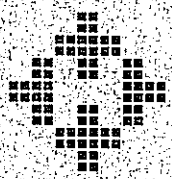
Population Health Information System
1991/92

Utilization of Personal Care Home Resources

Volume I: Key Findings

October 1993



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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 to the Population Health Information System

In January 1991, the Manitoba Centre for Health Policy and Evaluation (MCHPE) was established at the University of Manitoba to provide the Department of Health with research-based analyses, evaluation and policy options. The researchers agreed to undertake several specific projects each year. In addition, they 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. We have attempted to develop an information system to facilitate rational decision making and ultimately to permit shifting the focus of discussions from the demand for health care services to the demand for health. The system is population-based, designed to track the health status and the use of health care services by residents of given regions (regardless of where such use takes place), as distinct from examining use of clinical care for individual patients or treatments by specific providers. The PHIS also identifies the socioeconomic characteristics of regional residents since low socioeconomic status has long been linked to poorer health outcomes and greater need for health care.

The Population Health Information System will produce separate reports for each of the modules outlined. Each module will contain a summary and detailed discussion of findings, as well as an appendix with detailed tables. This report contains the Utilization of Personal Care Home Resources Module.

MODULES OF THE POPULATION HEALTH INFORMATION SYSTEM

Population Health: Health Status Indicators

Socioeconomic Characteristics

Utilization of Hospital Resources

Utilization of Personal Care Home Resources

Utilization of Physician Resources

We intend for this first report of the PHIS to have limited distribution, primarily to obtain comment and feedback. Subsequent reports will examine several years of data; trends over time will be of most interest.

Note that the data to date are presented without benefit of statistical tests or confidence intervals. This is not a problem since we are dealing with data for an entire population, not a sample. Also, we use multiple independent indicators and only draw conclusions when several indicators point in the same direction. The data represent usage for the entire Manitoba population at one point in time. The small size of some regions (specifically Thompson and Norman) must be acknowledged: conclusions drawn from the data from these regions must remain tentative.

Executive Summary

Age Distribution: Eighty-five percent of nursing home residents are 75 years or older with 27% of the total being 90 or older (Figure 1).

Access: There are inter-regional differences in utilization. Excluding Norman and Thompson regions, which have very small elderly populations (Figure 2) making rates unstable in those regions, the number of PCH residents per 1000 population aged 75 or older ranges from 120 in Parklands to 142 in Westman (Figure 3). Regions with higher rates of nursing home residents have higher per capita nursing home costs. In addition, the substitution of non-acute hospital care for PCH care, as appears to occur in Winnipeg, drives up costs even further (Figures 10 and 12).

Severity: Winnipeg has a higher proportion of Level 3 and 4 residents (heavier care) than non-Winnipeg (Table 1). In every region, a higher proportion of PCH admissions are from the hospital than from the community (Figure 6). Persons admitted from the hospital generally require more nursing care than those admitted from the community.

Expected Length of Stay: The Expected Length of Stay (ELOS) is the length of time an individual is expected to live in a PCH, and our previous analyses have found it to be dependent on age, sex and health status as defined by level of care of an individual at admission. If standards of admission varied markedly across regions or type of home, (that is if some facilities tended to admit younger, lighter care individuals), this would be reflected in variations in Expected Length of Stay. Across regions, ELOS ranges from 4.0 to 4.7 years, and is remarkably similar across different comparison groups (proprietary/non-proprietary and secular/ethno-cultural) (Figure 7).

Key Findings

The Personal Care Home module of the Population Health Information System examines Manitoba's utilization of nursing homes for the fiscal year in question (April 1 to March 31). For this report, claims for the year 1991/1992 were analyzed; in subsequent reports, several years of data will be analyzed and trends assessed.

This first volume of the Personal Care Home module contains the highlights of the analyses. The methods used for conducting these analyses are described in Appendix A. Volumes II and III of the module contain more extensive tables, a listing of which is contained in Appendix B.

Analyses were conducted to study utilization of PCH resources by residents of regions defined by Manitoba Health, with Winnipeg examined as a single region. Overall provincial utilization patterns were used as a comparison. Since Winnipeg utilization patterns strongly affect the provincial averages, an aggregate of non-Winnipeg regions was also developed. Since this is a population-based analysis, population figures for each region were used as the denominators for all rate calculations.

The numerator for all rates was calculated either by counting individuals (eg. number of individuals admitted) or by summarizing events (e.g. number of days in PCH) for individuals who had been residents of the specific region upon entry to PCH.

Rates of the number of persons using PCH services, the number of admissions, the number of days of PCH care and the estimated annual costs for PCH care (per 1000 residents of a region) were developed. In addition to crude rates, age- and sex-standardized rates of indicators were developed to permit comparisons across regions. Rates were standardized using an indirect method.

Age Distribution

Eighty-five per cent of nursing home residents are 75 years or older with 27% of the total being 90 or older (Figure 1). However, since the proportion of elderly residents (defined as those aged 75 or over for this report) varies markedly across the regions—from 1.1% of Thompson's residents to 8.9% of Parklands residents (Figure 2)—in assessing regional use of nursing homes, it is important to adjust for the age and sex characteristics of populations, before making comparisons of residents' use across regions. All analyses presented here are so adjusted. The tables in Volume II provide both crude and age- and sex-adjusted rates of use.

Winnipeg/Non-Winnipeg Comparison

Winnipeg residents are slightly less likely to be residents of Personal Care Homes than non-Winnipeg residents: 130.8 and 134.8 respectively per 1000 population aged 75 or older (Table 1). However, estimated annual costs per capita are very similar between Winnipeg and non-Winnipeg residents, because a higher proportion of Winnipeg residents require a high level of care.

Regional Comparisons

Despite the overall similarity between Winnipeg and non-Winnipeg, there are some regional variations in the utilization of PCH resources (Figure 3). Both Westman and Norman have more PCH beds per 1000 persons 75 years and older than the provincial average (Westman 144, Norman 160, Manitoba 128). This results in more residents of PCH per 1000 population (Westman 142, Norman 161, Manitoba 133) and higher estimated costs per capita (Westman $3148, Norman $3762, Manitoba $3000). (Note that Norman has less than 1000 elderly residents so a few beds makes a big difference.) Parklands Region, however, has fewer beds per thousand (122) and therefore fewer residents (120) and lower estimated annual costs ($2495).

Figure 1: PCH Residents, 1991/92
Proportion each age group

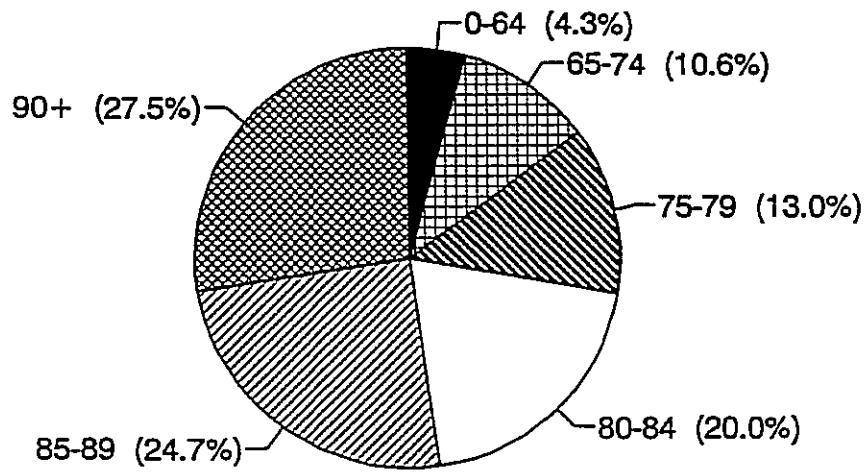


Figure 2: Percentage of Elderly
By Region of Residence, 1991/92

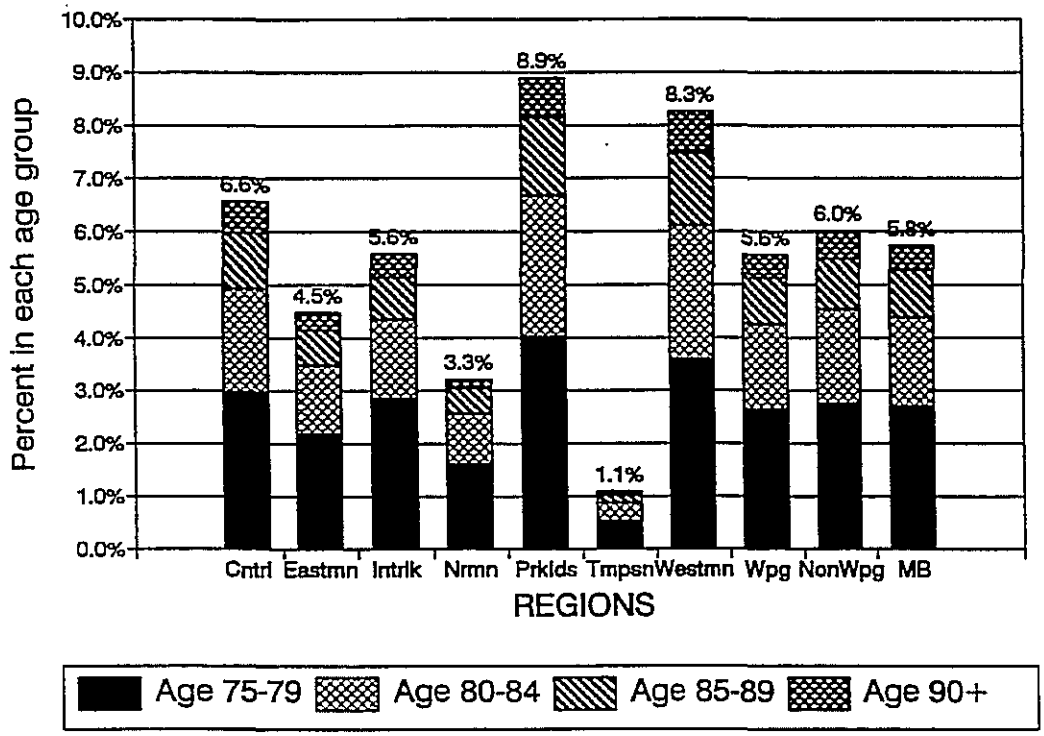


TABLE 1

ACCESS TO AND USE OF PERSONAL CARE HOMES IN 1991/92

ACROSS WINNIPEG AND NON-WINNIPEG RESIDENTS

AGE 75+, BY REGION OF RESIDENCE

	Winnipeg	**Non-Winnipeg**
Population	36 488	29 264
PCH Beds/1000 population	128	130
Residents of PCH per 1000 population	130.8	134.8
Level 1 (lightest care)	3.7	5.8
Level 2	42.2	55.7
Level 3	48.3	44.2
Level 4 (heaviest care)	36.5	29.0
Admissions to PCH per 1000 population	27.1	28.3
Days of PCH care per resident of region	38.2	39.0
Estimated cost of PCH care per resident of region ($)	3018	2977

Figure 3: Utilization of PCH Resources
Age 75+, 1991/92

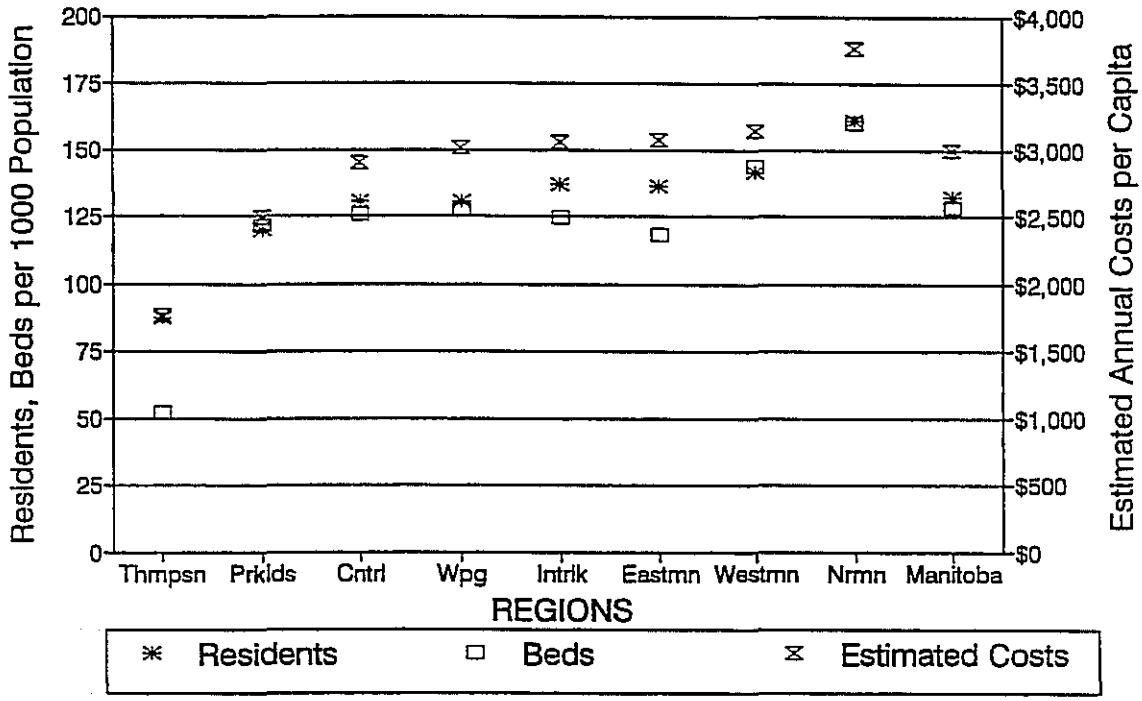
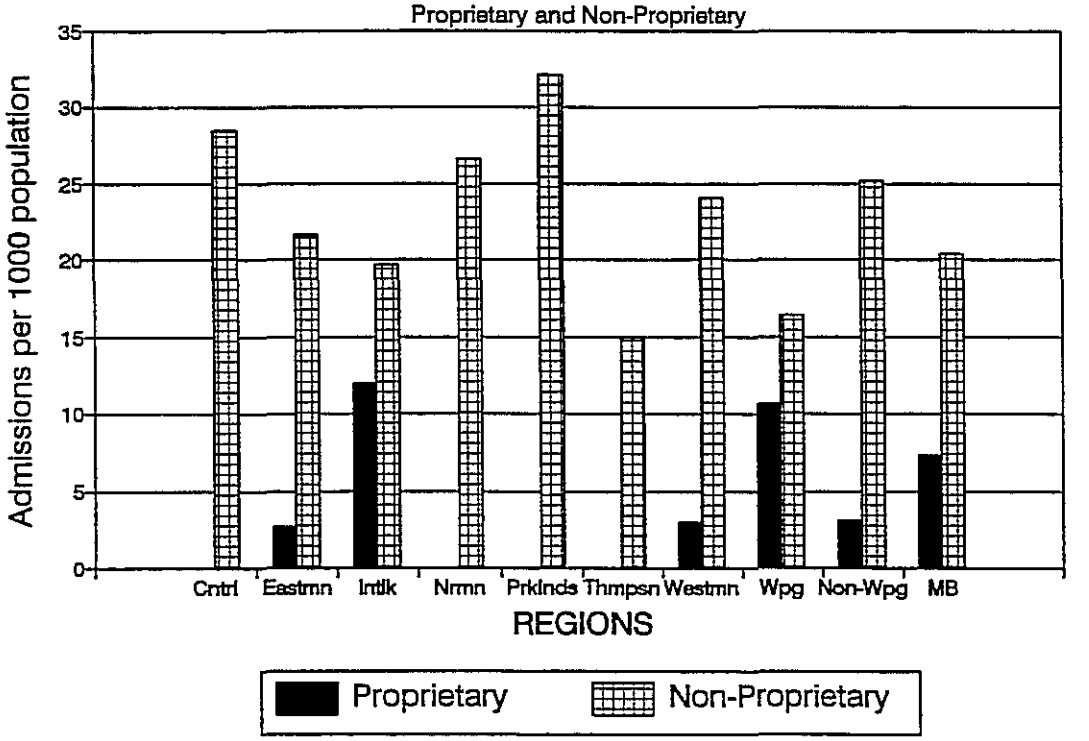


Figure 4: Admissions, 1991/92, Age 75+
By Type of Nursing Home
Proprietary and Non-Proprietary



Thompson region invites special comment. The number of beds, residents and estimated costs in Thompson appear to be significantly lower than the rest of Manitoba. To be brought up to the Manitoba rate would require the building of 38 new PCH beds. However, one must also consider that there are 32 beds in a federally funded nursing home in Thompson, specifically for Status Indians, about which we lack information in the provincial system. The other nursing home in the Thompson region, which is in the provincial personal care home program, is also on a reserve. In all of Thompson region, there are only 137 non-Status persons over the age of 75 years.

Types of Nursing Home Admissions

Nursing homes in Manitoba can be divided into two recognized categories: proprietary and non-proprietary. Non-proprietary homes can be further subdivided into those juxtaposed to an acute care facility and those that are free-standing. Although not a formal designation, nursing homes can also be described as secular or ethno-cultural. Ethno-cultural homes are those that residents have chosen because the majority of persons living in those homes profess a particular religious faith, or prefer to speak a language other than English. Admissions to each type of home (Figures 4 and 5) are influenced by the availability in the region. The majority of both proprietary and ethno-cultural beds are in Winnipeg and all juxtaposed nursing homes are in non-Winnipeg regions.

Admissions to nursing home can also be separated into those admitted from the hospital or from the community. In every region, there are more admissions from hospital than the community (Figure 6).

Figure 5: Admissions, 1991/92, Age 75+

By Type of Nursing Home

Secular and Ethno-Cultural

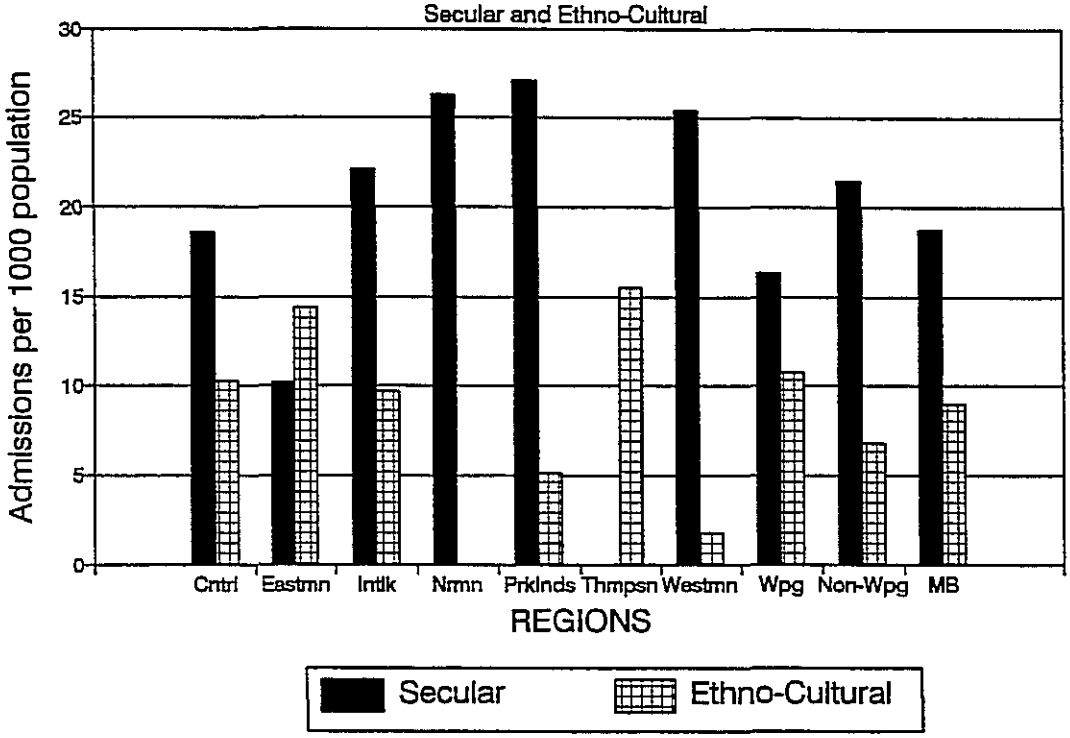
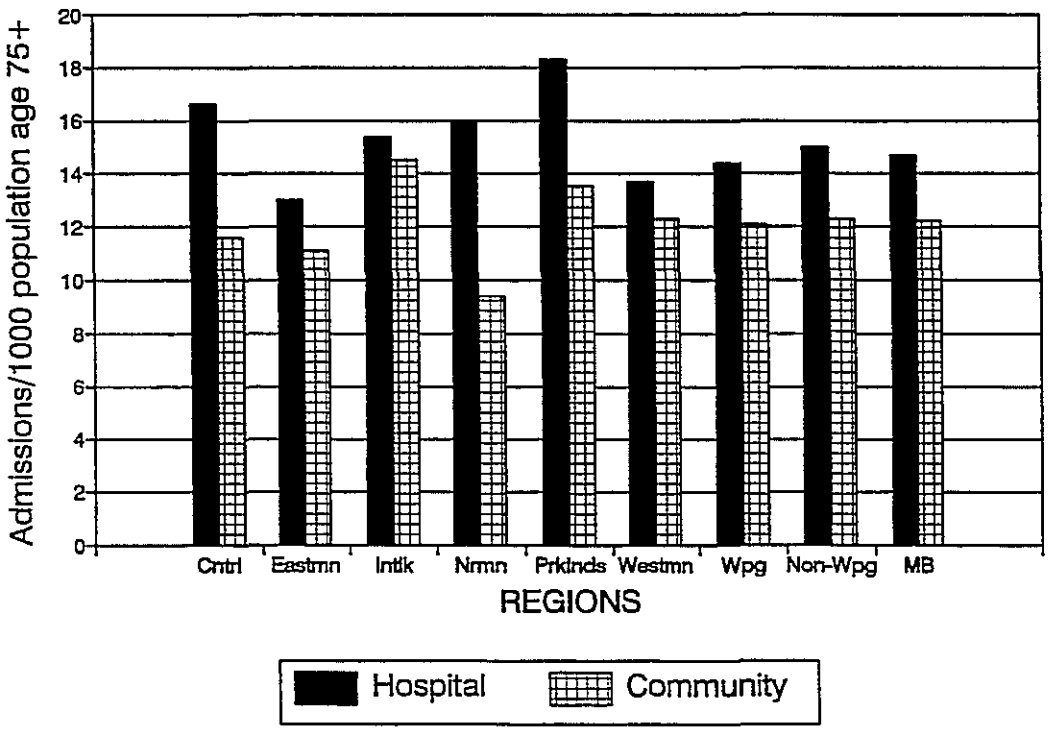


Figure 6: Admissions to PCH, 1991/92

From Hospital or Community, Age 75+



Levels of Care

In the Manitoba system, there are four levels of care, depending on the amount of nursing assistance or supervision the individual resident requires, with Level 1 being the lightest and Level 4 the heaviest. Figure 7 illustrates the proportion of residents at each level of care in each region. Westman's proportion of Level 1 care residents (7%) is almost twice that of the provincial average of 4%, further evidence that Westman has more PCH beds than the Manitoba norm. Parklands' high proportion of residents requiring Level 2 care is particularly intriguing given its lower than average PCH bed to population ratios. In Parklands, there are many small isolated communities which are either difficult or inefficient for home care providers to reach, and from which many of the younger people have moved. Individuals in these isolated communities are therefore admitted to a nursing home at a lighter level of care than they would be if they were less isolated or had more family supports.

Expected Length of Stay

Except for occasional readmission to hospital, 95% of individuals entering a nursing home in Manitoba remain there until death. The Expected Length of Stay (ELOS) is the length of time an individual is expected to live in a PCH, and our previous analyses have found it to be dependent on age, sex and level of care of an individual at admission. If standards of admission varied markedly across regions or type of home, (that is if some facilities tended to admit younger, lighter care individuals), this would be reflected in variations in Expected Length of Stay for individuals admitted. Across regions, ELOS ranges from 4.0 to 4.7 years, and is remarkably similar across different comparison groups (proprietary/non-proprietary and secular/ethno-cultural) (Figure 8).

Figure 7: PCH Use, 1991/92, Age 75+

Percent residents at each level of care

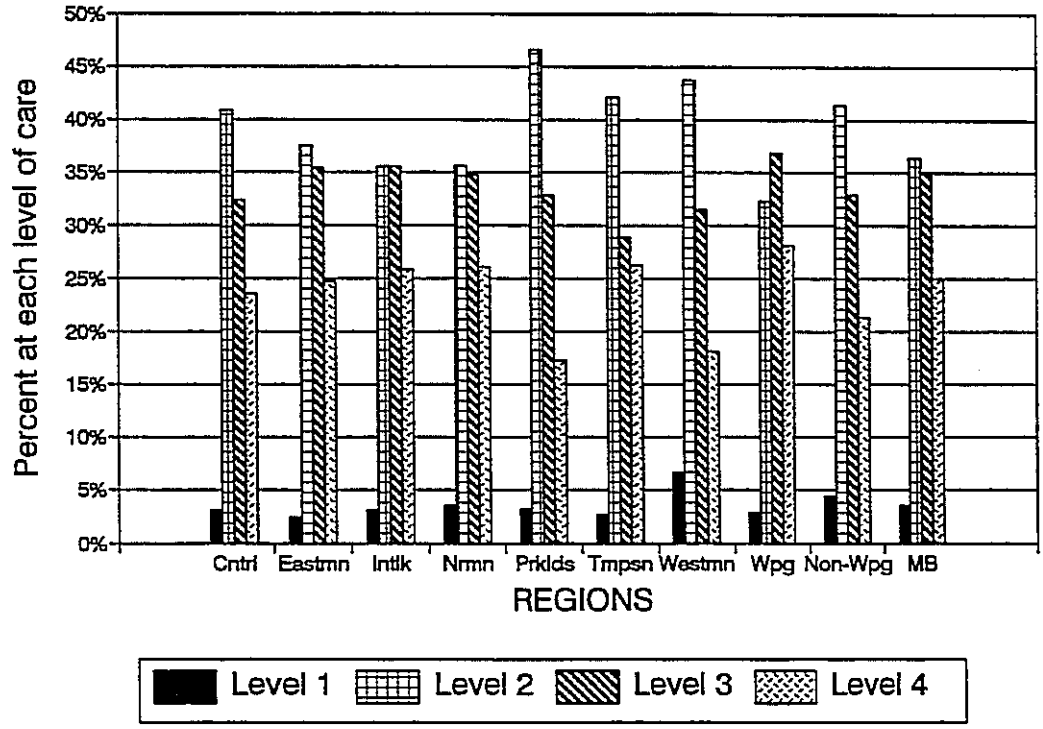
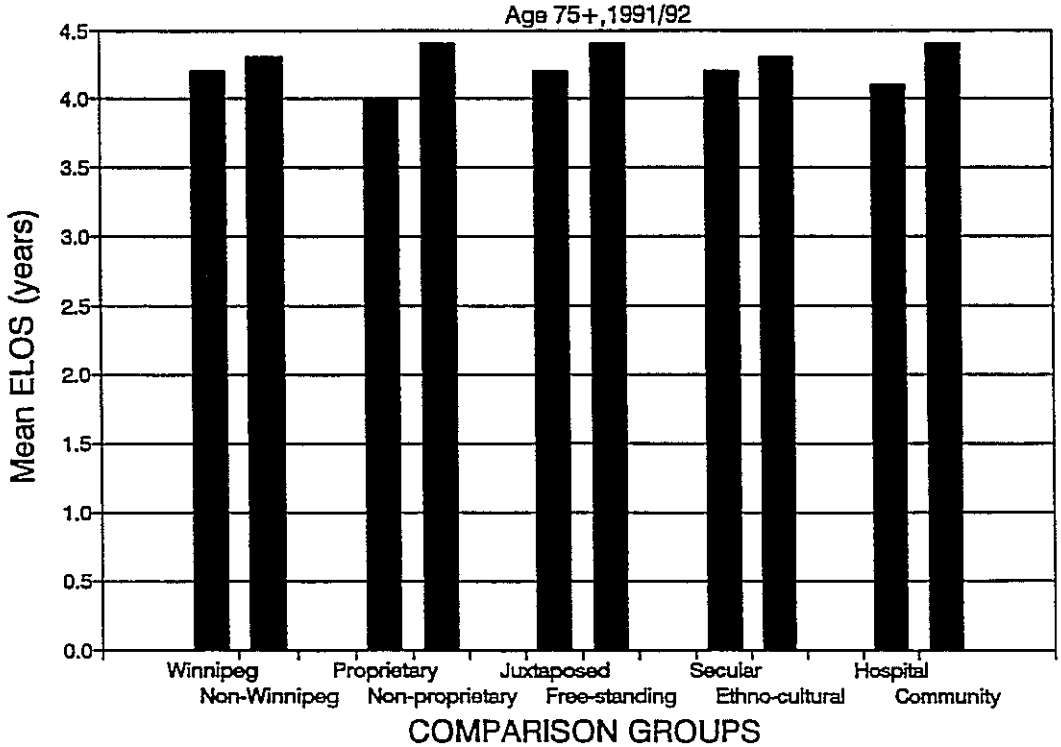


Figure 8: Expected Length of Stay

Different Comparison Groups

Age 75+,1991/92



Cost per Day

The estimated cost per day of PCH care ranges from $75.04 in Westman to $79.01 in Winnipeg (Figure 9). Westman's and Parklands' lower costs reflect their higher proportion of residents at lower levels of care, whereas Winnipeg's slightly higher costs reflect its higher proportion of heavy care residents.

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. To some extent, this seems to be true, for example, in Parklands and Winnipeg (Figure 10). However, the driving force behind both PCH and hospital use for non-acute care appears to be the overall availability of beds. Figure 11 illustrates that where bed to population ratios are higher, regardless of whether they are PCH or hospital beds, higher use is made of those beds for non-acute care.[1] Hospital costs per day, even for non-acute care, are higher than costs for PCH care,[2] therefore a small difference in the number of hospital days per capita has a notable effect on total costs (Figure 12).

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[1] For comparison purposes only, rates are indexed to the Manitoba rate in Figure 11; this is not to suggest that the Manitoba rate is the "correct" rate.

[2] Non-acute hospital costs were estimated to be $225 per day. Source: Comparative Costs of Manitoba's Major Teaching Hospitals (1991), P. 46.

Figure 9: Estimated Costs per PCH Day
Age 75+, 1991/92

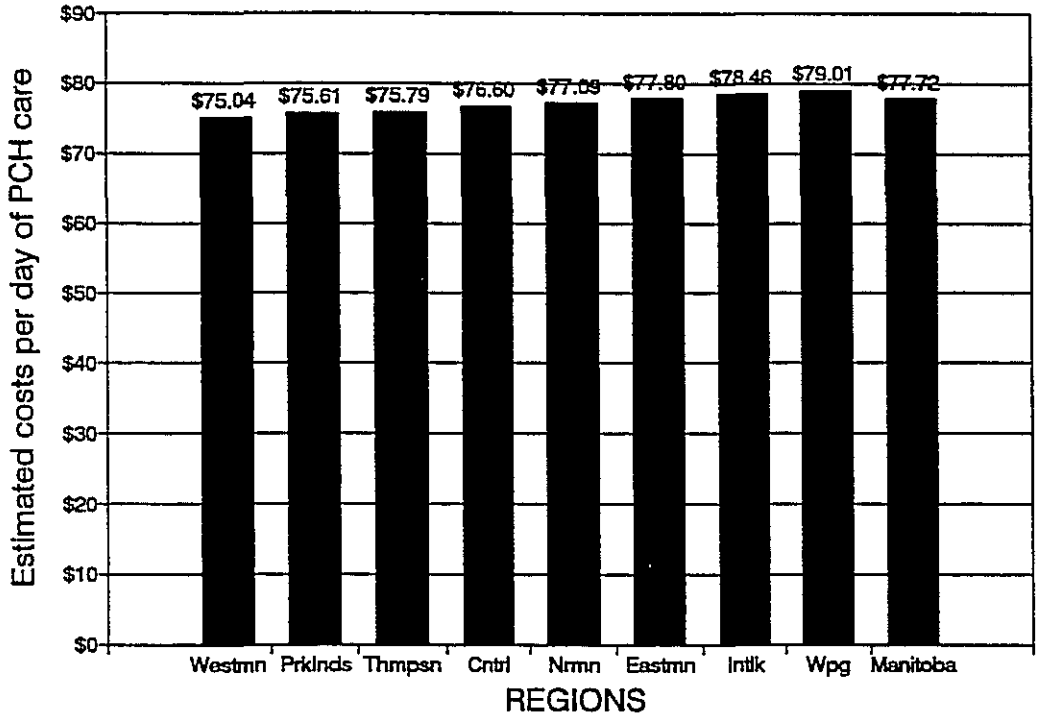


Fig 10: Non-acute Use, 1991/92, Age 75+
PCH Use and Hospital Use of 60+ Days

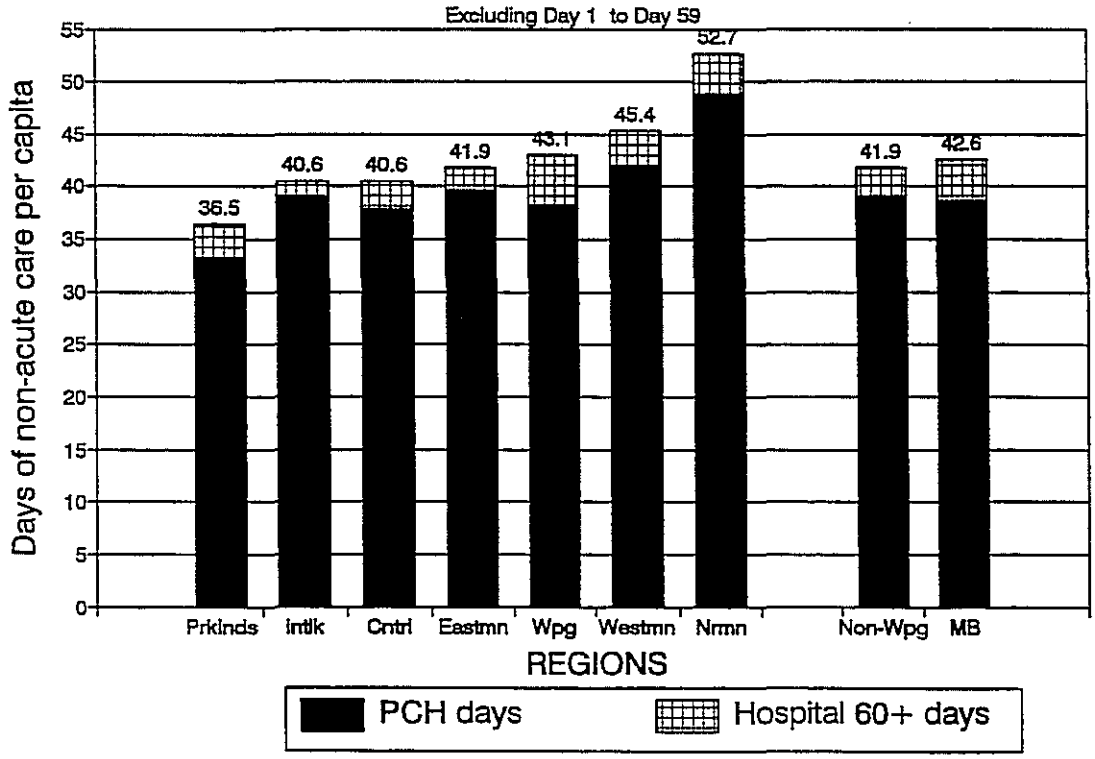


Figure 11: Use of Non-acute Care
Age 75+, 1991/92, Indexed to Manitoba

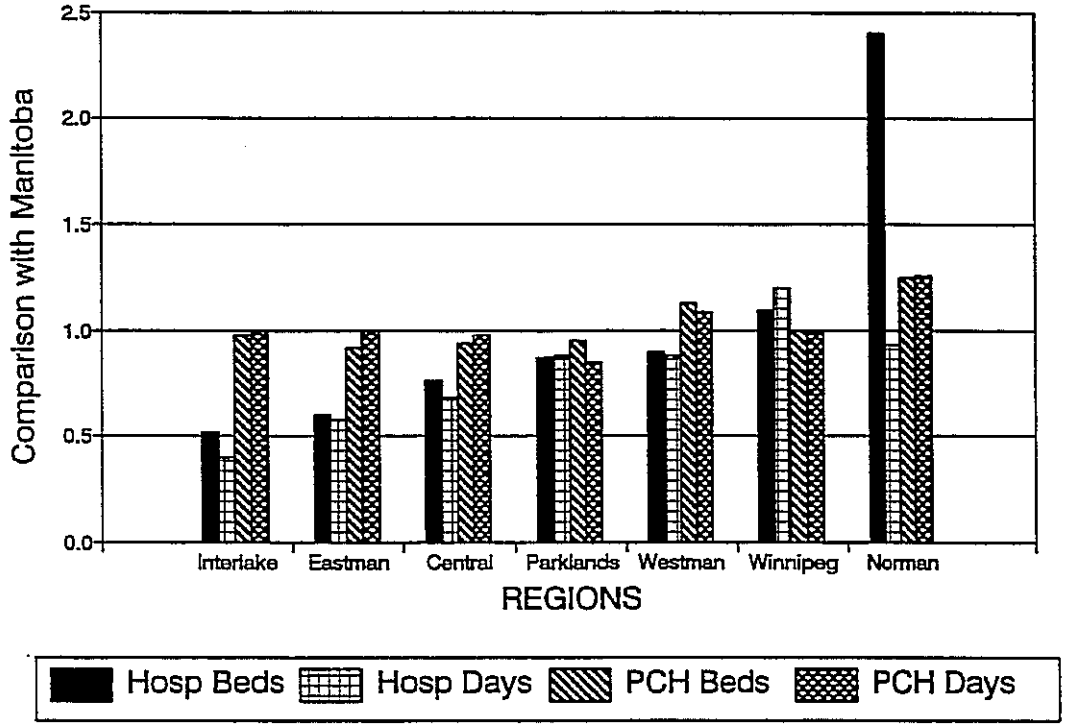
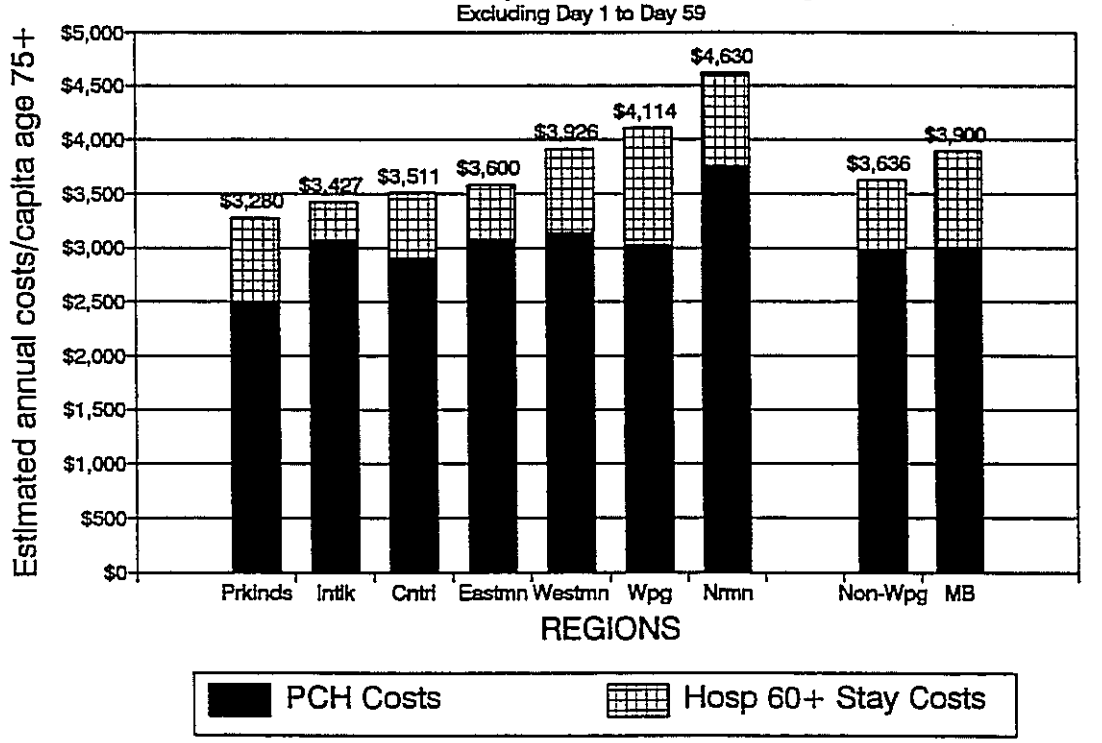


Fig 12: Non-acute Costs, 91/92, Age 75+
PCH and Hospital Costs of 60+ Days
Excluding Day 1 to Day 59



APPENDIX A: Methods

METHODS

Introduction

The Personal Care Home module of the Population Health Information System (PHIS) examines Manitoba's utilization of nursing homes for the fiscal year in question (April 1 to March 31). For this report, claims for the year 1991/1992 were analyzed; in subsequent reports, several years of data will be analyzed and trends assessed.

Analyses were conducted to study utilization of PCH resources by residents of regions defined by Manitoba Health, with Winnipeg examined as a single region. Overall provincial utilization patterns were used as a comparison. Since Winnipeg utilization patterns strongly affect the provincial averages, an aggregate of non-Winnipeg regions was also developed. Since this is a population-based analysis, population figures for each region were used as the denominators for all rate calculations.

The numerator for all rates was calculated either by counting individuals (eg. number of individuals admitted) or by summarizing events (e.g. number of days in PCH) for individuals who had been residents of the specific region upon entry to PCH.

Rates of the number of persons using PCH services, the number of admissions, the number of days of PCH care and the estimated annual costs for PCH care (per 1000 residents of a region) were developed. In addition to crude rates, age- and sex-standardized rates of indicators were developed to permit comparisons across regions. Rates were standardized using an indirect method.

Definitions

Manitoba Population All tables are based on claims for Manitoba residents alive as of December 31, 1991. Thus persons who died between January 1 and March 31, 1992, were counted in the population denominators.

Although residents who move to another province are covered by Manitoba for hospital and medical services for three months, this is not true of nursing home services. Therefore, as soon as a person leaves the province, he or she is excluded from the population counts for PCH utilization.

Region of Residence Manitoba is divided by Manitoba Health into eight regions: Central, Eastman, Interlake, Norman, Parklands, Thompson, Westman and Winnipeg. For numerator data, i.e. PCH use data, Region of Residence was assigned according to the Municipal Code in the PCH file, which refers to the last region of residence prior to admission to PCH and does not change regardless of the location of the PCH. [1] For non-PCH residents, Region of Residence is identified from the MHSC population registry. Many Status Indians do not actually reside on the reserve with which they are registered. In this case, the postal code associated with each claim is used to determine region of residence.

The Health Information System is designed to provide comparative information on the population's use of the health care system. If a Norman resident enters a PCH in the Norman region, but

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[1] The registry could not be used to assign region of residence because of the length of stay in PCH: municipal code in the registry changes to that of the PCH whereas the municipal code in the PCH file remains the same for as long as the person resides in a PCH.

subsequently is transferred to a PCH in Winnipeg, the individual's use remains associated with the Norman region, just as Norman residents hospitalized in Winnipeg are counted in the Norman rates. This is the accepted method for obtaining a picture of various populations' use of the health care system.

Analyses were also conducted based on Personal Care Home Region, rather than Region of Residence prior to admission to PCH; these tables are available on request from the Manitoba Centre for Health Policy and Evaluation (Volume III of the Utilization of Personal Care Home Resources, 1991/92).

Age The age of an individual is determined as of December 31. Age was stratified into six age groups (0-64, 65-74, 75-79, 80-84, 85-89, 90+). For most of the analyses the latter four age groups were combined into one: all individuals aged 75 or older.

Nursing Homes and Beds In 1991/92 there were 118 nursing homes in Manitoba[2], comprising 8,558 beds. There are three hospitals in the province, with a total of 27 beds, that function like nursing homes, but are not accredited as such.[3] We have not included them in this analyses; they are counted in the hospital analyses.

Residents Residents are all persons who lived in a Personal Care Home at some time during the fiscal year. In 1991/92, there were 10,237 residents of PCH.

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[2] 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.

[3] They are Cartwright (10 beds), Elkhorn (8 beds), and Hartney (9 beds) all in Westman Region.

Admissions In 1991/92, there were 2,152 admissions to nursing homes. Included in this figure are those whose status changed from Respite Care (intermittent care for individuals who live outside of a PCH), to a long term PCH admission.

Estimated PCH Costs Annual costs were estimated based on the gross per diem rates established by Manitoba Health for determining payment to proprietary homes. These rates represent the median of rates in free-standing, non-proprietary nursing homes. The gross per diems include a resident fee, equivalent to about 30% of the total per diem in 1991/92. Our estimated costs are based on these gross per diems, i.e., the resident fee is not netted out. Hence our costs should overestimate the costs of PCH care when compared to data in the Manitoba Health Services Commission Annual Report, which are based on payments. However, several factors mitigate against this:

(1) Pharmacy costs, which are insured but are not reflected in the per diem, are equivalent to about 10% of the annual resident fee.

(2) The per diem that we use, i.e. based on the median costs to non-proprietary free-standing homes, is less than the actual median costs to all non-proprietary homes for the following reasons[4]:

   i) It was developed based on median costs established in 1979/1980, with percentage increases since then.

   ii) It does not include the costs for juxtaposed facilities because they are prorated between the hospital and the nursing home, and may not reflect actual use costs.

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[4] Personal communication with Long Term Care Branch, Manitoba Health, May 1993.

iii) The per diem for proprietary homes includes only $2.40 for capital costs, which is lower than the actual per diem capital costs for non-proprietary homes.

Levels of Care Manitoba has four levels of care designations based on nursing time required. 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 hour.

In general, level of care does not change for an entire fiscal period; when level of care does change, the change is not recorded until the beginning of the next fiscal year.

Expected Length of Stay (ELOS) for Admissions Shapiro and Tate [5] analyzed admissions to Manitoba nursing homes over the period 1974 to 1982, and then determined for each of those individuals their actual length of stay in nursing home. All use was tracked until 1982. To determine which characteristics affect length of stay, a number of characteristics were analyzed, including age, sex and care level at entry. They found average lengths of stay to be quite similar over the entire period studied so we have some basis for using these data, even though they are somewhat dated. From their results, we constructed Table A, reflecting the expected average length of stay for different age, sex and level of care characteristics.

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[5] Shapiro E and Tate R. Survival Patterns of Nursing Home Admissions and Their Policy Implications. *Cdn Jnl Pub Hlth* 1988;79:268-274.

For our analysis, every admission was assigned an Expected Length of Stay (ELOS) based on the person's age, sex and level of care, and these numbers were used to derive mean expected lengths of stay. If standards of admission varied markedly across regions or type of home, (that is, if some facilities tended to admit younger, healthier individuals), this would be reflected in variations in ELOS for individuals admitted.

Table A: Expected Average Length of Stay (Years) by Age and Care Level on Admission for Males and Females

		Male	
Age	Care Level 1	Care Level 2	Care Level 3
<65	14.8	8.2	7.4
65-74	7.2	5.4	3.8
75-84	6.2	3.8	2.7
85+	4.5	3	1.8

		Female	
Age	Care Level 1	Care Level 2	Care Level 3
<65	16.5	10.3	10.3
65-74	14.7	8	5.8
75-84	9.3	6.1	4.4
85+	6.3	4.5	3

Types of Nursing Homes There were two major categories into which all nursing homes were divided: proprietary/non-proprietary and secular/ethno-cultural.

Proprietary/Non-proprietary: Twelve of the 17 proprietary (for-profit) nursing homes are located in Winnipeg. For-profit homes comprise 2311 or 27% of all Manitoba nursing home beds. Non-proprietary homes can be further divided into those that are juxtaposed to an acute care facility and those that are freestanding. There are 39 juxtaposed homes (all outside of Winnipeg), with 1073 or 13% of all nursing home beds and 17% of all non-proprietary nursing home beds.

Secular/Ethno-cultural: Ethno-cultural homes are those residents have chosen because the majority of persons living in those homes profess a particular religious faith, or prefer to speak a language other than English. There are 31 ethno-cultural PCHs in Manitoba, with 2931 or 35% of PCH beds. (All ethno-cultural homes are also non-proprietary.)

From Hospital In deciding whether an individual was admitted to PCH from hospital or community we relied primarily on the "From-code" on the PCH abstract. A check of this coding against discharge dates in the hospital file proved the code to be highly accurate (approximately 99%). Individuals who on the From-code were coded Transfers from PCH were placed in the Admitted from Community category, since upon examination, these proved to be cases previously on respite care, or cases which were transferred from one PCH to another in the first year. The "Other" category includes individuals admitted from Mental Health Centres or which were unspecified in the PCH file.

Other Issues

Change of residence prior to PCH entry One of our concerns in reviewing the nursing home data was the extent of movement by residents in the year or two prior to nursing home admission. If there was considerable movement in order to be close to health care providers or family members, particularly to a region such as Winnipeg, analyses focusing on Region of Residence prior to entry would tend to overstate Winnipeg residents' use of nursing homes. We compared the municipal code

from the population registry file both at 24 months before and at the time of admission with municipal code from the PCH file. In most regions, except for Eastman, Interlake and Thompson, over 90% of individuals are admitted to PCH from the same region in which they lived two years previously. In both Interlake and Eastman, there are many small communities near Winnipeg which are virtually suburbs of Winnipeg. In Thompson, there is only one nursing home that is in the provincial PCH program, and it is on a Reserve; hence the out-migration from Thompson to Winnipeg, Norman and Parklands.

Inclusion of Status Indians The question of inclusion of Status Indians arises because we do not have data on federally funded PCHs for Status Indians. [6] Whereas inclusion of the Status Indians who are in provincial PCH program would understate the usage by Status Indians, the exclusion of all Status Indians because of the missing data on federally-funded nursing homes would understate both the population and the utilization for all of Manitoba.

The number of Status Indians in PCH is very small, less than 1% of all users. This small number makes a negligible difference in the calculation of summary statistics. For the sake of consistency in the PHIS System, Status Indians for which data are available are included in this analysis, even though we know their use is underreported.

[6] There are 165 federally funded PCH beds in five Regions of the province.

APPENDIX B: List of Tables

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Utilization of Personal Care Home Resources, 1991/92

VOLUME III: LIST OF TABLES

Utilization of Personal Care Home Resources, 1991/92

MANITOBA CENTRE FOR HEALTH POLICY AND EVALUATION

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Number	Title and Author(s)
91-04-01	*Manitoba Health Care Studies and Their Policy Implications*, by Evelyn Shapiro
91-05-02	*Hospital Funding within the Health Care System: Moving Towards Effectiveness*, by Charlyn Black, M.D., Sc.D. and Norman Frohlich, Ph.D.
91-11-04	*Maternal Demographic Risk Factors and the Incidence of Low Birthweight, Manitoba 1979-1989*, by Cam Mustard, Sc.D.
92-10	*An Assessment of How Efficiently Manitoba's Major Hospitals Discharge Their Patients*, by Marni Brownell, Ph.D. and Noralou Roos, Ph.D.
93-01	*The Utilization of Prenatal Care and Relationship to Birthweight Outcome in Winnipeg, 1987-88*, by Cam Mustard, Sc.D.

Population Health Information System (analyses for 1991/92 to be released in 1993)

Utilization of Personal Care Home Resources, by Carolyn DeCoster, R.N., M.B.A., Noralou Roos, Ph.D. and Bogdan Bogdanovic, B. Comm., B.A.

Utilization of Hospital Resources, by Charlyn Black, M.D., Sc.D., Noralou Roos, Ph.D. and Charles Burchill, B.Sc., M.Sc.

Socio-Economic Status and Health: A Preliminary Regional Analysis, by Norman Frohlich, Ph.D. and Cam Mustard, Sc.D.

Population Health: Health Status Indicators, by Marsha Cohen, M.D., F.R.C.P.C. and Leonard MacWilliam, M.Sc., M.N.R.M.

Utilization of Physician Resources, by Douglas Tataryn, Ph.D. and Noralou Roos, Ph.D.

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