POPULATION AGING AND THE CONTINUUM OF OLDER ADULT CARE IN MANITOBA

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University of Manitoba | Faculty of Medicine
Community Health Sciences

Manitoba Centre for Health Policy
Department of Community Health Sciences
Faculty of Medicine, University of Manitoba

Authors: Malcolm Doupe, PhD
Randy Fransoo, PhD
Dan Chateau, PhD
Natalia Dik, MSc
Charles Burchill, MSc
Ruth-Ann Soodeen, MSc
Songul Bozat-Emre, MSc
Wendy Guenette

Manitoba Centre for Health Policy

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Manitoba Centre for Health Policy
Dept. of Community Health Sciences
Faculty of Medicine, University of Manitoba
4th Floor, Room 408
727 McDermot Avenue
Winnipeg, Manitoba, Canada
R3E 3P5

Email: reports@cpe.umanitoba.ca
Phone: (204) 789-3819
Fax: (204) 789-3910

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About the Manitoba Centre For Health Policy

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

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

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

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Community Health Sciences

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- Linda Dando – Director, Home Care, WRHA
- Lori Lamont –Vice-President and Chief Nursing Officer, WRHA
- Deborah Malazdrewicz – Executive Director, Health Information Management, Manitoba Health
- Lori Mitchell – Researcher, WRHA
- Jackie Prentice – Team Lead, Cross Department Coordination Initiative, Manitoba Health
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Table of Contents

List of Figures

List of Tables

List of Appendix Figures and Tables

Executive Summary

Introduction and Research Purposes

Older adults (people 65+ years old) are the main users of home care services and nursing homes (called personal care homes, or PCHs, in Manitoba), and the number of older adults living in Manitoba will soon increase considerably. Most Canadian provinces have expanded their care options for older adults, and Manitoba initiated an Aging in Place program in 2004. As one part of this program, supportive housing was created as an alternate to PCH use so that some people can continue living in the community. To date however, Manitoba has not developed a tool that differentiates supportive housing users from PCH users. This tool is important to ensure that people receive the right type of care based on their needs. Also, a new strategy is required to more clearly define PCH residents' needs so that providers can develop better care plans for these individuals. Knowledge from this tool can also be used to help understand the capacity of supportive housing to offset PCH use, now and in the future.

This research was conducted at the Manitoba Centre for Health Policy (MCHP), Faculty of Medicine, University of Manitoba, and provides evidence about the continuum of home care, supportive housing, and PCH care in Manitoba. Using a combination of clinical data from the Winnipeg Regional Health Authority (WRHA) and health care use data from the Population Health Research Data Repository (Repository) housed at MCHP, the objectives of this research were to:

- develop a tool for placing people into either supportive housing or PCH care and a second tool to more clearly describe PCH residents' needs.
- use this new evidence to estimate the capacity for supportive housing to offset current and future PCH use.

Focus of the Report

This report is written in three sections. Section I is entitled *Population Aging and Personal Care Home (PCH) Use in Manitoba.* To provide context for the remainder of this report, past and projected population aging trends are provided for Manitoba and its 11 Regional Health Authorities (RHAs). Past and projected PCH use trends are also provided for Manitoba.

Section II of this report is entitled *Manitoba's Expanded Continuum of Care: Evidence to Support Planning Processes.* This section first reviews data historically collected to monitor home care and PCH use in Manitoba, emphasizing the strengths and challenges of these data. Next, this section illustrates the two new tools we developed in this research. These tools were developed using the following data provided by the WRHA: i) a resident assessment instrument (called RAI–Home Care or RAI–HC©) that richly describes home care users' needs, ii) a similar instrument (the Resident Assessment Instrument Minimum Data Set 2.0 or RAI–MDS 2.0©) for PCH residents, and iii) a file that identifies supportive housing users and also provides their move in and out dates. Collectively, these files provide a wealth of information that until recently was not available at MCHP.

Section III of this report is entitled *Key Messages*. The main findings from this report are summarized in this section. Key policy recommendations and future research directions are also provided in this section.

Study Methods

Different study methods were used throughout this report. In Section I, we used a combination of files from the Manitoba Bureau of Statistics and data housed at MCHP to describe population aging and PCH use trends in Manitoba, from 1985 and projected to 2031.

All remaining analyses in this report use data from the WRHA, specifically from the RAI–HC© and RAI–MDS 2.0© systems and also from their supportive housing file. By linking these data with files housed at MCHP, we were able to richly describe home care, supportive housing, and PCH users from April 1, 2005 to February 1, 2007. People on this continuum were compared based on the challenges they had with activities of daily living (ADLs; e.g., locomotion, eating) and instrumental activities of daily living (IADLs; e.g., using the phone, shopping) tasks, and also based on their degree of cognitive impairment, bladder and/or bowel incontinence, and presence of behavioral symptoms (e.g., wandering, being verbally abusive, resisting care).

Findings

Population Aging Projections

The number of older adults living in Manitoba has already increased considerably, from 134,591 people in 1985 to 163,903 people in 2007. Future growth in this population will be mainly, but not exclusively, due to the Baby Boomer period (i.e., between 1946 and 1966). Also, the majority of PCH users in Manitoba are 75+ years old. Growth in this segment of our population will be quite modest until 2021, after which time it will increase markedly. From 2007 to 2036, the number of 75+ year–olds living in Manitoba is expected to almost double.

Population aging projections vary considerably across Manitoba. For some RHAs (Brandon, Central, and Winnipeg), present and projected population aging trends are very similar to the Manitoba average. Conversely, while the populations of Assiniboine and Parkland are currently much older, projected growth in the number of 75+ year–olds in these RHAs is much smaller than elsewhere. The opposite trend is expected for NOR–MAN and Burntwood/Churchill. These RHAs have younger populations that are projected to age considerably in the future. Lastly, the population age of Interlake, North Eastman, and South Eastman is currently similar to Manitoba. In each of these RHAs however, growth in the number of 75+ year–olds is expected to exceed the Manitoba average.

Past and Projected PCH Use

RHA–specific PCH projections are beyond the scope of this research. For the entire province however, rates of PCH use (i.e., days used per 1,000 population) have actually *decreased* in Manitoba due to fewer admission rates and shorter lengths of stay. However, given Manitoba's past population aging trends, total or overall days of PCH use have increased considerably for 85+ year–old males and females.

What about future PCH use? In this research, we developed two provincial–level PCH projection models, each with different assumptions. In our first model, we assumed that PCH use rates have reached a 'floor' effect in Manitoba (i.e., PCH days used per 1,000 population, which have decreased substantially in Manitoba, are as low as they can get). Projected PCH use in this scenario is directly proportional to population aging trends. In our second model (using regression analysis), we assumed that PCH use rates will continue to decrease for some years to come, eventually reaching a 'floor' effect. These two models provide very different projections. Our 'immediate floor effect' model projects that older Manitobans will use 49.0% more PCH beds by 2030/31, while our regression model projects that they will use 29.1% more PCH beds by this time. Some of the merits and challenges of each of these projections are discussed in this report. In particular, these projections do not account for any deficit of PCH beds that exists in Manitoba.

Differentiating Supportive Housing from PCH Users, Describing the Diversity of PCH Residents, and Estimating the Capacity for Supportive Housing to Offset PCH Use

Manitoba's existing tool to accept (panel) PCH residents was developed some time ago and does not help to place supportive housing users. Using a statistical process called decision tree analysis, we developed an algorithm that differentiates the needs of home care, supportive housing, and PCH users. This algorithm correctly places 65.0% of home care users, 79.7% of supportive housing users, and 83.5% of our PCH panel cohort. It can therefore be used to extend Manitoba's current panelling process, especially for deciding who should receive supportive housing versus PCH care. This tool was developed on a smaller sample of individuals from one RHA only. Pilot tests should be completed prior to implementing this tool.

We also developed a new strategy for describing PCH residents' needs. This strategy defines thirteen groups of people based on their ADL, cognitive performance, bladder and/or bowel incontinence, and behavioral challenges. In each of these domains, individuals were scored as being either: i) independent (e.g., score of '1'; at most requiring set–up help to complete ADLs, having no behavioral symptoms, being continent); ii) having some challenges (e.g., score of '2'; needing non weight–bearing ADL assistance, being incontinent once in a while, displaying behavioral symptoms that are more easily altered); and iii) having substantial challenges (e.g., score of '3'; needing weight–bearing ADL assistance, having behavioral challenges not easily altered, having a severe cognitive impairment). Based on this scoring system, each resident was profiled ranging from '1111' (i.e., minimal to no needs in any domain) to '3333' (substantial challenges in each domain).

Profiling residents in this manner can help with resource planning. For example, at the time of PCH assessment (panel), 27.4% of people had at most moderate challenges in any domain. Conversely, 48.9% of this cohort needed weight–bearing ADL assistance at this time. Also, 20.0% of this cohort had behavioral symptoms and, in a small percent of cases, these symptoms were not easily altered. Collectively, these profiles richly describe the diversity of PCH residents' needs, much more so than Manitoba's four broad levels of care.

Our new profiles were also used to compare the needs of supportive housing and PCH users. Not surprisingly, these groups were often mutually exclusive. For example, PCH residents needed weight–bearing ADL help during 67.0% of all PCH days, while almost no supportive users required this much help. Conversely, 63.5% of supportive housing users required, at most, set–up ADL help and/or had mild cognitive impairments, as compared to a small proportion of PCH users. Lastly, almost no supportive housing users had any behavioral symptoms, and very few of these people were frequently incontinent.

By combining these new profiles with our PCH projection models, we can also help planners prepare for the future. Our projections indicate that Manitoba will need more beds of some type in the near future, and our profiles can help to decide what type of beds to build. For example, because some PCH and supportive housing users in Winnipeg are currently similar (i.e., have the same profile), some normally PCH–bound residents can continue to be diverted to supportive housing. In fact, planners in this region may choose to build mainly supportive housing beds for the next few years. In the longer term however, these data show that planners in Winnipeg will need to either: i) change the current philosophy of supportive housing to accept sicker people and expand this program and/or ii) build more PCH beds.

Beyond these broad trends, definitive planning should not occur using data from this report. While our PCH projections are based on Manitoba, our new profiles were developed in Winnipeg. To provide more definitive evidence, ongoing research at MCHP is required to describe for each RHA: i) when

and to what extent we can expect PCH bed use to increase in the future and ii) what combination of PCH and supportive housing beds is needed to meet this increased use. Based on this evidence, planning strategies may vary across RHAs, pending the need for more PCH beds and differences in user characteristics.

Lastly, it is important to note that supportive housing and PCH use in Manitoba have different payment structures. In addition to need, affordability may, in some instances, influence people's decision to live in a supportive housing environment, which in turn limits planners' ability to plan for the future. Ongoing research is also required to develop a single payment scale applicable to both supportive housing and PCH users, to more closely reflect Manitoba's universal continuum of older adult care.

Policy Implications

This research provides a tool to help ensure that supportive housing in Manitoba functions as it was originally intended–as an alternate option to PCH use for some individuals. By using this tool, planners can help to ensure that supportive housing functions as an intermediate step between home–based and PCH care, so that people receive care that matches their needs.

To help with this process, we have also developed a strategy to more richly define PCH residents' needs, as compared to Manitoba's four broad levels of care. This tool can be used to help organize care plans currently and for the future. For example, while Manitoba will need more PCH beds in the years to come, our results show that planners can prepare for this need by building a combination of supportive housing and PCH beds. This may mean that the current philosophy of supportive housing has to change considerably, to accept sicker people.

It is also important to consider each of these policy statements jointly. For supportive housing to be optimally effective, planners will have to rigorously monitor both supportive housing and PCH minimal admission criteria, to ensure that people get the correct type of care. To assist with this, planners may need to develop different levels of supportive housing care, to house various kinds of 'lite level' PCH residents. Also, transitioning across this broader spectrum of care will only be seamless if a single payment structure for supportive housing and PCH care is developed in Manitoba. This expanded continuum of older adult care may differ somewhat across Manitoba, pending the future need for PCH beds and differences in user characteristics.

Data Improvements

Improvements to data are important to further develop older adult planning strategies. Aside from the Winnipeg Regional Health Authority (WRHA), Manitoba is currently limited in its ability to measure the health profile of home care, supportive housing, and PCH users. In the event that the RAI–HC© and RAI MDS 2.0© systems are not immediately globally implemented, several interim strategies can be used to collect valuable evidence. These include: i) electronically recording data gathered from the tools developed in this research and ii) applying Manitoba's level of care algorithm to PCH and supportive housing users at their time of admission and electronically entering the six individual items (that measure ADLs, behavior, etc) that comprise these levels. In addition, it is important for Manitoba to develop a universal supportive housing file. This file should, at minimum, capture data such as people's supportive housing acceptance, move in and move out dates, as well as their disposition status (e.g., death, PCH).

Lastly, while focused on less in this report, continued trends to expand community–based versus institutional care may impact the need for home care services. From this perspective, it is important for Manitoba to have a single provincial system for measuring home care use. Ideally, this system should record, at the person–level, the type and direct hours of home care provided. This latter information is important for demonstrating the continued value of home care services.

Future Research Directions

Two follow–up research projects are recommended in this report. *First,* our evidence shows that Manitoba's RHAs are at various stages of population aging, and PCH projections in each RHA are important for planning purposes. As was done in this research, these projections should also incorporate clinical data, so that planners can build the right combination of supportive housing and PCH beds. As stated previously however, this first requires additional clinical data from the non–Winnipeg regions. In the interim, replicating this research in the WRHA has merit as the number of supportive housing beds in this region has recently increased substantially. Also, MDS 2.0 assessment data are now available in both for profit and not–for profit PCHs. Replicating this research on a larger sample of users would allow us to further clarify the need for supportive housing and PCH beds in Winnipeg.

Second, different payment structures currently exist in Manitoba for supportive housing versus PCH care. Research is being initiated at MCHP to compare these expenses, including direct (out–of–pocket) and indirect (e.g., hospital and emergency room admission rates) costs. This evidence may be used to develop a single payment scale applicable to both supportive housing and PCH users, to more closely reflect Manitoba's universal continuum of care.

Chapter 1: Research Introduction and Report Organization

Introduction

About 169,000 **older adults**[1] (people 65+ years old)[2] live in Manitoba, comprising 13.6% of our population. This number of people is expected to almost double by the year 2036 while the number of people between 20 and 64 years old will increase by 35%. Similar to other Canadian provinces and to most developed countries (Day, 1996; Statistics Canada, 2005), Manitoba's population is therefore projected to age in the next few decades.

Older adults are the main users of **home care** services and **personal care homes (PCHs)**,[3] and most Canadian provinces have initiated plans to expand care options in this area. In 2004, Manitoba announced **supportive housing** as one component of an **Aging in Place** strategy, allowing some normally eligible PCH residents to continue living in the community (Manitoba Health, 2006).[4] To date however, Manitoba has not developed a tool that differentiates supportive housing from PCH users, to help ensure that people get the right type of care. Also, a new strategy is required to more clearly define PCH residents' needs, to help organize more effective care plans currently, and to plan for future resources. Specifically, evidence is needed to help estimate how much supportive housing can be used as an alternate to PCH use, now and in the future.

Research Objectives

Manitoba Centre for Health Policy (MCHP) is renowned for using administrative health care data to conduct population health and health services research. While a diverse range of administrative files are housed at MCHP, information on people's functional dependence, cognitive impairment, social networks, and incontinence is generally lacking. In 2000, the **Winnipeg Regional Health Authority (WRHA)** implemented a resident assessment instrument (called RAI–Home Care; RAI–HC©)[5] to define home care users' needs in several areas (e.g., social supports, functional dependence, and cognitive impairment), with the goal of promoting more effective and personalized care (interRAI, 2002). In 2004, a similar instrument for PCHs (the Resident Assessment Instrument **Minimum Data Set** 2.0; RAI–MDS 2.0©)[6] (interRAI, 2005) was implemented in the WRHA. Linking these data with files housed at MCHP provides a unique opportunity to study Manitoba's expanded continuum of older adult care.

This research was conducted to understand several items related to supportive housing and PCH care in Manitoba. The specific objectives of this research were to:

- develop a tool for placing people into either supportive housing or PCH care and a second tool to more clearly describe PCH residents' needs.
- use this new evidence to estimate the capacity for supportive housing to offset current and future PCH use.

1 Terms in bold type face are defined in the Glossary at the end of this report.
2 For the purposes of this report, "+" should be interpreted to mean "and older".
3 Personal care homes are referred to as nursing homes in other locations.
4 Supportive housing is one component of Aging in Place and is designed to provide people with 24–hour support and supervision but not necessarily hands–on care. More information about Aging in Place is available at the following Manitoba Health website http://www.gov.mb.ca/health/aginginplace/index.html.
5 The Canadian version of RAI–HC is copyright© Canadian Institute for Health Information, 2002, and subsequent references to RAI–HC© in this report acknowledge this copyright status.
6 The Canadian version of RAI–MDS 2.0 is copyright© Canadian Institute for Health Information, 2002, and subsequent references to RAI–MDS 2.0© in this report acknowledge this copyright status.

Focus and Organization of This Report

The remainder of this report is divided into three sections. Section I is entitled *Population Aging and Personal Care Home (PCH) Use in Manitoba*. Past and projected **population aging** trends are highlighted in Chapter 2 of this report for Manitoba and its RHAs. Past, present, and projected PCH use patterns are provided for Manitoba in Chapter 3 of this report.

Section II of this report is entitled *Manitoba's Expanded Continuum of Care: Evidence to Support Planning Processes*. Manitoba's continuum of home care services and PCH use is reviewed in Chapter 4 of this report, emphasizing the strengths and challenges of **administrative health data** collected along this continuum. As this is our first time linking RAI–HC© and RAI–MDS 2.0© data to the files housed at MCHP, Chapter 5 of this report provides a brief introduction to these new data and highlights some of their strengths and challenges when used for research purposes.

Based on this information, Chapter 6 describes our study cohort and the data we used to develop the new tools in our research. Chapter 7 presents our new tool that differentiates home care, supportive housing and PCH users, to help ensure that people get the right care based on their needs. Chapter 8 presents our second new tool that more clearly describes PCH residents' needs. Using this tool, this chapter also: i) shows the similarities and differences between supportive housing and PCH users and ii) estimates the capacity of supportive housing to offset future PCH use in Winnipeg.

The third section of this report is entitled *Key Messages*. The main findings and policy implications stemming from this research are provided in Chapter 9 of this report.

SECTION 1: Population Aging and Personal Care Home (PCH) Use in Manitoba

Chapter 2: Past, Present, and Projected Population Aging Trends in Manitoba

Chapter Highlights

Population aging is a global phenomenon that will affect most developed countries. At least within Manitoba, this process will occur mainly because of high **fertility rates** from 1946 to 1966 (i.e., the **Baby Boom Period**) followed by much lower fertility rates from 1967 onward (the **Baby Bust Period**). It is difficult to project exactly how much or for how long population aging will occur, as these projections also depend on future net migration rates as well as age– and sex–specific death rates.

More than 90% of all PCH residents are 75+ years old, and this segment of our population is expected to grow by 89.2% from 2007 to 2036. However, this increase in population size will not begin in earnest until 2021 (when **Baby Boomers** first reach age 75), and will continue for some time after 2051 (when Baby Boomers born in 1966 reach age 85). Population aging will therefore be a somewhat temporary, albeit lengthy, process.

Population aging projections vary substantially across Manitoba. Some RHAs (Brandon, Central, Winnipeg) are similar to Manitoba, both in terms of their present population age and their projected growth in the number of 75+ year–olds. Alternatively, while Assiniboine and Parkland currently have much older populations, projected growth in the number of 75+ year–olds is much smaller in these regions. Conversely, while NOR–MAN and Burntwood/Churchill currently have populations much younger than Manitoba, the number of 75+ year–olds in these regions is projected to increase substantially. Lastly, North Eastman, Interlake, and South Eastman share a combination of these characteristics. While their current population age is similar to the province, projected growth in their number of 75+ year–olds is still substantial.

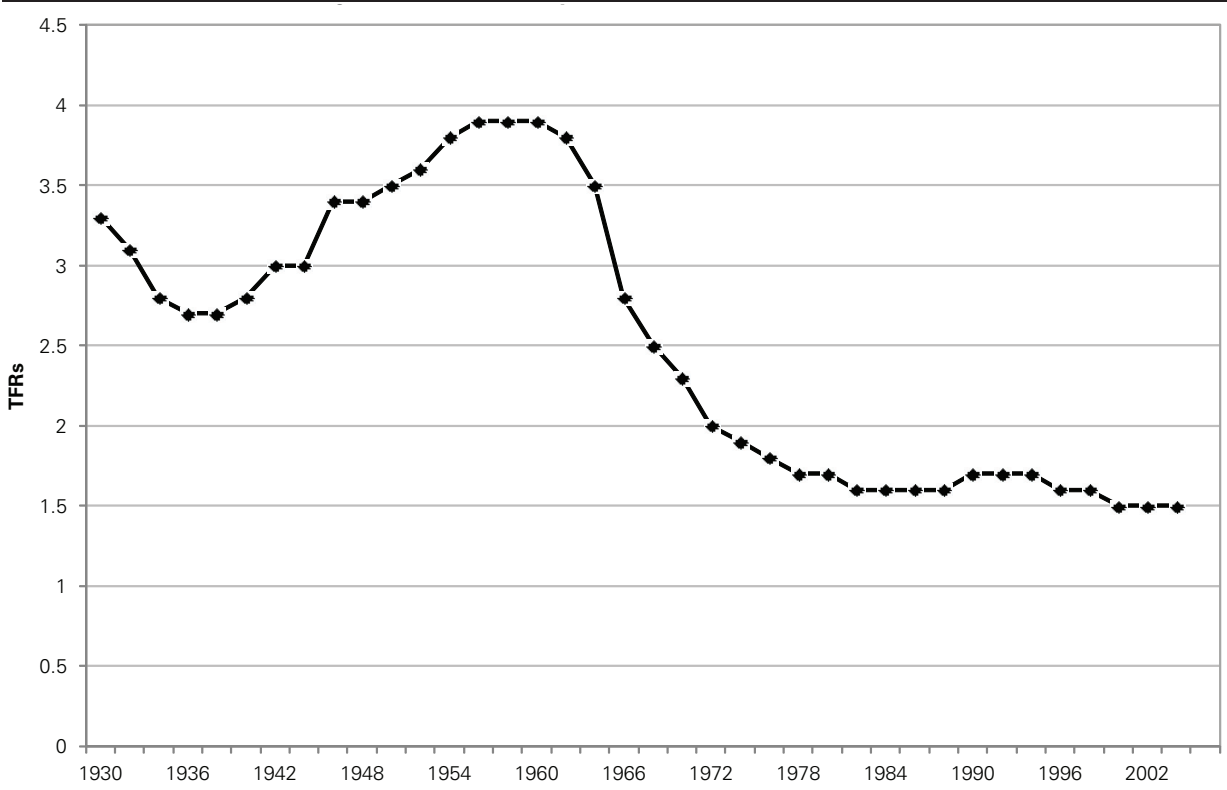
Detailed Chapter Results

A Brief Explanation about Population Aging

Projected population aging trends are largely influenced by past changes in fertility rates. Trends in **total fertility rate (TFR)** for Canada are shown in Figure 2.1 (Statistics Canada, 1997; Statistics Canada, 2008). During the Baby Boom period (1946 to 1966),[7] TFR was typically above 3.0 births per woman of childbearing age in Canada. This period of time is followed by the Baby Bust period (1967 and onward) where TFR has remained well below a value of 2.0 births since 1973. These past changes in fertility rate have resulted in a large 'bubble' in our population size. As it pertains to population aging, early Baby Boomers (born in 1946) will reach age 75 by the year 2021 and late Baby Boomers (born in 1966) will become 85 by the year 2041.

7 There is some disagreement about the exact start and end dates of the Baby Boom generation. Based on the definition used by Statistics Canada (Statistics Canada, 2001), Baby Boomers in this report are defined as the generation born between 1946 and 1966.

Figure 2.1: Total Fertility Rates (TFRs) in Canada, 1930–2004



Sources : Statistics Canada (1983), Historical Statistics of Canada;
Statistics Canada (1997), Health Reports, Winter 1996 Volume 8 No. 3
Statistics Canada (2008), Report on the Demographic Situation in Canada 2005 and 2006

Population aging trends are also influenced by birth, migration (inter–provincial and international), and age–specific death rates. Net in–migration rates dampen aging projections as most immigrants to Canada are younger. Conversely, decreases in age–specific death rates have generally been greater for older adults. Continuation of this trend will heighten population aging projections. Various population aging scenarios exist, depending on how these factors change in the future.[8]

A Look at Population Aging Projections in Manitoba

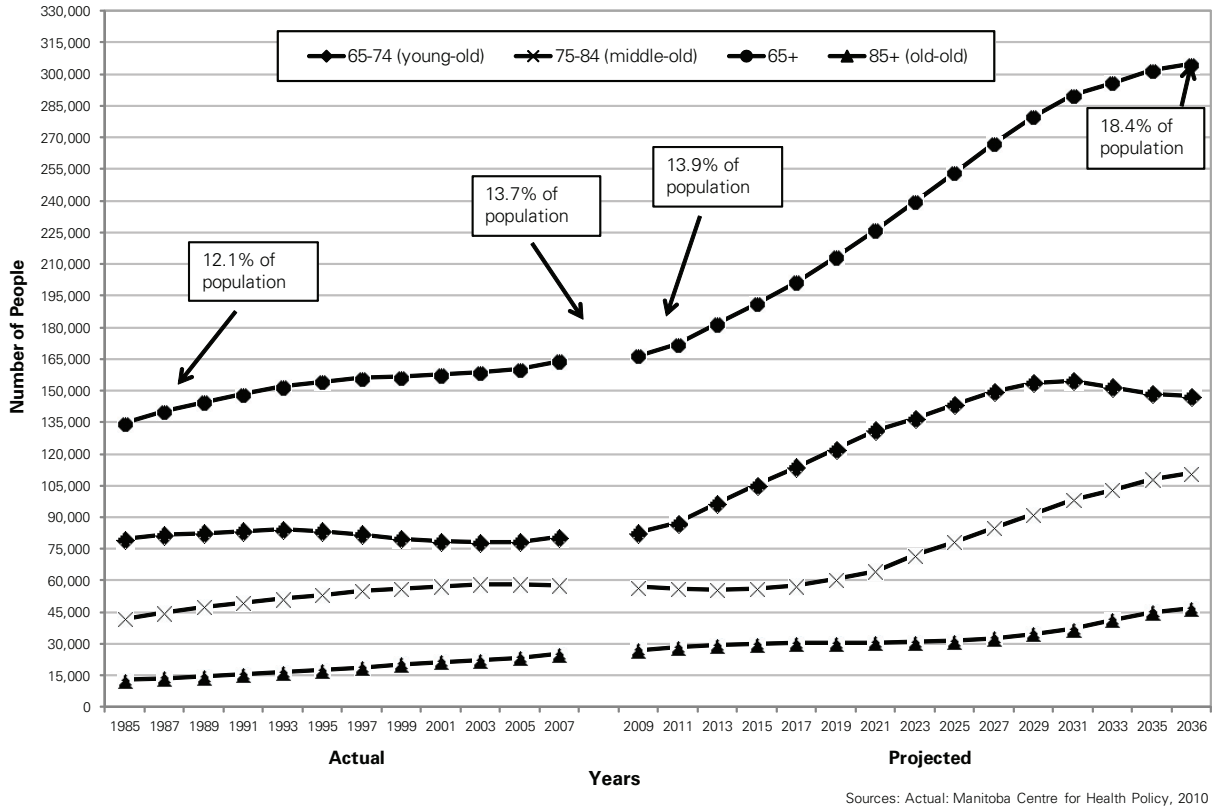
How much, when, and for how long will Manitoba's population age? Data from Figure 2.2 show that the number of older Manitobans has already increased substantially, from 134,591 people in 1985 to 163,903 people in 2007 (an increase of 21.8%).[9] During this time the relative age of our older adult population has also shifted substantially. While the number of 65–74 year–olds living in Manitoba has remained stable since 1985, the number of 75 to 84 year–olds (42,034 people in 1985 versus 57,923 people in 2007) and especially 85+ year–olds (13,011 people in 1985 versus 25,369 people in 2007) has increased considerably since this time.

8 Population projections are usually based on high, medium, or low scenarios (e.g., projected birth and net in–migration rates are greater, and death rates tend to be lower, in the higher versus low scenario) (Manitoba Bureau of Statistics, 2004). Also, birth and migration rates impact relative population aging metrics (i.e., when projecting the percent of a population that will be 65+ years old) but have less influence when projecting growth in the actual number of older adults (i.e., percent increase in the number of 65+ year–olds).

9 All data in this chapter were obtained from the Manitoba Bureau of Statistics, which reports population–based data as of December 31 in a given year.

Baby Boomers born in 1946 will reach age 65 by the year 2011. From this year until 2036, the number of older Manitobans is expected to increase by 77.3% (from 171,869 people in 2011 to 304,790 people in 2036) (Figure 2.2) (Manitoba Bureau of Statistics, 2008). The relative age of this population will also change during this time. Baby Boomers born in 1946 will reach ages 75 and 85 in the years 2021 and 2031 respectively, and Figure 2.2 shows that the number of middle–old and old–old Manitobans will increase starting at these times. Conversely, the majority of Baby Boomers will have reached age 65 by the year 2031 (i.e., 1966 + 65 = 2031), and Figure 2.2 shows how growth in the number of young–old Manitobans will stabilize starting about this time.

Figure 2.2: Past (1986–2007) and Projected (2009–2036) Number of Older Adults Living in Manitoba, Overall and by Sub–Groups (young–old; middle–old; old–old)



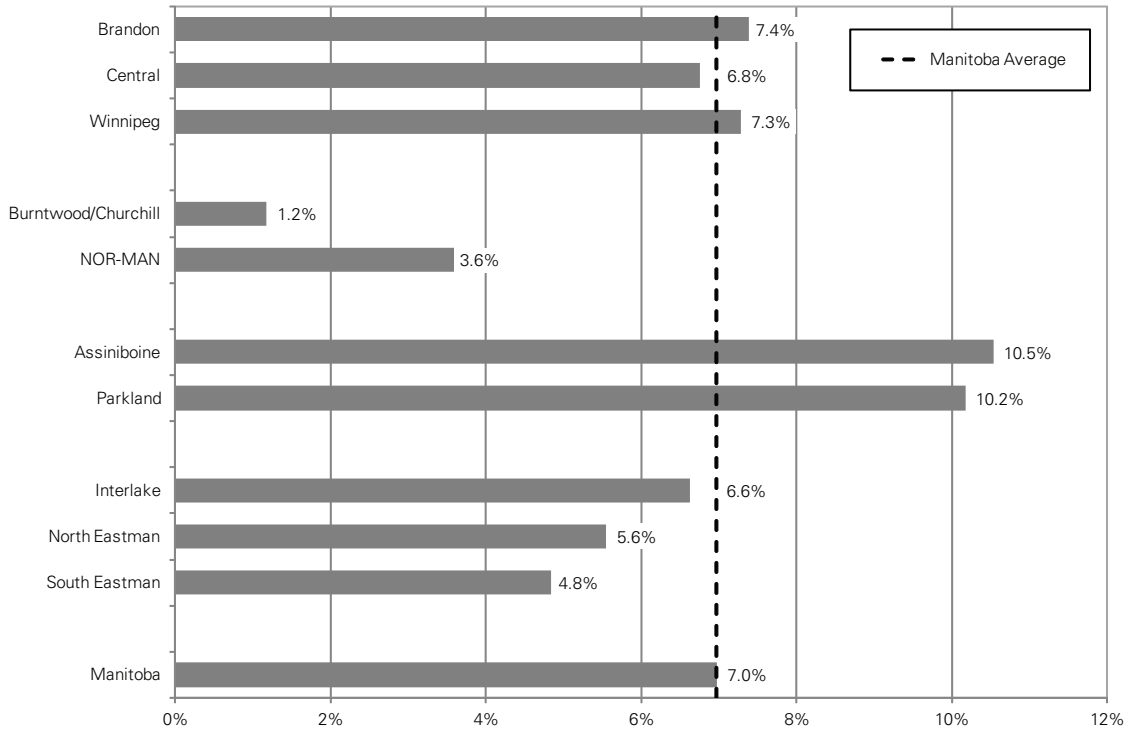
Sources: Actual: Manitoba Centre for Health Policy, 2010
Projected: Manitoba Bureau of Statistics, 2008

The majority of PCH residents in Manitoba are 75+ years old. Regional Health Authorities (RHAs) in Manitoba vary substantially by the percent of their population currently 75+ years old (Figure 2.3) and by their projected growth in this number of individuals (Figure 2.4). Highlights from these figures are summarized as follows:

- In 2007, 7.0% of Manitoba's population was 75+ years old (Figure 2.3). However, the number of 75+ year–olds living in Manitoba is projected to increase by 89.2% from 2007 (83,292 people) to 2036 (157,590 people) (Figure 2.4). Growth in this segment of our population will be somewhat minimal until 2020 (11.4%). However, Baby Boomers will reach age 75 years starting at 2021, after which, growth in the number of 75+ year–olds will be much more substantial.

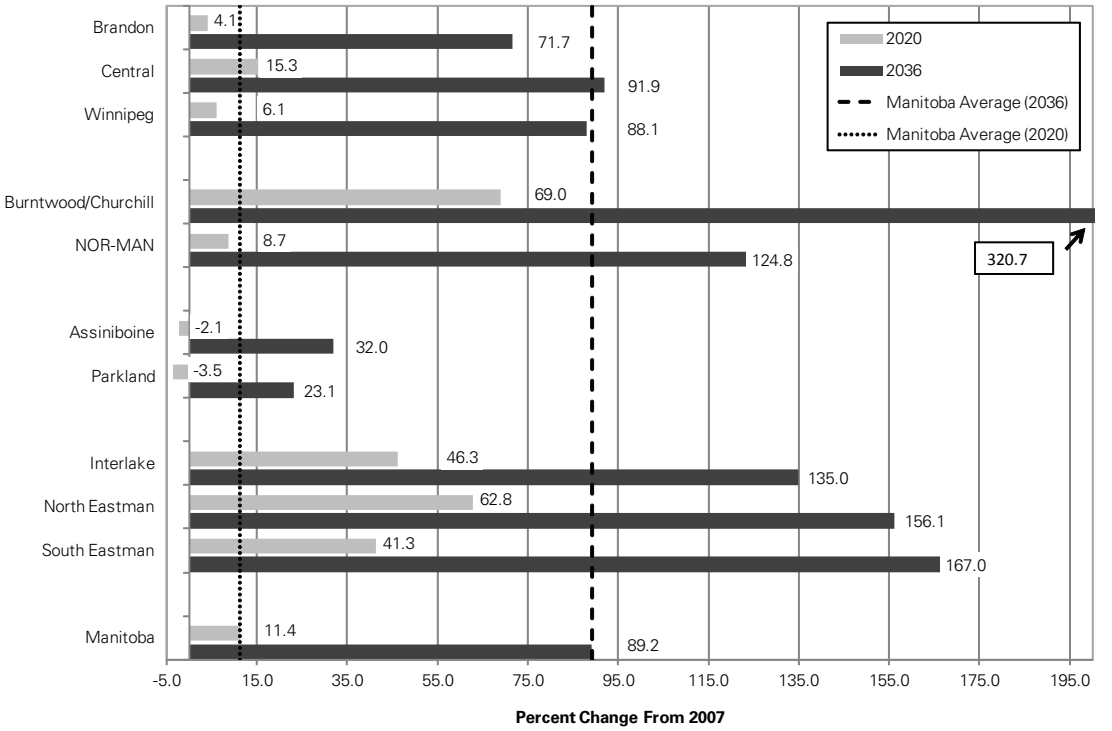
- Compared to these provincial data, RHAs can be grouped into one of four population aging 'camps', summarized as follows:
  - Average Agers (Brandon, Central, Winnipeg) Each of these RHAs are similar to Manitoba, both in terms of their present population age (about 7.0% of each population is comprised of 75+ year–olds) (Figure 2.3) and in terms of their projected increase in the number of 75+ year–olds (Figure 2.4).
  - Late Aging Boomers (Burntwood/Churchill, NOR–MAN) While these RHAs are currently much younger than Manitoba (Figure 2.3), growth in their number of 75+ year–olds is projected to be quite substantial (Figure 2.4). This population growth is partly due to small numbers in the baseline year (e.g., in 2007, only 568 people 75 years and older lived in Burntwood/Churchill).
  - Early Starters (Assiniboine and Parkland) These RHAs are currently much older than Manitoba (e.g., 10.2% of the Parkland population was 75+ years old in 2007). However, continued growth in the number of 75+ year–olds is projected to be somewhat minimal. In Parkland, for example, the number of 75+ year–olds is expected to grow by only 23.1% from 2007 (4,276 people) to 2036 (5,265 people), far less than all other RHAs.
  - Persistent Agers (Interlake, North Eastman, South Eastman) These RHAs share characteristics of both the 'average agers' and 'late boomers'. While the population age of these regions is currently similar to Manitoba, continued growth in the number of 75+ year–olds is still projected to be substantial, much more than the Manitoba average.

Figure 2.3: Percent of Population Age 75+ by Regional Health Authorities and Manitoba, December 31, 2007



Source: Manitoba Centre for Health Policy, 2010

Figure 2.4: Projected Growth (% change from 2007) in the Number of 75+ Year–Olds by 2020 and 2036, Regional Health Authorities and Manitoba



Source: Manitoba Bureau of Statistics, 2008

Chapter 3: Past, Present and Projected PCH Use Patterns in Manitoba

Chapter Highlights

This chapter updates earlier MCHP research (Menec, MacWilliam, Soodeen, & Mitchell, 2002) and shows that PCH use rates (i.e., days used per 1,000 population) in Manitoba are actually *lower* today compared to the past. However, as shown in Figure 2.2 in the previous chapter, Manitoba's population has already aged considerably. Consequently, total days of PCH use have actually increased substantially for 85+ year–old males and females.

Also building on earlier MCHP research (Frohlich, DeCoster, & Dik, 2002), this chapter projects increased PCH use in Manitoba. Based on our most plausible scenario, this increase in use will be modest until 2020/21 (just before Baby Boomers reach age 75). At this time however, the need for additional PCH beds will increase considerably. By 2030/31, Manitoba may require about 29.1% more PCH beds. It is important to note that these projections are based on past use trends only and do not consider several factors. First, they do not include the number of people accepted but waiting for admission into a PCH, and our data show that this number of people has increased in recent years. Second, Chapter 2 of this report shows that population aging projections vary substantially across Manitoba. RHA–level PCH projections are beyond the scope of this research.

Detailed Chapter Results

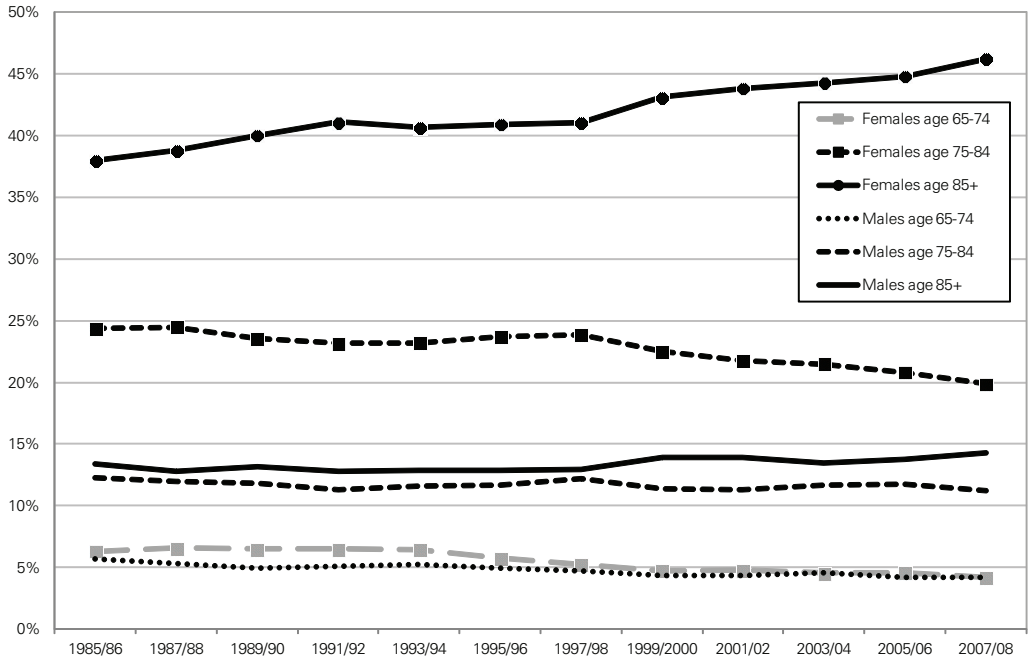
An Update of Past and Present PCH Use in Manitoba

How much has PCH use changed in recent years? Do more or fewer people reside in PCHs today versus in the past? Is the overall volume of PCH use increasing or decreasing in Manitoba? Answers to these and other questions help to understand future PCH use in our province.

Both user– and population–based measures are required to fully describe PCH use. User–based PCH trends are shown in Figure 3.1.[10] As noted by others (Menec et al., 2002), PCH residents today are generally older as compared to the past. In 2007/08, 85+ year–old females comprised almost half (46.2%) of all PCH residents, while 14.3% of all residents were 85+ year–old males. Looking at these data in another way—in 2007/08, 66.1% of all PCH residents were 75+ year–old females.

10 Older adults comprise 96.1% of all PCH users in Manitoba, and data for people younger than 64 are not included in this chapter. Also, PCH use patterns are reported using fiscal years in this chapter. For example, the year 1985/86 refers to PCH use patterns from April 1, 1985 to March 31, 1986.

Figure 3.1: Distribution of Older Adult Personal Care Home (PCH) Residents by Age & Sex, Manitoba, 1985/86–2007/08



Source: Manitoba Centre for Health Policy, 2010

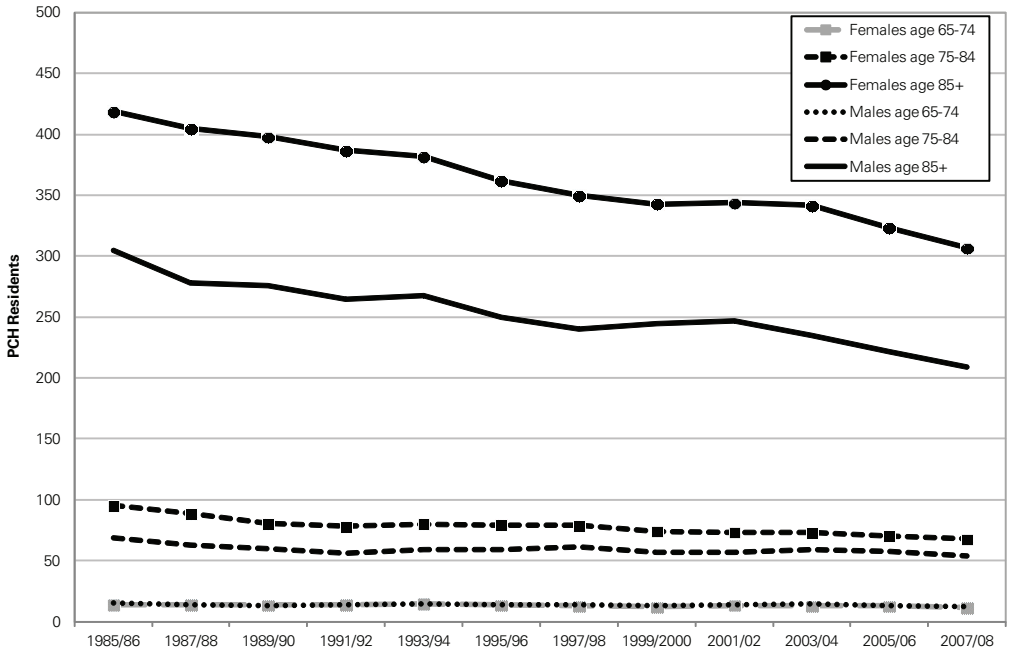
Figures 3.2 through 3.4 describe changes in PCH use patterns since 1985/86. Collectively, these data show that rates of PCH use (i.e., the number of users per 1,000 population) has actually decreased from the past (Figure 3.2). Also, amongst PCH users, lengths of stay (LOS) have decreased substantially (Figure 3.3). Consequently, the number of PCH days used per 1,000 population has actually decreased in Manitoba (Figure 3.4). Further details about these trends are provided in the following text.

Very few older adults actually reside in a PCH. These population use rates are, however, age– and sex–specific (Figure 3.2). For example, in 2007/08, roughly 1.2% (12 people per 1,000 population) of 65–74 year–olds (males and females combined) lived in a PCH, as did only 5.4% and 6.8% of 75–84 year–old males and females, respectively. Conversely, in 2007/08, one in five (20.9%) 85+ year–old males and one in three (30.7%) 85+ year–old females lived in a PCH.

Since 1985/86, per capita PCH use rates have decreased for older adults (Figure 3.2). This decrease has been greatest for 85+ year–old males (31.4%; from 304.5 users per 1,000 population in 1985/86 to 208.9 users per 1,000 population in 2007/08), followed closely by 75–84 year–old females (28.5%; from 95.3 users per 1,000 population in 1985/86 to 68.2 users per 1,000 population in 2007/08) and 85+ year–old females (26.8%; from 418.6 users per 1,000 population in 1985/86 to 306.6 users per 1,000 population in 2007/08). Per capita PCH use rates have decreased less dramatically for all other age/sex groups (e.g., 16.7% for 65–74 year–old males; from 15.2 users per 1,000 population in 1985/86 to 12.7 users per 1,000 population in 2007/08).

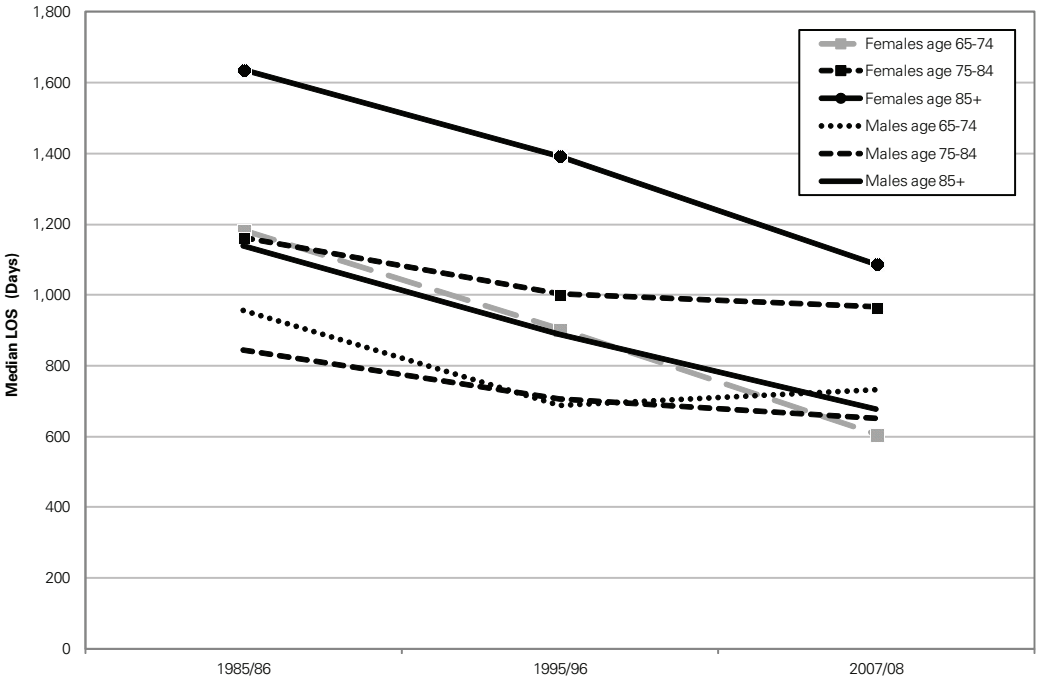
Median lengths of PCH stay have also decreased considerably in recent years (Figure 3.3). This decrease has been substantial for 65–74 year–old females (48.8%; from 1,183 days in 1985/86 to 606 days in 2007/08) and for 85+ year–old males (40.6%; from 1,139 days in 1985/86 to 677 days in 2007/08) and females (33.6%; from 1,637 days in 1985/86 to 1,087 days in 2007). Since 1985/86, median PCH LOS has decreased the least for 75–84 year–old females (16.8%; from 1,162 days in 1985/86 to 967 days in 2007/08).

Figure 3.2: Number of Personal Care Home (PCH) Residents per 1,000 Population by Older Adult Age and Sex Categories, Manitoba, 1985/86–2007/08



Source: Manitoba Centre for Health Policy, 2010

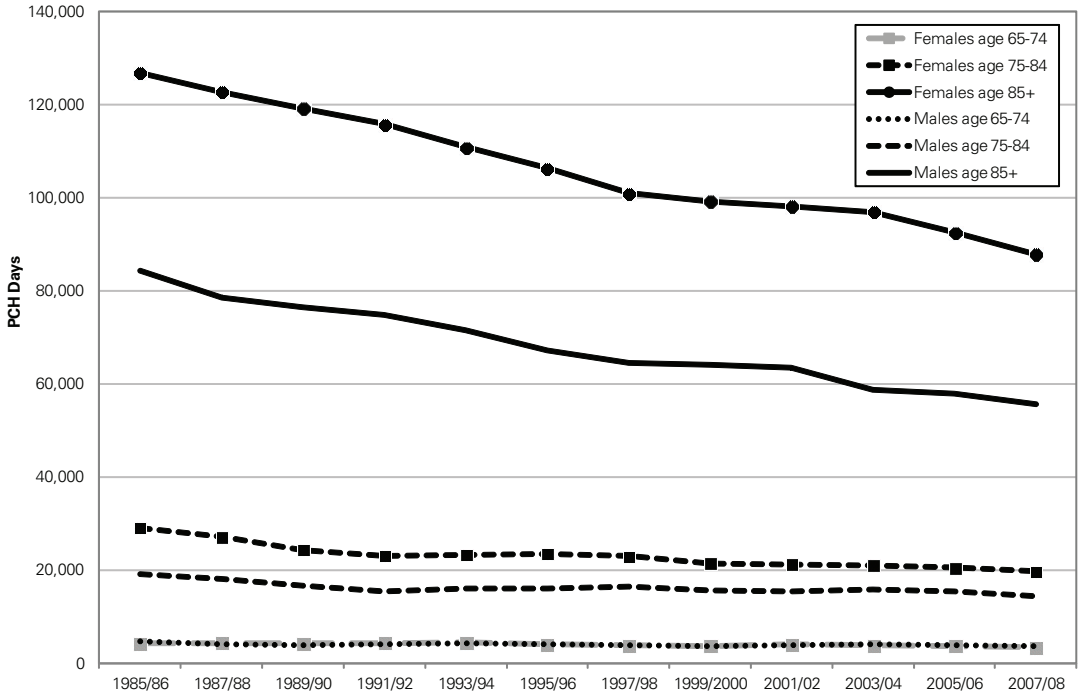
Figure 3.3: Median Personal Care Home (PCH) Resident Lengths of Stay (LOS) by Older Adult Age and Sex Categories, Manitoba, 1985/86–2007/08



Source: Manitoba Centre for Health Policy, 2010

Given these trends, it is not surprising that per capita volumes of PCH use (i.e., days per 1,000 population) have also decreased since 1985/86 (Figure 3.4). This decrease has been greatest for 85+ year–old males (34.0%; from 84,236.5 days per 1,000 population in 1985/86 to 55,574.8 days per 1,000 population in 2007/08), followed closely by 75–84 year–old females (32.3%; from 29,136.9 days per 1,000 population in 1985/86 to 19,715.0 days per 1,000 population in 2007/08) and 85+ year old–females (30.7%; from 126,834.0 days per 1,000 population in 1985/86 to 87,865.4 days per 1,000 population in 2007/08). Since 1985/86, per capita volume of PCH use has decreased least dramatically for 65–74 year–old females (20.1%; from 4,281.9 days in 1985/86 to 3,422.3 days in 2007/08) and males (21.5%; from 4,621.4 days per 1,000 population in 1985/86 to 3,627.8 days per 1,000 population in 2007/08).

Figure 3.4: Rate of Personal Care Home (PCH) Use (Days Used per 1,000 Population) by Older Adult Age and Sex Categories, Manitoba, 1985/86–2007/08



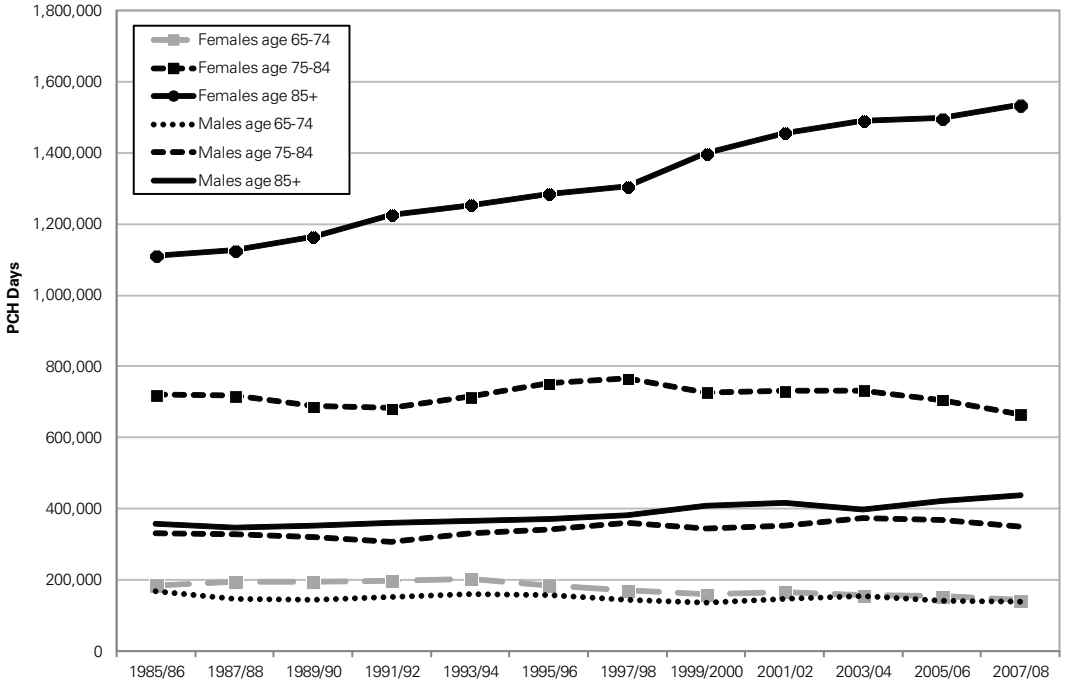
Source: Manitoba Centre for Health Policy, 2010

Trends in per capita use do not account for changes in the actual size of a population, and as demonstrated in Figure 2.2 of this report, the number of 75+ year–olds in Manitoba has risen substantially since 1985/86. Total changes in PCH use (i.e., accounting for population growth) are shown in Figure 3.5. Highlights from this figure are summarized in the following text.

- As PCHs in Manitoba operate at or near capacity, it not surprising that the overall volume of PCH use (total days used by older adults) has increased by only 13.9% since 1985/86 (data not shown). However, this volume of PCH use has been re–distributed substantially across users. Since 1985/86, the increase in total PCH days used has been largest for 85+ year–old females (38.0%; from 1,111,700 days in 1985/86 to 1,534,306 days in 2007/08) and males (22.9%; from 357,668 days in 1985/86 to 439,430 days in 2007/08). These trends in total use have occurred despite dramatic reductions in per capita PCH use (Figure 3.4) and are due to substantial growth in the size of our old–old population (Figure 2.2).

- Total days of PCH use by 75 to 84 year–olds has remained quite stable since 1985/86 (i.e., has only increased by 5.1% for males and decreased by 7.5% for females). Conversely, total days of PCH use has decreased quite dramatically for 65 to 74 year–old males and females, by 16.8% and 22.2% respectively. This latter trend is due to decreases in per capita PCH days used (Figure 3.4), accompanied by only slight increases in the number of young–old Manitobans (Figure 2.2).

Figure 3.5: Total Number of Personal Care Home (PCH) Days Used by Older Adult Age and Sex Category, Manitoba, 1985/86–2007/08



Source: Manitoba Centre for Health Policy, 2010

Projecting the Use of PCH Beds in Manitoba

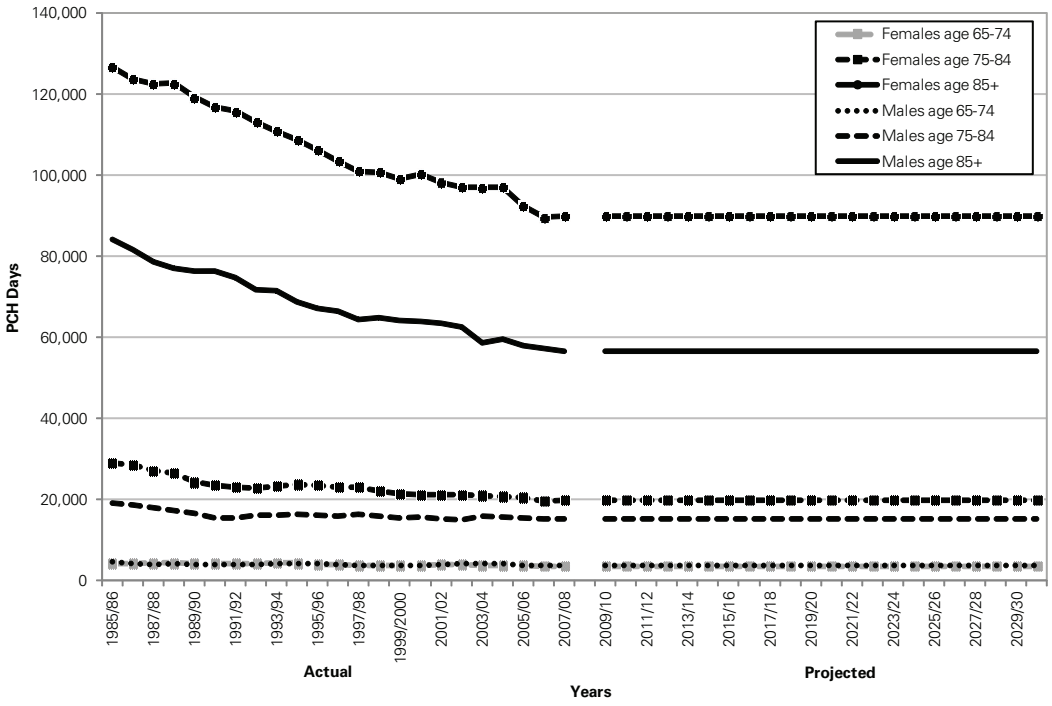
In the previous section, per capita use rates were combined with population aging trends to describe past overall changes in PCH use. These same principles were used to project future PCH use in Manitoba.

Data from Figure 3.4 (PCH days per 1,000 age– and sex–specific population) were used as the basic building block of our projection models. Our two projection scenarios make different assumptions about how these trends will change in the future. These scenarios, and their basic assumptions, are summarized in the following text.

- Scenario 1
  Figure 3.4 illustrates that per capita use rates have decreased substantially in the past. This scenario proposes that further reductions in per capita use will not occur.[11] This is meant to be the least optimistic scenario, where future PCH use rises proportionally with population growth. Past and projected per capita PCH use rates for this scenario are provided in Figure 3.6.

- Scenario 2
  Per capita use rates have changed uniquely across older adult age and sex groups (see Figure 3.4). For 85+ year–old males and females, this rate of decline was quite steep from about 1985/86 to about 1997/98 and has since slowed down somewhat (i.e., a curvilinear trend). A different trend is shown for 65 to 74 year–olds, where the rate of decline has been much slower (and linear) from 1985/86 to 2007/08. We used **regression analysis** to measure these unique trends in per capita use rates for each age–and sex–specific population. These, in turn, were used to project per capita PCH use rates from 2007/08 to 2030/31 (Figure 3.7).[12]

Figure 3.6: Actual (1985/86–2007/08) and Projected (2009/10–2030/31) Personal Care Home (PCH) Use Rates (Days Used per 1,000 Population) by Older Adult Age and Sex Category, Manitoba: Projection Scenario 1

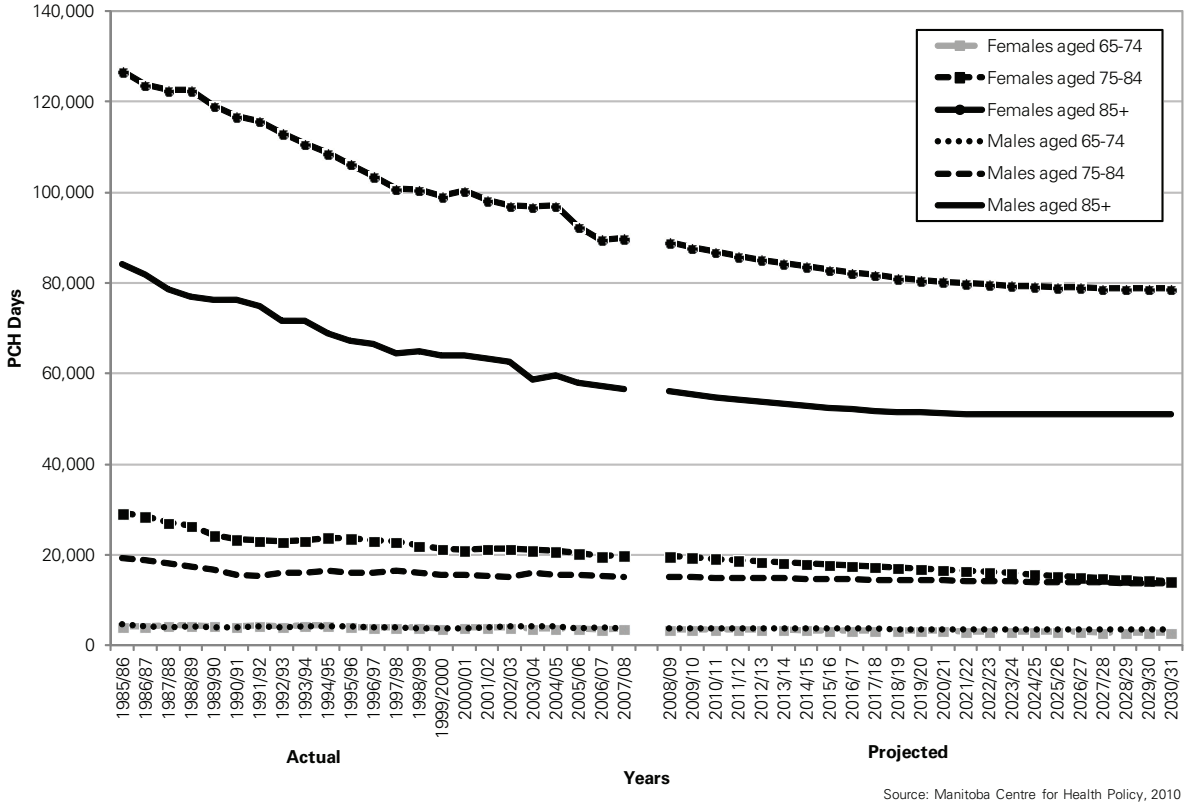


Source: Manitoba Centre for Health Policy, 2010

11 This could happen if the actual number of users/1,000 population (Figure 3.2) and/or the median LOS of PCH users (Figure 3.3) reached a 'floor effect', which in turn would influence PCH days/1,000 population.

12 While a more technical description of these regression models is available from the first author of this report, the assumptions and methods of this procedure are summarized in the following four points. (1) Prediction using regression analysis should never occur beyond the parameters of available data. As models were developed using actual data from 1985/86 to 2007/08 (22 years), this was interpreted to mean that PCH need should not be projected beyond 2030/31; 95% confidence intervals were also included in the projection model to recognize the challenges of making accurate projections far into the future. (2) Based on actual data from 1985/86 to 2007/08, regression models projected curvilinear trends (slowing rates of decline) for 85+ year–old males and females and linear trends for 65–74 year–olds. While curvilinear trends were initially reported for 75 to 84 year olds, these trends predicted rapidly *increasing* rates of decline, so that very few PCH beds would be needed by 2030/31. Looking closely at the 75 to 84 year–old data in Figure 3.4 however, this rate of decline was quite dramatic from 1985/86 to 1990/91 and has slowed since this time. For 75 to 84 year–olds, projection models were therefore based on data from 1991/92 to 2007/08, projecting slight linear decreases in per capita PCH use into the future. (3) When projecting curvilinear trends in Figure 3.6 (for 85+ year–olds), projected per capita use rates were held constant at the asymptote (lowest part) of the projection model curve, based on the assumption that per capita use rates should never increase in the future. (4) Regression $\mathbf{R^2}$ values were calculated for each age–sex model. These values range in size from 0.981 for 85+ year–old females (indicating that 98.1% of the variation in annual per capita use rates could be explained by a curvilinear trend) to 0.28 for 65 to 74 year–old males.

Figure 3.7: Actual (1985/86–2007/08) and Projected (2008/09–2030/31) Personal Care Home (PCH) Use Rates (Days Used per 1,000 Population) by Older Adult Age and Sex Category, Manitoba: Projection Scenario 2



Source: Manitoba Centre for Health Policy, 2010

As our next step in projecting PCH beds, data from Figures 3.6 and 3.7 were superimposed on age– and sex–specific population projections from 2007/08 to 2030/31. This projection strategy does not account for the small proportion (less than 5.0%) of PCH beds used by younger adults (i.e., less than 65 years old) and assumes that PCHs in Manitoba will continue to operate at 100% capacity. Based on these assumptions, PCH bed projections are provided in Figure 3.8 for each of the two scenarios provided.

As expected, our two scenarios provide very different PCH bed projections. In Scenario 1 (current per capita rates of use are as low as they can get), the need for additional PCH beds for older adults starts immediately and increases more rapidly starting in 2021/22 (when Baby Boomers start to reach age 75 years). This model projects that older Manitobans will use 13,366 PCH beds by the year 2030/31, a 49.0% increase from the number of PCH beds used by older adults in 2007/08.[13] While the assumption behind this projection (per capita use rates are as low as they can get) may not be realistic, these data highlight the importance of developing alternate care strategies to PCH use.

Scenario 2 is a more optimistic model and assumes that reductions in per capita use will continue to some extent into the future, helping to offset increased use due to population growth. This model projects that the need for more PCH beds will be modest until 2020/21. At this time, older adults are projected to use 9,644 PCH beds, which is 7.5% more beds as compared to 2007/08. Shortly after this year, the need for PCH beds is projected to increase substantially. By 2030/31, older adults are projected to use 11,573 PCH beds in Manitoba, which is 29.1% more beds as compared to 2007/08.

13 The number of PCH beds used by older adults in 2007/08 was calculated by summing the total PCH days in Figure 3.5 (3,273,100 days) and dividing this by 365 (assuming that PCH beds were used at 100% capacity). This was deemed valid, as Manitoba Health reports that 3,445,053 PCH days were used in 2007/08 (by all age groups) (Manitoba Health, 2008). People 64 years old and younger comprise about 5% of all PCH users; 95% of 3,445,053 is 3,272,800, which is approximately equal to 3,273,100.

Five additional points should be considered from these projections. First, each of our scenarios project PCH use and do not consider the number of people currently accepted (**panelled**) but waiting for PCH admission. This number of people varies throughout time in Manitoba. For example, on average, from 1997 to 2002, 29.8% of all people panelled annually into a PCH were not admitted in the same fiscal year (data not shown). From 2003/04 to 2007/08, this proportion of individuals increased to 34.8%. These numbers imply that the wait list for PCH admission is growing in Manitoba. This factor should be incorporated into future planning scenarios.

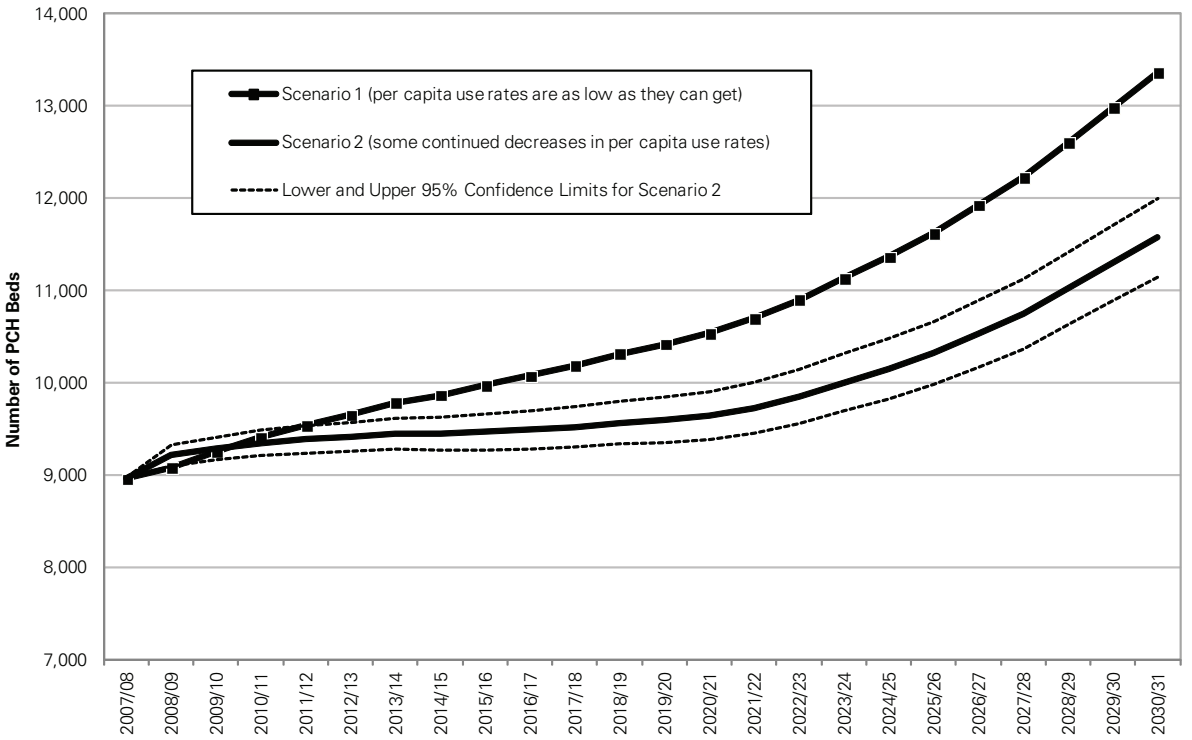
Second, our Scenario 1 should not be discounted entirely. Across all age categories, PCH use rates (days/1,000 population) decreased by 31.2% from 1985/86 to 2007/08 (Figure 3.4). Our regression models (Scenario 2; Figure 3.7) estimate that these rates will further decrease 13.4% by 2030/31. If this is not attainable, actual increases in PCH use may be a hybrid of Scenarios 1 and 2. To some extent, this, as well as a more optimistic scenario, is accounted for by the 95% **confidence limits** in our regression model. These confidence limits show us that by 2030/31, older Manitobans may actually use somewhere between 11,151 PCH beds (a 24.3% increase from 2007/08) and 11,994 beds (a 33.8% increase from 2007/08). Similarly, these confidence limits indicate that by 2020/21 older adults may use between 9,385 (a 5.7% increase from 2007/08) and 9,904 (a 10.4% increase from 2007/08) PCH beds.

Third, accurately projecting PCH use requires, in part, that we can accurately predict how past PCH use rates (i.e., days used per 1,000 population; Figure 3.4) will continue to change in the future. While our projections account for past trends in PCH use (e.g., that people now enter into a PCH later in life and tend to stay for a shorter time), they do not account for how these trends could systemically change in the future. For example, it is possible that advances in medical technology will systematically keep people alive longer in the future, but in poorer health. If this occurs, our PCH projections in Figure 3.8 may start to approximate Scenario 1. Conversely, some evidence suggests that Baby Boomers will want to receive alternate forms of care in the future, which may reduce their use of PCH beds per stay. As discussed in Chapter 8 of this report, future analyses should therefore focus on PCH bed *equivalent* projections. These projections could predict the joint need for PCH and supportive housing beds in Manitoba. When combined with the appropriate clinical data, this type of evidence can help planners to better predict future overall use, and to decide on the appropriate combination of supportive housing and PCH beds required to help meet this increased use.

Fourth, Figure 2.2 shows us that most of the projected increase in PCH use (until 2030/31) is due to growing numbers of 75 to 84 year–olds. A large proportion of PCH users, however, are 85+ years–olds (Figure 3.1), and Baby Boomers will not reach this age until 2031/32. This means that the use of additional PCH (or equivalent) beds will likely increase substantially after 2031/32.

Fifth, projections in Figure 3.8 are based on provincial data. As shown earlier in this report (Figure 2.4), these projections may vary substantially across Manitoba. RHA–specific PCH projections are beyond the scope of this report.

Figure 3.8: Scenarios Projecting the Number of Personal Care Home (PCH) Beds Used by Older Manitobans, 2007/08–2030/31 *



* Estimates in this figure are based on 100% usage of PCH bed days. In 2007/08, PCH beds were used at 96% capacity. In any given year, the actual number of required PCH beds may therefore be underestimated by approximately 4%.

Source: Manitoba Centre for Health Policy, 2010

SECTION 2: Manitoba's Expanded Continuum of Care: Evidence to Support Planning Processes

Manitoba's universal home care program was established in 1974 and provides a continuum of services including home–based care planning and provision, liaising with other care providers, and managing PCH placement. In 2004, Manitoba Health announced Aging in Place[14] as an alternative to PCH care for some individuals. This in effect expands Manitoba's continuum of home and PCH care to include supportive housing. However, most RHAs have limited data to identify the different needs of this continuum of users. Also, there is no centralized system in Manitoba that identifies supportive housing clients, and that records their program start (i.e., move in) and end dates. Without this type of information, it is challenging to study the role that supportive housing plays in Manitoba, as an alternate to PCH use, now and in the future.

Recently, the RAI–HC© and RAI–MDS 2.0© systems were implemented in the WRHA. These systems richly describe home care, supportive housing, and PCH users in many domains. Especially when used in conjunction with the WRHA supportive housing file, these data overcome some of the aforementioned challenges, and provide a unique opportunity to study the continuum of older adult care in Manitoba.

This section provides two types of information. Chapters 4 through 6 provide background information for interpreting all subsequent results in this report. Chapter 4 describes the strengths and challenges of home care and PCH data historically provided to MCHP for research purposes. Chapter 5 discusses some of the strengths and challenges of the newly implemented RAI–HC© and RAI– 2.0© systems in the WRHA, when used for research purposes. Based on this information, Chapter 6 discusses the methodology we used to conduct all subsequent analyses in this report.

The remaining chapters in this section address our two study objectives. In Chapter 7, we present a tool that differentiates the needs of home care, supportive housing, and PCH users. This tool can be used to help place people into supportive housing versus PCH care, so that the type of care people receive matches their needs. Chapter 8 discusses a second new tool we developed to more clearly define PCH residents' needs. Using this tool, we also demonstrate the similarities and differences between supportive housing and PCH users. Lastly, by referring to our PCH projection models (Chapter 3), we discuss the potential for supportive housing to offset PCH use, now and in the future.

14 Aging in Place provides several housing options for older adults as an alternative to PCH care. These include: i) help for seniors and their families; ii) supports to seniors in group living; and iii) supportive housing. More information about these options are provided at the following URL: http://www.gov.mb.ca/health/aginginplace/

Chapter 4: Continuum of Care Data Currently Available in Manitoba

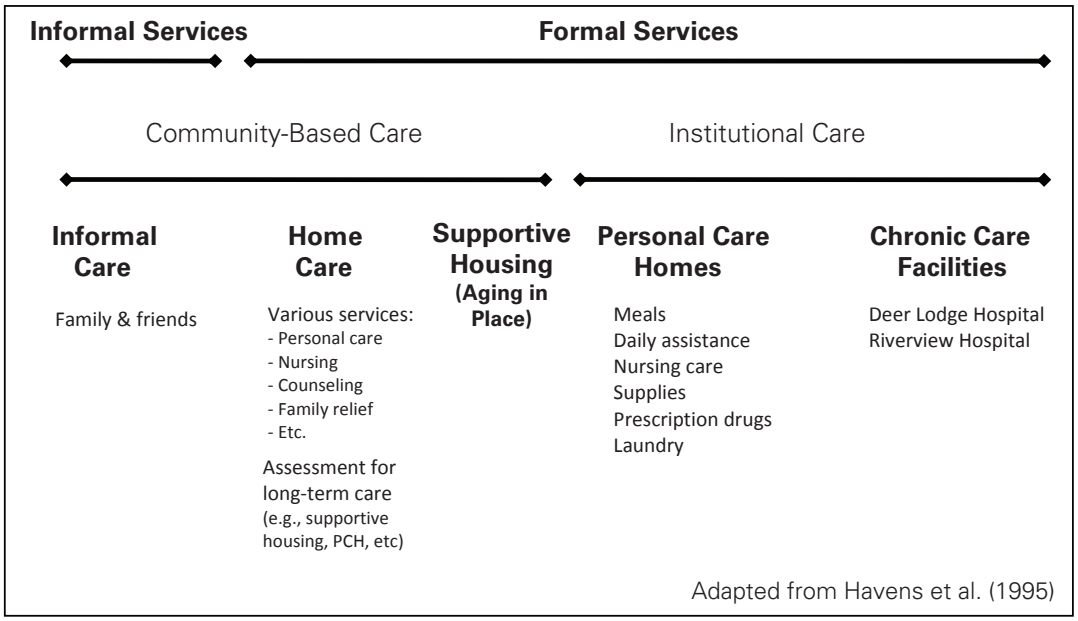
Manitoba's Continuum of Care

Manitoba's continuum of care is provided in Figure 4.1 (Havens, 1995) and is characterized by a single point of entry. A home care case coordinator works with individuals to determine home care eligibility and to ensure that appropriate services are provided. If and when needed, this case coordinator also assists with an application to PCH care. Home care services in Manitoba are provided at no direct cost to the individual. The number of home care users in Manitoba has risen considerably, from 25,949 clients in 1995 to 34,593 clients in 2004.[15]

Manitoba residents are required to cost share PCH living expenses using an income–based formula. This per diem fee currently ranges from $31.30 to $73.40 / day (Manitoba Health, 2010) and helps to cover costs for room and board, assistance with some daily tasks, prescription drugs, and other services. As of 2008/09, there were 9,952 PCH beds in Manitoba and 5,641 PCH beds in the WRHA (Manitoba Health, 2009).

In 2004, Manitoba Health implemented Aging in Place (Manitoba Health, 2006). As one aspect of this program, supportive housing is designed to provide 24–hour support and supervision (but not continuous care) to people with fairly minor physical and/or cognitive needs. Unlike PCHs, supportive housing residents pay for rent and a service package (e.g., meals, laundry, housekeeping), but receive personal care services (e.g., to help with mobility) at no extra cost. Supportive housing residents are also responsible for their prescription drug costs, as per Manitoba's income–based **Pharmacare program**. The number of supportive beds has increased considerably in the WRHA from 272 beds in 2005 to 516 beds in 2010.

Figure 4.1: A Basic Schematic of Manitoba's Continuum of Care



15 Numbers obtained from the Manitoba Support Services Payroll files housed at MCHP (data not shown).

Continuum of Care Data Historically Collected in Manitoba

Administrative files housed at MCHP capture basic measures of home care and PCH use. From Manitoba's level of care algorithm, some data are also available to define PCH residents' needs. The strengths and challenges of these data are discussed in this section.

Measuring Home Care Use

Data gathered to determine home care eligibility are not captured electronically in Manitoba and are therefore not available to MCHP. Population–based research can therefore not be conducted to determine, for example, differences in home care user characteristics across regions. Also, patterns of home care use have historically been measured using the **Manitoba Support Services Payroll (MSSP)** file. Previous MCHP research shows that these data undercount the true number of home care clients by as much as 14% (Roos et al., 2001). Further, MSSP does not consistently record the type and direct hours of home care services provided. Because of these limitations, MSSP is typically only used to estimate the number of home care clients and their total duration (days open) of use.

Personal Care Home Users

Within Manitoba, a standardized tool is used to help determine PCH eligibility. As a part of this tool, all PCH applicants are evaluated on the assistance they need to complete ADL tasks (e.g., bathing and dressing, ambulation and transfers, eating, elimination); on their need for professional interventions (e.g., IV medication, oxygen therapy); and on their behaviour management (e.g., extent of wandering, disruptive behaviour). Based on scores in each of these items, an algorithm is used to assign people to one of four levels of care. Unfortunately, only the assessment date and assigned level of care (not the individual item) is recorded electronically in Manitoba. However, data at MCHP are available to accurately define PCH resident admission, hospitalization, discharge, and death dates.

The Need for an Integrated System

To support program planning in Manitoba, an integrated data system is required to measure the needs of home care, supportive housing, and PCH users. Using a standard set of measures, the RAI–HC© and RAI–MDS 2.0© systems richly describe users' needs across this continuum and can be used to help decide when people require a different type of care. In addition, a centralized file is needed in Manitoba to capture supportive housing users and to identify their admission/discharge dates and disposition status (e.g., to PCH, hospital, death). Collectively, having this type of data across all RHAs would provide answers to the following basic questions: i) What are the health–related characteristics of supportive housing users in Manitoba, how long do people stay in supportive housing before transferring to PCH care, and how much does this vary across Manitoba RHAs? ii) If supportive housing is expanded in Manitoba, who should this program accommodate, if the goal is to reduce PCH use now and in the future? Answers to these and other questions are needed to help plan future continuing care strategies in Manitoba.

Chapter 5: Getting to Know RAI–HC© and RAI–MDS 2.0©

Overview

This research is our first opportunity to link the RAI–HC© (home care) and RAI–MDS 2.0© (PCH) systems with administrative health files housed at MCHP, and considerable effort was dedicated to understanding how these data should be used.[16] During this process, we learned that the supporting software for RAI–HC© should now be used to count home care clients in the WRHA. This chapter is dedicated to answering some 'behind the scene' questions about RAI–HC© and RAI–MDS 2.0© data, important for understanding our results in later chapters and for guiding subsequent research at MCHP. An overview of these findings is provided in this chapter. More detailed results are presented in Appendices 1 (for RAI–HC©) and 2 (for RAI–MDS 2.0©).

Terminology

The WRHA implemented RAI–HC© as a strategy to further enhance home care services. RAI–HC© is, in turn, supported by an information technology system developed by Momentum Healthware Inc. called the Home Care Task Management Module (TMM). TMM implements RAI–HC© and also stores home care case activity data (e.g., for identifying home care users, their reasons for home care use, start and end dates). RAI–HC© is comprised of a standardized assessment instrument (called the Minimum Data Set for home care; MDS–HC) and several resulting applications designed to improve home care provision (interRAI, 2002).

In 2004, the WRHA implemented RAI–MDS 2.0© in PCHs. Like RAI–HC©, this instrument consists of an actual assessment tool (Minimum Data Set Version 2; MDS 2.0) and resulting applications (interRAI, 2005).

Using TMM versus MSSP to Measure Home Care Use

Historically, home care use has been measured using the MSSP files. MSSP does not provide a start and end reason for each home care record, making it difficult to identify people who use home care once versus multiple times. Conversely, TMM provides several start (e.g., new client, start of new services) and end (e.g., transfer to a different home care facility, discharged) reasons for each home care record. These can be used to more clearly define people with one versus multiple home care episodes. Not surprisingly therefore, TMM provides different (and likely more accurate) patterns of home care use compared to MSSP. For example, TMM shows that most people use home care once for a longer duration. Conversely, MSSP shows that many people have multiple home care episodes, each shorter in duration. Overall, TMM provides some advantages over MSSP for measuring home care use patterns.

We also compared counts of home care users between MSSP and TMM. These analyses demonstrate that TMM does not capture all home care clients until April 2005. Unfortunately, fewer home care clients were entered into MSSP commencing April 2004. To accurately record trends in the number of home care clients in Winnipeg, we recommend using only MSSP until March 31, 2004 and using a combination of MSSP and TMM data until March 31, 2006 (the end of our analysis period).

16 Throughout this deliverable we conversed extensively with key WRHA staff regarding the use of RAI–HC© data. We would especially like to acknowledge the support and feedback provided by Dr. Lori Mitchell, WRHA Home Care Researcher; Jim Legaros, WRHA Policy Analyst; Pat Younger, WRHA Home Care Team Manager; and Tara–Lee Procter, Transitional Manager, WRHA Home Care Program.

Assigning MDS–HC Assessments to Home Care Clients

MDS–HC assessments richly describe the socio–demographic and clinical profile of home care clients. These assessments have many tables (each providing a different type of information about the client). A given assessment is 'locked' when all tables have been accurately completed (denoted as Full–Locked [F–L]). This is an all–or–none process. For unlocked assessments, it is not possible to determine which tables have accurate information.

During preliminary discussions, Advisory Group members emphasized that unlocked assessments should not be used, except in certain circumstances. They also emphasized that MDS–HC assessments are completed mainly on longer–term clients using community–based (versus, for example, palliative care) home care services. Our analyses show that 85.2% of long–term community–based home care clients had at least one F–L assessment. However, only 51.8% of all home care users had an F–L assessment, representing 68.5% of all home care days open. Research using (F–L) MDS–HC assessments can therefore be generalized to some but not all types of home care clients.

MDS 2.0 Assessments

Like MDS–HC, MDS 2.0 assessments richly describe PCH residents using various clinical measures. Minimally, these assessments should be completed with 14 days of PCH admission with follow–up assessments done every 90 days (interRAI, 2005).[17] Also like MDS–HC, MDS 2.0 assessments must be locked to verify accuracy. At the time of this research, RAI–MDS 2.0© was implemented only in WRHA not–for–profit PCHs.

As explained by Advisory Group members, 2004/05 should be considered a 'building year' for MDS 2.0 assessments. For example, 720 residents were admitted to not–for–profit Winnipeg PCHs in 2004/05; only 47.6% of these residents had a locked assessment at any time in this year. This improved dramatically by 2006/07, where most (86.2%) admitted residents had one or more locked MDS 2.0 assessments.

Similar trends were found when looking at the timing between MDS 2.0 assessments. For example, of all new residents in 2004/05, only 18.8% were assessed with 30 days of their PCH admission date. This improved dramatically by 2006/07, where 74.3% of all new residents were assessed during this time. Also, the number of residents with two or more locked assessments increased substantially in 2005/06, and almost all (93.6%) consecutive assessments were completed within 120 days of each other. PCH–level data for these results are available in Appendix 2.

17 After the initial full assessment, three quarterly reviews and an additional full assessment are required in each 12 month period.

Chapter 6: Study Methods for Subsequent Chapters

The remainder of this report describes the new tools we developed. These analyses used data from the RAI–HC© and RAI–MDS 2.0© systems in the WRHA and the WRHA supportive housing client registration file.

Defining the Study Cohort

In Chapter 5, we learned that RAI–HC© does not directly provide an assessment reason (i.e., for home care application versus panel for supportive housing or PCH placement). To conduct our remaining research, we first had to flag assessments completed at these different times. A schematic of this strategy is shown in Figure 6.1.

We first identified all people with an MDS–HC assessment (locked or not) between April 1, 2005 and February 1, 2007 (n=17,859). These assessments were cross–tabulated with the WRHA supportive housing file followed by the PCH panel file housed at MCHP. Remaining assessments were matched to the home care clients described in Chapter 5, focusing on people using longer–term community–based home care services.[18] Only one MDS–HC assessment was selected per person to ensure that sub–groups of our study cohort were independent.

Assignment to the Supportive Housing Cohort

The WRHA supportive housing file contained 349 individuals who lived in supportive housing for at least one full day between April 1, 2005 and February 1, 2007. Of these people, 217 had an F–L MDS–HC assessment that was completed either 60 days prior to their supportive housing program move–in date or at some point during their stay.[19] This small number of individuals comprises the supportive housing cohort in our research.

Assignment to the PCH Panel Cohort

In Winnipeg, 3,151 people were panelled for PCH admission between April 1, 2005 and February 1, 2007; 52.9% (n=1,668) of these people were panelled from hospital (Table 6.1). While this latter group had very few F–L assessments, Advisory Group members emphasized that select MDS–HC tables (e.g., measuring functional independence, cognitive performance, incontinence) were almost always completed for these residents. Based on this information and after conducting some **sensitivity analyses**,[20] people were assigned to the PCH panel group if they were: i) panelled from community and had an F–L MDS–HC assessment within 60 days of their panel date or ii) panelled from hospital and had a locked or unlocked MDS–HC assessment during their hospital stay.

18 More details about this home care sample are provided in Appendix 1 (see section entitled *Assigning MDS–HC Assessments to Home Care Clients*) and in particular Table A1.5. Type of home care episodes was estimated using the WRHA home care office IDs listed in the TMM case activity file. Long–term clients using community–based services are defined as 'Group A' clients in Table A1.5 (versus clients, for example, who used only palliative services).

19 About half of this cohort had multiple F–L MDS–HC assessments that fit this criterion. In this instance, we chose the assessment closest to the person's supportive housing move–in date.

20 To further investigate use of these unlocked assessments, we measured changes in response codes (for ADLs and CPS scores) between unlocked and previously locked MDS–HC assessments (in community). As expected, these analyses show increasing ADL dependence (and worsening CPS scores) as residents transitioned to hospital. Also, some of our results in Chapter 8 were calculated both with and without these unlocked data. Similar results were obtained with and without these data. Based on this information, we decided to restrict our analyses to MDS–HC items completed at the time of hospital panel and use unlocked hospital–based MDS–HC assessments completed at this time.

Assignment to the Home Care Cohort

This group consists of individuals who were not assigned to either the supportive housing or PCH panel group but were identified as using long–term (more than 90 days) community–based home care services. In total, 6,351 of these users had an F–L MDS–HC assessment. For people with multiple assessments, the latest was used.

During interim analyses, we noticed that ADL dependency typically followed a certain sequence, where people first became dependent in **early–loss ADLs** (e.g., dressing, personal hygiene), followed by **middle–loss ADLs** (transfer, locomotion, toilet use), and then **late–loss ADLS** (eating and being mobile in bed). As a final step in data preparation, we removed all individuals in Figure 6.1 without this basic pattern (for example, if an assessment showed that dependency in late–loss ADLs preceded dependency in middle– or early–loss ADLs). This final step in data cleaning reduced the size of our supportive housing cohort by 6.1% (from 231 people to 217 people in Figure 6.1) and also reduced our PCH panel and home care groups by 7.4% (from 2,174 to 2,014 people in Figure 6.1) and 4.0% (from 6,351 to 6,097 people), respectively.

Development of a PCH Resident Cohort

RAI–MDS 2.0© data were provided from April 1, 2005 to March 31, 2007. A sub–set of this cohort (i.e., new and existing residents with two or more locked MDS 2.0 assessments) was used in Chapter 8 to create PCH volume metrics.

Figure 6.1: Study Cohort (April 1, 2005 to February 1, 2007) Used for Analyses in Chapters 7 and 8

Home Care	Supportive Housing	PCH Panel	PCH Residents
Long-term (>90 day) clients using community-based clients*	Clients having F-L** MDS-HC assessments 60 days prior to their supportive housing move-in date, or at some time during supportive housing stay	People having an MDS-HC assessment +/- 60 days of their PCH panel date a) Community 716 people with F-L MDS-HC assessments b) Hospital 1,298 people with F-L & other MDS-HC assessments	Residents with two or more full or quarterly locked MDS 2.0 assessments (non-proprietary PCHs only)† a) New residents (n = 1,189) b) New and existing residents (n = 4,090)
n = 6,097	n = 217	n = 2,014	

* Defined as Group A clients in Table AI.5 of Appendix I

** F-L - Full-Locked; MDS-HC assessments that have been 'signed off' by assessors as being 100% complete and accurate.

† For Personal Care Home (PCH) residents, we used MDS 2.0 assessments captured from April 1, 2005 to March 31, 2007.

Source: Manitoba Centre for Health Policy, 2010

Table 6.1: Number of People Panelled to Personal Care Home (PCH) from Community versus Hospital and the Number (Percent) of these People with an MDS–HC Assessment Completed Within 60 days of their Panel Date, Winnipeg Regional Health Authority, April 1, 2005 – February 1, 2007

Source of PCH panel*	# of total recorded PCH panels	# (%) of people with (only) unlocked MDS-HC assessments +/- 60 days of PCH panel*	# (%) of people with full-locked MDS-HC assessments +/- 60 days of PCH panel*	# (%) of people without any MDS-HC assessments (locked or unlocked) +/- 60 days of PCH panel*
Community	1,483	279 (17.7)	798 (50.8)	406 (25.8)
Hospital	1,668	1,154 (67.5)	399 (23.3)	115 (6.7)
Total	3,151	1,433 (43.7)	1,197 (36.5)	521 (15.9)

*For individuals panelled from hospital, MDS-HC assessments also had to occur between their hospital admission and separation dates.

Note: The size of the PCH panel cohort in this table (798+399+1,154=2,351) does not equal the final panel cohort in Figure 6.1 (n=2,014), as data in the present table include: i) panel members whose ADL scores did not follow typical hierarchical patterns (n=160); ii) hospital-based panel members whose panel or MDS-HC assessment date occurred outside of the hospitalization period (n=146); iii) people who were identified as being panelled from community, but with the actual panel date intersecting hospital care (n=31).

Source: Manitoba Centre for Health Policy, 2010

Variables Used from the MDS–HC and MDS 2.0 Assessments

Several iterations of analyses were conducted in Chapters 7 and 8 of this report, each using different measures from RAI–HC©. After some discussion with select Advisory Group members, we decided to base our analyses on a combination of RAI–HC© outcome scales (e.g., the **Cognitive Performance Scale,** the **Activities of Daily Living Hierarchy Scale**, and the **Instrumental Activities of Daily Living difficulty scale**) and also individual MDS–HC variables (e.g., measuring incontinence, the presence of behavioral symptoms) (Table 6.2). While not presented in this report, some of our analyses in Chapters 7 and 8 were also conducted using additional RAI–HC© outcomes. Some of these additional findings are available from the first author of this report.

Table 6.2: An Overview of the Outcome Scales and Individual Measures used from RAI–HC© (home care) and RAI–MDS 2.0© (personal care homes) to Conduct this Research

Variable	Brief Description	MDS-HC (home care) Assessment Questions	MDS 2.0 (PCH) Assessment Questions
ADL Hierarchy Scale*	This scale measures a hierarchy of dependency when performing ADL tasks, with a scale that ranges from 0 (independent) to 6 (completely dependent). People needing assistance with early-loss ADLs (e.g., hygiene) are assigned lower scores than people needing assistance to complete late-loss ADL's (e.g., eating).	H2Ai: Personal hygiene H2Ah: Toilet use H2Ad: Locomotion H2Ag: Eating	G1Aj: Personal hygiene G1Ai: Toilet use G1Ae: Locomotion G1Ah: Eating
IADL Difficulty Scale*	This scale measures the amount of difficulty people have when performing 3 instrumental activities of daily living (IADLs) tasks - meal preparation, ordinary housework & telephone use. This scale ranges from 0 (no difficulties in any 3 tasks) to 6 (great difficulty in all 3 tasks). A score of 4 defines people with great difficulty completing only 1 of these IADL tasks.	H1Ba: Meal preparation H1Bb: Ordinary housework H1B3: Phone use	N/A
Cognitive Performance Scale (CPS)*	CPS measures the extent and severity of people's ability to make daily decisions (e.g. when to eat), to make themselves understood, and their memory recall. This scale ranges from 0 (intact) to 6 (very severe impairment). A score of '3' defines individuals with impairments in at least two of these areas, and with more significant impairments either when making daily decisions or themselves understood.	B2a: Cognitive skills for daily decision-making B1a: Short-term memory recall C2: Making self understood	B4: Cognitive skills for daily decision-making B2a: Short-term memory recall C4: Making self understood
Bladder Continence**	Control of urinary bladder function, with or without appliances.	I2 Response options: 0: Continent w/o device 1: Continent with device 2: Incontinent ≤ 1/week 3: Incontinent ≥ 2/week 4: Incontinent daily 5: Mult. daily incontinence	H1 Response options: 0: Continent 1: Incontinent ≤ 1/week 2: Incontinent ≥ 2/week 3: incontinent daily
Bowel Continence**	Control of bowel movement, with or without appliances.	I3 Response options: 0: Continent, no ostomy 1: Continent with ostomy 2: Incontinent ≤ 1/week 3: Incontinent once/week 4: Incontinent 2-3/week 5: Incont. almost all of time	H1 Response options: 0: Continent 1: Incontinent < 1/week 2: Incontinent 1/week 3: Incontinent 2-3/week 4: Incont. almost all of time
Behavioural Symptoms**	All response options for this question (wandering, verbally abusive behaviour etc) were combined to create the following categories: 1 (no symptoms in any area); 2 (symptom ≥ 1 area, but easily altered), 3 (symptom ≥ 1 area, and not easily altered)	E3a: Wandering E3b: Verbally abusive E3c: Physically abusive E3d: Socially disruptive E3e: Resists care	E4A&Ba: Wandering E4A&Bb: Verbally abusive E4A&Bc: Physically abusive E4A&Bd: Socially disruptive E4A&Be: Resists care
Caregiver Status**	Determines if the person has a 1^{O}y or 2^{O}y informal helper, & if so, if this helper has challenges. All responses were combined to create the following categories: 1. (1^{O}y or 2^{O}y helper, & no problems); 2. (1^{O}y or 2^{O}y helper, with 1+ problem); 3. (no 1^{O}y or 2^{O}y helper)	G1: (Presence of helper) G2a: Caregiver cannot continue 1^{O}y helper not happy with support from others 1^{O}y helper feeling stressed, etc.	N/A

* Outcome scales are provided as a part of the RAI-HC© and RAI-MDS 2.0© systems.
** Measure developed using individual items from MDS-HC and MDS 2.0 assessments
Note: 1^{O}y - primary; 2^{O}y - secondary

Source: Manitoba Centre for Health Policy, 2010

Chapter 7: A Process for Placing Supportive Housing and PCH Users

Chapter Highlights

This chapter uses a mathematical process called **Decision Tree Analysis (DTA)** to help differentiate the needs of supportive housing versus PCH users. Using a combination of RAI–HC© outcome scales and individual measures, our new tool, called the Expanded Long–term Care Placement Tool uses 12 decisions to correctly identify 76.0% of home care, supportive housing, and PCH panel members. This level of agreement varies by individual decision, emphasizing the need to consider this tree as a guideline versus a definitive decision making tool. Also, as a caveat to our results, DTA typically involves training (where the **decision tree** rules are developed) and validation (testing) groups. Given the limited sample of our supportive housing cohort (Figure 6.1), DTA validation was not feasible in this project. Pilot testing of this tool is also required, preferably using data from multiple RHAs.

Detailed Chapter Results

An Overview of Decision Tree Analysis (DTA)

People (or objects) can often be categorized into pre–determined groups (i.e., supportive housing versus PCH care). DTA uses different measures (e.g., a person's ability to dress independently, measures of cognitive impairment) to correctly place people into these groups. Starting with the entire sample as one, this process works using a variety of *if/then* splitting rules[21] that continue until the best agreement is reached between actual and predicted outcomes (i.e., when as many people as possible are placed in their correct group). Like all statistical techniques, levels of agreement in DTA are strongly affected by the type and number of variables inputted into the model. DTA samples are therefore typically divided into training (where the rules are developed) and validation (testing) sub–groups.

Initial outputs from DTA are often overly complex with too many *if/then* splitting rules, and decision trees should be manually simplified (called 'pruning') based on pre–determined rules.[22] This pruning process continues iteratively until a balance is reached between tree complexity and accuracy of results.

Study Cohort and Variables Used

From Figure 6.1, our supportive housing cohort consisted of 217 people. To equally weight our sample, we added to this group a random selection of 217 home care clients and a similar number of our PCH panel cohort stratified by level of care. In total therefore, DTA was conducted on 652 individuals. This small number of individuals could not be further divided into a training and validation group.

Variables entered into DTA are listed in Table 7.1 and include a range of individual items and outcome scales produced by RAI–HC©.

21 An example of this rule may be IF a person had some cognitive impairments but could independently perform ADL tasks, THEN they would likely reside in supportive housing.

22 Overly complex decision trees often have very good levels of agreement in the training sample but poor validation results, meaning that the DTA model cannot be generalized to an overall population. We therefore developed three pruning rules for use in this research. First, any splitting that resulted in cell sizes less than 5 were automatically pruned, as these cell sizes cannot be displayed at MCHP. Also, DTA sometimes splits groups without a change in outcome (e.g., both the 'parent' and all 'offspring' groups as labeled as supportive housing users), and these groups were automatically pruned. Lastly, splitting rules in some instances provide non–intuitive results, usually involving few people (e.g., more independent people were labeled as PCH versus supportive housing users). In these few instances, decision trees were pruned.

Table 7.1: Measurements Used from RAI–HC© to Conduct Decision Tree Analysis

Scale		Range of Response Options
ADL-Hierarchy Scale*	0	Independent, or at most, requiring set-up help in all 4 ADLs
	1	Requiring at most supervision in all 4 ADLs
	2	At most, limited (non-weight bearing) assistance to complete each ADL
	3	Extensive (weight-bearing assistance) for toilet and personal hygiene; at most, limited (non-weight bearing) assistance for locomotion and eating
	4	Extensive (weight-bearing assistance) for locomotion and eating
	5	Full dependence for locomotion and eating
	6	Full dependence for all ADLs
IADL-Difficulty Scale*	0	No difficulty in any 3 IADLs
	1	Some difficulty in 1 IADL but no difficulty in the other 2 IADLs
	2	Some difficulty in 2 IADLs but no difficulty in the other 1 IADL
	3	Some difficulty in all 3 IADLs
	4	Great difficulty in 1 IADL but not the other 2 IADLs
	5	Great difficulty in 2 IADLs but not the other 1 IADLs
	6	Great difficulty in all 3 IADLs
Cognitive Performance Scale*	0	Intact
	1	Borderline intact (challenges in one area but not severe)
	2	Mild impairment (challenges in 2 or 3 areas, but none severe)
	3	Moderate impairment (challenges in 2 or 3 areas, and more severe in 1 area)
	4	Moderate severe impairment (challenges in 2 or 3 areas, and more severe in 2 areas)
	5	Severe impairment
	6	Very severe impairment
Bladder Continence**	0	Continent without device
	1	Continent with device
	2	Incontinent ≤ 1/week
	3	Incontinent ≥ 2/week
	4	Incontinent daily
	5	Multiple daily incontinence episodes
Bowel Continence**	0	Continent without ostomy
	1	Continent with ostomy
	2	Incontinent ≤ 1/week
	3	Incontinent once/week
	4	Incontinent 2-3 times/week
	5	Incontinent almost all of the time
Behavioural Symptoms**	1	No symptoms in any area
	2	Symptoms in one or more area, but easily altered
	3	Symptoms in one of more area, not easily altered
Caregiver Status**	1	No challenges with primary or secondary helper
	2	One or more challenges with primary or secondary helper
	3	No primary or secondary helper

* Outcome scale from RAI-HC©.
** Measure developed using individual MDS-HC assessment items.

Source: Manitoba Centre for Health Policy, 2010

The Expanded Long–Term Care Placement ($LTCP_{EXP}$) Tool

The Expanded Long–term Care Placement ($LTCP_{EXP}$) Tool is presented in Figure 7.1, with levels of agreement provided in Figure 7.2. From our list of possible variables, $LTCP_{EXP}$ used four measures (the ADL Hierarchy Scale, the IADL Difficulty Scale, the Cognitive Performance Scale, and bladder incontinence) to differentiate home care, supportive housing, and our PCH panel cohort. For example, individuals who required at most set–up help to perform ADLs (i.e., a score of '0' on the ADL–H

Scale) and who had no cognitive challenges (CPS=0) were designated as home care users (*decision 1*). Conversely, individuals requiring weight–bearing ADL assistance (i.e., a score of 3 or greater on the ADL–H Scale) were assigned to the PCH panel group (*decision 12*). As a third example, for mostly ADL–independent individuals with borderline intact CPS scores, $LTCP_{EXP}$ differentiates between home care users who had, at most, great difficulty completing one IADL task (score of '4' or lower on the IADL Difficulty Scale) (*decision 2*) and supportive housing users who had great difficulty completing two or more IADLs (*decision 3*). Lastly, for individuals requiring ADL supervision, with mild cognitive impairments, and with great difficulties conducting two or more IADLs, $LTCP_{EXP}$ assigned people without bladder challenges to supportive housing (*decision 7*) and people with any degree of bladder incontinence to the PCH panel group (*decision 8*). Collectively, these and other decisions correctly identified 65.0% of home care clients, 79.7% of supportive housing, and 83.5% of our PCH panel cohort, for an overall level of agreement of 76.0% (Table 7.2).

Table 7.2: Percent Agreement Between Actual and Predicted User Groups by the $LTCP_{EXP}$ Tool, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

		Predicted User Groups			
		Home Care	Supportive Housing	PCH Panel	Total (#)
Actual User Groups	Home Care	**65.0%**	12.9%	22.1%	217
	Supportive Housing	14.3%	**79.7%**	60.0%	217
	PCH Panel	51.0%	11.5%	**83.5%**	218
					652

Note: $LTCP_{EXP}$ signifies Expanded Long-Term Care Placement Tool

Interpretation: 65% of actual home care users, 80% of actual SH users, and 84% of those actually panelled for PCH were correctly placed (predicted) by $LTCP_{EXP}$.

Source: Manitoba Centre for Health Policy, 2010

It is important to keep in mind that at each juncture, $LTCP_{EXP}$ makes an average (and therefore imperfect) decision. Looking at Table 7.3 for example, of the 113 people assigned to home care in decision 1, 85% (n=96) were actually home care clients, while the remaining 17 individuals were from either our supportive housing or PCH panel cohort. $LTCP_{EXP}$ should therefore be viewed as a guideline rather than a definite decision–making strategy. It is also important to keep in mind that many of the variables used by $LTCP_{EXP}$ are co–related. For example, only 17.7% of the people in decision 1 (those who required at most set–up help to complete ADLs) had greater difficulties in two or more IADL tasks (i.e., a score of 5 or greater on the IADL Difficulty Scale), compared to 97.2% of individuals in decision group 12. A negligible proportion of all groups (except groups 9, 11, and 12) had behavioral symptoms. These three groups had needs in many other areas.[23]

23 It is important to note that 15% of home care clients were incorrectly assigned to decision 12 (PCH panel) (Table 7.3). Each of these clients needed weight–bearing ADL assistance, but may have had limited or no challenges in all other domains (e.g., Table 7.3 shows that only 49.3% of this group had significant cognitive impairments, and only 32.6% had an informal caregiver who was having difficulties). While not detected in our current sample, these additional factors (e.g., the presence of an informal caregiver) may have more strongly influenced decisions if a larger cohort of people had been available.

Figure 7.1: Schematic of the $LTCP_{EXP}$ for Placing the Home Care, Supportive Housing and Personal Care Home (PCH) Panel Cohorts, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

ADL-Hierarchy Scale*	At most, set-up help (0)				Supervision (1)					Non weight-bearing assistance (2)		Weight - bearing Assistance (3+)	
Cognitive Performance Scale (CPS)*	Intact (0)	Borderline Intact (1)		Mild+ Impair. (2+)	Intact or Borderline Intact (0-1)	Mild Impairment (2)			Mod.+ impair. (3+)	Intact (0)	Any impair. (1+)	–	
IADL-Difficulty Scale*	–	At most, great difficulty with 1 IADL (≤4)	Great difficulty with 2+ IADL (≥5)	–	–	At most, great difficulty with 1 IADL (≤4)	Great difficulty with 2+ IADL (≥5)		–	–		–	
Bladder Continence**	–				–		Continent (0-1)	Some incont. (2+)	–	–		–	
Decision #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
Decision	Home Care	Home Care	Support. Housing	Support. Housing	Home Care	Support. Housing	Support. Housing	PCH Panel	SH / PCH Panel	Home Care	PCH Panel	PCH Panel	

* Outcome scale provided from RAI-HC©.

** Measure developed using individual MDS-HC assessment items.

Note: $LTCP_{EXP}$ signifies Expanded Long-Term Care Placement Tool

Note: The symbol '–' denotes that a measure was not used to further refine the decision tree result. For example, regardless of their cognitive, IADL and bladder challenges, individuals requiring weight-bearing ADL assistance were assigned to decision #12 (see Table 7.3 for more details).

Note: A general description of each measure is provided in Table 6.2, and the scoring system used for each measure is explained in Table 7.1.

Source: Manitoba Centre for Health Policy, 2010

Table 7.3: Further Details About the Groups Identified by the $LTCP_{EXP}$ Tool, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

I. Decision Tree Results:												
i) Decision #:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
ii) Decision:	**Home Care**	**Home Care**	**Support. Housing**	**Support. Housing**	**Home Care**	**Support. Housing**	**Support. Housing**	**PCH Panel**	**SH/PCH panel**	**Home Care**	**PCH Panel**	**PCH Panel**
iii) Cohort Size:	**113**	**37**	**16**	**170**	**16**	**6**	**6**	**10**	**28**	**17**	**89**	**144**
II. Actual Users (%):												
i) Home Care	85	59	s	14	75	s	s	s	s	65	s	15
ii) Supportive Housing	s	41	69	81	s	s	s	s	54	s	s	5
iii) PCH Panel	s	0	s	5	s	s	s	60	43	s	69	80
III. Additional Traits:												
ADL Hierarchy (% scoring 3+)	0	0	0	0	0	0.0	0.0	0.0	0.0	0	0	100
Cogntive Performance (% scoring 3+)	0	0	0	18.2	0	0.0	0.0	0.0	100.0	0	31.5	49.3
IADL Difficulty (% scoring 5+)	17.7	0.0	100.0	59.4	68.8	0.0	100.0	100.0	82.1	70.6	87.6	97.2
Bladder continence (% scoring 3+)	17.7	32.4	s	11.8	s	s	0.0	s	s	s	23.5	61.1
Bowel continence (% scoring 3+)	s	s	0.0	s	s	0.0	s	s	s	0	10.1	38.9
Behavioural symptoms (% showing 2+)	s	s	s	11.2	s	0.0	0.0	s	32.1	0	19.1	16.7
Caregiver Status (% scoring 2+)	5.3	16.2	s	14.1	s	s	0.0	s	32.1	s	31.5	32.6

Note: Results are based on a random sample of home care, supportive housing and those panelled for PCH

's' indicates data suppressed due to small numbers

Note: $LTCP_{EXP}$ signifies Expanded Long-Term Care Placement Tool

Source: Manitoba Centre for Health Policy, 2010

Additional Analyses

As a part of this research, we were specifically asked by Manitoba Health to replicate Manitoba's current levels of PCH care using RAI–HC©. This process would allow Manitoba's **levels of care** to still be estimated (for historical or tracking purposes), in the event that the level of care form[24] is no longer used. Highlights of these results are provided in the present section.

A brief explanation of Manitoba's Levels of Care

All Manitobans applying for PCH admission are assessed on the amount of assistance they need to complete ADLs in four areas (bathing and dressing, assistance with meals including feeding, ambulation/mobility/transfers, and elimination). People are also assessed based on their need for professional interventions (e.g., oxygen therapy, skin care, the recording of vital signs) and on their need for behavioral management and support. In each of these six areas of care, people receive a score ranging from:

- *Independent* (score of X) – requires no supervision or assistance
- *Minimum dependence* (score of A) – requires some supervision/encouragement and/or intermittent assistance
- *Partial dependence* (score of B) – requires ongoing supervision and/or assistance
- *Maximum dependence* (score of C) – completely dependent and/or requires ongoing supervision
- *Chronic care indicator* (score of D) – as 'score C' but requires ongoing attention by medical staff and/or multiple people to provide assistance

Based on these scores, the levels of care are defined using the following rules:

- *Level of Care I*: Score of 'independent' or 'minimal dependence' in all six items.
- *Level of Care IV*: Score of 'maximum dependence' in four or more items.
- *Level of Care III*: a) Score of 'maximum dependence' in two or three areas of care plus a score of 'independent' or 'minimal dependence' in all other items OR b) Score of 'maximum dependence' in the behavioral management item plus a score of 'partial dependence' in at least two other items.
- *Level of Care II*: All remaining combinations.

Replicating Levels of Care using RAI–HC©

This analysis was conducted on the PCH panel cohort (n=2,014) defined in Figure 6.1, which were randomly allocated into a decision tree training (n=1,209) and validation (n=805) group. While several interim analyses were conducted using different RAI–HC© measures, DTA results in this section were developed using measures from Table 7.1 (except caregiver status).[25] This final decision tree is summarized in Figure 7.2, and the level of agreement between predicted and actual values is shown in Table 7.4 (validation sample). Results from this analysis are summarized as follows:

24 In Manitoba, levels of care are calculated using a **Dependency Assessment Supplement (DAS)**. This supplement is one component of a larger assessment instrument entitled 'Application/Assessment for Long Term Care' (M.H. 241 [MG–1682]). Levels of care in Manitoba are calculated at minimal during PCH panel.

25 This decision was made to minimize data that would have to be collected in a revised DAS form (like that shown in Figure 7.1), if this tool was implemented in Manitoba.

- DTA used 11 decisions to place the PCH panel cohort into three levels of care.[26] For example, regardless of their scores in other domains, panel applicants who didn't require weight–bearing ADL assistance were assigned a care level of I/II (*decision 1*). People who required weight–bearing assistance for toilet use and personal hygiene were assigned to level of care III (*decision 2*). Lastly, people requiring weight–bearing assistance for locomotion and eating were assigned to levels of care III or IV, pending their challenges in other domains. For example, these residents with moderate to severe cognitive impairments and some bowel incontinence were assigned to level of care III if they had no behavioral symptoms (*decision 7*), and to level of care IV if some behavioral symptoms were present (*decision 8*).
- By applying this algorithm to the validation sample, DTA correctly identified 83.8% of level of care I/II residents, 61.2% of level of care III residents, but only 43.8% of level of care IV residents—for an overall agreement level of 68.9% (Table 7.4). This lower agreement in level of care IV may be due to the smaller number of residents in this category (n=240 people, or 12.0% of entire PCH panel cohort).[27]

Table 7.4: Percent Agreement Between Actual and Predicted Levels of Care, Personal Care Homes (PCH) Panel Cohort, Winnipeg Regional Health Authority, April 1, 2005 – February 1, 2007

		Predicted Levels of Care			
		Levels of Care I/II	Level of Care III	Level of Care IV	Total (#)
Actual Levels of Care	Levels of Care I/II	**83.8%**	16.0%	0.3%	s
	Level of Care III	33.0%	**61.2%**	5.9%	358
	Level of Care IV	6.3%	50.0%	**43.8%**	96
					s

Interpretation: 84% of actual Levels I/II residents, 61% of actual Level III residents, and 44% of actual Level IV residents were correctly identified.

's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2010

26 Since very few level of care I residents exist in Manitoba levels I and II were combined in this analysis.

27 Other algorithms provide better agreement scores in this validation sample. For example, an algorithm using individual ADL items and CPS correctly allocated 82.6% of level of care I/II residents, 58.1% of level of care III residents and 70.8% of level of care IV residents. Use of this algorithm, however, would require additional data to be collected in a revised DAS form (like that shown in Figure 7.1). Details of this additional algorithm are available from the first author of this report.

Figure 7.2: Schematic of Decision Tree Analysis for Assigning People to their Actual Level of Care, Personal Care Home (PCH) Panel Cohort, Winnipeg Regional Health Authority, April 1, 2005 – February 1, 2007

ADL Hierarchy Scale*	At most, non weight-bearing assistance with ADLs (≤2)	Weight-bearing assistance for toilet & personal hygiene (3)	Weight-bearing assistance for locomotion & eating (4)								
Cognitive Performance Scale (CPS)*	–		At Most, Mild Impairments (≤2)			Moderate to Severe Impairment (3-5)					Very Severe (6)
Bowel Continence**	–		–			Continent w/o ostomy (0)	Cont. with ostomy to incont. 2-3 times/week (1-4)		Incontinent almost all of the time (5)		--
Behavioral Symptoms**	–		–				No Symptoms (0)	Symptoms (≥1)	--		--
Bladder Continence**	–		≤ Incont. Daily (≤4)	Multiple Daily Incontinence Episodes (5)		–					--
IADL Difficulty Scale*	–		--	Great Diff. 2 IADLs (≤5)	Great Diff. 3 IADLs (6)	–			Great Diff. 2 IADLs (≤5)	Great Diff. 3 IADLs (6)	--
Decision #	1	2	3	4	5	6	7	8	9	10	11
Decision (Predicted Level of Care)	I/II	III	III	III	IV	III	III	IV	III	IV	IV
Additional Details:											
I. Cohort Size	620	257	111	35	26	29	45	9	9	53	15
II. Actual Users (%)											
Level of care I/II	71	28	7	0	0	10	0	0	0	0	0
Level of care III	28	64	80	77	46	76	62	22	78	26	0
Level of care IV	1	8	13	23	54	14	38	78	22	74	100

* Outcome scale provided from RAI-HC©.

** Measure developed using individual MDS-HC assessment items.

Note: The symbol '--' denotes that a measure was not used to further refine the decision tree result. For example, individuals requiring at most non weight-bearing assistance were assigned a level of care I/II regardless of their scores in other domains.

Source: Manitoba Centre for Health Policy, 2010

Chapter 8: Defining PCH Residents' Needs and Estimating the Capacity for Supportive Housing to Reduce PCH Use

Chapter Highlights

This chapter introduces our second new tool, called the Expanded Level of Care ($LofC_{Exp}$) Tool, for more clearly defining the needs (profiles) of PCH residents. By applying this tool more broadly, we have also estimated the capacity for supportive housing to offset PCH use, now and in the future.

Our $LofC_{Exp}$ tool defines 13 groups (clusters) of people in our PCH panel cohort, based on their challenges with ADLs, cognitive impairment, bladder/bowel incontinence, and behavioral management symptoms. These clusters richly describe the diversity of PCH residents' needs, which has implications for resource planning. For example, 44.2% of our PCH panel cohort required weight–bearing ADL assistance and also had mild or greater cognitive impairments. Also, 20.0% of this cohort had some behavioral management symptoms (e.g., wandering or resisting care) and, in a small percent of this cohort, these symptoms were not easily altered.

We also applied $LofC_{Exp}$ to supportive housing and actual PCH users. For this latter group, we were able to allocate the volume of PCH days to these different groups. Not surprisingly, the characteristics of these two groups were often mutually exclusive. For example, PCH residents needed weight–bearing ADL help during 67.0% of all PCH days, while almost no supportive users required this much help. Conversely, 63.5% of supportive housing users required at most set–up ADL help and/or had mild cognitive impairments, as compared to a small proportion of PCH users. Lastly, almost no supportive housing users had any behavioral symptoms and very few of these people were frequently incontinent.

These comparisons were also used to estimate the potential for supportive housing to offset our earlier projections of PCH use. As long as this region has sufficient PCH beds currently, our analyses indicate that planners in Winnipeg could choose to build more supportive beds in the near future, to offset projections of PCH use. In the longer term however, planners will have to either: i) change the current philosophy of supportive housing to accept sicker people and expand this program or ii) build more PCH beds.

Detailed Chapter Results

An Explanation of Cluster Analysis

Cluster analysis is a mathematical tool that places people or objects into similar groups (clusters) based on predetermined measures (e.g., population age structures of countries, mileage for different car models). This process starts with each person/object as an individual cluster, groups items that are most similar, and gradually relaxes grouping criteria until one overall group is formed. Unlike traditional statistics, cluster analysis does not calculate the ideal number of statistically different groups. Rather, this process relies on people to decide, using both mathematical and context specific knowledge, when the clustering technique should stop. For each number of groupings (clusters), cluster analysis provides a statistical (R^2) value to describe the mathematical 'fit' of the overall model.[28]

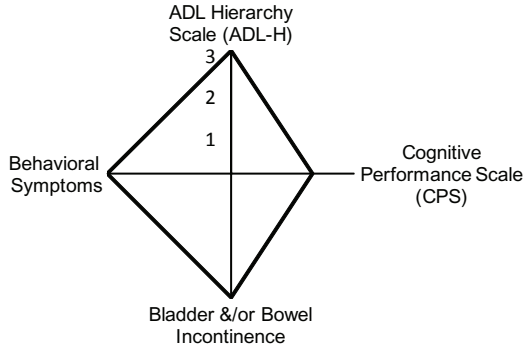
28 R^2 values in traditional statistics summarize the percent of variation shared between two measures (e.g., how much of the variation in child height can be explained by age). R^2 values in cluster analysis are interpreted similarly and indicate how much of the variation in predictor variables (ADLs, CPS) exists within versus between cluster analysis groups. R^2 values are greatest when the variation between groups far exceeds that within groups (i.e., people within each group are very similar, but collectively, the groups are very different).

We used cluster analysis to define unique groups of our PCH panel cohort (2,014 people in Figure 6.1). Each member of this cohort was scored based on their ADL needs, their level of cognitive impairment, their degree of bladder and/or bowel incontinence, and their behavioral symptoms. In each of these domains, individuals were scored as being either: i) independent (e.g., requiring at most set–up help to complete ADLs, having no behavioral symptoms, being continent); ii) having some challenges (e.g., needing non weight–bearing ADL assistance, being incontinent once in a while, having behavioral symptoms that are easily altered); or iii) having substantial challenges (e.g., needing weight–bearing assistance to complete at least some ADLs, having behavioral challenges that not easily altered, having more pronounced cognitive impairments). These measures are summarized in Table 8.1.

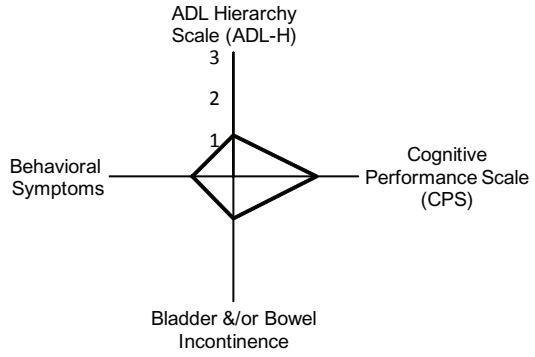
Because we used four domains and a three–level scoring system, cluster analysis provided each individual with a four–digit scoring profile. For example, people profiled as '3233' in Figure 8.1 needed weight–bearing assistance to complete ADLs, had mild cognitive impairments, were frequently incontinent, and had significant behavioral symptoms. Conversely, profile '1211' people (Figure 8.1) had minimal challenges in the ADL, continence, and behavioral domains. These people, however, had some level of cognitive impairment. Based on this scoring system, cluster analysis was used to group members of our PCH panel cohort into similar profile groups.

Figure 8.1: An Example of Cluster Analysis Profiles Used to Describe Personal Care Home (PCH) Residents in Manitoba, PCH Panel Cohort, Winnipeg Regional Health Authority, April 1, 2005 – February 1, 2007

Profile 3233



Profile 1211



ADL–H

– Independent (1)

– Non weight–bearing assistance (2)

– Weight–bearing assistance (3)

CPS

– Intact (1)

– Mild impairment (2)

– Moderate + impairment (3)

Behavioural Symptoms

– No symptoms (1)

– Symptoms, easily altered (2)

– Symptoms, not easily altered (3)

Bladder/Bowel Incontinence

– Continent, with or without device (1)

– Sometimes incontinent (2)

– Frequently + incontinent (3)

Source: Manitoba Centre for Health Policy, 2010

Table 8.1: Measurements Used from RAI–HC© to Conduct Cluster Analysis

Scale/Item		Original Scoring*				Derived Categories Used for Cluster Analysis
ADL-Hierarchy Scale**	0	Independent, or at most, requiring set-up help in all 4 ADLs				Independent (1)
	1	Requiring at most supervision in all 4 ADLs				Non Weight-bearing Assistance (2)
	2	At most, limited (non-weight bearing) assistance to complete each ADL				
	3	Extensive (weight-bearing assistance) for toilet and personal hygiene; At most, limited (non-weight bearing) assistance for locomotion and eating				Weight-bearing Assistance (3)
	4	Extensive (weight-bearing assistance) for locomotion and eating				
	5	Full dependence for locomotion and eating				
	6	Full dependence for all ADLs				
Cognitive Performance Scale**	0	Intact				Intact (1)
	1	Borderline intact (challenges in one area but not severe)				Mild Impairment (2)
	2	Mild impairment (challenges in 2 or 3 areas, but none severe)				
	3	Moderate impairment (challenges in 2 or 3 areas, and more severe in one area)				Moderate+ Impairment (3)
	4	Moderate severe impairment (challenges in 2 or 3 areas, and more severe in two)				
	5	Severe impairment				
	6	Very severe impairment				
Bladder Continence†	0	Continent without device	Bowel Continence†	0	Continent without ostomy	Continent (1)
	1	Continent with device		1	Continent with ostomy	
	2	Incontinent ≤ 1/week		2	Incontinent < 1/week	Sometimes Incontinent (2)
	3	Incontinent ≥ 2/week		3	Incontinent once/week	
	4	Incontinent daily		4	Incontinent 2-3 times/week	Frequently Incontinent (3)
	5	Multiple daily incontinence episodes		5	Incontinent almost all of the time	
Behavioural Symptoms†	1	No symptoms in any area				No Symptoms (1)
	2	Symptoms in one or more area, but easily altered				Symptoms, easily altered (2)
	3	Symptoms in one of more area, not easily altered.				Symptoms, not easily altered (3)

* While scoring (i.e., response options for assessment items &/or algorithms for outcomes scales) is configured somewhat differently in RAI-HC © (for the supportive housing and PCH Panel cohorts) versus RAI-MDS 2.0© (for actual PCH residents), the derived categories in these measures are identical between these systems.

** Outcome scale provided from RAI-HC©.

† Measure developed using individual MDS-HC assessment items.

Source: Manitoba Centre for Health Policy, 2010

Cluster Analysis Results

Using cluster analysis, we developed the new $LofC_{Exp}$ Tool that defines 13 groups in our PCH panel cohort, explaining about 72% of the variation in our four measurement domains.[29] A schematic of $LofC_{Exp}$ is provided in Figure 8.2. These groups can be combined in several ways to describe the various needs of our PCH panel cohort. For example, 50.7% of this cohort (clusters 1 through 8) required, at most, non weight–bearing assistance to complete ADLs, while people in our remaining clusters (9 through 13) required weight–bearing help. Alternatively, 9.9% of this cohort (clusters 1 and 9) were cognitively intact, while 20.0% of people (clusters 5, 7, 8, 12, 13) exhibited behavioral symptoms. In 3.7% of this cohort, these symptoms were not easily altered (clusters 8 and 13).[30] Lastly, as the name implies, $LofC_{Exp}$ can be viewed as an extension of Manitoba's current levels of care. For example, 75.5% of level of care I/II residents resided in clusters 1 through 6, compared to 72.4% of level of care III residents in clusters 6 through 11, and 95.8% of level of care IV residents in clusters 9 through 13.

Individual profiles within $LofC_{Exp}$ are presented in Table 8.2. These profiles further describe the diverse needs of our PCH panel cohort. For example, in addition to having limited challenges in all other domains (i.e., requiring at most set–up help with ADLs, being cognitively intact, having no behavioral challenges), most people in cluster 1 were either continent or only infrequently incontinent (i.e., for most people in cluster 1, the third digit is a '1' or a '2'). Cluster 2 individuals are distinct from this group by having mild cognitive impairments. Clusters 9 through 11 are also separated primarily on their level of cognitive impairment. Clusters 12 and 13 differ mostly on the ease at which their behavioral symptoms can be altered.

29 We originally selected fifteen clusters from this process. This, however, included four small additional clusters (each comprising less than 2% of the overall sample), which were ignored. However, two additional clusters were required to separate people with 'some' versus 'extensive' ADL needs. After consulting with a biostatistician, the decision was made to create the final cluster groupings manually. This may affect the overall R^2 value minimally.

30 In Figure 8.3, the majority of clusters split on ADL, CPS, and behavioral symptoms, but not on bladder and/or bowel incontinence. While the first three measures are often co–related (e.g., the majority of people with more extreme behavioral symptoms also have more advanced cognitive and/or ADL challenges), we interpreted this to mean that challenges with incontinence occurred regardless of challenges in other areas.

Figure 8.2: A Schematic of the LofC$_{EXP}$ Tool, Personal Care Home (PCH) Panel Cohort, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

ADL-Hierarchy	1 or 2	Set-up (1)	Non weight-bearing assistance (2)		Independent or non weight-bearing assistance (1 or 2)				Weight-bearing assistance (3)				
Cognitive Performance Scale (CPS)	Intact (1)	Mild impairment (2)				Moderate+ impairment (3)		Mild+ (2-3)	Intact (1)	Mild Impair (2)	Mod+ Impair (3)	Mild+ (2-3)	
Bladder &/or Bowel Incontinence	–		Continent (1)	Some+ incontinence (2-3)	Cont. or some incont. (1-2)	–			--				
Behavioural Symptoms	None (1)				Easily altered (2)	None (1)	Easily Altered (2)	Not easily altered (3)	None (1)			Easily Altered (2)	Not easily altered (3)
Cluster #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
% of PCH panel cohort (n=1,994)*	5.1	6.4	8.0	11.1	3.5	8.4	6.0	2.2	4.8	18.2	17.7	6.8	1.5
Level of Care Distribution Across Clusters													
% of total, Level I/II:	8.2	14.3	16.0	19.0	5.5	12.5	5.6	2.7	2.8	8.1	4.0	1.2	0.2
% of total, Level III:	3.1	1.4	2.3	6.4	2.4	6.3	7.6	1.4	6.9	27.2	23.1	8.9	2.2
% of total, Level IV:	1.3	0.0	0.4	0.0	0.4	0.8	1.3	0.0	4.2	21.3	47.5	19.2	3.8

* 20 people (1.0% of cohort; total n=2,014) were not assigned to these profiles.

Note: The symbol '--' denotes that a variable was not used to further define cluster groupings. For example, cluster 1 individuals could have multiple incontinence scores.

Note: Refer to Table 8.1 for a description of variable categories.

Note: LofC$_{EXP}$ signifies Expanded Level of Care

Source: Manitoba Centre for Health Policy, 2010

Table 8.2: Distribution of $LofC_{EXP}$ Profiles Across Personal Care Home (PCH) Panel Cohort, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

Clusters	Profiles	% of PCH Panel Cohort (n=1,994)*	
1	1111	1.2	(5.1)**
	1121	s	
	2111	2.0	
	2121	1.0	
	1131; 2131	0.7	
2	1211	4.3	(6.4)
	1221	1.6	
	1231	0.5	
3	2211	8.0	(8.0)
4	2221	6.8	(11.1)
	2231	4.3	
5	1212; 1222; 2212; 2222	3.5	(3.5)
	1232; 2132; 2232	0.0	
6	1311;	1.4	(8.4)
	2311;	2.8	
	1321; 2321	3.1	
	1331; 2331	1.2	
7	1312; 1322; 1332	1.0	(6.0)
	2312; 2322; 2332	5.0	
8	1213; 1223; 1233; 1313; 1323; 1333	0.8	(2.2)
	2213; 2223; 2233; 2313; 2323; 2333	1.4	
9	3111; 3121	2.9	(4.8)
	3131	1.9	
10	3211; 3221	7.4	(18.2)
	3231	10.8	
11	3311; 3321	4.5	(17.7)
	3331	13.2	
12	3212; 3222; 3232	1.3	(6.8)
	3312; 3322; 3332	5.5	
13	3213; 3223; 3233; 3313; 3323; 3333	1.5	(1.5)

*20 people (1.0% of cohort) were not assigned to these profiles.

** Sum of all profiles in each cluster, including suppressed data

's' indicates data suppressed due to small numbers

Note: $LofC_{EXP}$ signifies Expanded Level of Care

Source: Manitoba Centre for Health Policy, 2010

Tool Uses

Comparing the profile of supportive housing and PCH users

Given the diversity of these results (i.e., the profiles in Table 8.2 range from '1111' to '3333'), we applied $LofC_{Exp}$ to the cohort of supportive housing users and across all PCH days (Table 8.3).[31] The majority (61.1%) of our supportive housing cohort exists in Cluster 2, mostly as profile '1211' (residents requiring

31 PCH days attributed to profiles were calculated using MDS 2.0 assessments (i.e., PCH data). Three items are important for understanding these results. First, at the time of our research, MDS 2.0 assessments were completed approximately every 90 days in non–proprietary PCHs in Winnipeg. Second, amongst non–proprietary PCHs, our volume metrics were confined to a sub–set of residents with two or more MDS 2.0 assessments (full and/or quarterly), comprising 87.2% (2,113,639/ 2,424,135) of all (new and existing) resident days. Third, PCH days were allocated to different profiles using the following principles: a) Days between consecutive assessments were equally allocated to different profiles. For example, if assessments 1 and 2 were 100 days apart and were profiled as '2222' and '2223' respectively, 50 days were allocated to each profile; b) Building on this same example, a maximum of 90 days prior to the first assessment was allocated to the profile '2222', while a maximum of 90 days following the last assessment was allocated to the profile '2223'.

at most set–up ADL help and with mild cognitive impairments) or '1221' (residents with these needs plus some incontinence challenges) individuals. A smaller number of supportive housing users also existed elsewhere. Most notably, 6.5% of these users were housed in cluster 1 (mostly as profile '1111' and '1121' users), while 12.0% of users were housed in cluster 6 (all profiles except '1331' and '2331'). Collectively therefore, almost all supportive housing users in Winnipeg had moderate and, in some instances, more severe cognitive challenges. The majority of these users also needed, at most, set–up help for ADL tasks, and/or at most, had infrequent incontinence episodes. The vast majority of supportive housing users did not have behavioral challenges (i.e., in most instances the last digit in supportive housing profiles is '1').

Not surprisingly, the characteristics of supportive housing and PCH residents were often mutually exclusive. For example, residents required weight–bearing ADL help during 67.0% of all PCH days (i.e. the first profile digit is a '3' in clusters 9 through 13). In comparison, almost no supportive housing clients were this ADL–dependent. Conversely, as mentioned previously, the majority of supportive housing users exist in cluster 2. PCH residents shared these same traits during only 4.2% of all PCH days.

Strategies to help plan for the future

Chapter 3 (Figure 3.8) shows that older Manitobans will use more PCH beds in the future. $LofC_{Exp}$ (Table 8.3) can also help planners decide the combination of supportive housing versus PCH beds that can be built to help meet this projected increase in use. The following text outlines how this can occur.

PCH projections in Figure 3.8 are based on Manitoba data, and our PCH profiles are based on Winnipeg residents. Definitive projections of PCH use for Winnipeg should not be interpreted from the following text, as RHA–level PCH projections are beyond the scope of this report.[32]

This being said, some general trends can still be stated. For example, our regression model (Scenario 2) in Figure 3.8 projects that older Manitobans will use 7.5% more PCH beds by 2020/21. Table 8.3 shows that residents have a 'supportive housing–like' profile (i.e., '1111', '1121', '1211', '1221') during 7.5% of all PCH days. As long as Winnipeg currently has a sufficient number of PCH beds, this means that planners in Winnipeg could opt to expand their supportive housing program versus building more PCH beds, at least in least in the near future.[33]

However, our regression model (Scenario 2) in Figure 3.8 also projects that PCH use will increase dramatically starting 2021/22, and that older Manitobans will use 29.1% more PCH beds by 2030/31.

32 PCH projections in this report are based on past rates of PCH use (Figure 3.4) and projections of population growth (Figures 2.2). Present and projected population growth for Winnipeg match very closely to the Manitoba average (Figures 2.3 and 2.4 of this report). Past rates of PCH use in Winnipeg also match very closely to the Manitoba average (data not shown in this report, but are available from the first author of this report). This means that PCH projections for Winnipeg may look very similar to Figure 3.8. This regional projection, however, has not been explicitly calculated in this report.

33 The following technical information is required to make more definitive projections. First, by 2020/21, diverting normally PCH–bound residents profiled as '1111', '1121', '1211', '1221' to supportive housing could reduce PCH days by 7.5%. Second, by 2020/21, Winnipeg would need 727 supportive housing beds to care for these people. This is made up of: i) 272 supportive housing beds that existed at the time of this study; ii) 423 supportive housing beds required by 2020/21 to care for the diverted PCH residents (in 2008/09, Winnipeg had 5,641 PCH beds; 7.5% of 5,641 beds = 423 beds); and iii) 32 additional supportive housing beds. By 2020/21 and after all PCH beds are filled with sicker residents, Winnipeg would still need additional supportive housing beds to care for profile '1111', '1121', '1211', '1221' people. These people account for (7.5% of 7.5%) 0.56% of our projected increased PCH use (0.56% of 5,641 PCH beds = 32 beds). Third, the accuracy of these calculations depends on several assumptions including: i) that PCH bed projections for Winnipeg are similar to Manitoba; ii) all assumptions discussed in Chapter 3 of this report; and iii) that the length of time spent at a given profile is similar for supportive housing and PCH residents (e.g., if people last longer at profile '1211' in supportive housing versus PCH care, our calculations will underestimate the required number of supportive housing beds).

From Table 8.3, if all PCH–bound residents with certain profiles ('1111', '1121', '1211', '1221', and all cluster 6 residents except profiles '1331' and '2331') were instead diverted to supportive housing in the future, this could free up about 12.1% of PCH days (to be used for sicker PCH residents). Even in this scenario, it is unlikely that supportive housing in Winnipeg will entirely offset longer–term increased PCH demands. Rather, at some point in the near future and especially commencing 2021, planners in Winnipeg will need to either: i) change the current philosophy of supportive housing to accept sicker people and expand this program or ii) build more PCH beds. By linking RHA–level bed projections with data such as that provided in Table 8.3, ongoing research at MCHP can provide more definitive evidence to support these decisions by describing for each RHA: i) when and to what extent we can expect PCH bed use to increase in the future and ii) what combination of PCH and supportive housing beds are needed to help meet this increased use.

Table 8.3: Distribution of $LofC_{EXP}$ Clusters Across Supportive Housing Users and Personal Care Home (PCH) Days, Winnipeg Regional Health Authority, April 1, 2005–February 1, 2007

Clusters	Profiles	Supportive Housing Cohort (% of Total Residents [n=216])*		PCH Cohort (% of Total Days)**	
1	1111	2.8		2.9	
	1121	2.8		0.7	
	2111	0	(6.5)	1.6	(7.0)
	2121	s		1.1	
	1131; 2131	s		0.7	
2	1211	43.5		3.2	
	1221	14.4	(61.1)	0.7	(4.1)
	1231	3.2		0.2	
3	2211	2.8	(2.8)	3.0	(3.0)
4	2221	s	(2.8)	2.8	(4.2)
	2231	s		1.4	
5	1212; 1222; 2212; 2222	2.8	(2.77)	0.8	(1.2)
	1232; 2132; 2232	0		0.3	
6	1311;	5.5		0.7	
	2311;	2.8	(12.5)	1.8	(5.8)
	1321; 2321	3.7		2.1	
	1331; 2331	s		1.2	
7	1312; 1322; 1332	s	(4.6)	0.2	(2.6)
	2312; 2322; 2332	s		2.4	
8	1213; 1223; 1233; 1313; 1323; 1333	2.3	(3.7)	1.0	(5.3)
	2213; 2223; 2233; 2313; 2323; 2333	s		4.3	
9	3111; 3121	s	(s)	2.4	(4.6)
	3131	s		2.2	
10	3211; 3221	s	(s)	3.3	(7.9)
	3231	0		4.6	
11	3311; 3321	s	(s)	3.9	(21.8)
	3331	s		17.9	
12	3212; 3222; 3232	s	(s)	1.2	(9.8)
	3312; 3322; 3332	s		8.6	
13	3213; 3223; 3233; 3313; 3323; 3333	s	(s)	21.9	(21.9)

* Based on file of 272 Winnipeg supportive housing beds and 216 users
Note: One supportive user was not assigned to any of these clusters.

** Analyses are conducted on Winnipeg non-propri etary PCHs only, using (new and admitted) residents with 2+ locked MDS 2.0 assessments. This comprises 75.3% (4,090/5,429) of all non-propietary PCH residents during our study period, and 87.2% of their PCH days (2,113,638.5 / 2,424,135.0).

's' indicates data suppressed due to small numbers

Note: $LofC_{EXP}$ signifies Expanded Level of Care

Source: Manitoba Centre for Health Policy, 2010

SECTION 3: Key Messages

Chapter 9: Summary of Findings, Policy Implications, and Future Research Directions

Summary of Findings

Results from this research can be summarized in three major themes.

First, health regions in Manitoba are at various stages of population aging, and projected growth in the number of 75+ year–olds (the predominant PCH users) will vary tremendously across our province. This being said, our analyses indicate that PCH use will increase modestly in Manitoba until about 2020/21 (7.5% more beds used from present). Shortly after this time however, Baby Boomers will reach age 75. By 2030/31, Manitoba may need 29.1% more PCH beds to cope with increasing older adult numbers.

As the second major theme, Aging in Place has expanded Manitoba's continuum of older adult care with supportive housing provided as an alternate to PCH use. This report provides a tool ($LTCP_{EXP}$) for allocating people to these different areas. Using RAI–HC© data from Winnipeg, this tool correctly identifies, on average, 76.0% of home care, supportive housing, and PCH users. Use of this tool is important for ensuring that supportive housing fulfills its role as an alternate to PCH use, so that people receive the best type of care to match their needs.

Third, using a process called cluster analysis, this research creates a tool ($LofC_{EXP}$) for describing PCH residents' needs, at least in the WRHA. By combining this strategy with our provincial PCH projections, some evidence is also provided to help planners prepare for the future. As long as Winnipeg has a sufficient number of PCH beds presently, this evidence suggests that planners in Winnipeg can at least partially offset projections in PCH use by building more supportive housing beds in the immediate future. In the longer term however, planners in Winnipeg will need to either: i) change the current philosophy of supportive housing to accept sicker people and expand this program or ii) build more PCH beds.

Beyond these broad trends, definitive planning should not be developed using data from this report. While our PCH projections are based on Manitoba data, our new profiles were developed in Winnipeg. To provide more definitive evidence, ongoing research at MCHP is required in order to describe for each RHA: i) when and to what extent we can expect PCH bed use to increase in the future and ii) what combination of PCH and supportive housing beds may best help to meet this increased use. Based on this evidence, planning strategies may vary across RHAs, pending the need for more PCH beds and differences in user characteristics.

Policy Implications

This research provides a tool to help ensure that supportive housing in Manitoba functions as it was originally intended–as an alternate option to PCH use from some individuals. By using this tool, planners can help to ensure that supportive housing functions as an intermediate step between home–based and PCH care, so that people receive care that matches their needs.

To help with this process, we have also developed a strategy to more richly define PCH residents' needs, as compared to Manitoba's four broad levels of care. This tool can be used to help organize care plans currently and for the future. For example, while Manitoba will need more PCH beds in the years to

come, our results show that planners can prepare for this need by building a combination of supportive housing and PCH beds. This may mean that the current philosophy of supportive housing has to change considerably, to accept sicker people.

It is also important to consider each of these policy statements jointly. For supportive housing to be optimally effective, planners will have to rigorously monitor both supportive housing and PCH minimal admission criteria, to ensure that people get the correct type of care. To assist with this, planners may need to develop different levels of supportive housing care, to house various kinds of 'lite level' PCH residents. Also, transitioning across this broader spectrum of care will only be seamless if a single payment structure for supportve housing and PCH care is developed in Manitoba. This expanded continuum of older adult care may differ somewhat across Manitoba, pending the future need for PCH beds and differences in user characteristics.

The Need for Better Data in Some RHAs

Improvements to data are important to further develop older adult planning strategies. Aside from the Winnipeg Regional Health Authority, Manitoba is currently limited in its ability to measure the health profile of home care, supportive housing, and PCH users. In the event that the RAI–HC© and RAI–MDS 2.0© systems are not immediately globally implemented, several interim strategies can be used to collect valuable evidence. These include: i) electronically recording data gathered from the tools developed in this research and ii) applying Manitoba's level of care algorithm to PCH and supportive housing users at their time of admission and electronically entering the six individual items (that measure ADLs, behavior, etc) that comprise these levels. In addition, it is important for Manitoba to develop a universal supportive housing file. This file should, at minimum, capture data such as people's supportive housing acceptance, move in and move out dates, as well as their disposition status (e.g., death, PCH).

Lastly, while focused on less in this report, continued trends to expand community–based versus institutional care may impact the need for home care services. From this perspective, it is important for Manitoba to have a single provincial system for measuring home care use. Ideally, this system should record, at the person–level, the type and direct hours of home care provided. This latter information is important for demonstrating the continued value of home care services.

Future Research Directions

Two follow–up research projects are recommended in this report. *First,* our evidence shows that Manitoba's RHAs are at various stages of population aging, and PCH projections in each RHA are important for planning purposes. As was done in this research, these projections should also incorporate clinical data, so that planners can build the right combination of supportive housing and PCH beds. As stated previously however, this first requires additional clinical data from the non–Winnipeg regions. In the interim, replicating this research in the WRHA has merit as the number of supportive housing beds in this region has recently increased substantially Also, MDS 2.0 assessment data are now available in both for profit and not–for–profit PCHs. Replicating this research on a larger sample of users would allow us to further clarify the need for supportive housing and PCH beds in Winnipeg.

Second, different payment structures currently exist in Manitoba for supportive housing versus PCH care. Research is being initiated at MCHP to compare these expenses, including direct (out–of–pocket) and indirect (e.g., hospital and emergency room admission rates) costs. This evidence may be used to develop a single payment scale applicable to both supportive housing and PCH users, to more closely reflect Manitoba's universal continuum of care.

Reference List

Day JC. *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995 to 2050*. U.S. Bureau of the Census, Current Population Reports, P25–1130, U.S. Government Printing Office, Washington, DC; 1996.

Frohlich N, DeCoster C, Dik N. *Estimating Personal Care Home Bed Requirements.* Manitoba Centre for Health Policy. 2002. http://mchp–appserv.cpe.umanitoba.ca/reference/pch2020.pdf. Accessed March 31, 2009.

Hassard, T. *Understanding Bioethics.* St. Louis, MO: Mosby Year Book; 1991.

Havens B. Long–term care diversity within the care continuum. *Canadian Journal on Aging.* 1995;14(2):245–262.

interRAI. *Resident Assessment Instrument Home Care (RAI–HC)© Manual, Canadian Version, Second Edition*. Ottawa, ON: Canadian Institute for Health Information; 2002.

interRAI. *Resident Assessment Instrument (RAI) MDS 2.0© and RAPs, Canadian Version, User's Manual*. Ottawa, ON: Canadian Institute for Health Information; 2005.

Last JM, Spasoff RA, Harris SS, et al., (eds). *A Dictionary of Epidemiology.* 4th Edition. New York, NY: Oxford University Press; 2001.

Manitoba Bureau of Statistics. *Manitoba Population Projections 2005–2036*. Winnipeg, MB: Government of Manitoba; 2004.

Manitoba Bureau of Statistics. *Manitoba Regional Health Authorities Population and Demographic Projections 2006 to 2036*. Winnipeg, MB: Government of Manitoba; 2008.

Manitoba Health. Manitoba Launches New $98–Million Long–Term Care Strategy for Seniors: Aging in Place to Provide $80 million in Capital Construction, Expanded Community Programs, Over 1,110 More Spaces in Winnipeg. News release. Manitoba Health. 2006. http://www.gov.mb.ca/chc/press/top/2006/01/2006–01–26–03 html. Accessed March 31, 2009.

Manitoba Health. Annual Statistics 2007–2008. Manitoba Health. 2008. http://www.gov.mb.ca/health/annstats/as0708.pdf. Accessed March 31, 2009.

Manitoba Health. Annual Statistics 2008–2009. Manitoba Health. 2008. http://www.gov.mb.ca/health/annstats/as0809.pdf. Accessed March 31, 2009.

Manitoba Health. Personal Care Services: Residential Charges in Manitoba. Manitoba Health. 2010. http://www.gov.mb.ca/health/personalcareservices/docs/manual.pdf. Accessed March 31, 2009.

Menec V, MacWilliam L, Soodeen RA, Mitchell L. *The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time?* Manitoba Centre for Health Policy. 2002. http://www.umanitoba.ca/centres/mchp/reports.htm#46. Accessed March 31, 2009.

Roos NP, Stranc L, Peterson S, Mitchell L, Bogdanovic B, Shapiro E. *A Look at Home Care in Manitoba*. Manitoba Centre for Health Policy. 2001. http://mchp–appserv.cpe.umanitoba.ca/reference/homecare.pdf. Accessed March 31, 2009.

Statistics Canada. Health Reports, Winter 1996 Volume 8 No. 3. http://dsp–psd.pwgsc.gc.ca/Collection–R/Statcan/82–003–XIE/0039682–003–XIE.pdf. Accessed October 21, 2010.

Statistics Canada. *Population Projections for Canada, Provinces and Territories 2000–2026*. Ottawa, ON: Statistics Canada; 2001.

Statistics Canada. *Population Projections: 2005–2031*. Ottawa, ON: Statistics Canada; 2005.

Statistics Canada. Report on the Demographic Situation in Canada 2005 and 2006. Statistics Canada. 2008. http://www.statcan.gc.ca/pub/91–209–x/91–209–x2004000–eng.pdf. Accessed October 21, 2010.

Glossary

ACRONYMS USED IN THE REPORT

ADL	Activities of Daily Living
ADL–H	Activities of Daily Living Hierarchy Scale
CPS	Cognitive Performance Scale
DAS	Dependency Assessment Supplement
DTA	Decision Tree Analysis
F–L	Full Locked
IADL	Instrumental Activities of Daily Living
MCHP	Manitoba Centre for Health Policy
MDS	Minimum Data Set
MDS–HC	Minimum Data Set for Home Care
MSSP	Manitoba Support Services Payroll
PCH	Personal Care Home
RAI	Resident Assessment Instrument
RAI–HC ©	Resident Assessment Instrument–Home Care
RAI–MDS 2.0 ©	Resident Assessment Instrument Minimum Data Set 2.0
RHA	Regional Health Authorities
TFR	Total Fertility Rate
TMM	Home Care Task Management Module
WRHA	Winnipeg Regional Health Authority

Activities of Daily Living (ADL)

A defined set of activities (movement in bed, transfers, locomotion, dressing, personal hygiene, and feeding) necessary for normal self–care. An individual's ability to perform ADLs is important for determining their required type of long–term care (e.g., home care or personal care home).

Activities of Daily Living Hierarchy Scale (ADL–H)

A scale used to measure an individual's degree of dependence in ADLs: Early–loss ADLs **(**dressing, bathing and personal hygiene) are assigned lower scores than middle–loss ADLs (locomotion, transfers, and toilet use), which are assigned lower scores than late–loss ADLs (eating and being mobile in bed). The ADL–H Scale ranges from 0 (independent) to 6 (total dependence).

Administrative Health Data

Data generated through the routine administration of health care programs. Administrative health databases, developed by provincial governments as a result of universal medical care insurance, are designed to collect and store this type of data. The administrative health databases housed at MCHP contain de–identified records for virtually all contacts with the Manitoba provincial health care system, including physicians, hospitals, personal care homes, home care, and pharmaceutical prescriptions.

Aging in place

A strategy implemented by Manitoba Health to expand the types of support available to older adults, so that the type of care they receive is best matched to their needs. As a major component of this strategy, the extent of support and assistance people receive is balanced with helping them retain as much independence as possible. Components of this strategy include Supports to Seniors in Group Living, Supportive Housing, and Personal Care Home placement (Aging in Place website: http://www.gov.mb.ca/health/aginginplace).

Baby Boomers

People born in the Baby Boom Period (about 1946 to 1966) (Statistics Canada, 2001).

Baby Boom Period

The period from about 1946 to 1966 that was characterized by high fertility rates. Babies born during this time are referred to as Baby Boomers.

Baby Bust Period

The time period from 1967 onwards characterized by lower fertility rates.

Cluster Analysis

"A set of statistical methods used to group variables or observations in strongly interrelated subgroups" (Last, 2001). The process starts with each person/object as an individual cluster, groups items that are most similar and gradually relaxes the grouping criteria until one overall group is formed. Unlike traditional statistics, cluster analysis does not calculate the ideal number of statistically different groups, but relies on people, using both mathematical and context specific knowledge, to decide when the clustering technique should stop.

Cognitive Performance Scale (CPS)

A scale produced from the Resident Assessment Instrument MDS 2.0© (RAI–MDS 2.0©) and Resident Assessment Instrument–Home Care (RAI–HC©) systems to evaluate a person's cognitive impairment. It combines information mainly on a person's ability to make daily decisions, their ability to make themselves understood, and their memory impairment. CPS scores range from 0 (intact) to 6 (very severe impairment).

Confidence Interval (CI)

The computed interval with a given probability that the true value of a variable (e.g., a mean or rate) is contained within the interval. For example, a 95% CI would have a 95% probability of containing the true population value.

Confidence Limits

The lower and upper boundaries of a **confidence interval**, or the values that define the range of a confidence interval.

Days Open of Home Care
The total number of days an individual receives home care services. Start and end dates of home care use are used for this calculation.

Decision Tree Analysis (DTA)
A statistical approach used to understand how several variables interact to place people or objects into pre–defined groups. Output from DTA is typically presented as a decision tree. At each branch of this tree an outcome is provided (i.e., based on a combination of variables, the tree predicts to which group people or objects belong to). The accuracy of each decision and the overall tree is also provided, by comparing how often DTA correctly places people into their actual groups.

Dependency Assessment Supplement (DAS)
A standardized tool used in Manitoba that identifies PCH residents as having one of four levels of care.

Early–Loss Activities of Daily Living
Dependence in activities of daily living typically follow a certain sequence, where people first become dependent in early–loss ADLs (e.g., dressing, personal hygiene), followed by dependence in middle–loss (transfer, locomotion, toilet use), and, finally late–loss (eating and being mobile in bed) ADLs.

Fertility Rate
The number of live births in an area during a year per 1000 women of childbearing age for that year, defined as the midyear female population age 15–44 in the same area for the same year.

Home Care
Health services such as personal care assistance, home support, health care, family relief, respite care and supplies and equipment provided to individuals within their own homes. Through the Manitoba Home Care Program, such services are provided free–of–charge to Manitobans of all ages. These services are based on assessed need and take into account other resources available to the individual including families, community resources and other programs.

Instrumental Activities of Daily Living (IADL)
Activities that enable people to live independently in the community, such as meal preparation, general housekeeping, ability to handle finances, social life, grocery shopping, heavy domestic work, and mobility outside the home.

Instrumental Activities of Daily Living (IADL) Difficulty Scale
A scale produced by the RAI–HC© system to measure the amount of difficulty home care clients have when performing three IADL tasks – meal preparation, ordinary housework & telephone use. This scale ranges from 0 (no difficulties in any three tasks) to 6 (great difficulty in all three tasks). A score of 4 defines people with great difficulty completing only one of these IADL tasks.

Late–Loss Activities of Daily Living

Dependence in activities of daily living typically follow a certain sequence,; people first become dependent in early–loss ADLs (e.g., dressing, personal hygiene), followed by dependence in middle–loss (transfer, locomotion, toilet use), and, finally late–loss (eating and being mobile in bed) ADLs.

Levels of Care

A classification system for PCH residents used to define the extent of their dependence, and to approximate the amount of daily nursing care they may require. These levels are based mainly on residents' abilities to complete ADL tasks and their degree of behavioral problems. In Manitoba, there are four levels of care; Level of care 4 residents typically are the most dependent and/or require the most nursing care.

Manitoba Support Services Payroll (MSSP) Database

An administrative database developed by Manitoba Health in 1988 as a payroll system for direct service workers employed by the Department of Health. The MSSP now also serves as a master file of the Manitoba Home Care Program's clients and of MSSP employees, and provides a means of scheduling workers and permits the generation of financial and statistical reports.

Middle–Loss Activities of Daily Living (ADLs)

Dependence in activities of daily living typically follow a certain sequence; people first become dependent in early–loss ADLs (e.g., dressing, personal hygiene), followed by dependence in middle–loss (transfer, locomotion, toilet use), and, finally late–loss (eating and being mobile in bed) ADLs.

Minimum Data Set

An assessment tool in each of the Resident Assessment Instrument (RAI–MDS 2.0©) and Resident Assessment Instrument–Home Care (RAI–HC©) systems, that reports people's functional dependence and cognitive impairment, plus many other clinical social–demographic measures.

Older Adults

People age 65 years and older. This age group can be further grouped in young–old (65–74), middle–old (75–84) and old–old (85+) age categories.

Panelled

The point at which an individual is assessed as needing Personal Care Home (PCH) placement.

Personal Care Home (PCH)

Residential facilities, also known as nursing homes, for predominantly older persons with chronic illness or disability. They may be proprietary (for profit) or non–proprietary. Non–proprietary PCHs may further be classified as secular or ethno–cultural (associated with a particular religious faith or language other than English) as well as either freestanding or juxtaposed with an acute care facility.

Pharmacare Program

A drug benefit program for eligible Manitobans, regardless of age, whose incomes are seriously affected by high prescription drug costs. Coverage is based on a person's total family income and the amount he/she pays for eligible prescription drugs. To qualify, an individual must meet all of the following criteria: 1) eligible for Manitoba Health coverage, 2) prescriptions are not paid through other provincial or federal programs, 3) prescription costs are not covered by a private drug insurance program, and 4) eligible prescription drug costs exceed the individual's Pharmacare deductible (from Manitoba Health website: *http://www.gov.mb.ca/health/pharmacare/)*.

Population Aging

A demographic term used to define the age structure of a given population. In any given year, population age can be calculated as the percent of a population age 65 years and older. Depending on the purpose, changes in population age can be calculated using this percentage value, or as growth (i.e., percent increase) in the actual number of older adults.

R^2

In traditional statistics, R^2 values summarize the percent of variation shared between two measures. Similarly, in cluster analysis, they indicate how much of the variation in predictor variables exists within versus between cluster analysis groups. In cluster analysis, R^2 values are greatest when the variation between groups far exceeds that within groups (i.e., people within each group are very similar but collectively the groups are very different).

Regional Health Authority (RHA)

Regional governance structure set up by the province to be responsible for the delivery and administration of health services in specified areas. In Manitoba, as of July 1, 2002, there are 11 RHAs: Winnipeg, Brandon, South Eastman, Assiniboine, Central, Parkland, North Eastman, Interlake, Burntwood, Norman and Churchill.

Regression Analysis

A statistical technique that describes and tests the relationship between a dependent variable and one or more explanatory variables (Hassard, 1991).

Resident Assessment Instrument (RAI–MDS 2.0©)

A set of assessment items, clinical assessment protocols, and outcome reports by the Centre for Health Systems Research and Analysis at the University of Wisconsin designed to improve the quality of clinical needs assessments and care planning for personal care home (PCH) residents. This instrument has been mandated for use by PCHs in the United States, and is also being utilized currently by select provinces in Canada, as well as by the WRHA in Manitoba. Minimum Data Set (MDS) data are a component of the RAI designed to report function and cognitive performance, indicators of social supports, and other resident characteristics.

Resident Assessment Instrument–Home Care (RAI–HC©)

A standardized, multi–dimensional assessment system that focuses on a person's functioning and quality of life by assessing needs, strengths, and preferences (e.g., social supports, functional dependence and cognitive impairment) in order to develop effective and personalized home care services.

Sensitivity Analysis

A procedure for assessing the robustness of a model through changing parameters.

Supportive Housing

A component of Manitoba's Aging in Place strategy. This program "provides personal support services and homemaking in group community residential settings (Manitoba Health, 1997). It combines apartment living, services such as meals and homemaking, and access to 24–hour support care and supervision" (from WRHA website: http://www.wrha.mb.ca/ltc/strategy/housing.php).

Total Fertility Rate

The number of children who would be born to an average woman who experiences each of the age–specific fertility rates of a population in a given year as she progresses through her reproductive lifetime.

Winnipeg Regional Health Authority (WRHA)

Formed in February 2000 through the amalgamation of the Winnipeg Community and Long Term Care Authority and the Winnipeg Hospital Authority. The WRHA is responsible for coordinating health services based on the needs of people in Winnipeg, including hospital, community health, home care and long term care services. Since it comprises about half the population of Manitoba, the WRHA has created 12 planning districts called the Winnipeg Community Areas (CAs).

Appendix 1. Getting to Know the RAI–HC© System: Detailed Results

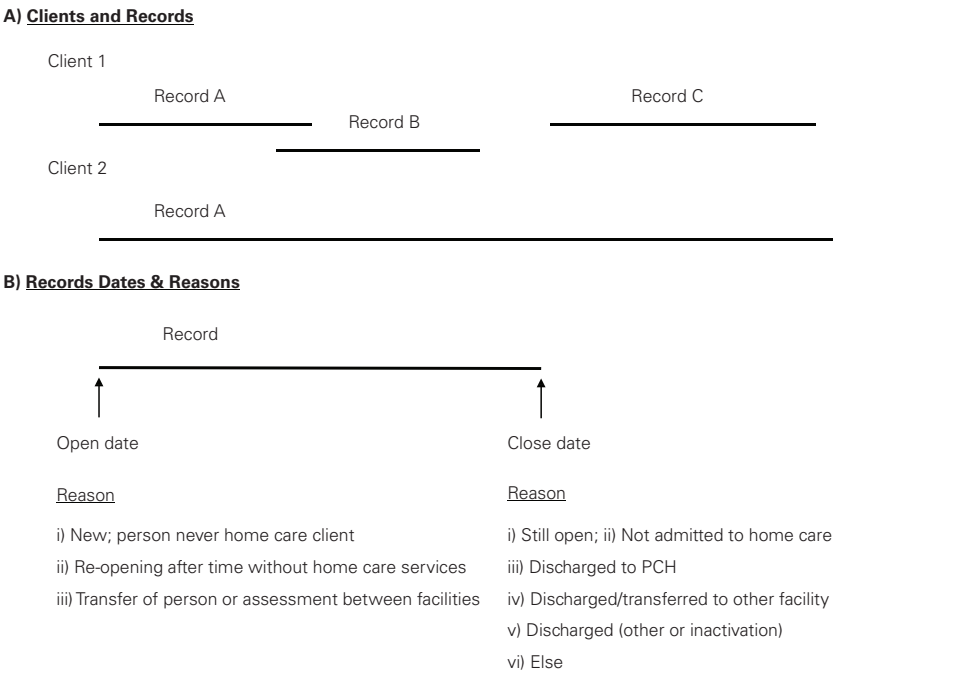
This research is our first opportunity to link the RAI–HC© system with administrative health files housed at MCHP. This appendix provides additional detail from Chapter 5, and is dedicated to answering some 'behind the scene' questions about RAI–HC©. Specifically, we wanted to understand: i) how patterns of home care use can be measured using the software that supports RAI–MDS 2.0© (called the Home Care Task Management Module; TMM), ii) how these patterns of use compare to traditional home care use files in Manitoba (the Manitoba Supportive Services Payroll file; MSSP), and iii) to what extent RAI–MDS 2.0© clinical data are available for home care clients in Winnipeg.

For this deliverable, RAI–HC© data were received from April 1, 2000 to about February 1, 2007. Except for the sections titled *Preparing TMM Data for Use* and *Comparing Patterns of Home Care Use in TMM versus MSSP*, the results in this Appendix focus on home care users who were first registered in TMM between April 1, 2002 and March 31, 2006. These analyses, however, have incorporated case activity records and MDS–HC assessment data until February 1, 2007. This was done to ensure that we accurately reported patterns of home care use, and the proportion of home care clients with Full–Locked MDS–HC assessments.

Preparing TMM Data for Use

Within TMM, client records are maintained in a case activity file that identifies home care clients, their records of home care use, and date sensitive open and close reasons. The relation between these data is shown in Figure A1.1.

Figure A1.1: Schematic Outlining the Relationship between Home Care Clients and Records in the Home Care Task Management Module Case Activity File



Source: Manitoba Centre for Health Policy, 2010

In raw format and for all years of data, 45,053 clients and 76,432 records were reported in the TMM case activity file (Table A1.1). These raw data are high quality as all cleaning strategies removed only 3.1% of clients (n=1,404) and 5.7% of home care records (n=4,369). Although most of the procedures used to prepare these data are self–explanatory, some additional details are provided.

- In some records, a client applied for but was never admitted to home care (i.e., record close reason = 'not admitted to home care' in Table A1.1). For clients with one home care record, both the client and the record were removed from raw data. For clients with multiple records, only records with this close reason (and not the client) were removed. Collectively, this cleaning strategy removed 1,016 clients and 3,238 records from the TMM case activity file.
- 656 clients had 609 records with negative times (i.e., the close date preceded the open date for the record). In these instances, case activity open/close dates were replaced with TMM system–generated dates (system–generated and case activity dates matched for 85% of all remaining records). No clients or home care records were removed during this process.
- In some instances, home care clients had multiple records with identical open and close dates (representing different home care services). All but one of these records were removed to avoid over–counting home care days open. Similarly, records partially overlapped for some home care clients. The strategies used to modify/remove these latter records depended on the degree of overlap and the 'open reason' of the subsequent (non–first) record. Collectively, these processes removed 74 clients and 616 home care records.

Table A1.1: Procedures Used to Prepare the Home Care Task Management Module (TMM) Data for Use, and Counts of Home Care Clients and Records Removed and/or Modified in each Procedure, April 1, 2000 to February 1 , 2007

	TMM clients	TMM records
A) Original number of home care clients and records (approximately April 1, 2000 to February 1 , 2007)	45,053	76,432
B) Procedures used to remove clients and/or records (number removed)		
i) Records with missing open date or first record with open reason = 'transfer'	314	515
ii) Reason for closing record = 'not admitted to home care'	1,016	3,238
iii) Records with negative times (close dates precedes open date)*	0	0
iv) For the same client:		
a) records with duplicate open/close dates	0	329
b) multiple records that overlapped in time	74	287
Total of clients/records removed	1,404	4,369
C) Final (cleaned) number of home care clients and records	43,649	72,063

* Open and close dates were modified for 656 clients & 609 records.

Source: Manitoba Centre for Health Policy, 2010

We also developed two criteria for converting case activity records into home care episodes. This permitted us to: i) identify when a client started and completed using home care services, ii) count the overall duration (days open) of home care use, and iii) define clients who used home care services once versus multiple times. Case activity records were treated as unique home care episodes when either: i) the open reason for a given record was listed as 'new, person never home care client' or 're–opening after time without home care services' or ii) non–first records had an open reason of 'transfer' *and* the gap between this and the previous record exceeded 30 days.[34]

34 TMM case activity files contain additional information to what is available in MSSP. Thus, we could create a more rigorous set of rules when converting TMM records to home care episodes (i.e., records were joined pending the gap in time and the open reason for the second record). Conversely, MSSP records with one day gap have traditionally been treated at MCHP as separate home care episodes.

Based on these procedures, the following home care use patterns were reported in TMM for 2002/03 to 2005/06 (Table A1.2):

- 26,118 home care clients were reported during this four–year period, comprising 30,919 home care episodes and 13,946,187 days open. Overall, 84.7% (22,127/26,118) of these clients had one home care episode; these account for 81.8% of all days open. Also, only 661 clients had three or more home care episodes, accounting for 3.3% of all days open.
- As another way of summarizing data in Table A1.2, 15.5% of these home care clients had less than 60 days open of home care services during these four years, while 70.3% of these clients had more than 180 days open during this time (data not shown). These basic results are comparable to home care use patterns reported using MSSP in previous MCHP research (Roos et al., 2001).

Table A1.2: Number of New Clients, Episodes and Days Open of Home Care, Winnipeg Regional Health Authority, 2002/03 to 2005/06

# of Home Care Episodes / Client	# of New Home Care Clients	# of Home Care Episodes	% of Home Care Episodes Closed (Feb 1, 2007)	Median Episode Duration (Days)	Total Duration (Days Open) of Home Care
1	22,127	22,127	71.6%	417	11,405,889
2	3,330	6,660	83.5%	187	2,081,452
3	541	1,623	87.1%	116	374,609
4	101	404	91.3%	68.5	69,839
5+	19	105	93.3%	53	14,398
Overall	**26,118**	**30,919**	**75.3%**	**336**	**13,946,187**

Findings reported using the Home Care Task Management Module (TMM) Software.

New clients defined as people first registered in TMM between April 1, 2002 and March 31, 2006.

Source: Manitoba Centre for Health Policy, 2010

Comparing Patterns of Home Care Use in TMM versus MSSP

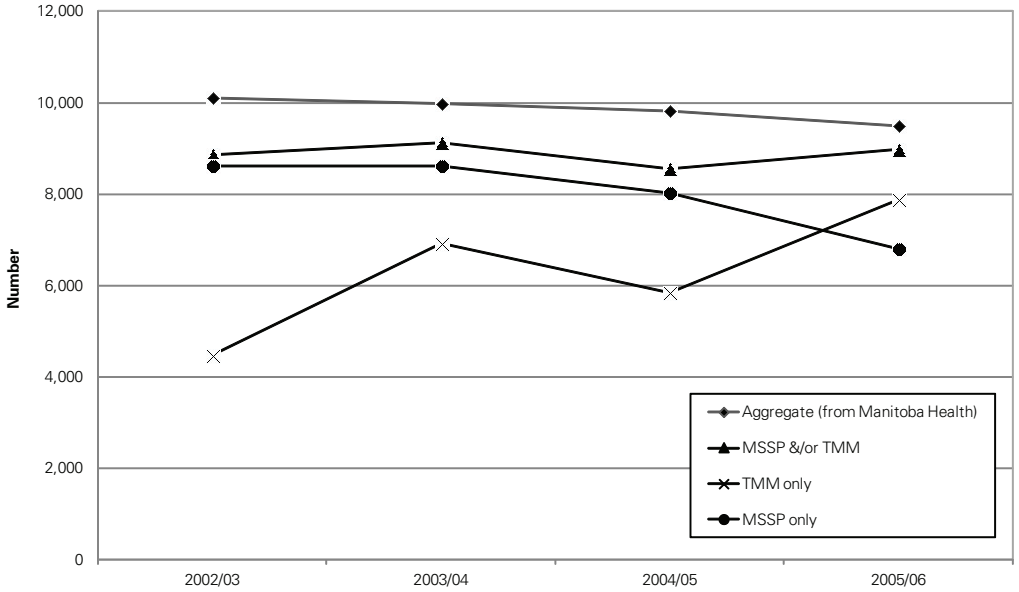
Counts of New Home Care Clients in TMM versus MSSP

The annual number of new home care clients[35] registered in MSSP and TMM is provided in Figure A1.2. This figure also provides the aggregate number of new home care admissions reported by the WRHA. Trends in these data are summarized as follows:

- In each system, the number of new clients varies by fiscal year. For example, fewer clients were registered in MSSP commencing April 1, 2004 (i.e., 2004/05 in Figure A1.2). Starting April 1, 2005, more clients were registered in TMM. We also created a third group ('MSSP and/or TMM' in Figure A1.2) to represent new clients registered in one or both systems. By using a combination of these systems, counts of new home care clients are quite stable across time.
- Previous MCHP research has shown that MSSP typically undercounts aggregate Winnipeg data by about 14% (Roos et al., 2001). Similar results are found in Figure A1.2 when comparing MSSP data to aggregate counts in 2002/03 and 2003/04 and, starting 2004/05, when comparing MSSP and/or TMM data to these aggregate counts. This suggests that home care clients should be measured using only MSSP until March 31, 2004 and then using a combination of both MSSP and TMM thereafter (or at least until March 31, 2006, which was the end of our study period).

35 To make fair comparisons between TMM and MSSP, data in this section are based on a slightly different definition of new home care clients: people who were not registered in either MSSP or TMM on April 1st of a given year, but who were subsequently registered in one or both of these systems within this same year. This definition is consistent with previous MCHP research conducted on home care services in Manitoba (Roos et al., 2001), and is also similar to the definition used to produce aggregate counts of new home care admissions annually in Manitoba.

Figure A1.2: Annual Number of New Home Care Clients in the Manitoba Support Service Payroll (MSSP) and Home Care Task Management Module (TMM) Software Systems, Winnipeg Regional Health Authority, April 1, 2002 to March 31, 2006



New Clients are defined as the number of people who were not registered in either MSSP or RAI-HC© on April 1st of a given year, but who were subsequently registered in one or both of these systems within this same year.

Source: Manitoba Centre for Health Policy, 2010

Patterns of Home Care Use Reported in TMM versus MSSP

Tables A1.3 and A1.4 compare patterns of home care use in MSSP and TMM, based on the 6,421 new clients present in both systems during 2003/04. Highlights of these findings are summarized as follows:

- On average for each client, 65.5% of days open were common between TMM and MSSP, and 50% of these clients had at least 84.1% of days open in common (data not shown). This means that the general timing of home care use is comparable between the two systems.
- TMM provides different counts of home care episodes as compared to MSSP (Table A1.3). For example, almost all MSSP clients with two or more episodes were reported having one home care episode using TMM. As stated previously (see footnote 34 in this appendix), this can be attributed to the unique (and more rigorous) strategies used to prepare TMM data for use. These differences however did not impact our comparisons in overall home care use duration (e.g., combining days open for all episodes). Data from Table A1.4 show, for example, that 1,512 clients in MSSP had more than 180 days open of home care. Using TMM, 1,388 (or 91.8%) of these clients also had longer home care use durations.

Table A1.3: Comparison of Clients with 1 versus 2+ Home Care Episodes in Home Care Task Management Module (TMM) versus the Manitoba Support Service Payroll (MSSP), Winnipeg Regional Health Authority, 2003/2004*

		MSSP		
		1 episode	2+ episodes	Total
TMM	1 episode	3,489	2,587	**6,076**
	2+ episodes	116	229	**345**
	Total	**3,605**	**2,816**	**6,421**

*Analyses limited to new clients registered in both MSSP and TMM. Data were truncated as of March 31, 2004.

Source: Manitoba Centre for Health Policy, 2010

Table A1.4: Comparison of Clients by Home Care Episode Duration in Home Care Task Management Module (TMM) versus Manitoba Support Service Payroll (MSSP), Winnipeg Regional Health Authority, 2003/04*

		MSSP			
		≤ 60 days open	61-179 days open	180+ days open	Total
TMM	≤ 60 days open	1,607	153	43	**1,803**
	61-179 days open	625	1,502	81	**2,208**
	180+ days open	598	424	1,388	**2,410**
	Total	**2,830**	**2,079**	**1,512**	**6,421**

*Analyses limited to new clients registered in both MSSP and TMM. Days open were combined for residents with multiple episodes. Data were truncated as of March 31, 2004.

Source: Manitoba Centre for Health Policy, 2010

Assigning MDS–HC Assessments to Home Care Clients

MDS–HC assessments were linked to new clients from April 1, 2002 to March 31, 2006. According to Advisory Group members, these assessment items are auto–filled with either a first response option[36] or a completed response from a previous assessment. To verify that an assessment has been accurately and entirely completed, assessors must lock or validate (denoted as full locked; F–L) a given assessment using an 'all or none' approach (i.e., if the response for a given item isn't known, the entire assessment should not be locked). Except in certain circumstances, we were advised by WRHA personnel to only use F–L MDS–HC assessments.

36 This is usually the 'healthiest' response option – e.g., indicating that a client has many informal supports, has no memory problems, can independently complete various tasks.

Advisory Group members also stressed that MDS–HC assessments were completed on longer term home care clients using community–based services. Therefore, we developed four groups of home care clients based on their duration and type[37] of home care use. These groups differentiate episodes that started in the community—rather than in a hospital—and also define clients who received only nursing, palliative, or children's services. Analyses of these groups matched our preliminary discussions (Table A1.5). [38]

- 51.0% of all clients in Table A1.5 (14,486/28,395) had 'Group A' home care episodes (i.e., that were initiated in a community–based home care office and were open longer than 90 days). These episodes comprised 71.7% (9,997,604/13,946,187) of all home care days open, and 85.2% (12,345/14,486) of these clients had an F–L MDS–HC assessment. Research using MDS–HC assessments can therefore be generalized to 'Group A' home care clients.
- As expected, different results are shown for other home care groups, which collectively comprise 28.3% of all days open. While 'Group C' clients (associated with only a hospital, nursing, palliative, or children's home care office) comprised 29.0% of all home care clients (23.6% of all days open), only 4.4% (362/8,232) had an F–L MDS–HC assessment. Research using these latter assessments should therefore not be generalized.

Table A1.5: Number of Clients, Episodes and Days Open by Select Types of Home Care Episodes, Winnipeg Regional Health Authority, 2002/03 to 2005/06

	All Home Care Clients & Episodes			Clients & Episodes with Full-Locked MDS-HC Assessments		
Home Care Episode Group*	**Clients****	**Episodes**	**Days Open**	**Clients**	**Episodes**	**Days Open**
A - home care episode was initiated in a community-based home care office; days open > 90 days	14,486	15,919	9,997,604	12,345	13,063	8,898,033
B - home care episode was initiated in a community-based home care office; days open < 90 days	4,578	5,124	186,110	1,672	1,723	90,626
C - home care episode involved only a hospital, nursing, palliative care or children's home care office	8,232	8,756	3,288,705	362	362	336,614
D - home care episode was initiated as per Group C with a subsequent transfer to a community-based office	1,099	1,120	473,768	335	335	229,382
Total	**28,395**	**30,919**	**13,946,187**	**14,714**	**15,483**	**9,554,655**

Note: New clients defined as people first registered in the Home Care Task Management Module (TMM) software between April 1, 2002 and March 31, 2006.
* Types of home care episodes were calculated using home care office IDs listed in the TMM case activity file.
** The episode groups are not mutually exclusive (i.e., clients can appear in more than one group); total counts in this table do not match totals in Table AI.2.

Source: Manitoba Centre for Health Policy, 2010

37 Within the TMM, each home care record is assigned a facility ID representing different WRHA home care offices. These IDs were used to develop different types of home care episodes for example those that were administered through community–based offices only, commenced in a hospital–based office with subsequent transfer to community, involved palliative care offices, etc.

38 These groups are not mutually exclusive (i.e., clients can appear in more than one group). The total number of clients in this table (n=28,395) is therefore greater than the total number of clients presented in Table A1.2 (n=26,118).

Appendix 2. Getting to Know the RAI–MDS 2.0© System: Detailed Results

The Canadian Institute of Health Information developed the Continuing Care Reporting System (CCRS) to support provinces implementing the Resident Assessment Instrument (RAI–MDS 2.0©) in personal care homes. Like RAI–HC©, this instrument consists of an actual assessment tool (Minimum Data Set Version 2; MDS 2.0) and resulting applications (interRAI, 2005).

In this research, we used RAI–MDS 2.0© for the period April 1, 2004 to September 2007. Analyses in this Appendix are provided for newly admitted residents in each of the 2004/05, 2005/06, and 2006/07 fiscal years (i.e., from April 1, 2006 to March 31, 2007). These analyses focus only on the not–for–profit PCHs in Winnipeg, as RAI–MDS 2.0© was not implemented in for–profit PCHs until 2007/08.

Like the MDS–HC assessments, MDS 2.0 assessments richly describe residents using various socio–demographic and clinical measures. Minimally, CCRS mandates that assessment must be completed within 14 days of PCH admission with follow–up assessment completed every 90 days (interRAI, 2005).[39] Also like MDS–HC, MDS 2.0 assessments must be locked to verify accuracy. All results in this section therefore include only locked MDS 2.0 assessments.

Tables A2.1 through A2.2 describe how frequently locked MDS 2.0 assessments were completed for newly admitted residents. Highlights of these tables are provided in the following text.

- As discussed by Advisory Group members from the WRHA, 2004/05 should be considered as a 'building year' for completing MDS 2.0 assessments. Table A2.1 shows that 720 residents were admitted to not–for–profit Winnipeg PCHs in 2004/05. Overall, only 47.6% of these residents had one or more locked MDS 2.0 assessments in this year, and this varies substantially by individual PCH. By 2006/07 however, most (86.2%) admitted residents had at least one locked MDS 2.0 assessment at some point during the year.
- Similar trends were found when looking at patterns of locked MDS 2.0 assessments. For example, of all new residents in 2004/05, only 18.8% were first assessed with 30 days of their PCH admission date (Table A2.2). This improves dramatically by 2006/07, when 74.3% of all new residents were assessed with 30 days of PCH admission.
- Lastly, the number of residents with two or more locked assessments increased considerably with time (i.e., in 2006/07, 1,182 assessments were completed on 431 residents) (Table A2.3). Also in 2006/07, 93.6% of consecutive assessments were completed within 120 days.

39 After the initial full assessments, three quarterly reviews (using abbreviated assessment items) and an additional full assessment are required in each 12 month period.

Table A2.1: Percent of Newly Admitted Personal Care Home (PCH) Residents With One or More Locked MDS 2.0 Assessments, Overall and by Individual Not–For–Profit PCHs, Winnipeg, Manitoba, 2004/05–2006/07

PCH Number	2004/05	2005/06	2006/07
All PCHs	47.6	77.3	86.2
506	81.3	71.4	90.0
509	25.0	87.5	92.3
573	42.9	88.2	100.0
587	82.9	89.5	84.9
596	28.0	95.7	100.0
607	90.9	100.0	84.2
615	0.0	100.0	•
617	54.1	92.3	76.3
619	58.8	100.0	94.4
626	31.8	83.3	80.4
628	57.1	100.0	96.0
635	50.9	80.9	91.4
636	100.0	36.4	11.1
639	30.4	100.0	79.3
642	83.3	100.0	76.9
643	85.0	88.9	100.0
649	81.0	52.1	90.9
657	46.7	94.4	96.9
667	90.5	100.0	90.0
680	15.2	68.7	87.8
685	87.5	92.9	100.0
688	38.8	90.9	93.1
699	17.6	52.9	77.4
Total Number of New Residents	**720**	**732**	**841**

Note: Data are truncated within each fiscal year of PCH admission (e.g., for residents admitted in 2004/05, results include full- and quarterly-locked assessments completed from April 1, 2004 to March 31. 2005)

'•' indicates percent cannot be calculated (no residents admitted in this

Source: Manitoba Centre for Health Policy, 2010

Table A2.2: Percent of Newly Admitted Personal Care Home (PCH) Residents First Assessed Within 30 Days of Admission, Overall and by Individual Not–For–Profit PCHs, Winnipeg, Manitoba, 2004/05–2006/07

PCH Number	2004/05	2005/06	2006/07
All PCHs	18.8	65.0	74.3
506	31.3	100.0	86.7
509	31.3	87.5	100.0
573	14.3	88.2	83.3
587	22.9	76.3	81.8
596	0.0	69.6	95.0
607	68.2	95.2	44.7
615	0.0	50.0	•
617	10.8	94.9	68.4
619	58.8	95.8	88.9
626	27.3	83.3	41.1
628	19.1	100.0	96.0
635	15.8	74.5	77.1
636	45.5	36.4	0.0
639	13.0	83.3	79.3
642	33.3	80.0	76.9
643	55.0	88.9	100.0
649	14.3	43.8	85.5
657	13.3	94.4	100.0
667	47.6	87.5	100.0
680	4.6	43.4	66.7
685	37.5	78.6	84.6
688	22.5	85.5	88.9
699	0.8	27.5	63.2
Total Number of New Residents	**720**	**732**	**841**

Note: Data are truncated within each fiscal year of PCH admission (e.g., for residents admitted in 2004/05, results include full- and quarterly-locked assessments completed from April 1, 2004 to March 31. 2005)

'•' indicates percent cannot be calculated (no residents admitted in this year)

Source: Manitoba Centre for Health Policy, 2010

Table A2.3: The Total Number of Admitted Residents with Multiple Locked MDS 2.0 Assessments, their Total Number of Locked Assessments, and the Percent of these Consecutive Assessments Occurring within 120 Days, Overall and by Individual Not–For–Profit Personal Care Home (PCH) Winnipeg, Manitoba, 2004/05–2006/07

PCH Number	2004/05			2005/06			2006/07		
	# (%) of admitted residents with multiple locked assessments	# of locked assessments for these residents	% of consecutive assessments within 120 days	# (%) of admitted residents with multiple locked assessments	# of locked assessments for these residents	% of consecutive assessments within 120 days	# (%) of admitted residents with multiple locked assessments	# of locked assessments for these residents	% of consecutive assessments within 120 days
All PCHs	38 (5.3)	84	78.3%	348 (47.5)	962	91.9%	431 (51.3)	1,182	93.6%
506	s (25.0)	9	60.0%	7 (50.0)	21	92.9%	17 (56.7)	50	100.0%
509	0 (0.0)	0	•	16 (66.7)	46	96.7%	16 (61.5)	44	100.0%
573	0 (0.0)	0	•	21 (61.8)	51	100.0%	21 (70.0)	55	94.1%
587	s (5.7)	s	100.0%	27 (71.1)	75	93.8%	22 (66.7)	65	90.7%
596	0 (0.0)	0	•	14 (60.9)	39	84.0%	13 (65.0)	41	100.0%
607	11 (50.0)	25	100.0%	11 (52.4)	27	100.0%	21 (55.3)	44	91.3%
615	0 (0.0)	0	•	s (50.0)	7	100.0%	0 (.)	0	•
617	0 (0.0)	0	•	26 (66.7)	80	98.1%	21 (55.3)	63	100.0%
619	0 (0.0)	0	•	19 (79.2)	52	100.0%	9 (50.0)	24	100.0%
626	0 (0.0)	0	•	7 (58.3)	20	92.3%	18 (32.1)	39	81.0%
628	0 (0.0)	0	•	9 (52.9)	31	90.9%	14 (56.0)	38	100.0%
635	0 (0.0)	0	•	20 (42.6)	56	94.4%	22 (62.9)	66	95.5%
636	0 (0.0)	0	•	s (36.4)	12	50.0%	s (11.1)	s	100.0%
639	0 (0.0)	0	•	14 (58.3)	42	100.0%	13 (44.8)	38	92.0%
642	0 (0.0)	0	•	8 (80.0)	25	94.1%	7 (53.9)	19	100.0%
643	8 (40.0)	16	37.5%	8 (88.9)	29	100.0%	13 (92.9)	38	100.0%
649	s (2.4)	s	100.0%	14 (29.2)	30	93.8%	34 (61.8)	91	86.0%
657	0 (0.0)	0	•	12 (66.7)	36	100.0%	14 (43.8)	39	100.0%
667	11 (52.4)	25	78.6%	s (50.0)	14	80.0%	6 (60.0)	21	100.0%
680	0 (0.0)	0	•	26 (31.3)	63	64.9%	50 (55.6)	149	90.9%
685	0 (0.0)	0	•	12 (85.7)	41	100.0%	8 (61.5)	25	100.0%
688	0 (0.0)	0	•	34 (61.8)	84	94.0%	35 (48.6)	88	100.0%
699	s (0.8)	s	100.0%	32 (20.9)	81	77.6%	56 (36.1)	143	82.8%

Note: Data are truncated within each fiscal year of PCH admission (e.g., for residents admitted in 2004/05, results include full- & quarterly-locked assessments completed from April 1, 2004 to March 31. 2005)

's' indicates data suppressed due to small numbers

'•' indicates percent cannot be calculated (no residents admitted in this year)

Source: Manitoba Centre for Health Policy, 2010

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Health and Health Care Use Among Older Adults: Using Population–Based Information Systems to Inform Policy in Manitoba, *Canadian Journal on Aging*, Volume 24, Supplement 1, 2005

High–Cost Users of Pharmaceuticals: Who Are They? by Anita Kozyrskyj, Lisa Lix, Matthew Dahl, and Ruth–Ann Soodeen

Primary Prevention: An Examination of Data Capabilities in Manitoba by Lisa Lix, Greg Finlayson, Marina Yogendran, Ruth Bond, Jennifer Bodnarchuk, and Ruth–Ann Soodeen

Aboriginal Health Research and Policy: First Nations–University Collaboration in Manitoba, *Canadian Journal of Public Health*, Volume 96, Supplement 1, January/February 2005

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