The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study

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THE MANITOBA CENTRE FOR HEALTH POLICY

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

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

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

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ABBREVIATIONS USED IN THIS REPORT

AMC	Assembly of Manitoba Chiefs
MCHP	Manitoba Centre for Health Policy
MKO	Manitoba Keewatinowi Okimakanak
PYLL	Potential Years of Life Lost
PMR	Premature Mortality Rate
RFN	Registered First Nations people
RHA	Regional Health Authority

Abbreviations for Tribal Council Areas:

DOTC	Dakota Ojibway Tribal Council
ILTC	Island Lake Tribal Council
Independent FN North	Independent/Unaffiliated First Nations North group
Independent FN South	Independent/Unaffiliated First Nations South group
IRTC	Interlake Reserves Tribal Council
KTC	Keewatin Tribal Council
SCTC	Swampy Cree Tribal Council
SERDC	Southeast Resource Development Council
WRTC	West Region Tribal Council

NOTE: Abbreviation terms, as well as reference maps, are also available on a fold-out page at the back of the report.

EXECUTIVE SUMMARY

Evidence-based decisions require health information for those who need to make those decisions – policy makers, decision makers, and health planners. Planning to meet the health needs of First Nations people in Manitoba is assisted by population-based information to help create an accurate picture of health status and illness, as well as the way in which people use health care services. This report is the first attempt in Manitoba to provide administrative claims data information based on the entire Registered First Nations population of the province through use of the Status Verification System files, with all other Manitobans as a comparison group.

This report has required cooperation among many people and organizations, including the Health Information and Research Committee of the Assembly of Manitoba Chiefs (AMC), Manitoba Health, First Nations and Inuit Health Branch of Health Canada, Indian and Northern Affairs Canada, and Manitoba Centre for Health Policy (MCHP).

Through funding and support from Manitoba Health, MCHP has worked collaboratively with the Health Information and Research Committee to provide information that will hopefully prove beneficial in the planning processes of First Nations communities, Tribal Councils, and Regional Health Authorities (RHAs).

MCHP is a unit of the Department of Community Health Sciences at the University of Manitoba. Its mission is to provide accurate and timely information to health care decision makers, analysts and providers, so they in turn can offer services which are effective and efficient in improving the health of Manitobans. As part of its responsibilities, MCHP has developed the Population Health Information System (POPULIS). This system is designed to examine relationships between the health of the population and health care use. Providing evidence-based information to facilitate decision-making, MCHP hopes to shift discussion from a focus on the demand for health care to the demand for health.

A population-based approach

A "population-based" approach describes the health status or health care use of all residents of a geographical region, whether that be a Tribal Council area or a Regional Health Authority (RHA). 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 geographical areas, as well as their use of health care resources (such as hospitals, physicians and preventive services).

Because people often travel for care, local supply and availability do not necessarily determine use patterns. Therefore, POPULIS tracks *all use* by residents of the area, *regardless of where the use occurred*, rather than just the care provided by "in-area"

physicians or facilities. In general, one would expect areas of poorer health status to have greater use of physicians and hospitals, but this is not necessarily the case.

To ensure that our Registered First Nations information was valid, the Status Verification System (SVS) was linked with health care use data for the years 1994/95 through 1998/99, and then anonymized prior to analysis by MCHP. This linkage was completed with the cooperation of AMC's Chiefs Health Committee and the Health Information and Research Committee, Manitoba Health, Indian and Northern Affairs Canada, and the First Nations and Inuit Health Branch of Health Canada. The research proposal was also reviewed by the Health Research Ethics Board of the University of Manitoba's Faculty of Medicine.

The use of the SVS file of Manitoba Band members was approved *strictly for use within this report only*. The Manitoba SVS files are a registry of all Registered First Nations people having band membership with a Manitoba First Nations community. This report only includes those Registered First Nations people who have affiliation with a Manitoba First Nations band and who were living in Manitoba. It does not include Manitoba Band members living outside Manitoba, nor those who have out-of-province Band affiliation but are residing in Manitoba.

What's in this report?

The focus of this report is to give insight to policy makers, decision-makers and planners on health care issues of the Registered First Nations people residing in Manitoba. As such, the following issues were addressed:

- Description of the collaborative network and methodology (Chapter 1)
- Assistance in interpreting the data for local use, with examples (Chapter 2)
- Descriptions of the population by age, sex, and Registered First Nations groupings (Chapter 3)
- Overall health status, including measures such as life expectancy (Chapter 4)
- The rates of illness and injury, such as diabetes treatment prevalence and injury hospitalization rates (Chapter 5)
- Preventive care measures, such as immunization rates (Chapter 6)
- The use of physician services, including visit rate, type of physician, and location of visits (Chapter 7)
- The use of hospital services, including admission rates, lengths of stay, and location of hospitalizations (Chapter 8)
- Surgical procedures, such as cardiac catheterization, Caesarian section, and amputation rates (Chapter 9)
- General information on the determinants of health, such as education, income, unemployment and housing issues (Chapter 10)

What comparisons are made in the report

Three geographical comparisons are given for most of the indicators:

- Comparison by Tribal Council areas, for Registered First Nations people living "on-reserve"
- Comparison by RHA areas, between Registered First Nations people and all other Manitobans living within the RHA

- Comparison by RHA areas, between Registered First Nations people living "on-reserve" or "off-reserve" within the geographical boundary of the RHA

There are *seven* Tribal Councils within the organizational structure of Manitoba First Nations communities, and *two* groupings we called "Independent First Nations North" and "Independent First Nations South" which include both independent and unaffiliated communities. As well, there are *twelve* provincial RHAs in Manitoba, each having a governance structure overseeing both acute care and community-based care.

The authors have not focused on providing a detailed understanding of *why* there are differences in rates. We believe that much of this interpretation should come from the perspective of the Tribal Councils and the RHAs, based upon an understanding of local circumstances.

The difference between a rate and the number of people

It is important to underscore the way in which our data is reported. We use *rate* comparisons throughout the report – for example, how many people per thousand would have a certain condition or use a certain service. This gives a good indication of a per capita risk, or per capita use. This does not necessarily reflect the numbers of clients who could potentially walk through the door for health services related to their condition. (The *number* of clients not only depends upon the rate, but also depends upon how many people are living in the area.)

For example, you could have double the rate of Condition X, but have fewer actual people walk through the door of the health centre. Imagine two groups of people – one group (A) has a rate of 20 per thousand for Condition X; the other group (B) has a rate of only 10 per thousand. So the per capita risk of the condition is twice as high in group A. If, however, there were many more people in group B, then the actual numbers walking through the door could be greater. For example, if group A is comprised of 1000 people, we would expect to see 20 with Condition X. But if there are 5000 people in group B, we would expect to see 50 with Condition X. So group A has a higher per capita "risk" or *rate*, yet group B has a higher actual *number* of people with the condition.

This could potentially happen in Manitoba – if an area rate is higher but the area's population is smaller, the actual number of clients could be smaller. Both viewpoints are important – the per capita risk or rate tells us about potential problems and risk factors, whereas the actual number tells us how many service providers may be required. *This report focuses on the first – per capita risk, or rates.* However, there is enough information in this report to calculate the actual number of clients. This is explained in Chapter 2 of the report.

How to use the information for planning purposes

A section focussing on understanding each indicator to facilitate local planning or decision-making has been provided (Chapter 2). Persons using this report may wish to confirm their understanding of the information by reading through this section.

Examples of each indicator are given, as well as a set of questions that may be conducive to generating discussion.

The concept of the health status of a region's population is derived from the region's Premature Mortality Rate (PMR), an age- and sex-adjusted rate of death before the age of 75 years. For fair comparisons, most rates in the report are adjusted to reflect the overall Manitoba age- and sex-distribution for the year 1996. PMR is one measure of the overall health status of a region's population, and thus their need for preventive services, health care services, and programs to address underlying determinants of health (such as income, education and employment). Populations having a high PMR are more likely to report poor overall health, greater number of symptoms, and more illness.

In order to stress the importance of health status, all figures in this report present the Tribal Council areas and the RHAs in the same order. Those areas at the top of the graphs, whether they be Tribal Council areas or RHAs, have the lowest PMRs – indicating the best health status in comparison with the other areas shown on the graph. Those areas at the bottom of the graphs have the highest PMRs – indicating areas with the poorest health status. This assists in understanding the link (or lack thereof) between the health status of the population and such indicators as the use of health care services or preventive health services.

Selected key findings on health status

- The Manitoba Registered First Nations population has twice the PMR compared with all other Manitobans (6.6 versus 3.3 deaths per thousand), indicating much poorer overall health status. Within each of the twelve RHAs, Registered First Nations people have substantially higher PMRs compared with all other RHA residents. Within southern RHAs with populations having the best overall health status are found Registered First Nations populations with the poorest health status.
- Although the health status of every Tribal Council population is much poorer than that of all other Manitobans, there is a marked gradient of PMR within Tribal Councils. Generally, northern Tribal Council areas have lower PMRs (slightly better health status) compared to southern Tribal Council areas with a range from 4.8 deaths per thousand (Keewatin Tribal Council) to 9.3 deaths per thousand (Dakota Ojibway Tribal Council).
- The life expectancy of Registered First Nations people (RFN) is about 8 years less than that of all other Manitobans (males: 68.4 versus 76.1 years; females: 73.2 versus 81.4 years). Within Tribal Council areas, there is also a substantial difference in life expectancy (males: from 64.6 years in Dakota Ojibway Tribal Council to 72.0 years in Keewatin Tribal Council; females: from 69.1 years in Southeast Resource Development Council to 80.3 years in Island Lake Tribal Council).
- A health status indicator that gives greater weight to deaths occurring at a young age is called the Potential Years of Life Lost (PYLL). The PYLL for Registered First Nations people is much higher than the PYLL for all other Manitobans (2.5 times higher for males, 3 times higher for females), indicating that not only is

there excessive mortality for RFN, but proportionally more younger people are dying. Registered First Nations women living in Winnipeg and in Southeast Regional Development Council, and RFN males living in Dakota Ojibway Tribal Council, are at particular risk of dying young.

- Diabetes treatment prevalence is 4.2 times higher for Registered First Nations people compared to all other Manitobans (18.9% versus 4.54%), but the population prevalence of amputation related to diabetes complications are sixteen times higher (3.1 versus 0.19 per thousand for ages 20 through 79). Dakota Ojibway Tribal Council has the highest age-adjusted diabetes treatment prevalence (25%) and the highest population prevalence of amputation related to diabetes (6.2 per thousand) of the Tribal Council areas.
- The injury hospitalization rate for Registered First Nations people is 3.7 times higher than for all other Manitobans (30.4 versus 8.3 hospitalizations per thousand). Of special concern are Registered First Nations' injury hospitalization rates in the northern Tribal Council areas of Keewatin (41.2 per thousand) and Independent First Nations North (38.3 per thousand), and in the RHAs of Burntwood, Nor-Man and Marquette (around 35 per thousand).

Selected key findings on preventive care, health care use

- Registered First Nation children are far less likely to have received their complete set of immunizations compared with all other Manitoban children, both at one year (62% versus 89%) and two years of age (45% versus 77%). This may be due to under-reporting in the provincial Manitoba Immunization Monitoring System (MIMS), but this may also be showing lack of preventive services.
- In the breast cancer screening program, the rate for Registered First Nations women is less than half the rate for all other Manitoba women – 26% versus 56% of women aged 50 through 69 years old received at least one mammography within the two year period of 1997-1998).
- Newborn breastfeeding rates on hospital discharge are substantially lower for Registered First Nations children compared with all other Manitobans (57.1% versus 80.5%).
- Registered First Nations' hospital discharge rates are 2.2 times the rates of all other Manitobans (348 versus 156 per thousand per year). Total days of hospital care for Registered First Nations people are about 1.7 times that of all other Manitobans (1.75 versus 1.05 days per person per year).
- Registered First Nations people have, on average, 6.1 visits per person per year compared with 4.9 for all other Manitobans. (Note: physician visit rates may be undercounted for northern/remote areas, where salaried physicians may not consistently submit diagnostic claims like fee-for-service physicians, and where nurse practitioner care is not recorded). Winnipeg RHA has the highest ambulatory visit rate, at 8.3 visits per person per year for RFN, and 5.2 for all other residents. Given the poorer health status, one expects to see a higher visit rate for Registered First Nations people.
- The "consult rate" is probably our best measure of referral to specialist care, taking into account the first, or referral, visit only. Knowing the health disparity, it is somewhat surprising that consult rates are only slightly higher for Registered

First Nations people compared with all other Manitobans (0.29 versus 0.27 consults per person per year). By Tribal Council area, consult rates are highest for Keewatin Tribal Council and Independent First Nations South, and lowest for Dakota Ojibway Tribal Council. By RHA, the highest consult rates in the province are for residents of Churchill (0.50 consults per person for RFN, 0.35 for other residents), and Winnipeg (0.33 consults per person for RFN, 0.30 for other residents).

- Overall rates of contact with specialists includes the consult (referral) visit as well as all subsequent visits. In Winnipeg and Brandon, where 90% of the specialists are located, Registered First Nations people have fewer contacts with specialists than do all others living in that RHA (Winnipeg: 1.60 visits per person per year for RFN versus 1.71 for other residents; Brandon: 0.82 RFN versus 0.98 other residents). The opposite pattern is observed in some RHAs, where Registered First Nations people have a higher specialist contact rate, presumably reflecting a more needs-based delivery of specialist care – Burntwood, Churchill, Marquette, Nor-Man, Parkland, and South Westman. Comparing Tribal Council areas only, Island Lake Tribal Council has the highest contact rate with specialists (0.98 visits per person per year), with Swampy Cree and West Region Tribal Councils having the lowest rates (0.49 and 0.47 respectively).

Please note that this report includes many important findings in addition to those mentioned above. Look in the "Key Findings" section of each chapter.

Where is this report available?

Hard copies of this report, as well as the four-page summary, are available through the Manitoba Centre for Health Policy (telephone 204-789-3805) at the University of Manitoba. Electronic versions are available at MCHP's website, under the heading of "Reports." There is also access to Excel spreadsheets for selected graphs in this report, through the MCHP website:.
http://www.umanitoba.ca/centres/mchp

CHAPTER 1. INTRODUCTION AND METHODS

1.1 Introduction – The Collaborative Network

Evidence-based decisions require health information for those who need to make those decisions – policy makers, decision makers, planners, and educators of health care providers. Planning to meet the health needs of First Nations people in Manitoba requires population-based information to help create an accurate picture of health, the rates of illness, and the way in which people use health care services. This report is based on the entire population of the province – not only Registered First Nations people, but also all other Manitobans as a comparison group. The framework of this report was based upon a health/health services indicators report published by the Manitoba Centre for Health Policy (MCHP) in June 1999, called the *Comparative Indicators of Population Health and Health Care Utilization for Regional Health Authorities*. Through discussion with the working group for this report, a few additional indicators of importance to planners were added. Most of the indicators in this report are adult-focussed. However, this is hopefully only a beginning – future reports could focus on more specific issues or age groupings.

This report has required cooperation among many people and organizations, including the Assembly of Manitoba Chiefs (AMC), Manitoba Health, First Nations and Inuit Health Branch of Health Canada, Indian and Northern Affairs Canada, and MCHP. The working group for this report was the Health Information and Research (HIR) Committee, which is a subcommittee of the AMC Chiefs Health Committee. The HIR Committee consists of the Health Directors for each of the Tribal Councils and Independent First Nations communities in Manitoba, plus the Health Advisors from AMC and from Manitoba Keewatinowi Okimakanak (MKO). Please take the time to look at the Acknowledgements section at the front of this report. We are truly grateful to all those who contributed to the process.

MCHP has a unique database in Canada, and indeed, throughout the world. Its population-based approach to studying health care use patterns allows for a study which is not susceptible to the usual problems of only studying small groupings and generalizing the findings. Through funding and support from Manitoba Health, MCHP has worked collaboratively with the Health Information and Research (HIR)Committee of the Assembly of Manitoba Chiefs to provide information that will be beneficial in the planning processes of First Nations communities, Tribal Councils, and Regional Health Authorities. MCHP is a unit of the Department of Community Health Sciences at the University of Manitoba. Its mission is to provide accurate and timely information to health care decision makers, analysts and providers, so they in turn can offer services which are effective and efficient in improving the health of Manitobans.

1.2 What's in this report?

The focus of this report is to give insight to policy makers, decision-makers and planners on health care issues of the Registered First Nations people residing in Manitoba. The abbreviation of RFN will refer to "Registered First Nations people" in this report. As such, the following issues were addressed:

- Descriptions of the population by age, sex, and Registered First Nations groupings (Chapter 3)
- Overall health status, including measures such as life expectancy (Chapter 4)
- The rates of illness, such as diabetes rates (Chapter 5)
- Preventive care measures, such as immunization rates (Chapter 6)
- The use of physician services, including visit rate, type of physician, and location (Chapter 7)
- The use of hospital services, including admission rate, lengths of stay, and location (Chapter 8)
- Surgical procedures, such as cardiac catheterization, Caesarian section, and amputation (Chapter 9)
- General information on the determinants of health (education, income, unemployment and housing issues) (Chapter 10)

1.3 The geographical areas used for comparisons

Three geographical comparisons are given for most of the indicators:

- Comparison by Tribal Council (and Independent groupings) geographical areas, for RFN living "on reserve"
- Comparison by Regional Health Authority (RHA), between RFN and all other Manitobans living within an RHA
- Comparison by RHA, between RFN living "on-reserve" or "off-reserve" within the geographical boundary of the RHA

Where you live, not where you go for treatment, is how the information is given in this report. A person living in a remote area may be hospitalized in Winnipeg for surgery, but the surgery is "attributed back" to the population living in that remote area. By doing this, MCHP offers insights into the health of the population *within a geographical region*, no matter where the people of that region received the care.

Tribal Council comparisons: There are *seven* Tribal Councils within the organizational structure of Manitoba First Nations communities, and *two* groupings called Independent North and Independent South which include both independent and unaffiliated communities. For the purposes of this report, an organizational participation framework has been described in Chapter 3 (see Figures 3.1 and 3.2), where each First Nations community is found within one of these nine groups.

Regional Health Authority comparisons: In 1997, the government of Manitoba established eleven geographically-defined rural and northern Regional Health Authorities (RHAs) outside Winnipeg. Winnipeg is a separate RHA. Each RHA provides a governance structure for rural and northern health services, both acute care and community-based care. Within each RHA, there is an appointed Board of

Directors responsible for the overall planning and integration of services for a geographically-defined population. Figure 3.3 in Chapter 3 shows the geographical boundaries for the RHAs.

"On-reserve" and "off-reserve" comparisons: MCHP defines the geographical area of residence from the Municipal or postal code. All RFN are assigned a Municipal Code dependent upon their band of membership. However, this may not be where the person is actually living – the postal code gives the information about actual residence. If a person's Municipal Code was the same geographical area as the postal code, then a person was presumed to live in a First Nations community, or *"on-reserve."* This may better be described *as living either in or near the First Nations community of which they are a member.* If there is geographical discrepancy between the Municipality code and the postal code, the person was presumed to be *living away from their First Nations community, hence "off-reserve."* Then their postal code was used to determine in which RHA a person resided. This will result in some misclassification, where some people may live close to, but not in, the First Nations community and will be grouped with "on-reserve" despite the reality of living "off-reserve." As well, other people may be living in another First Nations community different than the band-affiliation, and will be grouped with "off-reserve" despite the reality of living in a First Nations community.

1.4 The methods used (also refer to the Appendix/Glossary)

We used four data sources for the information in this report: health care administrative data (for Chapters 3 through 9), Vital Statistics data (Chapter 4 information on death rates), survey data from the Statistics Canada Census of 1996 (Chapter 10), and publicly-available reports from Indian and Northern Affairs Canada (Chapter 10). The bulk of the information is from the health care administrative data, which originates from Manitoba Health.

Permission was obtained from AMC's Chiefs Health Committee and the Health Information and Research Committee, from Indian and Northern Affairs Canada (INAC), and from the First Nations and Inuit Health Branch of Health Canada (formerly Medical Services Branch), to proceed with a linkage of the Status Verification System (SVS) file of Manitoba Band members with the Manitoba Health administrative data. This linked file was strictly for use within this report, unless further permission is obtained from all stakeholders. The Manitoba SVS files are a registry of all Registered First Nations people having band membership with a Manitoba First Nations community. The principal researcher of this report, PJM, obtained permission through INAC's Access to Information and Privacy Coordinator, through a "Request For Personal Information by Research Body or Researcher for Research or Statistical Purposes", from Section 8(2)(j) under the federal Privacy Act. This linked file prevented problems with large undercounting of the RFN of Manitoba – Manitoba Health records of the 1,144,860 Manitobans in the year 1999 classify 69,526 persons as being RFN, whereas the linked database used in this MCHP report classified 87,328 as RFN for the same year.

As indicated in Appendix B, other sources such as the First Nations and Inuit Health Branch indicate the number of First Nations people in Manitoba as being over 100,000. *This report only includes those RFN who have affiliation with a Manitoba First Nations band and who are living in Manitoba,* not Manitoba Band members living outside Manitoba nor those who have out-of-province band affiliation but are residing in Manitoba. The report only classifies groups as "RFN" if they are deemed RFN by the government of Canada in the SVS files. Therefore, non-Registered First Nations people, Métis and Inuit populations would be included in the "all other Manitoban" rates. Please refer to the Appendix for more extensive information on the data sources and linkages. As well, Appendix B contains a table indicating RFN population counts from various sources including Statistics Canada, First Nations and Inuit Health Branch, Manitoba Health, and our linked database for this report.

The "encounter-based" Manitoba Health data (that is, data on health care system use) are anonymized and housed in the Population Health Research Data Repository at the University of Manitoba. One limitation of this data source is in physician visit rates. Contacts with nurse practitioners are not recorded, nor are some of the contacts with physicians who work on a salary-basis rather than a fee-for-service basis (see Section 7.2 for further information). This limitation may result in undercounted visit rates to practitioners, especially in northern/remote areas.

The 1996 Census was used to provide information at the neighborhood level on such indicators as unemployment, income, and marital status. Two First Nations communities declined participation in the 1996 Census. Because of the small size of many First Nations communities, much of the census information is suppressed but is included when a larger group, like Tribal Council, is reported. All of the indicators in Chapter 10 derived from the census are reported by Tribal Council area, not by individual community. Public reports by Indian and Northern Affairs Canada (INAC) were used to obtain information about housing in First Nations communities. More extensive information about each of these data sources, and definitions for each of the indicators in this report, is given in Appendix E, the Glossary.

Most of the indicators are given as *"standardized" or "adjusted" rates.* The rates have been adjusted to create a fair comparison among different groups. If you want to compare the rate of a certain disease between an area with a young population to another area where there is an older population, you would want a fair method of comparison. The rates are standardized to reflect what the rate would be if each area's population had the same age and sex distribution as the Manitoba population at December 31, 1996. For example, in the young region there will not be many people in older age brackets. So a disease which afflicts the elderly may show up as a fairly small percent of the population, even though most of the elderly have this disease. When the rate is "standardized", the standardized rate would become larger, since the proportion of those with the disease will increase when the area's population would be presumed to have the same distribution of elderly as the overall Manitoba population. See Chapter 2 (understanding your data) for further explanation of standardized rates.

In Appendix C, you will find the *"crude" rates* for some indicators, that is, the actual count divided by the actual population, without any adjustment for age and sex distribution differences by regions. This is helpful in giving a realistic look at the effect of the population burden of illness on the region's health care system - in reality, what percentage of the regional population will require health care services for their illness. In all graphs and charts, rates are suppressed where the counts on which the rates are based represent 5 persons or less.

Most of the graphs contain information about *statistical comparisons*. This is also discussed in Chapter 2. Statistical testing simply gives an indication as to whether or not a rate is statistically higher or lower than the comparison group, or if the rate could be considered similar to the comparison group when no statistical difference is noted. For the Tribal Council graphs, each area was compared with the Manitoba "on-reserve" overall rate. For the RHA comparison of RFN compared to all other Manitobans, three comparisons were analyzed: each of the RFN groups by RHA were compared to the overall rate for all RFN of Manitoba; each of the groups of "all other Manitobans" by RHA were compared to the overall rate for "all other Manitobans"; and within each RHA, the RFN and "other" groups were compared. Finally, for the RHA comparison of "off-reserve" with "on-reserve" RFN, three comparisons were also done: the "off-reserve" within the RHA were compared with the overall Manitoba "off-reserve" RFN population; the "on-reserve" within the RHA to the overall Manitoba "on-reserve" RFN population; and the "off" and "on" reserve persons within each RHA were compared to each other. Statistical comparison tests of age- and sex-standardized rates were done using t-test methodology developed by Carriere and Roos (1997). We used 99% confidence limits for rate comparisons, to maintain an acceptable Type I error at approximately 0.05. This avoids the problem of inflated Type I error (finding a difference which does not exist) when doing multiple comparisons of Tribal Council areas and of RHAs. All data management, programming and analyses were performed using SAS® software.

1.5 Where the information was obtained

The administrative database used for this report is referred to as the Population Health Research Data Repository, which includes anonymized files such as physician and hospital billing claims and the Vital Registry of births and death. "Anonymized" refers to the fact that all identifiers are taken out of the records – name, address, and actual medical number. MCHP obtained ethical approvals from the University of Manitoba Faculty of Medicine's Health Research Ethics Board, and from AMC's Chiefs Health Committee and HIR Committee to access this database for purposes of this report.

The system used by MCHP to derive health and health care use rates from this database is called POPULIS (Population Health Information System). This allows researchers to derive rates of specific conditions, rates of health services use, and diagnoses for physician visits and hospitalizations. These rates are for groups of

people living in geographical areas defined by Municipality Code and/or postal code. Socioeconomic conditions in a geographical area have also been shown to be related to health status. MCHP looks at the relationship between socioeconomic status and the use of health care services. People living in areas of socioeconomic risk usually experience more health problems, so MCHP examines the relationship between these rates and the "need" for health care, for preventive care, and for issues regarding the underlying determinants of health (such as income or education).

1.6 How to use this report

There are many graphs in this report, but each graph has been chosen to give information about key indicators helpful to health planning. These graphs will enable planners to examine their geographical region's overall health and health care use. Chapter 2 is written to help people understand and interpret the indicators, and to understand how each chapter relates to some aspect of health, the rates of illness, or health care service use.

But it is important to put each graph into context of other indicators, especially the underlying determinants of health. As a First Nations elder has stated, when describing the Medicine Wheel:

> "The lines intersecting at the centre of the circle signify order and balance. They help people examine experience by breaking down complex situations into constituent parts, while reminding them not to forget the whole. The centre of the circle is the balance point where apparent opposites meet. The flags at the ends of the intersecting lines signify the four winds whose movement is a reminder that nothing is fixed or stagnant, that change is the normal experience and transformation is always possible" (Royal Commission on Aboriginal Peoples 1996:647).

This report helps people examine experience by breaking down highly complex situations into a few selected "snapshot" indicators. Indeed, it is important not to forget the whole context when looking at one indicator in isolation. Through giving population-based information to planners, decision-makers and policy makers about health and health care services use patterns, our hope is that this report will help in the normal experience of change, and in the transformation of health and health services in the future.

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CHAPTER 2. INTERPRETING THE DATA FOR LOCAL USE

2.1 What's in this chapter?

Chapter 2 focuses on how to interpret this report for use at the policy, planning or decision-making level. It could be subtitled, "How to get an overall view of your Tribal Council area or RHA from this report." This chapter will take you through the process of finding information in the report, and figuring out what this information is telling you. It is based upon a similar chapter found in a 1999 MCHP report for Regional Health Authorities (Black, Roos, Fransoo and Martens 1999).

This report includes indicators of demographics, health status, illness rates, provision of preventive care, use of physician and hospital services, rates of medical procedures, and some of the basic determinants of health. Chapter 2 provides an overview, giving examples and posing questions that may arise out of your data.

2.2 How the chapters are set up

Chapters 1 and 3 give you background information about the methods, and the definitions of areas and groups of persons used in the report. Starting with Chapter 4, results on various indicators of health, or health care use, are given. Chapters 4 through 10 are similar in their setup – a general section, followed by sections with each specific indicator.

The general section is an overview of the entire chapter and its findings. First, we describe what health indicators are in the chapter. Then we go through some background information about these indicators. Next, we give you the key findings from the entire chapter – essentially, we're giving you the highlights from each of the sections of that chapter, all in one place. Finally, we select some Canadian or Manitoban studies, and compare our findings to what other researchers found.

The more specific sections go through each of the indicators, giving a basic definition, some comments about the graphs, a table with the range of results by geographical area or group of people, the key messages from this section, and then the graphs of the indicators.

2.3 How the groupings of geography and people are defined (Chapter 3)

Chapter 3 gives details about how we defined geographical regions, as well as groups of people, for the report. Tribal Council areas, including two groups of Independent/Unaffiliated communities, are described and mapped (see Figures 3.1 and 3.2). As well, Regional Health Authority areas (RHAs), and Winnipeg Community Areas (Winnipeg CAs) are described and mapped (see Figures 3.3 and 3.4). In the text, the Tribal Council areas are often abbreviated: Keewatin Tribal

Council (KTC); Island Lake Tribal Council (ILTC); Interlake Reserves Tribal Council (IRTC); Independent and Unaffiliated First Nations North (Independent FN North); Independent and Unaffiliated First Nations South (Independent FN South); Swampy Cree Tribal Council (SCTC); West Region Tribal Council (WRTC); Southeast Resource Development Council (SERDC); and Dakota Ojibway Tribal Council (DOTC).

Registered First Nations people (abbreviated as RFN)of Manitoba, and "all other Manitobans," are the two broad groupings in this report. Chapter 3 explains in detail how these groups are defined, as well as how the RFN group is further split into "on-reserve" and "off-reserve" populations. "On-reserve" may more appropriately be described as those RFN living *in or near the First Nations community of which they are band members*, as determined through resident postal codes (explained further in Chapter 1 Methods, and in Chapter 3).

Whatever region you may wish to examine more closely, whether it be a Tribal Council area or an RHA, you will find demographic information in Chapter 3. Overall population counts by age category are given in Tables 3.1 and 3.2. The two most basic ways to describe the people of your region are age and gender; this provides an indication of those resources that may be most needed. In other words, how many males and females, and of what age, are likely to "walk through the door" of the various types of health services. The *population pyramid*, or population profile, of your region puts all of this information into one picture. It shows the percentage distribution of the whole population for each five-year age and gender group. Figures 3.5 through 3.27 are the population pyramids for each area and for two groups of people (RFN, all other Manitobans).

> Example: Island Lake Tribal Council (ILTC)
> The shape of the population pyramid for ILTC is like a triangle, with the "bulk" of the population being younger. In fact, if you look at Table 3.1, 2,847 of the total population of 5,568, or 51%, are ages 0 through 19 years. This is very different from the population distribution for all other Manitobans. For all other Manitobans, the population pyramid in Figure 3.6 and the numbers in Table 3.2 show that out of the 1,054,422 people, only 282,321 or 27%, are 0 through 19 years old. This shows up clearly in the more rectangular population pyramid in Figure 3.6, showing fewer young people proportionally, compared to ILTC.

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

- *How does my area's population pyramid compare to Manitoba's? To other Tribal Council areas or 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.*

2.4 How the graphs in Chapters 4 through 10 are set up

All the graphs in this report are ordered in the same way, based on the level of population health status of the area. Each graph shows either the Tribal Council areas or the RHAs in order of increasing overall Premature Mortality Rate (PMR). PMR is a standardized rate of "premature" death, that is, death before the age of 75 years. The areas having the lowest PMR, considered the areas with the highest health status, are at the top. PMR increases as you go down, so the areas with the highest PMR, or the lowest health status, are on the bottom. This is described in detail in Chapter 4.

Most health indicators are shown in three ways: (1) a comparison of the nine Tribal Council areas; (2) a comparison of RFN to all other people living within each of the twelve Regional Health Authorities (RHAs); and (3) a comparison of RFN living "on-reserve" and "off-reserve" within each of the RHAs. Obviously, some RHAs don't have "on-reserve" RFN – Winnipeg, Brandon and Churchill – and others may have very small population numbers in any of these groupings. So in many graphs, you will see a notation of "no on-reserve population," or "rates suppressed due to small numbers." We only report rates if they are based on more than five cases.

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

All of the graphs show statistical significance, in terms of symbols like "M On", "M Off", "MS", "MO", and an asterisk (*), showing that the rate is most likely different (either higher or lower) than the corresponding rate – *M On* meaning the corresponding rate of **M**anitoba "**On**-reserve" RFN; *M Off* the rate of **M**anitoba "**Off**-reserve" RFN; *MS* meaning all **M**anitoba RFN (**s**tatus); *MO* meaning all **O**ther **M**anitobans, and * meaning a difference between the two groupings within one single RHA.

For example, in Figure 4.1, the two Tribal Council areas of KTC and DOTC are statistically significantly different from the overall Manitoba "on-reserve" rate, shown on the bottom bar of the graph. KTC has a lower PMR than all other Tribal Council areas, implying a higher health status. DOTC has a higher PMR than all other Tribal Council areas, so this area has the lowest health status. All other Tribal Council areas are considered similar, although we have ordered the graphs throughout this report in their order of PMR as shown in Figure 4.1.
Figure 4.2 shows a comparison within each RHA – comparing RFN living in the RHA to all other Manitobans living in the same RHA. The asterisk (*) at the left hand side (right next to the name of the RHA) indicates that there is a significant difference in PMR between RFN and all other residents within that RHA. As well,

there is a comparison of each group (RFN and all others) within the RHA to the corresponding provincial average for that group. If there is "MO" beside the "all other Manitoban" rate in an RHA, then it means that this RHA rate is significantly different than the overall provincial Manitoba "all other Manitoban" rate shown at the bottom of the graph. Similarly, if there is "MS" beside the RFN rate in an RHA, then it means that this RHA rate is significantly different than the overall provincial Manitoba RFN rate shown at the bottom of the graph. For the bars showing "all other Manitobans" by RHA, only three have PMRs that are statistically different than the provincial "all other Manitoban" rate – South Eastman and Central are lower PMRs (meaning a better overall health status), and Nor-Man is higher (meaning a lower overall health status). Similarly, for the RFN groups, only those living in Marquette and in Burntwood have statistically different rates from the overall provincial rate for RFN – Marquette is a higher PMR (meaning lower health status) and Burntwood is a lower PMR (meaning higher health status). All of the other rates are most likely similar to the overall corresponding rates. Even if a rate looks a bit higher (like the RFN in South Westman) but is not "statistically different," the rate could fluctuate the next year due to the small numbers of events upon which the rates were based or the small population for that grouping.

Finally, in Figure 4.3, comparisons are made using an asterisk *, "M On" and "M Off" notations. In this graph, there are no * in the left hand side, meaning that within each RHA, the "off-reserve" and "on-reserve" rates are similar. However, there are three RHAs where the "on-reserve" population's PMR is statistically different than the overall "on-reserve" rate for Manitoba – Central and Marquette have higher rates, and Burntwood a lower rate. As well, those RFN living "off-reserve" in Interlake have a statistically lower PMR than the overall Manitoba "off-reserve" rate.

When looking at each graph, health policy planners and decision-makers need to keep in mind the following:

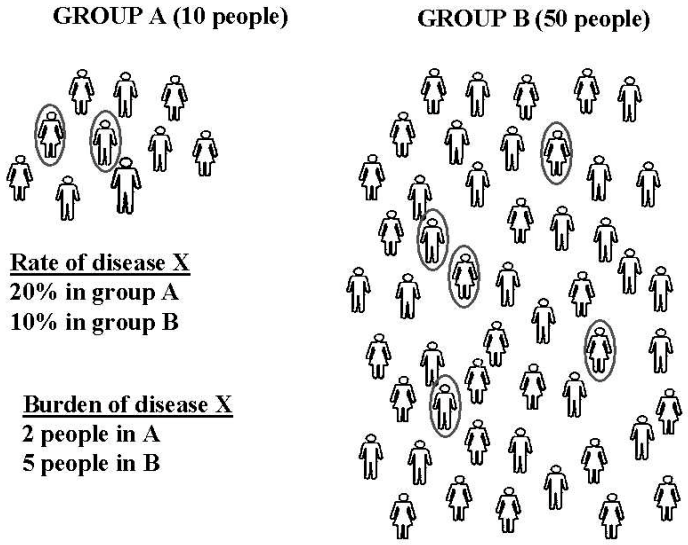
- *If a region's rate is high or low, is it statistically higher/lower, or could it be expected to vary substantially from year to year?*
- *What does the adjusted rate graph tell a region about its comparative rate to other regions?*

2.5 Adjusted and crude rates, and actual client numbers

Most of the graphs in this report are "adjusted" or "standardized" rates, meaning that the rates have been adjusted to create a fair comparison among groups that differ in their age/sex proportions (see Section 1.4). Although the graphs point to the rates of specific conditions by geographical areas (Tribal Council areas or RHAs), and compare the rates to other areas, these *adjusted rates* do not necessarily tell you how many people are "walking through the door" for treatment. The adjusted rate would give you that information only if the area had the identical age/sex structure of the province. If an area has a very different population pyramid than the overall Manitoba pyramid, the adjusted rate may give you an overestimate or underestimate of the actual number of people with the condition. The crude rate, before age/sex

adjustment, is more helpful in figuring out how many people are walking through the door for treatment.

But what's a crude rate? If you were to take the number of persons with a given condition, divided by the number of persons living in that area, and multiplied by 1000 to give a rate per thousand, you end up with what's called a *crude rate*. Crude rates are given in Appendix C tables. 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 – in other words, how many people could potentially walk through the door.



This is an important distinction which can help us understand the difference between the risk of a condition, and the number of persons with the condition. Let's take the example of Disease X within two groups of people, Groups A and B.

The *number of people* with Disease X is higher in Group B than in Group A, at 5 versus 2 persons. So in a sense, the "burden" of illness for Group B is higher, that is, more people will walk through the door of a clinic in Area B compared to Area A. However, the *crude rate* of Disease X is *twice as high in Group A*. Two out of ten, or 20%, of Group A have Disease X, compared with five out of fifty, or 10% of Group B. So the per capita risk of having Disease X is far greater for Group A, even though more actual people in Group B have Disease X due to the greater population size in Group B.

The graphs in this report point out *rate differences*, which is important in trying to understand why certain populations are at greater or less "risk" of a condition than other populations. However, there is enough information in this report to help you calculate the *actual number of persons* with a condition in a geographical area, which is important in trying to understand the health care services requirements.

Example: Central RHA and Burntwood RHA

Figure 5.2 shows the diabetes treatment prevalence per thousand population ages 20 through 79 years. The adjusted rate for RFN living in Central RHA is higher than the corresponding RFN population living in Burntwood RHA (230 per thousand versus 170 per thousand). But how does that "translate" into numbers of persons in both RHAs who actually need care? To get an actual number, you multiply the *crude rate* by the *population count*. Looking at Appendix C, Table C-4, the crude diabetes treatment prevalence rates per thousand are: 158.33/1000 for Central, and 120.70/1000 for Burntwood (which still shows Central as a "higher" rate). To approximate the numbers of persons affected, we need a population figure for RFN living in the RHAs, which is given in Chapter 3, Table 3.2. This diabetes rate is only for those RFN ages 20 through 79, so to approximate the 20-79 year old population in both RHAs, you can subtract off the 0-19 year olds (Central: 5,919 – 3,085 = 2,834; Burntwood: 26,473 – 13,193 = 13,280). To find the actual number of RFN persons requiring diabetes treatment for Central, you multiply 158.33/1000 by 2,834 to equal 449 persons. Similarly, the actual number of RFN persons requiring diabetes treatment in Burntwood is 120.70/1000 times 13,280 to equal 1,603. So even though the diabetes treatment prevalence is much higher in Central than in Burntwood RHA, the actual numbers of persons requiring health services is almost four times as high in Burntwood due to its comparatively larger population of RFN.

When looking at each graph, health policy planners and decision-makers need to keep in mind the following:

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

2.6 Health status indicators of your region (Chapter 4)

It is important to know whether or not a region's population has better or poorer health status in comparison with the rest of the province. Three measures of health status are included in this report – the Premature Mortality Rate (PMR), life expectancy, and Potential Years of Life Lost (PYLL). Two of the indicators – life expectancy and PYLL – are given separately for males and females. Every graph in the report is based on PMR ranking showing the Tribal Council areas and RHAs in the same order – increasing PMRs as you go from top to bottom. So the top Tribal Council area (KTC) or RHA (South Eastman) have the population with the best overall health status compared with the other areas on the graph. Similarly, the bottom areas (DOTC, or Churchill) have the lowest health status in comparison with the other areas on the graph.

Example: Independent First Nations South

Independent FN South has a PMR of 6.2 deaths per thousand people ages 0 through 74 years old. This is similar to that of the overall Manitoba "on-reserve" rate (6.5 per thousand), as shown in Figure 4.1. Figure 4.1 shows an adjusted rate, which means that the rate is given as if the Independent FN South population pyramid looked like the Manitoba pyramid, with the same proportion of persons in each of the five-year age and gender categories. There is no marking of "M On" beside the Independent FN South rate, which tells you that even though its rate is not the same as the overall rate, it's close enough to be considered similar. There are some Tribal Councils that have lower PMRs (indicating populations with better health status) and some higher (a population with worse health status), with Independent FN South located about midway.

Another way of looking at the health status in this report is the life expectancy at birth. The life expectancy rates in this report *do not* have statistical testing. Independent FN South *men* live, on average, to about 68 years; *women* live to about 76 (see Figures 4.4 and 4.7). In comparison, Manitoba RFN men live to about 69 "on-reserve" and 68 "off-reserve" (see Figure 4.6), and women live to about 74 "on-reserve" and 73 "off-reserve" (see Figure 4.9). But the picture looks slightly different for all other Manitobans (Figures 4.5 and 4.8), where Manitoba life expectancies are 76 years for men and 81 for women.

The final look at overall health status in this chapter is the "Potential Years of Life Lost", PYLL. This takes into account age at death – deaths for younger persons are assigned higher weight. So a high PYLL indicates that the area's population may be dying before age 75, but also at a much younger age than 75. For example, PYLL would probably be high in an area where young people often die from injury. For Independent FN South, male and [female PYLLs are similar to the overall Manitoba "on-reserve" rates] (see Figures 4.10 and 4.13) – although the female PYLL appears lower than the overall provincial rate, it is not "statistically different." If you put this Tribal Council area within an RHA context, the Independent FN South communities are found in the RHAs of North Eastman, Central, Marquette, Parkland, and Interlake. All of these RHAs have statistically higher PYLL for RFN compared with all other RHA residents, as indicated by an asterisk (*) beside the RHA name in Figures 4.11 and 4.14.

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

- *What is the relative health status of the area compared to other areas (looking at PMR) and how will this affect the population's need for health care services?*
- *Do all three health status indicators (PMR, life expectancy, and PYLL) tell the same story? Does this make sense, and how could this be used in planning?*
- *Are there differences between males and females?*

2.7 Major disease profiles of your region (Chapter 5)

Three major diseases – diabetes, hypertension, and cancer – are profiled in Chapter 5. These are "adjusted" rates, which allow for fair comparisons between regions. The adjusted rate would be the rate seen if each area had the same age and gender composition as the entire population of Manitoba. Crude rates are given in Appendix C.

Example: Dakota Ojibway Tribal Council (DOTC)

The diabetes rates are based solely on administrative database information about physician and hospital visits, not on any diabetes surveillance registry. This is why the rates are referred to as "diabetes treatment prevalence" rates, since they are based upon either two physician visits for diabetes or one hospitalization for diabetes within a three-year period (see Chapter 5 for more explanation).

Figures 5.1 to 5.3 show information about diabetes treatment prevalence rates. DOTC has a higher diabetes treatment prevalence (249 per thousand, or 24.9% - see Figure 5.1) than the overall Manitoba "on-reserve" RFN (203 per thousand – shown at the bottom of Figure 5.1 as well as the bottom of Figure 5.3), "off-reserve" RFN (170 per thousand – shown at the bottom of Figure 5.3), and all other Manitobans (45 per thousand – shown at the bottom of Figure 5.2). These rates are all age/sex adjusted, meaning that this would be the rate if all the groups had the same overall age/sex distribution as the entire population of Manitoba. In Appendix C, Table C-1 shows the "crude" diabetes treatment prevalence rate for DOTC as 188 per thousand (18.8%). Because DOTC has a very young population, the adjusted rate will be higher than the crude rate since diabetes rates are higher in older age groups. So if DOTC had a similar population pyramid as Manitoba (more rectangular instead of pyramidal), the area would have a greater proportion of elderly, and hence a higher overall rate of diabetes. The crude rate gives a picture of the real percentage of people with diabetes living within DOTC – 18.8% of the population of all adults 20 to 79 years old were treated for diabetes.

DOTC has a rate of hypertension (210 per thousand) similar to the Manitoba "on-reserve" rate (235 per thousand), as seen in Figure 5.4. The phrase "similar to" refers to the fact that the DOTC rate is not statistically different than the overall provincial "on-reserve" RFN rate shown at the bottom of the graph. For the rate of injury hospitalization (see Figure 5.7), DOTC is also similar to the Manitoba "on-reserve" rate (35.1 per thousand versus 33.2 per thousand). One of the RHAs which overlaps DOTC is Central. Looking at Figure 5.5, RFN and all other people in Central RHA have similar rates of hypertention (no asterisk * in the column), yet statistically lower hypertension rates than the provincial RFN rate (187 per thousand versus 221 per thousand). Looking at Figure 5.8, RFN living in Central RHA have dramatically higher (and statistically higher *) injury hospitalization rates

more than three times higher than all other people in the region (33.8 per thousand versus 10.1 per thousand).

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

- *Why are the area rates different or similar?*
- *How are the illness rates likely to influence the need for health care?*
- *Do the services of the area reflect the health needs of the population – both in the area of prevention and treatment?*

2.8 Are preventive programs "working" in your region? (Chapter 6)

Child health is an important issue for all Manitobans. Two measures of the "success" of childhood preventive health care programs are the immunization rate (Figures 6.1 through 6.6), and the newborn breastfeeding rate (Figures 6.10 through 6.14). These are age-specific rates, reported as the percent of one-year olds and two-year olds that have received the complete immunization schedule and as the percent of newborns who were breastfed. Another indicator of the success of a preventive program is the rate of mammography screening for women aged 50-69. This is also an age-specific rate (Figures 6.7 through 6.9). Since all of these indicators are age-specific, the rates are *crude rates*, not age-adjusted rates.

Example: "Off-reserve" Registered First Nations people (RFN) living in Winnipeg

Looking at the three indicators of preventive care measures, RFN in Winnipeg show significantly lower levels of preventive care compared with all other Winnipeggers. As seen in Figures 6.2, 6.3, 6.5 and 6.6, 69.2% of one-year old and 50.9% of two-year old RFN children living in Winnipeg received the complete set of immunizations. These rates are lower than those for all other one- and two-year old children in Winnipeg, who have rates of 89.1% and 77.7% for one- and two-year immunizations. Of all RFN newborns living in Winnipeg, 60.0% were breastfed at hospital discharge, compared to 81.9% of all other Winnipeg newborns (Figures 6.11 and 6.12). Only 29.3% of RFN Winnipeg women ages 50 through 69 received a mammogram in 1997 and 1998, compared with 53.6% of all other Winnipeg women aged 50 through 69 years (Figure 6.8).

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

- *How effective is the region in providing immunizations and mammography?*
- *Is there a way to increase the immunization rates?*
- *Why are so few women receiving mammography screening?*
- *Do regions with varying immunization or mammography rates have different service delivery systems, or is this influenced by other factors?*

2.9 How do people in your region use physician services? (Chapter 7)

Chapter 7 describes the way in which residents of Tribal Council areas and RHAs use physicians and specialists. Measures include: "ambulatory" visit rate; types of providers visited (general practice/family practice or specialists); and location of visits (in the area, in another RHA, in Winnipeg, or out of province). 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 people in nursing homes or in their own homes.

Most physicians in the province are paid through fee-for-service. In order to receive payment for their services, they record the reason (diagnosis) for the visit. There are some physicians, especially in northern remote areas, who are paid a salary. Many of these physicians still "shadow bill" the government, that is, they fill out an evaluation claim so that the diagnosis code is still recorded for the visit. However, we realize that the evaluation claims are not as complete as the fee-for-service billings, since there is little incentive for the physician to complete the forms. As well, many northern and remote communities have access to nurse practitioner services for basic illness care. Nurses in these situations do not record their services through the fee-for-service billing system, so these visits are not included in the report. Thus our rate of general practitioner use may be undercounted for some northern/remote areas.

Example: Interlake Reserves Tribal Council (IRTC)

IRTC is considered one of the Tribal Council areas having a population with a better health status compared to many other Tribal Council areas - that is, you find IRTC near the top of each graph. It is geographically situated within Interlake RHA, which is of average health status compared with all other RHAs (refer to Chapter 4 on health status indicators, and specifically PMR). IRTC has an ambulatory visit rate of 5.6 visits per person, statistically higher than the overall Manitoban "on-reserve" RFN rate of 5.2 visits per person (Figure 7.1). This, however, may be partially due to northern remote area visits to nursing stations not being recorded in the administrative system. Within the corresponding RHA of Interlake, RFN have a statistically (*) higher visit rate than all other people living in the area (5.6 versus 4.5 visits per person), with little difference between RFN living "on-reserve" and "off-reserve" (see Figures 7.2 and 7.3). For consultations, Figure 7.4 shows that IRTC's consult rate (0.27) is similar to the provincial "on-reserve" RFN rate (0.28 visits per person), and Figure 7.5 shows that Interlake RFN have a rate slightly higher than all other Interlake residents (0.29 versus 0.26 visits per person). Total ambulatory specialist contact rates for IRTC are higher than the Manitoba "on-reserve" provincial rate (0.79 versus 0.68 visits per person), as shown in Figure 7.7. As shown in Figure 7.8, within Interlake RHA, RFN have lower specialist contact rates than all other residents of the region (0.87 versus 1.08 visits per person), and Figure 7.9 shows that RFN living "on-

reserve" have lower visit rates than RFN living "off-reserve" within the RHA (0.81 versus 1.07 visits per person).

The type of physician visit shows some differences – in Figure 7.10, it shows that 86.0% of all IRTC ambulatory visits are to general practitioners or family practitioners (GPs/FPs) rather than to specialists. In Interlake RHA, 76.1% of visits by all other residents are to GPs/FPs (see Figure 7.12). For RFN living "on-reserve" in Interlake, 85.6% of visits are to GPs/FPs (Figure 7.13), compared with 80.1% of visits by RFN living "off-reserve" (Figure 7.14). Thus those living "off-reserve," as well as all other residents of Interlake RHA, have a higher proportion of visits to specialists compared with those living "on-reserve." Manitoba overall rates are mainly driven by the large portion of the population living in Winnipeg, where the proportion of ambulatory visits to specialists is the highest in the province. Figure 7.8 shows that Interlake RHA ("all other residents") patterns are affected by its proximity to Winnipeg, having the highest rate of visits to specialists of all the non-Winnipeg RHAs.

Is this pattern reflected in RFN visits? Figure 7.13 shows that for "on-reserve" RFN, those living in Interlake have one of the highest proportions of visits to specialists for "on-reserve" RFN, other than in Burntwood (South Eastman rates here are unreliable due to small numbers). This is also true for "off-reserve" RFN (Figure 7.14) compared with all other "off-reserve" RFN.

Where do people in IRTC go for GP/FP visits? Mostly, they stay in the Interlake RHA in which they reside – 83% of visits are in their RHA (see Figure 7.15). Comparing "on-reserve" with "off-reserve" RFN from Interlake (Figures 7.18 and 7.19), "on-reserve" RFN are more likely to visit a GP/FP in their RHA compared to "off-reserve" RFN (83% versus 72%), with most of the other visits occurring in Winnipeg. All other people living in Interlake only have around 71% of visits occurring in their RHA, with most other visits also occurring in Winnipeg (Figure 7.17).

Where do people in IRTC go for specialist visits (see Figures 7.20 and 7.21)? For IRTC, the vast majority of visits to specialists are in Winnipeg (94.1%), higher than the corresponding percentage for all RFN people living in Interlake (85.5% - see Figure 7.21), and for other people living in Interlake (82.3% - see Figure 7.22). Comparing those RFN living "on-reserve" and "off-reserve" within Interlake RHA, a much higher percentage of specialist visits for "on-reserve" go to Winnipeg (93% versus 68%, as shown in Figures 7.23 and 7.24)).

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

- *Does a lower/higher physician visit rate make sense because of the health status of the population in an area, or does it reflect "under/over-servicing"?*

- *Are there groups of people within the region with high need (poor health status), and do they have good access to physician services? Are there "contradictory findings" that could be explained by local factors?*
- *Why do some regions use GP/FPs more extensively, whereas others use specialists? Is this explained by disease patterns, or proximity to major centers, or other regional factors?*
- *Are there patterns of usage of "within RHA" or "outside RHA" ambulatory visits (for both GP/FPs and for specialists) which could or should be altered?*

2.10 How do people in your region use hospital services? (Chapter 8)

Chapter 8 provides information on hospitals, including "separation rates" (frequency of use), days of stay in hospital, and location of hospitalizations. Once again, these rates have been age- and sex-adjusted, so that an area's adjusted rate would be the rate if that area had the same population pyramid as the overall Manitoba population (see Chapter 3). Crude rates for each of the indicators are also given in Appendix C.

Example: Registered First Nations people (RFN) living in North Eastman RHA

In North Eastman RHA, RFN have a significantly higher rate of hospital separations – double the rate of hospitalization – compared with all other Manitobans of the area (349 versus 160 hospitalizations per thousand population – Figure 8.2). The asterisk (*) beside the RHA name tells us that this is a statistically significant difference in rates. North Eastman RHA has a population that is about average in terms of the PMR , that is, not significantly different than the Manitoba overall PMR (see Chapter 4 for a discussion on PMR and overall health status). In Figures 8.1 and 8.2 for the Tribal Council of SERDC and for RFN living in North Eastman, hospital separation rates are also similar to the Manitoba average rate (that is, not statistically different). Figure 8.3 shows very little difference in hospitalization rates for "on-reserve" and "off-reserve" RFN groups within North Eastman RHA. It is often interesting to look at overall trends within the graphs. For example, Figure 8.1 shows increasing hospitalizations as you go down the graph, that is, as PMR increases (health status gets worse), with the exceptions of SERDC and DOTC.

Total days of hospital care per person shows a similar picture (Figure 8.4), with SERDC having a statistically similar rate at 2.32 days per person to the overall "on-reserve" rate of 1.76 days per person per year. RFN living in North Eastman have a much higher total days of hospital care, 1.8 times the total days of care per person (1.84 versus 1.00 days per person – Figure 8.5), compared with all other North Eastman residents. Those RFN living "on-reserve" in North Eastman RHA have a statistically higher rate than those living "off-reserve" in the RHA (1.94 versus 1.24 days per person – see Figure 8.6). For SERDC, Figure 8.7 shows that only about one-third (37.0%) of the hospitalizations occur within the RHA of residence, with the majority of hospitalizations occurring in Winnipeg (58.7%). This pattern is

quite similar to that for all other people living in North Eastman (see Figures 8.8 through 8.11).

Note that the hospital days and hospital separation rates are "adjusted." Since the population pyramids of SERDC and Manitoba are very different, the adjusted rates are different from the crude rates (listed in Appendix C). For example, the adjusted hospitalization separation rate for SERDC is 333 per thousand, whereas the crude rate is 254 per thousand. In other words, when the rate for SERDC takes into account the relative hospitalization rates for each age group of people, and weights these as if SERDC were an "older" population, then the rate goes up. Similarly, the adjusted total days of hospitalization for SERDC is 2.32 days per person, compared with the crude rate of 1.16 days per person. To get the actual number of days used by SERDC people in 1998/99, the crude rate (1.16 per person) would be multiplied by the population figure for SERDC (3,646 persons) to yield 4229 days in hospital for the entire population of SERDC. The crude rate is useful in figuring out the "real world" of persons in hospital beds, whereas the adjusted rate gives a fairer comparison between groups of people with very different patterns of age distribution.

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

- *Do hospital use levels make sense given the health status of residents of the region?*
- *Does a higher "separation rate," that is, more frequent use of hospitals, reflect poorer health of local residents, a higher than average number of hospital beds, or something else related to the use of hospitals?*
- *Do residents of the high-use regions 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?*
- *Is the location of hospitalization a problem for some areas of the province, when people are hospitalized far away from home?*

2.11 What are the rates of selected surgical procedures for people in your area? (Chapter 9)

Chapter 9 focuses on surgical procedures, with all rates adjusted for age and sex. This is an interesting and eclectic mix of procedures, including some focussing on young, middle-aged or elderly people, and some focussing on procedures affecting mostly males or females. Chapter 9 provides rates of these procedures for each region. Unfortunately, some of these procedures are relatively rare, so rates have been calculated over a number of years. Sometimes, the low numbers in a group (such as "off-reserve" within a region), make it difficult to obtain a stable rate, so the information was suppressed due to small numbers.

"High profile" procedures are those that are often talked about in the press and media. Cardiac catheterization, angioplasty, and coronary artery bypass graft surgery are discussed here because they are high profile procedures associated with major

improvements in quality of life. "Discretionary" procedures have been the subject of critical reviews in the research literature because of potential overuse. We chose three as indicators: tonsillectomy/adenoidectomy, hysterectomy, and Caesarian section surgeries. One more category, "adverse outcomes," was chosen to reflect differences in the course of illness of diabetes. Amputation is considered an adverse outcome of diabetes, and possibly a measure of the quality of care or the severity of the illness.

Example: Brandon RHA

Figure 9.2 shows that people living in Brandon RHA have a lower than provincial average rate (MO) for cardiac catheterization (1.78 versus 2.65 per thousand). Only the "all other Manitobans" rate is shown, since the "off-reserve" RFN in Brandon has a rate based upon numbers too small to be reported. The Brandon RHA rate for "all other Manitobans" is lower than average for coronary artery bypass graft surgery (see Figure 9.4), but shows an average rate for angioplasty (see Figure 9.6). This Brandon pattern may also be evident in "high profile" procedure rates for neighbouring Tribal Council areas and RHAs. The Tribal Council area of DOTC appears to have similar patterns of low rates for cardiac catheterization and coronary artery bypass graft surgery, albeit not statistically lower (Figures 9.1 and 9.3). So, too, South Westman RHA shows statistically lower rates for all three procedures, compared with the provincial average (Figures 9.2, 9.4 and 9.6).

Examples where average to low rates probably represent good practice include hysterectomy, Caesarian section, and tonsillectomy/adenoidectomy – these are called "discretionary procedures" due to the high degree of fluctuation seen within the province that may be more related to physician practice patterns. The three-year Brandon Caesarian section rate is similar for both RFN and all other Manitobans, and also similar to the provincial rate (Brandon: 183 per thousand births for RFN, 166 per thousand for all others; provincially: 142 per thousand for RFN, 173 for all others) (see Figures 9.8 and 9.9). The five-year Brandon hysterectomy rates for women aged 25 years or older is similar to the provincial average (Brandon: 3.5 per thousand for RFN, 5.3 per thousand for all others; provincially: 5.0 per thousand for both RFN and all others) (see Figure 9.11). The hugely elevated hysterectomy rate for women of the WRTC (West Region Tribal Council) neighbouring area, at 9.7 per thousand (Figure 9.10), may need to be considered in light of where these surgeries are done – in Brandon, or in local RHA hospitals. Brandon has a similar tonsillectomy/adenoidectomy rate for RFN, compared to the provincial RFN average (5.3 versus 4.2 per thousand). However, "all other children" in Brandon experience a much higher (and statistically higher) tonsillectomy/adenoidectomy rate than the provincial average (7.5 versus 5.8 per thousand – see Figure 9.14). These elevated patterns do not seem to be evident in the RFN children of surrounding Tribal Council areas – DOTC has a lower-than-average "on-reserve" corresponding rate as shown in Figure 9.13 (2.0 versus 4.5 per

thousand), and WRTC an average rate (4.0 versus 4.5 per thousand). The elevated patterns only relate to "all other Manitoban" children of the area.

In the "adverse outcomes" measure of amputation associated with diabetes, Brandon rates for RFN are one of the highest rates in the province (6.3 per thousand persons ages 20 through 79 years, compared with the overall provincial RFN rate of 3.1 per thousand), but the Brandon rate for all other residents is similar to the overall provincial average (0.17 versus 0.19 per thousand – see Figure 9.17). The neighbouring Tribal Council of DOTC also has a statistically higher rate than the provincial "on-reserve" rate (6.2 versus 3.4 per thousand), as seen in Figure 9.16. Once again, it is important to distinguish between an age/sex adjusted, or "standardized" rate and the "crude" rate. The standardized rate is used for comparative purposes, so that all the area rates, whether they be RHAs or Tribal Council area rates, are adjusted to reflect the rate if that area had the same age/sex distribution of population as the Manitoba overall population in 1996. If planners need to know the actual rate, that is, the number of people having the procedure divided by the number of people in the area, then a crude rate is a better estimate of the numbers of persons requiring the procedure. Appendix C gives the crude rates: for DOTC, the amputation rate (diabetes related) is 3.77 per thousand – higher than the overall "on-reserve" RFN crude rate of 2.02 per thousand, the overall crude rate for all RFN (both "on-reserve" and "off-reserve") of 1.59 per thousand, and substantially higher than the overall provincial "all other Manitoban" rate of 0.20 per thousand. For the RHA of Brandon, however, the crude amputation rate is 1.26 per thousand for RFN living in Brandon. The effect of age/sex adjustment of the RFN living in Brandon substantially increases the standardized rate to 6.3 per thousand – this is most likely due to the fact that Brandon RFN have even more young people proportionally in the age 20 through 79 bracket than many of the other RFN groupings in the report. This is shown in Table 3.2, where Brandon has a high proportion of RFN in the 20-39 age bracket compared to the 40-59 age bracket, when compared with other neighbouring RHAs such as Central, South Westman and Marquette.

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

- *Compared to other regions, does the Tribal Council area or RHA have a high or low rate of the procedure?*
- *Are surgery rates related to the proximity of the region to major health centres?*
- *Where rates of cardiac procedures are low, do local physicians have good referral links to relevant surgeons, or could these links be improved?*
- *What does a "low" or a "high" rate mean – is it an appropriate response to real need, or does it mean under- or over-servicing?*
- *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 does a high rate of an "adverse outcome" such as diabetic-associated amputations mean? Could it be an indication of severity of disease, duration of diabetes, or lack of preventive care?*

2.12 What other factors (determinants of health) could be affecting health in your region, such as housing and unemployment (Chapter 10)?

It is well known that health is not just the absence of disease, nor is it health care, but rather health is a holistic concept that includes social factors. The "social determinants" of health – determinants such as education and income, employment, and housing issues – highlight for planners and policy-makers the interconnected nature of health and social policy. Chapter 10 gives an overview of some of these indicators, based on information from Statistics Canada obtained during the 1996 census. As well, housing issues are addressed in detail, using information obtained from Indian and Northern Affairs Canada (INAC) 1998/99 reports for each First Nations community in Canada. We have reported most of these indicators by Tribal Council area. There are a few indicators for which we had information for Winnipeg Community Areas (Winnipeg CAs) as well. *Due to the limited information sources, no statistical testing was done for the determinants of health indicators.*

Example: South East Resource Development Council (SERDC)

SERDC Tribal Council area has one of the highest PMRs in Manitoba, indicating a population of low health status and a population possibly in need of health care, preventive health programs, and socioeconomic policy interventions. Figure 10.1 shows the proportion of those at least 15 years old who have completed a high school diploma. SERDC has the lowest high school attainment of all the Tribal Council areas, at 16.1% of the population. This is less than half the proportion for all RFN in Manitoba (33.5%), and much lower than the Manitoba general population level of 58.7%. Figures 10.3 and 10.4 highlight income levels for SERDC – although not the lowest, SERDC has one of the lower average household incomes ($24,428) and census family incomes ($23,808) in Manitoba, lower than the average Manitoba "on-reserve" income, and substantially lower than incomes of the general population. Figure 10.5 shows the unemployment rate for those at least 25 years old – SERDC had the highest unemployment rate for any Tribal Council area in the province, at 33.1%. This is over five times the rate of 6.0% for the general population of Manitoba. Looking at housing conditions, Figure 10.8 shows that SERDC has similar proportions of habitable housing units compared with other Tribal Council areas, at 72.7% of the total housing units. However, Figure 10.11 shows SERDC as somewhat of an anomaly compared with other southern Tribal Councils, with one of the highest proportions of homes lacking modern plumbing – 29.9% of homes, compared with the Manitoba "on-reserve" overall rate of 22%, and with many Tribal Councils having less than 5% of homes lacking modern plumbing. Both the average number of persons per total housing unit (Figure 10.9), and the average number of persons per habitable housing unit (Figure 10.10), are similar to the Manitoba "on-reserve" average (SERDC 4.8 persons per total housing unit and 7.3 persons per habitable housing unit; Manitoba "on-reserve" 4.8 persons per total housing unit, and 7.6 persons per habitable housing unit). However, these numbers are

extremely high when compared with a comparable figure available for the general Manitoban population, at 2.6 persons per housing unit.

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

- *How does your area compare to other areas in terms of education, income, and unemployment, and how does this compare with the overall Manitoba "on-reserve" data, or with the general population of Manitoba data?*
- *What is the housing situation in the Tribal Council area, in terms of habitable housing units, crowding, and availability of modern plumbing?*
- *Is there a need for specific programs to be put into place to address these issues?*

2.13 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 Tribal Council areas and the RHAs of Manitoba. The information can be used in many ways. A region can get an overview of the population it is serving, its health status, health service utilization, preventive programs, procedure rates and underlying determinants of health. Regions can also "cross-compare" their information with other regions (Tribal Councils, RHAs, population groups such as RFN or all other Manitobans). 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 entire population of Manitoba.

If you would like to access an electronic version of this report, which may help you in creating your own summary presentations, you will find this on the website of the Manitoba Centre for Health Policy, under Reports (complete reports). You will also find Excel spreadsheets for some of the graphs presented in the report.
http://www.umanitoba.ca/centres/mchp

References:

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CHAPTER 3. DESCRIPTIONS OF THE AREAS AND THE POPULATION

3.1 What's in this chapter?

This chapter includes definitions of the way in which the MCHP data were analyzed, including geographical boundaries, grouping of people, and descriptions of the populations. Specifically, the chapter includes information about the following:

- Map of the Tribal Council geographical areas
- Map showing an overlay of the Tribal Council areas with the Regional Health Authority boundaries of Manitoba
- Organizational Participation Chart by First Nations communities used for this report
- Map of the Regional Health Authorities of Manitoba and Winnipeg Community Areas
- Tables of the population size by Tribal Council and RHA, with Registered First Nations persons ("on-reserve", "off-reserve") and all other Manitobans, by age categories
- Population pyramids (population profiles) for each Tribal Council area and RHA

Terminology used in this report is taken from the *Report of the Royal Commission on Aboriginal Peoples (1996)*. "Aboriginal people" refers to the indigenous inhabitants of Canada. There are three Aboriginal groups recognized within Canada – First Nations, Inuit (known as "Eskimo" in Alaska), and Métis. The term "First Nations" replaces the terms "Indian" or "Native American" except in historical references. Métis are distinct Aboriginal peoples of mixed heritage, First Nations and European, who also associate themselves with a distinctive Métis culture.

In 1876, the federal Indian Act designated legal terms for being "Registered" (also known as Treaty, or Status) as a First Nations person. In 1985, this was revised under Bill C-31 to reinstate the status of women who had forfeited their own Treaty status by marrying non-Treaty men. The Status Verification System files of the federal government's Indian and Northern Affairs Canada lists those who are registered and thus receive entitlements of land, voting rights, and Band membership. Separate tracts of land, sometimes called "reserves," have been set aside through legislation and differentiated from other provincial or territorial boundaries under legal terms and treaties. In the past few years, the term "First Nations community" is also commonly used to refer to a relatively small group of Aboriginal people residing in a single locality. The governing body of a First Nations community is the elected Chief and Band Councillors. A Tribal Council is defined as an institution established as a grouping of bands with common interests who voluntarily join together to provide advisory and/or program services to member bands (Indian and Northern Affairs Canada). The specific advisory services include economic development, financial management, community planning, technical services, and band governance. For more information, refer to the Glossary, in Appendix E, under the term, "Tribal Council areas."

3.2 Key findings

- In 1998, 57% of the Manitoba RFN population were living "on-reserve," compared to 43% living "off-reserve"
- In 1998, 39.0% of RFN persons were younger than 15 years old – almost double the proportion when compared with only 20.0% of all other Manitobans.
- In 1998, 3.0% of the Manitoba RFN population were 65 years or older – about one-fifth the proportion when compared with 14.4% of all other Manitobans.

3.3 Canadian Comparisons

- In 1996, the majority of Canada's Aboriginal population lived in Northern Canada west of Quebec. The area with the largest concentration of Aboriginal peoples was the Northwest Territories, at 61.9% of the population. The province with the largest concentration of First Nations persons was Manitoba, at 11.7% of the population (Statistics Canada, 1998). *In our report, only 7.5% of the Manitoba population was classified as Registered First Nations for the year 1998 - there were 85,959 Registered First Nations persons (7.5%), and 1,054,422 other Manitobans, for a total provincial population of 1,140,381.* Thus we are undercounting First Nations compared to Statistics Canada, presumably due to not identifying Registered First Nations persons having band affiliation outside Manitoba, persons who self-report being First Nations but may not be Registered (including non-registered First Nations, Métis and Inuit), and persons who had missing information in the SVS file databases.

- The Canadian First Nations population is much younger than the general Canadian population. In 1996, approximately 35% of the First Nations population was 15 years of age or younger, compared with 21% for Canada overall. In contrast, only 4% of the First Nations population were 65 or older, compared with 11% of the overall Canadian population (Statistics Canada, 1998). *In our MCHP database for 1998, the Manitoba Registered First Nations population less than 15 years old comprises 39.0% of the total Registered First Nations population, compared with 20.0% of the population of all other Manitobans. Only 3.0% of Manitoba Registered First Nations people, compared with 14.4% of all other Manitobans, are 65 years or older.*

- There were 623 registered bands in Canada in 1997, with membership numbers ranging from less than 100 to more than 2,000. As of 1996, 46.6% of Registered First Nations lived on-reserve (Health Canada, 1999). *In our MCHP database for the year 1998, of the 85,959 Registered First Nations, 48,700 (56.65%) lived "on-reserve." Thus the First Nations persons residing in Manitoba may be more likely to live in the First Nations community of their band affiliation, compared to the Canadian average.*

3.4 Geographical locations

Geographical comparisons are made throughout this report. It is essential that the reader be very clear as to how we have defined the areas, and the groupings of people.

The ***Tribal Council areas***, including groupings of Independent and Unaffiliated First Nations communities, have been defined through a process involving the Health Information and Research Committee of Assembly of Manitoba Chiefs, and through the assistance of Mike Anderson from Manitoba Keewatinowi Okimakanak (MKO) and Charles Burchill (MCHP). Although seven of the geographical areas approximate the seven official "Tribal Councils," the other two (Independent groupings) are merely geographical groupings for purposes of this report. Figure 3.1a shows a map of the Tribal Council geographical areas used for this report. Each First Nations community has been "grouped" within one of the designated nine geographical areas for purposes of geographical data analysis (see chart in Figure 3.2). Figure 3.1b shows an overlay of the provincial Regional Health Authority boundaries with the Tribal Council areas.

Each Tribal Council graph in the report has the same order of areas, based on the Premature Mortality Rate (PMR) of the Tribal Council area (see Chapter 4 for a further explanation of this ordering). The Tribal Councils at the top of the graphs (KTC, ILTC etc.) have the lowest PMRs, indicating better overall health status compared with other Tribal Council areas. Those Tribal Council areas at the bottom of the graphs (DOTC, SERDC etc.) have the highest PMRs, and hence the poorest overall health status of the Tribal Council areas.

The ***Regional Health Authority (RHA) areas*** are recognized jurisdictional health regions of the province. There is a map of the RHA geographical boundaries in Figure 3.3. Each graph in the report has the same order of RHAs, based on the Premature Mortality Rate (PMR) of the regional population (including all persons, whether Registered First Nations or all others, living in the RHA). Refer to Chapter 4 for further explanation of PMR. Those RHAs at the top of the graph (South Eastman, Central etc.) have the lowest PMRs of all the RHAs and hence the populations with the best health status. Those RHAs at the bottom of the graph (Churchill, Nor-Man, Burntwood) have the highest PMRs, meaning the poorest overall health status.

Because Winnipeg is a highly populated RHA having defined communities with very different characteristics, there is also a map of the twelve subdivisions of Winnipeg, called "Community Areas" shown in Figure 3.4. The only section that provides information on Winnipeg Community Areas is Chapter 10, Determinants of Health – within this chapter, Winnipeg Community Areas are also ordered by PMR, with those areas having the best overall health status at the top (Fort Garry, River Heights etc.), and those having the poorest health status at the bottom of the graph (Downtown, Inkster etc.).

Figure 3.1a: Map of the Tribal Council Areas

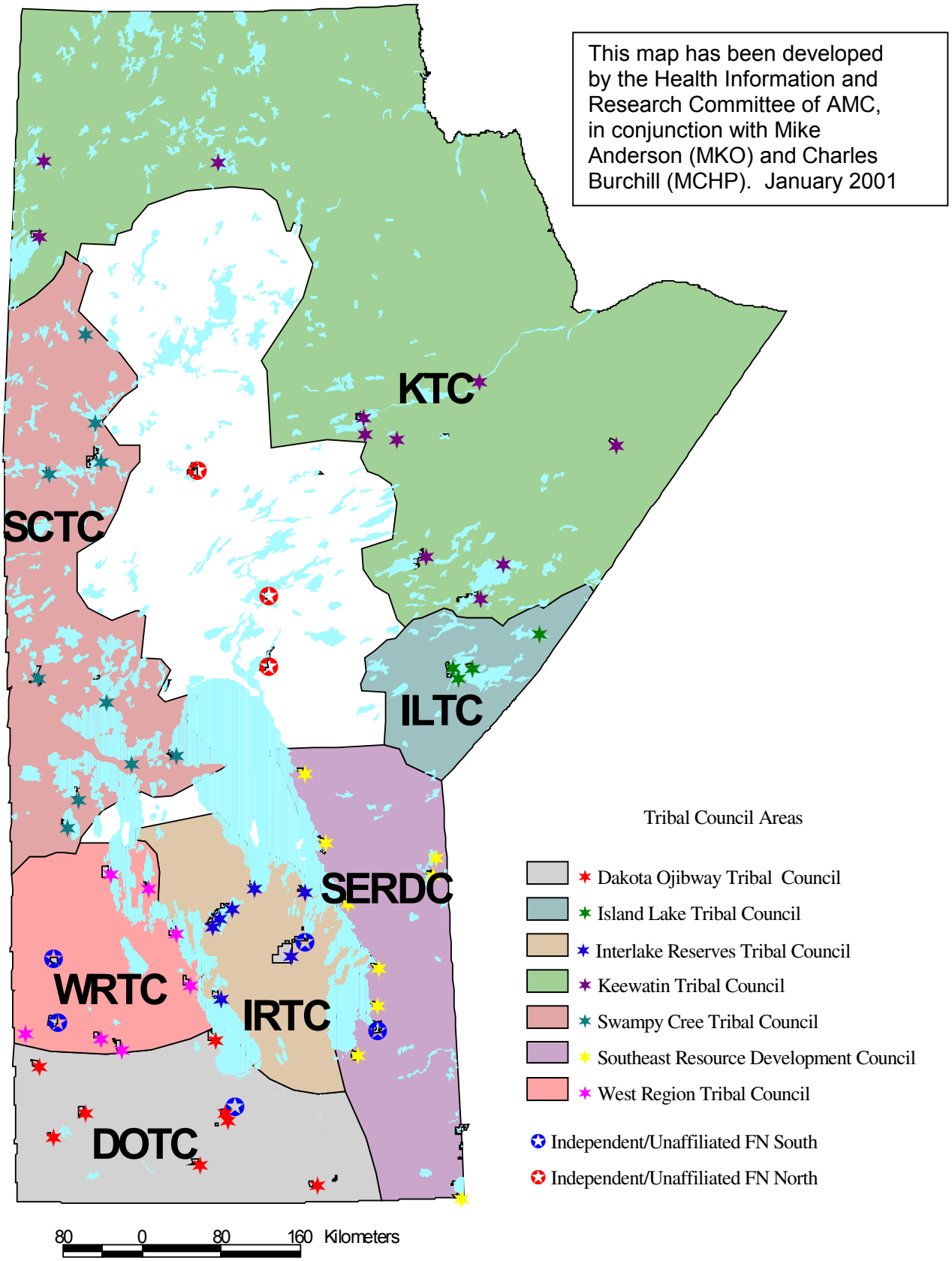


Figure 3.1b: Map of the Tribal Council Areas with RHA Boundaries Superimposed

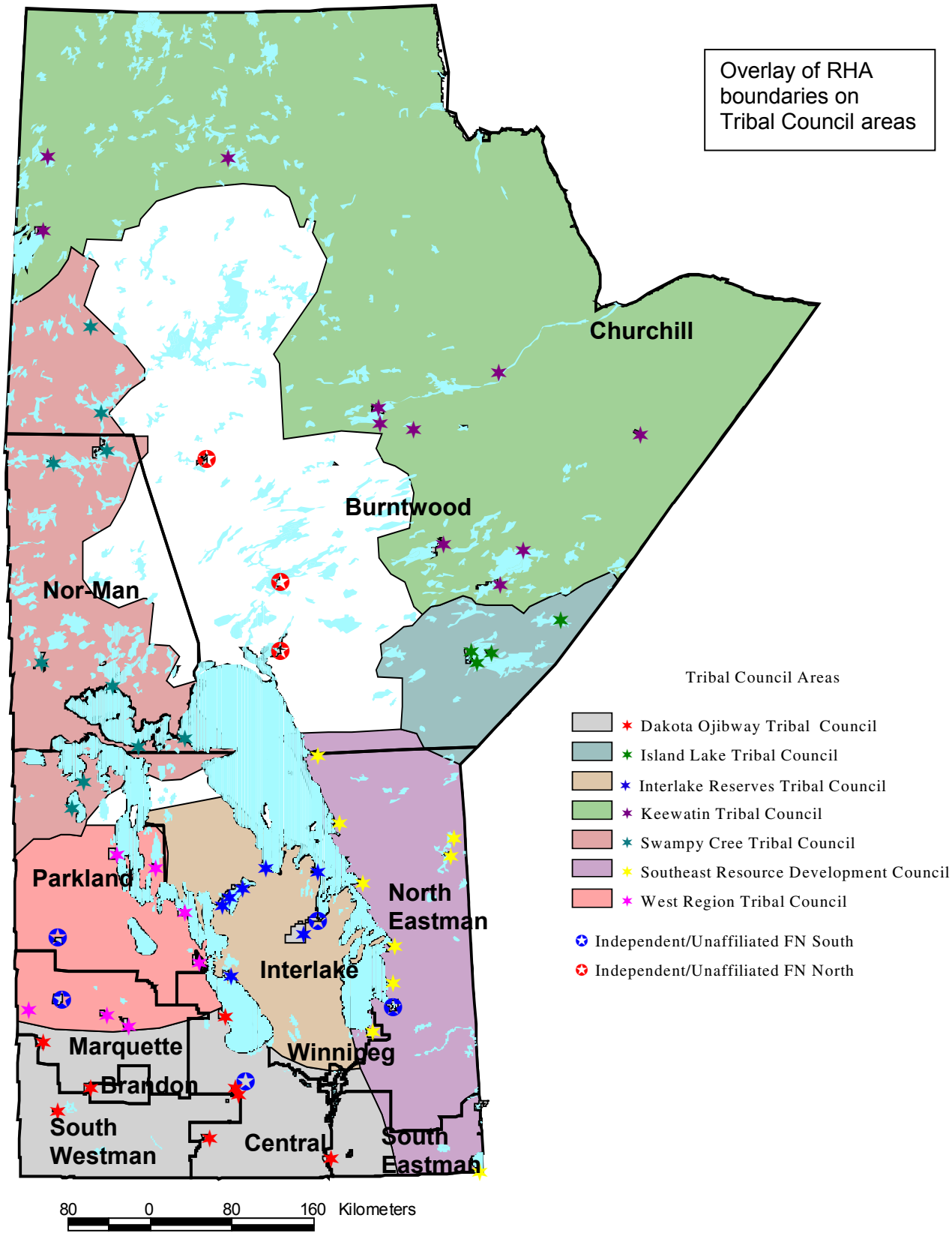
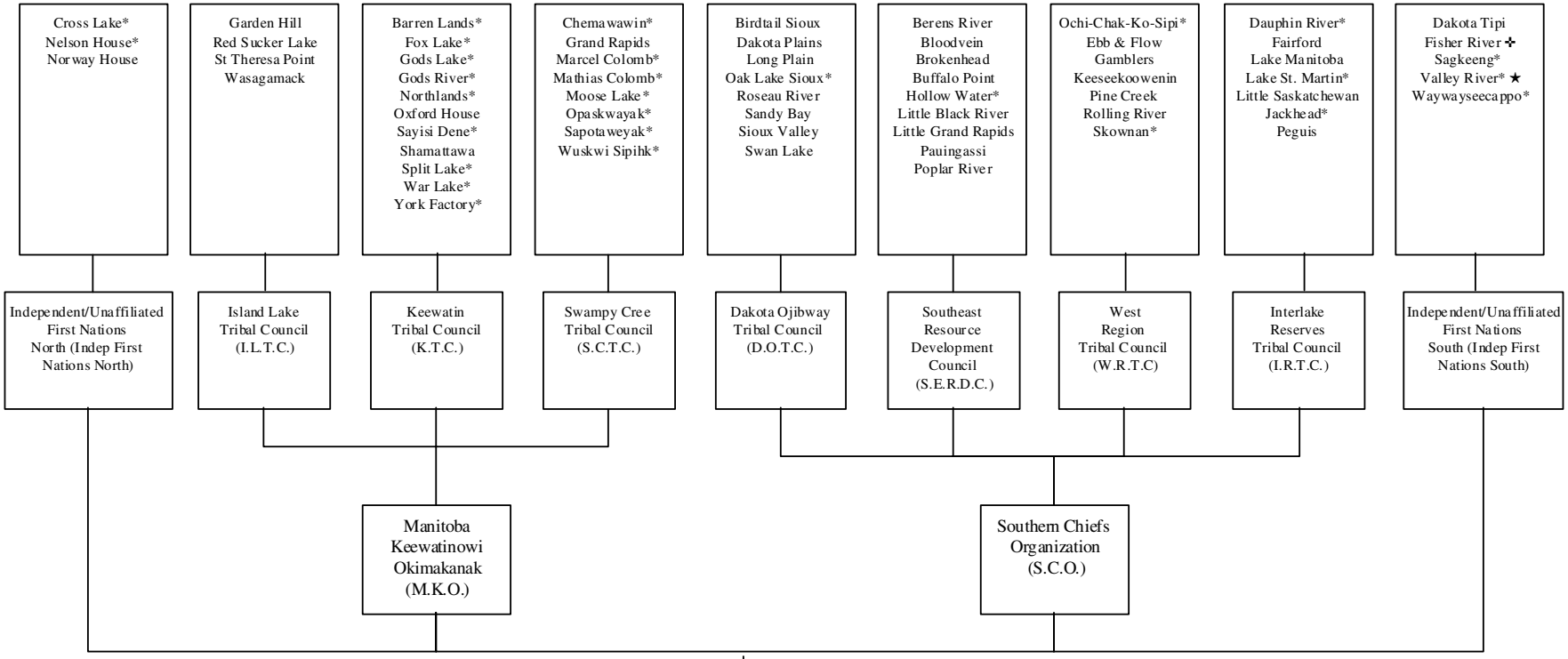


Figure 3.2: Organizational Participation Chart for This Report, (June 2001)



***Common First Nation Naming Variations**
The following First Nations may be represented by various common names. Traditional and common names are provided.

Barren Lands	Brochet
Chemawawin	Easterville
Cross Lake	Pimicikamak
Dauphin River	Anama Bay
Fox Lake	Bird
God's Lake	God's Lake Narrows
God's River	Manto Sipi Cree Nation
Hollow Water	Hole Water
Jackhead	Kinonjeoshtegon
Lake St. Martin	The Narrows
Marcel Colomb	Black Sturgeon (Granville)
Mathias Colomb	Pukatawagan
Moose Lake	Mosakahiken Cree Nation
Nelson House	Nisichawayasihk, South Indian Lake
Northlands	Lac Brochet
Oak Lake Sioux	Canupawakpa
O-chi-Chak-Ko-Sipi	Crane River
Opaskwayak	The Pas
Sagkeeng	Fort Alexander
Sapotaweyak	Shoal River
Sayisi Dene	Churchill, Tadoule Lake
Skownan	Waterhen
Split Lake	Tataskweyak
Valley River	Tootinaowaziibeeng
War Lake	Ilford
Waywayseecappo	Lizard Point
Wuskwi Sipihk	Indian Birch
York Factory	York Landing

* First Nation may also be named traditionally or use a common variation (see list)
✣ means that this community does not belong to the organization
★ means that this community does not belong to any organization, and is "unaffiliated"

Figure 3.3: Map of the RHAs (Regional Health Authorities) of Manitoba

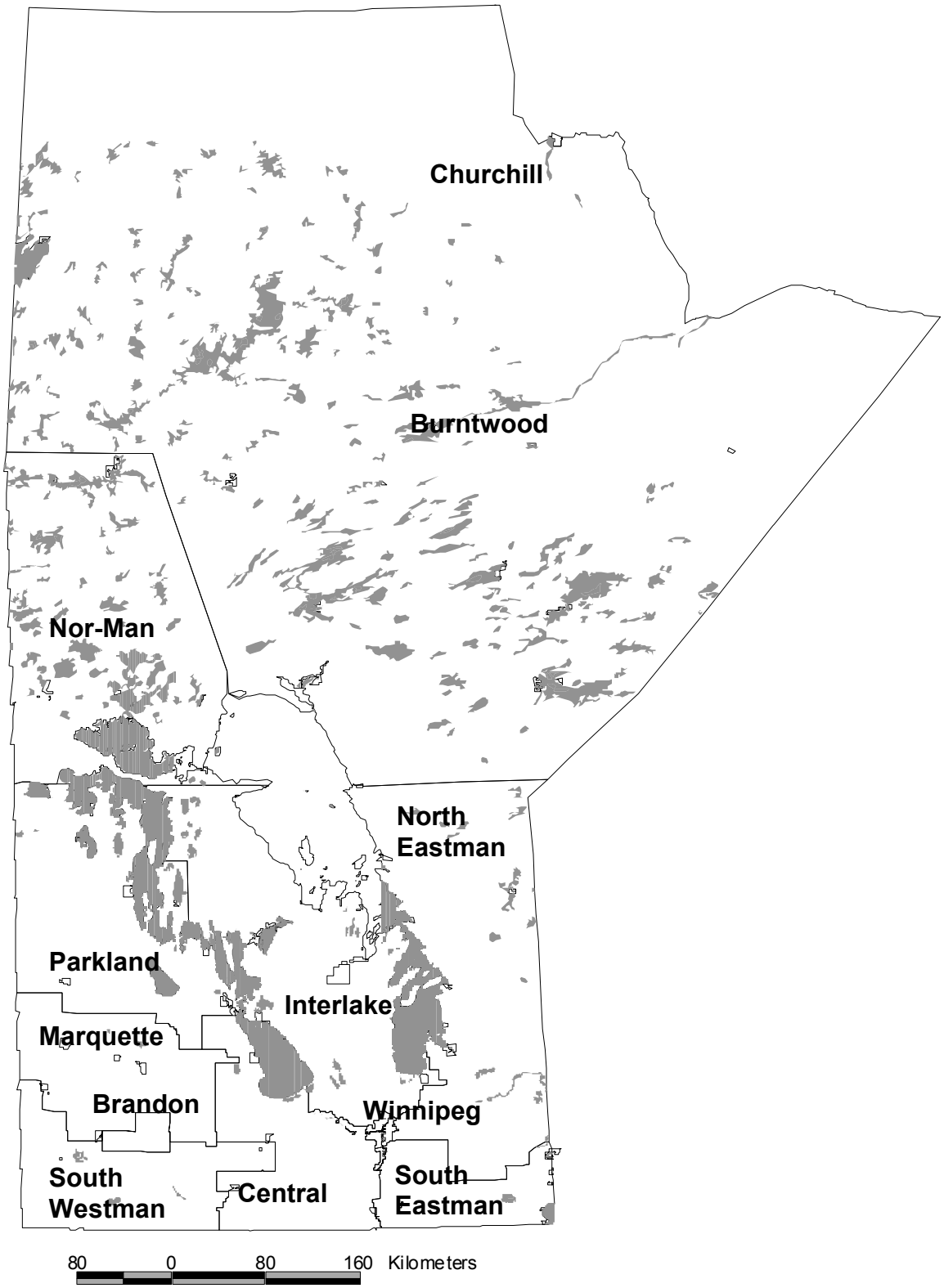
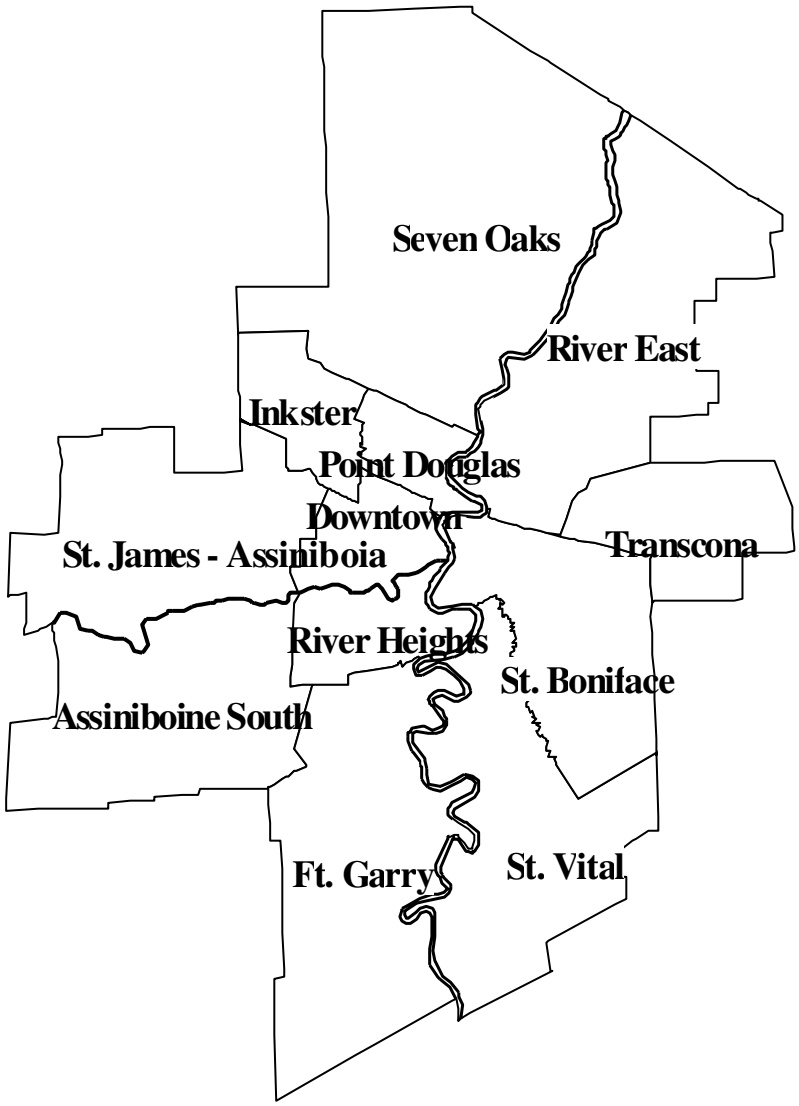


Figure 3.4: Map of the Winnipeg Community Areas



3.5 "On-reserve," "off-reserve," and Registered Nations definitions

This report defines ***"on-reserve" and "off-reserve"*** Registered First Nation (RFN) persons according to postal code of residence. This will cause some discrepancies with reports from First Nations community records, where "on-reserve" may often include people who are not living within the community at the time – for example, someone attending university, or someone with Band membership living in another First Nations community.

Because the POPULIS system (refer to Chapter 1, section 1.5) uses postal code and/or Municipality Code to determine where a person resides, a slightly different way of classification was necessary. In this report, if a Registered First Nations person has band membership with a Manitoba First Nations community, and if their residential postal code could be within that community or very close to that community, then we classify this person as living *"on-reserve."* A more realistic definition may be *"living either 'on-reserve,' or very close to the community of their band affiliation."*

On the other hand, if there is discrepancy between the band affiliation (Municipal Code) and residential postal code, then the person is identified as living *"off-reserve."* This could include situations where a person is *truly living "off-reserve," situations where students have lived away from the community and have changed their postal code information with Manitoba Health, and situations where a person lives in a different First Nations community from their band affiliation.* Needless to say, we realize that this will yield slightly different counts of persons who are normally identified as "on-reserve" or "off reserve" Registered First Nations.

Moreover, we are only identifying *those persons having Registered First Nations status for a Manitoba First Nations community*, and *residing within Manitoba*, due to the fact that the Status Verification System (SVS) files used for this report only included Manitoba band affiliation (see the Glossary in Appendix E for a definition of SVS). Those First Nations individuals who have affiliation with a band outside Manitoba will not be included in the First Nations group, but will rather be included in the "all other Manitobans" group. Table B-1 in Appendix B lists comparisons of population counts by various sources, including Medical Services Branch 1999, Indian and Northern Affairs Canada 1996, Statistics Canada 1996, and the MCHP linked database used for this project.

3.6 Population figures for this report

For purposes of this report, our analyses included the years 1994 through 1999. The linked file for this report identified 92,869 living, and 4,766 deceased Registered First Nations persons during this six-year period, for a total of 97,635 RFN. The original SVS file prior to linkage contained 107,000 RFN with a Manitoba First Nations community band affiliation. But this would include persons living outside Manitoba

but having affiliation with a Manitoba Band, persons who did not have a current Manitoba Health registration number because they died prior to 1994, and persons with too much missing information thus making linkage impossible.

The database for this report has different number counts for each specific year of the six years 1994 through 1999, since people are born, die, or move in and out of the province. So although the total number of living and deceased persons within the files for the six years was 97,635 each year had slightly different "snapshots" of Manitobans. For example, in the year 1999 there were 87,328 (7.63%) Registered First Nations, and 1,057,532 (92.37%) other Manitobans, for a total provincial population of 1,144,860. However, this snapshot differs slightly for the preceding year – in 1998 there were 85,959 RFN (7.5%), and 1,054,422 other Manitobans, for a total provincial population of 1,140,381. Of the 85,959 RFN, 42,767 (49.75%) were male, and 48,700 (56.65%) lived "on-reserve." Tables 3.1 and 3.2 detail the population figures for the Tribal Council areas and for RHAs, by age categories, for the year 1998.

Table 3.1: Population by Tribal Council for "on-reserve" Manitoba Registered First Nations persons as of December 31, 1998 (source: MCHP linked database)

Tribal Council	Age Categories					Total
	0-19	20-39	40-59	60-74	75+	
Keewatin Tribal Council	3,457	2,179	933	316	97	6,982
Island Lake Tribal Council	2,847	1,717	740	199	65	5,568
Interlake Reserves Tribal Council	1,863	1,259	740	222	71	4,155
Indep First Nations North	4,373	2,935	1,360	394	125	9,187
Indep First Nations South	1,885	1,336	750	228	63	4,262
Swampy Cree Tribal Council	3,119	1,991	883	224	68	6,285
West Region Tribal Council	1,285	820	450	139	30	2,724
Southeast Resource Devel Council	1,815	1,076	526	183	46	3,646
Dakota Ojibway Tribal Council	2,595	1,565	774	232	61	5,227
Manitoba "on-reserve" totals	23,239	14,878	7,156	2,137	626	48,036

Table 3.2: Population by Regional Health Authority – Registered First Nations and all other Manitobans by age, and "on-reserve"/"off-reserve" Registered First Nations within the RHA, for the year 1998

RHA	Age groupings by Registered First Nations (RFN) and all other Manitobans (AOM)										Total by RHA		
	0-19		20-39		40-59		60-74		75+				
	RFN	AOM	RFN	AOM	RFN	AOM	RFN	AOM	RFN	AOM	RFN	AOM	All
South Eastman	143	17,307	115	15,051	38	12,379	10	5,048	1	2,601	307	52,386	52,693
Central	3,085	28,580	1,765	24,504	804	21,458	212	9,939	53	6,668	5,919	91,149	97,068
Brandon	1,151	11,925	737	12,973	219	11,252	32	5,147	4	3,250	2,143	44,547	46,690
South Westman	198	9,391	163	7,889	79	8,398	29	4,825	9	3,576	478	34,079	34,557
Winnipeg	10,091	157,248	7,500	187,332	3,019	165,930	497	69,913	97	42,162	21,204	622,585	643,789
Interlake	3,408	17,952	2,452	17,123	1,422	18,470	436	8,690	125	4,394	7,843	66,629	74,472
Marquette	1,349	8,968	917	8,128	520	8,779	163	5,038	41	3,824	2,990	34,737	37,727
North Eastman	3,045	8,956	1,956	8,135	969	9,301	310	4,170	89	1,832	6,369	32,394	38,763
Parkland	2,504	9,789	1,417	9,038	685	9,690	187	5,767	46	4,234	4,839	38,518	43,357
Burntwood	13,193	6,494	8,264	6,248	3,649	4,758	1,040	774	327	144	26,473	18,418	44,891
Nor-Man	3,527	5,458	2,303	5,360	1,005	4,984	230	1,634	74	762	7,139	18,198	25,337
Churchill	90	253	88	278	52	191	16	53	9	7	255	782	1,037
Manitoba Total	41,784	282,321	27,677	302,059	12,461	275,590	3,162	120,998	875	73,454	85,959	1,054,422	1,140,381

RHA	Age groupings by Registered First Nations (RFN) "On-Reserve"/ "Off-Reserve"										Total by RHA		
	0-19		20-39		40-59		60-74		75+				
	On R	Off R	On R	Off R	On R	Off R	On R	Off R	On R	Off R	On R	Off R	All RFN
South Eastman	10	133	4	111	4	34	3	7	0	1	21	286	307
Central	2,029	1,056	1,158	607	528	276	148	64	37	16	3,900	2,019	5,919
Brandon		1,151		737		219		32		4		2,143	2,143
South Westman	111	87	83	80	44	35	20	9	3	6	261	217	478
Winnipeg		10,091		7,500		3,019		497		97		21,204	21,204
Interlake	2,341	1,067	1,650	802	989	433	310	126	97	28	5,387	2,456	7,843
Marquette	1,182	167	789	128	465	55	151	12	36	5	2,623	367	2,990
North Eastman	2,551	494	1,627	329	822	147	271	39	72	17	5,343	1,026	6,369
Parkland	1,630	874	958	459	482	203	134	53	32	14	3,236	1,603	4,839
Burntwood	10,677	2,516	6,831	1,433	3,033	616	909	131	287	40	21,737	4,736	26,473
Nor-Man	2,708	819	1,778	525	789	216	191	39	62	12	5,528	1,611	7,139
Churchill		90		88		52		16		9		255	255
Manitoba Total	23,239	18,545	14,878	12,799	7,156	5,305	2,137	1,025	626	249	48,036	37,923	85,959

3.7 What is a population pyramid?

In this chapter, you will find population pyramids, or "profiles" for each geographical area of Tribal Council and RHA. A population pyramid is simply a picture showing the age and sex distribution of the population. The percentage of the population within each five-year age bracket (such as 0-4, 5-9, 10-14, and so on, up to 100+ years old), is shown for both males (on the left side of the graph) and females (on the right side). All of these "bars" add up to 100%, meaning the entire population fits into one of these groupings.

Most developing countries of the world will have a population pyramid triangular in shape, indicating a very young population, with few people in the oldest age brackets. Most industrial countries have a population pyramid that looks more rectangular, with the young and middle-aged people representing similar and smaller percentages of the population, and many more elderly people in the "top part" of the pyramid. Figure 3.5 shows the distribution for all Registered First Nations people in Manitoba – a very young population, with few elderly people. In contrast, the population pyramid for all other Manitobans (Figure 3.6) has a much more rectangular appearance indicating a lower birth rate, and a higher proportion of elderly people.

Figure 3.5: Population Profile of Registered First Nations in Manitoba, Dec 31, 1998 Population 85,959

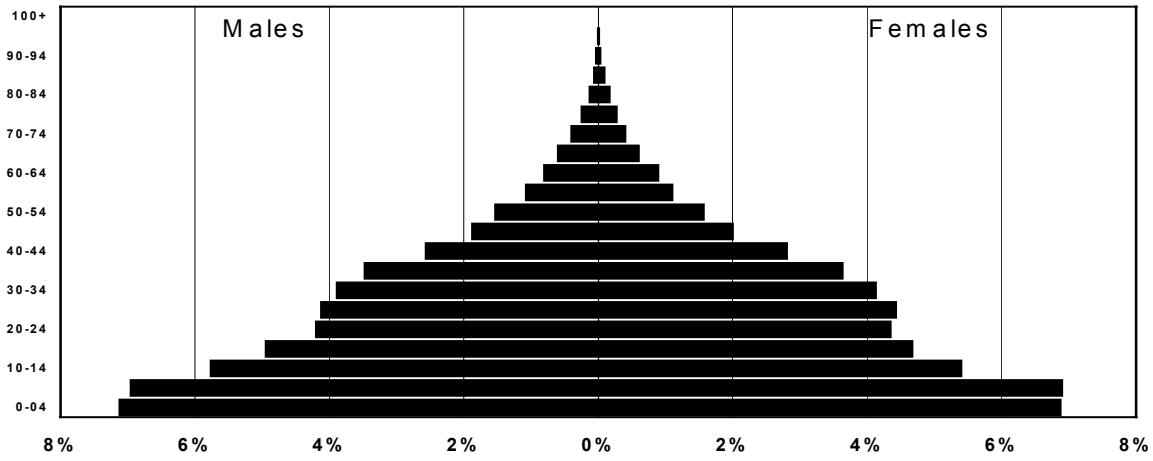


Figure 3.6: Population Profile of All other Manitobans, Dec 31, 1998 Population 1,054,422

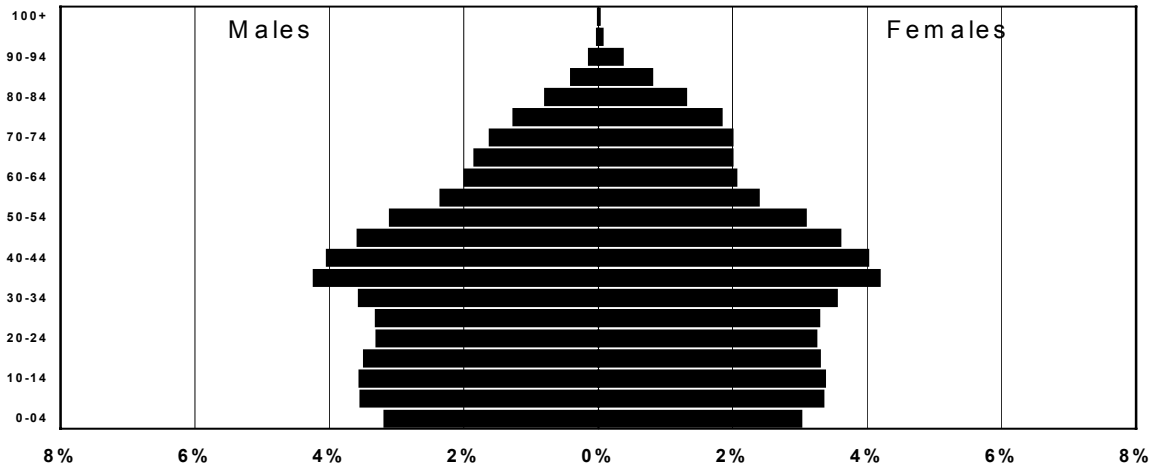


Figure 3.7: Population Profile of Keewatin Tribal Council, Dec 31, 1998 Population 6,982

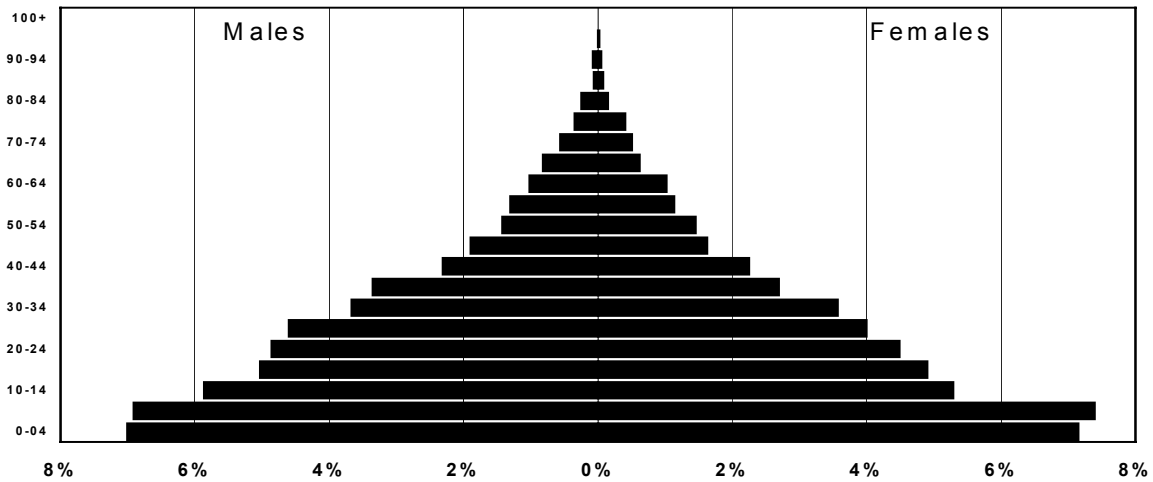


Figure 3.8: Population Profile of Island Lake Tribal Council, Dec 31, 1998 Population 5,568

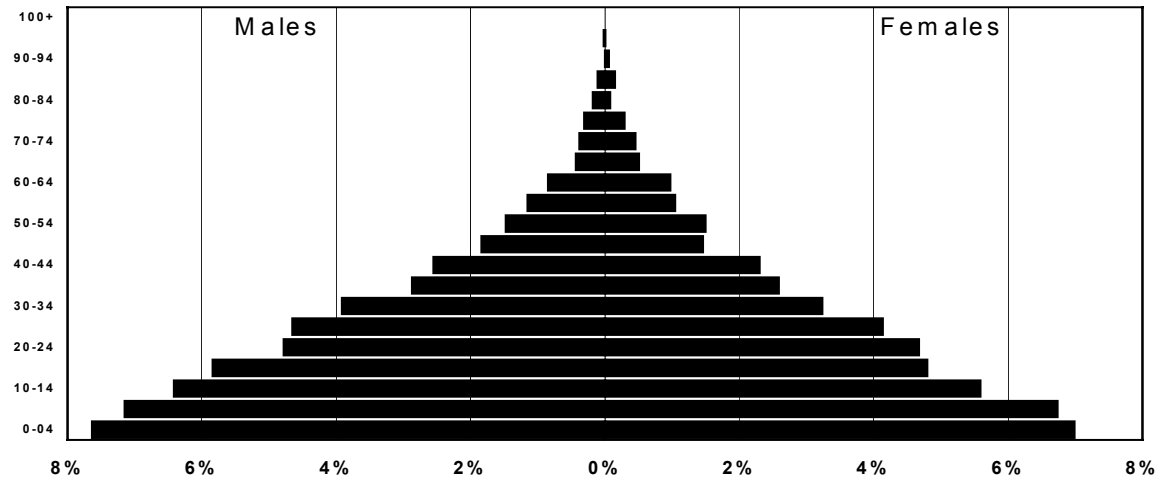


Figure 3.9: Population Profile of Interlake Reserves Tribal Council, Dec 31, 1998 Population 4,155

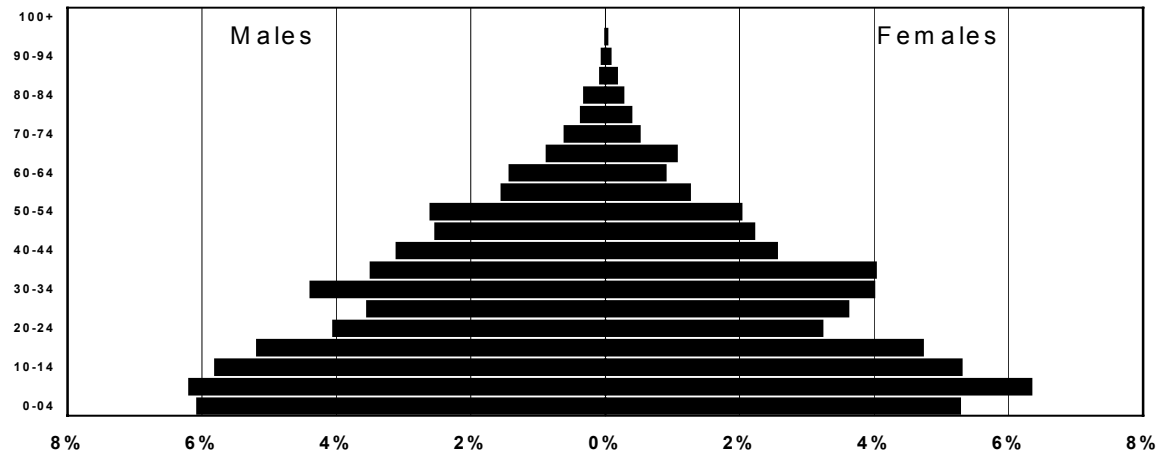


Figure 3.10: Population Profile of Independent First Nations North, Dec 31, 1998 Population 9,187

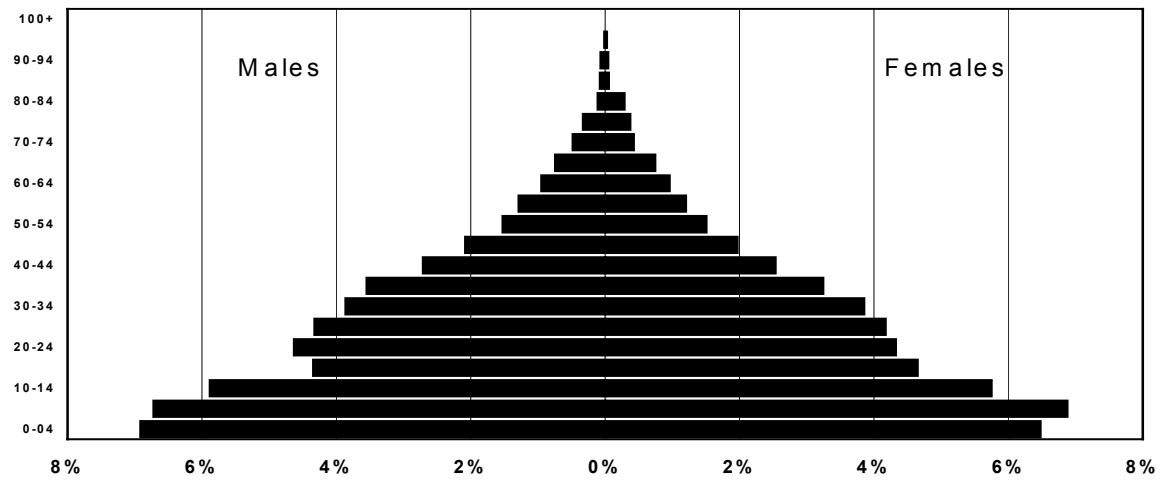


Figure 3.11: Population Profile of Independent First Nations South, Dec 31, 1998 Population 4,262

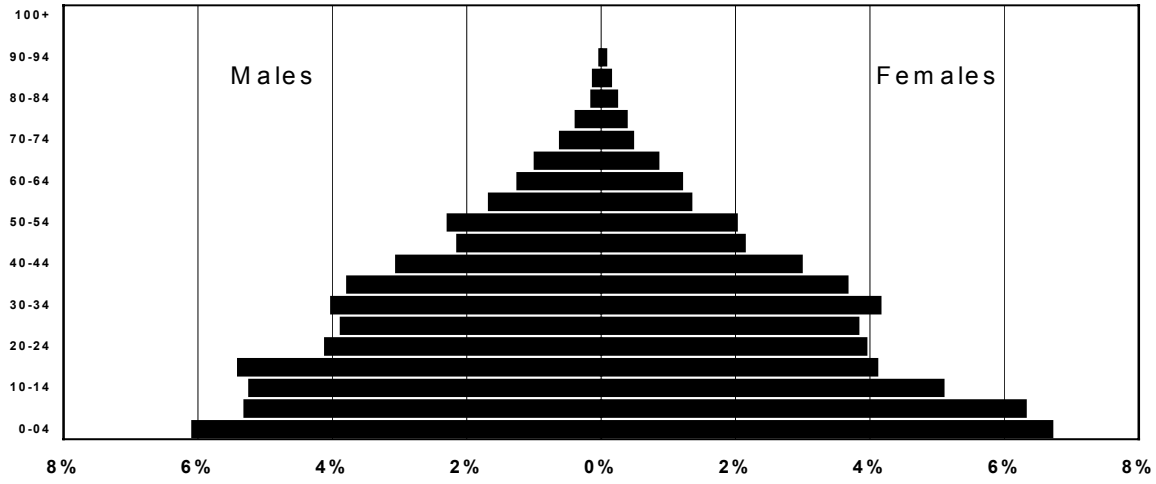


Figure 3.12: Population Profile of Swampy Cree Tribal Council, Dec 31, 1998 Population 6,285

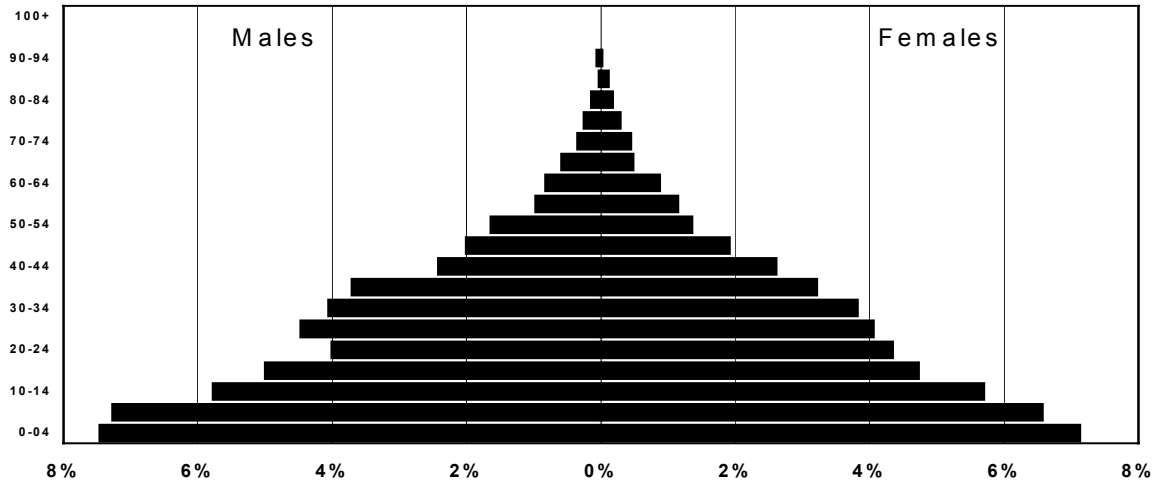


Figure 3.13: Population Profile of West Region Tribal Council, Dec 31, 1998 Population 2,724

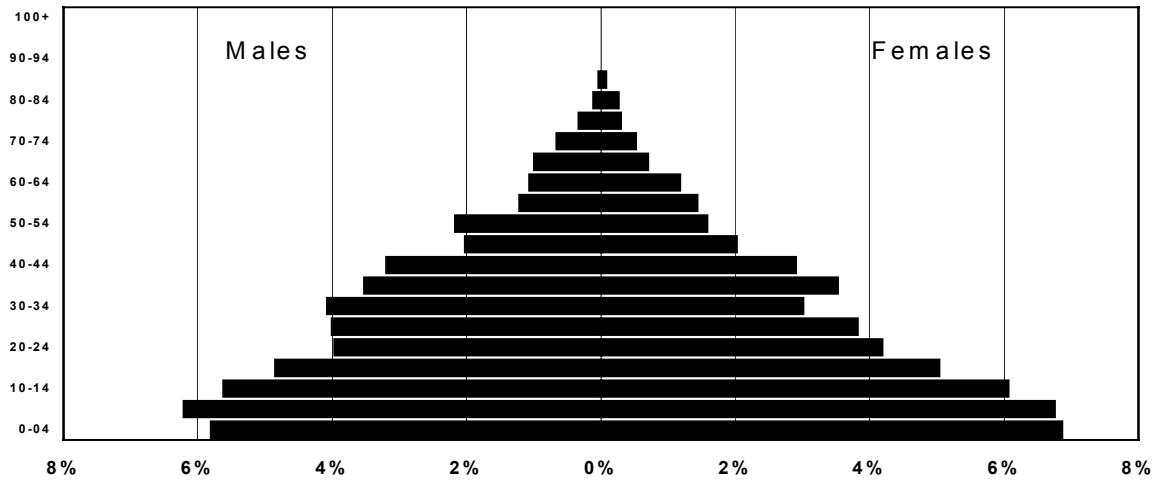


Figure 3.14: Population Profile of Southeast Resource Development Council, Dec 31, 1998 Population 3,646

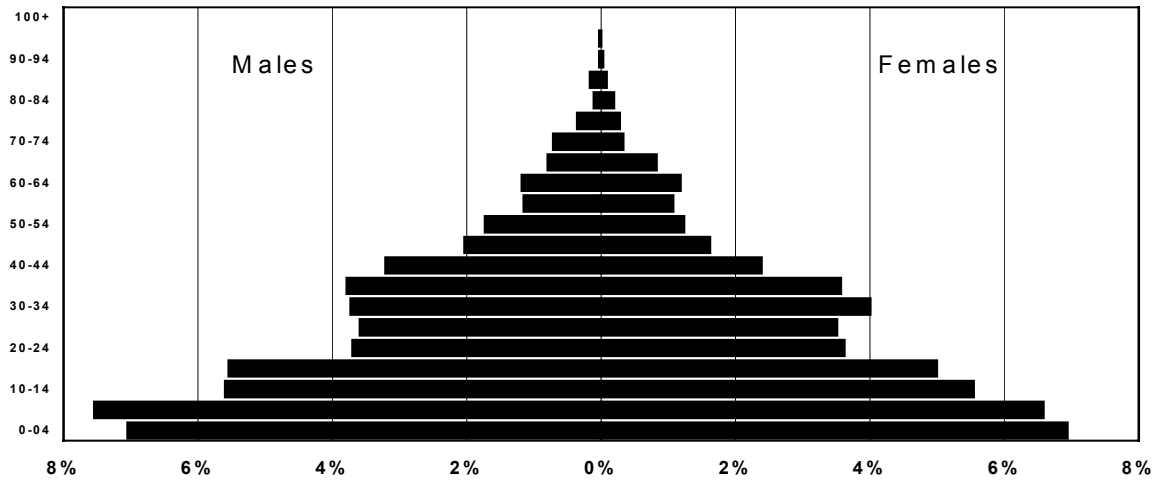


Figure 3.15: Population Profile of Dakota Ojibway Tribal Council, Dec 31, 1998 Population 5,227

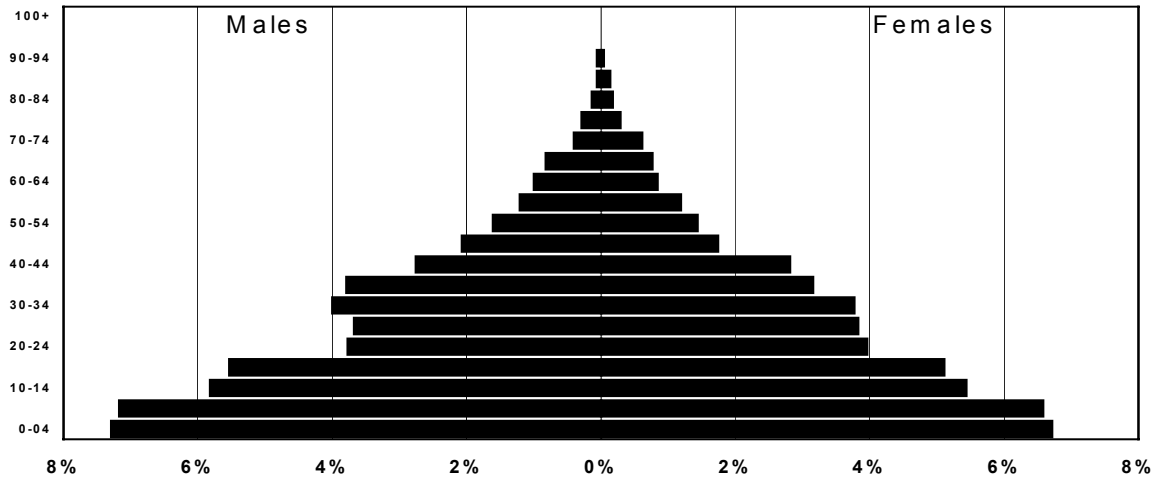


Figure 3.16: Population Profile of South Eastman RHA, Dec 31, 1998 Population 52,693

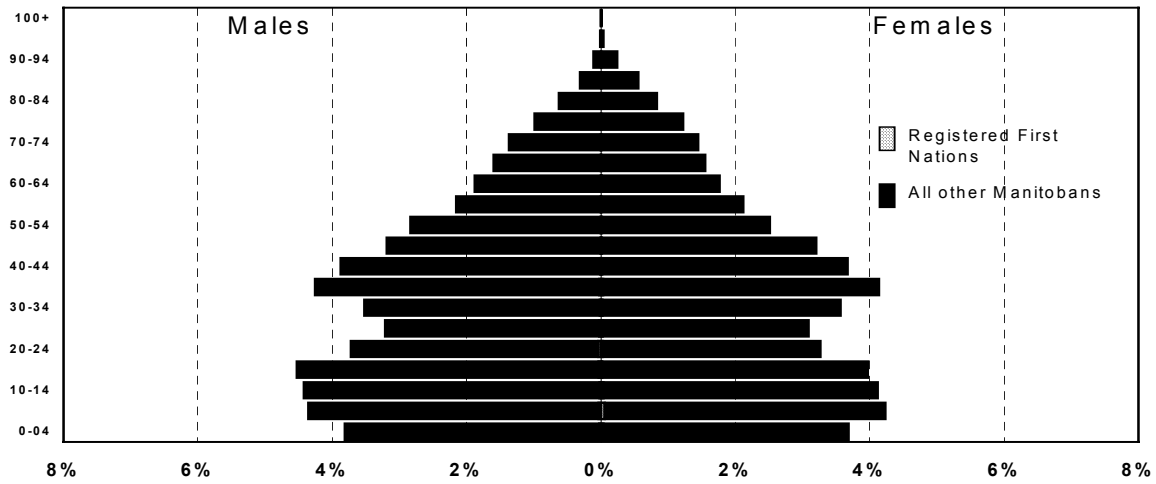


Figure 3.17: Population Profile of Central RHA, Dec 31, 1998
Population 97,068

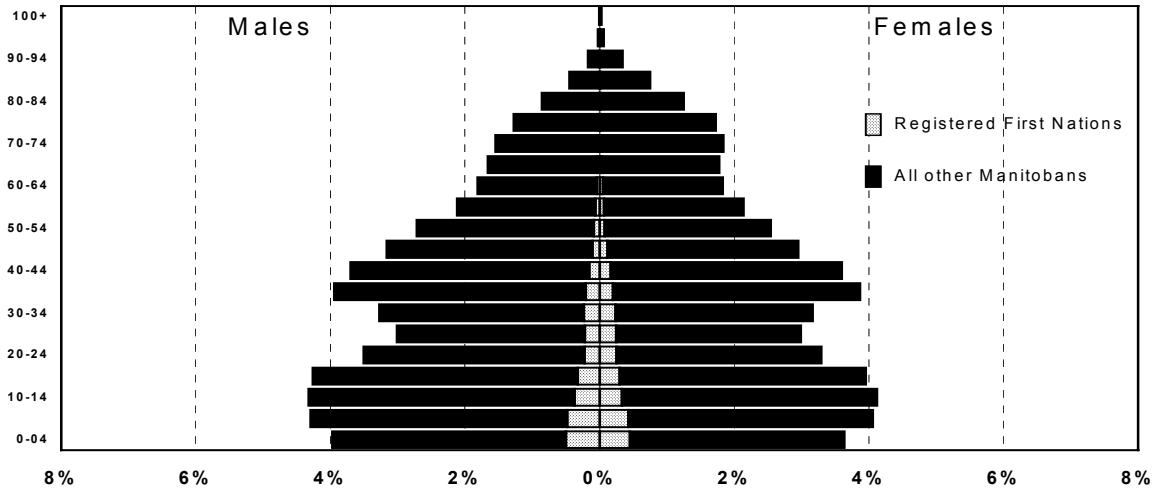


Figure 3.18: Population Profile of Brandon RHA
Dec 31, 1998
Population 46,690

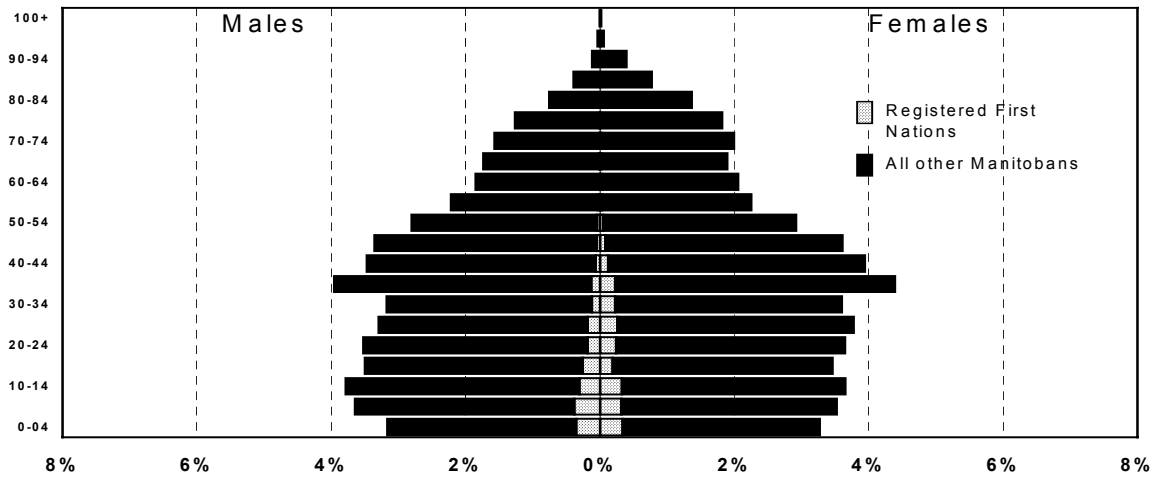


Figure 3.19: Population Profile of
South Westman RHA, Dec 31, 1998
Population 34,557

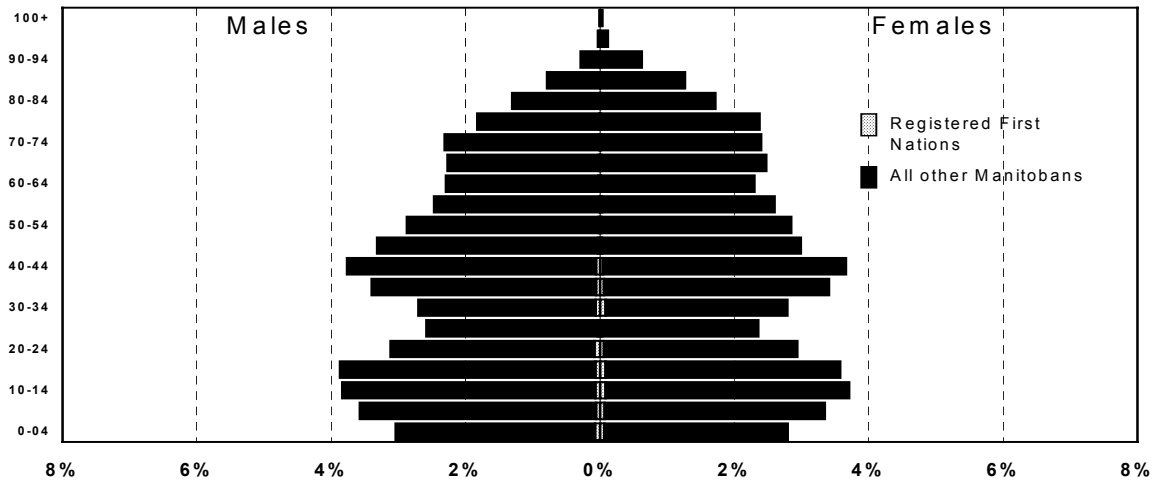


Figure 3.20: Population Profile of Winnipeg, RHA
Dec 31, 1998
Population 643,789

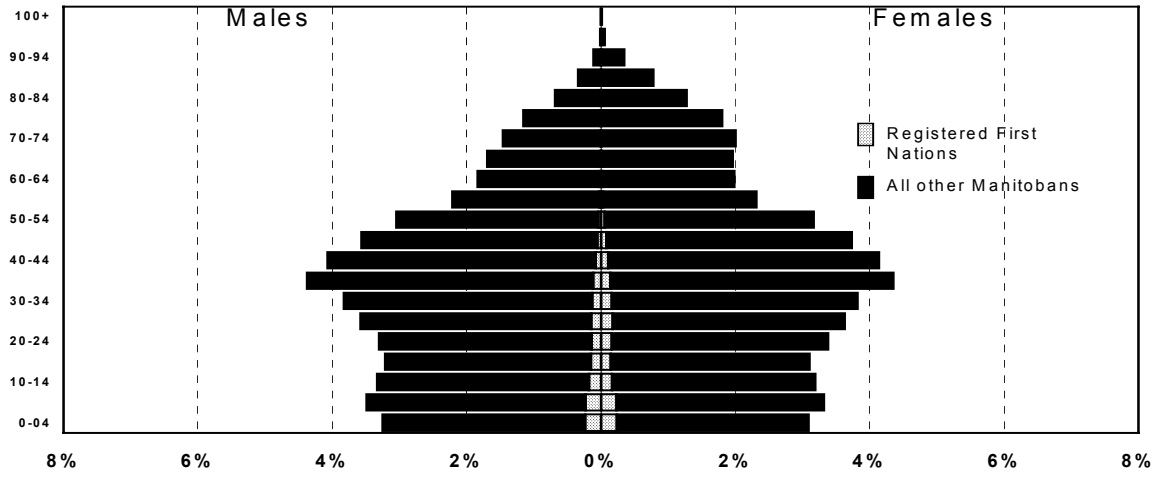


Figure 3.21: Population Profile of Interlake RHA, Dec 31, 1998
Population 74,472

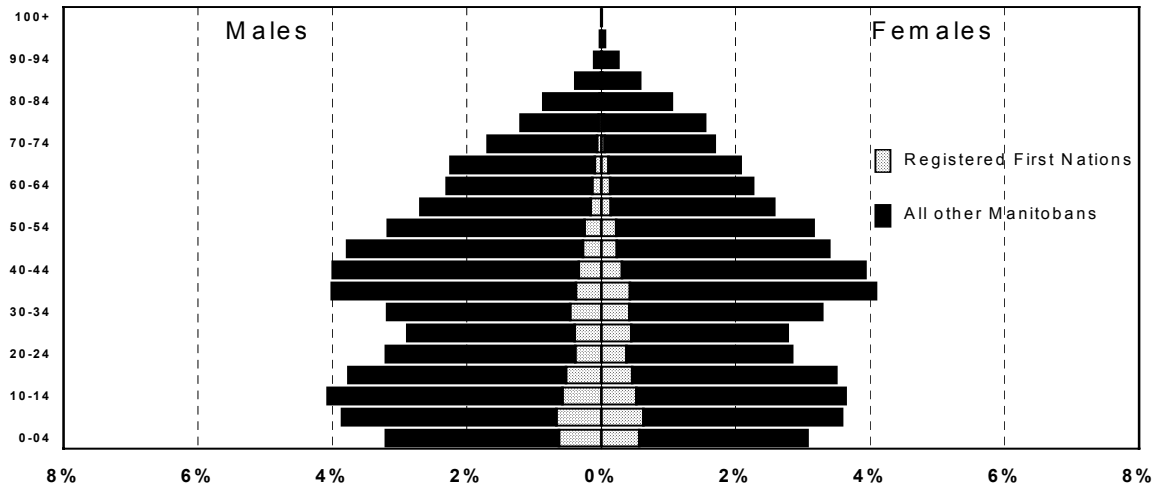


Figure 3.22: Population Profile of Marquette RHA, Dec 31, 1998
Population 37,727

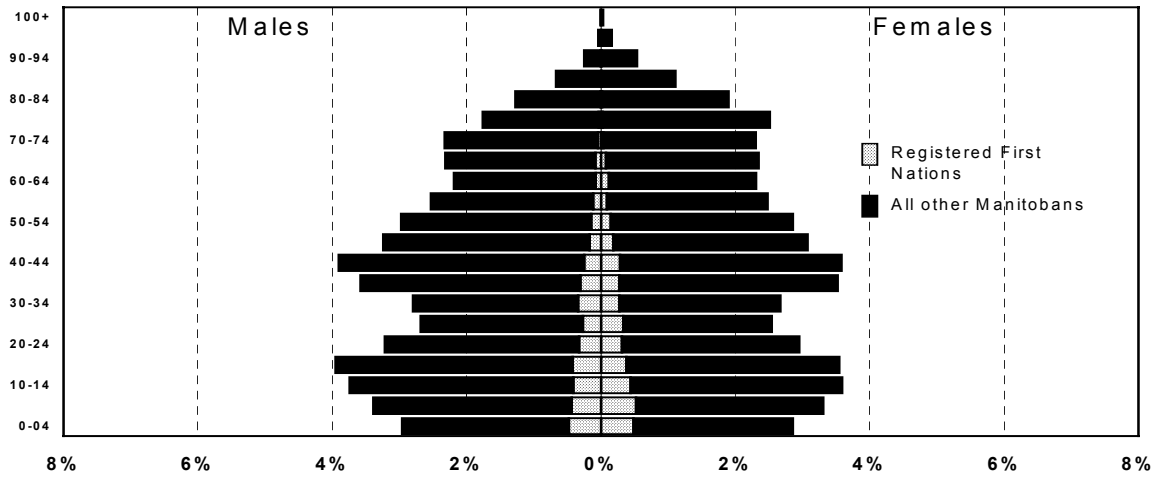


Figure 3.23: Population Profile of North Eastman RHA, Dec, 31, 1998 Population 38,763

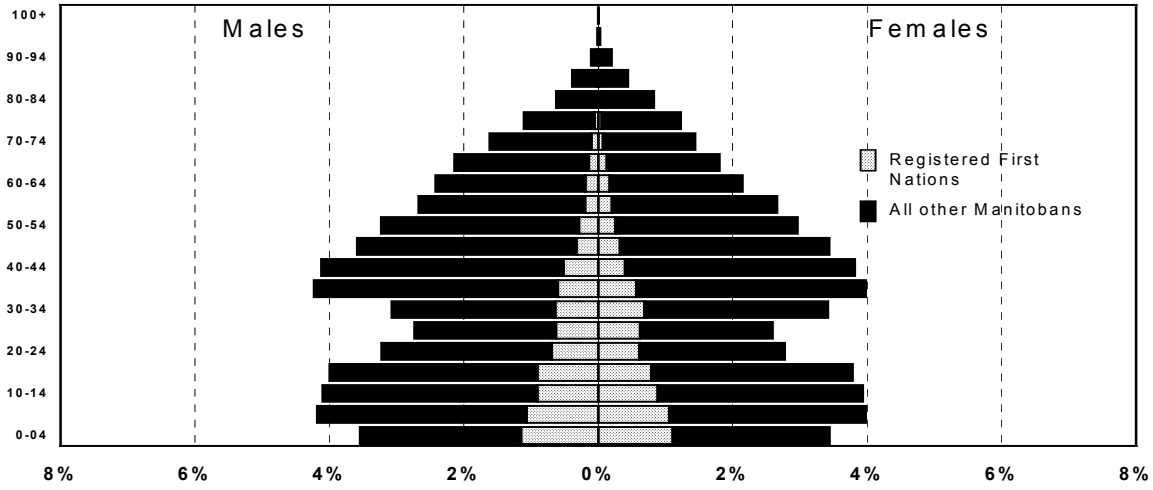


Figure 3.24: Population Profile of Parkland RHA, Dec 31, 1998 Population 43,357

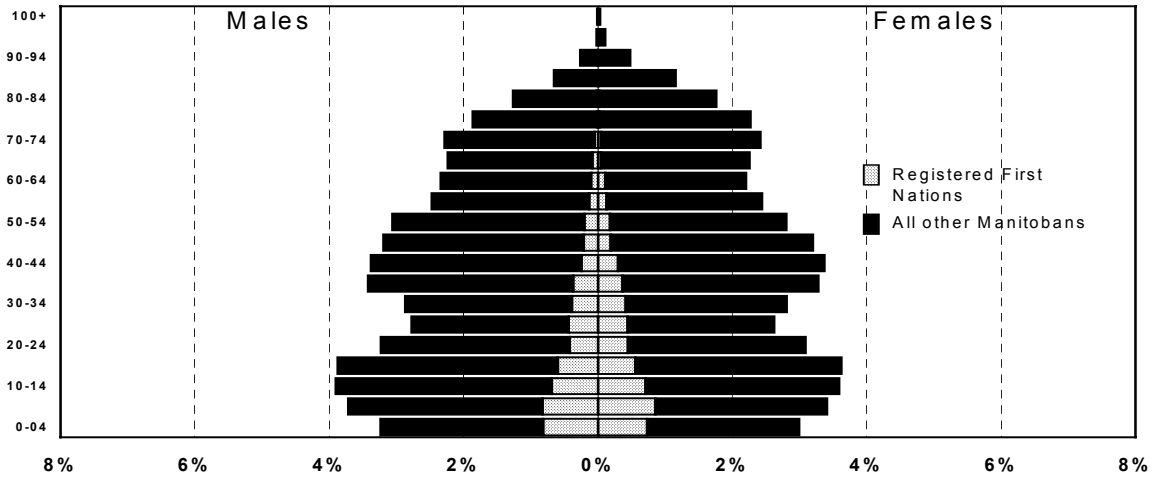


Figure 3.25: Population Profile of Burntwood RHA, Dec 31, 1998 Population 44,891

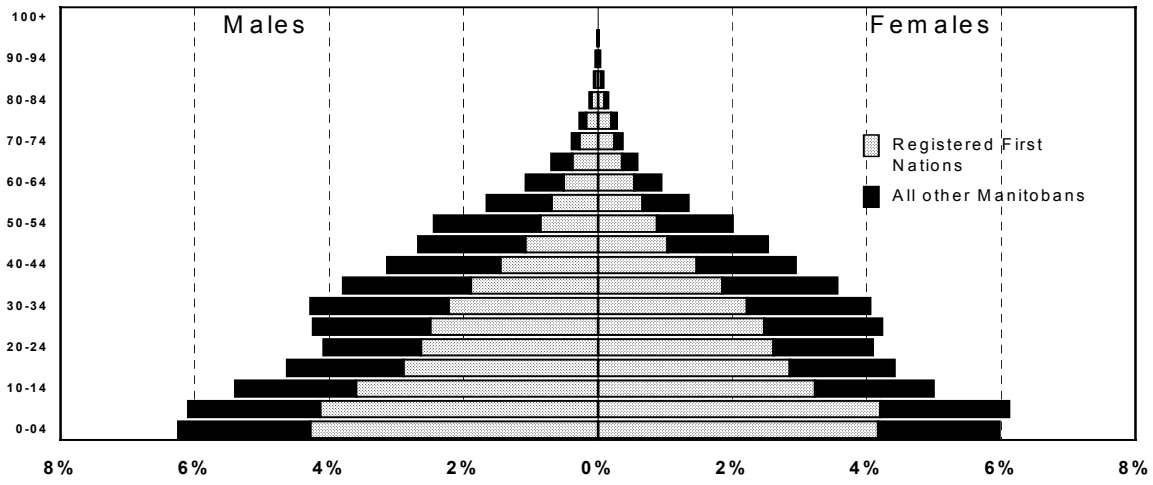


Figure 3.26: Population Profile of Nor-Man RHA, Dec 31, 1998
Population 25,337

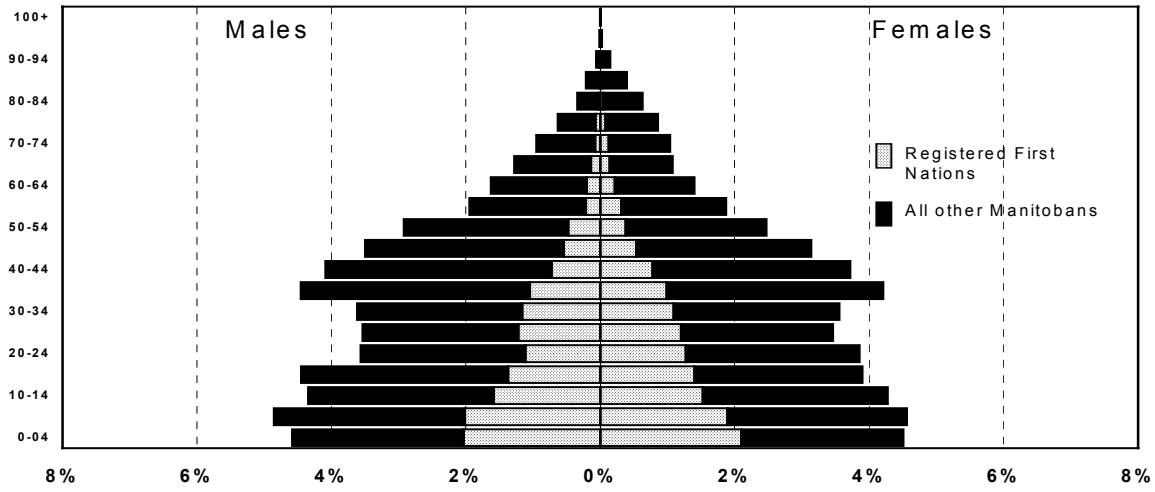
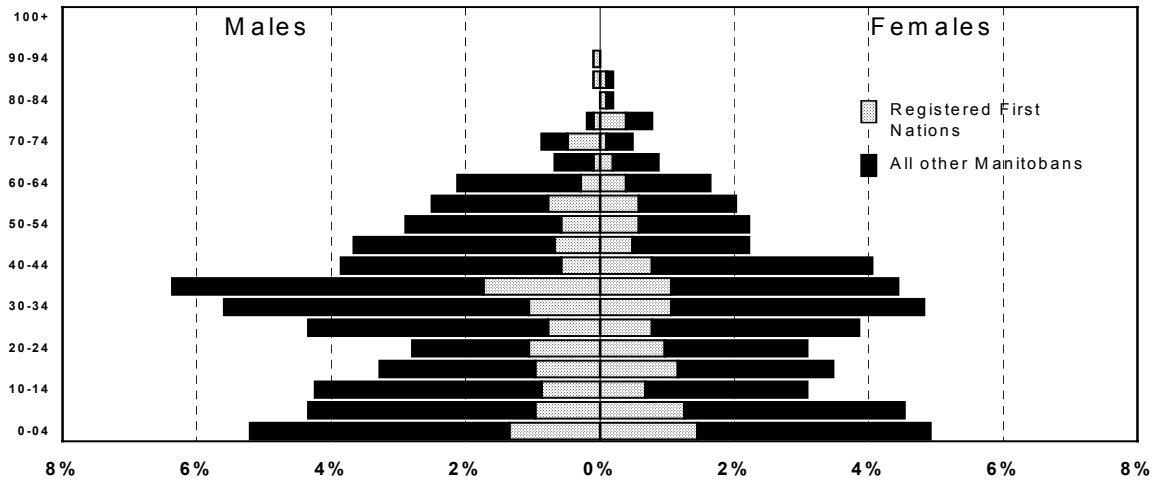


Figure 3.27: Population Profile of Churchill RHA Dec 31, 1998
Population 1,037



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

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CHAPTER 4. HEALTH STATUS INDICATORS – THE FRAMEWORK OF THE REPORT

4.1 What's in this chapter?

This chapter includes the following:

- Premature mortality rate (PMR) – the overall framework of the report
- Life expectancy, reported by male and female separately
- Potential years of life lost (PYLL), reported by male and female separately

It is important to understand the overall health status of the population before looking at the regions' use of health care services. You would expect populations with poorer health status to use more physician services and hospital services, compared to populations with better health status. PMR, life expectancy, and PYLL are three general measures of the health status of a region's population.

Premature mortality rate (PMR) measures the rate of premature death, that is, death before the age of 75 years. It is given as a rate per thousand, that is, premature deaths per thousand population. PMR is considered the best single measure to reflect the health status of a region's population (Carstairs and Morris 1991; Eyles et al. 1991; Eyles and Birch 1993). Populations having a high PMR are more likely to report poor overall health, greater number of symptoms, and more illness. This would likely lead to the conclusion that populations having a high PMR may use more health care services, may need more preventive services. Populations with poorer health status are often at risk in other ways – determinants of health, or underlying socio-economic factors – such as low income, low education, and low employment rates. This may underscore the simultaneous need for policy interventions beyond the typical health care services.

Life expectancy is a typical measure used for worldwide comparisons. It is based on the life experience of the population, from infants to the elderly. This is the expected length of life from birth, given in years.

Potential years of life lost (PYLL) is similar to PMR but gives greater weight to the death of a younger person. It adds up the number of years "lost" when a person dies before the age of 75. So the rate is given as years per thousand, that is, years of life lost per thousand population. PYLL will be a larger number if there is a high death rate among young or middle-age persons – probably from events such as injury, or diseases that may cause death at an early age. PYLL will be a smaller number if most of the deaths in a population occur in later life – probably from conditions such as heart problems or chronic problems (Young 1998).

4.2 The order of the regions in this report – PMR as the framework

All the graphs in this entire report are ordered by PMR, to give a picture of the health status of a region's population. The Tribal Council/Independent areas with the lowest PMRs are at the top of the left-hand side of the graphs, and the areas with the highest PMRs are at the bottom left-hand side of the graphs.

All graphs of the Tribal Council groups are ordered by overall PMR (the PMR of all "on-reserve" Registered First Nations living in that Tribal Council) from lowest to highest (from better health status to poorer health status). The First Nations communities included in each of these Tribal Council areas are listed in Figure 3.2 of Chapter 3. So the Tribal Council areas are ordered throughout the report as follows:

Keewatin Tribal Council
Island Lake Tribal Council
Interlake Reserves Tribal Council
Indep First Nations North (Independent/Unaffiliated First Nations North)
Indep First Nations South (Independent/Unaffiliated First Nations South)
Swampy Cree Tribal Council
West Region Tribal Council
Southeast Resource Devel Council (Southeast Resource Development Council)
Dakota Ojibway Tribal Council

Similarly, all graphs of the Regional Health Authorities (RHAs) are ordered by overall PMR (the PMR of *all people* living in that RHA, both Registered First Nations and all other Manitobans) from lowest to highest (from better health status to poorer health status). So the RHAs are ordered throughout the report as follows:

South Eastman
Central
Brandon
South Westman
Winnipeg
Interlake
Marquette
North Eastman
Parkland
Burntwood
Nor-Man
Churchill (rates in Churchill fluctuate substantially, due to small numbers)

When you look at the graphs in this report, the regions having the populations with better health status are listed at the top, with decreasing health status as you go down the graph. So you can view the indicator with this in mind – does the pattern of the indicator also reflect the underlying health status of the people in the region?

Why did we choose PMR as the overall framework of the report, instead of another overall health indicator? Possibly in the First Nations population, PYLL (Potential Years of Life Lost) would be a better framework, since it may better reflect the

circumstances that lead to preventable deaths at a younger age. In contrast, PMR may better capture the burden of death due to chronic disease, more prevalent in older populations and possibly suited to industrialized populations. In this report, we also report PYLL rates, both "adjusted" rates in Sections 4.8 and 4.9, and "crude" rates in Appendix C. These are given separately for males and females. When Tribal Council areas are ordered by the overall averaged male/female PYLLs, the ordering is very similar to that obtained using PMR. Ordering the Tribal Council areas by life expectancy also gives similar results. Therefore, in keeping with other MCHP reports that use PMR as a framework of health status, we have chosen PMR to order the graphs within this report as well.

4.3 Key findings from this chapter

Premature Mortality Rate (PMR)

- The Manitoba Registered First Nations population has double the PMR compared to all other Manitobans. Within every RHA, Registered First Nations people have substantially higher PMRs (that is, substantially poorer health status) compared to all other people living in the region.
- There is a large gradient of PMR in the Tribal Council areas, with the highest PMR (DOTC at 9.28 per thousand) being almost double that of the lowest PMR (KTC at 4.75 per thousand). Generally, Tribal Council areas in the North have lower PMRs (indicating that the "on-reserve" Registered First Nations population has a better health status) than those in the South.
- Some of the regions that have populations with the best overall health status (like Central, Marquette and South Westman RHAs) have Registered First Nations populations with the poorest health status.
- Both "on-reserve" and "off-reserve" Registered First Nations people have high PMRs, with very little difference between them.

Life expectancy

- Life expectancy for Registered First Nations people is about eight years less than all other Manitobans (males 68 versus 76 years; females 73 versus 81 years)
- The greatest differential between RFN and all other Manitoban life expectancies are seen in the southern RHAs.
- In general, "on-reserve" males and females live about as long as those living "off-reserve."
- For Registered First Nations "on-reserve" males and females, life expectancy is generally shortest in the more southerly Tribal Council areas, with up to 8 years difference for males and 11 years difference for females when compared to northerly Tribal Councils.

Potential Years of Life Lost (PYLL)

- The PYLL for Registered First Nations people (RFN) is substantially greater than that of all other Manitobans. The PYLL for RFN males is 2.5 times the general population rate (158 years/1000 versus 63), and for females the rate is three times higher (103 years/1000 versus 36). Of special concern are the RFN

elevated rates in the following groups: females in Winnipeg and SERDC, and males in DOTC.

- The differential between Registered First Nations and all other Manitobans is greater for PYLL (2.5 to 3 times) than for PMR (double), indicating that not only is there excessive mortality, but proportionally younger RFN people are dying. In general, the differential is greatest in the south areas.
- The PYLL for Registered First Nations males is generally higher in southern areas of the province (the opposite pattern to all other Manitobans), but there is no difference among regions for RFN females.

4.4 Canadian Comparisons from other studies

- In a study of Winnipeg First Nations and non-First Nations persons aged 50 and over, the First Nations people had significantly lower life satisfaction, associated with worse health and worse social circumstances. Fifty-nine percent (59%) of the First Nations persons, compared to only 26% of the non-First Nations, perceived their health as being fair or poor (Blandford and Chappell 1990). *This parallels our finding that PMR for Registered First Nations people of Manitoba is double that of all other Manitobans. PMR has been considered not only a mortality rate, but also an indicator of perceived health (Carstairs and Morris 1991).*

- Death rates are higher in the First Nations population than in the general Canadian population. Infant mortality in the first year of life was 13.8/1000 live births for First Nations infants from 1986-1990, compared to 7.3/1000 for all Canadian infants. For residents of First Nations communities in the years 1979 to 1983, the death rate (age-standardized) was 1.7 times higher for males (5.61/1000 vs. 3.40 for all Canadian men), and 1.9 times higher for females (3.35/1000 vs. 1.73/1000 for all Canadian women) (MacMillan et al. 1996). *Our Manitoba data indicate an even greater differential for the years from 1995 through 1999, with double the PMR rate comparing Registered First Nations to all other Manitobans.*

- The potential years of life lost (PYLL) for all Canadian First Nations people in 1982-1985 was 2.8 times higher than the rate for all Canadians (157.2 per 1000 population per year vs. 56.5/1000). The higher First Nations rate was mainly due to injuries, presumably affecting younger persons (Young 1994). One study of the Navajo in the USA calculated that the life expectancy of a male would increase 5.2 years, and a female 2.7 years, if motor vehicle accidents were eliminated (Carr and Lee 1978). *In our report, the differential in PYLL between RFN and all other Manitobans is very similar to that previously reported, at 2.5 times higher for RFN males and 3 times higher for RFN females.*

4.5 Premature Mortality Rates (PMR)

Definition: This is the number of deaths before the age of 75 years per 1000 persons ages 0 through 74 years in the region. It is considered "premature" death when it occurs before the age of 75. It is age- and sex-adjusted to reflect the overall Manitoba age and sex population distribution.

How to read the graphs: Figure 4.1 shows Tribal Council areas for all "on-reserve" Registered First Nations (RFN) persons in Manitoba. The overall rate for the Manitoba "on reserve" population is 6.5 deaths per 1000 persons, with KTC being the lowest at 4.8 and DOTC the highest at 9.3. The notations of "M On" indicate that these rates are significantly different from the Manitoba "on-reserve" rate. Figure 4.2 compares Registered First Nations with all other Manitobans by the RHA in which they live. For Manitoba, the PMR of the Registered First Nations (including both "on-" and "off-reserve") persons is 6.6 deaths per 1000, which is double the rate for all other Manitobans (3.3/1000). The PMR for Registered First Nations persons shows a trend opposite to that for the overall RHA populations. RHAs having overall populations with the best health status also tend to have Registered First Nations populations with the poorest health status. Figure 4.3 compares RFN persons living "on-reserve" and "off-reserve," with both groups having similar PMRs (6.5 and 6.8 respectively). Male and female age-specific crude mortality rates are given in Appendix C, in Tables C-10 and C-11. Similar trends are observed in most age categories, though mortality rates in Keewatin Tribal Council appear high for the youngest age category.

Range of PMR (deaths per thousand):

Tribal Council:	4.8 (KTC) to 9.3 (DOTC)
RHA Registered First Nations:	5.4 (Burntwood/Interlake) to 9.4/9.9 (Marquette/South Westman)
RHA all other Manitobans:	2.6 (South Eastman) to 5.3 (Churchill)
"On-reserve"/ "off-reserve":	6.5 versus 6.8

Figure 4.1: Direct Adjusted Premature Mortality Rate per 1,000 Population 0-74 years by Tribal Council 1995 - 1999

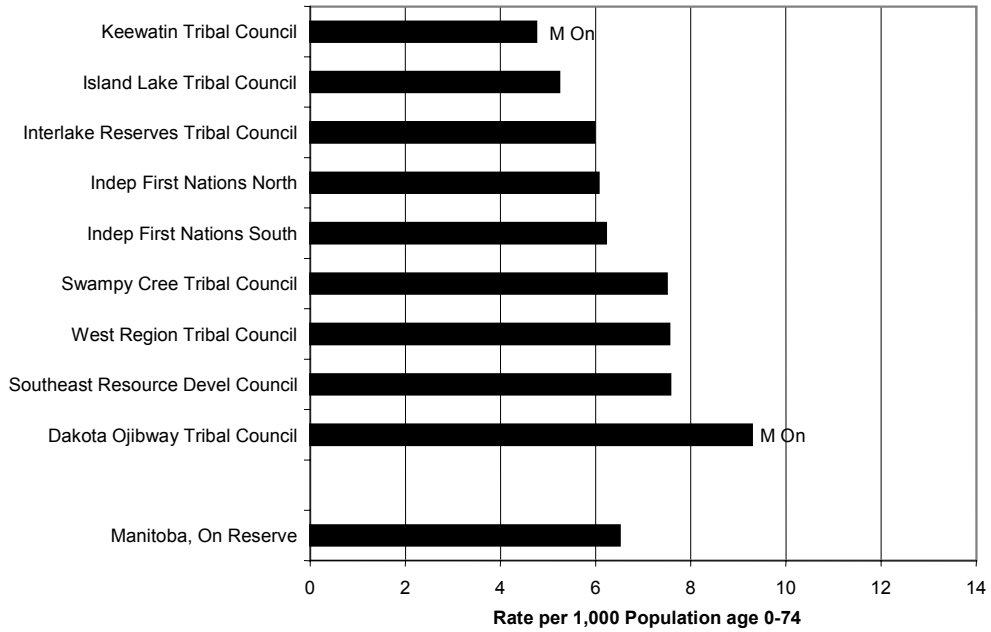
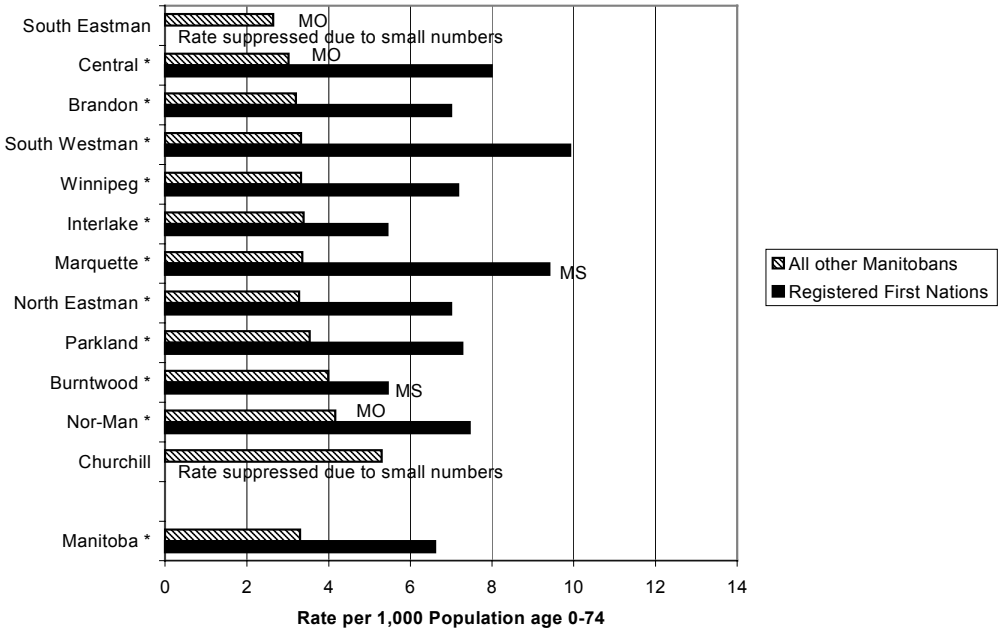
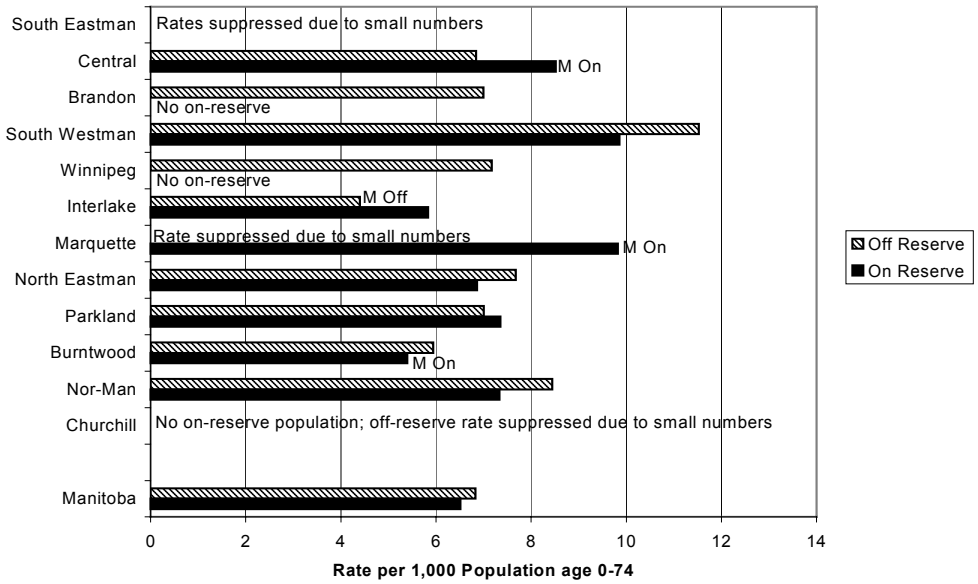


Figure 4.2: Direct Adjusted Premature Mortality Rate per 1,000 Population 0-74 years
Registered First Nations vs. All Other Manitobans by RHA
1995 - 1999



Key Messages:
PMR varies hugely by Tribal Council area, showing almost double the PMR in DOTC compared with KTC. The PMR of Registered First Nations Manitobans is double that of all other Manitobans. Rates are particularly high (indicating less healthy populations) in southern areas, both by RHA and by Tribal Council, which is the opposite trend from all other Manitobans. People living "on-" and "off-reserve" have similar PMRs.

Figure 4.3: Direct Adjusted Premature Mortality Rate per 1,000 Population 0-74 years
Off Reserve vs. On Reserve Registered First Nations by RHA
1995 - 1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

4.6 Life Expectancy of Males

Definition: This is the expected years of life from birth for males, based on the mortality of the population using the Vital Statistics records from 1995 through 1999.

How to read the graphs: Figure 4.4 shows the male life expectancy by Tribal Council (for "on-reserve" males), with a trend to decreasing life expectancy as the area population PMR increases (i.e., as health status becomes worse). Note that there is no statistical significance testing done for life expectancy charts. In general, northern Tribal Council areas have higher life expectancy compared with southern areas. Comparing Registered First Nations males to all other Manitoban males, in Figure 4.5, there is an eight year gap (68.4 versus 76.1 years). Life expectancy decreases for "all other males" as the overall population health status of the RHA becomes worse (i.e., as the PMR increases), but life expectancy increases for First Nations males as the overall population health status of the RHA becomes worse. This results in the widest gaps in life expectancy for males being observed in the RHAs having populations with the best health status (southern RHAs). The difference between "on-reserve" and "off-reserve" Registered First Nations males is shown in Figure 4.6, with a small difference seen at the provincial level of on-reserve males with one year of additional life expectancy.

Range of Life Expectancy for Males (years):

Tribal Council:	64.6 years (DOTC) to 72.0 years (KTC)
RHA Registered First Nations:	61.7 years (South Eastman) to 77.8 (Churchill)
RHA all other Manitobans:	67.5 years (Churchill) to 77.3 (South Eastman)
"On-reserve"/ "off-reserve":	68.8 years versus 67.9 years

Figure 4.4: Life Expectancy at Birth (years) for Males by Tribal Council 1995 - 1999

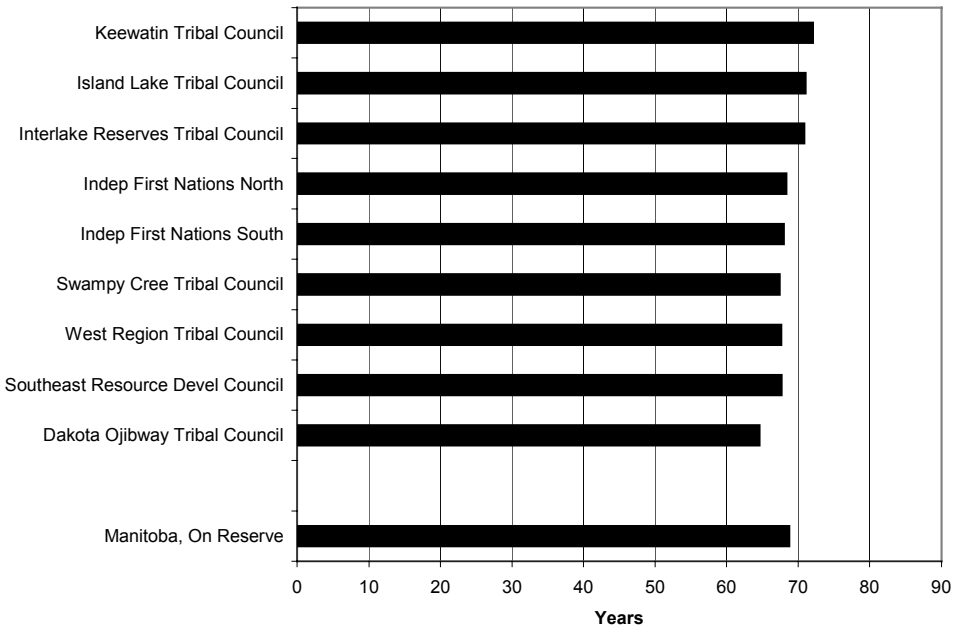
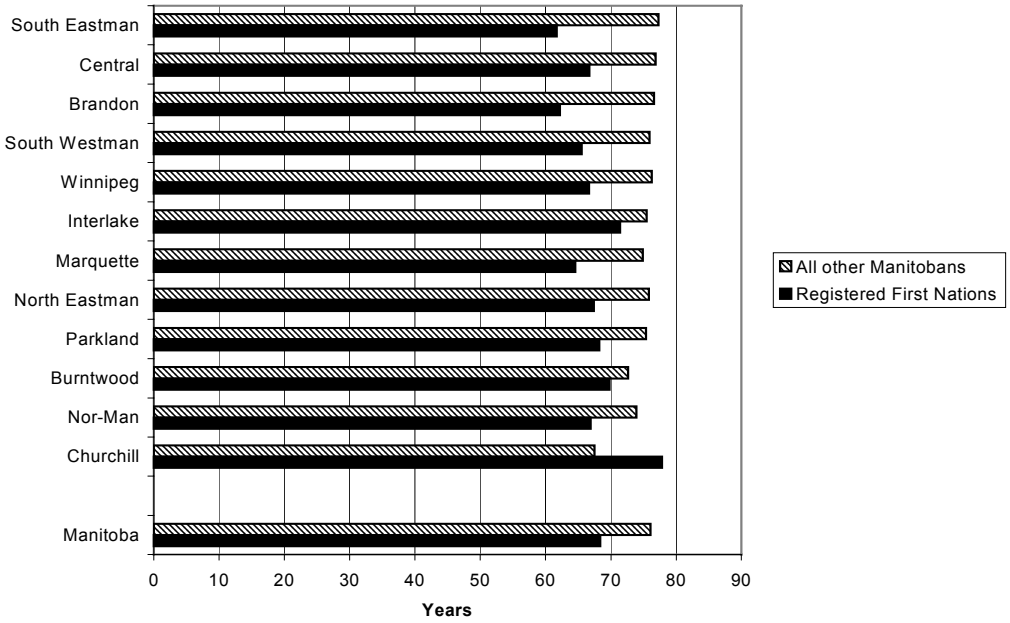
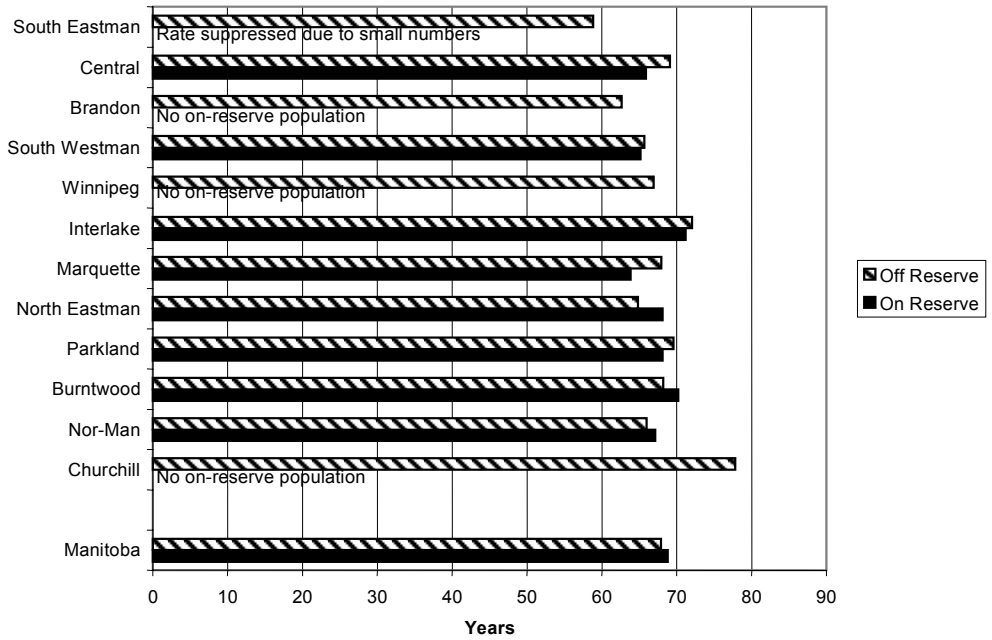


**Figure 4.5: Life Expectancy at Birth (years) for Males
Registered First Nations vs. All Other Manitobans by RHA
1995 - 1999**



Key Messages:
Within Tribal Council areas, there is a large variation of life expectancy for males – over 7 years difference. Overall, the life expectancy of Registered First Nations males is eight years lower than for all other Manitoban males (68.4 versus 76.1 years). In general, Registered First Nations males live longer in northern RHAs and northern Tribal Council areas compared to their southern counterparts. This is exactly the opposite for all other males, who have the longest life expectancy in southern RHAs.

**Figure 4.6: Life Expectancy at Birth (years) for Males
Off Reserve vs. On Reserve Registered First Nations by RHA
1995 - 1999**



Statistical Notation:
There is no statistical testing for the Life Expectancy values

4.7 Life Expectancy for Females

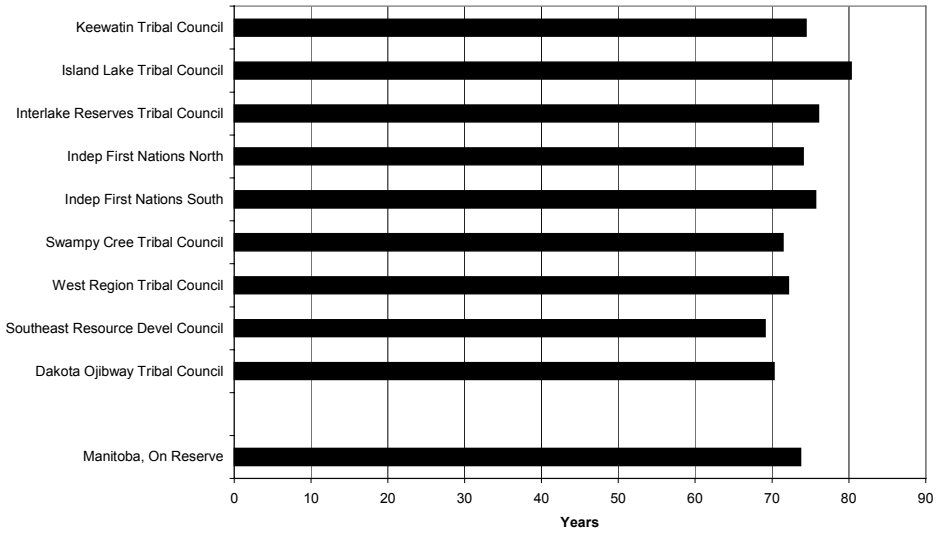
Definition: This is the expected years of life from birth for females, based on the mortality of the population using the Vital Statistics records from 1995 through 1999.

How to read the graphs: Figure 4.7 shows the female life expectancy by Tribal Council (for "on-reserve" females), with a trend to decreased life expectancy as the PMR of the Tribal Council increases. Note that there is no statistical significance testing done for life expectancy charts. In general, northern Tribal Council females have higher life expectancy than in the south. Figure 4.8 compares Registered First Nations females to all other Manitoban females – there is an eight year gap (73.2 versus 81.4 years). Although life expectancy for all other Manitoban females decreases in RHAs as PMR increases, life expectancy for First Nations females shows no consistent pattern. The difference between "on-reserve" and "off-reserve" Registered First Nations females is shown in Figure 4.9, with a one-year difference at the provincial level (on-reserve females 73.8 years, off-reserve females 72.8 years).

Range of Life Expectancy for Females (years):

Tribal Council:	69.1 (SERDC) to 80.3 (Island Lake)
RHA Registered First Nations:	70.5 (Parkland) to 80.8 (South Eastman)
RHA all other Manitobans:	75.9 (Churchill) to 83.0 (South Eastman)
"On-reserve"/ "off-reserve":	73.8 years versus 72.8 years

Figure 4.7: Life Expectancy at Birth (years) for Females by Tribal Council 1995 - 1999



Key Messages:
Within Tribal Council areas, there is a large difference in life expectancy of females – up to 11 years difference. Overall, the life expectancy of Registered First Nations females is eight years lower than for all other Manitoban females (73.2 versus 81.4 years). In general, Registered First Nations females live longer in northern Tribal Council areas compared to their southern counterparts. However, there is no distinct pattern by RHA for Registered First Nations women, in contrast to the decreased life expectancy of all other Manitoban females living in northern RHAs.

Figure 4.8: Life Expectancy at Birth (years) for Females Registered First Nations vs. All Other Manitobans by RHA 1995 - 1999

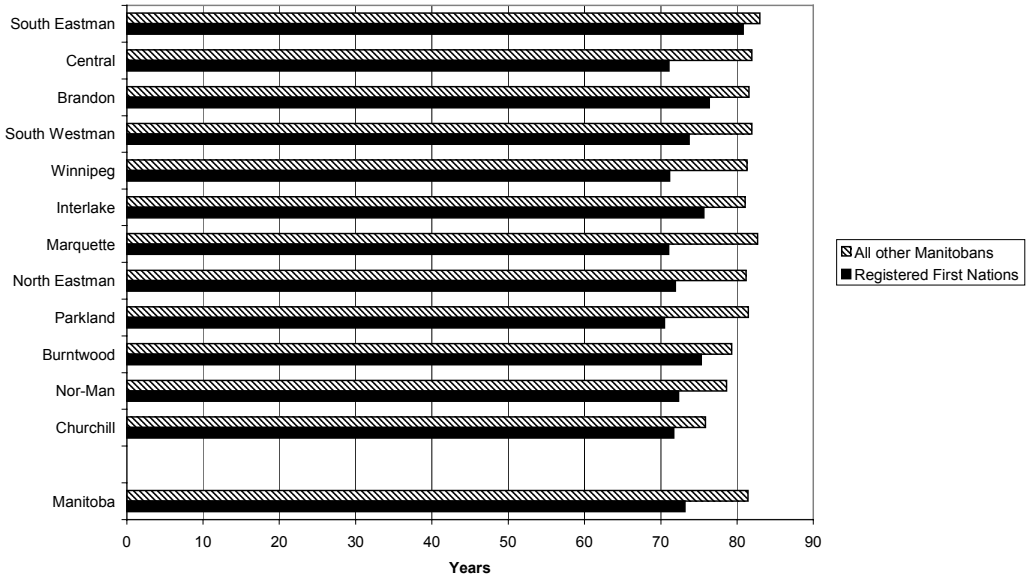
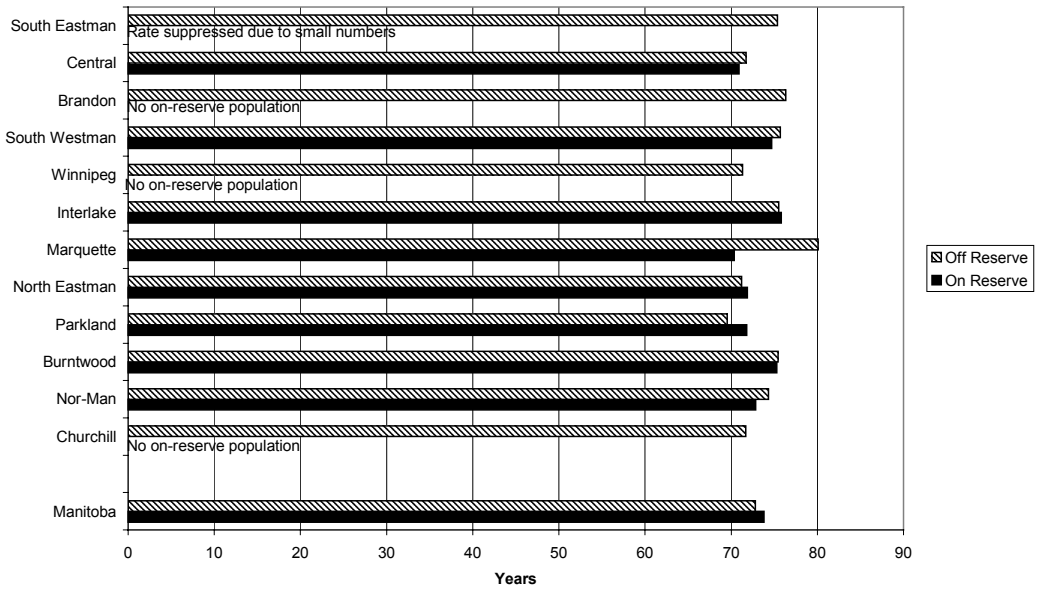


Figure 4.9: Life Expectancy at Birth (years) for Females Off Reserve vs. On Reserve Registered First Nations by RHA 1995 - 1999



Statistical Notation:
There is no statistical testing for the Life Expectancy values

4.8 Potential Years of Life Lost (PYLL) for Males

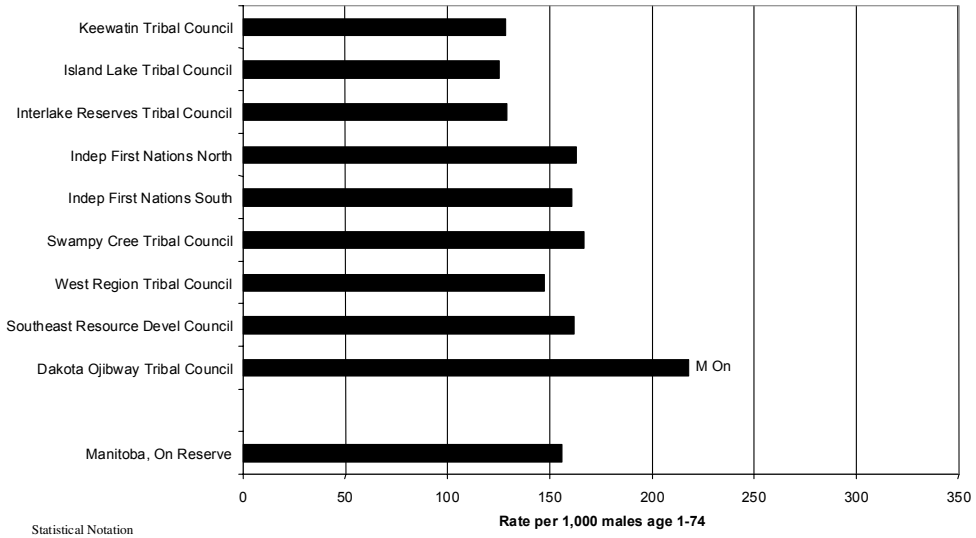
Definition: PYLL is an indicator of premature mortality (death before age 75) which gives greater weight to a death occurring at a younger age than a death at later ages. By emphasizing the loss of life at an early age, PYLL focuses attention on the need to deal with the major causes of early deaths, such as injury, in order to improve health status. The rate is given as "years per thousand", meaning years of life lost per thousand population.

How to read the graphs: Figure 4.10 shows the PYLL for Registered First Nations males living on-reserve in different Tribal Council areas. The only statistically significantly different rate is DOTC, having a high rate (217.9 years per 1000 males ages 1 through 74) compared to the overall Manitoba on-reserve rate (154.5). Figure 4.11 shows a wide gap between the PYLL of Registered First Nations males (158.3) and all other Manitoban males (62.5), with the greatest discrepancy seen in the southern RHAs having populations with the overall best health status. Overall, Registered First Nations males living "off-reserve" and "on-reserve" have similar PYLLs (163.4 versus 154.4), as seen in Figure 4.12, even though some RHAs show substantial but not statistically significant differences (probably due to highly fluctuating rates based upon small numbers). Male and female age-specific crude mortality rates are given in Appendix C, in Tables C-10 and C-11. Similar trends are observed in most age categories, though mortality rates in Keewatin Tribal Council appear high for the youngest age category.

Range of PYLL for Males (years per thousand):

Tribal Council:	124.9 (Island Lake) to 217.9 (DOTC)
RHA Registered First Nations:	105.0/108.5 (Churchill/Interlake) to 243.3 (South Eastman)
RHA all other Manitobans:	54.5 (South Eastman) to 94.1/157.0 Burntwood/Churchill
"On-reserve"/ "off-reserve":	154.5 years versus 163.4 years

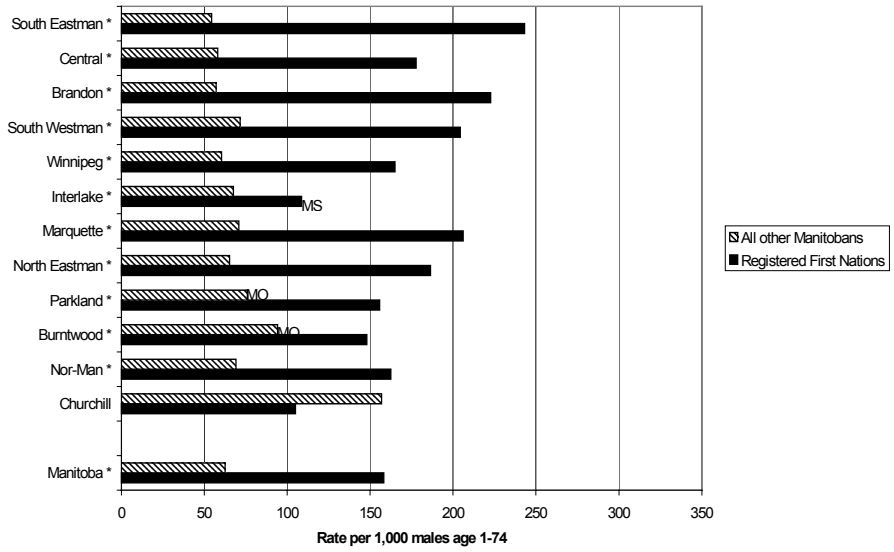
Figure 4.10: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Males age 1-74 years by Tribal Council 1995 - 1999



Statistical Notation

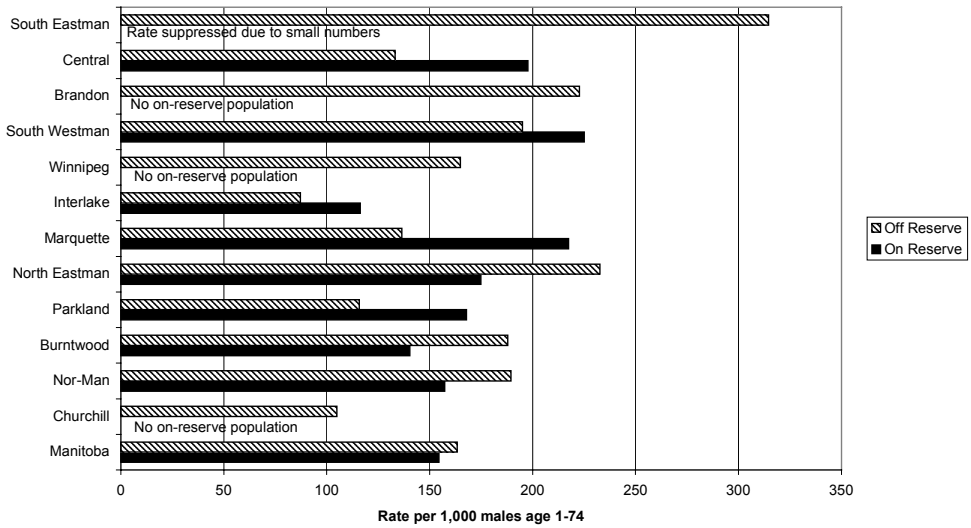
M On - significantly different from MB rate for On-Reserve RFN

Figure 4.11: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Males age 1-74 years
Registered First Nations vs. All Other Manitobans by RHA
1995 - 1999



Key Messages: *The PYLL for Registered First Nations males of Manitoba is 2.5 times that of all other Manitoban males. Dakota Ojibway Tribal Council males have the highest PYLL by Tribal Council, at 3.5 times the "all other Manitoban male" rate. Each RHA shows large gaps between Registered First Nations males and all other Manitoban males residing within the RHA. This gap is the widest in southern RHAs having the healthiest overall populations (4.5 times as high in South Eastman), and decreases in northern RHAs (1.6 times as high in Burntwood).*

Figure 4.12: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Males age 1-74 years
Off Reserve vs. On Reserve Registered First Nations by RHA
1995 - 1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

4.9 Potential Years of Life Lost (PYLL) for Females

Definition: PYLL is an indicator of premature mortality (death before age 75) which gives greater weight to death occurring at a younger age than those at later ages. By emphasizing the loss of life at an early age, PYLL focuses attention on the need to deal with the major causes of early deaths, such as injury, in order to improve health status. The rate is given as "years per thousand", meaning years of life lost per thousand population.

How to read the graphs: Figure 4.13 shows the PYLL for Registered First Nations females living on-reserve in different Tribal Council areas. The only statistically significantly different rate is SERDC, having 1.8 times the rate compared to the overall "on-reserve" female population (183.0 years per 1000 females ages 1 through 74 versus 100.9). Figure 4.14 shows a wide gap in PYLL, with 2.8 times the rate for First Nations females compared to all other Manitoban females (103.3 versus 36.5). The greatest discrepancies are seen in the RHAs of Winnipeg (129.0 vs. 36.7), Marquette (132.8 vs. 33.9) and North Eastman (145.1 vs. 39.0), where RFN females have rates at least 3.5 times higher compared with all other Manitoba females. Registered First Nations females living "off-reserve" and "on-reserve" have statistically similar PYLLs (109.3 versus 99.6), as seen in Figure 4.15. Male and female age-specific crude mortality rates are given in Appendix C, in Tables C-10 and C-11. Similar trends are observed in most age categories, though mortality rates in Keewatin Tribal Council appear high for the youngest age category.

Range of PYLL for Females (years per thousand):

Tribal Council:	74.8/74.0/75.5 for ILTC/IRTC, Indep South to 183.0 SERDC
RHA Registered First Nations:	33.2 (South Eastman) to 145.1 (North Eastman)
RHA all other Manitobans:	28.9 (South Eastman) to 53.3 (Nor-Man)
"On-reserve"/ "off-reserve":	99.6 versus 109.3 years

Figure 4.13: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Females age 1-74 years by Tribal Council 1995 - 1999

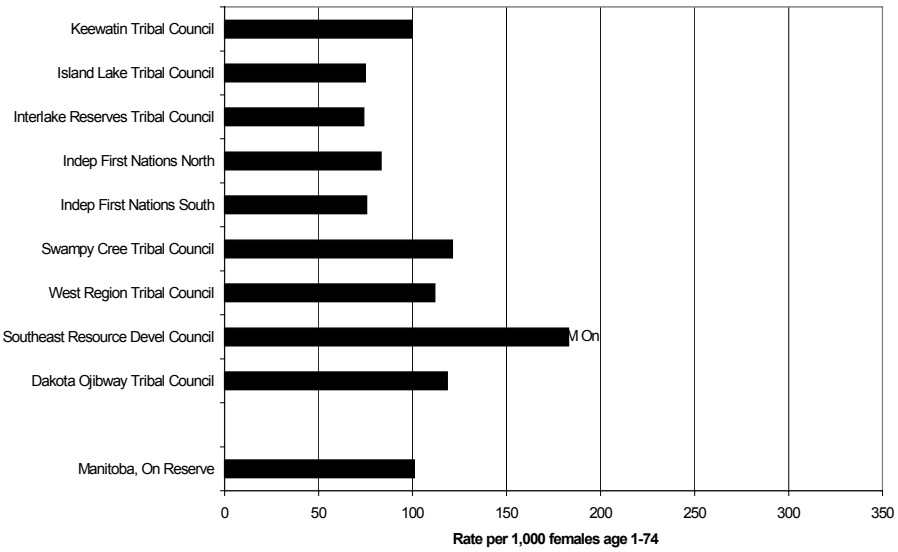
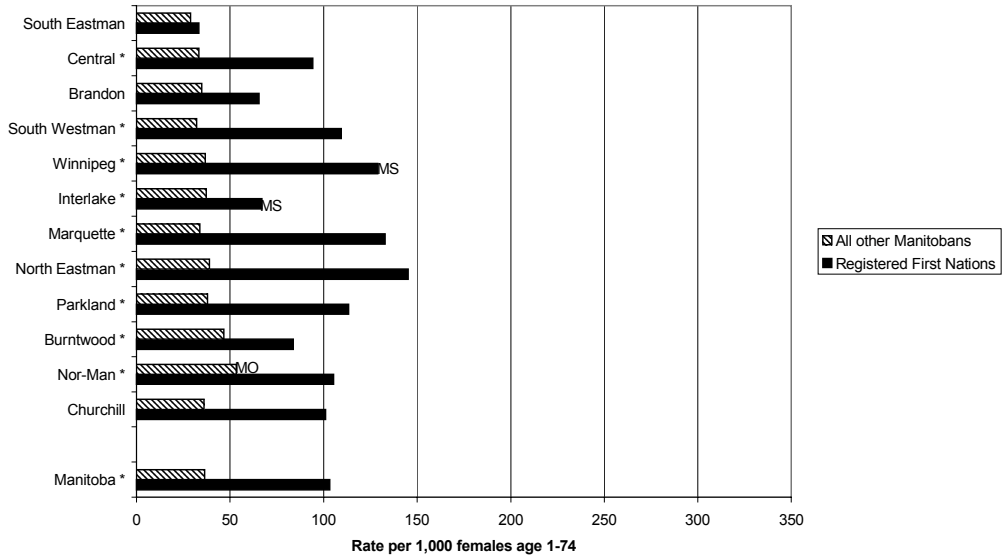
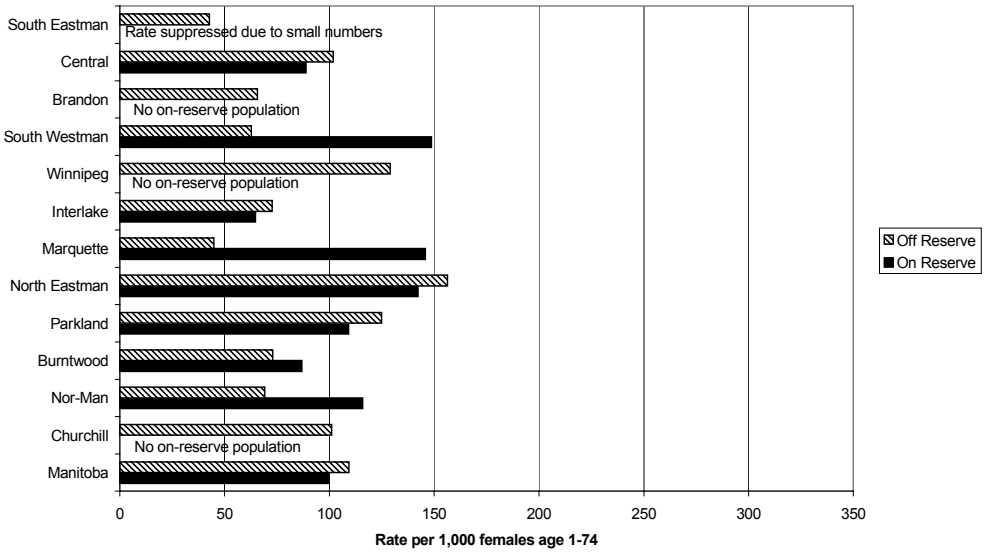


Figure 4.14: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Females age 1-74 years
Registered First Nations vs. All Other Manitobans by RHA
1995 - 1999



Key Messages:
Although the PYLL for Registered First Nations females is only two-thirds that of Registered First Nations males, the rate compared to all other Manitoba females is 2.8 times higher. Of particular concern is the rate for the SERDC Tribal Council area. As well, within the three RHAs of Winnipeg, Marquette and North Eastman, the PYLL for Registered First Nations females is at least 3.5 times the PYLL for all other women residing in the same RHA.

Figure 4.15: Direct Adjusted Potential Years of Life Lost (PYLL) per 1,000 Population for Females age 1-74 years
Off Reserve vs. On Reserve Registered First Nations by RHA
1995 - 1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

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CHAPTER 5. MEASURES OF ILLNESS AND INJURY

5.1 What's in this chapter?

This chapter includes information about illness and injury, with three specific indicators chosen:

- Diabetes
- Hypertension
- Injury rates and causes

5.2 Definitions for diabetes, hypertension and injury

"Burden" of disease is an important indicator of health status. It is also indicative of the health care needs of populations. The three conditions chosen for this chapter – diabetes, hypertension, and injury – are known to be significant problems among First Nations. The term "burden" could refer to *each person's risk* of having the condition, as well as to *actual numbers* of persons affected by the condition. In this chapter, you will find information about the rates of these conditions, that is, the risk of a person having this condition. The actual numbers of people affected by this condition depend upon both the risk of the condition, and the size of the population. For a discussion on calculating "burden" in terms of numbers of people, refer to section 2.5 in Chapter 2.

Diabetes is a chronic condition in which the pancreas no longer produces enough insulin (Type I Diabetes) or when cells stop responding to the insulin that is produced (Type II Diabetes), or a temporary condition during pregnancy (gestational diabetes), so that glucose in the blood cannot be absorbed into the cells of the body. There are several sources and several ways in which diabetes rates can be obtained. Some rely upon diabetes "registries" whereby people diagnosed as diabetics are registered. There are various methods used by researchers only having access to administrative data, that is, general physician and hospital files. Different definitions may be used, as well as different "looks", such as how many people currently have diabetes (prevalence), or how many new cases are observed during a period of time (incidence). Manitoba Health is currently completing a report which contains both prevalence and incidence rates.

For purposes of MCHP's report , diabetes rates have been derived from physician and hospital billing claims ("administrative" data) rather than from diabetes registries. The definition is as follows: if, within three years, a person had at least two ambulatory visits to physicians primarily for diabetes, or at least one hospitalization with a diagnostic coding for diabetes, then the person was considered a diabetic. So this definition relies on billing records for "treatment" of diabetes, and therefore it is called "diabetes treatment prevalence" rather than "diabetes prevalence." The administrative data does not distinguish between various types of diabetes, so the prevalence represents a combination of Type I, Type II and

gestational diabetes. "Prevalence" is a term used to describe how many persons have the condition in the population during a certain time period. All of the diabetes rates have been age/sex- adjusted to reflect the overall population's age/sex distribution (see Chapter 2 for further explanation of adjusted rates). Please refer to the Glossary in Appendix E for information as to the reliability and validity of this measure, compared to self-reports of diabetes. The population prevalence of diabetes produced using MCHP's administrative database prevalence was considered valid and reliable when compared to Tribal Council rates based upon self-reported diabetes in the *Manitoba First Nations Regional Health Survey* (1998).

Hypertension is often referred to as high blood pressure. If left untreated, hypertension can lead to heart attack, stroke, enlarged heart, or kidney damage. Those people who had at least one visit for hypertension in the three-year period of 1996/97 through 1998/99 were defined as having hypertension. This is a relatively crude definition, and does not take into consideration whether a person is on medication for high blood pressure. Please refer to the Glossary in Appendix E, for information as to the reliability and validity of this indicator, compared to self-reports of hypertension. The population prevalence of hypertension produced using MCHP's administrative database prevalence was considered valid and reliable when compared to Tribal Council rates based upon self-reported high blood pressure in the *Manitoba First Nations Regional Health Survey* (1998).

Injuries are physical damage usually inflicted on the body by external force. The indicator used in this chapter has been defined as hospitalizations for at least one day that are as a result of an injury. The type of injury is also coded, and grouped for this report into categories such as "violence" (violence by others, violence to self), "falls," "motor vehicle," or "drowning." Please refer to the Glossary in Appendix E for an extensive listing of all types of injury included within each category.

5.3 Key Findings

Diabetes

- Diabetes treatment prevalence (age- and sex-adjusted) in the Tribal Council areas ranges from 150 per thousand (15%) in KTC to 250 per thousand (25%) in DOTC, with many southern Tribal Councils having the highest rates in the province.
- Diabetes treatment prevalence (age/sex adjusted) among RFN in Manitoba is over four times higher than for all other Manitobans (189 versus 45.4 per thousand, or 18.9% versus 4.5%). The differential between RFN and all other Manitobans within RHAs ranges from just over twice as high in Burntwood and Churchill, to over six times as high in Central and South Westman.
- Overall, "on-reserve" RFN have slightly higher diabetes treatment prevalence than "off-reserve" RFN (203 versus 170 per thousand, or 20.3% versus 17.0%), and for some RHAs, the difference is as much as 50%.

Hypertension

- Overall provincial age/sex adjusted hypertension prevalence is 221 per thousand aged 25 or over (that is, 22.1%) for RFN, and 202 per thousand (20.2%) for all other Manitobans, with higher rates for "on-reserve" compared with "off-reserve" RFN (235 versus 199 per thousand). Within Winnipeg, similar rates are seen for both RFN and all others, whereas many RHAs show somewhat elevated rates for RFN (Marquette, North Eastman, Parkland, Burntwood, and Churchill). In Nor-Man RHA, RFN had a statistically significantly lower rate than all other RHA residents, but this may in part be due to under-reporting of physician claims in northern/remote areas.

Injury and causes of injury

- Injury hospitalization rates are 3.7 times higher for RFN compared with all other Manitobans provincially (30.4 versus 8.3 per thousand), and consistenty higher in every RHA in the province.
- The northern Tribal Councils of KTC (41.2 per thousand) and Independent First Nations North (38.3 per thousand) have the highest rates in the province. The Tribal Councils of ILTC (22.5 per thousand) and IRTC (22.2 per thousand) have the lowest tribal council rates in the province, but both are still more than 2.5 times higher than the provincial rate of all other Manitobans.
- The main cause of injury hospitalization for RFN, representing 31.6% of the total, was in the category of "violence," with 17.1% due to "violence by others" and 14.5% due to "violence to self." For RFN, the category of "falls" represented about one-fifth of the injury hospitalizations (21.8%).
- In contrast, the main cause of injury hospitalization for all other Manitobans was "falls" (48.0%), with the category of "violence" representing about one-tenth of the total ("violence by others" at 4.1% and "violence to self" at 6.3%).
- RFN living "off-reserve" have a slightly higher proportion of injury hospitalizations due to "violence by others" compared to those living "on-reserve" (20.6% versus 15.1%), though "violence to self" proportions were similar (14.6% versus 14.5%).

5.4 Canadian Comparisons

- Diabetes is a major health concern among many Canadian First Nations populations (Young et al., 2000). Based on 1997 data from the First Nations and Inuit Regional Health Survey, the age-adjusted prevalence of diabetes among Canadian First Nations people and Labrador Inuit was 11% for men and 16% for women. In comparison, 1994/95 data from the National Population Health Survey showed 3% prevalence for both men and women in the general Canadian population (Health Canada, 1999). Longitudinal comparisons indicate that diabetes prevalence is increasing among Canadian First Nations people. Between 1991 and 1997, self-reported prevalence increased among all age groups (Young et al., 2000). In Manitoba, diabetes prevalence was reported at 11.7% among First Nations people in 1995/96. Prevalence among all Manitobans was 5.3%. Prevalence among First Nations people was highest at age 55-64, at 38.9%, whereas the prevalence for all Manitobans in that age group was 11.1%. The

greatest difference between First Nations diabetes prevalence and overall prevalence occurred among 45-54 year olds, where First Nations prevalence was five and a half times higher than Manitoba overall, at 29.6% compared with 5.4% (Jacobs et al., 2000). *In our report, the overall diabetes treatment prevalence for Manitoban RFN was 18.9% (189 per thousand persons ages 20 through 79 years, age and sex adjusted), compared with a prevalence of 4.5% for all other Manitobans. However, this points to the difference between "crude" and "adjusted" rates. Our rates have been adjusted to reflect the overall population age/sex structure for the entire province, so this makes a huge difference in the RFN population diabetes rates. Since the RFN population is relatively young, and since diabetes rates tend to increase with increasing age, the adjusted rate for RFN is much higher than the crude rate (crude rates are given in Appendix C, and an explanation of crude rates is in Chapter 2). The crude rate for diabetes treatment prevalence for RFN was 13.1%, and 15.0% for RFN living "on-reserve." The crude rate for all other Manitobans was 4.7%. Comparing our reported crude rates to those in the literature, Manitoba rates are still slightly elevated for both RFN and for all other Manitobans. But substantially higher rates in First Nations populations is evident in both our report and in the Canadian data, and especially evident when rates are age- and sex-adjusted for a fairer comparison.*

- Adjusted hypertension prevalence among Northwestern Ontario and Manitoba First Nations people was 27.4% in 1986/87. First Nations people in these regions had higher systolic blood pressure than Canadians up to age 45, when the trend reversed (Young, 1991). Interestingly, there is evidence of low mean blood pressure rates in Inuit communities in the North, with no rise with age, particularly in more remote communities (Young, 1994). One study of Six Nations Reserve (Anand et al. 2001) close to Hamilton, Ontario, Canada, found a higher frequency of cardiovascular disease in the Aboriginal population (18.5%) compared with European populations from the three Canadian cities of Hamilton, Toronto and Edmonton (7.6%). Data from the First Nations and Inuit Regional Health Survey also point to high rates of hypertension within the Canadian First Nations population. Age-adjusted prevalence of hypertension in 1997 was 22% for men and 25% for women among Canadian First Nations and Labrador Inuit. Hypertension prevalence in the general Canadian population was 8% for men and 10% for women in 1994/95 (Health Canada, 1999). *In our report, age- and sex-adjusted hypertension prevalence was 22.1% for RFN, with higher rates for RFN "on-reserve" compared with "off-reserve" (23.5% versus 19.9%). Seven out of twelve RHAs show somewhat elevated rates for RFN compared to all other RHA residents. Similar to the findings of lower mean blood pressure rates in Inuit communities, the rates for both RFN and "all other Manitobans" (presumably including Inuit) in Churchill RHA, at 6.0% and 12.1% respectively, are considerably lower than in any other RHA in Manitoba or provincially. All of the prevalence figures in this report are adjusted for age and sex so trend comparisons by age group are not possible. Our reported adjusted hypertension rate for the "all other Manitobans" group was 20.2% (the crude rate was 20.1%), much higher than the Health Canada figures of 8% for men and 10% for women.*

- Injury mortality rates are extremely high among most Canadian First Nations populations. In 1997, age-standardized injury mortality rates among First Nations were 117 per 100,000 population in Manitoba, 142 per 100,000 population in

Saskatchewan, and 185 per 100,000 population in British Columbia. These rates are up to 6 ½ times higher than the 1996 national rate of 28 per 100,000 population (Health Canada, 1999). In the 1980s, the leading cause of injury mortality for Canadian First Nations was motor vehicle traffic, which accounted for 29% of injury deaths, followed by suicide, which accounted for 21% of injury deaths (Young, 1994). In a 1994-97 study of brain injury patients at a Saskatoon hospital, First Nations patients were much less likely to receive care and support after being discharged from the hospital than non-First Nations patients (Blackmer & Marshall, 1999). *In our report, the rates are based upon injury hospitalizations, and are thus not directly comparable to injury mortality rates. Overall RFN rates were 30.4 injury hospitalizations per thousand, which is 3.7 times higher than the rate for all other Manitobans (8.3 hospitalizations per thousand). Causes for injury hospitalization are also not directly comparable to causes of injury mortality – the leading cause of RFN Manitoba injury hospitalizations was violence, accounting for almost one-third of the total (17.1% violence by others, 14.5% violence to self). Motor vehicle and other vehicle injury hospitalizations accounted for only 9.2% and 3.6% respectively.*

5.5 Diabetes Treatment Prevalence

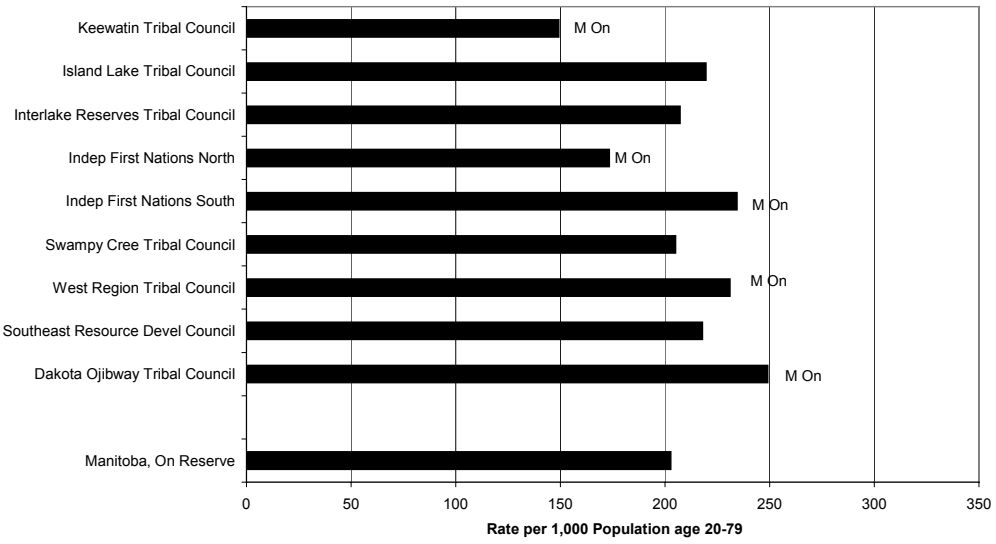
Definition: The number of persons having at least two physician visits or one hospitalization with a diabetes diagnosis in a three-year period from 1996/97 through 1998/99, per thousand residents of that region (as of a mid-point population at December 1997). This is age and sex adjusted to reflect the age/sex distribution of Manitoba. Refer to section 5.2 for further discussion on different sources of data and types of data used in different reports to generate diabetes rates.

How to read the graphs: If you prefer to think in terms of a percentage of persons with diabetes, each of these rates can be divided by 10 to give the percent. For example, the overall Manitoba rate for Registered First Nations people (RFN) is 189 per thousand, or 18.9%, compared with an overall rate for all other Manitobans of 45.4 per thousand, or 4.54%. Figure 5.1 shows diabetes treatment prevalence by Tribal Council for "on-reserve" Registered First Nations people. Prevalence is highest in some of the southern tribal councils of DOTC (249 per thousand), Independent First Nations South (234 per thousand), and WRTC (231 per thousand), while it is lowest in some of the northern areas of KTC (149 per thousand) and Independent First Nations North (173 per thousand). Figure 5.2 compares Registered First Nations people to all other Manitobans by RHA. Prevalence among RFN is 4.2 times higher than that among all other Manitobans at the provincial level (189 versus 45.4 per thousand), with more of a differential in southern RHAs compared to northern RHAs. For example, South Westman RFN have 6.4 times the prevalence compared with all others living in South Westman RHA, whereas Burntwood RFN have 2.4 times the prevalence compared with all others living in Burntwood RHA. Figure 5.3 shows "on-reserve" having a higher diabetes treatment prevalence compared to "off-reserve" (203 versus 170 per thousand).

There are two concerns about obtaining a realistic diabetes rate using provincial physician/hospital claims. First, claims may be missing from northern and remote regions where salaried health care providers are the norm. Secondly, diabetes rates may appear to be "high" in those areas where there are active surveillance and screening programs, so true diabetes rates may be undercounted in areas where these programs are not active. However, within this report there is a strong relationship between PMR and diabetes treatment prevalence rates both in Tribal Council area rates for "on-reserve" RFN (Spearman's correlation coefficient $r=0.60$, one-tailed testing, $p<0.05$), and in RHAs for "all other Manitobans" ($r=0.92$, one-tailed, $p<0.0001$) – that is, as you go down the Tribal Council graph, diabetes rates increase as PMR increases. Refer to Chapter 4 for further discussion about PMR. This could point to the fact that our diabetes treatment prevalence rates may, indeed, be showing true differences. A further discussion of validating the diabetes rates with self-reported diabetes is found in Section 5.2 and in the Glossary in Appendix E.

Range of Diabetes Treatment Prevalence per thousand:	
Tribal Council:	149 (KTC) to 249 (DOTC)
RHA Registered First Nations:	156 (Churchill and Brandon) to 270 (South Westman)
RHA all other Manitobans:	38/41/41/42 (Central/South Eastman/North Eastman/South Westman) to 71/73 (Burntwood/Churchill)
"On-reserve"/ "off-reserve":	203 versus 170 per thousand (significantly different)

Figure 5.1: Direct Adjusted Diabetes Treatment Prevalence per 1,000 Population age 20-79 years by Tribal Council 1996/97 - 1998/99



Key Messages: *: In general, diabetes treatment prevalence is higher in southern Tribal Council areas compared to the north. Compared with all other Manitobans, diabetes treatment prevalence is four times higher for RFN people overall (45 versus 189 per thousand), ranging from twice as high in Burntwood and Churchill, to six times as high in Central and South Westman RHAs. Higher diabetes treatment prevalence rates are strongly associated with populations having poorer health status (PMR), both within Tribal Councils for RFN, and within RHA areas for all other Manitobans.*

Figure 5.2: Direct Adjusted Diabetes Treatment Prevalence per 1,000 Population age 20-79 years Registered First Nations vs. All Other Manitobans by RHA 1996/97 - 1998/99

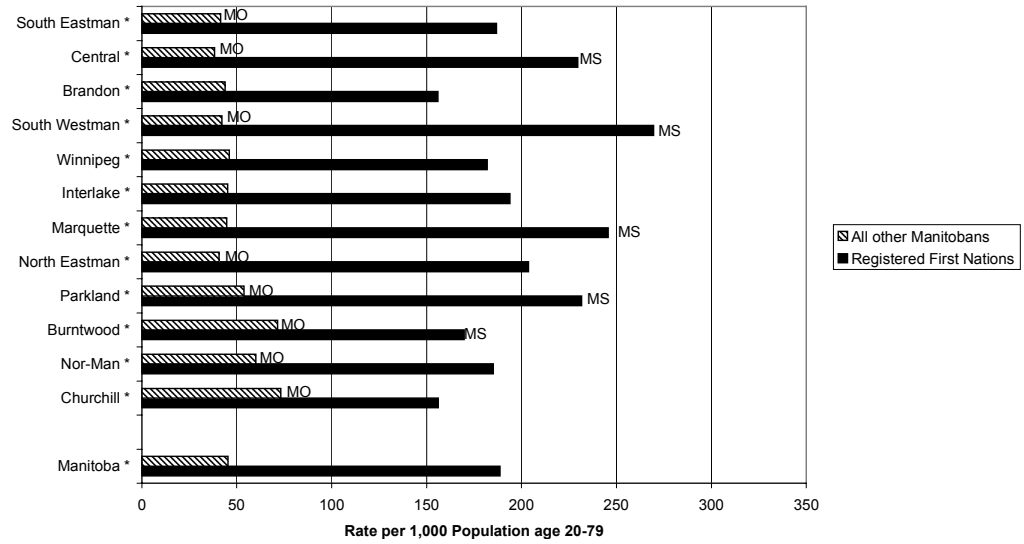
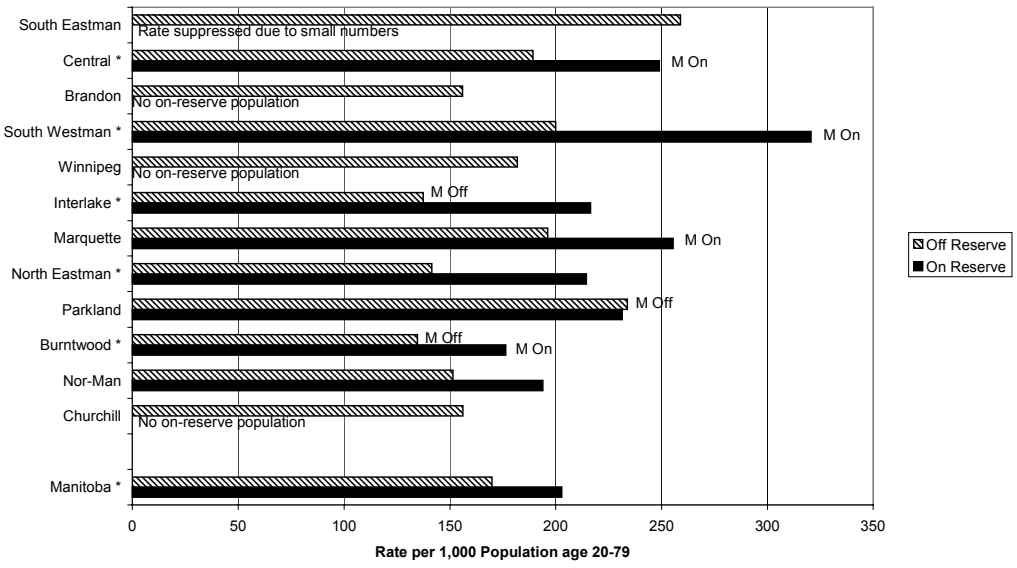


Figure 5.3: Direct Adjusted Diabetes Treatment Prevalence per 1,000 Population age 20-79 years Off Reserve vs. On Reserve Registered First Nations by RHA 1996/97 - 1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

5.6 Hypertension Prevalence

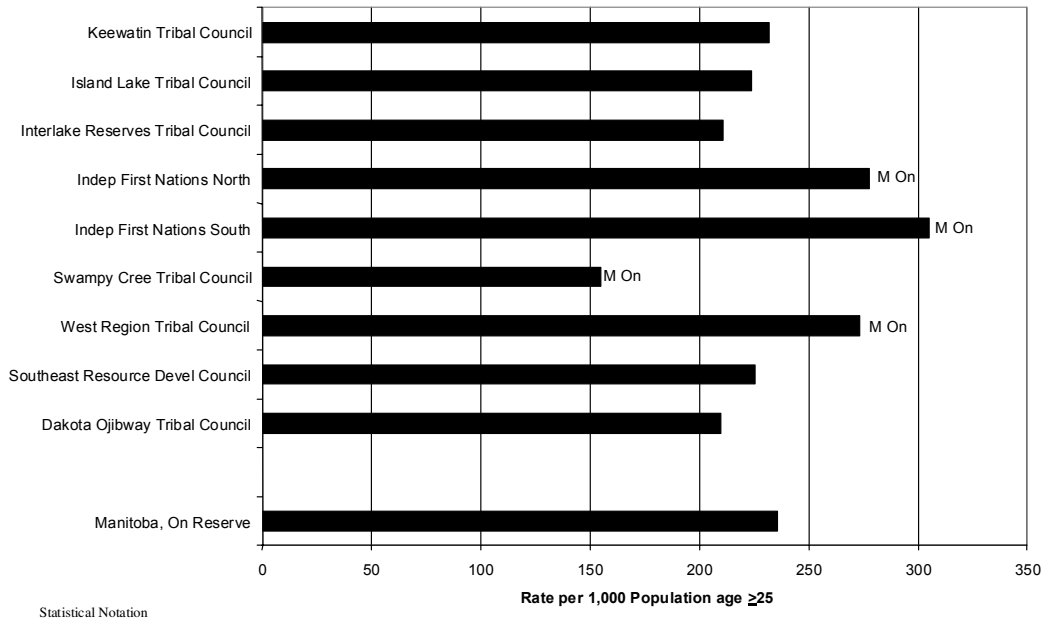
Definition: This is the number of persons aged 25 or older in a region who had at least one physician visit for hypertension in a three-year period from 1996/97 through 1998/99, per thousand persons aged 25 or older in that region.

How to read the graphs: Because this definition relies upon physician visit claims, hypertension prevalence may be underestimated in northern and remote areas where nurse practitioners, or salaried physicians, may not be recording the visit in the Manitoba Health billing claims. This may account for the fact that there is very little evidence showing a relationship between hypertension rates and the health status of the populations in Figures 5.4 and 5.5 (see Chapter 4 for a discussion on health status and PMR). Figure 5.4 shows hypertension prevalence by "on-reserve" RFN within each Tribal Council, with an overall prevalence of 235 per thousand (23.5%). Rates show no particular geographical pattern, with high rates for both Independent North (278 per thousand) and South (305 per thousand) Tribal Councils. Figure 5.5 compares Registered First Nations people and all other Manitobans by RHA, showing fairly close rates at the provincial level (221 versus 202), despite the RFN rate being statistically (*) higher. Most RHAs show similar rates for RFN and all other residents in southern areas including Winnipeg, but higher rates for RFN in northern areas (with the exception of Nor-Man). Those RFN living "on-reserve" have a statistically higher hypertension rate than RFN living "off-reserve."

Range of Hypertension Prevalence per thousand aged 25 and over:

Tribal Council:	155 (SCTC) to 273/278/305 (WRTC/Independent North/Independent South)
RHA Registered First Nations:	121/156/161 (Churchill/Nor-Man/Brandon) to 281 (North Eastman)
RHA all other Manitobans:	60 (Churchill) to 218 (Interlake)
"On-reserve"/ "off-reserve":	235 versus 199 per thousand (statistically different)

Figure 5.4: Direct Adjusted Hypertension Prevalence per 1,000 Population age ≥ 25 years by Tribal Council 1996/97 - 1998/99



Statistical Notation

M On - significantly different from MB rate for On-Reserve RFN

Key Messages:
Hypertension prevalence, as determined through physician claims, appears to fluctuate greatly by geographical area but not particularly by RFN/other groupings of Manitobans. Overall provincial hypertension prevalence is 221 per thousand aged 25 or over (that is, 22.1%) for RFN, and 202 (20.2%) for all other Manitobans, with higher rates for "on-reserve" compared with "off-reserve" RFN (235 versus 199 per thousand). Within Winnipeg, similar rates are seen for both RFN and all others, whereas many RHAs show somewhat elevated rates for RFN.

Figure 5.5: Direct Adjusted Hypertension Prevalence per 1,000 Population age ≥ 25 years
Registered First Nations vs. All Other Manitobans by RHA
1996/97 - 1998/99

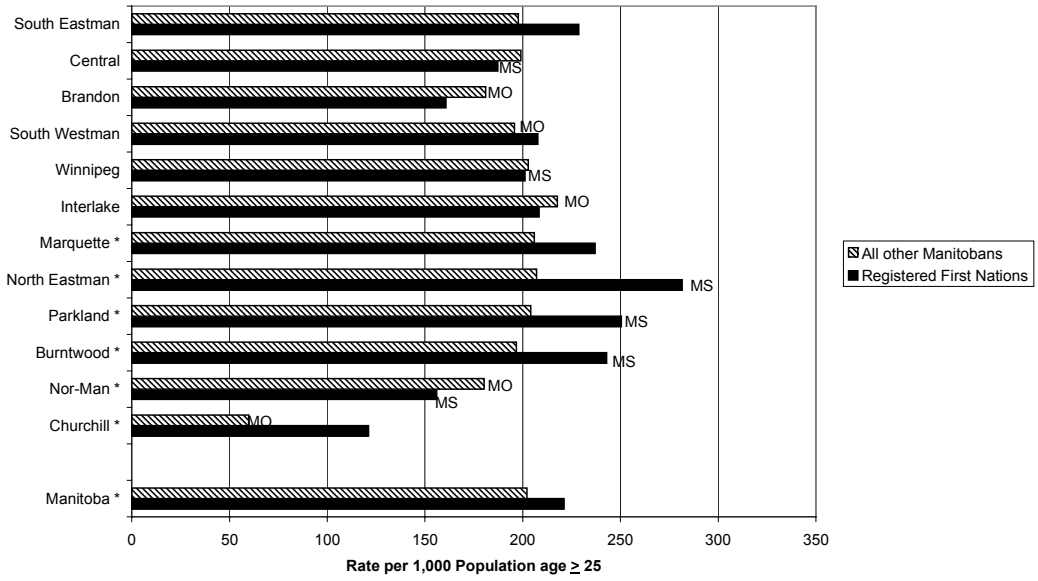
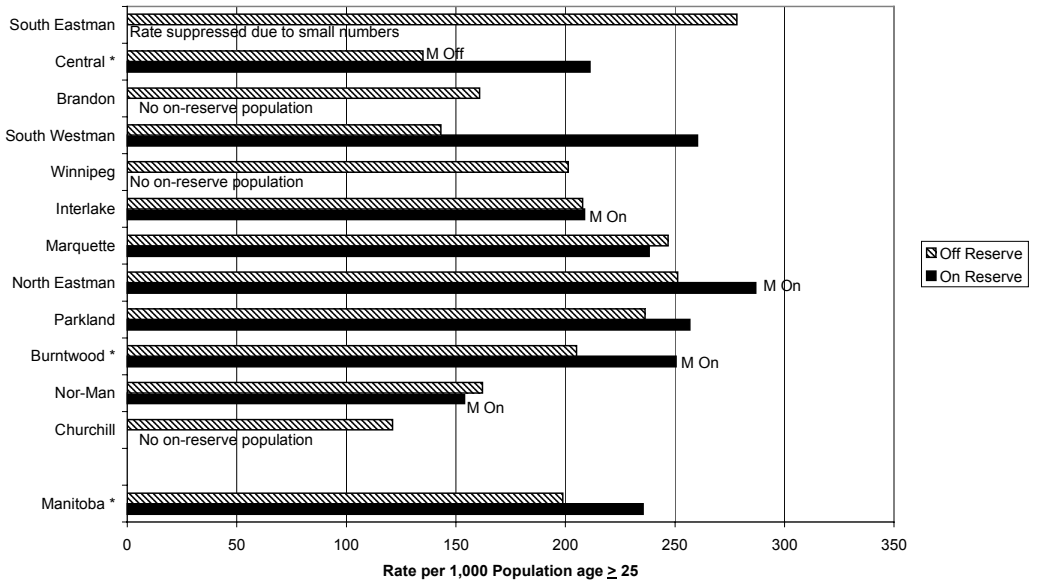


Figure 5.6: Direct Adjusted Hypertension Prevalence per 1,000 Population age ≥ 25 years
Off Reserve vs. On Reserve Registered First Nations by RHA
1996/97 - 1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

5.7 Injury

5.7.1 Injury Hospitalization Rates

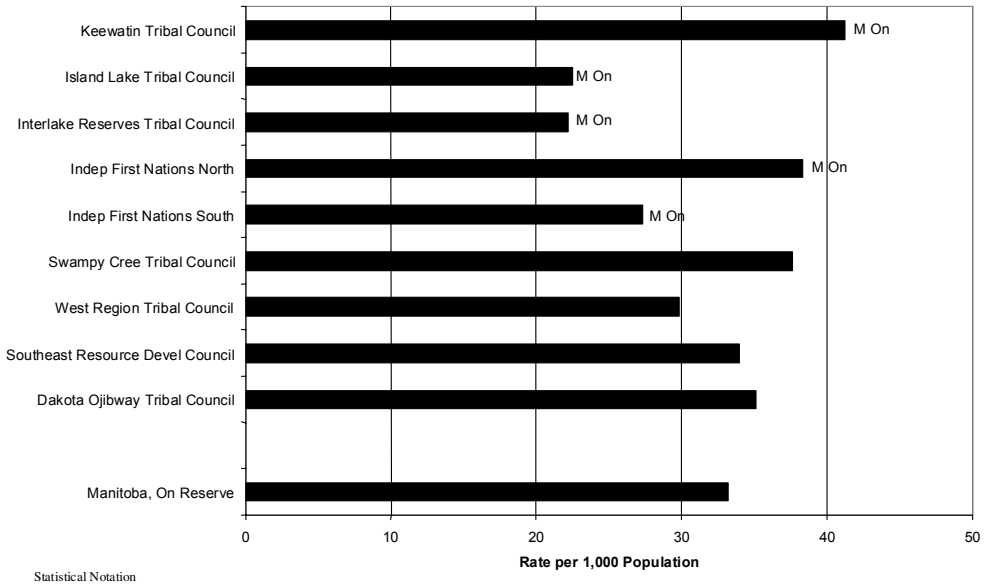
Definition: This is the number of hospitalizations lasting one day or longer that resulted from an injury, per thousand area residents. All rates have been age and sex adjusted to the overall Manitoba population distribution, and are based upon five years of data (1994/95 through 1998/99).

How to read the graphs: Figure 5.7 shows that injury hospitalization rates are particularly high for Tribal Councils in northern Manitoba, with KTC (41.2) and Independent North (38.3) showing elevated rates compared to the overall Manitoba RFN "on-reserve" rate of 33.2 per thousand. However, ILTC is an interesting anomaly, being a northern Tribal Council but having one of the lowest rates in the province next to IRTC. Winnipeg injury hospitalization rates are one of the lowest in the province, with rates 0.8 times the provincial rate for both "all other Manitobans" (6.8 versus 8.3) and for RFN (25.6 versus 30.4). However, the differential between injury rates for RFN and for all other Manitobans is evident in Figure 5.8 (30.4 versus 8.3 per thousand provincially), with RFN rates 3.7 times higher. This differential is apparent in every RHA, with rates ranging from 1.7 times higher in South Westman to rates over three times higher in several southern RHAs including Winnipeg (3.8 times), Central (3.3 times), North Eastman (3.4 times), and Brandon (3.2 times higher). Those RFN living "on-reserve" have elevated injury hospitalization rates compared to those living "off-reserve" (33.2 versus 27.0 per thousand), as seen in Figure 5.9.

Range of Injury Hospitalization Rates per thousand people:

Tribal Council:	22.2/22.5 (IRTC/ILTC) to 38.3/41.2 (Independent North/KTC)
RHA Registered First Nations:	19.5/21.5/25.6 (South Westman/Interlake/Winnipeg) to 35.3/35.9/36.9 (Burntwood/Nor-Man/Marquette)
RHA all other Manitobans:	6.8 (Winnipeg) to 15.0 (Nor-Man)
"On-reserve"/ "off-reserve":	33.2 versus 27.0 per thousand (statistically different)

Figure 5.7: Direct Adjusted Injury Hospitalization Rates per 1,000 Population by Tribal Council 1994/95 - 1998/99



Statistical Notation

M On - significantly different from MB rate for On-Reserve RFN

Key Messages:
Injury hospitalization rates are 3.7 times higher for RFN compared with all other Manitobans (30.4 versus 8.3 per thousand), and RFN rates are consistently higher in every RHA in the province. Winnipeg has one of the lowest injury hospitalization rates in the province, yet the RFN rate is still 3.8 times higher than for all other Winnipeg residents (25.6 versus 6.8 per thousand). The northern Tribal Councils of KTC (41.2 per thousand) and Independent First Nations North (38.3 per thousand) have the highest rates in the province.

Figure 5.8: Direct Adjusted Injury Hospitalization Rates per 1,000 Population
Registered First Nations vs. All Other Manitobans by RHA
1994/95 - 1998/99

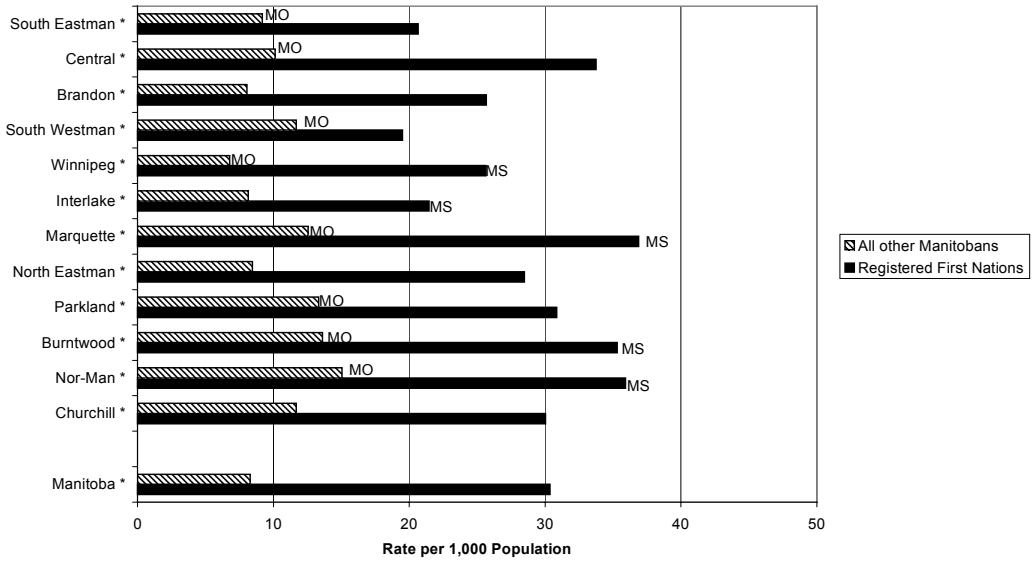
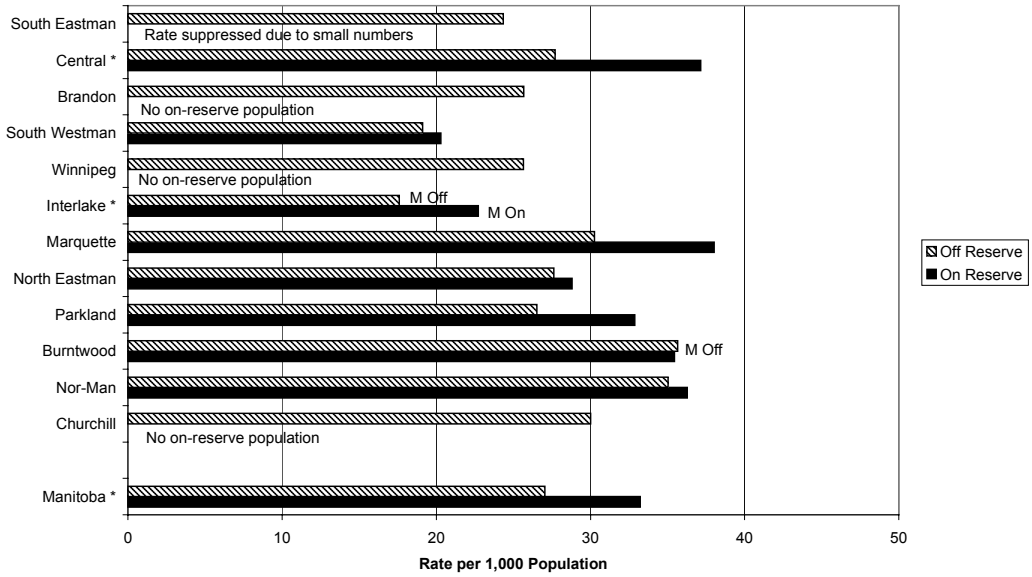


Figure 5.9: Direct Adjusted Injury Hospitalization Rates per 1,000 Population
Off Reserve vs. On Reserve Registered First Nations by RHA
1994/95 - 1998/99



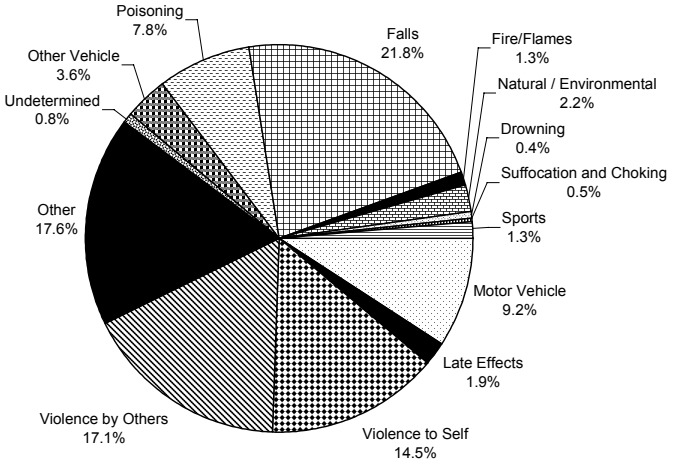
Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

5.7.2 Causes of injury hospitalization

Definition: The number of injury hospitalizations due to each category have been compared to the total number of injury hospitalizations to give a percent of injury hospitalizations by injury category. See the Glossary in Appendix E for the kinds of injuries included in each of the 14 categories of injury.

How to read the graphs: There are four pie charts included in this section: all RFN compared to all other Manitobans (Figures 5.10 and 5.11), and RFN "on-reserve" compared to "off-reserve" (Figures 5.12 and 5.13). Each pie chart adds up to 100%. In Figure 5.10, the largest proportion of the RFN injury hospitalizations belongs to the category of "violence" – almost one-third of the total injury hospitalizations, with "violence by others" representing 17.1%, and "violence to self" representing 14.5%. In contrast, Figure 5.11 shows that for all other Manitobans, the category of "violence" represents about 10% of the total injury hospitalizations, with "violence by others" 4.1%, and "violence to self" 6.3% of the total. For all other Manitobans, injury hospitalizations due to "falls" represents about half (48.0%) of the total, compared with 21.8% for RFN. Despite the fact that "on-reserve" RFN have slightly higher injury hospitalization rates than "off-reserve" (see Figure 5.9 in previous section), the causes are very similar. Figures 5.12 and 5.13 show that the category of "violence" is still the largest category, comprising 29.6% of the injury hospitalizations for "on-reserve," and 35.2% for "off-reserve" Registered First Nations people. "Violence by others" is higher for those living "off-reserve" (20.6% versus 15.1%), and injury due to vehicles other than motor vehicles is higher for those living "on-reserve" (4.1% versus 2.8%). No statistical testing was done for the pie chart information.

**Figure 5.10: Percent of Injury Hospitalizations by Injury Group:
Registered First Nations
1994/95 - 1998/99**



Key Messages:

The main cause of injury hospitalization for RFN was in the category of "violence," with 17.1% due to "violence by others" and 14.5% due to "violence to self." In contrast, the main cause of injury hospitalization for all other Manitobans was "falls" (48.0%), with "violence by others" at 4.1% and "violence to self" at 6.3%. (RFN living "off-reserve" have higher rates of violence by others compared to those living "on-reserve" (20.6% versus 15.1%).

**Figure 5.11: Percent of Injury Hospitalizations by Injury Group:
All other Manitobans
1994/95 - 1998/99**

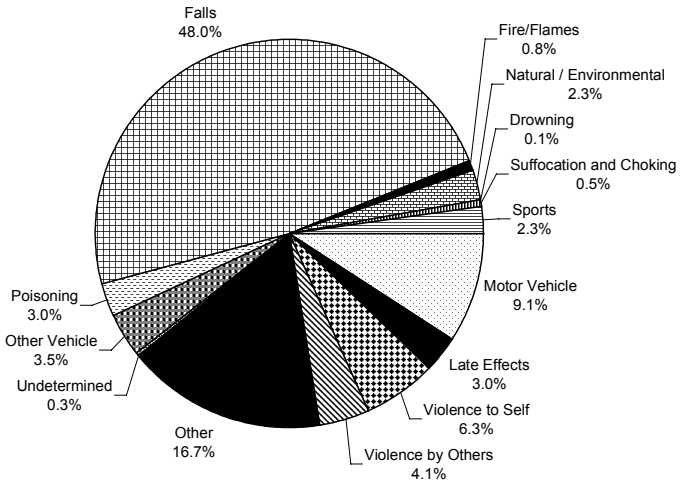


**Figure 5.12: Percent of Injury Hospitalizations by Injury Group:
Registered First Nations On Reserve
1994/95 - 1998/99**

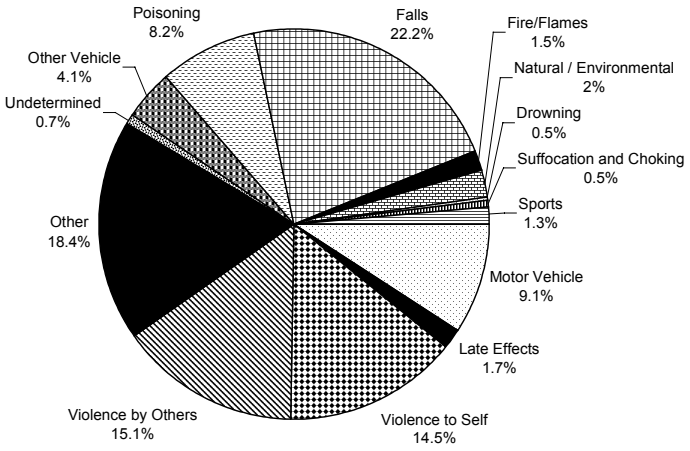
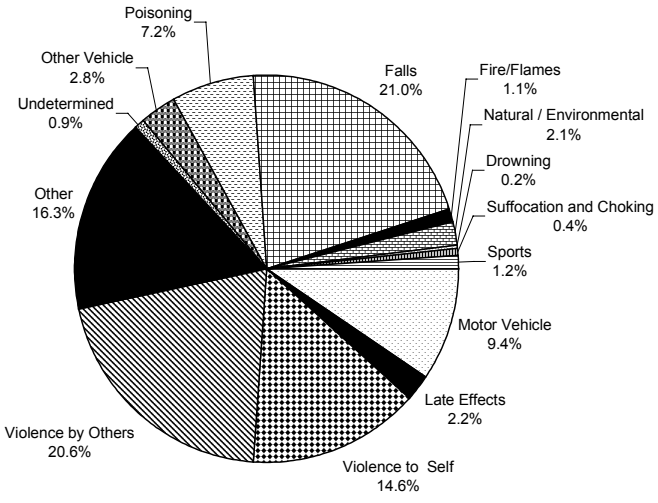


**Figure 5.13: Percent of Injury Hospitalizations by Injury Group:
Registered First Nations Off Reserve
1994/95 - 1998/99**



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CHAPTER 6. PREVENTIVE CARE MEASURES

6.1 What's in this chapter?

This chapter includes information about the following:

- Childhood immunization rates at ages one and two years
- Mammography rates for women ages 50 through 69 years
- Breastfeeding rates at hospital discharge for newborns

Prevention is the first and foremost consideration in any health services initiative. A fundamental policy issue in public health is the question of "How can health services prevent illness from occurring, rather than simply treat illness once it occurs?" Each of the indicators for this chapter is a picture of preventive health programs – immunization by community health centres and physicians, provincial mammography screening programs, and efforts by community health providers, peer organizations such as La Leche League Canada, and the Canadian Prenatal Nutrition Program (CPNP), to increase breastfeeding rates within communities of Manitoba.

6.2 Preventive indicators and data sources

In the province of Manitoba, three data sources enable us to look at the three issues surrounding preventive care. The provincial registry referred to as MIMS (Manitoba Immunization Monitoring System) records childhood immunizations of Manitoba residents, whether these are given by a physician or a public health nurse. MIMS can measure the cumulative percentage of *immunizations* completed by certain ages in specified birth cohorts, and calculate percentages of children who are up-to-date for their complete set of recommended immunizations. The Canadian Immunization Guide (5th edition, 1998) is available at the Population and Public Health Branch website, through Health Canada (www.hc-sc.gc.ca/pphb-dgspsp/). Most categories of immunization have targets of 95% coverage or higher for the complete doses of each vaccine (Canada Communicable Disease Report, 1997). The Glossary in Appendix E explains the complete immunization schedules for ages one and two.

Manitoba's systematic breast screening program, or *"mammography"* program, is operated by the Manitoba Breast Screening Program and available to women ages 50 through 69 years old. Operated by CancerCare Manitoba (formerly known as Manitoba Cancer Treatment and Research Foundation), the breast screening program began in mid-1995, and involves the delivery of mammography screening through a province-wide program and a reminder system independent from a physician referral. It is recommended that all women between 50 and 69 years of age be screened every two years for breast cancer. The information in this report has been supplied through the CancerCare Manitoba Breast Screening Program. More information about the breast screening program, and related research is available through the CancerCare Manitoba website (http://www.cancercare.mb.ca).

In Manitoba, the hospital discharge file for a newborn contains information on the type of feeding, recorded as either "breast," "both breast and artificial," or "artificial." This report groups together "breast" and "both breast and artificial" to report the percentage of newborns residing within a geographical area who were breastfeeding at discharge ("any breastfeeding"). For purposes of this report, we will refer to this rate as the *"breastfeeding initiation" rate*, that is, how many newborns actually began, or "initiated," breastfeeding. At present, there is no provincial source of data which gives estimates of how long babies were breastfed ("breastfeeding duration"), other than the National Longitudinal Survey of Children and Youth which excluded First Nations communities in the sample.

According to the World Health Organization, recommendations for breastfeeding include exclusive breastfeeding for the first six months of life, followed by breastfeeding up to two years old and beyond (World Health Assembly 1994). Breastfeeding is an important health issue, due to protection against gastrointestinal and respiratory infections (Beaudry et al. 1995; Dewey et al. 1995; Howie et al. 1990; Rubin et al. 1990; Scariati et al. 1997; Walker 1993; Wilson et al. 1998), even in smoking households (Nafstad et al. 1996). As well, breastfeeding benefits cognitive development (Fergusson et al. 1982; Horwood and Fergusson 1998; Lanting et al. 1994; Lucas et al. 1992; Morrow-Tlucak et al. 1988; Niemela and Jarvenpaa 1996). Exclusive breastfeeding is more protective against respiratory infection than partial or no breastfeeding (Wilson et al. 1998). Recent findings suggest a protective effect of breastfeeding in reducing the risk for Type II diabetes in adolescence and adulthood (Baur et al. 1998; McManus, Cunningham et al. 2001; Pettitt, Forman, Hanson et al. 1997; Pettitt and Knowler 1998). It has been estimated that the cost to the USA for preventable infant diarrhea in non-breastfed infants is $291.3 million per year, and $660 million per year for preventable ear infections (Riordan 1997).

6.3 Key findings

Immunization

- Registered First Nations children, both "on-reserve" and "off-reserve," have far lower complete immunization rates than all other Manitoban children at ages one (62% versus 89%) and two (45% versus 77%). Although this may be due to underreporting into the MIMS system, it may also be showing evidence of lack of preventive services, since even the "off-reserve" children who presumably would receive immunizations in the provincial system have rates only about 10% higher than those "on-reserve" at both ages one and two.
- Three Tribal Council areas record immunization rates over 70% for one-year-olds: IRTC, SCTC, and WRTC. Churchill RHA has high immunization rates both for Registered First Nations children and for all other children living in the RHA.

Mammography

- Although mammography rates for all Manitoban women fall short of the goals of the screening program, the rate for Registered First Nations women is less than half the rate for all other Manitoba women (26% versus 56%).

- Screening rates vary substantially, from 9.7% (ILTC) to 47.9% (SCTC) by Tribal Council area, from 15.3% (Burntwood) to 46.5% (Nor-Man) for RFN women by RHA, and from 51.0% (Central) to 68.3% (Brandon) for all other women.

Breastfeeding initiation

- Overall breastfeeding initiation rates for Registered First Nations newborns was 57.1%, with slightly lower rates for those living "on-reserve" (54.3%). These rates are substantially lower than for all other Manitoban newborns, at 80.5%. By RHA, Registered First Nations newborn breastfeeding initiation rates vary from about 40% to 80%, compared with the corresponding variation for all other newborns from about 70% to 90%. Moreover, breastfeeding initiation rates in general are lowest in those areas with the highest PMRs, that is, areas having populations with the poorest health status.

6.4 Canadian Comparisons

- Canadian First Nations immunization rates vary substantially across provinces and vaccines. Coverage in 1997 of "on-reserve" First Nations two-year-olds ranged from less than 50% for Diptheria/Pertussis in Alberta, and Bacillus Calmette-Guérin (BCG) for tuberculosis infection in Alberta and Saskatchewan, to over 90% for Haemophilus influenzae type b (Hib) in the Atlantic provinces. With the exception of Hib and BCG (which is not administered to the general population), Canadian immunization rates were higher than "on-reserve" First Nations rates in all provinces (Health Canada 1999). *In our report, findings are similar. The overall completion rate of "on-reserve" First Nations two-year-olds was substantially lower than that of all other Manitoba children (45% versus 77%).*

- In 1989, 44.5% of First Nations Manitoban children had completed immunization schedules by their first birthday, compared with 90.8% of all other Manitobans. As well, 38.6% of non-Winnipeg First Nations children had completed their immunization schedules, compared with 65.2% of First Nations in inner-city Winnipeg and 62.9% in suburban Winnipeg (Roberts et al., 1994). *In our report for children born 1994 through 1997, the one-year immunization rates in 1995 through 1998 were higher than in 1989; 62% of First Nations children had completed immunization schedules, compared with 88.7% of all other Manitoban children. "On-reserve" First Nations children had an overall rate of 57.3%, with several Tribal Council areas reporting rates of over 70%. Winnipeg First Nations children had an overall rate of 69.2%, twenty percent lower than the rate for all other Winnipeg children (89.1%).*

- Results from the 1994 National Population Health Survey (NPHS) indicated that among the general Canadian population, 60% of women have had a mammography test. In the Manitoba First Nations Regional Health Survey in 1997, 20% of the women reported having had a mammography. *Our report showed results similar to that of the First Nations regional survey, with mammography rates for the years 1997 and 1998 at 20.1% for "on-reserve" RFN women ages 50 through 69 year, and 13.7% for "off-reserve" RFN women. For all other Manitoban women, the rate of 56.2% approximated that reported in the NPHS.*

- According to 1997 data from the First Nations and Inuit Regional Health Survey, 54% of children ages two or younger had been breastfed at birth. In comparison, data from the 1994/95 National Longitudinal Survey on Children and Youth indicate that 75% of Canadian children had been breastfed (Health Canada 1999). *In our report, 57.1% of First Nations infants and 80.5% of all other Manitoban children were breastfed at hospital discharge, with rates slightly higher for "on-reserve" compared to "off-reserve" First Nations (60.5% versus 54.3%).*

6.5 Childhood Immunization Rates (for one-year and two-year old children)

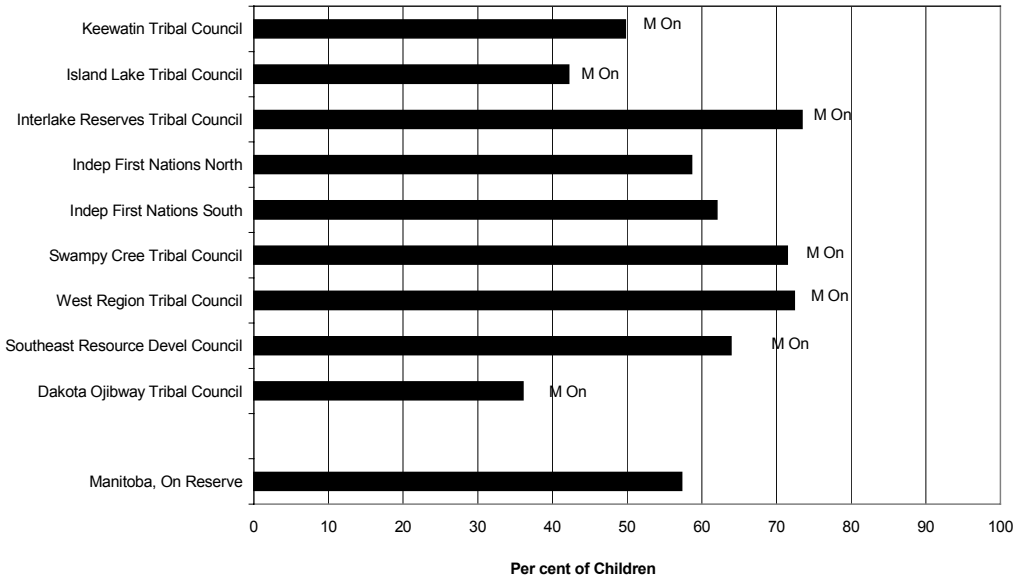
Definition: The immunization rate is calculated as the number of children who resided in Manitoba for the full time period (1994 through 1997 for one-year rates; 1994 through 1996 for two-year rates) and who were up-to-date for a complete set of recommended immunizations, compared to the number of children who resided in Manitoba for the respective full-time period. This is expressed as a percentage of children with an up-to-date complete set of immunizations. Immunization rates are provided by the Manitoba Immunization Monitoring System (MIMS), where physicians and nurses record immunizations given to residents of Manitoba. Data from federal nurses and First Nations community health nurses may be incomplete. See the Glossary in Appendix E for details as to immunization schedules.

How to read the graphs: Figures 6.1 and 6.4 represent the one- and two-year complete set of immunizations respectively for "on-reserve" children by Tribal Council area. Similar trends are seen for both graphs – IRTC, SCTC, and WRTC all have rates over 70% at age one and over 55% at age two, and are significantly higher than the Manitoba "on-reserve" rate of 57.3% at age one and 41.4% at age two. DOTC rates are lowest, at 36.1% age one and 24.3% age two. Figures 6.2 and 6.5 show discrepancies between immunization rates of RFN children and all other Manitoba children within an RHA, with every RHA having lower First Nations rates except in Churchill. Overall, immunization rates of RFN children are about 2/3 that of all other Manitoban children. Comparing those children living "on-reserve" or "off-reserve," reported rates are higher for "off-reserve" although this may be an artifact of lower reporting by federal nurses and First Nations community health nurses into the MIMS system.

Range of childhood immunization rates:

Tribal Council:	One-year: 36.1% (DOTC) to 73.4% (IRTC) Two-year: 24.3% (DOTC) to 59.9% (WRTC)
RHA Registered First Nations:	One-year: 41.2%/42.3%/42.7% (South Westman/South Eastman/Central) to 91.3% (Churchill) Two-year: 29.1% (Central) to 88.9% (Churchill)
RHA all other Manitobans:	One-year: 73.5% (Burntwood) to 92.7% (South Westman) Two-year: 58.9% (Burntwood) to 88.9% (Churchill)
"On-reserve"/ "off-reserve":	One-year: 57.3% versus 67.3% Two-year: 41.4% versus 49.6%

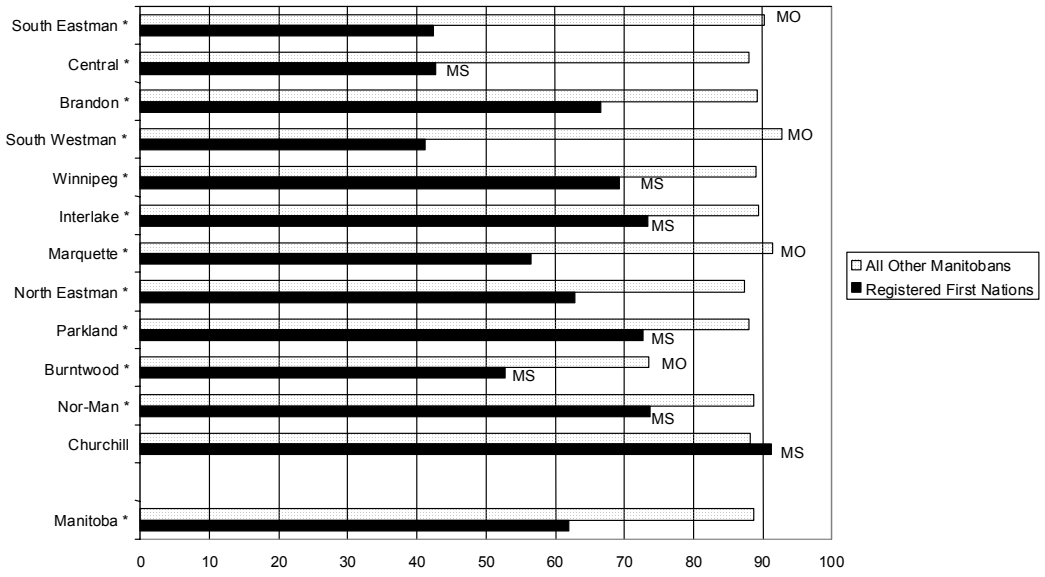
Figure 6.1: Crude 1-Year Old Immunization Rates (per cent with complete immunization schedules) by Tribal Council Children born 1994 - 1997



SOURCE: Manitoba Immunization Monitoring System

Key messages:
Immunization rates fluctuate greatly within Tribal Council area, which may reflect variations in under-reporting within the MIMS system for First Nations children living in a First Nations community setting. However, this may also indicate real deficits, where less than half of the two-year olds have a complete set of immunization whether they are living in a First Nations community or "off-reserve" within an RHA. Churchill RHA has very high immunization rates, and no difference between Registered First Nations people and all other RHA residents. With a Health Canada target of over 95%, only 45% of Registered First Nations children and 77% of all other Manitoban children are immunized completely at age two.

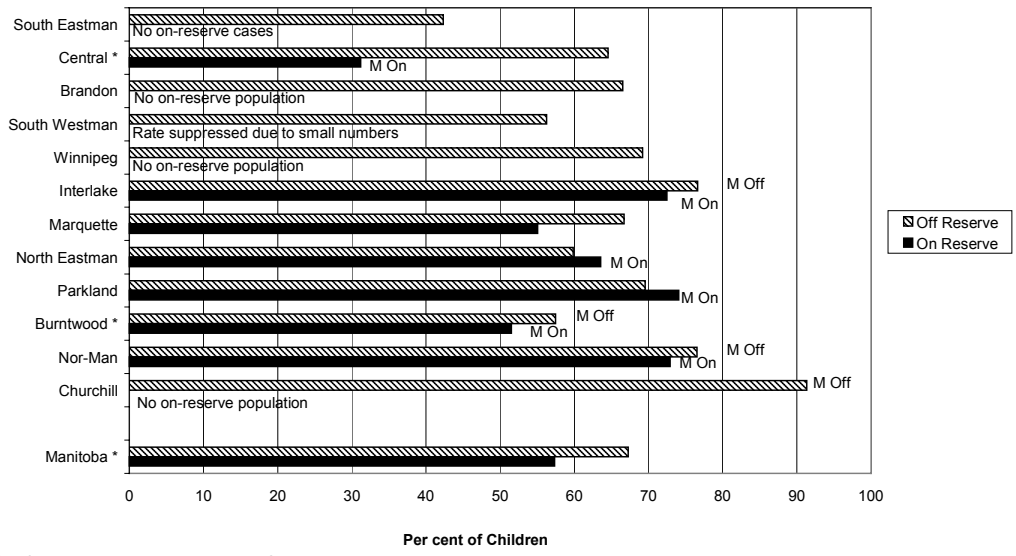
Figure 6.2: Crude 1-Year Old Immunization Rates
(per cent with complete immunization schedules)
Registered First Nations vs. All Other Manitobans by RHA
Children born 1994 - 1997



SOURCE: Manitoba Immunization Monitoring System

Statistical Notation:
MS - significantly different from MB rate for RFN
MO - significantly different from MB rate for all other Manitobans
* within RHA, RFN rate significantly different from all other MB rate

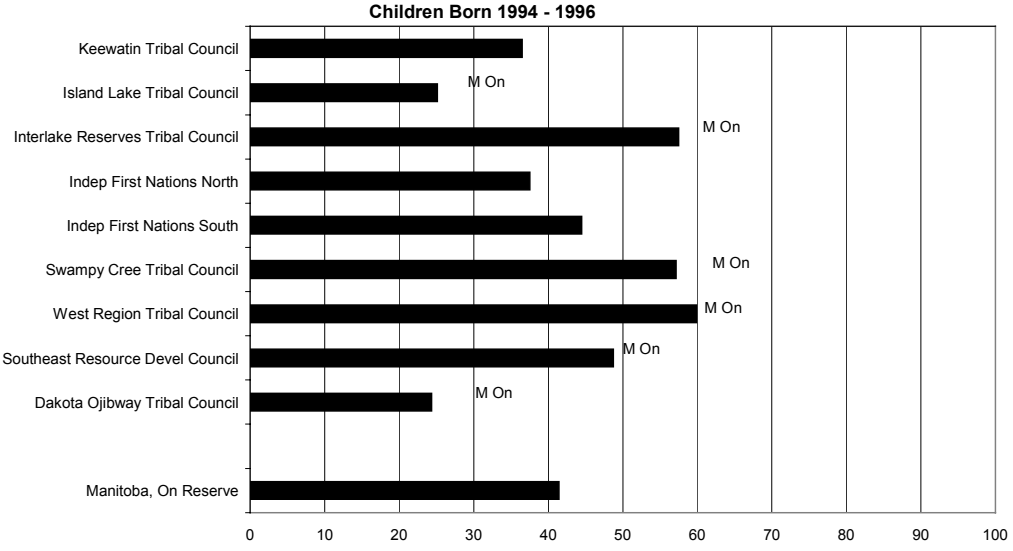
Figure 6.3: Crude 1-Year Old Immunization Rates
(per cent with complete immunization schedules)
Off Reserve vs. On Reserve Registered First Nations by RHA
Children born 1994 - 1997



SOURCE: Manitoba Immunization Monitoring System

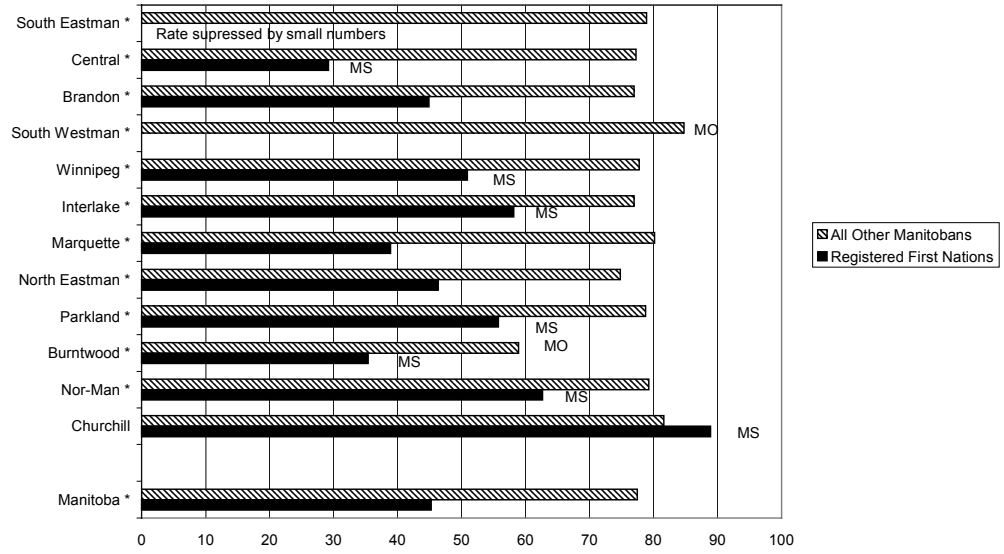
Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

Figure 6.4: Crude 2-Year Old Immunization Rates (per cent with complete immunization schedules) by Tribal Council Children Born 1994 - 1996



SOURCE: Manitoba Immunization Monitoring System

Figure 6.5: Crude 2-Year Old Immunization Rates
(per cent with complete immunization schedules)
Registered First Nations vs. All Other Manitobans by RHA
Children Born 1994 - 1996

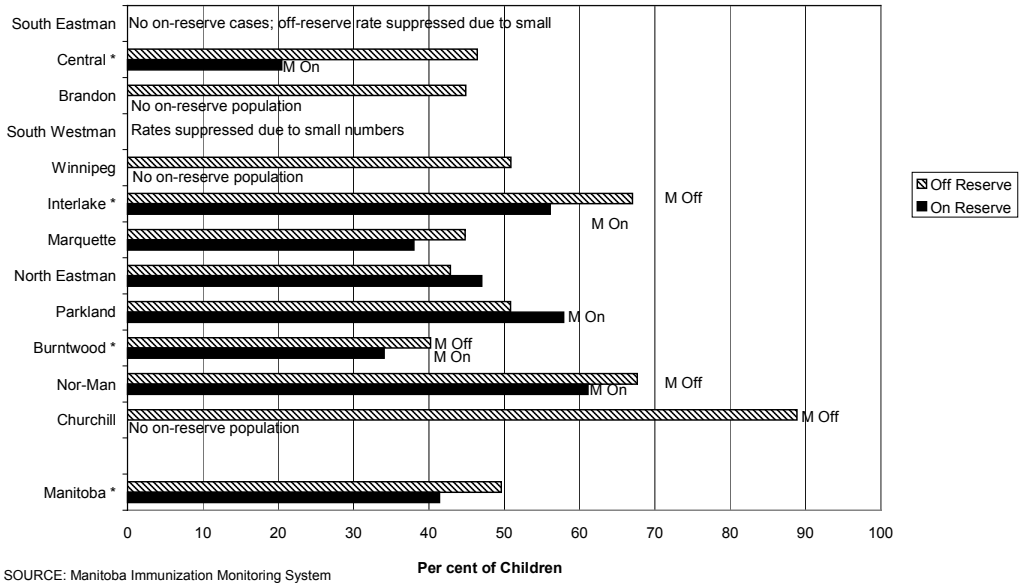


SOURCE: Manitoba Immunization Monitoring System

Per cent of Children

Statistical Notation:
MS - significantly different from MB rate for RFN
MO - significantly different from MB rate for all other Manitobans
* within RHA, RFN rate significantly different from all other MB rate

Figure 6.6: Crude 2-Year Old Immunization Rates
(per cent with complete immunization schedules)
Off Reserve vs. On Reserve Registered First Nations by RHA
Children Born 1994 - 1996



SOURCE: Manitoba Immunization Monitoring System

Per cent of Children

Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

6.6 Screening Mammography

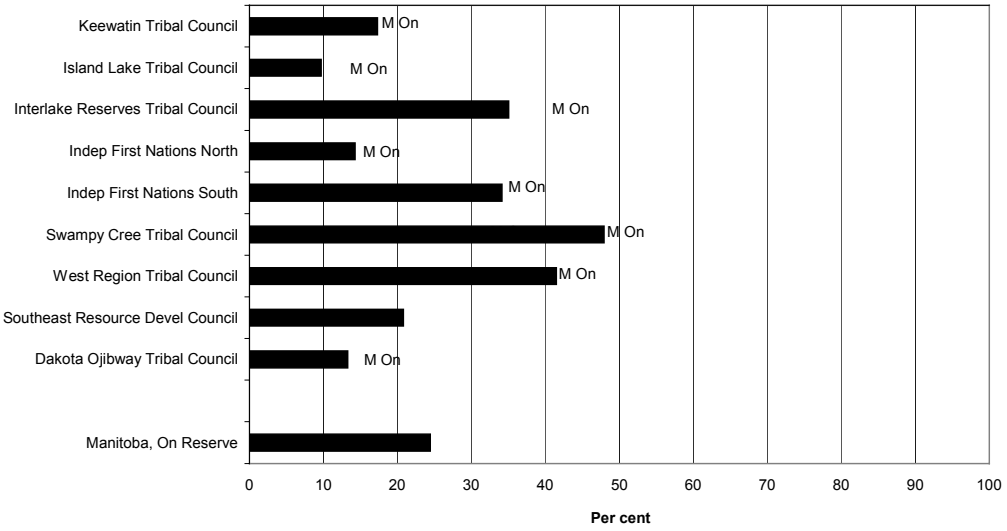
Definition: This is the number of women ages 50 through 69 who had at least one mammogram in the two-year fiscal period of 1997/98 through 1998/99, compared to the number of women ages 50 through 69 in that region and expressed as a percent. Mammography is a procedure used for breast cancer screening, with the Manitoba Breast Screening Program recommending screening every two years for women ages 50 through 69 years.

How to read the graphs: Figure 6.7 shows the mammography rate for "on-reserve" Registered First Nations women living in the Tribal Council areas. Knowing that the Manitoba Breast Screening Program would like to achieve 70% screening rates, the Tribal Council rates fall far short, as low as 9.7% in ILTC, 13.3% in DOTC, and 14.3% in Independent FN North, and a maximum of 47.9% in SCTC. When Registered First Nations women are compared to all other Manitoban women (see Figure 6.8), the gap of coverage is wide provincially, with less than half the rate seen for First Nations women compared to all other women (25.8% versus 55.9%). In Figure 6.9, "on-reserve" women have a slightly lower mammography rate than "off-reserve" women (24.4% versus 28.5%), although both fall well below the goal for screening programs.

Range of screening mammography rates:

Tribal Council:	9.7/13.3/14.3% (ILTC/DOTC/Indep FN North) to 41.5/47.9% (WRTC/SCTC)
RHA Registered First Nations:	15.3/15.7/18.2% (Burntwood/Central/Brandon) to 46.5%(Nor-Man)
RHA all other Manitobans:	47.4/51.0/53.6% (Burntwood/Central/Winnipeg) to 64.3/64.5/68.3% (Parkland/Nor-Man/Brandon)
"On-reserve"/ "off-reserve":	24.4% versus 28.5%

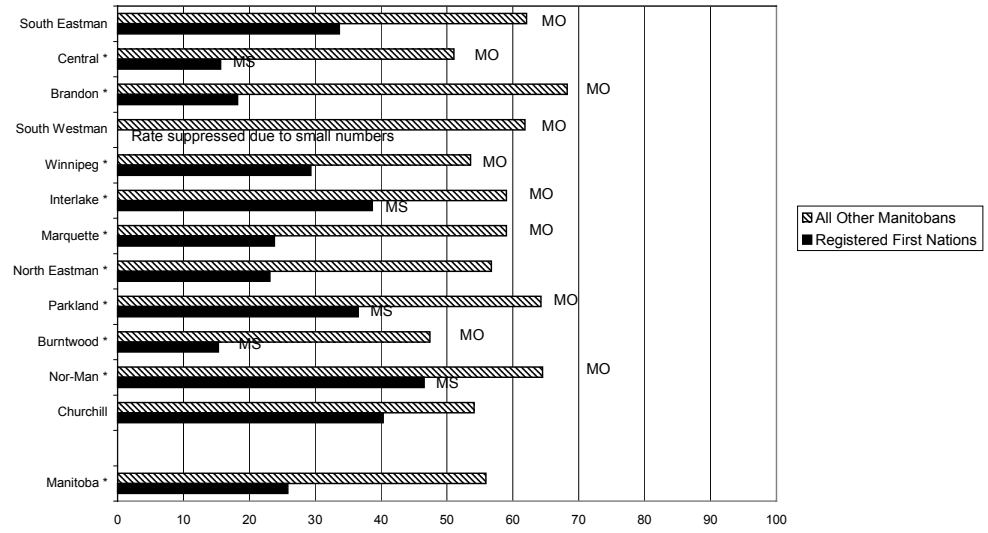
Figure 6.7: Direct Adjusted Mammography Rate (women ages 50-69 receiving at least one mammogram) by Tribal Council 1997/98 - 1998/99



SOURCE: Manitoba Breast Cancer Screening Program, CancerCare Manitoba

***Key messages**:*
Although mammography rates for all Manitoban women fall short of the goals of the screening program, the rates for Registered First Nations women are an area of even greater concern at screening rates less than half the rate of all other women (26% versus 56%). Those RFN women living "off-reserve" show slightly higher rates provincially compared to those "on-reserve," but these rates are still low (29% versus 24%). Screening rates vary substantially, from 9.7% (ILTC) to 47.9% (SCTC) by Tribal Council area, from 15.3% (Burntwood) to 46.5% (Nor-Man) for RFN women by RHA, and from 47.4% (Burntwood) to 68.3% (Brandon) for all other women.

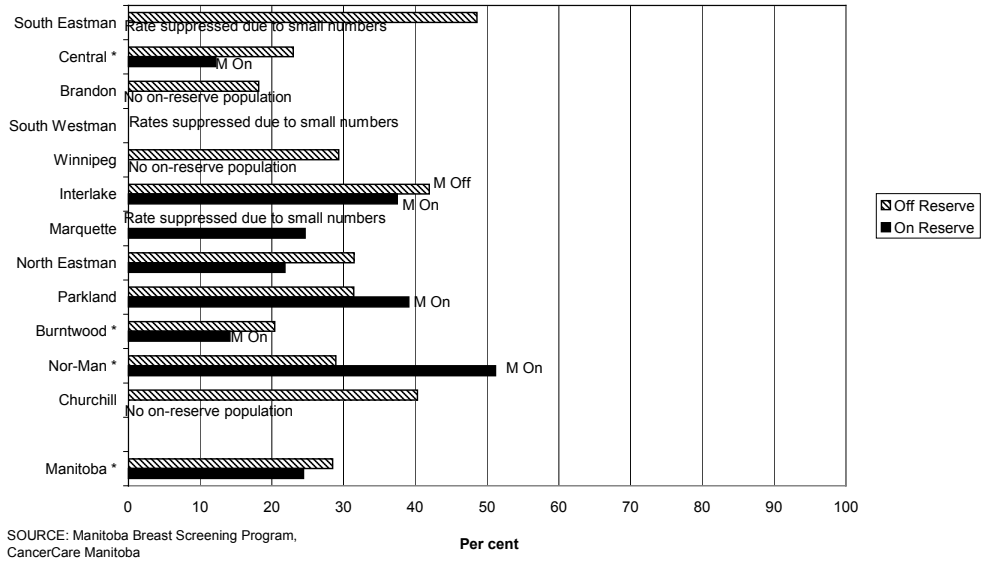
Figure 6.8: Direct Adjusted Mammography Rate
(women ages 50-69 years receiving at least one mammogram)
Registered First Nations vs. All Other Manitobans by RHA
1997 - 1998



Source: Manitoba Breast Cancer Screening Program
CancerCare Manitoba

Statistical Notation:
MS - significantly different from MB rate for RFN
MO - significantly different from MB rate for all other Manitobans
* within RHA, RFN rate significantly different from all other MB rate

Figure 6.9: Direct Adjusted Mammography Rate
(women ages 50-69 years receiving at least one mammogram)
Off Reserve vs. On Reserve Registered First Nations by RHA
1997/98 - 1998/99



SOURCE: Manitoba Breast Screening Program,
CancerCare Manitoba

Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

6.7 Breastfeeding Initiation Rate

Definition: This is the number of live born babies who were exclusively or partially breastfed at hospital discharge (i.e., who "initiated" breastfeeding in hospital), compared to the number of live born babies in that region during the year, expressed as a percent.

How to read the graphs: Figure 6.10 shows the breastfeeding initiation rate for newborns at hospital discharge and living "on-reserve" within a Tribal Council area. Overall, just over half (54.3%) of these newborns were breastfed, with rates in general being higher in the northern areas and lower in the southern areas. Generally within the Tribal Councils as well as the RHAs, as the health status of the population becomes poorer, so do the breastfeeding rates (that is, as you go down the graph, breastfeeding rates decrease). Figures 6.11 and 6.12 show the comparison of Registered First Nations newborn breastfeeding rates to those of all other Manitobans living in the RHA (provincially, 57.1% versus 80.5%). In both groups, breastfeeding rates decrease as the health status of the RHA population also decreases, with the exception of Churchill. The "on-reserve" (54.3%) and "off-reserve" (60.5%) breastfeeding rates, shown in Figures 6.13 and 6.14, are similar overall, but show dissimilar patterns. "Off-reserve" rates show declining rates from southern RHAs to northern RHAs (with the exception of Churchill), following a similar pattern to all other Manitobans. No statistical testing was done for these rates.

Note that some of the bars have a category of "unknown", where the information was missing from the hospital discharge file. So the percentage of "any breastfeeding" may appear lower than if you just took the known records. For example, calculating breastfeeding initiation rates only on the known data, that is, taking the percentage of breastfed babies divided by the percentage of "any breastfeeding" added to "no breastfeeding," WRTC has an initiation rate of 39.6%. Tables 6.1 and 6.2 show the percent of breastfed newborns using only known data (excluding the "unknown" category from the calculation).

Table 6.1. Breastfeeding initiation rates of newborns (at hospital discharge), 1994 through 1998, if "unknown" records are excluded from the calculation, by RHA

RHA	All RFN living in the RHA	RFN on-reserve only	RFN off-reserve only	all other Manitobans living in the RHA
South Eastman	80.00	suppressed	80.00	87.26
Central	58.03	54.59	64.75	87.24
Brandon	68.01		68.01	79.17
South Westman	68.18	61.11	73.08	83.70
Winnipeg	60.25		60.25	82.18
Interlake	59.01	57.93	62.50	82.57
Marquette	60.44	59.67	66.67	84.38
North Eastman	43.53	42.23	49.66	79.77
Parkland	45.77	41.91	54.27	75.18
Burntwood	61.09	60.13	64.60	70.76
Nor-Man	52.46	52.81	51.28	73.93
Churchill	80.65		80.65	89.61
Manitoba	**57.89**	**55.20**	**61.09**	**82.21**

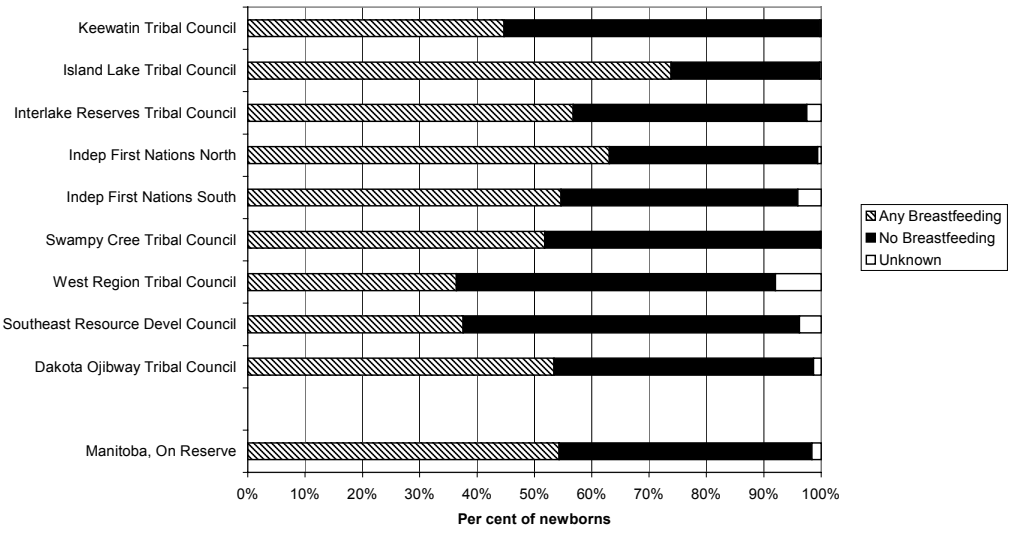
Table 6.2. Breastfeeding initiation rates of newborns (at hospital discharge), 1994 through 1998, if "unknown" records are excluded from the calculation, by Tribal Council area (includes only "on-reserve" Registered First Nations people)

Tribal Council Area	Percentage of newborns initiating breastfeeding
Keewatin Tribal Council	44.78
Island Lake Tribal Council	74.02
Interlake Reserves Tribal Council	58.20
Indep First Nations North	63.45
Indep First Nations South	56.90
Swampy Cree Tribal Council	51.85
West Region Tribal Council	39.51
Southeast Resource Devel Council	39.05
Dakota Ojibway Tribal Council	54.12
Manitoba, On Reserve	**55.20**

Range of breastfeeding initiation rates:

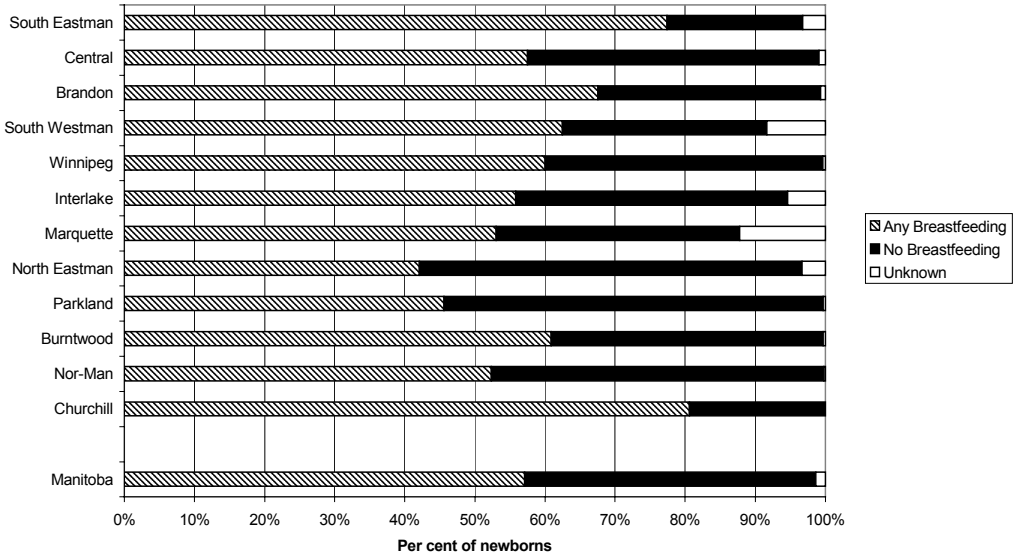
Tribal Council:	36.4%/37.6% (WRTC/SERDC) to 73.8% (ILTC)
RHA Registered First Nations:	42.1%/45.6% (North Eastman/Parkland) to 77.4%/80.6% (South Eastman/Churchill)
RHA all other Manitobans:	70.3% (Burntwood – note that Interlake has 17% missing data) to 86.5%/86.8%/87.3% (Central/South Eastman/Churchill)
"On-reserve"/ "off-reserve":	54.3% versus 60.5%

Figure 6.10: Breastfeeding Initiation Rates of newborns (at hospital discharge) by Tribal Council 1994-98



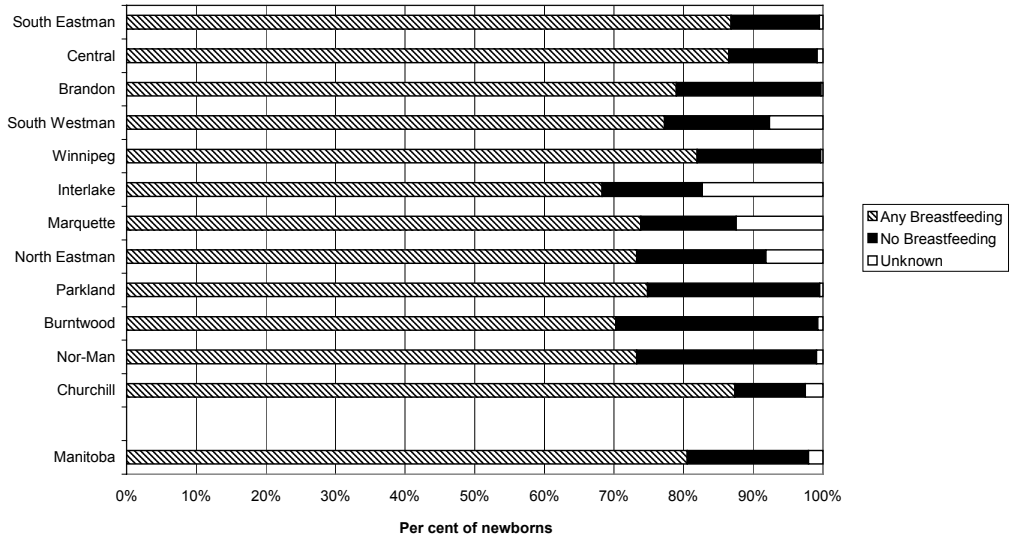
Statistical Notation:
There is no statistical testing shown for the Breastfeeding Initiation Rates

Figure 6.11: Breastfeeding Initiation Rates of newborns (at hospital discharge)
Registered First Nations by RHA
1994-98



Key messages:
Knowing that breastfeeding is associated with decreased respiratory infection and gastrointestinal infection, low breast-feeding rates for Registered First Nations newborns is a concern. Breastfeeding initiation rates for RFN newborns are around two-thirds that of all other newborns (57.1% versus 80.5%). In general, breastfeeding rates of RFN newborns also decrease as the health status of the geo-graphical area population decreases, with rates below 50% in three Tribal Councils (KTC, WRTC, and SERDC) and in two RHAs (North Eastman and Parkland).

Figure 6.12: Breastfeeding Initiation Rates of newborns (at hospital discharge)
All other Manitobans by RHA
1994-98



Statistical Notation:
There is no statistical testing shown for the Breastfeeding Initiation Rates

**Figure 6.13: Breastfeeding Initiation Rates of newborns (at hospital discharge)
On-Reserve Registered First Nations by RHA
1994-98**

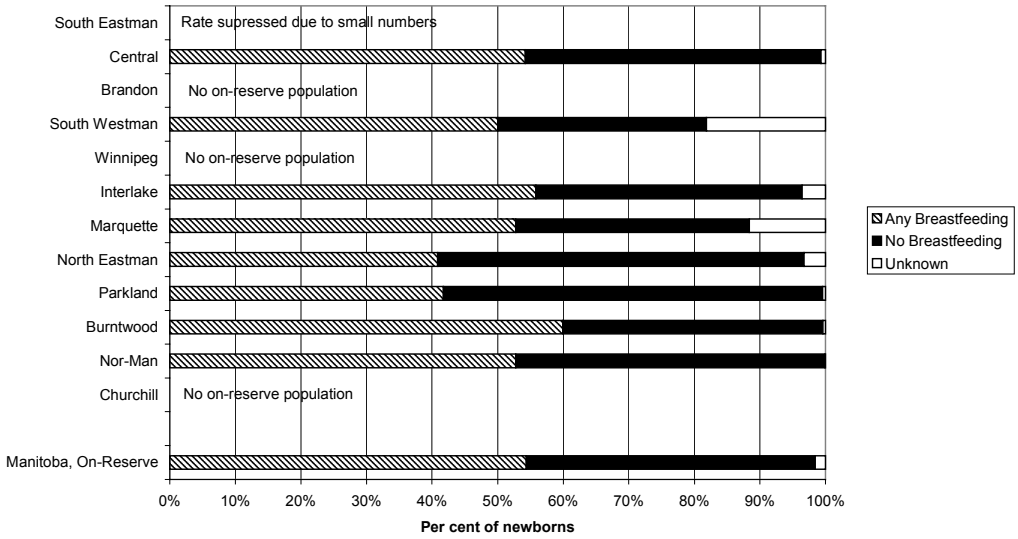
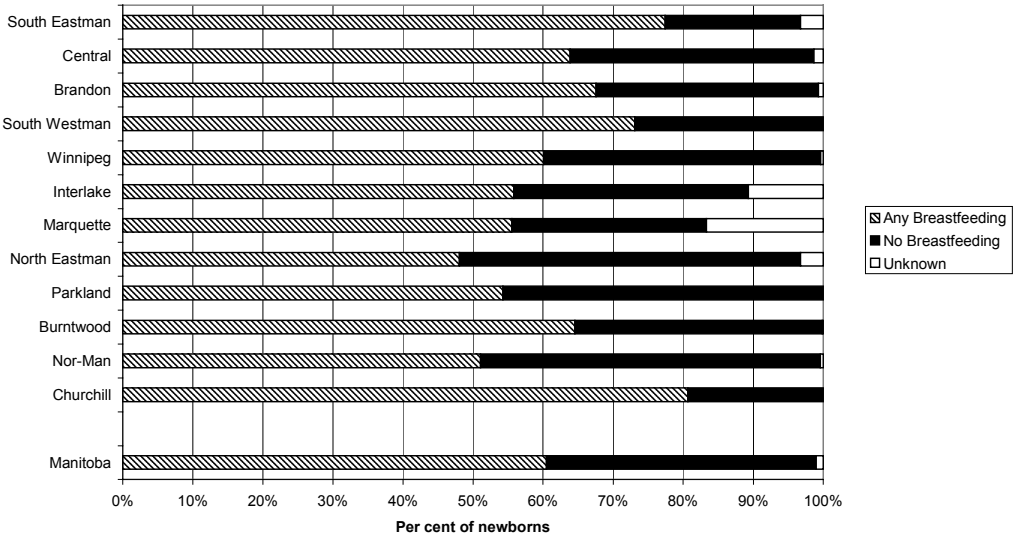


**Figure 6.14: Breastfeeding Initiation Rates of newborns (at hospital discharge)
Off-Reserve Registered First Nations by RHA
1994-98**



Statistical Notation:
There is no statistical testing shown for the Breastfeeding Initiation Rates

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CHAPTER 7. USE OF PHYSICIAN SERVICES

7.1 What's in this chapter?

This chapter contains information as to how people use "ambulatory" (walk-in) services, with the following specific indicators:

- the ambulatory visit rate of the area's population
- the ambulatory consult rate of the area's population
- the ambulatory specialist contact rate of the area's population
- the type of ambulatory visit provider (% by general practitioner or by specialist)
- the location of ambulatory visits to general practitioners or family practitioners (GP/FPs)
- the location of ambulatory visits to specialists

7.2 Definitions used for ambulatory visit rates, types of physicians, and locations of visits

What is an ambulatory visit? An ambulatory, or "walk-in" visit is any contact with a physician that occurs while the client is not a hospital in-patient. Physician visits to people in physician offices, personal care homes, emergency rooms of hospitals (although these are not all reported in the claims data), and outpatient departments are all included within ambulatory visits.

Consult visits occur when a client is referred by one physician to another physician because of the complexity, obscurity, or seriousness of a patient's illness, or because of a request for a second opinion. After the consult, the patient is usually returned to the care of the referring physician. Consultations are usually provided by specialist physicians, but may occasionally be provided by GP/FPs. Non-consultative care refers to all other ambulatory visits, including subsequent visits while a patient's condition is monitored. This could be provided by both general and specialist physicians.

Physicians are classified into seven categories of practice: general practice (including family physicians), plus six categories of specialists: psychiatry, paediatrics, obstetrics and gynaecology, medical specialists (including general internists), general surgeons, and surgical specialists. Most physicians in the province are paid through fee-for-service. In order to receive payment for their services, they record the reason (diagnosis) for the visit. There are some physicians, especially in northern remote areas, who are paid a salary. Many of these physicians still "shadow bill" the government, that is, they fill out an evaluation claim so that the diagnosis code is still recorded for the visit. However, we realize that these evaluation claims are not as complete as the fee-for-service billings, since there is little incentive for the physician to complete the forms. As well, many northern and remote communities have access to nurse practitioner services for basic illness care. Nurses in these situations

do not record their services through the fee-for-service billing system, so these types of visits are not represented in our report.

Locations of visits were grouped as "within the RHA in which a person resides," "outside the RHA," "in Winnipeg," or "out-of-province." Generally, where a person lived at the first visit of a year was considered this person's residence throughout the year. Although we are able to track visits to neighbouring provinces/states, we do not have information as to whether these are specialist or GP/FP visits. Thus all visits out-of-province have been included as GP/FP visits.

7.3 Key findings

Ambulatory Visits

- In 1998, 78.2% of Registered First Nations people, and 83.1% of all other Manitobans, made at least one ambulatory visit to a physician for an overall of 82.7% of the Manitoban population.
- Overall rates of physician contacts vary by supply of physicians (with Winnipeg and Brandon rates being higher). In most areas of the province, physicians provide services to Registered First Nations people at a higher rate, corresponding with their poorer health status. Provincially, RFN have 6.1 visits per person per year, and all other Manitobans have 4.9 visits per person per year. In Winnipeg (8.3 RFN, 5.2 all others) and Brandon (7.5 RFN, 4.8 all others), RFN have 1.6 times the visit rate compared with all other residents. In the northern RHAs of Burntwood and Nor-Man, RFN visits are probably underestimated due to under-recorded claims data for services provided by salaried physicians as well as lack of reporting by nurse practitioners.
- Ambulatory consult rates are only slightly higher for RFN compared to all other Manitobans (0.29 consults per person per year versus 0.27). The Tribal Council having the population with the poorest overall health status (DOTC) has the lowest consult rate (0.21) of all Tribal Council areas. Higher consult rates for RFN compared to all other Manitobans are seen in some RHAs, although these differences are sometimes small (Central, Winnipeg, Interlake, North Eastman, Parkland, Burntwood, and Nor-Man). One noteable exception is Churchill, where the consult rates are the highest in the province (0.50 RFN, 0.35 all others).
- The overall rate of contact with specialist physicians is largely driven by where one lives in the province, with residents of Winnipeg (both RFN and all others) having the highest rates. This could be due to the fact that Winnipeg residents tend to visit specialists (especially paediatricians and general internists) on an ongoing basis, rather than for consults, to a far larger extent than non-Winnipeggers. Given their poor health status, one would expect RFN individuals to receive more overall specialist contacts than other Manitobans, and this is the case in several RHAs (South Westman, Marquette, Parkland, Burntwood, Nor-Man and Churchill). In other RHAs, rates are statistically similar (South Eastman, Central, Brandon) or lower (Winnipeg, Interlake) for RFN compared with other RHA residents. Specialist physician contact rates

(visits per person per year) in the two urban locations where 90% of specialists practice are: 1.60 RFN versus 1.71 all others in Winnipeg; 0.82 RFN versus 0.98 all others in Brandon.

- The percentage of ambulatory visits that involve specialists is lower, in general, for Registered First Nations people than for all other Manitobans (16.1% RFN versus 26.3% all other Manitobans). Winnipeg RHA uses specialists proportionally more than any other RHA in the province. But even in Winnipeg, RFN use of specialists is about 2/3 the proportion compared with all other Winnipeg residents (21.7% versus 32.2%).

Location of ambulatory visits

- Overall, the majority of general practitioner/family practitioner (GP/FP) visits occur within a person's RHA, both for RFN (84%) and for all other Manitobans (91%). Noteable exceptions are the RHAs in close proximity to Brandon (i.e., South Westman and Marquette) and Winnipeg (i.e., South Eastman, Interlake, North Eastman), where the main urban centre is often used for GP/FP visits.
- Most specialist visits occur either in Winnipeg or Brandon. In RHAs outside the two urban centres, few occur within the RHA. There are four noteable exceptions. For RFN living in Central and Churchill RHAs, over one-third of their specialist visits occur within their RHAs – Central at 34.6%, and Churchill at 35.9%. For other Manitobans, those living in Parkland and Churchill RHAs have at least one-third of their specialist visits occur within their RHA – Parkland at 33.7% and Churchill at 42.8%.

7.4 Canadian Comparisons

- In 1987/88, First Nations community clinic attenders in Saskatoon were 1.14 times more likely than non-First Nations clinic attenders to report having had a physical examination within the last year (57% vs. 50%). Non-First Nations attenders were more likely to report having gone more than three years without a physical. Whereas 20.2% of non-First Nations reported having their last physical examination over three years ago, only 9.9% of First Nations made the same report (Waldram, 1990). *In our report, the Manitoba average ambulatory visit rate was 1.2 times higher for Registered First Nations people compared to all other Manitobans (6.1 versus 4.9 visits per person per year). However, this does not take into account underestimated visits in northern and remote communities, especially for RFN, due to missing claims data of salaried physicians as well as no claims data from nurse practitioners. In the two urban areas of Winnipeg and Brandon, visit rates for Registered First Nations people are 1.6 times the rates of the other RHA residents, reflecting the comparatively poorer health status.*

- Aboriginals in the Yukon and Northwest Territories in 1994/95 were less likely than non-Aboriginals to report having seen a physician in the last year (36% vs. 60%). However, Aboriginals in the Territories were more likely to have consulted a nurse in the last year than their non-Aboriginal counterparts (41% vs. 18%) (Diverty & Perez, 1998). Similarly, in 1991, 67% of First Nations in Canada reported having seen a physician in the last year, compared with 82% of Canadians in general. On-Reserve and Inuit First Nations reported lower use of

physicians and health professionals than First Nations living in urban or rural settings (Newbold, 1997). *In our report, "off-reserve" Registered First Nations people were 1.4 times more likely to visit physicians than "on-reserve," at 7.4 versus 5.2 visits per person per year. This, however, may be biased towards an underestimation of "on-reserve" rates in northern and remote communities, due to missing claims data of salaried physicians as well as no claims data from nurse practitioners.*

- Physician consultation rates for an Innu community in Labrador were equal to or lower than a nearby Caucasian community among younger residents in 1986. Among older residents, however, this trend reversed, with the Innu community having higher physician consultation rates for females age 35 and up, and males age 45 and up. Innu males age 25-34 also had higher physician consultation rates than males in the Caucasian community (Neuwelt et al., 1992). *In our report, Registered First Nations people were slightly more likely to have a consult visit compared with all other Manitobans (0.29 versus 0.27 consult visits per person per year). In most RHAs (Central, Winnipeg, Interlake, North Eastman, Parkland, Burntwood, Nor-Man, and Churchill), the consult rate of Registered First Nations people was somewhat higher than that of all other RHA residents. Most noteable was the RHA of Churchill, having the highest consult rates in the province. Churchill's RFN rates were 1.7 times higher than the provincial RFN rate (0.50 versus 0.29 visits per person), and 1.4 times that of all other Churchill residents (0.50 versus 0.35 visits per person).*

- According to the 1998 Manitoba First Nations Regional Health Survey, 18% of First Nations in Manitoba reported needing care but not receiving it in 1997. However, 63% of First Nations Manitobans go for a regular checkup once a year. *In our report for the year 1998/99, 78.2% of Registered First Nations people, and 83.1% of all other Manitobans, made at least one ambulatory visit to a physician for an overall of 82.7% of the Manitoban population. When these percentages were adjusted for age and sex to make a fair comparison, 81.5% of RFN and 83.0% of all other Manitobans made at least one ambulatory visit to a physician in 1998/99.*

7.5 Ambulatory Visit Rate

Definition: This is the total number of ambulatory visits divided by the number of persons in a region, for the fiscal year 1998/99. An ambulatory, or "walk-in", visit is any contact with a physician that occurs while the client is not an in-patient of a hospital. Physician visits (both general practitioner/family practitioner, and specialist) to people in a clinic, personal care home, or as an out-patient, as well as most visits occurring in emergency rooms, are included. No matter where the visit occurs, the visit is credited back to the client's area of residence. Contacts with fee-for-service physicians are reimbursed through the Manitoba Health billing system. However, salaried physician or nurse practitioner visits may not be included if the health care provider is not reimbursed on a fee-for-service basis (though some salaried physicians submit evaluation claims with diagnoses for the visit). *This may result particularly in an under-estimate for rural/remote areas receiving health care from salaried physicians and nurse practitioners.*

How to read the graphs: Figures 7.1 to 7.3 show the ambulatory visit rates, that is, the sum of all visits to general practitioners/family practitioners, consult visits (see Section 7.6), and specialist visits. The "on-reserve" First Nations rate was 5.2 visits per person per year, and the "off-reserve" rate was 7.4, for an average RFN rate of 6.1 visits per person per year. These rates were higher than the ambulatory visit rate for all other Manitobans, at 4.9 visits per person per year, and reflect a needs-based system addressing the poorer health status of RFN. In Figure 7.2, a statistical difference between RFN and all others living in the RHA is indicated by the asterisk (*). All RHAs except South Eastman show statistically higher visit rates for RFN compared to all other RHA residents. In Winnipeg (8.3 versus 5.2 visits per person per year) and Brandon (7.5 versus 4.8 visits per person per year), the visit rate is 1.6 times greater for RFN compared to other RHA residents.

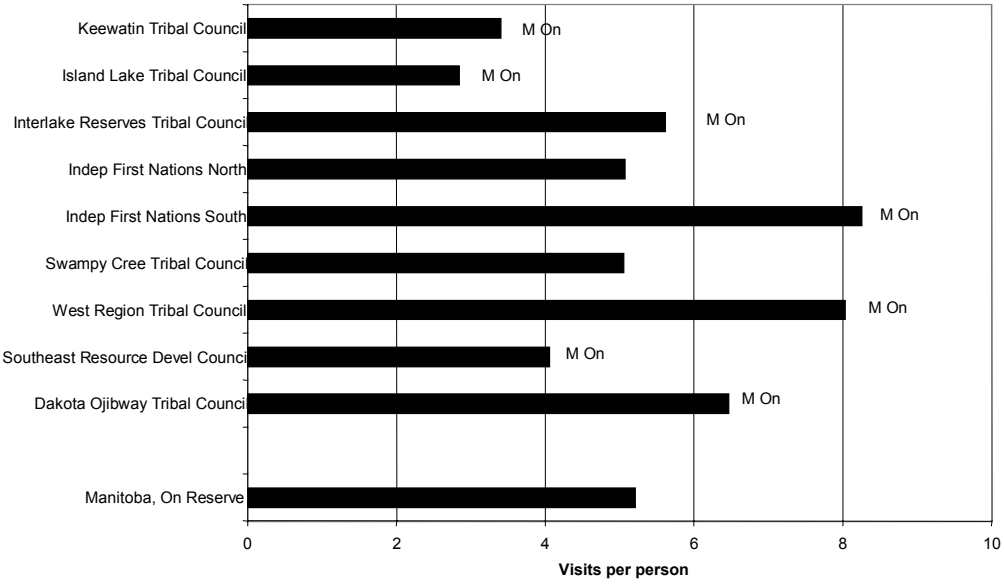
One would expect the visit rates to be undercounted for Registered First Nations people in northern and remote communities, where nurse practitioners and some salaried physicians do not submit billings for patient visits. This may partially explain the lower visit rates seen in Burntwood and Nor-Man, and in northern Tribal Council areas (KTC, ILTC, SCTC). It may also explain the finding that RFN living "off-reserve" have higher visit rates (7.4) than do RFN living "on-reserve" (5.2) – it may be an artifact of the administrative claims for visits being more undercounted in First Nations communities.

Note of interest:
In 1998/99, 78.2% of Registered First Nations people, and 83.1% of all other Manitobans, made at least one ambulatory visit to a physician for an overall of 82.7% of the Manitoban population. When these percentages were adjusted for age and sex to make a fair comparison, 81.5% of RFN and 83.0% of all other Manitobans made at least one ambulatory visit to a physician in 1998/99.

Range of ambulatory visit rates (visits per person per year)*:	
Tribal Council:	2.8/3.4 (ILTC/KTC) to 8.0/8.3 (WRTC/Independent South)
RHA Registered First Nations:	3.8 (South Eastman) to 7.5/7.7/8.3 (Brandon/Parkland/Winnipeg)
RHA all other Manitobans:	3.8/4.0/4.1 (Burntwood/Central/South Westman) to 4.8/5.2 (Brandon/Winnipeg)
"On-reserve"/ "off-reserve":	5.2 versus 7.4

**note: northern and remote area rates may be under-reported due to missing physician claims and nurse practitioner care*

Figure 7.1: Direct Adjusted Ambulatory Physician Visit Rate, by Tribal Council 1998/1999



Key Messages: *In 1998, 82.7% of the Manitoban population made at least one ambulatory visit to a physician (78.2% of RFN, 83.1% of all other Manitobans). For Registered First Nations people, the overall ambulatory visit rate was 6.1 visits per person per year, compared with a visit rate of 4.9 for all other Manitobans. This corresponds with the greater need of RFN due to their poorer health status. General practitioner visit rates (the bulk of the ambulatory visits) may be undercounted in northern/remote areas due to missing claims from salaried physicians and from nurse practitioners. This may partially explain the RFN "off-reserve" rate being higher than the "on-reserve" rate, at 7.4 versus 5.2 visits per person per year.*

Figure 7.2: Direct Adjusted Ambulatory Physician Visit Rate, Registered First Nations vs. All Other Manitobans by RHA 1998/1999

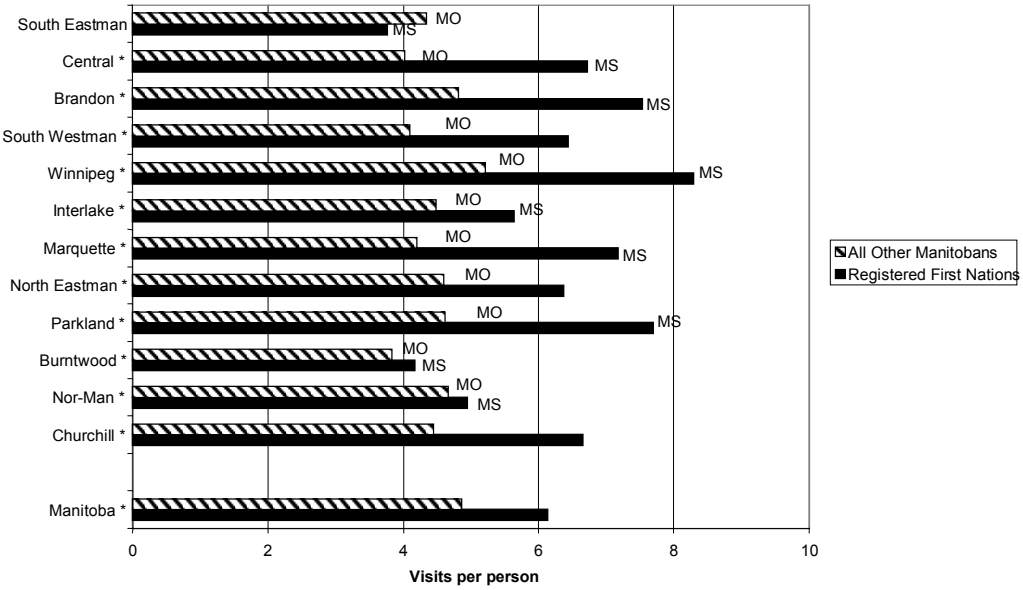
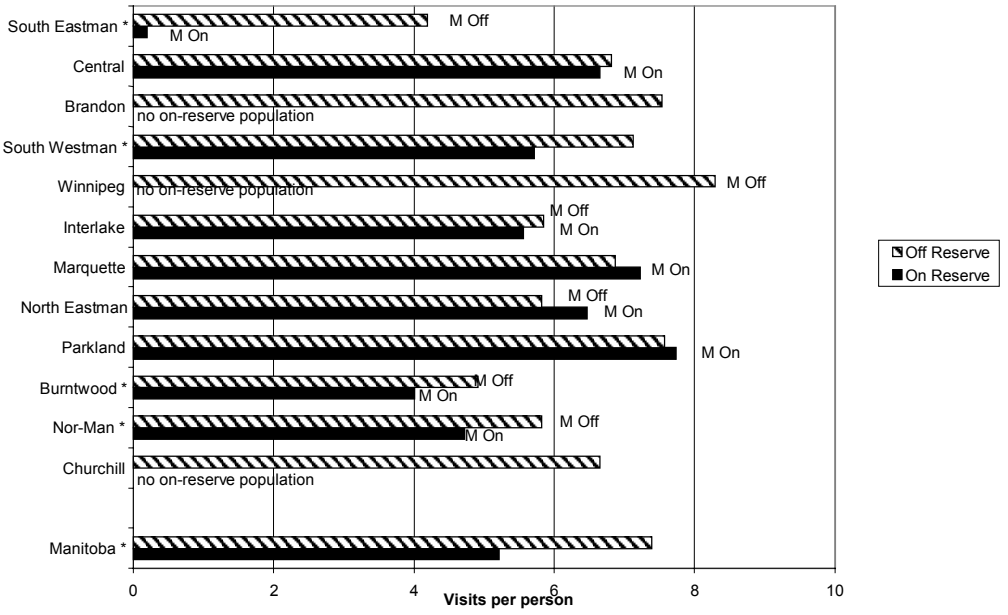


Figure 7.3: Direct Adjusted Ambulatory Physician Visit Rate, Off Reserve vs. On Reserve Registered First Nations by RHA 1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

7.6 Ambulatory Consult Rate

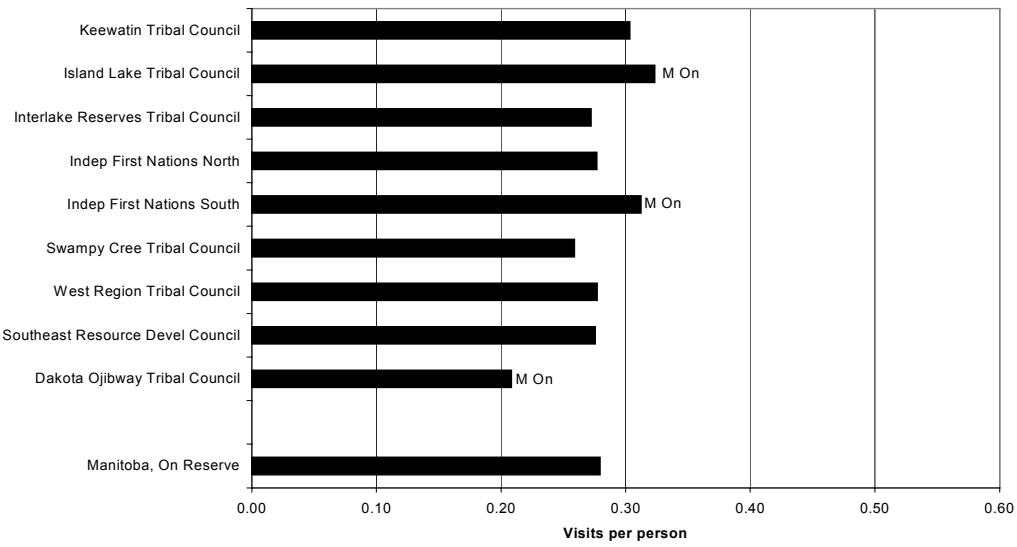
Definition: This is the total number of consult visits divided by the number of persons living in the region, for the fiscal year 1998/99. A consult visit occurs when a client is referred by one physician to another because of the complexity, obscurity, or seriousness of a patient's illness, or because of a request for a second opinion. Consultations are usually provided by specialists. Although MCHP's administrative claims data may undercount general practitioner/family practitioner rates in northern and remote areas (see Section 7.5), specialist visit claims appear to be more complete.

How to read the graphs: As shown in Figures 7.4 through 7.6, the ambulatory consult rate for Manitobans is remarkably similar, whether they be Registered First Nations people (0.29), or all other Manitobans (0.27), or RFN living "on-reserve" (0.28) and "off-reserve" (0.30) visits per person per year. This means if you took about 10 people, they would have a total of about 3 consults in the year. In the Tribal Council areas (see Figure 7.4), ILTC has a high consult rate, at 0.32 visits per person per year, and DOTC the lowest, at 0.21 visits per person per year. This is interesting, since it appears as if the area with the poorest health status also has the lowest consult visit rate. As seen in Figure 7.5, Winnipeg Registered First Nations people have only slightly higher consult rates compared with other Winnipeg resident (0.33 versus 0.30 visits per person per year), despite the poorer health status of RFN. That being said, Winnipeg rates for both groups are the second highest in the province. Churchill RHA shows the highest consult visit rates in the province, both for RFN (0.50) and all other people living in Churchill (0.35 visits per person per year), and both rates are statistically higher than corresponding provincial averages. This may reflect referral patterns of health care providers in Churchill.

Range of ambulatory consult rates (visits per person per year):

Tribal Council:	0.21 visits (DOTC) to 0.32/0.31/0.30 (ILTC/Independent South/KTC)
RHA Registered First Nations:	0.19 (Marquette) to 0.33/.50 (Winnipeg/Churchill)
RHA all other Manitobans:	0.17 (Nor-Man/Marquette/South Westman) to 0.30/0.35 (Winnipeg/Churchill)
"On-reserve"/ "off-reserve":	0.28 versus 0.30

Figure 7.4: Direct Adjusted Ambulatory Consultation Rate, per person by Tribal Council 1998/1999



Key Messages:
Overall ambulatory consult rates are similar for all Manitobans, at between 0.27 and 0.30 visits per person per year, whether they be RFN, all other Manitobans, RFN "off-reserve" or "on-reserve." However, there is a range of consult rates by Tribal Council area for "on-reserve" RFN from 0.21 to 0.32, with the Tribal Council having the poorest health status (DOTC) having the lowest consult rate. Given the poorer health status of RFN in comparison with all other Manitobans (see Chapters 4 and 5), one would expect higher consult rates for RFN. This holds true in most RHAs, but the differences are small. Once exception is Churchill RHA, where consult rates are the highest in the province for both RFN (0.50) and all others (0.35 visits per person). Winnipeg rates are only slightly higher for RFN (0.33) compared with all other residents (0.30), although these rates are the second highest in the province.

Figure 7.5: Direct Adjusted Ambulatory Consultation Rate, per person
Registered First Nations vs. All Other Manitobans by RHA
1998/1999

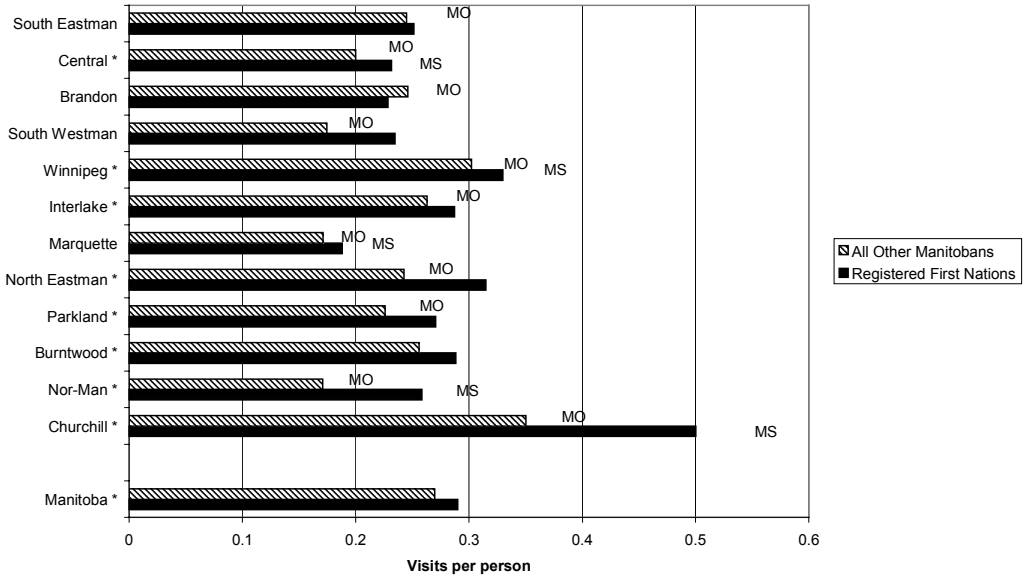
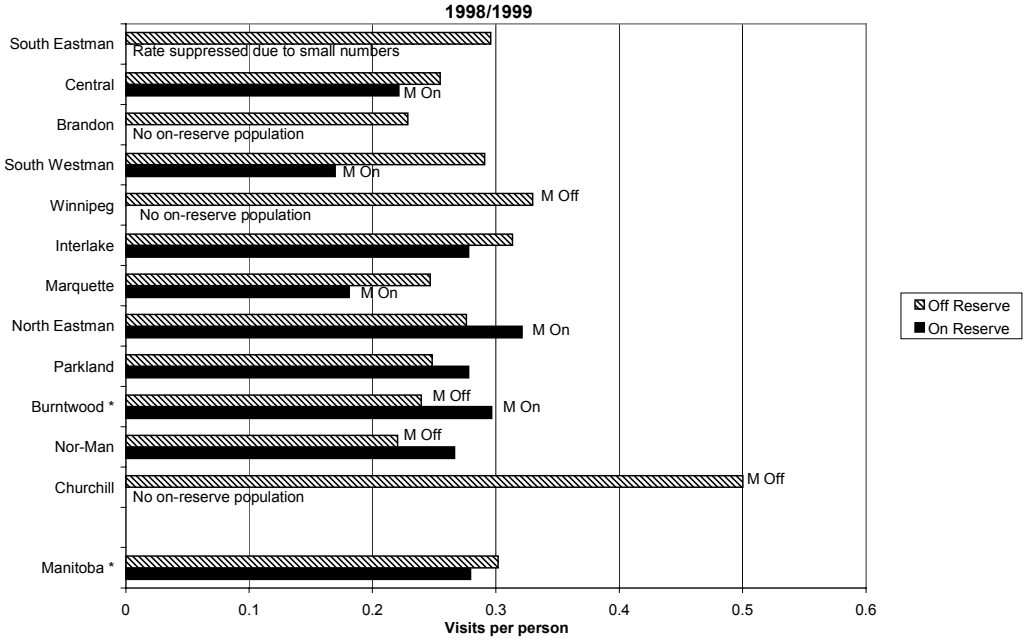


Figure 7.6: Direct Adjusted Ambulatory Consultation Rate, per person
Off Reserve vs. On Reserve Registered First Nations by RHA
1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

7.7 Ambulatory Specialist Contact Rate

Definition: This is the total number of ambulatory visits provided by *specialist* physicians, divided by the number of persons living in the region, for the fiscal year 1998/99. The rate of visits to specialists includes the use of specialists for consultation (that is, where their opinion has been sought by another physician) as well as for follow-up care. The visits can be initiated by the specialist or by the patient. Most follow-up visits to specialists are to paediatricians and internists, fields that include both generalists as well as sub-specialists[1]. Although MCHP's administrative claims data may undercount general practitioner/family practitioner rates in northern and remote areas (see Section 7.5), specialist visit claims appear to be more complete.

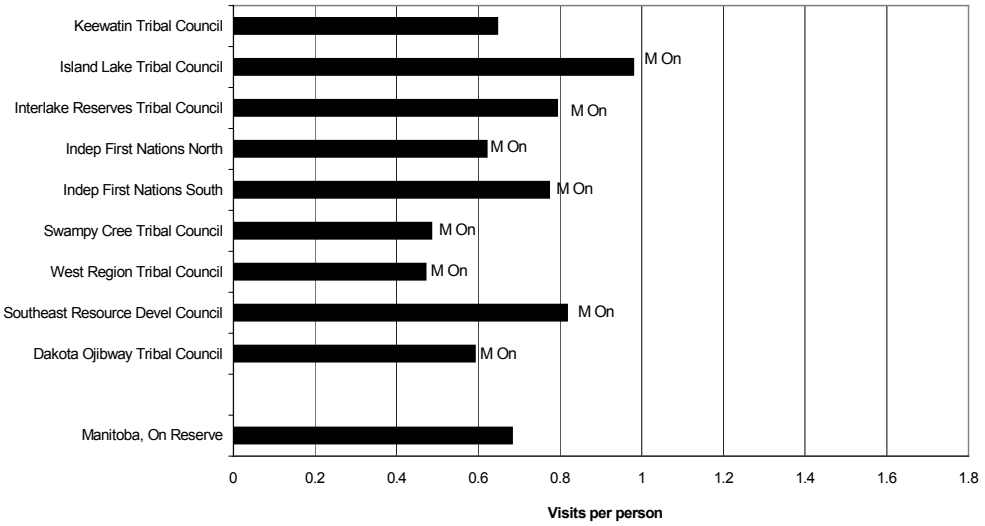
How to read the graphs: Figure 7.7 shows that in general, the Tribal Council areas that are close to Winnipeg, such as IRTC, Independent FN South, and SERDC, tend to have higher rates of contact with specialist physicians. This is expected, since 90% of specialists are located in Winnipeg and Brandon. However, members of ILTC also have one of the highest rates of contacts with specialist physicians at 0.98 visits per person per year. Provincially, RFN have considerably less contact with specialist physicians than do all other Manitobans, at 0.90 visits per person compared with 1.28 visits per person (see Figure 7.8). This is just an average over the entire population. Possibly a better description would be to say for every 10 RFN, you would expect about 9 visits to specialists in a year, whereas for 10 "all other Manitobans," you would expect between 12 and 13 visits in a year. The highest rates of contact with specialists occurs in Winnipeg, both for Registered First Nations people (1.60 visits per person) and for all other persons living in Winnipeg (1.71 visits per person). Both of these rates far exceed the corresponding rates in other RHAs. Across the province, specialist visits are not well targeted to area populations of poorer health status, showing no relationship with PMR (that is, as you go down the graph, the rates do not show a pattern of increase – see Chapter 4 for more explanation of PMR and overall health status of populations). Figure 7.9 shows that in every area but the north (Burntwood and Nor-Man RHAs), "off reserve" Registered First Nations people have higher rates of contacts with specialists than do "on reserve." At the provincial level, the "off-reserve" rate is 1.7 times the "on-reserve" rate (1.18 versus 0.68 visits per person), with the "off-reserve" rate being highly driven by the Winnipeg "off-reserve" RFN visit rate.

[1] Services provided by sub-specialist paediatricians are known to be under-represented in the claims database. However most of these specialists are hospital-based, so we believe that relatively few ambulatory visits are missed because of this limitation (Frohlich et al., 2001)

Range of ambulatory specialist contact rates (visits per person per year):

Tribal Council:	0.47/0.49 (WRTC/SCTC) to 0.77/0.79/0.82/0.98 (Independent South/IRTC/SERDC/ILTC)
RHA Registered First Nations:	0.47/0.48 (Parkland/Nor-Man) to 1.60 (Winnipeg)
RHA all other Manitobans:	0.30 (Nor-Man) to 1.71 (Winnipeg)
"On-reserve"/ "off-reserve":	0.68 versus 1.18

Figure 7.7: Direct Adjusted Ambulatory Visit Rate to Specialists, per person by Tribal Council 1998/1999



Key Messages: *The rate of contact with specialist physicians is largely driven by where one lives in the province. Residents of Winnipeg, both RFN and all others, have much higher rates of contacts than do Manitobans who live elsewhere. Given their poor health status, one would expect RFN to receive more specialist contacts than other Manitobans. In several RHAs, (South Westman, Marquette, Parkland, Burntwood, Nor-Man) RFN specialist contact rates are significantly higher than those of other residents. In other RHAs, including Winnipeg and Brandon where the majority of specialists practice, RFN have fewer or similar contacts with specialists than do other residents. Provincially, RFN living "off-reserve" tend to have higher specialist visit rates than do "on-reserve" RFN, except in the two northern RHAs of Burntwood and Nor-Man.*

Figure 7.8: Direct Adjusted Ambulatory Visit Rate to Specialists, per person Registered First Nations vs. All Other Manitobans by RHA 1998/1999

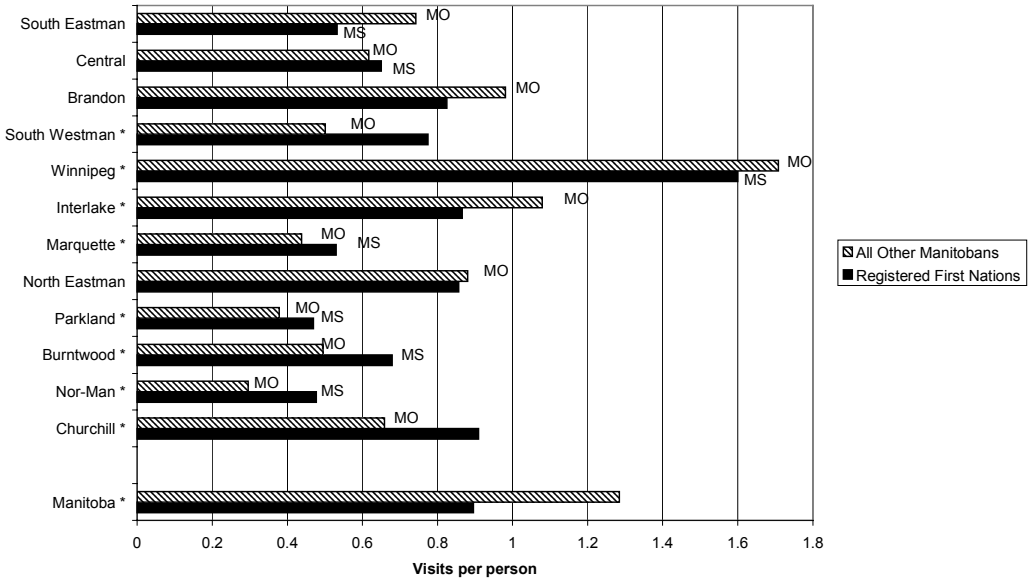
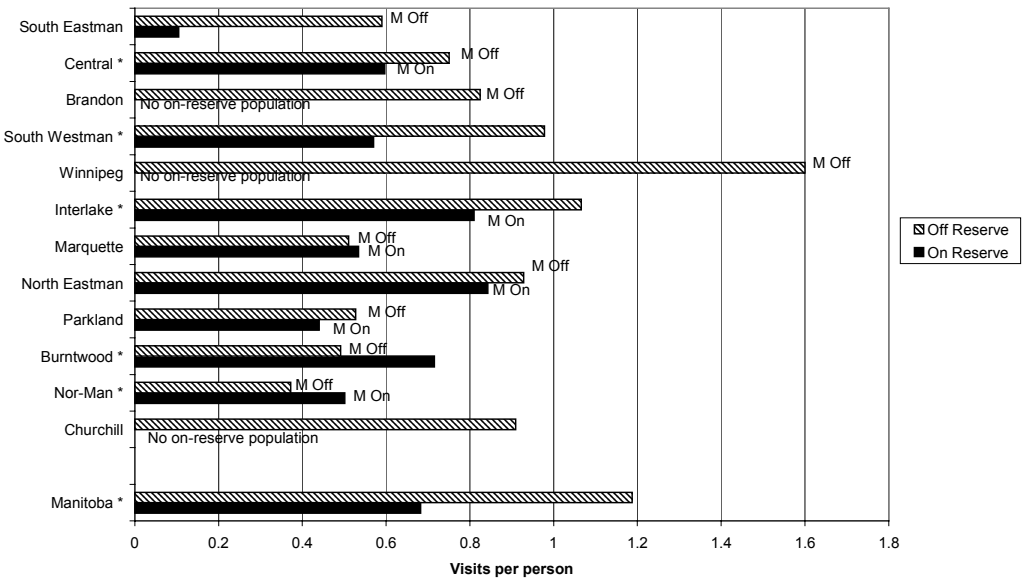


Figure 7.9: Direct Adjusted Ambulatory Visit Rate to Specialists, per person Off Reserve vs. On Reserve Registered First Nations by RHA 1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

7.8 Ambulatory Visit Providers (% by GP/FP or Specialist)

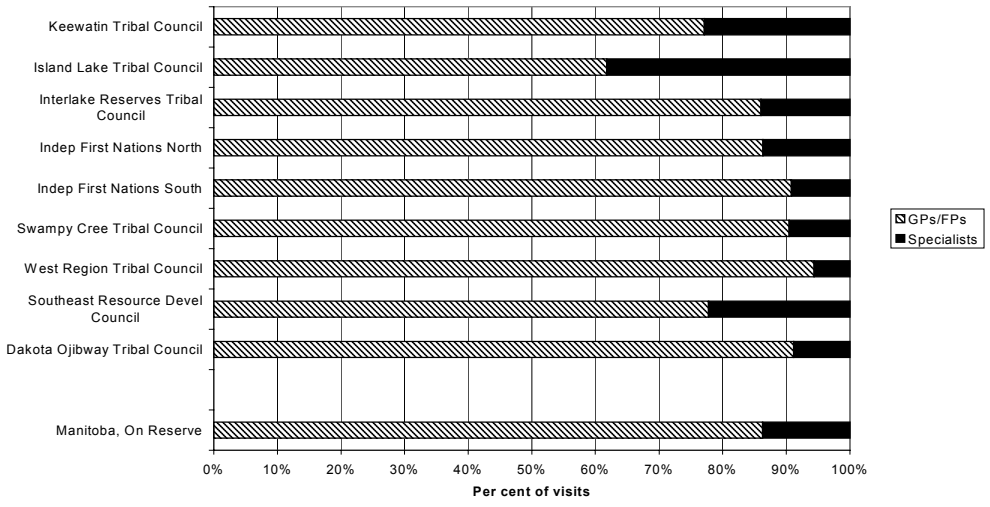
Definition: This is the number of ambulatory visits provided either by GP/FP (general practice or family practice physicians) or by a "specialist" compared to the total number of ambulatory visits, expressed as a percent. Specialists include the physician speciality codes of psychiatry, paediatrics, obstetrics and gynaecology, medical specialists (including general internists), general surgeons, and surgical specialists.

How to read the graphs: Figure 7.10 shows 86.3% of the ambulatory visits for Registered First Nations people "on-reserve" are to GP/FPs, and 13.7% are to specialists. By Tribal Council, ILTC has the highest proportion of visits to specialists (38.2%), with KTC and SERDC following at 22.9% and 22.2% respectively. However, this must be viewed with caution. *Knowing the potential for undercounting GP/FP visits in some northern and remote areas where salaried physicians may not submit all claims, the proportion of visits to specialists may be over-estimated.* For all RFN (Figure 7.11), 83.9% of the visits are to GP/FPs and 16.1% to specialists, with RFN living in Winnipeg RHA having the highest proportion of specialist visits (21.7%) compared with all other RHAs. Compared to Registered First Nations people (Figures 7.11 and 7.12), all other Manitobans are 1.6 times more likely to visit a specialist for a given ambulatory visit (26.3% versus 16.1%). Most RHAs have elevated proportions of specialist visits for other RHA residents compared to RFN residents, with the exceptions of Burntwood (13.3% versus 18.3%) and Nor-Man (6.3% versus 9.9%). Comparing RFN "on-reserve" to "off-reserve" (Figures 7.13 and 7.14), most RHAs have similar rates but the overall Manitoba rate is lower for "on-reserve" compared to "off-reserve" (13.7% versus 18.2%). This may, in part, be due to the large Winnipeg "off-reserve" population, where greater use of specialists is the norm.

Range of ambulatory visit providers (% of ambulatory visits to specialists)*:	
Tribal Council:	5.6% (WRTC) to 22.2/22.9/38.2% (SERDC/KTC/ILTC)
RHA Registered First Nations:	6.0% (Parkland) to 18.3/21.7% (Burntwood/Winnipeg)
RHA all other Manitobans:	6.3% (Nor-Man) to 32.2% (Winnipeg)
"On-reserve"/ "off-reserve":	13.7% versus 18.2%

**note: northern and remote area rates of GP/FPs may be under-reported due to missing physician claims and nurse practitioner care, resulting in a possible overestimate of specialist visit percentages*

Figure 7.10: Ambulatory Visit Providers, GPs/FPs vs Specialists by Tribal Council 1998/99



***Key Messages**: The percentage of ambulatory visits to specialists by Registered First Nations people is lower, in general, than for all other Manitobans (13.7% "on-reserve", 18.2% "off-reserve", 16.1% all RFN, and 26.3% all other Manitobans). There are three notable exceptions, although these may be overestimations due to an under-reporting of general practitioner visits by salaried physicians working in northern and remote areas. Island Lake Tribal Council uses specialists for 38.2% of the visits. As well, RFN in the two RHAs of Burntwood (18.3% versus 13.3%) and Nor-Man (9.9% versus 6.3%) have a higher percent of visits to specialists compared with other Manitobans living in the RHAs. Those persons living in Winnipeg have the highest percentage of specialist visits in the province. But even in Winnipeg the percent of all physician visits that were provided by specialists is about 2/3 that of all other Winnipeg residents (21.7% versus 32.2%).*

Figure 7.11: Ambulatory Visit Providers, GPs/FPs vs Specialists
Registered First Nations by RHA
1998/99

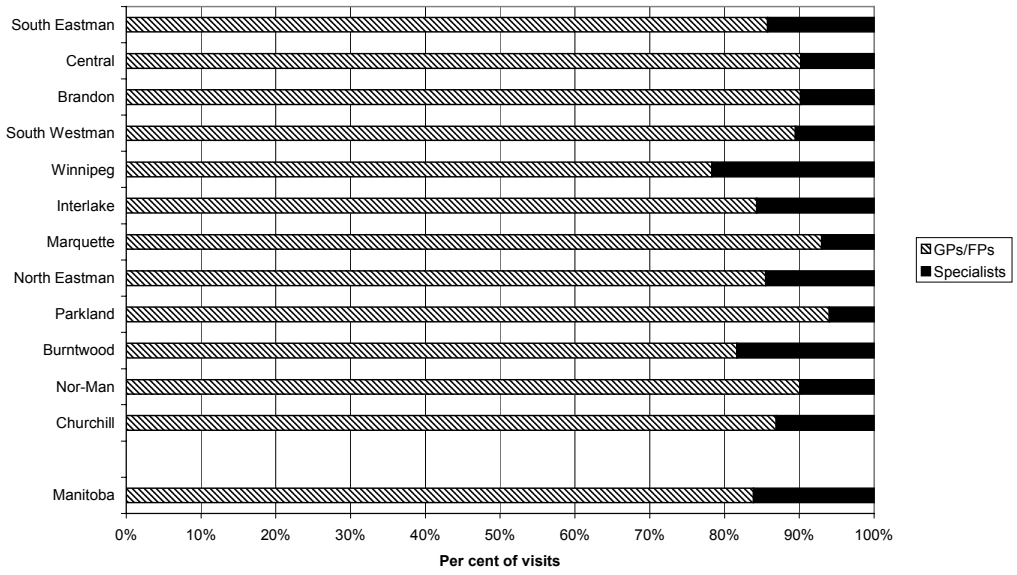


Figure 7.12: Ambulatory Visit Providers, GPs/FPs vs Specialists
All other Manitobans by RHA
1998/99

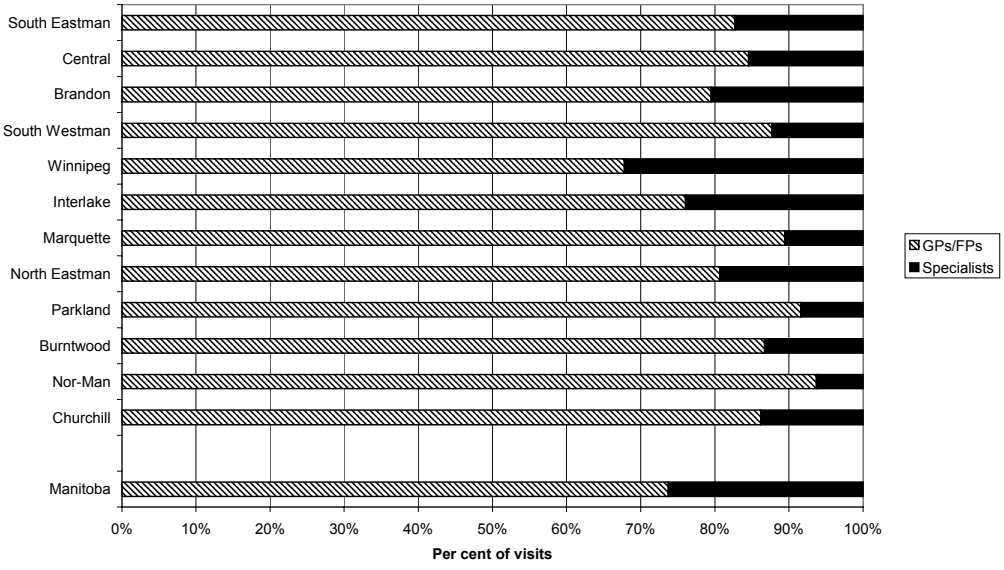
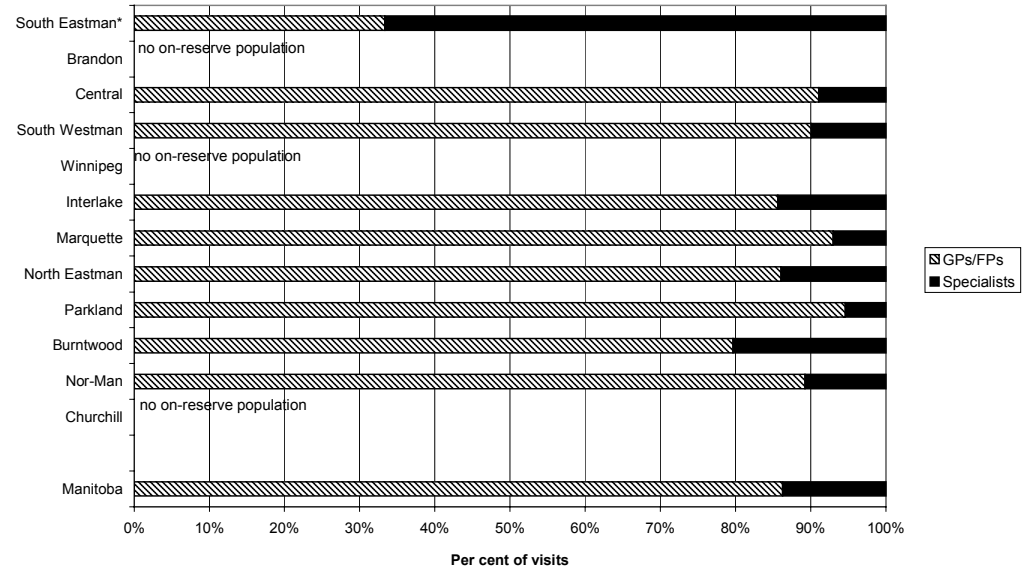
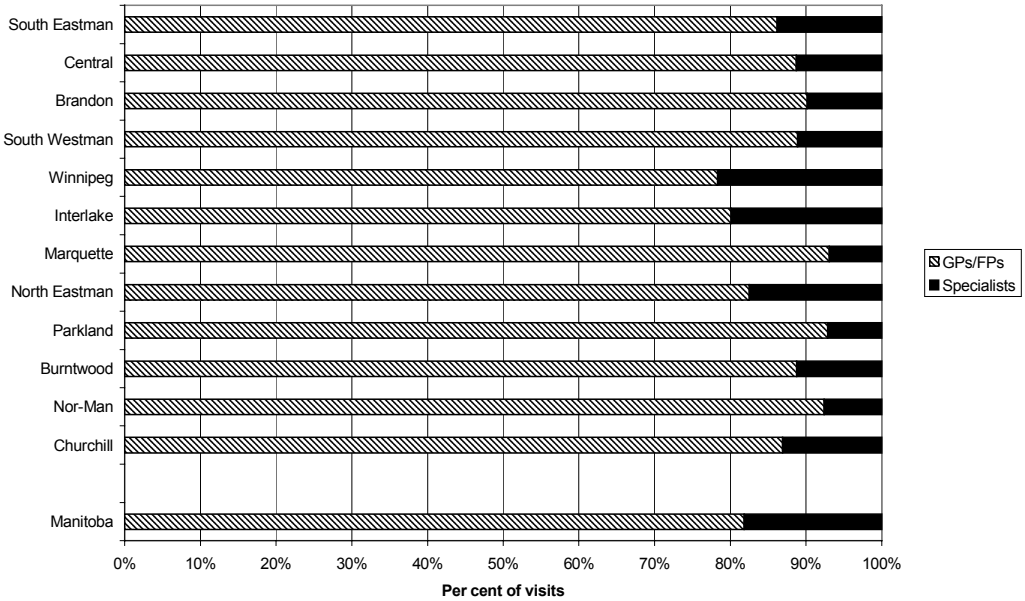


**Figure 7.13: Ambulatory Visit Providers, GPs/FPs vs Specialists
On Reserve Registered First Nations by RHA
1998/99**



* Rates are based on small numbers, so may fluctuate greatly in other years

**Figure 7.14: Ambulatory Visit Providers, GPs/FPs vs Specialists
Off Reserve Registered First Nations by RHA
1998/99**



7.9 Location of Ambulatory Visits to GP/FPs

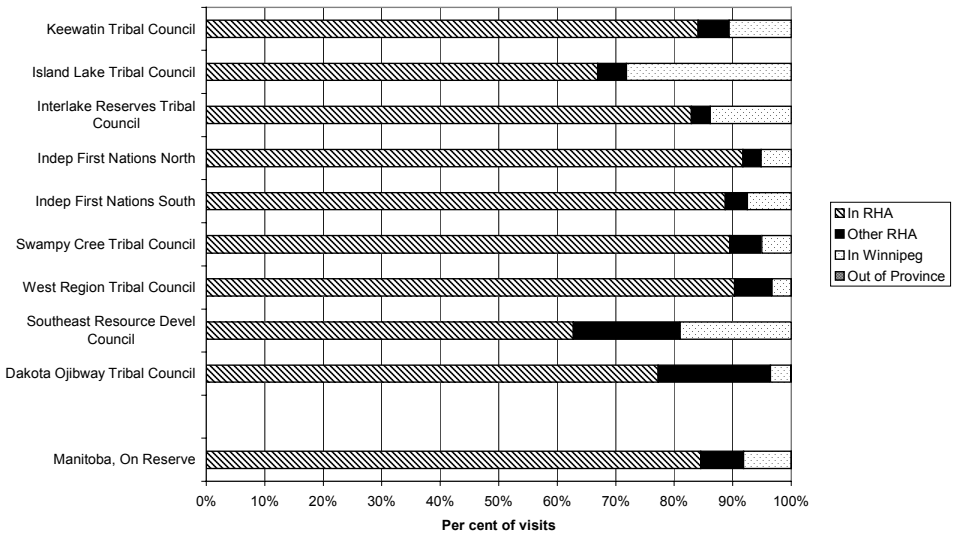
Definition: This is the number of ambulatory visits (see Section 7.1) by a region's residents to general practitioners/family physicians (GP/FP) in various locations, divided by the total number of visits to GP/FPs for that region, and expressed as a percent. The location of visits is classified as either within the RHA (Regional Health Authority) where a person lives, in another RHA, in Winnipeg, or out-of-province. It is an indicator of how far a person needs to travel for generalist visits, although even distances within some RHAs can be great (see maps in Chapter 3).

How to read the graphs: Figures 7.15 through 7.19 show 84.5% of visits for "on-reserve" Registered First Nations people, and 81.7% for "off-reserve", are within their RHA (for an overall RFN percent of 83.6%). For all other Manitobans, 90.9% of their visits are within their RHA, but this is highly driven by the fact that at least half of Manitobans live in Winnipeg (97.7%) where almost everyone accesses Winnipeg RHA GP/FPs. The range for RFN (Figure 7.16) is from about 34.0% (South Eastman) to 89.5% (Parkland), and the range for all other Manitobans is about 64.3% (North Eastman) to 94.4% (Parkland), excluding Winnipeg. It is not surprising that two Tribal Councils close to Winnipeg each have a high percentage of visits in Winnipeg (IRTC 13.8%, SERDC 19.0%). But two northern Tribal Councils also have large percentages of Winnipeg visits (10.6% KTC, 28.2% ILTC). Figures 7.16 and 7.17 show that people living in RHAs close to Winnipeg (whether they be RFN or other Manitobans) tend to have higher percentages of GP/FP visits in Winnipeg – South Eastman (31% RFN, 24% others), North Eastman (13% RFN, 29% others), and Interlake (15% RFN, 26% others). Very few visits are made out-of-province, representing only 0.2% overall.

Range of ambulatory visit location to GP/FPs (% of visits occurring in RHA of residence):

Tribal Council:	62.7% (SERDC) to 90.3%/91.8% (WRTC/Independent North)
RHA Registered First Nations:	34.0% (South Eastman) to 89.5% (Parkland)
RHA all other Manitobans:	64.3% (North Eastman) to 97.7% (Winnipeg)
"On-reserve"/ "off-reserve":	84.5% versus 81.7%

Figure 7.15: Location of Ambulatory Visits to GPs/FPs by Tribal Council 1998/99



Key Messages:
Over 80% of visits to GP/FPs occur within a person's RHA of residence, both for Registered First Nations people (83.6%) and all other Manitobans (90.9%). As expected, persons living in RHAs close to Winnipeg tend to have higher visit rates to GP/FPs in Winnipeg, ranging from 6% in Central to 31% in South Eastman for RFN persons, and from 15% in Central to 29% in North Eastman for all other Manitobans.

Figure 7.16: Location of Ambulatory Visits to GPs/FPs
Registered First Nations by RHA
1998/99

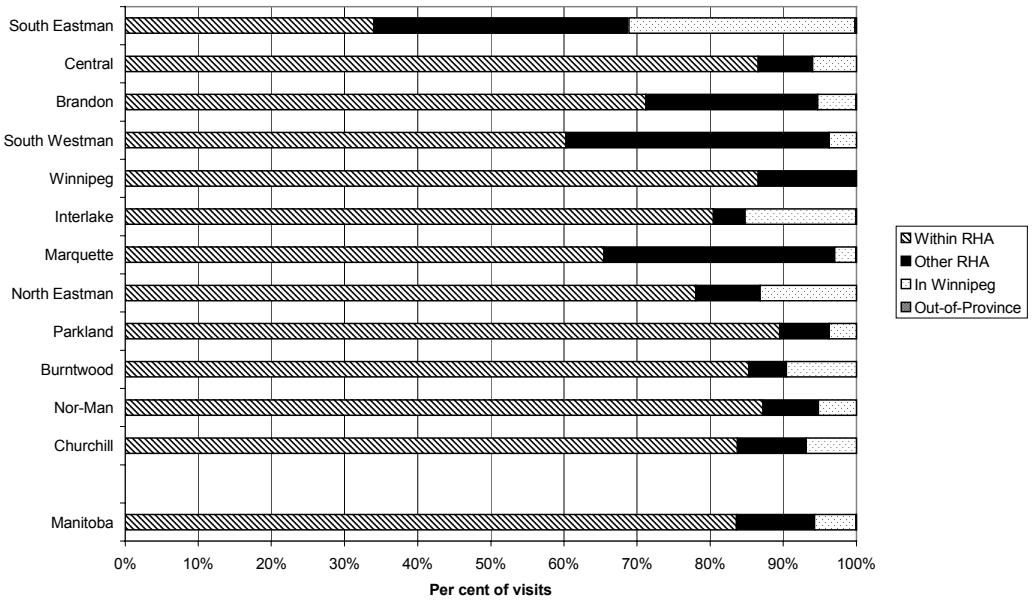


Figure 7.17: Location of Ambulatory Visits to GPs/FPs
All other Manitobans by RHA
1998/99

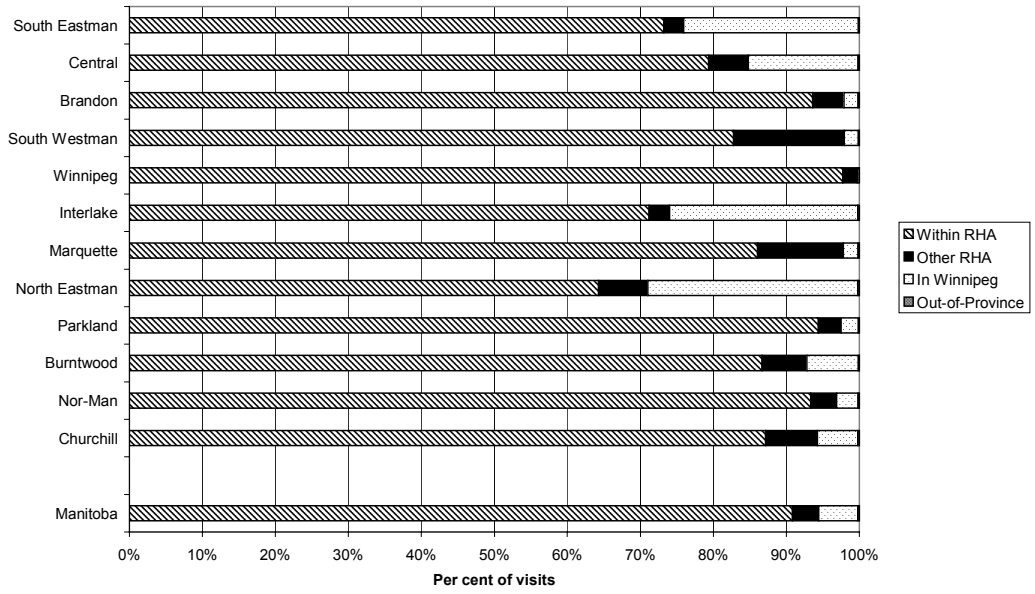


Figure 7.18: Location of Ambulatory Visits to GPs/FPs
On Reserve Registered First Nations by RHA
1998/99

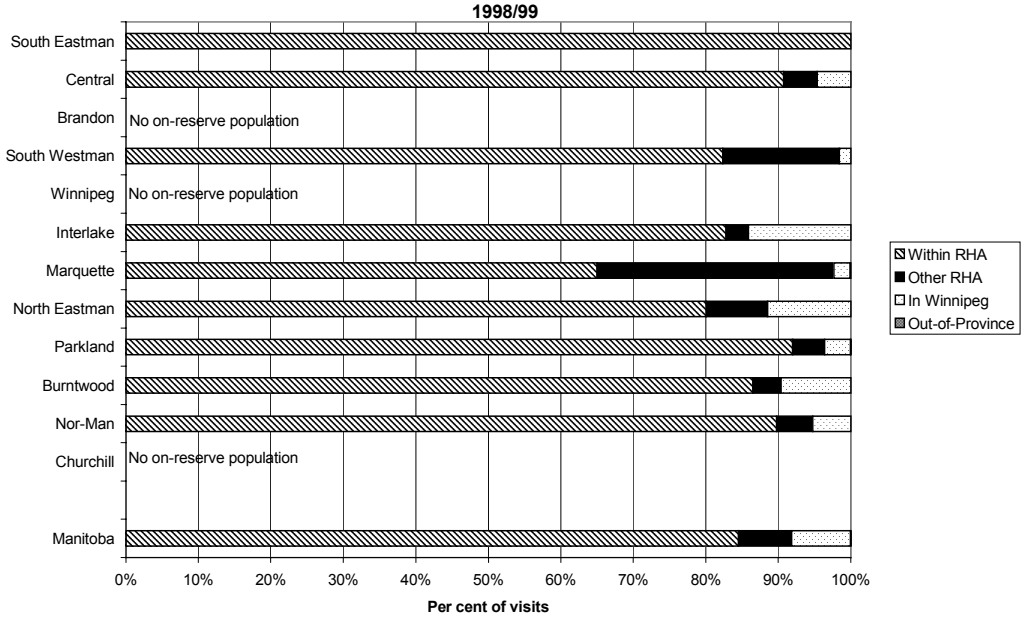
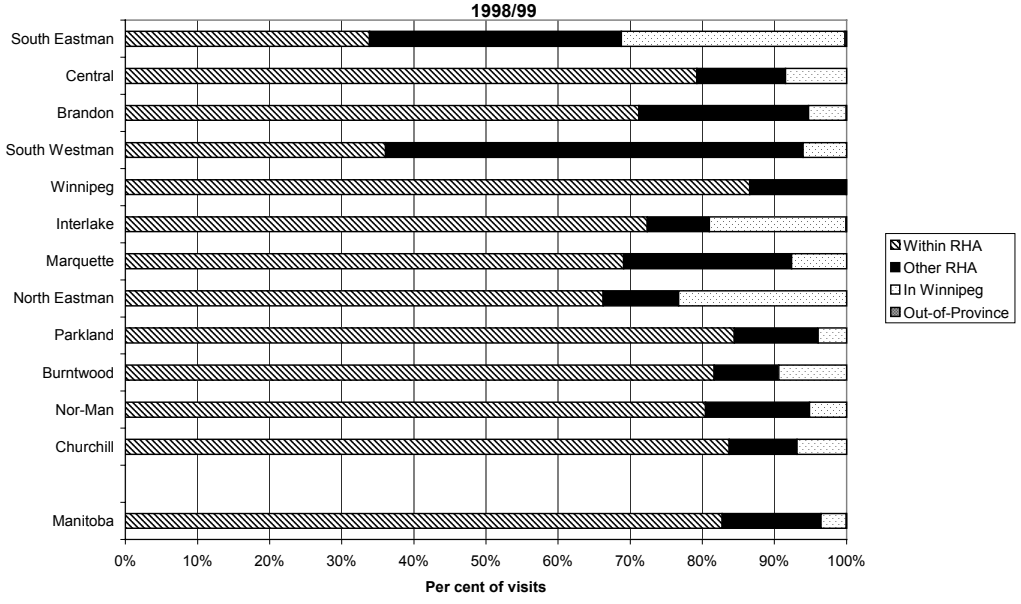


Figure 7.19: Location of Ambulatory Visits to GPs/FPs
Off Reserve Registered First Nations by RHA
1998/99



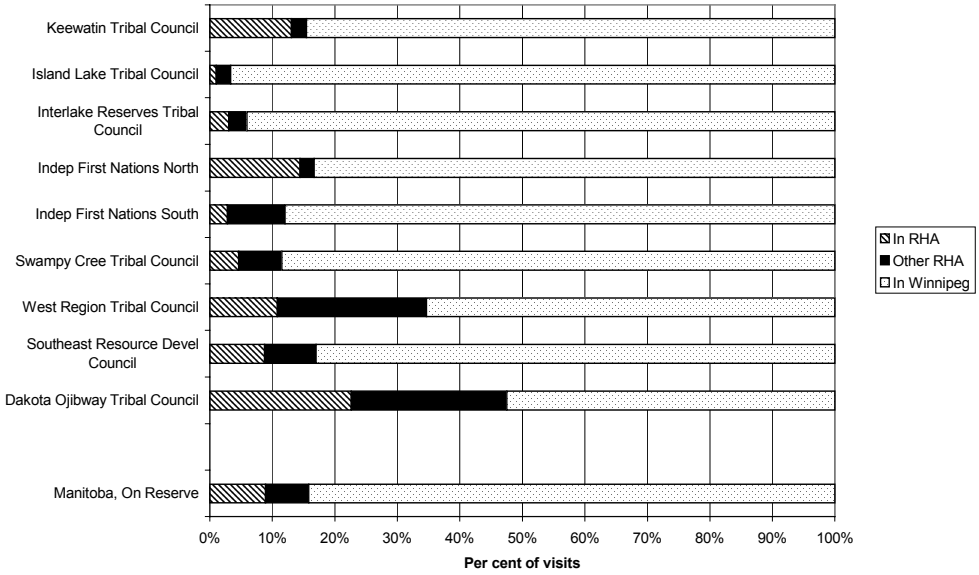
7.10 Location of Ambulatory Visits to Specialists

Definition: This is the number of ambulatory visits (see Section 7.1) by a region's residents to specialist physicians in various locations, divided by the total number of visits by residents to specialists, and expressed as a percent. Locations include within a person's RHA of residence, in another RHA, or in Winnipeg. This shows the extent to which people travel for specialist visits. All out-of-province visits have been designated as GP/FP visits (see previous section), since we do not have the physician specialty code for out-of-province visits.

How to read the graphs: In contrast to ambulatory visits to GP/FPs, the majority of specialist visits occur either in Winnipeg or Brandon RHAs. In Figure 7.20, "on-reserve" Registered First Nations people have 84.2% of their specialist visits in Winnipeg and only 8.9% in their own RHA. In the northern Tribal Council areas of KTC and Independent North, there is a higher percentage of specialist visits occurring within their RHA of residence, at 13.1% and 14.4% respectively. In Figures 7.21 and 7.22, South Westman and Marquette RHA residents most likely visit Brandon RHA (the "other RHA") for the majority of their specialist visits, as do residents of Brandon itself. In Burntwood, Brandon and Parkland RHAs, RFN are much more likely to access specialist services in Winnipeg compared to all other RHA residents, whereas in Central RHA, RFN are more likely to access specialists within their own RHA compared to all other RHA residents. Although Figures 7.23 and 7.24 show that "on-reserve" RFN specialist visits occur mostly in Winnipeg (84.1% of specialist services), and "off-reserve" occur mostly within their RHA (81.7%), the latter is highly affected by those "off-reserve" persons living in Winnipeg itself. Comparing "on-reserve" to "off-reserve" by RHA, similar patterns occur within some RHAs, but in others (Burntwood and Interlake), RFN living "on-reserve" are much more likely to see specialists in Winnipeg.

Range of ambulatory visit location to specialists (% of visits occurring in RHA of residence):	
Tribal Council:	1.0% (ILTC) to 13.1%/14.4%/22.6% (KTC/Independent North/DOTC) within the RHA
RHA Registered First Nations:	0% (Marquette) to 69.8%/97.3% (Brandon/Winnipeg)
RHA all other Manitobans:	0%/0.4% (Marquette/North Eastman) to 86.4%/98.6% (Brandon/Winnipeg)
"On-reserve"/ "off-reserve":	8.9% versus 82.3% (affected by Winnipeg "off-reserve" RFN)

Figure 7.20: Location of Visits to Specialists by Tribal Council 1998/99



Key Messages:

Most ambulatory specialist visits occur either in Winnipeg or Brandon. In RHAs outside the two urban centres, few occur within the RHA. There are four noteable exceptions. For RFN living in Central and Churchill RHAs, about one-third of their specialist visits occur within their RHAs – Central at 34.6%, and Churchill at 35.9%. For other Manitobans, those living in Parkland and Churchill RHAs have at least one-third of their specialist visits occur within their RHA – Parkland at 33.7% and Churchill at 42.8%.

In northern Manitoba, KTC and Independent North Tribal Councils appear to have greater access to specialists within their RHA (about 13-14% of the visits are in the RHA), whereas ILTC specialist visits are almost entirely in Winnipeg.

Figure 7.21: Location of Ambulatory Visits to Specialists
Registered First Nations by RHA
1998/99

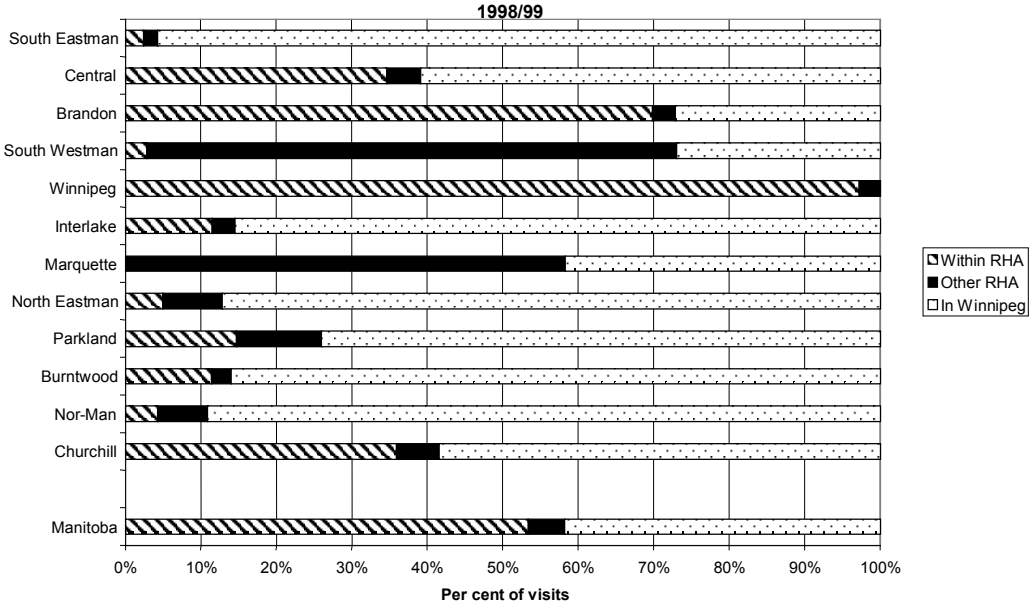


Figure 7.22: Location of Ambulatory Visits to Specialists
All other Manitobans by RHA
1998/99

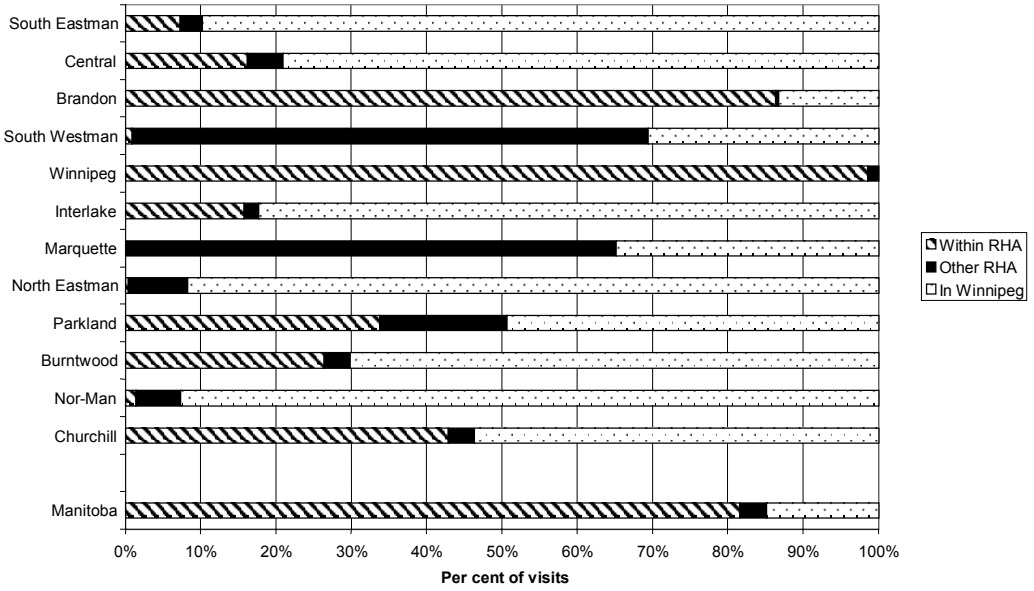
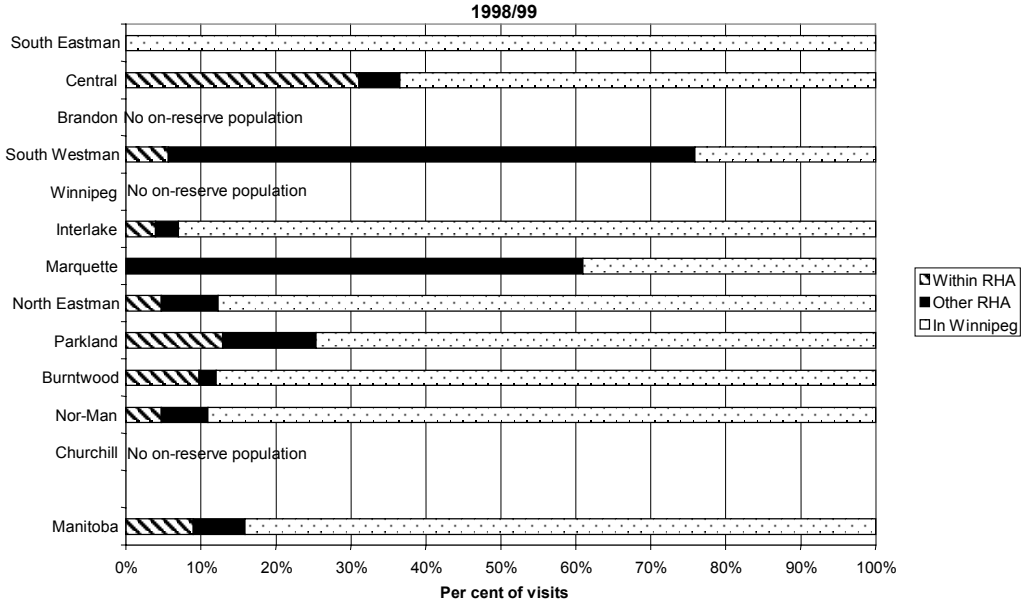
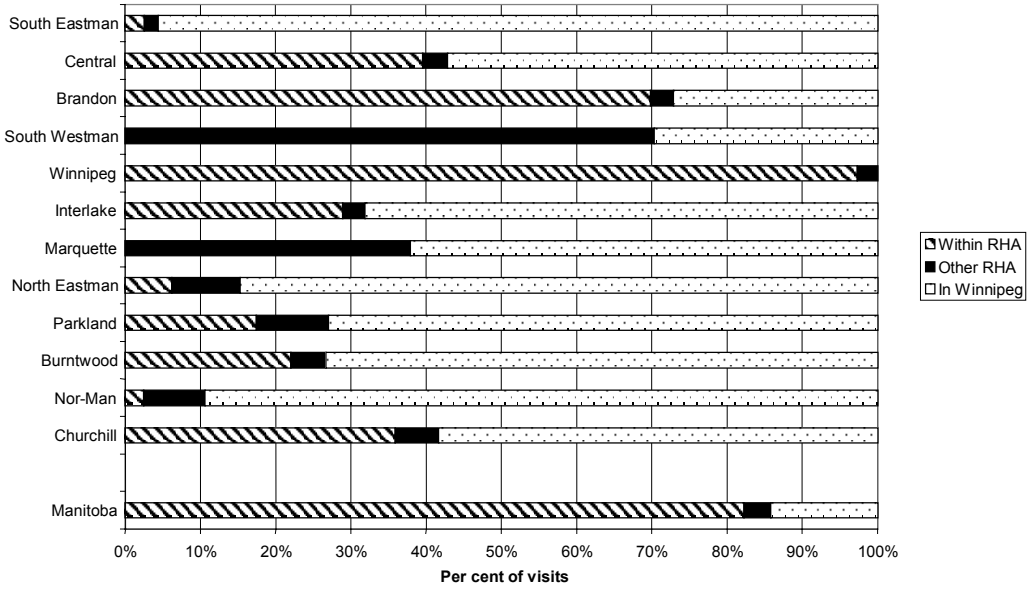


**Figure 7.23: Location of Ambulatory Visits to Specialists
On Reserve Registered First Nations by RHA
1998/99**



* Rates are based on small numbers, so may fluctuate greatly in other years

**Figure 7.24: Location of Ambulatory Visits to Specialists
Off Reserve Registered First Nations by RHA
1998/99**



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CHAPTER 8. USE OF HOSPITAL SERVICES

8.1 What's in this chapter?

This chapter contains information on how people use hospital services (inpatient and surgical outpatient), based on the following specific indicators:

- The hospitalization ("separation") rate
- The total days of hospital care
- The location of hospitalizations

8.2 Definitions used for hospital separation rates, hospital lengths of stay, and location of hospitalization

What is a "hospital separation"? A separation from a hospital occurs any time a patient leaves because of discharge, transfer to another facility, sign-out against medical advice, or death. Why do we use separation rather than admission? Hospital abstract files for inpatient care are based on information gathered at the time of discharge rather than admission. In this report, inpatient hospital stays, as well as surgical outpatient records, are used to produce the hospital separation rate. Newborns are excluded from this, to avoid counting the mother and the newborn twice. This population-based area rate represents the number of hospital separations per 1000 persons, no matter where hospitalization occurred. It is an "adjusted rate," meaning that different age/gender distributions are taken into account in the comparisons (see Chapter 2 for a further explanation of adjusted rates). The hospital separation rates included women giving birth. However, we have also included hospital separation rates excluding women giving birth, in case the higher birth rate of Registered First Nations women could influence the results. These rates are given in Appendix D. Trends remained the same as were evident in the total hospital separation rates.

For each inpatient record, the length of hospital stay is the total days of care provided from time of admission to time of discharge. The total days of hospital care are all the days spent by area residents as inpatients, or as surgical outpatients (assigned length of stay one day) in a hospital during the fiscal year 1998/99, calculated as a rate per 1000 persons. Total days of care in hospital depends not only on the length of stay of each person, but also on the number of hospital separations during that year. The maximum length of stay was truncated to 365 days (meaning that any length of stay more than 365 days was given a value of only 365 days), to avoid having a few patients unduly influence the total length of stay. The "total days of hospital care" indicator is also adjusted to take into account different age/gender distributions. Similar to the hospital separation rates, total days of hospital care were also calculated with excluding women giving birth (see Appendix D). Overall trends still remained the same.

Locations of hospitalizations were grouped as "within the RHA in which a person resides," "outside the RHA," "in Winnipeg," or "out-of-province." Where a person lived at the first hospitalization of the year was considered this person's residence throughout the year.

8.3 Key findings

Hospital Separation Rates

- For both Registered First Nations people and all other Manitobans, hospital separation rates are lowest in the major urban centres of Winnipeg and Brandon, and RHAs within close proximity to Winnipeg (Interlake, North Eastman, South Eastman).
- RFN hospital separation rates are more than double that for all other Manitobans (348/1000 versus 156/1000), and this is true for every Tribal Council "on-reserve" Registered First Nations population as well. Within each RHA the differential between RFN and all other RHA residents is smallest in northern RHAs (1.8 times) and greatest in Central RHA (2.3 times).
- Rates for "on-reserve" RFN are greater than for RFN living "off-reserve" (377/1000 versus 309/1000)
- In 1998/99, 15.5% of all Registered First Nations people, and 11.4% of all other Manitobans, were admitted to hospital at least once, for an overall provincial rate of 11.8%.

Total Days of Hospital Care

- The total days of hospital care for Registered First Nations people is about 1.7 times that of all other Manitobans (1.75 days per person versus 1.05 day per person).
- In Winnipeg, the total days of hospital care is much higher for RFN (1.86 days per person) than for all other Winnipeg residents (0.99 days per person).
- Parkland RHA has the highest RFN total days of care in the province (2.71 days per person). As well, Parkland and North Eastman RFN living "on-reserve" have 1.6 tmes the total days of hospital care compared to "off-reserve" RFN in those RHAs.
- Brandon RHA has one of the lowest total days of hospital care for RFN (1.09 days per person). In contrast with most other RHAs, there is no significant difference in total days between RFN and all other Brandon residents. However, if long stays are excluded (stays of 30 days or greater), Brandon shows a similar pattern to other RHAs, with RFN total days of care substantially greater than for all other Brandon people (1.02 versus 0.63 days per person).

Location of Hospitalizations

- Parkland RHA residents' hospitalizations have a high percentage occurring within the RHA: 78% of hospitalizations for RFN and all other RHA persons; 72% for "off-reserve" and 81% for "on-reserve" First Nations from Parkland.

- Island Lake Tribal Council, and South East Resource Development Corporation Tribal Council, use Winnipeg hospitals extensively, at 75.4% and 58.7% of the hospitalizations respectively.

8.4 Canadian Comparisons

- Based on 1985/86 data from the Saskatchewan Hospital Services Plan, Treaty Status First Nations in Saskatchewan had higher hospitalization rates than all other Saskatchewan residents. This trend was found at all age groups (Waldram et al., 1995). *In our report, Manitoba Registered First Nations people had over double the rate of hospitalizations compared with all other Manitobans (348 per 1000 versus 156 per 1000), after adjusting for age and gender distribution.*

- Aboriginal admissions to psychiatric hospitals in Northwestern Ontario in 1991/92 were 33% higher than what would be expected based on the population. As well, their length of stay in hospital was twice as long as for non-Aboriginals (Dalrymple et al., 1995). *In our report, we did not examine psychiatric hospitals alone. Registered First Nations people's total days of hospital care was 1.7 times higher than for all other Manitobans, at 1.75 days per person versus 1.05 days per person. This differential ranged from no significant difference in Brandon RHA to 2.1 times greater in Parkland. In Winnipeg, RFN total days of hospital care were 1.9 times greater than for all other Winnipeg residents.*

- In Manitoba, a greater proportion of First Nations days in acute care were "appropriate" (45.9%) compared with the general Manitoba population at 32.8%, based on 1993/94 admissions (DeCoster et al., 1999). *In our report, and looking at the context of comparative illness rates (see Chapters 4 and 5), it is not surprising that both hospital separation rates and total days of hospital care would be greater for the Registered First Nations people of Manitoba compared to all other Manitobans. One way to approximate a comparison on the acuity of care is to work out a rough estimation of the average length of stay per person by dividing the total days of hospital care (total days per person) by the hospital separation rate (hospital separations per person). The rough estimate of average length of stay is 5.03 days for RFN, and 6.73 days for all other Manitobans. Assuming poorer overall health status in the RFN group, it would not be surprising to find their days in the hospital rated at higher acuity levels.*

8.5 Hospital Separation Rate

Definition: This rate is the total number of hospital separations per 1000 residents of the region, no matter where that hospitalization occurred. A separation from a hospital occurs any time a patient leaves because of discharge, transfer to another facility, sign-out against medical advice, or death. Inpatient hospital stays, as well as surgical outpatient records, are included. It is an "adjusted rate," meaning that different age and sex distributions are taken into account in the comparisons. This includes hospitalizations for women giving birth. Appendix D shows rates excluding births.

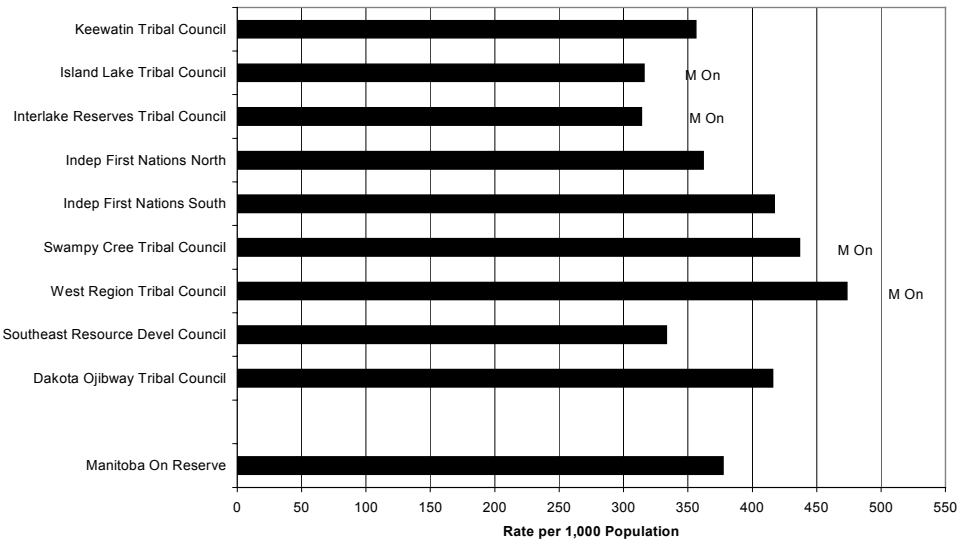
How to read the graphs: Figure 8.2 shows that the hospital separation rate for Registered First Nations people is 2.2 times greater than for all other Manitobans (348 versus 156 separations per thousand). One would expect RFN hospitalization rates to be greater, given their much poorer overall health status (see Chapter 4). Tribal Council areas (Figure 8.1) have hospitalization rates ranging from 314 per thousand (IRTC) to 473 per thousand (WRTC) – every Tribal Council area has a rate over double that of all other Manitobans. Within most RHAs, RFN residents also have double the rate compared to all other Manitobans (Figure 8.2). This differential is the least in northern RHAs (1.6 to 1.8 times the rate), and highest in Central RHA (2.3 times), with the differential remarkably stable throughout all other RHAs (1.9 to 2.1 times). Provincially, RFN living "on-reserve" had a higher hospital separation rate than those living "off-reserve" (377 versus 309 separations per 1000 people – Figure 8.3). The only RHA which shows a statistically higher rate (*) for "on-reserve" compared to "off-reserve" RFN is Parkland (504 versus 397).

Note of interest: In the fiscal year 1998/99, 15.5% of all Registered First Nations people, and 11.4% of all other Manitobans, were admitted to hospital at least once, for an overall provincial rate of 11.8%.

Range of hospital separation rates (per thousand population):

Tribal Council:	314/316 (IRTC/ILTC) to 473 (WRTC)
RHA Registered First Nations:	210/254 (South Eastman/Winnipeg) to 472 (Parkland)
RHA all other Manitobans:	134 (Winnipeg) to 245 (Churchill)
"On-reserve"/ "off-reserve":	377 versus 309

Figure 8.1: Direct Adjusted Hospital Separation Rates per 1,000 Population by Tribal Council 1998/99



Key messages:
For most Manitobans, hospital separation rates are lowest in the major urban centres of Winnipeg and Brandon and for RHAs within close proximity to Winnipeg (Interlake, North Eastman). This is also true for Registered First Nations people, with the lowest rates in Winnipeg and Brandon. But overall, RFN hospital separation rates are more than double that for all other Manitobans (348/1000 versus 156/1000), and rates for "on-reserve" RFN are greater than those living "off-reserve" (377/1000 versus 309/1000).

Figure 8.2: Direct Adjusted Hospital Separation Rates per 1,000 Population
Registered First Nations vs. All Other Manitobans by RHA
1998/99

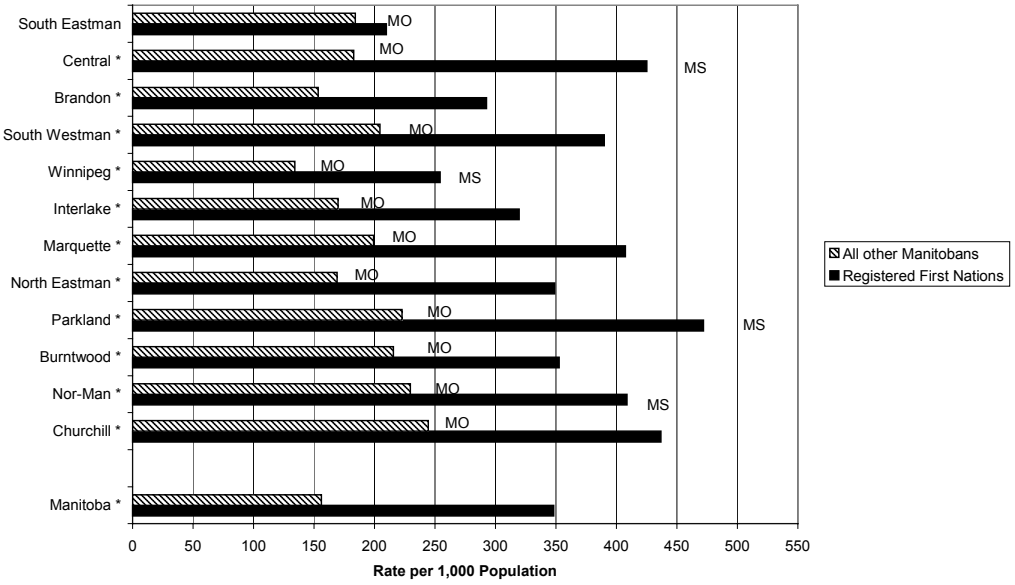
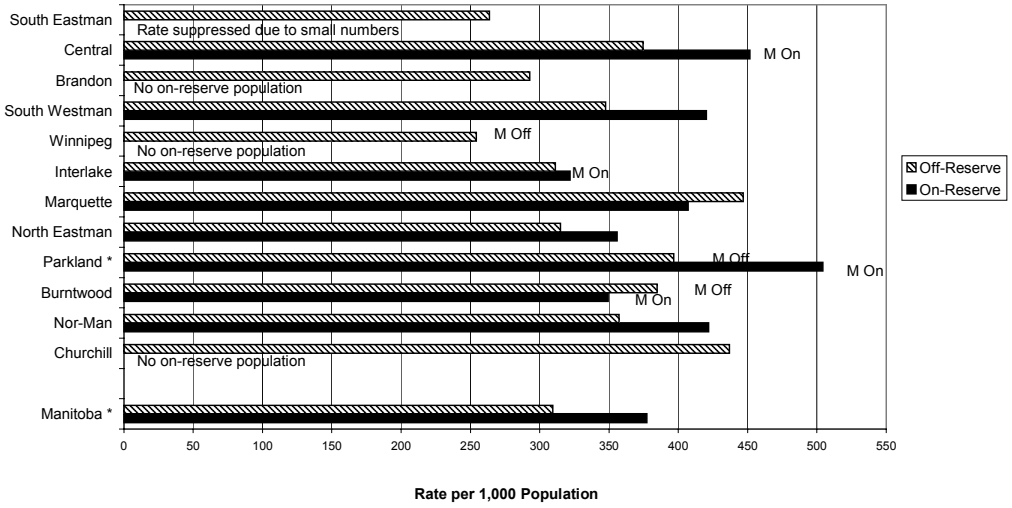


Figure 8.3: Direct Adjusted Hospital Separation Rates per 1,000 Population
Off Reserve vs. On Reserve Registered First Nations by RHA
1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

8.6 Total Days of Hospital Care

Definition: This is the total number of days spent as inpatients or surgical outpatients in a hospital (regardless of hospital location) during the fiscal year 1998/99, divided by the number of persons within that region, and calculated as a rate of total days per person. Any patient who stayed in hospital for more than 365 days was assigned a length of stay of 365 days, to prevent a few cases from distorting the results. Surgical outpatients were assigned a length of stay of one day to reflect resource requirements. The total days of hospital care includes hospitalizations for women giving birth, although total days excluding births are given in Appendix D.

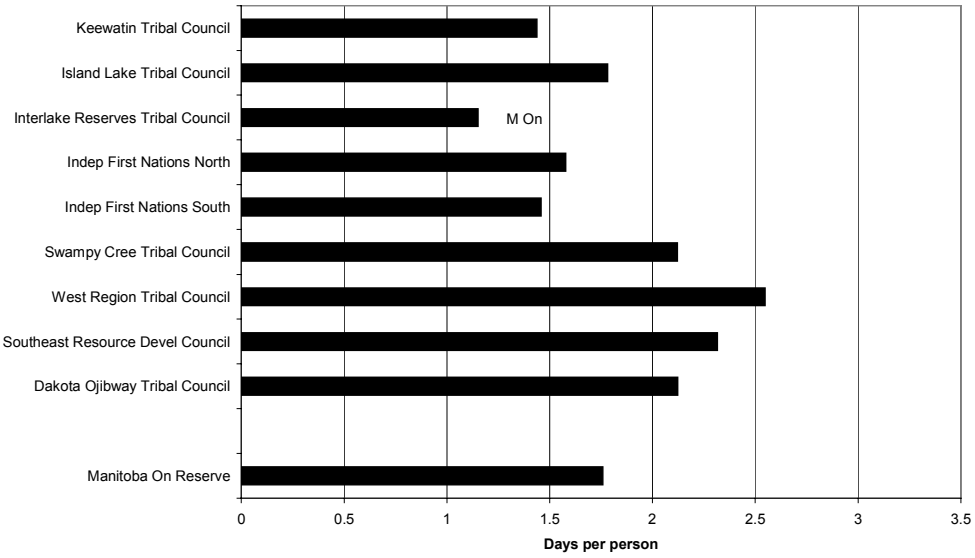
How to read the graphs: Figures 8.4 through 8.6 show the total days of hospital care per person. In Figure 8.5, the total days of hospital care is 1.7 times higher for RFN compared to all other Manitobans (1.75 versus 1.05 days per person per year). This is not a length of stay just for those in hospital, but rather an average number of days over the whole population (those who were/were not hospitalized).

In Winnipeg RHA, RFN total days are 1.9 times higher than for all other Winnipeg residents. Central and Parkland RHAs have the highest differential, with RFN total days 2.0 and 2.1 times higher respectively. In Brandon, the opposite occurs, with RFN total days only 0.8 times that of all other Brandon residents (though statistically the rates are considered similar). This is due to the fact that comparatively fewer RFN, and more "all other" Brandon residents, stay 30 days or more – a length of stay which is considered long, and probably due to chronic conditions or to waiting for placement in long-term care facilities. In a further analysis (not shown) comparing RFN to all other Brandon residents for those who stay *less than 30 days*, the total days of care of the RFN are much higher than the "all other" Brandon rate at 1.02 days for RFN versus 0.63 days for all other Brandon residents. When only lengths of stay less than 30 days were analyzed at the provincial level, the Manitoba overall average was 1.26 days for RFN and 0.56 for all other Manitobans (see Appendix D, Tables D-1 and D-2).

In Figure 8.6, the only RHAs where the "on-reserve" rate is statistically (*) higher than the "off-reserve" total days of hospital care are Parkland (3.1 versus 1.8 days per person) and North Eastman (1.94 versus 1.24).

Range of total days of hospital care per person:	
Tribal Council:	1.15 days per person (IRTC) versus 2.55 (WRTC)
RHA Registered First Nations:	0.77/1.09/1.28 days per person (South Eastman/Brandon/Interlake) to 2.71 (Parkland)
RHA all other Manitobans:	0.89/0.93 (Interlake/Burntwood) to 1.35/1.37/1.50 (Brandon/Nor-Man/Churchill)
"On-reserve"/ "off-reserve":	1.76 versus 1.76

Figure 8.4: Direct Adjusted Total Days of Hospital Care per person by Tribal Council 1998/99



Key messages:

The total days of hospital care for Registered First Nations people is about 1.7 times that of all other Manitobans (1.75 days per person versus 1.05 day per person), and 1.9 times higher in Winnipeg (1.86 versus 0.99 days). Parkland RHA has the highest RFN total days of care in the province (2.66 days per person). Brandon has one of the lowest total days of care for RFN (1.09), with no difference in total days between RFN and all other Brandon residents. However, Brandon patterns are similar to other RHAs if only short stays (less than 30 days) are considered, with RFN higher at 1.02 days per person compared with 0.63 days per person for other people living in Brandon.

Figure 8.5: Direct Adjusted Total Days of Hospital Care per person Registered First Nations vs. All Other Manitobans by RHA 1998/99

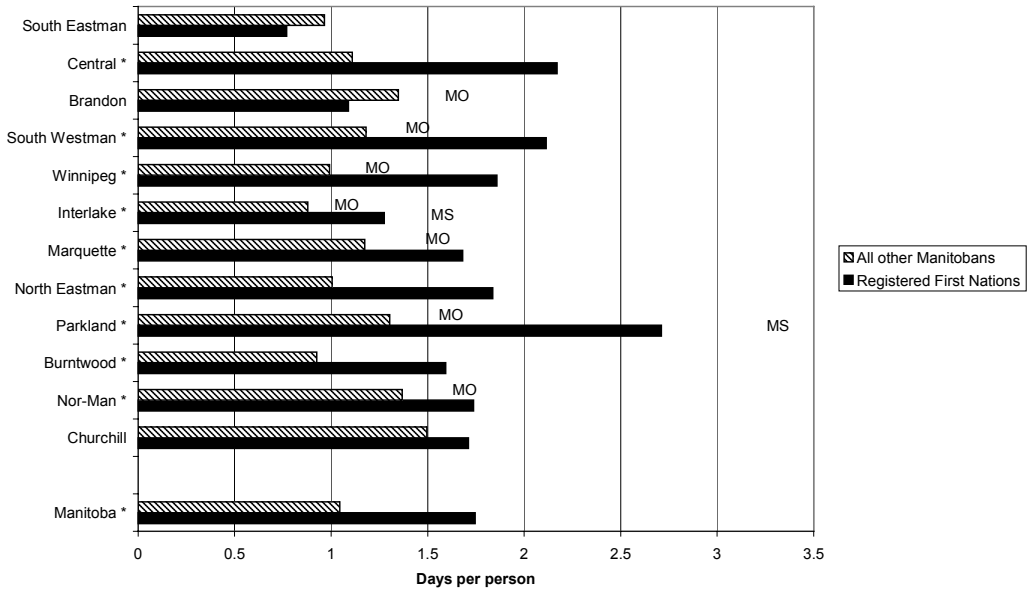
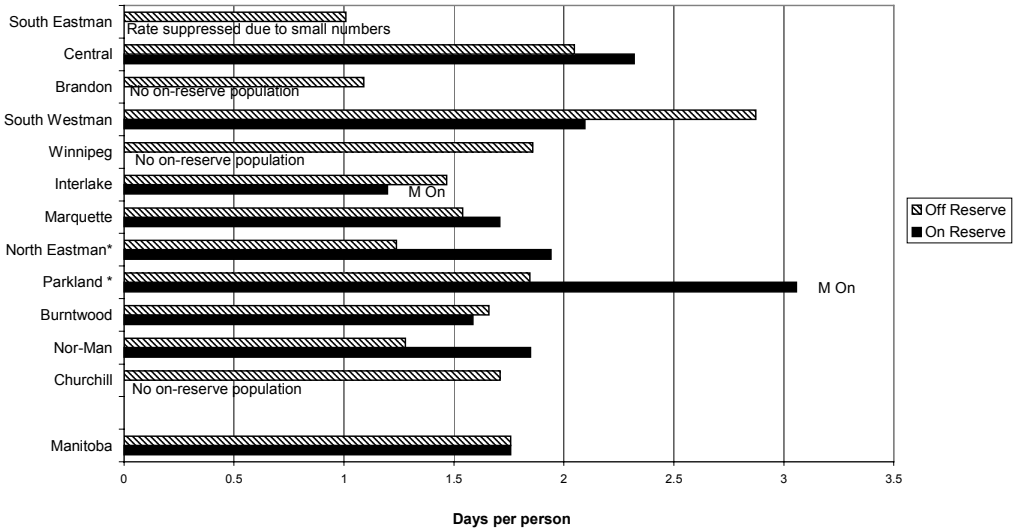


Figure 8.6: Direct Adjusted Total Days of Hospital Care per person Off Reserve vs. On Reserve Registered First Nations by RHA 1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

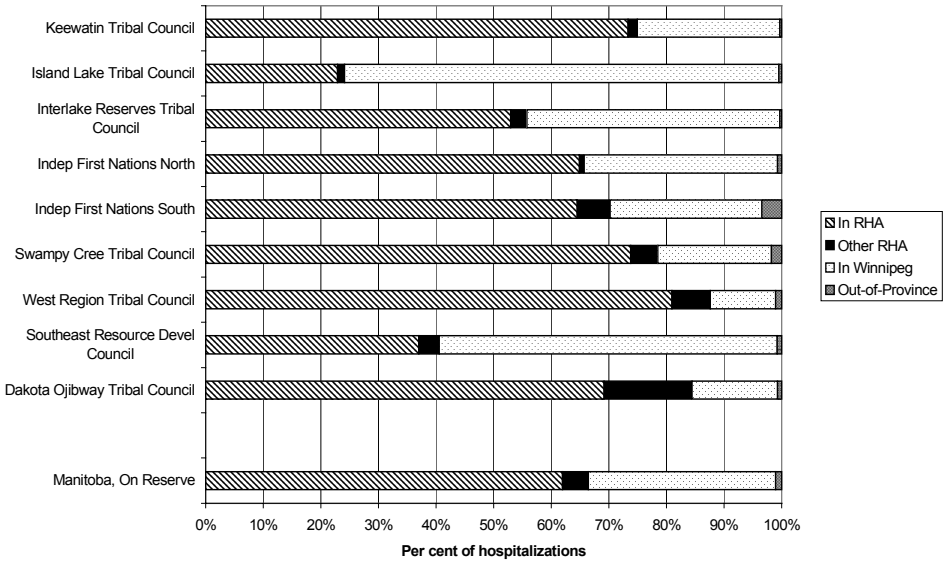
8.7 Location of Hospitalizations

Definition: This is the proportion of regional hospitalizations that occur "within the RHA of residence," "within another RHA," "within Winnipeg RHA," or "out of the province." For those persons living within Winnipeg RHA, hospitalizations in Winnipeg are called "within the RHA of residence" rather than "within Winnipeg RHA."

How to read the graphs: Figure 8.7 shows that 62.0% of hospitalizations for "on-reserve" Registered First Nations people take place within their RHA of residence, and 32.5% take place in Winnipeg. However, this varies greatly by Tribal Council, and not necessarily by north versus south. Within northern Tribal Councils, ILTC has 75% of hospitalizations in Winnipeg, whereas KTC only has 25% in Winnipeg. Similarly, within southern Tribal Councils SERDC has over half (59%) of the hospitalizations in Winnipeg, whereas DOTC only has 15% in Winnipeg. Comparing RFN to all other Manitobans (Figures 8.8 and 8.9), only 66% of RFN hospitalizations occur within their RHA, compared to 80% for all other Manitobans. The proportion for all other Manitobans may be affected by Winnipeg residents, since 97% of their hospitalizations occur within Winnipeg. Outside the cities of Winnipeg and Brandon, there is an identical range of hospitalizations occurring within a person's RHA: from 39% (South Westman) to 78% (Parkland) for RFN; and from 39% (North Eastman) to 78% (Parkland) for all other Manitobans. Figures 8.10 and 8.11 compare "on-reserve" and "off-reserve" RFN hospitalization locations. The "off-reserve" proportions are highly affected by Winnipeg Registered First Nations people, with 85% of their hospitalizations occurring within Winnipeg. For those living "off-reserve" outside Winnipeg, from 16% (South Westman) to 72% (Parkland) of hospitalizations occur within their RHA. For RFN living "on-reserve," from 46% (North Eastman) to 81% (Parkland) of hospitalizations are within the RHA.

Range of location of hospitalizations within the RHA of residence:	
Tribal Council:	22.9% (ILTC) to 80.9% (WRTC)
RHA Registered First Nations:	20.9% (South Eastman) to 78.4%/ 84.7% (Parkland/Winnipeg)
RHA all other Manitobans:	38.6%/41.8% (North Eastman/Churchill) to 78.2%/81.3%/97.1% (Parkland/Brandon/Winnipeg)
"On-reserve"/ "off-reserve":	62.0% versus 72.8%

Figure 8.7: Location of Hospitalizations by Tribal Council 1998/99



Key messages:
Outside Winnipeg RHA, there is a similar range of hospitalizations taking place within a person's RHA for both Registered First Nations people and for all other Manitobans. The non-Winnipeg RHA whose residents consistently appear to stay within the RHA for hospitalizations is Parkland: 78% of hospitalizations for RFN; 78% for all other Parkland residents; 72% for "off-reserve" RFN; and 81% for "on-reserve" RFN. ILTC and SERDC use Winnipeg hospitals extensively, at 75.4% and 58.7% of the hospitalizations respectively.

Figure 8.8: Location of Hospitalizations
Registered First Nations by RHA
1998/99

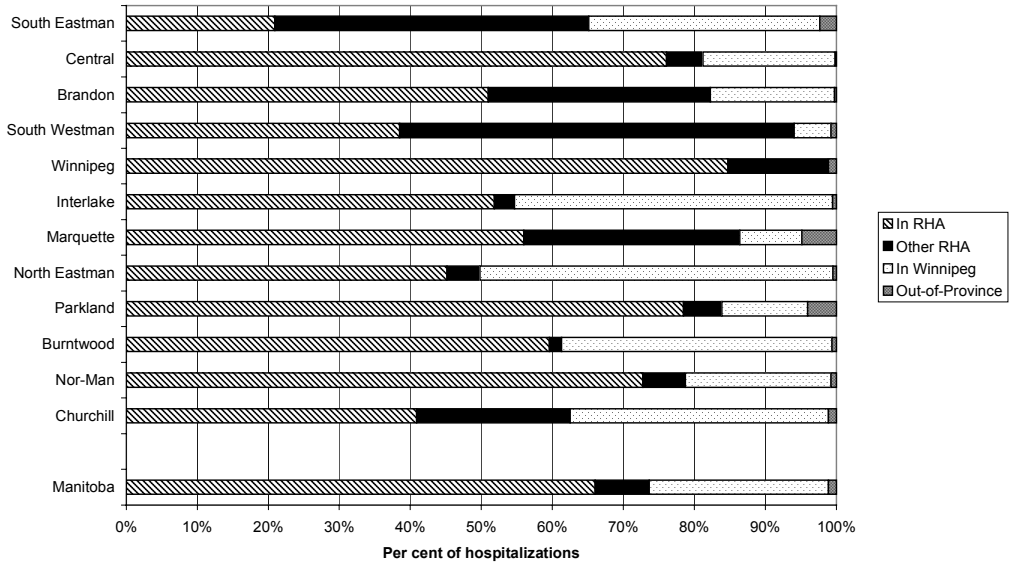


Figure 8.9: Location of Hospitalizations
All other Manitobans by RHA
1998/99

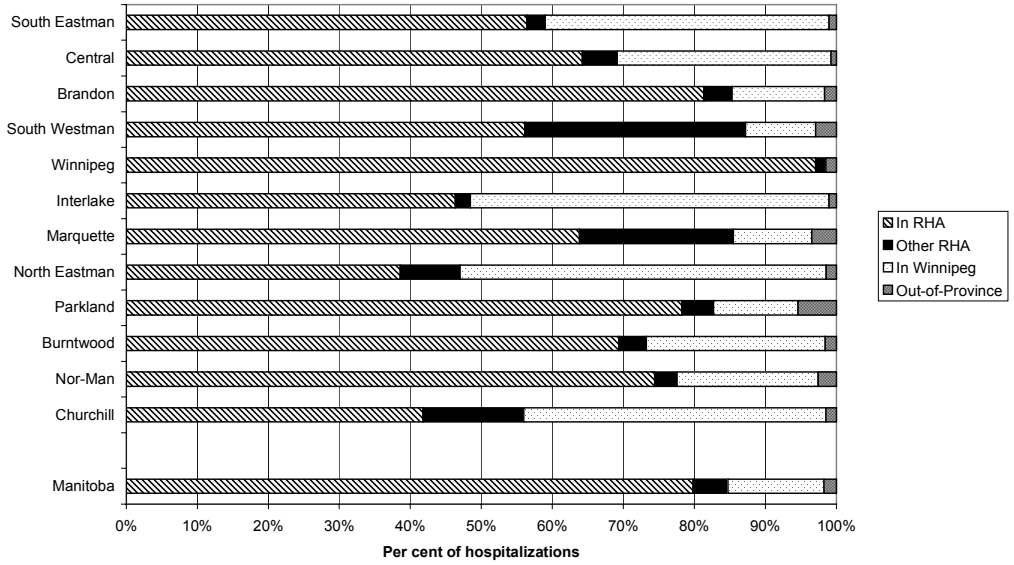


Figure 8.10: Location of Hospitalizations
On-Reserve Registered First Nations by RHA
1998/99

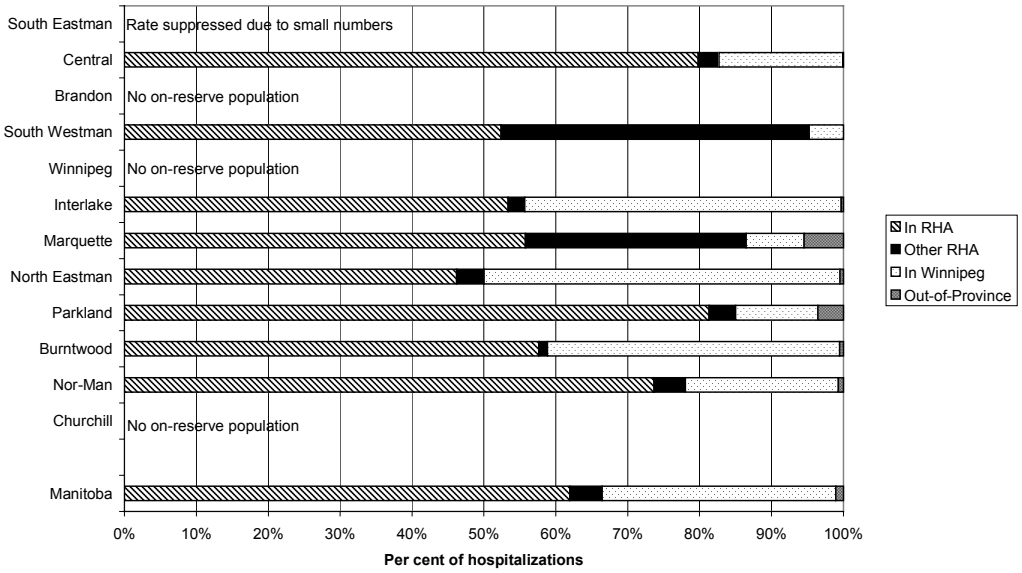
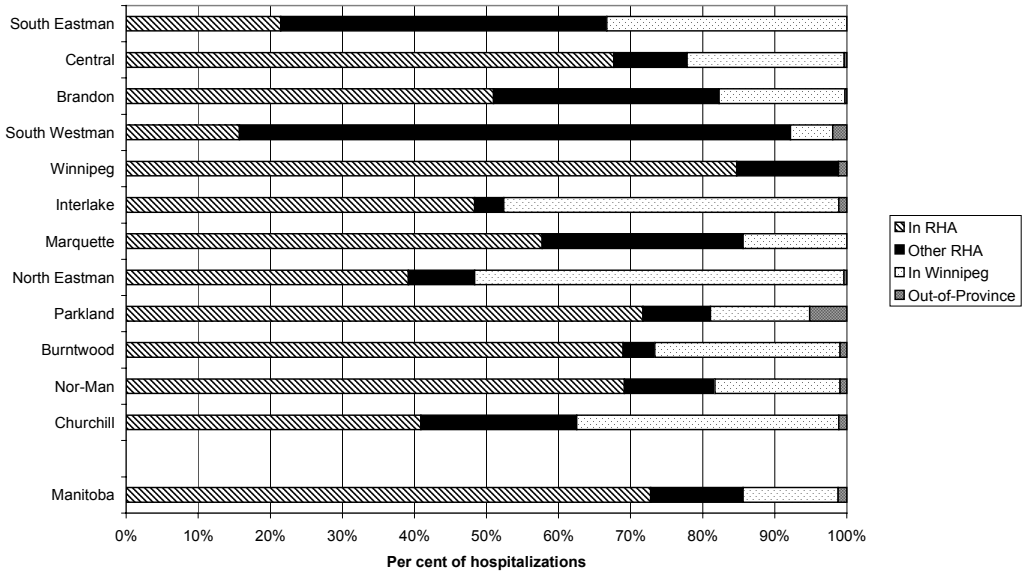


Figure 8.11: Location of Hospitalizations
Off-Reserve Registered First Nations by RHA
1998/99



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Dalrymple AJ, O'Doherty JJ, Nietschei KM. Comparative analysis of Native admissions and registrations to Northwestern Ontario treatment facilities: Hospital and community sectors. Can J Psychiatry 1995; 40:467-73.

DeCoster C, Peterson S, Carriere KC, Kasian P. Assessing the extent to which hospitals are used for acute care purposes. Medical Care 1999; 37(6):JS151-JS166.

Waldram JB, Herring DA, Young TK. *Aboriginal Health in Canada: Historical, Cultural, and Epidemiological Perspectives*. Toronto: University of Toronto Press, 1995.

CHAPTER 9. PROCEDURES

9.1 What's in this chapter?

This chapter contains information on surgical procedures, classified into the three groupings of "high profile," "discretionary," and "adverse outcomes," using the following as indicators:

High profile procedures

- Cardiac catheterization
- Coronary artery bypass graft surgery
- Angioplasty

Discretionary procedures

- Caesarian section
- Hysterectomy
- Tonsillectomy/adenoidectomy

Adverse outcomes procedures

- Amputation associated with diabetes

9.2 Definitions used

"High profile" procedures refer to procedures often portrayed in the media as indicators for access to surgery. These include cardiac catheterization, coronary artery bypass graft surgery, and angioplasty. Cardiac catheterization is considered the most accurate method for identifying the exact location and severity of coronary artery disease. Coronary artery bypass graft surgery is done to create new routes around narrowed and blocked arteries from coronary artery disease, so that more blood can flow to the heart. Angioplasty is another procedure that uses a balloon-tipped catheter to enlarge a narrowing in a coronary artery. See the Glossary in Appendix E for more details about each of these procedures.

"Discretionary" procedures refer to procedures that often show wide variation in rates among physician practices. These procedure rates may change due to changing understanding about indications for, and benefits of, the procedure. These include Caesarian sections, hysterectomy, and tonsillectomy/adenoidectomy. A Caesarian section is a procedure in which a baby is removed from the uterus through surgery, rather than being born vaginally. The World Health Organization has established maximum Caesarian section rates of 10 to 15% of all births, yet the Canadian overall Caesarian section rate was 18.7% in 1997/98 (Canadian Institute for Health Information 2000). Rates tend to increase as maternal age increases. Hysterectomy is a surgical operation to remove a woman's uterus (subtotal hysterectomy), or uterus and cervix (total hysterectomy). Tonsillectomy/adenoidectomy is the surgical removal of the tonsils and/or the adenoids, usually done in situations of recurrent tonsillitis. See the Glossary in Appendix E for more detailed information about each of these procedures. Extensive information on Caesarian section rates and tonsillectomy/adenoidectomy rates in Manitoba is found in MCHP's child health

report (Brownell, Martens, Kozyrskyj et al 2001) in Chapter 8: Quality of Care. This report is available through MCHP, or on our website at www.umanitoba.ca/centres/mchp.

The procedure chosen as an indicator of "adverse outcomes" was the rate of amputation associated with diabetes. Adverse effects may be more frequent depending upon the length of a person's illness, the type of treatment (or lack of treatment) during the illness, or the severity of the illness. Amputation was chosen as an adverse outcome of diabetes, one of the primary illnesses within First Nations communities.

9.3 Key findings

High profile procedures:

- Cardiac catheterization rates for Registered First Nations people are higher than rates for all other Manitobans (3.47 versus 2.65 per thousand). "Off-reserve" RFN rates are higher than "on-reserve" RFN rates (4.08 versus 3.16 per thousand), probably driven by the high Winnipeg RFN "off-reserve" rate (5.32 per thousand). ILTC has a particularly high rate compared to the rest of the Tribal Council areas (5.4 per thousand). Knowing that diabetes often has related complications involving cardiovascular conditions, and knowing that diabetes rates are high in the Registered First Nations people, high rates of cardiac catheterization would be expected for RFN compared to all other Manitobans.
- Rates of coronary artery bypass graft surgery are relatively similar throughout the province, both comparing RFN with all other Manitobans (0.68 versus 0.66 per thousand), and comparing "on-reserve" with "off-reserve" RFN (0.71 versus 0.57 per thousand). The rates seem unrelated to any healthiness indicator and more related to geography, with higher rates around Winnipeg and low rates around Brandon.
- Provincially, RFN and all other Manitobans have similar rates of angioplasty. However, Registered First Nations people living in Winnipeg have 1.7 times the rate of all other Winnipeg people (1.09 versus 0.64 per thousand).

Discretionary procedures:

- Knowing that the World Health Organization estimate of appropriate Caesarian Section rates is 100 to 150 per thousand (10 to 15% of births), adjusted rates for the RFN women of Manitoba at 142 per thousand (crude rate 134 per thousand) appear to be more appropriate than corresponding rates for all other Manitoba women at 173 per thousand (crude rate 176 per thousand). Winnipeg, Nor-Man and Burntwood RHAs show statistically elevated rates for all other women compared to RFN women, at 1.3 to 1.5 times the corresponding rates. Nor-Man RHA's rate for all other Manitoba women is the highest in the province, at 265 per thousand.
- Hysterectomy rates are similar for RFN and all other Manitoba women (5.0 per thousand), and for "on-reserve" and "off-reserve" RFN women (4.9 versus 5.1 per thousand). Elevated hysterectomy rates are evident for everyone living in

Parkland RHA (8.6 per thousand for RFN, 6.9 per thousand for all others), and for RFN women living in WRTC (9.7 per thousand).

- Tonsillectomy/adenoidectomy rates for RFN children are lower than for all other Manitoba children (4.2 versus 5.8 per thousand children ages 0-14 years). However, some RHAs have elevated rates for RFN children (Nor-Man and Interlake), whereas others have elevated rates for all other children (Burntwood and Parkland).

Adverse outcome procedure:

- Diabetes prevalence rates are 4.2 times higher for RFN compared to all other Manitobans (18.9% versus 4.54%), but the population prevalence of amputation due to diabetes is sixteen times higher (3.1 versus 0.19 per thousand ages 20 through 79). This differential is particularly great in Brandon (6.3 versus 0.17 per thousand) and Marquette (6.5 versus 0.09 per thousand). "On-reserve" RFN living in DOTC have the highest tribal council rate in the province, at 6.2 per thousand.

9.4 Canadian Comparisons

Very few Canadian or worldwide comparisons are available for any procedure rates, other than indirect information from the First Nations and Inuit Regional Health Survey National Report 1999 regarding the use of diabetic clinics by First Nations persons.

- Based on the Manitoba First Nations Regional Health Survey (1998:71), only 45% of Manitoba First Nations people with diabetes reported attending a diabetes education clinic, compared with 58% for the overall Canadian First Nations population surveyed. The authors suggest that this may mean people with diabetes may not be receiving appropriate information to help manage their illness. *In our report, the high amputation rate related to diabetes, at sixteen times the rate for all other Manitobans, also points to the need for diabetes education and information to assist in diabetic management. So, too, the disparity of amputation rates within Tribal Council areas, from a low of 1.2 per thousand (Independent First Nations South) to a high of 6.2 per thousand (DOTC) indicates huge variations in diabetes outcomes even within Tribal Council areas of Manitoba.*

9.5 Access to High Profile Procedures

9.5.1 Cardiac Catheterization

Definition: This is the number of cardiac catherization procedures per thousand persons in the region, adjusted for age and sex distribution. It is calculated over a five-year period (1994/95 through 1998/99), since this rare event needs several years of data to be more stable for comparison. Cardiac catheterization is a method for identifying the exact location and severity of coronary artery disease.

How to read the graphs: Because cardiac catheterization is a relatively rare event, much of the data were suppressed, since rates based on five or less events within a group are not reported. Therefore, only two graphs are given for this section. *The "on-reserve"/ "off-reserve" RFN comparison is given at a provincial level only in the comparison chart showing the ranges.* As seen in Figure 9.1, cardiac catheterization rates for Tribal Councils are quite similar, with only one Tribal Council having a significantly higher rate – ILTC at 5.4 per thousand, compared to the overall "on-reserve" RFN rate of 3.2 per thousand. Comparing Registered First Nations people to all other Manitobans (Figure 9.2) shows higher cardiac catherization rates for RFN (3.47 versus 2.65 per thousand). RFN rates are significantly (*) higher in three RHAs – Winnipeg, North Eastman and Parkland. One area of note is the low rates in the tri-region of Brandon/South Westman/Marquette for all other Manitobans (and presumably for RFN, though many rates are suppressed due to small numbers).

Range of cardiac catheterization rates:

Tribal Council:	1.9 per thousand (KTC) to 5.4 (ILTC)
RHA Registered First Nations:	1.36 (Marquette) to 5.32/6.74 (Winnipeg/Churchill)
RHA all other Manitobans:	1.30/1.36/1.78 (South Westman/Marquette/Brandon) to 2.75/2.94 (Interlake/Winnipeg)
"On-reserve"/ "off-reserve":	3.16 versus 4.08 per thousand

Key messages:
There is an elevated rate of cardiac catheterizations for Registered First Nations people compared to all other Manitobans (3.47 versus 2.65 per thousand). This is particularly evident for "off-reserve" RFN compared to "on-reserve" RFN (4.08 versus 3.16 per thousand), and probably driven mainly by the high Winnipeg RFN rate (5.32 per thousand). One northern Tribal Council, ILTC, has high cardiac catheterization rates (5.4 per thousand). The tri-region area of Brandon/South Westman/Marquette appears to have particularly low rates.

Figure 9.1: Direct Adjusted Cardiac Catheterization Rates per 1,000 Population by Tribal Council 1994/1995 - 1998/1999

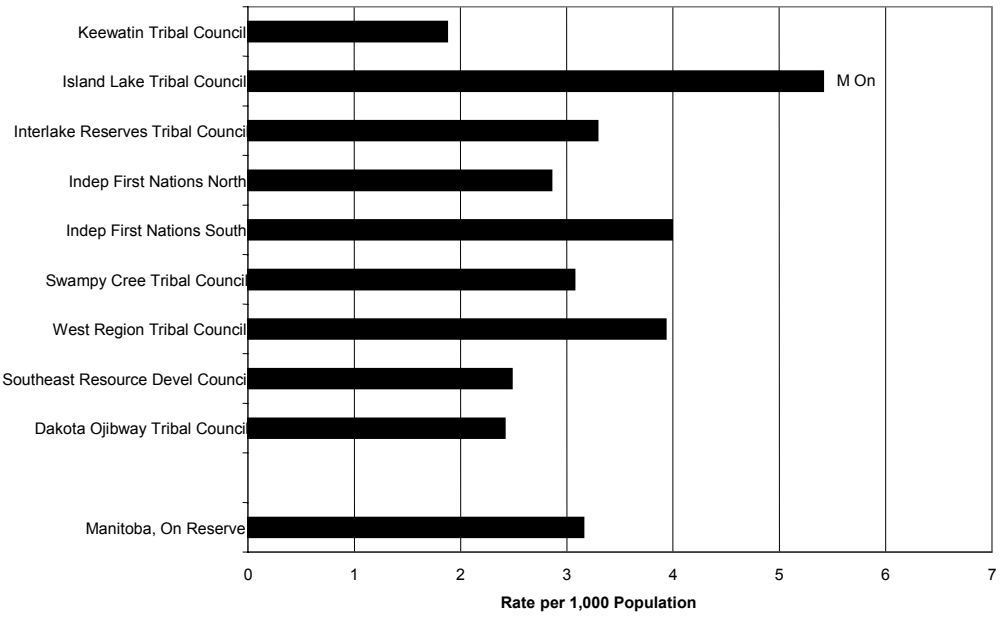
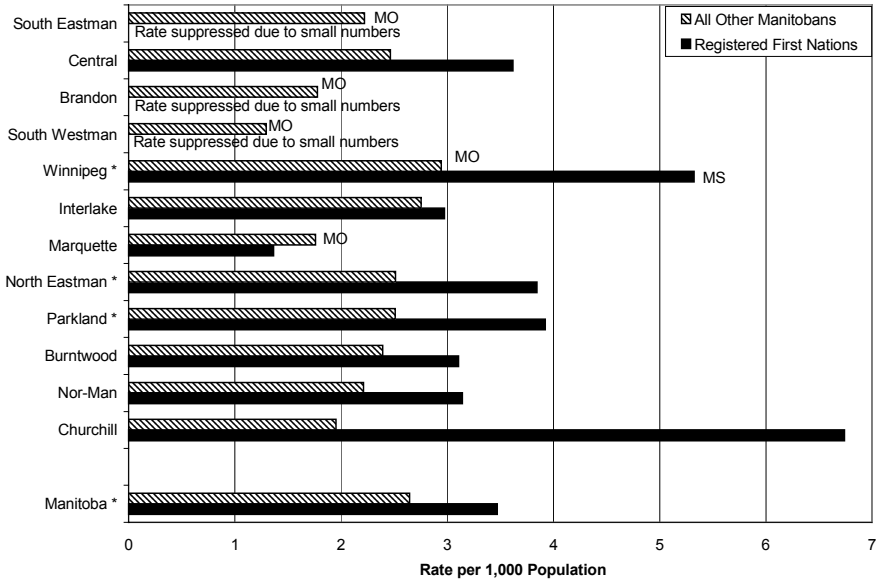


Figure 9.2: Direct Adjusted Cardiac Catheterization Rates per 1,000 Population Registered First Nations vs. All Other Manitobans by RHA 1994/1995 - 1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

9.5.2 Coronary artery bypass graft surgery

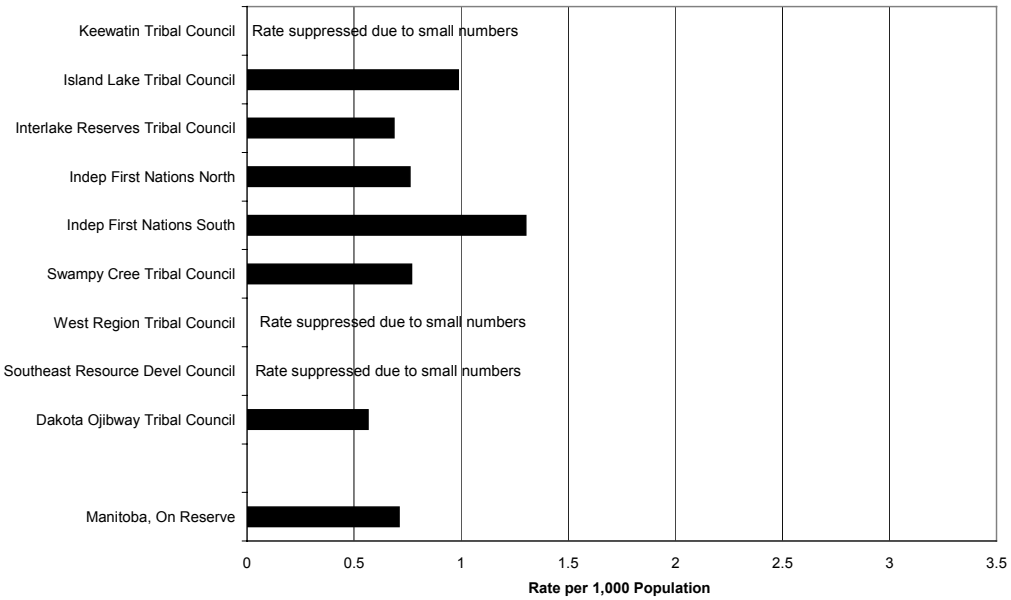
Definition: This is the number of coronary artery bypass surgeries per thousand persons in the region, adjusted for age and sex differences by region. Because this is a rare event, the rate was calculated over a period of five years (1994/95 through 1998/99) to give a more stable estimate. Coronary artery bypass graft surgery creates new routes around narrowed and blocked arteries from coronary artery disease, so that more blood can flow to the heart.

How to read the graphs: Because coronary artery bypass graft surgery (CABGS) is a relatively rare event, much of the data were 'suppressed' (five or less events within a group). Therefore, only two graphs are given for this section, and the "on-reserve" / "off-reserve" RFN comparison is reported in the comparison chart showing the ranges. Figure 9.3 shows the relative similarity of CABGS rates throughout all Tribal Councils, with an overall provincial "on-reserve" rate of 0.71 per thousand. Once again, Figure 9.4 shows similar rates at the provincial level when comparing RFN to all other Manitobans (0.68 versus 0.66 per thousand), and all RHAs also show similar rates (that is, not statistically significant, since there is no asterisk * in the column). The striking feature is the low rates in the tri-region of Brandon/South Westman/Marquette for all other Manitobans (and presumably for RFN, though the rates are suppressed due to small numbers).

Range of Coronary artery bypass graft surgery:

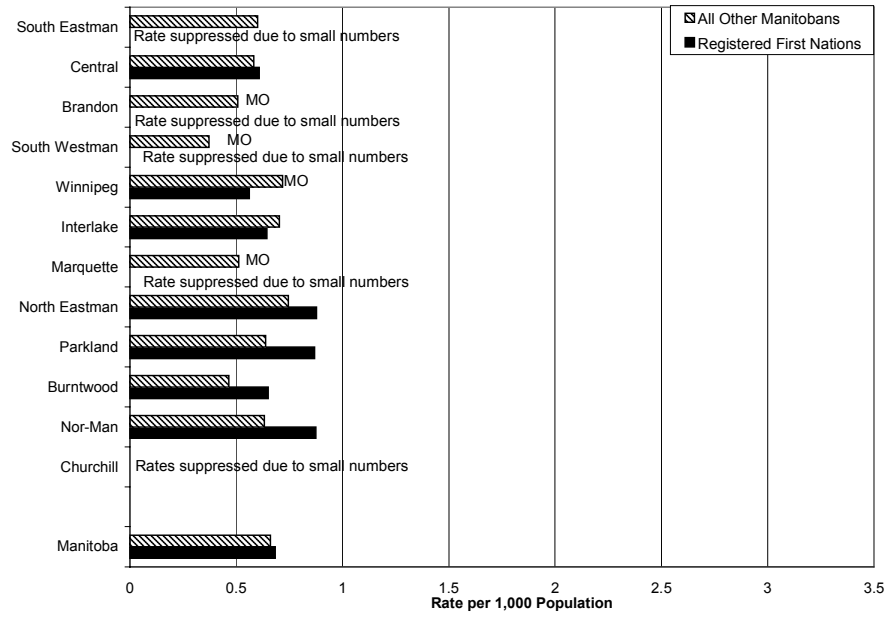
Tribal Council:	many suppressed rates, but overall rates of 0.71 per thousand
RHA Registered First Nations:	many suppressed rates, but 0.56 (Winnipeg) to 0.87/0.87/0.88 Nor-Man/Parkland/North Eastman
RHA all other Manitobans:	0.37 (South Westman) to 0.70/0.72/0.75 (Interlake/Winnipeg/North Eastman)
"On-reserve"/ "off-reserve":	0.71 versus 0.57 per thousand (not statistically different)

Figure 9.3: Direct Adjusted Coronary Artery Bypass Surgery Rates per 1,000 Population by Tribal Council 1994/1995 - 1998/1999



***Key messages**: Rates of coronary artery bypass graft surgery are relatively similar throughout the province, both by RFN compared with all other Manitobans (0.68 versus 0.66 per thousand), and by "on-reserve" compared with "off-reserve" RFN (0.71 versus 0.57 per thousand). The rates seem unrelated to any health status indicator, and more related to geography, with higher rates around Winnipeg and low rates around Brandon for all other Manitobans.*

Figure 9.4: Direct Adjusted Coronary Artery Bypass Surgery Rates per 1,000 Population Registered First Nations vs. All Other Manitobans by RHA 1994/1995 - 1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

9.5.3 Angioplasty

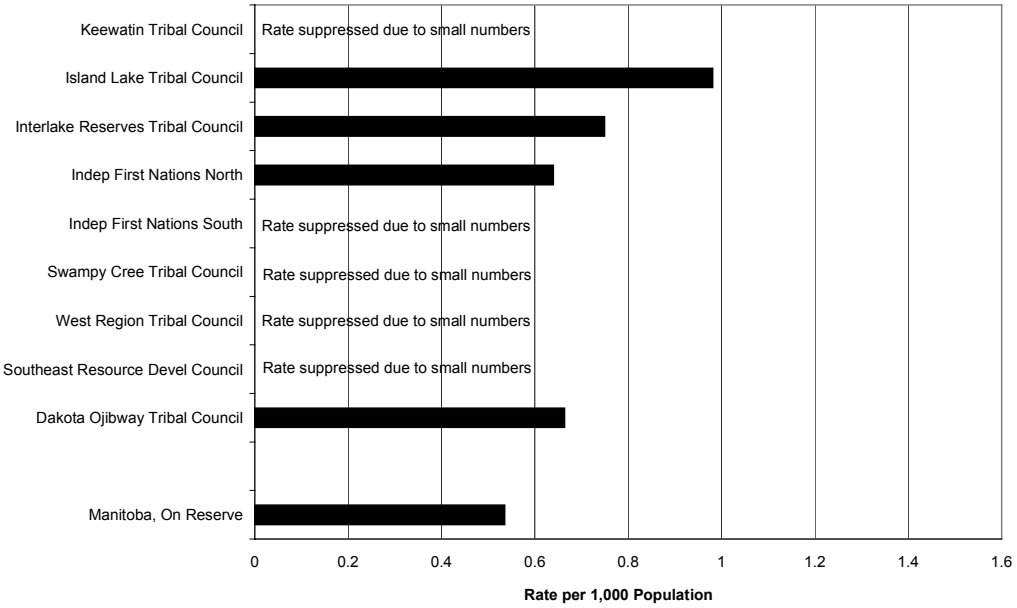
Definition: This is the number of angioplasty procedures per thousand persons in the region, adjusted for age and sex differences by region. Because this is a rare event, the rate was calculated over a period of five years (1994/95 through 1998/99) to give a more stable estimate. Angioplasy is a procedure that uses a balloon-tipped catheter to enlarge a narrowing in a coronary artery.

How to read the graphs: Because angioplasty is a relatively rare event, much of the data were 'suppressed' (five or less events within a group). Therefore, only two graphs are given for this section, and the "on-reserve"/"off-reserve" RFN comparison is given at a provincial level only in the comparison chart showing the ranges. In Figure 9.5, most rates were suppressed due to small numbers, but those that are evident are all higher than the Manitoban "on-reserve" rate of 0.53. Presumably, most of the suppressed rates would be lower. Although not statistically higher, ILTC's higher angioplasty rate of 0.98 shows a similar pattern to Figure 9.1, where ILTC also had the highest cardiac catheterization rate of all the Tribal Councils. In Figure 9.6, RFN in Winnipeg and Central RHAs have the highest rates in the province. For all other Manitobans, two RHAs have lower than average rates (South Westman and Marquette). However, at the provincial level there is no statistically significant difference in angioplasty rates between RFN and all other Manitobans (0.61 versus 0.57 per thousand), nor between "on-reserve" and "off-reserve" RFN (0.53 versus 0.78 per thousand).

Range of angioplasty rates per thousand:

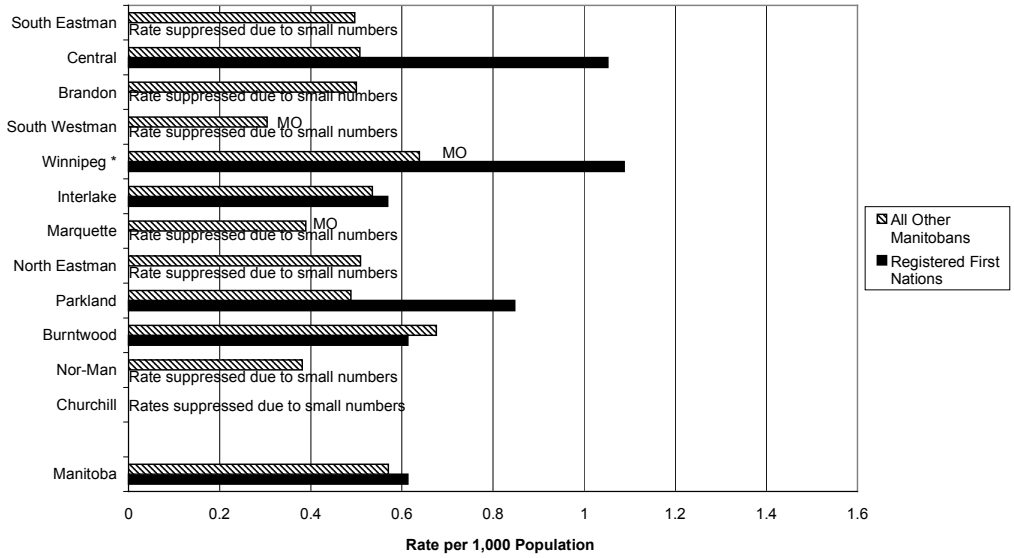
Tribal Council:	many suppressed rates, but overall rate is 0.53 per thousand
RHA Registered First Nations:	low rates are suppressed – high rates are Central/Winnipeg (1.05/1.09), overall provincial rate is 0.61 per thousand
RHA all other Manitobans:	0.37 (South Westman) to 0.70/0.72./0.75 (Interlake, Winnipeg/ North Eastman
"On-reserve"/ "off-reserve":	0.53 versus 0.78

Figure 9.5: Direct Adjusted Angioplasty Rates per 1,000 Population by Tribal Council 1994/1995 - 1998/1999



Key messages:
Provincially, RFN and all other Manitobans have similar rates of angioplasty. Registered First Nations people living in Winnipeg RHA have 1.7 times higher rates compared to all other Winnipeg people (1.09 versus 0.64 per thousand).

Figure 9.6: Direct Adjusted Angioplasty Rates per 1,000 Population Registered First Nations vs. All Other Manitobans by RHA 1994/1995 - 1998/1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

9.6 Discretionary Procedures

9.6.1 Caesarian Section Rates

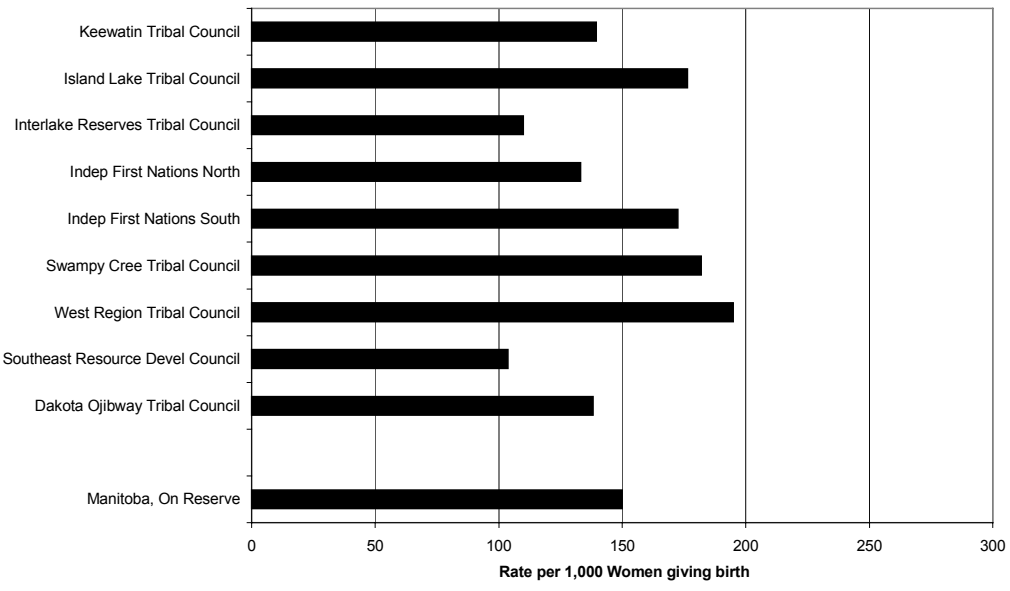
Definition: This is the number of Caesarian section procedures per thousand women giving birth, adjusted for the maternal age distribution (since it is known that as maternal age increases, so does the risk of having a Caesarian section birth). It has been calculated using three years of data (1996/97 through 1998/99).

How to read the graphs: Figures 9.7 through 9.9 show a rate per thousand women giving birth. To convert these rates to percentages, simply divide the rate by ten. For example, the overall "on-reserve" rate of 150 per thousand women could also be stated as 150/10 or 15% of the births being Caesarian Sections. Figure 9.7 shows the random way in which Caesarian section rates vary, with no relationship to a regional population's health status (i.e., as you go down the graph). Provincially, RFN women have a statistically (*) lower rate than all other Manitoban women (142 versus 173 per thousand), and most RHAs reflect this pattern (either similar or lower rates for RFN). Nor-Man rates for all other Manitoban women are the highest in the province (265 per thousand), whereas RFN women in Nor-Man have much lower rates (176 per thousand) that are similar to the provincial average for all other Manitoban women. Rates for "on-reserve" and "off-reserve" RFN women are similar in RHAs and provincially. Note that no matter where the woman gave birth, the Caesarian section would be attributed back to the region of residence. This is a "population-based" approach rather than a "facility-based" approach. In regions with high rates, planners need to look at where women are giving birth, whether it be within the region or elsewhere. Facility-based rates for Caesarian sections are given in the *Manitoba Perinatal Surveillance Report* (1999).

Range of Caesarean Section rates per thousand:

Tribal Council:	104/110 (SERDC/IRTC) to 195 (WRTC)
RHA Registered First Nations:	113/130/134/134 (North Eastman/Burntwood/Winnipeg/Interlake) to 183/192/209 (Brandon/South Westman/Marquette)
RHA all other Manitobans:	141 (South Eastman) to 265 (Nor-Man)
"On-reserve"/ "off-reserve":	150 versus 134

Figure 9.7: Direct Adjusted C-Section Rates per 1,000 Women giving birth by Tribal Council 1996/97 - 1998/99



Key messages:
Knowing that the World Health Organization estimate of appropriate Caesarian Section rates is 100 to 150 per thousand (10 to 15% of births), both the age-adjusted and the crude rates for the RFN women of Manitoba (142 per thousand; crude rate 134 per thousand) appear to be more appropriate than corresponding rates for all other Manitoba women (173 per thousand; crude rate 176 per thousand). Caesarian section rates could indeed be considered "discretionary," with rates driven more by geographical variation than by population health status. Winnipeg, Nor-Man and Burntwood RHAs show statistically elevated rates for all other women compared to RFN women, at 1.3 to 1.5 times the corresponding rates. Nor-Man RHA's rate for all other Manitoba women is the highest in the province, at 265 per thousand.

Figure 9.8: Direct Adjusted C-Section Rates per 1,000 Women giving birth
Registered First Nations vs. All Other Manitobans by RHA
1996/97 - 1998/99

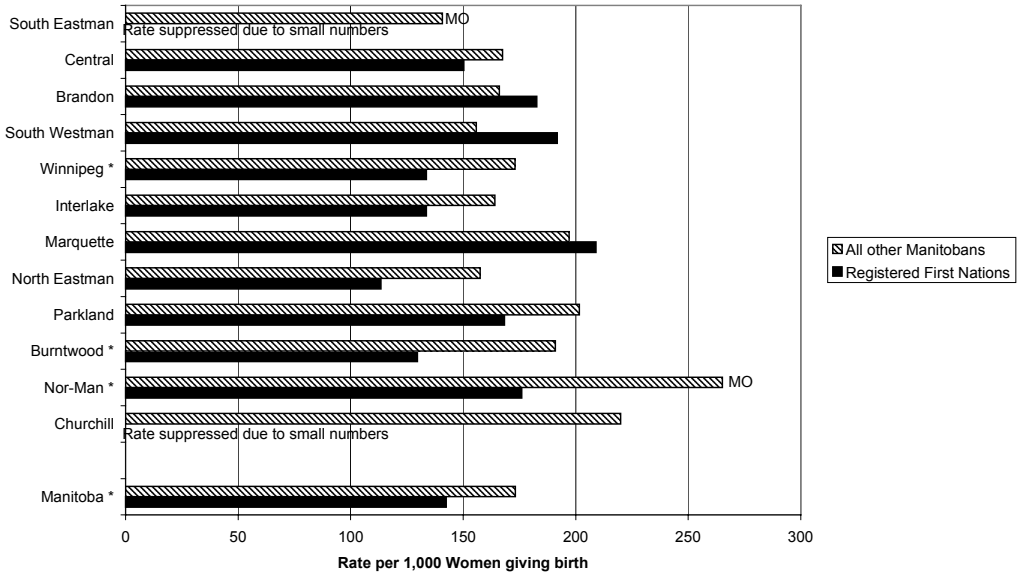
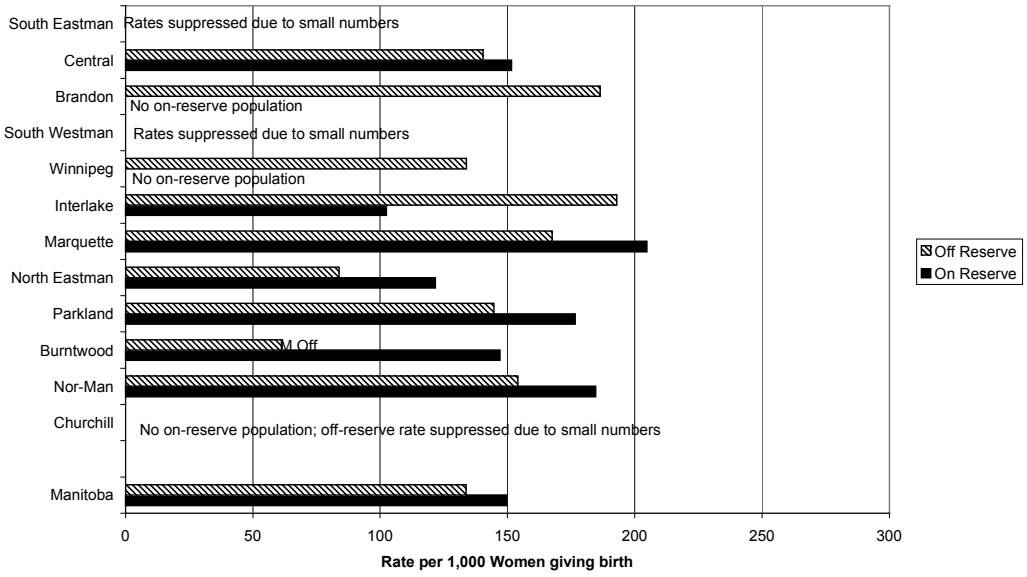


Figure 9.9: Direct Adjusted C-Section Rates per 1,000 Women giving birth
Off Reserve vs. On Reserve Registered First Nations by RHA
1996/97 - 1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

9.6.2 Hysterectomy Rate

Definition: This is the number of hysterectomy surgeries per thousand women age 25 or more, adjusted for the age distribution of women in the region. Hysterectomy is a surgical operation to remove a woman's uterus (subtotal hysterectomy), or uterus and cervix (total hysterectomy).

How to read the graphs: There appears to be no relationship between regional population health status healthiness and the hysterectomy rates, either for RFN or for all other Manitoba women. Overall hysterectomy rates are similar for RFN women living "on-reserve" throughout Manitoba (Figure 9.10), for all RFN women compared to all other Manitoba women (Figure 9.11), and for "on-reserve" and "off-reserve" RFN women (Figure 9.12), with provincial rates of 5 per thousand. However, there are geographical locations that appear to be anomalies. One Tribal Council – WRTC – has a rate almost double the provincial average (9.7 versus 4.9 per thousand). Similarly, Parkland RHA has elevated rates for both RFN women (8.6) and all other women (6.9) living in the RHA. This is also evident for "on-reserve" RFN in Parkland, with a rate statistically higher than the overall Manitoba "on-reserve" rate (9.0 versus 4.9 per thousand).

Range of Hysterectomy rate per thousand:

Tribal Council:	2.8 (KTC) to 9.7 (WRTC)
RHA Registered First Nations:	3.5/4.0 (Brandon/Burntwood) to 8.6 (Parkland)
RHA all other Manitobans:	4.3/4.7 (Burntwood/Winnipeg) to 6.9 (Parkland)
"On-reserve"/ "off-reserve":	4.9 versus 5.1

Figure 9.10: Direct Adjusted Hysterectomy Rates per 1,000 women age ≥ 25 years by Tribal Council 1994-1999

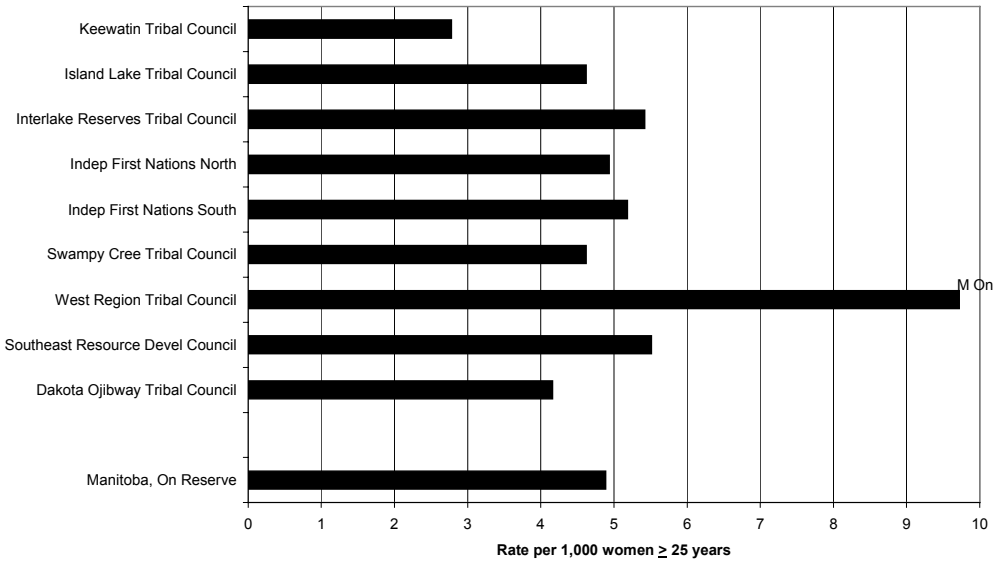
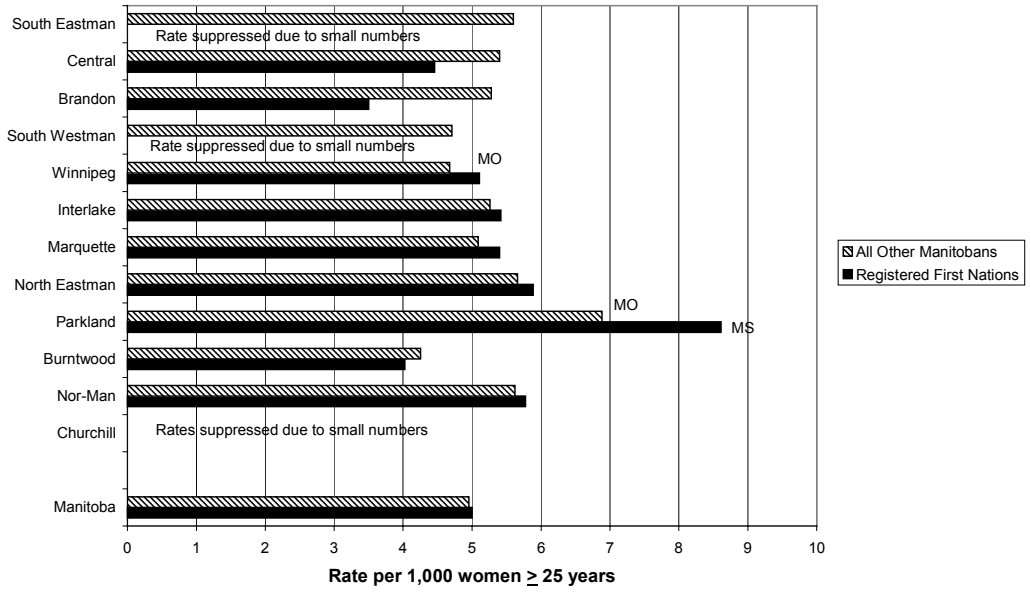


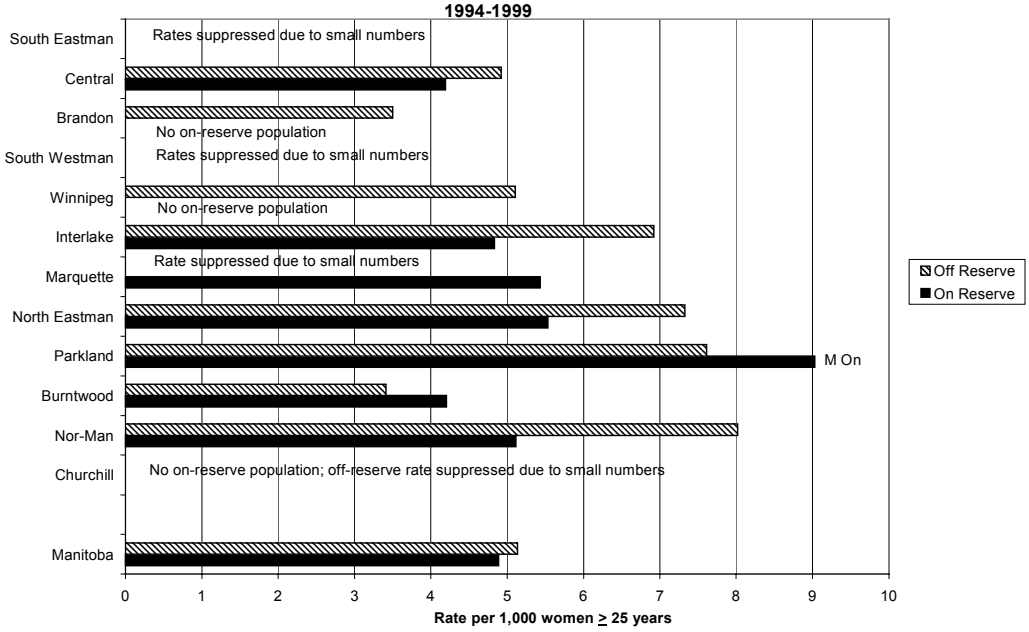
Figure 9.11: Direct Adjusted Hysterectomy Rates per 1,000 women age ≥ 25 years Registered First Nations vs. All other Manitobans by RHA 1994-1999



Key messages:

Hysterectomy rates could indeed be considered "discretionary," with rates driven more by geographical variation than by health need. Hysterectomy rates are similar for RFN and all other Manitoba women (5.0 per thousand), and for "on-reserve" and "off-reserve" RFN women (4.9 versus 5.1 per thousand). Elevated hysterectomy rates are evident for all women living in Parkland RHA (8.6 RFN, 6.9 per thousand for all others), and for WRTC (9.7 per thousand).

Figure 9.12: Direct Adjusted Hysterectomy Rates per 1,000 women age ≥ 25 years Off Reserve vs. On Reserve Registered First Nations by RHA 1994-1999



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

9.6.3 Tonsillectomy/Adenoidectomy Rate

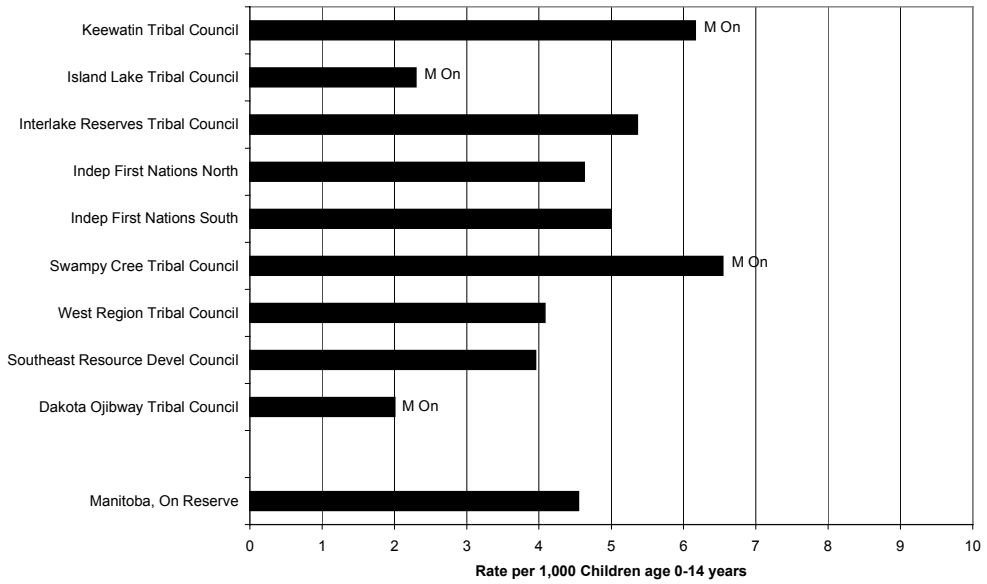
Definition: This is the number of tonsillectomy/adenoidectomy surgeries (removal of tonsils and/or adenoids) per thousand children ages 0 through 14 years living in the area. The rate is based upon five years (1994/95 through 1998/99) of data.

How to read the graphs: There appears to be little relationship between regional population health status and the tonsillectomy/adenoidectomy rates, either for Registered First Nations children or for all other Manitoba children. Figure 9.13 shows low, high and average rates in different northern Tribal Councils – ILTC at 2.3, KTC at 6.2, SCTC at 6.5, and Independent FN North at 4.6 per thousand. In Figure 9.14, rates are lower for RFN children compared to all other Manitoba children (4.2 versus 5.8 per thousand). This pattern is reflected in most of the RHAs including Winnipeg (3.4 RFN versus 5.1 all others, per thousand), despite its lower overall rates. For RFN children, high rates occur in Nor-Man and Interlake, but for all other children, high rates occur in Burntwood and Parkland RHAs. In Figure 9.15, "on-reserve" and "off-reserve" RFN children have similar rates provincially (5.1 versus 5.2 per thousand), but "on-reserve" children in Interlake and Nor-Man have particularly high rates.

Range of Tonsillectomy/Adenoidectomy rate per thousand:

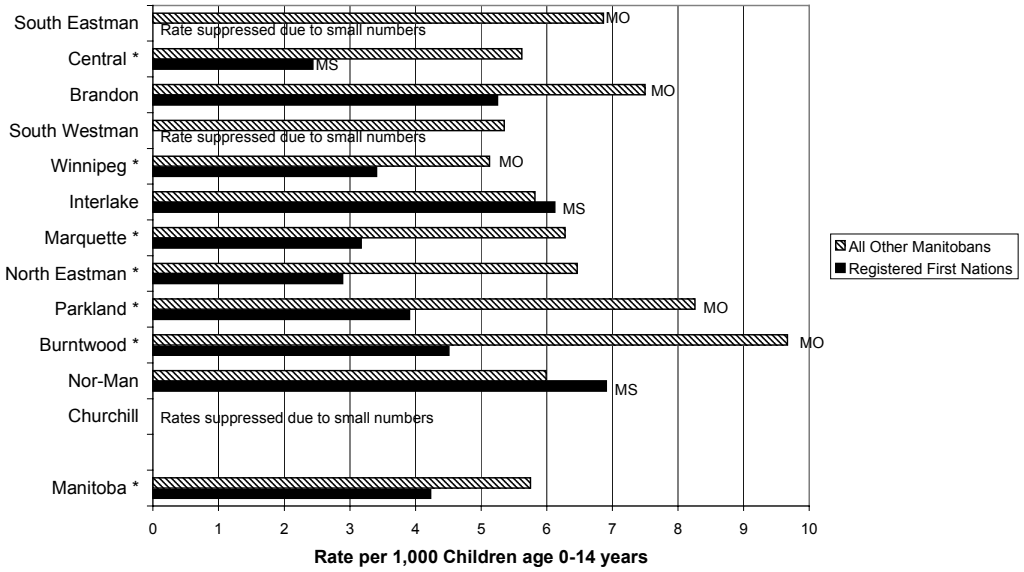
Tribal Council:	2.0/2.3 (DOTC/ILTC) to 6.2/6.5 (KTC/SCTC)
RHA Registered First Nations:	2.4/2.9 (Central/North Eastman) to 6.1/6.9 (Interlake/Nor-Man)
RHA all other Manitobans:	5.1 (Winnipeg) to 8.3/9.7 (Parkland/Burntwood)
"On-reserve"/ "off-reserve":	5.1 versus 5.2 per thousand

Figure 9.13: Direct Adjusted Tonsillectomy/Adenoidectomy Rates per 1,000 Children age 0-14 years by Tribal Council 1994/95-1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN

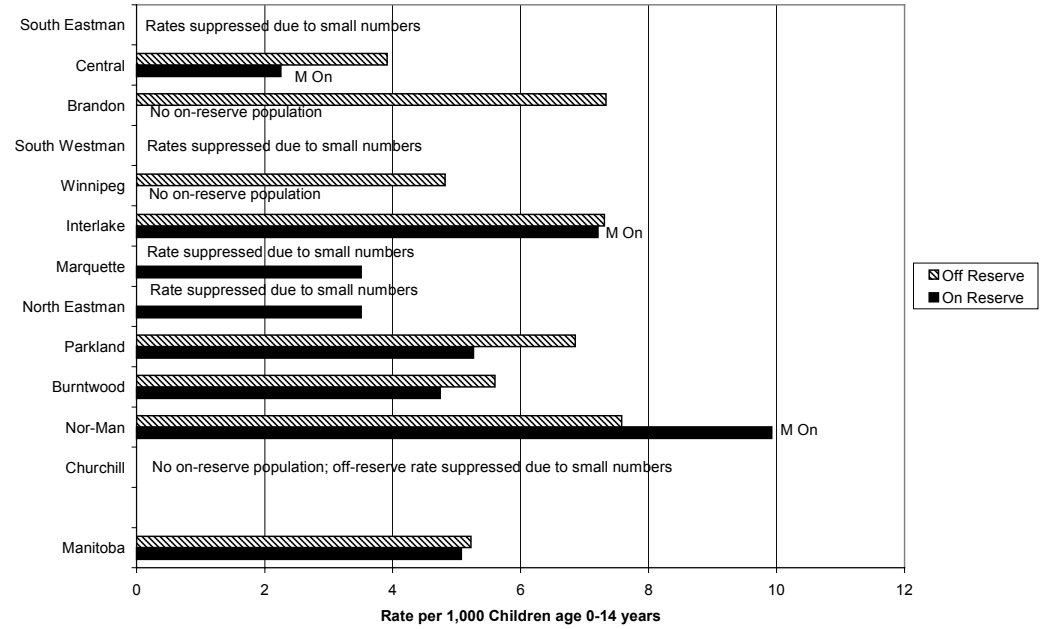
Figure 9.14: Direct Adjusted Tonsillectomy/Adenoidectomy Rates per 1,000 Children age 0-14 years, Registered First Nations vs. All Other Manitobans by RHA 1994/95-1998/99



Key messages:
Tonsillectomy/ Adenoidectomy rates for RFN children are lower than for all other Manitoba children (4.2 versus 5.8 per thousand children ages 0-14 years), with similar patterns seen throughout most of the RHAs. However, some RHAs have particularly elevated rates: RFN children in Nor-Man and Interlake; all other children in Burntwood and Parkland.

Statistical Notation:
MS – significantly different from MB rate for RFN
MO – significantly different from MB rate for all other Manitobans
* within RHA, RFN rate significantly different from all other MB rate

Figure 9.15: Direct Adjusted Tonsillectomy/ Adenoidectomy Rates per 1,000 Children 0-14 years, Off Reserve vs. On Reserve Registered First Nations by RHA 1994/95-1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
* within RHA, On-Reserve rate significantly different from Off-Reserve rate

9.7 Adverse Outcomes

9.7.1 Population prevalence of amputation due to diabetes

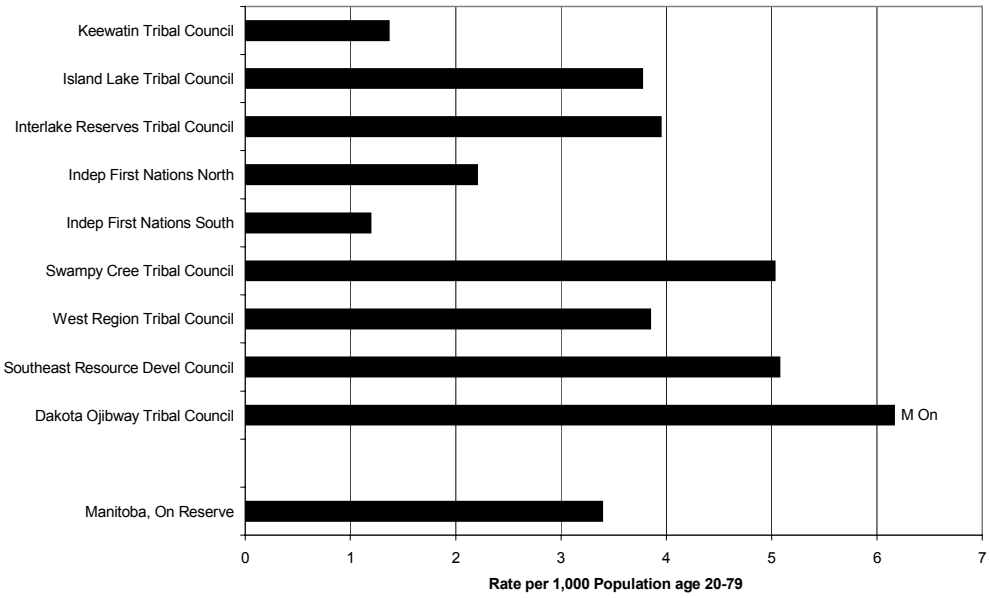
Definition: This is the number of lower limb amputations due to diabetes, per thousand persons in the region (including both diabetics and non-diabetics) ages 20 through 79 years old. It is adjusted for age and sex differences by region. This does not include all amputations, but rather only those for which there was an existing condition of diabetes coded along with the amputation.

How to read the graphs: There is a strong relationship between the health status of a region's population, and the regional population prevalence of amputation due to diabetes (Spearman's correlation coefficient $r=0.70$, one-tailed, $p<0.02$). In Figure 9.16, the rate tends to increase as you go down the graph of Tribal Councils. Similarly, in Figure 9.17, rates increase as you go down the graph of RHAs for all other Manitobans. Not surprisingly, these patterns also correspond with those for the condition of diabetes itself (see Chapter 5). DOTC is the only Tribal Council with statistically higher population prevalence of amputation due to diabetes than the overall RFN "on-reserve" rate (6.2 versus 3.4 per thousand). The population prevalence of amputation due to diabetes is extremely high for RFN in every region compared to all others in the region, and is sixteen times higher at the provincial level (3.1 versus 0.19 per thousand). This differential is wide-ranging: 5 times higher in Burntwood, 15 times higher in Winnipeg, 36 times higher in Brandon, and 71 times higher in Marquette RHA. This must be viewed in context of the higher underlying prevalence rates of diabetes for RFN compared to all other Manitobans, at 18.9% versus 4.54% (see Chapter 5). However, knowing that diabetes rates are 4.2 times higher for RFN compared to all other Manitobans still does not explain the *sixteen*-fold difference in the population prevalence of amputation due to diabetes. It appears that RFN diabetics have a fourfold risk of amputation compared to other Manitoban diabetics. The prevalence for RFN seem to be particularly high in the Marquette and Brandon regions in both Figures 9.17 and 9.18, whereas the prevalence for all other Manitobans living in the Marquette/Brandon RHAs are similar to the provincial average. At a provincial level, population prevalence of amputation due to diabetes is statistically similar for "on-reserve" and "off-reserve" RFN (3.3 versus 2.6 per thousand).

Range of Population Prevalence of Amputation with Diabetes Comorbidity, per thousand ages 20 through 79 years:

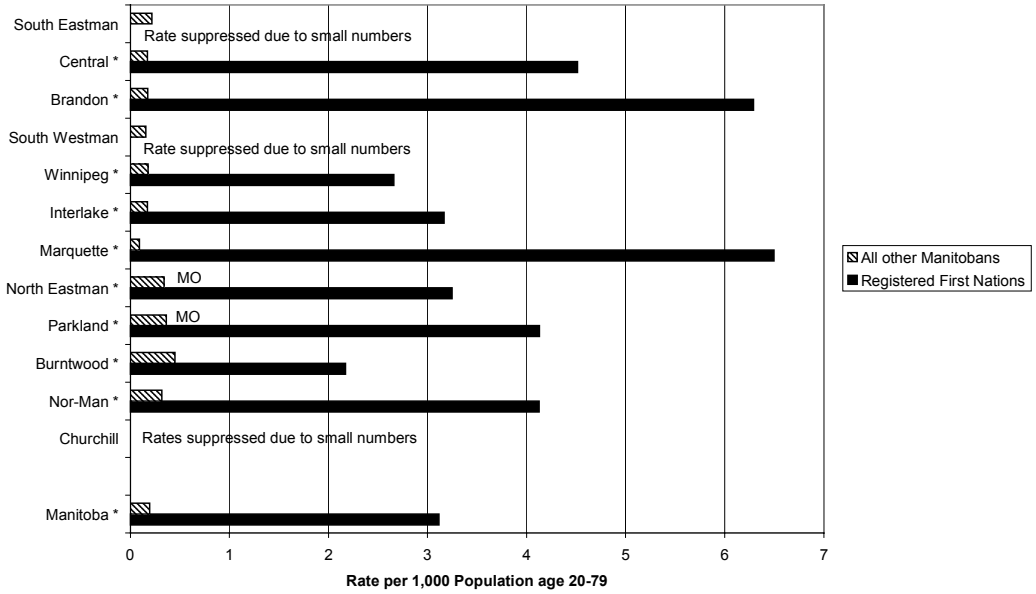
Tribal Council:	1.2/1.4 (Independent FN South/KTC) to 6.2 (DOTC)
RHA Registered First Nations:	2.2/2.7 (Burntwood/Winnipeg) to 6.3/6.5 (Brandon/Marquette)
RHA all other Manitobans:	0.09/.16/.17 (Marquette/South Westman/Brandon) to 0.34/0.36/0.45 (North Eastman/Parkland/Burntwood)

Figure 9.16: Direct Adjusted Population Prevalence of Amputation with Diabetes Comorbidity per 1,000 Population age 20-79, by Tribal Council 1994/95 - 1998/99



Statistical Notation:
M On – significantly different from MB rate for On-Reserve RFN

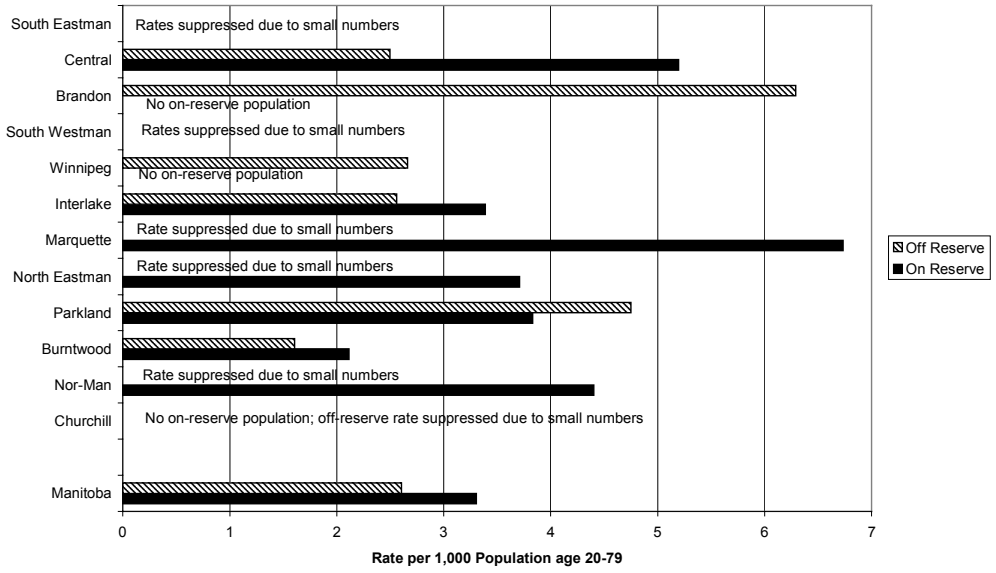
Figure 9.17: Direct Adjusted Population Prevalence of Amputation with Diabetes Comorbidity, per 1,000 Population age 20-79 Registered First Nations vs. All Other Manitobans by RHA 1994/95 - 1998/99



Key messages:
Diabetes prevalence rates are 4.2 times higher for RFN compared to all other Manitobans (18.9% versus 4.54%), but amputation rates related to diabetes complications are sixteen times higher (3.1 versus 0.19 per thousand). This differential is particularly high in Brandon and Marquette. RFN persons living in DOTC, and in Brandon or Marquette RHAs, have the highest amputation rates in the province.

Statistical Notation:
MS – significantly different from MB rate for RFN
MO – significantly different from MB rate for all other Manitobans
* within RHA, RFN rate significantly different from all other MB rate

Figure 9.18: Direct Adjusted Population Prevalence of Amputation with Diabetes Comorbidity, per 1,000 Population age 20-79 Off Reserve vs. On Reserve Registered First Nations by RHA 1994/95 - 1998/99



Statistical Notation:
M On: significantly different from MB rate for On-Reserve RFN
M Off: significantly different from MB rate for Off-Reserve RFN
MS: significantly different from Manitoba rate for RFN
MO: significantly different from MB rate for all other Manitobans
* within RHA, the two group rates are significantly different

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CHAPTER 10. DETERMINANTS OF HEALTH

10.1 What's in this chapter?

This chapter includes indicators that relate to underlying determinants of health, such as education, income, employment, and housing issues:

- Education level of Registered First Nations people (RFN), by Tribal Council area and by Winnipeg Community Area (Winnipeg CA)
- Average income per household and per census family, by Tribal Council area
- Unemployment rate, by Tribal Council area and by Winnipeg CA
- Housing issues, including:
  - Housing quality
  - Average persons per housing unit
  - Modern plumbing

10.2 Definitions and data used for indicators of health determinants

Most of the indicators in this chapter are reported for Tribal Council areas. Two of the indicators were also available for Registered First Nations people living in the twelve Winnipeg CAs. The majority of data on determinants of health comes from Statistics Canada 1996 Census Basic Summary Tabulations. These data are a 20% sample of the population 15 years of age and over, excluding institutional residents. Both *Basic Profile* data and *Target Group Profile* data were used for the analyses. Graphs produced with Statistics Canada data include: educational level, average household income and census family income, and unemployment rate.

For the income information, a "household" refers to all persons who live within the same dwelling, regardless of their relationship to each other. Household income is the sum of incomes of all persons in the household. A "census family" refers to couples (married or common-law), with or without children, and lone parents with at least one child, living within the same dwelling. Census family income is the sum of incomes of all members of the census family. As well, a provincial figure for the average persons per total housing units for the general population of Manitoba (2.6 persons per housing unit) was derived from the Statistics Canada 1996 Census, and included as a comparison on the housing graphs.

All of the information on housing within Tribal Council areas was derived from public report summaries of Indian and Northern Affairs Canada (INAC), specifically the *Housing and Infrastructure Assets Summary Reports* from 1998/99. To obtain Tribal Council area rates, First Nations communities were grouped according to the organizational chart used in this report (explained in Chapter 3). The following indicators are reported:

- Distribution of Housing Quality
- Proportion of housing units which could be called "habitable housing"
- Average number of persons per total housing units
- Average number of persons per habitable housing unit
- Proportion of housing units that lack modern plumbing systems

A *housing unit* is defined as any self-contained dwelling unit in a First Nations community with at least one bedroom and considered to be a main residence (as opposed to seasonal or vacation home) irrespective of occupancy, need for renovation or repair. It may be a detached or semi-detached house, a mobile home, a row house or a multi-unit residence or apartment where each unit may be counted separately. In this chapter, we have used the four descriptors of housing quality found in the INAC reports: adequate, requires minor renovation, requires major renovation, and requires replacement. These terms are more fully described in the indicator section within this chapter, as well as in the Glossary (Appendix E) of this report.

For calculations on average numbers of persons per housing unit, we have used the reported "on-reserve" population from the INAC reports. These numbers may differ slightly from those in the administrative database used throughout the rest of the chapters of the report. Appendix B contains a table reporting the various population numbers from different sources, including the INAC reports and our MCHP report numbers.

First Nation housing is reportedly among the worst in Canada. With a birth rate double the national average, there is an ever-increasing demand for housing in many communities. Having too few houses results in overcrowding, a problem that has far-reaching consequences. In the *Manitoba First Nations Regional Health Survey* Community Consultations section (1998:9), First Nations persons interviewed about housing stated that there were many problems, including shortages in housing which resulted in overcrowding, illness, family tension, and unsanitary conditions. Housing conditions are directly related to the health of people, in terms of both physical and emotional illness. Many of those interviewed also reported that houses were poorly constructed and are now in need of major repair. As well, many households do not have access to indoor plumbing, and the situation may have implications for the health of water supplies in the area.

10.3 Key findings

Education level

- Educational attainment, as measured by the completion of high school, is much lower in RFN groups than in the general Manitoba population. In 1996, only 33.5% of RFN (and 27.9% of RFN "on-reserve") completed high school, in comparison with 58.7% of the general population. In Winnipeg, the high school completion rate for the general population is 64.9%, whereas RFN rates vary from 28.3% in Point Douglas to 61.6% in Fort Garry. There is a strong

relationship between the health status (PMR) of the RFN in Winnipeg CAs and the proportion completing high school.

Income

- The average income of "on-reserve" Registered First Nations people in Manitoba for the year 1996 was substantially lower than the Manitoba average, whether it be compared by "household" ($25,687 RFN versus $43,404 all Manitobans) or by "census family" income ($25,216 RFN versus $50,236 all Manitobans). All Tribal Council areas are well below provincial income levels, although there is some indication that northern Tribal Councils have slightly higher incomes than southern Tribal Councils.

Unemployment

- Unemployment rates among Registered First Nations people, whether they be in Winnipeg or "on-reserve," are generally at least twice as high as the overall Manitoba unemployment rate of 6.0%. For Tribal Council areas, the lowest unemployment rate is more than triple the provincial rate, and the highest is five times the rate. For most Winnipeg areas, RFN rates are at least double, with some Winnipeg CAs having eight times the Winnipeg unemployment rate.

Housing issues

- About one-quarter (25.8%) of the housing units in Manitoba First Nations communities in 1998/99 were in need of either major renovations or replacement. This is consistent throughout most Tribal Council areas.
- The average number of persons per housing unit in First Nations communities is about twice that of the overall general population of Manitoba, at 4.8 versus 2.6 persons per total housing unit. The potential situation of overcrowding for RFN "on-reserve" becomes more evident when only habitable housing units are considered, at 7.6 persons per habitable housing unit.
- Overall, 22.0% of the housing units in Manitoba First Nations communities lacked modern plumbing in the year 1998/99. Four Tribal Councils have a substantial percentage of the housing units without modern plumbing: KTC (42.1%), ILTC (95.5%), SERDC (29.9%) and IRTC (11.6%).

10.4 Canadian Comparisons

Education level

- First Nations in Canada are not getting as much education as Canadians generally. In 1996, 46% of Canadian First Nations aged 15 and up had completed high school, compared with 65% of all other Canadians. Similarly, 4.5% of First Nations had a university degree or certificate, compared with 16% of all other Canadians (Health Canada 1999). In Manitoba, 19% of First Nations reported completing high school in 1997, while 13% of those reported completing post-secondary education (Manitoba First Nations Regional Health Survey, 1998). *In our report, using Statistics Canada 1996 data, only 33.5% of all Manitoba RFN had completed high school in 1996, and only 27.9% of those RFN living "on-reserve," compared with 58.7% of the general population of Manitoba. Our rates seem*

much higher than those reported in the in-person interviews of the Manitoba First Nations Regional Health Survey, done in 1997. However, the gap in educational attainment between RFN and the general population of Manitoba is still evident.

Income

- The average annual income of Canadian First Nations **individuals** in 1995 was $17,382, much lower than the Canadian average of $26,474. There was also a difference in average annual income between on-reserve and off-reserve First Nations individuals: while the on-reserve average was $14,055, the off-reserve average was $18,463 (Health Canada 1999). In Manitoba, 49% of First Nations reported a **household** income of less than $10,000 in 1997, whereas only 5% of Canadian households reported similar income levels (Manitoba First Nations Regional Health Survey, 1998). *In our report, using Statistics Canada 1996 data, the average income of "on-reserve" Registered First Nations people in Manitoba for the year 1996 was substantially lower than the Manitoba average, whether it be compared by* ***"household"*** *($25,687 RFN versus $43,404 all Manitobans) or by* ***"census family"*** *income ($25,216 RFN versus $50,236 all Manitobans).*

Unemployment

- The 1997/98 unemployment rate among Canadian First Nations was 29%. The overall Canadian unemployment rate for the same period was 10% (Health Canada 1999). Whereas 32% of Canadians reported no wage-related work in the previous year, 46% of Manitoba First Nations people reported a similar situation (Manitoba First Nations Regional Health Survey, 1998). *In our report, using Statistics Canada 1996 data, the overall RFN "on-reserve" unemployment rate for 1996 was 24.8%, compared with an unemployment rate of 6.0% for the general Manitoba population. Rates in Tribal Council areas varied from 17.7% to 33.1%. Within the city of Winnipeg, unemployment rates for Registered First Nations people showed a greater differential, from a low of 0% to a high of 51% by Winnipeg Community Area.*

Housing issues

- In 1991, the average number of people per occupied private dwelling for RFN "on-reserve" was 4.1, 50% higher than the Canadian average of 2.7. Compared to only 1% of Canadian dwellings, 22% of "on-reserve" dwellings had more than one person per room. However, the situation appears to be improving; in 1997/98, 54% of on-reserve housing was adequate, up from 46% in 1991/92 (Health Canada 1999). In the Manitoba First Nations Regional Health Survey (1998), 73% indicated that four or more people were living in the house, compared with 37% of all other Canadians. When asked to report on problems within the household, 20% of the Manitoba First Nations respondents reported "overcrowding in the house" as a major problem, and 70% reported "housing availability" as a major problem in their community (Manitoba First Nations Regional Health Survey, 1998). Thirteen percent (13%) suggested that housing availability had improved over the two years prior to the 1997 survey. *In our report, we found that the average number of people per housing unit was 4.8 for the Tribal Council "on-reserve" populations, compared with 2.6 for the general Manitoba population. When only habitable housing was considered, the "on-reserve" rate was 7.6 persons per*

habitable housing unit. Of all the housing units in First Nations communities of Manitoba, 51.2% were rated "adequate" and 23.0% "requiring minor renovations" in 1998/99.

- In 1997, 73% of First Nations Manitobans reported living in a household of four or more people. A 1994 Manitoba study of shigellosis outbreaks found that communities in which the average number of people per dwelling was six or seven were close to eight times as likely to have outbreaks as communities with an average of two or three people per dwelling. Shigellosis was also associated with truck-to-barrel water delivery systems and no water delivery (Rosenberg & Kendall, 1997). *In our report, when one considers habitable housing units only, most Tribal Council areas had at least 6 persons per habitable housing unit, with some much higher than this (SCTC at 10.7 persons per habitable housing unit). This puts many of the Registered First Nations people living "on-reserve" at risk for shigellosis. Some Tribal Councils (KTC, ILTC, SERDC) had substantial numbers of housing units lacking modern plumbing.*

- In 1996, 37% of on-reserve dwellings needed major repairs and 33% needed minor repairs, compared with 8% and 26% of Canadian non-reserve dwellings. *In our report for the year 1998/99, we found that 17.2% of homes required major renovations and 8.6% needed replacement, whereas 23.0% needed minor renovations.*

10.5 Education level (attainment of a high school diploma)

Definition: This is the proportion of Registered First Nations people ages 15 and older who have a high school diploma, by Tribal Council area and by Winnipeg Community Area (CA). This was obtained from the 1996 Statistics Canada census. No statistical testing was done on this data, nor was there age/sex adjustment.

How to read the graphs: In Figure 10.1, only 27.9% of the overall "on-reserve" RFN had a high school diploma in 1996, somewhat lower than all RFN at 33.5% (including both "on-reserve" and "off-reserve," and much lower than the general population of Manitoba at 58.7%. No Tribal Council area has a percentage of high school diploma attainment anywhere near that of the provincial general population. In Winnipeg, the overall attainment of a high school diploma was 64.9% of the population, once again much higher than that of all RFN living in Winnipeg at 41.4%. However, educational attainment for RFN in Winnipeg exceeds that for any Tribal Council area in Manitoba, with most Winnipeg CAs showing over 40% attainment. In Winnipeg, there is a strong relationship between decreasing health status of the area (as measured by PMR, going down the graph – see Chapter 4) and decreasing educational levels (Spearman's correlation coefficient $r=-.92$, $p<0.0001$).

NOTE: although it would be preferable to base a high school diploma attainment rate on a population of adults over 18 years of age, the only data available by the Tribal Council areas in the Statistics Canada 1996 public statistics were based upon people 15 years and older.

Range of education levels (% of persons ages 15 or older attaining a high school diploma):	
Tribal Council:	16.1% (SERDC) to 33.4%/34.0%/34.3% (WRTC/IRTC/Independent FN South)
Winnipeg Community Areas	28.3% (Point Douglas) to 61.6% (Fort Garry)
Manitoba "on-reserve" RFN compared with all Manitobans:	27.9 versus 58.7

***Key messages**: Educational attainment, as measured by the completion of high school, is much lower in RFN groups than in the general Manitoba population. In 1996, only 33.5% of RFN (and 27.9% of RFN "on-reserve") completed high school, in comparison with 58.7% of the general population. In Winnipeg, every area shows lower high school completion rates for RFN compared with the Winnipeg general population (64.9%), with RFN rates being anywhere from 28.3% in Point Douglas to 61.6% in Fort Garry. There is a strong relationship between health status (PMR) of the Winnipeg CAs and the attainment of a high school diploma.*

Figure 10.1: Proportion of Registered First Nations age 15 years or older with High School Diploma by Tribal Council Statistics Canada 1996 Census

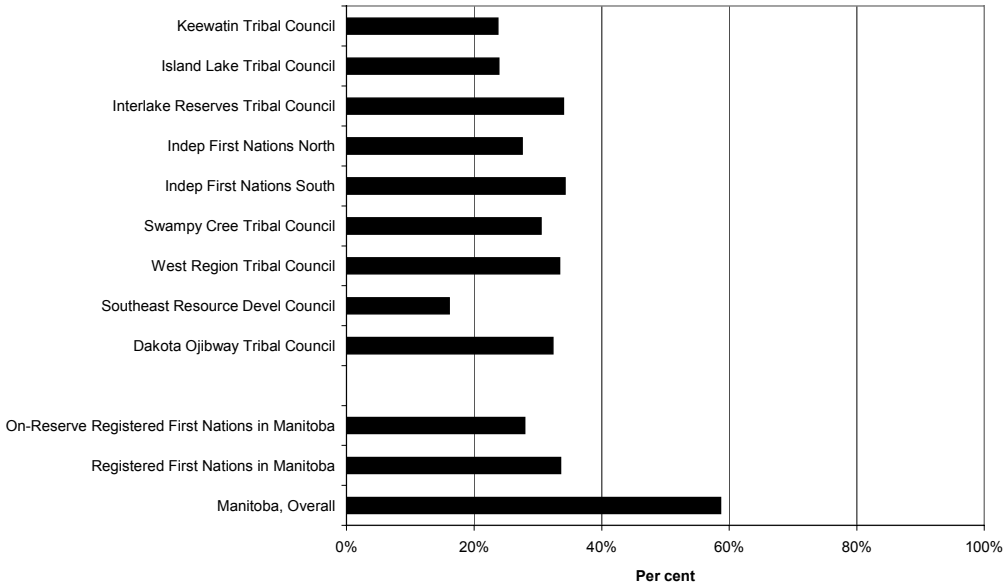
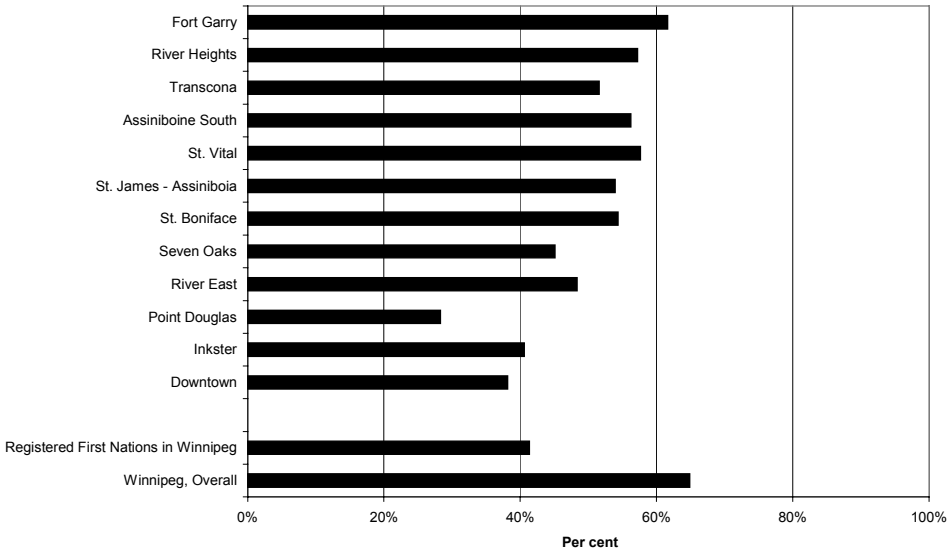


Figure 10.2: Proportion of Registered First Nations age 15 years or older with High School Diploma by Winnipeg Community Area Statistics Canada 1996 Census



10.6 Average Income per Household and per Census Family by Tribal Council areas

Definition:

Average household income: this is the average income per household, with the "household income" being the sum of all incomes of persons who live within the same dwelling, regardless of their relationship to one another.

Average "census family" income: this is the average income per census family, with the "census family income" being the sum of all incomes of persons who live within the same dwelling and who would be called a census family. A census family is a couple (married or common-law) with or without children, or lone parents with at least one child. All of these data were derived from the Statistics Canada 1996 Census. No statistical testing was done on these data.

How to read the graphs: In Figures 10.3 and 10.4, the average household/census family income is shown for each Tribal Council area, for the overall Manitoba "on-reserve" population, and for the Manitoba general population. The average household income for all "on-reserve" RFN is $25,687, compared with the average household income for all Manitobans at $43,404. The average household income for every Tribal Council area is lower than the overall Manitoba average. The average census family income for all "on-reserve" RFN is $25,216, only half the income compared with that for all Manitobans at $50,236. In general, northern Tribal Council areas have slightly higher household income levels compared with their southern counterparts. As you go down the Tribal Council graphs, there appears to be somewhat of a trend to decreasing income with increasing PMR (hence, decreasing health status of the population – see Chapter 4 for a description of PMR).

Range of average household and census family income levels:

Tribal Council household family income:	$20,503 (DOTC) to $31,842 (Independent FN North) per household
Tribal Council census family income	$20,644 (DOTC) to $29,537 (Independent FN North) per census family
Manitoba "on-reserve" RFN compared with all Manitobans:	Household family income: $25,687 RFN vs. $43,404 all Manitobans Census family income: $25,216 RFN versus $50,236 all Manitobans

Key messages:
The average income of "on-reserve" RFN people in Manitoba is substantially lower than the Manitoba average, whether it be compared by household ($25,687 RFN versus $43,404 all Manitobans) or by census family income ($25,216 RFN versus $50,236 all Manitobans). All Tribal Council areas are well below provincial income levels, although there is some indication that northern Tribal Councils have slightly higher incomes compared with southern Tribal Councils. Although not a strong relationship, there is some indication that income decreases as the Tribal Council's population health status decreases.

Figure 10.3: Average Household Income for Registered First Nations by Tribal Council Statistics Canada 1996 Census

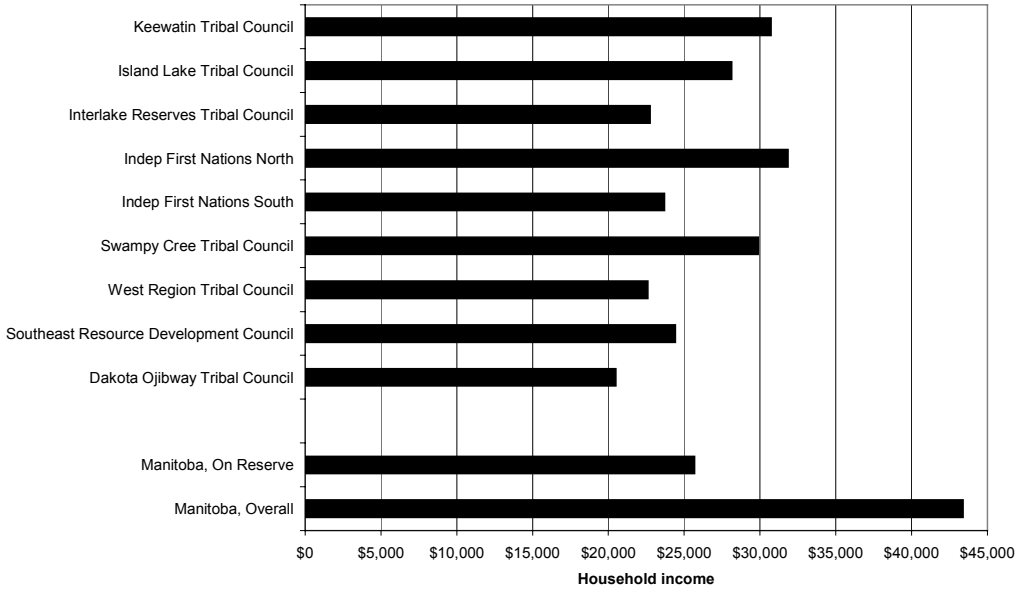
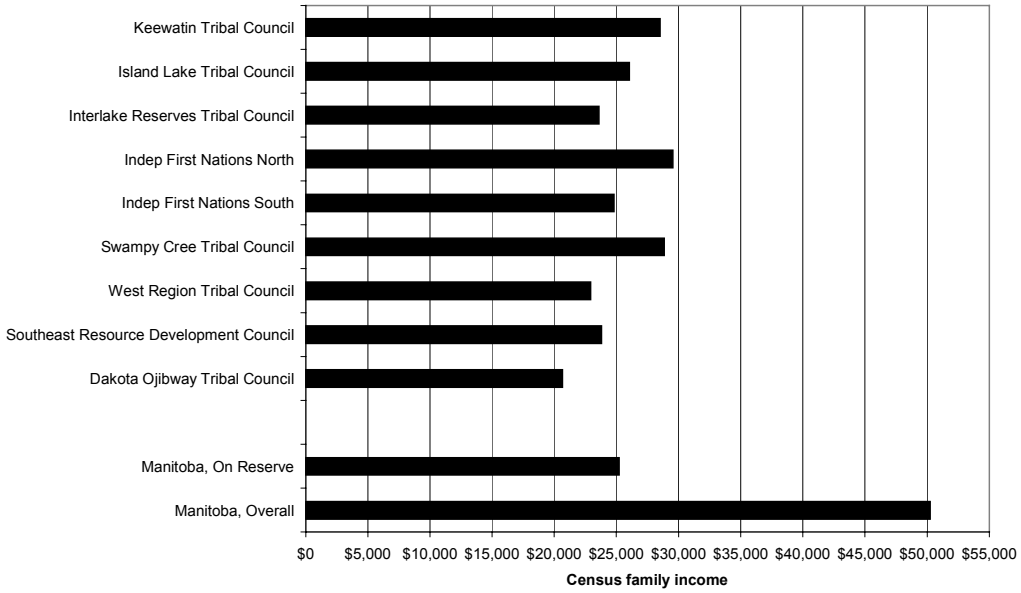


Figure 10.4: Average Census Family Income for Registered First Nations by Tribal Council Statistics Canada 1996 Census



10.7 Unemployment Rate

Definition: This is the number of persons who are part of the labour force but not currently working divided by the number of persons in the labour force, and expressed as a percentage. Persons are considered part of the labour force if they are employed or working in self-employment, are on temporary lay-off, are about to start a new job, or are actively looking for work. The information was based upon the Statistics Canada 1996 Census. No statistical testing was done on these data, nor are the rates age/sex adjusted.

How to read the graphs: The 1996 unemployment rate of Manitoba "on-reserve" Registered First Nations people at least 25 years old was four times higher, at 24.8% compared with an overall Manitoban unemployment rate of 6.0%. As seen in Figure 10.5, unemployment rates by Tribal Council varied from just under 20% to over 30%, showing no particular association with either north/south geography or by the health status (as measured by PMR) of the regional population. As seen in Figure 10.6, the unemployment rate of RFN living in Winnipeg also varies tremendously by Winnipeg CAs, from very low rates in Transcona and St. Vital, to the higher rates in such places as Point Douglas, Inkster and Downtown – rates between 30 and 50% (higher than any Tribal Council area). Most RFN living in Winnipeg CAs had unemployment rates at least double the Manitoba average of 6.0%. Within Winnipeg, there does seem to be a relationship between unemployment and PMR for Registered First Nations people, such that the poorer the health status of an area's population, the greater the unemployment rate. However, this is not statistically significant (Spearman's correlation coefficient r=0.43, one-tailed, p=.07).

Although not shown in graph form, the "employment-to-population ratio" of "on-reserve" Registered First Nations people at least 25 years old is 40.8% provincially, compared with 55.0% for all Manitobans. This is a measure of all persons working, expressed as a percentage of the total population age 25 or over. As such, the total population would include persons who do not wish to work and thus are not actively seeking employment, such as students, homemakers, and elderly people.

Range of unemployment rates:

Tribal Council:	17.7%/19.0% (IRTC/SCTC) to 30.2%/30.3%/33.1% (DOTC/Independent FN North/SERDC)
Manitoba "on-reserve" RFN compared with all Manitobans	24.8% versus 6.0%
Winnipeg Community Areas:	Transcona/St. Vital 0%/7% to Downtown/Point Douglas 46%/51%

Key messages:
Unemployment rates among RFN people, whether they be in Winnipeg or outside Winnipeg, are generally at least twice as high as the overall Manitoba unemployment rate of 6.0%. For Tribal Council areas, the lowest unemployment rate is more than triple the provincial rate, and the highest is five times the rate. For most Winnipeg areas, rates are at least double, and some area unemployment rates are eight times higher than the provincial unemployment rate of 6.0%. In Winnipeg, the unemployment rates are over 30% in the three areas with the poorest health status (Point Douglas, Inkster, and Downtown).

Figure 10.5: Unemployment Rate of Registered First Nations age 25 years and older by Tribal Council
Statistics Canada 1996 Census

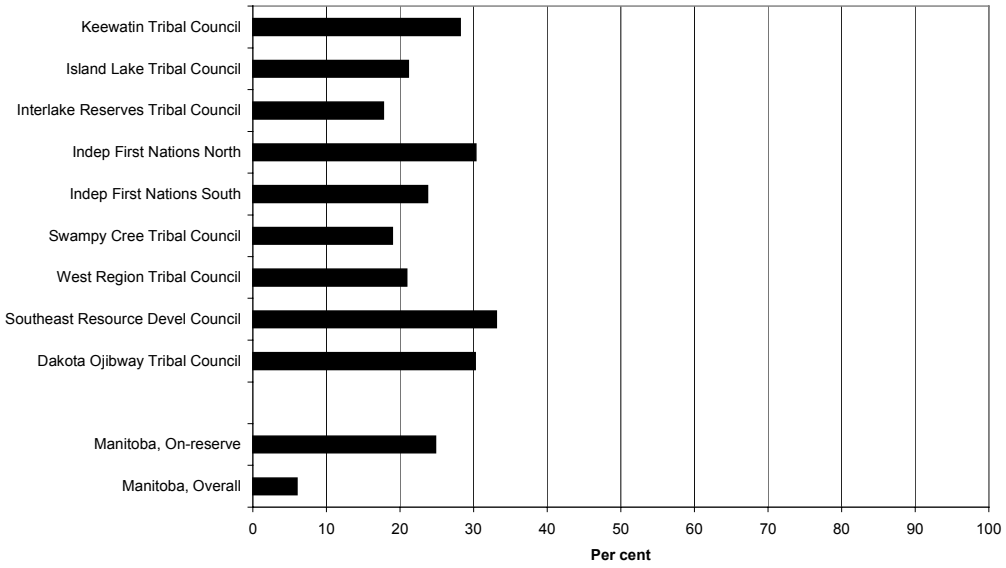
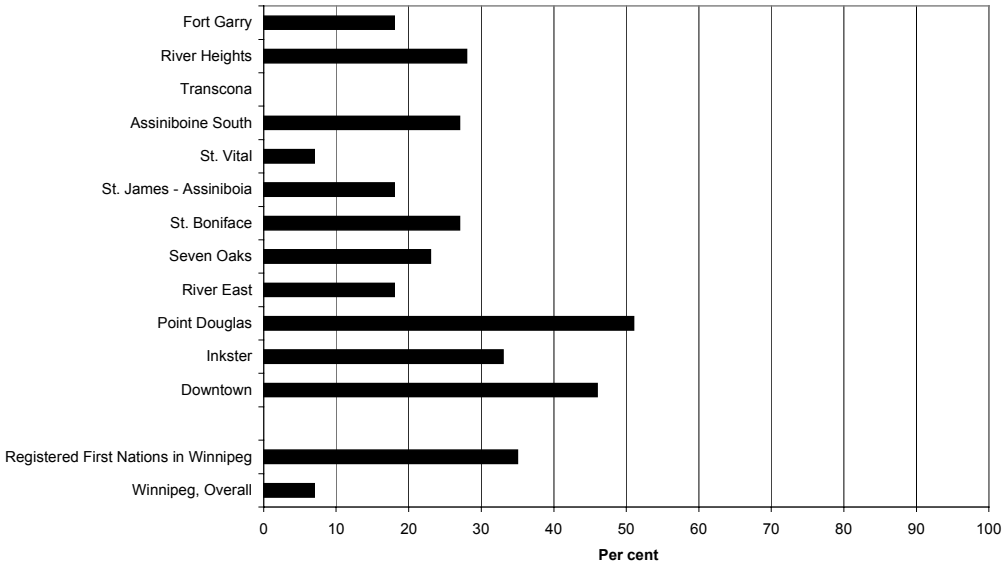


Figure 10.6: Unemployment Rate of Registered First Nations age 25 years and older by Winnipeg Community Area
Statistics Canada 1996 Census



10.8 Housing Issues

The source of data for this section is the Indian and Northern Affairs Canada (INAC) 1998/99 report *Housing and Infrastructure Assets Summary Report.* This report gives information about each First Nations community, so we combined the data to produce Tribal Council area indicators using the Tribal Council areas defined in Chapter 3. For any comparison data for all Manitoba residents (both RFN and all other Manitobans), the data are derived from the Statistics Canada 1996 Census.

10.8.1 Housing Quality:

Definition: This is the number of houses in a Tribal Council area that were listed in each housing category in the fiscal year 1998/99, divided by the total number of housing units in the Tribal Council, and expressed as a percentage. The categories of housing units are: adequate, minor renovations required, major renovations required, and replacement required. No statistical testing was done on these data.

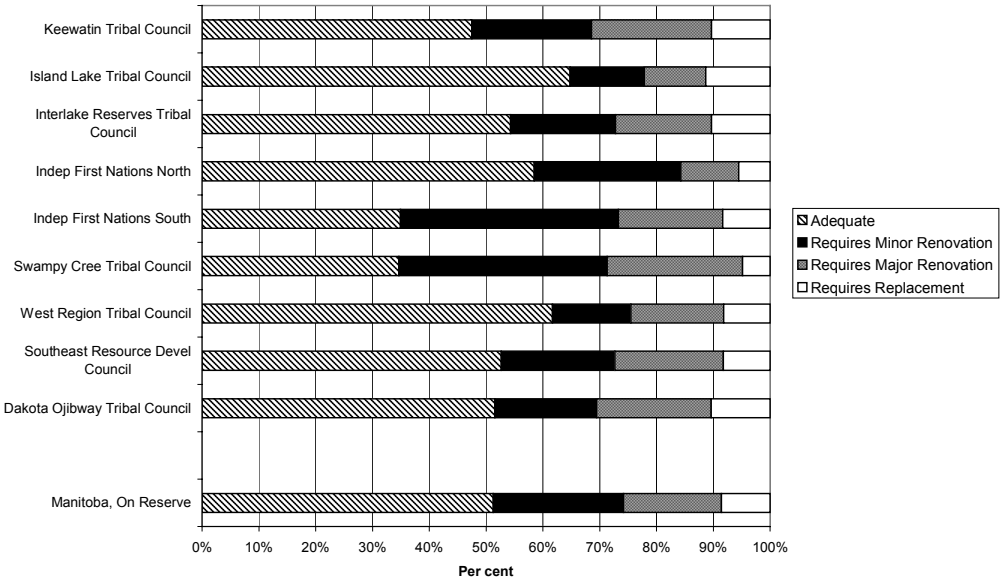
Adequate units are housing units that do not require replacement, minor renovations, or major renovations. *Minor renovation units* are housing units which meet minimum National Building Code standards but require normal preventative maintenance and upgrading. *Major renovation units* are housing units that require renovation because they fail to meet minimum National Building Code standards. *Replacement units* are housing units which are uninhabitable as a result of fire or natural disaster; or those declared unsafe or unfit for human habitation by a certified inspector because they do not meet basic quality standards and cannot be economically renovated to an acceptable condition. The total number of housing units is the summation of all four categories. As well, a new category was devised for purposes of this report. We defined *habitable housing units* as a summation of adequate units and minor renovation units, i.e., the number of housing units that may be safely inhabited.

How to read the graphs: Figure 10.7 shows the percentage of each housing quality category by Tribal Council area, with the categories adding up to 100%. Overall, for all housing units "on-reserve" in Manitoba, 51.2% are adequate, 23.0% require minor renovations, 17.2% require major renovations, and 8.6% require replacement. Figure 10.8 represents the habitable housing categories (adequate and requiring minor renovations), with 74.2% of the housing units in First Nations communities of Manitoba considered habitable.

Range of percentages of habitable housing:

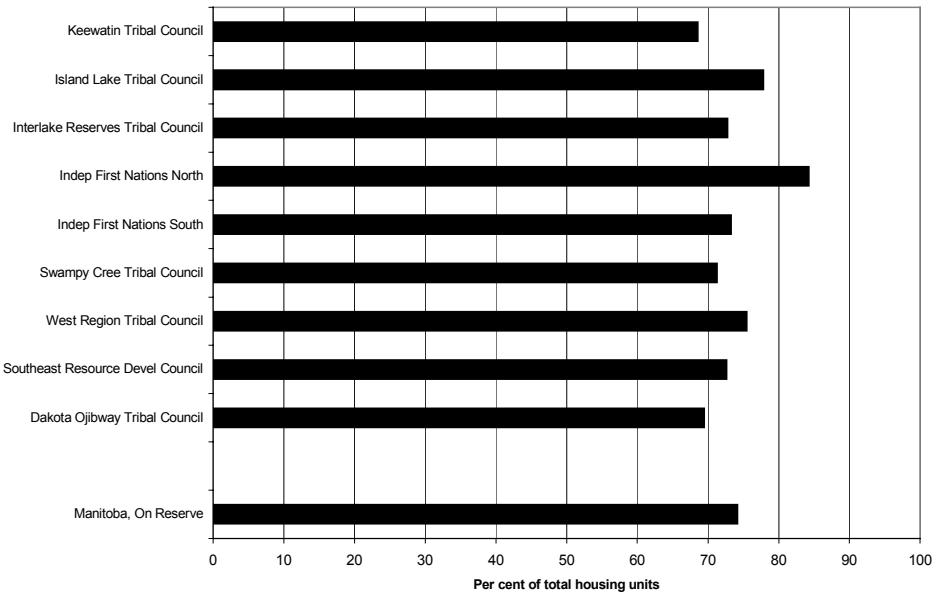
Tribal Council:	68.6%/69.5% (KTC/DOTC) to 84.3% (Independent FN North)

Figure 10.7: Distribution of Housing Quality by Tribal Council 1998/99 (INAC)



Key messages:
About one-quarter (25.8%) of the housing units in Manitoba First Nations communities in 1998/99 were in need of either major revisions or in need of replacement. This is consistent throughout most Tribal Council areas.

Figure 10.8: Habitable Housing Units by Tribal Council 1998/99 (INAC)



10.8.2 Average Persons per Housing Unit

Definition: The "average persons per total housing unit" is the total number of "on-reserve" people in a Tribal Council area divided by the total number of housing units (including housing units categorized as adequate, requiring minor renovation, requiring major renovation, and requiring replacement).

The "average persons per habitable housing unit" is the total "on-reserve" RFN population divided by the total number of habitable housing units (habitable housing units are those that are considered adequate or requiring minor renovation).

How to read the graphs: As shown in Figure 10.9, there were 4.8 persons per housing unit in the Manitoba "on-reserve" Tribal Councils in 1998/99, compared with 2.6 persons per housing unit in the general population of Manitoba in 1996. Every Tribal Council area had a higher number of persons per housing unit than the provincial general population average, with two Tribal Council areas (KTC and SCTC) having over double the number of persons per housing unit at 5.4 and 5.7 respectively. If one were to consider only habitable housing units, the overall number of persons per habitable housing unit was 7.6 for "on-reserve" populations, highlighting the likelihood that overcrowding is an issue in First Nations communities. Three Tribal Council areas in particular had large numbers of persons per habitable housing unit – KTC at 8.1, IRTC at 9.2 and SCTC at 10.7 persons per habitable housing unit.

Range of average persons per total, and per habitable housing unit:

Tribal Council:	3.6 (WRTC) to 5.7 (SCTC) persons per total housing unit 5.3/5.7 (WRTC/Independent FN North) to 9.2/10.7 (IRTC/SCTC) persons per habitable housing unit
Manitoba "on-reserve" RFN compared with all Manitobans	4.8 versus 2.6 persons per total housing units

Key messages:
The average number of persons per housing unit in First Nations communities in 1998/99 was about twice that of the overall general population of Manitoba, at 4.8 versus 2.6 persons per total housing unit. The potential situation of overcrowding in First Nations communities becomes more evident when only habitable housing units are considered, at 7.6 persons per habitable housing unit for Manitoba "on-reserve" populations.

Figure 10.9: Average Persons per Total Housing Units by Tribal Council 1998/99 (INAC)

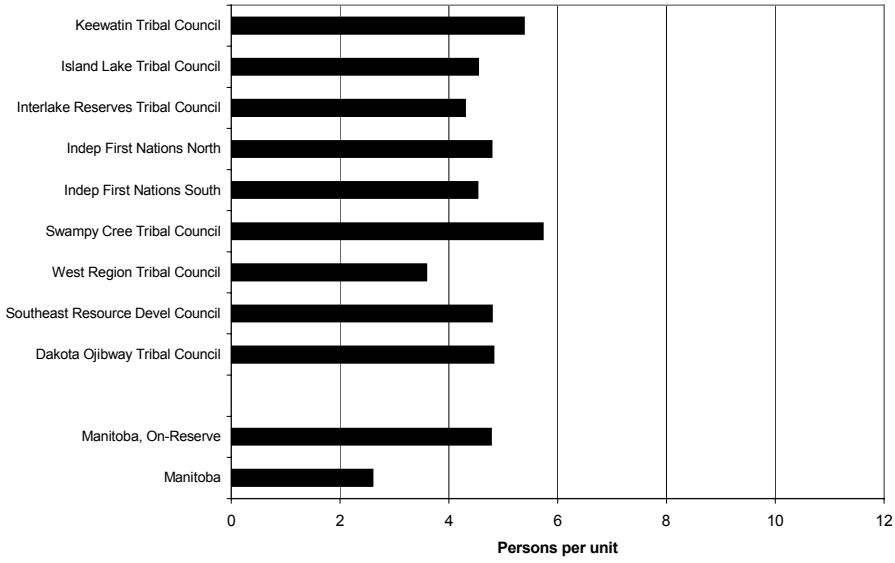
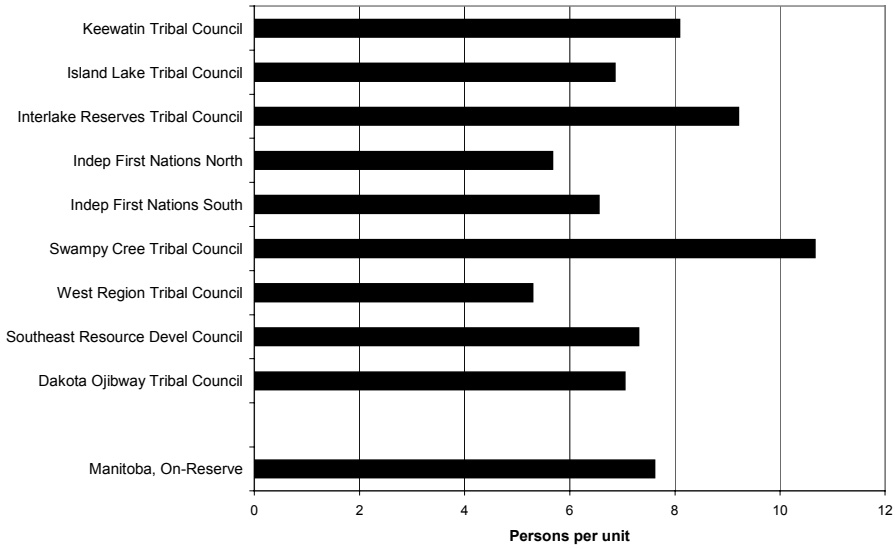


Figure 10.10: Average Persons per Habitable Housing Unit by Tribal Council 1998/99 (INAC)



10.8.3 Lack of Modern Plumbing

Definition: This is the number of housing units that do not have the basic plumbing facilities (an indoor toilet, an assured supply of hot and cold running water, and a bath or a shower), divided by the total number of housing units, and expressed as a percent.

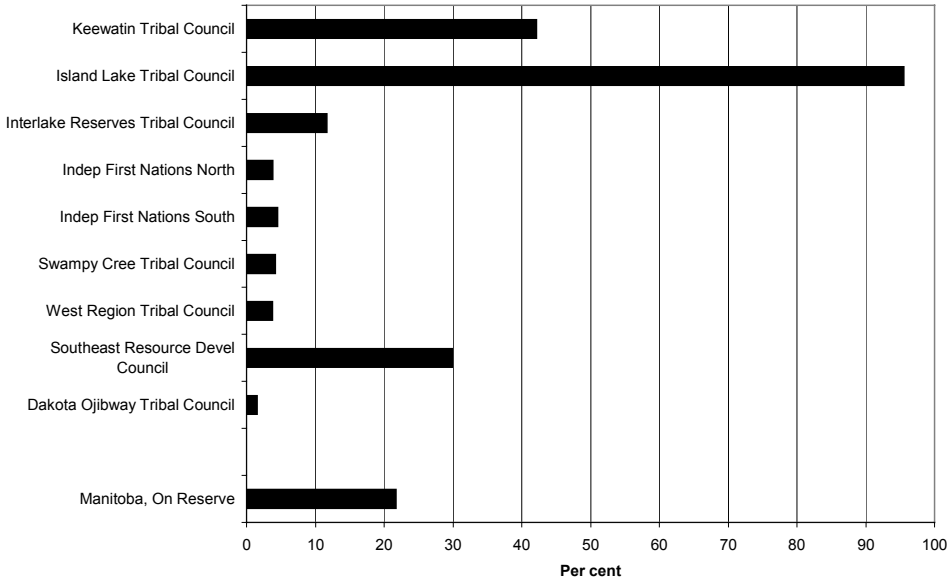
How to read the graph: This graph shows a dramatic picture of the differences among Tribal Councils regarding access to modern plumbing. Few homes in southern Tribal Councils lacked modern plumbing, whereas in the north, 42.1% of the housing units in KTC and 95.5% in ILTC lacked modern plumbing. Independent FN North is an anomaly in the north, with only 3.8% of the housing units lacking modern plumbing. In the south, SERDC is the anomaly, with over one-quarter (29.9%) of the units lacking modern plumbing.

Range of percentages of housing units lacking modern plumbing:

Tribal Council:	1.5% (DOTC) to 95.5% (ILTC) lacking modern plumbing

Key messages:
Overall, 22.0% of the housing units in Manitoba First Nations communities lacked modern plumbing in the year 1998/99. Four Tribal Councils having a substantial percentage of the housing units without modern plumbing are KTC (42.1%), ILTC (95.5%), SERDC (29.9%) and IRTC (11.6%).

Figure 10.11: Per Cent of Units Lacking Modern Plumbing Systems by Tribal Council 1999 (INAC)



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Rosenberg T, Kendall O. Shigellosis on Indian reserves in Manitoba, Canada: Its relationship to crowded housing, lack of running water, and inadequate sewage disposal. *American Journal of Public Health* 1997; 87(9):1547-1551.

APPENDIX A. METHODS

Data Preparation

Several sources of data were used from the Manitoba Centre for Health Policy's Population Health Research Data Repository, including: hospital discharge abstracts, physician claims, and the population registry.

Assignment of Residence Information

First-occurring residence for a given year was generally used.

Denominator

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

Overall Physician Utilization Analyses

Physician analyses used 1998/99 claims data, with the 1998 Manitoba population as the denominator. Age was calculated as of December 31. All data were adjusted for age and sex. Only ambulatory visits are included, such as physician office visits and most emergency room visits. Visits by physicians to clients admitted to hospital are not included. Physician claims are based on the fee-for-service billing claims. There may be under-reporting, especially in rural/remote areas, due to the fact that salaried physicians may not necessarily record all contacts (although they are supposed to use a "shadow bill" system to record visits and diagnoses).

For overall physician utilization analyses, physician visits were categorized as "general" versus "consults", and GP/FPs (general practitioners/family practitioners) versus "specialists." The out-of-province physician visits were considered general physician visits, since information is available regarding specialist/consult classifications only for Manitoba physicians. Physician location was assigned to one of four categories:

- in the same RHA as the recipient
- in a different RHA from the recipient, other than Winnipeg RHA
- in Winnipeg
- out of province

Overall Hospital Utilization Analyses

These analyses used 1998/99 inpatient and surgical outpatient data, with the 1998 population as the denominator. Exclusions for the overall hospital utilization analyses were out-of-province residents and long-term care facilities. Age was calculated as of December 31 for each year. All data were adjusted for age and sex.

Hospital utilization was defined in three ways: by separations, days in hospital, and location of hospitalization. For records where the length of stay was greater than 365 days, this was truncated to 365 days. Surgical outpatient stays were assigned a length of stay of one day. Hospitalization location was assigned to one of four categories:

- in the same RHA as the recipient
- in a different RHA from the recipient, other than Winnipeg RHA
- in Winnipeg
- out of province

Rates of Procedures

All procedures (except for Caesarian section) were selected from five fiscal years of hospital discharge abstracts (1994/95 to 1998/99) and using a denominator consisting of the years 1994 through 1998. Age was calculated as of December 31 for each given year, and region was assigned as of the first occurring record for each given year.

APPENDIX B. REGISTERED FIRST NATION POPULATION COUNTS

Table B-1: A Comparison of First Nation Population Counts from Various Sources (see footnote for details)

	SVS/MCHP linked		MSB		INAC		Stats Can	MCHP Unlinked	
	Total 1999	On-reserve 1999	Total 1999	On-reserve 1999	On-reserve 1999	On- reserve 1996	On-reserve Registered FN 1996	On-reserve 1996	Total 1996
Birdtail Sioux	467	266	562	447	450	392	295	223	322
Dakota Plains	215	62	265	208	189	207	75	51	193
Long Plain	2148	648	2533	1333	1311	991	585	426	1380
Oak Lake/ Pipestone	384	261	524	301	297	265	290	250	367
Roseau River	1375	517	1753	961	935	966	540	450	1025
Sandy Bay	3802	2288	4322	2989	2948	2689	2170	1974	2951
Sioux Valley	1524	934	1881	1136	1121	1108	1005	845	1270
Swan Lake	910	307	1049	533	529	485	370	230	745
DOTC Total	**10825**	**5283**	**12889**	**7908**	**7780**	**7103**	**5330**	**4449**	**8253**
Garden Hill FN	2962	2241	3122	2849	2780	2640	1790	2122	2787
Red Sucker Lake	671	558	718	674	632	570	545	453	552
St. Theresa Point	2544	2049	2654	2485	2454	2282	1860	1885	2387
Wasagamack	1212	944	1271	1162	1153	1066	985	804	1041
ILTC Total	**7389**	**5792**	**7765**	**7170**	**7019**	**6558**	**5180**	**5264**	**6767**
Cross Lake FN	4877	3293	5400	3700	3544	3319	3275	2697	3484
Nelson House	3854	2491	4271	3149	2058	2766	2510	2080	3005
Norway House	4819	3572	5299	3850	3778	3542	3300	2832	3586
Indep North Total	**13550**	**9356**	**14970**	**10699**	**9380**	**9627**	**9085**	**7609**	**10075**
Dauphin River	199	108	213	130	117	136	90	92	145
Fairford	1896	908	2118	1096	1093	1113	815	746	1305
Peguis	5152	2287	6838	3034	2994	2706	2020	1718	3056
Jackhead	460	187	548	227	211	224	0	197	456
Lake Manitoba	1201	569	1371	1019	1009	756	565	422	846
Lake St. Martin	1498	509	1743	1164	1168	1053	620	481	1209
Little Saskatchewan	707	341	846	517	492	462	335	311	514
IRTC Total	**11113**	**4909**	**13677**	**7187**	**7084**	**6450**	**4445**	**3967**	**7531**
Dakota Tipi	170	109	199	109	106	147	0	102	192
Fisher River	2199	959	2717	1471	1536	1485	975	853	1595
Fort Alexander/Sageeng	4721	1982	5651	3075	3024	3287	1650	1690	3483
Tootinadwaziibeeng	785	335	1091	569	551	542	310	225	485
Waywayseecappo	1421	905	1880	1381	1330	1129	940	780	1119
Indep South Total	**9296**	**4290**	**11538**	**6605**	**6547**	**6590**	**3875**	**3650**	**6874**
Barren Lands	603	322	708	465	397	417	235	256	403
Fox Lake	747	388	891	434	418	382	150	236	435
God's Lake FN	1799	1055	2015	1315	1226	1267	1120	935	1589
God's River FN	540	451	559	472	459	450	445	368	428
Northlands	727	467	808	686	682	641	600	322	626
Oxford House	1942	1567	2011	1733	1677	1600	1565	1502	1765
Sayisi Dene FN	491	268	629	331	328	265	305	250	392
Shamattawa FN	939	740	1041	920	891	897	720	683	837
Split Lake Cree FN	2271	1386	2493	1685	1652	1569	1450	1200	1761
War Lake FN	191	144	222	160	162	145	145	76	129
York Factory	808	305	900	397	351	321	295	239	**558**
KTC Total	**11058**	**7093**	**12277**	**8598**	**8243**	**7954**	**7030**	**6067**	**8923**
Chemawawin FN	1124	850	1208	1024	969	791	800	507	690
Grand Rapids FN	997	629	1164	730	553	563	520	382	567
Indian Birch/Wuskwi Sipihk	399	181	412	331	319	219	120	138	224
Mathias Colomb	2246	1153	2623	1909	1911	2168	1220	1025	1852
Mosakahiken Cree Nation	1016	663	1109	906	898	759	525	338	534
Opaskwayak Cree Nation	3152	2275	3890	2489	2477	2316	1880	1487	1908
Sapotawyak FN	1269	589	1583	810	720	692	525	366	740
SCTC Total	**10203**	**6340**	**11989**	**8199**	**7847**	**7508**	**5590**	**4243**	**6515**

	SVS/MCHP linked		MSB		INAC		Stats Can	MCHP Unlinked	
	Total 1999	On-reserve 1999	Total 1999	On-reserve 1999	On-reserve 1999	On- reserve 1996	On-reserve Registered FN 1996	On-reserve 1996	Total 1996
Berens River	1845	849	2089	1529	1522	1269	760	765	1222
Bloodvein	1016	531	1155	906	836	757	430	374	690
Brokenhead	974	282	1278	491	488	306	305	172	633
Buffalo Point FN	48	20	91	41	41	34	25	22	30
Hollow Water	1060	529	1163	718	709	533	520	444	818
Little Black River	635	272	702	540	542	360	335	182	443
Little Grand Rapids	1395	796	1194	1051	987	930	610	739	1252
Pauingassi FN			515	484	484	439		0	790
Poplar River FN	1007	519	1079	962	955	880	505	452	855
SERDC Total	**7980**	**3798**	**9266**	**6722**	**6564**	**5508**	**3470**	**3012**	**6733**
Ebb And Flow	1585	906	1750	986	968	889	820	536	998
Gamblers	74	41	126	38	36	34	40	27	36
Keeseekoowenin	647	314	839	635	634	593	340	232	390
O-Chi-Chak-Ko-Sipi FN	566	290	671	328	294	387	290	201	330
Pine Creek	1654	654	1993	879	671	825	505	437	889
Rolling River	540	245	712	344	342	342	260	243	476
Waterhen	848	315	945	529	524	488	470	447	**647**
WRTC Total	**5914**	**2765**	**7036**	**3739**	**3469**	**3558**	**2725**	**2123**	**3766**
Grand Total	**87328**	**49626**	**101407**	**66827**	**63933**	**60856**	**46730**	**40384**	**65437**

SVS/MCHP linked: for the year 1999, the number of Registered First Nations (both "total" and "on-reserve") in the file used for this report, i.e., a one-time linkage between MCHP data and the SVS, or Status Verification System, file from Indian and Northern Affairs Canada
MSB: for the year 1999, publicly available numbers from Medical Services Branch (First Nations and Inuit Health Branch) reports, both "total" and "on-reserve"
INAC: for the years 1996 and 1999, publicly available numbers from Indian and Northern Affairs Canada reports for on-reserve Registered First Nations
StatsCan: publicly available numbers from Statistics Canada 1996 Census, for those persons who reported being "Registered First Nations"
MCHP unlinked: for the year 1996, the number of Registered First Nations (both "total" and "on-reserve") based upon Municipality A codes in our anonymized database derived from Manitoba Health data

Note: in the SVS/MCHP linked file and in the MCHP unlinked file, this only includes persons with a Manitoba band affiliation. "On-reserve" would best be described in these files as persons living in or near their affiliated Band community.

APPENDIX C. CRUDE RATES AND AGE-SPECIFIC MORTALITY RATES

Table C-1: Crude rates of PMR, PYLL, Diabetes Treatment Prevalence, Hypertension, and Injury Hospitalization for Tribal Council areas (per thousand)

Tribal Council	Premature Mortality Rate	PYLL		Diabetes Treatment	Hyper-tension	Injury Hospitalizations
		Male	Female			
KTC	3.20	122.98	96.50	108.71	174.26	41.64
ILTC	2.65	88.93	61.29	160.45	162.76	22.98
IRTC	3.71	109.54	53.11	168.51	165.91	19.84
Indep North	3.50	137.71	59.21	121.50	202.92	34.15
Indep South	3.91	135.70	58.25	182.65	245.16	24.38
SCTC	3.79	123.37	87.71	139.90	106.13	34.47
WRTC	4.40	109.20	86.96	181.95	202.83	26.96
SERDC	4.59	128.68	145.48	161.92	169.26	32.38
DOTC	5.04	166.39	78.31	187.87	160.78	30.54
Manitoba, On Reserve	3.75	126.01	78.06	150.23	175.82	30.85

Table C-2: Crude rates of physician visits to GPs/FPs and to consults; hospital separation rates, total days of hospital care for Tribal Council areas (per thousand)

Tribal Council	Physician Data			Hospital Data	
	Ambulatory Visit Rate	Ambulatory Consultation Rate	Ambulatory Visits to Specialists	Separation Rate	Total Days of Hospital Care
KTC	2443.57	212.69	559.30	277.43	902.75
ILTC	1998.92	208.33	764.01	247.31	1028.38
IRTC	4861.38	203.78	678.56	229.60	692.66
Indep North	3972.15	221.04	543.27	263.52	932.73
Indep South	7281.02	247.01	668.93	315.11	984.05
SCTC	3862.60	187.02	368.66	318.70	1180.91
WRTC	6751.38	214.89	380.32	356.09	1412.26
SERDC	3285.52	207.35	729.29	254.25	1253.43
DOTC	5550.18	155.80	490.72	296.54	1155.54
Manitoba, On Reserve	4166.00	206.26	571.83	280.66	1031.50

Table C-3: Crude rates of surgical procedures for Tribal Council areas (per thousand)

Tribal Council	Cardiac Cath.	Angio-plasty	CABGS	C-Sections	Hysterec-tomy	Mammo-graphy	Tonsil/ Adenoid	Amputation (diabetes related)
KTC	0.97	0.09	0.15	117.45	2.88	183.67	5.90	0.74
ILTC	2.52	0.46	0.38	160.40	4.80	107.62	2.21	2.01
IRTC	1.82	0.37	0.37	96.89	5.34	344.00	5.24	2.16
Indep North	1.47	0.34	0.37	123.10	4.95	148.51	4.38	1.21
Indep South	2.47	0.20	0.79	154.09	5.45	352.17	4.82	0.91
SCTC	1.45	0.10	0.34	165.47	4.33	483.47	6.22	2.91
WRTC	2.17	0.30	0.37	191.92	10.73	421.05	3.94	2.45
SERDC	1.32	0.17	0.17	79.37	5.09	203.82	3.77	3.35
DOTC	1.23	0.29	0.29	125.89	4.21	135.75	1.88	3.77
Manitoba, On Reserve	1.64	0.26	0.35	133.89	4.95	250.70	4.35	2.02

Table C-4: Crude rates of PMR, PYLL, Diabetes Treatment Prevalence, Hypertension, and Injury Hospitalization for RFN people living in each RHA (per thousand)

All Registered First Nations (both "on-reserve" and "off-reserve")

RHA	Premature Mortality Rate	PYLL		Diabetes Treatment Prevalence	Hypertension	Injury Hospitalizations
		Males	Females			
South Eastman	2.84	130.30	13.48	90.91	126.13	14.97
Central	3.79	123.56	62.91	158.33	136.60	28.94
Brandon	2.42	136.70	44.54	80.61	90.00	18.64
South Westman	6.31	162.63	64.79	212.12	162.39	16.27
Winnipeg	3.32	119.92	93.27	107.86	126.21	21.56
Interlake	3.38	89.46	50.11	154.10	161.07	19.37
Marquette	5.76	165.90	99.01	196.37	183.55	31.52
North Eastman	4.52	160.40	122.68	151.39	217.94	26.39
Parkland	3.68	119.79	76.88	170.88	178.06	28.33
Burntwood	3.15	126.76	69.88	120.70	175.05	32.97
Nor-Man	3.51	116.76	75.40	121.39	104.35	32.09
Churchill	3.21	102.27	95.00	120.25	91.55	26.73
Manitoba	3.51	124.56	78.60	130.58	154.37	27.18

Table C-5: Crude rates of physician visits to GPs/FPs and to consults; hospital separation rates, total days of hospital care for RFN people living in each RHA (per thousand)

All Registered First Nations (both "on-reserve" and "off-reserve")

RHA	Physician Data			Hospital Data	
	Ambulatory Visit Rate	Ambulatory Consultation Rate	Ambulatory Visits to Specialists	Separation Rates	Total Days of Hospital Care
South Eastman	3771.99	188.93	537.46	140.07	410.42
Central	5852.22	171.09	572.90	298.19	1066.73
Brandon	6059.70	175.37	596.83	168.46	587.03
South Westman	5696.65	184.10	598.33	282.43	1276.15
Winnipeg	7270.91	255.16	1577.96	189.96	895.63
Interlake	4938.03	227.46	774.45	233.58	743.85
Marquette	6331.00	151.97	443.81	316.72	1112.04
North Eastman	5252.94	239.13	761.03	261.74	1083.22
Parkland	6332.99	201.61	377.97	348.01	1403.80
Burntwood	3133.57	211.39	574.28	261.13	923.70
Nor-Man	3737.54	189.39	370.78	297.10	1003.92
Churchill	6258.82	431.37	819.61	345.10	1121.57
Manitoba	5104.31	218.05	822.67	251.10	954.59

Table C-6: Crude rates of surgical procedures for RFN people living in each RHA (per thousand)

All Registered First Nations (both "on-reserve" and "off-reserve")

RHA	Cardiac Cath	Angio-plasty	CABGS	C-Sections	Hysterec-tomy	Mammo-graphy	Tonsil/ Adenoid	Amputation (diabetes related)
South Eastman	0.00	0.00	0.00	181.82	6.29	583.33	6.04	0.00
Central	1.65	0.40	0.26	142.86	4.20	165.14	2.14	2.43
Brandon	0.19	0.00	0.09	179.19	3.78	214.29	5.24	1.26
South Westman	0.83	0.00	0.42	187.50	1.67	160.00	1.28	0.74
Winnipeg	1.71	0.29	0.22	115.19	5.12	276.49	3.30	1.00
Interlake	1.66	0.30	0.38	117.30	5.37	388.26	6.05	1.78
Marquette	0.75	0.07	0.14	189.57	6.13	232.70	3.06	3.84
North Eastman	2.15	0.16	0.49	97.43	5.74	235.49	2.76	2.17
Parkland	1.92	0.35	0.44	157.48	9.42	398.99	3.86	2.29
Burntwood	1.53	0.28	0.28	116.54	4.02	163.32	4.31	1.18
Nor-Man	1.45	0.12	0.39	160.44	5.72	469.92	6.47	2.30
Churchill	4.72	0.00	0.79	166.67	5.81	388.89	0.00	0.00
Manitoba	1.59	0.26	0.30	127.03	5.07	264.47	4.05	1.59

Table C-7: Crude rates of PMR, PYLL, Diabetes Treatment Prevalence, Hypertension, and Injury Hospitalization for all other Manitobans living in each RHA (per thousand)

RHA	All other Manitobans					
	Premature Mortality Rate	PYLL		Diabetes Treatment Prevalence	Hyper-tension	Injury Hospitalizations
		Males	Females			
South Eastman	2.43	51.23	27.65	39.51	187.53	8.67
Central	3.04	57.07	33.62	40.29	209.46	10.30
Brandon	3.32	57.71	36.16	44.89	187.02	8.19
South Westman	4.05	74.44	35.68	51.70	237.21	13.09
Winnipeg	3.42	61.26	38.85	46.04	203.00	6.90
Interlake	3.89	71.04	40.48	49.69	231.34	8.43
Marquette	4.29	76.54	38.73	55.06	252.29	14.08
North Eastman	3.72	69.06	41.05	44.07	215.08	8.48
Parkland	4.52	81.06	42.58	65.35	247.31	14.62
Burntwood	2.67	83.53	41.04	45.93	130.88	12.78
Nor-Man	3.70	65.77	51.01	54.46	162.64	14.41
Churchill	3.53	139.40	19.22	54.41	45.08	10.25
Manitoba	3.45	63.33	38.17	46.72	206.89	8.44

Table C-8: Crude rates of physician visits to GPs/FPs and to consults; hospital separation rates, total days of hospital care for all other Manitobans living in each RHA (per thousand)

RHA	All other Manitobans				
	Physician Data			Hospital Data	
	Ambulatory Visit Rate	Ambulatory Consultation Rate	Ambulatory Visits to Specialists	Separation Rate	Total Days of Hospital Care
South Eastman	4196.71	233.57	725.82	170.31	788.61
Central	4048.48	198.95	624.74	185.55	1135.48
Brandon	4924.20	254.02	1010.84	160.53	1429.91
South Westman	4413.89	185.13	542.68	235.89	1523.93
Winnipeg	5280.37	310.96	1700.42	138.03	988.89
Interlake	4579.22	270.98	1096.88	176.30	879.41
Marquette	4562.25	186.54	483.49	237.24	1605.58
North Eastman	4642.34	247.14	898.13	169.38	954.25
Parkland	4964.72	243.96	418.58	259.05	1734.46
Burntwood	3417.80	230.70	453.90	179.34	555.33
Nor-Man	4466.46	165.21	282.23	210.96	1065.28
Churchill	4186.46	333.33	579.28	171.36	620.20
Manitoba	4930.67	276.04	1295.68	160.93	1060.58

Table C-9: Crude rates of surgical procedures for all other Manitobans living in each RHA (per thousand)

RHA	All other Manitobans							
	Cardiac Cath.	Angio-plasty	CABGS	C-Sections	Hysterec-tomy	Mammo-graphy	Tonsil/ Adenoid	Amputation (diabetes related)
South Eastman	2.00	0.44	0.54	143.20	5.65	622.18	6.88	0.20
Central	2.52	0.52	0.60	168.14	5.36	511.18	5.62	0.19
Brandon	1.83	0.51	0.53	164.17	5.25	682.37	7.49	0.18
South Westman	1.64	0.39	0.50	155.00	4.72	618.02	5.34	0.21
Winnipeg	3.01	0.66	0.73	179.51	4.68	536.11	5.13	0.18
Interlake	3.13	0.61	0.81	167.32	5.37	590.31	5.87	0.19
Marquette	2.32	0.50	0.71	198.74	4.98	590.53	6.36	0.14
North Eastman	2.82	0.57	0.86	163.24	5.92	568.75	6.61	0.37
Parkland	3.30	0.63	0.87	193.71	6.46	641.58	8.39	0.50
Burntwood	1.43	0.43	0.22	186.24	4.19	526.12	9.69	0.25
Nor-Man	1.97	0.37	0.55	251.39	6.04	650.45	6.00	0.29
Churchill	1.46	0.00	0.24	214.29	2.55	519.23	4.66	0.00
Manitoba	2.77	0.60	0.70	176.42	4.97	559.38	5.76	0.20

Table C-10: Age-specific male mortality rates by Tribal Council area (per thousand)

Tribal Council areas	Male mortality rate per thousand, by age category			
	00-19 years	20-39 years	40-59 years	60-74 years
Keewatin Tribal Council	2.474	2.541	5.892	19.305
Island Lake	0.813	2.473	5.459	41.570
Interlake Reserves	1.266	3.043	4.167	36.530
Indep First Nations North	1.304	3.851	8.659	28.602
Indep First Nations South	1.283	3.630	9.047	29.310
Swampy Cree	0.257	4.805	8.539	37.433
West Region	1.295	1.873	12.346	41.551
Southeast Resource Devel	0.873	3.690	7.148	38.540
Dakota Ojibway	1.238	4.534	13.103	46.382
Manitoba, On Reserve	1.226	3.477	8.046	33.863

Table C-11: Age-specific female mortality rates by Tribal Council area (per thousand)

Tribal Council areas	Female mortality rate per thousand, by age category			
	00-19 years	20-39 years	40-59 years	60-74 years
Keewatin Tribal Council	1.433	2.198	3.687	17.467
Island Lake	1.059	1.275	4.825	11.650
Interlake Reserves	0.589	0.557	4.367	30.151
Indep First Nations North	0.469	1.437	5.736	24.185
Indep First Nations South	0.218	1.859	3.476	30.060
Swampy Cree	0.683	2.131	7.126	34.483
West Region	0.601	1.998	4.859	34.056
Southeast Resource Devel	1.639	2.240	14.519	21.176
Dakota Ojibway	0.846	1.085	9.014	42.553
Manitoba, On Reserve	0.837	1.622	6.048	26.800

APPENDIX D. HOSPITALIZATION SEPARATION RATES AND TOTAL DAYS OF CARE BY CATEGORY, WITH AND WITHOUT BIRTHS INCLUDED

Table D-1: Provincial Age- and Sex-Standardized rates (per thousand) excluding hospitalization for birthing, comparing Registered First Nations people (RFN) and all other Manitobans (AOM)

Group and rate (per thousand)	Rate by length of stay categories (per thousand) excluding hospitalizations for birthing			
	0-29 days	30-179 days	180+ days	Overall
RFN hospital separation rate	317.05	7.427	0.288	324.765
AOM hospital separation rate	138.241	5.75	0.483	144.475
RFN total days of hospital care	1187.05	410.72	73.73	1671.50
AOM total days of hospital care	523.46	357.59	128.40	1009.46

Table D-2: Provincial Age- and Sex-Standardized rates (per thousand) including hospitalization for birthing, comparing Registered First Nations people (RFN) and all other Manitobans (AOM)

Group and rate (per thousand)	Rate by length of stay categories (per thousand) Including hospitalizations for birthing			
	0-29 days	30-179 days	180+ days	Overall
RFN hospital separation rate	340.30	7.48	0.29	348.07
AOM hospital separation rate	149.95	5.77	0.48	156.20
RFN total days of hospital care	1260.08	413.11	73.73	1746.91
AOM total days of hospital care	558.90	358.41	128.40	1045.71

APPENDIX E. GLOSSARY (INCLUDING DEFINITIONS)

Age Calculations

Age for both numerator and denominator for rates analyses is typically calculated as the age at the end of December of the year. For example, in the fiscal year 1994/95, Age = 1994 – birth year.

Ambulatory (walk-in) Visits

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

For purposes of this report, ambulatory visit rates, consult rates and specialist visit rates *exclude* any visits to obstetricians or gynaecologists that are related to issues of pregnancy, that is, if the ICD-9-CM codes are 640 through 648, 650 through 659, 660 through 669, V22, or V23.

Amputation

Removal of part or all of a body part enclosed by skin. For example, removal of part of a finger or an entire finger would be termed an amputation. Removal of an appendix, on the other hand, would not be termed amputation. It is performed to prevent the spread of gangrene as a complication of frostbite, injury, diabetes, arteriosclerosis (hardening of the arteries), or any other illness that impairs blood circulation. It is also performed to prevent the spread of bone cancer and to curtail loss of blood and infection in a person who has suffered severe, irreparable damage to a limb. When performing an amputation, surgeons generally cut above the diseased or injured area so that a portion of healthy tissue remains to cushion bone. Sometimes the location of a cut may depend in part on its suitability to be fitted with an artificial limb, or prosthesis. In this report, amputation was defined as any hospitalization for a lower limb amputation (ICD-9-CM of 84.40, 84.45-84.48 present in any procedure field) where the ICD-9-CM diagnosis was '250' in any

diagnostic field, that is, with diabetes comorbidity. Excluded were those records where injuries resulted from accident injury and those who were fitted with a prosthesis.

Angioplasty

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

Breastfeeding Initiation Rate

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

Consult Rate

A consult visit occurs when a client is referred by one physician to another because of the complexity, obscurity or seriousness of a patient's illness, or because of a request for a second opinion. Consultations are usually provided by specialists. See AMBULATORY VISITS for more information and for exclusion criteria.

Coronary Artery Bypass Graft Surgery (CABGS)

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

Caesarian Section (C-Section)

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

Calendar Year

A calendar year runs from January 1 to December 31.

Cardiac Catheterization

The most accurate method (the "gold standard") for evaluating and defining coronary artery disease (CAD), cardiac catheterization is used to identify the exact location and severity of CAD. During cardiac catheterization, a small catheter (a thin hollow tube with a diameter of 2-3 mm) is inserted through the skin into an artery in

the groin or the arm. Guided with the assistance of a fluoroscope (a special x-ray viewing instrument), the catheter is then advanced to the opening of the coronary arteries, the blood vessels supplying blood to the heart. When the catheter is used to inject radiographic contrast (a solution containing iodine, which is easily visualized with x-ray images) into each coronary artery, the cardiac catheterization is termed coronary angiography. Coronary angiography is usually performed in conjunction with cardiac catheterization. The images that are produced are called the angiogram. Angiographic images accurately reveal the extent and severity of all coronary arterial blockages. For this report, we used the term "cardiac catheterization" to represent any hospitalization occurring in a teaching hospital with ICD-9-CM codes of 37.22, 37.23, or 88.53 - 88.57 present in any procedure field.

Days of Hospital Care

The total number of days of hospital care used by all residents of a given region within a given fiscal year. Inpatient days from admission to discharge (excluding days of discharge), and surgical outpatient days (assigned a length of stay of one day) are both included in the total number of days. For records where the length of stay was greater than 365 days, this was truncated to 365 days.

Data Suppression

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

Diabetes Treatment Prevalence

Diabetes mellitus is a chronic condition in which the pancreas no longer produces enough insulin (Type I Diabetes) or when cells stop responding to the insulin that is produced (Type II Diabetes), so that glucose in the blood cannot be absorbed into the cells of the body. The most common endocrine disorder, Diabetes Mellitus affects many organs and body functions, especially those involved in metabolism, and can cause serious health complications including renal failure, heart disease, stroke, and blindness. Symptoms include frequent urination, fatigue, excessive thirst, and hunger. Type I Diabetes begins most commonly in childhood or adolescence and is controlled by regular insulin injections. The more common form of diabetes, Type II, occurs in approximately 3-5% of Americans under 50 years of age, and increases to 10-15% in those over 50. It can usually be controlled with diet and oral medication. The Canadian National Population Health Survey for 1994/95 showed 3% prevalence for both men and women in the general population. Another form of diabetes called gestational diabetes can develop during pregnancy and generally resolves after the baby is delivered. For this report, diabetes rates were calculated by looking at physician or hospital visits defined as due to diabetes (whether this was Type I, Type II or gestational diabetes).

"Diabetes treatment prevalence" was defined as the occurrence of at least two physician visits or one hospitalization with a diabetes diagnosis ("250" ICD-9-CM) in a three-year period, and expressed as a rate for people ages 20 through 79 years inclusive. A physician visit is really a physician "episode", i.e., this one visit could include both the visit to the physician and the related visits for laboratory tests (the laboratory testing is not counted as a second "visit"). Different sources of data

could presumably yield slightly different actual rates. In determining the validity of the diabetes treatment prevalence found through using our administrative data definition, a comparison was done between self-reports of diabetes in a 1997 survey called *Manitoba First Nations Regional Health Survey (1998)*, and our administrative database categorization of "diabetic" or not. This comparison was done by Brenda Elias, Charles Burchill and Patricia Martens in November 2001. The Kappa reliability score was 0.6038, which is considered moderate to substantial agreement. The concordance was 89.8%, the positive predictive value 58.7%, the negative predictive value 96.2%, sensitivity 76.0% and the specificity was 91.9%. A comparison was also made between crude rates for Tribal Council areas derived from the survey (a random sample) and administrative database crude rates (given in the Appendix of this report). Tribal Council area rates were comparable between the in-person survey sample and the population-based determination through the administrative database. Contact Brenda Elias or Patricia Martens for further information.

Employment – Population Ratio

The Employment-to-Population Ratio is a measure of all persons working, expressed as a percentage of the total population age 15 and over. See "Unemployment Rate".

Fiscal Year

For most health care institutions, the fiscal year is defined as starting April 1 and ending the following year at March 31. For example, the 1996/97 fiscal year would be April 1, 1996 to March 31, 1997, inclusive, and may also be denoted as FY 1996.

General Practitioner (GP)

A physician who operates a general practice and provides ambulatory care.

Hospital Separation(s) (also known as Hospital Discharge)

A separation from a health care facility occurs anytime a patient leaves because of death, discharge, sign-out against medical advice, or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions, are used because hospital abstracts for inpatient care are based on information gathered at the time of discharge. In this report, both inpatient hospital stays and surgical outpatient records are included. The words "separation," "hospitalization," "discharge," and "stay" are used interchangeably. In this report, hospital separations do not include newborn separations, since this would essentially result in a double counting (the woman and the baby being discharged).

Housing Unit

A housing unit is defined as any self-contained dwelling unit on a reserve or settlement with at least one bedroom and considered to be a main residence (as opposed to seasonal or vacation home) irrespective of occupancy, need for renovation or repair. It may be a detached or semi-detached house, a mobile home, a row house or a multi-unit residence where each unit may be counted separately.

- *Adequate Housing Units*. Housing units that do not require replacement, minor renovations, or major renovations.
- *Major Renovation Housing Unit*. Refers to a housing unit which requires a renovation because it fails to meet minimum National Building Code Standards.
- *Minor Renovation Housing Unit*. Refers to a housing unit meeting minimum National Building Code Standards but requires normal preventative maintenance and upgrading.
- *Replacement Housing Units*. Refers to housing units which are uninhabitable as a result of fire or natural disaster; or those declared unsafe or unfit for human habitation by a certified inspector because they do not meet basic quality standards and cannot be economically renovated to an acceptable condition.
- *Total Housing Units*. Total number of housing units in each community irrespective of quality standards or occupancy.
  Total Housing Units = Adequate Units + Minor Renovation Units + Major Renovation Units + Replacement Units
- *Habitable Housing Units*. Housing units that may be safely inhabited.
  Habitable Units = Adequate Units + Minor Renovation Units

Hypertension

Primary hypertension is often referred to as high blood pressure. The "tension" in hypertension describes the vascular tone of the smooth muscles in the artery and arteriole walls. It accounts for over 90 per cent of all cases of hypertension in the U.S. and develops without apparent causes. Hypertension is a major health problem, especially because it often has no symptoms. If left untreated, hypertension can lead to heart attack, stroke, enlarged heart, or kidney damage. In this report, hypertension was defined as the occurrence of at least one visit for hypertension (ICD-9-CM 401 or 402) in a three-year period, and expressed as a rate for people 25 years and older. In determining the validity of the hypertension treatment prevalence found through using administrative data, a comparison was done between self-reports of "high blood pressure" in a 1997 survey called *Manitoba First Nations Regional Health Survey (1998)*, and our administrative database categorization of "hypertensive" or not. This comparison was done by Brenda Elias, Charles Burchill and Patricia J. Martens in November 2001. The Kappa reliability score was 0.38, which is considered moderate to low agreement. The concordance was 80.1%, the positive predictive value 39.2%, the negative predictive value 93.8%, sensitivity 67.7% and the specificity was 82.2%. A comparison was also made between crude rates for Tribal Council areas derived from the survey (a random sample) and administrative database crude rates (given in the Appendix of this report). Tribal Council area rates were comparable between the in-person survey sample and the population-based determination through the administrative database; however the survey sample had very wide confidence limits associated with the rates. Contact Brenda Elias or Patricia Martens for further information.

Hysterectomy

A surgical operation to remove the uterus and, sometimes, the cervix. Removal of the body of the uterus without removing the cervix is referred to as a subtotal hysterectomy. Removal of the entire uterus and the cervix is referred to as a total

hysterectomy. In this report, hysterectomy was defined as any hospitalization with ICD-9-CM codes of 68.4, 68.5 or 68.9 present in any of the procedure fields.

Immunization

An intervention to initiate or increase resistance against infectious disease. The recommended immunization schedule for children under two years of age includes:

(a) Four Diphtheria, tetanus, pertussis (DTP or DTaP) shots. These are given at two, four, six, and 18 months of age. Prior to 1997 the DPT vaccine used whole cell pertussis, and after that, the vaccine used acellular pertussis (DPaT)
(b) Three to four inactivated Polio (IPV) shots. These are given at two, four, and 18 months of age, with an optional shot at six months of age
(c) Four Haemophilus influenzae type b (Hib) shots. These are given at two, four, six, and 18 months of age
(d) The Hepatitus B (Hep B) vaccine may be given. The recommended schedule for Hep B consists of three doses at zero, one, and six month intervals, where the second dose is given at least one month after the first, and the third dose is given at least four months after the first and two months after the second.

In this report, both 1-year and 2-year rates were calculated for the following:
1-year (365-day) required doses: 3 DTP, 2 IPV, 3 Hib
2-year (730-day) required doses: 4 DTP, 3 IPV, 1 MMR, 4 Hib

Income

- *Household Income*. Household refers to all persons who live within the same dwelling, regardless of their relationship to each other. Household income is the sum of incomes of all persons in the household.
- *Census Family Income*. A "census family", according to Statistics Canada, refers to couples (married or common-law), with or without children, and lone parents with at least one child, living within the same dwelling. Census family income is the sum of incomes of all members of the census family.

Injury Hospitalizations

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

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

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Motor Vehicle	E810: Motor vehicle traffic accident involving collision with train E811: Motor vehicle traffic accident involving re-entrant collision with another vehicle E812: Other motor vehicle traffic accident involving collision with motor vehicle E813: Motor vehicle traffic accident involving collision with other vehicle E814: Motor vehicle traffic accident involving collision with pedestrian E815: Other motor vehicle traffic accident involving collision on the highway E816: Motor vehicle traffic accident due to loss of control, without collision on the highway E817: Noncollision motor vehicle traffic accident while boarding or alighting E818: Other noncollision motor vehicle traffic accident E819: Motor vehicle traffic accident of unspecified nature E822: Other motor vehicle nontraffic accident involving collision with moving object E823: Other motor vehicle nontraffic accident involving collision with stationary object E824: Other motor vehicle nontraffic accident while boarding and alighting E825: Other motor vehicle nontraffic accident of other and unspecified nature
Other Vehicle	E820: Nontraffic accident involving motor-driven snow vehicle E821: Nontraffic accident involving other off-road motor vehicle E826: Pedal cycle accident E827: Animal-drawn vehicle accident E828: Accident involving animal being ridden E829: Other road vehicle accident E831: Accident to watercraft causing other injury E833: Fall on stairs or ladders in water transport E834: Other fall from one level to another in water transport E835: Other and unspecified fall in water transport E836: Machinery accident in water transport E837: Explosion, fire, or burning in watercraft E838: Other and unspecified water transport accident E840: Accident to powered aircraft at takeoff or landing E841: Accident to powered aircraft, other and unspecified E842: Accident to unpowered aircraft E843: Fall in, on, or from aircraft E844: Other unspecified air transport accidents E845: Accident involving spacecraft E846: Accidents involving powered vehicles used solely within the buildings and premises of industrial or commercial establishment E847: Accidents involving cable cars not running on rails E848: Accidents involving other vehicles, not elsewhere classified
Poisoning	E850: Accidental poisoning by analgesics, antipyretics, and antirheumatics E851: Accidental poisoning by barbiturates E852: Accidental poisoning by other sedatives and hypnotics

Table E-1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Poisoning (continued)	E853: Accidental poisoning by tranquilizers E854: Accidental poisoning by other psychotropic agents E855: Accidental poisoning by other drugs acting on central and autonomic nervous system E856: Accidental poisoning by antibiotics E857: Accidental poisoning by other anti-infectives E858: Accidental poisoning by other drugs E860: Accidental poisoning by alcohol, not elsewhere classified E861: Accidental poisoning by cleansing and polishing agents, disinfectants, paints, and varnishes E862: Accidental poisoning by petroleum products, other solvents and their vapors, not elsewhere classified E863: Accidental poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant food and fertilizers E864: Accidental poisoning by corrosives and caustics, not elsewhere classified E865: Accidental poisoning from poisonous foodstuffs and poisonous plants E866: Accidental poisoning by other and unspecified solid and liquid substances E867: Accidental poisoning by gas distributed by pipeline E868: Accidental poisoning by other utility gas and other carbon monoxide E869: Accidental poisoning by other gases and vapors E980: Poisoning by solid or liquid substance, undetermined whether accidentally or purposely inflicted E981: Poisoning by gases in domestic use, undetermined whether accidentally or purposely inflicted E982: Poisoning by other gases, undetermined whether accidentally or purposely inflicted
Falls	E880: Fall on or from stairs or steps E881: Fall on or from ladders or scaffolding E882: Fall from or out of building or other structure E883: Fall into hole or other opening in surface E884: Other fall from one level to another E885: Fall on same level from slipping, tripping, or stumbling E886.9: Fall on same level from collision, pushing, or showing, by or with other person - Other and unspecified E887: Fracture, cause unspecified E888: Other and unspecified fall
Fire and Flames	E890: Conflagration in private dwelling E891: Conflagration in other and unspecified building or structure E892: Conflagration not in building or structure E893: Accident caused by ignition of clothing E894: Ignition of highly flammable material E895: Accident caused by controlled fire in private dwelling E896: Accident caused by controlled fire in other and unspecified building or structure E897: Accident caused by controlled fire not in building or structure E898: Accident caused by other specified fire and flames E899: Accident caused by unspecified fire
Natural and Environmental Factors	E900: Excessive heat E901: Excessive cold E902: High and low air pressure and changes in air pressure E903: Travel and motion

Table E-1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Natural and Environmental Factors (continued)	E904: Hunger, thirst, exposure and neglect E905: Venomous animals and plants as the cause of poisoning and toxic reactions E906: Other injury caused by animals E907: Lightning E908: Cataclysmic storms, and floods resulting from storms E909: Cataclysmic earth surface movements and eruptions E928.1: Other and unspecified environmental and accidental causes - Prolonged stay in weightless environment: E928.2: Other and unspecified environmental and accidental causes - Exposure to noise
Drowning	E830: Accident to watercraft causing submersion E832: Other accidental submersion or drowning in water transport accident E910: Accidental drowning and submersion
Suffocation and Choking	E911: Inhalation and ingestion of food causing obstruction of respiratory tract or suffocation E912: Inhalation and ingestion of other object causing obstruction of respiratory tract or suffocation E913: Accidental mechanical suffocation
Sports	E886.0: Fall on same level from collision, pushing, or shoving, by or with other person - in sports E917.0: Striking against or struck accidentally by objects or persons – in sports
Late Effects	E929: Late effects of accidental injury E989: Late effects of injury, undetermined whether accidentally or purposely inflicted
Violence to Self	E950: Suicide and self-inflicted poisoning by solid or liquid substances E951: Suicide and self-inflicted poisoning by gases in domestic use E952: Suicide and self-inflicted poisoning by other gases and vapors E953: Suicide and self-inflicted injury by hanging, strangulation, and suffocation E954: Suicide and self-inflicted injury by submersion [drowning] E955: Suicide and self-inflicted injury by firearms and explosions E956: Suicide and self-inflicted injury by cutting and piercing instrument E957: Suicide and self-inflicted injuries by jumping from high places E958: Suicide and self-inflicted injury by other and unspecified means E959: Late effects of self-inflicted injury
Violence by Others	E960: Fight, brawl, rape E961: Assault by corrosive or caustic substance, except poisoning E962: Assault by poisoning E963: Assault by hanging and strangulation E964: Assault by submersion [drowning] E965: Assault by firearms and explosives E966: Assault by cutting and piercing instrument E967: Child and adult battering and other maltreatment E968: Assault by other and unspecified means E969: Late effects of injury purposely inflicted by other person E970: Injury due to legal intervention by firearms E971: Injury due to legal intervention by explosions E972: Injury due to legal intervention by gas E973: Injury due to legal intervention by blunt object E974: Injury due to legal intervention by cutting and piercing instrument

Table E-1 Continued

External Cause of Injury Category	ICD-9-CM/ICD-9 Definition
Violence by Others (continued)	E975: Injury due to legal intervention by other specified means E976: Injury due to legal intervention by unspecified means E977: Late effects of injuries due to legal intervention E978: Legal execution
Other	E914: Foreign body accidentally entering eye and adnexa E915: Foreign body accidentally entering other orifice E916: Struck accidentally by falling object E917.1: Striking against or struck accidentally by objects or persons - caused by crowd, by collective fear or panic E917.2: Striking against or struck accidentally by objects or persons – in running water E917.9: Striking against or struck accidentally by objects or persons - other E918: Caught accidentally between objects E919: Accidents caused by machinery E920: Accidents caused by cutting and piercing instruments or objects E921: Accident caused by explosion of pressure vessel E922: Accident caused by firearm missile E923: Accident caused by explosive material E924: Accident caused by hot substance or object, caustic or corrosive material, and steam E925: Accident caused by electric current E926: Exposure to radiation E927: Overexertion and strenuous movements E928.0: Other and unspecified environmental and accidental causes - prolonged stay in weightless environment E928.8: Other and unspecified environmental and accidental causes - other E928.9: Other and unspecified environmental and accidental causes - unspecified accident E990: Injury due to war operations by fires and conflagrations E991: Injury due to war operations by bullets and fragments E992: Injury due to war operations by explosion of marine weapons E993: Injury due to war operations by other explosion E994: Injury due to war operations by destruction of aircraft E995: Injury due to war operations by other and unspecified forms of conventional warfare E996: Injury due to war operations by nuclear weapons E997: Injury due to war operations by other forms of unconventional warfare E998: Injury due to war operations but occurring after cessation of hostilities E999: Late effect of injury due to war operations
Undetermined	E983: Hanging, strangulation, or suffocation, undetermined whether accidentally or purposely inflicted E984: Submersion [drowning], undetermined whether accidentally or purposely inflicted E985: Injury by firearms and explosives, undetermined whether accidentally or purposely inflicted E986: Injury by cutting and piercing instruments, undetermined whether accidentally or purposely inflicted E987: Falling from high place, undetermined whether accidentally or purposely inflicted E988: Injury by other and unspecified means, undetermined whether accidentally or purposely inflicted

Life Expectancy

Expected years of life from birth, based on the mortality experience of a given population from 1995 through 1999. Life expectancy at birth for males and females is a commonly accepted indicator of population health. This indicator has the advantage of describing the experience of all people in the population, not just those 0-74 (as for the premature mortality measure). Statistics are not typically used to identify differences in life expectancy rates. The methodology for calculating life expectancy for this report was based on "Users Guide to 40 Community Health Indicators" published by the Community Health Division, Health Services & Promotion Branch, Health & Welfare Canada, 1992. Vital Statistics records from 1995 through 1999 were used, with the population for those years as the denominator. Age and residence were calculated as of date of death.

Location of Care

The location of an ambulatory physician visit or hospitalization is based upon the location of the physician or hospital. There are four categories: within the RHA (Regional Health Authority) of residence; outside the RHA (but not in Winnipeg); in Winnipeg RHA; and out of province.

Mammography

Mammography is a procedure to determine if a woman has breast cancer or a breast tumor; it is commonly used for breast cancer screening. Mammograms can show most breast cancer two to three years before it can be detected through self-exams. Manitoba has a province-wide breast screening program operated by the Manitoba Breast Screening Program. The goal of the Manitoba Breast Screening Program is to screen 70% of Manitoba women age 50-69 every two years, approximately 33,000 women per year. It is recommended that all women between 50 and 69 years of age be screened every two years for breast cancer or breast tumors. In this report, five tariff codes were used to define mammography: 7098, 7099, 7104, 7110, 7111. The rate was based upon the proportion of women ages 50 through 69 years who received mammography over a two-year period from 1997/98 through 1998/99.

Physician Specialties

Physicians are classified as either general practice (including family practice), or specialist. Specialists refer to the following: psychiatry, paediatrics, obstetrics and gynaecology, medical specialists, general surgeons, and surgical specialists.

Potential Years of Life Lost (PYLL)

PYLL is a measure of premature mortality which gives greater weight to deaths occurring at younger ages than to those at later ages. The Statistics Canada definition of PYLL is the number of years of life 'lost' when a person dies prematurely, that is, before the age of 75. Statistics Canada reports age-standardized potential years of life lost for males and females, for all-cause and for selected preventable causes. PYLL is calculated by subtracting the actual age of death from 75 in each age group, and dividing the total potential years of life lost by the total population under age 75. A person dying at age 25, for example, has lost 50 years of life (75-25=50 PYLL). By emphasizing the loss of life at an early age, PYLL focuses attention on the need to

deal with the major causes of such early deaths - cancer, injuries, and cardiovascular disease - in order to improve health status. PYLL has also been found to vary with characteristics such as sex, socio-economic status and place of residence. For this report, Vital Statistics records from 1995 through 1999 were used, with the population from 1995 through 1999 as the denominator. Age was calculated as of date of death. PYLL was calculated as (75 - age at death). Deaths before age one and after age 75 were excluded. Demographic information was assigned as of date of death. All data were adjusted for age, and output separately by sex.

Premature Mortality Rate (PMR)

The number of deaths of people aged 0 through 74 years, divided by the number of residents ages 0 through 74 years of age in the area. The rate is standardized to account for age/sex differences in populations. PMR is an important indicator of the general health of a population; high PMR indicates poor health status. In this report, mortality over a 5-year period (1995 to 1999) was used, along with the population under the age of 75 over the same time period, yielding an annual PMR rate based upon five years of data. Age was defined as of month end of date of death. All other demographic information was assigned as of date of death.

Prevalence

The measure of a condition in a population at a given point in time is referred to as point prevalence. A second type of prevalence is called period prevalence. Over a period of time, such as one year, this measures the number of individuals with a particular condition in the population during that time period. Period prevalence is the most common measure of prevalence used in MCHP studies. Prevalence data provide an indication of the extent of a condition and may have implications for the provision of services needed in a community.

Rates and Standardization of Rates

Unless otherwise noted, rates were standardized for age and sex using the direct method of standardization. These rates are referred to by various terms, including "direct standardization," "directly standardized," "age and sex-adjusted," "adjusted rate." This procedure mathematically removes the effects of different population structures that may influence overall rates of use of health care. For most of the analyses in this report, the age groups used for standardization were: 0-19, 20-39, 40-59, 60-74, and 75+ years. When numerators were less than 5 cases, rates were suppressed due to instability. Standardization permits valid and "fair" comparisons between groups, by standardizing the rate to the overall Manitoba population age and sex distribution in 1996. Within one group, a crude rate provides a measure of the magnitude of a given condition.

Regional Health Authorities (RHAs)

Twelve RHAs have been defined within Manitoba. The RHAs have the responsibility for providing for the delivery and administration of health services in specified geographic areas. The regions consist of North Eastman, South Eastman, Central, South Westman, Brandon, Marquette, Interlake, Parkland, Nor-Man, Burntwood, Churchill and Winnipeg (formed from the Winnipeg Hospital Authority

and the Winnipeg Community and Long Term Care Authority). Treaty individuals are generally assigned to an RHA based on a combination of postal code and municipal code assigned by Manitoba Health.

Registered First Nations

First Nations is a term that came into common usage in the 1970s to replace the word "Indian." Although the term First Nations is widely used, no legal definition of it currently exists. "First Nations peoples" refers to the group of Aboriginal persons called Indians, both registered (Status or Treaty) and non-registered (Non-Status), as designated by the terms of the 1876 Indian Act. All Registered First Nations (Status or Treaty Indians) receive entitlements of land, voting rights, and Band membership. In this report, we use the term "Registered First Nations" to refer to a Status Indian, and "First Nations communities" to refer to the separate tracts of land often called "reserves."

Specialist Contact Rate

Ambulatory specialist contacts are visits provided by specialist physicians, including the use of specialists for consultations (see CONSULT RATE) as well as for follow-up care. (The visits can be initiated by the patient's family doctor, specialist, or by the patient.) See AMBULATORY VISITS for more information and for exclusion criteria.

Status Verification System (SVS) files

The following was based upon the First Nations and Inuit Health (FNIHB), Health Canada website (February 11, 2002) at http://www.hc-sc.gc.ca/fnihb-dgspni/fnihb/nihb/publications/pilot_projects_handbook/appendix_A.htm

Status Verification System (SVS) is a national database maintained by FNIHB headquarters which contains a complete list of Registered Indians and recognized Innu/Inuit clients eligible for benefits under NIHB. NIHB refers to the Non-Insured Health Benefits Program - a program of the First Nations and Inuit Health Branch, Health Canada. This program provides a range of benefits not included in provincially and territorially administered insurance programs, to First Nations and Inuit individuals in the categories of drugs, dental services, vision care, medical supplies and equipment, mental health services, medical transportation, and payment of non-insured benefits outside of Canada.

Tonsillectomy/Adenoidectomy

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

Total Days of Hospital Care

See "Days of Hospital Care"

Tribal Council Areas

Tribal Council areas refer to nine groupings of First Nations communities based upon an organizational chart in Chapter 3 of this report. There are seven Tribal Councils, plus two groupings that combine all Independent or Unaffiliated First Nations communities in the North, and in the South. The seven official Tribal Councils can be described using the official definition of "Tribal Council" available from Indian and Northern Affairs Canada, shown below (taken directly from http://www.ainc-inac.gc.ca/ps/igs/tcp_e.html on February 11, 2002).

Program Authority and Administration

The Tribal Council Program is one component of First Nation Indian Government Support funding programs. The other components are Band Support Funding, Band Advisory Services, Band Employee Benefits, Indian and Inuit Management Development and Indian and Inuit Careers Programs. Introduced in 1984, this program operates under broad authorities provided by the *Department of Indian Affairs and Northern Development Act* and derives its legislative authorities for the activity from annual Parliamentary appropriations and Treasury Board authorities.

Objective

Tribal Councils are defined as institutions established as "a grouping of bands with common interests who voluntarily join together to provide advisory and/or program services to member bands".

The purpose of this program is to provide funding to Tribal Councils to enable them to provide advisory services to their First Nation members and also to enable Tribal Councils to delivery programs and services, subject to the agreement of the First Nation members. Tribal Councils may also enter into agreements with other federal government departments (such as Health Canada and Human Resources Development Canada) to delivery programs and services.

Current Situation

Tribal Councils are required to incorporate under provincial or federal legislation and must maintain their corporate affairs in good standing to be eligible for continued funding. Chiefs or other representatives from member communities serve as a Board of Directors and oversee the provision of advisory or other common services to member communities. Tribal Councils are primarily accountable to member First Nations and exercise flexibility in managing the delivery of advisory services or programs, consistent with the department's responsibility to account for public funds.

The specific advisory services that have been devolved from DIAND to Tribal Council administration include: economic development; financial management; community planning; technical services; and band governance.

Tribal Councils are required to provide all five Advisory Services to their members.

In 2000-01, there are 80 Tribal Councils providing advisory and program services to 493 First Nations. There are 135 First Nations not affiliated with a Tribal Council but 16 of these, with a population of 2000 or more, also receive funding for advisory services. Approximately 80 per cent of the on reserve population reside in communities where Tribal Councils or large unaffiliated First Nations provide advisory services.

Funding for Tribal Council advisory services and administrative overhead is determined by a funding formula which takes into account the services delivered, the number of First Nations forming the Tribal Council, the on-reserve population of member First Nations, and the geographic location of the Tribal Council office.

Unemployment Rate

The Unemployment Rate is a measure of all persons who are part of the labour force and who are not working, expressed as a percentage of the total labour force. Persons are considered part of the labour force if they are employed or working in self-employment, are on temporary lay-off, are about to start a new job, or are actively looking for work. Employment is considered a determinant of health, that is, an underlying factor assumed to influence overall health status.

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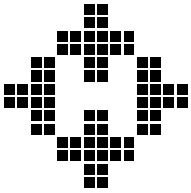

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PULLOUT: ABBREVIATIONS AND DEFINITIONS USED IN THIS REPORT

RFN	Registered First Nations people who have band affiliation with a Manitoba First Nations community and are currently residents of the province of Manitoba, Canada
All other Manitobans	Those not classified as RFN, including Manitoba non-Aboriginal people, Aboriginal people who are not registered in the Indian & Northern Affairs Canada Status Verification System (for example, Métis), and those who have band affiliation with a non-Manitoba First Nations community
"on-reserve" RFN	Manitoba Registered First Nations people living in or near the First Nations community of their Band affiliation
"off-reserve" RFN	Manitoba Registered First Nations people not living in or near the First Nations community of their Band affiliation
AMC	Assembly of Manitoba Chiefs
MCHP	Manitoba Centre for Health Policy
MKO	Manitoba Keewatinowi Okimakanak
PYLL	Potential Years of Life Lost
PMR	Premature Mortality Rate
RHA	Regional Health Authority

Abbreviations for Tribal Council Areas:

DOTC	Dakota Ojibway Tribal Council
ILTC	Island Lake Tribal Council
Independent FN North	Independent/Unaffiliated First Nations North group
Independent FN South	Independent/Unaffiliated First Nations South group
IRTC	Interlake Reserves Tribal Council
KTC	Keewatin Tribal Council
SCTC	Swampy Cree Tribal Council
SERDC	Southeast Resource Development Council
WRTC	West Region Tribal Council

Maps showing Tribal Council areas (left), and an overlay of the twelve provincial Regional Health Authority boundaries (right)