SUPPORTIVE HOUSING FOR SENIORS: REFORM IMPLICATIONS FOR MANITOBA'S OLDER ADULT CONTINUUM OF CARE



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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, College of Medicine, Faculty of Health Sciences, University of Manitoba. The mission of MCHP is to provide accurate and timely information to healthcare 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, healthcare 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, Healthy Living & Seniors. 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 Health Sciences, College 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 Manitoba Health, Healthy Living & Seniors.





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ACRONYMS

ADLs	Activities of Daily Living
ARD	Alzheimer's Disease and Related Dementias
ATC	Anatomical Therapeutic Chemical
CPS	Cognitive Performance Scale
CTAS	Canadian Emergency Department Triage and Acuity Scale
ED	Emergency Department
IQR	Inter-Quartile Range
MCHP	Manitoba Centre for Health Policy
MDS	Minimum Data Sets
РСН	Personal Care Home
PHIN	Personal Health Identification Number
Repository	Population Health Research Data Repository

EXECUTIVE SUMMARY

Introduction and Research Purpose

The older adult care continuum is generally comprised of home care services, community-based supportive housing, and nursing homes (called personal care homes or PCHs in Manitoba). Despite having different names and providing various care options across Canada, the general goal of supportive housing is to extend community-based living for some individuals as an alternate to PCH care.

Supportive housing in Manitoba provides care to people who are still able to reside in the community, but who are frail and/or cognitively impaired to the point where they can no longer manage in their own home even with informal supports and home care services. Supportive housing tenants typically receive: i) help with meals, laundry, and light housekeeping; ii) 24-hour on-site assistance to complete personal tasks like bathing, dressing, and grooming; and iii) some (but not 24-hour) professional home care services as deemed eligible by the home care program. For the purposes of this research, the term 'supportive housing' defines dwellings that are authorized by government and/or health regions to receive some financial support. Tenants are also approved by stakeholders to reside in these dwellings as part of the continuing care eligibility assessment process, meaning that supportive housing is a formal component of Manitoba's continuum of older adult care. These factors differentiate supportive housing from various other housing options (e.g., 55+ retirement or assisted living complexes) that exist in Manitoba. These alternate housing options are not part of this research.

The purpose of this research is to examine supportive housing and PCH use in the Winnipeg Health Region of Manitoba, Canada. Three types of analyses were conducted. *First*, we examined the clinical profile (e.g., defining the amount of help people needed to complete activities of daily living tasks like dressing and bathing, their level of cognitive impairment, their severity of behavioural challenges, their frequency of bowel and bladder incontinence) of supportive housing tenants and PCH residents. Our goal in this part of the research was to identify how many PCH residents were clinically similar to the majority of supportive housing tenants (these PCH residents are called 'less clinically burdened' in this report). These results were used to estimate the extent to which supportive housing in Winnipeg can be expanded to help offset growing PCH demands.

Second, we compared the additional features of supportive housing and PCH users, comparing things like: i) the fees people paid to use these different components of continuing care, ii) differences in their healthcare use patterns (e.g., how often they visited an emergency department), and iii) differences in their informal support networks (e.g., if they had an informal caregiver and if so, how healthy this person was). Collectively, this information is used to discuss ways in which our continuing care system may need to change, helping to ensure that supportive housing is used optimally. *Third*, we also calculated the government/health region contributions to supportive housing and PCH care operational costs. These results provide a useful framework for discussing continuing care reform strategies from a financial perspective.

This information is summarized in the following three research questions, stated as follows:

- 1. What percent of newly admitted PCH residents are clinically similar to the majority of newly admitted supportive housing tenants?
- 2. Aside from their clinical characteristics, to what extent do supportive housing tenants and PCH residents differ by other factors, such as user demographics and various healthcare use patterns?
- 3. What are the government/health region contributions to operational costs (with and without considering healthcare use) of both supportive housing and PCH use?

Analyses were conducted on a cohort of 927 supportive housing tenants and 5,267 PCH residents from the Winnipeg Health Region, who were newly admitted into one of these care options between April 1, 2006 and March 31, 2011. The clinical characteristics (e.g., Activities of Daily Living (ADL) tasks, cognitive performance) of these people were captured using resident assessment instruments (InterRAI), which are also called Minimum Data Sets or MDS records. The MDS 2.0[®] instrument was used to capture these data on PCH residents, while MDS-HC[®] was completed on home care clients and supportive housing tenants.

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To be included in this study, PCH residents had to have been assessed using MDS 2.0 within 30 days of their first PCH admission date. Supportive housing tenants had to have been assessed using MDS-HC at some point during their supportive housing stay. This strategy ensures that we measured the clinical profile of residents at about their time of PCH admission, with comparison to the general cohort of supportive housing tenants.

MDS data were also linked to the Population Health Research Data Repository housed at the Manitoba Centre for Health Policy (MCHP), Faculty of Health Sciences, University of Manitoba. The Repository is a collection of administrative data that provides information on the health service use of Manitobans, including data on contacts with physicians and hospitals, pharmaceutical dispensing, as well as the use of home care services and PCHs. The specific files used to identify the use of these and other healthcare services are provided throughout this report.

Main Findings

The major 'take-home' points from this research are summarized in the following six headings.

Clinical Comparisons

During the study period, 10.4% of newly admitted PCH residents were clinically similar to most newly admitted supportive housing tenants. These 'less clinically burdened' PCH residents (and supportive housing tenants) required at most verbal supervision to complete ADL tasks, had at most mild cognitive challenges and few behavioural challenges, and were bladder and bowel continent almost all of the time. Furthermore, across all PCH days of the study period, residents were 'less clinically burdened' 8.1% of the time. These findings are important as previous MCHP research shows that, without additional reform strategies, Manitobans will require between 32% and 53% more PCH beds by the year 2031. Our present results demonstrate that increasing the number of PCH beds is not the only reform option in Winnipeg, and show that stakeholders could expand supportive housing units in Winnipeg, our results imply that stakeholders could double the number of supportive housing units in this region. This finding is particularly salient as Manitoba currently has one of the highest PCH bed supplies in Canada, and only one level of supportive housing as compared to multiple levels of this care offered in some other provinces.

Helping to Understand Why Less Clinically Burdened People Reside in a PCH

Our results also show that increasing the number of supportive housing units without changing processes may have limited merit. To illustrate, the majority of people in our study cohort paid much more to reside in supportive housing dwellings versus PCH facilities. Coupled with this, less clinically burdened people were often admitted into PCHs from the poorest Winnipeg neighborhoods, meaning that cost disincentives may have limited some people's ability to live in supportive housing. Also, our analyses show that 25% of less clinically burdened PCH residents had informal caregivers who were unable to continue providing support because of their own health challenges. Conversely, only 10% of supportive housing tenants had informal caregivers who were experiencing this level of difficulty. Collectively, these results warrant discussion about the potential challenges related to cost disincentives and reliance on informal supports in the current model of long-term continuing care.

Supportive housing was used at or near capacity for the duration of the study period, and during this time 52.5% of tenants had transferred to a PCH, while 13.4% died. Amongst tenants who left supportive housing for various reasons in the last two years of the study period (N=393), the median length of supportive housing stay was 640 days. Comparatively, the median length of stay amongst PCH residents who died during this same time period (N=3,268) was 849 days. Some of these PCH residents (N=166) had first resided in supportive housing. While the median length of PCH stay for these latter people was much shorter (444 days), their total length (supportive housing and PCH combined) of service use was 1,141 days. While perhaps some improvements related to continuing care transitions could be made (i.e., people resided in supportive housing and PCH care for longer than people who resided in PCHs only), overall these results suggest that supportive housing functions as an important alternative to PCH use (i.e., PCH lengths of stay were cut in half).

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Healthcare Use - Potential Areas to Improve

Our analyses identify patterns of healthcare use that warrant further discussion. As compared to PCH residents, supportive housing tenants tended to have more of their healthcare use contacts with 'downstream' services. For example, 81.2% of PCH residents had 10 or more visits annually with a primary care physician during the study period as compared to only 10.2% of supportive housing tenants (33.4% of these tenants had fewer than three contacts with primary care physicians annually). Conversely, more supportive housing tenants (41.9%) versus PCH residents (31.1%) had one or more visits annually with a specialist physician. Similarly, a much larger proportion (47.4%) of supportive housing tenants versus PCH residents (31.9%) had one or more visits annually to an emergency department (ED) during the study period. Upon arrival to the ED, almost half (47.9%) of the visits made by supportive housing tenants were triaged as less or non-urgent, as compared to 33.7% of the visits made by PCH residents. Lastly, while the study groups were dispensed similar types of prescription drugs, the total volume of these dispensed medications (measured in person-days of use) was higher for supportive housing tenants versus PCH resident staffing models for supportive housing tenants.

Government/Health Region and User Costs

Based on the data provided to us, we show that the government/health region contributions to operational costs are much less for supportive housing (median of \$14,400 per unit annually) than for PCHs (median of \$45,348 per bed annually). This finding is in contrast to user fees which were calculated to be much higher for supportive housing tenants (median of \$1,625 per month, \$19,500 annually) than PCH residents (median of \$1,287 per month, \$15,444 annually). When considered with our other findings (i.e., less clinically burdened PCH residents tend to come from the lowest income areas), this evidence further supports the need for continuing care reform to ensure that cost disincentives do not hinder access to supportive housing for some people.

Better Data, Please

While not related to reform strategies per se, this research calls for a much enhanced and government-centralized supportive housing data system, reflecting the important role that supportive housing plays in helping to offset PCH demands. The present analyses required substantial data cleaning of the supportive housing file with a 'line-by-line' review of open text, and with facility-level user fees often applied globally to a range of tenants. This system is in stark contrast to PCH records, where person-level utilization and per diem fees are recorded. From the perspective that it's challenging to manage what can't be measured, a better and more integrated supportive housing data system is required.

Future Research Directions

Specific research activities would help to further guide continuum of care reform strategies. First, it is important to validate PCH residents who were defined as less clinically burdened in this research using other forms of analyses (e.g., direct observation, chart review, focus groups with family members) to i) further ensure that these individuals are indeed candidates for supportive housing care, and ii) understand with greater clarity their non-clinical reasons for PCH use.

Second, this research should be expanded to include home care. This is especially important given the new Procura data system available in Winnipeg that provides person-level information on the hours of home care received and on the costs of providing these services. Analyses of these data systems, especially when linked to MDS records, would enable stakeholders to define from both a clinical and costing perspective the 'tipping points' by which people transition out of home-based care, as a means to investigate strategies for further enhancing this care. Also, comparing user profiles across the broader continuum would enable stakeholders to define more clearly if and how these care options could be better aligned to help people stay in their community for as long as safely possible. This, in turn, would be assisted by the development of more up-to-date transition algorithms to help ensure that people are best matched with the services they require.

CHAPTER 1: INTRODUCTION AND RESEARCH PURPOSE

Rationale and Study Purpose

Across Canada, the older adult care continuum has traditionally been comprised of home care services and personal care homes (PCHs).¹ Home care provides a variety of services that help people to stay in their homes for as long as safely possible (Manitoba Health, 2013), while PCHs provide 24-hour professional care in an institutional setting (Manitoba Health, 2015). Home care is provided at no direct charge in Manitoba, while PCH residents pay a daily fee ranging from \$35 to \$81 depending on their net income and marital status (Manitoba Health, 2015).

Healthcare planners across Canada have added various types of community-based congregate housing structures – termed supportive housing in Manitoba – as an intermediate care continuum option. Supportive housing in Manitoba provides care to people who are still able to reside in a congregate setting, but who are frail and/or cognitively impaired to the point where they can no longer manage in their own home even with informal supports or home care services. These tenants typically require help with meals, laundry, and light housekeeping, and also have available 24-hour on-site personal support to complete personal tasks like bathing, dressing and grooming. Supportive housing tenants may also require some (but not 24-hour) professional home care services as deemed eligible by the home care program (Manitoba Health, 2012; Winnipeg Regional Health Authority, 2014).

Supportive housing tenants in Manitoba are typically charged a monthly rent fee and also a service fee for meals, laundry, and light housekeeping. The cost to provide personal support and supervision is offset by the government and/or the health regions. Tenants are also approved by stakeholders to reside in these dwellings as part of the continuing care eligibility assessment process, meaning that supportive housing is a formal component of Manitoba's continuum of older adult care. This financial support and assessment process differentiates supportive housing from other housing options (e.g., 55+ retirement or assisted living complexes) that are not formally part of the continuing care system in Manitoba. It is important to note that the nomenclature used to define supportive housing varies widely across Canada (e.g., planners in British Columbia use the term 'assisted living' as equivalent to supportive housing in Manitoba; while in Alberta these dwellings are called residential facilities, a term used elsewhere to define PCHs). A report by the Canadian Centre for Elder Law provides an excellent summary of these different terms used and their care continuum implications (Canadian Centre for Elder Law, 2008).

Manitoba Health, Healthy Living and Seniors has recently produced a blueprint to support the advancement of the older adult care continuum (Manitoba Health, 2014), in part to better understand the appropriate volume of continuum care services required now and in the future, but also to determine how these services can better be configured, specifically to ensure that supportive housing serves as an appropriate alternative to PCH care. While past research from the Manitoba Centre for Health Policy (MCHP) (Chateau et al., 2012; Doupe et al., 2011) has helped to support this restructuring process, many additional challenges exist and the need for additional evidence is summarized in the following text:

Assuming the present care continuum remains at status quo, Manitobans are projected to require between 32% and 53% more PCH beds by the year 2031, depending on the extent to which past reductions in PCH use will continue into the future (Chateau et al., 2012; Doupe et al., 2011). This information, however, should be considered from the perspective that Manitoba currently has one of the highest supplies of PCH beds in Canada (i.e., 338 beds per 1,000 people 85 and older) as compared to provinces like New Brunswick, British Columbia, and Alberta (each with a PCH bed supply of less than 270 beds per 1,000 people 85 and older) (Sivananthan, Doupe, & McGregor, 2015). This evidence highlights the need to consider expanding community-based care options in Manitoba, versus developing reform strategies that focus only on increasing the number of PCH beds.

¹ Personal care homes are referred to as nursing homes or residential facilities in most other Canadian provinces.

- Also however, the literature shows that higher volumes of PCH beds do not automatically result in shorter waits
 for PCH care. In fact, some evidence suggests that the opposite is true. Manitoba has a high supply of PCH beds
 but also has a high volume of alternate level of care hospital days (Sivananthan et al., 2015). These days define
 people who no longer need acute care services but who are waiting in hospital for PCH admission. This evidence
 highlights the need for continuing care reform strategies to help ensure that the correct range and supply of
 care options are available, and with transition processes that optimize their use.
- Unfortunately, very little evidence exists to guide continuing care reform decisions. As an example, using data from 13 American states, Grabowski et al. (2012) reported a 10% growth in the number of community-based supportive housing structures from 1993 to 2007, and a concomitant 1.4% decline in nursing home occupancy rates and increases in resident acuity during this same time period. While the authors discuss many potential explanations for these results, their data cannot be used to state unequivocally the capacity for supportive housing to offset PCH use, and the policy changes, if any, required for this to happen. Similarly, while several authors have reported that about 10% of nursing home residents have "lower clinical needs" (Buttar, Blaum, & Fries, 2001; Doupe et al., 2012; McNabney, Wolff, Semanick, Kasper, & Boult, 2007; Mor et al., 2007; Young, 2009), this body of literature is generally quite siloed (i.e., considers nursing home residents only), and hence has similar challenges.
- While based on a small and potentially non-representative cohort of people, past MCHP research (Doupe et al., 2011) demonstrates that about 1 in 8 (12.5%) newly admitted PCH residents in the Winnipeg Health Region are clinically similar to the vast majority of supportive housing tenants,² hence demonstrating the potential need for more supportive housing dwellings. In addition however, several authors have criticized continuing care systems for organizing and delivering care in ways that align poorly with people's needs (Cohen, Murphy, Nutland, & Ostry, 2005; Jansen, 2011; Manitoba Nurses' Union, 2006; Turcotte, 2014), that rely heavily on informal supports (Parkland Institute, 2013), and that have vaguely defined and/or poorly developed policies to support the effective use of services (e.g., to facilitate overall system navigation, to ensure that transitions across the continuum are timely and equitable) (British Columbia Law Institute, 2013; Cohen et al., 2005; Government of Manitoba, 2014). Collectively therefore, the evidence required to guide continuing care reform must be multifaceted by demonstrating on one hand what types of care structures are needed, counterbalanced with the need to understand how various policies and practices impede or facilitate the effective use of these care options.

Given this information, the purpose of this research is to examine supportive housing and PCH use in the Winnipeg Health Region of Manitoba, Canada. Three types of analyses were conducted. *First*, we examined the clinical profile (e.g., defining how much help people needed to complete activities of daily living tasks like dressing and bathing, their level of cognitive impairment, their severity of behavioural challenges, their frequency of bowel and bladder incontinence) of supportive housing and PCH users, specifically identifying how many PCH residents were clinically similar to the majority of supportive housing tenants (these PCH residents are called 'less clinically burdened' in this report). These results were used to estimate the extent by which supportive housing in Winnipeg can be expanded to help offset growing PCH demands. *Second*, we compared the additional features of these continuing care users (i.e., supportive housing tenants, less and more clinically burdened PCH residents), focusing on: i) the fees people paid to use these services; ii) differences in their healthcare use patterns (e.g., how often they visited an emergency department); and iii) differences in their informal support networks (e.g., determining if they had an informal caregiver and if so, how healthy this person was). This information is used to discuss ways in which the continuing care system may need to change, helping to ensure that supportive housing is used optimally. *Third*, we calculated the government/health region contributions to supportive housing and PCH care operational costs to help understand the public resource implications of providing these different care options.

² This MCHP research was conducted on a small sample (N=217) of community-based supportive housing tenants during the period from April 1, 2005 to February 1, 2007; and also on the subset of PCH residents (N=4,090) who resided in not-for-profit facilities during this same period of time.

Research Questions

Three research questions are addressed in this document, each specific to the Winnipeg Health Region in Manitoba, Canada.

- 1. What percent of newly admitted PCH residents are clinically similar to the majority of newly admitted supportive housing tenants?
- 2. Aside from their clinical characteristics, to what extent do supportive housing tenants and PCH residents differ by other factors, such as user demographics and various healthcare use patterns?
- 3. What are the government/health region contributions to operational costs (with and without considering healthcare use) of both supportive housing and PCH use?

Focus and Organization of This Report

Study results are presented in six chapters. Chapter 2 of this report explains how we developed the cohort of supportive housing tenants and PCH residents. Chapter 3 uses a statistical process called cluster analysis to investigate the clinical profile of the cohort. We used this process to identify the number of PCH residents who were clinically similar (i.e., less clinically burdened) to most supportive housing tenants. These findings were used to estimate the potential for supportive housing to further offset PCH use in Winnipeg.

The sub-groups of less and more clinically burdened PCH residents are further compared to supportive housing tenants in Chapter 4. These analyses focus on various user (e.g., demographics, informal supports) and healthcare use (e.g., emergency department visit rates) measures, to help identify additional unique features of these groups. Person-level (out-of-pocket) payment and government/health region contributions to the operational costs of supportive housing and PCH use are presented in Chapter 5. Conclusions, policy implications, and future research directions are presented in Chapter 6.

Policy Relevance

Canada's population is aging rapidly (Doupe et al., 2011; Employment and Social Development Canada, 2015; Statistics Canada, 2010) and with this demographic change comes a large increase in the number of people with complex functional challenges, chronic physical diseases, and mental illness (Alzheimer's Society of Canada, 2010; Canadian Institutes of Health Information, 2011). Compounding this demographic shift, growing evidence suggests that increases in lifespan are often spent in poor health and with significant loss of functional mobility (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015; Crimmins & Beltran-Sanchez, 2011; Parker & Thorslund, 2007; Prince et al., 2014). Presently, 8% of community-dwelling Canadians 75-84 years old and 20% of those 85 and older report having at least moderate challenges completing ADL tasks like walking without help and preparing meals (Canadian Institutes of Health Information, 2011). Also, one in three Canadians aged 85 and older have Alzheimer's disease and related dementias (ARDs) (Canadian Institutes of Health Research, 2010; Canadian Study of Health and Aging Working Group, 1994). Chronic disease and mental illness trajectories are therefore sobering, and the number of Canadians living with ARDs is expected to almost triple from 480,600 people presently to 1,125,000 in 2038 (Alzheimer's Society of Canada, 2010). Factors such as challenges completing ADL tasks (Borrayo, Salmon, Polivka, & Dunlop, 2002; de Meijer, Koopmanschap, Koolman, & van Doorslaer, 2009; Li, Fann, & Kuo, 2011), cognitive impairments associated with ARDs (Gaugler, Duval, Anderson, & Kane, 2007; Luppa et al., 2010; Tomiak, Berthelot, Guimond, & Mustard, 2000), and depression and loneliness (Harris, 2007; Russell, Cutrona, & de la Mora, 1997) are all important determinants of continuing care use. While many older adults lead healthy and independent lives (Canadian Institutes of Health Information, 2011), 30% of Canadians aged 85 and older live in specialized care facilities (including PCHs) (Statistics Canada, 2011), and these individuals comprise up to 60% of all PCH days in Manitoba (Doupe et al., 2011). Without further healthcare reform, older Manitobans are projected to use up to 53% more PCH beds by 2031 (Doupe et al., 2011), a finding that has substantial cost implications. Measuring objectively the potential for supportive housing to help offset both the current and projected demand in PCH use, estimating the costs associated with expanding supportive housing versus PCH care, and exploring additional care continuum challenges has great value to help guide older adult continuum of care reform strategies.

CHAPTER 2: DEFINING THE STUDY COHORT

Chapter Highlights

This research was conducted on a cohort of 927 supportive housing tenants and 5,267 long stay personal care home (PCH) residents (i.e., excluding people who were in a PCH temporarily for respite reasons) who were newly admitted into these care options between April 1, 2006 and March 31, 2011. One additional year of data (extending until March 31, 2012) was used to ensure that healthcare use patterns were measured on all participants for at least one year or until death, whichever came first. During the study period, 31.3% of supportive housing tenants (N=290 people) were also reported as newly admitted PCH residents. With one exception (i.e., measuring lengths of PCH stay for people who had previously used supportive housing), this subset of users was not considered separately in this report.

For inclusion in this study, supportive housing tenants and PCH residents had to have been assessed at least once using the interRAI Minimum Data Set (MDS) data system.³ More specifically, PCH residents had to have had an MDS 2.0 assessment completed within 30 days of their PCH move-in date (thus profiling residents at about their time of PCH admission). Supportive housing tenants had to have had an MDS-HC assessment completed at some point during their stay. For tenants with multiple MDS-HC assessments, we selected the one closest to their supportive housing move-in date. For 95.4% of tenants, this first assessment was completed within six months of their supportive housing move-in date. Our clinical profiles in this chapter therefore define supportive housing tenants early during their supportive housing stay.

Data Sources Used in the Research

MCHP houses the Population Health Research Data Repository (Repository), a comprehensive collection of administrative data that is collected to administer the universal healthcare system in Manitoba. The Repository contains information of key interest to healthcare planners, including data on mortality and birth, contacts with physicians and hospitals, pharmaceutical dispensing, as well as the use of home care services and PCHs. A variety of social services and housing data are also now available at MCHP.

Person-level data in the Repository are de-identified and do not contain information such as patient name. However, the data can be linked at the person level across various Repository files using a scrambled number assigned to each registered Manitoban. Strict regulations are enforced at MCHP to protect patient confidentiality. All data management, programming and analyses were performed using SAS[®] version 9.4.

Several Repository files were linked to conduct this research. Because some of these files are available in the Winnipeg Health Region only, our analyses are confined to this region. A list of these files is provided in the following text.

- Manitoba Health Insurance Registry: This file was used as the central file for creating all other linkages, and to identify people's sex, birth date, death date, and the residential location of supportive housing and PCH users prior to their admission (for calculating area-level income quintiles).
- The Supportive Housing file: This file was provided by the Winnipeg Health Region specifically for this research and was used to identify supportive housing users and their admission dates. Tenants who had moved out of supportive housing also had a discharge date and disposition status (e.g., transferred to a PCH, death).
- Long Term Care Utilization History file: This file was required to identify newly admitted PCH residents and their length of PCH stay.

³ The Canadian versions of MDS-HC and MDS 2.0 are Copyright[©] Canadian Institute for Health Information, 2002.

- Long Term Care MDS Assessment and Home Care MDS Assessment files (i.e., interRAI data systems, also called Minimum Data Sets or MDS records). In 2000, the Winnipeg Health Region implemented a resident assessment instrument (MDS-Home Care or MDS-HC) that can be used to define home care clients' and supportive housing tenants' 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; MDS 2.0) (interRAI, 2005) was implemented in this health region. These files were required to develop a clinical profile (e.g., ADL tasks, cognitive performance, behavioural challenges, and bladder and bowel incontinence) for supportive housing tenants (using the MDS-HC file) and PCH residents (using the MDS 2.0 file).
- Home Care Procura file: This file was available for Winnipeg residents only at the time of this research, and was used to identify the types of home care services used by supportive housing tenants, and their related costs.
- Hospital Abstracts data: This file was used to identify the number of hospital separations and overall length of hospital stay of study participants.
- Medical Services file: This file was used to identify the number and type of physician contacts made by study participants.
- Emergency Department Information System: This file is available in the Winnipeg Health Region only, and was used to identify the number of emergency department visits made by study participants.
- Drug Program Information Network: This file was required to identify the volume of overall and potentially inappropriate drugs dispensed to study participants, and to calculate out-of-pocket costs associated with prescription drug use;
- Manitoba Housing (Tenant Management System) file: This file was used to identify the person-level costs paid by a subset of tenants who resided in supportive housing dwellings managed by Manitoba Housing.
- Canada Census data: This data was used to calculate income quintiles for study participants prior to entering a supportive housing dwelling or PCH.
- The Vital Statistics Mortality data: This file was used to determine the date of death of study participants.
- Various additional files were provided by Manitoba Government and Winnipeg Health Region stakeholders, documenting the fees charged by all other (non-Manitoba Housing) supportive housing dwellings, and identifying tenants who received additional subsidies (and the subsidy amount). More information about these additional files is provided in Chapter 5 of this report.

For additional information on the datasets used in this report, see http://umanitoba.ca/faculties/health_sciences/medicine/units/community_health_sciences/departmental_units/mchp/resources/repository/datalist.html.

Describing the Study Cohort

Research Study Period

This research was conducted on the cohort of all *newly admitted* supportive housing and PCH users during the five year period commencing April 1, 2006 and ending March 31, 2011. Our period of analyses, however, extends until March 31, 2012. This was done to ensure that healthcare use patterns were measured on all users for at least one year or until death, whichever came first.

Supportive Housing Dwellings within the Winnipeg Health Region

Ten community-based supportive housing dwellings existed within the city of Winnipeg during the study period, comprising 516 units.⁴ A map of these dwellings is provided in Figure 2.1. These dwellings range in size from 20 units (Arlington Haus, located in Downtown Winnipeg,) to 144 units (Rosewood Supportive Housing, located in Fort Garry). Some supportive housing dwellings have been in operation since before the start date of the study period (e.g., Fred Douglas Heritage House), while others (e.g., Windsor Park Place) opened more recently.

4 As of June 2013, there were 528 supportive housing units.



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Describing the Supportive Housing Data File

MCHP received the supportive housing file from the Winnipeg Health Region specifically to conduct this research. In addition to containing (scrambled) personal identifiers, this file contains each person's application and assessment dates, and where appropriate, their move-in and move-out dates (with disposition). Free text is also included for most individuals, helping to explain assessment decisions. The original supportive housing file we received from the Winnipeg Health Region contained 2,039 people with 3,070 records (see Figure 2.2).⁵

Upon initial review of these data, several individuals had unusable personal health identification numbers (PHINs) (N=209 people) and/or missing supportive housing move-in dates (N=606 people), and these people were excluded from this research. Some people (N=25) were also excluded because their move-in and/or move-out dates did not coincide with other repository files (e.g., PCH data). Also, in order to identify newly admitted supportive housing users during the study period, all people (N=220) admitted prior to April 1, 2006 or after March 31, 2011 were excluded from this file. Last, as a prerequisite for inclusion in this study, supportive housing tenants had to have had an MDS-HC assessment completed at some point during their supportive housing stay. Failure to meet this criterion excluded 43 people, resulting in a final cohort of 927 people who were newly admitted to a supportive housing dwelling in the Winnipeg Health Region between April 1, 2006 and March 31, 2011. In total, 95.4% of these tenants had their first MDS assessment completed within six months of their supportive housing move-in date (data not shown). The user profiles developed in this research therefore characterize people relatively soon after their supportive housing admission date.

⁵ Supportive Housing data were received in three separate but overlapping files dating from 2004 to 2008, 2007 to 2010, and 2010 onward. These files were first amalgamated and duplicate records were removed and/or combined as appropriate. Figure 2.2 provides the exclusions from this combined file, keeping in mind that the study cohort includes supportive housing tenants who were newly admitted between April 1, 2006 and March 31, 2011.



Figure 2.2: Establishing the Supportive Housing Cohort

* This cohort includes all people found in the available Supportive Housing files between April 1, 2004 and March 31, 2011.

PHINs = Personal Health Identification Numbers; MDS = Minimum Data Sets

Of initial concern was the large number of supportive housing tenants excluded due to missing PHINs and/or move-in dates (Figure 2.2). To investigate this matter more thoroughly, for each year of the study period we first calculated the actual person-days of care used by the final study cohort, and expressed this number as a percent of total person-days capacity (this latter number was obtained by multiplying the number of units in each dwelling by 365 days). This quotient represents the annual occupancy rate for each dwelling, with 100% representing capacity. As shown in Table 2.1, aside from the first year of operation, most dwellings in a given year operated at 80-100% capacity. We surmise that the vast majority of people with missing move-in dates (N=606 people from Figure 2.2) applied for but for various reasons never actually used supportive housing services during the study period. The final cohort of 927 newly admitted supportive housing tenants, distributed by dwelling, is provided in Table 2.2.

Cit.C			Occi	upancy Rat	ie %	
alle		2006/07	2007/08	2008/09	2009/10	2010/11
Arlington Haus (opened prior to April 2006)	20	68.1	80.3	82.3	97.5	93.9
Chez Nous (opened December 2008)	24	-	T	25.7	71.8	95.9
Fred Douglas Heritage House (opened prior to April 2006)	28	76.8	93.1	95.3	109.6	90.9
Harmony Court at Riverwood Square (opened June 2008)	96	ı	ı	16.9	51.5	84.2
Irene Baron Eden Centre (opened January 2008)	48	-	17.9	91.7	102.6	98.4
Lions Supportive Housing (opened prior to April 2006)	36	63.1	84.3	93.0	96.7	107.6
Résidence Despins (opened prior to April 2006)	48	72.0	90.0	97.2	95.4	95.2
Riverside Lions (opened October 2008)	48			58.6	90.6	104.9
Rosewood Supportive Housing (opened prior to April 2006)	144	76.9	82.3	91.6	98.4	100.6
Windsor Park Place (opened June 2009)	24	ı	I	I	ı	85.6
Occupancy rate was calculated by expressing the actual person-days	of use (for a	ill clients a	dmitted aft	er April 1, 1	999) as a p	ercent of

total facility capacity (calculated as the number of units in each facility multiplied by the number of days open).

Client move out dates were in some cases missing from the supportive housing file, in which case PCH admission dates were used as a surrogate. This may contribute to occupancy rates exceeding 100% in some facilities (e.g., where clients exited supportive housing and waited in hospital for PCH admission)

Site	Number (%) of Units	Number (%) of Newly Admitted Tenants
Total	516 (100)	927 (100)
Arlington Haus (opened prior to April 2006)	20 (3.9)	29 (3.1)
Chez Nous (opened December 2008)	24 (4.7)	46 (5.0)
Fred Douglas Heritage House (opened prior to April 2006)	28 (5.4)	46 (5.0)
Harmony Court at Riverwood Square (opened June 2008)	96 (18.6)	145 (15.6)
Irene Baron Eden Centre (opened January 2008)	48 (9.3)	110 (11.9)
Lions Supportive Housing (opened prior to April 2006)	36 (7.0)	73 (7.9)
Résidence Despins (opened prior to April 2006)	48 (9.3)	107 (11.5)
Riverside Lions (opened October 2008)	48 (9.3)	87 (9.4)
Rosewood Supportive Housing (opened prior to April 2006)	144 (27.9)	251 (27.1)
Windsor Park Place (opened June 2009)	24 (4.7)	33 (3.6)

Table 2.2: Final Number of Supportive Housing Tenants Newly Admitted between April 1, 2006 andMarch 31, 2011 (Study Cohort)

Defining the Cohort of Newly Admitted Personal Care Home Residents

In total, 8,313 long stay residents were newly admitted into a Winnipeg PCH during the study period (Figure 2.3).⁶ For inclusion in this research, these residents must have had an MDS 2.0 assessment completed within 30 days following their PCH admission date. As shown in Figure 2.3, numerous residents were excluded from the present research due to this criterion, leaving a final PCH cohort of 5,267 individuals.⁷ The distribution of this cohort across licensed Winnipeg PCHs is provided in Table 2.3.

⁶ This definition denotes level of care I through IV PCH residents. Individuals who were coded as a level of care V (receiving respite or temporary PCH care) and also those residing in chronic care facilities (levels of care VI and VII) are excluded from this research.

⁷ In total, 3,046 newly admitted PCH residents were excluded from this research. Compared to the study cohort (N=5,267), these residents were dispersed somewhat similarly across PCH sites, and were distributed similarly by age and sex, hence minimizing concerns about biases created by our exclusion criteria.



Figure 2.3: Establishing the Personal Care Home Cohort

* This cohort includes all people admitted into one of 38 licensed PCHs in the Winnipeg Health Region between April 1, 2006 and March 31, 2011. All individuals must have been paneled as Level I through IV (denoting long-term stay people and excluding those staying in chronic care facilities). Misericordia Health Centre (a transitional facility) was excluded from this analysis.

Site	Number (%)	Number (%) of Newly
	Of Beus	Admitted Residents
Total	5,636 (100)*	5,267 (100)
Actionmarguerite (Saint-Boniface)	309** (5.5)	259 (4.9)
Actionmarguerite (Saint-Vital)	154 (2.7)	122 (2.3)
Beacon Hill Lodge	175 (3.1)	135 (2.6)
Bethania Mennonite Personal Care Home	148 (2.6)	98 (1.9)
Calvary Place Personal Care Home	100 (1.8)	88 (1.7)
Charleswood Care Centre	155 (2.8)	244 (4.6)
Concordia Place	140 (2.5)	112 (2.1)
Deer Lodge Centre	235** (4.2)	290 (5.5)
Donwood Manor	121 (2.1)	90 (1.7)
Extendicare/Oakview Place	245 (4.3)	330 (6.3)
Extendicare/Tuxedo Villa	213 (3.8)	351 (6.7)
Extendicare/Vista Park Lodge	100 (1.8)	79 (1.5)
Fred Douglas Lodge	136 (2.4)	121 (2.3)
Golden Door Geriatric Centre	78 (1.4)	41 (0.8)
Golden Links Lodge	88 (1.6)	57 (1.1)
Heritage Lodge	86 (1.5)	121 (2.3)
Holy Family Home	276 (4.9)	195 (3.7)
Kildonan Personal Care Centre	120 (2.1)	93 (1.8)
Lions Personal Care Centre	116 (2.1)	135 (2.6)
Luther Home	80 (1.4)	80 (1.5)
Maples Care Centre	200 (3.5)	162 (3.1)
Meadowood Manor	88 (1.6)	61 (1.2)
Middlechurch Home of Winnipeg	197 (3.5)	268 (5.1)
Misericordia Place	100 (1.8)	124 (2.4)
Park Manor Personal Care Home	100 (1.8)	132 (2.5)
Parkview Place	277 (4.9)	228 (4.3)
Pembina Place Mennonite Personal Care Home	57 (1.0)	19 (0.4)
Poseidon Care Centre	218 (3.9)	363 (6.9)
River East Personal Care Home	120 (2.1)	60 (1.1)
River Park Gardens	80** (1.4)	33 (0.6)
Riverview Health Centre	228 (4.0)	164 (3.1)
St. Joseph's Residence	100 (1.8)	86 (1.6)
St. Norbert Personal Care Home	91 (1.6)	64 (1.2)
The Convalescent Home of Winnipeg	84 (1.5)	123 (2.3)
The Salvation Army Golden West Centennial Lodge	116 (2.1)	21 (0.4)
The Saul and Claribel Simkin Centre	200** (3.5)	102 (1.9)
The Sharon Home	155** (2.8)	113 (2.1)
West Park Manor Personal Care Home	150 (2.7)	103 (2.0)

Table 2.3: Final Number of Personal Care Home Residents Newly Admitted between April 1, 2006 and March 31, 2011 (Study Cohort)

* this is the number of beds in the 2010/11 fiscal year plus the number of beds in 2008/09 for The Sharon Home (which closed in 2009/10). The actual number of PCH beds in the 2010/11 fiscal year was N=5,481.

** indicates that the number of beds changed over the study period.

Actionmarguerite (Saint-Boniface) changed from 314 to 309 beds.

Deer Lodge Centre changed from 290 to 235 beds.

River Park Gardens Personal Care Home did not open until the 2007/08 fiscal year.

The Saul and Claribel Simkin Centre changed from 72 to 200 beds.

The Sharon Home changed from 157 to 155 beds, and then closed in the 2009/10 fiscal year.

CHAPTER 3: COMPARING THE CLINICAL PROFILE OF PERSONAL CARE HOME AND SUPPORTIVE HOUSING USERS

Chapter Highlights

This chapter examines the clinical profile of newly admitted personal care home (PCH) residents and supportive housing tenants during the study period, looking specifically for subgroups of these people with similar profiles. All people were defined by the amount of help they needed to conduct activities of daily living tasks (ADLs), their level of cognitive impairment, their severity of behavioural challenges, and their frequency of bladder and bowel incontinence.

Highlights of our findings are summarized in the following text:

- For the most part, supportive housing and PCH users differed greatly in their clinical profile. For example, 92.0% of supportive housing tenants required at most verbal supervision to complete ADL tasks as compared to only 18.5% of PCH residents.
- The profile of supportive housing tenants was quite homogeneous. Most of these tenants required at most ADL supervision, had at most minor cognitive and bladder incontinence challenges, and had very few behavioural or bowel continence challenges. Conversely, the cohort of PCH residents was clinically very diverse, ranging from individuals who were clinically similar to supportive housing tenants, to many people who experienced significant and co-morbid challenges.
- Cluster analysis is a statistical technique that groups similar objects or people based on multiple characteristics. The results from this technique build upon our descriptive findings, and demonstrate that 10.4% of all newly admitted PCH residents in the Winnipeg Health Region were clinically similar to most newly admitted supportive housing tenants. The vast majority of these *'less clinically burdened'* PCH residents (and also the supportive housing tenants): i) required at most verbal supervision to complete ADL tasks; ii) had at most mild challenges with cognitive impairment; iii) had behavioural challenges that were easily managed; iv) were bladder incontinent less than daily; and, v) had no challenges with bowel continence.
- Volume-based analysis in this chapter demonstrates that across all PCH days of the study period, PCH residents
 were less clinically burdened 8.1% of the time. These analyses showing that 10.4% of newly admitted PCH
 residents were less clinically burdened at the time of admission and that 8.1% of all PCH days were occupied by
 less clinically burdened residents illustrate the potential for supportive housing in the Winnipeg Health Region
 to offset PCH use.
- While not the focus of this research, the results in this chapter also demonstrate the large number of PCH residents with significant and co-morbid challenges. As an example, in addition to requiring weight-bearing help to complete ADLs at the time of PCH admission, 15.5% of this cohort had severe cognitive challenges, and many experienced frequent bouts of both bladder (e.g., multiple times daily) and bowel (e.g., two to three times per week) incontinence. This latter evidence heightens the importance of shifting Manitoba's care continuum in such ways that extend community-based models of care, hence reserving the current supply of PCH beds for those who need them the most. These findings also emphasize the present complexity of PCH care environments, which would be further increased if only sicker people were admitted into these facilities.

Chapter Methods

Variables Used to Conduct Analyses

In consultation with our Advisory Group, analyses in this chapter are based on five key MDS variables. These variables are described in the following text, with further information provided in Table 3.1:

- Activities of Daily Living (ADL) Hierarchy Scale: Measures a hierarchy of ADL dependency when performing select tasks (personal hygiene, toilet use, locomotion, eating) and provides a score ranging from 0 (independent in all tasks) to 6 (completely dependent in all tasks). People needing assistance to complete early-loss ADLs (e.g., hygiene) are assigned lower scores than people needing assistance to complete late-loss ADLs (e.g., eating).
- Cognitive Performance Scale (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 short-term 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 a more severe impairment either when making daily decisions or when making themselves understood.
- *Behavioural Challenges:* MDS records measure people's behavioural challenges related to wandering, being verbally or physically abusive, being socially disruptive, or resisting care. Response options to these questions can be used to identify people with no challenges in any of these areas, challenges in one or more area(s) that can be easily managed, or challenges in one or more area(s) that cannot be easily managed.
- *Bladder and Bowel Continence:* These variables, while analyzed separately, define people who are continent with or without appliances, and who are incontinent with varying degrees of frequency (ranging from less than once per week to multiple times daily).

For analysis purposes individual response options for each variable were collapsed into a four point scale (see Table 3.1), defined as follows:

- SCORE of 1: Defines people who were reported to have no discernable challenges in a given area (e.g., people who could complete ADL tasks independently, had no discernable behavioural challenges, were completely continent, were cognitively intact).
- SCORE of 2: Defines people who were reported to have mild challenges only (e.g., who required verbal supervision only to complete ADL tasks, displayed behavioural challenges that were easily managed, were bowel incontinent at most once per week, were bladder incontinent less than daily, had cognitive impairments not considered to be severe).
- SCORE of 3: Defines people who were reported to have moderate challenges (e.g., required limb guiding
 assistance to complete ADL tasks; occasionally displayed behavioural challenges that were not easily managed;
 were bowel incontinent at most two to three times per week; were bladder incontinent at most once per
 day; had more severe cognitive challenges in at most two areas of daily decision making, making one's self
 understood, or short-term memory).
- SCORE of 4: Defines people who were reported to have severe challenges (e.g., required weight-bearing help to complete at least some ADL tasks; frequently displayed behavioural challenges that were not easily managed; were bowel incontinent daily; were bladder incontinent multiple times daily; had severe cognitive challenges and as a result either never made daily decisions, were comatose, or were fully dependent on others for eating).

Clinical Measure	MDS-HC	MDS 2.0 (PCH)	MDS Scoring	Scoring Used in this
	(Supportive Housing)	Assessment Questions		Research
	Assessment Questions			
Activities of Daily	Personal hygiene	Personal hygiene	Independent in each task (0)	No challenges
Living (ADL)	Toilet use	Toilet use		(Score of 1)
Hierarchy Scale*	Locomotion	Locomotion	At most, supervision (e.g., oversight)	Mild challenges
	Eating	Eating	required for each task (1)	(Score of 2)
		5	At most, limited assistance (non-weight-	Moderate challenges
			bearing help: e.g., guided maneuvering	(Score of 3)
			of limbs) required for each task (2)	(00010 01 0)
			Extensive (weight-bearing) or total help	Severe challenges
			required for personal bygiene or toilet	(Score of 4)
			Extensive (but not total) help needed	
			for locomotion eating (4)	
			Total help needed for one or both of	
			locomotion eating (5)	
			Total help needed for all four ADIs (6)	
a				N
Cognitive	Cognitive skills for daily	Cognitive skills for daily	Intact (0)	No challenges
Performance	decision-making	decision-making	Bendedline forest (dealline see forest	(Score of 1)
Scale (CPS)*	Short-term memory recall	Short-term memory recall	Borderline intact (challenges in one	Mild challenges
	Making self understood	Making self understood	area but not severe) (1)	(Score of 2)
	Eating self-performance	Being comatose	Mild impairment (challenges in two or	
		Eating self-performance	three areas, but none severe) (2)	
			Moderate impairment (challenges in	Moderate challenges
			two or three areas, and more severe in	(Score of 3)
			one area) (3)	
			Moderate severe impairment	
			(challenges in two or three areas, and	
			more severe in two) (4)	
			Severe impairment (having severely	Severe challenges
			impaired decision making skills but with	(Score of 4)
			some ability to feed one's self) (5)	
			Very severe impairment (being	
			comatose, or having severely impaired	
			decision making skills and having to be	
			fed) (6)	
Behavioural	Wandering	Wandering	No symptoms exhibited	No challenges
Challenges**	Verbally abusive	Verbally abusive		(Score of 1)
-	Physically abusive	Physically abusive	Symptoms occurred in last seven days,	Mild challenges
	Socially disruptive	Socially disruptive	but were easily altered	(Score of 2)
	Resists care	Resists care	Symptoms occurred in one to three of	Moderate challenges
			last seven days; at least some were not	(Score of 3)
			easily altered	
			Symptoms occurred in four or more of	Severe challenges
			last seven days; at least some were not	(Score of 4)
			easily altered	
Bladder	Continent without device	Continent	Continent (complete control)	No challenges
Continence**	Continent with device	Incontinent ≤ 1/week		(Score of 1)
	Incontinent < 1/week	Incontinent > 2/week	Usually continent (incontinent about	Mild challenges
	Incontinent > 2/week	Incontinent daily	once per week)	(Score of 2)
	Incontinent daily	Multiple daily incontinence	Occasionally incontinent (two or more	()
	Multiple daily incontinence	watche daily incontinence	times per week)	
	Multiple daily incontinence		Erequently incontinent (daily)	Modorato challongos
			rrequently incontinent (daily)	(Score of 2)
			Completely in continuet (multiple deily)	
			completely incontinent (multiple daily	Severe challenges
D		Continent	episodes)	(Score of 4)
Bowel	Continent, no ostomy	Continent	Continent (complete control)	INO Challenges
Continence**	Continent with ostomy	Incontinent <1/week		(Score of 1)
	Incontinent ≤1/week	Incontinent 1/week	Usually continent (incontinent less than	Mild challenges
	Incontinent 1/week	Incontinent 2-3/week	once per week)	(Score of 2)
	Incontinent 2-3/week	Incontinent almost all of time	Occasionally incontinent (once per	
	Incontinent almost all of time		week)	
			Frequently incontinent (two to three	Moderate challenges
			times per week)	(Score of 3)
			Completely incontinent (daily)	Severe challenges
				(Score of 4)

Table 3.1: An Overview of the Outcome Scales and Individual Measures used from MDS-HC (for Supportive Housing Tenants) and MDS 2.0 (for Personal Care Home Residents) to Conduct this Research

* Outcome scales are provided as a part of the MDS-HC and MDS 2.0 systems.

**Measure developed using individual items from MDS-HC and MDS 2.0 assessments

PCH = Personal Care Home

Note: Table amended from Doupe M et al. Population Aging and the Continuum of Older Adult Care in Manitoba. Manitoba Centre for Health Policy; 2011

From Table 3.1, each person in this study was profiled according to the type and extent of challenges they experienced (i.e., ranging from a score of '1' in every domain meaning that people experienced no challenges whatsoever; to a score of '4' in one, multiple, or all clinical domains). People were combined into these various groups using a statistical technique called cluster analysis. This process starts with each person as his/her own cluster, commences by grouping people who are most similar across multiple clinical domains, and gradually relaxes grouping criteria until one overall group is formed. This process relies on stakeholders to decide, using both mathematical and contextual knowledge, when the clustering technique should stop, hence selecting the 'ideal' number of groups that are optimally different from each other yet similar within. Once this number of groups is decided, cluster analysis provides a statistical (pseudo R²) value to describe the mathematical 'fit' of the overall model. Like traditional R² values provided by ordinary least squared regression, pseudo R² values are largest when people within each group (cluster) are very similar, and when the differences between groups are large.⁸

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We used cluster analysis to define unique groups of the study cohort (N=6,194; comprised of 5,267 newly admitted PCH residents and 927 newly admitted supportive housing tenants), specifically looking for PCH residents who were similar clinically to the vast majority of supportive housing tenants. These analyses were conducted separately within each stratum of the ADL Hierarchy Scale (i.e., independent, requiring verbal supervision only, requiring limb-guiding assistance, requiring weight-bearing help to complete at least one ADL task), as depicted in Table 3.1. Within each of these strata, study members were then grouped (clustered) multi-dimensionally according to the degree of cognitive, behavioural, bladder, and bowel challenges they experienced. The number of supportive housing tenants and PCH residents within each cluster was then compared.

Detailed Chapter Results

Descriptive Results

Eighteen percent of the study cohort could independently complete ADL tasks, while 11.3% were reported to require verbal supervision to complete these tasks ("mild challenges"), and 44.8% required weight-bearing help to do so ("severe challenges", Table 3.2). This distribution, however, varied substantially by study group. For example, 73.2% of supportive housing tenants were defined as being ADL independent during the study period as compared to only 8.5% of PCH residents. Conversely, only 1.7% of all supportive housing tenants were reported to require weight-bearing help to complete ADL tasks as compared to 52.4% of PCH residents.

	Cohorts			
Activities of Daily Living Scores	Overall N (%)	Supportive Housing N (%)	Personal Care Home N (%)	
Total (%)	6,194 (100)	927 (100)	5,267 (100)	
No Challenges (score of 1)	1,126 (18.2)	679 (73.2)	447 (8.5)	
Mild Challenges (score of 2)	699 (11.3)	174 (18.8)	525 (10.0)	
Moderate Challenges (score of 3)	1,594 (25.7)	58 (6.3)	1,536 (29.2)	
Severe Challenges (score of 4)	2,775 (44.8)	16 (1.7)	2,759 (52.4)	

Table 3.2: Distribution of Activities of Daily Living Scores for the Study Cohort

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

⁸ As described by Finch (2005), the final number of clusters should be decided by identifying cut points associated with a local maximum pseudo F and a local minimum pseudo T² value. This process optimizes homogeneity within clusters and heterogeneity across different groups, and has been shown to identify accurately the number of clusters present in simulated data (Milligan & Cooper, 1985).
The degree to which people experienced additional clinical challenges is also reported within each ADL stratum (Tables 3.3 to 3.6). Collectively, these data demonstrate the greater number of clinical challenges faced by PCH residents versus supportive housing tenants. For example, amongst people who had mild challenges completing ADL tasks (i.e., required verbal supervision), only 17.2% of supportive housing tenants experienced any degree of behavioural challenges compared to 33.9% of PCH residents (Table 3.4). Similarly, 7.5% of these supportive housing tenants experienced any degree of bowel incontinence compared to 17.9% of PCH residents. This same pattern was found amongst moderate and severely challenged ADL residents (Tables 3.5 and 3.6). Collectively, this evidence highlights the considerable clinical diversity reported amongst PCH residents, especially as compared to the more homogeneous cohort of supportive housing tenants.

Table 3.3: Distribution of Clinical Scores Amongst People Who Could Independently Complete Activities of Daily Living Tasks

	Sı	pportive Housin	g Tenants (N=67	'9)	Pei	rsonal Care Home	e Residents (N=4	47)
	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)
No Challenges	99 (14.6)	624 (91.9)	510 (75.1)	651 (95.9)	252 (56.4)	360 (80.5)	319 (71.4)	395 (88.4)
Mild Challenges	473 (69.7)	47 (6.9)	93 (13.7)	20 (2.9)	107 (23.9)	37 (8.3)	74 (16.6)	40 (8.9)
Moderate Challenges	101 (14.9)	8 (1.2)	47 (6.9)	S	76 (17.0)	39 (8.7)	27 (6.0)	S
Severe Challenges	6 (0.9)	0 (0.0)	29 (4.3)	S	12 (2.7)	11 (2.5)	27 (6.0)	s

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

Table 3.4: Distribution of Clinical Scores Amongst People Who Required Verbal Supervision to Complete Activities of Daily Living Tasks

	Su	pportive Housin	g Tenants (N=17	4)	Per	rsonal Care Home	e Residents (N=5	25)
	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)
No Challenges	10 (5.7)	144 (82.8)	125 (71.8)	161 (92.5)	165 (31.4)	347 (66.1)	312 (59.4)	431 (82.1)
Mild Challenges	117 (67.2)	S	24 (13.8)	7 (4.0)	135 (25.7)	80 (15.2)	114 (21.7)	66 (12.6)
Moderate Challenges	39 (22.4)	S	14 (8.0)	S	186 (35.4)	64 (12.2)	51 (9.7)	13 (2.5)
Severe Challenges	8 (4.6)	0 (0.0)	11 (6.3)	S	39 (7.4)	34 (6.5)	48 (9.1)	15 (2.9)

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

Table 3.5: Distribution of Clinical Scores Amongst People Who Required Limb-Guiding Assistance to Complete Activities of Daily Living Tasks

	S	upportive Housin	ng Tenants (N=58	B)	Per	sonal Care Home	Residents (N=1,	536)
	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)
No Challenges	s	43 (74.1)	30 (51.7)	45 (77.6)	501 (32.6)	1,062 (69.1)	566 (36.8)	1,040 (67.7)
Mild Challenges	34 (58.6)	11 (19.0)	9 (15.5)	S	373 (24.3)	242 (15.8)	366 (23.8)	253 (16.5)
Moderate Challenges	18 (31.0)	S	7 (12.1)	S	532 (34.6)	156 (10.2)	267 (17.4)	114 (7.4)
Severe Challenges	S	S	12 (20.7)	S	130 (8.5)	76 (4.9)	337 (21.9)	129 (8.4)

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

Table 3.6: Distribution of Clinical Scores Amongst People Who Required Weight-Bearing Help to Complete Activities of Daily Living Tasks

	S	upportive Housir	ng Tenants (N=16	5)	Pers	sonal Care Home	Residents (N=2,	759)
	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)	Cognitive Performance N (%)	Behavioural Challenges N (%)	Bladder Continence N (%)	Bowel Continence N (%)
No Challenges	0 (0.0)	9 (56.3)	7 (43.8)	12 (75.0)	683 (24.8)	1,765 (64.0)	555 (20.1)	1,100 (39.9)
Mild Challenges	7 (43.8)	S	S	S	463 (16.8)	443 (16.1)	405 (14.7)	449 (16.3)
Moderate Challenges	S	S	S	S	982 (35.6)	288 (10.4)	377 (13.7)	277 (10.0)
Severe Challenges	S	S	S	S	631 (22.9)	263 (9.5)	1,422 (51.5)	933 (33.8)

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

Results from Cluster Analysis

Descriptive results are strongly supported by our findings from cluster analysis. This statistical process allocated *ADL-independent participants* (N=1,066)⁹ into nine subgroups based on the challenges they were reported to have in other clinical domains (Table 3.7). Cluster 1 of this subgroup was the largest in size (N=711), and is comprised of 256 PCH residents (4.9% of the overall PCH cohort) and about half (N=455; 49.1%) of all supportive housing tenants. In addition to being able to complete ADL tasks independently, these individuals were reported to have on average mild challenges with cognitive performance (i.e., mean CPS score of 1.6; 95% confidence limits of the mean ranging from 1.6-1.7), and on average no challenges in each of the behavioural, bladder continence, and bowel continence domains. As a second example, Cluster 2 of ADL-independent participants (8.2% of all supportive housing tenants, 0.6% of PCH residents) were reported to experience no challenges in the behavioural and continence domains (i.e., mean scores of about 1), and had on average moderate challenges in the cognitive domain (i.e., mean score of 3.1; 95% confidence limits of the mean ranging from 3.0-3.1; thus identifying people who had moderately severe cognitive challenges in at most two areas of daily decision making, making one's self understood, or short-term memory).

⁹ This number does not equal the number of ADL-independent users reported descriptively in Table 3.2 (N=1,126). In the cluster analysis on this subgroup, there were 60 people who were not allocated into any cluster reflecting this difference in counts. For more information see footnotes in Tables 3.7 to 3.10.

Table 3.7: Cluster Results for People Who Could Independently Complete Activities of Daily Living Tasks

	Cluste	r Size		Clinical Pro	ofile Mean	
	N (% of en	tire cohort)	(95	% Confidence Lin	uits of Mean Valu	es)
	Supportive	Personal Care	Cognitive	Behavioural	Bladder	Bowel
	ноизіпд N = 665 (71.7)	ноте N = 401 (7.6)	Performance	Challenges	Continence	Continence
Cluster 1	455 (49.1)	256 (4.9)	1.6 (1.6-1.7)	1.0 (1.0-1.0)	1.1 (1.1-1.2)	1.0 (1.0-1.0)
Cluster 2	76 (8.2)	31 (0.6)	3.1 (3.0-3.1)	1.0 (1.0-1.0)	1.2 (1.1-1.2)	1.0 (1.0-1.0)
Cluster 3	60 (6.5)	32 (0.6)	1.7 (1.6-1.8)	1.0 (1.0-1.0)	3.5 (3.4-3.6)	1.0 (1.0-1.0)
Cluster 4	25 (2.7)	15 (0.3)	1.7 (1.5-1.8)	2.0 (2.0-2.0)	1.1 (1.0-1.2)	1.0 (1.0-1.0)
Cluster 5	19 (2.0)	17 (0.3)	3.1 (3.0-3.2)	2.0 (2.0-2.0)	1.1 (1.0-1.2)	1.0 (1.0-1.0)
Cluster 6	11 (1.2)	18 (0.3)	1.7 (1.5-1.9)	1.0 (1.0-1.0)	1.7 (1.6-1.9)	2.0 (2.0-2.0)
Cluster 7	6 (0.6)	S	1.5 (1.1-1.8)	1.0 (1.0-1.0)	3.3 (3.0-3.6)	2.0 (2.0-2.0)
Cluster 8	S	S	1.5 (1.3-1.8)	3.0 (3.0-3.0)	1.3 (1.0-1.5)	1.0 (1.0-1.0)
Cluster 9	S	16 (0.3)	3.2 (3.0-3.3)	3.0 (3.0-3.0)	1.1 (1.0-1.3)	1.0 (1.0-1.0)
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's' indicates suppressed due to small numbers

60 ADL-independent individuals were not allocated to any cluster, and are excluded from this table.

Percentage values demonstrating cluster size are based on the overall cohort of 927 supportive housing tenants, and on the overall cohort of 5,267 personal care home residents.

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The pseudo R² value for this analysis is 0.780, indicating that 78% of the 'variance' (multi-dimensional distance using clinical

Note: Refer to Table 3.1 for an overview of clinical scores. In general, scores ≤2 depict people with at most mild challenges, scores) between participants exists between (versus within) cluster groups.

while scores of ≥ 3 depict people with moderate to severe challenges.

Amongst individuals who required verbal supervision to complete ADL tasks (Table 3.8; N=680 people), cluster analysis created six subgroups of people based on their challenges in other clinical domains. As an example, Cluster 1 of this group (147 supportive housing tenants, 15.9% of this cohort; 367 PCH residents, 7.0% of this cohort) were reported to experience no obvious difficulties in the behavioural and continence domains (mean score of about 1.0 in each of these domains) and on average mild cognitive challenges (mean score of 2.2; 95% confidence limits of the mean ranging from 2.1-2.3). Alternatively, Cluster 2 of this cohort contains people (N=60; 1.7% of all supportive housing tenants and 0.8% of all PCH residents) with negligible challenges in the cognitive, behavioural, and bowel continence domains (mean score of about 1.0 in each of these areas), but who experienced moderate (mean score of 3.4; 95% confidence limits of the mean ranging from 3.2 to 3.6) bladder continence difficulties (meaning that they were bladder incontinent about daily).

Table 3.8: Cluster Results for People Who Required Verbal Supervision to **Complete Activities of Daily Living Tasks**

	Cluste	er Size		Clinical Pro	ofile Mean	
	N (% of en	tire cohort)	(95	% Confidence Lin	its of Mean Valu	es)
	Supportive	Personal Care	Connitive	Behavioural	Rladder	Bowel
	Housing	Home	Derformanco	Challonand	Continonco	Continonco
	N = 171 (18.4)	N = 509 (9.7)		Clialieliyes		
Cluster 1	147 (15.9)	367 (7.0)	2.2 (2.1-2.3)	1.3 (1.3-1.4)	1.2 (1.2-1.3)	1.1(1.1-1.1)
Cluster 2	16 (1.7)	44 (0.8)	1.5 (1.4-1.7)	1.2 (1.1-1.3)	3.4 (3.2-3.6)	1.2 (1.1-1.3)
Cluster 3	S	22 (0.4)	3.4 (3.2-3.6)	1.2 (1.0-1.3)	3.2 (2.9-3.5)	1.3 (1.1-1.5)
Cluster 4	S	20 (0.4)	1.1 (1.0-1.2)	2.7 (2.3-3.0)	1.1 (1.0-1.3)	1.0 (1.0-1.0)
Cluster 5	S	12 (0.2)	2.9 (2.5-3.3)	1.4 (1.1-1.7)	3.3 (2.9-3.7)	3.4 (3.1-3.7)
Cluster 6	0 (0.0)	44 (0.8)	3.2 (3.0-3.3)	3.6 (3.5-3.8)	2.1 (1.8-2.4)	1.3 (1.2-1.5)
:		-				

's' indicates suppressed due to small numbers

19 ADL-supervision individuals were not allocated to any cluster, and are excluded from this table.

Percentage values demonstrating cluster size are based on the overall cohort of 927 supportive housing tenants, and on the overall cohort of 5,267 personal care home residents.

The pseudo \mathbb{R}^2 value for this analysis is 0.771, indicating that 77% of the 'variance' (multi-dimensional distance using clinical scores) between participants exists between (versus within) cluster groups.

Note: Refer to Table 3.1 for an overview of clinical scores. In general, scores ≤2 depict people with at most mild challenges,

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while scores of ≥ 3 depict people with moderate to severe challenges.

While the goal of this chapter is to identify PCH residents who were clinically similar to supportive housing tenants, it is important to recall (from Table 3.2) that 81.6% of PCH residents (versus only 8.0% of supportive housing tenants) required either limb-guiding or weight-bearing help to complete ADL tasks. Clustering results (Tables 3.9 and 3.10) verify that many of these PCH residents experienced significant additional and co-morbid challenges. Looking at individuals who required weight-bearing help to complete ADLs (Table 3.10), we see that 1,128 of these PCH residents (Cluster 1; 21.4% of all PCH residents) also had significant bladder continence challenges (mean score of 2.8, demonstrating that these residents were, on average, bladder incontinent almost daily) as well as bowel continence challenges (mean score of 1.8, meaning that residents were on average bowel incontinent about once per week). As a second example, in addition to requiring weight-bearing help to complete ADL tasks, 814 people (Cluster 2; 15.5% of the entire PCH cohort) were also reported to have significant cognitive performance challenges (mean score of 3.5; 95% confidence limits of the mean ranging from 3.4 to 3.5), were bladder incontinent multiple times daily (mean score of 3.9; 95% confidence limits of the mean ranging from 3.8 to 3.9), and were also bowel incontinent multiple times per week (mean score of 3.4; 95% confidence limits of the mean ranging from 3.3 to 3.4). Similar to our descriptive findings, these results from cluster analysis further clarify the large number of PCH residents with significant and often co-morbid clinical challenges. Conversely, there are very few supportive housing tenants in each of Tables 3.9 and 3.10 (most cells are suppressed given small counts of people).

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	Clust	er Size		Clinical Pro	otile Mean	
	N (% of er	ntire cohort)	(95	% Confidence Lin	its of Mean Valu	es)
	Supportive	Personal Care	Consistive	Behavioural	Blador	Bowol
	Housing	Home	Derformance		Continonco	Continence
	N = 58 (6.3)	N = 1,535 (29.1)		Cildileiiges		
Cluster 1	50 (5.4)	1,160 (22.0)	2.1 (2.0-2.1)	1.2 (1.2-1.2)	2.0 (2.0-2.1)	1.3 (1.2-1.3)
Cluster 2	S	217 (4.1)	3.0 (2.9-3.1)	3.3 (3.3-3.4)	2.3 (2.2-2.5)	1.7 (1.6-1.8)
Cluster 3	S	83 (1.6)	1.3 (1.2-1.4)	1.0 (1.0-1.1)	3.3 (3.1-3.5)	3.6 (3.5-3.7)
Cluster 4	S	64 (1.2)	3.4 (3.3-3.5)	1.3 (1.2-1.4)	3.7 (3.5-3.8)	3.8 (3.6-3.9)
Cluster 5	0 (0.0)	11 (0.2)	1.6 (1.3-2.0)	2.8 (2.3-3.3)	3.8 (3.5-4.1)	3.7 (3.4-4.0)

's' indicates suppressed due to small numbers

1 individual requiring limb-guiding assistance to complete ADL tasks was not allocated to any cluster, and is excluded from this table.

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Percentage values demonstrating cluster size are based on the overall cohort of 927 supportive housing tenants, and on the overall cohort of 5,267 personal care home residents.

The pseudo R² value for this analysis is 0.698, indicating that 70% of the 'variance' (multi-dimensional distance using clinical scores) between participants exists between (versus within) cluster groups.

Note: Refer to Table 3.1 for an overview of clinical scores. In general, scores ≤2 depict people with at most mild challenges, while scores of ≥ 3 depict people with moderate to severe challenges.

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	Clust	er Size		Clinical Pro	ofile Mean	
	N (% of e	ntire cohort)	(95	% Confidence Lim	its of Mean Valu	es)
	Supportive	Personal Care	Cognitive	Behavioural	Bladder	Bowel
	Housing	Home	Performance	Challenges	Continence	Continence
	N = 16 (1.7)	N = 2,759 (52.4)		•		
Cluster 1	S	1,128 (21.4)	1.6 (1.6-1.6)	1.0 (1.0-1.1)	2.8 (2.8-2.9)	1.8 (1.8-1.9)
Cluster 2	S	814 (15.5)	3.5 (3.4-3.5)	1.6 (1.6-1.7)	3.9 (3.8-3.9)	3.4 (3.3-3.4)
Cluster 3	S	322 (6.1)	3.3 (3.2-3.3)	1.6 (1.5-1.7)	1.4 (1.4-1.5)	1.2 (1.2-1.3)
Cluster 4	S	234 (4.4)	3.5 (3.5-3.6)	4.0 (4.0-4.0)	3.3 (3.2-3.4)	2.8 (2.6-2.9)
Cluster 5	S	110 (2.1)	2.1 (2.0-2.2)	2.9 (2.8-3.0)	3.0 (2.8-3.2)	1.3 (1.2-1.3)
Cluster 6	0 (0:0)	122 (2.3)	2.5 (2.3-2.7)	1.6 (1.4-1.7)	1.4 (1.3-1.5)	3.7 (3.6-3.8)
Cluster 7	0 (0:0)	29 (0.6)	1.4 (1.2-1.6)	3.3 (3.1-3.5)	3.6 (3.2-3.9)	3.8 (3.6-3.9)
	-	-				

Percentage values demonstrating cluster size are based on the overall cohort of 927 supportive housing tenants, and on the s' indicates suppressed due to small numbers

overall cohort of 5,267 personal care home residents.

The pseudo R² value for this analysis is 0.798, indicating that 80% of the 'variance' (multi-dimensional distance using clinical scores) between participants exists between (versus within) cluster groups.

Note: Refer to Table 3.1 for an overview of clinical scores. In general, scores ≤2 depict people with at most mild challenges,

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while scores of ≥ 3 depict people with moderate to severe challenges.

Looking at the results shown in Tables 3.7 through 3.10, the greatest degree of overlap between supportive housing and PCH users exists in Clusters 1 through 6 from the ADL-independent group (Table 3.7), and in clusters 1 and 2 for people requiring ADL supervision (Table 3.8). These clusters comprise 87.3% of the entire supportive housing cohort (N=809 tenants) and 14.8% of the overall PCH cohort (N=780 residents). To assess these clusters more closely – and to avoid overstating the number of PCH residents who were similar clinically to supportive housing tenants – we reviewed the actual scores of people in these clusters (e.g., 1,1,1,1,1 to denote people without challenges in any domain). These individual scores were used to create the final group of PCH residents who were defined as being *less clinically burdened* (Table 3.11). The following criteria were used to define these individuals:

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- Had a score of '1' in bowel continence (meaning that people were entirely continent); and also had a score of no greater than '2' in each of the other domains (i.e., experienced at most mild challenges). This criterion denotes all people in Table 3.11 except for those in the last two rows;
- Had a score of '3' in the cognitive performance domain (i.e., had severe challenges in only two of the areas of communication, remembering recent events, or making daily decisions); and experienced no challenges in the behavioural and continence domains, and had either no or mild challenges completing ADL tasks. This denotes people in the last two rows in Table 3.11.

Based on these guidelines, we defined a subgroup of 548 PCH residents (10.4% of the overall PCH cohort) who were *less clinically burdened*. These individuals were clinically similar to 71.3% of all supportive housing tenants (N=661 people). The remainder of our PCH cohort was defined as *more clinically burdened* (N=4,719 people; 89.6% of this cohort). Both groups were distributed similarly across all PCHs included in this study, with at least some less clinically burdened residents in each facility (data not shown).

		Clinical Profile			Number (%) of Cohort	
Activities of	Cognitive	Behavioural	Bladder	Bowel	Supportive	Personal Care
Daily Living	Performance	Challenges	Continence	Continence	Housing	Home
(ADLs)					(N=927)	(N=5,267)
1	1	1	1	1	68 (7.3)	170 (3.2)
1	1	1	2	1	11 (1.2)	20 (0.4)
1	1	2	1	1	S	10 (0.2)
1	1	2	2	1	S	0 (0.0)
1	2	1	1	1	321 (34.6)	53 (1.0)
1	2	1	2	1	55 (5.9)	13 (0.2)
1	2	2	1	1	19 (2.0)	S
1	2	2	2	1	S	0 (0.0)
2	1	1	1	1	S	88 (1.7)
2	1	1	2	1	S	18 (0.3)
2	1	2	1	1	S	8 (0.2)
2	2	1	1	1	67 (7.2)	59 (1.1)
2	2	1	2	1	11 (1.2)	16 (0.3)
2	2	2	1	1	12 (1.3)	8 (0.2)
2	2	2	2	1	S	S
1	3	1	1	1	59 (6.4)	25 (0.5)
2	3	1	1	1	23 (2.5)	51 (1.0)
TOTAL					661 (71.3)	548 (10.4)

Table 3.11: Clinical Profiles of Personal Care Home Residents* Defined as Less Clinically Burdened

* Selected from the subgroups of users in Clusters 1 through 6 in Table 3.7 (people who could complete ADLs independently), and also in Clusters 1 and 2 in Table 3.8 (people who required verbal supervision to complete ADLs).

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 to interpret the meaning of scorings 1 through 4.

In addition to counting people, we were also interested in defining less clinically burdened PCH residents from a volume (person-days) perspective. From this analysis, we report that the entire cohort of PCH residents (N=5,267 people) accounted for 3.7 million PCH days from April 1, 2006 to March 31, 2012, and residents were less clinically burdened for a total of 296,809 days during this same time period, or for 8.1% of all PCH days (data not shown). All other (non-clinical) factors aside, this result implies that supportive housing in the Winnipeg Health Region has the potential to reduce PCH demands by between 8.1% (based on a person-days analysis) and 10.4% (based on a person-level analysis). Details to conduct person-days analysis are provided in the following text:

- Consecutive MDS assessments were reviewed for less clinically burdened PCH residents, and for each of these follow-up assessments residents were dichotomized as either less or more clinically burdened as described in Table 3.11. This process was used to count the total number of days that each resident contributed to being less or more clinically burdened. In the event that a person switched clinical status (i.e., less to more clinically burdened) between consecutive assessments, one half of the total days between these assessments were allocated to each clinically burdened group. These analyses also included 30 individuals (out of 548 less clinically burdened people) with one MDS assessment only. The median length of stay for these residents was 47 days (i.e., they were admitted into PCH towards the end of the study period), and for these residents all days were assigned as being less clinically burdened.
- A small number of more clinically burdened residents at PCH admission became less clinically burdened thereafter. Using the same process as defined above, PCH days for these residents were divided into those where residents were less and more clinically burdened.
- Using this process, roughly two-thirds of all "less clinically burdened" PCH days were attributed to residents who
 were less clinically burdened at admission, while one-third of these days belonged to people who were initially
 more clinically burdened but improved in health thereafter. Conversely, 87% of all "more clinically burdened"
 PCH days were attributed to people who were more clinically burdened at the time of PCH admission.

CHAPTER 4: ADDITIONAL COMPARISONS BETWEEN SUPPORTIVE HOUSING TENANTS AND PCH RESIDENTS

Chapter Highlights

This chapter compares the supportive housing and PCH study groups in more detail, focusing on a range of their personal characteristics (e.g., age and sex profile, presence and health status of informal supports) and healthcare use patterns (e.g., length of supportive housing and PCH stay, disposition status, visits with primary care physicians and emergency departments). Depending on the outcome, text in this chapter compares the overall groups of supportive housing and PCH residents to all supportive housing tenants, or less and more clinically burdened PCH residents. Key outcomes from these comparisons are summarized as follows:

- Basic supportive housing and PCH use patterns are provided in this chapter. Of all tenants (N=927) admitted into supportive housing during the study period, 32.8% were still in this care environment as of March 31, 2012, 13.4% died while residing in these dwellings, and 52.5% transferred to a PCH during this time. Amongst tenants who left supportive housing in the last two years of the study period (April 1, 2010 to March 31, 2012; N=393 people), their median (inter-quartile range, IQR; 25th-75th percentile) length of supportive housing stay was 640 (344-985) days. Comparatively, the median length of stay amongst PCH residents who died during this same time (N=3,268 people) was 849 (IQR=301-1,673) days. Some of these latter residents (N=166) had transferred into a PCH from supportive housing, and their median length of PCH stay prior to dying was much shorter (444 days; IQR=194-865). Further, these latter residents spent a median of 1,141 total days (IQR=723-1,661) in both supportive housing and PCH care prior to dying. While perhaps some improvements related to continuing care transitions could be made (i.e., people resided in supportive housing and PCH care for longer than people who resided in PCHs only), overall these results suggest that supportive housing functions as an important alternative to PCH use (i.e., PCH lengths of stay were cut in half).
- From Chapter 3 of this report, we estimate that 10.4% of PCH residents were clinically similar to the majority of supportive housing tenants, implying that there is much potential for supportive housing to further offset PCH use in the Winnipeg Health Region. Findings from the current chapter, however, suggest that additional reform strategies may first be required in order for this to happen. For example, substantial differences in informal care were noted between the cohort of supportive housing tenants and less clinically burdened PCH residents. While almost all (97.6%) of our cohort had an informal care provider, for 24.7% of less clinically burdened PCH residents versus only 9.9% of supportive housing tenants, informal care providers were unable to continue in their role due to health reasons. Similarly, 24.7% of informal providers for less clinically burdened PCH residents reported feeling distressed, angry, or depressed because of their care responsibilities, versus only 12.7% of informal providers for supportive housing tenants. While no causal inferences can be made from these findings that is, we cannot say for sure that less clinically burdened people were in a PCH because of their failing informal supports they highlight a potential shortcoming of the present care continuum, and justify discussions to ensure that the current model of supportive housing care does not rely excessively on the need for informal supports.
- Further evidence in this chapter supports the notion that supportive housing tenants may benefit from receiving more and/or additional types of care. For example, a greater proportion of supportive housing tenants (47.4%) versus PCH residents (31.9%) had at least one emergency department (ED) visit annually during the study period. Upon arrival at the ED however, these visits were more frequently triaged as less or non-urgent for supportive housing tenants (during 47.9% of all ED visits) versus PCH residents (33.7% of all ED visits). These results likely reflect PCH residents' much greater access to on-site medical staff (nurses and doctors). Only 10.2% of supportive housing tenants had regular (10 or more) visits annually with a primary care physician during the study period, as compared to 81.2% of PCH residents. Thirty-three percent of supportive housing tenants had fewer than three contacts annually with a primary care physician, as compared to only 5.7% of PCH residents.

- In our initial analysis, median lengths of hospital stay were much longer for supportive housing (35; IQR=10-67 days) versus PCH (3; IQR=1-9 days) users. Upon further analysis however, this difference is almost entirely attributed to supportive housing tenants' last hospitalization, typically while waiting for PCH placement. Of the 487 supportive housing tenants who transferred into a PCH during the study period, their median length of hospital stay was 49 (IQR=15-76) days. Further, excluding this last hospitalization reduced both the number of hospitalized supportive housing tenants and their length of hospital stay (median of 14; IQR=5-36 days).
- Several results in this chapter further highlight the differences between less and more clinically burdened PCH residents, helping to verify our cluster results in Chapter 3. As an example, less clinically burdened PCH residents stayed in a PCH for a median of 747 days during the study period versus a median of 585 days for more clinically burdened residents.¹⁰ Also, a greater proportion of more clinically burdened PCH residents (26.8%) were hospitalized one or more times annually during the study period, as compared to 18.8% of less clinically burdened residents. Lastly, the death rate during the study period was higher (54.5%) amongst the more versus less (44.9%) clinically burdened PCH residents.

Chapter Methods

The strategies used to create chapter results are summarized in the following text:

- With some exceptions noted (e.g., home care use patterns), all findings in this chapter are reported by: i) the entire cohort of supportive housing tenants (N=927); ii) the entire cohort of PCH residents (N=5,267); and iii) the subgroups of PCH residents defined as less (N=548) and more (N=4,719) clinically burdened. Rather than being completely independent from each other, it is important to recall that 31.3% of supportive housing tenants (N=290 people) were also defined as newly admitted PCH residents during the study period. With some exceptions (e.g., when calculating lengths of stay for different groups of people), this subset of users was not treated independently in this report.¹¹
- User profiles were measured by i) age and sex calculated at the time of each person's supportive housing or PCH admission date (measured using the administrative files); ii) income quintile and geography one year prior to each person's admission date (also measured using administrative files¹²); and, iii) informal supports using MDS assessments. Informal support data (identifying the presence of a caregiver, the type of care they provided, the types of challenges informal caregivers' experienced) are available in the MDS-HC files only. Our findings on informal support were therefore restricted to the subset of PCH residents (N=2,249) for whom a MDS-HC assessment was completed at or around the time of their PCH panel. For more information see text pertaining to Table 4.3.

¹⁰ It is important to note that these results should not be interpreted as 'true' lengths of stay, as they were calculated prospectively. They are therefore necessarily short as by definition all members of the study cohort were admitted after April 1, 2006 with at most six years of follow-up. See the Methods section of this chapter for a more complete explanation.

¹¹ This N= 290 people were new supportive housing tenants and PCH residents from April 1, 2006 to March 31, 2011. By March 31, 2012, the number of supportive housing tenants who had transferred to a PCH increased to N=487 (see Table 4.4; 52.5% of supportive housing clients transferred to a PCH between April 1, 2006 and March 31, 2012).

¹² Income quintile is an area-level measure developed from Statistics Canada Census Data and assumes that people living in the same community-based dissemination area have similar incomes. Geography was defined as living in the Winnipeg Health Region versus elsewhere, and was determined using individual postal codes. Data for each measure were reported one year prior to each person's admission date, reflecting people's income status while still living in the community.

- Visit-based profiles (disposition status, length of stay) were developed from the supportive housing and personal care home files, and linked to the Repository file verifying death. Length of stay data were calculated both prospectively and retrospectively. The prospective analysis was conducted on the entire study cohort, specifically to compare lengths of stay for more versus less clinically burdened PCH residents. It is important to note, however, that these calculations provide censored results, as study participants were newly admitted after April 1, 2006 with at most six years of follow-up. To provide "true" or more accurate lengths of stay, a retrospective analysis was conducted on a separate cohort of PCH residents who died between April 1, 2010 and March 31, 2012, and looking backwards in time to capture their actual admission date. A similar strategy was used for supportive housing tenants, on the subset of people who died, transferred to a PCH, or were sent home between April 1, 2010 and March 31, 2012.
- Healthcare use profiles (e.g., ED visits, hospitalizations, physician visits, and prescription drug use) were developed by linking several administrative files. Further details about these linkages are provided in the appropriate sections of this chapter. As mentioned previously, these measures were captured using data until March 31, 2012, ensuring that healthcare use patterns were studied for at minimum one year or until death, whichever occurred first.

Detailed Chapter Results

User-Based Profiles

User-based profiles are provided in Table 4.1. Overall, 10.5% of the cohort was younger than 75 years of age, while 56.0% was 85 and older. This age distribution varied somewhat by care environment, with PCH residents tending to be younger (6.9% of supportive housing tenants versus 11.0% of PCH residents were younger than 75 years). Also, a greater proportion of supportive housing tenants (80.6%) versus PCH residents (67.6%) were female. This difference by sex exists within each age category. As an example, amongst 75-84 year olds, 79.0% of supportive housing tenants versus 63.6% of PCH residents were female. These age and sex distributions did not vary discernably by PCH subgroups.

During the study period, approximately 92% of supportive housing and PCH users originated from the Winnipeg Health Region (Table 4.1). Across all users combined, 37.9% were admitted from the lowest income areas (i.e., income quintile 1 and 'not found'), while 42.2% of people were admitted from higher income areas (quintiles 3-5). While this income distribution is similar for the overall groups of supportive housing tenants and PCH residents, a somewhat greater proportion of less (44.3%) versus more (36.8%) clinically burdened residents moved into a PCH from the lowest income areas.

		Cohorte		Personal Care Home		
		Conorts		Cohort S	ubgroups	
Demographic Profile		Supportive	Personal Care	Less Clinically	More Clinically	
	Overall	Housing	Home	Burdened	Burdened	
	N (%)	N (%)	N (%)	N (%)	N (%)	
Total	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)	
Age						
≥64	189 (3.1)	14 (1.5)	175 (3.3)	19 (3.5)	156 (3.3)	
65-74	458 (7.4)	50 (5.4)	408 (7.7)	44 (8.0)	364 (7.7)	
75-84	2,080 (33.6)	348 (37.5)	1,732 (32.9)	176 (32.1)	1,556 (33.0)	
85+	3,467 (56.0)	515 (55.6)	2,952 (56.0)	309 (56.4)	2,643 (56.0)	
Sex						
Male	1,886 (30.4)	180 (19.4)	1,706 (32.4)	163 (29.7)	1,543 (32.7)	
Female	4,308 (69.6)	747 (80.6)	3,561 (67.6)	385 (70.3)	3,176 (67.3)	
Female Stratified by Age*						
≥64	95 (50.3)	8 (57.1)	87 (49.7)	7 (36.8)	80 (51.3)	
65-74	233 (50.9)	30 (60.0)	203 (49.8)	28 (63.6)	175 (48.1)	
75-84	1,377 (66.2)	275 (79.0)	1,102 (63.6)	119 (67.6)	983 (63.2)	
85+	2,603 (75.1)	434 (84.3)	2,169 (73.5)	231 (74.8)	1,938 (73.3)	
Geography						
Non-Winnipeg	504 (8.5)	72 (7.8)	432 (8.7)	41 (7.8)	391 (8.8)	
Winnipeg Health Region	5,400 (91.5)	855 (92.2)	4,545 (91.3)	487 (92.2)	4,058 (91.2)	
Income Quintile		-	-			
Lowest (NF/Q1)	2,237 (37.9)	365 (39.4)	1,872 (37.6)	234 (44.3)	1,638 (36.8)	
Middle (Q2)	1,177 (19.9)	185 (20.0)	992 (19.9)	92 (17.4)	900 (20.2)	
Highest (Q3-Q5)	2,490 (42.2)	377 (40.7)	2,113 (42.5)	202 (38.3)	1,911 (43.0)	

Table 4.1: Demographic Profile of Supportive Housing	Tenants and Personal Care Home Residents
People admitted from April 1, 2006 - March 31, 2011	

NF = Income Quintile Not Found

*Unlike all other categories in this table, percent columns in these strata do not total 100. Rather, these values represent the percent of each age category that are female (e.g., 36.8% of all less clinically burdened people 64 years old or younger were female, meaning that 63.2% were male).

As demonstrated in Chapter 3, study groups differed greatly regarding the challenges they experienced completing activities of daily living (ADL) tasks, their cognitive impairment, the behaviours they displayed, and how frequently they were bladder and/or bowel incontinent. Consistent with the manner in which the subgroups of PCH residents were developed, less burdened PCH residents were very similar to supportive housing tenants, and different from their more clinically burdened counterparts on each of these clinical measures (Table 4.2). The following text highlights these group comparisons, further emphasizing the overlap between supportive housing and less clinically burdened PCH users, and the substantive diversity that exists amongst PCH residents.

- Thirty percent of all study participants required at most verbal supervision (i.e., 'independent' or 'mild challenges' in Table 4.2) when conducting ADL tasks. This varies tremendously by study group, ranging from 92.0% of all supportive housing tenants, 100% of less clinically burdened PCH residents, and only 9.0% of more clinically burdened PCH residents. Amongst this latter group, 58.5% of people required some form of weight-bearing assistance (severe challenges) to complete ADL tasks, versus only 1.7% of supportive housing tenants.
- Across all groups combined, 55.2% of people experienced at most mild cognitive impairments when making daily decisions, communicating, and/or with short term memory recall. This degree of impairment varies by study group, ranging from 80.1% of supportive housing tenants, 86.1% of less clinically burdened PCH residents, and only 46.8% of more clinically burdened residents. Conversely, 17.2% of this latter group was severely cognitively impaired, meaning that residents had extreme challenges making daily decisions and at least at times needed to be fed.
- Seventy percent of all study participants (88.5% of supportive housing tenants, 93.6% of less clinically burdened PCH residents) displayed no discernable behavioural challenges during the study period. Conversely, 19.7% of more clinically burdened PCH residents experienced moderate to severe behavioural challenges, meaning that at least once in the week preceding their MDS assessment, these residents exhibited behavioural challenges (wandering, being verbally or physically abusive, being socially disruptive, or resisting care) that were difficult to manage.
- During the study period, 43.3% of all participants were bladder incontinent at least daily (moderate and severe challenges in Table 4.2). This proportion of people with bladder incontinence varies by study group, ranging from 13.8% of supportive housing tenants, 0.0% of less clinically burdened PCH residents, and 54.2% of more clinically burdened PCH residents. Similarly, 31.6% of more clinically burdened PCH residents were bowel incontinent multiple times per week (i.e., moderate to severe challenges in Table 4.2), versus virtually no supportive housing tenants and less clinically burdened PCH residents.

		Cohorts			Personal Care Home		
		Conorts		Cohort S	ubgroups		
		Supportive	Personal Care	Less Clinically	More Clinically		
	Overall	Housing	Home	Burdened	Burdened		
	N (%)	N (%)	N (%)	N (%)	N (%)		
Total	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)		
Activities of Daily							
Living (ADL)							
No Challenges	1,126 (18.2)	679 (73.2)	447 (8.5)	296 (54.0)	151 (3.2)		
Mild Challenges	699 (11.3)	174 (18.8)	525 (10.0)	252 (46.0)	273 (5.8)		
Moderate Challenges	1,594 (25.7)	58 (6.3)	1,536 (29.2)	0 (0.0)	1,536 (32.5)		
Severe Challenges	2,775 (44.8)	16 (1.7)	2,759 (52.4)	0 (0.0)	2,759 (58.5)		
Cognitive							
Performance							
No Challenges	1,712 (27.6)	111 (12.0)	1,601 (30.4)	315 (57.5)	1,286 (27.3)		
Mild Challenges	1,709 (27.6)	631 (68.1)	1,078 (20.5)	157 (28.6)	921 (19.5)		
Moderate Challenges	1,938 (31.3)	162 (17.5)	1,776 (33.7)	76 (13.9)	1,700 (36.0)		
Severe Challenges	835 (13.5)	23 (2.5)	812 (15.4)	0 (0.0)	812 (17.2)		
Behavioural							
Challenges							
No Challenges	4,354 (70.3)	820 (88.5)	3,534 (67.1)	513 (93.6)	3,021 (64.0)		
Mild Challenges	893 (14.4)	91 (9.8)	802 (15.2)	35 (6.4)	767 (16.3)		
Moderate Challenges	560 (9.0)	S	S	0 (0.0)	S		
Severe Challenges	387 (6.2)	S	S	0 (0.0)	S		
Bladder		-	-		-		
Continence							
No Challenges	2,424 (39.1)	672 (72.5)	1,752 (33.3)	477 (87.0)	1,275 (27.0)		
Mild Challenges	1,086 (17.5)	127 (13.7)	959 (18.2)	71 (13.0)	888 (18.8)		
Moderate Challenges	793 (12.8)	71 (7.7)	722 (13.7)	0 (0.0)	722 (15.3)		
Severe Challenges	1,891 (30.5)	57 (6.1)	1,834 (34.8)	0 (0.0)	1,834 (38.9)		
Bowel							
Continence							
No Challenges	3,835 (61.9)	869 (93.7)	2,966 (56.3)	548 (100.0)	2,418 (51.2)		
Mild Challenges	842 (13.6)	34 (3.7)	808 (15.3)	0 (0.0)	808 (17.1)		
Moderate Challenges	426 (6.9)	15 (1.6)	411 (7.8)	0 (0.0)	411 (8.7)		
Severe Challenges	1,091 (17.6)	9 (1.0)	1,082 (20.5)	0 (0.0)	1,082 (22.9)		

 Table 4.2: Clinical Profile of Supportive Housing Tenants and Personal Care Home Residents

 People admitted from April 1, 2006 - March 31, 2011

's' indicates suppressed due to small numbers

Note: Refer to Table 3.1 for definitions of "no", "mild", "moderate", and "severe challenges".

Data on informal supports are captured during MDS-HC assessments (i.e., pre-PCH admission), and are therefore provided for i) the entire cohort of supportive housing residents (N=927), and ii) a subset of PCH residents (N=2,249; 42.7% of this cohort) who had an MDS-HC assessment completed within 90 days of their PCH panel date. MDS-HC assessments identify people with an informal care provider, define the relationship of the informal provider to this person, describe the types of informal support that people provide and their willingness to increase this care, and report on the types of challenges that informal care providers are experiencing. Results from this portion of MDS-HC are provided in Table 4.3, with highlights provided in the following text.

- Almost all (97.6%) of the study cohort reported having an informal care provider. While about one-third (31.9%) of all people lived with their informal care provider, this value ranged from less than one-quarter of all supportive housing and less clinically burdened PCH users, to 39.8% of more clinically burdened PCH residents. Informal caregivers provided assistance to complete ADL tasks for a much smaller proportion of less (23.5%) versus more (37.8%) clinically burdened PCH residents, likely reflecting the clinical differences between these subgroups of residents. Informal care providers were reported to provide both emotional support and assistance with instrumental activities of daily living (e.g., shopping, paying bills, making meals, housekeeping) for the vast majority of supportive housing and PCH users.
- While about half of all informal caregivers in each study group were willing to increase the types of support they provided, those for PCH residents were less able to do so. Overall, informal caregivers reported that they were unable to continue providing care due to their own health challenges for 24.7% of less clinically burdened PCH residents as compared to only 9.9% of supportive housing tenants. Similarly, informal caregivers reported having feelings of distress, anger, or depression related to their care responsibilities for 24.7% of less clinically burdened PCH residents as compared to 12.7% of supportive housing tenants.

Table 4.3: Supportive Housing Tenants' and Personal Care Home Residents' Characteristics **Related to Informal Care**

People admitted from April 1, 2006 - March 31, 2011

		Cohorts		Personal C	are Home
				Cohort Su	ibgroups [*]
Informal Care		Supportive	Personal Care	Less Clinically	More Clinically
	Overall	Housing	Home*	Burdened	Burdened
	N (%)	N (%)	N (%)	N (%)	N (%)
Total	3,176	527	2,249	253	1,996
Tenant/Resident is Married	780 (24.6)	104 (11.2)	676 (30.1)	60 (23.7)	616 (30.9)
Tenant/Resident has Informal Caregiver	3,099 (97.6)	920 (99.2)	2,179 (96.9)	247 (97.6)	1,932 (96.8)
Informal Caregiver Characteristics**					
Living Arrangements					
Caregiver lives with client	990 (31.9)	165 (17.9)	825 (37.9)	57 (23.1)	768 (39.8)
Caregiver is spouse, child, or child-in-law	2,589 (83.5)	770 (83.7)	1,819 (83.5)	192 (77.7)	1,627 (84.2)
Type of Support Provided					
Activities of Daily Living ⁺	931 (30.0)	143 (15.5)	788 (36.2)	58 (23.5)	730 (37.8)
Instrumental Activities of Daily Living ^t	2,937 (94.8)	868 (94.3)	2,069 (95.0)	225 (91.1)	1,844 (95.4)
Advice or Emotional Support	3,074 (99.2)	913 (99.2)	2,161 (99.2)	243 (98.4)	1,918 (99.3)
Caregiver willing to increase any type of support	1,656 (53.4)	491 (53.4)	1,165 (53.5)	125 (50.6)	1,040 (53.8)
Caregiver unable to continue care due to decline in his/her health	678 (21.9)	6.6) 16	587 (26.9)	61 (24.7)	526 (27.2)
Caregiver feeling distressed, angry, or depressed due to care responsibilities	705 (22.7)	117 (12.7)	588 (27.0)	61 (24.7)	527 (27.3)
* Informal support data are captured during MDS-HC assessments and are not avi	ailable in MDS 2.0. I	Results are capture	d on a subset of per	sonal care home (P(CH) residents

(N=2,249; 42.7% of the total PCH cohort) prior to PCH admission. For inclusion in this table, people needed to have an MDS-HC assessment completed within 90 days of their PCH panel date.

** Percentages are based on the subset of individuals with an informal care provider.

+ Examples of Activities of Daily Living include dressing, personal hygiene, and feeding.
Examples of Instrumental Activities of Daily Living include shopping, paying bills, making meals, and housekeeping

Users' disposition status and length of stay are provided in Tables 4.4 and 4.5, respectively. Results are summarized in the following text:

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- The study cohort consists of individuals who were admitted into either a supportive housing dwelling or a PCH facility between April 1, 2006 and March 31, 2011. By March 31, 2012, 32.8% of the supportive housing cohort was still residing in this care environment, 52.5% had transferred to a PCH, and 13.4% had died while living in a supportive housing dwelling. While the death rate amongst PCH residents was much higher (53.5%) during this same period, it was somewhat lower amongst less (44.9%) versus more (54.5%) clinically burdened PCH residents. These latter data further emphasize the differences in overall health status between less and more clinically burdened PCH residents.
- As explained in the Methods section of this chapter, length of stay measures were calculated prospectively and
 retrospectively using different cohorts of people. The prospective analysis was conducted on the usual study
 cohort (i.e., all people admitted from April 1, 2006 to March 31, 2011; and followed-up until March 31, 2012),
 specifically to compare lengths of stay for more versus less clinically burdened PCH residents. Coinciding with
 our findings about death rates, this analysis shows us that less versus more clinical burdened PCH residents
 stayed in a PCH for a much longer period of time (i.e., a median of 747 versus 585 days, respectively).

The above prospective calculation provides censored lengths of stay that by definition are short. To provide more accurate lengths of stay, we conducted a separate retrospective analysis on all users who left their respective living environments (by death for PCH residents; by death, transferring to a PCH, or going home for supportive housing tenants) between April 1, 2010 and March 31, 2012. This cohort was followed backwards in time to obtain people's actual admission dates and hence calculate their complete lengths of stay. From this method, length of stay for supportive housing tenants (N=393) was measured at a median of 640 (IQR=344-985) days, as compared to a median of 849 (IQR=301-1,673) days for PCH residents (N=3,268). Amongst these latter residents, some (N=166) had transferred into a PCH from supportive housing, and their subsequent length of PCH stay was much shorter (median=444 days; IQR=194-865 days). Further, these latter people spent a median of 1,141 (IQR=723-1,661) total days in both supportive housing and PCH care prior to dying. While perhaps some improvements related to continuing care transitions could be made (i.e., people resided in supportive housing and PCH care for longer than people who resided in PCHs only), overall these results suggest that supportive housing functions as an important alternative to PCH use (i.e., PCH lengths of stay were cut in half).

		Cohorts		Personal C Cohort S	Care Home ubgroups
Disposition Status*	Overall N (%)	Supportive Housing N (%)	Personal Care Home N (%)	Less Clinically Burdened N (%)	More Clinically Burdened N (%)
Total	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)
Still Residing in Same Care Environment	2,595 (41.9)	304 (32.8)	2,291 (43.5)	281 (51.3)	2,010 (42.6)
Death	2,943 (47.5)	124 (13.4)	2,819 (53.5)	246 (44.9)	2,573 (54.5)
Home	60 (1.0)	12 (1.3)	48 (0.9)	12 (2.2)	36 (0.8)
Personal Care Home	487 (7.9)	487 (52.5)	N/A	N/A	N/A
Other**	109 (1.8)	0 (0.0)	109 (2.1)	9 (1.6)	100 (2.1)

Table 4.4: Disposition Status of Supportive Housing Tenants and Personal Care Home Residents People admitted from April 1, 2006 - March 31, 2011

* Disposition of residents is calculated as of March 31, 2012.

** The disposition status of "Other" includes extended care hospitals, moved out of the province, or other/not specified.

Table 4.5: Lengths of Stay of Supportive Housing Tenants and Personal Care Home Residents

			Cohorts		Personal C Cohort Su	are Home Ibgroups
Lengths of	Stay	Overall	Supportive Housing	Personal Care Home	Less Clinically Burdened	More Clinically Burdened
Prospective (Censored) Calculations*						
Length of Supportive Housing and PCH Stay for Tenants and Residents from Date Admitted to	z	6,194	927	5,267	548	4,719
Study Period until Date Left their Care Environment or Censored at March 31, 2012	Days; Median (IQR)	239-990)	571 (366-891)	607 (332-1,009)	747 (432-1,193)	585 (313-984)
Retrospective (Non-Censored) Calculations**						
Length of Supportive Housing and PCH Stay for Tenants and Residents who Left their Care	Z	3.661	393	896.8		
Environment between April 1, 2010 and March 31, 2012		794 (309-1,599)	640 (344-985)	849 (301-1,673)	N/A	N/A
Length of Supportive Housing and PCH Stay for PCH Residents who Died between April 1, 2010	z	166	166	166	VIII	V) IV
and March 31, 2012 and who had used Supportive Housing	Days; Median (IQR)	1,141 (723-1,661)	524 (282-853)	444 (194-865)	A/NI	Y/N
* Prospective length of stay was calculated for the cohort or home for cumorative bounded to while this more to	of users who were admitted during the study period, u	up until they left their of	environment (i.e., by dea	ath for PCH residents; by	/ death, transferring to	a PCH, or going

values were censored at March 31, 2012).

** These values are based on all users who left their living environment between April 1, 2010 and March 31, 2012, and are calculated using people's actual admission dates. While this method provides more accurate (noncensored) lengths of stay, findings cannot be partitioned into sub-groups of more versus less clinical burdened PCH residents.

PCH = Personal Care Home IQR = Inter-Quartile Range (25^{th} and 75^{th} percentile)

Healthcare Use Profiles

Emergency department (ED) use patterns are shown in Table 4.6. In total, 37.1% of all study participants had no ED visits during the study period. This visit pattern varied by study group (25.0% of supportive housing versus 39.3% of PCH users had no ED visits during the study period). Conversely, a greater proportion of supportive housing tenants (23.5%) versus PCH residents (18.1%) had at least two ED visits annually during this time.

Visit acuity levels (Canadian Emergency Department Triage and Acuity Scale; CTAS) (Beveridge et al., 1998) also differed by study groups; 47.9% of all visits made by supportive housing tenants were triaged as being less or non-urgent (CTAS 4 and 5) during the study period, as compared to only 33.7% of all ED visits made by PCH residents. Conversely, only 12.8% of all ED visits made by supportive housing tenants were reported as being more acutely urgent (CTAS 1 and 2), as compared to 24.4% of visits made by PCH residents. Chief complaints (reported at the time of triage) denoting the main reason for the ED visit were similar across the study groups, with the exception that more visits made by supportive housing (versus PCH) users were for cardiovascular reasons, while fewer visits made by supportive housing tenants were for respiratory reasons. In general, ED patterns did not vary substantially amongst PCH subgroups.

Table 4.6: Patterns of Emergency Department use Made by Supportive Housing Tenants and **Personal Care Home Residents**

People admitted from April 1, 2006 - March 31, 2011. Emergency Department use measured until March 31, 2012

		Cohorts		Personal (Care Home
				Cohort S	ubgroups
Emergency Department Use		Supportive	Personal Care	Less Clinically	More Clinically
	Overall	Housing	Home	Burdened	Burdened
	N (%)	N (%)	N (%)	N (%)	N (%)
Total	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)
Visits/year					
0	2,300 (37.1)	232 (25.0)	2,068 (39.3)	205 (37.4)	1,863 (39.5)
>0 to <1	1,774 (28.6)	255 (27.5)	1,519 (28.8)	185 (33.8)	1,334 (28.3)
1 to <2	949 (15.3)	222 (23.9)	727 (13.8)	86 (15.7)	641 (13.6)
2 to <3	443 (7.2)	94 (10.1)	349 (6.6)	28 (5.1)	321 (6.8)
3+	728 (11.8)	124 (13.4)	604 (11.5)	44 (8.0)	560 (11.9)
Distribution of Visits by Urgency*					
Resuscitation/Emergent (CTAS 1, 2)	1,952 (22.1)	225 (12.8)	1,727 (24.4)	197 (22.6)	1,530 (24.7)
Urgent (CTAS 3)	3,529 (40.0)	673 (38.4)	2,856 (40.4)	385 (44.3)	2,471 (39.8)
Less/Non Urgent (CTAS 4, 5)	3,220 (36.5)	840 (47.9)	2,380 (33.7)	274 (31.5)	2,106 (34.0)
Other/Missing	123 (1.4)	14 (0.8)	109 (1.5)	14 (1.6)	95 (1.5)
Distribution of Visits by Chief Complaint*					
Other Complaints	2,382 (27.0)	475 (27.1)	1,907 (27.0)	257 (29.5)	1,650 (26.6)
Orthopedic	1,422 (16.1)	306 (17.5)	1,116 (15.8)	141 (16.2)	975 (15.7)
Neurologic	1,211 (13.7)	226 (12.9)	985 (13.9)	117 (13.4)	868 (14.0)
Respiratory	1,045 (11.8)	122 (7.0)	923 (13.1)	103 (11.8)	820 (13.2)
Cardiovascular	927 (10.5)	303 (17.3)	624 (8.8)	72 (8.3)	552 (8.9)
Gastrointestinal	861 (9.8)	127 (7.2)	734 (10.4)	85 (9.8)	649 (10.5)
Skin	411 (4.7)	67 (3.8)	344 (4.9)	39 (4.5)	305 (4.9)
Genitourinary	270 (3.1)	29 (1.7)	241 (3.4)	21 (2.4)	220 (3.5)
Ear, Nose, Throat	144 (1.6)	37 (2.1)	107 (1.5)	14 (1.6)	93 (1.5)
Mental Health	89 (1.0)	41 (2.3)	48 (0.7)	15 (1.7)	33 (0.5)
Trauma	35 (0.4)	10 (0.6)	25 (0.4)	S	S
Obstetrics and Gynaecology	20 (0.2)	S	S	S	S
Substance Misuse	7 (0.1)	S	S	S	S
* This is a visit-based analysis, and is calculated only fo	or those people with	one or more emer	gency department v	isits during the stud	y period.

r inis is a visit-based analysis, and is calculated only for those people with one of more emergency de 's' indicates suppressed due to small numbers

CTAS = Canadian Emergency Department Triage and Acuity Scale

Data on inpatient hospital separations, lengths of hospital stay, and primary care and specialist physician visit rates are provided in Table 4.7. Highlights of this table are provided in the following text:

- Forty percent of the overall cohort was never admitted as a hospital inpatient during the study period, meaning that 60% of the cohort was hospitalized at some point during this time. While annual hospitalization rates were similar across study groups, the median length of hospital stay was much longer for supportive housing tenants (35 days) versus PCH residents (3 days). Upon closer inspection however, 33.5% of supportive housing tenants who transferred into a PCH did so through hospital, and this last hospitalization accounts for much of these group differences (see footnote of Table 4.7). The median length of this last hospital stay was 59 (IQR=39-89) days. By excluding this hospitalization, only 14.6% of supportive housing tenants had one or more hospitalizations annually during the study period, with a median length of stay of 14 (IQR=5-36) days.
- Contrary to these data for hospitalizations, only 10.2% of supportive housing tenants had regular (10 or more) visits annually with a primary care physician during the study period, as compared to 81.2% of PCH residents. Conversely, 33.4% of supportive housing tenants had fewer than three contacts annually with a primary care physician, as compared to only 5.7% of PCH residents.

Table 4.7: Hospital Use and the Physician Visits Patterns of Supportive Housing Tenants and Personal Care Home Residents

People admitted from April 1, 2006 - March 31, 2011. Healthcare use measured until March 31, 2012

Hospital Use		Cohorts		Personal C Cohort Si	Care Home ubgroups
Physician Visits	Overall	Supportive	Personal Care	Less Clinically	More Clinically
		Housing	Home	Burdened	Burdened
Total; N (%)	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)
Inpatient Hospital Admissions					
Per Year; N (%)*					
0	2,459 (39.7)	414 (44.7)	2,045 (38.8)	223 (40.7)	1,822 (38.6)
>0 to <1	2,114 (34.1)	263 (28.4)	1,851 (35.1)	222 (40.5)	1,629 (34.5)
1 to <2	693 (11.2)	147 (15.9)	546 (10.4)	46 (8.4)	500 (10.6)
2 to <3	288 (4.6)	45 (4.9)	243 (4.6)	20 (3.6)	223 (4.7)
3+	640 (10.3)	58 (6.3)	582 (11.0)	37 (6.8)	545 (11.5)
Hospital Lengths of Stay (days);	5 (1-12)	35 (10-67)	3 (1-9)	4 (1-9)	3 (1-9)
Median (IQR)**) (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Primary Care Physician Visits Per					
Year; N (%)					
0 to <3	609 (9.8)	310 (33.4)	299 (5.7)	24 (4.4)	275 (5.8)
3 to <10	1,211 (19.6)	522 (56.3)	689 (13.1)	76 (13.9)	613 (13.0)
10+	4,374 (70.6)	95 (10.2)	4,279 (81.2)	448 (81.8)	3,831 (81.2)
Specialist Physician Visits					
Per Year; N (%)					
0	2,944 (47.5)	359 (38.7)	2,585 (49.1)	209 (38.1)	2,376 (50.3)
>0 to <1	1,227 (19.8)	180 (19.4)	1,047 (19.9)	117 (21.4)	930 (19.7)
1 to <2	788 (12.7)	152 (16.4)	636 (12.1)	83 (15.1)	553 (11.7)
2 to <3	414 (6.7)	72 (7.8)	342 (6.5)	50 (9.1)	292 (6.2)
3+	821 (13.3)	164 (17.7)	657 (12.5)	89 (16.2)	568 (12.0)
* Of the 487 supportive housing clie	ents who transferred	into a PCH (see Tabl	e 4.4). 163 did so thr	ough the hospital, ar	nd much of the

group differences for hospital admissions and length of stay are attributed to this hospitalization. The median (IQR) length of this last hospital stay was 59 (IQR=39-89) days; by excluding this hospitalization, only 14.6% of supportive housing tenants had one or more hospitalizations annually during the study period, with a median length of stay of 14 (IQR=5-36) days. ** Computed amongst the subset of users with one or more hospitalizations during the study period.

IQR = Inter-Quartile Range (25th and 75th percentile)

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Home care use patterns in this study were measured using the Procura data system from the Winnipeg Health Region, and is restricted to supportive housing tenants. Results from these analyses are presented in Table 4.8 and are summarized as follows:

Throughout the study period, 67.7% (N=628) of the supportive housing cohort used home care services during their supportive housing stay. Across this time period, 57.5% of home care recipients used these services on average less than once per week, while 24.1% used home care services on average at least three times weekly. The median duration of all home care visits was 0.6 hours. Across the total hours of home care provided per tenant, 46.3% of this time was provided by nurses, while 48.8% and 4.9% of this total time was provided by Home Care Attendants and Home Support Workers, respectively.

Home Care Use	Supportive Housing Cohort
Total Cohort; N	927
Used Home Care Services; N (%)	628 (67.7)
Frequency of Home Care Use; N (%)*	
<1 day per week	360 (57.3)
1 to <2 days per week	73 (11.6)
2 to <3 days per week	44 (7.0)
3 to <5 days per week	56 (8.9)
≥5 days per week	95 (15.1)
Hours of Home Care Used per Day; Median (IQR)*	0.6 (0.5 - 0.9)
Percent of Home Care Hours Provided, by Provider Type;	
Mean*	
Nurse	46.3%
Home Care Attendant	48.8%
Home Support Worker	4.9%

Table 4.8: Patterns of Home Care Use Made by Supportive Housing Tenants

Tenants admitted from April 1, 2006 - March 31, 2011. Home care use measured until March 31, 2012

* Computed amongst the subset of tenants who used home care services during the study period

IQR = Inter-Quartile Range (25th and 75th percentile)

Measures of prescription drug dispensation are provided in Tables 4.9 and 4.10. Drug dispensation was measured for the entire duration of each person's supportive housing or PCH stay (with the exception of polypharmacy which was measured during the first year of a person's stay only), and 'use' was defined as having one or more dispensed prescriptions with at least 30 days duration. Different classes of medication use were defined at the Anatomical Therapeutic Chemical (ATC) 4th level (WHO Collaborating Centre for Drug Statistics Methodology, 2005). Results from these analyses are summarized as follows:

• While the proportion of prescription drug users during the study period was slightly higher for supportive housing tenants (96.0% of people) versus PCH residents (89.4%), a greater proportion of both less and more clinically burdened PCH residents (about 50%) was defined as polypharmacy prescription drug users (i.e., they were dispensed seven or more classes of medications during their first year of stay), as compared to 37.2% of supportive housing tenants. Data on overall drug volume however, show that supportive housing tenants were dispensed a greater volume of drugs overall (on average, 3,172 person-days of drugs per tenant) as compared to PCH residents (2,509 person-days of drugs per resident). These differences aside, both supportive housing tenants and PCH residents were dispensed similar types of prescription drugs during the study period, with psychoanaleptics (used to treat Alzheimer's Disease and Related Dementias) dispensed most often

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Beers Criteria medications are a subset of drugs not recommended for use by older adults, due to limited
efficacy and/or significant contraindications of the drugs (Beers et al., 1991; Beers, 1997). For this research we
used a subset of these drugs that are considered to be higher risk independent of the prescription dose or
of people's disease. Overall, 12.0% of study participants were dispensed one or more of these Beers Criteria
drugs during the study period, which was roughly similar across study groups. The type of Beers Criteria drugs
dispensed was also similar across study groups, with benzodiazepines (a class of psychoactive drugs with
sedative and anti-anxiety effects) dispensed most often to both supportive housing tenants and PCH residents.

Table 4.9: Patterns of Prescription Drug Dispensation Made to Supportive Housing Tenants and Personal Care Home Residents

Personal Care Home Cohorts **Cohort Subgroups Prescription Drug Dispensation** Supportive Personal Care Less Clinically More Clinically Overall Housing Home Burdened Burdened 6,194 548 Total; N 927 5,267 4,719 Number (%) of People who were Dispensed Drugs within Entire Length of 5,598 (90.4) 890 (96.0) 4,708 (89.4) 491 (89.6) 4,217 (89.4) Stay Number (%) of People who were Dispensed Different Classes of Drugs* in Their First Year of Stay 624 (10.1) 0 45 (4.9) 579 (11.0) 61 (11.1) 518 (11.0) 1-3 963 (15.5) 222 (23.9) 741 (14.1) 79 (14.4) 662 (14.0) 4-6 1,638 (26.4) 315 (34.0) 1,323 (25.1) 127 (23.2) 1,196 (25.3) 2,624 (49.8) 345 (37.2) 7+ 2.969 (47.9) 281 (51.3) 2,343 (49.7) Total Person-Days of Drugs Dispensed 16,153,925 2,940,362 13,213,563 1,653,412 11,560,151 within Entire Length of Stay** (2,608/person) (3,172/person) (2,509/person) (3,017/person) (2,450/person) Total Person-Days of Drugs Dispensed by Drug Type 1.681.198 (10.4) 349,370 (11.9) 1.331.828 (10.1) **Psychoanaleptics** 154 156 (93) 1 177 672 (10 2) 236,249 (8.0) 152,288 (9.2) 1,207,365 (10.4) 1,595,902 (9.9) 1,359,653 (10.3) **Psycholeptics** Agents Acting on the Renin-932,544 (5.8) 225,596 (7.7) 706,948 (5.4) 103,514 (6.3) 603,434 (5.2) Angiotensin System 975,348 (7.4) 125,765 (7.6) 849,583 (7.3) 1,185,661 (7.3) 210,313 (7.2) Diuretics Serum Lipid Reducing Agents 499,935 (3.1) 167,613 (5.7) 332,322 (2.5) 46,763 (2.8) 285,559 (2.5) 167,597 (5.7) 471,781 (3.6) 59,903 (3.6) 411,878 (3.6) **Calcium Channel Blockers** 639,378 (4.0) Antacids, Drugs for Treatment of 960,427 (5.9) 161,137 (5.5) 799,290 (6.0) 103,656 (6.3) 695,634 (6.0) **Peptic Ulcers and Flatulence** Thyroid Therapy 774,219 (4.8) 153,557 (5.2) 620,662 (4.7) 74,475 (4.5) 546,187 (4.7) **Beta Blocking Agents** 771,003 (4.8) 150,220 (5.1) 620,783 (4.7) 87,687 (5.3) 533,096 (4.6) Antithrombotic Agents 774,624 (4.8) 149,551 (5.1) 625,073 (4.7) 78,890 (4.8) 546,183 (4.7) 100,875 (3.4) 432.067 (3.3) 65,126 (3.9) 366.941 (3.2) 532,942 (3.3) **Drugs Used In Diabetes** Cardiac Therapy 343,337 (2.1) 97,699 (3.3) 245,638 (1.9) 38,530 (2.3) 207,108 (1.8) 869,739 (5.4) 89,543 (3.0) 780,196 (5.9) 105,293 (6.4) 674,903 (5.8) Vitamins **Antianemic Preparations** 533,522 (3.3) 88.250 (3.0) 445.272 (3.4) 52,221 (3.2) 393.051 (3.4) 216,956 (1.3) 134,378 (1.0) **Drugs for Treatment of Bone Diseases** 82.578 (2.8) 22.613 (1.4) 111.765 (1.0) 510,214 (17.4) 3,332,324 (25.2) Other 3,842,538 (23.8) 382,532 (23.1) 2,949,792 (25.5

People admitted from April 1, 2006 - March 31, 2011. Drug dispensation measured until March 31, 2012

* Different classes of drugs were defined at the 4th level of the Anatomical Therapeutic Chemical (ATC) classification system. This system divides drugs into different groups based on the organ or system they act upon, as well as their chemical, pharmacological, and therapeutic properties. The 4th level denotes chemical subgroups of drugs used for similar purposes (WHO Collaborating Centre for Drug Statistics Methodology, 2006).

**This was calculated by counting the number of days that people were dispensed a given class of drugs, and summed across all drug classes. This value exceeds the total person-days of residency as people often received multiple drugs.

Note: This table is based on prescription drugs only; over the counter medications are not included in these results.

Table 4.10: Beers Criteria Drugs Dispensed to Supportive Housing Tenants and
Personal Care Home Residents

People admitted from April 1, 2006 - March 31, 2011. Drug dispensation measured until March 31, 2012

		Cohorts		Personal (Care Home
Boors Critoria Drugs		conorts		Cohort S	ubgroups
Beers Criteria Drugs	Overall	Supportive	Personal Care	Less Clinically	More Clinically
	Overall	Housing	Home	Burdened	Burdened
Total; N (%)	6,194 (100)	927 (100)	5,267 (100)	548 (100)	4,719 (100)
Number (%) of People Dispensed 0 to 3					
Beers Criteria Drugs					
0	5,448 (88.0)	832 (89.8)	4,616 (87.6)	476 (86.9)	4,140 (87.7)
1	664 (10.7)	87 (9.4)	577 (11.0)	62 (11.3)	515 (10.9)
2	72 (1.2)	S	S	10 (1.8)	S
3	10 (0.2)	s	S	0 (0.0)	s
Number (%) of People Dispensed Beers					
Criteria Drugs*					
Benzodiazepine	267 (35.8)	33 (34.7)	234 (35.9)	23 (31.9)	211 (36.4)
Antimuscarinic	170 (22.8)	30 (31.6)	140 (21.5)	16 (22.2)	124 (21.4)
Antidepressant	179 (24.0)	24 (25.3)	155 (23.8)	21 (29.2)	134 (23.1)
Antihistamines	179 (24.0)	12 (12.6)	167 (25.7)	17 (23.6)	150 (25.9)
Other Beers Criteria Drugs	43 (5.8)	6 (6.3)	37 (5.7)	S	S

's' indicates suppressed due to small numbers

* Percentages calculated amongst the subset of people dispensed Beers Criteria drugs (i.e., N=664+72+10=746 people in the overall cohort). Totals exceed 100% because people could be dispensed multiple types of Beers Criteria drugs.

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CHAPTER 5: USER AND GOVERNMENT/HEALTH REGION COST PROFILES

Chapter Highlights

Evidence from across Canada demonstrates that utilization fees are generally higher for supportive housing versus PCHs (British Columbia Ministry of Health, 2015; Government of Alberta, 2014). Such findings may mean that some people's ability to pay impacts their choice to live in a supportive housing dwelling. The present chapter investigates the differences in user fees paid by supportive housing tenants and PCH residents. It also provides some basic information about government/health region contributions to supportive housing and PCH operational costs, including costs related to the broader kinds of healthcare use. Highlights of these results are provided in the following text:

- Supportive housing tenants in Manitoba are typically charged a monthly rent fee and also a service fee for meals, laundry, and light housekeeping. From this perspective, two subcategories of supportive housing exist in Winnipeg: i) Full Pay Dwellings, where tenants pay the market-value fee charged by the supportive housing sites; and, ii) Reduced Pay Dwellings, where the tenant fees for rent are reduced by various means. Nearly three quarters (73.0%; N=677 people) of the supportive housing cohort resided in full pay dwellings during the course of this study, while the remainder (N=250 people, 27.0% of this cohort) resided in reduced pay dwellings.
- Tenant fees were substantially higher in full versus reduced pay supportive housing dwellings. Between April 1, 2006 and March 31, 2011, tenants residing in full pay dwellings paid a median of \$1,789 per month in rent and service fees, while tenants residing in reduced pay dwellings paid a median of \$1,031 in these fees monthly.
- Per diem fees paid by PCH residents are set by the province of Manitoba and are standard across all PCHs. Throughout the study period these fees ranged from between \$24 and \$74 daily, depending on a person's net income and marital status. The median per diem paid by PCH residents during this study period was \$1,287 monthly. When comparing these fee structures across study groups, reduced pay supportive housing tenant fees were at the 30th percentile of per diem fees paid by PCH residents. In other words, fee amounts were highly comparable between these two groups and in fact slightly favour reduced pay supportive housing tenants. However, full pay supportive housing tenant fees ranked at about the 70th percentile of those paid by PCH residents. Keeping in mind that 73% of supportive housing tenants resided in full pay dwellings, our results show that user fees are in general much higher for supportive housing tenants than for PCH residents.
- This difference in fees increases somewhat when considering prescription drug use. Supportive housing tenants pay for their drugs as part of Manitoba's Pharmacare program, while PCH residents receive their drugs at no cost. Overall, supportive housing tenants paid a median of \$1,733 in user fee and drugs costs monthly during the study period (\$1,886 for full pay tenants and \$1,096 for reduced pay tenants), while PCH residents paid a median of \$1,287 monthly during this same time.
- The results in this chapter show only the basic government/health region contributions to supportive housing operational costs. This money is provided as a flat rate to each supportive housing dwelling for costs related to the personal support and supervision of tenants. Based on these values, the government/health region contributed \$1,200 monthly (\$14,400 annually) per unit to supportive housing operational costs during the course of the study, versus \$3,779 monthly (\$45,348 annually) per PCH bed. This lower contribution to supportive housing versus PCHs remains after accounting for differences in these groups' healthcare use. Taking both operational and healthcare use costs into account, we estimate that the median annual government/ health region cost associated with supportive housing was \$21,708 per person during the study period, as compared to the median annual cost of \$47,676 per PCH resident. While user fees are often greater for supportive housing tenants than for PCH residents, the government/health region contribution to operational costs (as defined in this report) is substantially less for supportive housing tenants.

Chapter Methods

This section addresses the methods we used to calculate user fees, government/health region contributions to operational costs, and costs related to healthcare use. With one exception, all results in this chapter are reported as a median and inter-quartile range (IQR, 25th-75th percentile), and are presented separately for supportive housing tenants and PCH residents.

Calculating User Fees

User fees were calculated using a 'current dollar' approach. This means that the fees assigned to each person were weighted by their time spent in either a supportive housing dwelling or a PCH facility, and that calculations accounted for changes in fee amounts throughout the study.

From discussions with Advisory Group members, we learned that supportive housing tenants in Manitoba are typically charged a monthly rent fee and also a service fee for meals, laundry, and light housekeeping. These fees were used to create two subgroups of supportive housing tenants: i) <u>Full Pay Tenants</u>, ¹³ who paid the market-value rent charged by the supportive housing sites; and ii) <u>Reduced Pay Tenants</u>, who paid a reduced rental fee for various reasons. The strategy used to identify these tenants and to estimate their user fees is provided in the following text.

The following reduced pay tenants were identified:

- 1. Three supportive housing dwellings (Windsor Park Place, Chez Nous, Arlington Haus) are owned and operated by Manitoba Housing. Rental fees in each of these dwellings are determined at 25% of a person's annual income. While these fees should have been present in the Tenant Management System data housed at MCHP, the data were only available for a portion of tenants at Windsor Park Place. However, as the fees for these tenants at this site varied minimally, an average fee was calculated for each year and applied to the remaining tenants at Windsor Park Place as well as those who resided in Chez Nous. As this average fee was greater than the maximum fee allotted for tenants residing at Arlington Haus, we applied the maximum fee value to all Arlington Haus tenants. Tenants in dwellings operated by Manitoba Housing (N=108) comprised 11.7% of the supportive housing cohort.
- 2. Select other tenants received a reduction in rental fees. These included tenants who resided i) in up to 50% of the units at Riverside Lions, and ii) in 35 units across remaining supportive housing sites. While an Affordable Housing file was provided from the Manitoba Government to identify these tenants and their user fees, only people in these latter sites (N=74; 8.0% of the supportive housing cohort) were found. Based on the data available to us, we were unable to identify reduced pay tenants who resided at Riverside Lions, and for the purposes of this research these individuals were defined as full pay.¹⁴
- 3. The final group of reduced pay tenants is comprised of people who resided at Lions Supportive Housing (N=68; 7.4% of the supportive housing cohort). These tenants' fees were subsidized by an internal foundation. Only aggregate fees for these tenants were available. As fees varied minimally across the units in this dwelling, these data were applied to each individual (again stratified by year to account for changing fee amounts).

¹³ Denotes people who resided in full pay supportive housing dwellings.

¹⁴ As shown in Table 2.2, this dwelling opened in October of 2008, which is approximately at the midpoint of the study period. Tenants from this dwelling comprise 9.4% (87/927*100) of the supportive housing study cohort. Assuming that 50% of these tenants actually received an additional subsidy (N=43), this would reduce the final cohort of full pay tenants by 6.4% (from 677 to 634 people), or increase the cohort of reduced pay tenants by 17.2% (from 250 to 293 people). From these calculations we can also infer that as much as 31.6% ([250+43]/927*100) of the supportive housing cohort was reduced pay (compared to the value of 27.0% used in this research).

- By default, all other supportive housing tenants were defined as full pay in this research. These individuals were
 linked to an aggregate file that provided unit-level tenant fees for each dwelling, overall and stratified by year. As
 user fees varied minimally within most dwellings, we developed an annual 'weighted' user fee specific to each
 location¹⁵ and applied this value to every resident who resided at this site.
- In addition to paying user fees, supportive housing tenants pay for prescription medication use until such time that they are eligible for coverage through Manitoba's Pharmacare Program.¹⁶ The Drug Program Information Network (DPIN) was used to calculate out-of-pocket prescription drug costs for supportive housing tenants.

User fees for PCH residents were easier to calculate. Data files housed at MCHP provided date-specific per diem fees paid by every resident, weighted to account for fee changes with time. Prescription medications are provided to PCH residents in Manitoba at no extra personal cost.

Government/Health Region Contributions to Operating Costs

Government/health region contributions to operating costs were calculated using aggregate numbers only. This process uses a current dollar approach, as explained in the following text:

- The government/health region contribution to operational costs is provided as a flat rate to supportive housing dwellings, to offset costs of providing personal support and supervision to tenants. During the study period, each dwelling received between \$35 and \$40 daily (the amount varying by year) per supportive housing unit. For tenants who received a rental subsidy (i.e., people who lived in reduced pay dwellings), we added the contribution provided by the government/health region to this basic amount. Total costs were calculated by multiplying the government/health region contribution for each tenant by his or her duration of supportive housing stay.
- To verify the accuracy of these calculations, we examined the Winnipeg Health Region's Consolidated Financial Statements, which report that this region spent \$7.5M on supportive housing in the 2010/2011 fiscal year (Ernst & Young, 2011). During this year, supportive housing in Winnipeg provided 495.5 person-years (5,946 person-months) of care (data not shown). Across all years of the study combined, the government/health region contribution to supportive housing costs was calculated at \$1,200 per person-month. Our estimates from these values (\$1,200*5,946 person-months = \$7,135,200) are within 5% of the overall supportive housing cost reported by the Winnipeg Health Region. Additional forms of government cost (e.g., operating costs for supportive housing dwellings that are owned and operated by Manitoba Housing) are not included in this research.
- Government/health region operational costs for PCHs were calculated using a current dollar approach. These
 facility-level (operating and miscellaneous) costs are available publically in the Winnipeg Health Region's
 Consolidated Financial Statements for each year of the study period (Winnipeg Regional Health Authority, 2015).
 From these files we created a weighted monthly operating cost per resident, pending the duration and timing
 of his/her PCH stay.¹⁷ While the remaining (roughly one-quarter of) PCH operating funds came from resident
 per diems, this component of operational costs was excluded in the present research as it does not constitute a
 government/health region expense.

¹⁵ The aggregate supportive housing file provides a breakdown of user fees per unit. Suppose, for example, that this file contained a dwelling with 10 units, showing that user fees in a given year were \$10/month for three of these units, and \$12/month for the remaining seven units. Using these data, the weighted monthly user fees allocated to each person in this dwelling would be \$11.40 (i.e., \$114 in fees collected every month divided by 10 units).

¹⁶ These tenants also pay for 100% of their over-the-counter (OTC) medications, such as stool softeners.

¹⁷ From the Consolidated Financial Statements, operating costs (expressed per bed) vary substantially across some Winnipeg PCHs. However, as some Winnipeg PCHs were excluded from these statements, we were not able to account for this variation in any given year (i.e., by assigning facility-specific costs to residents). Our calculations therefore assume that i) facility-level costing differences were randomly distributed across our sample, and ii) operational costs were similar for PCHs both absent from and included in the Consolidated Financial Statements.

Government/Health Region Costs Associated with Healthcare Use

Government/health region costs associated with healthcare use (hospital use, primary care and specialist physician visits, emergency department visits, home care use, prescription drug use) were measured at the person level using a combination of current and constant dollar (i.e., applying costs from one time period to use patterns in another) approaches. Because these data were skewed substantially to the left (i.e., typically a small number of people had much higher healthcare use rates and costs), we present both the median and IQR of healthcare use costs, as well as the mean and standard deviation. Strategies used to calculate healthcare use costs are provided in the following text:

- Hospitalizations: The Canadian Institute for Health Information assigns a Resource Intensity Weight to each case that is discharged from a hospital based on the characteristics of the person, the diagnosis, interventions, and other factors that are expected to affect the cost of providing hospital care (Canadian Institute for Health Information, 2010). Resource Intensity Weight values provide a measure of the average relative resources used during a given hospitalization, which when combined with Manitoba-specific costing values (Finlayson, Ekuma, Yogendran, Burland, & Forget, 2010) was used to estimate the cost associated with a given hospital visit. Resource Intensity Weight values are based on 2010/11 fiscal year costs, and hence this component of healthcare uses a constant dollar approach.
- Physician Visits: For each physician visit in Manitoba a record is created summarizing the diagnosis and the service (using a tariff code) that was provided. Each tariff code is assigned a dollar value that is paid to the physician. Tariff codes were used to determine the costs associated with physician visits (current dollar approach) in this study. It is important to note that some physicians in Manitoba are paid using alternate (i.e., not fee-for-service) contracts. While these providers are expected to submit 'shadow billing' diagnoses and tariff codes for audit and research purposes, the extent to which this practice is followed is unclear.
- Emergency Department (ED) Visits: The 2012 Annual Report of the Auditor General of Ontario estimates that the average cost of an ED visit is \$186.44 (Ministry of Health and Long-Term Care, 2012). This value was applied to each ED visit made during the study period, using a constant dollar approach.
- Home care utilization was measured using the Procura data system, which reports the amount and type of
 home care services that each individual received daily. Stakeholders from the Winnipeg Health Region provided
 the costs associated with these different services, allowing us to estimate total monthly home care costs per
 supportive housing tenant (current dollar approach). As noted in Chapter 4 of this report, home care costs are
 associated with supportive housing tenants only, and not PCH residents.
- Costs for prescription drugs are paid by supportive housing tenants until an income-adjusted ceiling of drug
 costs is reached, after which prescription drugs are paid for by the Manitoba Pharmacare program. Alternatively,
 drugs dispensed to PCH residents are paid for by the government/health region. The analyses in this chapter
 are confined to prescription drugs only (excluding over-the-counter). Using a current dollar approach,
 government-based drug costs were calculated using the Drug Program Information Network. These costs were
 calculated at the person-level.

Detailed Chapter Results

User Fees

User fees are provided in Table 5.1. Full pay supportive housing tenants paid a median of \$1,789 (IQR=\$1,564-\$1,918) monthly, while reduced pay tenants paid a median of \$1,031 (IQR=\$924-\$1,305) in monthly fees. These supportive housing tenants fees changed minimally when (out-of-pocket) expenses related to prescription medications were included in our calculations. Considering these costs together, the median monthly user costs for supportive housing throughout this study were \$1,886 and \$1,096, for full pay and reduced pay tenants, respectively.

Table 5.1: Median Monthly User Fees and Total Costs Paid by Supportive Housing Tenants and People admitted from April 1, 2006 - March 31, 2011. Fees measured until March 31, 2012 **Personal Care Home Residents**

Fees	Coh	orts	Supportive Hou	sing Subgroups
	Supportive Housing	Personal Care Home	Full Pay Tenants	Reduced Pay Tenants
Total Cohort; N (%)	927 (100)	5,267 (100)	677 (73)	250 (27)
User Fees; (\$) ***	1,625 (1,325-1,872)	1,287 (1,002-1,929)	1,789 (1,564-1,918)	1,031 (924-1,305)
Prescription Medication Cost; (\$)	93 (49-148)	N/A	104 (56-160)	73 (40-106)
Total Costs (User Fees plus Medication Costs); (\$) ⁺	1,733 (1,401-1,977)	1,287 (1,002-1,929)	1,886 (1,661-2,019)	1,096 (1,000-1,327)

* All values in this table are presented as the median (inter-quartile range; IQR, 25th and 75th percentile) for each group.

** User fees consist of rent and service packages for supportive housing clients, and per diem fees paid by PCH residents.

+ Unlike arithmetic averages, median values cannot be added across categories to obtain a total value. Rather, total costs were first calculated for every individual, and a distribution of these total values is presented across study groups.

N/A: Personal Care Home residents in Manitoba do not pay for their prescription medications.

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PCH residents paid a median of \$1,287 in per diem fees (IQR=\$1,002-\$1,929) monthly throughout the study (Table 5.1). The distribution of these user fees is provided in Figure 5.1. From this figure, we can see that 5% of all PCH residents paid at most \$896 in monthly fees during the study period, while 5% of PCH residents paid at least \$2,191 in monthly fees. The median value of fees for reduced pay supportive housing tenants (\$1,031) ranks near the 30th percentile of fees paid by PCH residents. In other words, the fees levied to these user groups are highly comparable to and in fact slightly favour reduced pay supportive housing tenants. Conversely, the median fee value for full pay supportive housing tenants (\$1,789) ranks at about the 70th percentile of fees paid by PCH residents. It is important to recall that the majority (73%) of the supportive housing cohort were full pay tenants.

Figure 5.1: A Detailed Comparison of the Monthly User Fees Paid by Supportive Housing Tenants and Personal Care Home Residents





* Fees exclude client-based prescription drug costs.

Government/Health Region Contributions to Operational Costs

Government/health region contributions to operational costs are provided in Table 5.2. Results are summarized as follows:

- During the study period, government/health region contributions to baseline operational costs were three-fold higher for PCHs (a median of \$3,779 monthly or \$45,348 annually) versus supportive housing dwellings (a median of \$1,200 monthly or \$14,400 annually). This cost difference remains even after accounting for difference in healthcare use between these groups. Operational and healthcare use costs combined were \$3,973 monthly (\$47,676 annually) for PCH residents during the study period versus \$1,809 monthly (\$21,708 annually) for supportive housing tenants. Mean values are provided to show that costing results are skewed substantially for both study groups, with mean values typically two-fold higher than medians. These latter results remind us that within both groups of supportive housing tenants and PCH residents, a small number of people used a disproportionate volume of healthcare resources.
- While median values for each costing component cannot be summed mathematically, government/health region contributions to operational costs comprise by far the largest component of overall costs for PCH residents. This is not the case for supportive housing tenants, where government/health region contributions to operational costs comprised a much smaller proportion of total costs. This finding aligns with our conclusions in Chapter 4, showing that a greater proportion of supportive housing tenants versus PCH residents tended to use downstream and typically more expensive healthcare services (e.g., hospitals).

Table 5.2: Monthly Government/Health Region Contributions per Supportive Housing Tenant and **Personal Care Home Resident**

People admitted from April 1, 2006 - March 31, 2011. Costs measured until March 31, 2012

مسمانه بالملسم		Coh	orts	
	Supportiv	e Housing	Personal C	are Home
Total Cohort; N (%)	927 (100)	5,267	(100)
	Median (inter-quartile range)	Mean (standard deviation)	Median (inter-quartile range)	Mean (standard deviation)
Government/Regional Contributions to Operational Cost (\$)*	1,200 (1,200-1,200)	1,198 (78)	3,779 (3,627-3,806)	3,690 (169)
Healthcare Use Costs (\$)***				
Physicians (Primary Care & Specialist Visits Combined)	22 (13-36)	28 (24)	55 (36-79)	61 (37)
Hospitalizations	156 (0-1,389)	1,411 (2,971)	25 (0-329)	445 (1,596)
Emergency Department Visits	15 (0-30)	25 (45)	7 (0-22)	21 (45)
Home Care Use ⁺	10 (0-93)	118 (289)	Not Applicable	Not Applicable
Prescription Medications	89 (2-214)	164 (473)	80 (29-164)	131 (373)
Total (operational plus healthcare use) Costs $(\$)^{t}$	1,809 (1,388-3,031)	2,943 (3,048)	3,973 (3,855-4,286)	4,349 (1,698)
* All values in this table are presented in two manners: 1.	l) as the median (inter-quartile range;	; IQR, 25 th -75 th percentile) for each <u>g</u>	Jroup, 2) as the mean and standard d	eviation to show skewed

healthcare use costs.

** All components of healthcare use were calculated using a current dollar approach, except for hospitalizations and emergency department visits which were calculated using a constant dollar approach (i.e., applying costs from one time period to use patterns in another).

⁺ Home care use applies to supportive housing tenants only, and not to PCH residents.

t Unlike arithmetic averages, median values cannot be added across categories to obtain a total value. Rather, total costs were first calculated for every individual, and a distribution of these total values is presented across study groups. The following text is provided to help place the costing results from Table 5.2 in context.

- Previous research conducted by MCHP shows that, without additional reform strategies, Manitobans will require between 32% and 53% more PCH beds by the year 2031 (Chateau et al., 2012; Doupe et al., 2011). Our results from Chapter 3 of the present report show that increasing the number of PCH beds is not the only reform option in this province, as 10% of PCH residents in this study were clinically similar to most supportive housing tenants. With about 5,500 PCH beds and 516 supportive housing units in Winnipeg, our results imply that stakeholders could essentially double the number of supportive housing units in Winnipeg (i.e., 516+550=1,066 supportive housing units), to help offset current and projected PCH demands.
- Using the median values from Table 5.2, adding 550 more PCH beds into the system would require an additional (550*\$3,973*12) \$26.2M in government/health region contributions annually. Conversely, adding this number of supportive housing units would require an additional (550*\$1,809*12) \$11.9M in annual government/health region contributions. This difference (\$14.3M) represents the potential for annual cost avoidance by expanding the care continuum using supportive housing instead of PCH care.
- There are many caveats to this statement. For example, supportive housing operating costs would presumably be much higher if these additional units were to be owned and operated by Manitoba Housing. Also, this approach to expanding care may require additional PCH staff if only sicker residents were admitted into these facilities. Nevertheless, these values do provide a framework for discussing care continuum reform options from a financial perspective.
CHAPTER 6: CONCLUDING STATEMENTS AND FUTURE RESEARCH DIRECTIONS

Concluding Statements

The present research links MDS data with administrative healthcare use records from the Winnipeg Health Region to investigate:

- 1. The number of newly admitted PCH residents who are clinically similar (termed 'less clinically burdened' in this research) to their supportive housing counterparts;
- 2. The additional unique features of these PCH residents as compared to supportive housing tenants, to help understand additional factors that may limit the potential for supportive housing to fulfill its intended role; and
- 3. Government/health region contributions to supportive housing and PCH operating costs, helping to understand care continuum reform strategies from a financial perspective.

The major 'take-home' points from this research are as follows:

- 1. Evidence from this study clearly demonstrates the potential for supportive housing to further offset PCH use in the Winnipeg Health Region. Our results show that 10.4% of newly admitted PCH residents were similar clinically to most newly admitted supportive housing tenants during the study period. These 'less clinically burdened' PCH residents required at most verbal supervision to complete ADL tasks, had at most mild cognitive challenges and few behavioural challenges, and were bladder and bowel continent almost all of the time. Further, across all PCH days of the study period, residents were 'less clinically burdened' 8.1% of the time. These findings imply that instead of building only more PCH beds to help care for the growing number of older adults planners could substantially expand supportive housing in its current form to help offset PCH use. With about 5,500 PCH beds and 516 supportive housing units in Winnipeg, this would equate to doubling the number of supportive housing units. As noted in Chapter 1 of this report, this recommendation is particularly salient as Manitoba currently has one of the highest PCH bed supplies in Canada (Sivananthan et al., 2015).
- 2. We also show, however, that increasing the number of supportive housing units without changing processes may have limited merit. As an example, the majority of people pay much more to reside in supportive housing dwellings versus PCH facilities. Coupled with this, less clinically burdened PCH residents are often admitted from the poorest Winnipeg neighborhoods, meaning that cost disincentives may limit some people's ability to live in supportive housing. Further, our analyses show that 25% of less clinically burdened PCH residents (versus only 10% of supportive housing tenants) had informal caregivers who were unable to continue providing support because of their own health challenges. Collectively, these results warrant discussion about the potential challenges related to cost disincentives and reliance on informal supports in the current model of long-term continuing care.
- 3. The results on healthcare use are mixed. On one hand, our analyses show that supportive housing plays an important role in the older adult continuum of care. The median length of stay amongst PCH residents who died during the last two years of the study period was 849 days. Some of these residents (N=166) had transferred into a PCH from supportive housing. Their median length of PCH stay was much shorter (444 days), and their total (supportive housing and PCH) length of stay was 1,141 days. While perhaps some improvements related to continuing care transitions could be made (i.e., people resided in supportive housing and PCH care for longer than people who resided in PCHs only), overall these results suggest that supportive housing functions as an important alternative to PCH use (i.e., PCH lengths of stay were cut in half).
- 4. Other healthcare use results warrant further discussion. Compared to PCH residents, supportive housing tenants tended to have more of their healthcare use contacts with 'downstream' services. For example, 81.2% of PCH residents had 10 or more visits annually with a primary care physician during the study period as compared to only 10.2% of supportive housing tenants (33.4% of these tenants had fewer than three of these contacts annually).

Conversely, more supportive housing tenants (41.9%) versus PCH residents (31.1%) had one or more visits annually with a specialist physician. Similarly, a much larger proportion (47.4%) of supportive housing tenants versus PCH residents (31.9%) had one or more visits annually to an emergency department during the study period. Upon arrival, almost half (47.9%) of these visits made by supportive housing tenants (versus 33.7% of those made by PCH residents) were triaged as less or non-urgent. Collectively, this evidence suggests a need for additional types of supportive housing staff.

5. Based on the data provided to us, we show that government/health region contributions to operational costs are much less for supporting housing (median of \$14,400 per unit annually) than for PCHs (median of \$45,348 per bed annually). This finding is in contrast to user fees, which were calculated to be much higher for supportive housing tenants (median of \$1,625 per month; \$19,500 annually) than PCH residents (median of \$1,287 per month; \$15,444 annually). When considered with our earlier findings (e.g., that less clinically burdened PCH residents tend to come from the lowest income areas), this evidence highlights the need to ensure that cost disincentives do not hinder access to supportive housing for some people.

Future Research Directions

Specific research activities would help to further guide continuum of care reform strategies. First, it is important to validate PCH residents who were defined as less clinically burdened in this research with other forms of analyses (e.g., direct observation, chart review, focus groups with family members) to i) further ensure that these individuals are indeed candidates for supportive housing care, and ii) understand with greater clarity their non-clinical reasons for PCH use.

Second, this research should be expanded to include home care. This is especially important given the new Procura data system available in Winnipeg that provides person-level information on the hours of home care received and on the costs of providing these services. Analyses of these data systems, especially when linked to MDS records, would enable stakeholders to define from both a clinical and costing perspective the 'tipping points' by which people transition out of home-based care, as a means to investigate strategies to further enhance this care. Also, comparing user profiles across the broader continuum would enable stakeholders to define more clearly if and how these care options could be better aligned to help people stay in their community for as long as safely possible. This, in turn, would be assisted by the development of more up-to-date transition algorithms to help ensure that people are best matched with the services they require.

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