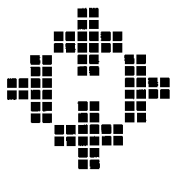


Population Health Information System  
1990-91 to 1992-93 & 1992-93

**A Report on the Health Status,  
Socio-Economic Risk and Health  
Care Use of the Manitoba  
Population 1992-93 and  
Overview of the 1990-91 to  
1992-1993 Findings**

November 1994



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Health Policy and Evaluation**  
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## **The Manitoba Centre for Health Policy and Evaluation**

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

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

Members of the MCHPE consult extensively with government officials, health care administrators, and clinicians to develop a research agenda that is topical and relevant. This strength, along with its rigorous academic standards and its exceptional data base, uniquely position the MCHPE to contribute to improvements in the health policy process.

The Centre's researchers are widely published and internationally recognized. They collaborate with a number of highly respected scientists from Canada, the United States and Europe.

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## Introduction

In January 1991, the Manitoba Centre for Health Policy and Evaluation (MCHPE) was established at the University of Manitoba. It received support from a special initiatives fund of the Government of Manitoba and was mandated to provide the Department of Health with research-based analyses, evaluation and policy options. As part of its responsibilities the Centre agreed to develop a health information system for the province.

The Population Health Information System (PHIS) is designed to focus on the link between health care utilization and health, and to make it possible to examine how effectively and efficiently health care services produce health in the population. Critical assessments of medical care typically focus on the clinical outcomes of individual treatments and quality of care delivered by institutions, not on the health of populations. Historically, allocations for hospital services have been made in response to demands stemming from population growth, increases in intensity of use, technological imperatives and political pressure. Moreover, there has been no systematic central planning to match the numbers and specialties of physicians and their practice locations to the health needs of populations. The Centre developed the information system in the hope of facilitating rational decision making and, ultimately, shifting discussions from a focus on the demand for health care to the demand for health.

The system is population-based and, thus, is designed to track the health status and health care resource use of residents of given regions (regardless of where such use takes place), rather than examining provisions of care by specific providers and institutions. The PHIS also identifies the socio-economic characteristics of regional residents since socio-economic status has long been linked to poorer health outcomes and greater need for health care.

The system is organized around important issues such as the intensity of use. For example: How much do residents of regions vary in their use of large technologically sophisticated hospitals for acute care? What is the relative use across regions of resource-intensive procedures like a coronary artery bypass versus less intensive procedures such as dilatation and curettage? What proportion of care is delivered by specialist physicians versus generalists? To what extent is health care concentrated on individuals who have frequent contact with physicians?

One of the long-term goals that spurred the development of the PHIS was an interest in demonstrating the links (or lack thereof) between different types of utilization, socio-economic status and the health status of the people of Manitoba.

The Population Health Information System has produced separate preliminary reports for each of the modules outlined below based on 1991-92 fiscal year data:

Population Health: Health Status Indicators (January 1994)

Utilization of Physician Resources (March 1994)

Utilization of Hospital Resources (December 1993)

Utilization of Personal Care Home Resources (October 1993)

Socio-Economic Characteristics (January 1994)

Each module contains a summary discussion of findings, as well as a set of detailed tables. This edition of the PHIS presents a few key findings from the 1992-93 fiscal year as well as comparisons with 1990-91 and 1991-92 data to assess the consistency of patterns over time. It also begins the process of making links across different modules. Fuller details are contained in the body of the report.

The Population Health Information System was developed on the assumption that significant insights into the health care system can be obtained by the use of a population health perspective. Put simply, to understand the delivery of health care

in Manitoba, it is important to examine the health of the population and relate it to patterns of services provided by the health care system. Previous work suggests that because socio-economic status is an important determinant of health, patterns of use and health can only be fairly assessed with knowledge of the socio-economic characteristics of the population.

Researchers in the population health field (e.g., Eyles et al., 1994) have advocated the use of a single measure - premature mortality - as the "best" indicator of health status capturing the need for health care.<sup>1</sup> Throughout this report, regions are ordered on the basis of three year (1990-91 through 1992-93) standardized mortality ratios (SMRs) for people aged 0-74 years of age within regions. All figures list the regions in order of increasing premature mortality.<sup>2</sup> Figures and tables start with Westman whose residents score best - having the lowest death rate among its non-elderly population - and are ordered through Thompson, whose residents score worst. Assuming Eyles et al.'s postulate is valid, this means that regions are also listed in order of increasing need for health services. Whenever a difference is identified either among regions or over time a statistical test has been performed and there is a probability of less than 1 in 20 that the difference is due to chance.<sup>3</sup>

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1/ Researchers have recently moved from using the standardized mortality ratio for people aged 0 to 64 years (SMR 0-64) to the expanded SMR 0-74 range to capture this aspect of health status/need.

2/ All rates reported (including expenditures) have been age and sex adjusted to allow for comparisons across regions. No adjustment has been made for inflation in the expenditure data.

3/ The details of the statistical tests are omitted for brevity and readability. For the same reason the term "significant" is omitted. Also note that a statistically significant difference with a large population may not be substantively important for policy purposes.



## Executive Summary

The Population Health Information System (PHIS) is designed to focus on the link between health care utilization and health, and to make it possible to examine how effectively and efficiently health care services produce health in the population.

This report uses data from the fiscal years 1990-91 through 1992-93 and presents some analyses which parallel those in the previous PHIS reports as well as possible trends over time.<sup>4</sup>

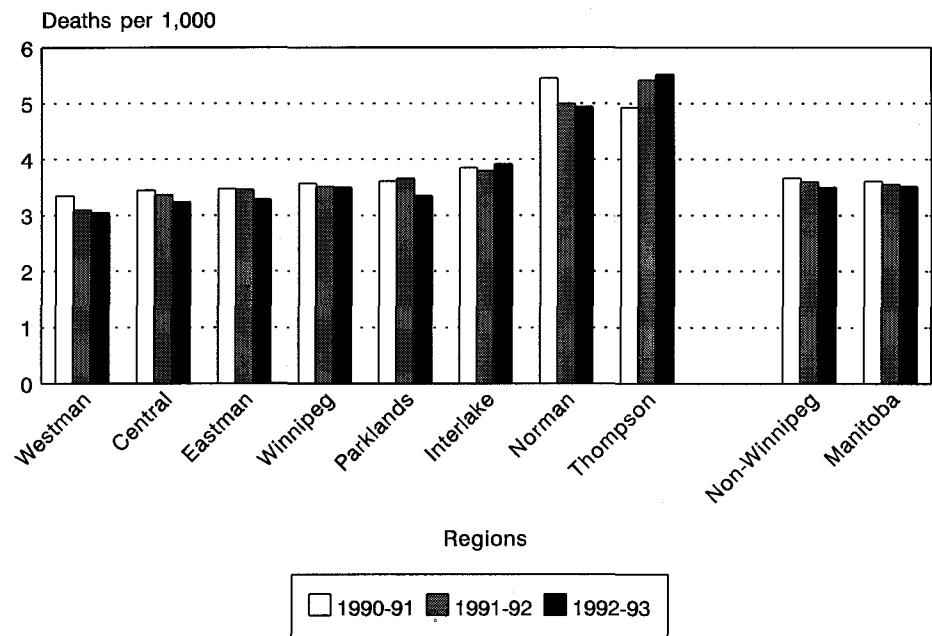
Data from the Health Status portion of the PHIS indicate that between 1990-91 and 1992-93 there was a small but statistically significant drop in the age-sex standardized rates of mortality among people aged 0-74 (Figure A). This may be cautiously interpreted as a modest improvement in the health status of Manitobans. Nevertheless, throughout the period both the Norman and Thompson regions showed higher than average premature mortality among their residents. For example, in 1992-93 the standardized mortality ratios (SMR) for people aged 0-74 in those regions were 41% and 57% higher than the provincial average, respectively. Westman, at the other extreme, had a mortality ratio 13% below the provincial average in 1992-93. Indeed, on a regional level, there was a strong relationship between premature mortality and the Socio-Economic Risk Index (a measure of socio-economic status)<sup>5</sup> (Figure B). Put simply, people from regions that fared poorly on a variety of economic and social indicators had a higher death rate. These regional differences were relatively stable over the three year period.

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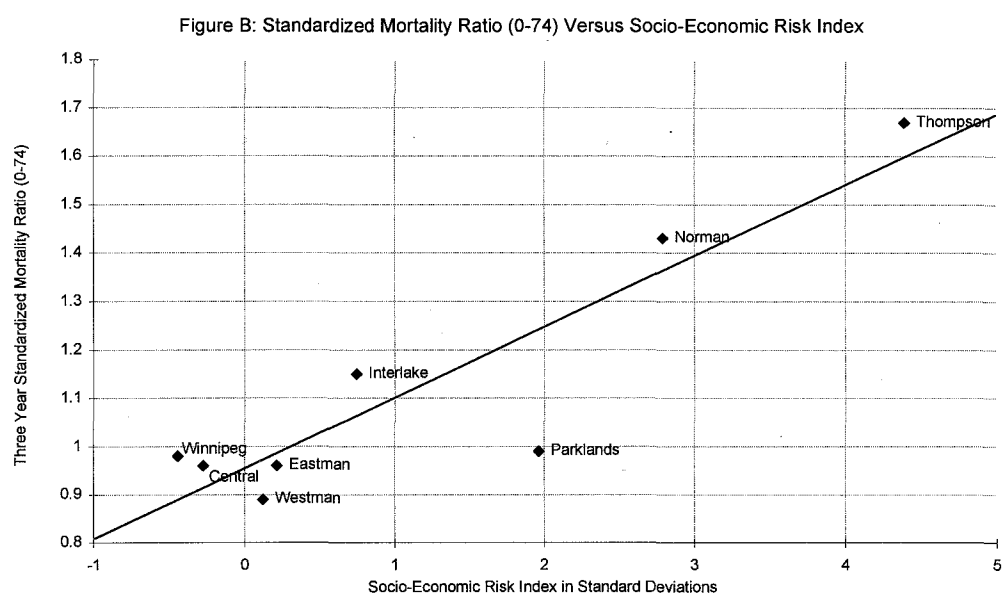
4/ To facilitate reading this executive summary, details of statistical tests have been omitted. Whenever a difference (either across regions or over time) is referred to, unless it is explicitly identified as insignificant, the reader is to understand that the difference is statistically significant.

5/ This index includes measures of unemployment, low levels of education, low housing value, low female participation in the labour force and high levels of single parent female households. It was developed in the Socio-Economics Characteristics Module (1991/92) and shown to be related to both poorer health and higher utilization of health care resources.

**Figure A: Mortality Among Persons aged 0-74  
Manitoba  
1990-91 to 1992-93**



Rates are age-sex adjusted to 1992 Manitoba Population Aged 0-74 years



Consistent with the modest improvements in mortality indicators, other commonly used measures of health status showed some improvement over the three years. The proportion of infants born with low birth weight dropped and mortality due to chronic disease also declined marginally from 1990-91 to 1992-93.

These improvements in population health status occurred in an environment characterized by stable or increasing use of physician services. Physician visits per 100 population increased slightly over the three year period both within Winnipeg and also in the rest of the province.

In 1992-93, the percentage of individuals contacting a physician at least once over the course of the year was relatively uniform across regions in the province (Figure C) despite the remarkably different availability of physicians (Figure D).

Approximately 80% of the residents in each region made at least 1 contact in 1992-93, whereas the physician supply varied by 302%. Nevertheless, differences in physician utilization were evident between Winnipeg and the rest of the province. In 1992-93, Winnipeg had a considerably larger supply of physicians than the rest of the Province (97% more), and visits per 100 residents were somewhat higher (16% more). Specialist physicians were particularly concentrated in Winnipeg where they accounted for 54% of physicians compared to only 14% outside the city. Winnipeggers were also much more likely to have a consultative visit with a physician than their non-Winnipeg counterparts. The net effect of these differences in utilization patterns was an expenditure per resident of Winnipeg for physician services that was \$29.47 higher than the comparable cost<sup>6</sup> for a non-Winnipeg resident (\$123.41 versus \$93.94).

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6/ Throughout we will be using administrative data as the basis of our cost discussions. While these clearly do not capture all costs associated with services, we will use the terms "cost" and "expenditures" interchangeably with the understanding that they refer to Provincial expenditures.

Figure C: Physician Utilization  
Manitoba  
1992-93

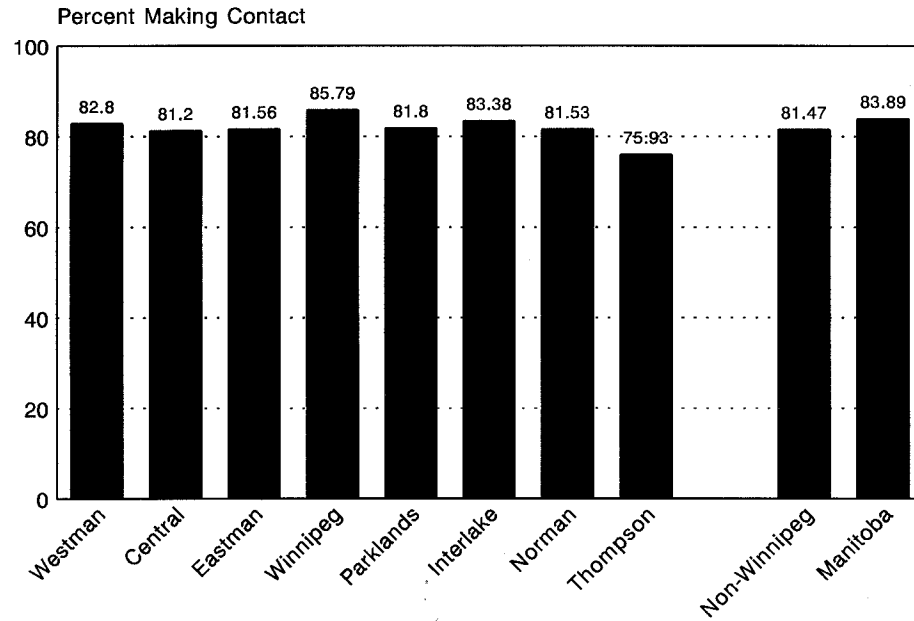
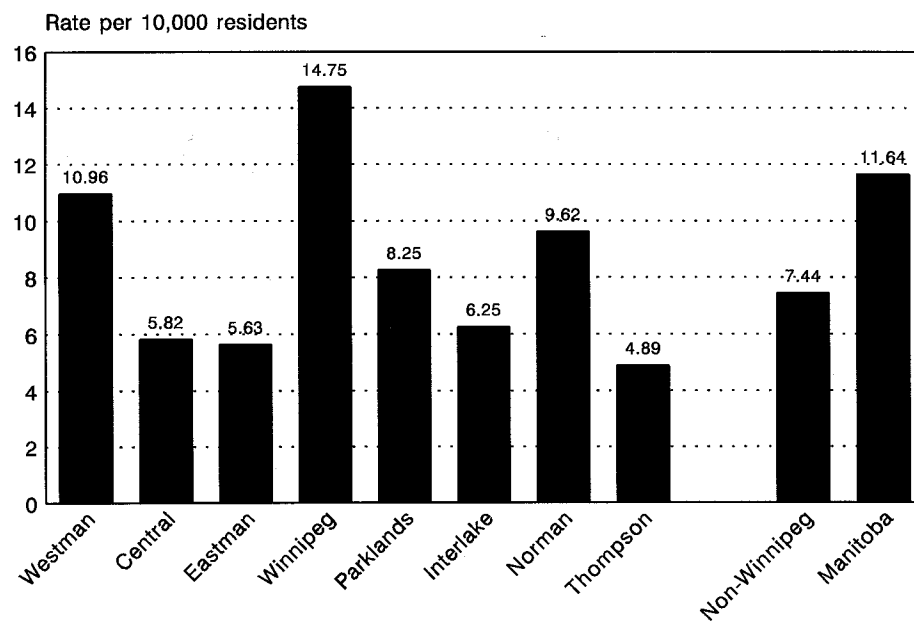


Figure D: Physician Supply  
Manitoba  
1992-93



Regionally there was a strong relationship between primary care visits (including both general practitioners and nursing station visits) and the Socio-Economic Risk Index (Figure E). This appears to indicate that primary care utilization may be related to this measure of risk and that those more at risk are making more use of these resources. But taken together with the persistent link between socio-economic factors and premature mortality, it suggests that relatively poorer health persists in the two northern regions despite relatively high access to primary care.

Short stay hospital utilization also varied across the regions, with variation in use tending to parallel the Socio-Economic Risk Index scores of the regions.<sup>7</sup> In general, residents of regions with the poorest health status and highest socio-economic risk (i.e., Norman and Thompson) make the heaviest use of hospitals for short stays. This pattern persisted over each of the three years examined.

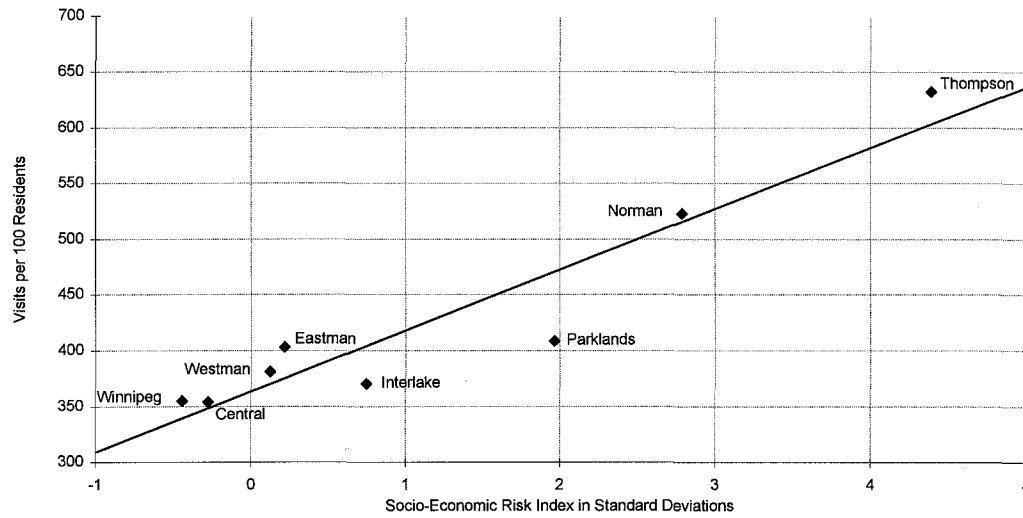
In 1992-93, there were also differences in hospital use between Winnipeg and the rest of the Province. Winnipeg residents spent fewer days in hospital than non-Winnipeg residents for short stay hospital admissions (less than 60 days), but more days in hospital for long stays (Figure F). Comparing 1992-93 with 1990-91, there was a 5% decline in short term hospital days per 1000 residents in Winnipeg and a .05% decline outside the city. Despite the drop in days, short-stay hospital separations per 1000 Winnipeg residents remained stable between 1990-91 and 1992-93 at 98 per 1000 residents. They increased slightly for non-Winnipeg residents.

Despite the marked difference in hospital use across regions, there was no clear relationship between rate of use and the proportion of hospital days used by very sick patients. There also appeared to be little or no substitution between a higher use of ambulatory physician care (more visits - or more contact with specialist

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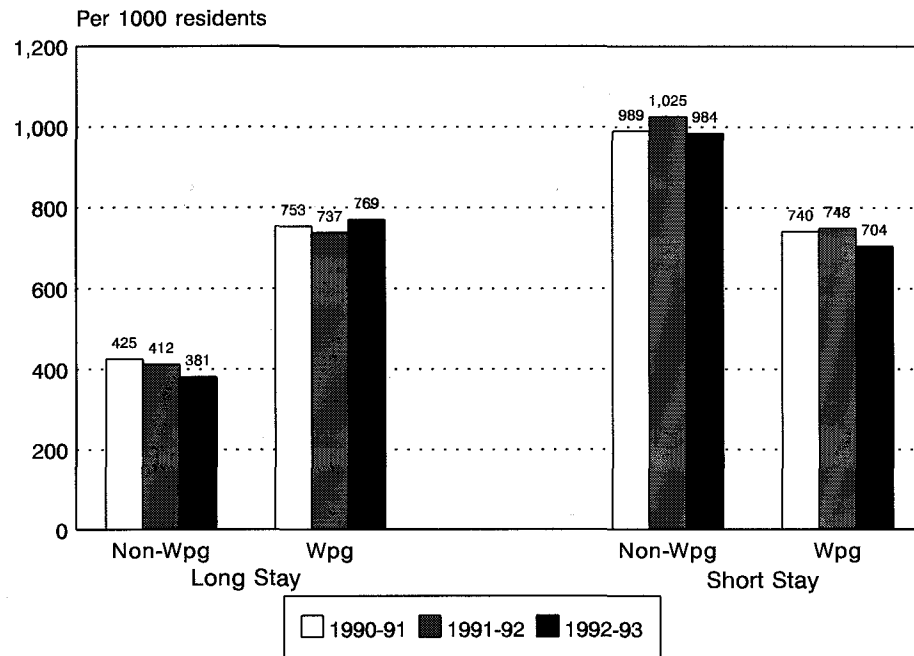
7/ Inpatient activity only is included.

Figure E: Primary care\* visits per 100 residents versus Socio-economic Risk Index: 1992-93



\* includes visits to General Practitioners and nursing station visits

Figure F: Hospital Days by Length of Stay  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93



physicians) and less reliance on hospitals. While Winnipeg residents had the richest physician supply, highest physician contact rate (overall and with specialists), and lowest rate of acute hospitalization in the province - residents of Norman had made high use of physicians but also had the highest rate of hospitalization. On the other hand, Westman residents, who, like Winnipeg residents, were among the healthiest and had the best access to specialist care (outside of Winnipeg) had a relatively high hospitalization rate.

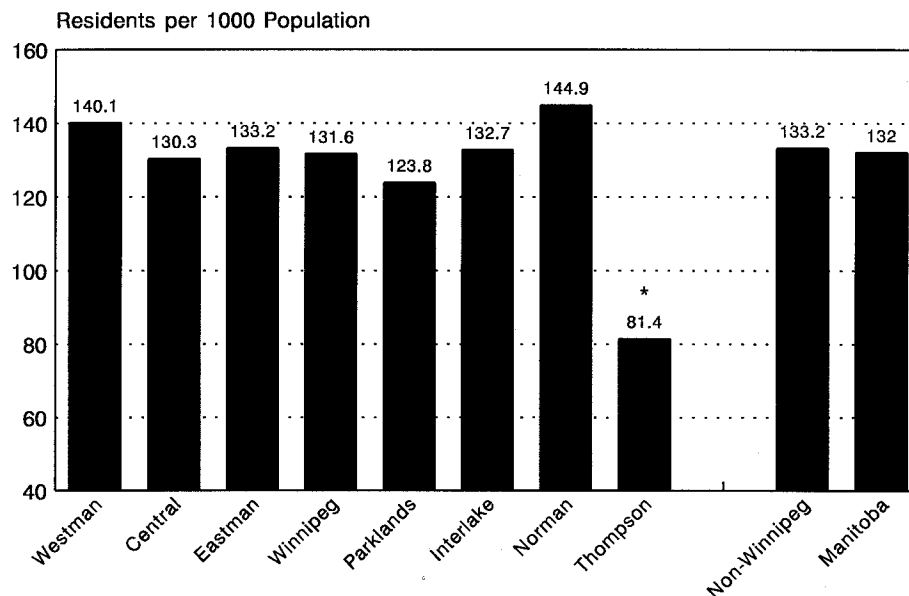
Manitoba has an aging population. The 1992-93 population 75 years and older was 2.3% larger than the previous year and 108 new nursing home beds were opened - representing a 1.3% increase in supply. Over the three year period, the increases were 5.2% in the elderly population and 3.1% in beds. Two indicators suggest that persons are being maintained in their homes longer. The level of nursing care required on admission and the number admitted to nursing homes from hospitals have both increased.

In 1992-93, there was relatively little variation in nursing home utilization across the province (Figure G) suggesting similar access to care. Excluding Norman and Thompson, which have very small elderly populations making rates unstable in those regions, the number of PCH residents per 1000 population aged 75 years or older ranged from 124 in Parklands to 140 in Westman. The average estimated provincial cost of PCH care per elderly resident was \$3,180. From 1990-91 to 1992-93 PCH utilization rates fell, probably due to decreased bed availability.

## **Conclusions**

As noted in the introduction, the Population Health Information System was designed to allow for a comparison of need (based on measures of socio-economic status), health care resource use, and the health of the population. This brief overview provides a hint at what can be concluded from a combined look at the use

Figure G: Utilization of PCH Resources Among Residents Aged 75+  
Manitoba  
1992-93



\* Excludes one federally funded nursing home

of physicians, hospital care, and personal care homes as they relate both to socio-economic status and the health of the population.

The three year period has been marked by a modest increase in the health status of the population as a whole, a slight increase in the utilization of physician services, a slight decrease in acute hospital services, and the persistence of relatively poorer health among the residents of Norman and Thompson. Westman residents continue to experience better than average health status. These findings indicate a pattern of relative stability within a system experiencing marginal shifts.

What conclusions can be drawn to date? First of all, the Canadian healthcare system works well in Manitoba inasmuch as, at the regional level, the Manitoba system appears to be, in part, needs driven. The two regions whose residents have



the highest levels of hospital use (the northern, geographically isolated Thompson and Norman regions) are also those whose residents have the poorest health and the highest scores on the Socio-Economic Risk Index.

Manitoba's system provides a high level of care to residents of disadvantaged regions. Despite this, there continues to be a strong relationship between socio-economic risk factors and poor health status. It is therefore important to ask whether high use of the health care system is the most effective way to ensure good health. While it would be quite wrong to suggest that the health problems of Norman and Thompson residents be ignored, the data raise fundamental questions about the role of the health care system in improving the health of the population. Given the continued disparity in premature mortality across socio-economic strata, high use clearly does not guarantee good health. Current health care programs and expenditure patterns are unlikely to solve the underlying problems creating differences in health status. A closer focus on the determinants of health and on programs designed to generate good health across the entire population is in order.

## **Socio-Economic Characteristics**

The population health literature includes a broad range of studies demonstrating the existence of a strong relationship between low socio-economic status and both poor health status and the use of health care resources. Ever since the "Lalonde Report" population health researchers in Canada have been sensitized to the impact that other factors such as lifestyle and the environment have on population health. In addition, there has been a growing movement to understand the determinants of health status beyond health services utilization.

The 1991-92 report focussed on the socio-economic characteristics of the Manitoba population. It described the development of a Socio-Economic Risk Index (SERI) based on six indicators of socio-economic status derived from 1986 Census data. These indicators were shown to be associated with health status and health care resource use.

In all, six socio-economic characteristics were identified and combined in the index. As the percentage of the labour force unemployed between the ages of 15 and 24, the percentage unemployed between 45 and 54, and the percentage of single parent female households rose in a region, so did poor health. As the percentage of the population between the ages of 25 and 34 having graduated high school increased, the percentage of females participating in the labour force climbed, and the average dwelling value increased across regions, poor health declined. Thus, the first three indicators were associated with higher risk of poor health and the last three with lower risk. It is not argued that these factors are the causes of poor health. The proper interpretation of the Index is that it is an indicator - a measure - of socio-economic factors associated with poor health.

As stated in the Introduction, for this report, we adopted the Eyles et al. (1994) measure of the mortality ratio for people aged 0 to 74 years (SMR 0-74) as a single indicator of health status, and (by extension) of the need for health care. Figure 1 plots the relationship between the three year (1990-91 to 1992-93) average SMR 0-74 and the Socio-Economic Risk Index. The Index is strongly related to this measure of health status. Seventy-nine percent of the regional differences in SMR 0-74 were accounted for by regional differences in the Index. This compares with the analysis in the 1991/92 report which related the Standardized Mortality Rate of persons 0-64 to the Index and explained 91% of the variance in this measure of mortality. Thus, the relationship between the Index and premature mortality (and hence poor health) appears to be relatively consistent over the time period in question.

A broad measure of health care resource usage examined in the 1991/92 module was the days per capita spent by each region's residents in hospital for acute care (i.e., 1 to 59 day stays). The short stay inpatient care data reported in the Utilization of Hospital Resources 1991/92 report was strongly related to the Socio-Economic Risk Index.<sup>8</sup> Indeed, the Index explained 92% of the regional variance in short stay days of care. Figure 2 shows the relationship between the Index and the age and sex standardized short stay days of care in 1992-93. Seventy-five percent of the variance across regions in short stay days of care is explained by the SERI<sup>9</sup>. This indicates that individuals in regions with higher risk are, in general, receiving more short stay inpatient care.

An important measure of primary care use is the number of visits residents make to a general practitioner per 100 population in a region. If physician resources are

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8/ The rates were age and sex standardized so that accurate comparisons of use patterns could be made across regions.

9/ Ninety percent of the variance in separations is also explained by the SERI..

Figure 1: Standardized Mortality Ratio (0-74) Versus Socio-Economic Risk Index

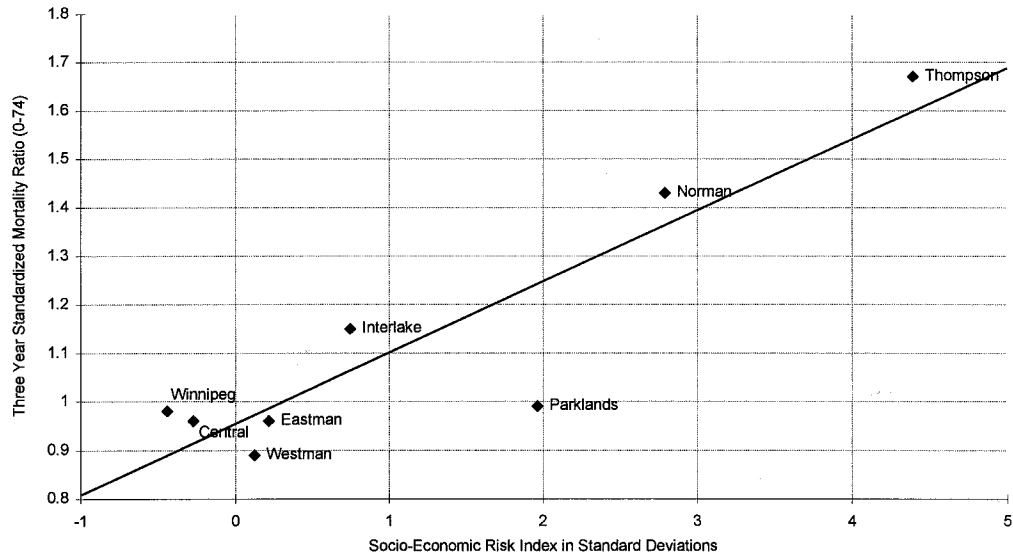
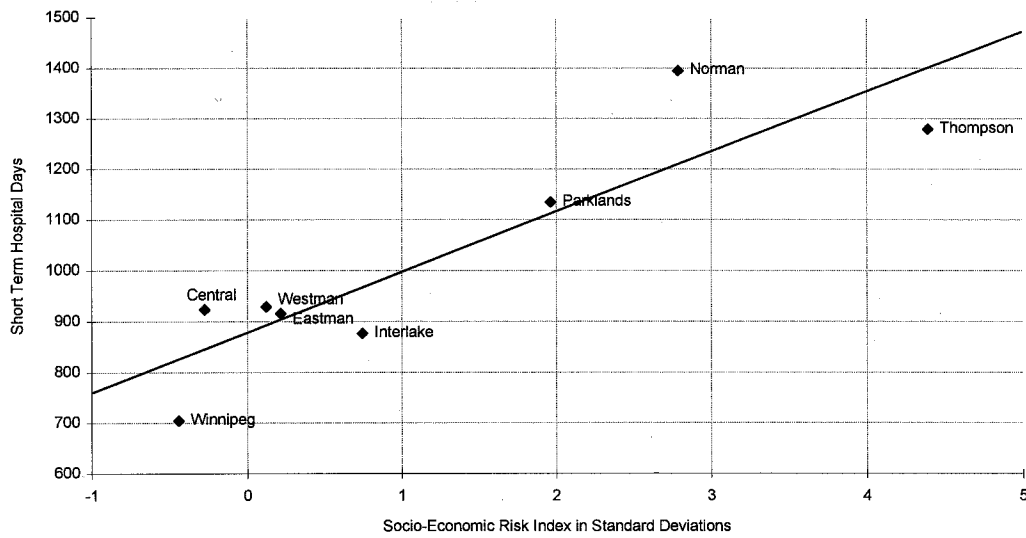
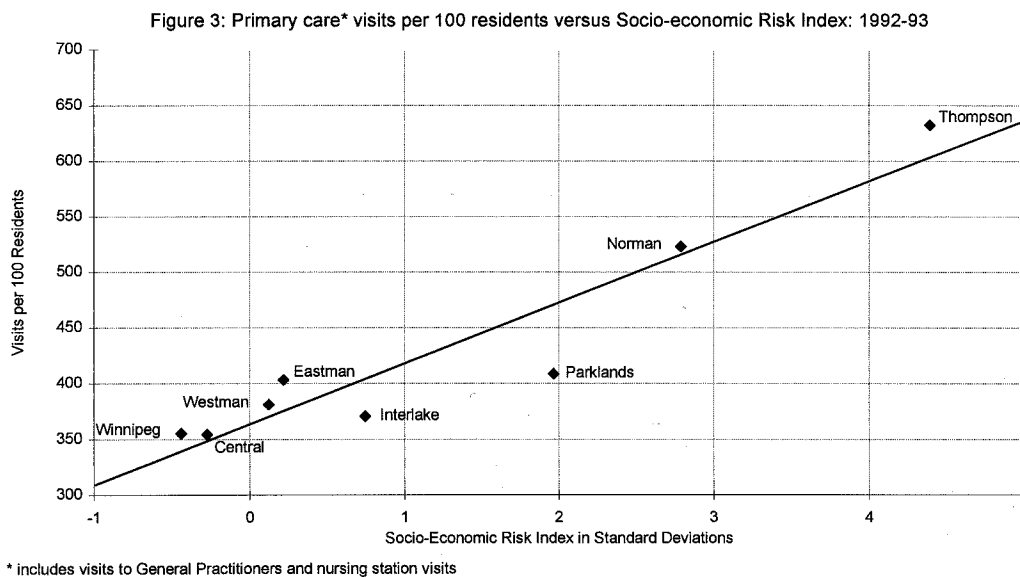


Figure 2: Short Term Hospital Days Versus Socio-Economic Risk Index: 1992-93



allocated to regions whose residents are of highest risk, then one would expect a relationship between this measure of health care resource use and the socio-economic risk. Figure 3 shows that there does indeed appear to be a strong relationship between this measure of utilization and the SERI. It should be noted however, that in Eastman, Norman and Thompson a number of ambulatory visits are to nursing stations. The analysis above is based on an adjustment of visits that equates a visit to a nursing station with a visit to a general practitioner and so the relationship must be interpreted with caution.<sup>10</sup> Nevertheless, 89% of regional differences in such visits are accounted for by differences in regional scores on the Socio-Economic Risk Index and the relationship is highly significant.

Despite the apparent link between higher socio-economic risk and the use of both short stay hospital resources and primary care visit resources, it is important to



10/ Visits to nursing stations in 1991-92 (the latest available data) were added to the Eastman, Norman and Thompson regions. This increased the visits in the former two regions by about 7 percent but raised the Thompson total by 61%. However, they were not age and sex adjusted.

recognize that premature mortality (SMR 0-74) is still strongly related to underlying socio-economic factors (see Figure 1). The additional care does not appear to correct for the underlying poor health.

## **Population Health: Health Status Indicators**

Improving the health of the Manitoba population is one of the primary goals of the provincial health care system. The Population Health: Health Status Indicators module of the PHIS is designed to provide data that make it possible to monitor the health of the population. Since there are a broad range of conditions that can adversely affect the health of various segments of the population, the module presents data on a variety of health indicators. Here we review data on a few key indicators of health status (i.e., mortality and low birth weight) in 1992-93 and over the three year period from April 1990 through March 1993.

In these analyses, as well as other analyses reported in this paper, the rates were age- and sex-adjusted using the direct method.<sup>11</sup> To ensure that differences reflect real change and not the changing age structure of the population within a region across time, the rates were standardized to the 1992-93 age distribution.

### **Mortality Indicators: Population and Cause Specific**

Mortality rates are an indicator of health status that capture the cumulative effects of disease in the population. Standardized Mortality Ratios (SMRs) of different groups therefore can be used as summary indicators of their health status. The following SMRs are included in this report: (1) male and female deaths, (2) age 0-74 deaths, (3) injury deaths, (4) cancer deaths, and (5) chronic disease deaths.

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11/ More detailed information on this method of adjustment can be found in the Glossary.

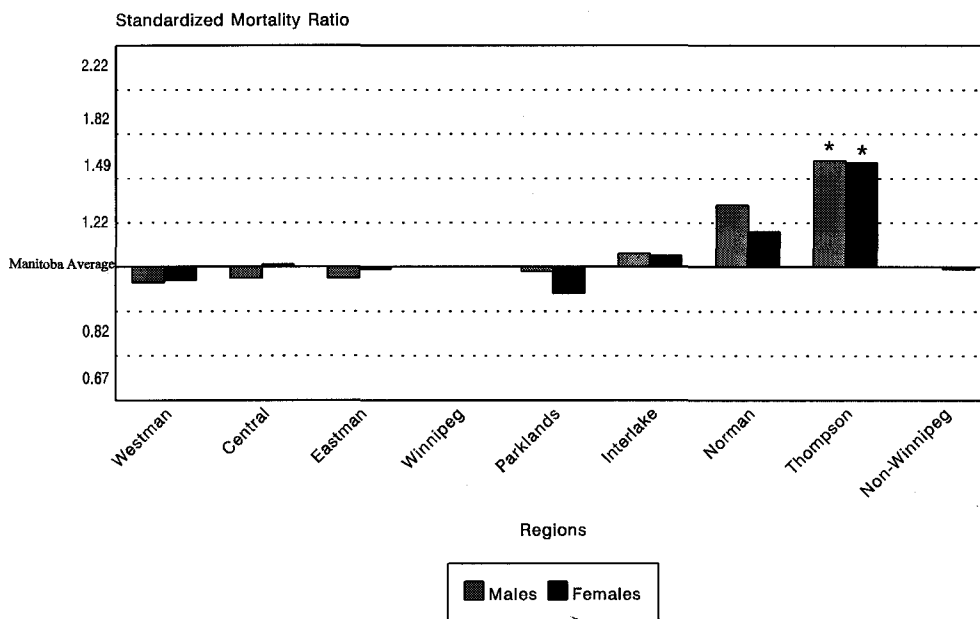
### Death Rates for Males and Females

The 1992-93 data show that mortality rates among both male and female residents of Thompson were higher<sup>12</sup> than the provincial average (Figure 4). The male mortality rate in Norman was also higher than the provincial average.

### Standardized Mortality Ratio (0-74)

The standardized mortality ratio for people aged 0 to 74 years (SMR 0-74) is considered the best single indicator of health status capturing the need for health care in the population. As shown in Figure 5, in 1992-93 the SMR 0-74 was higher than the provincial average for residents of Thompson and Norman regions. The residents of Westman had the lowest SMR 0-74.

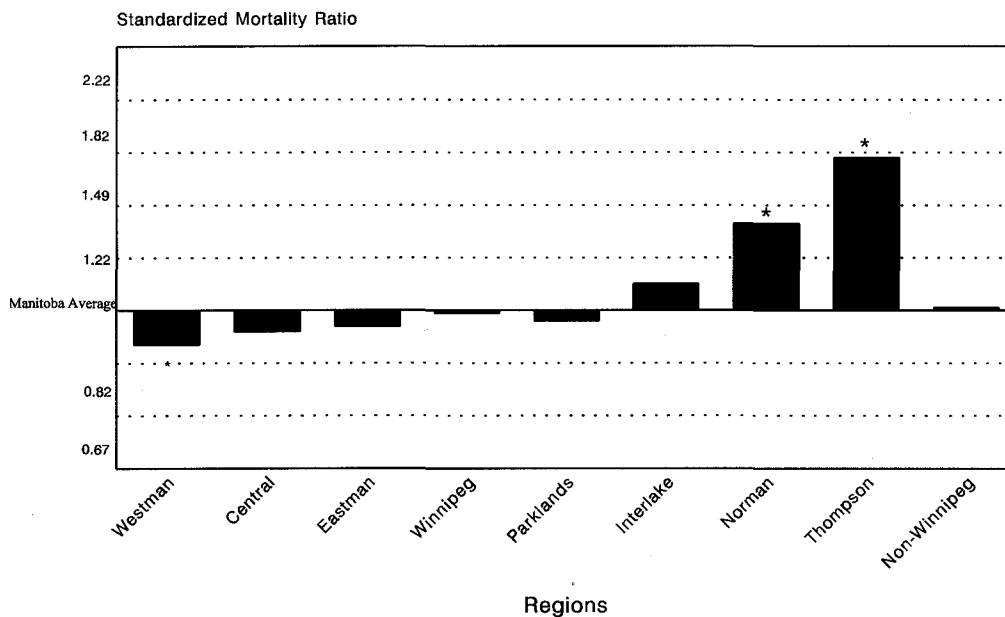
Figure 4: SMRs for Deaths Among Males and Females  
Manitoba  
1992-93



12/ At the risk of being redundant, it is worth repeating that, as stated in the Introduction, unless otherwise stated, only statistically significant results are reported in this paper. Thus, differences between regions or over time are only mentioned when the probability that they occurred by chance is less than one in twenty.



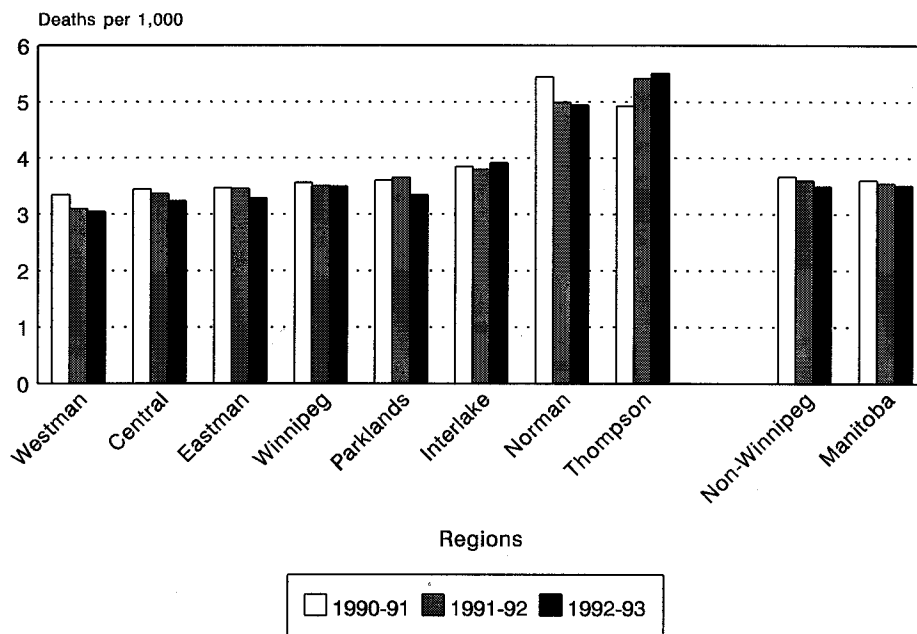
Figure 5: SMRs for deaths among persons aged 0-74  
Manitoba  
1992-93



\* Results are significantly different than the mean ( $p < .05$ )

Figure 6 presents three years of age-sex standardized rates of mortality among persons 0 to 74 years of age by region in Manitoba. It shows that residents of Westman had the lowest mortality rate over each of the three years, however, only significantly so in the most recent two years. In addition, over the three years, both Norman and Thompson residents had higher death rates than in the rest of the province. In 1990-91 Norman had the highest 0-74 mortality rate followed by Thompson. This order was reversed for the next two years, however the rank order of the other regions was relatively stable over the three years. For Manitoba as a whole there was a modest decline in mortality from 1990-91 to 1992-93 from 3.60 to 3.53 per 1000 population.

Figure 6: Mortality Among Persons aged 0-74  
Manitoba  
1990-91 to 1992-93



Rates are age-sex adjusted to 1992 Manitoba Population Aged 0-74 years

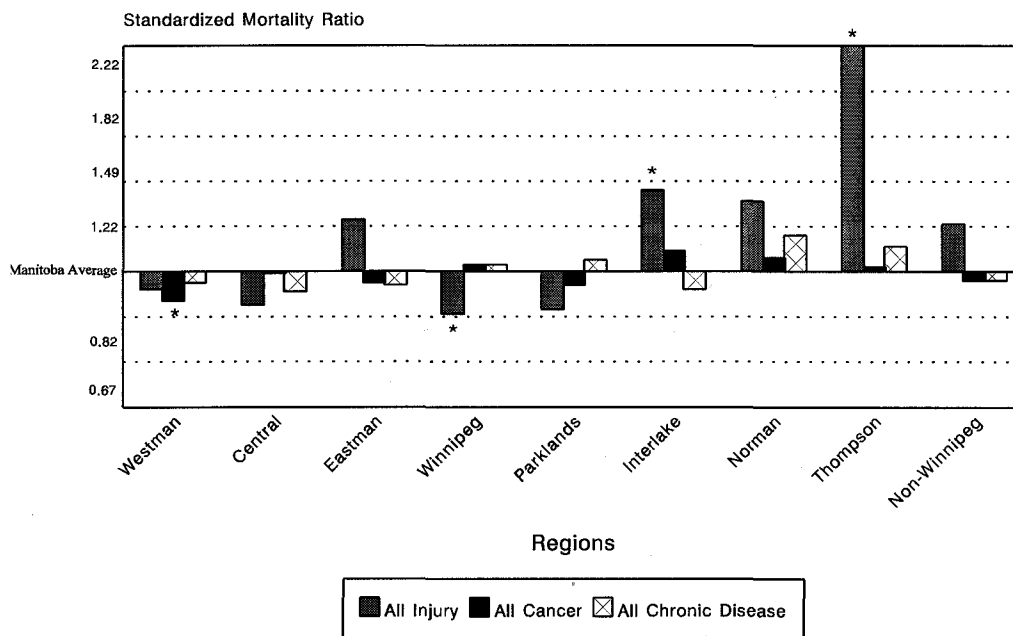
### Deaths due to Injury, Cancer & Chronic Disease<sup>13</sup>

Certain specific causes of death have been associated with poor population health. Among these are deaths due to injury, cancer and chronic diseases.

In 1992-93, deaths due to all injuries among Thompson residents were three times higher than the provincial average (Figure 7). Residents of Interlake also experienced a higher rate of deaths due to injury than the Manitoba average, whereas Winnipeg residents had a lower rate of injury deaths. There was a relationship between deaths from injury and the Socio-Economic Risk Index - 59% of the regional variance was explained by the Index.

13/ A list of specific causes included in the injury, cancer and chronic disease indicators is located in Appendix A.

Figure 7: SMRs for summary death indicators  
Manitoba  
1992-93



\* Results are statistically different than the mean ( $p < .05$ )

Over the three year period, there was relative stability in deaths due to injury on a regional basis except in Norman and Parklands (Figure 8). Norman residents had a lower mortality rate due to injury in 1992-93 than in 1990-91, while Parkland's rate was lower in 1992-93 than in both the preceding years.

In 1992-93, cancer death rates were similar among all residents of Manitoba regardless of the region in which they lived, except in Westman where the residents had a lower than average rate (Figure 7). There was a significant relationship between the regional cancer deaths and socio-economic risk - 47% of the regional differences was explained by the Index.

Figure 9 shows that from 1990-91 to 1992-93, mortality due to cancer was relatively stable in all the regions except Thompson where the number of deaths per

Figure 8: Mortality due to All Injuries  
Manitoba  
1990-91 to 1992-93

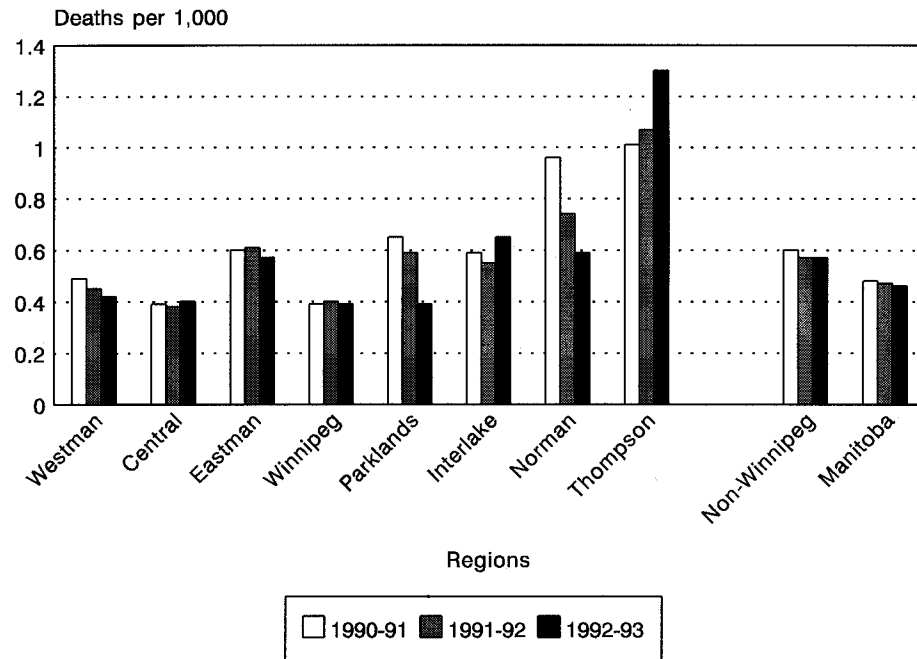
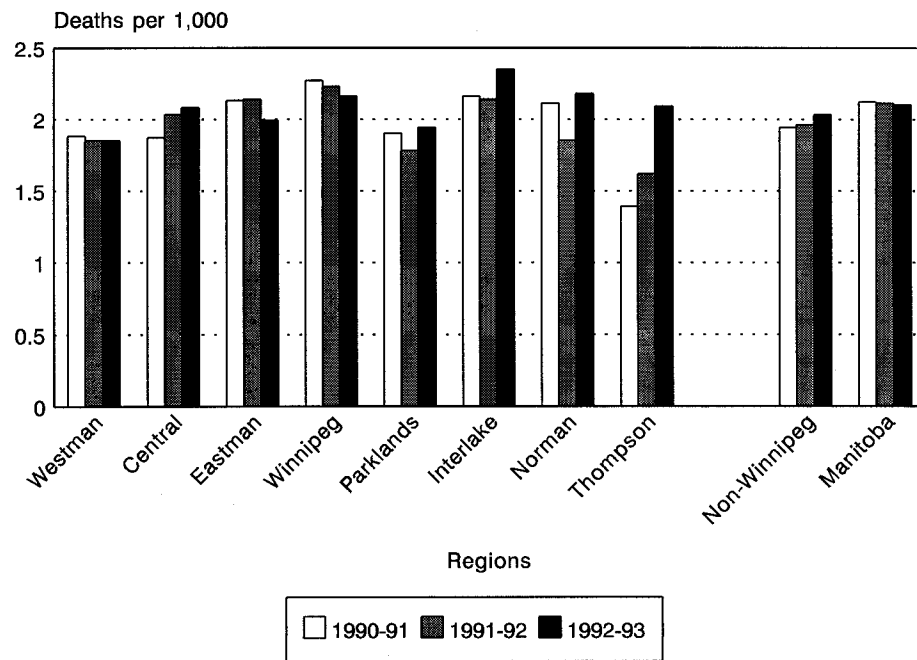


Figure 9: Mortality due to All Cancers  
Manitoba  
1990-91 to 1992-93

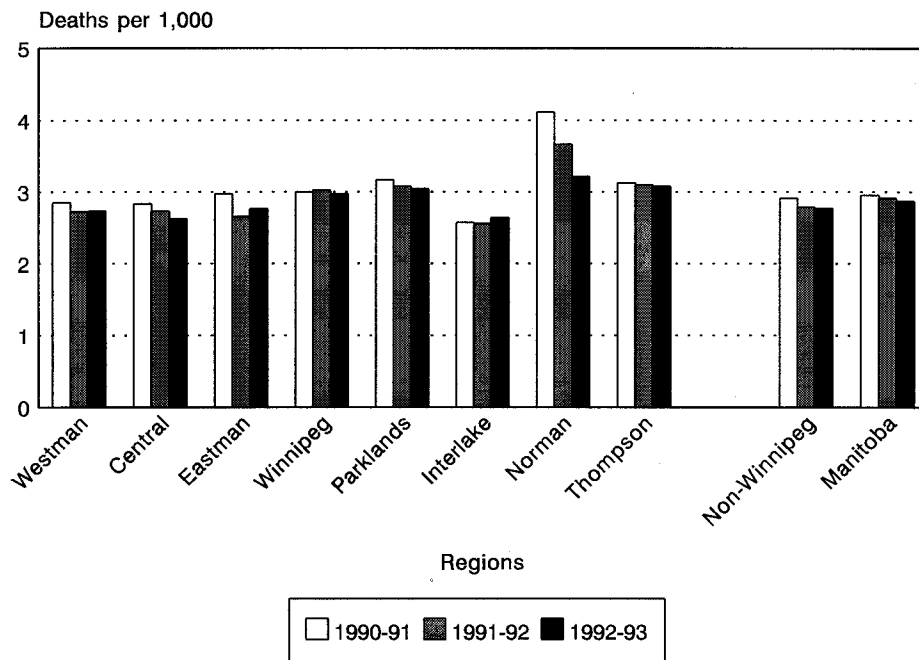


1,000 residents increased steadily, but not in a statistically significant fashion. However, there were significant differences between regional rates for specific regions compared with the entire province. Specifically, Westman's mortality rate due to all cancers in each of the three years was lower than the provincial rate in the respective year and Winnipeg's rates were higher than the Manitoba rate. Winnipeg rates were also higher than Non-Winnipeg rates in each of the three years.

For adults in their mid-years, chronic diseases are the main causes of death and disability. The combined rate of deaths due to asthma, vascular complications, diabetes, ischemic heart disease and emphysema among Manitoba residents is categorized as deaths due to chronic diseases. In 1992-93, no differences in the rate of deaths due to chronic diseases across regions in the province were statistically significant (Figure 7). However, it is worth noting that Norman residents had the highest rate of chronic disease deaths followed by residents of Thompson. Central region residents had the lowest rate of chronic disease deaths, just slightly below the provincial mean. There was a significant relationship between chronic disease deaths and the Socio-Economic Risk Index scores of the regions - 57% of the regional variation was explained by regional differences in the Index.

Mortality rates due to chronic disease in Manitoba from 1990-91 to 1992-93 are presented in Figure 10. The rate of chronic disease deaths remained stable in all regions except Norman where there was a yearly decline over the three years. Despite this decline, Norman remained the region in Manitoba with the highest rate of chronic disease mortality every year. The rank order among the regions remained essentially the same each year. There was a small but consistent decrease in the provincial and aggregate Non-Winnipeg mortality rates over the three year period.

Figure 10: Mortality due to Chronic Disease  
Manitoba  
1990-91 to 1992-93

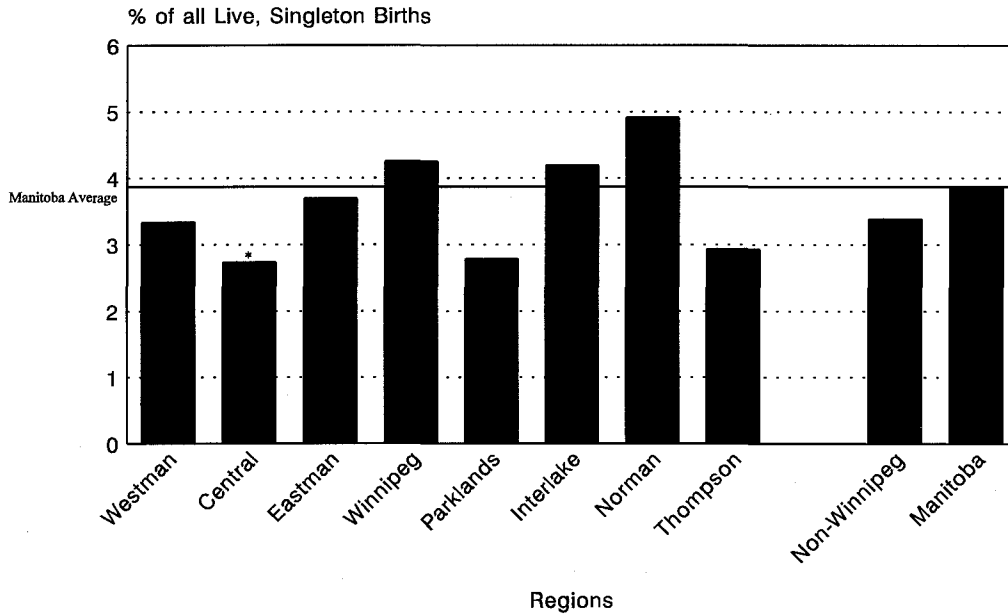


### Proportion of Low Birth Weight (< 2500 grams) Births

Although the proportion of low birth weight infants born to Norman, Winnipeg and Interlake residents were higher than in other regions of Manitoba in 1992-93 (Figure 11), none of these differences were statistically significant. However, Central region women had a rate of low birth weight newborns much lower than the provincial average. In addition, all non-Winnipeg regions combined had a lower rate of low birth weight infants than Winnipeg. On a regional basis, there was no significant relationship between the proportion of low birth weight births in the province and the Socio-Economic Risk Index.

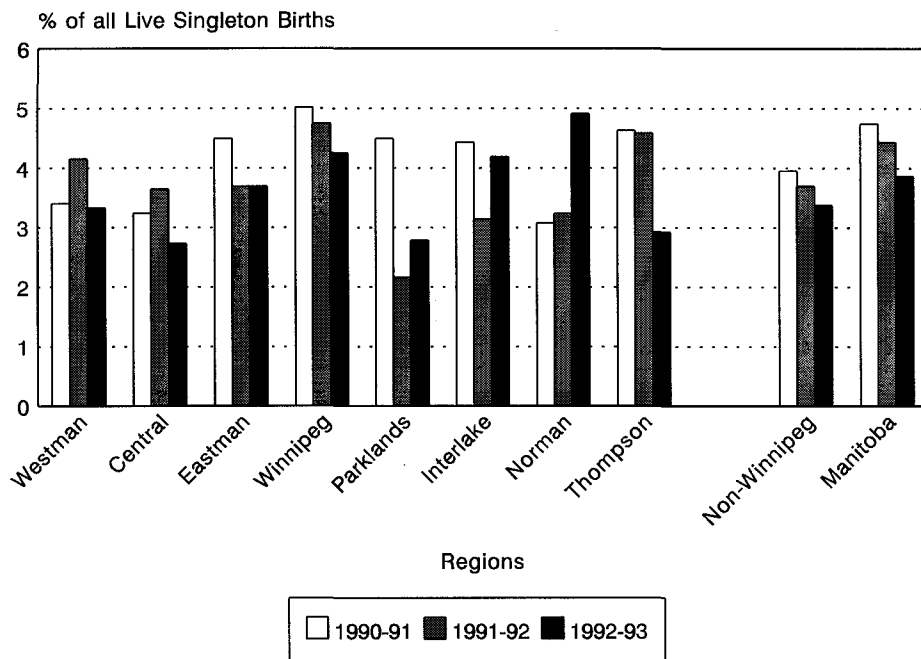
Between 1990-91 and 1992-93 the rate of low birth weight infants per 100 live singleton births declined in Winnipeg (Figure 12). This pattern was also present in the non-Winnipeg region and in the province as a whole. Thus, overall, the rate of

Figure 11: Proportion of low birth weight births  
Manitoba  
1992-93



\* Results are significantly different than the mean (p < .05)

Figure 12: Proportion of Low Birth Weight Births  
Manitoba  
1990-91 to 1992-93



low birth weight infants declined in the province over the three year period.

## Summary

Table 1 presents a summary of the results for 1992-93. In Table 1 the province's SMR for a condition is represented as "1". If an SMR for a particular region for a specific condition is greater than one, then that region's rate for that condition is higher than the provincial average. If the SMR for a particular region is less than one for a given condition, then that region has a lower rate for that condition. Thus a SMR above one implies that a region is less healthy and a SMR below one implies a region is more healthy than the provincial average. The SMR is a ratio, therefore, a SMR of 1.30 means that the rate in that region for that particular condition was 30% higher than for the province as a whole. A SMR below one, in a similar way, represent rates below the provincial average. For example, a SMR

Table 1

### Summary of Standardized Mortality Ratios for Health Status Indicators Manitoba - 1992-93

Indicator	Westman	Central	Eastman	Wpg	Parklands	Interlake	Norman	Thompson	Non-Wpg	Mb Rate†
<2500 gram birth weight	0.86	<u>0.71</u>	0.96	1.10	0.72	1.09	1.27	0.76	<u>0.87</u>	38.60
Male deaths	0.93	0.95	0.95	1.00	0.98	1.06	<u>1.32</u>	<b><u>1.62</u></b>	1.00	8.30
Female deaths	0.94	1.01	0.99	1.00	0.89	1.05	1.17	<b><u>1.60</u></b>	0.99	7.20
Age 0-74 deaths	<b><u>0.88</u></b>	0.92	0.94	0.99	0.96	1.11	<b><u>1.39</u></b>	<b><u>1.78</u></b>	1.01	3.50
Injury deaths	0.92	0.86	1.26	<b><u>0.83</u></b>	0.84	<u>1.43</u>	1.37	<b><u>3.26</u></b>	<b><u>1.23</u></b>	0.46
Cancer deaths	<u>0.88</u>	0.99	0.95	1.03	0.94	1.10	1.06	1.02	0.96	2.07
Chronic disease deaths	0.95	0.91	0.94	1.03	1.05	0.92	1.17	1.12	0.96	2.81

† per 1,000 in the province

Note: Bold, double underlined numbers are significant at  $p < .01$ .  
Single underlined numbers are significant at  $p < .05$ .



of 0.5 for a region would mean that the region had a rate that was half that of the Province's while a SMR of two for another region would mean that it had twice the average rate. Thus a .5 and a two represent equivalent absolute differences from the average mortality rate, and a SMR of 0.33 is as different from the average on the low side as is a SMR of three on the high side.

Table 1 shows that Thompson region had the largest number of health status indicators that are statistically significantly different from the provincial average (4 out of 7). All of these differences point to poor health among Thompson residents. Each of these four indicators in the region was more than 1.6 times the respective Manitoba average. With respect to the rest of the regions in the province, Norman was above average on two indicators (SMR 0-74 and male deaths), indicating poor health, while Westman was below average on SMR 0-74 and cancer deaths, indicating good health. Winnipeg and Interlake were below average in injury caused deaths. No other differences were statistically significant.

## Utilization of Physician Resources

The physician module examines three major themes: (1) access to physicians, (2) overall patterns of visits to physicians, and (3) expenditures on physician visits. Separate results are presented for overall rates of ambulatory care, use of specialty care, and by categories of residents grouped according to how frequently the individuals visit a physician during the year.

Two sets of analyses were conducted. First, patterns of physician services received by Winnipeg residents were compared with patterns of care received by individuals who reside in other areas of the province (non-Winnipeg). Second, the analyses focused on comparing and contrasting patterns of care received by residents of the different Manitoba Health regions with Winnipeg defined as a single region.<sup>14</sup>

In discussing the utilization of physician resources, we first address the fiscal 1992-93 findings and later present an overview of the results from 1990-91 to 1992-93.

### Winnipeg Non-Winnipeg Comparisons: 1992-93

#### Physician Supply

During fiscal 1992-93 there were a total of 966 physicians practising in Winnipeg. Given a Winnipeg population of 653,117 in 1992, there was an average of 1.48 physicians for every 1000 residents. Winnipeg had 97% more physicians per resident than rural Manitoba. The non-Winnipeg regions had a total of 361 physicians serving a population of 484,367 individuals for an average of 0.74 physicians per 1000.

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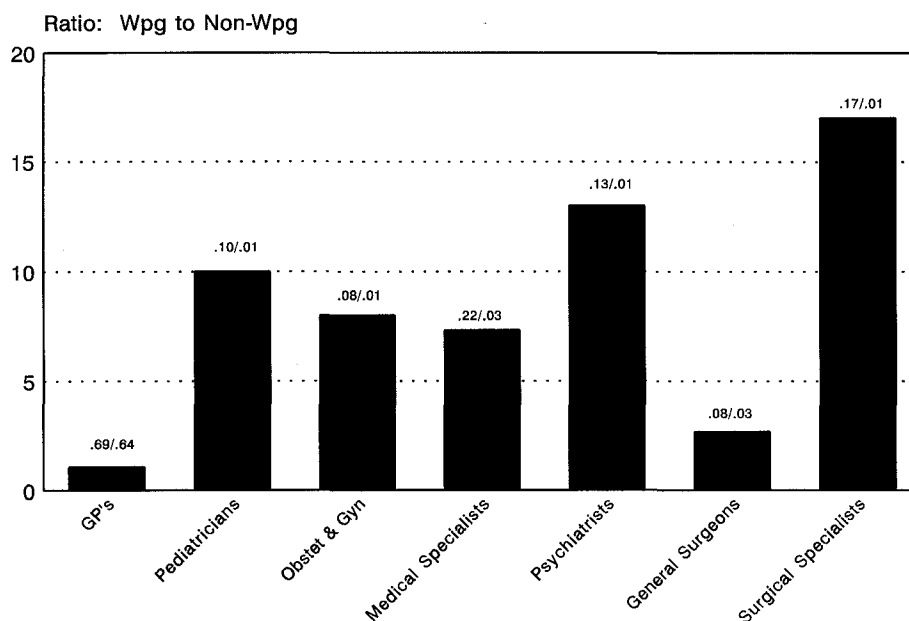
14/ Details of the methodology can be obtained by referring to the 1991/92 module on Utilization of Physician Resources. Brief definitions of terms appear in the Glossary at the back of this report.

Winnipeg and non-Winnipeg had a roughly equivalent supply of general practitioners per 1000 residents (.69 and .64, respectively), but in Winnipeg the majority (53%) of physicians practicing were specialists. By contrast, specialists in non-Winnipeg regions only accounted for 14% of the physicians in those areas. The ratio of the type of physician by specialty serving Winnipeg versus non-Winnipeg per 1000 residents is displayed in Figure 13.

### Overview of Ambulatory Care

Access to physicians, as measured by the percentage of individuals having at least one contact during the year, was higher for Winnipeg residents than non-Winnipeg residents (85.79 versus 81.47; Table 2). Winnipeg residents also made 16% more overall visits to physicians than non-Winnipeg residents (519 versus 446 per 100 residents; Table 3).

Figure 13: Physician Supply by Specialty  
Ratio of Winnipeg to Non-Winnipeg Physicians per 1000 Residents  
1992-93



Despite the fact that Winnipeg residents had more access to specialists for routine care, they were also 34% more likely to be referred for a consultation visit than were non-Winnipeg residents (18.76 versus 14.01; Table 2). There was also a 41% higher rate of consultative visits per 100 residents for Winnipeg compared to non-Winnipeg (25.1 versus 17.8 per 100 residents; Table 3).

All of these Winnipeg - non-Winnipeg differences (in terms of access, utilization & type of care) were statistically significant, although they were below significance levels that might be expected given there were more than twice the number of physicians available to Winnipeg residents than non-Winnipeg residents.

### **Age and Sex Differences**

Within most age groups (e.g., 0-14, 15-16, etc.) Winnipeg residents were more likely to see a physician at least once and have higher overall rates of visits per 100 than residents of non-Winnipeg regions (Tables 2 and 3). In Winnipeg, males and females in the 0-14 age group were 11% more likely to see a physician at least once as compared to those from non-Winnipeg. In most cases, within age groups, males and females had similar rates of contact and numbers of visits, except for females in the 15-64 age group where the contact rate for females was higher. This difference is likely related to reproductive care.

### **Overall Use of the System and Government Expenditures<sup>15</sup>**

During the fiscal year 1992-93 Winnipeg residents made, on average, 16% more visits than did non-Winnipeg residents (73.0 more per 100 residents). The corresponding difference in cost was \$29.47 per resident accounting for an

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15/ In March 1993, physicians received a special payment for a 1.6% fee increase, retroactive to April 1, 1991 for 1991-92 services and in November 1993 another payment for a .95% increase retroactive to April 1, 1992 for 1992-93 services. The cost data here reflect neither of these payments.

Table 2

Percentage Access (persons having at least 1 contact) by Type of Care and Age and

Sex of Resident:

Winnipeg and Non-Winnipeg Residents - 1992-93

	Winnipeg Residents	Non-Winnipeg Residents	Ratio - Winnipeg to Non-Winnipeg
Overall	85.79	81.47	1.05
Type of Care			
Consultative	18.76	14.01	1.34
Non-consultative	85.55	81.22	1.05
Age & Sex of Residents			
0-14 Males	91.04	82.25	1.11
Females	91.96	82.53	1.11
15-64 Males	75.87	71.50	1.06
Females	88.97	85.57	1.03
65-74 Males	90.90	87.99	1.03
Females	91.42	91.16	1.00
75+ Males	95.32	94.56	1.01
Females	95.33	95.01	1.00

Table 3

Visits per 100 Residents by Type of Care:  
Winnipeg and Non-Winnipeg Residents - 1992-93

	Winnipeg Residents	Non-Winnipeg Residents	Ratio - Winnipeg to Non-Winnipeg
Overall	519.20	446.10	1.16
Type of Care			
Consultative	25.10	17.80	1.41
Non-consultative	494.10	428.30	1.15
Age & Sex of Residents			
0-14 Males	48.06	38.04	1.26
Females	47.09	37.56	1.25
15-64 Males	37.70	30.92	1.22
Females	57.45	50.97	1.13
65-74 Males	72.42	64.83	1.12
Females	73.61	69.07	1.07
75+ Males	89.24	81.52	1.09
Females	89.90	82.72	1.09

additional \$19.2 million at the provincial level. The overall differences between Winnipeg and non-Winnipeg can be meaningfully disaggregated by examining visit intensity and physician specialty.

Figures 14 and 18, respectively, show the government expenditures per resident and physician utilization of Winnipeg versus non-Winnipeg residents, both broken down by visit intensity. The largest difference in visit rates between Winnipeg and non-Winnipeg regions is accounted for by the high use group (i.e., 15 or more visits). This group of individuals, although relatively few in number, accounted for 46% of the difference in visits between Winnipeg and non-Winnipeg. Of the additional \$29.47 per resident that was spent on Winnipeggers, \$15.16 was spent on the highest use group, \$8.46 was spent on the group that had 8-14 visits and \$5.86 was spent on the largest group, those making 1-7 visits per 100 residents.

Figure 14: Expenditures Per Resident by Visit Intensity  
Winnipeg and Non-Winnipeg Comparison  
1992-93

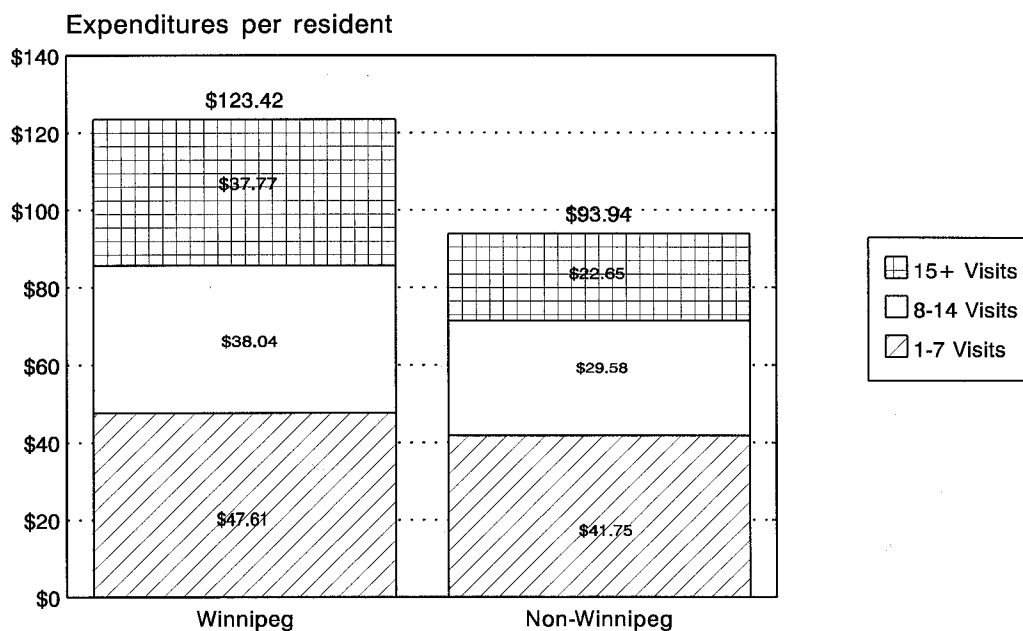
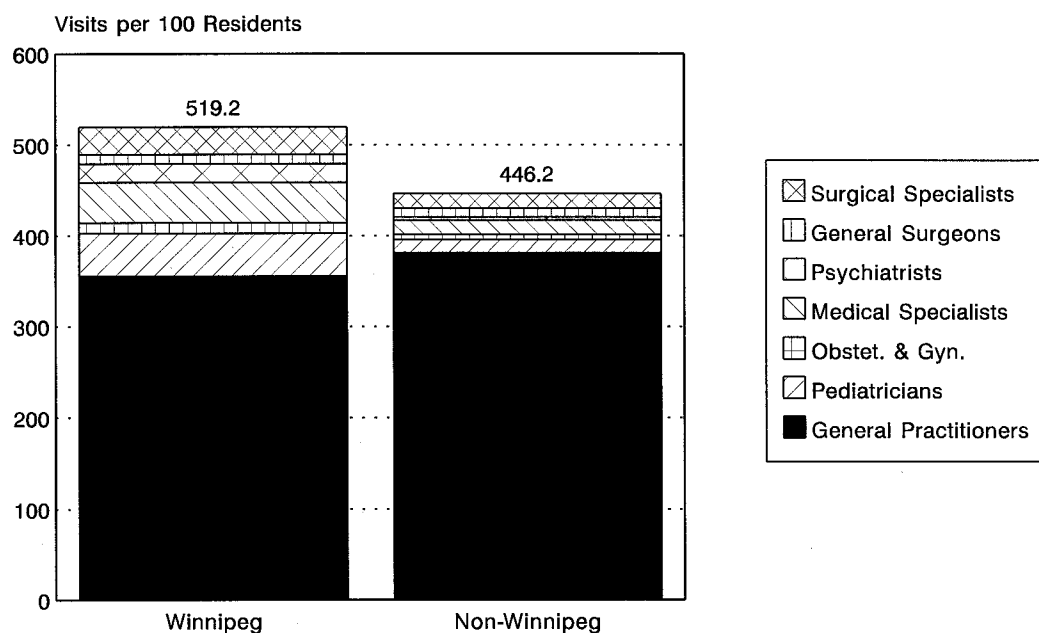


Figure 15 displays the utilization of physicians by Winnipeg and non-Winnipeg residents broken down by physician specialty. The data show Winnipeg residents' higher overall use of physicians was related to higher rates of visits to specialists. There are two possible explanations: 1) some of these specialists may have substituted for general practitioners in providing primary health care in Winnipeg, since Winnipeg residents made 6.9% fewer visits to general practitioners than did non-Winnipeggers or 2) general practitioners in the rest of the province may have provided care that might, in Winnipeg, be provided by specialists. Medical specialists, pediatricians, surgical specialists and psychiatrists account for most of the difference in visits between Winnipeg and non-Winnipeg. Eighty-six percent of the excess expenditures from Winnipeg residents came from pediatricians, medical specialists and psychiatrists, with psychiatrists alone accounting for 50.9% of the total difference between Winnipeg and non-Winnipeg expenditures.

Figure 15: Utilization by Physician Specialty  
Comparison Winnipeg and Non-Winnipeg  
1992-93





## Regional Comparisons: 1992-93

### Overall Use of the System

Compared with other regions of the province, a higher proportion of Winnipeg residents visited physicians at least once during 1992-93 (Figure 16). Yet, despite the wide range in supply of physicians in Manitoba, ranging from 14.79 physicians per 10,000 residents in Winnipeg to 4.90 in Thompson, a very high proportion of the population in each region were seen by a physician (Figures 16 and 17).

Residents of Winnipeg and Interlake had the highest rate of individual contact with the system (85.8% and 83.4% of individuals contacted the system at least once).

Thompson residents had the lowest rate (75.9% of the population made at least one contact).

Figure 16: Physician Utilization  
Manitoba  
1992-93

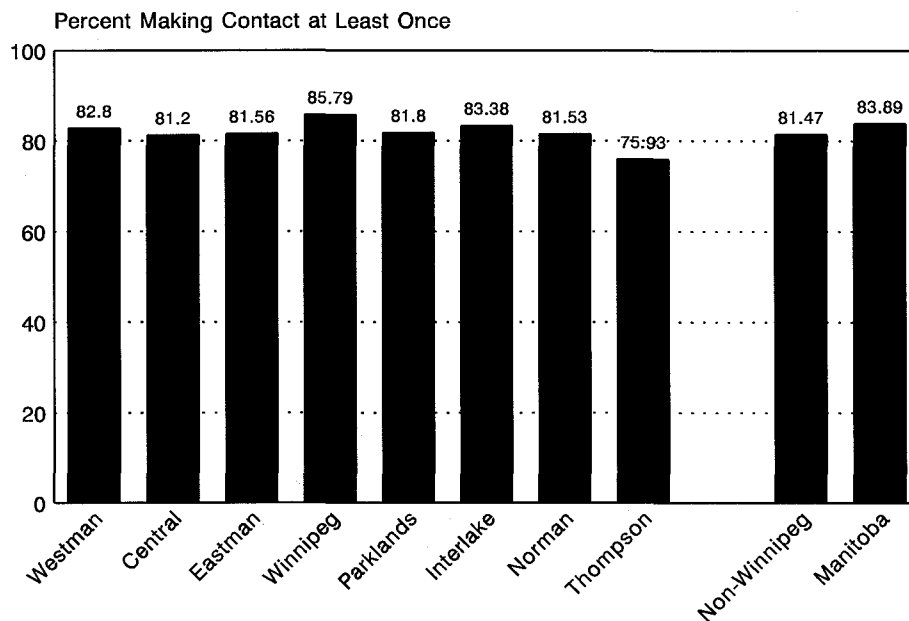
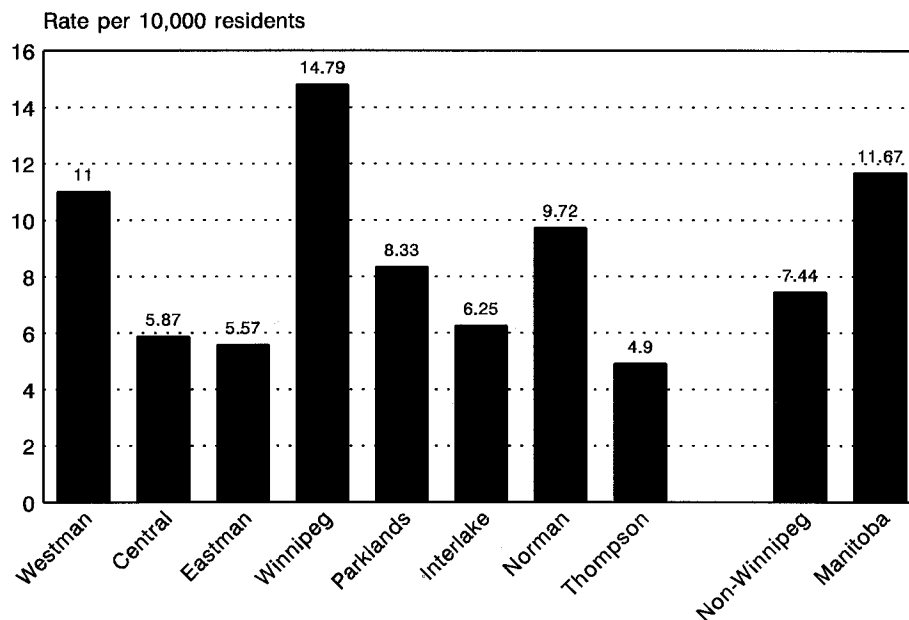


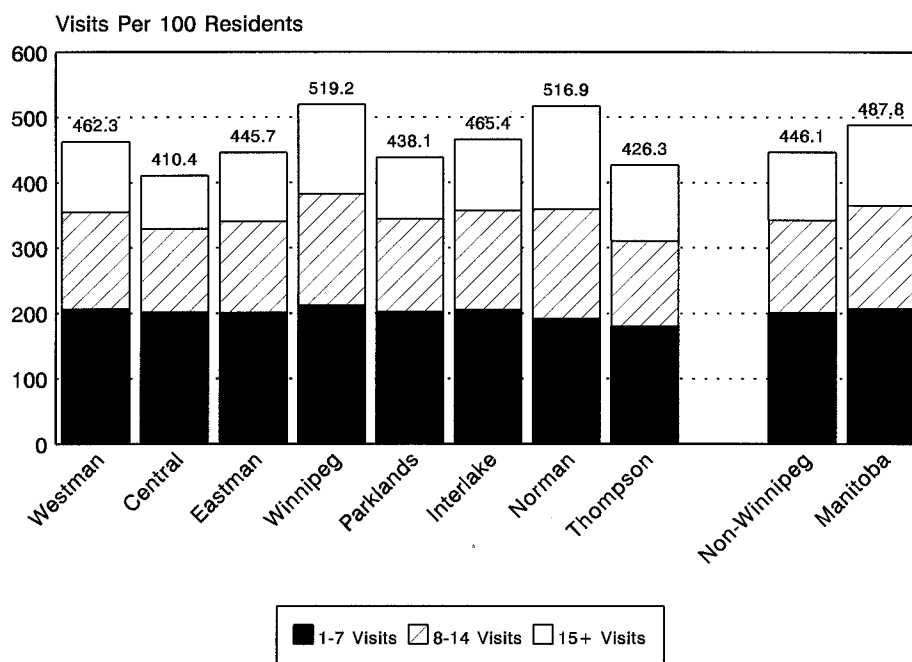
Figure 17: Physician Supply  
Manitoba  
1992-93



An important caveat to this finding is that the Manitoba Health database does not include visits to nursing stations. Thus, in remote areas the actual utilization of primary care may be significantly understated. Eastman and Norman numbers of ambulatory visits per 100 population may be 5% to 10% higher than reported here, while the Thompson region may have more than 50% more than is reported to Manitoba Health. Nursing station visits were added in when calculating the number of primary care visits. However, no individual data on visits are available and thus we cannot adjust the percentage of individuals getting at least one primary care visit. Therefore, these data must be interpreted with caution.

As to the volume of visits to physicians, Winnipeg and Norman had the highest number of visits per 100 residents (519.2 and 516.8, respectively; Figure 18),

Figure 18: Physician Utilization by Visit Intensity Group  
Manitoba  
1992-93

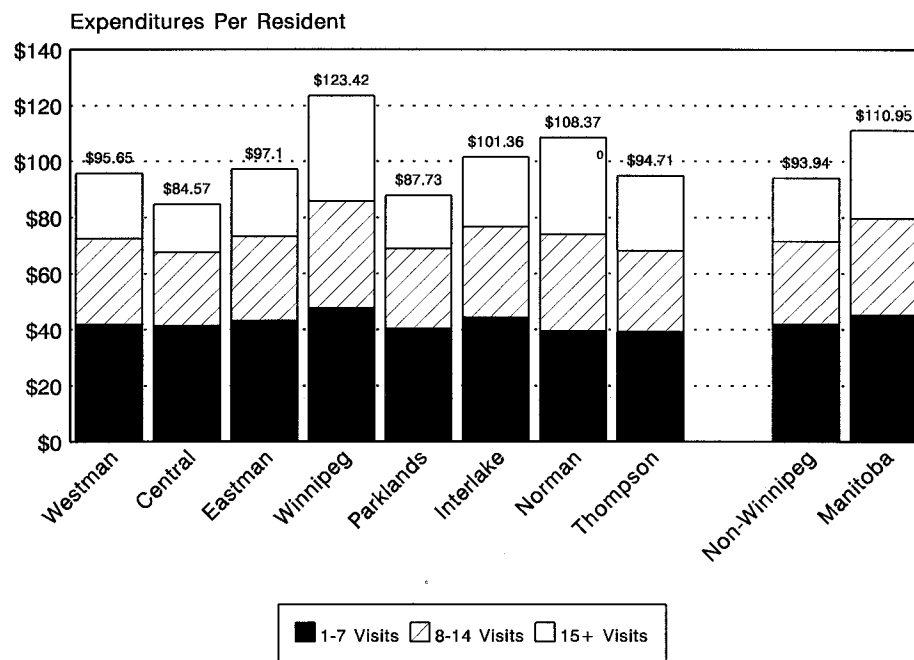


while Central had the lowest visit rate (410.4). Although the residents of Winnipeg and Norman had a similarly high volume of visits, expenditures per Winnipeg resident were the highest in Manitoba (Figure 19). In all other regions per resident expenditures were below those in Winnipeg. From a different perspective, looking at the cost per visit, outside of Winnipeg (\$23.77), Eastman (\$21.78), Interlake (\$21.78) and Thompson (\$22.22) had the highest expenditures per visit while Central (\$20.60) and Parklands (\$20.02) had the lowest expenditures per visit.

### Visits and Expenditures by Intensity Group

Rates of visits for the lowest visit intensity group (i.e., 1-7 visits) ranged from 179.9 per 100 residents in Thompson to 219.9 in Winnipeg (Figure 18). The highest intensity group (15 or more visits) made from 81.8 to 158.5 visits per 100

Figure 19: Physician Utilization by Visit Intensity Group  
Manitoba  
1992-93

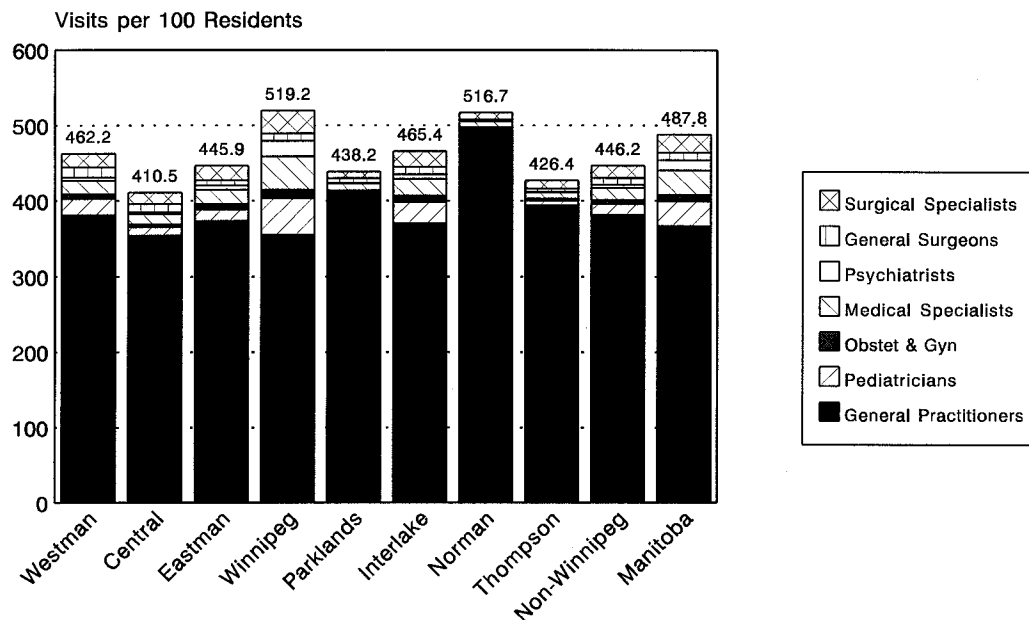


residents in Central and Norman, respectively. The higher rates of visits in Norman and Winnipeg were reflected in higher overall costs per resident for these regions. As shown in Figure 19, costs per resident were relatively similar for the lowest visit intensity group but varied markedly for the highest group. Expenditures on the highest group ranged from a low of \$17.11 per resident in Central to a high of \$37.77 per resident in Winnipeg. Norman region had the second highest expenditures at \$34.53 per resident.

### Visits and Expenditures by Physician Specialty

Across every region, general practitioners accounted for the largest number of visits (Figure 20) and the greatest proportion of expenditures. Visits per 100 residents to general practitioners ranged from 354 in Central to 493 in Norman. The general practitioner visits in Norman were significantly higher than the rate in

Figure 20: Physician Utilization by Specialty:  
Manitoba  
1992-93



Parklands - the region with the next highest rate (409 visits per 100). Expenditures for general practitioners in Norman (\$97.80 per resident) were also much higher than the next highest region (i.e., \$81.69 per resident in Thompson). Central had the lowest expenditures for general practitioners (\$65.34 per resident).

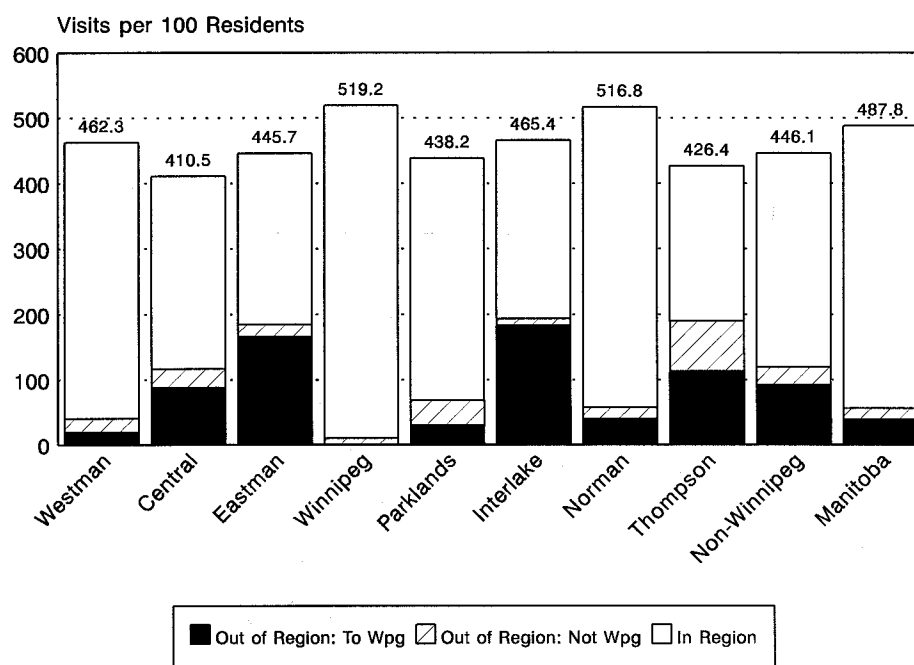
In all other physician specialties, except general surgery (for which Westman and Central had higher visit levels than other regions), residents of Winnipeg had higher rates of visits than all other areas of the province (Figure 20). Visit rates were generally higher in regions with higher numbers of specialists. For example, Westman was the only non-Winnipeg region that had more than one pediatrician working in the region. There, the number of pediatrician visits per 100 residents was higher than in all other non-Winnipeg regions except Interlake. Expenditures per resident were also highest in Winnipeg for all physician specialties, except

general surgery. In that field, the Westman region incurred higher costs than other regions.

### Visits and Expenditures by Location of Care

As shown in Figure 21, the residents of all regions made most of their physician visits within their region of residence. However, a significant proportion of the visits made by residents living in Eastman, Interlake, and Central regions (i.e. regions bordering on Winnipeg) were made to Winnipeg physicians.<sup>16</sup> In addition, more than half of the visits by Thompson residents made "out of region" were to Winnipeg physicians.

Figure 21: Physician Utilization by Location of Care:  
Manitoba  
1992-93



16/ Specifically, 37% of visits by Eastman residents, 39% of visits by Interlake residents and 21% of visits by Central residents were made to out of region - Winnipeg physicians.

The greatest proportion of expenditures per resident were also made within the same region of residence. Eastman, Interlake, and Thompson had out-of-region expenditures of over 45% of the total expenditures per resident. Winnipeg and Westman had the lowest out-of-region expenditures per resident.

### **Overview of Ambulatory Care from 1990-91 to 1992-93**

In the broadest terms, over the period fiscal 1990-91 to 1992-93, use of physician services tended to increase between the first two years and then decline in the subsequent year. The net results were 1992-93 utilization rates that tended to be near or slightly above the 1990-91 rate. From fiscal 1990-91 to 1991-92 both Winnipeg and the non-Winnipeg areas showed about a 3% increase in visits to physicians per 100 residents. In the following year there was roughly a 2% decline in the total number of visits per 100 residents - resulting in a net increase of about 1% between 1990-91 and 1992-93. Greater stability was recorded in access to physicians of both Winnipeg and non-Winnipeg residents. The percentage of Winnipeg residents who made contact with a physician over this time period hovered around 85% while non-Winnipeg access was around 81%.

Over the three years under consideration in Winnipeg there was a small but significant increase in expenditures of 3.5%, whereas in non-Winnipeg expenditures declined 1.3%. Between fiscal 1990-91 and 1991-92 there was an increase in costs in Winnipeg (5.2%) as well as outside of Winnipeg (4.2%). Between 1991-92 and 1992-93 there was a corresponding drop of roughly 1.7% in expenditures in Winnipeg and 5.6% in non-Winnipeg.

Between 1990-91 and 1992-93, in Winnipeg the number of residents who paid 1-7 visits to physicians was relatively constant. However, outside Winnipeg the number of residents who made 1-7 visits increased 5% from 1990-91 to 1991-92

then returned to the previous level in 1992-93<sup>17</sup>. Among those who made 8-14 visits to physicians, the number of visits increased 3% in both regions over the three years. In the highest visit intensity group (over 15 visits) there was an increase from 1990-91 to 1991-92 in both the Winnipeg and non-Winnipeg areas (7% and 5% respectively) followed by a corresponding decrease to earlier levels in 1992-93.

From 1990-91 to 1992-93 there was an overall increase in visits per 100 residents to general practitioners in Winnipeg (3%) and non-Winnipeg (1%). In both cases there was an increase in visits from fiscal 1990-91 to 1991-92 (4% and 2% respectively) followed by a decrease from 1991-92 to 1992-93 of 1%. Increases followed by decreases were also found for visits to other physician specialties.

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17/ To be precise it should be noted that we have not conducted a strict cohort analysis and so different individuals may constitute high users, etc. in each of the years in question.



## Utilization of Hospital Resources

Hospital resources utilization account for the largest component of expenditures in the health care system. Significant differences in utilization occur both between Winnipeg and the rest of the province and among regions.

### Winnipeg Non-Winnipeg Comparisons

#### Use of All Hospital Care

Table 4 shows the utilization rates of hospital care for Winnipeg and non-Winnipeg residents. Based on capacity as of March 31, 1992, non-Winnipeg residents had an effective bed supply 25% higher than was available to Winnipeg residents. Persons residing outside of Winnipeg were 36% more likely to have a hospital contact and had 52% more hospital separations than persons living within Winnipeg. This differential was reduced only slightly when transfers for rural Manitobans (often to Winnipeg hospitals) were factored out by examining episodes of hospital care. Rural residents still received 46% more hospitalizations by this measure of use. Rural residents had much shorter hospital stays, however, with an average length of stay for inpatient care 42% lower than for Winnipeg residents. A 52% higher rate of hospital separations combined with the shorter average length of stay resulted in a 7% lower overall use of hospital days for rural residents (1365 hospital days per 1000 non-Winnipeg residents versus 1473 for Winnipeg residents).

These patterns were relatively stable over the three fiscal years 1990-91 to 1992-93. In all three years, non-Winnipeg residents had more contact with a hospital, more episodes of hospital care, and higher rates of separations than Winnipeg residents (Figures 22, 23, and 24). In contrast, rural residents had comparatively shorter lengths of stay and lower overall rates of use of hospital days (Figures 25 and 26).

Figure 22: Persons Hospitalized  
Winnipeg and Non-Winnipeg Comparisons  
1990-91 to 1992-93

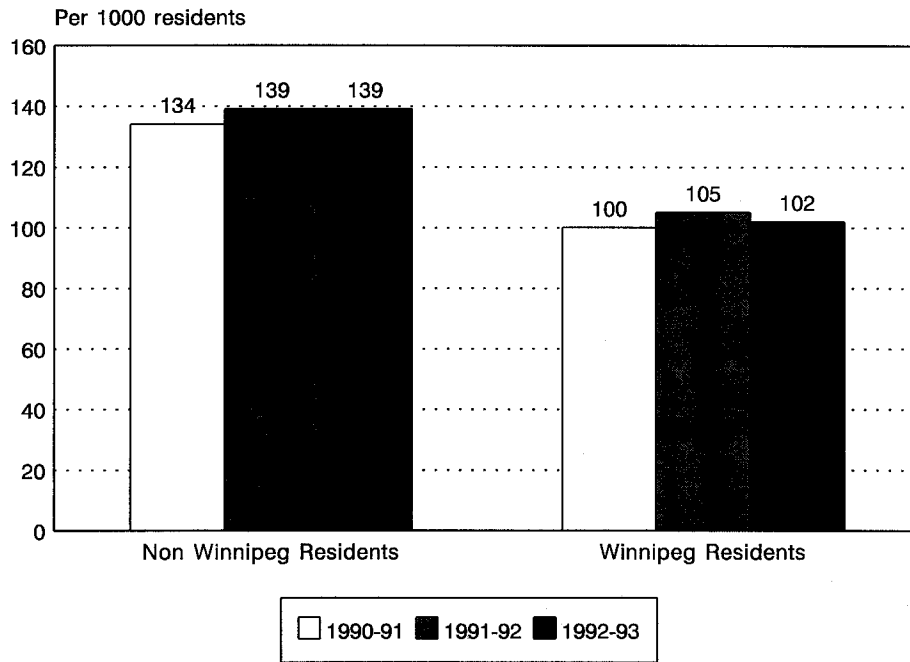


Figure 23: Episodes of Hospital Care  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93

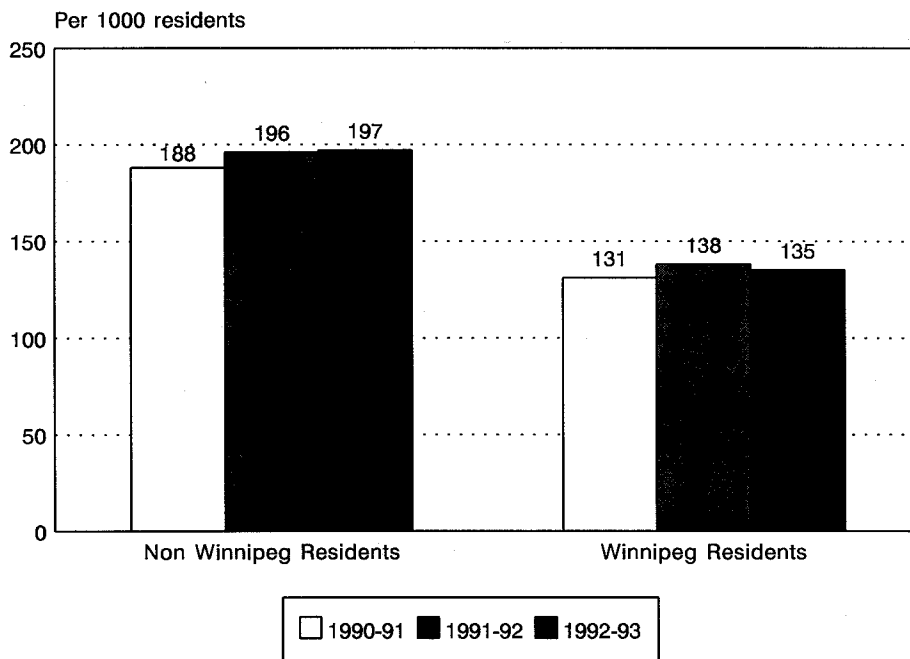


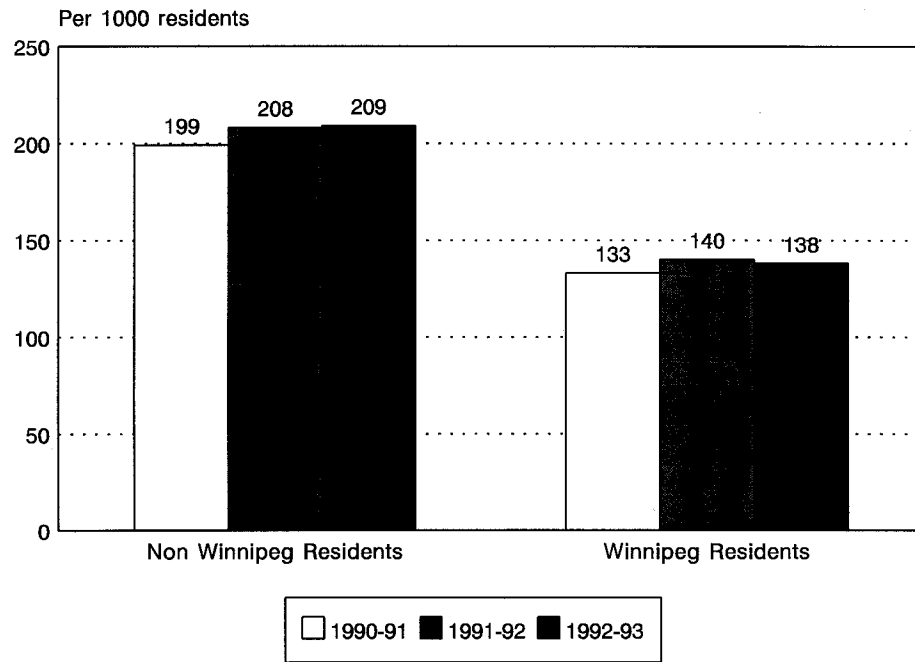
Table 4  
 Hospital Care Utilization Rates  
 Non-Winnipeg and Winnipeg Residents - 1992-93

	Winnipeg Residents	Non-Winnipeg Residents	Ratio: Winnipeg to Non-Winnipeg <sup>18</sup>
Effective number of hospital beds per 1000 residents <sup>19</sup>	5.1	6.4	0.80
Persons hospitalized per 1000 residents	102	139	0.73
Episodes of hospital care per 1000 residents	135	197	0.68
Hospital separations per 1000 residents	138	209	0.66
Average length of stay	14.2	8.2	1.73
Hospital days per 1000 residents	1,473	1,365	1.08

18/ Ratios of Winnipeg to non-Winnipeg rates were calculated from numbers rounded to 2 decimal places and hence may differ slightly from what would be calculated using numbers in the table.

19/ Based on patterns of use described in Table 3 of the Manitoba Health Services Commission Annual Report 1991-92 and additional information from Manitoba Health, the 3,139 active treatment beds located in Winnipeg were allocated in the following manner: 2,527 (80.5 percent) to Winnipeg residents; 515 (16.4 percent) to rural residents and 97 (3.1 percent) to non-residents. This produced a total of 3,150 effective active and extended treatment beds available to non-Winnipeg residents and 3,142 active and extended treatment beds available to Winnipeg residents.

**Figure 24: Hospital Separations  
Winnipeg and Non-Winnipeg Comparisons  
1990-91 to 1992-93**



**Figure 25: Average Length of Hospital Stay  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93**

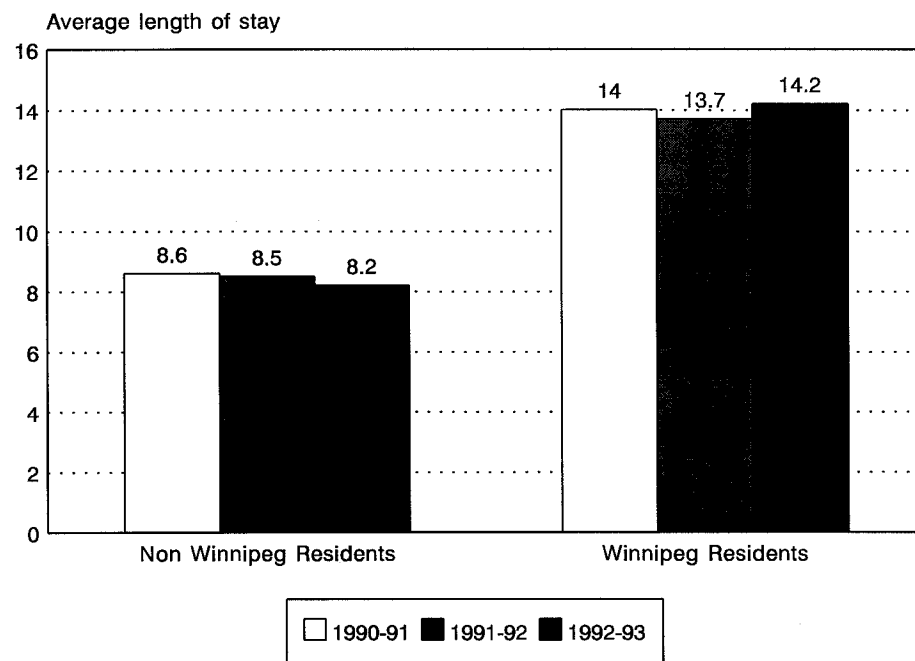
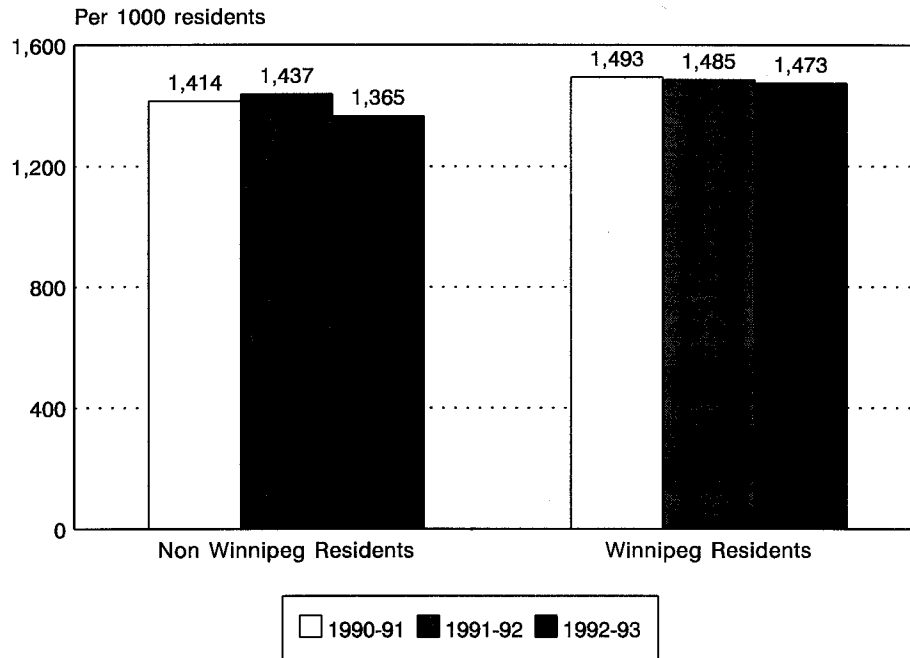


Figure 26: Hospital Days  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93



### Use of Short versus Long Stay Care

Analysis of utilization rates by length of stay revealed that Winnipeg and non-Winnipeg regions had fundamentally different patterns of hospital care utilization (Table 5). Non-Winnipeg residents received considerably more short stay separations and days of hospital care than Winnipeg residents. Rural residents were 50% more likely to be hospitalized, had rates of separation that were 71% higher, and had rates of use of hospital days that were 40% higher than Winnipeg residents, in spite of having a 17% shorter average length of stay.

By contrast, for long stay care Winnipeg residents had rates of hospitalization 64% higher than non-Winnipeg residents (Table 5). Average lengths of stay were 20%

longer and total hospital days per 1000 residents were 100% higher for Winnipeg residents than rural residents.

The impact of high rates of long stay care on the use of hospital resources was significant. For Winnipeg residents, while only 5% of inpatient separations (i.e., 3.8 out of 102 total inpatient) were for long stay hospital care, 52% of hospital

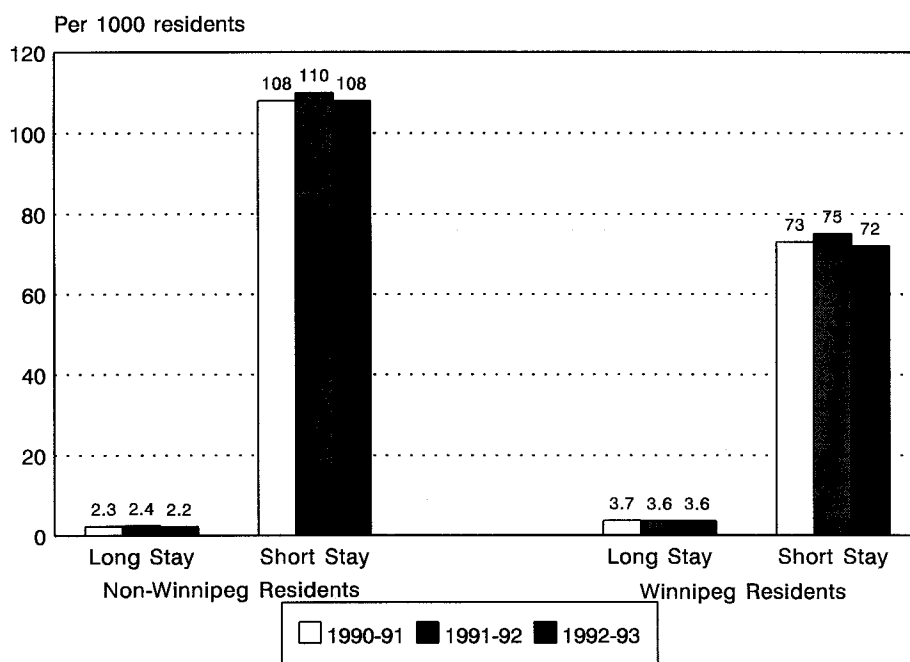
Table 5  
Inpatient Short Stay and Long Stay Care Utilization Rates  
Non-Winnipeg and Winnipeg Residents - 1992-93

	Long Stay Inpatient Care (60+ days)			Short Stay Inpatient Care (< 60 days)		
	Winnipeg Residents	Non- Winnipeg Residents	Ratio: Winnipeg to Non-Winnipeg <sup>20</sup>	Winnipeg Residents	Non- Winnipeg Residents	Ratio: Winnipeg to Non-Winnipeg <sup>25</sup>
Persons hospitalized per 1000 residents	3.6	2.2	1.64	72	108	0.67
Episodes of hospital care per 1000 residents	N/A	N/A	N/A	96	156	0.61
Hospital separations per 1000 residents	3.8	2.3	1.65	98	167	0.59
Average length of stay	201	168	1.2	7.2	6	1.2
Hospital days per 1000 residents	769	381	2	704	984	0.72

20/ Ratios of Winnipeg to non-Winnipeg rates were calculated from numbers rounded to 2 decimal places and hence may differ slightly from what would be calculated using numbers in the table.

days (i.e., 769 out of 1473 total days) were devoted to long stay hospital care. For non-Winnipeg residents, 2% of inpatient separations for long stay care accounted for 28% of the hospital days they received. Thus, while large portions of hospital resources were devoted to provision of long stay hospital care, Winnipeg residents had much higher adjusted rates of long stay hospital care than rural residents. Since Winnipeg residents represent 57% of the provincial population, their high utilization of long stay hospital days had a major impact on use of provincial hospital resources.<sup>21</sup> As illustrated in Figures 27 through 29, all of these Winnipeg - non-Winnipeg differences were relatively stable over the three fiscal years 1990-91 to 1992-93.

Figure 27: Persons Hospitalized by Length of Stay  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93



21/ These differences in length of stay and days per 1000 residents are potentially sensitive to the accounting practice of allocating all long stay days for a given patient to the year in which separation takes place and must be interpreted cautiously.

Figure 28: Hospital Separations by Length of Stay  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93

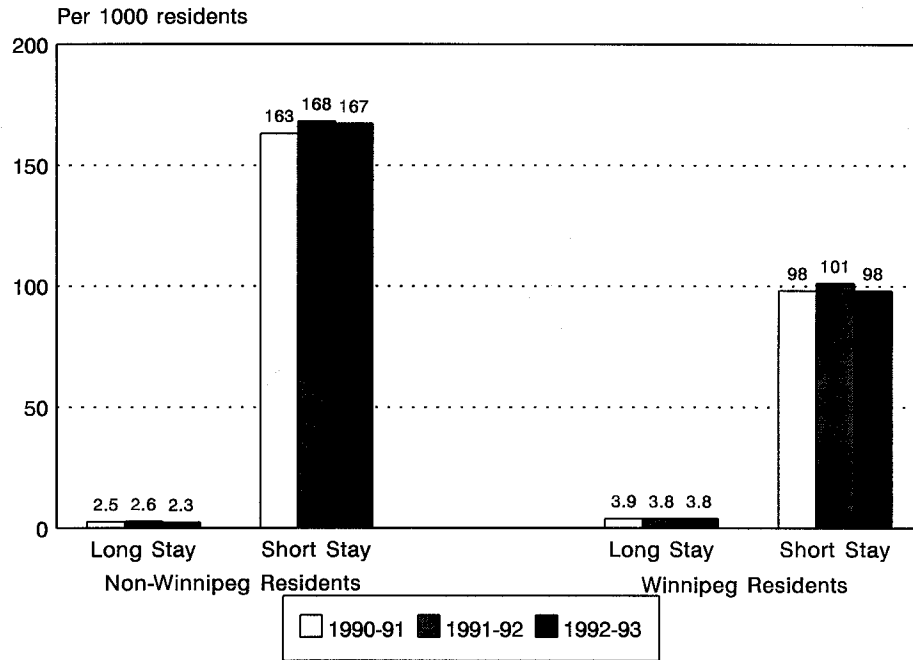
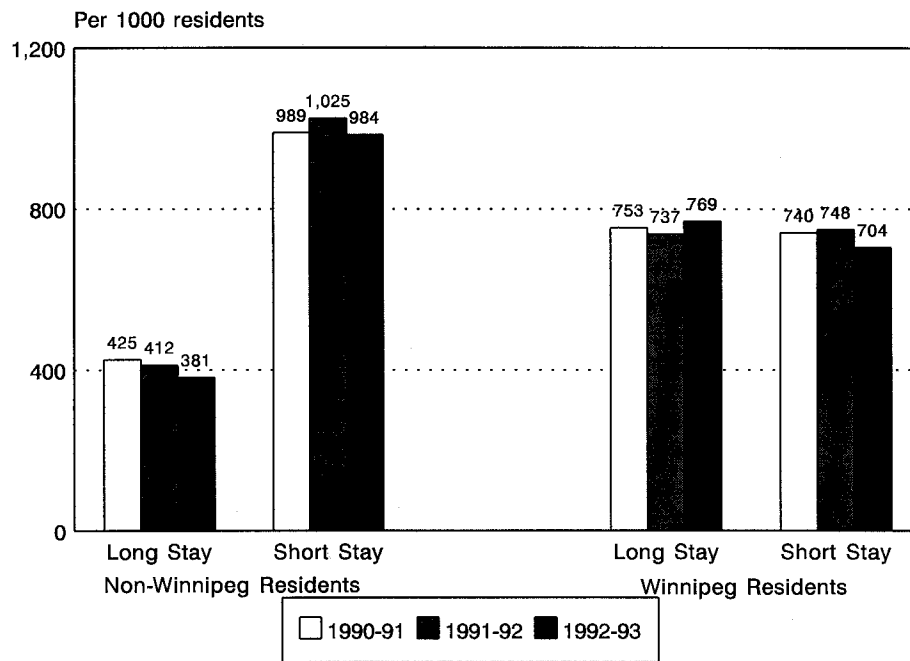


Figure 29: Hospital Days by Length of Stay  
Winnipeg and Non-Winnipeg Comparison  
1990-91 to 1992-93





## **Regional Comparisons**

### **Use of All Hospital Care**

Table 6 demonstrates that, across regions, there was considerable variation in use of hospital resources. Interlake, Central, Eastman and Westman residents had adjusted rates of use of inpatient days per 1000 residents that were lower than the provincial average of 1,425, whereas the rates for Winnipeg and Parklands residents were higher than the provincial average. Norman and Thompson residents had the highest regional rates, with use well above the provincial average.

### **Use of Short versus Long Stay Care**

As was the case with the Winnipeg versus non-Winnipeg comparisons, fundamentally different patterns of use of short and long stay days contribute to regional differences in the use of total hospital days.

Figure 30 (also see Table 6) shows that, across all regions, Winnipeg residents were among the heaviest users of long stay hospital care, (769 days per 1000 residents), using 153 percent more days per capita than Central and Interlake residents, who had the lowest use of long stay days (304 days per 1000 residents). Among non-Winnipeg regions, Central, Interlake, and Eastman residents had rates below the rural average of 381 long stay days per 1000 residents. Westman's rate was equivalent to the rural average, while Parklands, Thompson and Norman had rates higher than the rural average. However, after accounting for random variation, the non-Winnipeg regions were not significantly different in their use of long stay days.

As a percentage of total days, Winnipeg residents also used the greatest proportion of long stay care (52%) (Figure 31). Residents of other regions used

Table 6

## Regional Use of Inpatient Care Hospital Resources by Short Versus Long Stay

Manitoba - 1992-93

	TYPE OF CARE	Westman	Central	Eastman	Winnipeg	Parklands	Interlake	Norman	Thompson	Non-Wpg Comparison	Manitoba
Number of residents		117,266	93,704	86,207	653,117	45,582	71,999	24,689	44,920	484,367	1,137,484
Number of persons hospitalized per 1000 residents	SHORT	103	99	96	72	128	95	145	151	108	8
	LONG	2	2	2	4	3	2	2	2	2	3
Number of hospital separations per 1000 residents	SHORT	156	150	146	98	205	141	237	267	167	127
	LONG	2	2	3	4	3	2	3	2	2	3
	<b>TOTAL</b>	<b>158</b>	<b>152</b>	<b>148</b>	<b>102</b>	<b>208</b>	<b>143</b>	<b>239</b>	<b>269</b>	<b>169</b>	<b>131</b>
Average length of stay per hospital separation	SHORT	6.4	6.3	6.0	7.2	6.1	6.3	5.3	4.1	6.0	6.5
	LONG	190.80	154.10	129.30	200.60	179.07	146.70	245.80	186.87	168.20	190.30
	<b>AVERAGE</b>	<b>9.3</b>	<b>8.4</b>	<b>8.0</b>	<b>14.2</b>	<b>9.2</b>	<b>8.4</b>	<b>7.2</b>	<b>5.0</b>	<b>8.2</b>	<b>10.9</b>
Number of days of hospital care per 1000 residents	SHORT	929	924	916	704	1,135	877	1,395	1,279	984	826
	LONG	381	304	341	769	499	304	676	856	381	599
	<b>TOTAL</b>	<b>1,311</b>	<b>1,228</b>	<b>1,257</b>	<b>1,473</b>	<b>1,633</b>	<b>1,181</b>	<b>2,071</b>	<b>2,135</b>	<b>1,365</b>	<b>1,425</b>

Figure 30: Adjusted Number of Days of Care by Length of Stay  
Manitoba  
1992-93

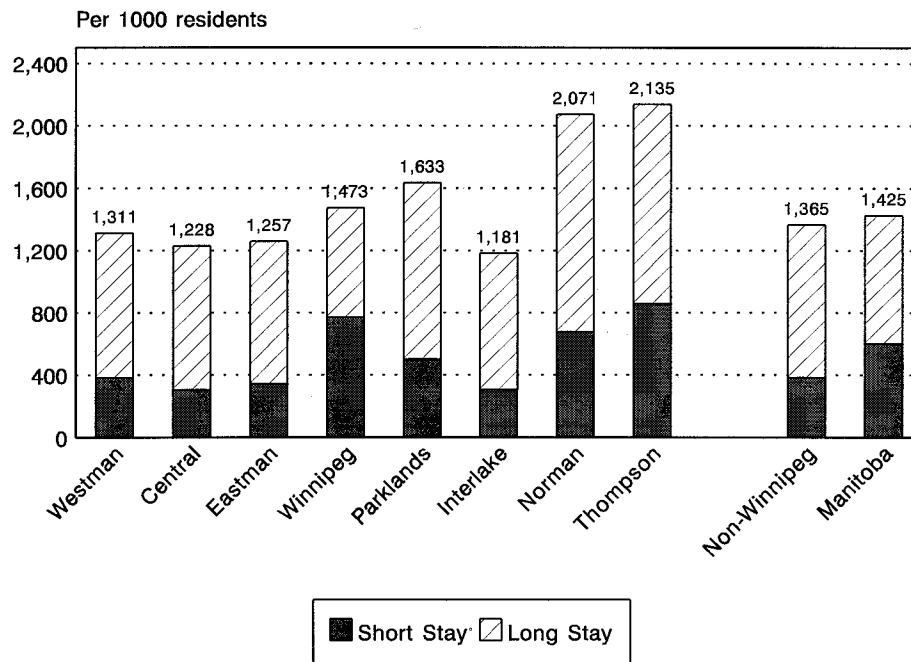
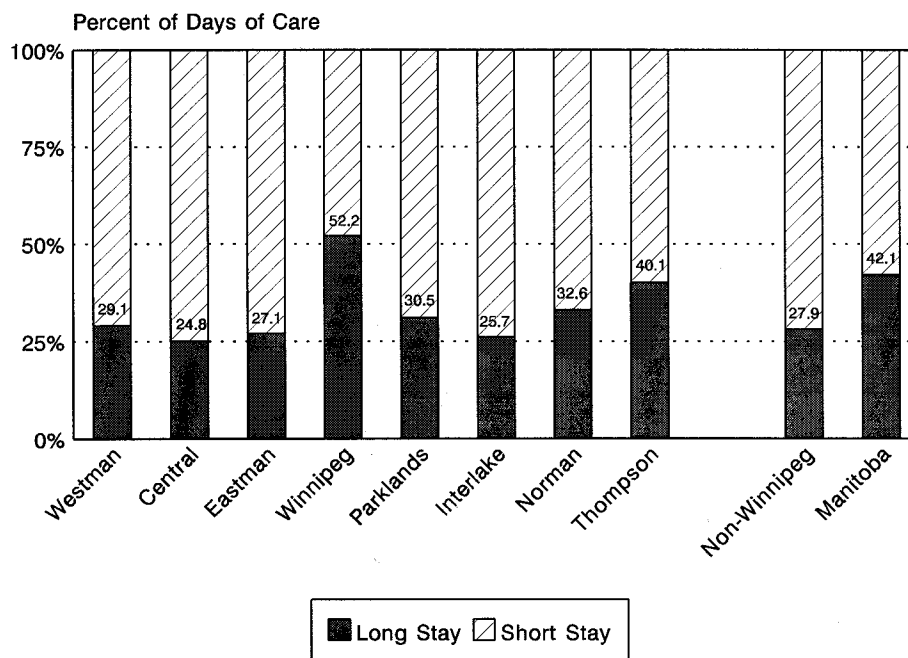


Figure 31: Length of Stay of Hospital Care  
Manitoba  
1992-93



proportionately less long stay care, ranging from 25% (Central) to 40% (Thompson) of total days.

The use of acute care across regions during fiscal 1992-93 showed a very different pattern. (Table 6 and Figure 30). Winnipeg residents consistently had the lowest adjusted rates of use of short stay hospital care, with only 72 individuals per 1000 hospitalized, 98 separations per 1000, and 704 days of care per 1000. As a group, Thompson, Norman and Parklands residents had the highest rates of use of acute care across these measures, while Westman, Central, Eastman, and Interlake occupied an intermediate position. These patterns of variation were similar, regardless of whether one analyzed rates of individuals hospitalized, separations, or days of hospital care. On all three measures, utilization rates of acute care in Winnipeg were approximately half of those for residents of Thompson and Norman, the regions with highest rates of use in each of the three categories.

In general, the pattern of average length of stay per hospital separation across the province was opposite to what was observed for rates of individuals hospitalized, hospital separations and days of hospital care (Table 6). Thompson residents had the highest adjusted rates of use, yet had the shortest hospital stays, averaging 4.1 days per separation in 1992-93.<sup>22</sup> Norman residents, who had the next highest rates of use, had an average length of stay of 5.3 days. Winnipeg residents had the lowest rates of use of acute care and also had the longest average hospital stays (7.2 days per hospital separation).

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<sup>22/</sup> Admissions to federal nursing stations, with an average length of stay of 1.0 day comprise 12.4 percent of admissions for Thompson residents. Adjusted rates of admissions to nursing stations are 27.6 per 1000 Thompson residents, while all other regions have rates of less than 1.0. This high use of nursing stations likely contributes to the very short observed length of stay for Thompson region.

Over time, from fiscal 1990-91 to 1992-93, the patterns reported here were generally stable. Figures 32, 33, 34 and 35 display the three year findings for short stay inpatient hospital care across the province. In terms of the number of persons hospitalized per 1000 residents, the number of hospital separations per 1000 residents, the number of days of hospital care per 1000 residents, and the average length of stay per hospital separation, the patterns remained consistent. Although Thompson and Norman residents had the shortest average length of stay, they had the highest rates of persons hospitalized, separations, and days of hospital care. Winnipeg had the opposite pattern, that is, its residents had the longest average length of stay per hospital separation yet the shortest rate per 1000 persons hospitalized, separations, and days of hospital care. There was a slight but significant drop in utilization between 1990-91 and 1992-93.

Figure 32: Hospitalizations for Short Stay Hospital Care  
Manitoba  
1990-91 to 1992-93

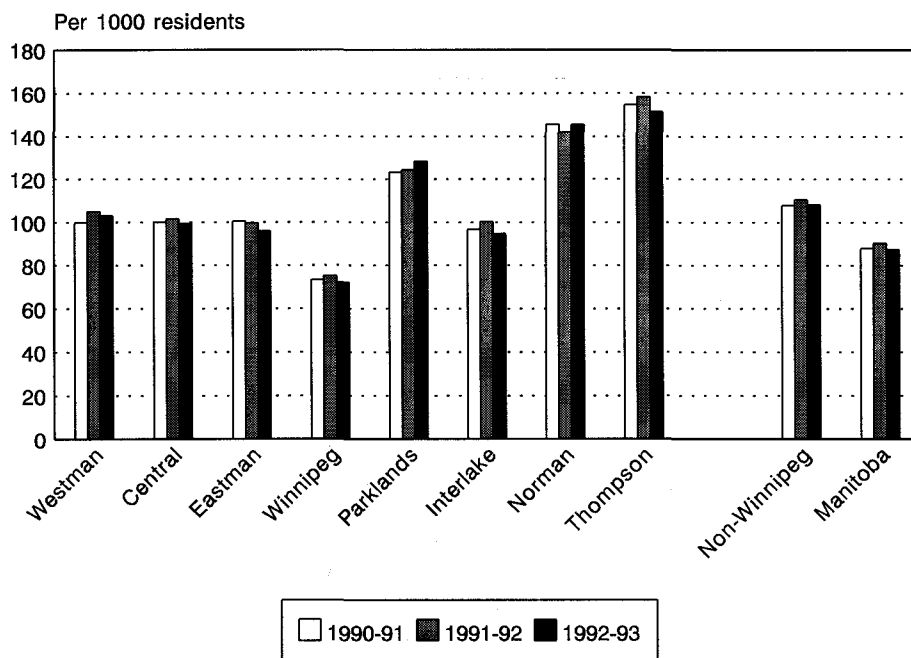


Figure 33: Hospital Separations for Short Stay Inpatient Hospital Care  
Manitoba  
1990-91 to 1992-93

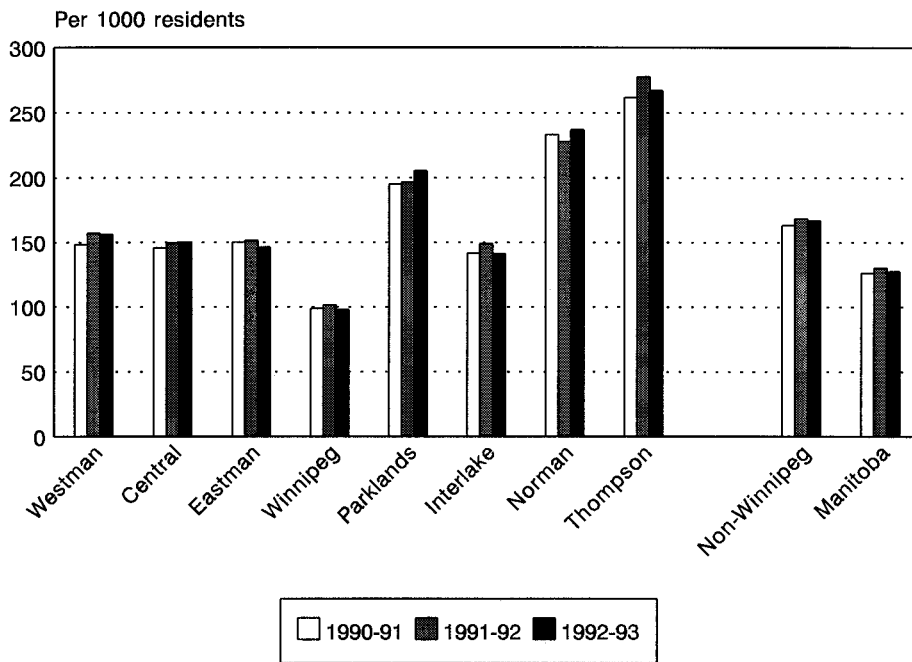


Figure 34: Days for Short Stay Inpatient Hospital Care  
Manitoba  
1990-91 to 1992-93

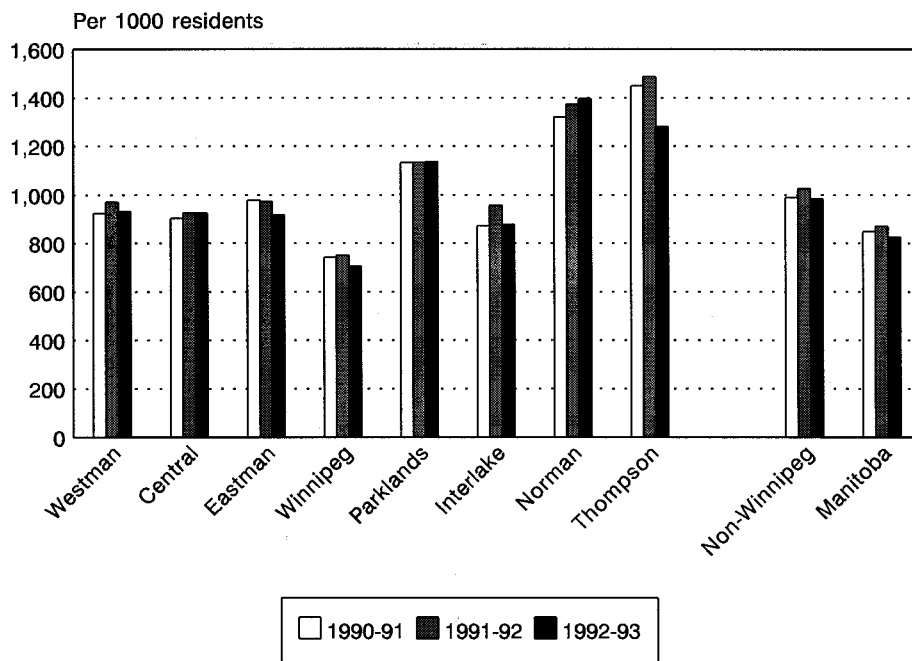
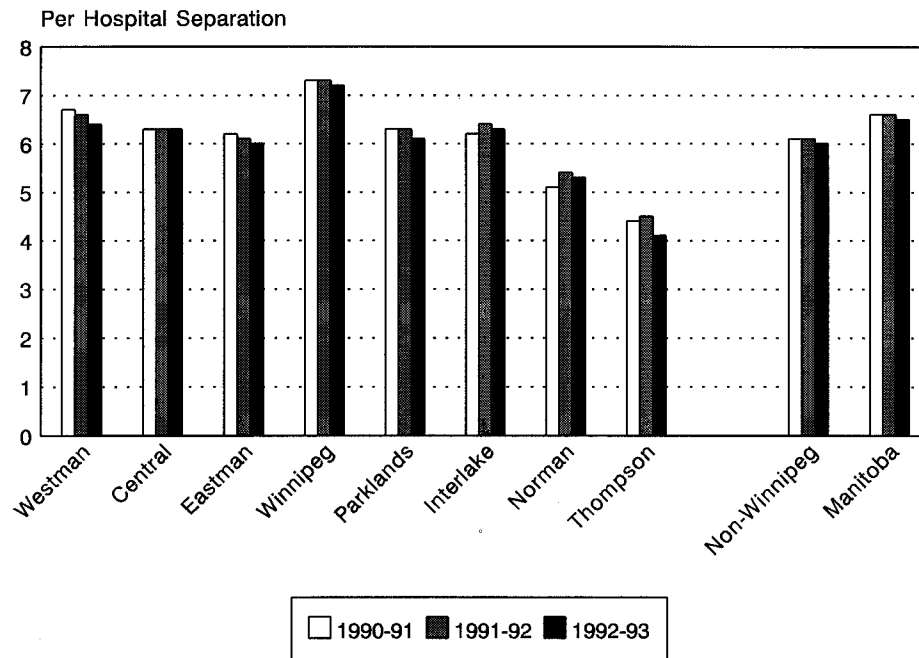


Figure 35: Average Length of Stay for Short Stay Inpatient Hospital Care  
Manitoba  
1990-91 to 1992-93

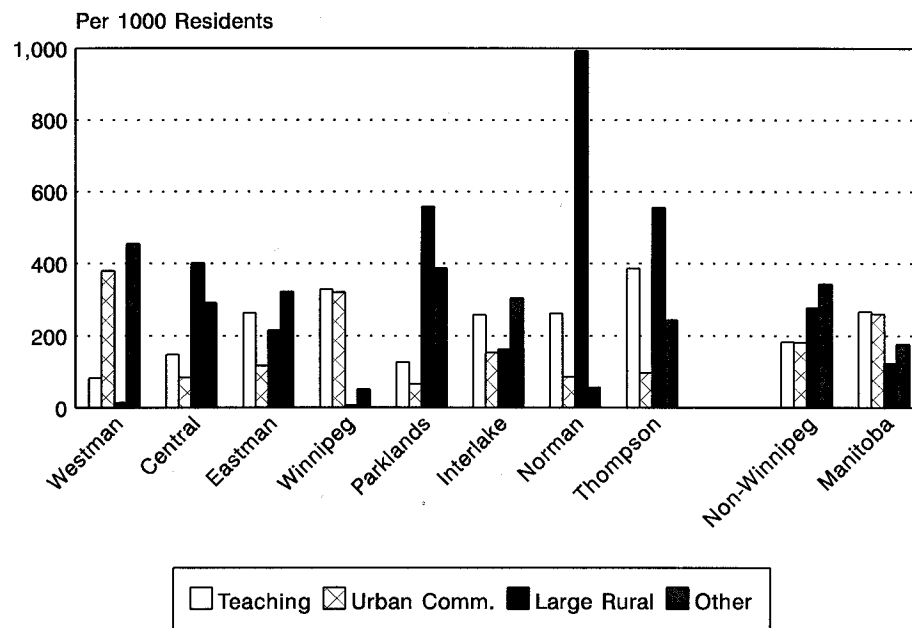


### Use of Short Stay Care by Level of Care

In 1992-93 the patterns of use of more specialized urban hospitals for the provision of short stay care varied markedly across regions (Figure 36). Adjusted rates of use of teaching hospitals ranged from 82 days per 1000 Westman residents to 386 days per 1000 Thompson residents. As a percentage of total short stay hospital days, only 8.8% of Westman residents' days and 11.8% of Parklands residents' days were spent in teaching hospitals, compared with 46.8% of Winnipeg residents' days. A similar variation is found when the sum of days used in teaching and large urban hospitals combined is considered. In these two highest levels of hospital care<sup>23</sup>, Parklands residents used 191 days per 1000 residents (16.9% of the total

23/ This information does not include the use of out of province hospitals.

Figure 36: Short Stay for Inpatient Care by Level of Care. Adjusted Number of Days of Care  
Manitoba  
1992-93



days), Central residents used 232 days per 1000 residents (25% of the total days), Westman used 462 days per 1000 residents (50% of the total), Thompson residents used 482 days (38% of the total), and Winnipeg residents used 648 days (92% of the total).

Rates of use of specialized hospital care are likely influenced by factors such as proximity to specialized hospitals, referral patterns, transportation arrangements for transfer to higher levels of care, and the particular specialties represented in any available regional hospital. The utilization patterns of Westman and Parklands



residents suggest that other levels of hospital care can substitute for care provided by teaching hospitals.<sup>24</sup>

### **Use of Short Stay Care by Discretionary Nature of Services<sup>25</sup>**

Rates of care for low variation conditions (e.g., heart attack, hip fracture), for which there is little clinical ambiguity about the need for hospitalization, showed the smallest differences across regions in 1992-93 (Figure 37). Consistent with findings reported by others (Wennberg et al., 1989), variation for surgical conditions was slightly higher. However, the greatest differences in rates of use across regions occurred for high variation medical conditions. In general, higher rates of use of days for surgical and high variation medical conditions (e.g., pneumonia, gastroenteritis) were associated with higher rates of use of short stay care.

### **Use of Short Stay Pediatric Care**

The use of adjusted<sup>26</sup> short stay pediatric hospital days per 1000 was highly variable across regions in the province in 1992-93. Rates ranged from 29 days per 1000 residents for Winnipeg, to 168 days per 1000 residents for Parklands. Parklands

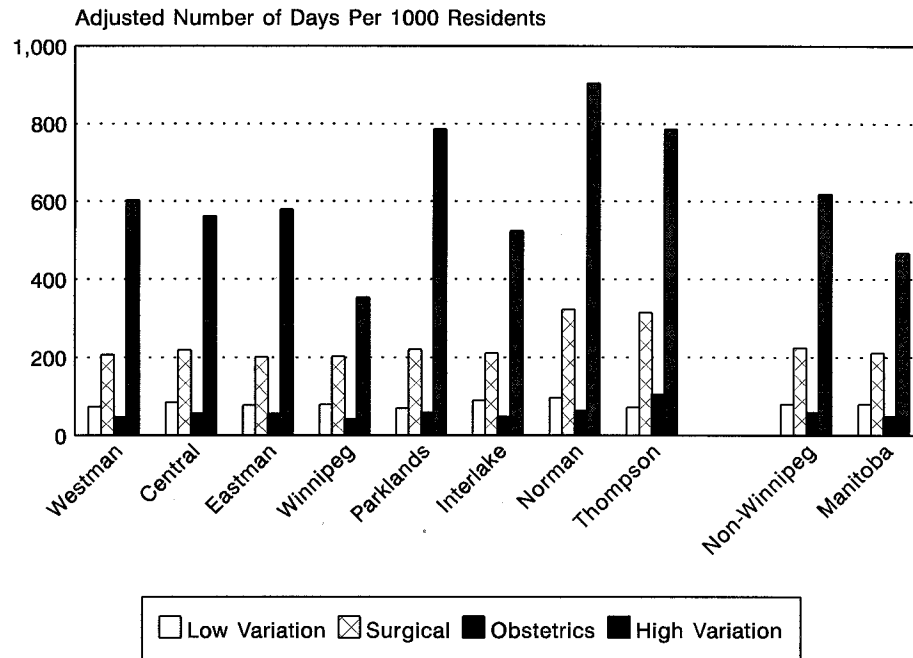
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24/ High rates of use of teaching hospitals by residents of a given region are likely associated with higher costs of providing care. While accurate per diem costs for Manitoba hospitals are currently not available, average interprovincial per diem charges, which are used to charge non-Manitoba residents for care at given hospitals, provide an estimate of differences in the costs of different levels of care. Inter-provincial charges are higher for teaching hospitals than urban community and rural hospitals. Similarly, Iglehart (1993), in the United States, has documented that patient care costs in teaching hospitals are generally higher than those in community hospitals.

25/ More information about what is meant by "discretionary nature of services" can be found in the Glossary.

26/ Adjusted rates of use of pediatric care measure pediatric utilization per 1000 standard population (where the age distribution is equivalent to the provincial population) and are comparable across regions. The patterns that emerge are similar to those observed when pediatric utilization is measured for the pediatric population.

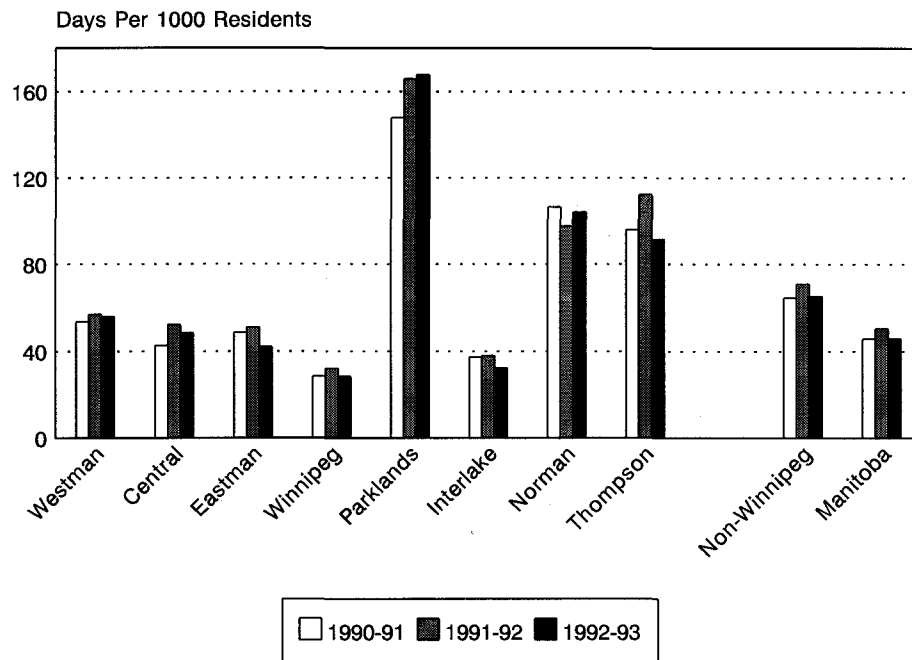
**Figure 37: Short Stay for Inpatient Care by Discretionary Nature of Admission  
Manitoba  
1992-93**



region had highly unusual patterns of pediatric care in that children resident in Parklands received 61% more days of care than residents of Norman, 80% more days than residents of Thompson, 200% more than residents of Westman, and 487% more than residents of Winnipeg.

As shown in Figure 38, over the three year period from 1990-91 to 1992-93, Parklands region continuously had the highest rate of short stay pediatric care. In addition, over time the gap between this region and others in the province appears to be increasing.

**Figure 38: Short Stay Pediatric Hospital Care  
Manitoba  
1992-93**



### Indicators of Access to Short Stay Hospital Care

As previously discussed, in general, residents of Thompson, who face the greatest geographic barriers to access, also had the highest rates of use of acute hospital care in 1992-93. Thompson residents were 2.1 times more likely to be hospitalized for short stay care and had 2.7 times more hospital separations than residents of the lowest use region, Winnipeg (Table 6).

Access to short stay hospital care can also be operationalized as rates of persons using very high intensity care (e.g., coronary bypass procedures, craniotomy, etc.), rates of care received at more technologically sophisticated specialized hospitals, and surgical services (both inpatient and outpatient). These data for the provincial regions in the fiscal year 1992-93 are presented in Table 7. Rates of persons using

Table 7

## Regional Use of Hospital Resources: Indicators of Access to Various Types of Short Stay Inpatient Care

Manitoba - 1992-93

Number of persons hospitalized <sup>27</sup> per 1000 residents for:	Westman	Central	Eastman	Winnipeg	Parklands	Interlake	Norman	Thompson	Non-Wpg	Manitoba
<b>Surgical care</b>										
Inpatient	31	32	31	28	30	31	46	39	33	30
Outpatient	35	36	39	33	32	39	48	28	36	35
Combined inpatient and outpatient surgical care	66	69	70	62	63	70	94	67	69	65
<b>Care at specialized facilities</b>										
Teaching hospital care	8	17	34	37	14	31	24	41	21	30
Urban community hospital care	49	13	18	34	9	21	9	13	24	30
Large rural hospital care	2	48	23	1	73	18	124	77	36	16
Very high intensity inpatient care <sup>28</sup>	5.9	5.9	5.5	6.0	5.4	6.1	7.7	7.1	6.0	6.0

27/ Rates of persons hospitalized are useful indicators of the ability of people to receive hospital care and are therefore relevant for comparisons of access. Only types of care for which access may be problematic are presented; the categories therefore do not sum to the total.

28/ Very high intensity care refers to hospitalizations that fall in the highest 5% of resource utilization (based on DRG weight classifications). These include admissions for craniotomy and other major cases requiring intense hospital treatment.

very high intensity care ranged from 5.4 persons hospitalized per 1000 residents in Parklands to 7.7 in Norman. In Winnipeg, where residents presumably have the greatest access to high intensity services due to geographic proximity, 6.0 persons per 1000 received very high intensity services which was equivalent to both the non-Winnipeg and the provincial rates. Residents of Interlake, Norman and Thompson had higher rates of use of these services, while residents of Westman, Central, Parklands, and Eastman had slightly lower rates of use of very high intensity resources.

In terms of access to technologically sophisticated care at specialized facilities, Winnipeg and Thompson residents had the highest rates of use of teaching hospitals (37 and 41 persons admitted per 1000 residents, respectively). Westman residents had the lowest rate of access in the province (8 persons per 1000 residents).<sup>29</sup>

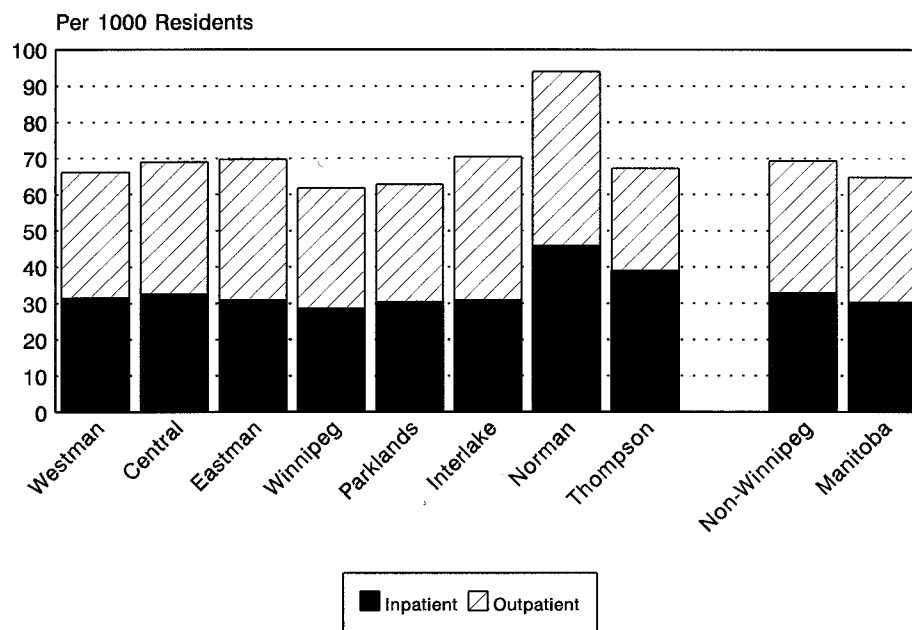
With the exception of Norman, access to surgical services in Manitoba (i.e., rates of persons receiving outpatient or inpatient surgery), was similar across the regions hovering around the provincial average of 65 persons hospitalized per 1000 residents. Norman residents, however, had a much greater likelihood of undergoing a surgical procedure. Their rate for surgical care of 94 persons hospitalized per 1000 residents was 45% higher than the provincial average (Figure 39).

Looking at access to surgical services in Manitoba over the years from fiscal 1990-91 to 1992-93, despite the concentration of surgical specialists and resources in Winnipeg, the city's residents had the lowest rate of persons hospitalized per 1000

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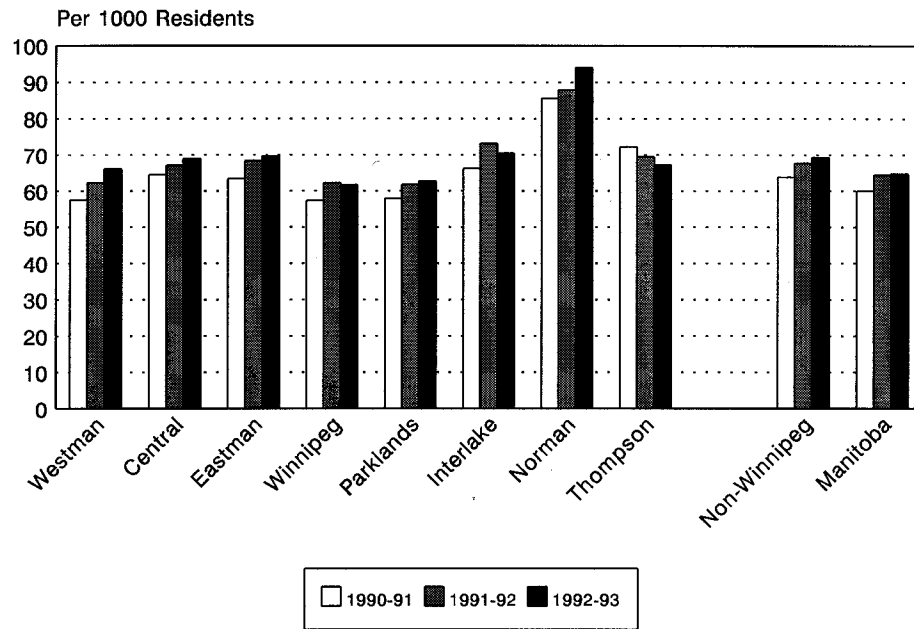
<sup>29/</sup> However, Westman's use of urban community hospitals provides an alternative to the use of teaching hospitals.

Figure 39: Outpatient and Inpatient Surgical Care: Number of persons Hospitalized  
Manitoba  
1992-93



for combined inpatient and outpatient surgery in 1992-93 and the second lowest rate in 1991-92 and 1990-91 (Figure 40). Over the three years non-Winnipeg residents consistently had higher rates of surgery than Winnipeg residents. Over that time period, total rates of surgery increased for all regions except Thompson which experienced a slight decline (Figure 40). Most of the increases in surgery were attributable to increases in rates of outpatient surgical procedures. For Thompson residents, rates of both inpatient and outpatient surgery decreased between 1990-91 and 1992-93.

Figure 40: Combined Outpatient and Inpatient Surgical Care: Number of Persons Hospitalized  
Manitoba  
1990-91 to 1992-93



## Utilization of PCH Resources

The personal care home (PCH) report of the Population Health Information System examines Manitoba's utilization of nursing homes. Although only 5.9% of the province's population are 75 or older, 85% of PCH residents and 82% of new admissions are 75 or older. Therefore this discussion focuses on that age group.

### Nursing Homes, Beds, Resident Admissions and Utilization

#### Fiscal 1992-93

In fiscal 1992-93 there were 120 nursing homes in Manitoba.<sup>30</sup> During the year 108 new nursing home beds opened (an increase of 1.3%) leading to a complement of 8,566 beds.

The population aged 75 or older grew at a rate of 2.3%. There were 10,460 residents of personal care homes (8,878 aged 75 or over) and there were 2,198 admissions to nursing homes (1,809 aged 75 or over). Included among these admissions are those persons whose status changed from Respite Care (intermittent care for individuals who live outside of a PCH) to a long term PCH admission.

In 1992-93 Winnipeg had fewer PCH beds per 1000 population than non-Winnipeg, yet almost identical rates of residents, admissions and days of PCH care (Table 8).

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<sup>30/</sup> For all analyses, we have excluded the 100-bed Rideau Park PCH in Westman, since the majority of its residents are from the Brandon Mental Health Centre, thus constituting a long term institutionalized population. In addition, there are three hospitals in the province with a total of 27 beds that function like nursing homes but are not accredited as such: Cartwright (10 beds), Elkhorn (8 beds), and Hartney (9 beds), all in Westman Region. They were not included in these analyses. Rather, they were counted in the hospital analyses.



Table 8

## Access to and Utilization of Personal Care Homes

Winnipeg and Non-Winnipeg Residents Aged 75+<sup>31</sup> - 1992-93

	Winnipeg Residents	Non-Winnipeg Residents	Ratio: Winnipeg to Non-Winnipeg
Population	37493	29750	1.26
PCH Beds/1000 population	126	130	0.97
Residents of PCH per 1000 population	131.6	133.2	0.99
Level 1 (lightest care)	3.2	5.0	0.64
Level 2	42.2	54.9	0.77
Level 3	50.2	43.0	1.17
Level 4 (heaviest care)	36.0	30.3	1.19
Admissions to PCH per 1000 population	27.1	27	1.00
Days of PCH care per resident of region	37.9	38.8	0.98
Estimated cost of PCH care per resident of region (\$)	3197	3166	1.01
Mean expected length of stay (years)	4.1	4.1	1.00

31/ Rates (except for beds/1000 - which are crude rates) are age and sex adjusted to the Manitoba population age 75+ years using a direct method of standardization.

Table 9 and Figure 41 show that, across regions in the provinces, there were small differences in utilization. Excluding Norman and Thompson<sup>32</sup>, which have very small elderly populations making rates unstable in those regions, the number of PCH residents per 1000 population aged 75 or older ranged from 124 in Parklands to 140 in Westman. Furthermore, in general, regions with higher rates of nursing home residents had higher per capita nursing home costs (Table 9). In 1992-93 the estimated provincial average cost of PCH care per resident was \$3,180.<sup>33</sup>

### **Fiscal 1990-91 to 1992-93**

Earlier, it was stated that in 1992-93 there were 120 nursing homes in Manitoba and that 108 new nursing home beds opened which represented an increase of 1.3%. Considering the entire three year period from 1990-91 to 1992-93, in total 255 new nursing home beds opened in the province (an increase of 3.1%). Non-Winnipeg beds grew 3.9% and Winnipeg beds 2.4% in that time. The population 75 years or older grew 5.2% over the three years, 4.3% in non-Winnipeg and 5.9% in Winnipeg. Because the elderly population grew faster than the bed supply, the bed to population ratios declined from 130 to 127 per 1000 aged 75 or older. However, whereas the ratio for non-Winnipeg regions was stable at 130, the ratio in Winnipeg fell from 130 to 126. In 1993-94 there will be 240 new PCH beds in Winnipeg. If the population in Winnipeg continues to grow at the same rate, the bed to population ratio will rise to 128.

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32/ Both Norman and Thompson's use are understated because they each have a federally funded nursing home for Status Indians for which we do not have information in our system. There are 165 federal nursing homes beds, 63 in Norman and Thompson. Because the elderly population is so small in these regions, the understatement effect on their utilization rates is proportionally greater than in other regions.

33/ These are estimated costs.

Table 9  
Regional Use of Personal Care Home Resources<sup>34</sup>  
Manitoba Residents Aged 75+<sup>35</sup> - 1992-93

	Westman	Central	Eastman	Winnipeg	Parklands	Interlake	Norman	Thompson	Non-Wpg	Manitoba
Population	9,843	6,370	3,933	37,493	4,207	4,096	806	495	29,750	67,243
PCH beds per 1000 pop.	145	127	117	126	119	123	161	53	130	127
Residents of PCH per 1000 pop. (Number)	140.1 (1,460)	130.3 (857)	133.2 (486)	131.6 (4,890)	123.8 (524)	132.7 (517)	144.9 (107)	81.4 (37)	133.2 (3,988)	132.0 (8,878)
Admissions to PCH per 1000 (Number)	26.4 (272)	28.4 (187)	29.1 (108)	27.1 (1000)	27.9 (119)	25.4 (100)	19.5 (15)	16.4 (8)	27.0 (809)	26.9 (1,809)
From Hospital <sup>36</sup>	15.2	16.5	16.7	15.7	19	11.8	10.4	*	15.6	15.6
From Community	9.7	10.8	12.1	10.9	8.5	13.2	9.1	*	10.5	10.6
Days of PCH care per resident	41.4	38.0	38.7	37.9	35.6	38.4	43.2	22.4	38.8	38.3
Estimated cost of PCH care per resident (\$)	3,324	3,117	3,195	3,197	2,876	3,202	3,486	1,860	3,166	3,180
Estimated cost of PCH care per day (\$)	80.29	82.03	82.56	84.35	80.79	83.39	80.69	83.04	81.60	83.03
Mean expected length of stay per admission (years)	4.2	4.0	4.1	4.1	4.2	4.1	4.1	5.5	4.1	4.1

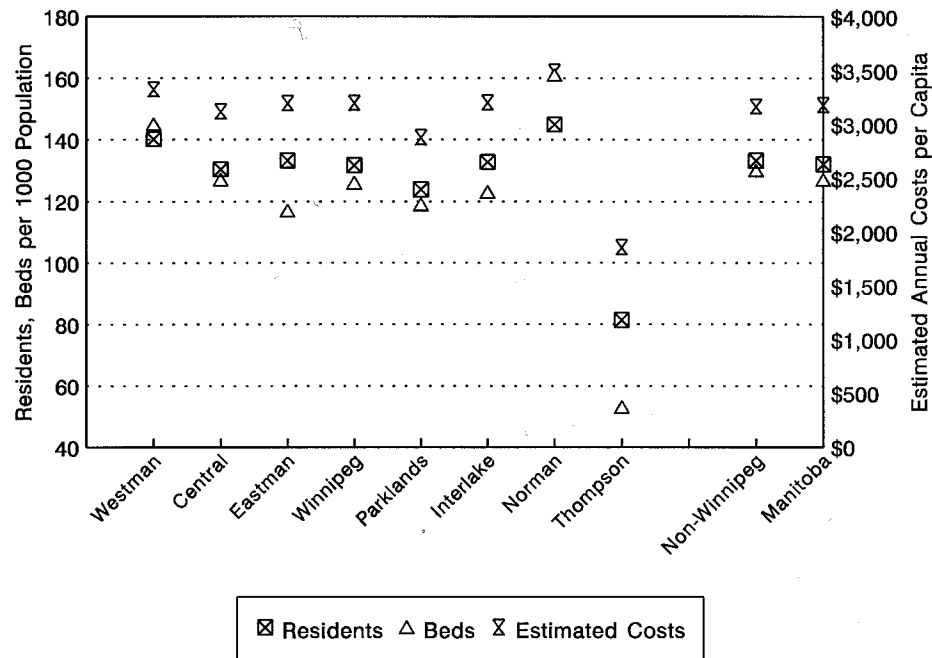
34/ Cells with less than five individuals are marked with an asterisk.

35/ Rates are age- and sex-adjusted to the Manitoba population using a direct method of standardization, except for bed to population ratios which are crude rates.

36/ These rates will not sum correctly because there are a few persons in the "other" category who are from Mental Health Centres or unspecified.

PHIS: OVERVIEW OF 1990-93 FINDINGS

Figure 41: Utilization of PCH Resources Among Residents Aged 75+  
Manitoba  
1992-93



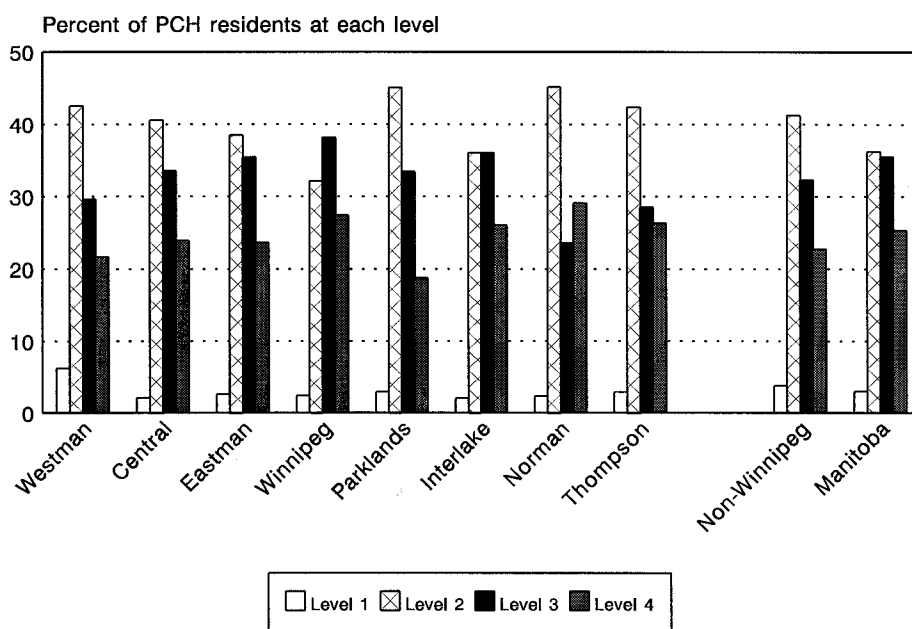
As measured by PCH residents per 1000 population aged 75 or older and days of PCH care per capita aged 75 or older, personal care home utilization fell from 1990-91 to 1992-93. This decrease in utilization was probably related to decreased bed availability. To illustrate how this might work one can look at the Parklands region where, in 1991-92, counter to the Manitoba trend, 55 new PCH beds opened, increasing its bed to population ratio from 111 to 122 per 1000 population aged 75 or older. In Parklands, residents' utilization rose accordingly.

## Age Distribution, Levels of Care and Origin of Admissions

The age distribution of persons admitted to PCH remained stable over the three year period. The proportion in the PCH population who were 75 or over ranged between 82% and 85%. The proportion aged 85 or over was about 43%.

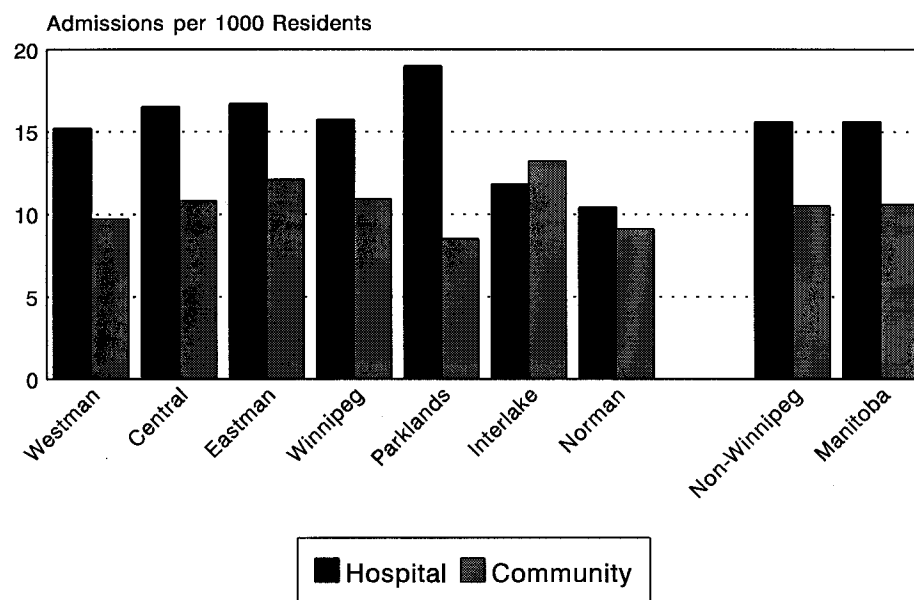
Although the majority of PCH admissions in 1992-93 were assessed as requiring Level 2 nursing care, ranging from 52.6% in Winnipeg to 68.8% in Parklands region, when 1990-91 admissions are compared to 1992-93 admissions it is seen that there was a tendency to admit more people requiring heavier levels of nursing care and also to admit more persons from hospital - those generally having poorer health status and therefore requiring more nursing care. In 1992-93, in all regions, over half of the PCH residents required the heavier levels of nursing care (see Levels 3 and 4 in Figure 42). Winnipeg nursing homes had the greatest proportion

Figure 42: Utilization of PCH Resources Among Residents Aged 75+ by Levels of Care  
Manitoba  
1992-93



of higher care residents (65.5%) followed by Interlake (62.0%). Westman and Norman regions, which had higher bed to population ratios, had fewer nursing home residents at the higher levels of care (51.2% and 52.7%, respectively). Parklands region also has a lower proportion of heavy care residents (52.1%), even though it has a relatively lower bed to population ratio. Anecdotal evidence suggests that this is because of the relative isolation of many communities in the Parklands region and the migration of younger family members (possibly informal care-givers) to other regions of the province. In most regions during 1992-93, 57% to 58% of the admissions to PCHs were from a hospital (Figure 43, Table 9). In Parklands, the proportion was 68% and in Interlake, it was 46.5%.

Figure 43: Admissions to PCHs from Hospitals or Community Among Residents Aged 75+  
Manitoba  
1992-93



Note: Thompson region is excluded because of insufficient observations

## **Expected Length of Stay and Costs**

If standards of admission varied markedly across regions or types of nursing homes, that is, if some facilities tended to admit younger, lighter care individuals, this would be reflected in variations in the expected length of stay (ELOS). Across regions, in 1992-93, the mean ELOS ranged between 4.0 and 4.2 years, except for Thompson region, where the ELOS was 5.5 years<sup>37</sup> (Table 9).

The mean ELOS for admissions from hospital was lower than for admissions from the community (3.9 and 4.3 respectively), reflecting the fact that residents admitted from a hospital are generally in poorer health, requiring higher levels of nursing care and having shorter survival than residents admitted from community settings.

The mean expected length of stay remained stable over the three years from 1990-91 to 1992-93. For most regions over that time and for the province as a whole, mean ELOS ranged from 4.0 to 4.2 years.

In fiscal 1992-93 the cost per day of PCH care ranged from \$80.29 in Westman to \$84.35 in Winnipeg (Table 9). Westman, Norman and Parklands had higher proportions of residents at lower levels of care, hence their slightly lower cost per day of care. The reverse was true in Winnipeg. Estimated annual costs per capita were 1% higher in Winnipeg because a larger proportion of its residents required higher levels of nursing care.

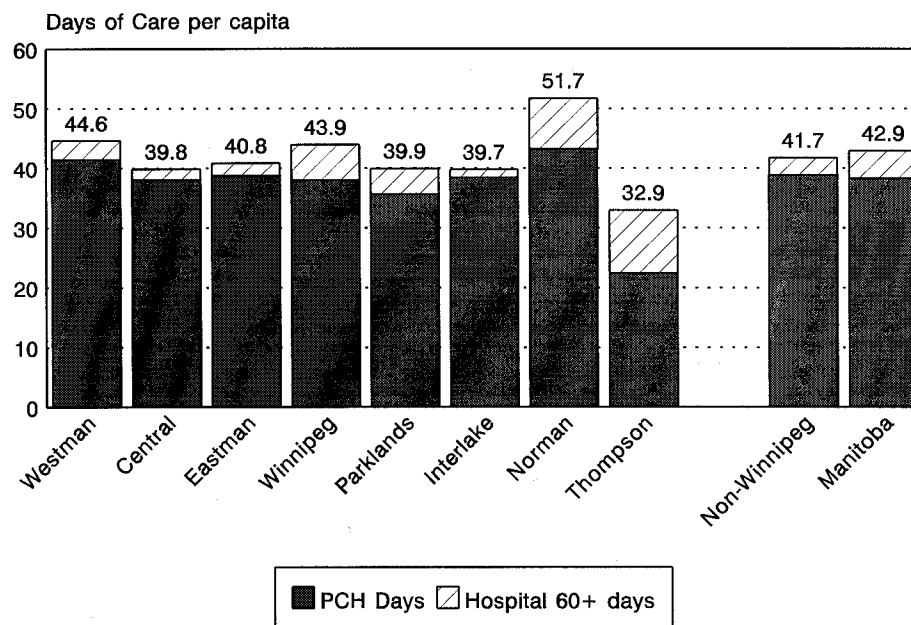
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<sup>37/</sup> Thompson's longer ELOS should be viewed with caution because it is based on only 8 admissions.

## Non-Acute Care

It is sometimes suggested that the heavy use of hospitals for long stay patients is due to the relative unavailability of nursing home beds. Focusing on the number of days which the elderly population of a region spend in a nursing home or in non-acute hospital stays permits examining the degree to which the two services substitute for one another across regions. As Figure 44 shows, although there are exceptions (e.g., Norman and Westman), as one might expect, regions whose residents are high users of hospital beds for non-acute stays (60 days or longer) tend to be lower users of nursing home resources (e.g., Winnipeg and Parklands), whereas regions that are lower users of hospital beds tend to be higher users of nursing home resources (e.g., Interlake, Eastman and Central).

Figure 44: Utilization of PCH and Non-Acute Hospitals (60+ days) Among Residents Aged 75+  
Manitoba  
1992-93

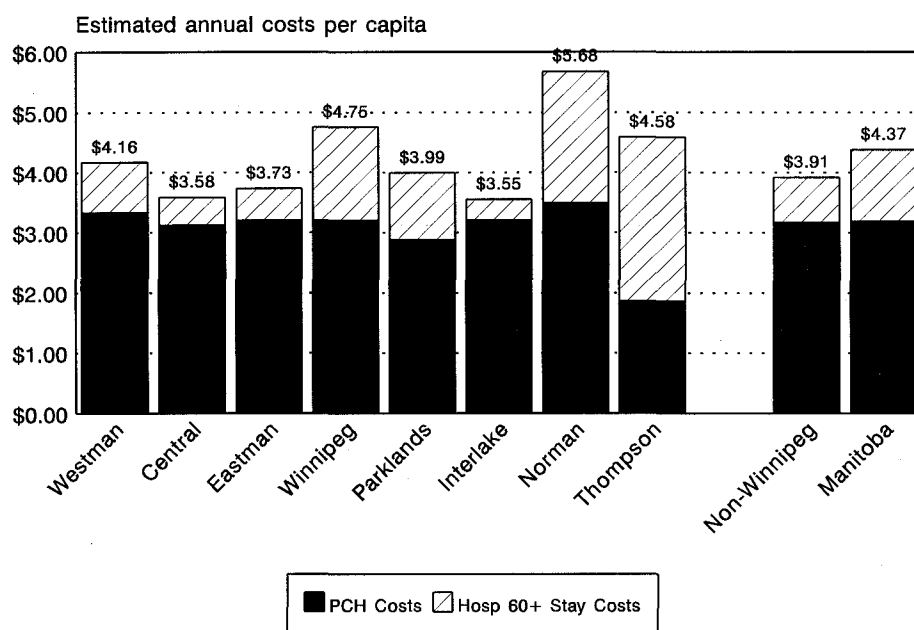




Costs per capita for non-acute care are highest in Norman, followed by Winnipeg, where the higher use of hospital beds for non-acute care would appear to drive up costs (Figure 45).

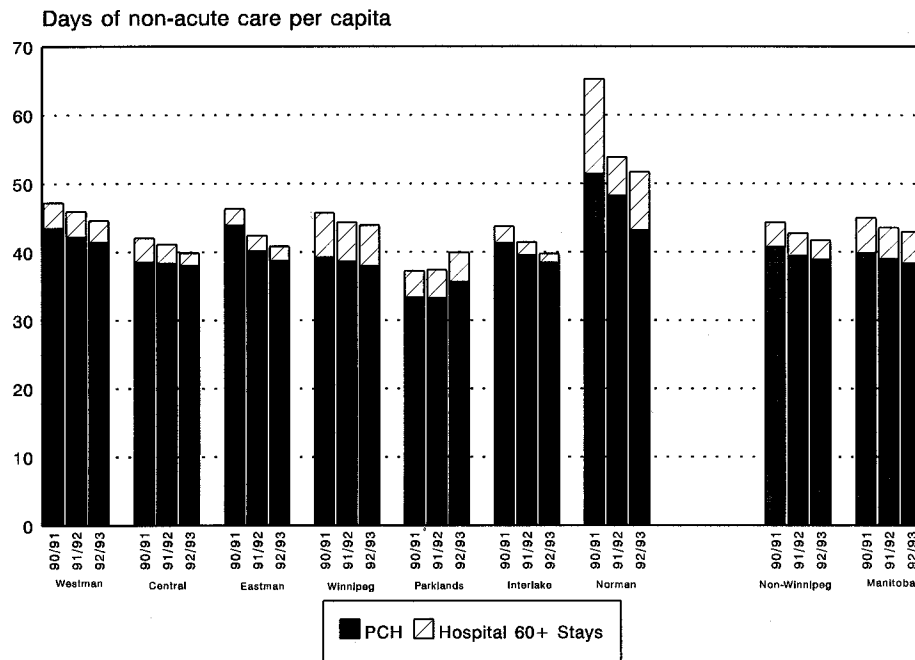
For every region in the province<sup>38</sup>, except Parklands, the number of days of non-acute care per person aged 75 or over declined from 1990-91 to 1992-93 (Figure 46). This applied both to days of nursing home care and days of non-acute hospital care (i.e., stays of 60 days or more).

Figure 45: Non-Acute Care Costs: PCH Use and Hospital Use of 60+ Days, Aged 75+  
Manitoba  
1992-93



38/ Thompson has been excluded from this analysis because of insufficient observations.

Figure 46: PCH Utilization: Non-Acute Care Per Capita, Age 75+  
 Manitoba  
 1990-91 to 1992-93



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## Appendix A

### **Infectious Disease & Injury Mortality Indicators**

- ▶ motor vehicle
- ▶ falls
- ▶ drowning and suffocation
- ▶ poisoning
- ▶ fire and flames
- ▶ suicide
- ▶ homicide
- ▶ other injuries
- ▶ all injuries
- ▶ pneumonia
- ▶ AIDS

### **Cancer Mortality Indicators**

- ▶ lung
- ▶ bladder
- ▶ kidney
- ▶ colon
- ▶ breast
- ▶ other cancer
- ▶ all cancers

### **Chronic Disease Mortality Indicators**

- ▶ asthma
- ▶ vascular complications
- ▶ hypertension
- ▶ diabetes
- ▶ ischemic heart disease
- ▶ emphysema
- ▶ all chronic diseases

## Glossary of Terms

Entries in this Glossary are divided into sections depending on the specific module in which the term appeared. The section entries are prefaced by a brief description of the module. The terms are listed in alphabetical order.

### Module: Socio-Economic Characteristics (SEC)

The SEC module of the Population Health Information System examines the socio-economic characteristics of residents in the province of Manitobans using the most recently available Census data (1986). These characteristics are linked to the health status of Manitobans and to their use of health care facilities for the fiscal year in question (April 1 to March 31). This module develops an index of socio-economic risk factors shown to be related to regional differences identified in this and the other modules of the Population Health Information System. More detailed technical descriptions of the terms below can be found in *Socio-Economic Characteristics* (Frohlich & Mustard, 1994) on the page(s) indicated below in parentheses.

**Age Dependency Ratio** (p.37): For the purposes of the SEC module, the age dependency ratio is one of the social characteristics used to describe the population. It refers to the ratio of the population within a region of Manitoba aged 65 years or older to the number of people aged 15-64 as identified in the 1986 Census.

**Diagnosis of Injury** (p.33): An individual health status measure used in the PHIS, "diagnosis of injury" refers to Manitoba hospital admissions of residents in the fiscal year 86/87 for a primary diagnosis of injury in the ranges ICD9-CM 800-

904, 925-929, 940-949, 950-957. For the purposes of the SEC module, admissions for both males and females were retained.

**Dwelling Value** (p.34): Commonly used as a measure of socio-economic status, for the purposes of the SEC module, dwelling value refers to the average value of all owner-occupied, non-farm, non-reserve, single detached dwellings in Manitoba as identified in the 1986 Census.

**Education** (p.34): Commonly used as a measure of socio-economic status, for the purposes of the SEC module, education refers to the number of household residents who attained a minimum of a high school education in Manitoba as identified in the 1986 Census. High-school completion rates for three age groups: (1) 25-34 year olds, (2) 35-44 year olds, and (3) 45-54 year olds were used.

**Employment** (pp.34-35): In the SEC module the word "employment" is used as a heading for the three indicators of labour force activity discussed in the document: (1) occupational groupings, (2) female labour force participation, and (3) regional unemployment rates for various age groups.

**Fertility** (p.33): An individual health status measure used in the PHIS, "fertility" refers to the general fertility rate calculated for each region of Manitoba in the fiscal year 86/87. The rate was calculated by taking the sum of all births and dividing by the number of women in the region between the ages 15 and 49.

**Female Labour Force Participation** (p.35): For the purposes of the SEC module, female labour force participation is defined as the number of women over the age of 15 who are working or seeking work in Manitoba as identified on the 1986 Census.

**Income (p.36):** Commonly used as a measure of socio-economic status, for the purposes of the SEC module, income refers to the average annual income from all sources of all members of a household over the age of 15 in Manitoba as identified on the 1986 Census. The figure is computed from the sum of the total household income within a geographical area divided by the number of households in the area.

**Mobility (p.36):** As reported in the SEC module, mobility refers to the proportion of the total population aged five years or older in a geographical area that moved into a region in the province of Manitoba in the previous five years from a location elsewhere in Canada as identified on the 1986 Census.

**Mother Tongue (p.37):** For the purposes of the SEC module, "mother tongue" is one of the social characteristics used to describe the population. French mother tongue reports the proportion of the total population for whom French was the first language learned in the home and is still understood by the respondent. Native mother tongue reports the proportion of the total population for whom a Native language was the first language learned in the home and is still understood by the informant. These definitions of cultural identification are more restrictive than was used on the 1986 Census.

**Occupational Groupings (p.34):** Commonly used as a measure of socio-economic status, for the purposes of the SEC module, occupational groupings refer to the classification of self-reported vocations of Manitobans as identified in the 1986 Census. In the SEC module data are reported on seven occupational groups, grouped into three categories, representing approximately 25% of the labour force in Winnipeg and 50% of the labour force outside of Winnipeg.

**Prototype Poor Health Status Index (PPHSI)** (pp.26-30): Developed specifically for the SEC module, the PPHSI is a measure of health status. The index is a composite of five health status indicators which were deemed as being sensitive to differences in socio-economic status. Higher scores on the index correspond to poorer health. The PPHSI is made up of the following variables:

- ▶ Hospitalization of females for injury (see 'Diagnosis of Injury')
- ▶ Hospitalization of males for injury (see 'Diagnosis of Injury')
- ▶ Hospitalization of children 0-4 for respiratory infection (see 'Respiratory Infection')
- ▶ Hospitalization of persons older than 65 for acute respiratory infection (see 'Respiratory Infection')
- ▶ Fertility (see 'Fertility')

**Regional Unemployment Rate** (p.35): Commonly used as a measure of socio-economic status, for the purposes of the SEC module, "unemployed" refers to individuals who were without work during the week the 1986 Census was conducted in Manitoba, had looked for work in the previous four weeks, and were available for work in the week of the Census. Four age-specific unemployment rates were computed for each region in the province: (1) ages 15-24, (2) ages 25-34, (3) ages 35-44, and (4) ages 45-54.

**Respiratory Infection** (p.33): An individual health status measure used in the PHIS, "respiratory infection" refers to Manitoba hospital admissions of residents in the fiscal year 86/87 for a primary diagnosis of acute respiratory infection in the ranges ICD9-CM 460-466, 480-487. For the purposes of the SEC module, admissions for individuals between the ages of 0-4 and 65 years of age or older



were retained.

**Single Female Parent Households (p.37):** For the purposes of the SEC module, "single female parent households" is one of the social characteristics used to describe the population. It is defined as the percent of single female parent households among households with children aged 0-14 and is distinguished from two other measures of single parenthood recorded in the 1986 Census, namely (1) the percent of single parent households, and (2) the percent of single female parent households among all households with parents aged 15-24 and children aged 0-14.

**Social Characteristics (p.37):** In the SEC module "social characteristics" is a heading for the three dimensions of regional social characteristics discussed in the document: (1) the age dependency ratio, (2) single parenthood, and (3) the distribution of peoples with French or Native as their mother tongue.

**Socio-Economic Risk Index (SERI) (pp.26-30):** Developed specifically for the SEC module, the SERI is the composite of six measures of socio-economic status that mark environmental, household, and individual preconditions which place people at risk of poor health and therefore may identify their relative need for various types of medical care. The index was designed to explain the different health status of groups in the population and the different health care needs of those groups. It consists of six variables - three positively correlated with the PPHSI and three negatively associated with the PPHSI. The SERI is made up of the following variables:

- ▶ The percentage of people unemployed between the ages of 15 and 24 (see 'Regional Unemployment Rate')

- ▶ The percentage of people unemployed between the ages of 45 and 54 (see 'Regional Unemployment Rate')
- ▶ The percentage of single parent female households (see 'Single Parent Female Households')
- ▶ The percentage of high school graduates between the ages of 25 and 34 (see 'Education')
- ▶ The percentage females participating in the labour force (see 'Female Labour Force Participation')
- ▶ The average dwelling value (see 'Dwelling Value')

### **Module: Population Health: Health Status Indicators**

The 'Health Status Indicators' module of the Population Health Information System examines various aspects of community health in the province of Manitoba for the fiscal year in question (April 1 to March 31). Using administrative data, 102 health status indicators were developed for this module. The indicators originated from three different sources: (1) Manitoba Health hospital discharge diagnoses, (2) diagnoses associated with physician visits, and (3) Vital Statistics, death information. They were grouped into six major categories: I. Demographic Profile, II. Low Birth Weight, III. Health Care System Sensitive Indicators, IV. Mortality Indicators: population and cause specific, V. Hospitalization Indicators, VI. Physician Visit Indicators for youth and the elderly. More detailed technical descriptions of the terms below can be found in *Population Health: Health Status Indicators Volume I: Key Findings and Volume II: Methods and Tables* (Cohen & MacWilliam (1994) on the page(s) indicated below in parentheses.

**Adjusted Rates** (Vol. II, p.18): Because the proportion of the very young or the very old varies markedly across the regions in the province and ultimately may influence the patterns of care delivered, rates were adjusted (standardized) for age differences before making comparisons of residents across regions. Sex-adjustments were also made due to the disproportionate numbers of males or females that reside in specific regions of the province since it is known that males and females have different health status profiles (also see 'Indirect Adjusted Rates').

**Age-specific Mortality** (Vol II: p.17): One of the rates determined for the health status indicators (see 'Determination of Rates'). The age specific mortality rate refers to the number of deaths to persons in a particular age group in a given region, divided by the number of persons in that age group in that region.

**Ambulatory Physician Visits** (Vol I, p. 53; Vol II, p.13): For the purpose of the 'Population Health: Health Status Indicators' module, an ambulatory visit was counted only when two or more contacts were made with a physician. Ambulatory visits include office visits, outpatient/emergency department visits, visits to persons in Personal Care Homes, and visits to patients in their own homes. Visits to patients admitted in hospital are not included. Contacts with physicians in salaried positions are included. However, because salaried emergency room physicians do not always submit evaluation claims, they may be under counted. Ambulatory care delivered as part of a global tariff (e.g., six-week post-operative care, chemotherapy, prenatal and post-partum care visits claimed at the time of delivery) are not included. Global billing for prenatal care constitutes just over 2% of all ambulatory visits, 35% of all visits to obstetrics and gynaecology specialists, and affects estimates of Winnipeg and non-Winnipeg equally.

**Ambulatory Sensitive Hospitalizations** (Vol I, p.55; Vol II, p.13): A 'Health Care System Sensitive Indicator', ambulatory sensitive hospitalizations refer to hospitalizations that might have been avoided if timely and effective outpatient care had been received. If received, appropriate outpatient care should have reduced the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition or managing a chronic disease or condition.

**Amenable Conditions** (Vol I, p.55; Vol II, p.15): A 'Health Care System Sensitive Indicator', amenable conditions refer to those medical conditions most readily affected by treatment. The conditions amenable to medical treatment were determined by a panel of physicians. Age limits were imposed for some of the conditions such as deaths from diabetes, acute respiratory infections and Hodgkin's disease.

**Avoidable Hospitalizations** (Vol II, p.15): A 'Health Care System Sensitive Indicator', avoidable hospitalizations refer to conditions for which hospitalization can be avoided if ambulatory care is provided in a timely and effective manner. These conditions were determined by a physician panel.

**Calculation of Age** (Vol I, p.50): Age was calculated as of December 31 of the fiscal year in question. The year of birth reported on the first claim of the fiscal year made by residents was recorded.

**Cancer Indicators** (Vol I, p.16): A 'Mortality Indicator' as well as a 'Hospitalization Indicator', cancer accounts for approximately one-quarter of all deaths in Canada. Lung cancer, breast cancer and cancer of the colon account for

most deaths. Some cancers, such as cancer of the bladder and kidney, are often associated with occupational exposure.

**Chronic Disease Indicators** (Vol II, p.16): A 'Mortality Indicator' as well as a 'Hospitalization Indicator', chronic diseases such as heart disease, stroke, and diabetes are the main cause of death and disability for adults in the mid-years. For the elderly, heart disease, stroke, chronic obstructive lung disease (emphysema), and diabetes are among the leading causes of death.

**Crude Rates (CR)** (Vol II, p.17): One of the rates determined for the health status indicators (see 'Determination of Rates'). Three crude rates were determined: (1) mortality, (2) hospitalizations and, (3) physician visits. The crude mortality rate is the number of deaths for a specific condition in a given region, divided by the population of that region. The crude hospitalization rate is the number of persons who had at least one hospitalization for a specific condition in a given region, divided by the population of that region. The crude physician visit rate is that number of persons who had at least two visits to a physician for a particular diagnosis in a given region, divided by the population of that region.

**Demographic Profile:** One of the six major health status indicator categories (also see 'Extremes of Age').

**Determination of Mortality** (Vol I, p.51): Causes of death were determined from provincial vital statistics which uses death certificates. The "main cause of death" was used in rate calculations. It should be noted that only one "cause" can be given even for persons with multiple health problems. In some circumstances it is difficult to know the cause of death precisely. Using death certificates may be

unreliable for certain conditions where the cause of death is poorly known, for multiple conditions, or where conditions carry a social stigma.

**Determination Of Rates** (Vol I, p.55; Vol II, p.17): The following rates were determined for the health status indicators: (a) 'Crude Rates' (CR) - mortality, hospitalization, and physician, (b) 'Indirect Adjusted Rates' (IAR), (c) 'Standardized Mortality/Morbidity Ratio' (SMR), (d) 'Excess Rates' - hospitalizations (EH), physician visits (EV), or deaths (ED), and (e) 'Age-specific Mortality'.

**Disability Among Youth** (Vol II, p.17): One of the 'Physician Visit Indicators', disability among youth refers to a list of disabling conditions derived from the World Health Organization which, when diagnosed in youths 0-24 years of age disadvantaged since birth and not treated with modern techniques, frequently result in early death. Individuals with these conditions are not necessarily admitted to hospital but will very likely see a physician for care over the course of the year. Reported are two or more physician visits in one year by individuals for these conditions.

**Discharge Diagnosis:** While coding at hospitals is generally good, there is always some discrepancies across hospitals with regard to how certain conditions are coded or with the number of coexisting conditions recorded. For the current study the first diagnosis, which is considered the most important reason contributing to the hospital stay, was used.

**Excess Rates** (Vol II, p.18): One of the rates determined for the health status indicators (see 'Determination of Rates'). Three excess rates were determined: (1)

mortality (ED), (2) persons hospitalized (EH), and (3) physician visits (EV). Excess rates compare each region's performance on the various indicators with that of the province. Thus, if the rate for a particular medical condition in a given region is higher than the provincial average, this implies that if that region's death mortality, persons hospitalized, or physician visit rate were the same as the provincial rate, then excess deaths, hospitalizations, or physician visits could theoretically be avoided.

**Extremes of Age** (Vol II, p.14): A health status indicator under the heading 'Demographic Profile', the proportion of the population at the extremes of age identifies the more vulnerable groups in society, that is, younger people under 25 who are more susceptible to injury and older people over 74 among whom there is more death and disability associated with chronic disease.

**Functional Limitation Indicators** (Vol II, p.16): One of the 'Physician Visit Indicators', the indicators of functional limitations are an acknowledgement of the fact that the definition of "health" includes more than the presence (or lack thereof) of medical conditions. For the elderly, in particular, good health means being able to carry out daily activities, function socially, the absence of disability, and a healthy self-perception. Medical conditions can be rated in terms of these "functional" dimensions or classifications. In the current module, the most common medical conditions were grouped into two classifications: (1) those conditions associated with functional limitations and, (2) those associated with restricted activity days.

**Health** (Vol I, p.55; Vol II, p.12): While there is no universally accepted definition of health, most authorities agree that health is more than the absence of

medically defined diseases. "Health" consists of several dimensions including a physiological or biological component, mental state, physical and social functioning, and health behaviours and attitudes. Several instruments to measure health status are currently available and can be broadly classified into those that measure individual health status and those that measure the health of populations or communities. It is with the latter that the Health Information System is concerned. There are several health status indicators currently developed to measure the health of populations and this module draws heavily from these.

**Health Care System Sensitive Indicators** (Vol.I, p.12): One of the six major health status indicator categories, the health care system sensitive indicators are comprised of aggregates of a series of medical conditions for which medical treatment is believed to be effective in either preventing the condition, finding and treating the condition in an early phase to avoid major consequences, or treating the condition in a late phase thus avoiding death or disability. The health care system sensitive indicators include the following: (1) mortality attributable to 'amenable conditions', (2) mortality attributable to 'single event rate indicators', (3) mortality attributable to 'Rate event indicators', (4) 'ambulatory sensitive hospitalizations', and (5) 'avoidable hospitalizations'. Each is defined separately in this glossary. The health care system sensitive indicators are derived both from mortality data and hospitalization data. There is no evidence in the literature to suggest that one performs better than the others in determining health status.

**Hospitalization Indicators:** One of the six major health status indicator categories (also see 'Injury Indicators', 'Cancer Indicators', 'Chronic Disease Indicators', and 'Infectious Disease Indicators').



**Hospitalizations** (Vol I, p.51; Vol II, p.13): The number of residents from a given region who had one or more hospital separations during the year in question. Even if a person was hospitalized out of region, the hospitalization was counted according to the residence of that person. Persons with more than one separation were only counted once regardless of the number of separations.

**Indirect Adjusted Rates** (Vol II, p.18): One of the rates determined for the health status indicators (see 'Determination of Rates'), indirect adjusted rates take into consideration regional age and sex distribution differences in order to make fair comparisons across regions. There are several mathematical methods for making these adjustments. In the 1991/1992 Health Status Indicators Module indirect adjusted rates are used (also see 'Adjusted Rates').

**Infectious Disease Indicators** (Vol II, p.16): One of the 'Hospitalization Indicators', mortality from infectious diseases have declined since the onset of the century. Nonetheless, a considerable number of hospitalizations result because of infectious diseases. For the elderly, pneumonia and influenza are the major causes of mortality and morbidity. Some infectious diseases reflect lifestyle, for example, pelvic inflammatory disease and AIDS.

**Injury Indicators** (Vol II, p.16): A 'Mortality Indicator' as well as a 'Hospitalization Indicator', injuries are the leading cause of death for adolescents and young adults. Injury deaths include unintentional injuries, suicides and homicides. Most unintentional injuries are attributable to motor vehicles.

**Low Birth Weight** (Vol II, p.14): One of the six major health status indicator categories, low birth weight infants are those weighing less than 2500 grams at

birth. Low birth weight may be due to premature delivery or to infants whose weight is low for their gestational age. These infants are at higher risk for developmental delay, physical complications such as birth defects and death.

**Mortality Indicators: Population and Cause-Specific:** One of the six major health status indicator categories (also see 'SMR', 'Injury Indicators', 'Cancer Indicators', and 'Chronic Disease Indicators').

**Population** (Vol I, p.50): The population refers to individuals in the Manitoba Health registry, whether or not any health service claim was made during the year in question. This includes persons who reside temporarily out of the province (e.g., persons attending post-secondary schools out of province) as well as Manitoba residents who have moved to another province (for two months after their move). In addition, new residents arriving from another province (eligible after a two month waiting period) and new Manitobans arriving from another country (eligible for coverage immediately) are also included. Excluded from the Manitoba population are non-residents of Manitoba, armed forces personnel, federal penitentiary inmates and foreign students. For persons who are temporarily out of province, such as vacations or business trips, Manitoba Health routinely records information about inpatient hospital care received in such circumstances. Reimbursed (insured) visits to physicians in other provinces by reciprocal arrangement are included in the files, as well as claims by Manitoba residents for emergency visits to foreign physicians. Population figures were used as the denominator for all rate calculations. The data are based on claims made by Manitoba residents who were alive as of December 31 in the year in question (April 1 to March 31). Thus, persons who died between January 1 and March 31 were counted in the population denominator, whereas people who were born during this

time were not counted. All analysis are based on when the event took place rather than when the claim was processed.

**Physician Visit Indicators:** One of the six major health status indicator categories (also see 'Functional Limitation Indicators' and 'Disability among Youth').

**Rate Event Indicators (Vol II, p.15):** A 'Health Care System Sensitive Indicator', rate event indicators refer to a list of medical (sentinel) conditions considered to be of concern only when sufficient numbers of events occur, rather than only one (see 'Single Event Rate Indicators').

**Region of Residence (Vol I, p.50; Vol II, p. 13):** Manitoba Health divides the province into eight regions: Central, Eastman, Interlake, Norman, Parklands, Thompson, Westman and Winnipeg. Because the Information system is population based (i.e., tracks the use of health services by Manitobans regardless of where the use takes place), the region of residence indicated on a claim is used in the analyses. However, postal codes are used to identify the region of residence of Treaty Status Indians because they may not actually reside on their First Nation of origin (reserve) which is the address recorded in the registry file.

**Single Event Rate Indicators (Vol II, p.15):** A 'Health Care System Sensitive Indicator', single event indicators refer to a list of medical conditions where death, and for most conditions the disease itself, are preventable or avoidable so that even one case is considered to be disturbing. These cases are considered "sentinel" events whose occurrence is a marker that quality of care may need to be improved.

**Standardized Mortality/Morbidity Ratio (SMR)** (Vol I, p.8; Vol II, p.18): The SMR (also called the Adjusted Mortality Ratio) is a widely used method which adjusts for differences in age and sex across regions. Instead of giving an adjusted rate, the SMR gives a ratio, that is a direct comparison with a standard. **SMR-province** uses the entire province as the standard where the province's rate of a condition is a given value of 1. If a SMR for a particular region for a specific condition is greater than one, then that region's rate for that condition is higher than the provincial average. If the SMR for a particular region is less than one for a given condition, then that region has a lower rate for that condition. Thus a SMR above one implies that a region is less healthy; a SMR below one implies a region is more healthy than the provincial average. **SMR-low** uses the region with the lowest indirect adjusted rate as the comparison instead of the provincial average. This reveals differences in rates across the regions and suggests the potential rate that a region could achieve.

### **Module: Utilization of Physician Resources**

The Utilization of Physician Resources module of the Population Health Information System examines the province of Manitoba's utilization of physician resources for the fiscal year in question (April 1 to March 31). Three major themes are discussed (1) access to physicians, (2) overall patterns of visits to physicians, and (3) expenditures on physician visits. The utilization of resources by the residents of regions in Manitoba are compared. Analyses were limited to physician services delivered to ambulatory patients and thus exclude contacts for hospitalized individuals. More detailed technical descriptions of the terms below can be found in *Utilization of Physician Resources Volume I: Key Findings & Volume II:*

*Methods and Tables* (Tataryn, Roos & Black, 1994) on the page(s) indicated below in parentheses.

**Access to Physician Services** (Vol I, p.12): Access to physician services is defined as the proportion of persons who make at least one physician visit during the fiscal year.

**Adjusted Rates:** Because the proportion of the very young or the very old varies markedly across the regions in the province and ultimately may influence the patterns of care delivered, rates were adjusted (standardized) for age differences before making comparisons of residents across regions. Sex-adjustments were also made due to the disproportionate numbers of males or females that reside in specific regions of the province since it is known that males and females have different health status profiles. Unless otherwise indicated, the rates presented were both age- and sex-adjusted using Manitoba population proportions and a direct method of standardization.

**Ambulatory Physician Visits** (Vol I, p.9; Vol II, p.5): An ambulatory visit is defined as a contact by a person with a physician. Ambulatory visits include office visits, outpatient/emergency department visits, visits to persons in Personal Care Homes, and visits to patients in their own homes. Visits to patients admitted in hospital are not included. Contacts with physicians in salaried positions are included. However, because salaried emergency room physicians do not always submit evaluation claims, they may be undercounted. Ambulatory care delivered as part of a global tariff (e.g., six-week post-operative care, chemotherapy, prenatal and post-partum care visits claimed at the time of delivery) are not included. Global billing for prenatal care constitutes just over 2% of all ambulatory visits,

35% of all visits to obstetrics and gynaecology specialists, and affects estimates of Winnipeg and non-Winnipeg equally.

**Calculation of Age** (Vol I, p. 9; Vol II, p.5): Age was calculated as of December 31 of the fiscal year in question. The year of birth reported on the first claim of the fiscal year made by residents was recorded.

**Consultive Care** (Vol I, p.14; Vol II, p. 9): Consultive care is an ambulatory physician visit that occurs as a result of one physician seeking the opinion of another either because of the "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 (see 'Type of Care').

**Expenditure per Visit** (Vol I, p.12; Vol II, p.7): Expenditure per visit is determined by the fee paid by Manitoba Health for the ambulatory physician visit. It does not include fees paid for ancillary services associated with the visit such as laboratory tests, X-rays, etc. The rate is influenced by the type of visit (e.g., 'consultive care' vs. other), the place of visit, and the specialty of the physician providing the care (see 'Types of Rates Calculated').

**Expenditure per Resident** (Vol I, p.12; Vol II, p.7): Expenditure per resident reports the average amount paid by Manitoba Health for physician services provided per resident in a given region of the province. The rate is influenced by the number of visits per resident and the expenditures per visit (see 'Types of Rates Calculated').

**Indicators of Need** (Vol I, p.13; Vol II, p.8): (see the SEC and the PH:HSI modules for more information): The relative need for medical care across regions of Manitoba is assessed by examining two indicators: (1) the Socio-Economic Risk Index (SERI) and (2) the Standardized Mortality Ratio (SMR). The SERI is the composite of six measures of socio-economic status that characterize environmental, household, and individual preconditions that place people at risk of poor health and therefore may identify their relative need for various types of medical care. The SMR measures death rates in the population 0-64 years of age and is considered by many to be the most valid and practical indicator of health status reflecting the need for health care.

**Location of Care** (Vol I, p.15; Vol II, p.10): Location of care refers to the region of the province where physician care is received by Manitoban residents. Location of care is classified in terms of whether it was received (1) within the region of residence, (2) outside the region of residence, in Winnipeg, and (3) outside the region of residence, other than in Winnipeg. Claims made by physicians based in Winnipeg who travelled to provide care over a short period of time to residents in rural and remote communities are classified as occurring in Winnipeg.

**Non-Consultive Care** (Vol I, p.15; Vol II, p.10): Non-Consultive care is an ambulatory physician visit that does not occur as a result of one physician seeking the opinion of another. It includes complete or regional histories and examinations as well as subsequent visits following consultive care in which the progress of the patient's condition is monitored by the physician who made the initial referral (see 'Type of Care').

**Number of Persons Making Contact with a Physician** (Vol I, p.11; Vol II, p.6): Persons making contact with a physician refers to the number of residents who had at least one ambulatory visit with a physician during the fiscal year in question. This measure provides a useful indicator of the ability of people to *access* physician services in the province (see 'Types of Rates Calculated').

**Number of Visits per 100 Residents** (Vol I, p.12; Vol II, p.7): The number of visits per 100 residents serves as a measure of the total ambulatory utilization for a given region regardless of where the use took place. It is defined as the total number of visits made by residents of a region, divided by the total number of people in that region, multiplied by 100 (see 'Types of Rates Calculated').

**Population** (Vol I, p.8; Vol II, p.4): The population refers to individuals in the Manitoba Health registry, whether or not any health service claim was made during the year in question. This includes persons who reside temporarily out of the province (e.g., persons attending post-secondary schools out of province) as well as Manitoba residents who have moved to another province (for two months after their move). In addition, new residents arriving from another province (eligible after a two month waiting period) and new Manitobans arriving from another country (eligible for coverage immediately) are also included. Excluded from the Manitoba population are non-residents of Manitoba, armed forces personnel, federal penitentiary inmates and foreign students. For persons who are temporarily out of province, such as vacations or business trips, Manitoba Health routinely records information about inpatient hospital care received in such circumstances. Reimbursed (insured) visits to physicians in other provinces by reciprocal arrangement are included in the files, as well as claims by Manitoba residents for emergency visits to foreign physicians. Population figures were used as the



denominator for all rate calculations. The data are based on claims made by Manitoba residents who were alive as of December 31 in the year in question (April 1 to March 31). Thus, persons who died between January 1 and March 31 were counted in the population denominator, whereas people who were born during this time were not counted (see 'Calculation of Age'). All analysis are based on when the event took place rather than when the claim was processed.

**Physician Claim Exclusions:** All claims for oral surgery, dental and periodontal contacts are excluded. Services provided by chiropractors and optometrists are also excluded.

**Physician Specialties** (Vol I, p.14; Vol II, p.9): Physician specialties refer to the seven main categories of care in the province. Physicians are classified according to whether they are in (1) general practice (including family practice), (2) psychiatry, (3) pediatrics, (4) obstetrics and gynaecology, (5) medical specialists, (6) general surgeons, and (7) surgical specialists.

**Physician Supply** (Vol I, p.14; Vol II, p.9): Physician supply refers to the number of physicians in each region of the province who, based on submitted claims, grossed \$40,000 or more for the fiscal year in question. Not included are technical specialists, like radiologists and anaesthetists, who do not provide primary patient care and claims made medical student residents and interns, who submit claims under their supervisor's billing number.

**Region of Residence** (Vol I, p.9; Vol II, p.5): Manitoba Health divides the province into eight regions: Central, Eastman, Interlake, Norman, Parklands, Thompson, Westman and Winnipeg. Because the Information system is population

based (i.e., tracks the use of health services by Manitobans regardless of where the use takes place), the region of residence indicated on a claim is used in the analyses. However, postal codes are used to identify the region of residence of Treaty Status Indians because they may not actually reside on their First Nation of origin (reserve) which is the address recorded in the registry file.

**Type of Care** (Vol I, p.14; Vol II, p.9): Type of care refers to the categories of care received by patients by physicians. Two types of care are differentiated: (1) 'Consultive Care' and (2) Non-Consultive Care'.

**Types of Rates Calculated** (Vol I, p.11; Vol II, p.6): The following rates were calculated for the 'Utilization of Physician Resources' module: (a) 'Number of Persons Making Contact with a Physician', (b) 'Visits per Patient', (c) 'Number of Visits per 100 Residents', (d) 'Expenditures per Visit', and (e) 'Expenditures per Resident'.

**Visit Intensity Groups** (Vol I, p.15; Vol II, p.10): Visit intensity is a measure of how many contacts patients make during the year with physicians. Individuals are classified according to whether they made: (1) 1 to 7 visits, (2) 8 to 14 visits, or (3) 15 or more visits.

**Visits per Patient** (Vol I, p.11; Vol II, p.6): Visits per patient is the average number of ambulatory visits made by people who made at least one visit during the fiscal year (see 'Types of Rates Calculated' & 'Visit Intensity Groups').

## **Module: Utilization of Hospital Resources**

The hospital use module of the Population Health Information System examines the utilization of hospital resources in the province of Manitoba for the fiscal year in question (April 1 to March 31). The report examines measures of overall use of hospital care, use of long stay, short stay, and outpatient surgical care, issues of access to hospitals, and patterns of care that contribute to differential utilization of hospitals in relation to measures of need for medical care. More detailed technical descriptions of the terms below can be found in *Utilization of Hospital Resources Volume I: Key Findings and Volume II: Methods and Tables* (Black, Roos & Burchill, 1993) on the page(s) indicated below in parentheses.

**Access to Hospital Services** (Vol I, p.16; Vol II, p.14): An indicator of the extent to which individuals receive necessary medical care, 'access' is defined in terms of rates of persons who use specific services in the population. In Manitoba, important issues of access relate to the use of newer technologies and procedures in the delivery of health care. To provide insight into the regional variation in the use of hospital services the following rates were analyzed: (1) the rate of persons using very high intensity care (see 'Intensity of Resource Use'), (2) the rates of persons receiving care in teaching and urban community hospitals (see 'Level of Care'), and (3) the rates of persons using inpatient and outpatient surgical procedures (see 'Outpatient Surgical Care').

**Adjusted Rates** (Vol II, p.5): Individuals' ages as of December 31 in the year in question were recorded. For short stay hospital care ages were stratified into the following groups: 0-14, 15-64, 65-74, & 75+, 80-84, 85-89, & 90+. For long stay hospital care, the age categories were: 0-64, 65-74, & 75+. Because the

proportion of elderly residents varies markedly across the province and ultimately may influence the patterns of care delivered, age characteristics were adjusted (standardized) before making comparisons of residents across regions. Sex-adjustments were also made due to the disproportionate numbers of males or females that reside in specific regions of the province. These 'adjusted' rates serve as indicators of the differential utilization of hospital care in one region relative to another after the effects of population structure have been removed. The tables presented in "Volume II" of the module provide both age- and sex-adjusted rates of use.

**Bed Supply** (Vol I, p.10; Vol II, p.8): Bed supply refers to the supply of hospital beds in each region during the year in question. Because 'actual bed supply' (i.e., the number of beds per 1000 population) does not account for hospital beds located in a given region but used by residents of another part of the province, a measure of 'effective bed supply' was developed to eliminate this bias. Effective bed supply (i.e., the effective number of hospital beds per 1000 residents) for the regions is obtained by adding the proportion of Winnipeg beds used by non-Winnipeg residents to the respective regions and conversely, to obtain the effective supply of beds for Winnipeg, by reducing the proportion of Winnipeg beds used by non-Winnipeg residents.

**Comorbidity** (Vol I, p.12; Vol II, p.10): In the hospital module patient comorbidity refers to medical conditions known to increase risk of death that exist in addition to the most significant condition that causes a patient's stay in hospital. The number of comorbid conditions is used to provide an indication of the health status (and risk of death) of patients. In other words, comorbidity is an indicator of the differential utilization of hospital care. Patient cases were classified as having

none, one, two, or three or more comorbid conditions. (Also see Level of Comorbidity and Complications)

**Days of Hospital Care** (Vol I, p.9-10; Vol II, pp.7-8): The total number of days of hospital care used by all residents of a given region for the year in question. It provides a useful estimate of the total resources used to provide inpatient hospital care.

**Discretionary Nature of Services** (Vol I, p.15; Vol II, p.13): An indicator of the differential utilization of hospital resources, the discretionary nature of services recognizes that requirements for hospital care are not clearly defined and that there is variation in rates of hospital admission across population groups. Specifically, there are differing judgements among physicians about the requirement for hospital care. Three categories of inpatient hospital care were defined: (1) high variation conditions with marked ambiguity about the need for hospitalization (e.g., pneumonia, gastroenteritis), (2) inpatient surgical conditions with less ambiguity about the need for hospitalization than was the case with 1 (e.g., appendectomy, cholecystectomy), and (3) low variation conditions with little ambiguity about the need for hospitalization (e.g., heart attack, hip fracture).

**DRG Weights** (Vol I, p.14; Vol II, pp.6-7): DRGs classify hospital care into homogeneous groups with respect to clinical and resource consumption in relation to an arbitrarily defined standard case. They are used as a tool to pay hospitals for care provided in the United States.

**Episodes of Hospital Care** (Vol I, p.9; Vol II, p.7): The number of hospital separations that occur in a given region during the year in question excluding

patient transfers between hospitals. Only separations from the hospital to which a patient was originally admitted are counted as episodes.

**Hospital Care Data** (Vol I, p.8; Vol II, p.6): The hospital care data refers to the complete set of hospital contacts included in the analyses in a given region during the year in question. The analyses were limited to inpatient hospital care separations and major surgical outpatient cases that could have been alternately performed on an inpatient or 'not for admission' basis. Because hospitals are not required to report all outpatient activities and there is inconsistent record keeping among hospitals, outpatient contacts for minor surgical procedures were excluded from the analyses. As with Manitoba Health reports, some hospital services were also excluded. For example, 'newborn' (baby) separations after birth were excluded.

**Hospitalizations (Persons Hospitalized)** (Vol I, p.9; Vol II, p.7): The number of residents from a given region who have had one or more hospital separations during the year in question. Even if a person was hospitalized out of region, the hospitalization was counted according to the residence of that person. Persons with more than one separation were only counted once regardless of the number of separations. Hospitalizations are a useful indicator of access to hospital resources and equity across regions.

**Indicators of Differential Utilization** (Vol I, p.11; Vol II, p.9): Differences in the way hospital care is utilized across regions in Manitoba was determined by examining utilization rates for age, sex, patient comorbidity, level of comorbidity, location of care, level of care, length of stay, type of care, and intensity of resource

use. Descriptions of the concepts and categories are outlined separately in this glossary.

**Indicators of Need** (Vol I, p.11; Vol II, p.9) (see the SEC and the PH:HSI modules for more information): The relative need for medical care across regions of Manitoba is assessed by examining two indicators: (1) the Socio-Economic Risk Index (SERI) and (2) the Standardized Mortality Ratio (SMR) (0-64 Year). The SERI is the composite of six measures of socio-economic status that mark environmental, household, and individual preconditions which place people at risk of poor health and therefore may identify their relative need for various types of medical care. The SMR measures death rates in the population 0-64 years of age and is considered by many to be the most valid and practical indicator of health status reflecting the need for health care.

**Inpatient Hospital Care** (Vol I, p. 8; Vol II, p.6): Inpatient hospital care refers to patient stays in a Manitoba hospital of one or more days. It is further classified into short-stay care (or acute care) comprised of separations with 1 to 59 days length of stay and long-stay inpatient care comprised of separations lasting 60 days or longer. (see Length of Stay and Type of Care)

**Intensity of Resource Use (IRU)** (Vol I, p.14; Vol II, p.12): An indicator of the differential utilization of hospital resources, 'intensity of resource use' refers to the degree to which hospitals use labour and materials. In order to ascertain the IRU, each hospital contact was assigned a DRG weight and then the cases were ranked from lowest to highest. Three levels of intensity of resource use were defined: (1) the lowest 10% of cases (e.g., false labour, pediatric tonsillectomy), (2) the highest

5% of cases (e.g., coronary bypass surgery, craniotomy), and (3) the intermediate cases (all others not classified as 1 or 2).

**Length of Stay (LOS)** (Vol I, p.10; Vol II, p.8): An indicator of the differential utilization of hospital resources, LOS refers to the *average* number of days of care for inpatient hospitalizations for residents of a given region in the province.

Outpatient surgical care requiring zero day stays is therefore excluded. Previously, LOS has been used to assess hospital efficiency. Eight length of stay categories were developed: (1) 1-8 days, (2) 9-14 days, (3) 15-22 days, (4) 23-59 days, (5) 60-89 days, (6) 90-179 days, (7) 180-365, and (8) 365 days or more. Short stay care was between 1 and 59 days, while long stay care was defined as 60 days or more.

**Level of Care** (Vol I, p.13; Vol II, p.11): An indicator of the differential utilization of hospital resources, level of care refers to type of hospital in which the health services were received. Hospitals in the province were grouped into one of seven levels after considering their size, level of specialization, and environment: (1) teaching, (2) urban community, (3) major rural, (4) intermediate rural, (5) small rural, (6) small multi-use, and (7) northern isolated. In addition, hospitals were categorized according to their role in the community. Four groupings were developed: (1) personal care homes, (2) chronic and rehabilitation institutions, (3) federal nursing stations, and (4) out of province facilities. The classification of specific hospitals, as well as information about bed numbers and interprovincial per diem rates is provided in Appendix A of Vol.II.

**Level of Comorbidity and Complications** (Vol I, p.12; Vol II, p.10): An indicator of the differential utilization of hospital resources, level of comorbidity and complications affects the 'complexity' of hospital care required to treat patients.



The measure is obtained by using the RDRG (Refined DRG) program. Patients are classified into three groups of complexity reflecting level of comorbidity and complications: (1) none or minor impact on hospital resource use, (2) moderate impact on resource use, and (3) major impact.

**Location of Care** (Vol I, p.13; Vol II, p.11): An indicator of the differential utilization of hospital resources, location of care refers to the region where the hospital care is received by Manitoban residents. In the analyses the location of care has been classified in terms of whether it was received (1) in province or (2) out of province and, in order to understand the dynamics of intraprovincial travel for care, whether it was received (1) within the region of residence, (2) outside the region of residence, in Winnipeg, and (3) outside the region of residence, other than in Winnipeg.

**Outpatient Surgical Care** (Vol I, p.8; Vol II, p.6): Outpatient surgical care refers to patient contacts for major surgical outpatient procedures at a Manitoba hospital. More specifically the contacts are defined as outpatient cases (day care with zero day length of stay) for surgical care recognized as falling into a surgical DRG category. 'Not for admission' surgical procedures that could have been alternately performed on an inpatient basis like cataract surgery and hernia repair are included. Excluded are contacts for minor procedures like toenail removal or skin biopsy.

**Persons Hospitalized:** see **Hospitalizations**

**Population** (Vol I, p.5; Vol II, p.3): The population refers to individuals in the Manitoba Health Services Commission (MHSC) registry, whether or not any health service claim was made during the year in question. Population figures were used

as the denominator for all rate calculations except length of stay and bed supply. The data are based on claims made by Manitoba residents who were alive as of December 31 in the year in question (April 1 to March 31). Thus, persons who died between January 1 and March 31 were counted in the population denominator, whereas people who were born during this time were not counted.

**Region of Residence** (Vol I, p.6&10; Vol II, pp.4&8): Manitoba Health divides the province into eight regions: Central, Eastman, Interlake, Norman, Parklands, Thompson, Westman and Winnipeg. Because the Information system is population based (i.e., tracks the use of health services by Manitobans regardless of where the use takes place), the last region of residence prior to hospitalization is used in the analyses. However, postal codes are used to identify the region of residence of Treaty Status Indians because they may not actually reside on their First Nation of origin (reserve) which is the address recorded in the registry file.

**Separations** (Vol I, p. 7&9; Vol II, p.5&7): A separation from a health care facility occurs anytime a patient (or resident) leaves because of death, discharge, or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions are used because hospital abstracts for inpatient care are based on information gathered at the time of discharge. The words 'separation', 'discharge', and 'stay' are used interchangeably in the hospital module.

**Type of Care** (Vol I, p.14; Vol II, p.12): An indicator of the differential utilization of hospital resources, type of care refers to the clinical categories of care received by inpatients while in hospital. Five types of care were differentiated: (1) adult surgical (excluding outpatient surgical care), (2) adult medical, (3) obstetric,

(4) psychiatric, and (5) pediatric (including both medical and surgical). The utilization of psychiatric care may be under-reported.

### **Module: Utilization of Personal Care Home (PCH) Resources**

The PCH module of the Population Health Information System examines the province of Manitoba's utilization of nursing home resources for the fiscal year in question (April 1 to March 31). The utilization of resources by the residents of regions in Manitoba are compared. More detailed technical descriptions of the terms below can be found in *Utilization of Personal Care Home Resources Volume I: Key Findings and Volume II: Methods and Tables* (DeCoster, Roos & Bogdanovic, 1993) on the page(s) indicated below in parentheses.

**Admissions** (Vol I, p.20; Vol II, p.6): The number of individuals who are admitted to PCHs for the year in question. This number includes people who were previously receiving respite care (intermittent care for individuals who live outside of a PCH).

**Adjusted Rates** (Vol I, p.19; Vol II, p.4): Individuals' ages as of December 31 in the year in question were recorded. Ages were usually stratified into groups such as: 0-64, 65-74, 75-79, 80-84, 85-89, & 90+. In addition, the analyses were commonly conducted with everyone older than 75 grouped together constituting a single category. Because the proportion of elderly residents varies markedly across the province and ultimately may influence the patterns of care delivered, age (and sex) characteristics were adjusted (standardized) before making comparisons of

residents across regions. The tables presented in "Volume II" of provide both crude and age- and sex-adjusted rates of use.

**Estimated PCH Costs** (Vol I, p.20; Vol II, p.6): The annual costs of operating a Personal Care Home had to be estimated. The estimates were based on the median per diem gross rates paid by Manitoba Health to non-profit, free-standing nursing homes in the province.

**Ethno-cultural** (Vol I, p.23; Vol II, p.9): Although not a formal designation, PCHs can be designated as either ethno-cultural or secular (not ethno-cultural). Ethno-cultural PCHs have a majority of residents who belong to a particular faith or prefer to speak a language other than English. Roughly one third of the Personal Care Homes in Manitoba can be categorized as ethno-cultural. They represent approximately one third of PCH beds.

**Expected Length of Stay (ELOS) for Admissions** (Vol I, p.21; Vol II, p.7): The ELOS is the length of time an individual is expected to live in a Personal Care Home. It is dependent on the age, sex and level of care of an individual at admission. If admission standards varied, it would be reflected in the ELOS for individuals admitted in that health care facility.

**"From-Codes"** (Vol I, p.23; Vol II, p.9): Admissions to PCHs can be separated into those admitted from (a) the hospital or (b) the community. In deciding whether an individual was admitted from hospital or community "From-codes" on the PCH abstract were used which ultimately proved to be very accurate (approximately 99%).

**Levels of Care** (Vol I, p.21; Vol II, p.7): Manitoba has four levels of care designations for PCHs. The designations are dependent on the nursing time required to attend the PCH resident. Persons in Levels 3 and 4 require at least 3.5 hours of nursing time over a 24-hour period. Level 2 care provides 2 hours and Level 1 provides 0.5 hours. In general, the level of care does not change over the course of the year for PCH residents.

**Nursing Homes and Beds** (Vol I, p.19; Vol II, p.5): Included in the analyses were more than 100 Personal Care Homes (Nursing Homes) operating in the province during the year in question. These PCHs account for approximately 8,500 beds.

**Population** (Vol I, p.18; Vol II, p.4): The population refers to individuals in the Manitoba Health Services Commission (MHSC) registry, whether or not any health service claim was made in the year in question. Population figures were used as the denominator for all rate calculations. The data are based on claims made by Manitoba residents who were alive as of December 31 in the year in question (April 1 to March 31). Thus, persons who died between January 1 and March 31 were counted in the population denominator, whereas people who were born during this time were not counted.

**Proprietary** (Vol I, p.23; Vol II, p.9): PCHs in Manitoba can be designated as either proprietary or non-proprietary. A proprietary PCH operates on a for-profit basis. There are 17 proprietary PCH facilities operating in the province and the majority of these are located in Winnipeg. Non-proprietary PCHs can be either freestanding or adjacent (juxtaposed) to an acute care facility. The 39 juxtaposed PCHs in the province are all located outside of Winnipeg.

**Respite Care:** Intermittent care for individuals who live outside of a PCH.

**Region of Residence** (Vol I, p.18; Vol II, p.4): Manitoba Health divides the province into eight regions: Central, Eastman, Interlake, Norman, Parklands, Thompson, Westman and Winnipeg. Because the Information System is population based (i.e., tracks the use of health services by Manitobans regardless of where the use takes place), the last region of residence prior to admission to a PCH is used in the analyses. For non-PCH Manitobans, their region of residence is identified from the MHSC registry. However, postal codes are used to identify the region of residence of Treaty Status Indians because they may not actually reside on their First Nation of origin (reserve) which is the address recorded in the registry file.

**Residents of PCHs** (Vol I, p.19; Vol II, p.5): Persons who lived in a Personal Care Home at some time during the year in question (April 1 to March 31). Annually, this amounts to roughly 10,000 individuals.

**Status Indians** (Vol I, p.24; Vol II, p.10): The designation 'Status Indians' or 'Treaty Status Indians' refers to a specific group of the aboriginal population (First Nations Peoples) who have certain rights and privileges under the Indian Act of Canada. Treaty Status Indians for which data are available were included in these analyses, although their use of PCHs is slightly under-reported. The postal code from a hospital or physician claim is used to determine the "region of residence" of Status Indians.

**Types of Nursing Homes** (Vol I, p.22; Vol II, p.8): (see 'Proprietary' and 'Ethno-cultural')