are the only groups separately identified in the Manitoba Health data files¹, related to their eligibility for certain uninsured medical benefits.

The pyramid for Manitoba (Figure 18) shows a triangular-shaped distribution of males and females age 50 and above, resting on a larger distribution of individuals age 30 to 49, itself resting on a fairly evenly distributed population of males and females from birth to 29 years of age. This distribution is very different from the pyramid of Treaty First Nations residents (representing about 10 percent of Manitoba's population) which is contained within it. The aboriginal pyramid is more triangular, with a lower apex, reflecting the much lower life expectancy of this population.

¹ A separate registry is maintained for Treaty (Registered) First Nations by Manitoba Health, but it is recognized to undercount the number of Treaty First Nations people (they remain in the total population, but not specifically identified as First Nations). Moreover, it assigns residence on the basis of the First Nations community ("reserve") for which an individual is registered. To improve the assignment of Treaty First Nations persons to their actual RHA of residence, postal code information from utilization data is used. While there is still significant undercounting of Treaty First Nations persons, the correction of residence results in a more accurate description of local population size and structure, especially for Winnipeg and northern RHAs.



The pyramid for South Eastman (Figure 19) shows a slightly more “triangular” shape than the Manitoba pyramid, indicating that it is a younger population. As with the Manitoba structure, it is still possible to see the increased numbers of the baby boom generation (ages 30 to 49), and of their children (ages 5 to 19) in the pyramid. The very few Treaty First Nations residents who live in Buffalo Point are not visible in the pyramid, indicating that they represent a very small proportion of the RHA population.

In comparison to Manitoba, South Westman’s population pyramid (Figure 20) is noticeably more “rectangular”, indicating that this RHA has an older population. In fact, South Westman has one of the oldest populations in the province. The very small proportion of Treaty First Nations in this RHA is just barely identifiable in some of the younger age groups.

Figure 19: Age Structure of South Eastman, 1995/96

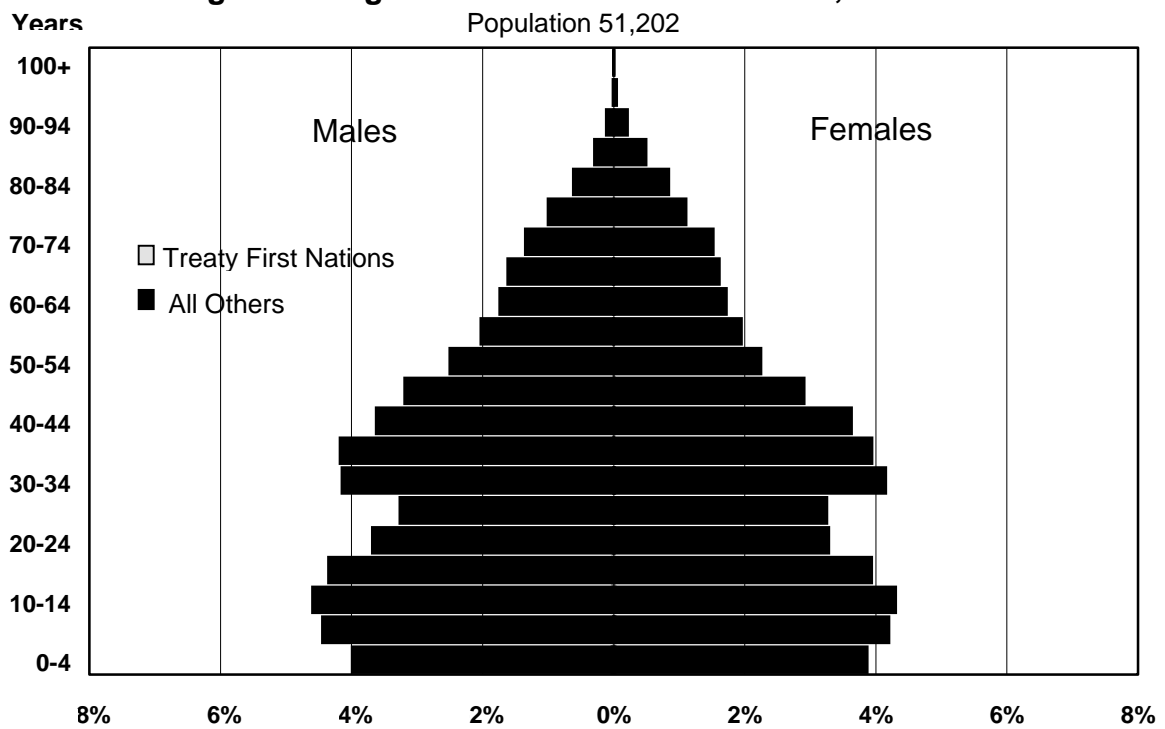
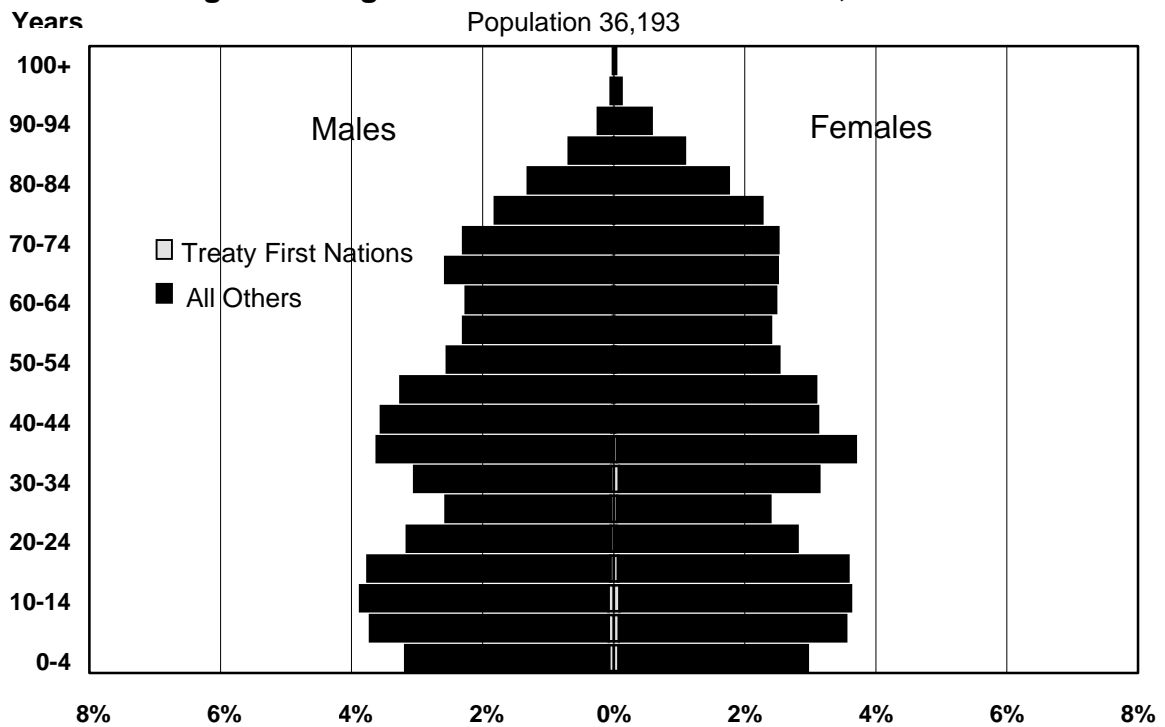
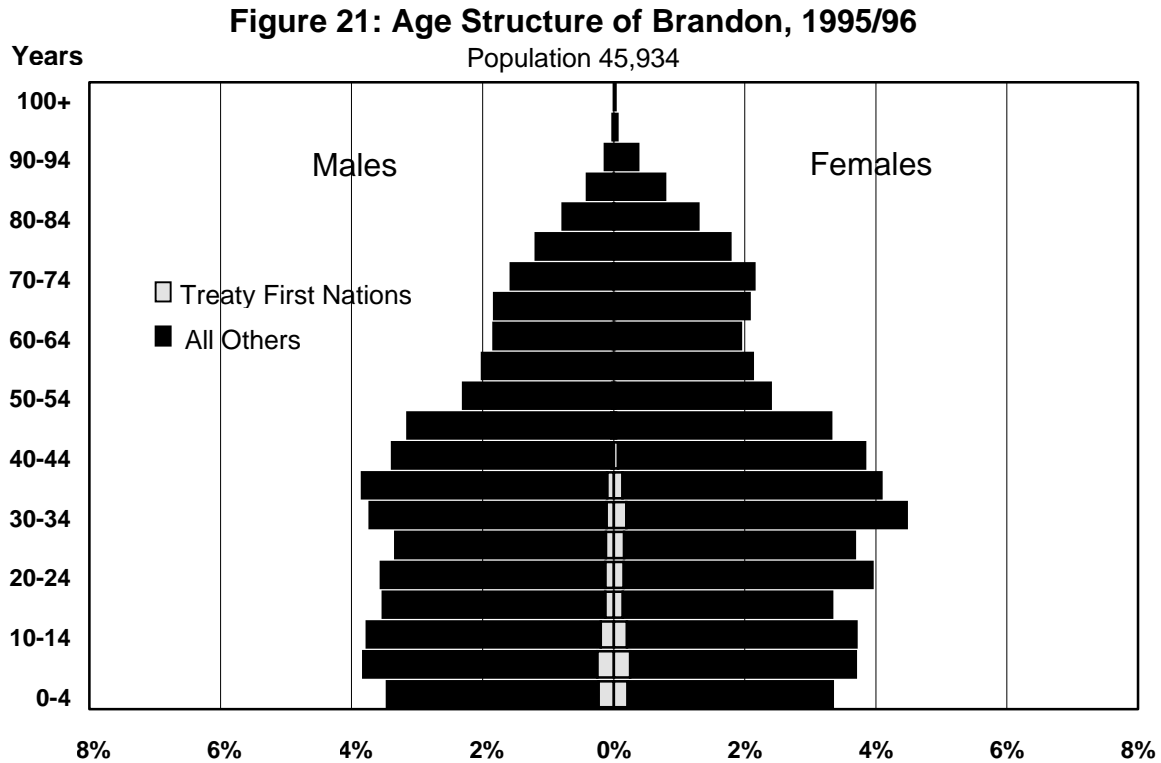


Figure 20: Age Structure of South Westman, 1995/96

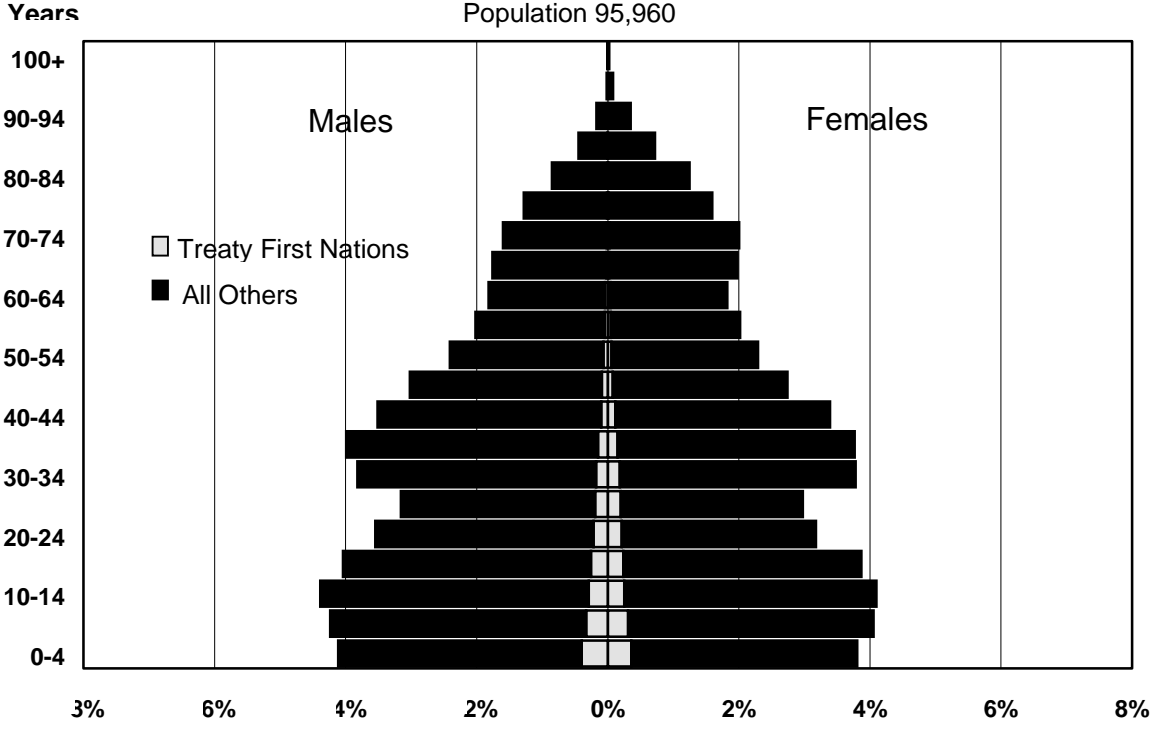


The population pyramid for Brandon (Figure 21) is similar to that of Manitoba – older than South Eastman and younger than South Westman. Brandon has a larger proportion of Treaty First Nations residents than the previous two RHAs.



The population distribution of Central (Figure 22) is very similar to Manitoba’s, with a fairly broad base of individuals 49 years and under, and similar proportion of Treaty First Nations residents.

Figure 22: Age Structure of Central, 1995/96



Marquette and Parkland (Figures 23 and 24) have a similar population distribution to that of South Westman, indicating an older than average population. In contrast, Marquette and Parkland have a larger proportion of Treaty First Nations residents than South Westman; they are similar to Manitoba in terms of First Nations residents.

Figure 23: Age Structure of Marquette, 1995/96

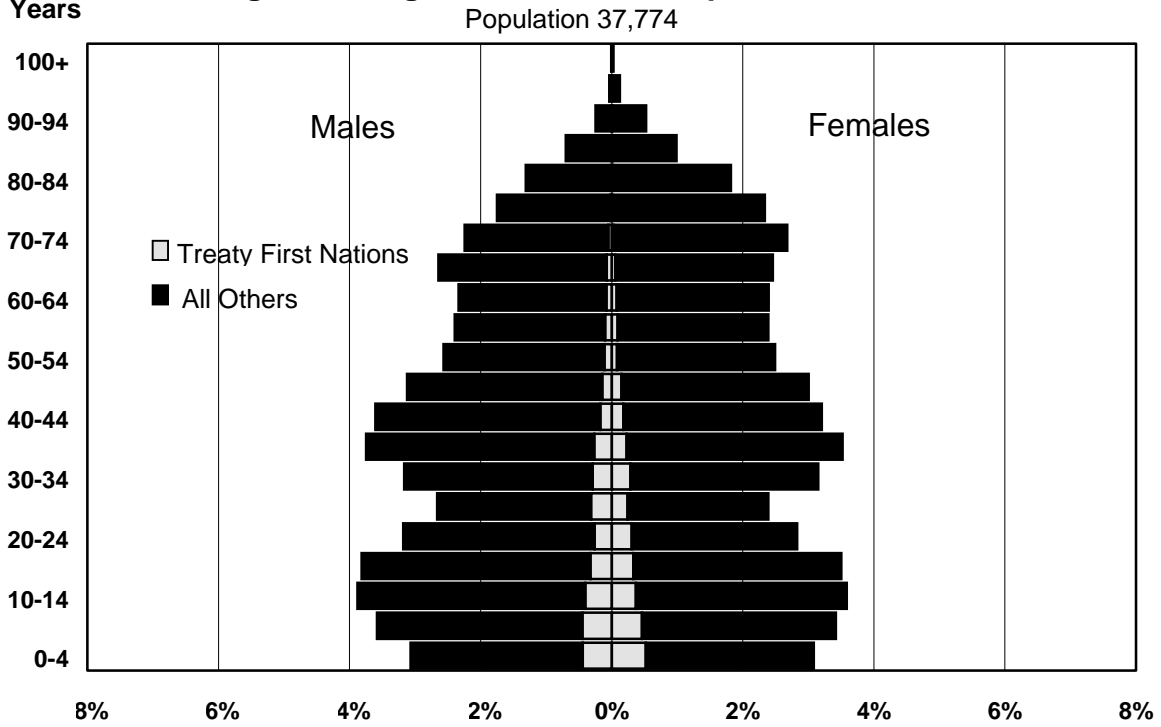
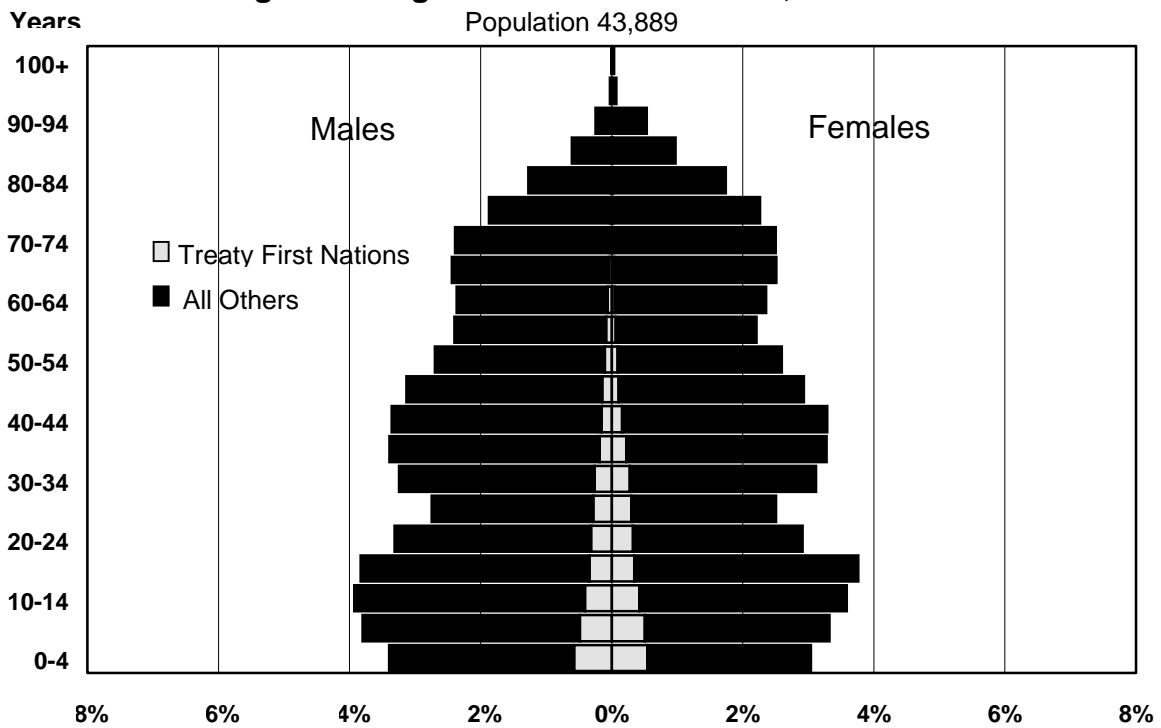
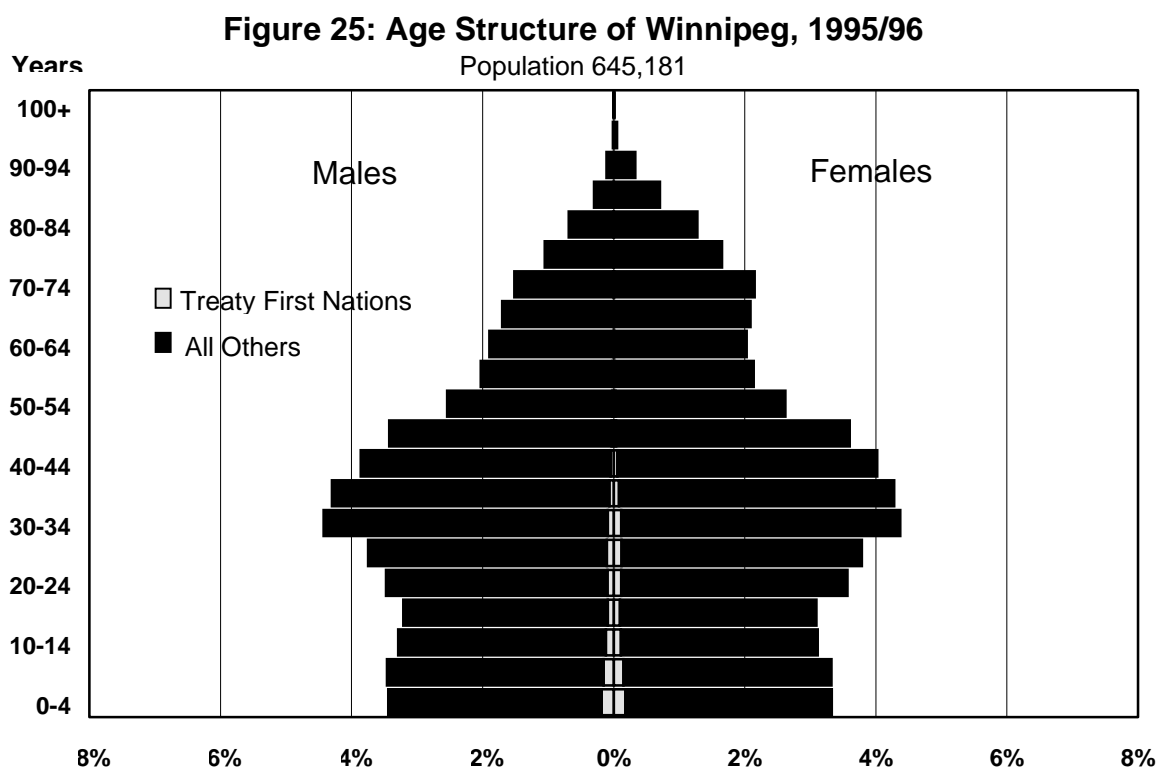


Figure 24: Age Structure of Parkland, 1995/96



In comparison to the other RHAs, Winnipeg (Figure 25) has a very different shape, with a “bulge” indicating a relatively large proportion of individuals in the 20 to 54 year age groups. Winnipeg also appears to have a smaller proportion of Treaty First Nations residents in its population compared to Manitoba, although there is likely to be some under-reporting of those who are resident in the city.



The North Eastman and Interlake populations (Figures 26 and 27) are fairly similar to that of South Eastman, indicating a younger population, but with more First Nations residents. There is a particularly high proportion of Treaty First Nations in the North Eastman population, residing primarily in the northern part of the RHA. Interlake’s Treaty First Nations population distribution is similar to that of Manitoba. Both North Eastman and Interlake have proportionately fewer persons aged 20-29 compared to major centers such as Winnipeg and Brandon.

Figure 26: Age Structure of North Eastman, 1995/96

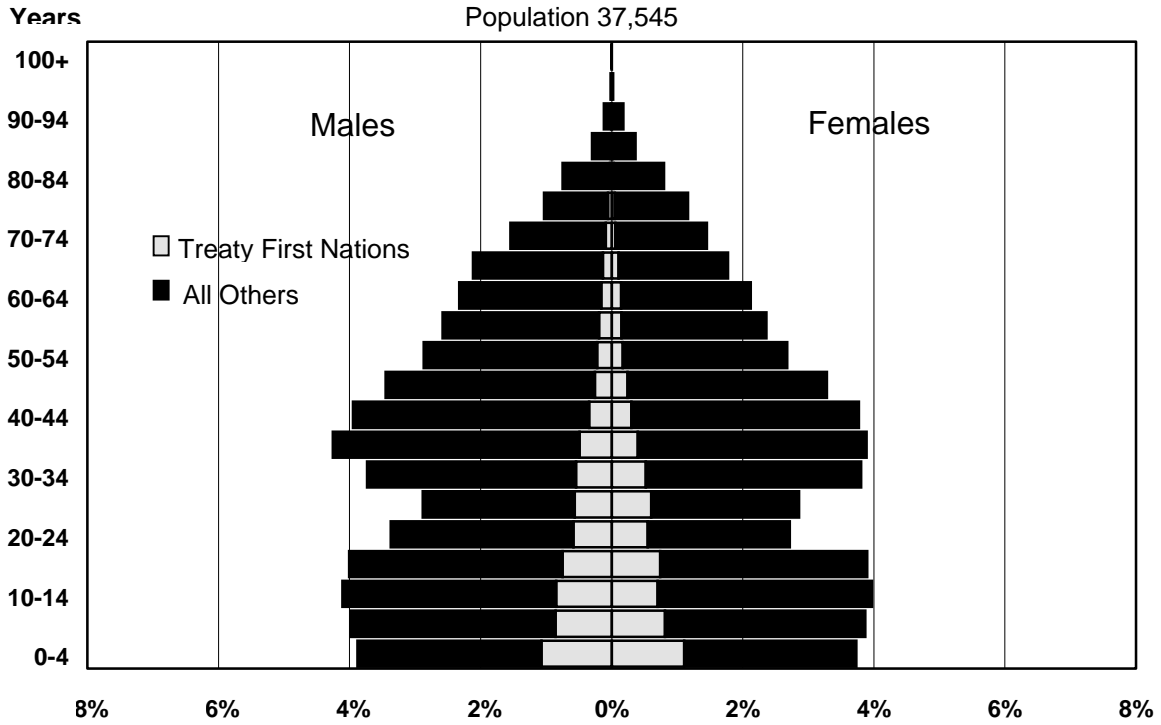
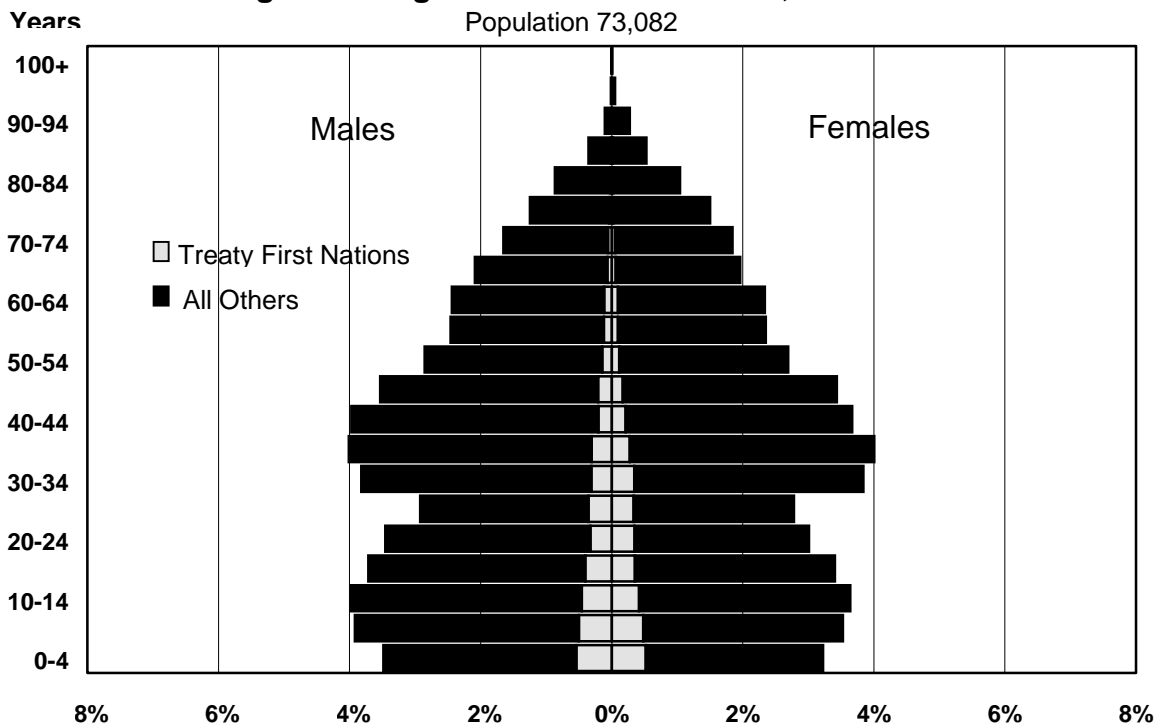


Figure 27: Age Structure of Interlake, 1995/96



In contrast to the other RHAs, Burntwood has a very unusual shape with its sharp triangular outline and very broad base (Figures 28a and 28b). A very large proportion of this population is young. Another important difference is the large proportion of Treaty First Nations persons in Burntwood. In Figure 28a, it is possible to see the population structure of this sub-population. This shape reflects a pattern of very high birth rates, with only a small proportion of persons surviving into old age. In Figure 28b, the shaded segments (representing the Treaty First Nations population) have been moved to the outer edges of the pyramid, to better illustrate the shape of the non-Treaty population in this RHA. The non-aboriginal population of Burntwood has a distribution that is closer to the other RHAs and the overall Manitoba population, but with fewer elderly residents. Thus, Burntwood is composed of two different sub-populations: a very young aboriginal population and a somewhat older non-aboriginal population.

Figure 28a: Age Structure of Burntwood, 1995/96

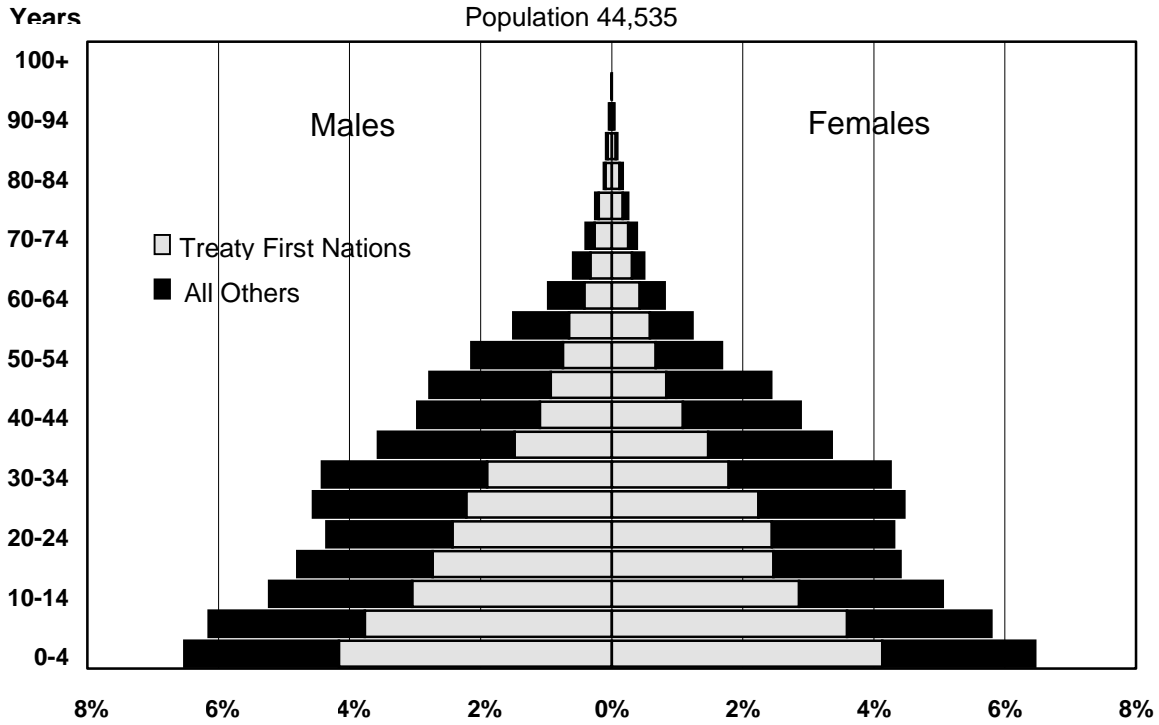
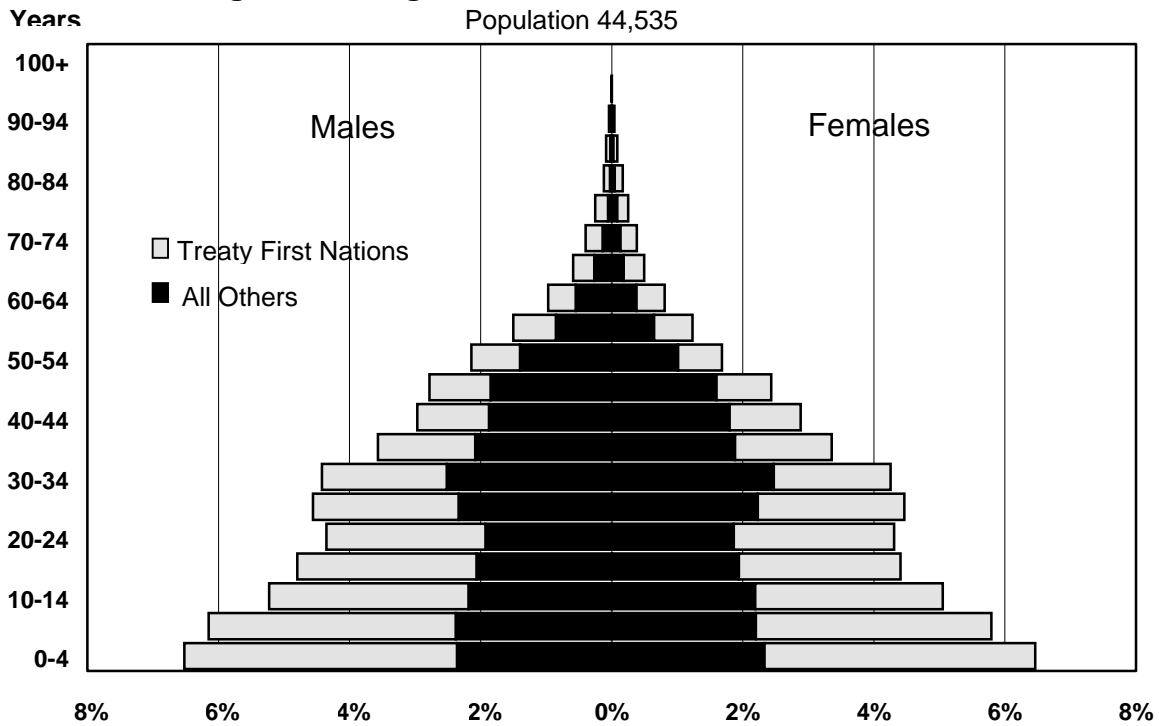
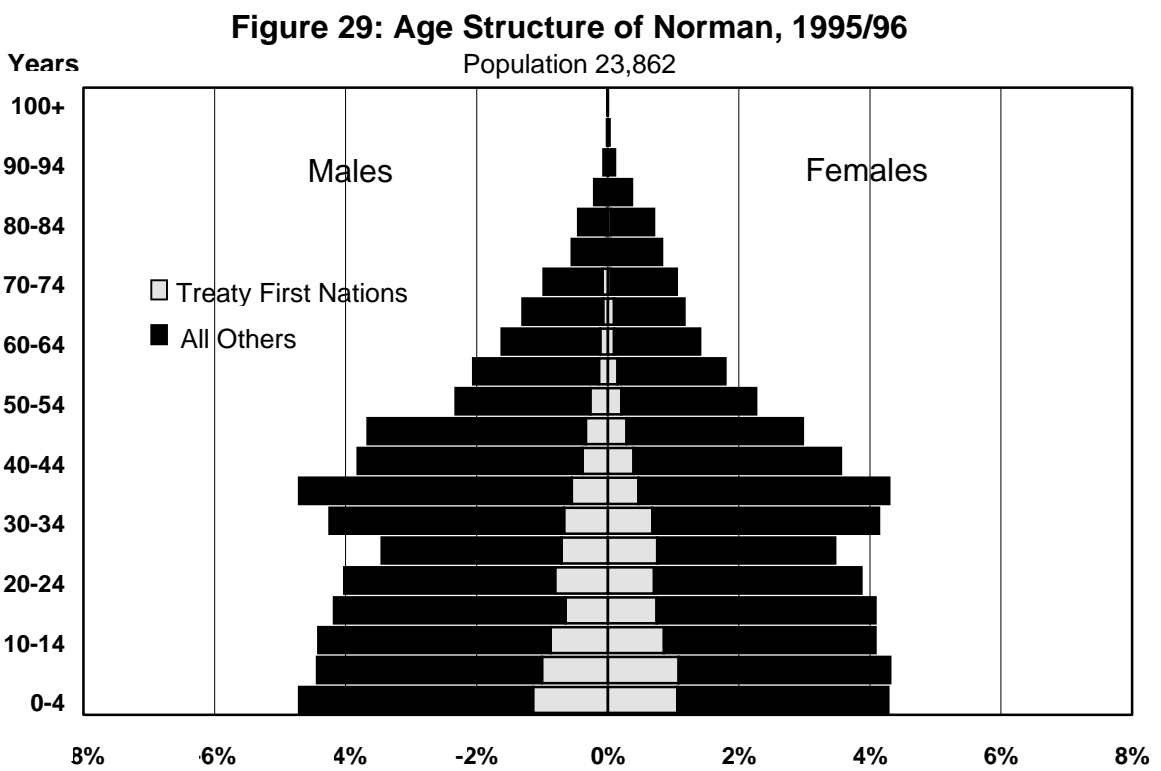


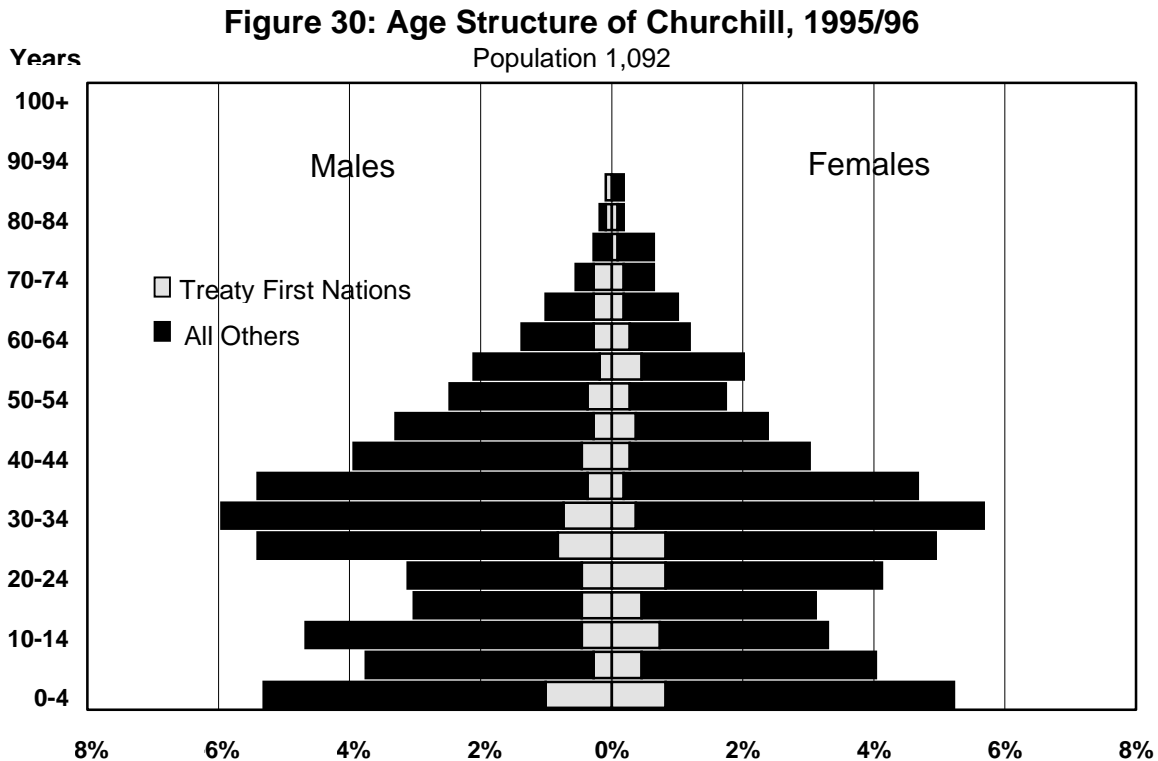
Figure 28b: Age Structure of Burntwood, 1995/96



The population pyramid of Norman (Figure 29) indicates that there is a smaller proportion of the very old compared to Manitoba, and a relatively high proportion of Treaty First Nations residents.



Churchill's population is composed primarily of "working-age" persons age 25 to 39, and young children aged 0-14, with a relatively low proportion of older persons. Churchill has a larger proportion of Treaty First Nations residents than the Manitoba average (about the same as Norman).



These population pyramids illustrate that there are some very big differences in the structure of populations across RHAs. Many of these differences – the birth rate, number and proportion of the very young and the elderly, and the relative size of the aboriginal population – have profound implications for the type and quantity of health care services that are needed.

In addition, many differences in utilization of health care resources are related to these differences in population structure across RHAs. Therefore, making comparisons across RHAs without taking these differences into account would be misleading. That is why all comparisons of health care utilization in this report are based on data that have been age- and sex-adjusted to remove the effects of differences in the age and sex composition of regional populations. Similarly, all comparisons of use of long-stay institutional care (i.e. long stays in hospitals and all use of personal care homes) are based only on the population age 75 and older.

6.2 Socio-Economic Risk Index (SERI)

The Socio-Economic Risk Index (SERI) is a composite index of six measures of socio-economic status that mark environmental, household, and individual conditions which put residents at risk for poor health, and hence are associated with higher need for health care. Six variables from the Census were chosen based on their strong relationship to health status and utilization of health care resources (see Appendix 1).

SERI values were calculated for each RHA (Figure 31) and PSA (Figure 32). The values have been graphed on a standardized scale, with the provincial average corresponding to a SERI value of 0. Low or negative values represent areas at lower risk, while high values represent areas at higher risk. For a thorough explanation and discussion of the SERI and its development, see Mustard and Frohlich (1995).

Figure 31: Socio-Economic Risk Index (SERI), 1986/91

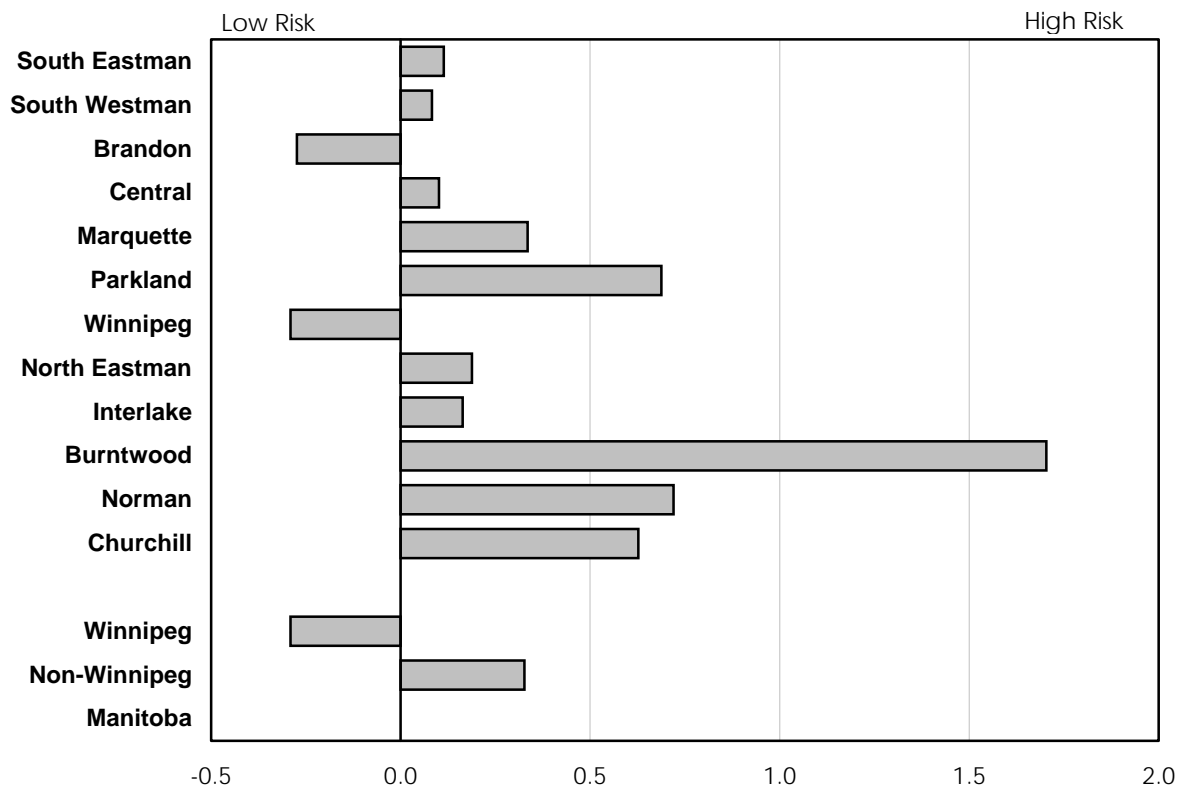
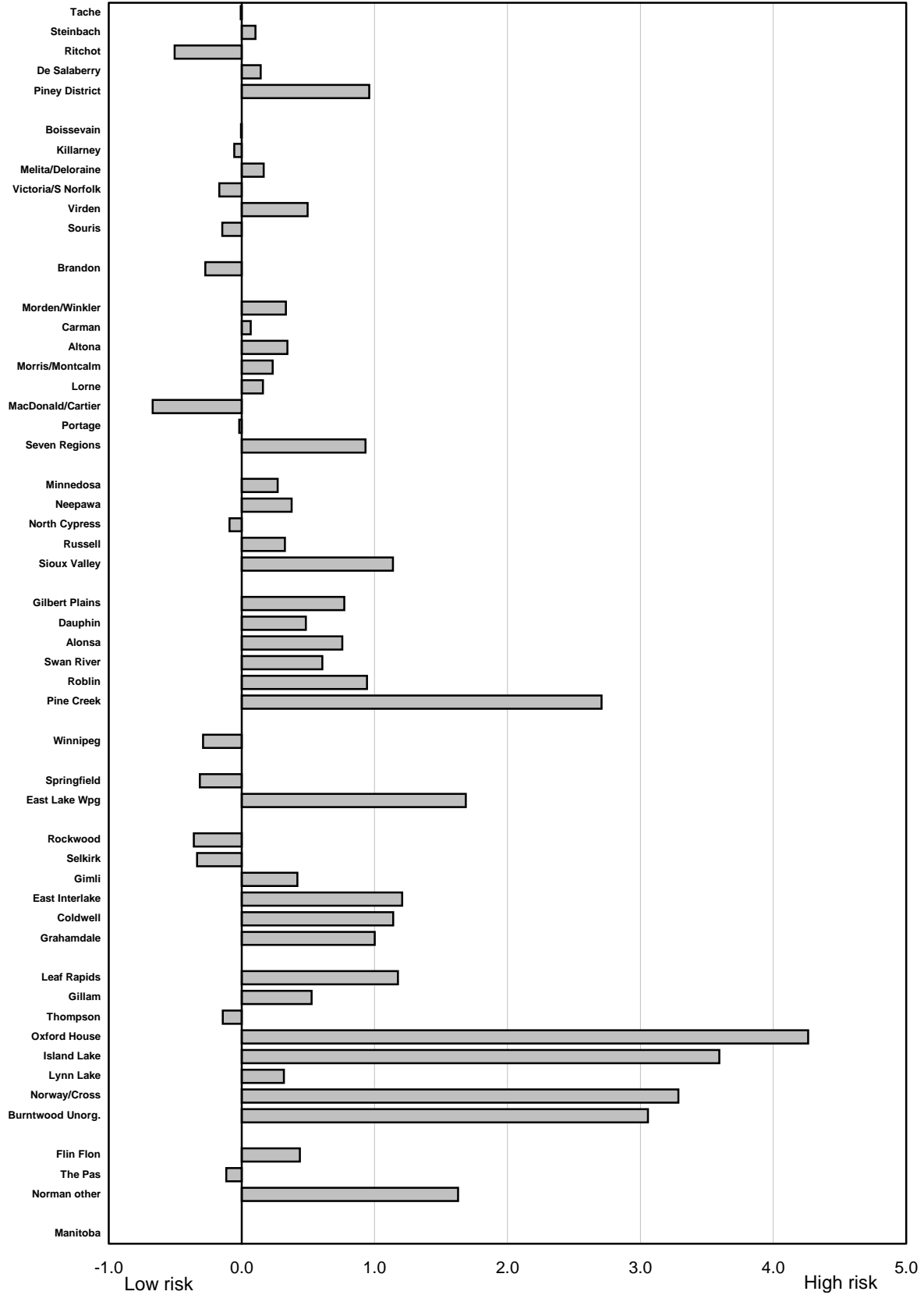


Figure 32: Socio-Economic Risk Index (SERI), 1986/91



7. HEALTH STATUS INDICATORS

7.1 Premature Mortality

Death before age 75 is considered premature. The premature mortality rate indicates the rate of premature death among residents of a given area. It has been suggested as the best single indicator of health status capturing the need for health care (Carstairs and Morris 1991; Eyles et al., 1991; Eyles et al, 1994). It is currently used in the British formula for allocation of funds from the Department of Health to regional health authorities. It is strongly associated with most self-reported health status indicators and physical measures used in the Health and Lifestyle Survey, including self-assessed health, number of symptoms, self-reported rheumatism and temporary sickness (Mays et al. 1992). Populations that have higher premature mortality rates are also more likely to report their health to be poor, to report a higher number of symptoms and to report being sick more often. We used 5 years of data (1991 through 1995) to improve stability of rates for all RHAs and PSAs.

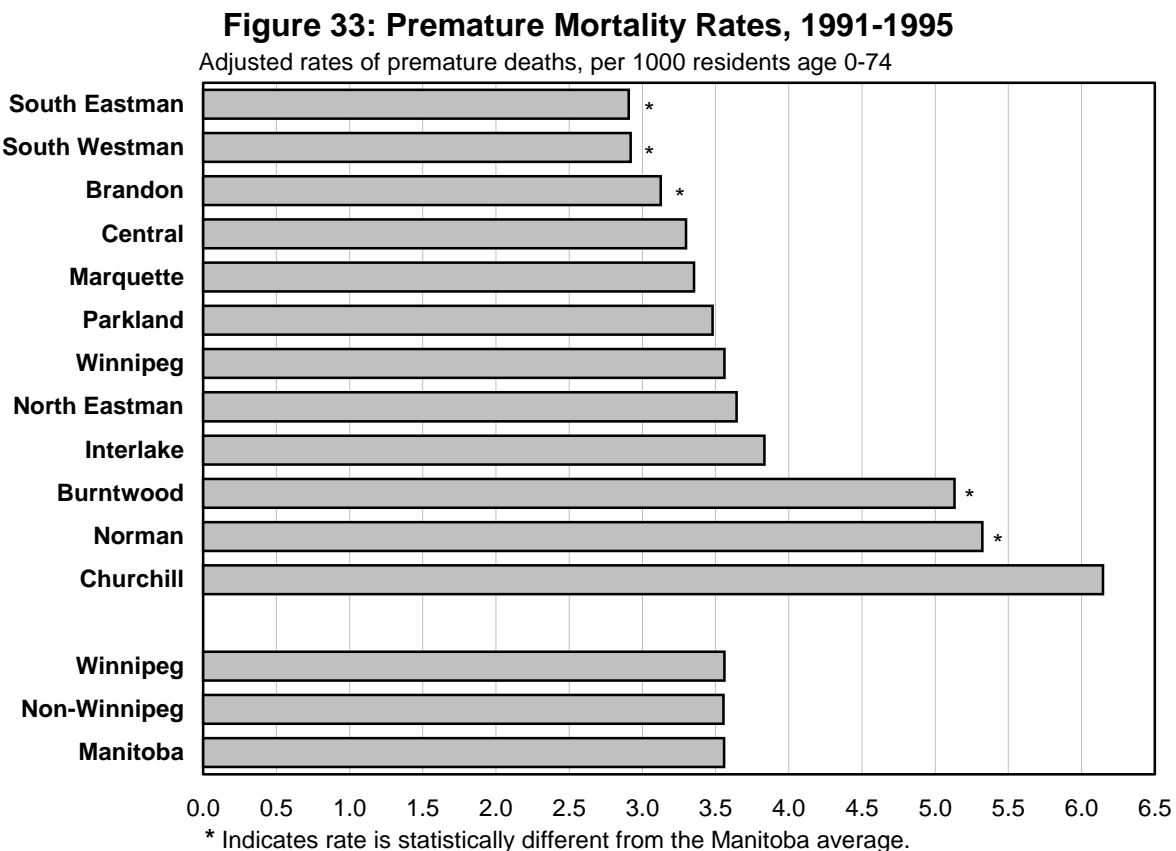
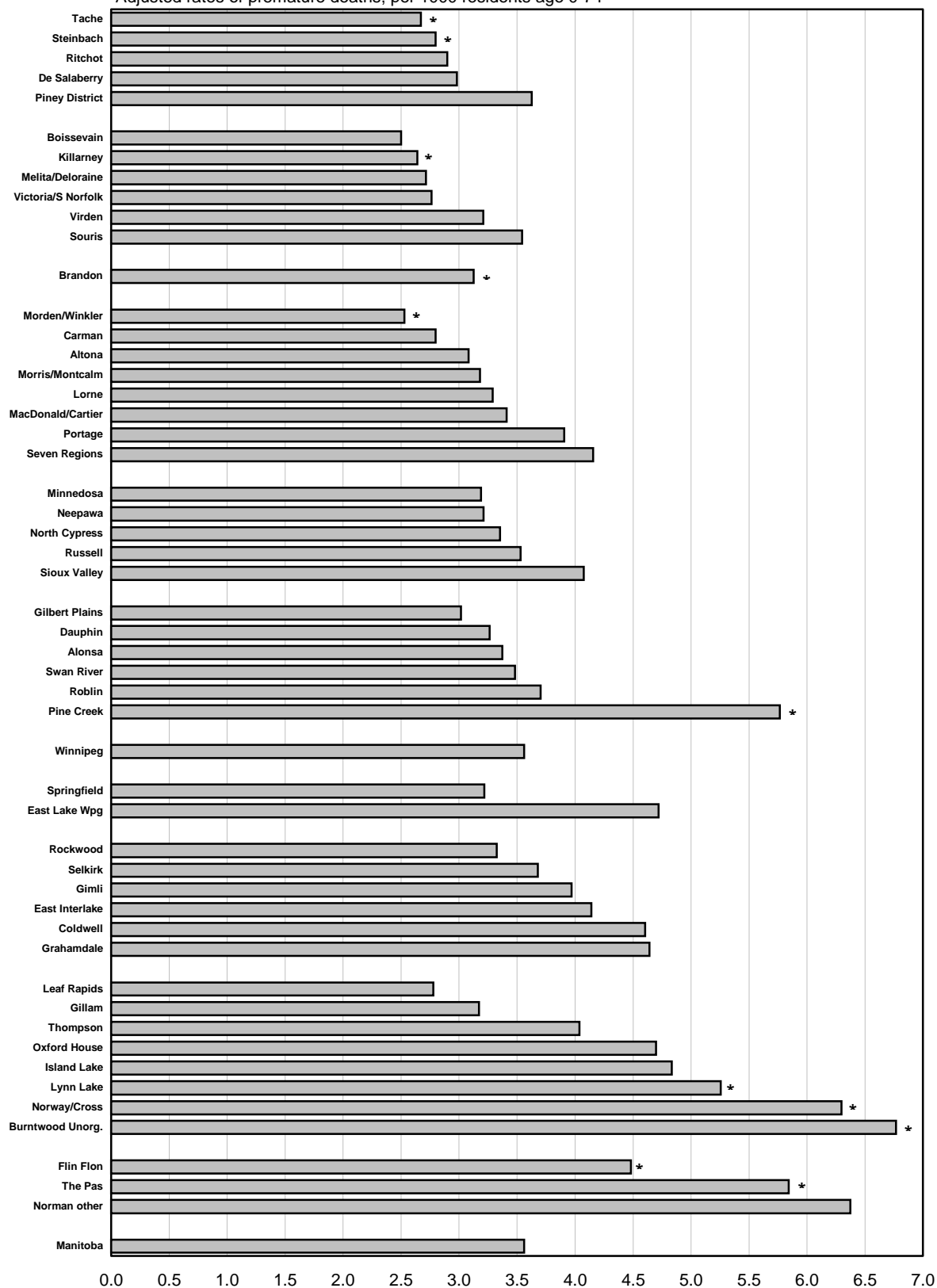


Figure 34: Premature Mortality Rates, 1991-1995

Adjusted rates of premature deaths, per 1000 residents age 0-74



* Indicates rate is statistically different from the Manitoba average.

7.2 Life Expectancy at Birth

Life Expectancy is probably the most widely used indicator of population health: the longer the life expectancy, the healthier the population. It has the advantage of describing the experience of all people in the population, not just those aged 0-74 (as for the premature mortality measure). It estimates the average expected years of life assuming that recent age-specific mortality rates remain reasonably stable.

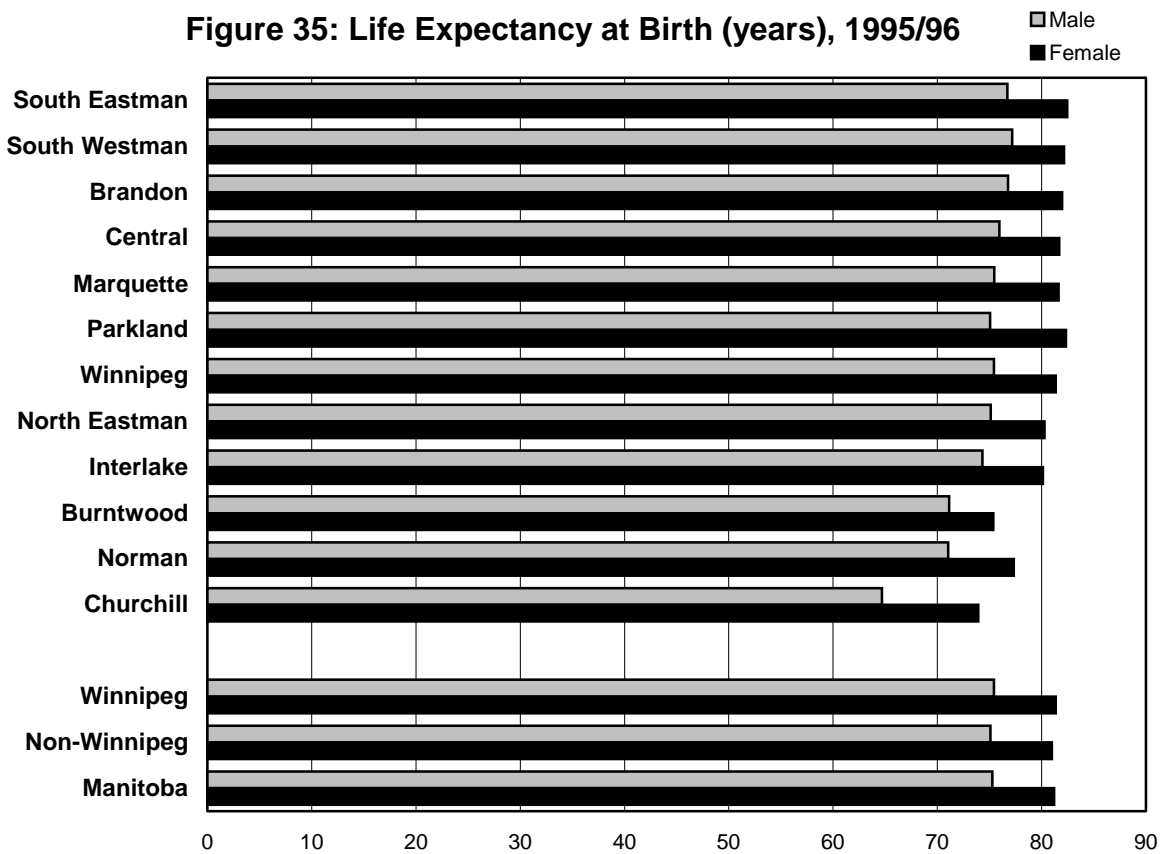
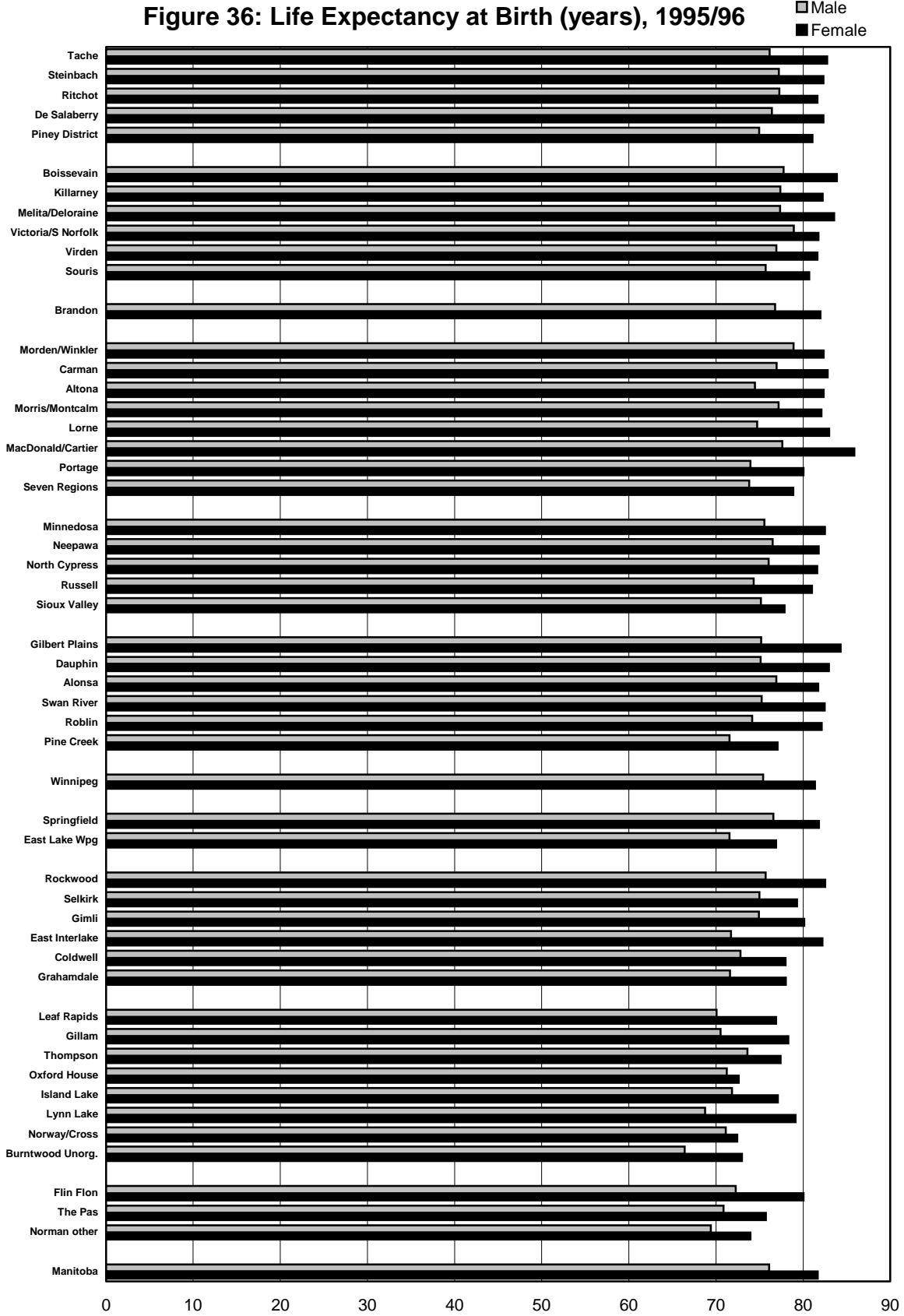


Figure 36: Life Expectancy at Birth (years), 1995/96



8. MEASURES OF DISEASE BURDEN

8.1 Diabetes

The prevalence of diabetes (i.e. the total number of diabetics in the community) was estimated from records of physician treatment: diabetics were defined as those who saw a physician for diabetes at least once in the three year period 1993/94 - 1995/96. Only adults aged 20-79 were included in this analysis. This definition was chosen among several for its close agreement with clinical measures and survey results (Robinson et al, 1997).

Figure 37: Diabetes Treatment Prevalence, 1993/94-95/96

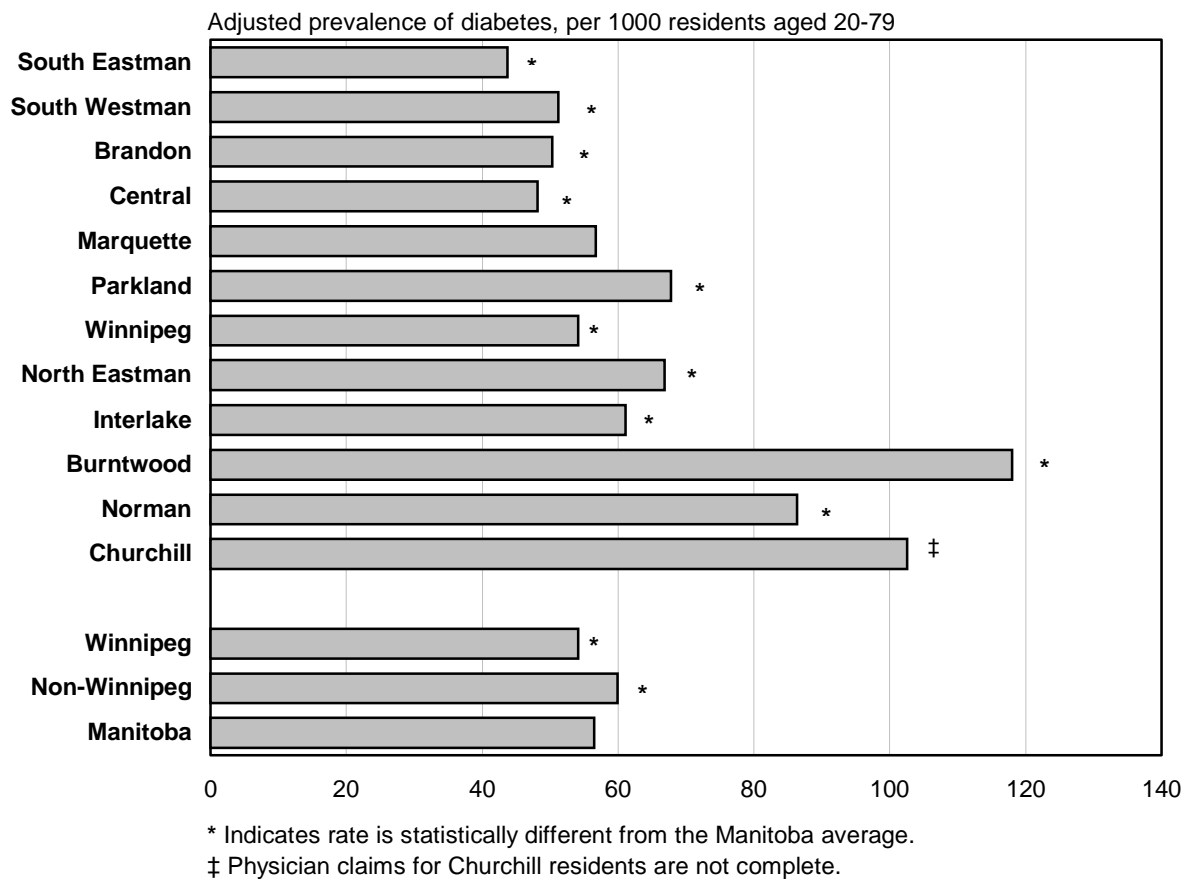
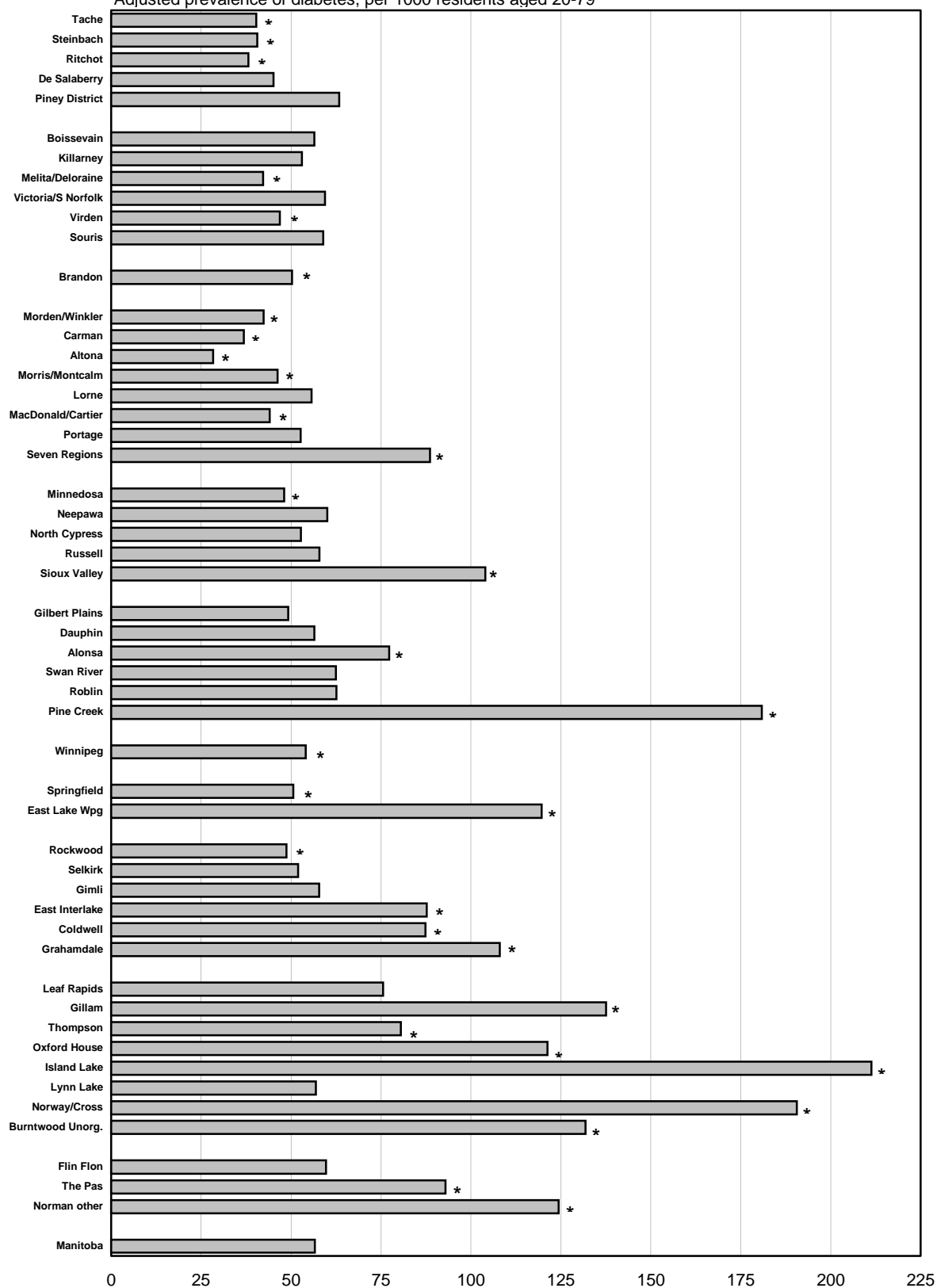


Figure 38: Diabetes Treatment Prevalence, 1993/94 - 95/96

Adjusted prevalence of diabetes, per 1000 residents aged 20-79



* Indicates rate is statistically different from the Manitoba average.

8.2 Hypertension

The prevalence of hypertension (high blood pressure) was estimated from records of physician treatment: hypertensive patients were defined as those who saw a physician for hypertension at least once in the three year period 1993/94 - 1995/96. Only adults aged 25 and over were included in this analysis. This definition was chosen among several for its close agreement with clinical measures and survey results (Robinson et al, 1997).

Figure 39: Hypertension Treatment Prevalence, 93/94-95/96

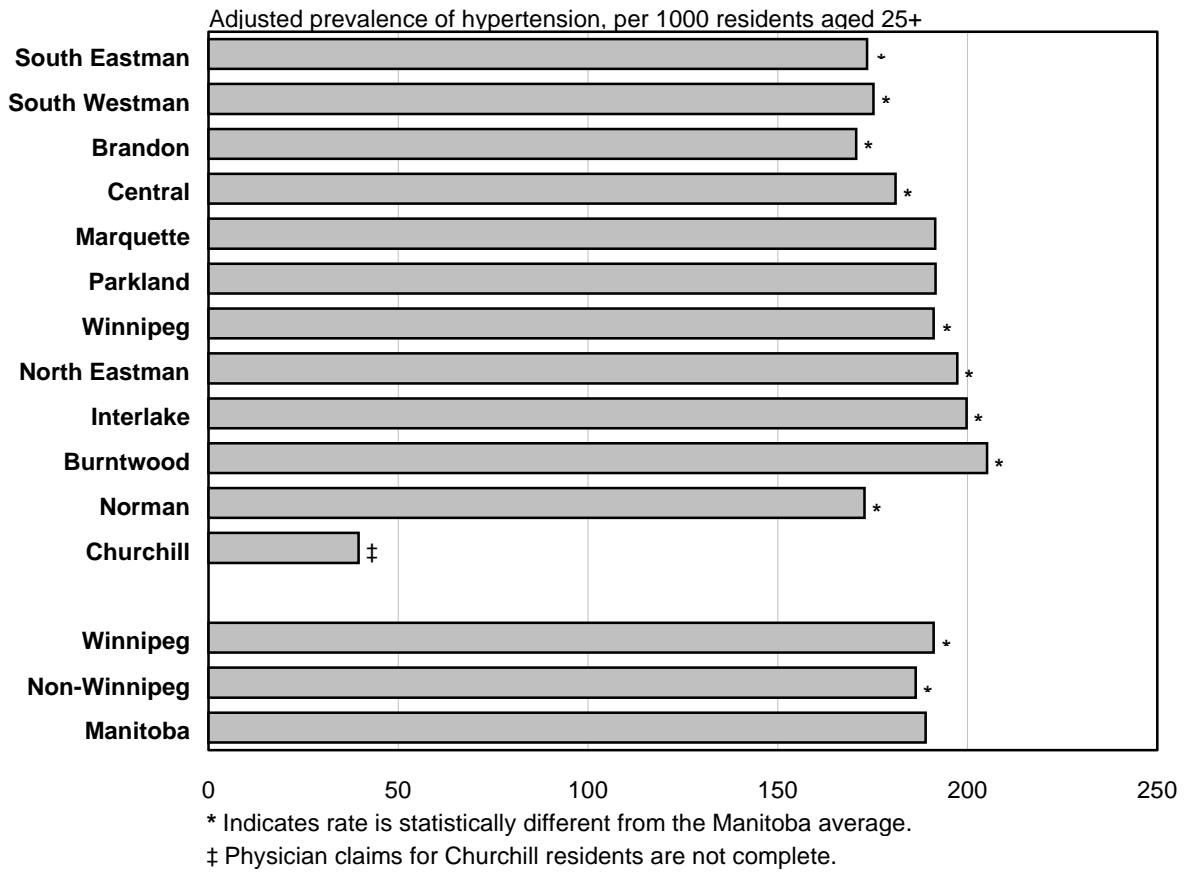
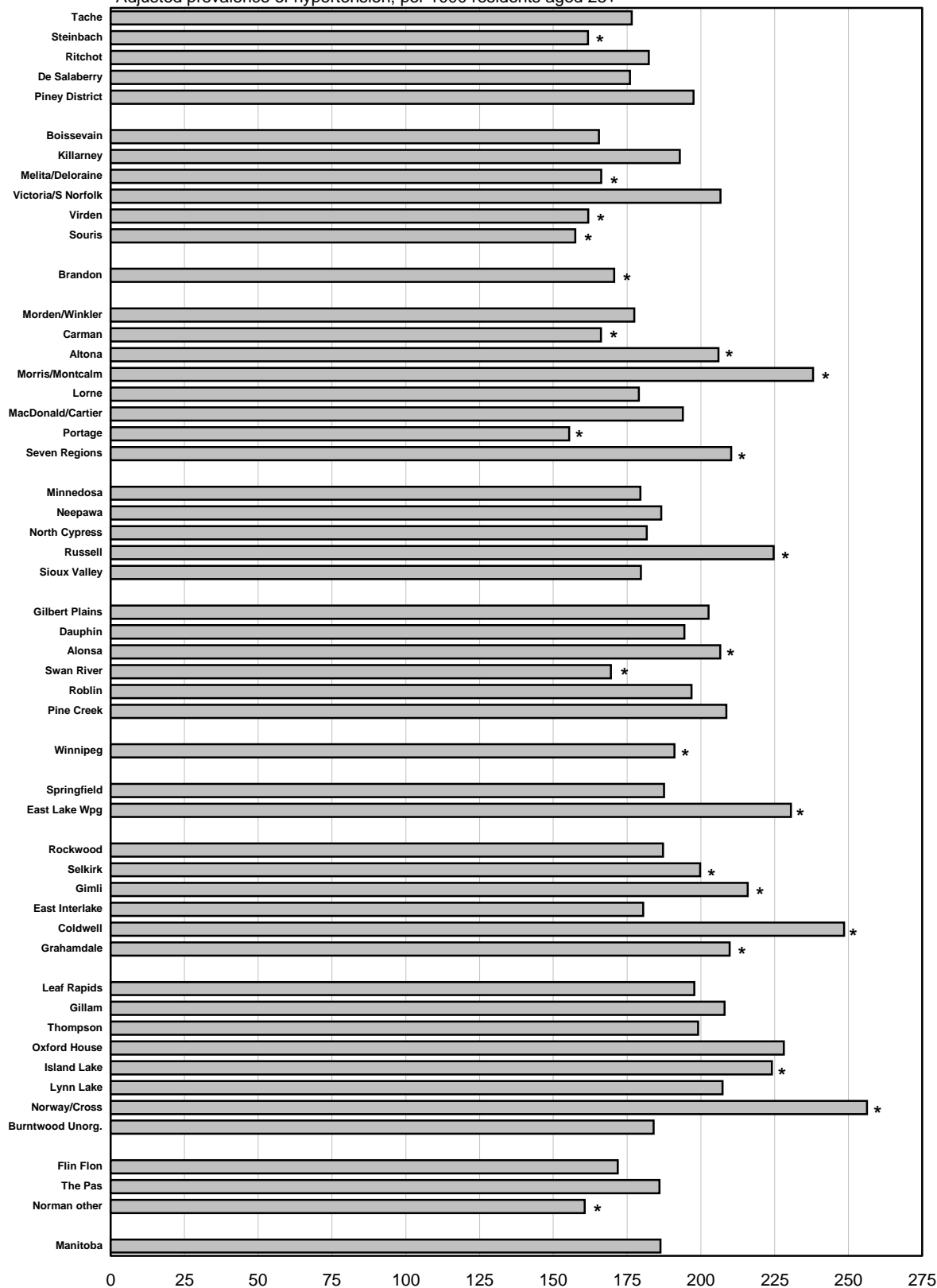


Figure 40: Hypertension Treatment Prevalence, 93/94-95/96

Adjusted prevalence of hypertension, per 1000 residents aged 25+



* Indicates rate is significantly different from the Manitoba average.

8.3 Cancer Incidence

This analysis presents the cancer incidence rate (the rate of new cases of cancer diagnosed each year) based on data from the Manitoba Cancer Treatment and Research Foundation Registry. Non-malignant skin cancers were excluded. Cancer is a legally notifiable disease, and the registry is generally credited with having high quality data. To ensure stability of rates, RHA level analyses used data from 1991 through 1995, while PSA level analyses required 10 years of data (1986-1995). The low rate for Burntwood should be interpreted carefully; instead of reflecting a lower actual rate of cancer, it may instead reflect the possibility that many cancers in this region go undetected and unreported. This issue deserves further study.

Figure 41: Cancer Incidence, 1991-1995

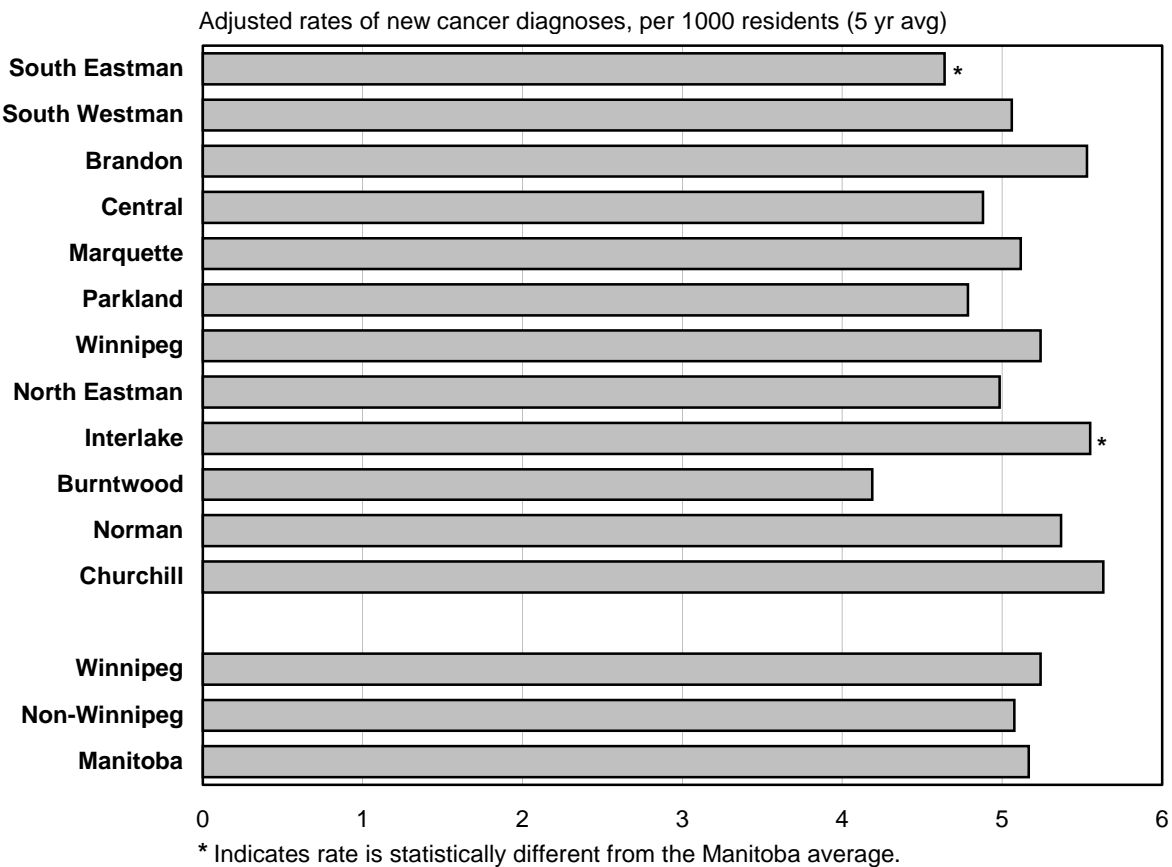
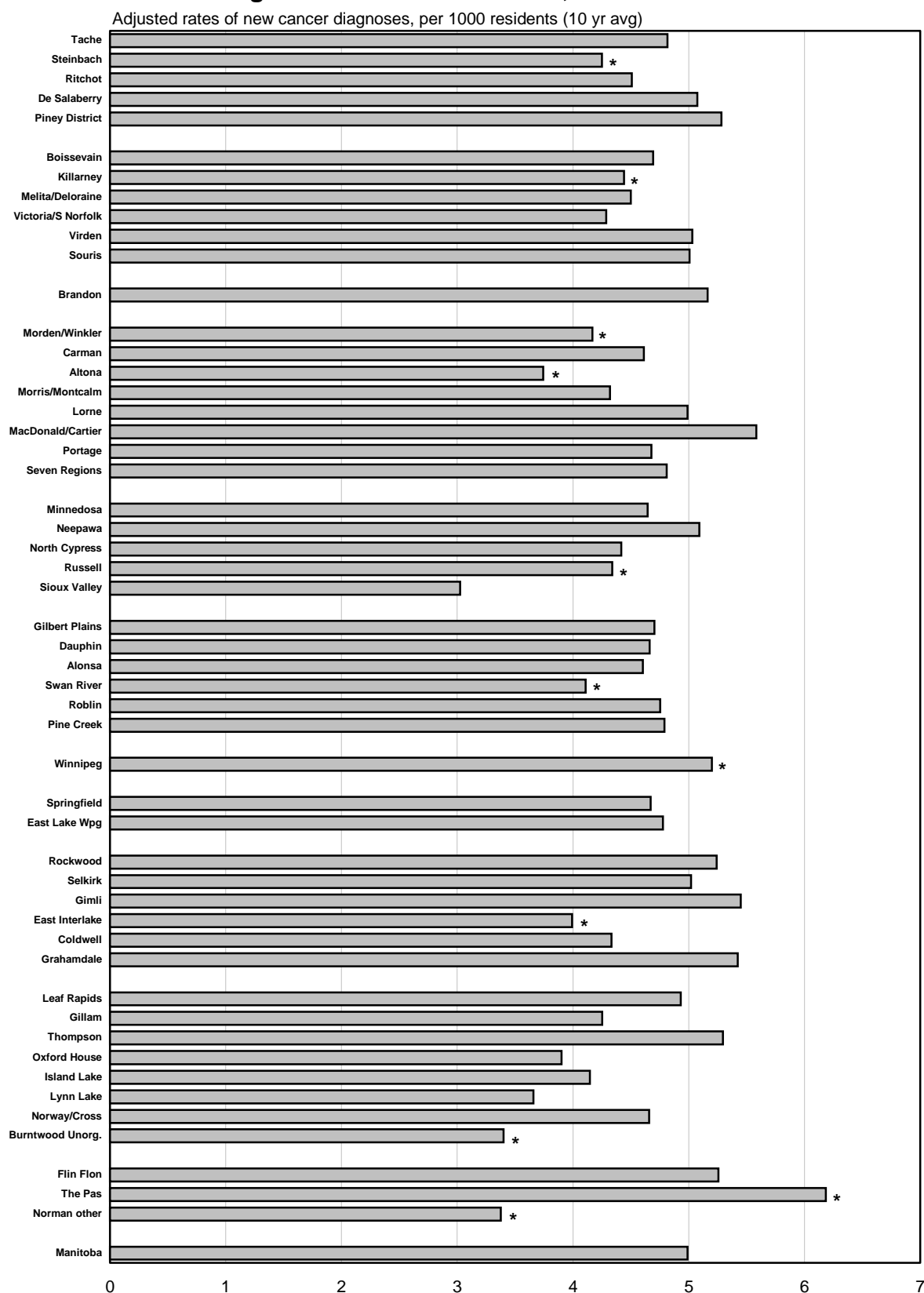


Figure 42: Cancer Incidence, 1986 - 1995



* Indicates rate is statistically different from the Manitoba average.

9. PROVISION OF PREVENTIVE CARE

9.1 Childhood Immunization Rates

These figures were generated by data from the Manitoba Immunization Monitoring System (MIMS). This system records immunizations provided by physicians and nurses, though data supplied by federal nurses (Medical Services Branch) are considered incomplete (this affects mostly Burntwood RHA, but also Norman, Churchill, North Eastman and Interlake). The analysis examined the routinely recommended immunizations (3 Diphtheria Pertussis Tetanus and 2 Polio) for all children born between 1989 and 1992 and who resided in Manitoba for the full two years after birth. The HIB (Haemophilus Influenzae B) vaccine was not included, as it was only introduced in 1992.

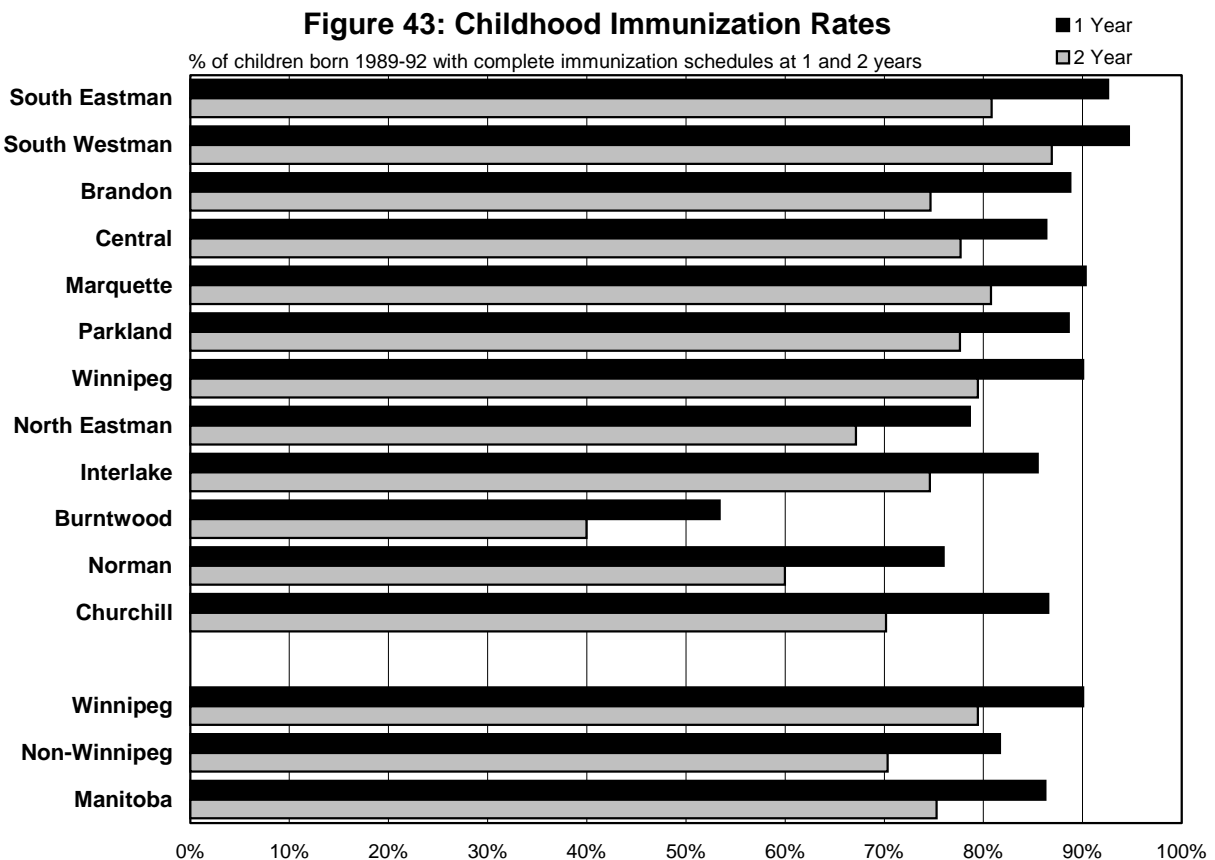
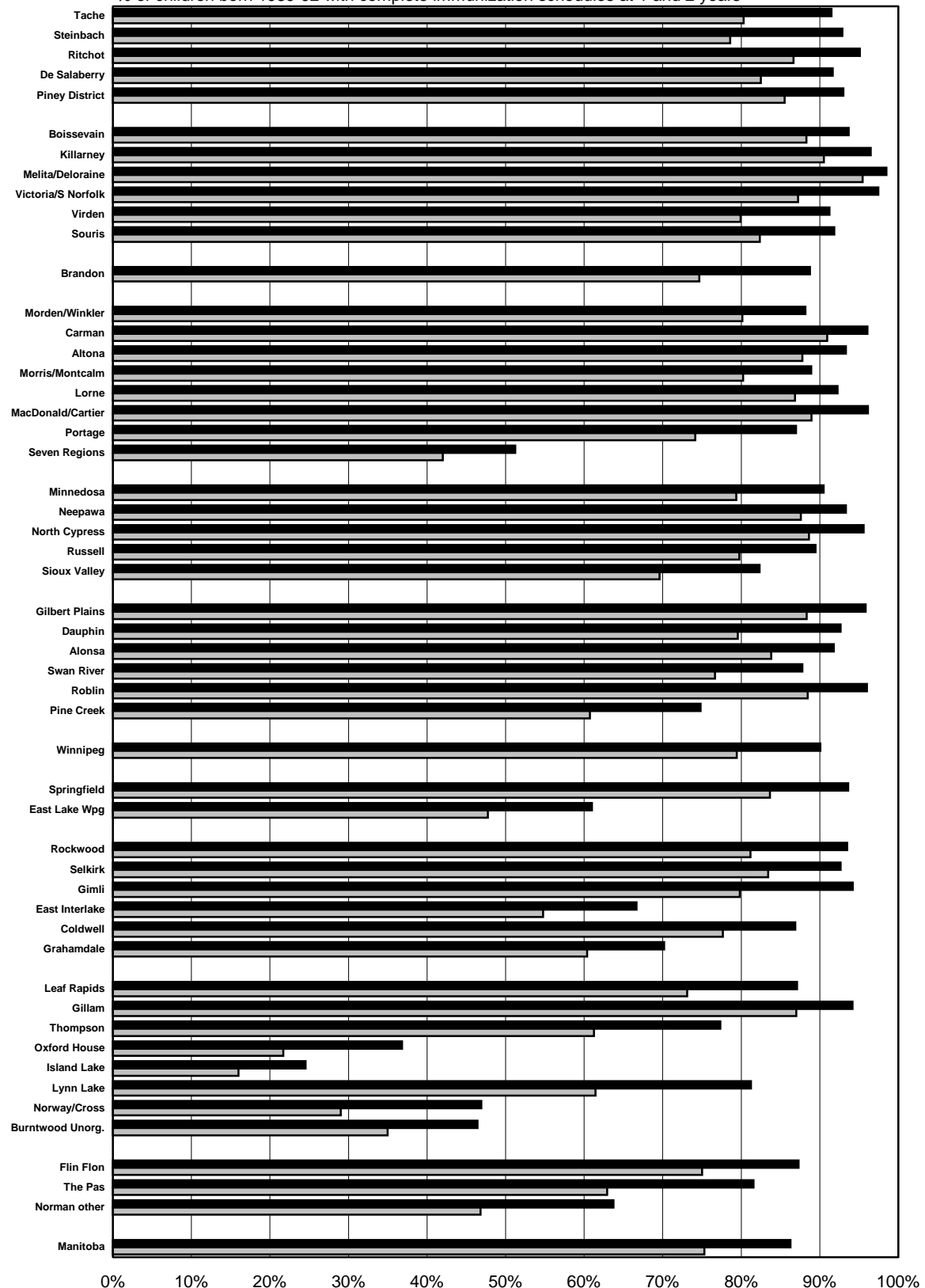


Figure 44: Childhood Immunization Rates

% of children born 1989-92 with complete immunization schedules at 1 and 2 years

■ 1 Year
□ 2 Year



9.2 Screening Mammography

This analysis indicates the rate of screening tests done for breast cancer detection. The rates show the proportion of women in the target age range (50-69) who had at least one mammogram in the two year period 1995/96-1996/97. Data were combined from the Manitoba Breast Screening Program and regular physician claims.

Figure 45: Screening Mammography Rates, 1995/96-96/97

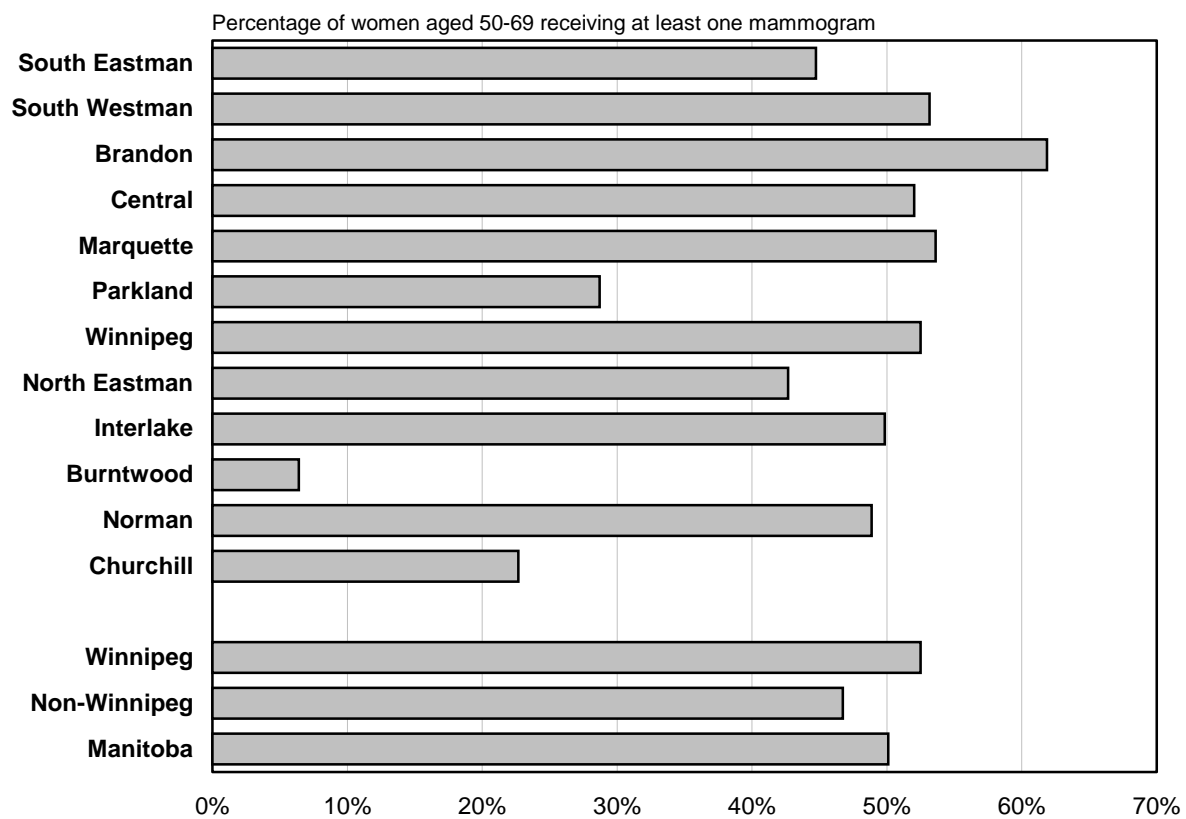
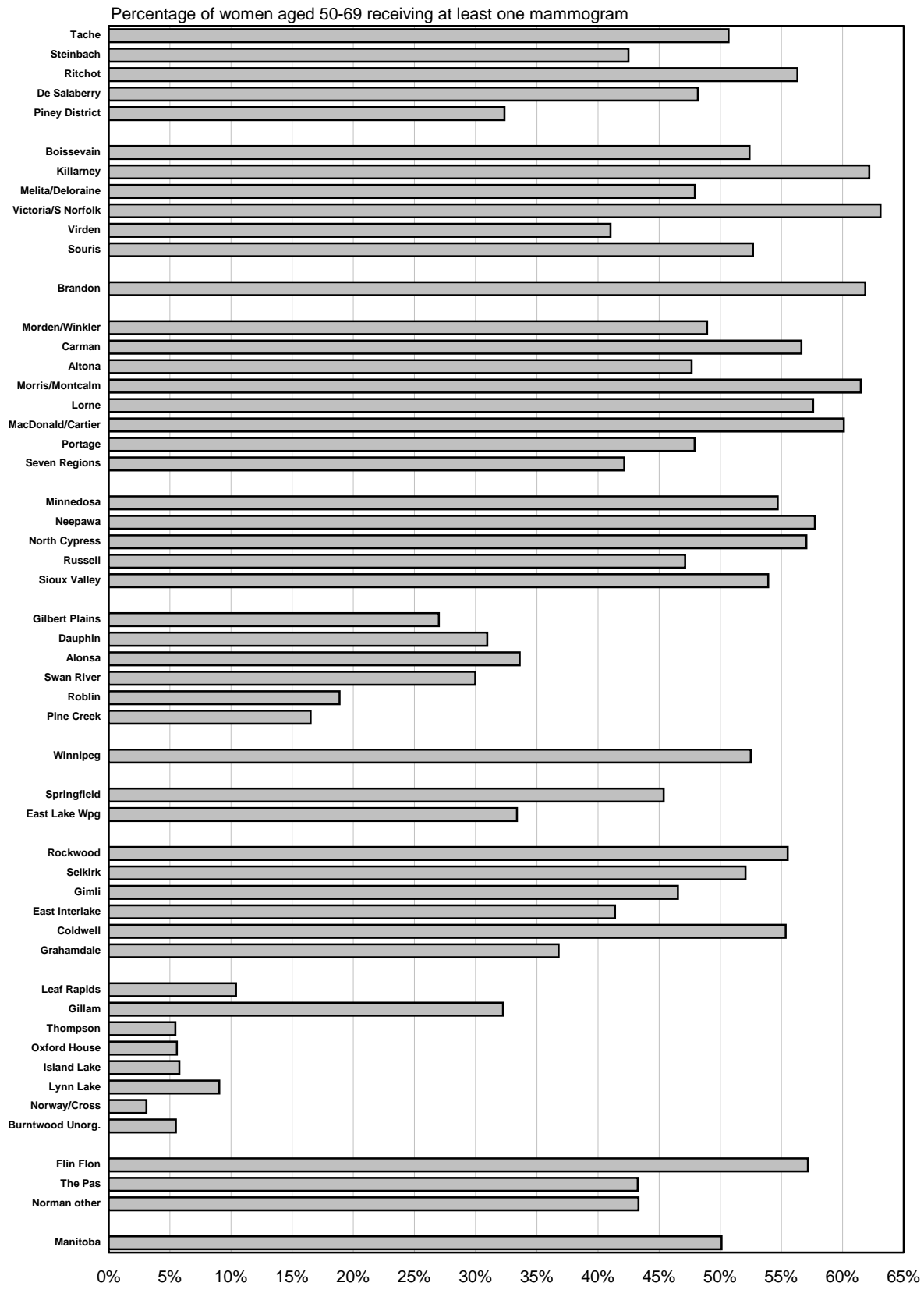


Figure 46: Screening Mammography Rates, 1995/96-96/97



10. USE OF PHYSICIAN SERVICES

10.1 In-Area Physician Supply

These data estimate the number of Full Time Equivalent (FTE) physicians practicing in each area in 1995/96 (GP/FPs and Specialists). We used the Health Canada methodology to measure FTEs, since not all practitioners are “full time.” For each month, each physician was assigned to the area where most of their patients lived. This method helps capture the mobility of physicians, particularly rural GPs, while still presenting only those who devote most of their time to local residents as “In-Area” supply. See Appendix 1 for further details.

Figure 47: In-Area Physician Supply, 1995/96

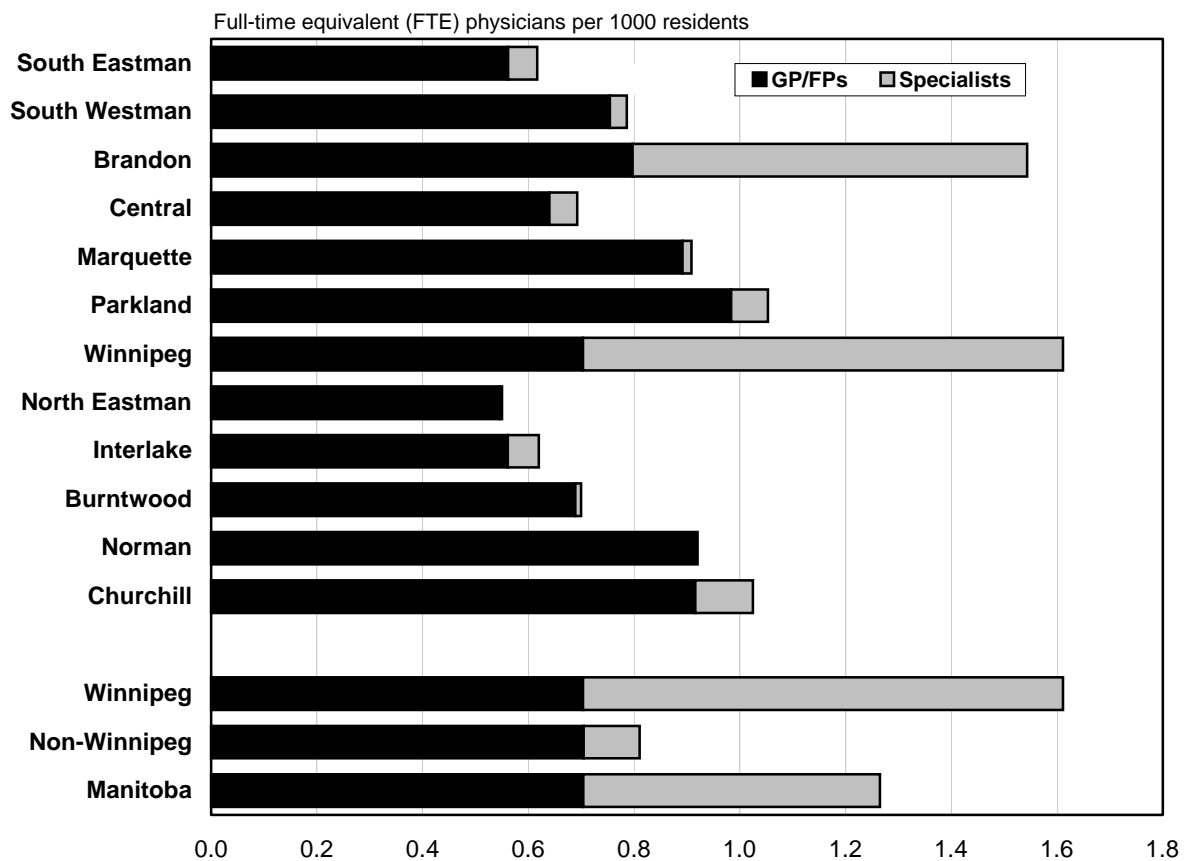
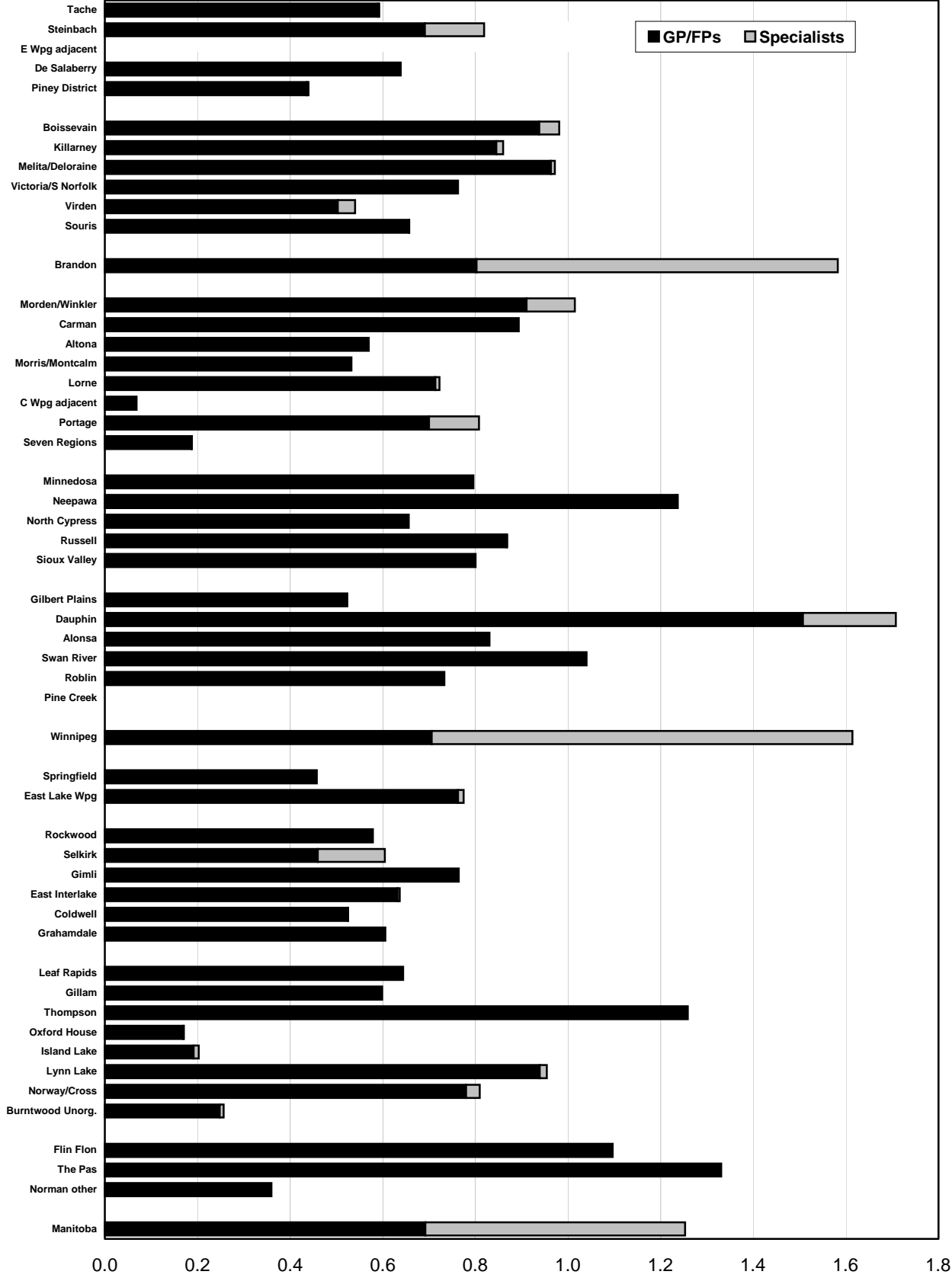


Figure 48: In-Area Physician Supply, 1995/96

Full-time equivalent (FTE) physicians per 1000 residents



10.2 Ambulatory Visit Rates

Ambulatory visits to physicians include all regular office visits, consultations, outpatient department & emergency room visits, visits to patients in Personal Care Homes, and visits to patients in their own homes. Consistent with the population health model, visits are always credited to the residents who receive them, regardless of where the visit took place. For example, if a Parkland resident visits a specialist in Winnipeg, that visit is counted in the Parkland rate. Consultations are a subset of ambulatory visits (see Ambulatory Consultation Rates, next).

Figure 49: Ambulatory Visit Rates to All Physicians, 1995/96

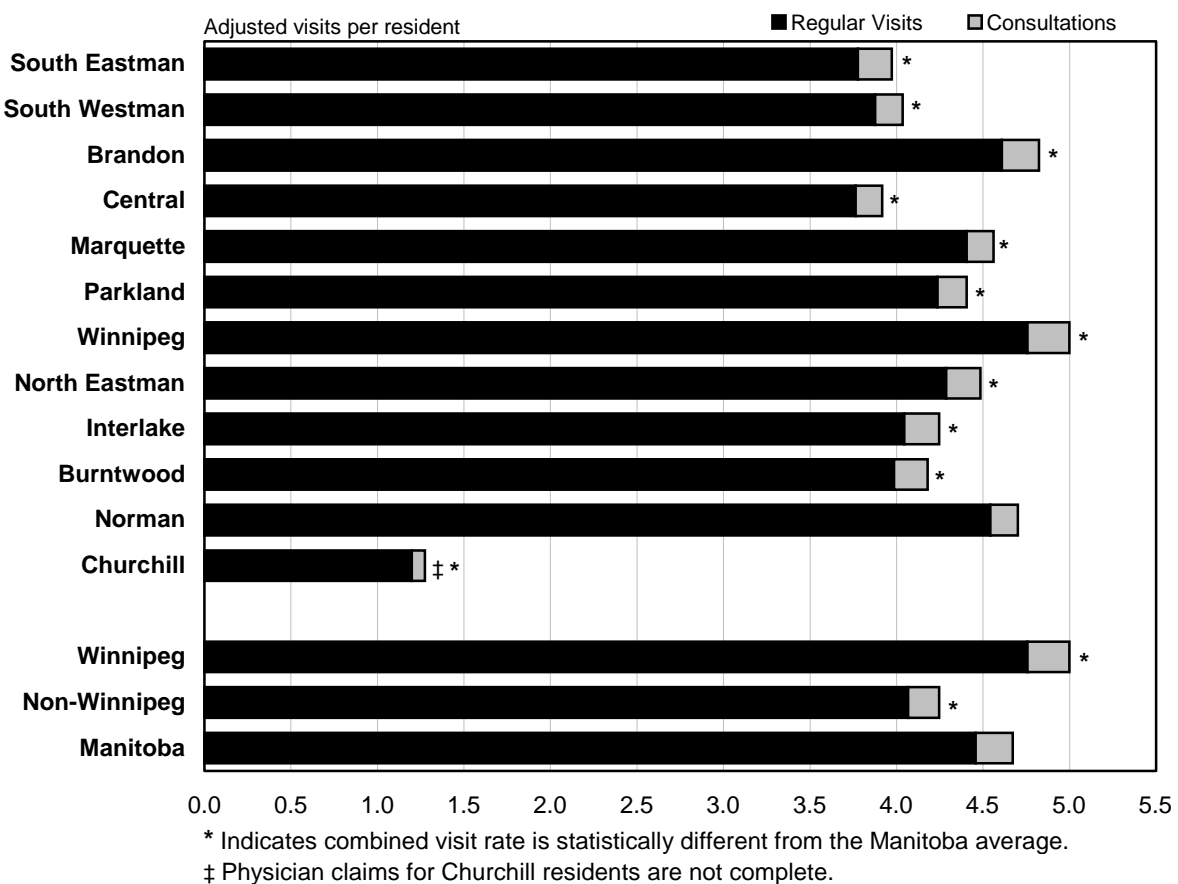
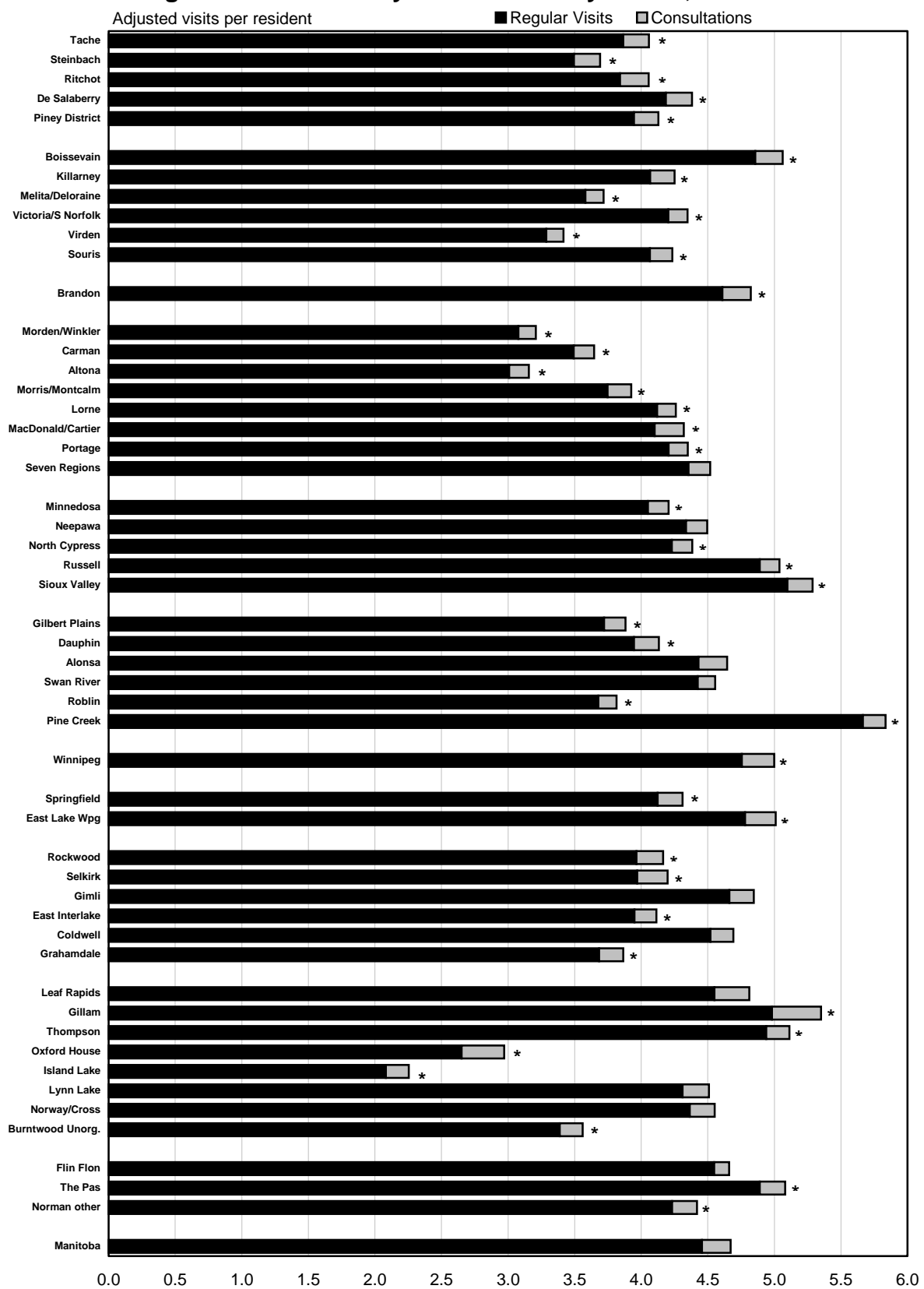


Figure 50: Ambulatory Visits to All Physicians, 1995/96



* Indicates combined visit rate is statistically different from the Manitoba average.

10.3 Ambulatory Consult Rates

A Consultation occurs when one physician requests another to examine a patient due to the “complexity, obscurity or seriousness” of the patient’s illness, or to satisfy the patient’s request. Since specialists provide over 93% of consultations, the consultation rate can be seen as an indicator of access to specialist services. Like all other ambulatory visits, consultations are credited to the residents who receive them, regardless of where the visit took place.

Figure 51: Ambulatory Consult Rates to All Physicians, 95/96

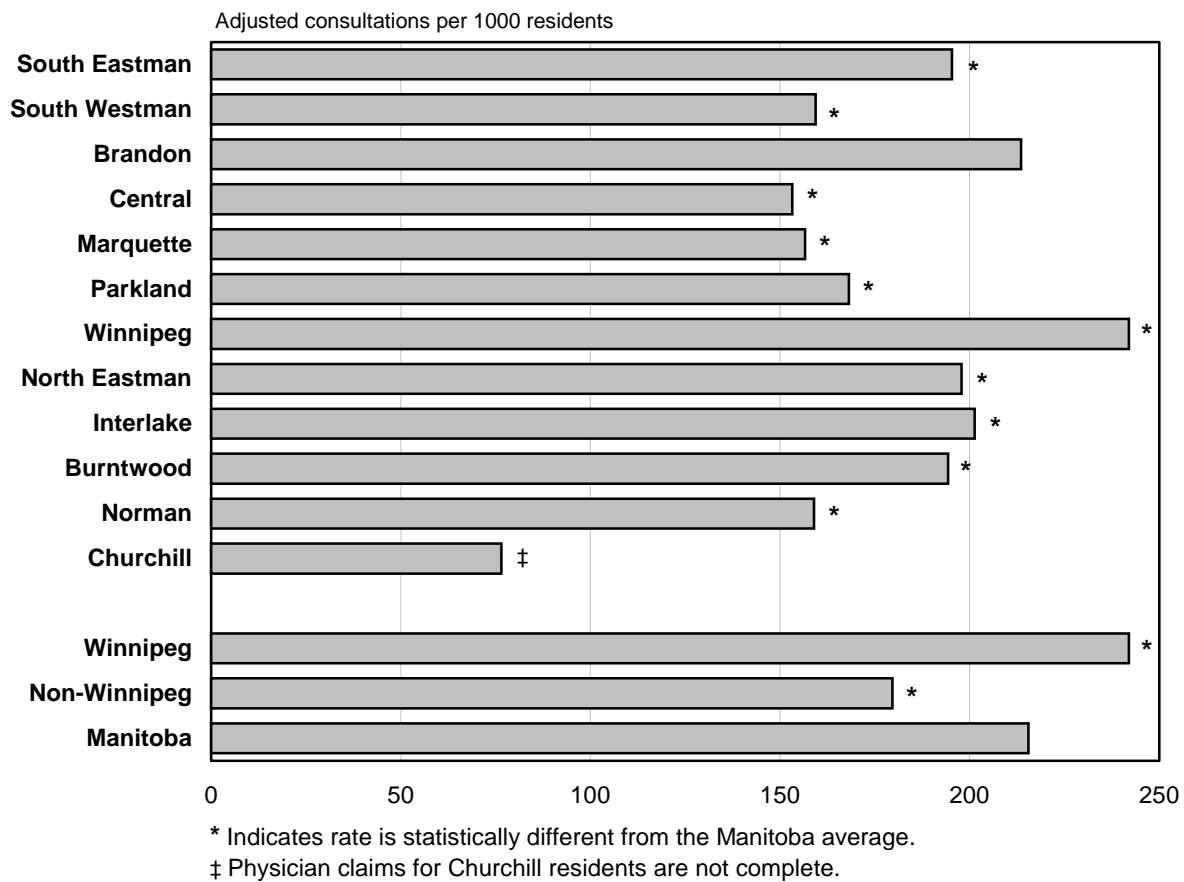
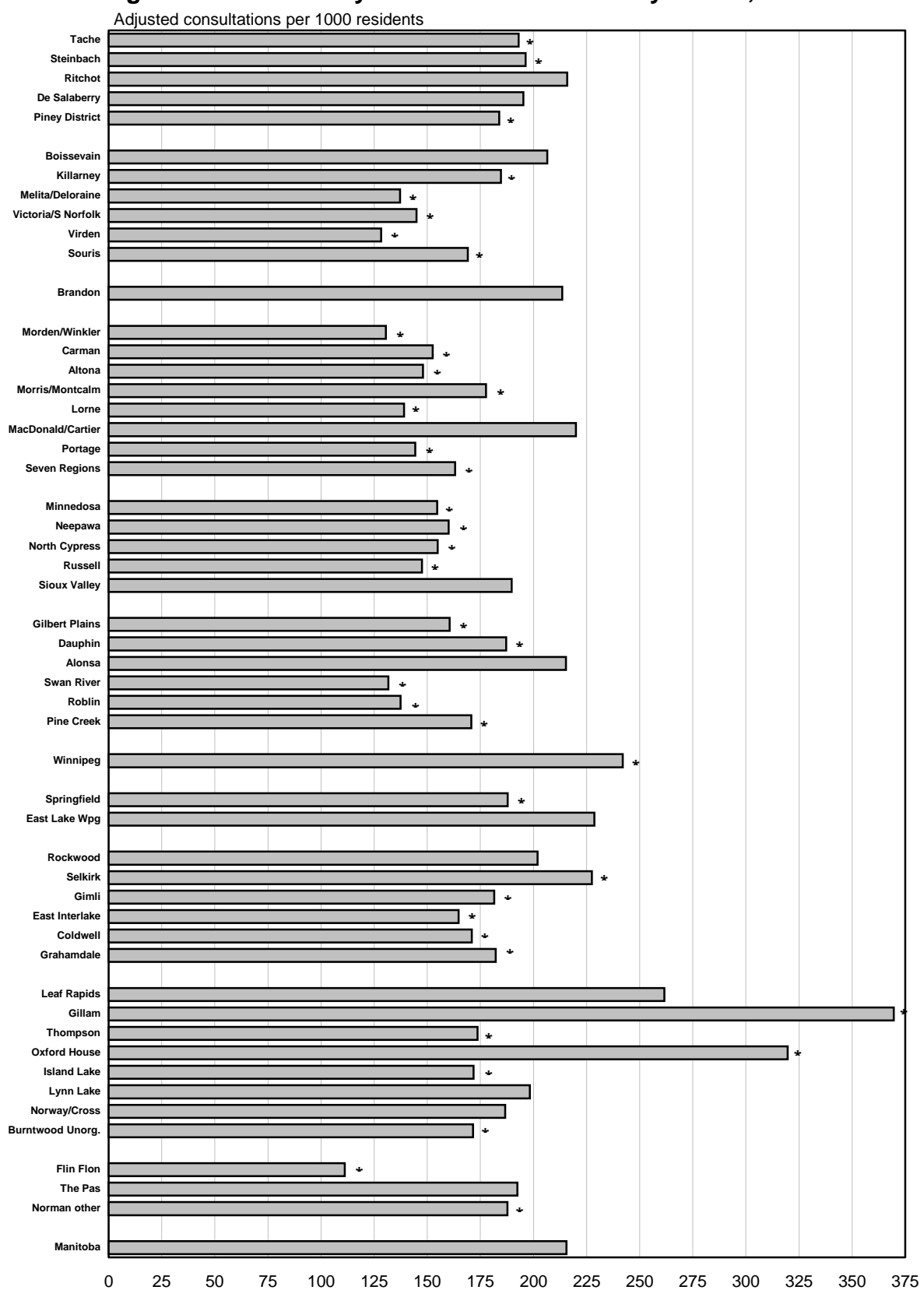


Figure 52: Ambulatory Consult Rates to All Physicians, 95/96



* Indicates rate is statistically different from the Manitoba average.

10.4 Ambulatory Visit Providers

These data indicate the proportion of ambulatory visits provided by general / family practitioners versus specialists. As with other analyses in this report, visits are credited to the regions whose residents received them, regardless of where the visits took place (the location of physician visits are analyzed in the next section).

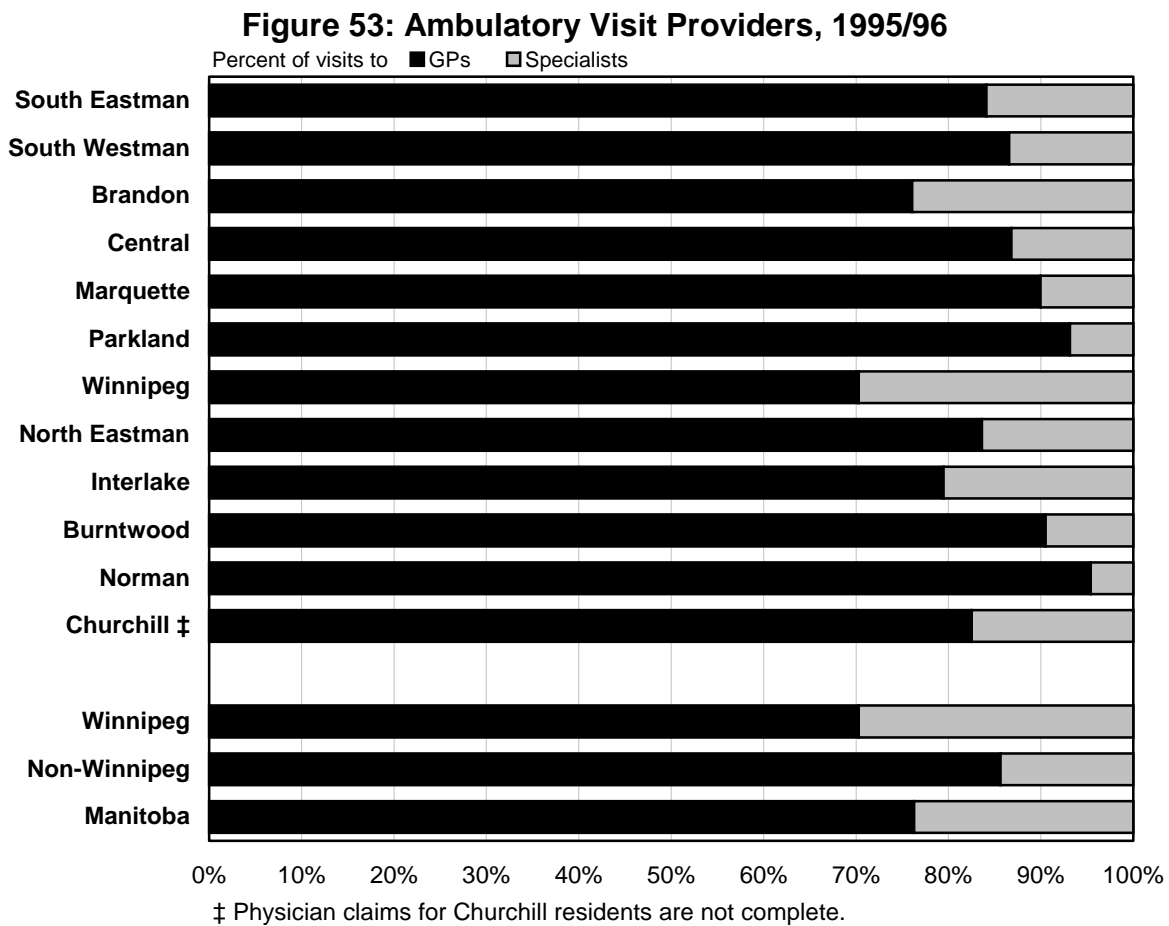
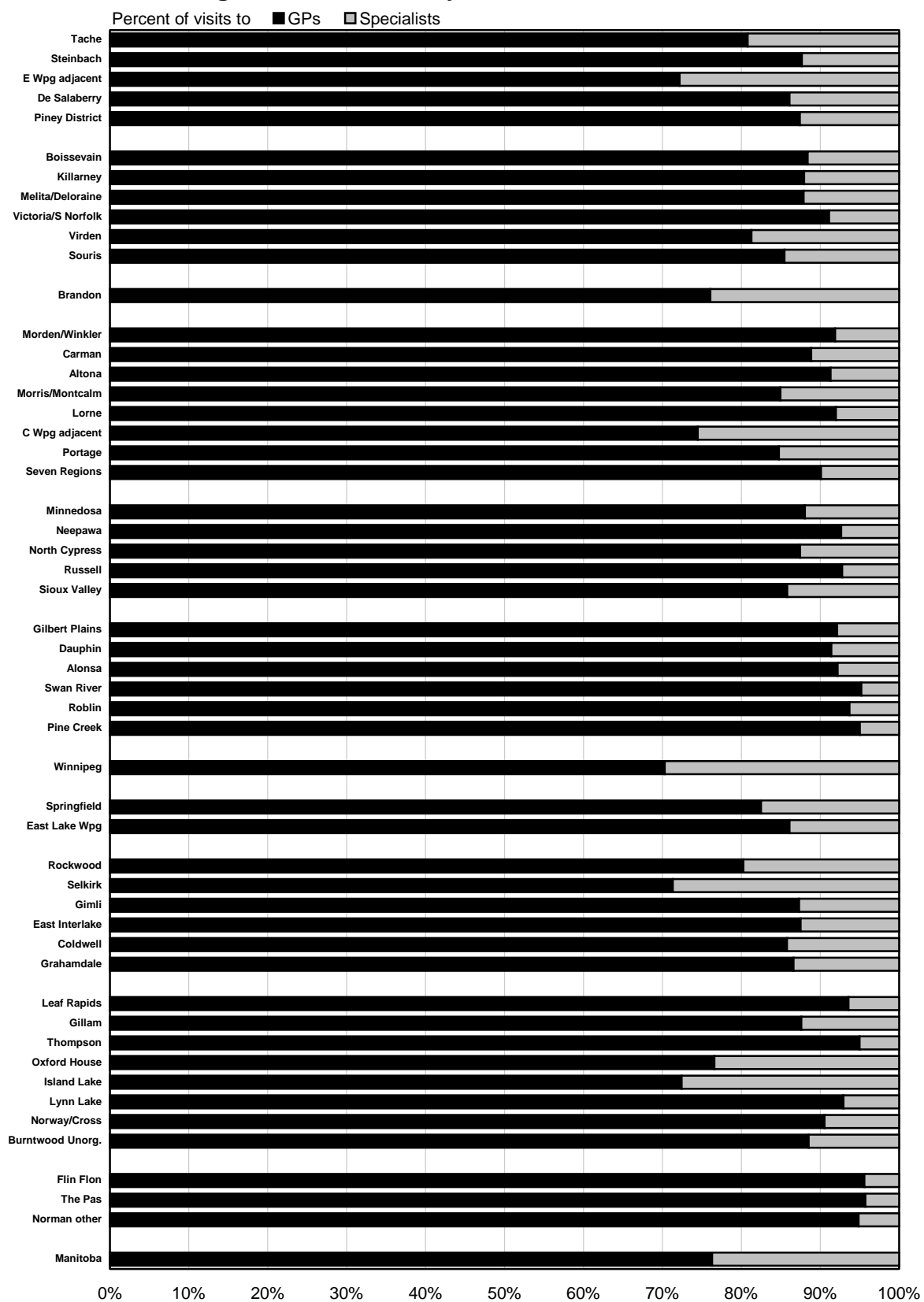


Figure 54: Ambulatory Visit Providers, 1995/96



10.5 Location of Ambulatory Visits to General & Family Practitioners

Figure 55 shows where residents of each RHA received care from GP/FPs - within their Physician Service Area (PSA), elsewhere in their RHA, in another RHA, or in Winnipeg. This illustrates the extent of patient travel for generalist visits. The “Within PSA” indicates the proportion of GP visits received quite close to home, while the “Elsewhere in RHA” category shows the extent of within-RHA travel (which includes substantial distances in some RHAs).

Figure 55: Location of Ambulatory Visits to GP/FPs, 1995/96

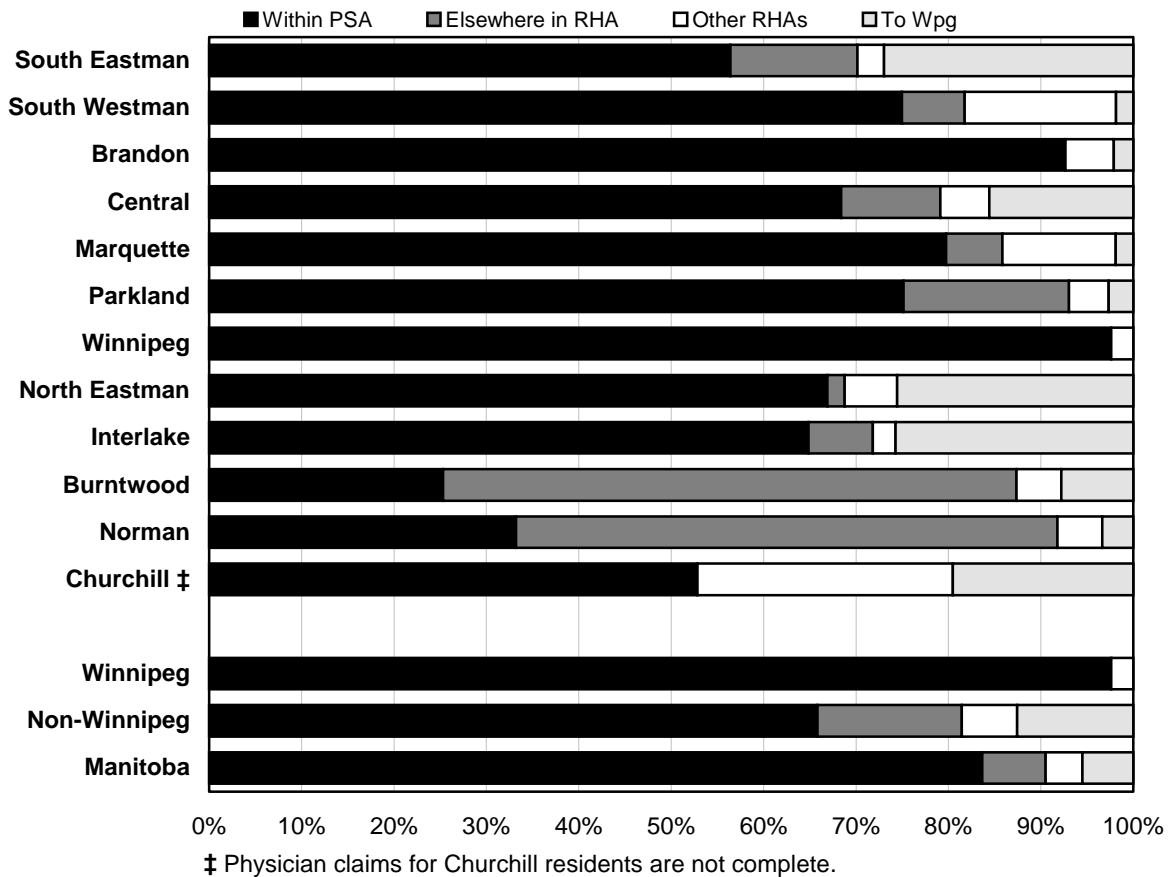
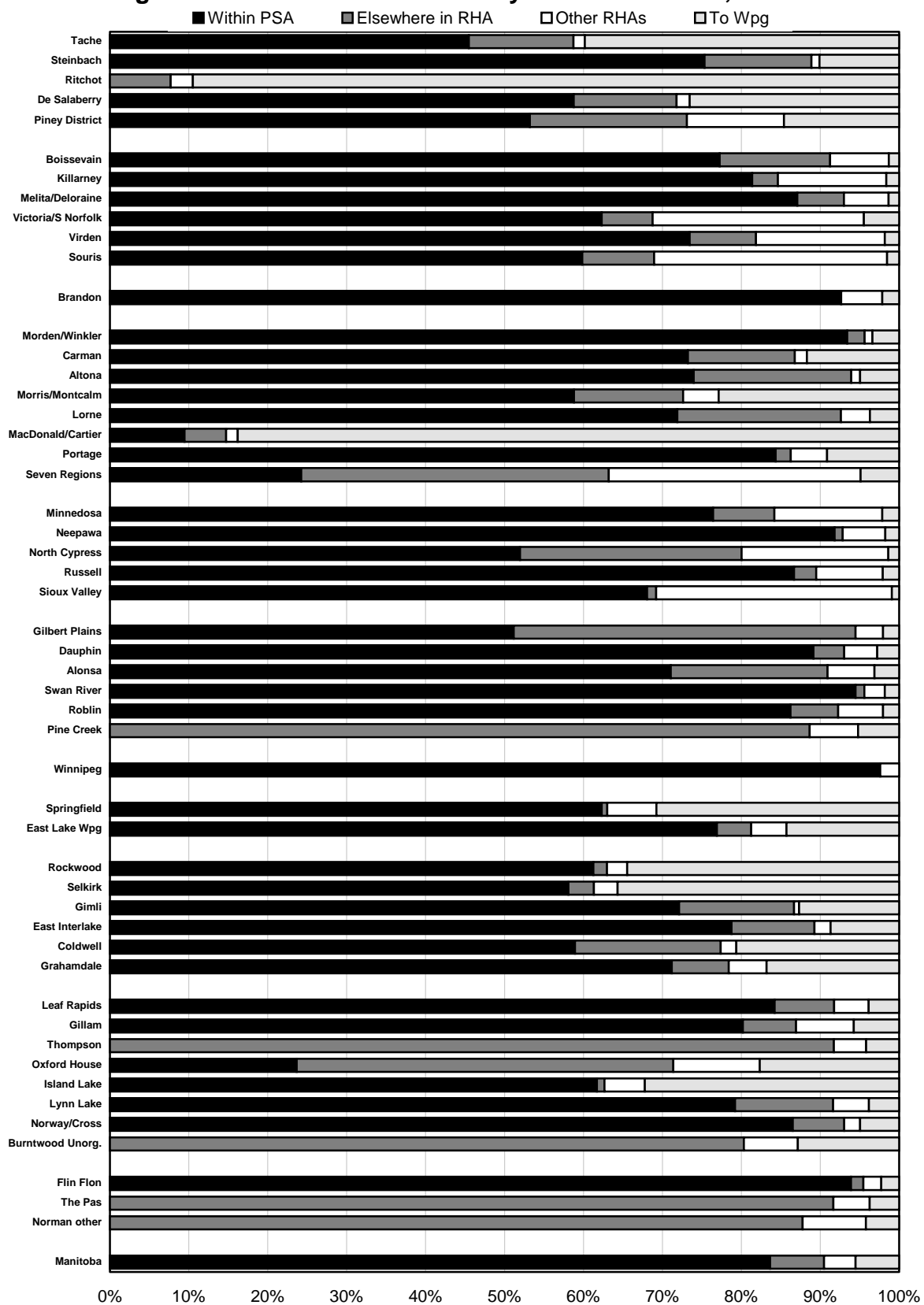


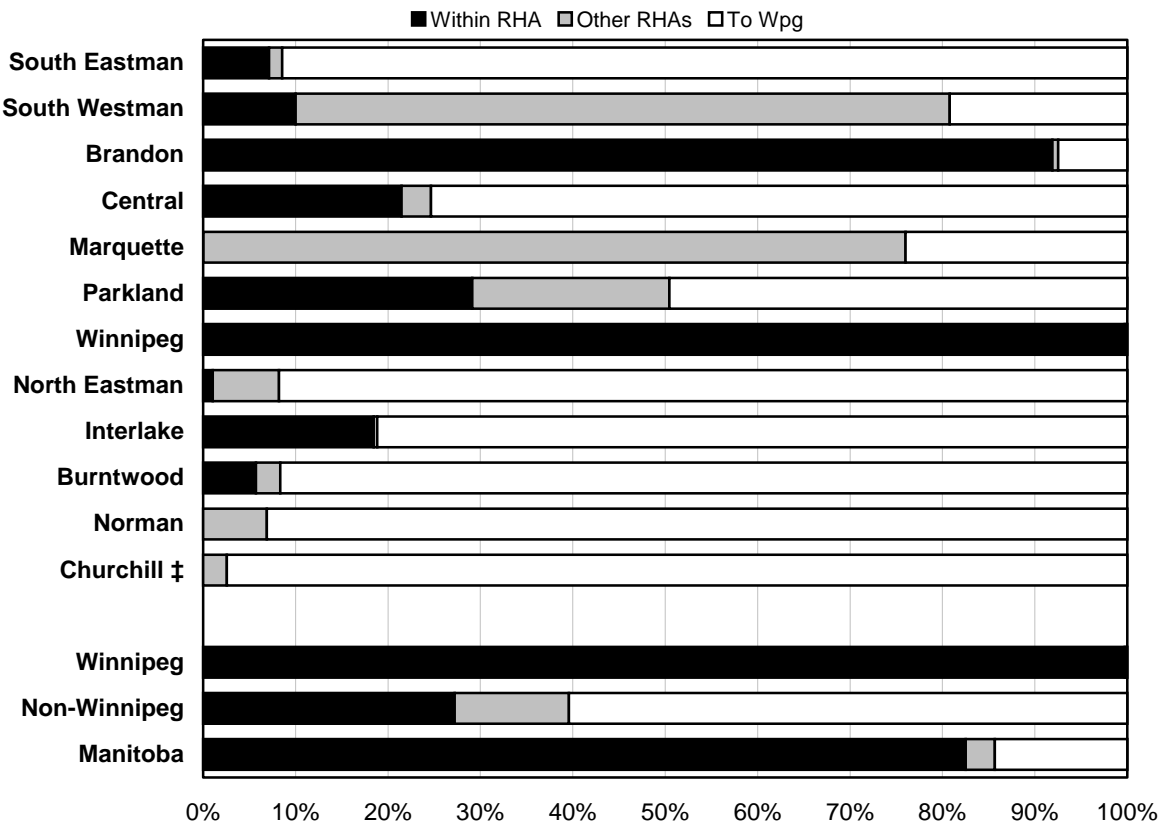
Figure 56: Location of Ambulatory Visits to GP/FPs, 1995/96



10.6 Location of Ambulatory Visits to Specialists

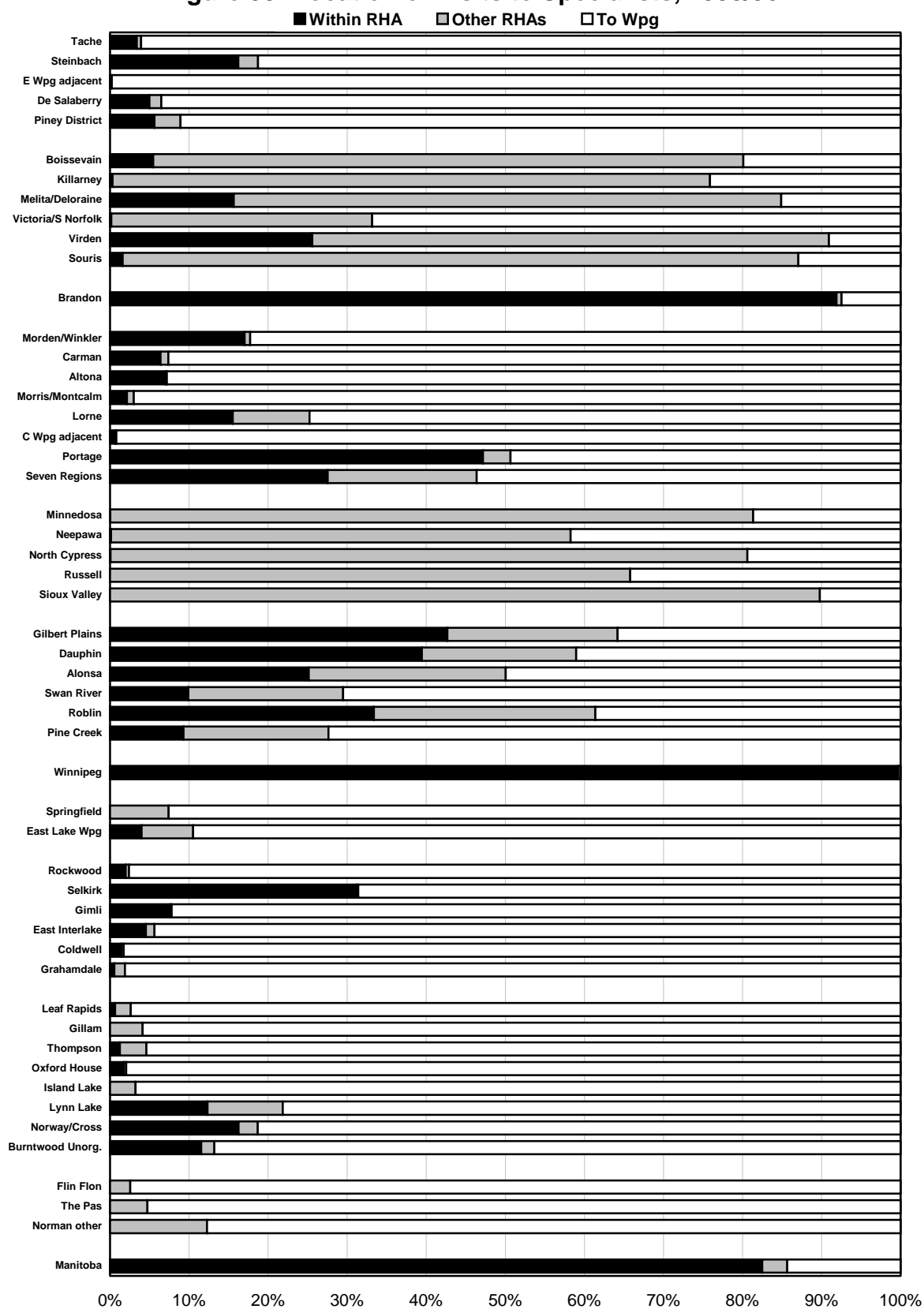
Figures 57 and 58 show where residents of each RHA and PSA received care from Specialists - within their RHA, in another RHA, or in Winnipeg. This illustrates the extent of patient travel for specialist visits.

Figure 57: Location of Visits to Specialists, 1995/96



‡ Physician claims for Churchill residents are not complete.

Figure 58: Location of Visits to Specialists, 1995/96

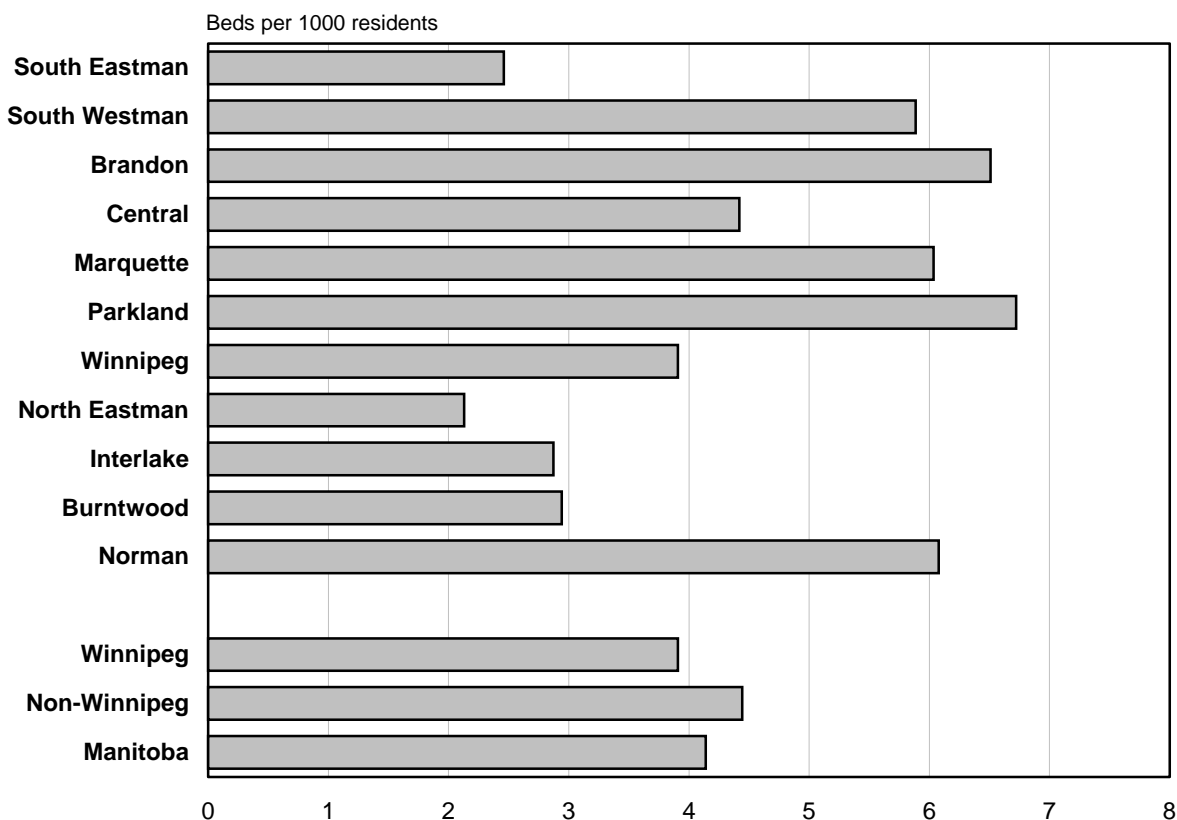


11. USE OF HOSPITAL SERVICES

11.1 In-Area Supply of Hospital Beds

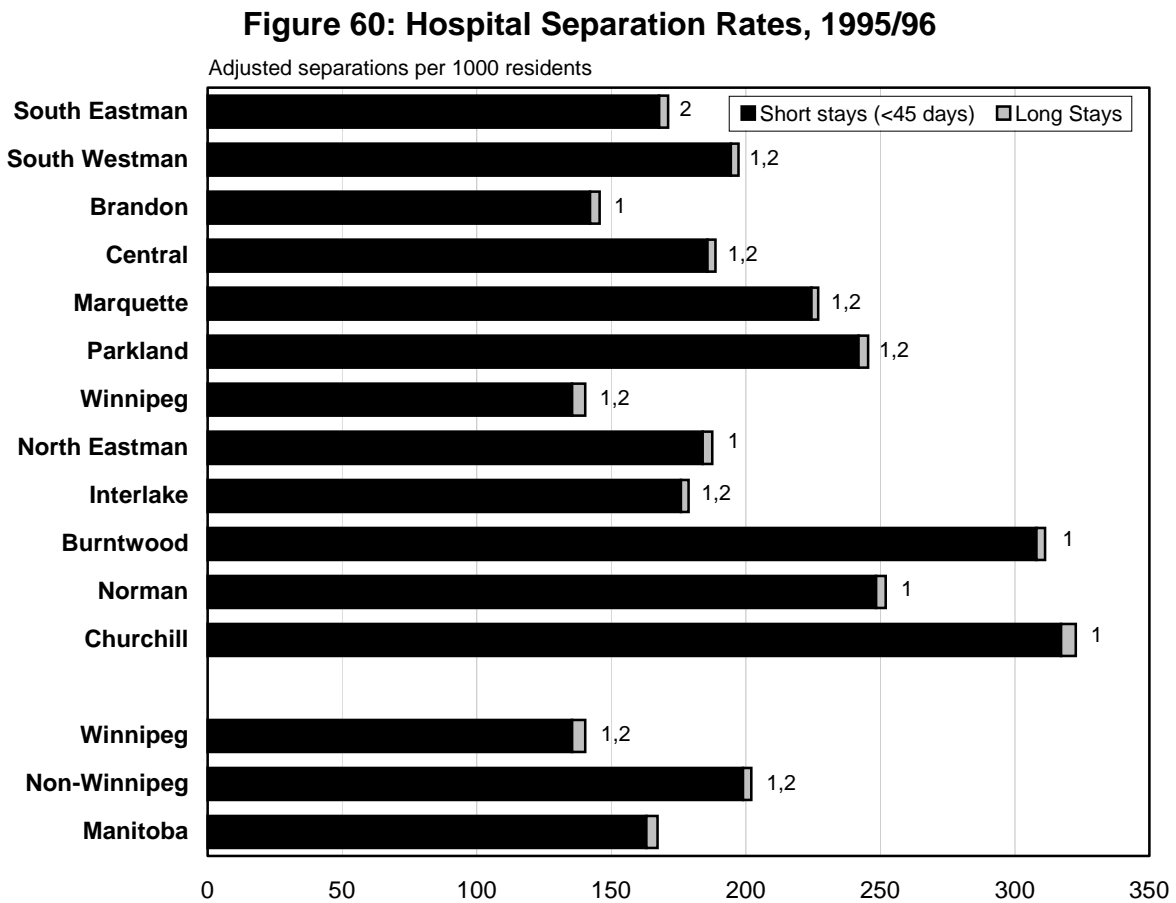
These data illustrate the supply of hospital beds (per 1000 residents) in acute care facilities in each RHA. Bassinets were not included as beds whereas long-term care beds within acute care hospitals were included. These bed supply numbers are simple per-capita values: they have not been age-sex adjusted. Churchill was excluded because its bed supply appears much higher than any other RHA (28.4 per 1000), and is used extensively by Nunavut residents.

Figure 59: Supply of Hospital Beds, 1995/96
(excluding Churchill)



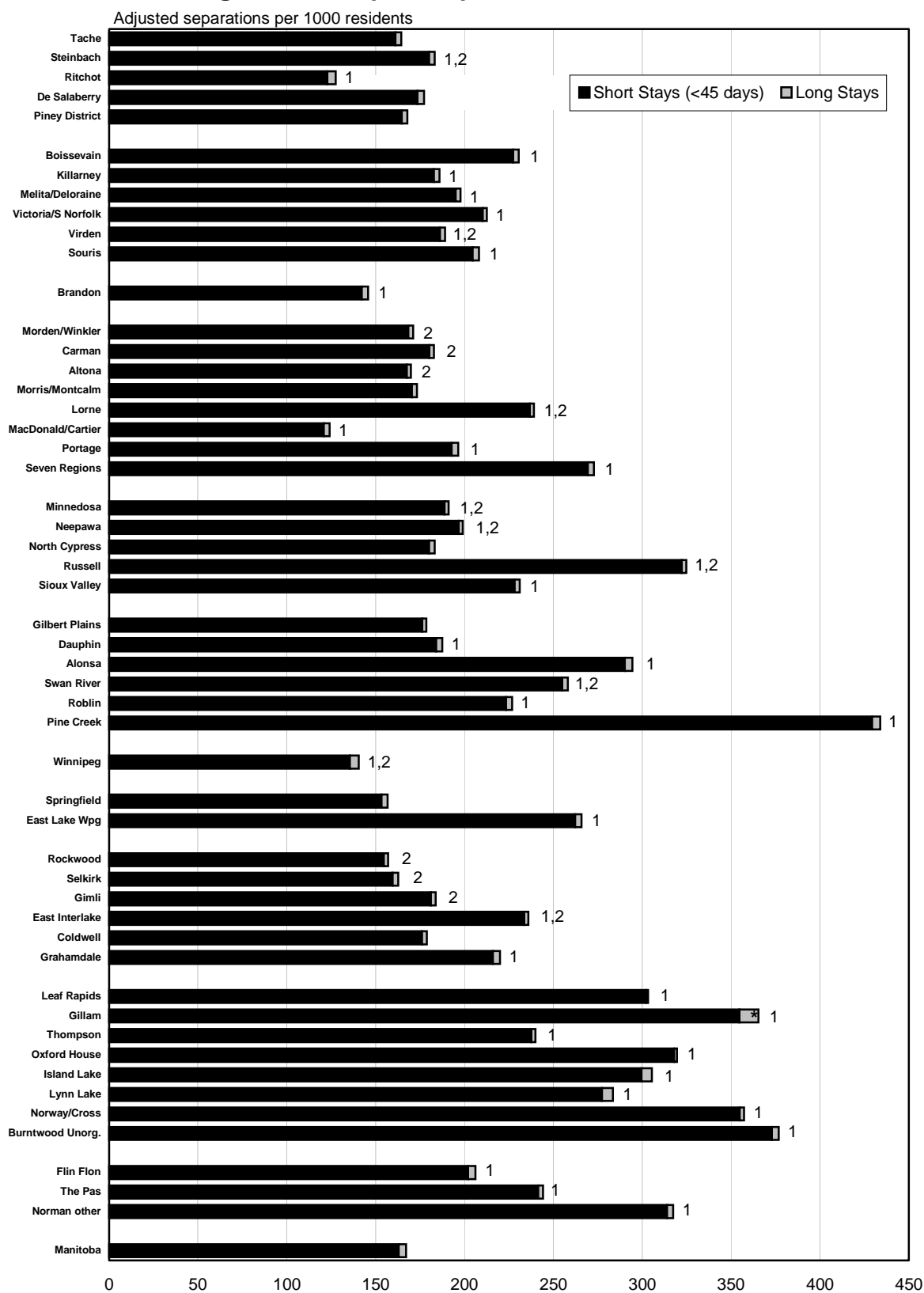
11.2 Hospital Separation Rates

A separation occurs whenever a patient is discharged from a hospital: to home, to another facility, or upon death. Therefore, separation rates indicate how frequently area residents use hospitals. These rates have been age-sex adjusted to account for differences among populations. Hospitalizations are allocated to the area whose residents who are hospitalized, regardless of where the hospitalization occurred. We identify short stays as those of less than 45 days, while stays of 45 days or greater are considered long stays. Since long stays are much less frequent, we averaged the data for three fiscal years to stabilize the long stay rates (1994/95, 1995/96 and 1996/97).



Numbers indicate statistical difference from Manitoba average: '1' for short stay separations; '2' for long stay separations (all lower than Manitoba average except Winnipeg)

Figure 61: Hospital Separation Rates, 1995/96

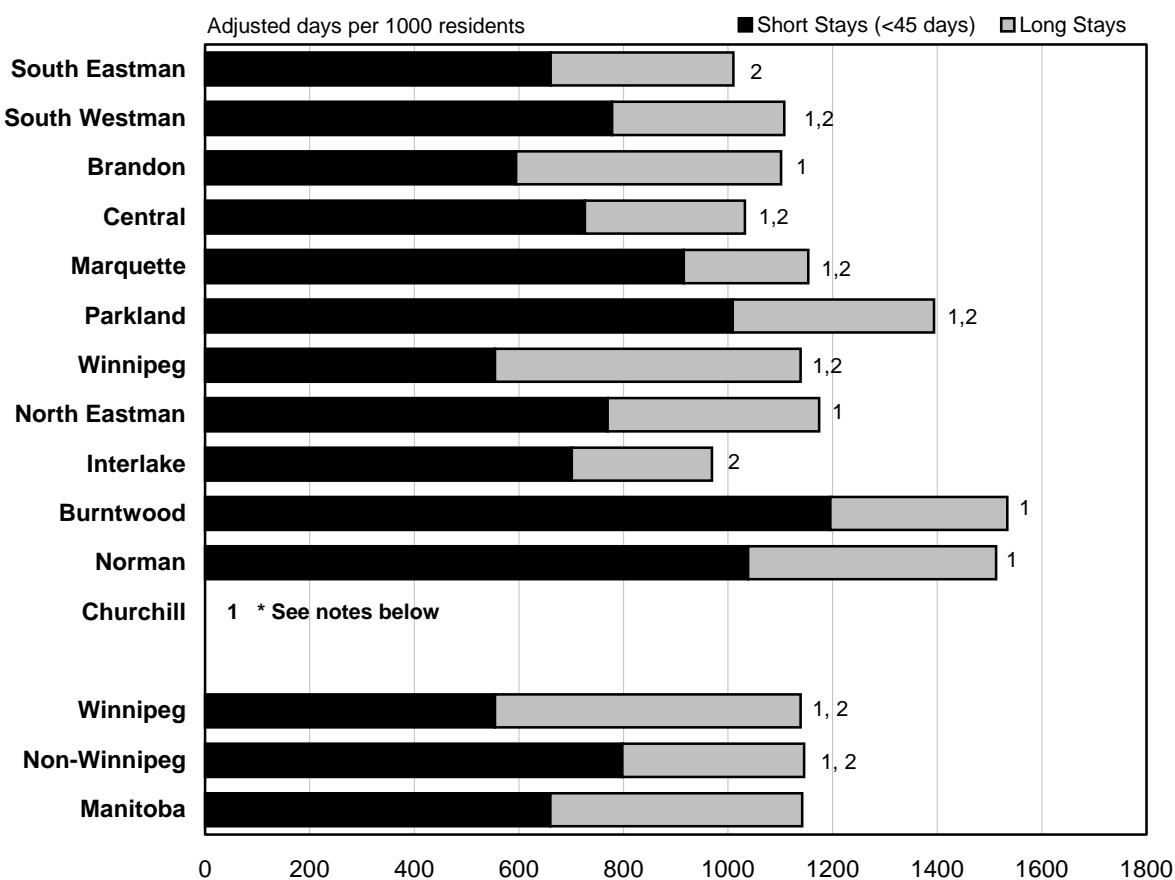


Numbers indicate statistical difference from Manitoba average: '1' for short stay separations; '2' for long stay separations (all lower than Manitoba average except Winnipeg)

11.3 Total Days of Hospital Care

Total days of care includes all inpatient care provided by all hospitals to residents of each RHA (regardless of hospital location). It is a function of the number of admissions and the length of stay of each patient. Again, since long stays are much less frequent, long stay rates are based on three years of data (94/95-96/97). This analysis is based on “In-Year” days (days in hospital during fiscal 1995/96) so each patient’s maximum length of stay is 365 days.

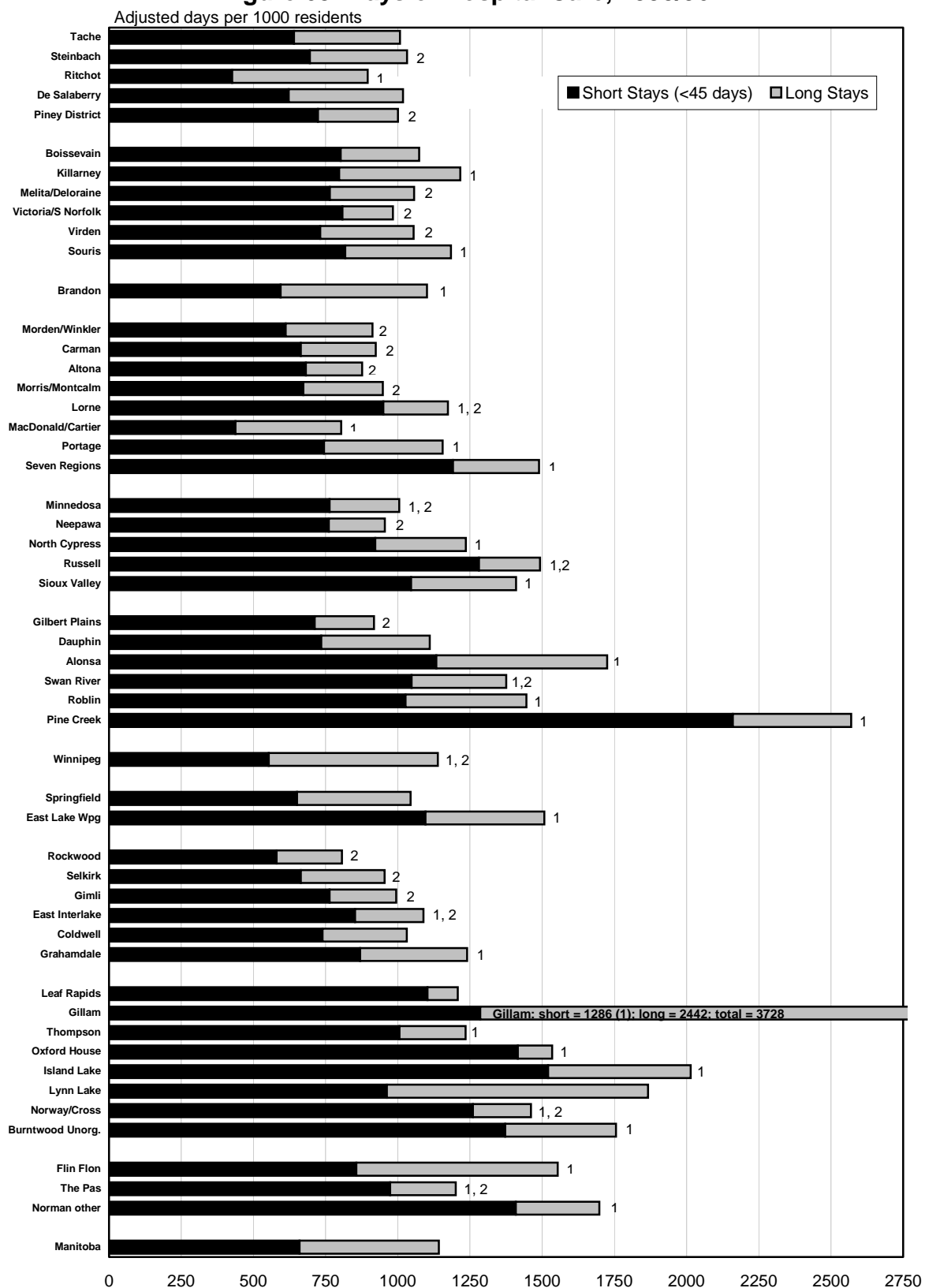
Figure 62: Days of Hospital Care, 1995/96



Numbers indicate statistical difference from Manitoba average: '1' for short stay days; '2' for long stay days (all lower than Manitoba average except Winnipeg)

* Days of care for Churchill residents were: short days

Figure 63: Days of Hospital Care, 1995/96



Numbers indicate statistical difference from Manitoba average: '1' for short stay days; '2' for long stay days (all lower than Manitoba average except Winnipeg)

11.4 Location of Hospitalizations

Figures 60 and 61 illustrate the proportion of hospital separations that occurred within the patient's RHA, in other RHAs, in Winnipeg, or out of province. This gives some indication of how many hospitalizations occurred locally, and how some patients travel beyond their RHA for hospitalization.

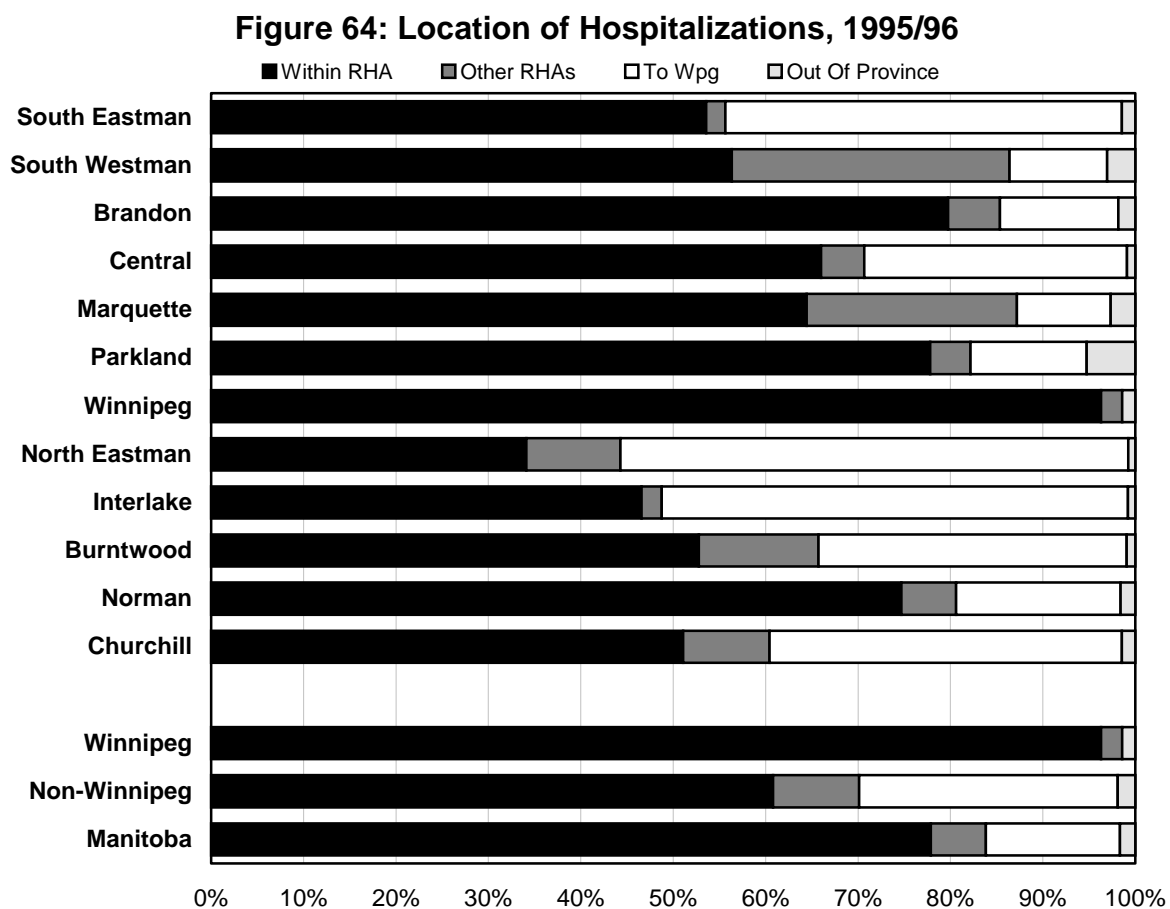
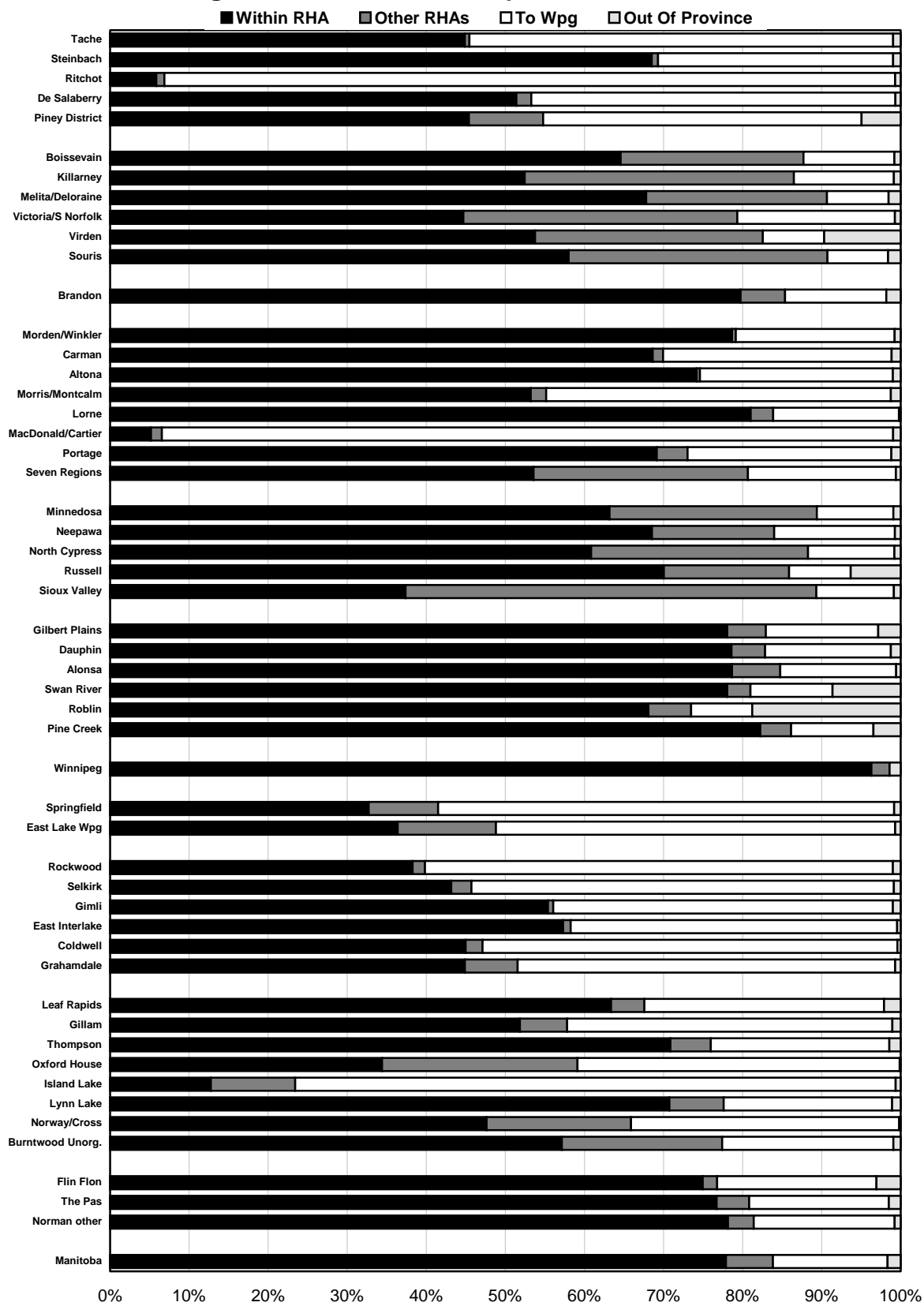


Figure 65: Location of Hospitalizations, 1995/96

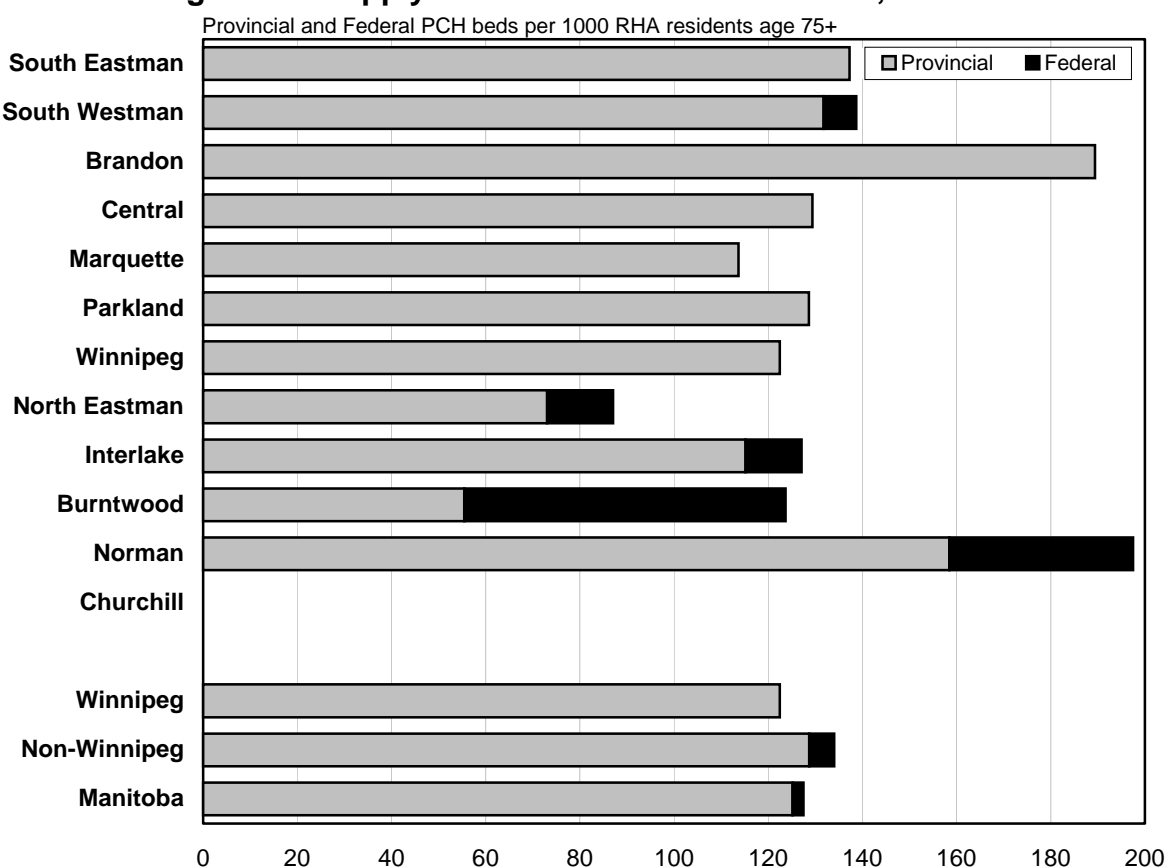


12. USE OF PERSONAL CARE HOMES

12.1 In-Area Personal Care Home (PCH) Beds

These data indicate the total number of beds in all personal care homes (public and proprietary) in 1995/96, expressed as beds per 1000 residents aged 75+. The 165 beds in federal nursing homes (operated by Indian and Northern Affairs) are included in the supply of beds (Figure 66), but not in any utilization figures (67-70) since the Manitoba Health Research Database contains no records of their utilization.

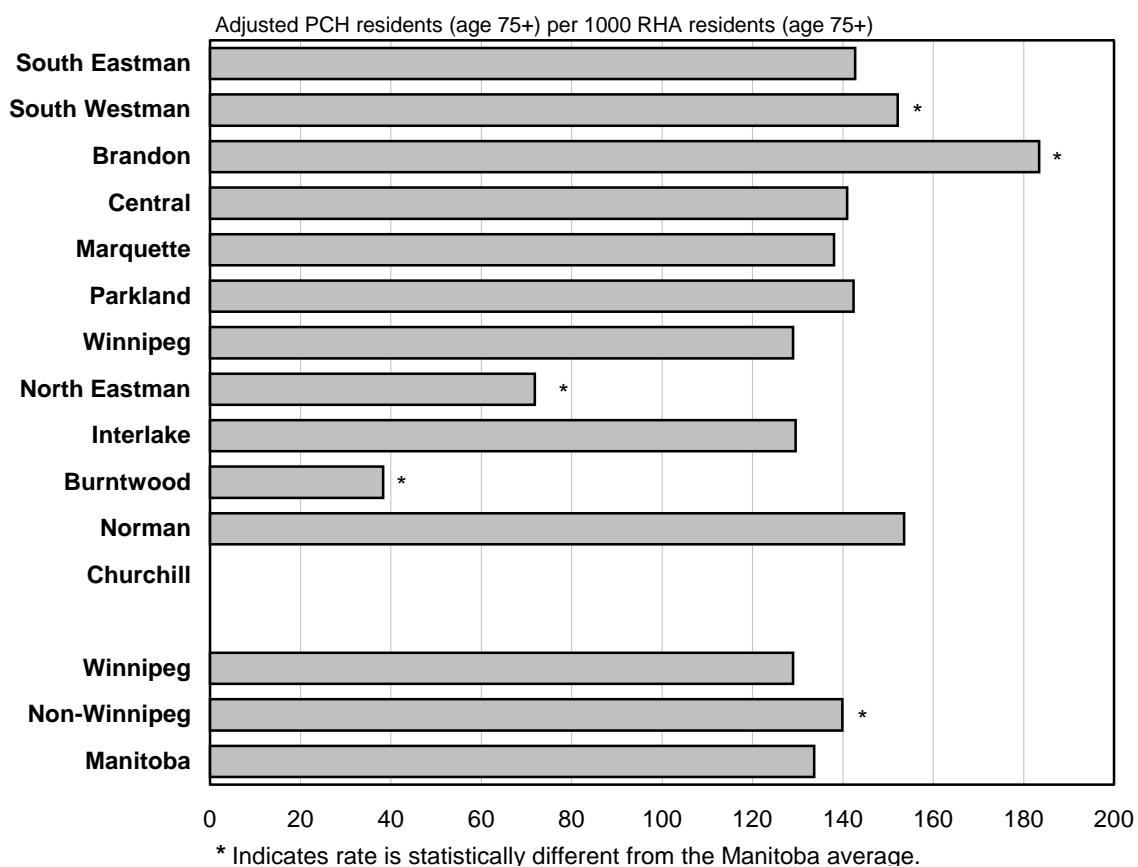
Figure 66: Supply of Personal Care Home Beds, 1995/96



12.2 Personal Care Home (PCH) Residents

A PCH Resident is a person who lived for any portion of fiscal year 1995/96 in any PCH in Manitoba. This graph only represents people aged 75+, so it underestimates the actual numbers of PCH residents. For the percentages of PCH residents who are age 75+, by region, refer to Appendix 1. This does not include information about residents of federal nursing homes.

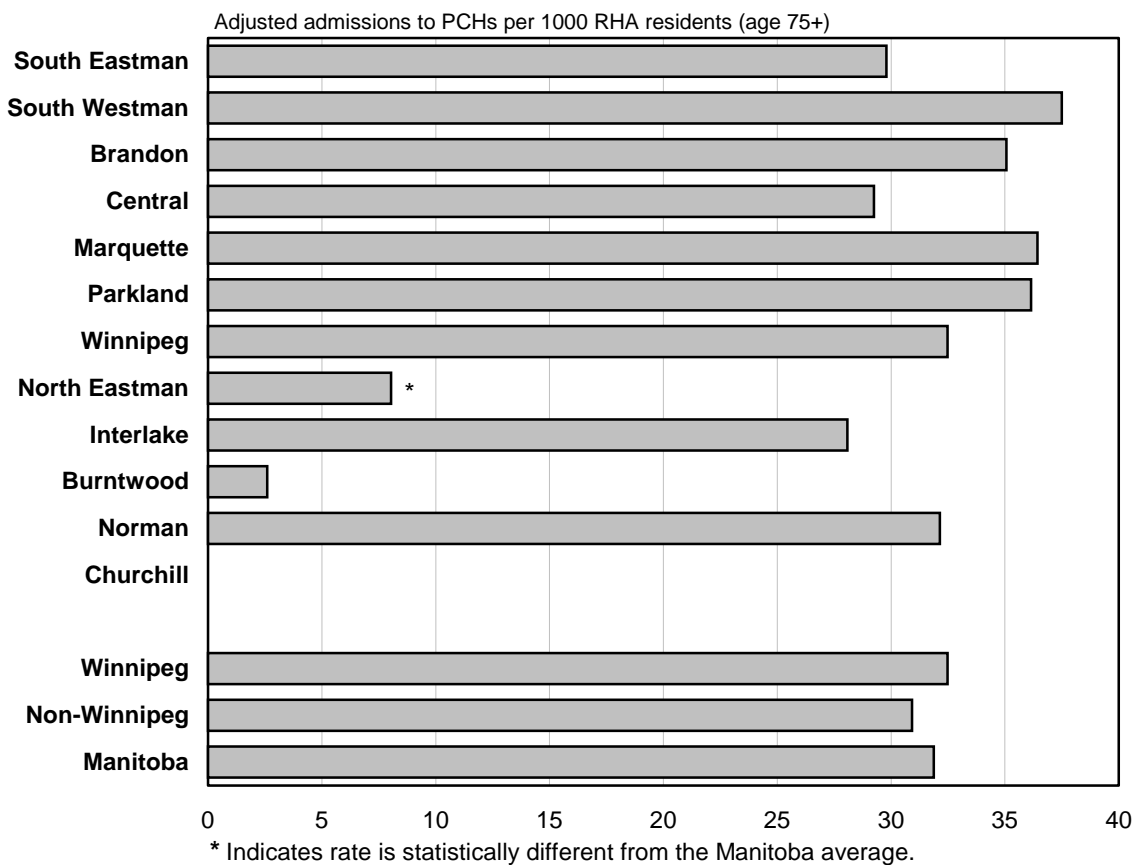
Figure 67: Number of Residents in PCHs, 1995/96



12.3 PCH Admissions

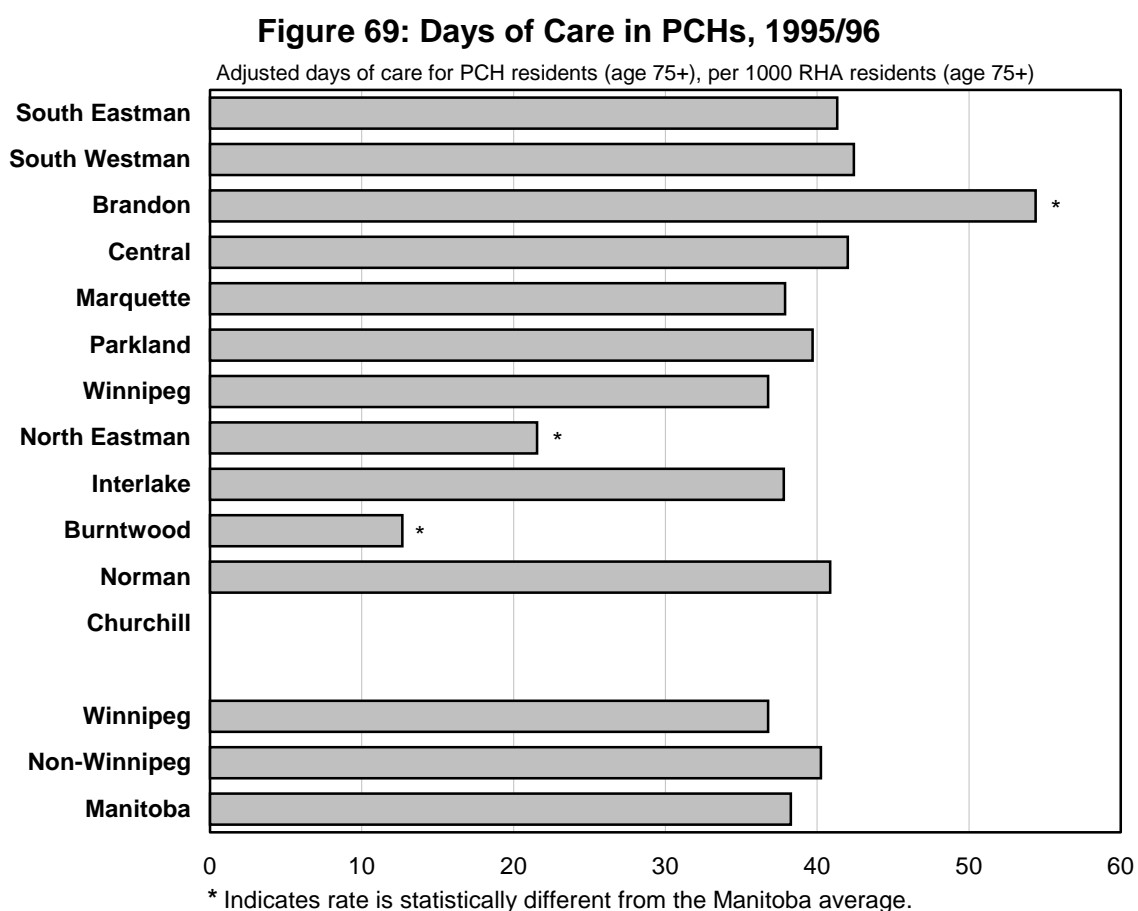
Admissions include all persons aged 75+ who were admitted to any PCH in Manitoba during fiscal year 1995/96. Results do not include information about residents of federal nursing homes.

Figure 68: Number of Admissions to PCHs, 1995/96



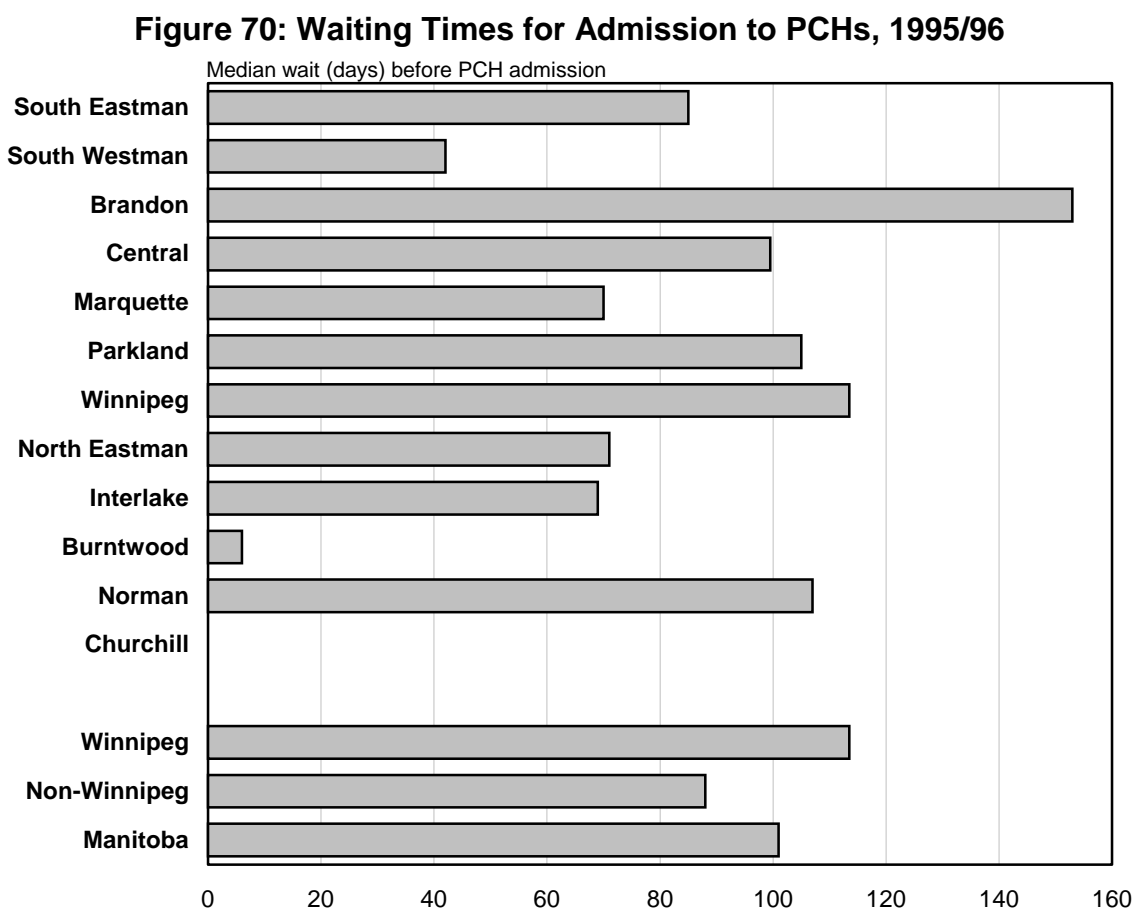
12.4 Days of Care in PCHs

This analysis includes all days of care provided to persons aged 75+ in PCHs in Manitoba anytime during 1995/96. (Often called “In-Year” days because only care provided in 1995/96 is included.) Similar to the previous graph, values do not include information about residents of federal nursing homes.



12.5 Waiting Times for PCH Admission

These values indicate the median waiting times (in days) for PCH admission for persons age 75 or more, in 1995/96. The median is the midpoint: half the people admitted had to wait longer; half shorter. Values do not include information about residents of federal nursing homes.



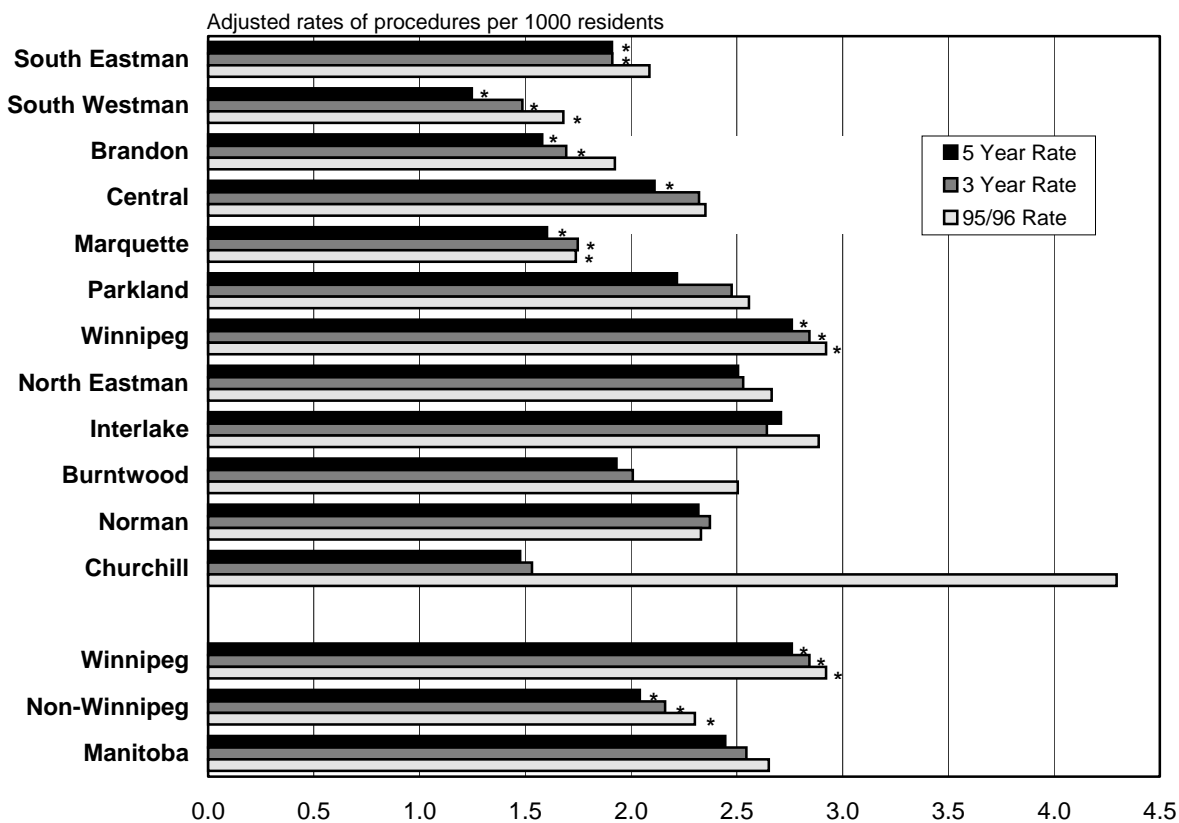
13. ACCESS TO HIGH PROFILE PROCEDURES

High Profile Procedure Graphs

Several procedures have been chosen as “high profile” because they are frequently cited in press and media reports and maintain familiarity with the public. These include cardiac catheterizations, coronary artery bypass surgery, angioplasty, hip and knee replacements, cataract surgery, and prostatectomy. The graphs show the procedure rates by RHA, including 1, 3, and 5-year rates which help ensure stability and show trends in rates over time.

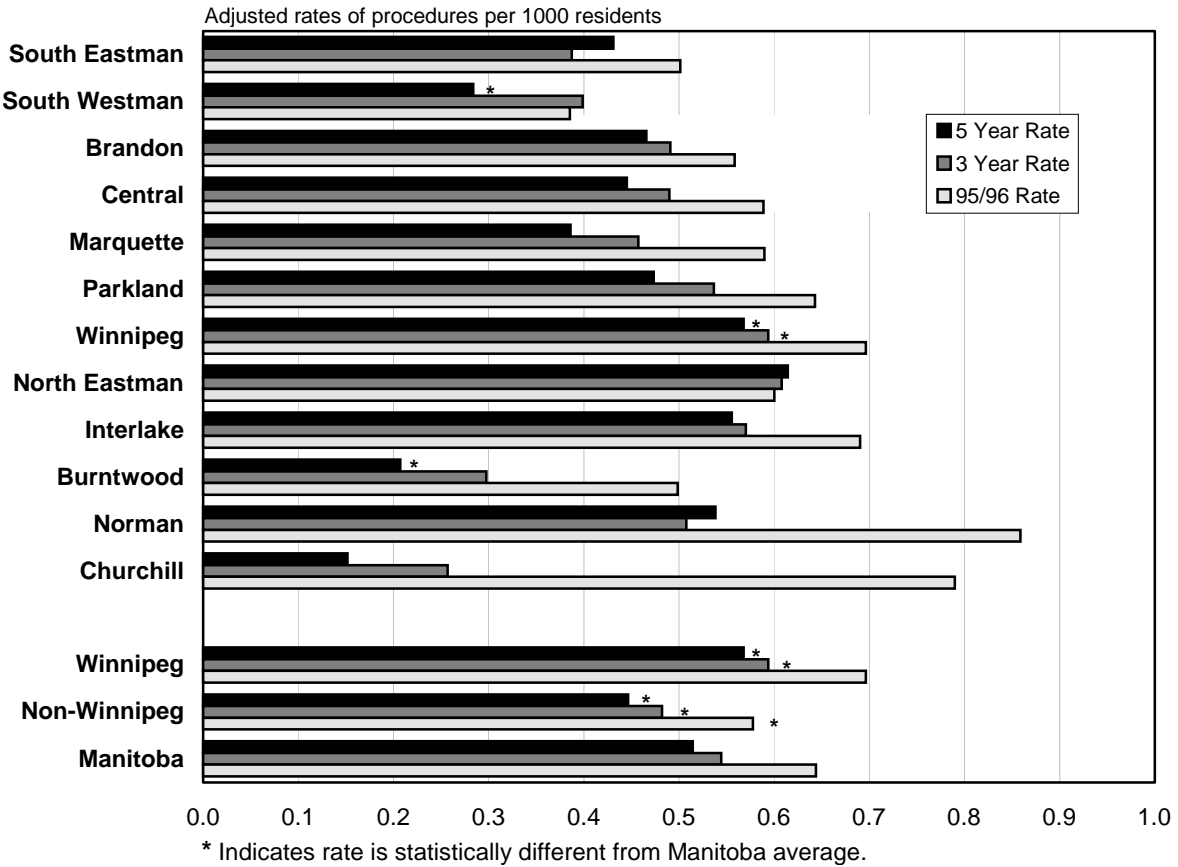
Cardiac Catheterization

Figure 71: Cardiac Catheterization Rates, 1991-95



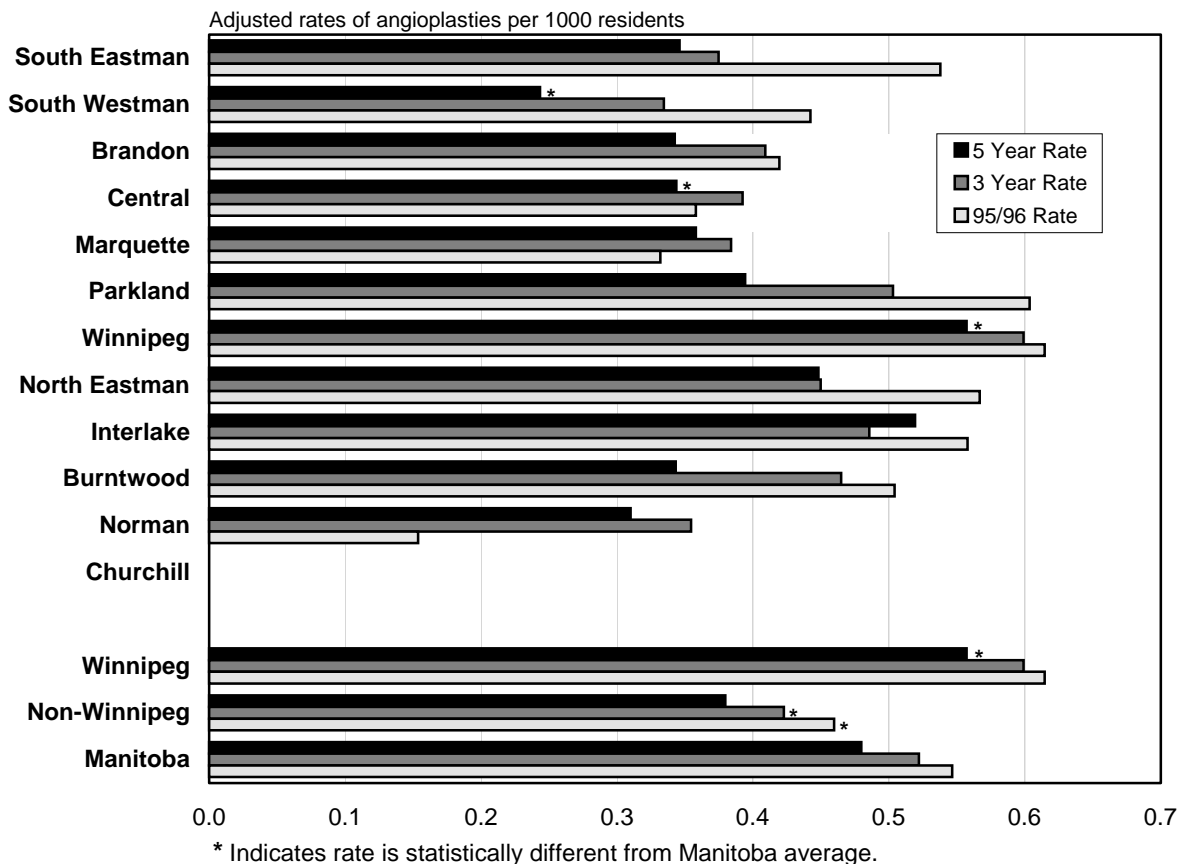
Coronary Artery Bypass Surgery

Figure 72: Coronary Artery Bypass Surgery Rates, 1991-95



Angioplasty

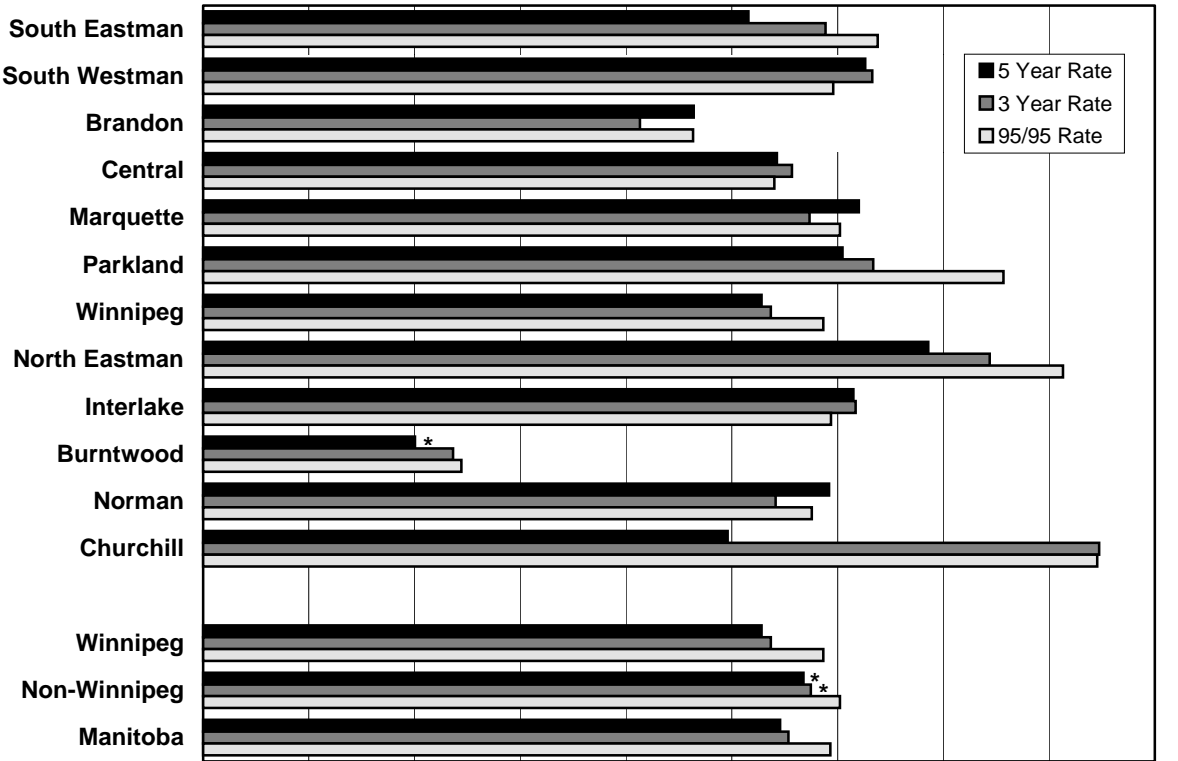
Figure 73: Angioplasty Rates, 1991-95



Total Hip Replacement

Figure 74: Total Hip Replacement Rates, 1991-95

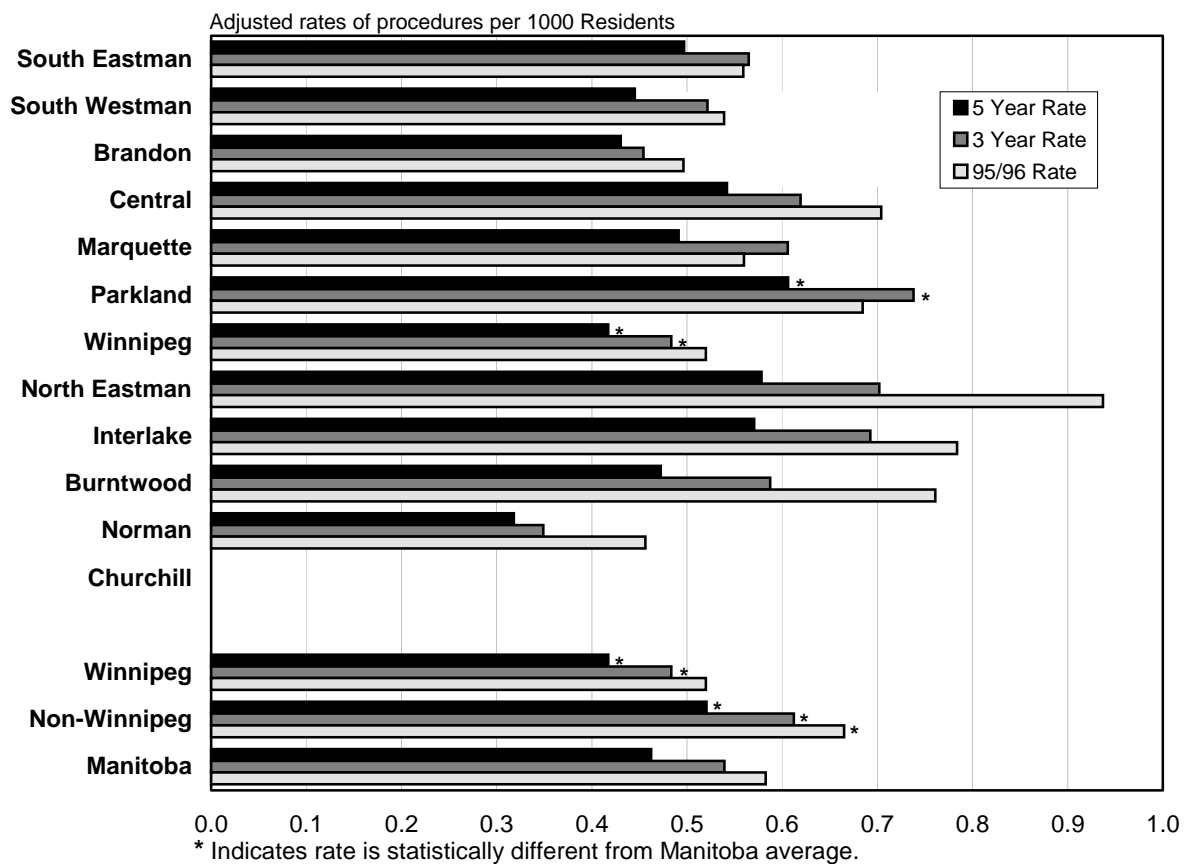
Adjusted rates of procedures per 1000 residents



* Indicates rate is statistically different from Manitoba average.

Total Knee Replacement

Figure 75: Total Knee Replacement Rates, 1991-95



Cataract Surgery

Figure 76: Cataract Surgery Rates, 1991-95
(Excluding Churchill)

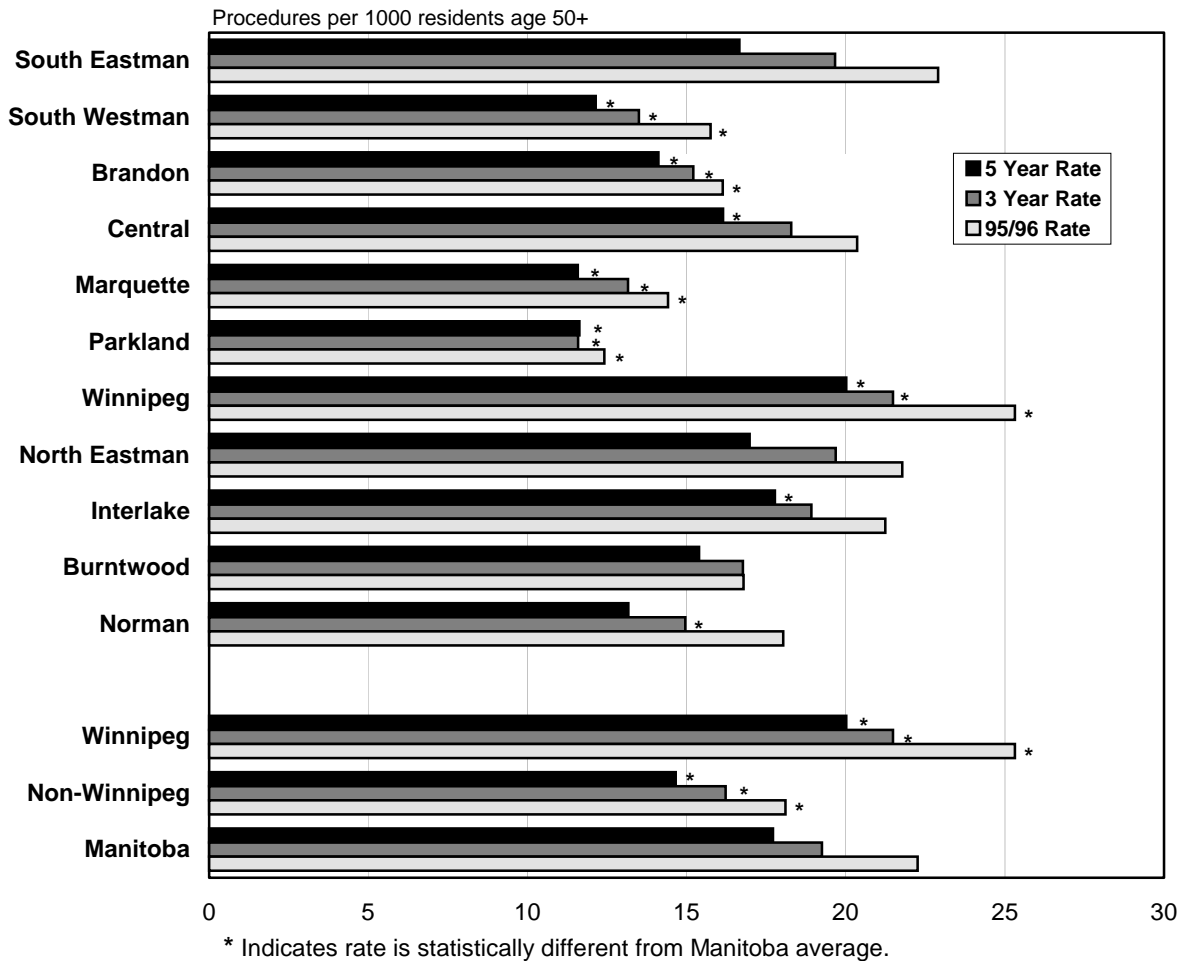
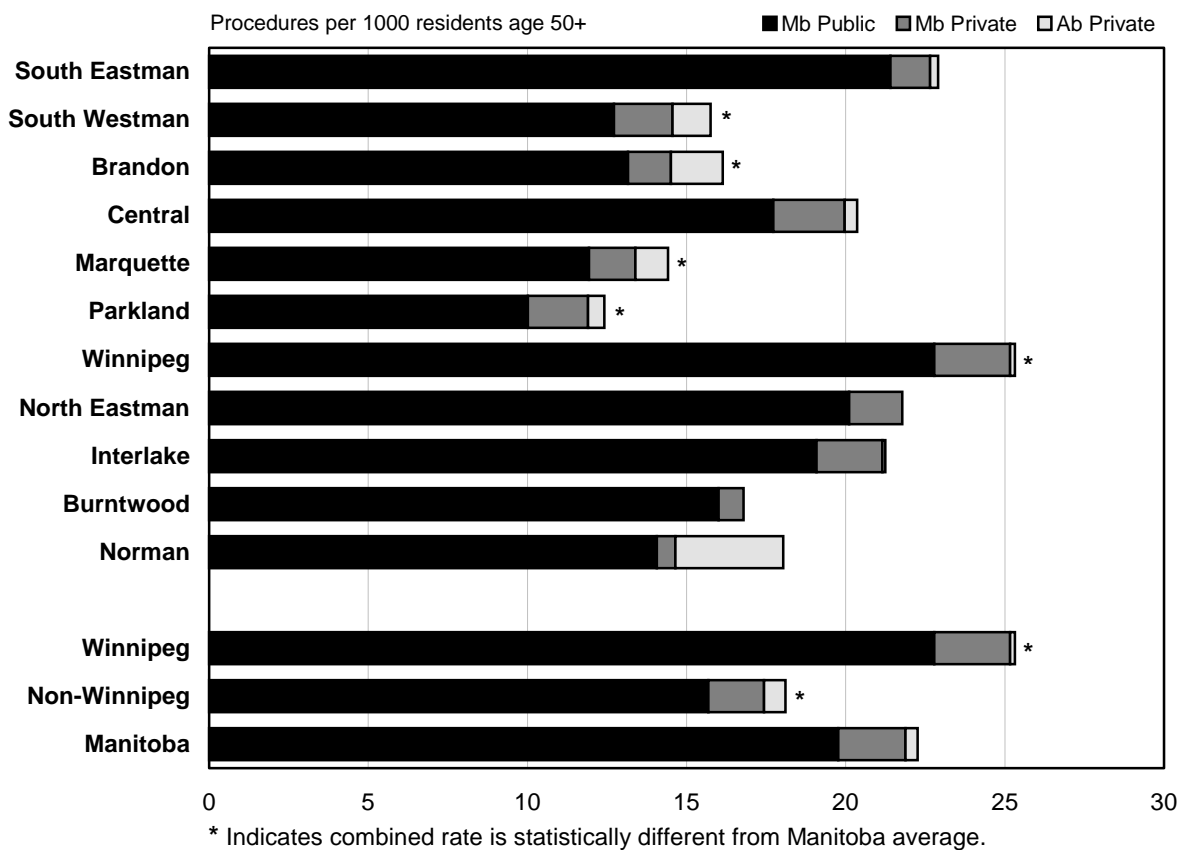


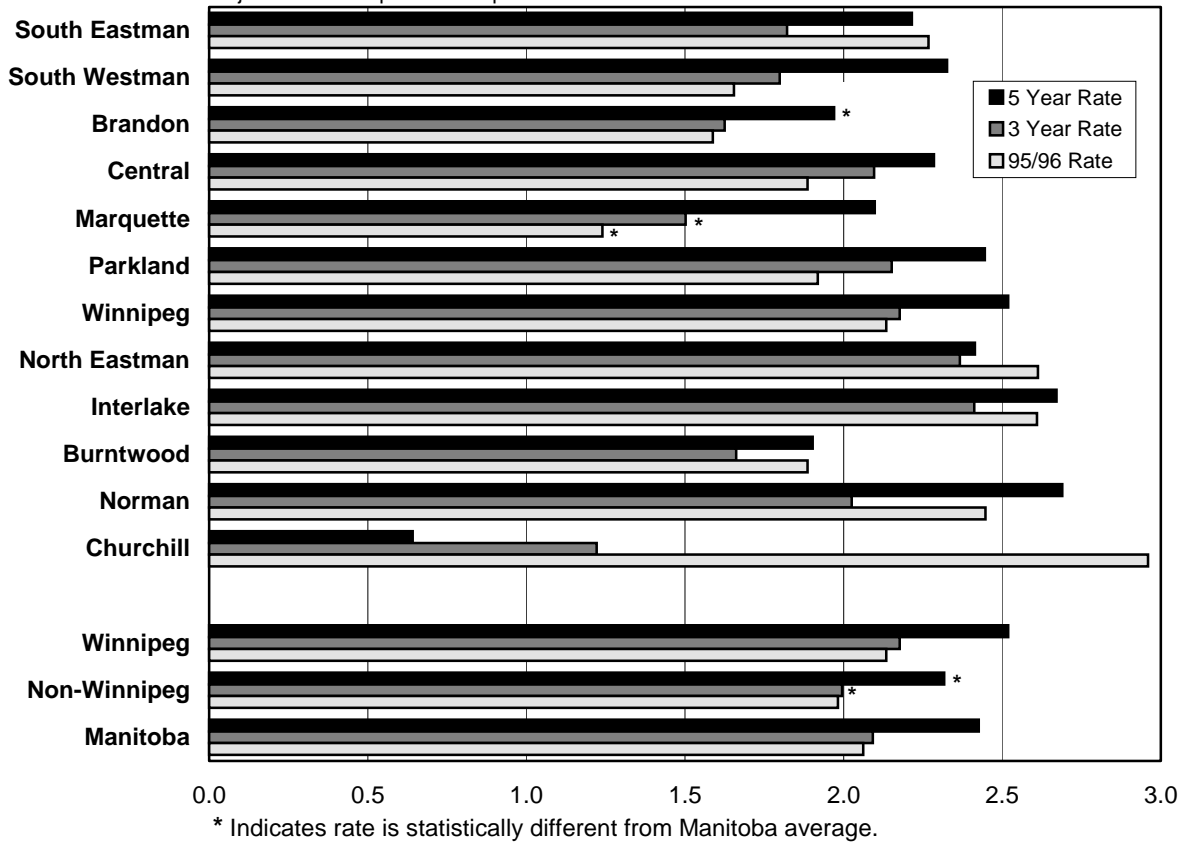
Figure 77: Cataract Surgery Rates, by Facility Type, 1995/96
 (Excluding Churchill)



Prostatectomy

Figure 78: Prostatectomy Rates, 1991-95

Adjusted rates of procedures per 1000 male residents



14. RATES OF USE OF “DISCRETIONARY” PROCEDURES

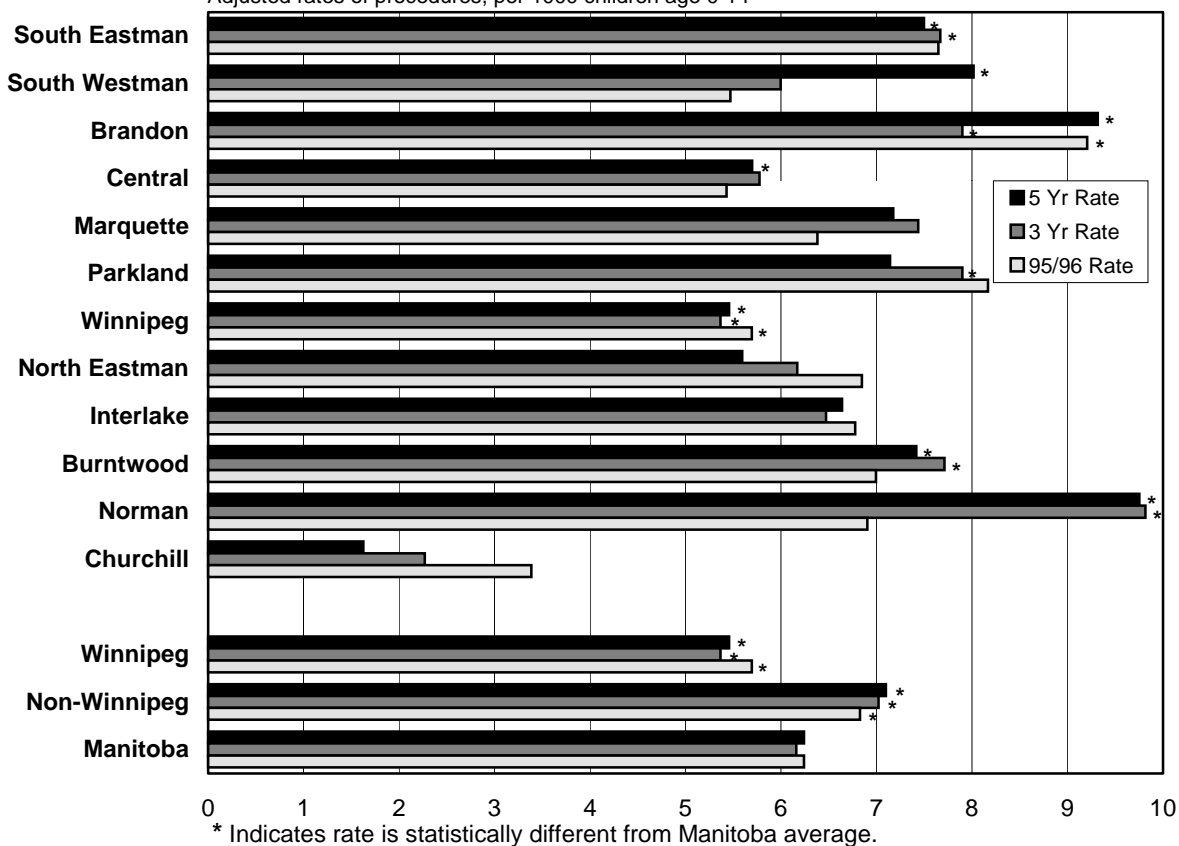
Discretionary Procedures Graphs

Several procedures have been considered “discretionary” because practice patterns vary markedly among physicians. These include tonsillectomy/adenoidectomy, Caesarian Sections, and hysterectomy. Procedure rates may change due to changing understanding about indications for, and benefits of, the procedure. The graphs show the procedure rates by RHA, including 1, 3, and 5-year rates which help ensure stability and show trends in rates over time.

Tonsillectomy /Adenoidectomy

Figure 79: Tonsillectomy or Adenoidectomy Rates, 1991-95

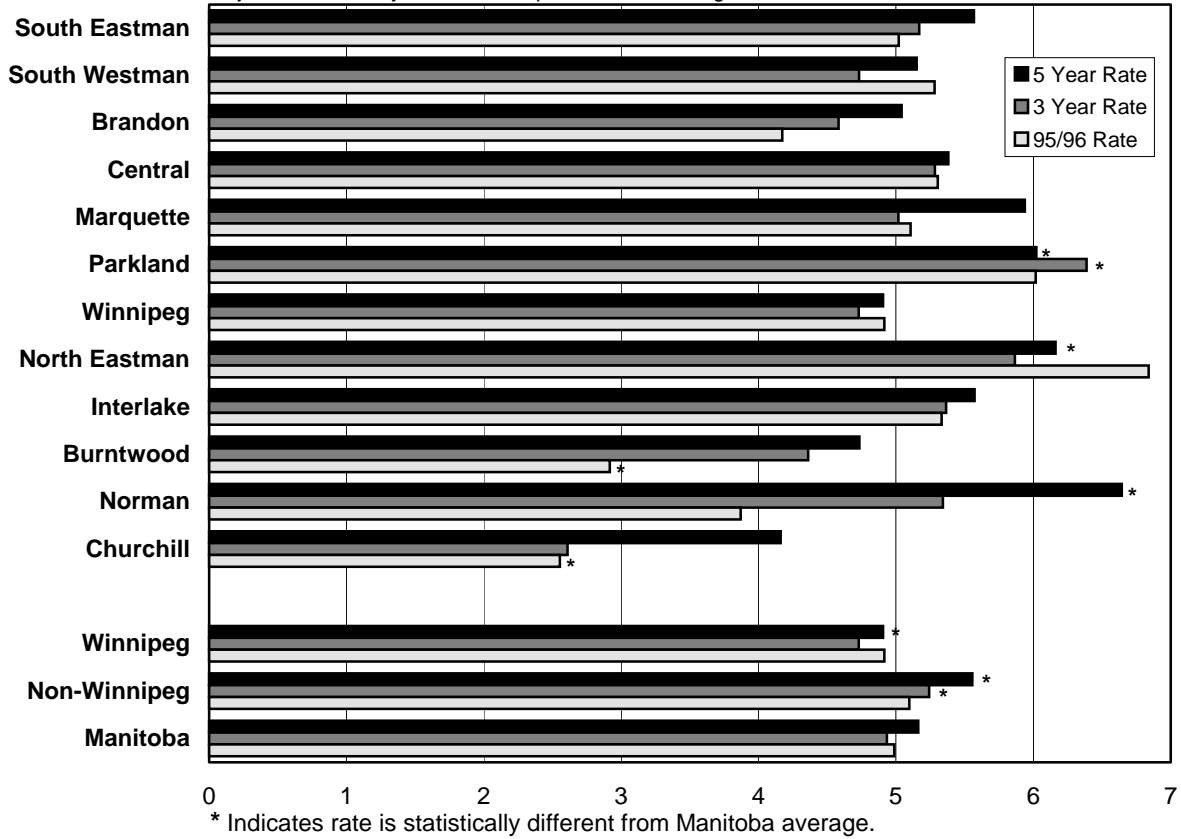
Adjusted rates of procedures, per 1000 children age 0-14



Hysterectomy

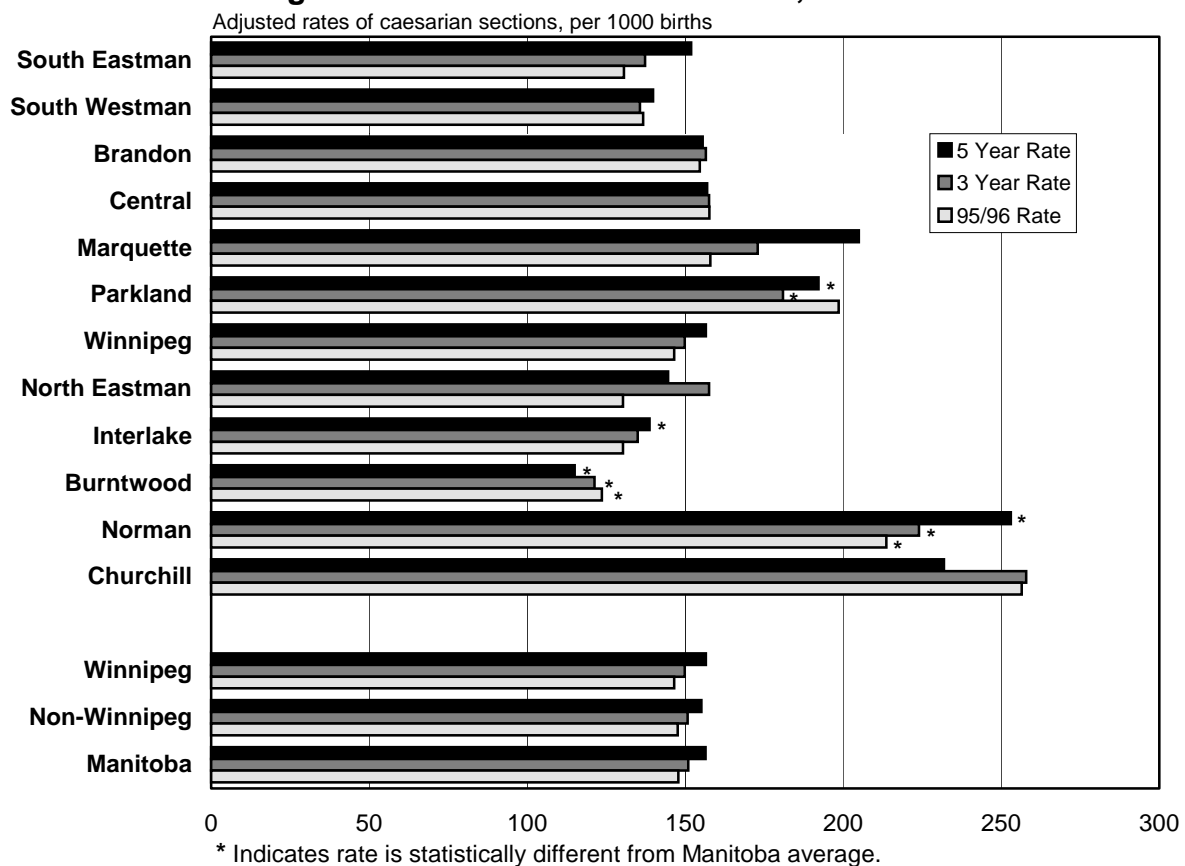
Figure 80: Hysterectomy Rates, 1991-95

Adjusted rates of hysterectomies, per 1000 women age 25+



Caesarian Section

Figure 81: Caesarian Section Rates, 1991-95



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APPENDIX 1: METHODS

Residents Included

All residents of Manitoba, including Treaty First Nations residents, were included in the study. However, approximately 30-40% of Treaty First Nations residents are not identified as such in our database, so our analyses underestimate the number of Treaty First Nations residents in all regions.

Level of Aggregation

All analyses were carried out at the Regional Health Authority (RHA) level; most were also carried out at the smaller Physician Service Area (PSA) level. Winnipeg is treated as a single entity throughout.

Study Period

Most analyses in this report used data from fiscal year 1995/96. However, for some analyses, we had to combine data over several years to get stable, reliable results for all RHAs (though Churchill has such a small population that some of its results remain unstable).

Region of Residence

Location of residence for each person was determined by Manitoba municipal code except for Treaty First Nations residents, whose residence was assigned on the basis of postal code, to more accurately locate those not living in the First Nations community to which they are registered “living off-reserve”.

Calculation of rates

Our analyses calculate population-based rates that reflect the use of all residents of each region, regardless of where the services were delivered. For example, if a resident of South

Westman visits a specialist in Winnipeg, that visit is counted in the rate for South Westman residents.

Age and Sex Standardization

Most analyses use the direct method of standardization to adjust for differences in the age and gender composition of regional populations. This allows a valid comparison of rates across all regions, even though some have younger populations than others. A standardized rate reflects what a region's rate would have been if it had the same population structure as the whole province.

Socio-Economic Risk Index (SERI)

The SERI is a composite index of six measures of socio-economic status that mark environmental, household, and individual conditions which put residents of a particular area at risk for poor health, and hence are associated with higher need for health care. The following six variables were chosen (from a pool of 23) for their strong relationship to health status and utilization of health care resources:

1. The percentage of people aged 15 to 24 who are unemployed.
2. The percentage of people aged 45 to 54 who are unemployed.
3. The percentage of families headed by single females.
4. The percentage of people aged 25 to 34 who completed high school.
5. The percentage of females participating in the labour force.
6. The average dwelling value.

The first three variables are negatively related to health status (high values being associated with poor health), while the last three are positively related to health status. SERI values were calculated for each Physician Service Area (PSA) on a standardized scale, with the provincial average corresponding to a SERI value of 0. Low (and negative) values represent areas at lower risk, while higher values represent areas at higher risk. For a thorough explanation and discussion of the SERI, see Mustard and Frohlich (1995).

Premature Mortality

The Premature Mortality rate (reflecting deaths among individuals aged 0-74) has been suggested as the best single indicator of health status capturing the need for health care (Carstairs and Morris 1991; Eyles et al. 1991). It is currently used in the British formula for allocation of funds from the Department of Health to regional health authorities. It is strongly associated with most of the self-reported health status indicators and physical measures used in the Health and Lifestyle Survey, including self-assessed health, number of symptoms, self-reported rheumatism and temporary sickness (Mays et al. 1992). That is, populations which have higher premature mortality rates are also more likely to report their health to be poor, to report a higher number of symptoms and to report being sick more often. We used 5 years of data (1991 through 1995) to ensure stability of rates for all RHAs.

Life Expectancy at Birth

Average expected years of life assuming that recent age-specific mortality rates remain stable.

Cancer Incidence

This analysis presents the cancer incidence rate (the rate of new cases of cancer being diagnosed) based on data from the Manitoba Cancer Treatment and Research Foundation Registry. Non-malignant skin cancers were excluded. Cancer is a legally notifiable disease, and the registry is generally credited with having high quality data. To ensure stability of rates, RHA level analyses used data from 1991 through 1995, while PSA level analyses required 10 years of data (1986-1995).

Childhood Immunization Rates

Immunizations include those given by physician and nurse providers. But there may be missing information from Medical Services Branch providers to First Nations communities. Therefore the immunization rates may underestimate true immunization rates for First Nations residents residing in First Nations communities.

Screening Mammography

These charts are meant to indicate the rate of screening tests done for breast cancer detection. The rates indicate the proportion of women in the target age range (50-69) who had at least one mammogram in the two-year period 1995/96-1996/97. Data were combined from the Manitoba Breast Screening Program and regular physician claims.

Diabetes Treatment Prevalence

For this analysis, a diabetic was defined as any adult (aged 20-79) having at least one physician claim for diabetes in three fiscal years (1993/94 through 1995/96). This definition was chosen among several for its ability to closely match clinical measures and survey results (Robinson et al, 1997).

Hypertension Treatment Prevalence

This analysis was done to assess the prevalence of hypertension (high blood pressure) among adults aged 25 and over. A person was defined as hypertensive if they had at least one physician claim for hypertension in three fiscal years (1993/94 through 1995/96). This definition was chosen among several for its ability to closely match clinical measures and survey results (Robinson et al, 1997).

In-Area Supply of Physicians

Physician supply was measured using Full Time Equivalence (FTE) instead of simple headcounts, as the FTE measure can more accurately account for differences in workload (e.g. part time practitioners). For every active civilian physician in Manitoba, an FTE value

was calculated from total 1995/96 billings, using the Health Canada FTE methodology (see Roos et al, 1997 - Specialist Deliverable). Since both patients and physicians show substantial mobility, we use a two-step algorithm to locate each physician's practice and the residents served:

Step 1) For each month of 1995/96, each physician was assigned to the area from which the majority of his/her patients was drawn. This establishes a monthly practice location from a population perspective (not according to the location of the physician's office).

Step 2) Since the number of visits provided may not be the same every month, each physician's total FTE value was allocated among the areas in proportion to the number of visits provided while serving residents from each area. For example, a physician may be assigned to Winnipeg and Thompson for six months each, but if they provided twice as many visits while in Winnipeg, then Winnipeg's supply will be credited with a greater proportion (2/3) of that physician's total FTE value.

Physician Visits

Ambulatory visits to physicians include office visits, consultations, outpatient & emergency room visits, visits to patients in Personal Care Homes, and visits to patients in their own homes. Visits to hospital patients were excluded. Ambulatory care delivered as part of a global tariff, such as for the six-week post-operative care period, were also excluded from this analysis because we do not know how many such visits occur. The biggest exclusion under this rule is for prenatal visits. Since some prenatal visits are also billed fee-for-service, we excluded all prenatal visits from the analyses. We estimate that prenatal visits account for approximately 3% of all ambulatory visits (Tataryn et al., 1994).

Procedure Rates

Rates of two groups of selected interventions and surgical procedures were examined: a group of procedures sometimes considered discretionary (tonsillectomy, hysterectomy, caesarian section) and a group of "high profile" procedures (cardiac catheterization, angioplasty, bypass surgery, hip replacement, knee replacement, prostatectomy, and cataract surgery). All procedures were identified from hospital separation abstracts from 1991/92

through 1995/96. Rates were calculated for 1, 3, and 5 year periods to ensure stability and examine trends in the data. The analyses were performed at the RHA level only, as PSAs contain too few residents/events to provide reliable rates. Most rates are expressed as rates per 1000 RHA residents, except for the following: Prostatectomy: males only; Hysterectomy: females age 25+ only; Cataracts: age 50+ only; Tonsil/Adenoid: age 0-14 only; C-Sections: per 1000 births.

Hospital Separations and Days

These data include all separations (including outpatient surgery) of Manitoba residents from all hospitals in 1995/96 (including out of province hospitals). Stays shorter than 45 days are considered Short Stays; those 45 days or longer are Long Stays. Total days of stay were also counted for all patients. The analyses for long stays were taken to represent Long Term Care, so we focussed on patients aged 75 and older.

Personal Care Home (PCH) use: Residents, Admissions, Waiting Times, Days

PCH residents are people who lived in a personal care home in Manitoba during 1995/96. Admissions are only those admitted to a PCH in Manitoba during 1995/96. Waiting times indicate the median waiting time for admission to a PCH. Days are the total number of days occupied by residents of PCHs in 1995/96. For the purposes of this report, federal PCH residents are not included, except in the supply of PCH beds (Figure 66).

Analyses for PCH utilization focussed on those aged 75 or more, as they are the primary users. This means some PCH residents were not included (n=1556 excluded from total of 11070). Only residents receiving care at levels 1-4 were included (levels 5-8 were excluded). We examined the use of levels 1-4, 5-8, and 1-8 separately, and found that levels 5-8 had very low utilization. The analyses using levels 1-8 were virtually identical to those using levels 1-4. Therefore, we chose to exclude levels 5-8, as they can be used to help support elderly persons and their families by keeping elderly persons in the community longer (i.e. not “truly” residents of the PCH).

The percentages of persons in PCHs by age categories are given below. The data used in this report only includes persons age 75 or more.

REGION	AGE CATEGORY OF PERSONS IN PCH		
	0-64 years	65-74 years	75 or more years old
South Eastman	3%	14%	83%
South Westman	2%	8%	90%
Brandon	6%	14%	80%
Central	3%	8%	89%
Marquette	2%	7%	91%
Parkland	4%	7%	89%
Winnipeg	4%	11%	85%
North Eastman	5%	14%	81%
Interlake	3%	9%	88%
Burntwood	7%	32%	61%
Norman	6%	16%	78%

APPENDIX 2: CRUDE RATES

1995/96 Populations by RHA and Age

Age Groups	0-4	5-14	15-44	45-64	65-74	75+	Total
South Eastman	4,025	8,984	23,270	9,364	3,126	2,433	51,202
South Westman	2,222	5,341	13,904	7,544	3,577	3,605	36,193
Brandon	3,123	6,884	20,533	8,754	3,499	3,141	45,934
Central	7,598	16,103	41,294	17,409	7,048	6,508	95,960
Marquette	2,324	5,465	14,648	7,822	3,786	3,729	37,774
Parkland	2,823	6,424	17,009	9,078	4,319	4,236	43,889
Winnipeg	43,642	85,041	297,629	130,830	48,073	39,966	645,181
North Eastman	2,859	5,985	16,199	8,134	2,588	1,780	37,545
Interlake	4,902	11,007	31,130	16,156	5,511	4,376	73,082
Burntwood	5,782	9,893	21,528	6,032	831	469	44,535
Norman	2,145	4,115	11,414	4,318	1,075	795	23,862
Churchill	115	172	572	181	35	17	1,092
Non-Winnipeg Manitoba	37,918 81,560	80,373 165,414	211,501 509,130	94,792 225,622	35,395 83,468	31,089 71,055	491,068 1,136,249
Percentage	0-4	5-14	15-44	45-64	65-74	75+	% Treaty Indians *
South Eastman	7.9%	17.5%	45.4%	18.3%	6.1%	4.8%	0.3%
South Westman	6.1%	14.8%	38.4%	20.8%	9.9%	10.0%	1.3%
Brandon	6.8%	15.0%	44.7%	19.1%	7.6%	6.8%	3.0%
Central	7.9%	16.8%	43.0%	18.1%	7.3%	6.8%	4.7%
Marquette	6.2%	14.5%	38.8%	20.7%	10.0%	9.9%	7.0%
Parkland	6.4%	14.6%	38.8%	20.7%	9.8%	9.7%	7.0%
Winnipeg	6.8%	13.2%	46.1%	20.3%	7.5%	6.2%	2.2%
North Eastman	7.6%	15.9%	43.1%	21.7%	6.9%	4.7%	13.9%
Interlake	6.7%	15.1%	42.6%	22.1%	7.5%	6.0%	8.1%
Burntwood	13.0%	22.2%	48.3%	13.5%	1.9%	1.1%	52.1%
Norman	9.0%	17.2%	47.8%	18.1%	4.5%	3.3%	15.6%
Churchill	10.5%	15.8%	52.4%	16.6%	3.2%	1.6%	13.7%
Non-Winnipeg Manitoba	7.7% 7.2%	16.4% 14.6%	43.1% 44.8%	19.3% 19.9%	7.2% 7.3%	6.3% 6.3%	 5.7%

* Between 30% and 35% of Treaty Indians are not identified as such in our database
Therefore, these percentages under-estimate the actual figures.

Health & Disease Indicators

Crude Rates of Diseases

	95/96 Population	Premature Mortality	<i>SERI</i>	<i>Diabetes</i>	<i>Hypertension</i>	<i>Cancer</i>
South Eastman	51202	2.60	0.11	41.7	165.0	4.0
South Westman	36193	3.78	0.08	60.8	213.6	6.8
Brandon	45934	3.03	-0.27	51.1	176.7	5.5
Central	95960	3.36	0.10	49.9	190.2	5.1
Marquette	37774	4.35	0.33	66.8	232.2	6.8
Parkland	43889	4.47	0.69	78.2	230.2	6.3
Winnipeg	645181	3.53	-0.29	53.6	190.7	5.2
North Eastman	37545	3.65	0.19	68.5	196.7	4.7
Interlake	73082	4.14	0.16	64.8	209.6	5.8
Burntwood	44535	2.95	1.70	86.3	142.8	2.1
Norman	23862	4.00	0.72	77.2	147.6	3.9
Churchill	1092	4.29	0.63	71.1	30.3	3.6
Winnipeg	645181	3.53	-0.29	53.6	190.7	5.2
Non-Winnipeg	491068	3.59	0.33	61.9	193.4	5.1
Manitoba	1136249	3.56	0	57.0	191.8	5.2

See Methods Appendix for denominators.

Physician Supply & Use Data

	Supply of Physicians Full-time Equivalents						Visits to Physicians Crude Rates		
	GPs #FTE	Spec #FTE	Total	GPs /1000	Spec /1000	Total /1000	Reg. Visits /1000	Consult /1000	Total /1000
South Eastman	28.8	2.8	31.6	0.56	0.05	0.62	3675	186	3861
South Westman	27.3	1.2	28.5	0.75	0.03	0.79	4170	170	4340
Brandon	36.6	34.3	70.9	0.80	0.75	1.54	4696	218	4914
Central	61.4	5.0	66.4	0.64	0.05	0.69	3797	151	3948
Marquette	33.7	0.6	34.3	0.89	0.02	0.91	4678	168	4846
Parkland	43.2	3.1	46.2	0.98	0.07	1.05	4442	180	4622
Winnipeg	453.9	585.5	1039.4	0.70	0.91	1.61	4790	247	5037
North Eastman	20.5	0.2	20.7	0.55	0.00	0.55	4237	196	4433
Interlake	41.0	4.3	45.3	0.56	0.06	0.62	4081	204	4285
Burntwood	30.7	0.5	31.2	0.69	0.01	0.70	3390	157	3547
Norman	21.9	0.0	22.0	0.92	0.00	0.92	4300	146	4447
Churchill	1.0	0.1	1.1	0.92	0.11	1.02	1140	74	1214
Winnipeg	453.9	585.5	1039.4	0.70	0.91	1.61	4790	247	5037
Non-Winnipeg	346.0	52.1	398.1	0.70	0.11	0.81	4079	178	4257
Manitoba	799.9	637.6	1437.5	0.70	0.56	1.27	4483	217	4700

Hospital Supply & Use Data

	Population	Supply		Separations		Days	
		Beds	Beds/1000	Short (<45)	Long (45+)	Short (<45)	Long (45+)
South Eastman	51202	126	2.46	156	2.9	587	297
South Westman	36193	213	5.89	222	4.6	1013	530
Brandon	45934	299	6.51	147	4.0	630	573
Central	95960	424	4.42	187	3.3	757	345
Marquette	37774	228	6.04	253	3.9	1161	373
Parkland	43889	295	6.72	266	5.2	1229	582
Winnipeg	645181	2521	3.91	137	5.1	567	602
North Eastman	37545	80	2.13	175	3.2	720	362
Interlake	73082	210	2.87	176	2.9	720	270
Burntwood	44535	131	2.94	236	1.4	737	136
Norman	23862	145	6.08	222	2.5	828	305
Churchill	1092	31	28.39	251	2.5	806	456
Winnipeg	645181	2521	3.91	137	5.1	567	602
Non-Winnipeg	491068	2182	4.44	198	3.4	813	368
Manitoba	1136249	4703	4.14	164	4.4	673	501

Personal Care Homes: Supply and Use Data

	Pop 75+	Supply			Crude Rates per 1000 (75+)			Wait Time (days)
		Prov. #Beds	Prov. Beds Per 75+	Prov. & Fed. Beds per 75+	Residents	Admiss.	Days	
South Eastman	2433	334	137	137	139.7	30.0	40.2	85.0
South Westman	3605	475	132	139	149.5	37.2	41.6	42.0
Brandon	3141	595	189	189	184.0	35.0	54.6	153.0
Central	6508	842	129	129	139.1	29.3	41.3	99.5
Marquette	3729	424	114	114	136.2	36.2	37.3	70.0
Parkland	4236	545	129	129	140.5	36.1	39.0	105.0
Winnipeg	39966	4895	122	122	130.8	32.7	37.4	113.5
North Eastman	1780	130	73	87	70.2	8.4	20.9	71.0
Interlake	4376	504	115	127	126.6	27.7	36.8	69.0
Burntwood	469	26	55	124	37.4	2.2	12.5	6.0
Norman	795	126	158	197	153.3	32.1	40.8	107.0
Churchill	17	0	0	0	0.0	0.0	0.0	n/a
Winnipeg	39966	4895	122	122	130.8	32.7	37.4	113.5
Non-Winnipeg	31089	4001	129	134	137.8	30.8	39.6	88.0
Manitoba	71055	8896	125	128	133.9	31.9	38.3	101.0

PROCEDURE RATES BY REGION

Crude Rates of Selected Procedures (5 year average 1991/92 – 1995/96)

*Rates per 1000 population (see Methods for explanation of denominators)

	Cardiac Cath.	ANGIOPLASTY	Bypass Surgery	Hip Replace	Knee Replace	Prostate Surgery (male)	<i>Cataract</i> Surgery (age 50+)	Hysterectomy (female)	Tonsil /Adenoid (0-14)	C-Sections (1000 births)
South Eastman	1.7	0.3	0.4	0.4	0.4	1.9	15.4	5.7	7.5	128.0
South Westman	1.5	0.3	0.4	0.9	0.6	3.5	13.7	5.0	8.0	138.8
Brandon	1.6	0.3	0.5	0.5	0.4	2.0	14.6	5.0	9.3	153.7
Central	2.2	0.4	0.5	0.6	0.6	2.4	16.9	5.3	5.7	157.6
Marquette	2.1	0.5	0.5	0.8	0.7	3.1	13.0	5.6	7.3	157.8
Parkland	2.7	0.5	0.6	0.8	0.8	3.6	12.8	5.6	7.1	187.7
Winnipeg	2.7	0.5	0.6	0.5	0.4	2.4	20.1	4.9	5.4	149.9
North Eastman	2.5	0.5	0.6	0.6	0.5	2.4	14.8	6.3	5.6	130.9
Interlake	2.8	0.5	0.6	0.6	0.6	2.9	16.6	5.6	6.7	131.0
Burntwood	1.2	0.3	0.1	0.1	0.2	0.6	9.9	5.2	7.2	113.7
Norman	1.9	0.3	0.4	0.5	0.2	1.8	11.1	7.1	9.6	206.5
Churchill	1.1	0.0	0.2	0.5	0.0	0.3	17.8	5.2	1.4	190.9
Winnipeg	2.7	0.5	0.6	0.5	0.4	2.4	20.1	4.9	5.4	149.9
Non-Winnipeg	2.1	0.4	0.5	0.6	0.5	2.4	14.7	5.5	7.1	145.7
Manitoba	2.4	0.5	0.5	0.5	0.5	2.4	17.8	5.2	6.2	148.0

APPENDIX 3: Physician Service Area (PSA) Definitions

Following is a listing of municipalities, villages, and towns in MCHPE's Physician Service Areas. The RHAs and PSAs are listed in same order as throughout the report (increasing premature mortality rate). 'RM' stands for Rural Municipality.

South Eastman RHA

PSA of Tache

Ste. Anne RM
Tache RM
Ste. Anne Village

PSA of Steinbach

Hanover RM
Steinbach town
La Broquerie RM

PSA of Ritchot

Ritchot RM

PSA of De Salaberry

De Salaberry RM
St. Pierre Jolys
Niverville

PSA of Piney District

Franklin RM
Piney LGD
Stuartburn LGD
Buffalo Point First Nation
Unorganized Territories

South Westman RHA

PSA of Boissevain

Morton RM
Boissevain town

PSA of Killarney

Argyle RM
Oakland RM
Wawanesa
Riverside RM
Roblin RM
Cartwright
South Cypress RM
Glenboro
Strathcona RM
Turtle Mountain RM
Killarney

PSA of Melita/Deloraine

Albert RM
Arthur RM
Melita
Brenda RM
Waskada
Edward RM
Winchester RM
Deloraine

PSA of Victoria/South Norfolk

South Norfolk RM
Treherne
Victoria RM

PSA of Virden

Archie RM
Pipestone RM
Oak Lake
Wallace RM
Virden
Elkhorn
Canupawakpa Dakota (Oak Lake) First Nation

PSA of Souris

Cameron RM
Hartney town
Glenwood RM
Souris
Sifton RM
Whitehead RM
Whitewater RM

Brandon RHA (and PSA)

Brandon city
 Cornwallis
 Elton

Central RHA**PSA of Morden/Winkler**

Plum Coulee
 Stanley RM
 Morden
 Winkler

PSA of Carman

Dufferin RM
 Carmen
 Grey RM
 Roland
 St. Claude
 Notre Dame de Lourdes

PSA of Altona

Rhineland RM
 Altona RM
 Gretna

PSA of Morris/Montcalm

Montcalm RM
 Emerson town
 Morris RM
 Morris town
 Roseau River First Nation

PSA of Lorne

Lorne RM
 Louise RM
 Crystal City
 Pilot Mound
 Pembina RM
 Manitou village
 Thompson RM
 Somerset
 Swan Lake First Nation

PSA of MacDonald / Cartier

Cartier RM
MacDonald RM
St. Francois Xavier RM
Headingly

PSA of Portage

North Norfolk RM
MacGregor
Portage La Prairie RM
Portage La Prairie
Long Plain First Nation
Dakota Plains First Nation
Dakota Tipi First Nation

PSA of Seven Regions

Lakeview RM
Westbourne RM
Gladstone town
Alonsa LGD
Sandy Bay First Nation

Marquette RHA

PSA of Minnedosa

Blanshard RM
Clanwilliam RM
Erickson
Hamiota RM
Hamiota village
Harrison RM
Miniota RM
Minto RM
Minnedosa
Odanah RM
Saskatchewan RM
Rapid City
Shoal Lake RM
Shoal Lake Village
Strathclair RM
Woodworth RM
Park LGD (South)
Keeseekoowenin First Nation
Rolling River First Nation

PSA of Neepawa

Glenella RM
 Langford RM
 Neepawa
 Landsdowne RM
 Rosedale RM

PSA of North Cypress

North Cypress RM
 Carberry

PSA of Russell

Birtle RM
 Birtle town
 Boulton RM
 Ellice RM
 St. Lazarre village
 Rosburn RM
 Rosburn village
 Russel RM
 Russel town
 Binscarth
 Shellmouth RM
 Silver Creek RM
 Birdtail Sioux First Nation
 Gamblers First Nation
 Waywayseecappo First Nation Treaty Four 1874

PSA of Sioux Valley

Daly RM
 Rivers town
 Sioux Valley First Nation

Parkland RHA**PSA of Gilbert Plains**

Ethelbert RM
 Ethelbert village
 Gilbert Plains RM
 Gilbert Plains village
 Grandview RM
 Grandview town

PSA of Dauphin

Dauphin RM
Dauphin town
Mossey River RM
Winnipegosis village
Mountain LGD South

PSA of Alonsa

Lawrence RM
McCreary RM
Ochre River RM
Ste. Rose RM
Ste. Rose Du Lac
McCreary village
Alonsa LGD
Waterhen First Nation
O-Chi-Chak-Ko-Sipi (Crane River) First Nation
Ebb and Flow First Nation

PSA of Swan River

Minitonas RM
Minitonas village
Swan River RM
Swan River town
Benito
Bowsman
Mountain LGD North
Wuskwi Sipiik (Indian Birch) First Nation

PSA of Roblin

Hillsburg RM
Shell River RM
Roblin
Park LGD (North)
Tootinaowaziibeeng Treaty Reserve (Valley River) First Nation

PSA of Pine Creek

Unorganized Territories
Sapotaweyak Cree Nation
Pine Creek First Nation

Winnipeg

For this report, Winnipeg was treated as a single entity, including East and West St. Paul.

North Eastman RHA

PSA of Springfield

Brokenhead RM
 Beausejour
 Garson village
 Lac Du Bonnet RM
 Lac Du Bonnet
 Springfield RM
 Whitemouth RM
 Reynolds LGD
 Pinawa LGD

PSA of East Lake Winnipeg

Powerview
 Victoria Beach RM
 Alexander LGD
 Pinefalls town
 Unorganized Territories
 Poplar River First Nation
 Sagkeeng (Fort Alexander) First Nation
 Little Black River First Nation
 Bloodvien First Nation
 Hollow Water First Nation
 Berens River First Nation
 Little Grand Rapids First Nation

Interlake RHA

PSA of Rockwood

Rockwood RM
 Stonewall
 Teulon
 Rosser RM
 Woodlands RM

PSA of Selkirk

St. Andrews RM
 Selkirk town
 St. Clements
 Brokenhead Ojibway Nation

PSA of Gimli

Riverton
 Gimli RM
 Gimli town
 Dunnottar

Winnipeg Beach
Armstrong LGD

PSA of East Interlake

Bifrost RM
Fisher LGD
Arborg
Unorganized Territories
Peguis First Nation
Fisher River Cree Nation
Jackhead First Nation

PSA of Coldwell

Coldwell RM
Eriksdale RM
St. Laurent RM
Lake Manitoba (Dog Creek) First Nation

PSA of Grahamdale

Siglunes RM
Grahamdale LGD
Fairford First Nation
Little Saskatchewan First Nation
Lake St. Martin First Nation
Dauphin River First Nation

Burntwood RHA

PSA of Leaf Rapids

Leaf Rapids

PSA of Gillam

Gillam LGD
Fox Lake First Nation

PSA of Thompson

Thompson city

PSA of Oxford House

Oxford House First Nation
Gods Lake First Nation
Gods River First Nation

PSA of Island Lake

Garden Hill First Nation
Red Sucker Lake First Nation

St Theresa Point First Nation
Wasagamack First Nation

PSA of Lynn Lake
Lynn Lake LGD

PSA of Norway/Cross
Norway House Cree Nation
Cross Lake First Nation

PSA of Burntwood Unorganized
Unorganized Territories
Nelson House First Nation
Matthias Colomb Cree Nation
Barren Lands (Brochet) First Nation
Shamattawa First Nation
York Factory First Nation
Sayisi Dene (Tadoule Lake) First Nation
Split Lake Cree Nation
War Lake First Nation
Northlands (Lac Brochet) First Nation

Norman RHA

PSA of Flin Flon
Flin Flon
Snow Lake

PSA of The Pas
The Pas

PSA of Norman Other
Consol LGD
Grand Rapids LGD
Unorganized Territories
Opaskwayak Cree Nation (The Pas)
Grand Rapids First Nation
Chemawawin First Nation
Mosakahiken Cree Nation (Moose Lake)