PROJECTING PERSONAL CARE HOME BED EQUIVALENT NEEDS IN MANITOBA THROUGH 2036

October 2012 (Updated November 2012)

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Acronyms

ADL	Activities of Daily Living
CI	Confidence Interval
CPS	Cognitive Performance Scale
LOC	Levels of Care
LOS	Length of Stay
MBS	Manitoba Bureau of Statistics
MCHP	Manitoba Centre for Health Policy
OR	Odds Ratio
PCH	Personal Care Home
RHA	Regional Health Authorities

Executive Summary

Introduction

It has been almost ten years since a projection of personal care home (PCH) bed needs was produced for Manitoba's regional health authorities (RHAs) (Frohlich, De Coster, & Dik, 2002). These projections only went to the year 2020 and indicated that only a few select areas would see any increase in PCH bed requirements. However, a more recent projection for Manitoba overall predicted a large increase in PCH need for the province after 2020 through to 2031 (Doupe et al., 2011). The present report provides individual RHA projections through to 2036.

This report projects the long term care needs of older Manitobans (people 65+ years old) and focuses on PCH bed equivalents. As highlighted in Doupe et al.'s report, expanded care options for older adults has moved some care previously provided in PCHs to alternate settings, such as supportive housing. Although there were few of these alternatives for older adult care during the period of time used to make these projections (1984–2009), Manitoba Health's Aging In Place initiative may change the delivery of PCH equivalent care substantially in the future. For that reason, the projections are not for PCH *beds*, per se, but rather for the care that is *currently* being provided via PCH beds. That is, a projected increase in PCH equivalent beds in this report should be interpreted as a projected increase in the capacity of PCH equivalent care that will be required. This increased capacity may be delivered through a variety of means, such as those described in the Aging In Place initiative.

Data and Methods

The PCH bed equivalent projections use two primary pieces of data. The first of these is age– and sex–specific population projections from the Manitoba Bureau of Statistics (MBS). Any attempt to project need for care must start with an indication of how many people are eligible to receive that care; the population projections fill that requirement. A 2008 report from MBS provides separate population projections for each of the former RHAs (n=11), with data combined for Churchill and Burntwood. The second piece of data required to project PCH bed equivalents is age– and sex–specific PCH use rates. These rates indicate how much PCH care a population needs or uses. *Projected* use rates tell us how much care will need to be provided to the projected population. The PCH bed equivalent projection simply applies the projected PCH use rate to the projected population size.

Two options were considered for future PCH use rates. The first scenario assumes that future PCH use rates will remain as they are now (an average rate from 2006/07 to 2008/09), called the *current rates* projections. The second scenario assumes that trends in PCH use rates, which are mostly declining, will continue for some time into the future. These projections are called the *continuing trends* projections.

Three additional analyses considered other factors that might influence the need for PCH bed equivalent care. First, we measured in–hospital length of stay between the assessment for PCH care (e.g., PCH panelling) and the actual PCH admission date. Adding these days to projection scenarios indicate the additional PCH bed equivalents required to eliminate in–hospital stay for panelled PCH residents. A second, similar analysis examined the wait times for those panelled in the community. Third, this study measured the generational changes in family structure (i.e., spouses and number of children) and their potential impact upon future PCH admission rates. These changes could affect the availability of informal support for older adults and, thus, the need for PCH admission or PCH equivalent care. As more and more women are choosing not to have children the influence of having children on the need for PCH admission, the levels of care required on admission, and the length of PCH stay were assessed.

Findings and Policy Implications

As of 2010, the province of Manitoba has 9,666 licensed PCH beds. PCH bed equivalent projections indicate that from 2021 to 2036 there will be a dramatic increase in the PCH bed equivalent need for the province. This is mainly due to the increase in the number of older adults resulting from the aging of the baby boom generation. Across the province, an increase of approximately 5,100 PCH bed equivalents was projected. Neither scenario suggests that the need for PCH bed equivalent care will remain what it is today or will decrease.

The timing of increases in PCH bed equivalent needs will vary across the province. Interlake–Eastern RHA, Northern RHA, and the former South Eastman RHA are projected to experience the most immediate increase in PCH bed equivalent need, more than doubling between now and 2036. Conversely, Western RHA is projected to experience a temporary decrease in PCH bed equivalent need, followed by a more subtle increase from 2031 to 2036. Winnipeg presently houses the largest number of PCH beds in Manitoba. PCH equivalent bed needs in this region are projected to increase minimally until 2021 and much more substantially through to 2036.

In–hospital wait times have very little effect on total PCH bed equivalent requirements, adding at most 3% to projected scenarios in Western RHA and less than 1% in Winnipeg. However, the effect of number of children on PCH admission and length–of–stay appears to be substantial. This may be a particular concern in Winnipeg, where the proportion of women with no identifiable children is 22.6% amongst today's 40–44 year olds, but only around 15% for the oldest adults (75+). Supportive housing and expanded homecare services may be essential for this group of individuals.

Because of continued advancements in health care delivery (e.g., new medical procedures, improved pharmaceutical therapies) and fluctuating population projections, PCH bed equivalent projections should continue to be revisited periodically. Having been 10 years since the previous projection, in another 10–year period, a new projection may have slightly different conclusions, particularly for the more distant period after 2031 when the baby boom generation begins to turn 85.

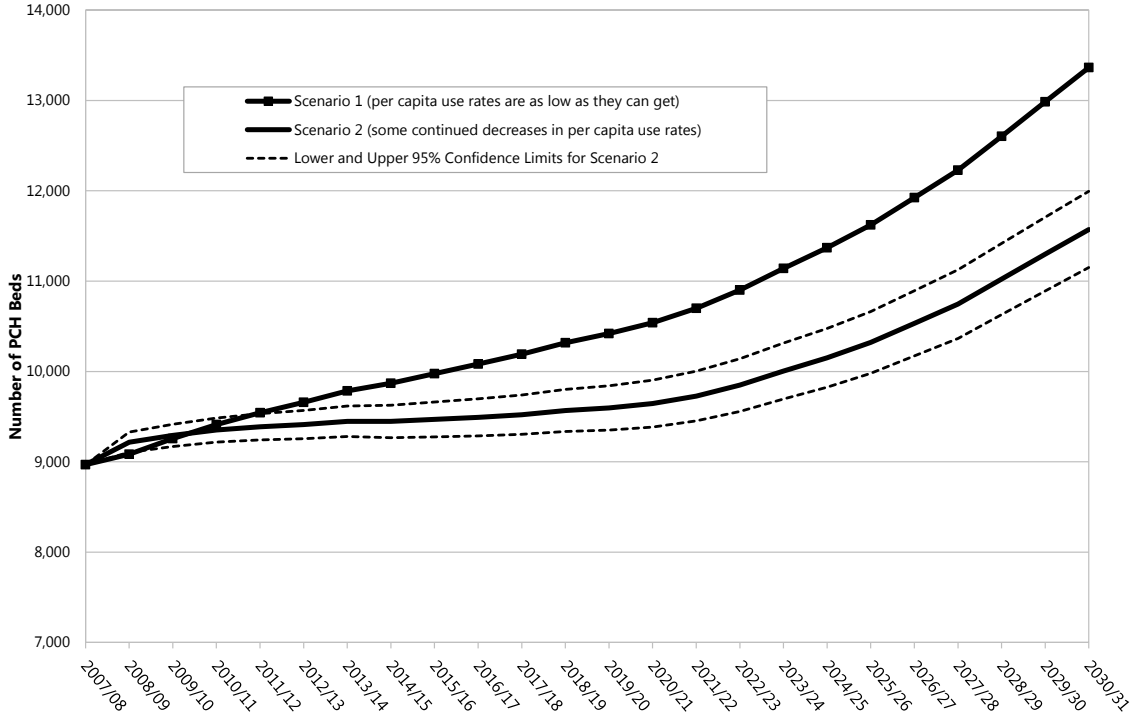
Chapter 1: Research Introduction and Report Organization

Introduction

In 2002, the Manitoba Centre for Health Policy (MCHP) produced a report estimating the need for **personal care home (PCH)**[1, 2] beds in the province's **Regional Health Authorities (RHAs)**. In this report, *Estimating Personal Care Home Bed Requirements,* the authors projected requirements for PCH beds up to the year 2020 for eleven of the twelve provincial RHAs existing at that time (Frohlich et al., 2002). The authors concluded that South Eastman, North Eastman, and Interlake would experience an increased need for PCH beds in the future, whereas RHAs in the western part of the province (Parkland, South Westman and the former Marquette RHAs) would experience no change in PCH need. Winnipeg, which accounts for over half of all PCH beds in Manitoba, was projected to have no change in PCH requirements. These results are somewhat surprising given the general tenor of news and reports related to the impact of population aging on the health care system. As noted by Frohlich et al. in the report, Canada's aging population has been presented as a major challenge for a publicly funded health care system.

These results stand in contrast to a projection of PCH bed requirements presented by a more recent report published by MCHP. In *Equivalent Population Aging and the Continuum of Older Adult Care in Manitoba,* Doupe et al. (2011) presented a projection of PCH bed requirements for the entire province of Manitoba, up to the year 2031. As seen in Figure 1.1, the more optimistic projection (scenario 2) presented an increase of around 25% in the 20 years from 2011 to 2031. Importantly, however, this projection agrees with the earlier one; between 2011 and 2020, there is almost no projected increase in PCH bed requirements. Why would the situation change so dramatically from 2021 to 2031?

Figure 1.1: Projected Number of PCH Beds for Older Manitobans, 2007/08–2030/31*



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

Source: Doupe et al., 2011

1 Personal care homes are referred to as "nursing homes" outside of Manitoba.

2 Terms in **bold** type face are defined in the Glossary at the end of this report.

The main reason for this change is simply the total number of individuals over the age of 75. The major drivers of the aging of the Canadian population are increased life expectancy and the change in **fertility rates** over time (i.e., the **baby boom generation**). Like the rest of Canada, high fertility rates in the years after World War II have resulted in a bulge in the population pyramid for Manitoba, as seen in Figure 1.2. The proportion of the population between ages 45 and 64 is greater than what would have been expected if fertility rates had not changed.

For projections of PCH bed requirements, the timing of the baby boom is a major factor. In 2020, the oldest of the baby boomers will be approaching 75 years of age. The youngest will not yet have turned 65 years old (Figure 1.3). By 2031, however, the picture will be very different. The entire baby boom generation will have turned 65 and almost half will be over 75. The oldest individuals will be approaching age 85. This small change in the age distribution of the baby boom is largely responsible for the dramatic change in PCH bed requirements described in the older report from 2002 that ends in 2020 and the more recent report from 2011 that ends in 2031.

Figure 1.2: Age Profile of Manitoba, Age 40+, 2011

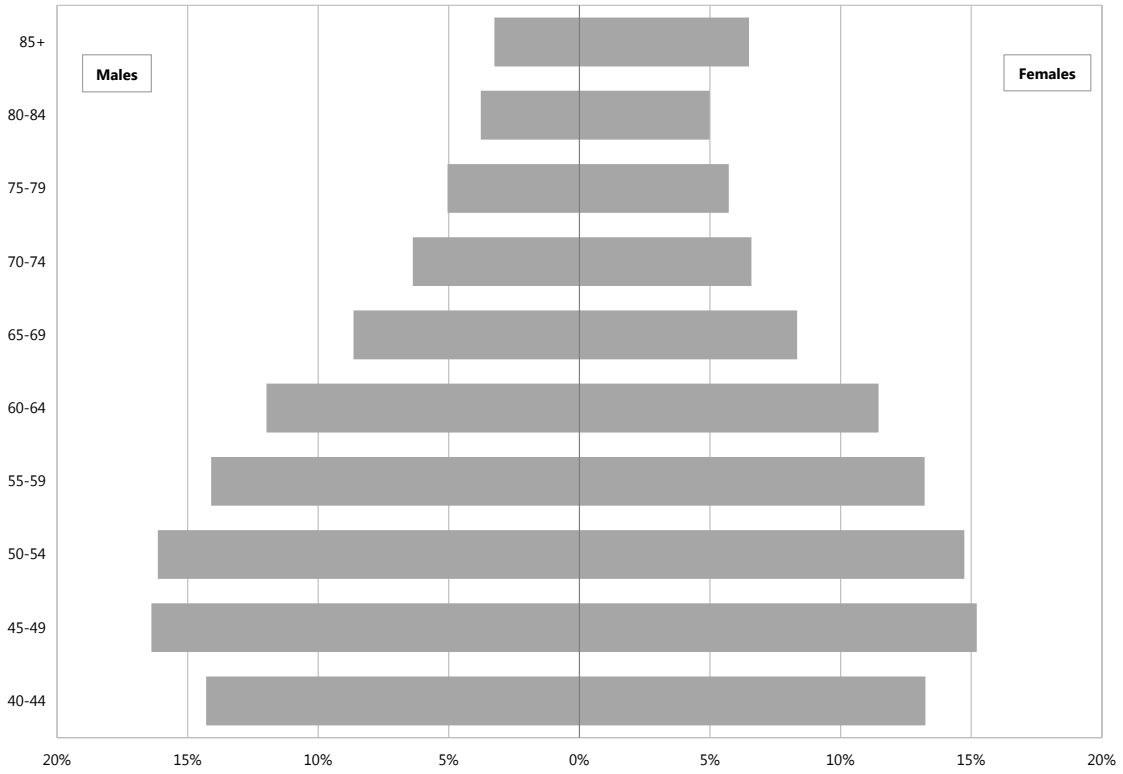
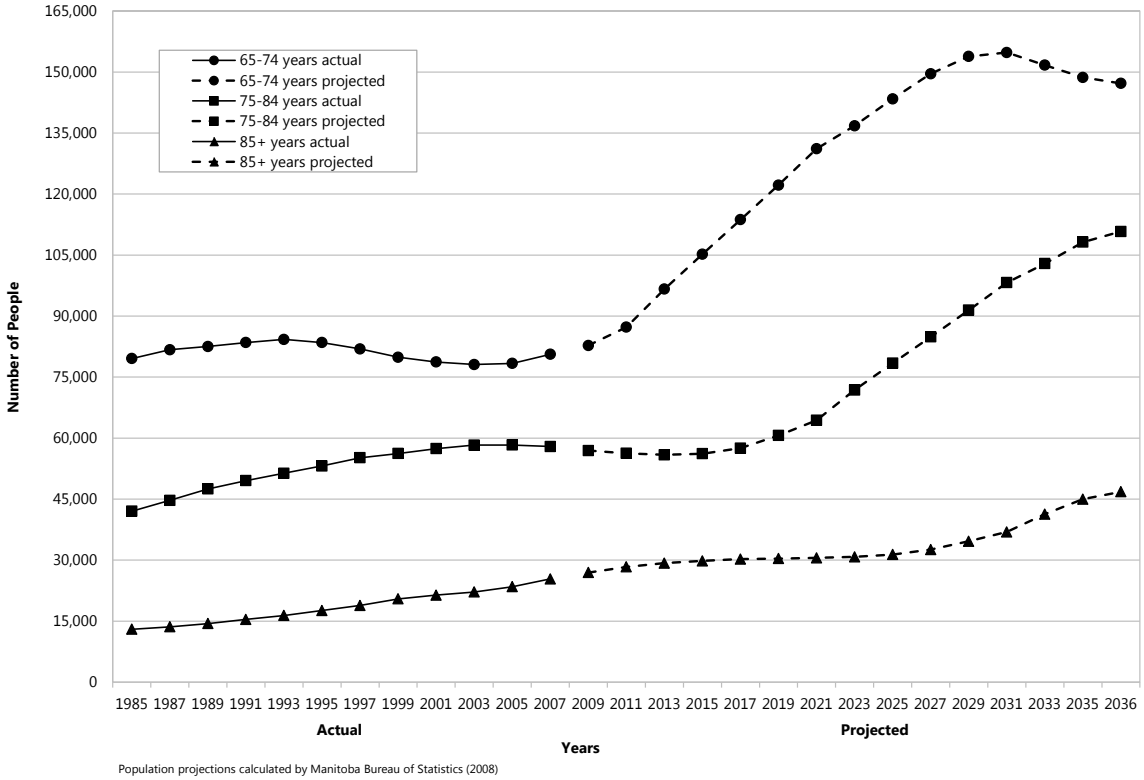


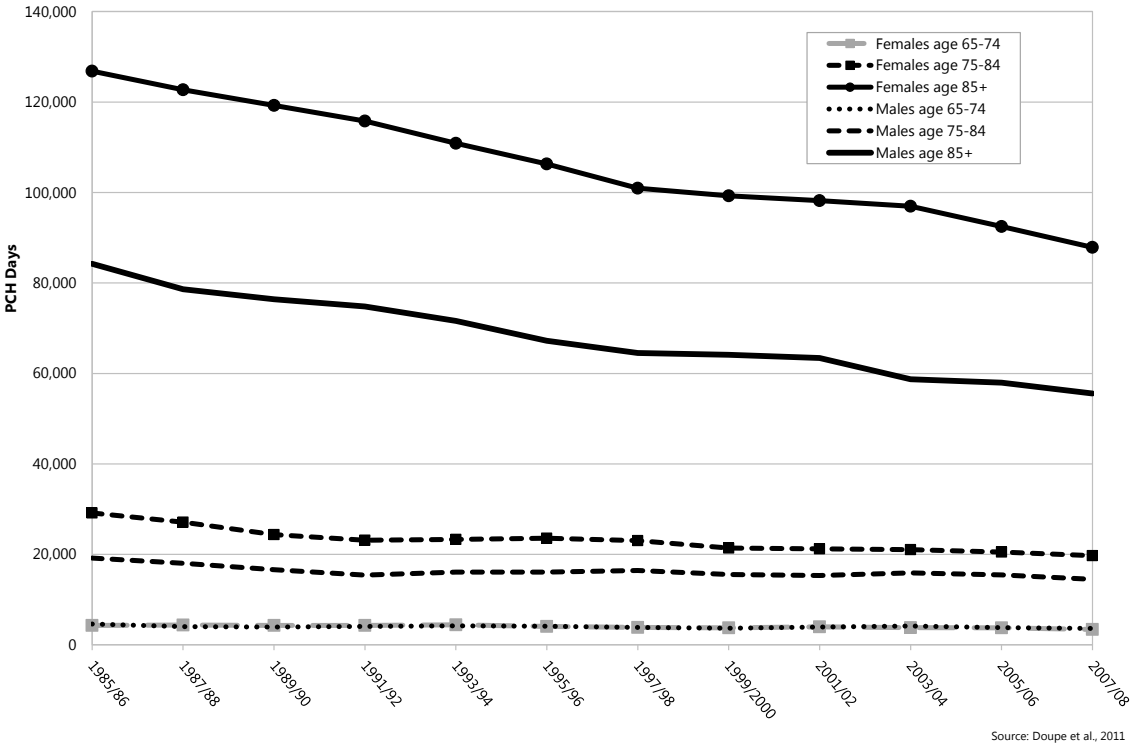
Figure 1.3: Actual (1986–2007) and Projected (2009–2036) Number of Older Adults Living in Manitoba by Age Group



Doupe et al. (2011) presented **PCH use rates** for five–year age groups starting with 65–69 year olds, up to the 85+ year olds (Doupe et al., 2011). Figure 1.4 shows just how important the aging of the population is. While the baby boom generation is under the age of 75 (i.e., prior to 2021), we can expect a lower rate of use of PCH beds; in the 2007 fiscal year[3], for every 1,000 individuals in the province between 65 and 74 years of age, 3,500 PCH days were provided about 3.5 days per person. The rate for those age 75 to 84 is dramatically higher, at almost 20,000 days per 1,000 population for females (an average of 20 days per person) and slightly less for males. As the baby boom enters this demographic between 2021 and 2031, the need for care provided by PCHs will rise accordingly. Thus, it is not surprising that the PCH bed projection provided in 2002 (by Frohlich et al.) did not predict an increased need in PCH beds (up to 2020), while the more recent report predicted a dramatic increase between 2020 and 2030.

3 April 1, 2007–March 31, 2008, hereafter written as 2007/08

Figure 1.4: Rate of Personal Care Home (PCH) Use (Days Used per 1,000 Population) by Age and Sex, Manitoba, 1985/86–2007/08



Source: Doupe et al., 2011

Purpose of this Report

These dramatically different results for the decade from 2020 to 2030, compared to 2011–2021, raises two important issues that will be addressed in the remainder of this report.

1. Given the range of projections for the RHAs in the earlier report from 2002, what can be expected for the period after 2020?
2. The baby boom will begin to turn 85–years–old starting around 2031; and to date, there are no PCH bed equivalent projections beyond this. Given the even more dramatic increase in use rates for this oldest age group (Figure 1.3), what will be the impact on projections beyond 2031?

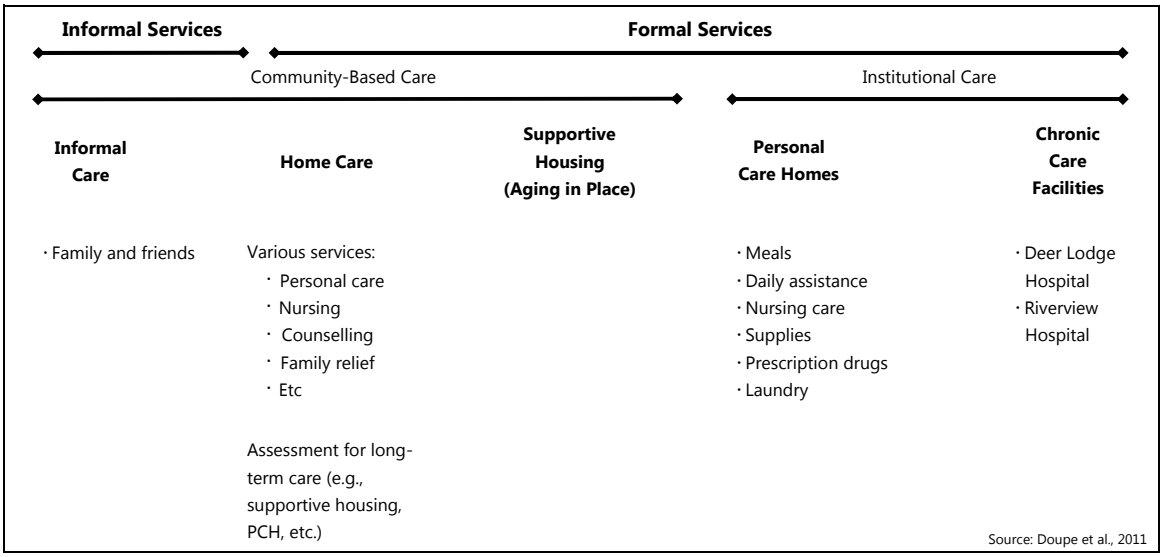
To address these two issues, this report presents separate projections of PCH bed equivalent needs for each RHA in Manitoba, up to the year 2036. As in Doupe et al. (2011), these projections do not account for the younger population (<65) of Manitobans who receive a small proportion of PCH care (<5%). These will be the first provincial projections beyond 2030 and the first RHA–specific projections conducted in Manitoba that extend beyond the year 2020.

PCH Bed Equivalents

The introduction of **supportive housing** units in Manitoba has changed the landscape of care for older adults since Frohlich et al.'s 2002 report on PCH bed projections. Doupe et al. (2011) described the continuum of long–term care for older adults, beginning with **homecare**, through supportive housing, to PCHs. Supportive housing is generally seen as a substitute for PCH care for those residents with relatively lower care requirements, and Doupe et al. suggested that "future analyses should

therefore focus on **PCH bed *equivalent*** projections" (emphasis theirs, p. 16) (2011). This point cannot be overemphasized. We therefore refer to all projections presented here as projections of *PCH bed equivalents,* or *PCH bed equivalent need*. Current alternative sources of care, including supportive housing, are described in Manitoba Health's Aging In Place initiative, introduced in 2004. Figure 1.5 presents a graphical representation of the continuum of care offered to older adults in Manitoba.

Figure 1.5: A Basic Schematic of Manitoba's Continuum of Care



The expression "PCH bed equivalent"refers to "the care currently provided to older adults in PCHs" where "current" is the period at and immediately prior to 2008/09. Consequently, the expression "PCH equivalent care"will also appear in the report. Although many supportive housing beds have been opened since this time, in 2008/09 there were very few of them relative to the number of PCH beds (in Winnipeg, there were 516 supportive housing beds compared to 5,641 PCH beds). Thus, we can assume that the impact of the few operational supportive housing beds in the period prior to 2008/09 would not appreciably alter our PCH bed equivalent projections.

The future of long–term care for older adults may involve models that are outside what was currently practiced; these models would contribute to the projected *equivalent* of the care currently provided in Manitoba's PCHs. In particular, Manitoba Health's *Aging in Place* initiative emphasizes alternatives such as supportive housing and assistance to seniors in group living. Enhanced homecare services may also reduce the demand for care in PCH. The numbers presented in this report, therefore, should not be taken as directives for building "bricks and mortar" institutions, but only as an indication of an increasing need in the total capacity of care for older adults, some of which may indeed be in the form of new PCH beds.

Changes to Regional Health Authorities

On April 17, 2012, the Government of Manitoba announced an amalgamation of the province's RHAs reducing the number from 11 to five:

- Northern RHA—the former NOR–MAN and Burntwood RHAs
- Western RHA—the former Brandon, Assiniboine, and Parkland RHAs
- Southern RHA—the former Central and South Eastman RHAs
- Interlake–Eastern RHA—the former Interlake and North Eastman RHAs
- Winnipeg RHA—Winnipeg and the former Churchill RHA

Churchill was merged with Winnipeg to reflect "the close link between communities that already exist with Winnipeg helping to sustain and improve health services in Churchill for northern Manitobans and residents of Nunavut" (Manitoba Health website: http://www.gov.mb.ca/health/rha/index.html. Accessed July 16, 2012). However, due to constraints in data used to calculate the PCH bed equivalent projections, the data and population of the former Churchill RHA is included in the new Northern RHA in the main report. The new RHAs, and the boundaries of the former RHAs from which they are comprised, are presented in Figure 2.1 of the next chapter.

With one exception, this report details projections for the new amalgamated RHAs, rather than the former RHAs. However, since the new RHAs are relatively large areas, the data and projections for the former RHAs can be found in appendices at the end of the report to help with planning during this transition period.

Data Sources and Study Period

All of the analyses in this report utilize health care use data from the Population Health Research Data Repository (Repository) housed at MCHP. The Repository is a comprehensive set of databases that contains records for all Manitobans' contacts with physicians, hospitals, home care, and personal care homes, and for pharmaceutical prescriptions dispensed in retail pharmacies. The Repository records have been de–identified: prior to data transfer, Manitoba Health processes the records to encrypt all personal identifiers and remove all names and addresses.

The following databases from the Repository were used for analyses in this report:

- Hospital Discharge Abstracts – used to determine hospital admission and discharge dates and to calculate length of stay while waiting for PCH admission
- Manitoba Health Insurance Registry – used to obtain data on the time a person is registered as a resident of Manitoba, as well as their age, sex, area of residence, marital status, and to identify deaths
- Long–Term Care – used to measure PCH admissions, length of stay, and level of care at panelling and at PCH admission

In addition to data from the Repository, population projections for each RHA were taken from a report by the Manitoba Bureau of Statistics, the results of which will be described in more detail later. The report utilizes information on births, deaths, and migration (including international, interprovincial, and intraprovincial migration). Assumptions were made concerning the numbers of these events in the future in order to produce estimates of the total population for an RHA. For instance, Winnipeg was expected to have life expectancy increase from 77.4 years for males in 2006 to 80.0 years in 2036. The projected number of deaths for males (in incremental five–year age groups) was based on this expected increase in life expectancy.

Data on PCH locations, number of beds, and occupancy rates were provided directly by Manitoba Health.

For describing PCH use, the study period covered 1985/86 through 2008/09. Projections of use are provided from 2009/10 through to 2035/36. All data management, programming, and analyses were performed using SAS ® statistical analysis software, Version 9.2.

Study Population

All individuals age 65+ living in Manitoba after April 1, 1985 and present in the Manitoba Health Insurance Registry were included in the analyses. Only the period of time when the individuals were 65+ was included in these analyses (i.e., if someone turned 65 during the study period, the data prior to this age was not included). Other than end of coverage by Manitoba Health (i.e., death or moving away from the province), there were no additional exclusion criteria that would remove a person from analyses.

Data on past and current PCH bed use considered only residents who spent one or more days in a licensed PCH facility between April 1, 1985 and March 31, 2008. Only residents panelled at level of care 1–4 (permanent or long–term PCH residents) were included. Level of care 5 (respite care) and people panelled for full or respite care in chronic care facilities (e.g., Deer Lodge and Riverview in Winnipeg) were not included. In addition, some portion of PCH facilities in Northern Manitoba is federally funded and as such that data may be missing. This last exclusion is not an issue for these projections so long as that portion of care for older Manitobans in those regions is maintained. If there are changes to the nature of the federal and provincial share of this care, adjustments to projections for northern Manitoba regions would be necessary. Chapter 5 describes effects of family structure; for these analyses, the number of children (any age) was calculated for all Manitobans age 65+ on April 1, 1995, or who turned 65 after April 1, 1995, and before the end of the study period (March 31, 2008). This was done by examining the members of the Manitoba Health family registration number when it was introduced in 1970.

Focus and Organization of the Report

The remainder of this report is divided into four main chapters. Chapter 2, *The Status of Personal Care Homes in Manitoba's Regional Health Authorities*, describes the location, size, and use of PCHs in each RHA. Also included are RHA–specific rates of PCH use (number of days and number of residents) relative to the RHA population. This information will provide the groundwork for developing the PCH bed equivalent projections that are presented later in the report.

Chapter 3 is entitled *Projections of Personal Care Home Equivalent Bed Needs* and has three main components: 1) population projections for the individual RHAs as calculated by the Manitoba Bureau of Statistics (MBS); 2) projected PCH use rates that are based on the assumption that recent trends in PCH use will continue into the future; and 3) PCH bed equivalent projections using two different scenarios — a) assuming no change in PCH use rates, referred to as the ***current rates*** **projection**, and b) assuming some change in PCH use rates, referred to as the ***continuing trends*** **projection**.

In the fourth chapter, *Additional Considerations for Personal Care Home Bed Equivalent Needs,* we consider additional factors that may affect the need for PCH beds or PCH bed equivalents. This chapter is divided into two main sections. First, using data only available for Winnipeg , we estimated the number of current PCH days that could be transferred to supportive housing care under its current model. Second, the wait times between in–hospital PCH panelling and hospital discharge for PCH admission are care

days that could be viewed as PCH days; we incorporated these days into the PCH bed equivalent projections. The rate of days waiting in the community after panelling is also presented.

Chapter 5 addresses issues of informal support for elderly residents and is titled *Effects of Family Structure on PCH Admission and Length of Stay*. Family structure, in terms of marital status and the number of children in a family, has changed considerably in the last 40 years. The family structure of Manitobans who will be in the primary PCH population in the next 25 years is presented by RHA. Since fewer women are having children, we assessed the impact of the number of children of older Manitobans on the need for PCH bed equivalent care. We also examined the differential impact of having a spouse upon older men and women.

The final chapter summarizes our PCH bed projections, the additional considerations, and their impact on projections. We also address potential policy implications and directions for future projections of PCH bed equivalent need.

Chapter 2: The Status of PCH in Manitoba's Regional Health Authorities

In this chapter, we describe PCH use in Manitoba. How many PCH beds are there in each RHA? Who is occupying those beds? What proportion of the older adult population in each RHA resides in a PCH in any given year? How many PCH bed *days* are provided by each of the RHAs?

This information will serve as one of the building blocks for producing PCH bed equivalent projections.

The Number and Location of PCH beds in Manitoba

Figures 2.1 and 2.2 display the location of licensed PCH facilities (excluding federal PCHs and beds) throughout Manitoba in 2009/10. As one would expect, the distribution of PCH beds across the RHAs reflects the proportion of the underlying population; the majority of PCH beds are found in Winnipeg with the remaining beds distributed among the rural RHAs, predominantly the ones in the south. There are some fundamental differences between urban and rural PCHs. Personal care homes in Winnipeg tend to be larger than those found in rural RHAs; the smallest Winnipeg PCH has 57 beds, in contrast, in rural RHAs, there are 38 facilities each with 30 or fewer beds.

The total number of PCH beds in 2009/10 for each of the five Manitoba RHAs is presented in Table 2.1. By far, the greatest number of beds was in Winnipeg where occupancy rates approach 99%. Empty bed

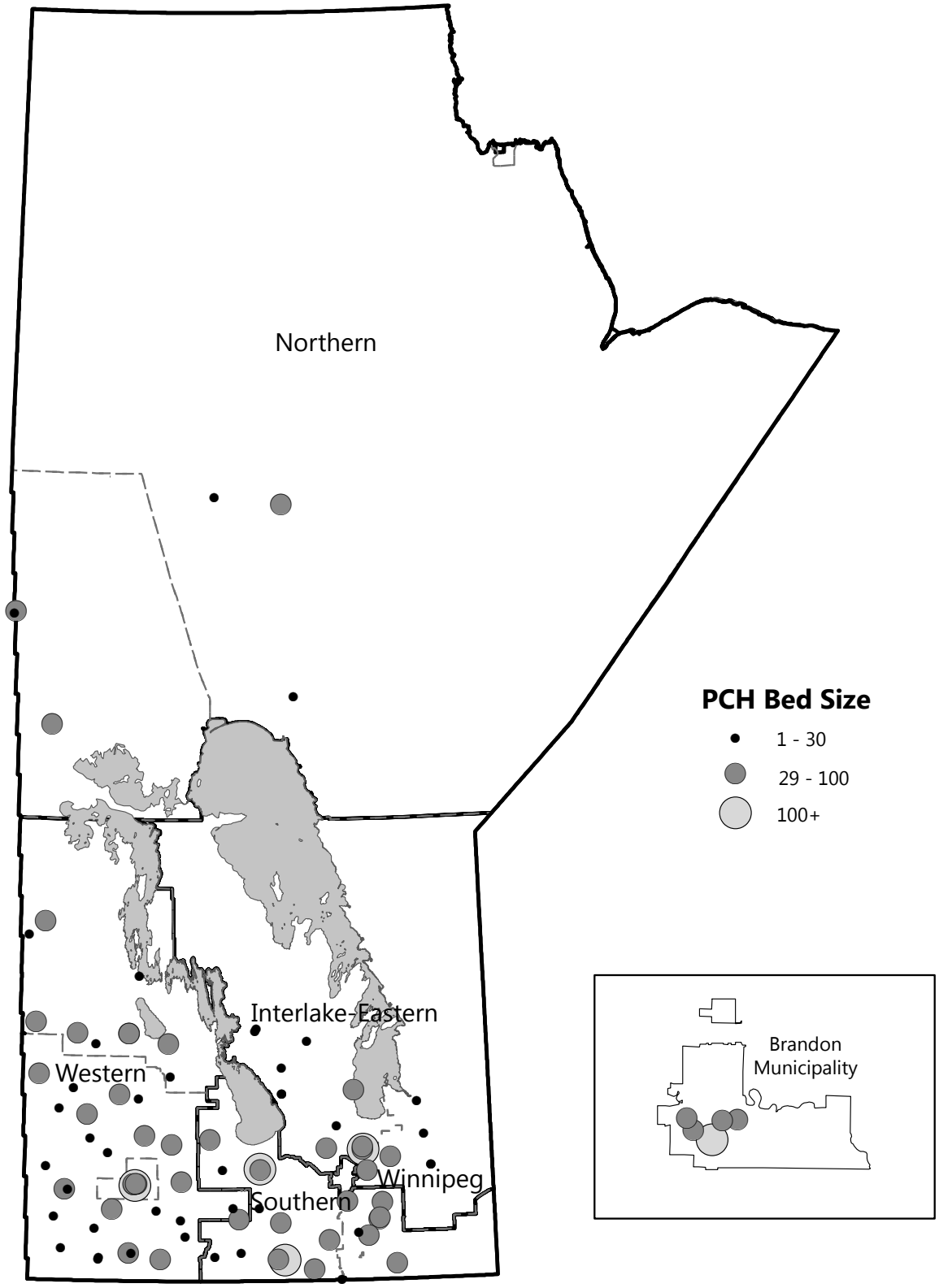
Table 2.1: Number of PCH Beds and Average Occupancy Rates by RHA, 2009/10

RHA	Number of Beds	Occupancy Rate
Western	2,019	96.72
Winnipeg	5,406	98.84
Southern	1,151	97.34
Interlake-Eastern	874	98.52
Northern	216	87.91
Total	9,666	97.95

Data for the former Churchill RHA is included in Northern RHA

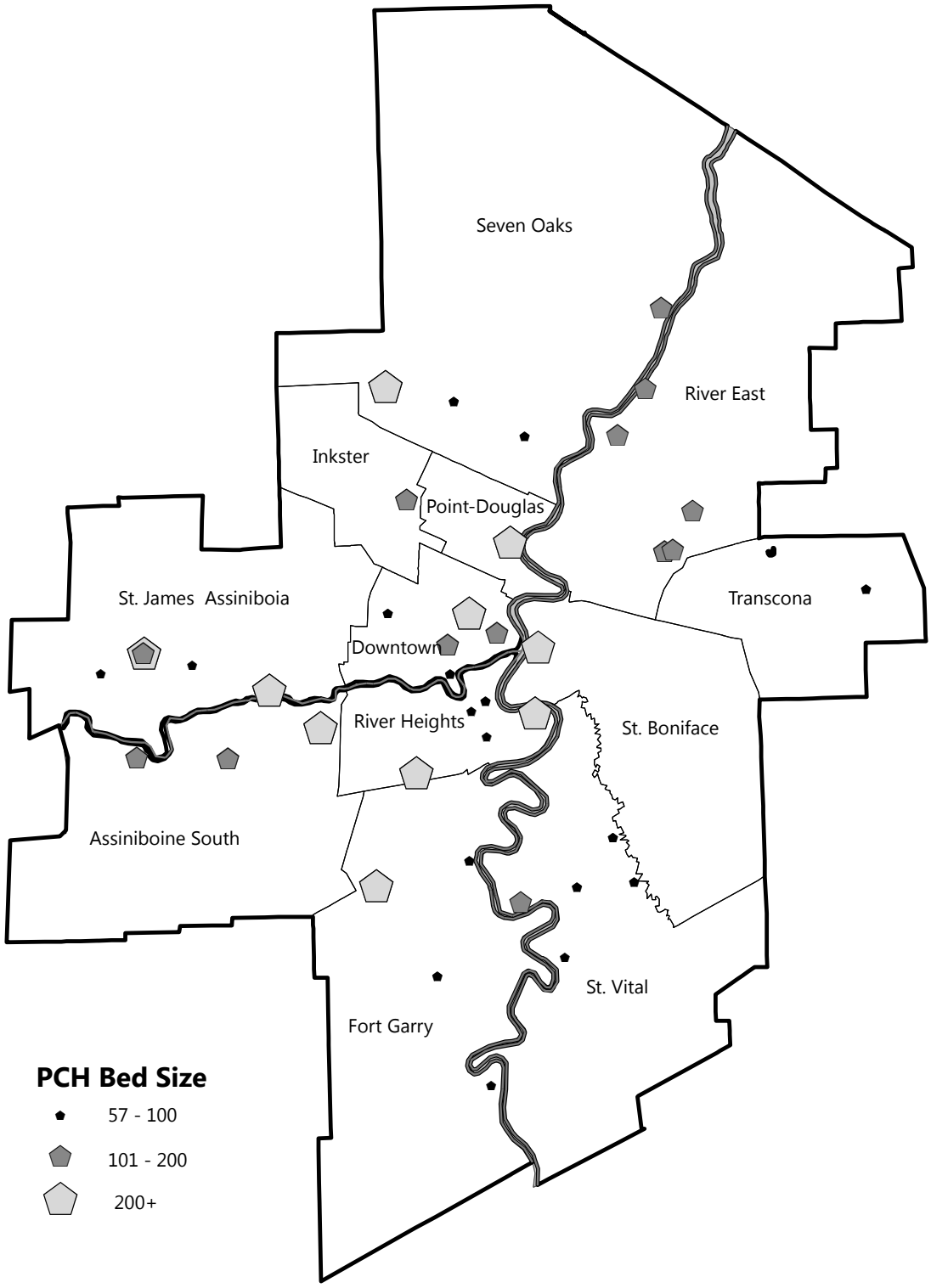
Data provided by Manitoba Health

Figure 2.1: Provincially Funded Licenced Personal Care Home (PCH) Facilities in Manitoba



*Excludes facilities that are unlicensed as well as federally funded PCHs

Figure 2.2: Provincially Funded Licenced Personal Care Home (PCH) Facilities in Winnipeg

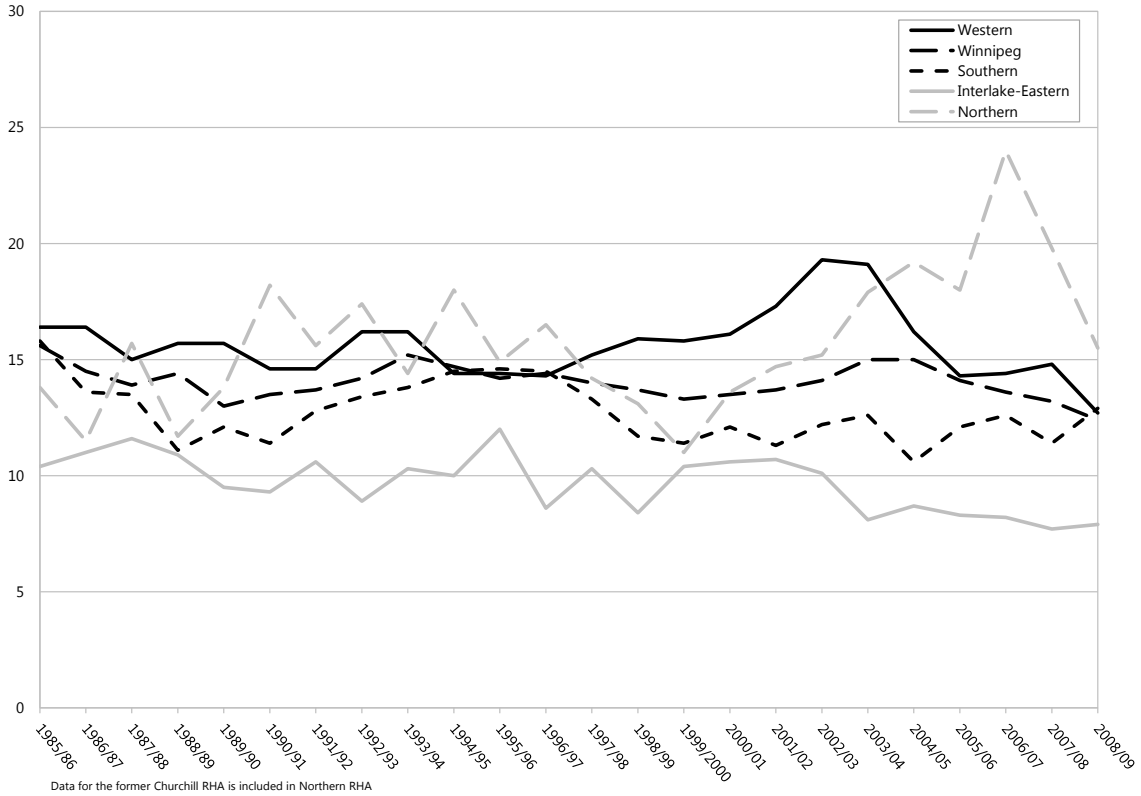


days are usually the result of resident turnover, where a bed may remain empty for a short period of time before a new resident is admitted.

PCH Resident Rates

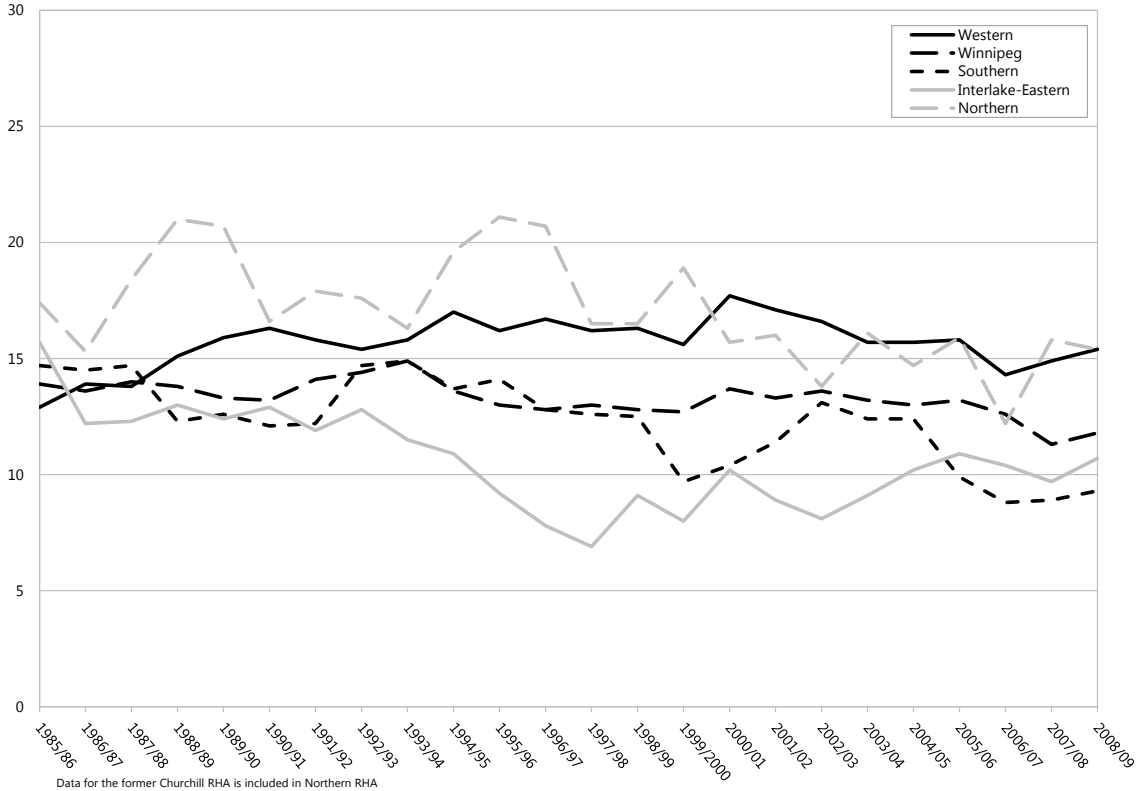
Who resides in Manitoba's PCHs? To answer this question, we calculated the PCH **resident rates** in Manitoba for three age groups (65–74, 75–84, 85+ years) separately for males and females. Each RHA's resident rate is simply the number of PCH residents in an age/sex group divided by the total number of residents in the same RHA in the age/sex group. It is then represented as a number per 1,000 individuals to facilitate comparison between RHAs and age groups. The following six figures show the resident rates for the five RHAs from 1985/86 to 2008/09. Results for the former RHAs can be found in Appendix 1. From Figures 2.3 through 2.8, PCH resident use rates vary dramatically by age and sex category but relatively little across the RHAs. The resident use rates for the 65–74 year–olds averaged around 15 per 1,000. For the 75–84 age groups, they were higher, around 70 per 1,000; and for 85+, the rates were over 200 per 1,000 for both sexes. Though the resident rates for the 65–74 age groups changed very little

Figure 2.3: PCH Residents per 1,000 Population by RHA, Males Age 65–74, 1985/86–2008/09



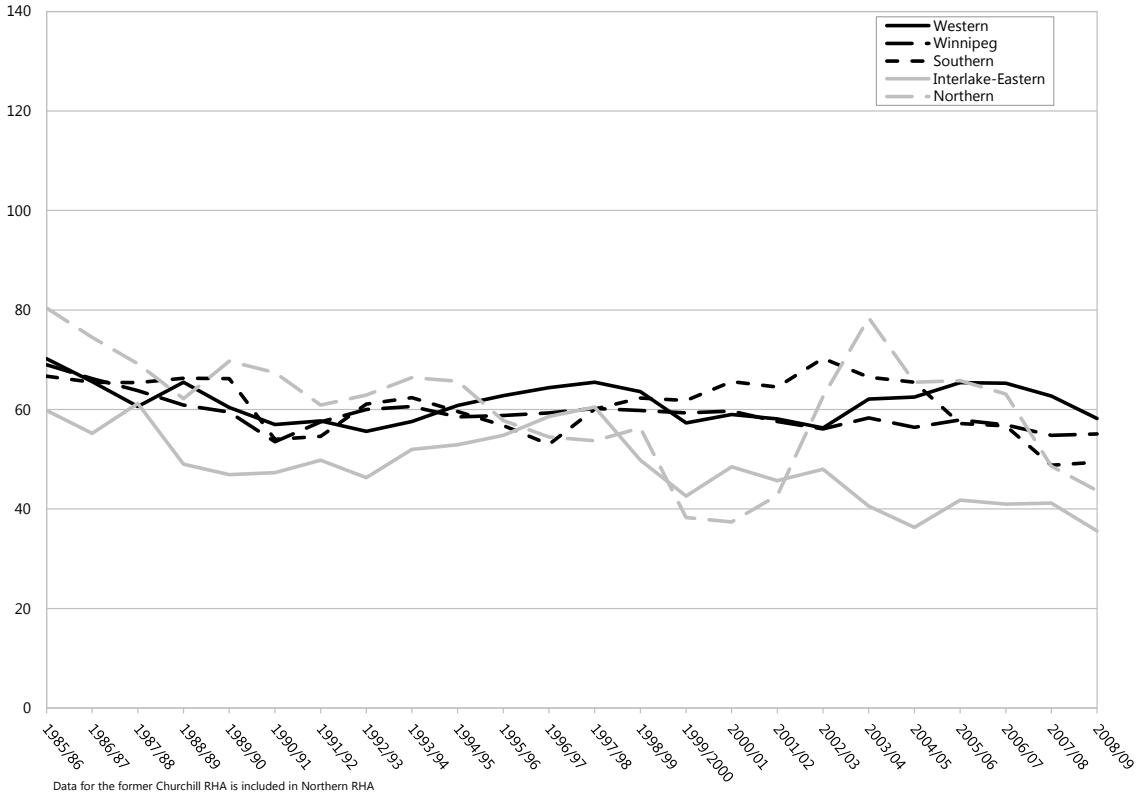
Data for the former Churchill RHA is included in Northern RHA

Figure 2.4: PCH Residents per 1,000 Population by RHA, Females Age 65–74, 1985/86–2008/09



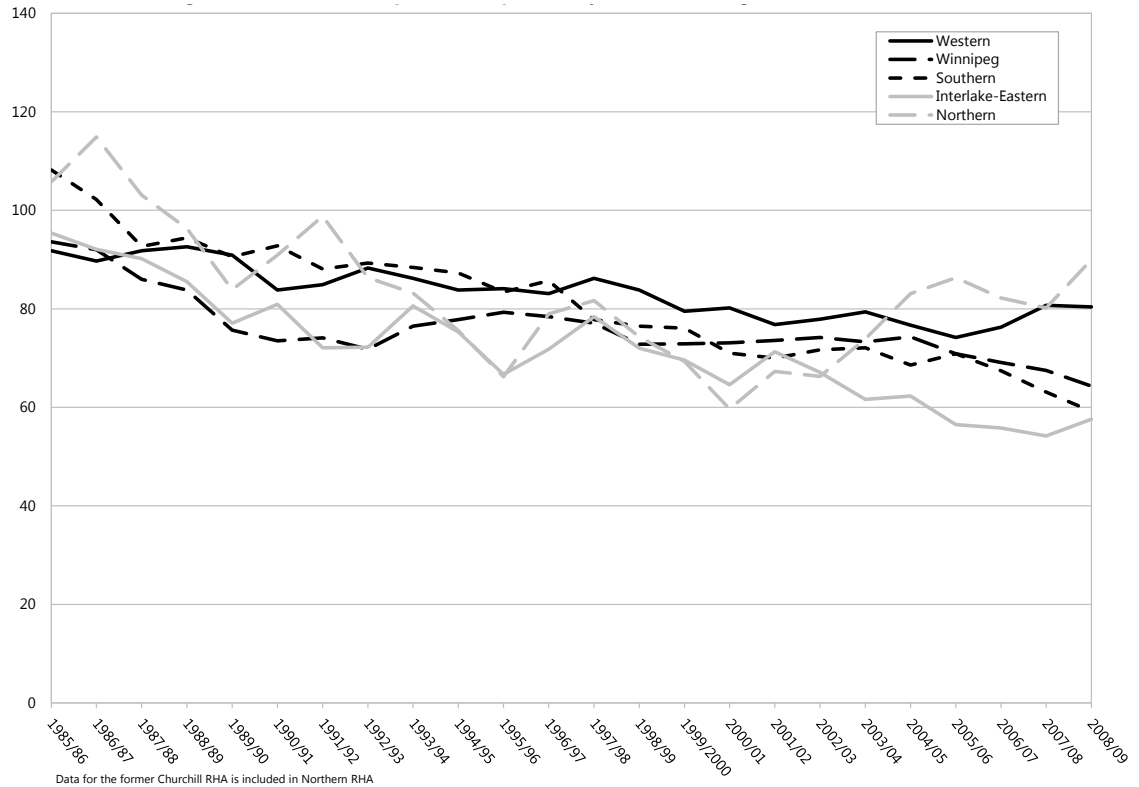
Data for the former Churchill RHA is included in Northern RHA

Figure 2.5: PCH Residents per 1,000 Population by RHA, Males Age 75–84, 1985/86–2008/09



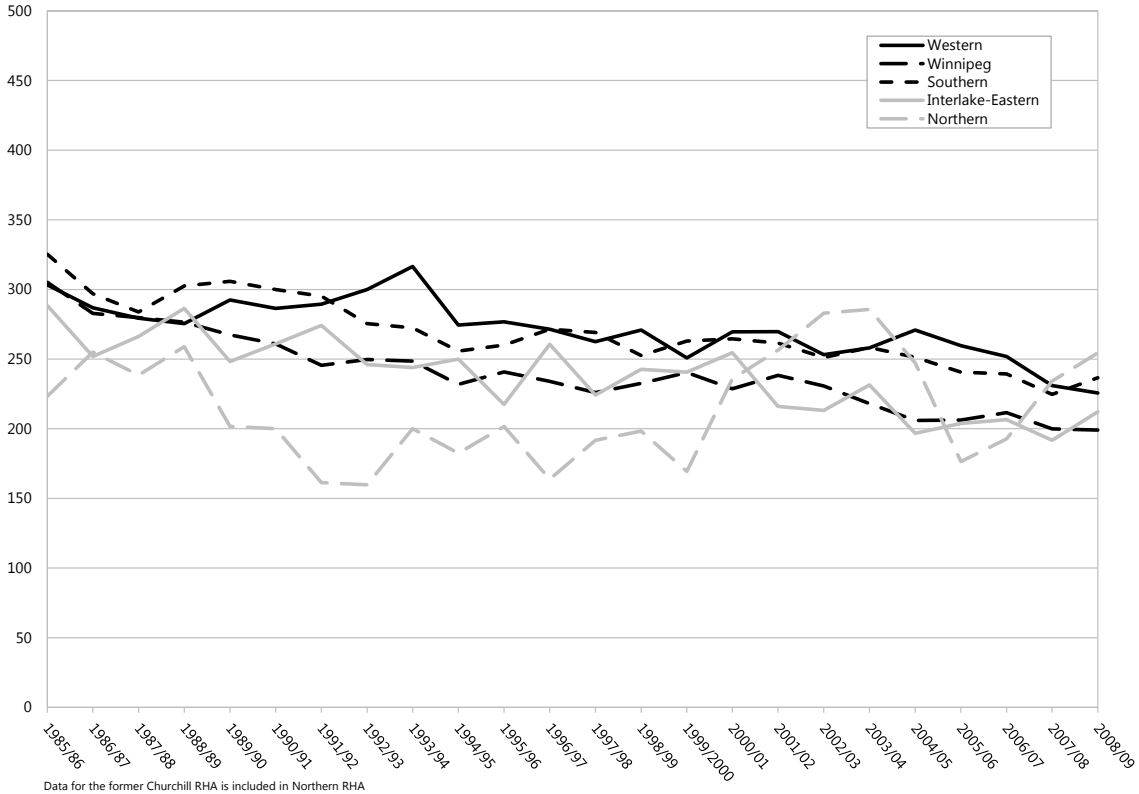
Data for the former Churchill RHA is included in Northern RHA

Figure 2.6: PCH Residents per 1,000 Population by RHA, Females Age 75–84, 1985/86–2008/09



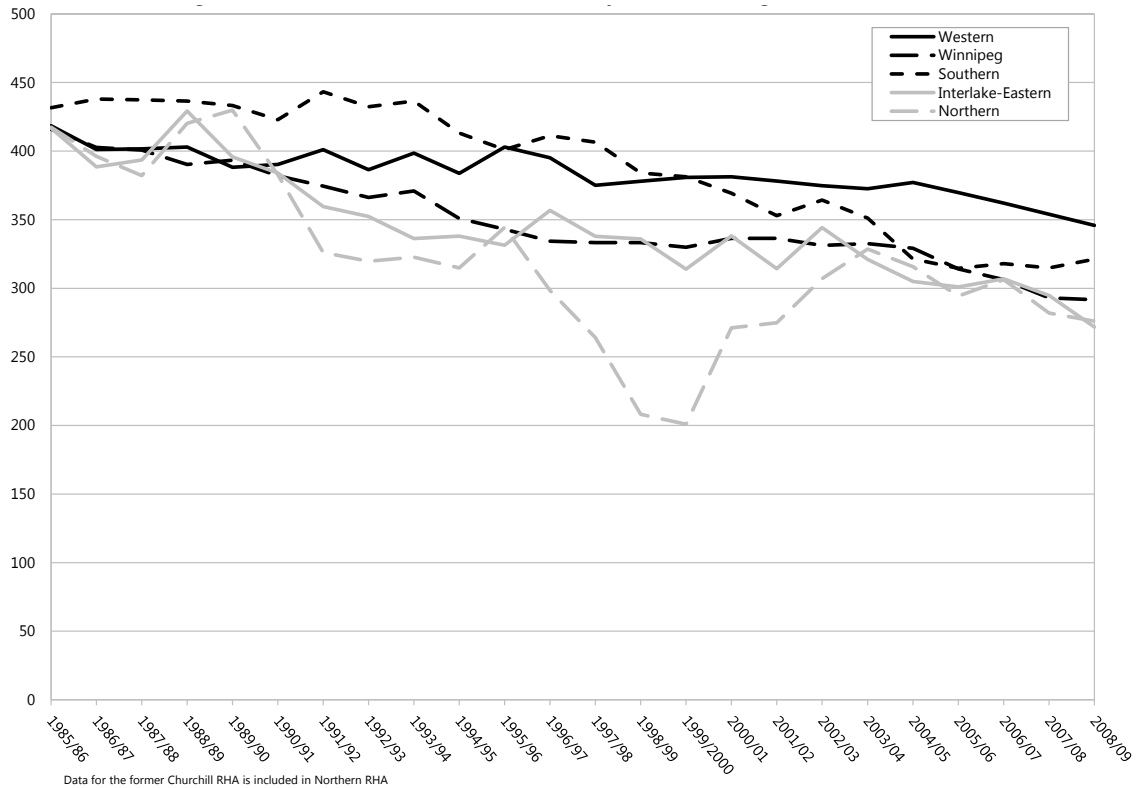
Data for the former Churchill RHA is included in Northern RHA

Figure 2.7: PCH Residents per 1,000 Population by RHA, Males Age 85+, 1985/86–2008/09



Data for the former Churchill RHA is included in Northern RHA

Figure 2.8: PCH Residents per 1,000 Population by RHA, Females Age 85+, 1985/86–2008/09



Data for the former Churchill RHA is included in Northern RHA

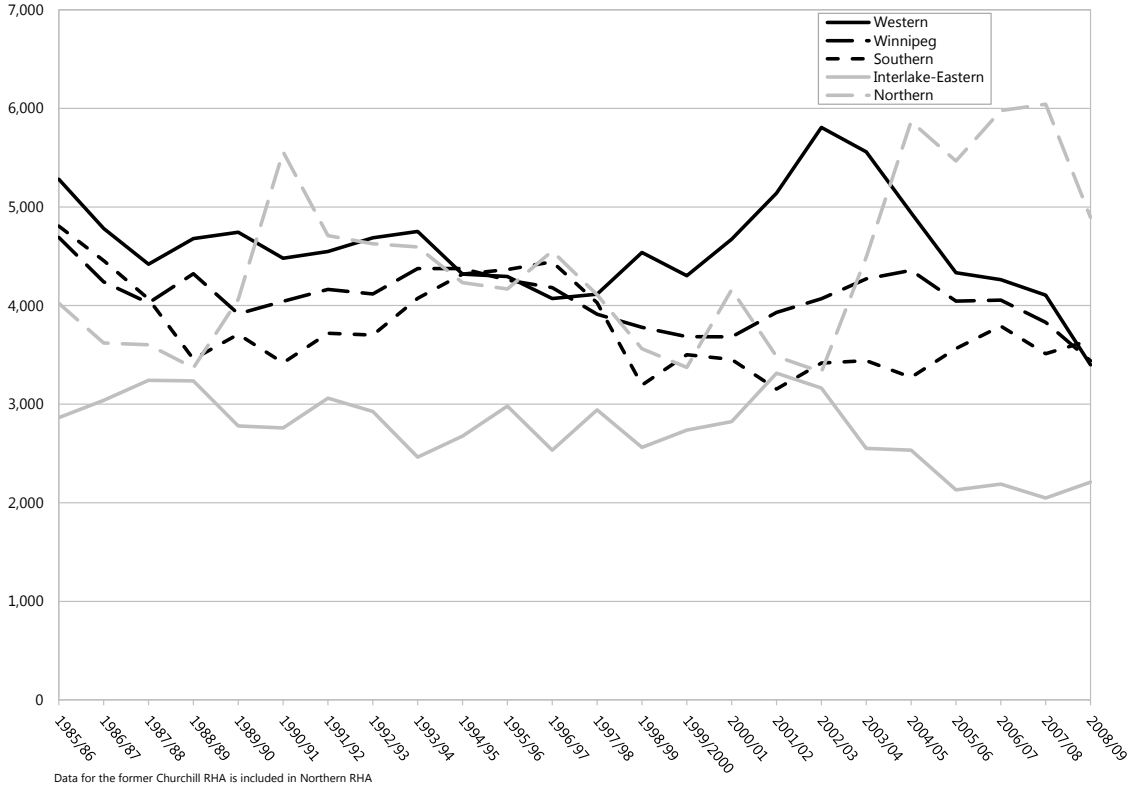
over the time period presented, there was a steady decline for the 85+ year–olds and an initial decline that may have plateaued for the 75–84 age groups.

Personal Care Home Population Use Rates

The following six figures show age– and sex–specific trends in PCH population use rates (days per 1,000 population) for the five RHAs (Appendix 1 for results for the former RHAs). Population use rates were calculated by dividing the total number of PCH days allocated to an age/sex category by the total population size in the same age/sex category. While somewhat dependent on the *resident rates* presented in the previous section, the *use rates* are subtly different. Whereas the resident rate only counts whether or not a person was resident in a PCH, the use rate counts the number of PCH days that were used.

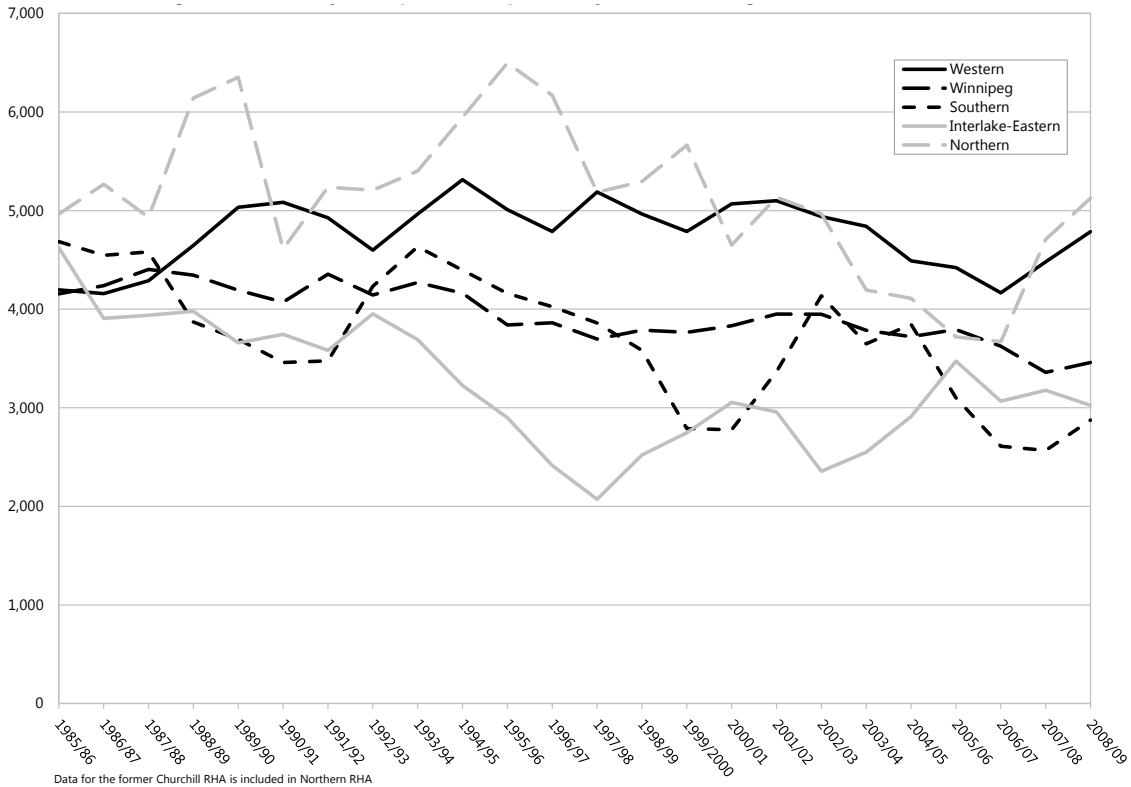
The trends in PCH population use rates are similar to those shown for the resident rates; the scale for the rates differed dramatically across age groups and rates for the 65–74 age group were more stable over time than for the older age groups, which declined over time. One thing to note is that population use rates seem to have decreased more rapidly than the resident rates. This is expected given the shorter average length of stay for residents in the more recent past, compared to the average length of stay a decade or two prior. Doupe et al. (2011) noted a sharp decline in average length of stay for females age 85+, from approximately 1,600 days in 1985/86 to only about 1,100 days in 2007/08 (see Figure 2.15).

Figure 2.9: PCH Days Used per 1,000 Population by RHA, Males Age 65–74, 1985/86–2008/09



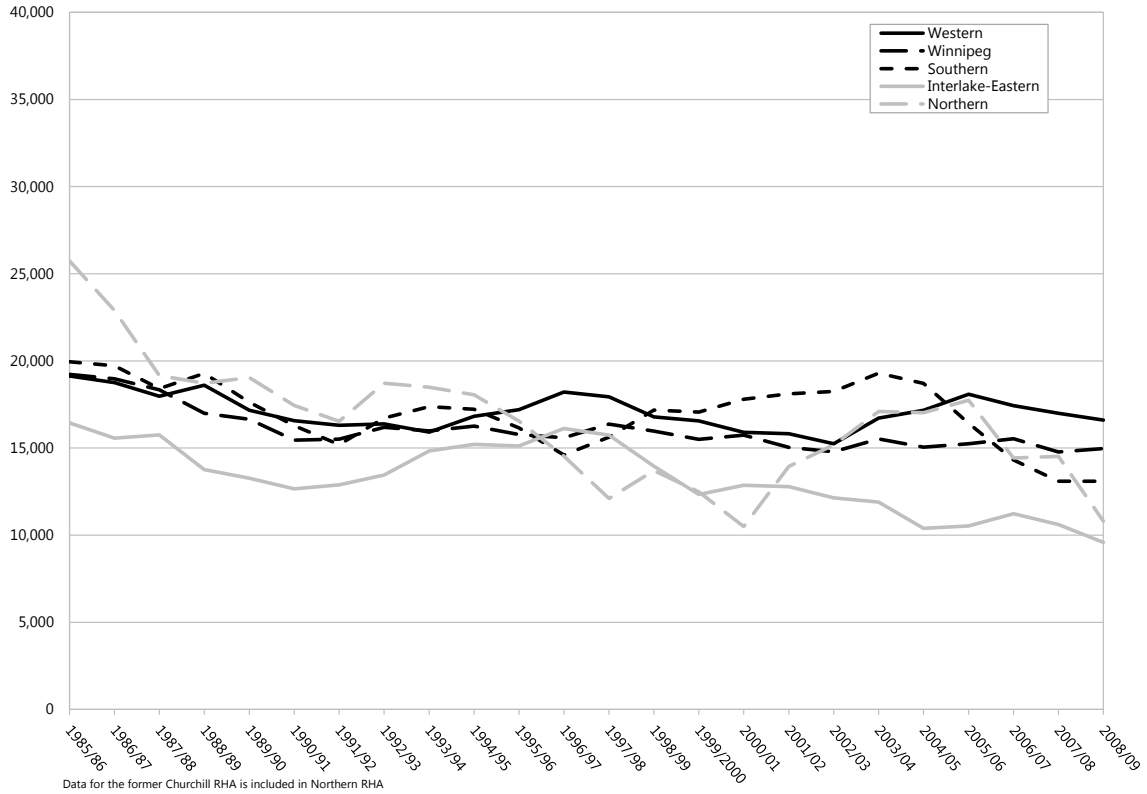
Data for the former Churchill RHA is included in Northern RHA

Figure 2.10: PCH Days Used per 1,000 Population by RHA, Females Age 65–74, 1985/86–2008/09



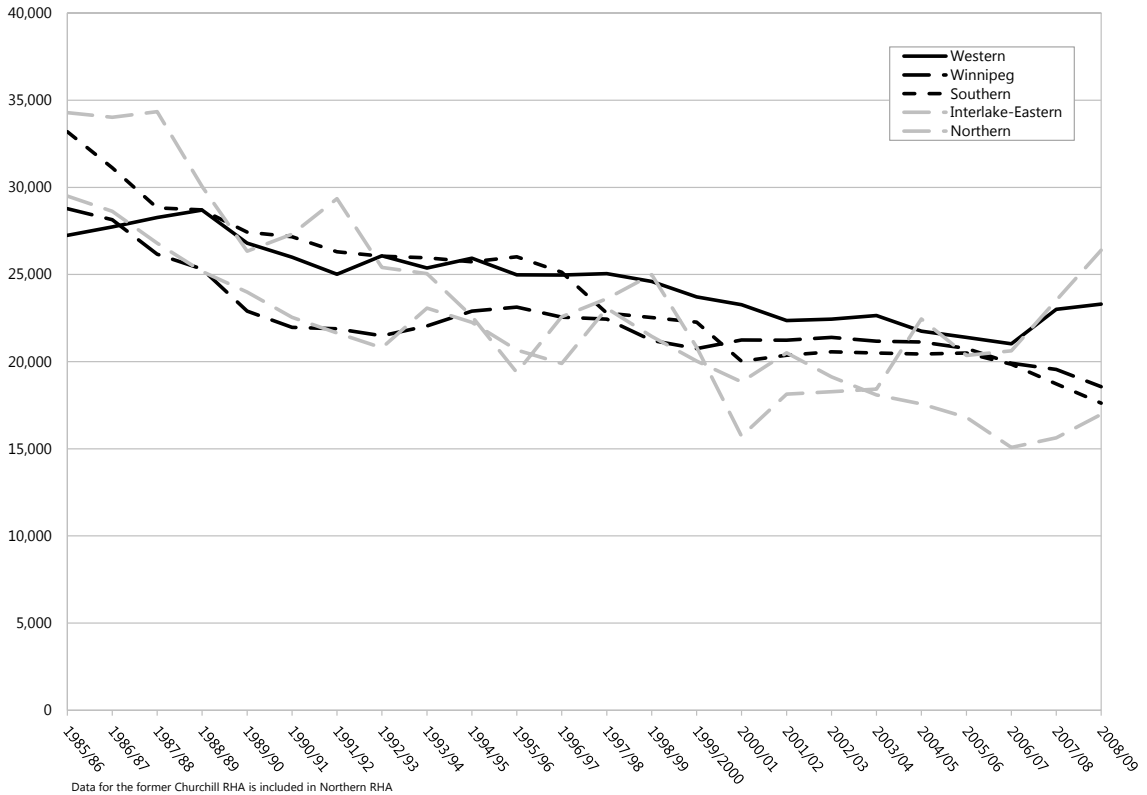
Data for the former Churchill RHA is included in Northern RHA

Figure 2.11: PCH Days Used per 1,000 Population by RHA, Males Age 75–84, 1985/86–2008/09



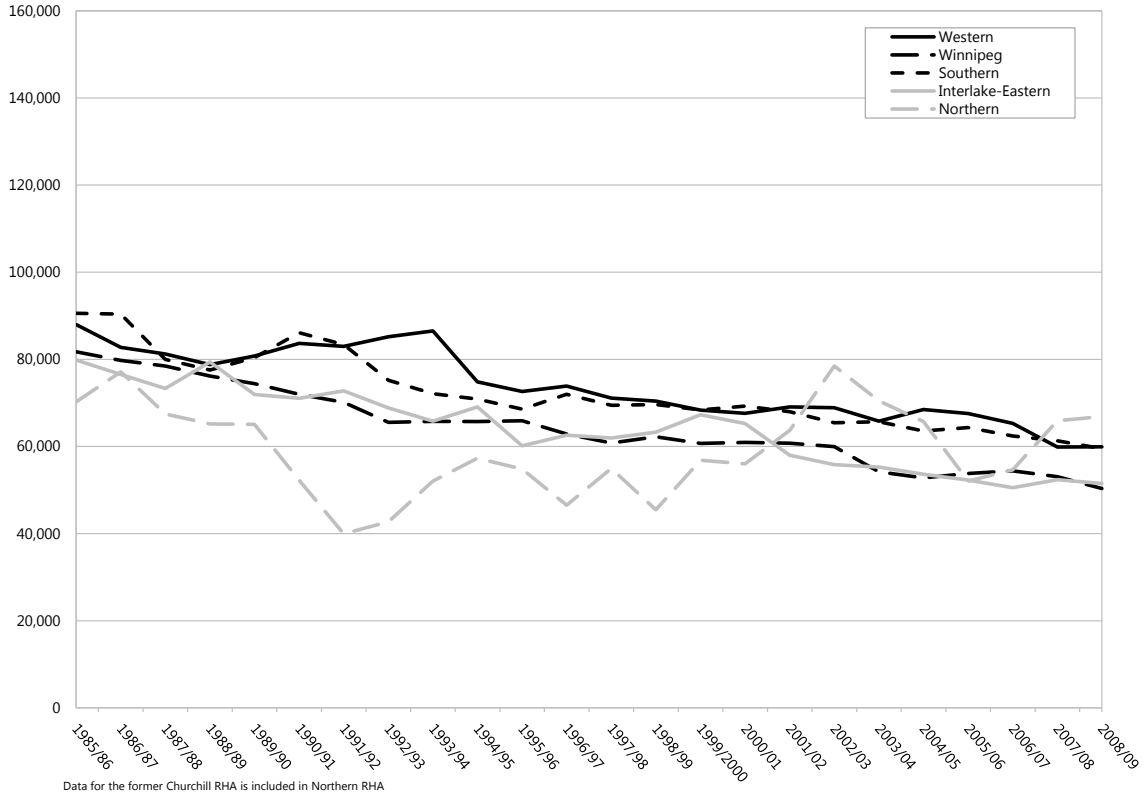
Data for the former Churchill RHA is included in Northern RHA

Figure 2.12: PCH Days Used per 1,000 Population by RHA, Females Age 75–84, 1985/86–2008/09



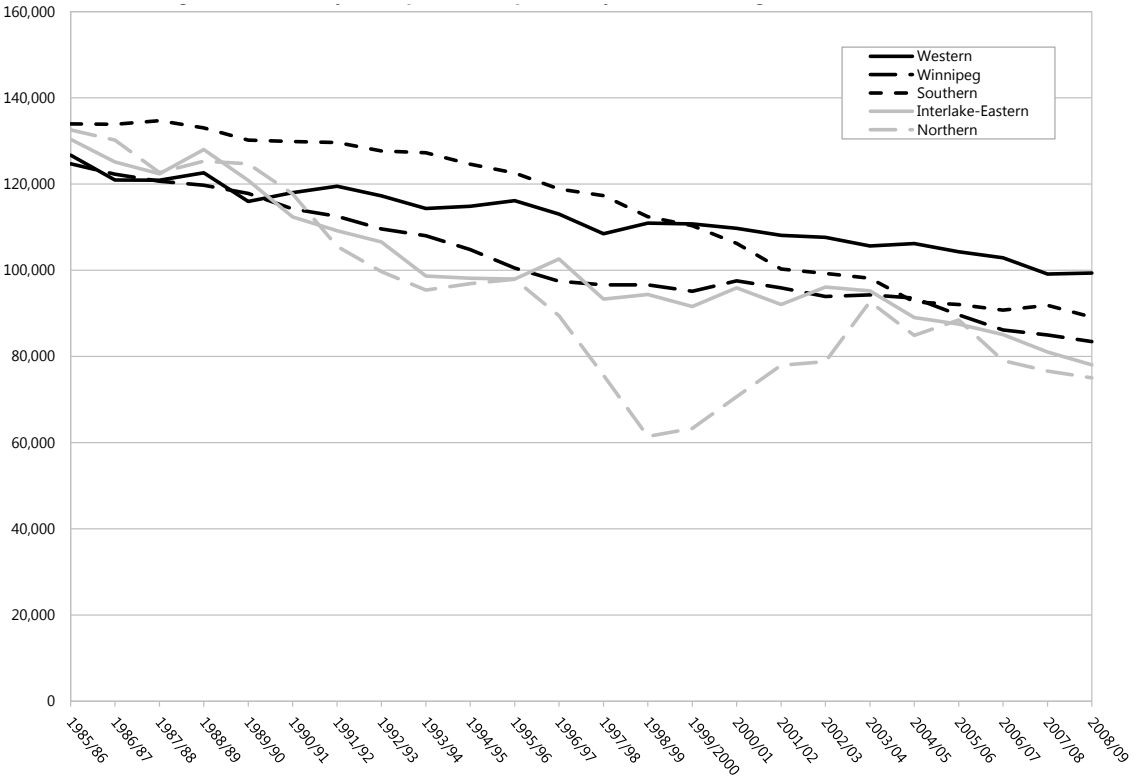
Data for the former Churchill RHA is included in Northern RHA

Figure 2.13: PCH Days Used per 1,000 Population by RHA, Males Age 85+, 1985/86–2008/09



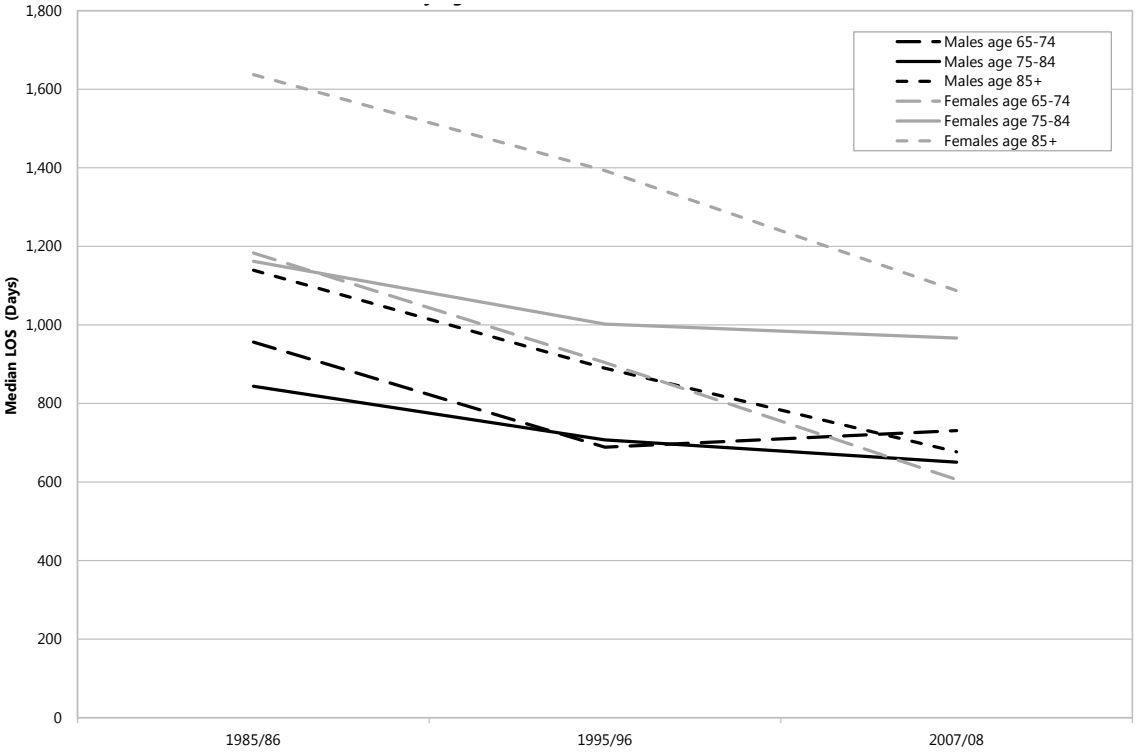
Data for the former Churchill RHA is included in Northern RHA

Figure 2.14: PCH Days Used per 1,000 Population by RHA, Females Age 85+, 1985/86–2008/09



Data for the former Churchill RHA is included in Northern RHA

Figure 2.15: Median PCH Resident Length of Stay (LOS) by Age and Sex, Manitoba, 1985/86–2007/08



Source: Doupe et al., 2011

Smaller declines were seen in other age/sex groups, with some remaining steady after 1995/96. This change in average length of stay explains why the more modest decline seen in resident rates would result in a steeper decline in use rates.

Together, the PCH use rates and the population sizes combine to account for the total amount of PCH care provided to older Manitobans. The following set of figures display this total number of days of PCH care in each year from 1985/06 to 2008/09 for Manitoba and by RHA, age, and sex. There are two major trends to note, the first is that the total care provided to females age 85+ steadily increased from 1985/86 to 2008/09; this occurred in every RHA other than Northern RHA. Second, the same group of people received much more care than any other group. In 2008/09, the females age 85+ used more than twice as many days of PCH care as the corresponding males and, in fact, received almost half of all PCH days in the province (47.7%). Surprisingly, this increase in total days provided occurred despite

Figure 2.16: Total Number of PCH Days Used by Older Adults, Manitoba, 1985/86–2008/09

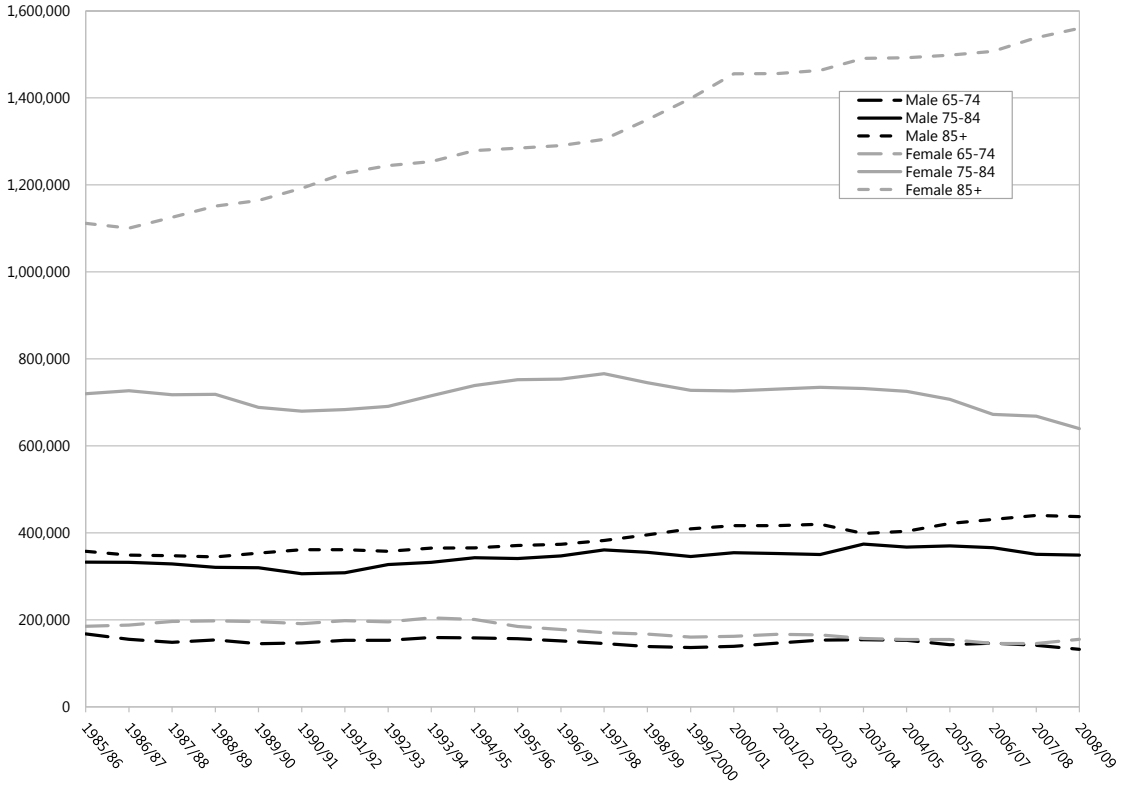


Figure 2.17: Total Number of PCH Days Used by Older Adults, Western RHA, 1985/86–2008/09

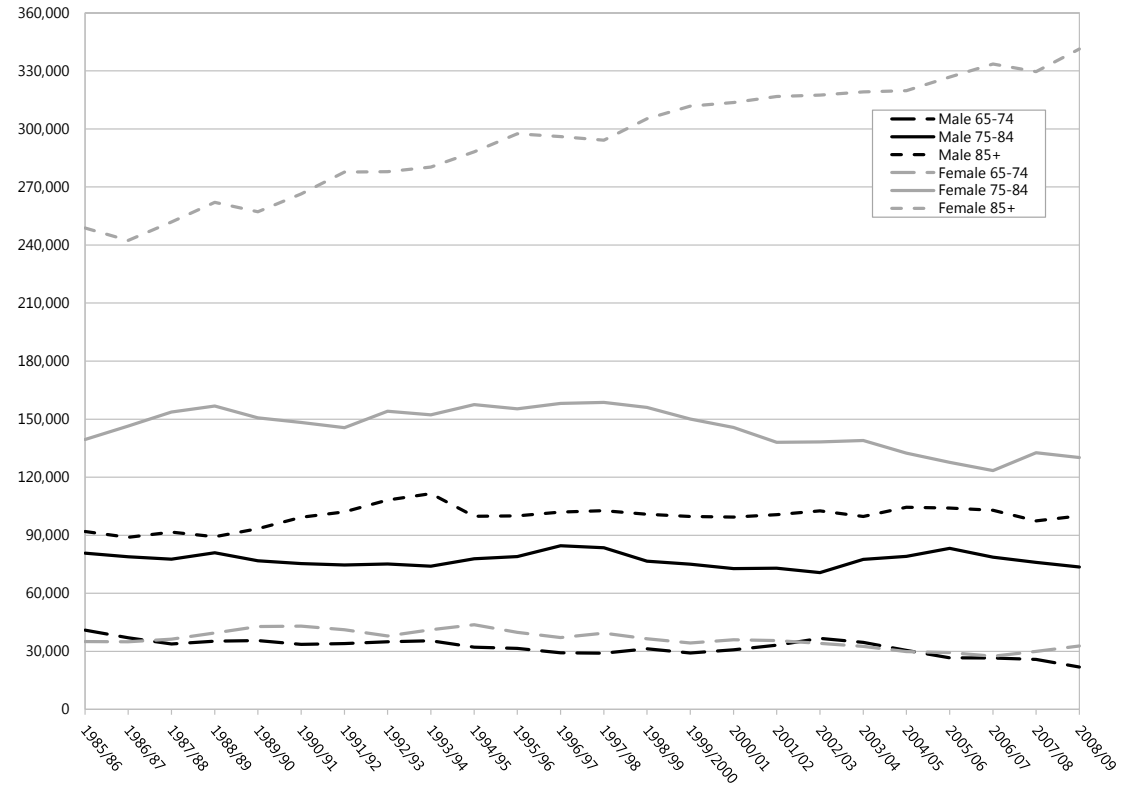
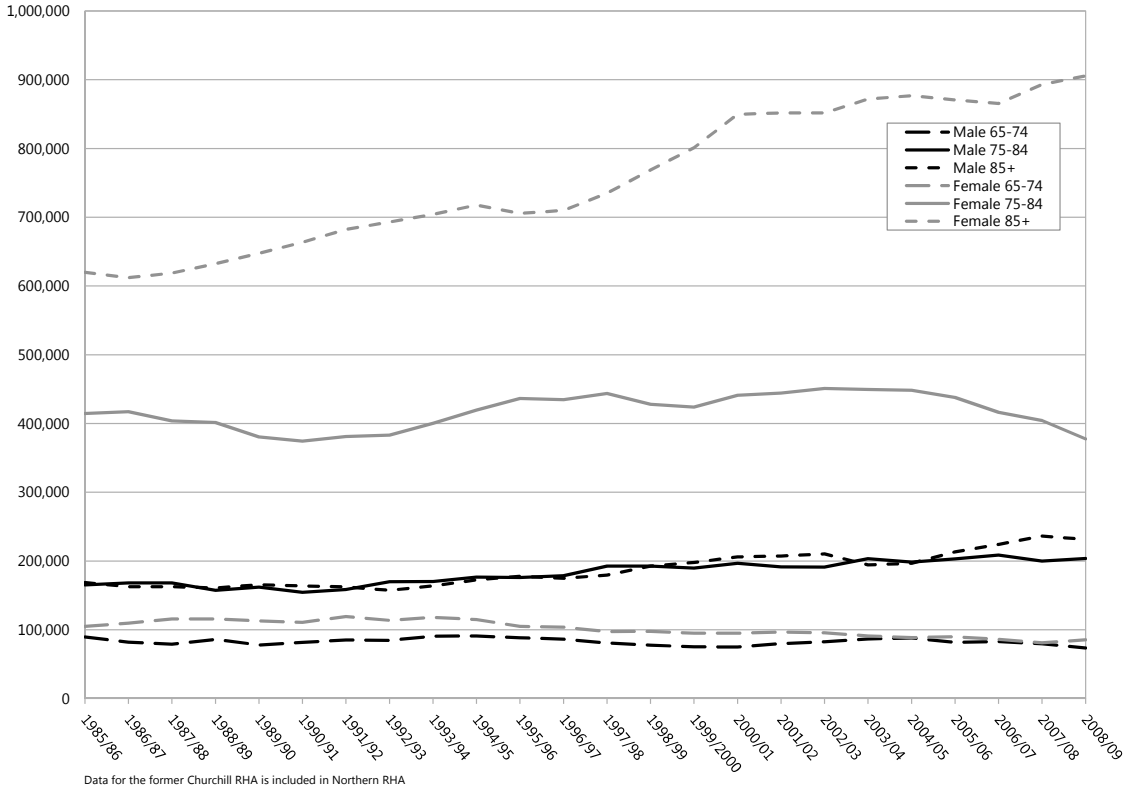


Figure 2.18: Total Number of PCH Days Used by Older Adults, Winnipeg RHA, 1985/86–2008/09



Data for the former Churchill RHA is included in Northern RHA

Figure 2.19: Total Number of PCH Days Used by Older Adults, Southern RHA, 1985/86–2008/09

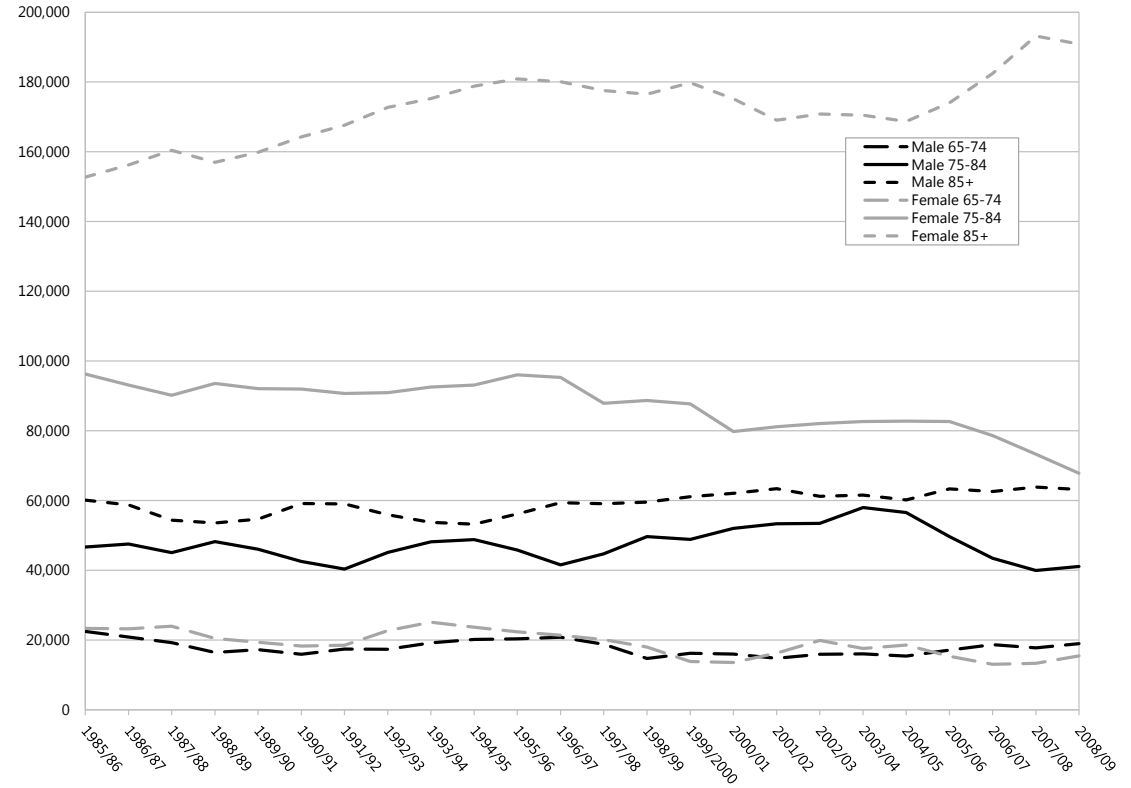


Figure 2.20: Total Number of PCH Days Used by Older Adults, Interlake–Eastern RHA, 1985/86–2008/09

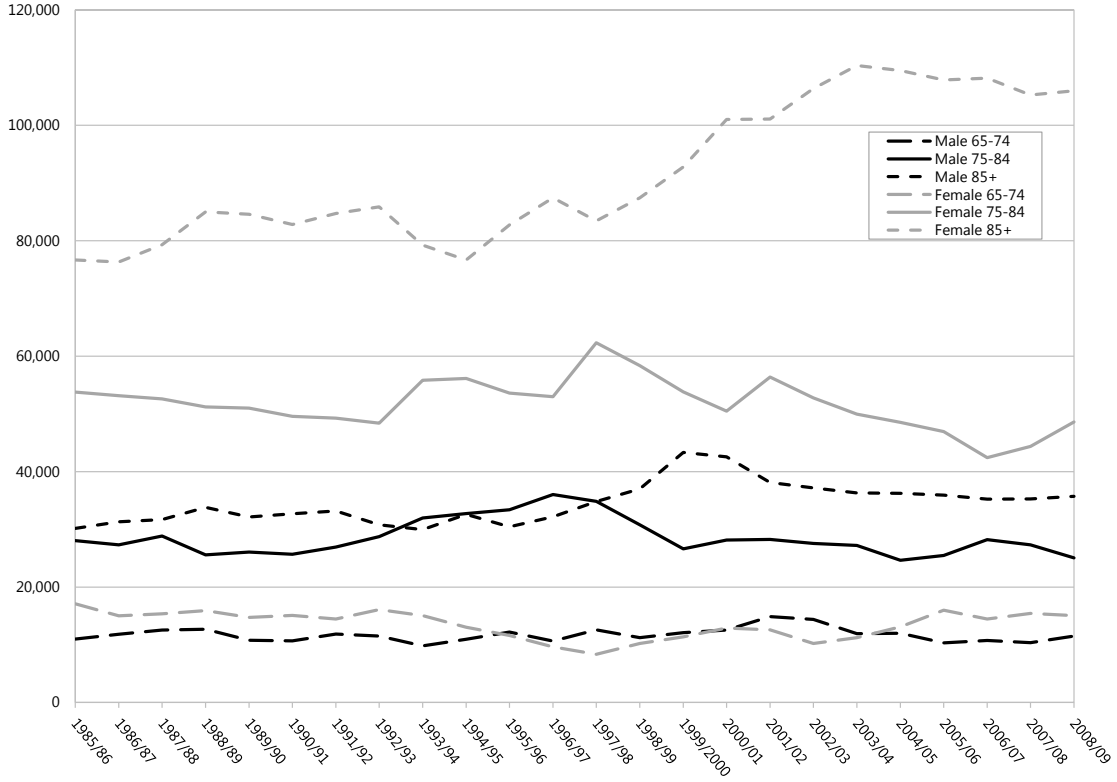
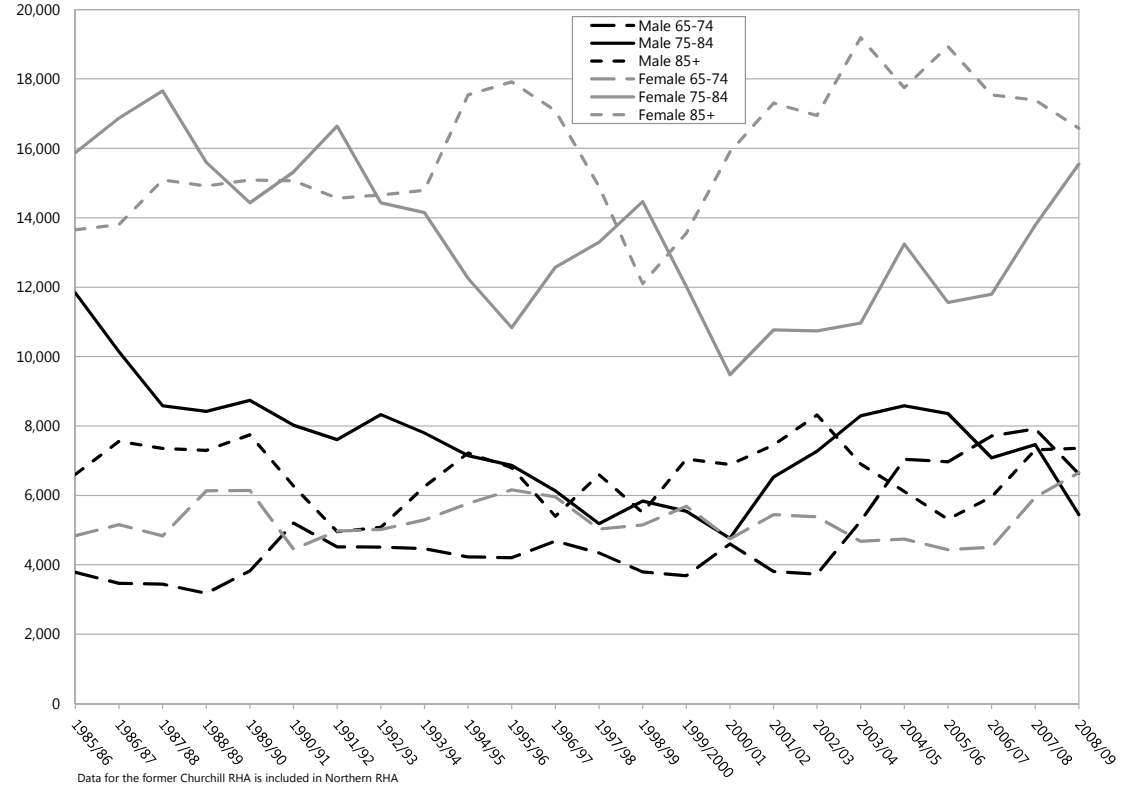


Figure 2.21: Total Number of PCH Days Used by Older Adults, Northern RHA, 1985/86–2008/09



Data for the former Churchill RHA is included in Northern RHA

the declining use rates for the same group of people (Figure 2.14). The apparent discrepancy is entirely explained by the large increase in the size of the population age 85+. As presented in Figure 1.3 in the previous chapter, the number of 85+ year–olds in Manitoba doubled from about 13,000 in 1985 to about 26,000 in 2008.

Inter–RHA Migration Prior To PCH Admission

Migration between RHAs immediately prior to PCH admission may actually cause inaccurate projections of PCH bed equivalents. Migration can create this inappropriate allocation particularly if the movement occurred in order to enter a PCH. The reason is that the resident rates and population use rates presented in the previous section do not consider that residents may transfer across RHAs prior to entering a PCH. Once a person is admitted to a PCH, they become a resident of the RHA in which the PCH is located and the previous residence is essentially ignored. Current and projected PCH use rates would be lower than needed for RHAs where residents left prior to admission to PCH and higher than needed for RHAs where residents were coming in at PCH admission. Using the rates for projections of PCH bed equivalents would result in an underestimation of need for the former and overestimation of need for the latter.

We examined inter–RHA migration prior to admission in order to determine if such migration was, in fact, occurring. An estimate of inter–RHA migration can then be considered in conjunction with the projections to determine how to allocate or increase resources for PCH bed equivalent care. Migration was estimated by looking at where newly admitted PCH residents lived 730 days (i.e., two years) prior to their admission. This was considered a long enough period of time to capture PCH residents who changed RHA prior to, or, at the time of admission, for example to be closer to family members.

Table 2.2 provides information about in–, out–, and net–migrations for PCH residents prior to their admission date. This analysis was conducted using the former RHA boundaries and provides a better

Table 2.2: Average Annual Number of PCH Admissions by RHA of Residence, April 1, 2004–October 1, 2009*

RHA of Residence Two Years Before Admission	Total Admissions by RHA Residents per Year	Admissions to PCH Outside RHA (loss) per Year	Admissions by Residents of Another RHA (gain) per Year	Net Gain or Loss per Year	Total Admissions to PCH in RHA per Year
Parkland	164.3	10.5	12.4	1.9	166.1
Assiniboine	296.3	35.1	21.0	-14.1	282.2
Brandon	155.1	13.9	35.1	21.2	176.3
Central	238.9	32.3	25.9	-6.4	232.5
Winnipeg	1,616.1	75.8	104.1	28.3	1,644.4
Interlake	183.6	39.6	16.1	-23.4	160.1
North Eastman	66.8	21.4	7.3	-14.1	52.7
Nor-Man	36.8	3.4	4.1	0.8	37.5
South Eastman	91.5	15.9	24.8	8.8	100.3
Burntwood/Churchill	24.4	5.8	2.8	-3.0	21.4
Total	2,873.4				2,873.4

* RHAs as defined prior to May 28, 2012

look at movement within the province than if the new amalgamated RHAs were used. Analysis were conducted on all newly admitted residents (not including transfers) between April 1, 2004 and to October 6, 2009. For the Winnipeg region, an average of 1,616 Winnipeg residents were admitted to a PCH each year between 2004 and 2009. Of those, about 76 people per year left Winnipeg to enter a PCH in another RHA. About 104 residents from outside Winnipeg were admitted to a Winnipeg PCH.

This represents a net "gain" of approximately 28 PCH residents per year, or about 1.7% of all admissions in Winnipeg. This minor addition to Winnipeg PCH resident numbers would have very little effect on PCH bed equivalent need. On the other hand, the proportional "gain" or "loss" of residents was most pronounced for the former North Eastman and Interlake RHAs, which happen to make up the new Interlake–Eastern RHA, and they had a net loss of residents. Therefore, the projections for Interlake–Eastern RHA presented in the following chapter may undercount the PCH bed equivalent need that would be required if residents were to remain in the RHA in which they resided prior to being admitted to PCH. Nonetheless, the projected total amount of PCH equivalent care for Manitoba would not be affected, since any adjustment would result in a corresponding decrease in the PCH bed equivalent need for another RHA, in this case most likely Winnipeg.

Summary

- The distribution of PCH beds between Winnipeg and rural areas is proportionate to the population, but the size of the institutions is very different. Urban PCHs are much larger.
- PCH resident and population use rates have been declining since 1985/86, particularly for the oldest age group (85+).
- At any given time, PCH resident and population use rates were lowest for 65–74 year–olds, and incrementally higher for 75–84 and 85+ year–olds. Females 85+ had the highest PCH resident and population use rates.
- Inter–RHA migration prior to or at time of PCH admission is a small portion of total PCH admissions. The need to adjust RHA–specific PCH projections for inter–RHA migration is therefore negligible.

Chapter 3: Projections of PCH Equivalent Bed Needs

In this chapter, we present two different projections of PCH bed equivalent needs. Both projections combine two fundamental pieces of information: 1) the number of people in the RHA age 65+ for each year up to 2036 and 2) the rate at which these people are expected to require PCH bed equivalent care over the same time period. The first component is identical for both sets of projections. The second component is varied between the two scenarios and presents either the "worst case" alternative or a "pragmatically optimistic" alternative.

Population Projections

The Manitoba Bureau of Statistics (MBS) regularly provides age and sex specific population projections for the province of Manitoba. The most recent report was released in 2010 and projected the Manitoba population from 2008 to 2041 (Manitoba Bureau of Statistics, 2010). The regular reports, however, do not provide separate projections for each of the RHAs; these separate projections are a fundamental building block in any attempt to predict resource needs for the RHAs. To fill this gap in knowledge, Manitoba Health contracted MBS to provide RHA–specific (as they existed at the time) population projections by age and sex. The report was completed in 2008 and provided projections from 2006 to the year 2036 (Manitoba Bureau of Statistics, 2008). As mentioned earlier, the projections take into account migration (international, interprovincial, and intraprovincial), births and deaths, and make assumptions about how these factors will change and influence age– and sex–specific population sizes in the future. We calculated the population projections for the new RHAs by summing the MBS projections for the former RHAs that they encompass. Because of its small size, MBS combined the former RHA of Churchill with the former RHA of Burntwood. For this reason, all numbers for the new Northern RHA include Churchill and all numbers for the new Winnipeg/Churchill RHA do not include Churchill. The population projections for each of the RHAs at key time points are provided in Tables 3.1 to 3.3. The same age and sex groups were employed here as in the previous chapter. Identical tables for the former RHAs can be found in Appendix 1.

Three general trends can be seen in these projections:

1. In all years and for each RHA, there are more females in a given age category than males. This relative difference between sexes increases with age, so that the ratio of females to males 85+ years old is almost 2:1. This is important to note since the PCH use rates presented in the previous chapter indicate that the age group that will have the biggest impact on PCH bed equivalent requirements are those age 85+; and more specifically, the females in that age group.
2. Second, the baby boom generation (people born between 1946 and 1964) progresses through these age groups sequentially, and the projected growth in number of older adults is time–dependent. For example, the first baby boomer (born in 1946) turned 65 in 2011; and we see a sequential increase in the number of 65–to 74-year–olds until 2031, at which time the vast majority of baby boomers will be 75+ years old. Similarly, growth in the number of 75–84 year–olds does not commence until 2021 (1946 plus 75). Growth in the number of 85+ year–olds is relatively stable until 2031 and should continue to increase until 2051.
3. Third, the relative increases in population vary considerably between RHAs. Western RHA sees a very modest increase in all age groups over the 25–year period and, in fact, sees temporary decreases in the 85+ groups between 2011–2031. At the other extreme, Interlake–Eastern and Northern RHAs see immediate and sustained increases in the two older age groups over the 25–year period. Winnipeg and Southern RHA see modest increases initially in the 85+ age group but larger increases from 2021 to 2036.

Table 3.1: Actual and Projected Populations for Adults Age 65–74 by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Western	6,830	8,666	8,696	7,429	7,077	9,079	9,720	8,330
Winnipeg	23,059	36,574	44,877	43,799	26,264	40,704	47,581	46,446
Southern	5,755	8,143	10,438	10,005	5,783	8,277	10,846	10,626
Interlake-Eastern	5,686	7,278	8,028	6,997	5,393	7,495	8,482	7,757
Northern	1,569	2,514	3,004	2,764	1,452	2,396	3,129	3,045
Manitoba	42,899	63,175	75,043	70,995	45,969	67,952	79,759	76,205

Data for the former Churchill RHA is included in Northern RHA

Population projections calculated by Manitoba Bureau of Statistics (2008)

Table 3.2: Actual and Projected Populations for Adults Age 75–84 by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Western	4,452	4,554	6,177	6,579	5,461	5,394	7,160	7,731
Winnipeg	14,038	15,681	25,893	29,959	19,901	20,081	32,016	35,566
Southern	3,273	4,042	5,993	7,126	3,896	4,698	6,819	8,119
Interlake-Eastern	2,874	3,884	5,187	5,655	3,075	4,378	6,011	6,483
Northern	559	842	1,474	1,736	638	816	1,502	1,825
Manitoba	25,196	29,004	44,723	51,055	32,971	35,367	53,509	59,725

Data for the former Churchill RHA is included in Northern RHA

Population projections calculated by Manitoba Bureau of Statistics (2008)

Table 3.3: Actual and Projected Populations for Adults Age 85+ by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Western	1,898	1,962	2,286	2,766	3,671	3,306	3,483	4,069
Winnipeg	5,255	6,198	7,945	10,699	12,235	11,435	12,703	16,292
Southern	1,220	1,467	2,041	2,582	2,351	2,597	3,269	3,914
Interlake-Eastern	781	1,333	1,922	2,334	1,490	1,929	2,738	3,369
Northern	123	133	238	368	251	195	294	416
Manitoba	9,277	11,093	14,432	18,750	19,998	19,462	22,488	28,060

Data for the former Churchill RHA is included in Northern RHA

Population projections calculated by Manitoba Bureau of Statistics (2008)

These population projections are the first component for assessing PCH bed equivalent needs. The second component is the rate at which the population groups will require PCH bed equivalent care and is different for the two projections that will be presented.

Projecting PCH Bed Equivalents

The method used to generate PCH bed equivalent projections is very similar to that used in Doupe et al. (2011), but was performed separately for each RHA in the province rather than the province as a whole. In general, the number of people that could be expected to need PCH care (i.e., **population projections** for people 65+ years old) was combined with the PCH use rate for the same population in the future. Applying the rate to the number of people resulted in a total number of PCH bed equivalent days required. This was done separately by each age group and sex and the resulting numbers were summed to get a total for an RHA. This total projected number of PCH days for an RHA was transformed into the number of beds by dividing the number of days by 365 (days in a year). For instance, if an RHA was projected to have 2,000 85+ year–old females in the year 2031 and they were expected to require 80,000 days per 1,000 population, then the RHA would require 160,000 PCH bed equivalent days of care

for this group in 2031 (the expected rate multiplied by the expected population). Assuming maximum occupancy rates, this would translate into about 438 PCH beds (i.e., 160,000 ÷ 365). After making the same calculations for males age 85+ and additional age groups (65–74, 75–84) for both sexes, the age–sex specific numbers were summed to provide the total number of PCH bed equivalents required for the RHA.

Projections using Current Use Rates

The first PCH bed equivalent projection combines the population projections with the **current use rates**. These projections assume that the current age– and sex–specific population rates of PCH use (days used per 1,000 population on average in 2006/07, 2007/08, and 2008/09) will remain unchanged in future years. These projections are similar to Doupe et al.'s (2011) "Scenario 1". As presented in the previous chapter, this rate of PCH care was calculated separately for each age and sex group and for each RHA. The ***current rates* projections** simply apply these age/sex specific population use rates to the corresponding age/sex population projections provided from MBS, annually from 2009 to 2036. The total projected number of PCH equivalent beds was calculated using the method described above.

Projections using *Continuing Trends*

The second PCH bed equivalent scenario projects RHA–specific past trends in age– and sex–specific population use rates (i.e., days used per 1,000 population), and these are then applied to the MBS population projections. Like the *Current Rates* scenario, these projections estimate age– and sex–specific PCH days of use, which were converted into PCH equivalent beds. Actual population use rates from 1985/86 to 2008/09 were used to project future population use rates until 2036. Because the dominant trends in these data show a decline in age– and sex–specific population use rates, the projected population use rates in this scenario are lower than the *Current Rates* scenario. As a result, the projected PCH bed equivalent requirements in the ***Continuing Trends*** scenario are much lower and may also be more realistic.

Within the *Continuing Trends* scenario, simple regression formulas were used to project trends in PCH use rates forward in time. These regression models considered both linear trends (straight line) and curvilinear trends (decreasing change over time). Several basic rules were employed to restrict the projected changes over time:

1. Any trend that projected an increasing PCH population use rate was curtailed at the last year (2008/09), and the estimated rate of use for that year was projected forward for all future years. Although rare, there are instances where the recent trend is for greater, rather than lesser, PCH use per 1,000 population. Because these instances contradict the prevailing pattern, projecting them forward for any length of time might result in unrealistic projected use rates.
2. All significant curvilinear trends were retained and curtailed at their asymptotic low point. An increase in rates after a period of decline would most likely be a spurious result of accounting for diminishing decreases in past use rates.
3. If the estimated low point of a significant curvilinear trend was higher than the actual use rate for the last three years, a truncated set of data was employed (1995/96 to 2008/09) and linear and curvilinear trends were recalculated for this restricted data; an example of this can be seen with the projected use rates for females age 75–84 in Winnipeg (presented in Figure 3.5). As described in rule 2 above, more distant rapid declines in use rates might impose a curvilinear trend in recent data and mask further declining rates.

4. Linear decreasing trends were allowed to continue until reaching the asymptotic low point found in corresponding age–sex groups in the full set of RHAs. For example, the linear declining trend for Western RHA females age 75–84 was allowed to continue until it reached the asymptotic low point for the females age 75–84 in Southern RHA (the low point across all RHAs).

These PCH use rate projections are presented in Figures 3.1–3.15. The actual data for past years (the solid lines) is provided from 1985/86 through to 2008/09. The estimated trend for the data (dotted lines) overlaps with these actual data and is also projected forward from 2009/10 to 2035/36 (dashed lines). The *continuing trends* projections combined these projected age/sex specific PCH population use rates with the age/sex specific population projections.

Figure 3.1: Actual and Projected PCH Days per 1,000 Population, Western RHA, Age 65–74, 1985/86–2036/37

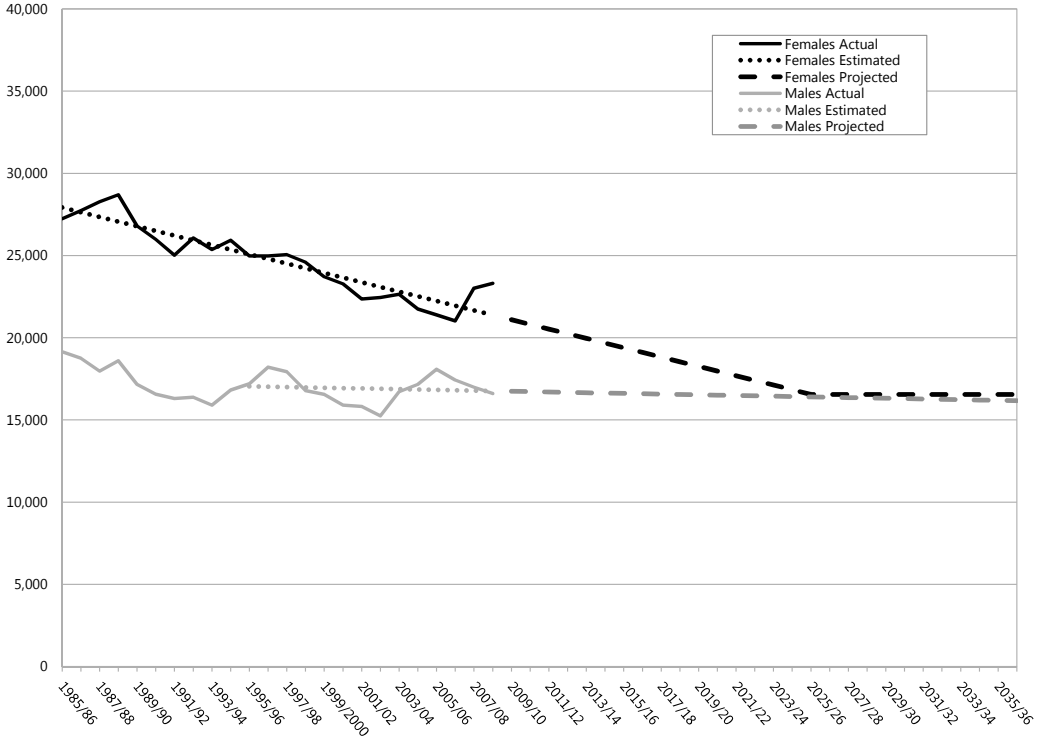


Figure 3.2: Actual and Projected PCH Days per 1,000 Population, Western RHA, Age 75–84, 1985/86–2036/37

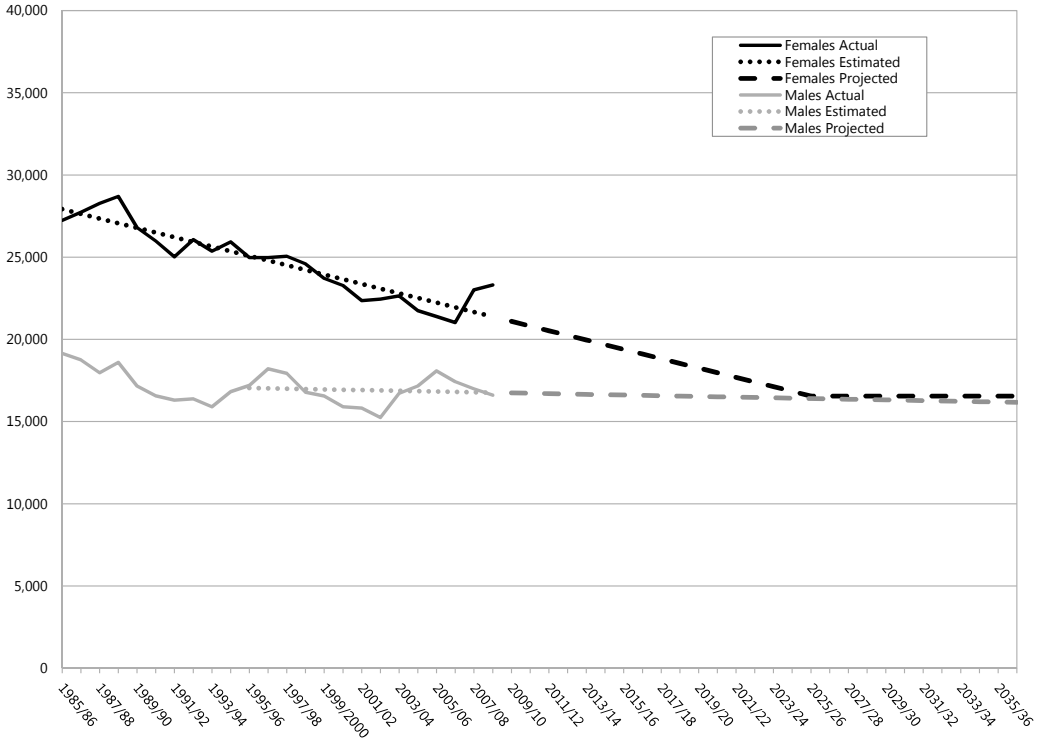


Figure 3.3: Actual and Projected PCH Days per 1,000 Population, Western RHA, Age 85+, 1985/86–2036/37

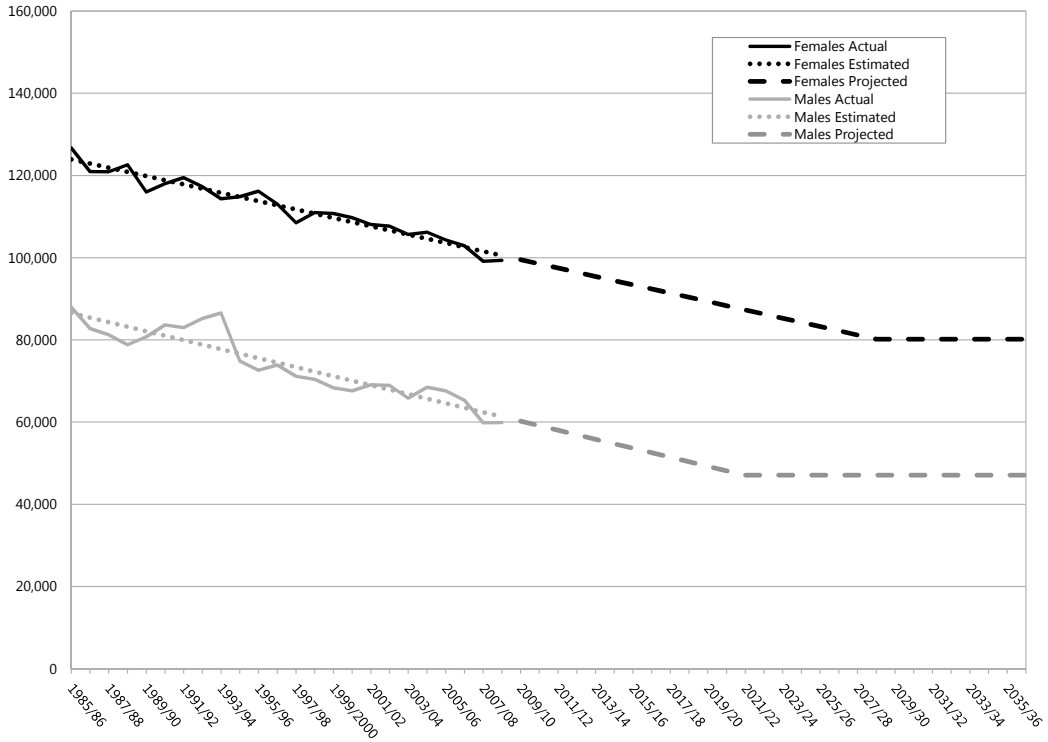
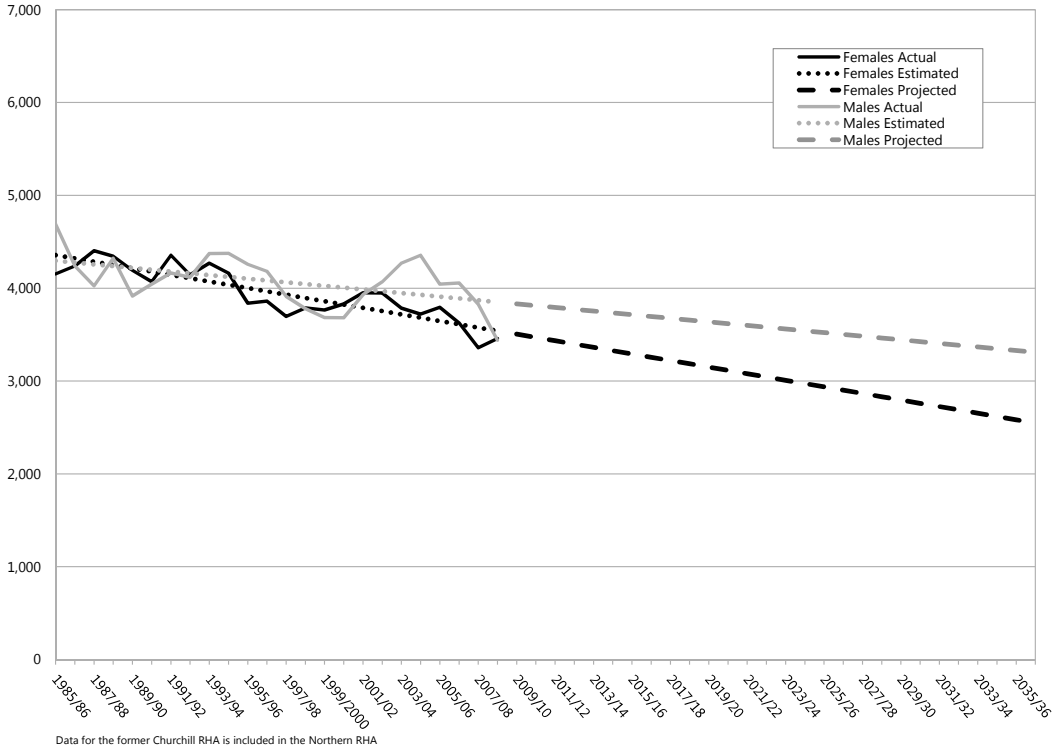
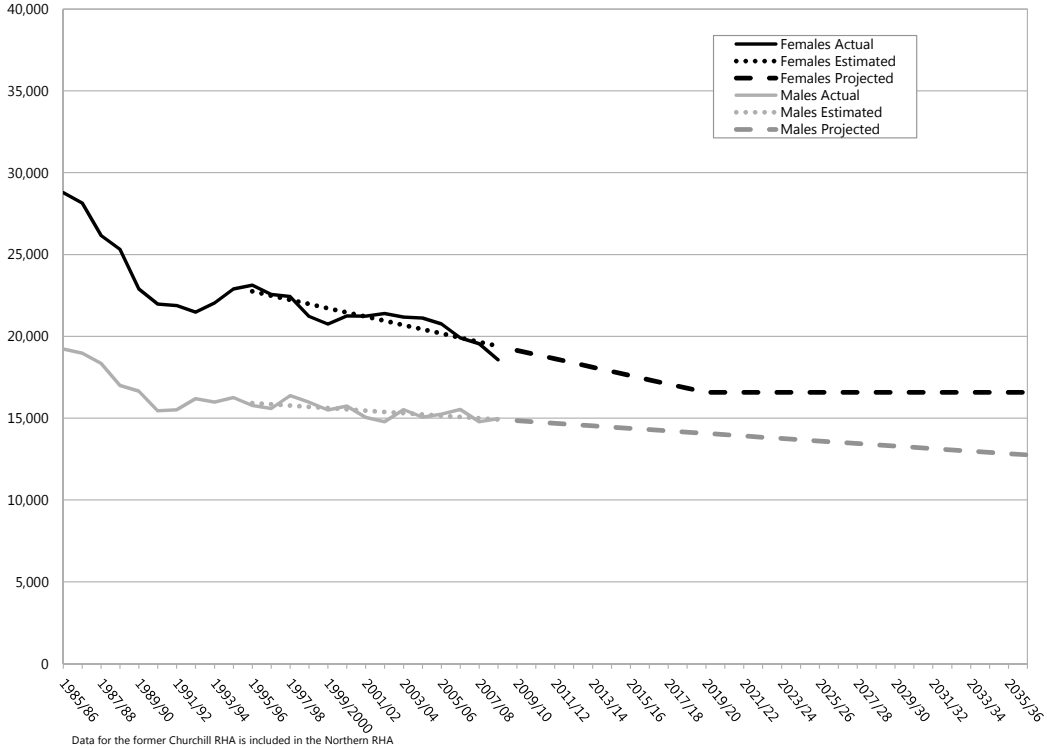


Figure 3.4: Actual and Projected PCH Days per 1,000 Population, Winnipeg RHA, Age 65–74, 1985/86–2036/37



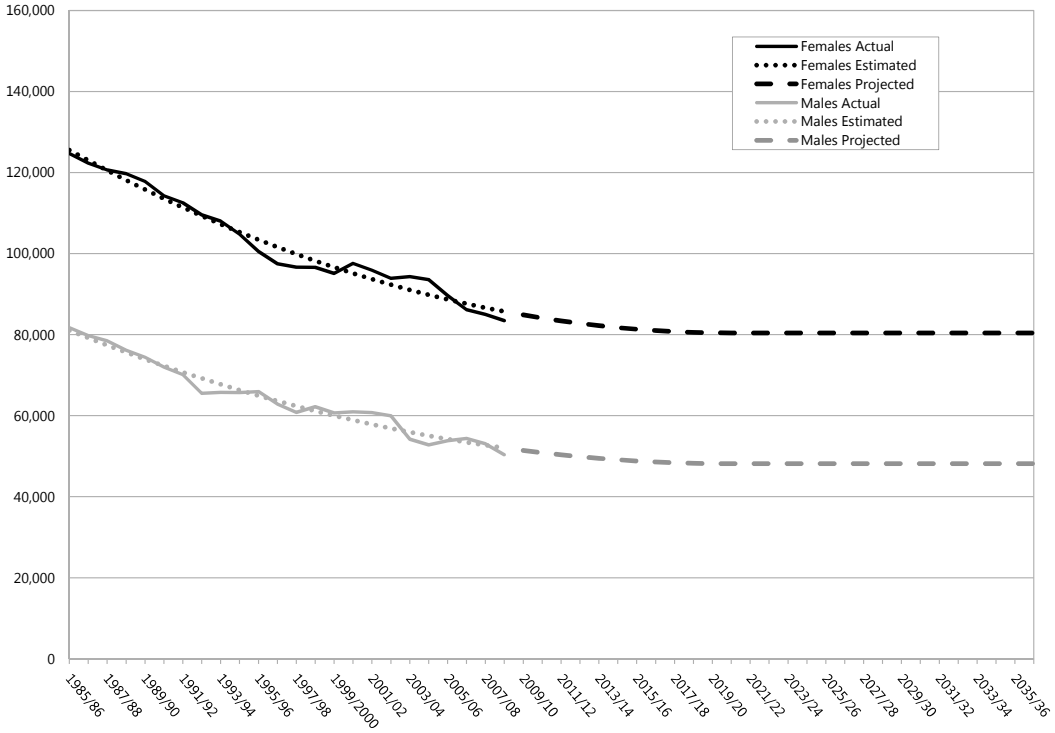
Data for the former Churchill RHA is included in the Northern RHA

Figure 3.5: Actual and Projected PCH Days per 1,000 Population, Winnipeg RHA, Age 75–84, 1985/86–2036/37



Data for the former Churchill RHA is included in the Northern RHA

Figure 3.6: Actual and Projected PCH Days per 1,000 Population, Winnipeg RHA, Age 85+, 1985/86–2036/37



Data for the former Churchill RHA is included in the Northern RHA

Figure 3.7: Actual and Projected PCH Days per 1,000 Population, Southern RHA, Age 65–74, 1985/86–2036/37

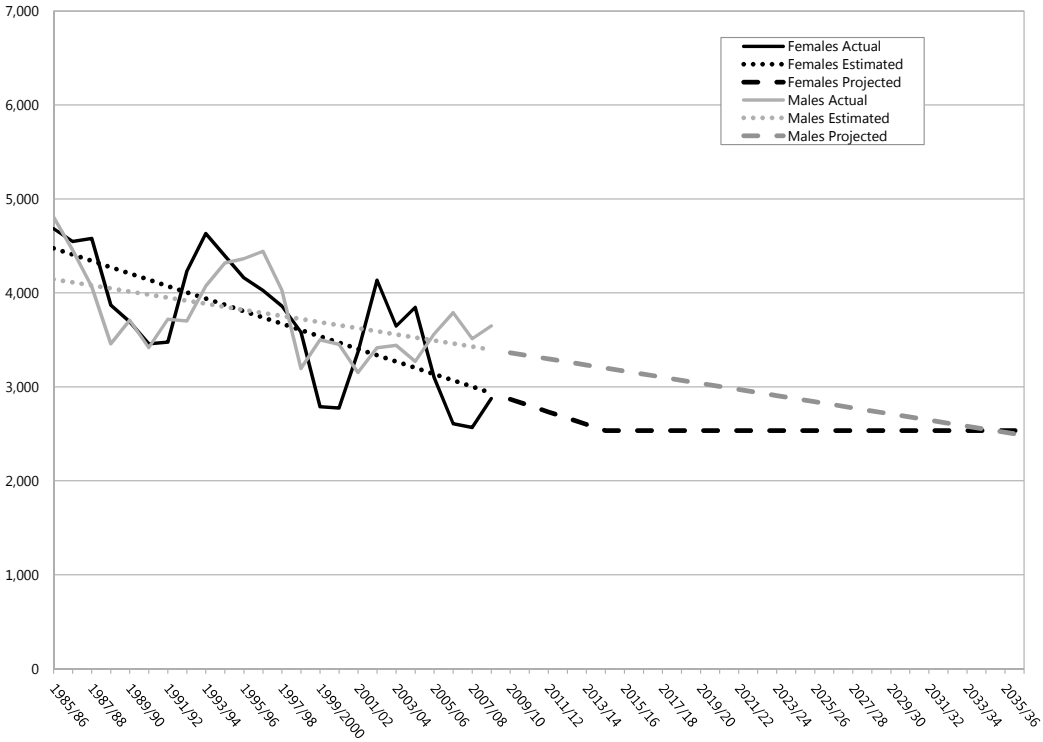


Figure 3.8: Actual and Projected PCH Days per 1,000 Population, Southern RHA, Age 75–84, 1985/86–2036/37

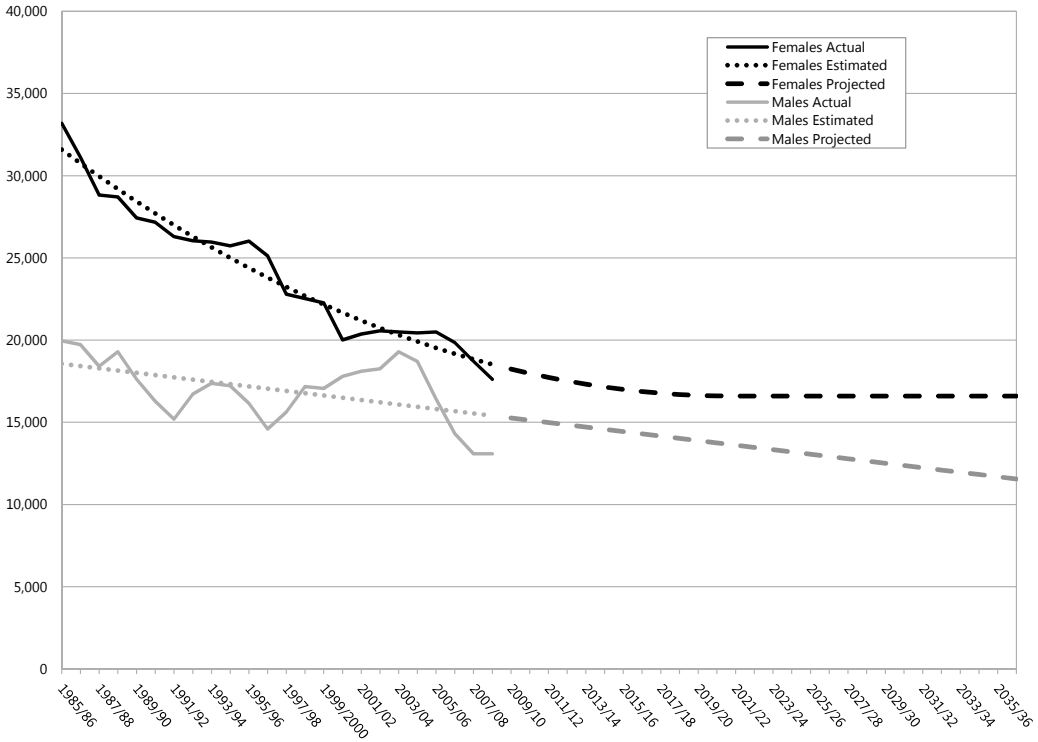


Figure 3.9: Actual and Projected PCH Days per 1,000 Population, Southern RHA, Age 85+, 1985/86–2036/37

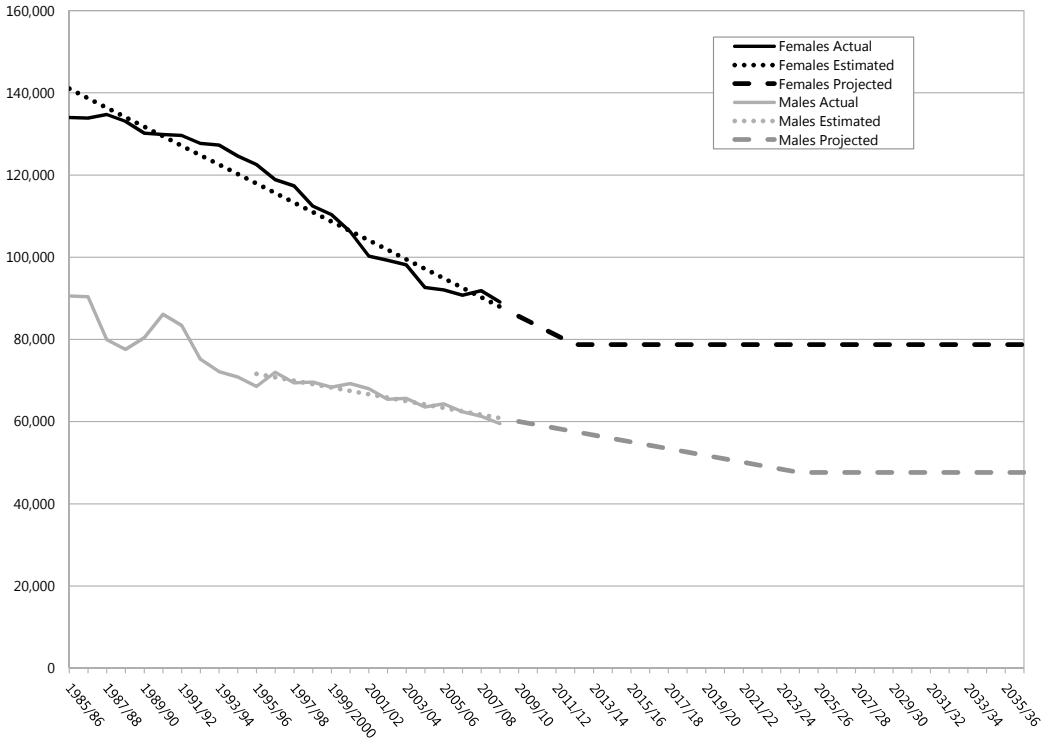


Figure 3.10: Actual and Projected PCH Days per 1,000 Population, Interlake–Eastern RHA, Age 65–74, 1985/86–2036/37

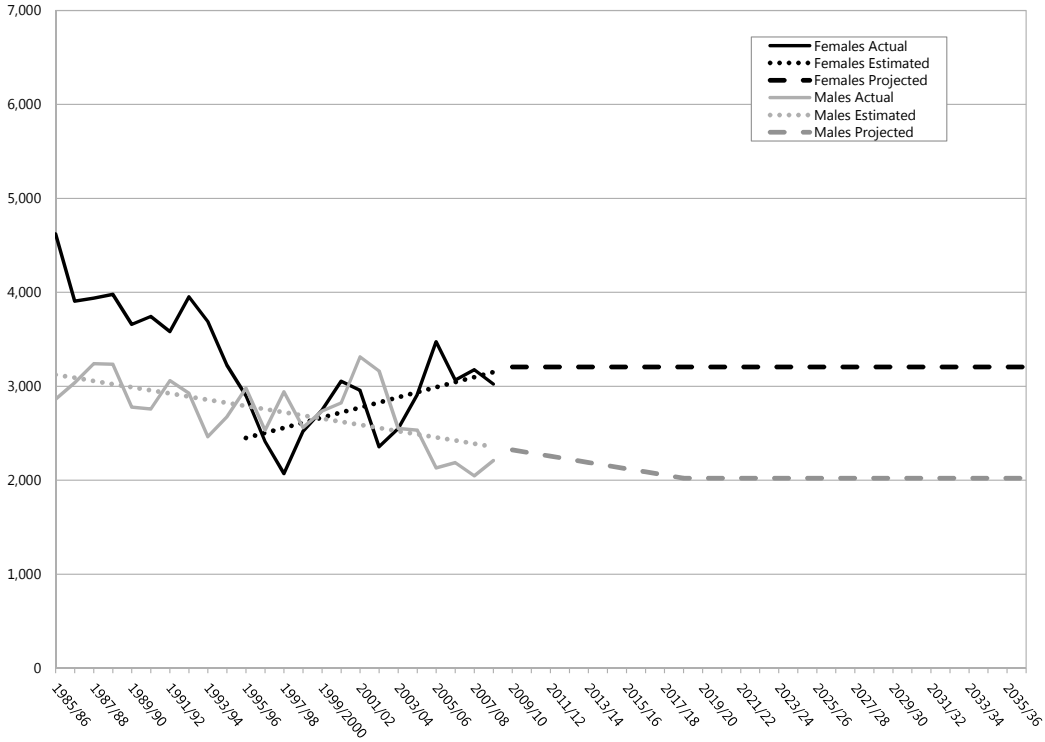


Figure 3.11: Actual and Projected PCH Days per 1,000 Population, Interlake–Eastern RHA, Age 75–84, 1985/86–2036/37

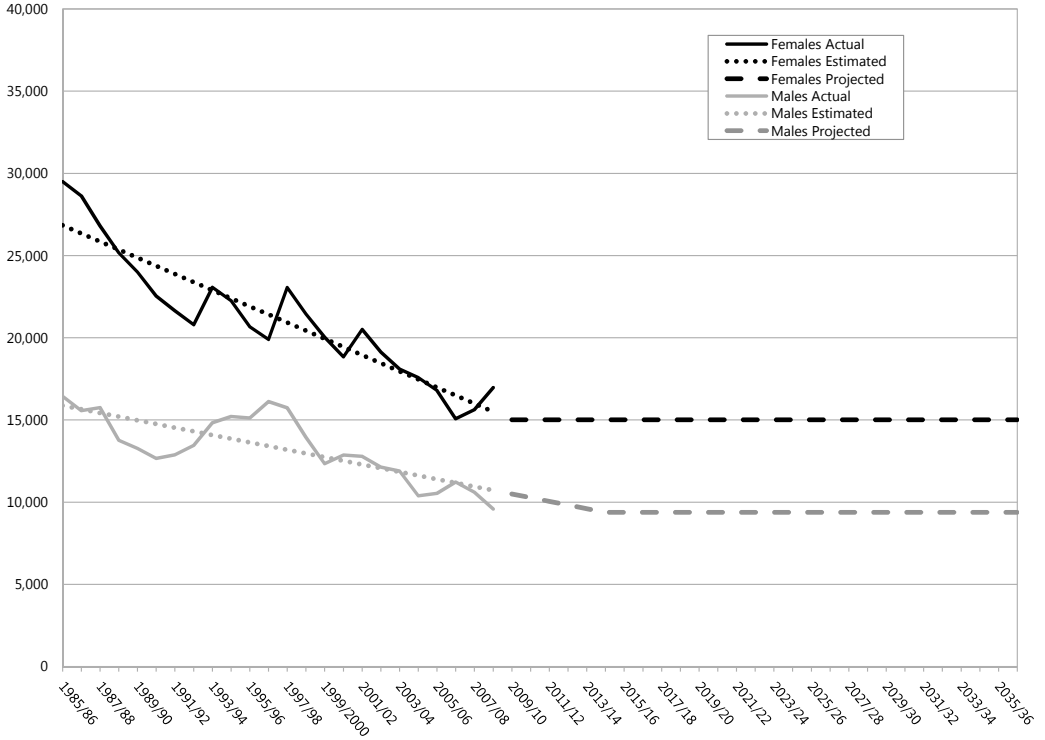


Figure 3.12: Actual and Projected PCH Days per 1,000 Population, Interlake–Eastern RHA, Age 85+, 1985/86–2036/37

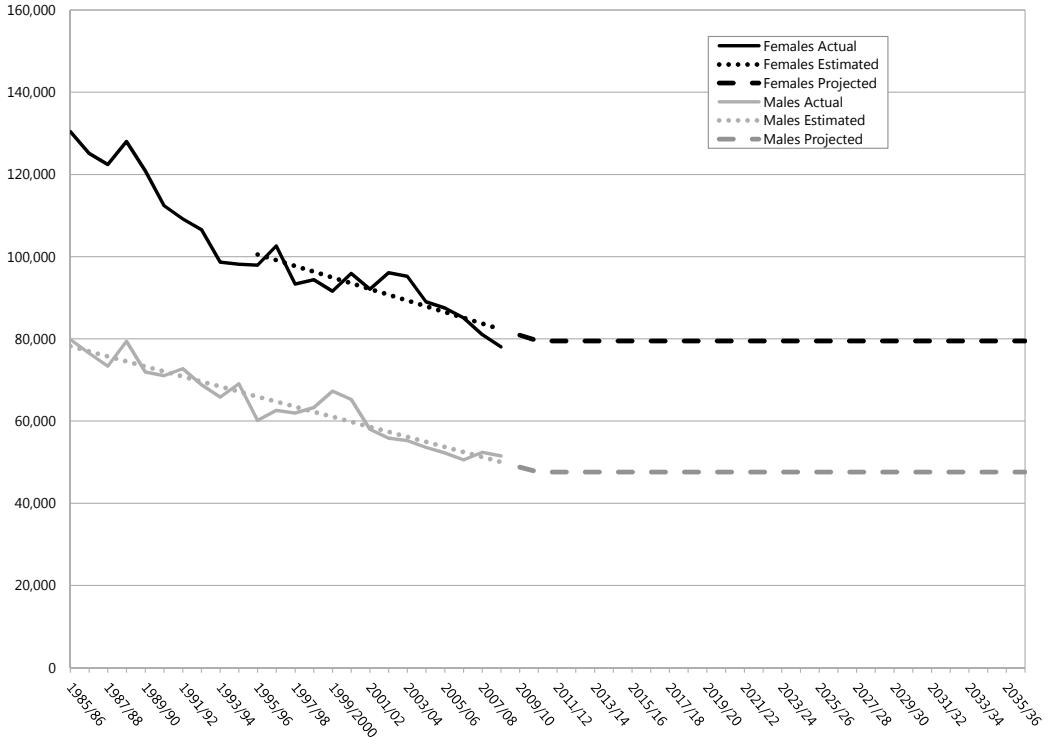
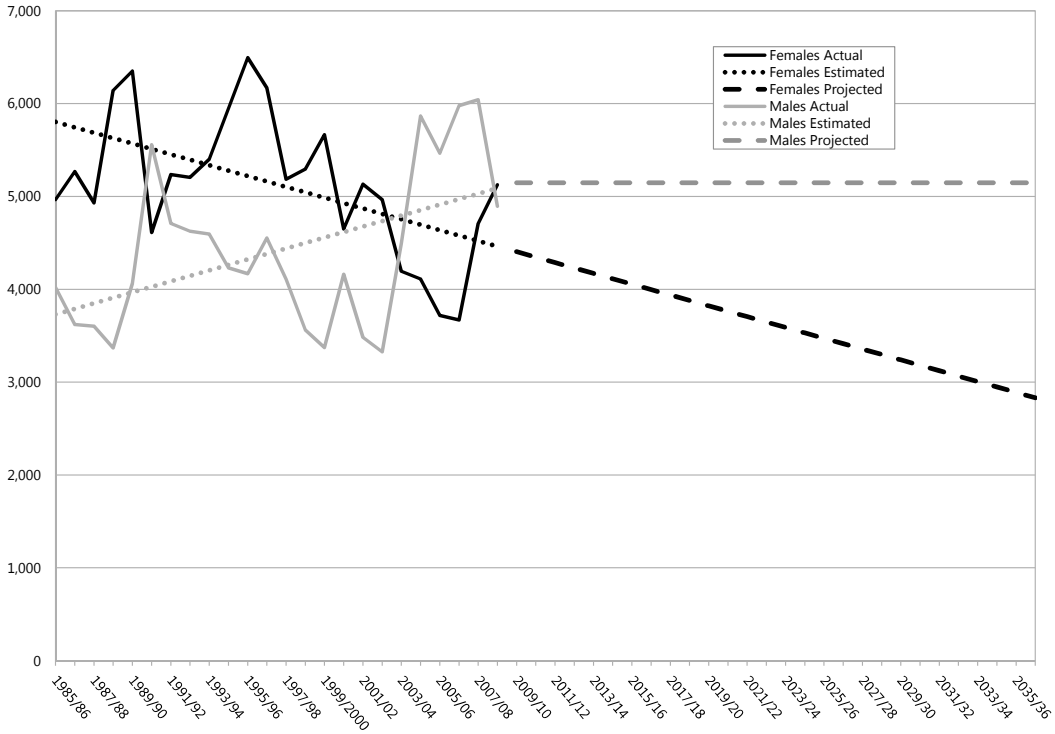
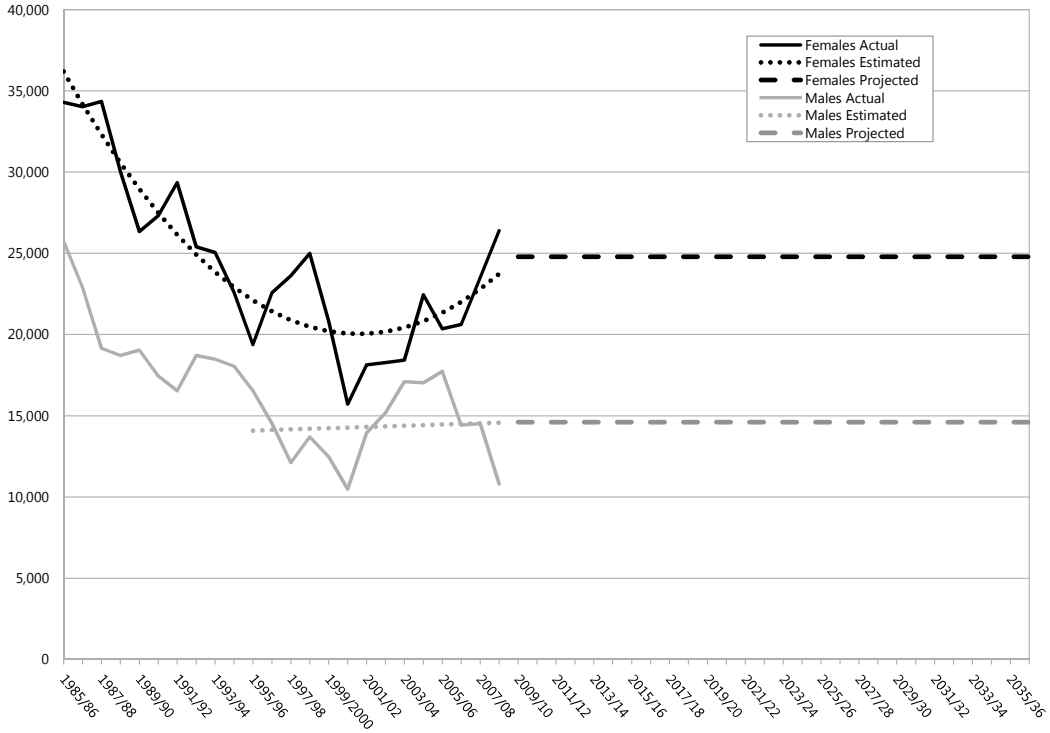


Figure 3.13: Actual and Projected PCH Days per 1,000 Population, Northern RHA, Age 65–74, 1985/86–2036/37



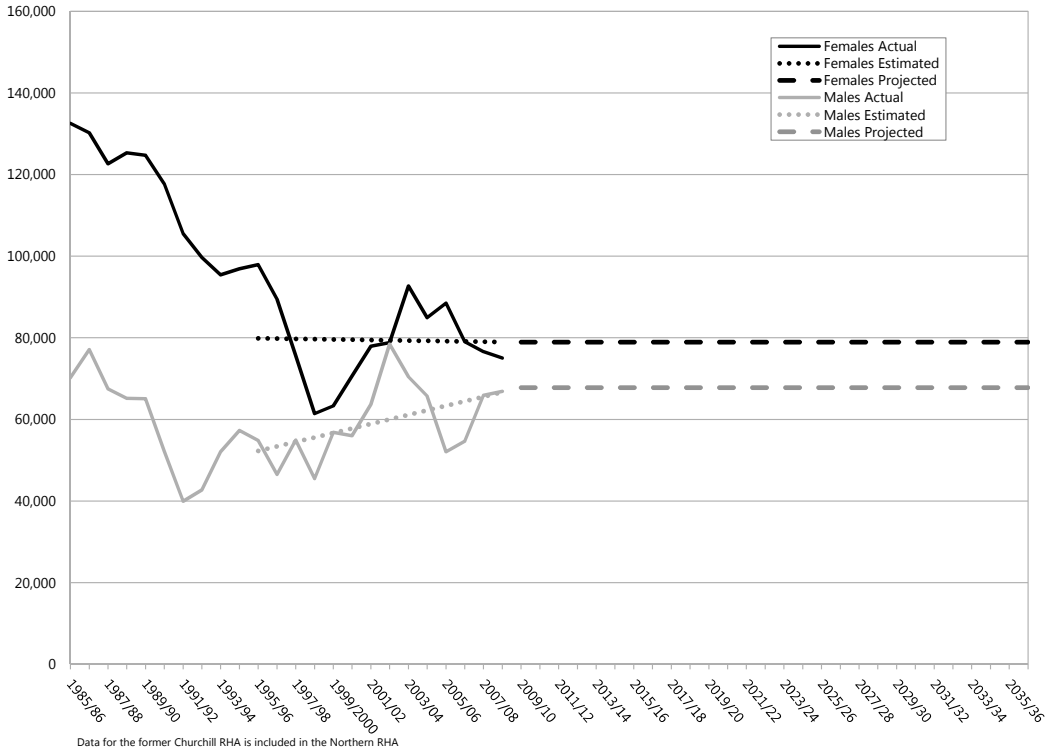
Data for the former Churchill RHA is included in the Northern RHA

Figure 3.14: Actual and Projected PCH Days per 1,000 Population, Northern RHA, Age 75–84, 1985/86–2036/37



Data for the former Churchill RHA is included in the Northern RHA

Figure 3.15: Actual and Projected PCH Days per 1,000 Population, Northern RHA, Age 85+, 1985/86–2036/37



Data for the former Churchill RHA is included in the Northern RHA

PCH Bed Equivalent Projections

The following five figures display both the *current rates* and the *continuing trends* projections for each RHA. These PCH bed equivalent projections for the former RHAs can be found in Appendix 1. In order to compare the RHAs directly, Tables 3.4 and 3.5 present the projected PCH bed equivalent needs based on the *current rates* and *continuing trends* for all five RHAs for key time points (2011, 2021, 2031, and 2036).

The accuracy of the projections in each of these scenarios depend on the validity of assumptions used to create each scenario (e.g., that PCH occupancy rates will remain close to 100%, that net regional migration will continue to be minimal). They also depend on the accuracy of the population projections conducted by MBS; and for the *continuing trends* projections, the degree to which PCH population use rates will follow past trends.

In all five RHAs, the *continuing trends* projections provide a temporarily slower rate of increase in PCH bed equivalent needs compared to the *current rates* projections. In the case of Western RHA, there is even a projected temporary *decrease* in PCH bed equivalent requirements. Despite the more optimistic outlook of the *continuing trends* projections, all five RHAs have is an inevitable increase in PCH bed equivalent requirements.

The relative increase in PCH bed equivalent care closely follows the population projections presented previously. Concentrating on those age 85+, in RHAs where the population increases were not expected until 2031 (i.e., Western RHA) the projected increase in PCH bed equivalent need is also delayed to about this time. In RHAs where population increases occurred (i.e., Interlake–Eastern and Northern RHAs), the projected increase in PCH bed equivalent need begins immediately in 2009/10. For Western and Winnipeg RHAs, there is a relatively small increase, or even decrease, in the projected need for PCH equivalent beds up to 2021. This remains true for Western RHA through to 2031.

What is particularly notable in these projections is that all five RHAs see an increase in the projected number of PCH equivalent beds after 2031 using either the *current rates* projections or the *continuing trends* projections. 2031 is also when the baby boom generation begins to reach 85 years old. For the province of Manitoba as a whole, the projected increase for the five–year period from 2031 to 2036 is almost as large as it is for the previous 10 years. In total, based on the *continuing trends* projections, Manitoba has a projected increase in PCH equivalent care equaling approximately 5,100 PCH beds, between 2011 and 2036.

Figure 3.16: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Western RHA, 2009/10–2036/37

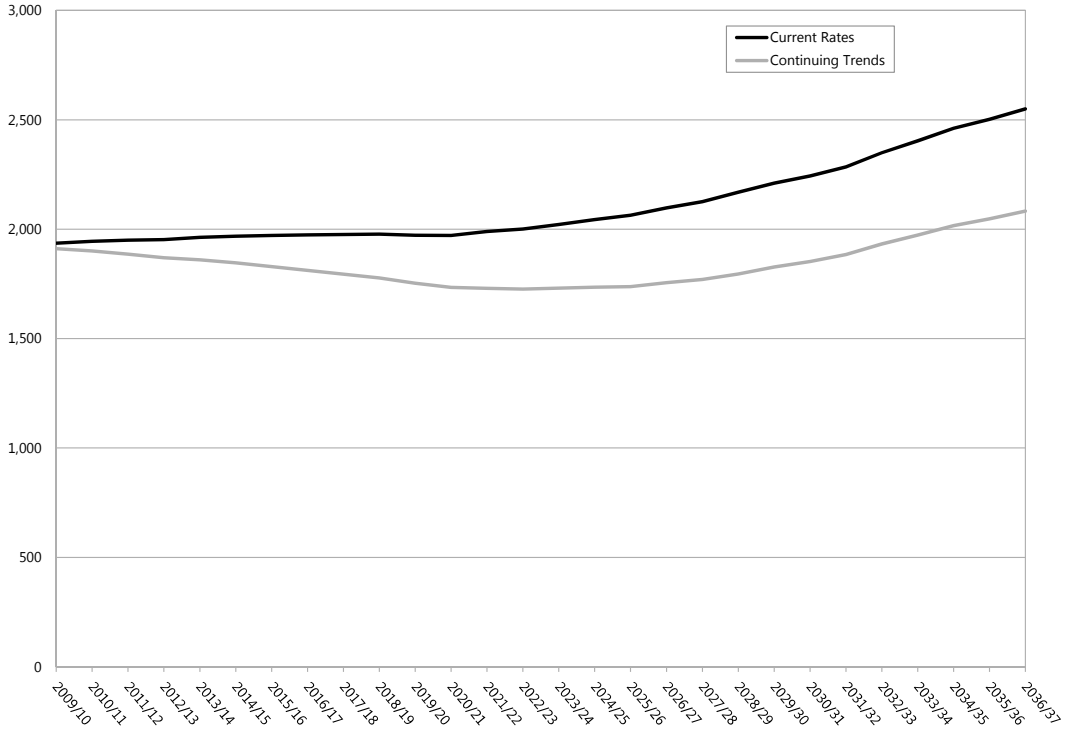
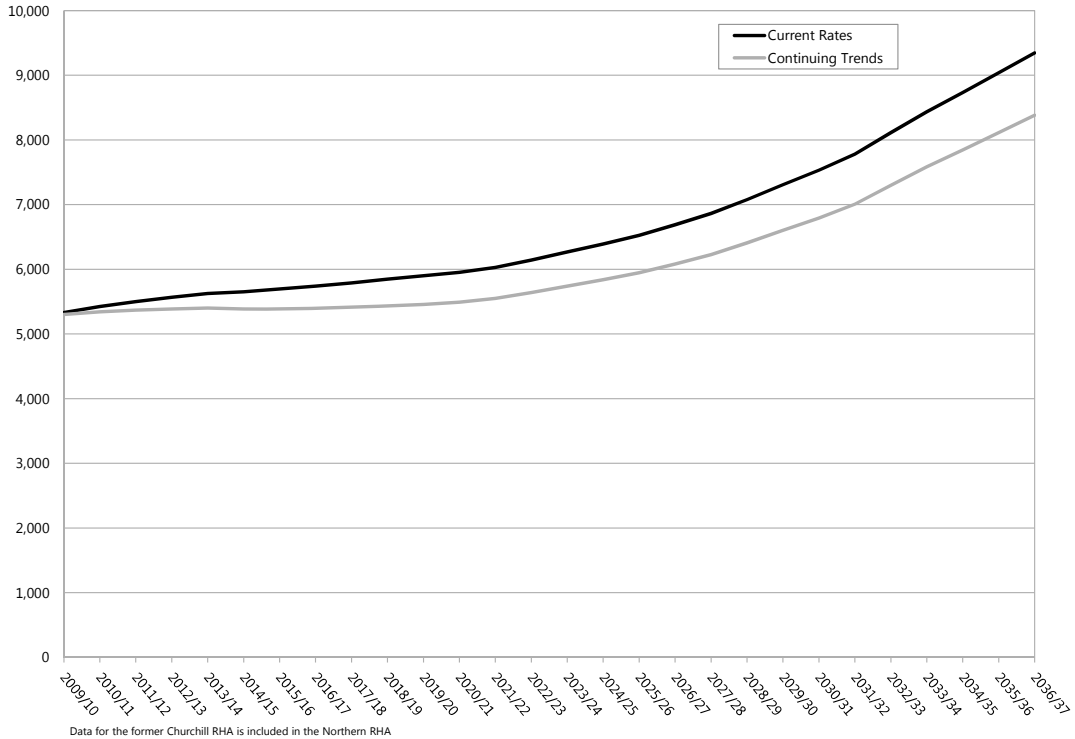


Figure 3.17: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Winnipeg RHA, 2009/10–2036/37



Data for the former Churchill RHA is included in the Northern RHA

Figure 3.18: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Southern RHA, 2009/10–2036/37

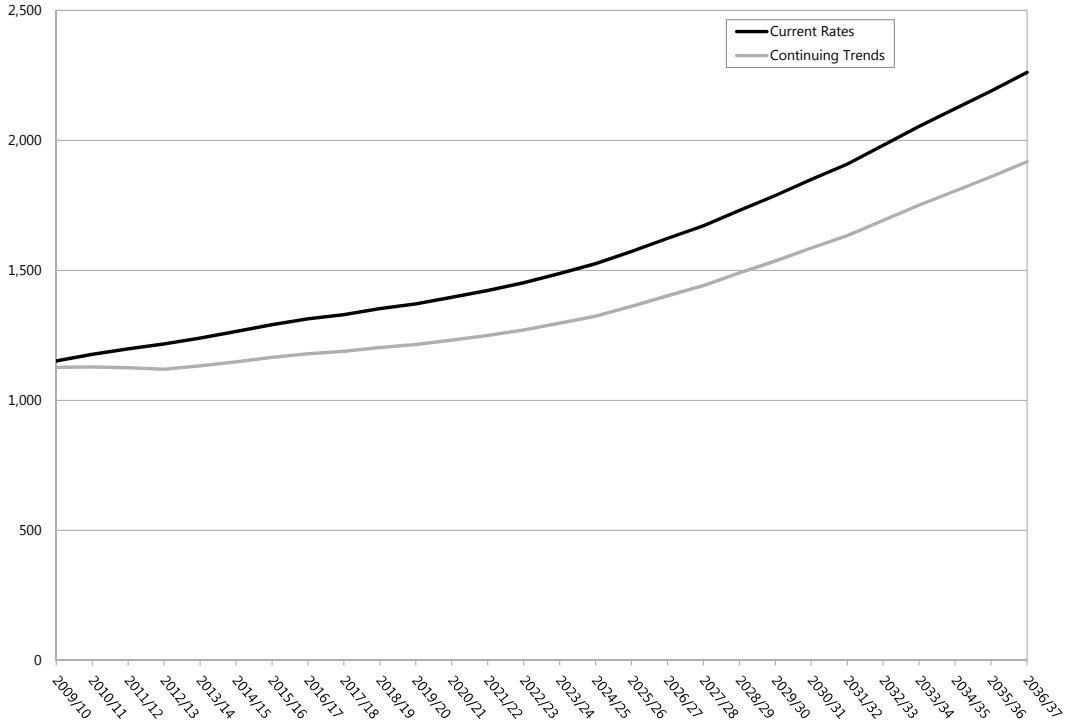


Figure 3.19: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Interlake–Eastern RHA, 2009/10–2036/37

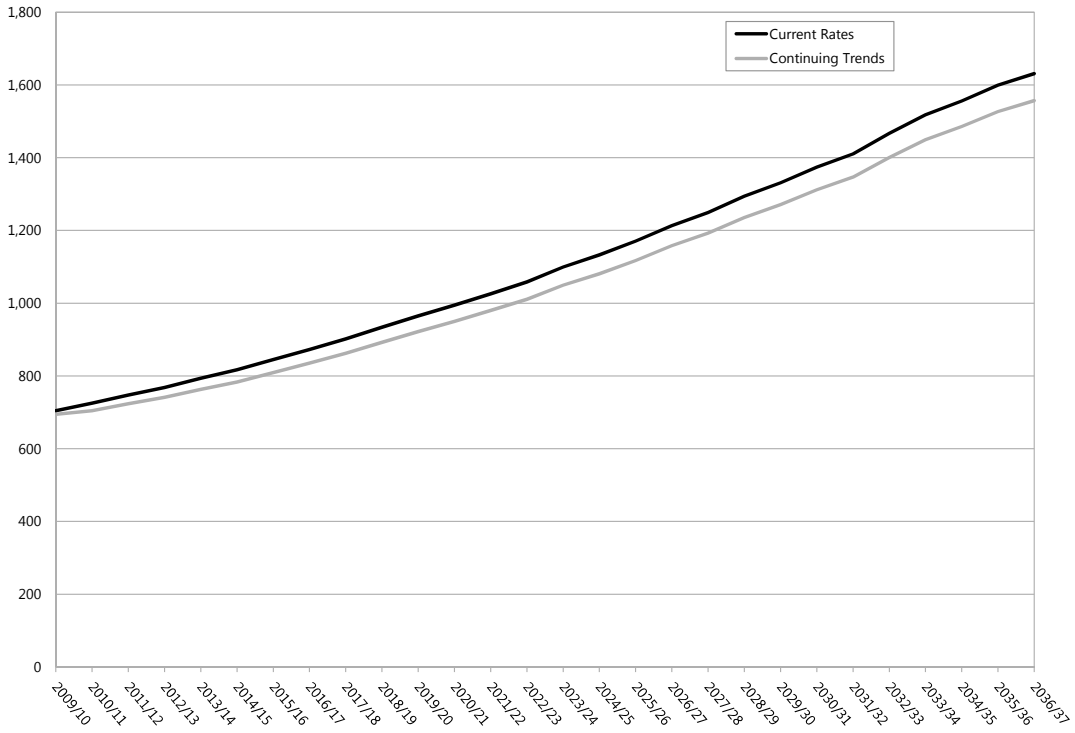
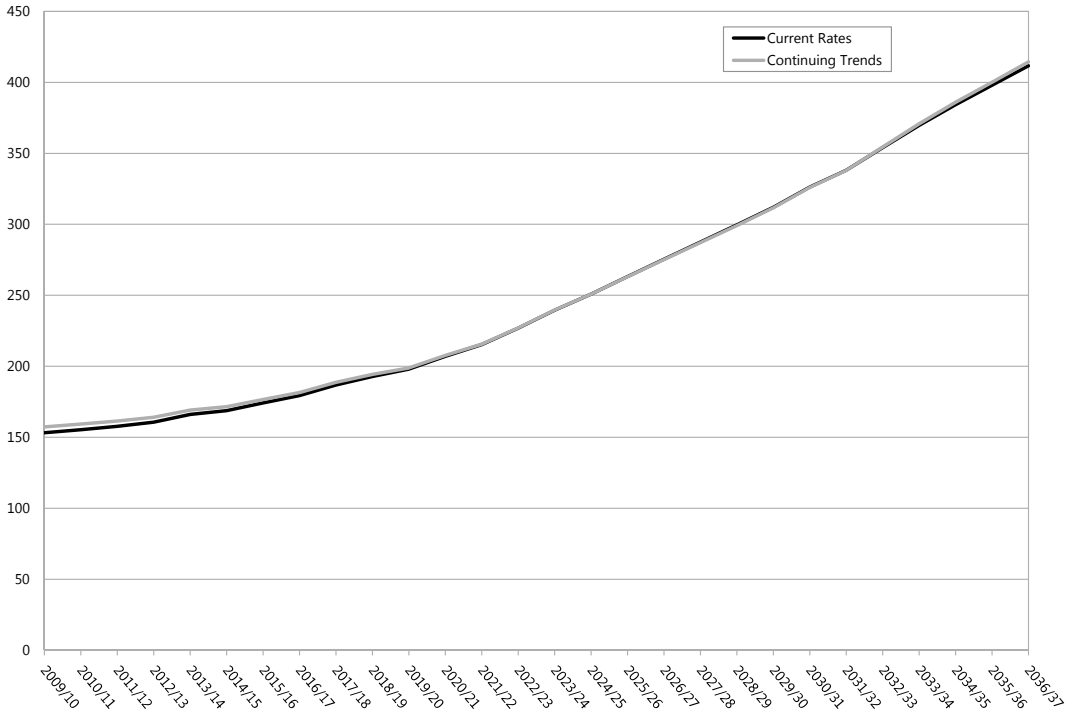


Figure 3.20: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Northern RHA, 2009/10–2036/37



Data for the fomer Churchill RHA is included in Northern RHA

Table 3.4: PCH Bed Equivalent Projections Based on the *Current Rates* by RHA for Select Years

RHA	2011	2021	2031	2036
Western	1,950	1,989	2,285	2,550
Winnipeg	5,500	6,029	7,781	9,346
Southern	1,198	1,423	1,909	2,262
Interlake-Eastern	748	1,026	1,411	1,631
Northern	158	215	338	412
Manitoba	9,554	10,682	13,723	16,201

Data for the former Churchill RHA is included in Northern RHA

Table 3.5: PCH Bed Equivalent Projections Based on the *Continuing Trends* by RHA for Select Years

RHA	2011	2021	2031	2036
Western	1,886	1,730	1,885	2,083
Winnipeg	5,368	5,550	7,006	8,383
Southern	1,125	1,250	1,634	1,918
Interlake-Eastern	724	980	1,346	1,557
Northern	162	216	338	414
Manitoba	9,265	9,725	12,208	14,355

Data for the former Churchill RHA is included in Northern RHA

PCH Bed Equivalent Projections for Southern RHA

For the most part, the new amalgamated RHAs comprise former RHAs that had very similar population projections for those age 65+. For this reason, the pattern in the PCH bed equivalent projections for the new larger RHAs can be applied to the former RHAs that were merged together. For example, Western RHA shows a slight decrease in PCH bed equivalent need for the immediate future and an eventual relatively modest increase by 2036. This general pattern is true of all three former RHAs that make up Western RHA (Brandon, Assiniboine, Parkland). This was not the case for Southern RHA and its component (former) RHAs.

The PCH bed equivalent projection for the former Central RHA more closely resembles the new Western RHA projection (a slow increase through 2021, rising afterward), while the former South Eastman RHA more closely resembles the Interlake–Eastern projection (an immediate and sustained increase in PCH bed equivalent need through 2036). What is presented for Southern RHA, therefore, is a blend between the two former RHAs which does not accurately project need for either. If future PCH bed equivalent capacities were based on this amalgamated picture, a potentially inappropriate allocation of care provision might result. Presented in this section are the *current rates* projections and the *continuing trends* projections for the former South Eastman and Central RHAs. By 2026, the increase in PCH equivalent need is only about 23% for Central and approximately 43% for South Eastman. By 2036, the increase would be 67% for Central and 117% for South Eastman.

Figure 3.21: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Central RHA, 2009/10–2036/37

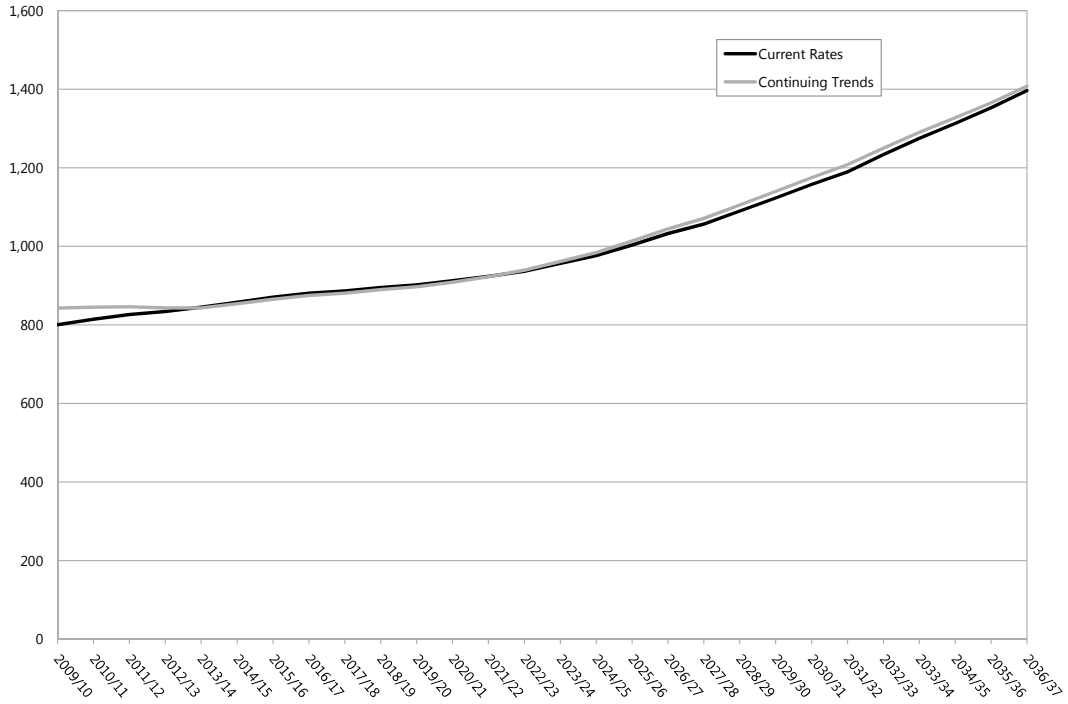
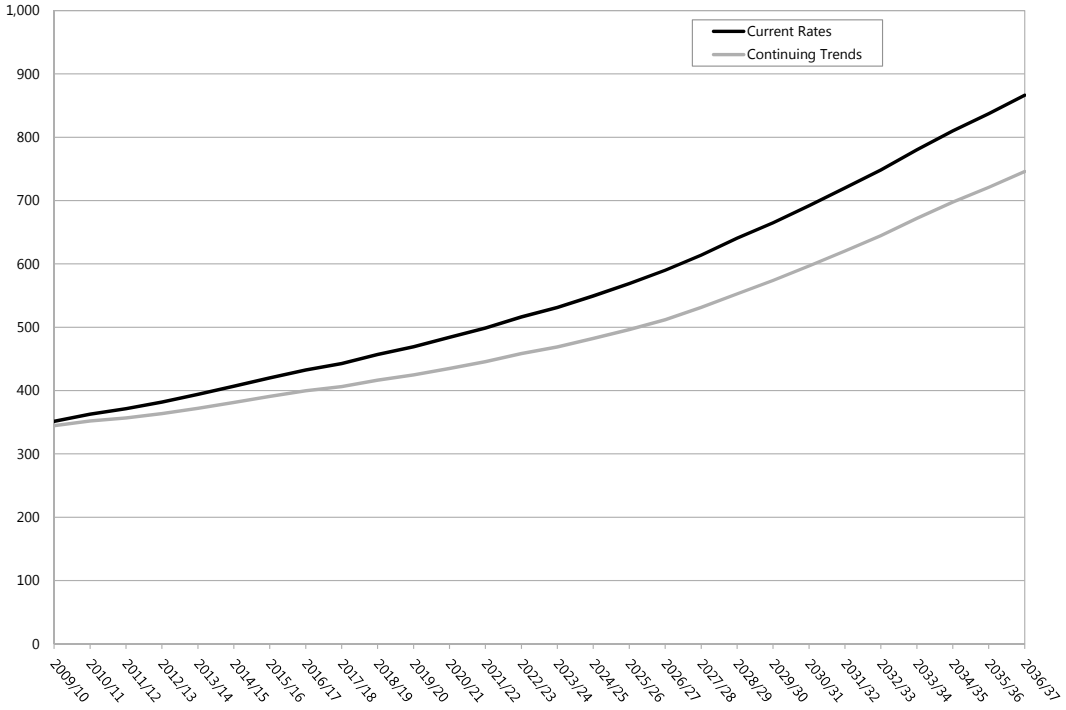


Figure 3.22: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, South Eastman RHA, 2009/10–2036/37



Summary

- Population projections for people age 65+ vary considerably across the province's RHAs. Western RHA will not see any increases in the oldest group (85+) until 2031. Interlake–Eastern RHA and Northern RHA show increases in the population of 85+ immediately. Winnipeg shows a small increase by 2021 and then accelerates.
- The *Current Rates* PCH bed equivalent projections follow a similar pattern to the population projections. Western and Winnipeg RHAs show no increase until after 2021. The increase for Winnipeg is significantly greater after 2031. Southern, Interlake–Eastern, and Northern RHAs show immediate and sustained increases in PCH bed equivalent projections. The total increase across Manitoba is 6,647 PCH bed equivalents.
- The *Continuing Trends* PCH bed equivalent projections are similar in pattern to the *Current Rates* projections but are delayed and/or attenuated. For Western RHA, there is even a projected temporary decrease in PCH bed equivalent need through 2031. The total increase across Manitoba is 5,090 PCH bed equivalents.
- The PCH bed equivalent projections for the new RHAs are similar in pattern to the former RHAs that they each comprise. The exception is Southern RHA, made up of the former South Eastman and Central RHAs. Whereas Central has a slow increase in need through 2021, South Eastman shows a steep and increasing need from the beginning.

Chapter 4: Additional Considerations for PCH Bed Equivalent Needs

The projections for PCH bed equivalent needs presented in Chapter 3 take into account only the projected population changes for particular age–sex groups and the historical trends in PCH use. There are however, other factors that may affect the need for PCH bed equivalents in the future. In this chapter, we consider four factors:

1. Supportive Housing – What proportion of care currently provided in PCHs is similar to the care available in supportive housing? We considered Doupe et al.'s (2011) analysis of residents in both settings and reiterate what the "equivalent" to PCH bed needs may be.
2. In–hospital wait times – Many residents admitted from hospital spend time in the hospital waiting for a PCH bed to become available. How many days do they wait? How would accounting for these wait times affect the PCH bed equivalent projections?
3. Community–based wait times – PCH residents not panelled in hospital spend time waiting for admission in the community (i.e., at home). An analysis was undertaken to quantify the total number of days spent waiting in the community for one fiscal year, in each RHA.
4. Family structure – How does the presence of a spouse and/or children affect entry to a PCH? How can we expect family structure to change for future PCH residents?

Incorporating New Information in Projections

Trends in chronic disease rates or in medical care that might influence PCH requirements and demand were not calculated directly in the PCH bed equivalent projections. That being said, any effect that these trends would have on PCH bed equivalent requirements should be captured in the trends of PCH use rates, since the PCH use rates naturally reflect changes in people's health status over time. In other words, while these factors may be important for estimating an *individual's* need for PCH care, their effect on the *system* would be already apparent in the PCH use rates. This should be kept in mind as any major change in the trends of rates of disease that was not apparent prior to 2008/09 may alter the projections. For example, a new treatment that would fundamentally affect the major drivers for PCH need (e.g., Alzheimer's disease and dementia) would have a concomitant impact on PCH bed equivalent projections.

Supportive Housing and PCH Bed Equivalent Needs

Doupe et al. (2011) presented a comprehensive description of Winnipeg residents of PCHs, residents in supportive housing, and community residents receiving homecare. The introduction of two new instruments, and subsequent data collection in Winnipeg, allowed for a much more in–depth examination and comparison of the health status of these populations. The **Resident Assessment Instrument for Home Care (RAI–HC ©)** and the **Resident Assessment Instrument—Minimum Data Set (RAI—MDS ©)** record information on resident status in several domains including cognition **(Cognitive Performance Scale (CPS))**, behavioural symptoms such as wandering or abusive behaviours, and also **Activities of Daily Living (ADLs)**(e.g., feeding, toileting, bathing) (interRAI, 2002; interRAI, 2005). Applying a **cluster analysis** to these data, Doupe et al. created profiles by grouping residents according to their level of impairment on ADLs, CPS, behavioural symptoms, and incontinence (in that order). A resident with the lowest level of impairment on all four components would have a profile of 1111 while a resident with the highest level of impairment on all four components would have

a profile of 3333. See Doupe et al. (2011) for a complete description of the cohort being studied, the data available, the analytic methods, and the results.

After identifying the profiles into which people clustered, the proportion of current supportive housing and PCH residents in each profile was calculated. It was thus possible to see which profiles overlapped (Table 4.1). Any overlap between them might suggest that PCH residents with profiles similar to many of those in supportive housing could be cared for in such alternate facilities and thus receive the *equivalent* of the care provided in the PCH. Based on the numbers presented in Table 4.1, Doupe et al. had suggested that 12.1% of current PCH days could be diverted to supportive housing (profiles 1111,1121,1211,1221, and cluster 6 excluding profiles 1331 and 2331). A more optimistic and liberal counting would indicate that up to 19.5% of PCH days could be diverted to supportive housing (all of cluster 1, 2, and 3; profiles 1212, 1222, 2212 and 2222 from cluster 5; and cluster 6 excluding profiles 1331 and 2331).

While this diversion of residents to supportive housing (or perhaps expanded homecare) is substantial, it would still be necessary to increase the total capacity of long–term care for older adults over the current supply, up to the numbers indicated in Chapter 3. Thus, this analysis of supportive housing only suggests that the increase in capacity does not need to be in the form of currently defined PCH beds or in new PCH buildings. Also, while the diversion of residents from PCH may be possible in Winnipeg, the placement or location of supportive housing in rural RHAs may make this a more difficult enterprise.

In–Hospital Wait Times for PCH Admission

In Winnipeg, over 50% of new PCH admissions were panelled for admission during a hospital stay (Doupe et al., 2011). In many of these cases, after **panelling** for PCH admission occurred, the patient remained in hospital for some period of time prior to being admitted to a PCH bed. If more PCH beds were available, could these in–hospital wait times be reduced or eliminated? In terms of our PCH bed equivalent projections, how many more bed equivalents would be required to account for these days?

To answer these questions, we looked at all people who were panelled for PCH during a hospitalization between January 1, 2004 and October 31, 2009. We determined if their panelling date occurred during the same hospitalization and counted the number of days from the panel date to PCH admission date.[4] Tables 4.2 to 4.7 display both the rates of in–hospital days after panelling (per 1,000 population for each age/sex group) and the rates of people who were panelled in hospital (per 1,000 population for each age/sex group) for Manitoba and the five RHAs from 2004/05 to 2008/09.

Taken together, the two rates paint a revealing picture. The data for Manitoba indicate that for all three age groups, the rate of days per 1,000 increased for males over the five–year period under examination, while the rate of residents per 1,000 did not change appreciably. This suggests that, on average, the wait times over the five years have been getting longer. For example, for males in the 85+ age group, the use rate was 1,534.8 days per 1,000 population in 2004/05, while the resident rate was 42.5 males waiting in hospital for admission (per 1,000 population). The average wait for these males was about 36 days (1,534.8/42.5). In 2008/09, the rates were 2,056.4 days per 1,000 population and 40.5 males per 1,000 population. The average wait, then was a little over 50 days.

The same pattern was generally true for females, except for the oldest age group, where the rate of days remained steady but the rate of people declined by almost one quarter. The end result is the same for the individuals; on average, their time in hospital prior to PCH admission. Wait times for 85+ females

4 We included people with any discharge outcome (including death) in order to count all post–panelling days spent in hospital.

Table 4.1: Distribution of Profiles of Care Across Supportive Housing Residents and PCH Days, Winnipeg, April 1, 2005–February 1, 2007

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

* Based on file of 272 Winnipeg supportive housing beds and 216 users

Note: One supportive user was not assigned to any of these clusters.

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

's' indicates data suppressed due to small numbers

Adapted from Doupe et al., 2011

increased from about 34 days (2004/05) to 46 days (2008/09). Across the RHAs, Southern RHA seems to be an exception to this trend and presents a good news story; both the rate of people waiting in hospital and the rate of days waiting in hospital decreased for the oldest females.

The age– and sex–specific hospital wait time rates were incorporated into the *continuing trends* projections. The average rate of in–hospital wait days for each age/sex group was first applied to the projected populations from MBS. The resulting projected in–hospital days for the six age/sex groups were then summed for each RHA, and the result was added to the *continuing trends* projections. These new projections, referred to as the *in–hospital days* projections, represent the required PCH bed equivalents if hospital wait times were to be eliminated. This was only done using the *continuing trends* projections as the baseline and not the *current rates* projections. Figures 4.1 to 4.5 compare these projections to the original *continuing trends* projections. For the most part, the increases in PCH bed equivalent projections due to the addition of in–hospital days are very small. The largest difference is in Western RHA, but even here the extra days result in only a 3% increase in the PCH bed equivalent projections. For Winnipeg, the two projections are almost identical, with the increase in the projected PCH bed equivalent need being less than 2% (120 PCH bed equivalents in 2036).

It is important to note that these numbers do not include individuals or hospital days for people who were paneled in the community, subsequently hospitalised, and from there discharged directly to PCH. For these individuals, there is no means of identifying how many of the days during the last hospital stay were acute care days and how many days were spent waiting for an available PCH bed. The rates presented in the following tables, therefore, are somewhat conservative. Appendix Table A2.1 presents the count of residents who were discharged directly to PCH from hospital, but who were not paneled during this hospital stay. Based on these numbers, the increase in PCH equivalent beds may be an additional 15% in Winnipeg and as much as 30% in Southern RHA. In concrete terms, for Winnipeg, rather than an additional 56 PCH bed equivalents in 2012/13 to account for post-panel in-hospital days (Figure 4.2), we could expect it to be 65; in Southern RHA, the required increase to account for in-hospital wait times could be as high as 75 PCH bed equivalents in 2012/13 rather than the 58 seen in Figure 4.3. Additionally, the numbers presented in this chapter do not include any days spent in hospital *waiting to be paneled* for PCH admission, but rather only the days spent waiting *after* paneling.

In short, in–hospital wait times have a very small effect on the total projected PCH bed equivalent needs for the RHAs. Although patients in hospital who are not there for acute care reasons place a heavy burden on the hospital system, the relative amount of bed days is trivial in comparison to the total bed days currently being provided in PCHs.

Table 4.2: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Manitoba, 2004/05–2008/09

		Males		Females	
Age Groups	Years	Days	Patients	Days	Patients
65-74	2004/05	92.5	2.3	82.6	2.3
	2005/06	83.2	2.6	60.7	2.0
	2006/07	83.0	2.0	68.6	1.9
	2007/08	118.7	2.4	80.8	1.9
	2008/09	182.6	2.4	97.5	1.9
75-84	2004/05	477.1	12.5	383.4	12.2
	2005/06	458.2	11.8	369.2	10.5
	2006/07	567.7	12.3	444.9	11.7
	2007/08	770.7	12.2	447.9	10.9
	2008/09	603.2	10.9	448.9	10.7
85+	2004/05	1,534.8	42.5	1,407.9	41.7
	2005/06	1,505.8	42.6	1,220.6	40.4
	2006/07	2,076.9	41.4	1,392.7	36.2
	2007/08	2,132.0	39.1	1,502.0	36.0
	2008/09	2,056.4	40.5	1,467.9	32.0

Table 4.3: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Western RHA, 2004/05–2008/09

		Males		Females	
Age Groups	Years	Days	Patients	Days	Patients
65-74	2004/05	128.3	1.8	141.9	2.1
	2005/06	115.8	1.9	92.6	2.3
	2006/07	59.8	1.4	181.8	2.7
	2007/08	116.2	2.9	147.9	3.0
	2008/09	365.8	3.7	190.5	2.9
75-84	2004/05	659.6	11.3	707.1	11.2
	2005/06	677.1	12.2	586.4	13.2
	2006/07	933.6	18.2	890.3	14.3
	2007/08	1,180.7	15.4	615.2	15.1
	2008/09	1,015.1	14.4	858.7	16.7
85+	2004/05	2,599.3	56.4	2,477.1	45.2
	2005/06	2,247.4	47.4	1,848.4	36.1
	2006/07	3,895.3	54.6	2,361.8	48.7
	2007/08	3,387.0	55.3	2,342.0	45.4
	2008/09	3,191.6	53.9	2,883.3	44.8

Table 4.4: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Winnipeg RHA, 2004/05–2008/09

		Males		Females	
Age Groups	**Years**	**Days**	**Patients**	**Days**	**Patients**
65-74	2004/05	76.6	2.8	32.3	2.4
	2005/06	74.7	3.2	28.6	2.0
	2006/07	59.5	2.1	45.8	1.9
	2007/08	124.0	2.8	58.8	1.7
	2008/09	136.8	2.3	47.4	1.7
75-84	2004/05	254.2	13.1	185.9	13.1
	2005/06	260.7	12.5	150.8	9.7
	2006/07	274.7	10.3	202.6	11.0
	2007/08	524.9	10.8	307.3	10.4
	2008/09	403.3	9.8	248.9	9.1
85+	2004/05	634.7	37.6	653.3	42.6
	2005/06	631.3	42.6	553.8	41.3
	2006/07	796.0	34.0	647.2	32.6
	2007/08	1,159.4	32.8	731.2	31.7
	2008/09	1,081.4	31.6	613.5	26.1

Data for the former Churchill RHA is included in Northern RHA

Table 4.5: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Southern RHA, 2004/05–2008/09

		Males		Females	
Age Groups	**Years**	**Days**	**Patients**	**Days**	**Patients**
65-74	2004/05	155.5	1.9	184.0	2.5
	2005/06	24.9	1.5	179.7	2.4
	2006/07	162.3	1.4	71.6	1.2
	2007/08	123.7	1.8	144.0	2.3
	2008/09	212.0	2.1	171.1	1.9
75-84	2004/05	1,100.5	15.5	917.3	12.1
	2005/06	803.0	10.6	1,225.5	12.9
	2006/07	1,245.4	13.2	1,130.7	13.4
	2007/08	1,262.2	14.4	1,001.5	8.9
	2008/09	965.9	12.7	719.8	9.6
85+	2004/05	3,175.3	51.7	3,582.1	44.5
	2005/06	4,446.7	49.7	3,775.3	49.2
	2006/07	4,604.2	44.9	3,645.8	35.8
	2007/08	4,420.3	41.3	4,036.6	43.3
	2008/09	3,902.9	55.6	3,170.4	41.5

Table 4.6: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Interlake–Eastern RHA, 2004/05–2008/09

		Males		Females	
Age Groups	Years	Days	Patients	Days	Patients
65-74	2004/05	68.2	1.3	127.7	1.3
	2005/06	134.7	2.1	64.9	1.1
	2006/07	103.2	2.2	40.3	1.7
	2007/08	125.5	1.8	43.9	1.0
	2008/09	119.2	1.5	157.0	2.4
75-84	2004/05	483.8	6.7	459.3	8.7
	2005/06	626.4	9.5	369.9	7.2
	2006/07	581.4	11.9	410.2	9.2
	2007/08	768.5	12.8	449.3	8.5
	2008/09	441.5	9.2	751.7	12.2
85+	2004/05	1,994.1	29.6	1,517.1	26.8
	2005/06	845.7	24.7	1,100.6	32.4
	2006/07	1,883.8	48.8	1,166.8	32.3
	2007/08	2,340.3	44.6	1,603.5	37.0
	2008/09	3,219.3	47.6	1,971.3	33.1

Table 4.7: Rates of In–Hospital Post–Panel Days and Patients per 1,000 Population, Northern RHA, 2004/05–2008/09

		Males		Females	
Age Groups	Years	Days	Patients	Days	Patients
65-74	2004/05	23.3	2.5	178.7	2.6
	2005/06	84.7	3.1	10.9	1.7
	2006/07	186.8	3.9	0.0	0.0
	2007/08	0.0	0.0	26.9	1.6
	2008/09	162.7	1.5	27.7	0.8
75-84	2004/05	861.1	15.9	127.1	10.2
	2005/06	832.3	8.5	109.2	12.3
	2006/07	959.3	10.2	152.1	8.7
	2007/08	772.4	3.9	58.0	8.5
	2008/09	958.3	9.9	225.8	10.2
85+	2004/05	64.5	10.8	244.0	19.1
	2005/06	333.3	19.6	397.2	32.7
	2006/07	2,201.8	55.0	1,864.9	45.0
	2007/08	0.0	0.0	819.4	22.0
	2008/09	390.9	18.2	1,800.9	27.1

Data for the former Churchill RHA is included in Northern RHA

Figure 4.1: PCH Bed Equivalent Projections Based on the *Continuing Trends* and *Continuing Trends Plus In–Hospital Days*, Western RHA, 2009/10–2036/37

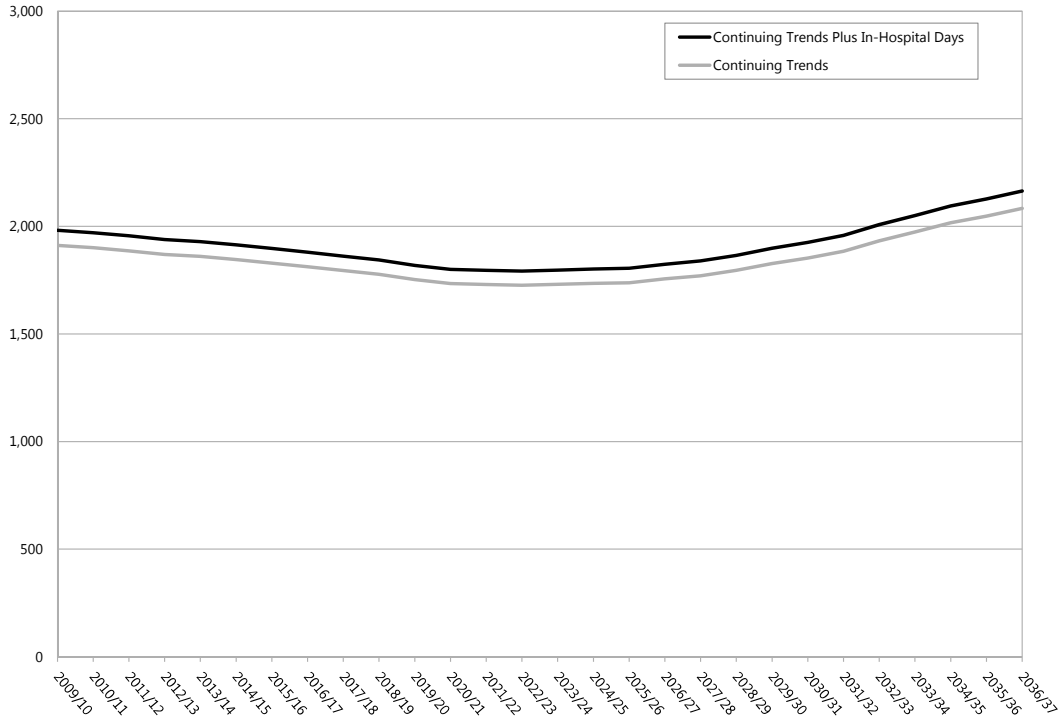
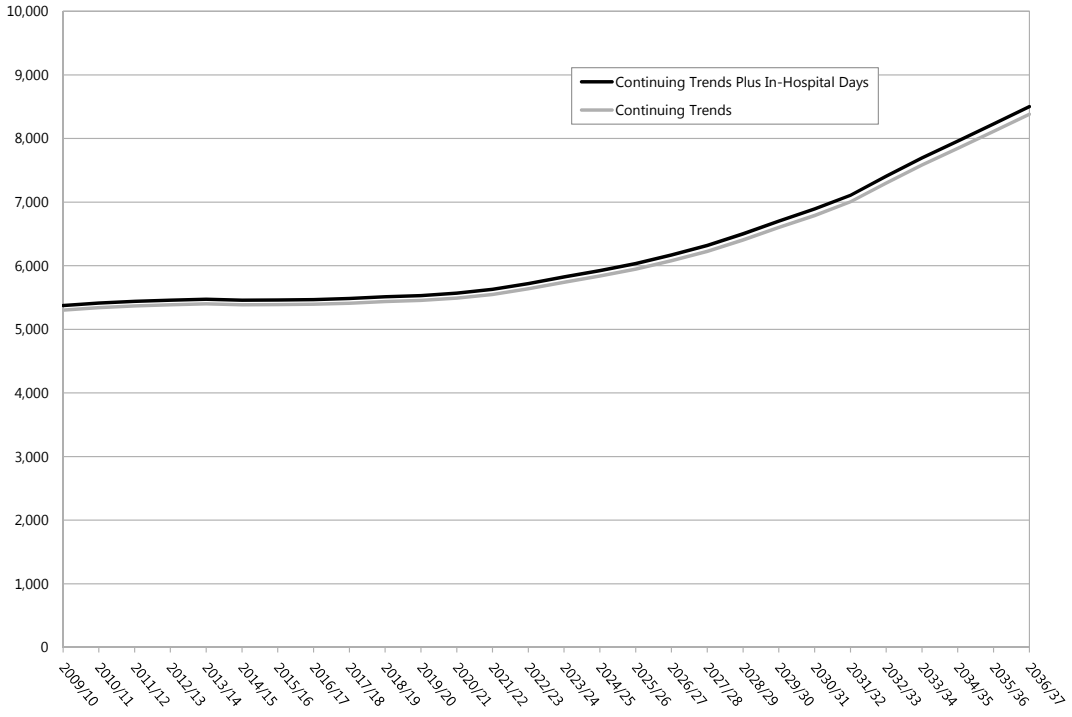


Figure 4.2: PCH Bed Equivalent Projections Based on *Continuing Trends* and *Continuing Trends Plus In–Hospital Days*, Winnipeg RHA, 2009/10–2036/37



Data for the former Churchill RHA is included in Northern RHA

Figure 4.3: PCH Bed Equivalent Projections Based on the *Continuing Trends* and *Continuing Trends Plus In–Hospital Days*, Southern RHA, 2009/10–2036/37

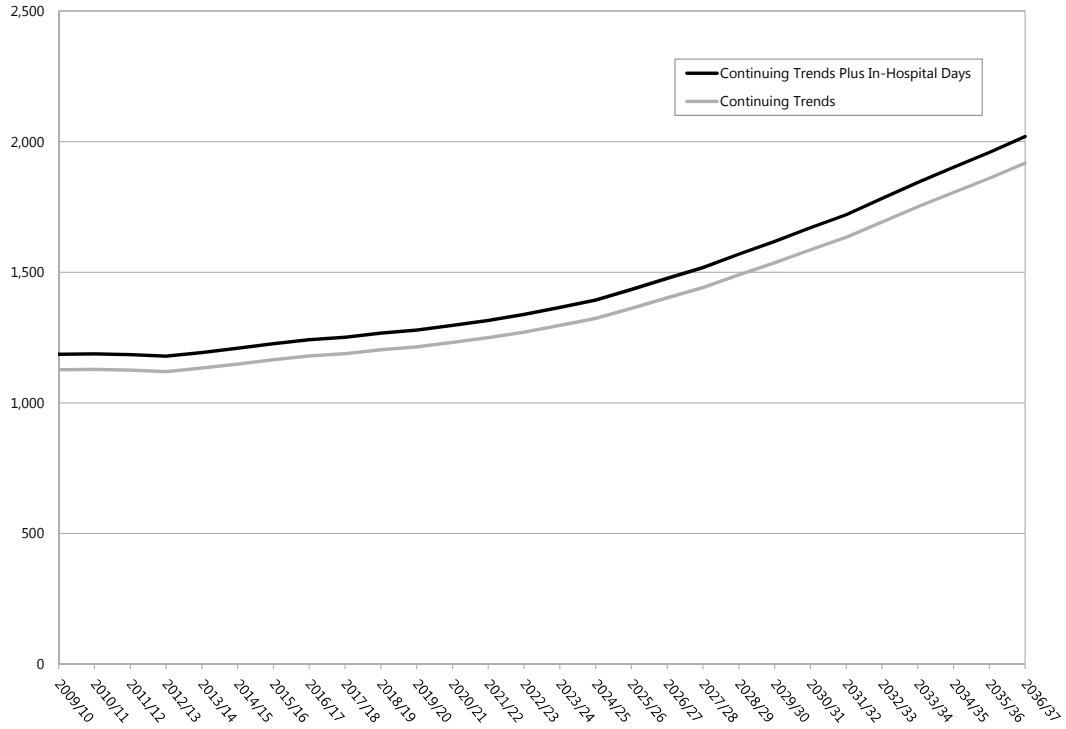


Figure 4.4: PCH Bed Equivalent Projections Based on the *Continuing Trends* and *Continuing Trends Plus In–Hospital Days*, Interlake–Eastern RHA, 2009/10–2036/37

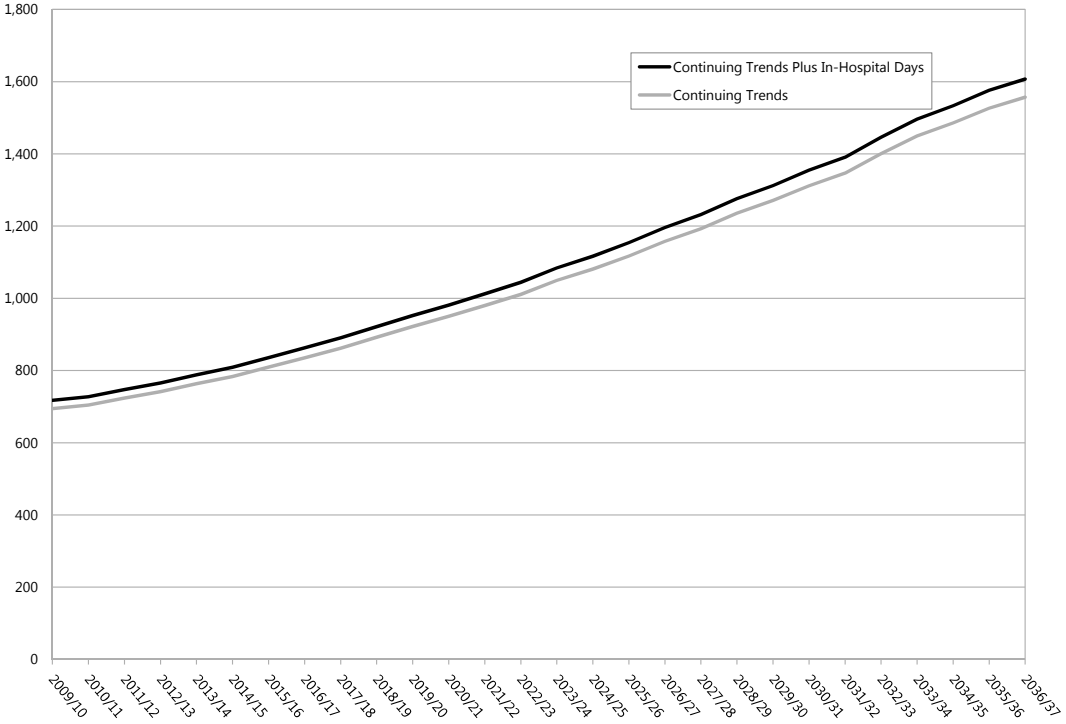
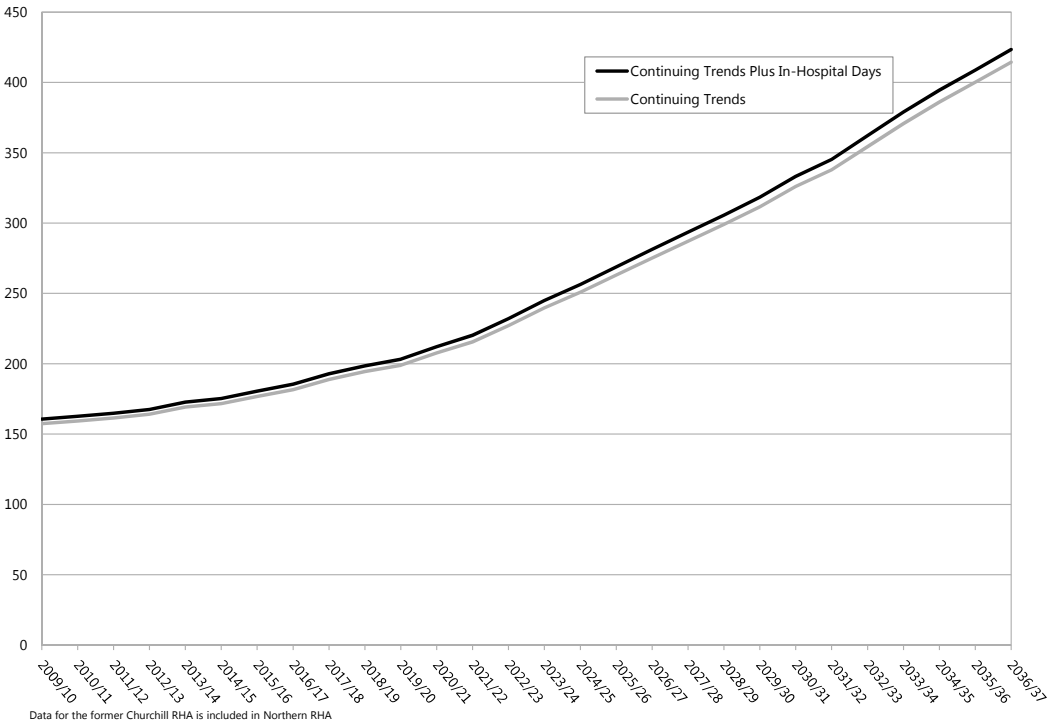


Figure 4.5: PCH Bed Equivalent Projections Based on the *Continuing Trends* and *Continuing Trends Plus In–Hospital Days*, Northern RHA, 2009/10–2036/37



Data for the former Churchill RHA is included in Northern RHA

Community Wait Times for PCH Admission

A similar analysis was conducted on community wait times for PCH admission. However, there are some considerations for assessing community wait times that are not present for hospital wait times. Some people may wait, perhaps by choice, for a lengthy period of time prior to being admitted to a PCH, greater than a year or even two years. This makes it difficult to truly assess the wait time for a single fiscal year by only considering the PCH admissions in that fiscal year; there may be additional individuals whose wait period spanned the entire year that would not be included. At the same time, a wait of longer than a year for an individual should not be applied entirely to a single year in order to assess wait time for that year. Thus, in order to calculate all community wait time within a single fiscal year, a novel approach was developed.

All community assessments from 2002/03 to 2004/05 were followed forward to determine how many days were spent waiting for admission to a PCH during 2004/05. We limited the analysis to counting the days waiting for admission within a single fiscal year. In addition to the people assessed in 2004/05 (who would presumably have some period of wait time before admission), the two–year lead (2002/03 and 2003/04) was thought to be long enough to capture almost everyone with earlier assessments who might still be waiting in the community in 2004/05. The total number of days waiting by all individuals, in a single fiscal year, provides some indication of how many bed equivalents might be required to eliminate community wait times.

In the three–year period, 2,408 individuals had been assessed in the community and had not yet been admitted to a PCH by 2004/05. We followed these individuals forward and found that as of 2009, 83.2% of them were eventually admitted to a PCH in 2004/05 or later, and 2% were still waiting for admission

in 2009; 13.9% died while waiting for PCH admission. Only 0.7% of those assessed moved out of the province before They were actually admitted to a Manitoba PCH. Median wait times for all those admitted was less than one year, with shorter wait times for those assessed with greater care needs, a higher **Level of Care (LOC)**. The median wait time for LOC 4 (highest need) was 108 days, 134 days for LOC 3, and 177 days for LOC 2. Mean wait times were much longer (243, 261, and 311 days for LOC 4, 3, and 2 respectively), indicating that a relatively small group of individuals had very long wait times. The long wait for some individuals raises an important point concerning community wait times: availability of more beds would not necessarily have translated into admission to a PCH. One possible reason is that many of these individuals, with formal or informal support, were able to stay at home while waiting for admission to a PCH of choice. Also, intervening services between the assessment and admission were not captured (i.e., homecare, supportive housing for Winnipeg residents, hospital admissions). Because of the uncertainty attached to these wait times, they were not incorporated into the projections. The data serve simply as a factor readers should consider when viewing the PCH bed equivalent projections provided in the previous chapter.

Table 4.8 presents the rates for days waiting in the community per 1,000 population and for people waiting in the community per 1,000 population, by age and sex, for each RHA. Winnipeg had the lowest rate of community wait days of all the RHAs and the lowest rate of people waiting for PCH admission. For females 85+, the rate is 5,709 days per 1,000 population in the RHA. Interlake–Eastern, Southern, and Northern RHAs had the highest rate of days waiting for PCH admission for this group, with a rate of 14,121 days per 1,000 population for Interlake–Eastern. This is not surprising after seeing the PCH bed equivalent projections, where these same RHAs see the steepest increase in need for PCH bed equivalent care. However, the relatively high rates for Western RHA, compared to Winnipeg, is a little surprising since Western RHA appears to have ample PCH bed supply. This may be a result of the mostly rural nature of the RHA, where residents may be more inclined to wait at home for admission for a PCH in their community or closer to home. The lower occupancy rate of 96.7%, compared to Winnipeg's 98.8%, (see Table 2.1) would support this explanation.

Table 4.8: Rates of Community Post–Panel Days and People per 1,000 Population by RHA, 2004/05

		Males		Females	
RHAs	Age Groups	Days	People	Days	People
Western	65-74	177.1	1.9	484.2	3.8
	75-84	1,279.2	10.4	1,821.3	15.3
	85+	7,663.0	64.9	7,577.7	62.1
Winnipeg	65-74	230.3	1.6	256.6	1.9
	75-84	1,555.6	11.8	1,868.6	12.6
	85+	4,953.5	38.4	5,709.1	41.0
Southern	65-74	662.4	4.0	452.8	2.3
	75-84	2,368.6	15.2	3,225.9	23.5
	85+	11,623.0	86.6	11,967.6	80.2
Interlake-Eastern	65-74	727.7	3.6	420.6	2.4
	75-84	2,638.5	14.8	3,197.4	21.7
	85+	8,887.6	74.0	14,121.1	87.8
Northern	65-74	415.0	5.8	529.1	5.2
	75-84	3,361.1	29.8	3,466.1	27.1
	85+	5,279.6	75.3	13,014.4	90.9
Manitoba	65-74	346.0	2.3	342.3	2.4
	75-84	1,752.5	12.6	2,151.5	15.3
	85+	6,840.0	54.7	7,556.5	54.0

Data for former Churhcill RHA is included in the Northern RHA

Summary

- Supportive housing is a demonstrated alternative to PCH admission for a portion of the population that has traditionally been cared for in PCHs. Such alternatives are a fundamental part of Manitoba Health's Aging In Place initiative, and are one of the PCH bed equivalents that may address the need for increased capacity of long–term care for older adults in the future. Based on data for the Winnipeg RHA, with enough supportive housing capacity, the current care provided in supportive housing could address from 12% to almost 20% of the care that has been provided in a PCH.
- Rates of in–hospital waiting for PCH admission follow a similar pattern to PCH use rates—both rates of people and of days are much higher for the older age groups. Winnipeg had the lowest in–hospital waiting rates.
- However, the total in–hospital waiting time in any year is trivial in comparison to the total amount of care being provided in PCHs in the same year. Thus, incorporating these hospital wait days into the PCH bed equivalent projections resulted in very small increases in the projections (<2%).
- Community waiting rates follow the same pattern as in–hospital rates, although they are much higher (three times or more) than in–hospital rates. Again, Winnipeg had the lowest rate of all the RHAs.

Chapter 5: Effects of Family Structure on PCH Admission and Length of Stay

Informal support has been highlighted as a major factor in determining the need for PCH care. For this project, how can **administrative health data** contribute to understanding the impact of informal support on PCH admission and use? To answer this, the impact of spouses and the number of living children on PCH use was assessed.

Numerous research studies have suggested that both spouses and children play an important role in determining the need for nursing home admission (Charles & Sevak, 2005; Freedman, 1996; Noël–Miller, 2010). Although administrative health data cannot assess whether a spouse or children provide support to relatives who may be near PCH admission, it is possible to examine differences in admissions based solely on whether a person is married or has children.

The Manitoba Health family registration number was first introduced in 1970; at that point in time, any children under the age of 18 were automatically covered with their parents. The same family registration number also indicates whether a person is married. For this report, we examined the full history of people covered under the same family registration number back to 1970 to identify any children and assess marital status for all individuals in Manitoba who were 40+ as of April 1, 2006. Not all children could be identified. If a child had turned 18 or left home prior to 1970 they would not appear in the same family registration number when it was introduced. But for many people who would be approaching the primary age for PCH admissions, the number of children could be assessed. As a somewhat extreme case, assuming that a 17–year–old child in 1970 was born to an 18–year–old mother (i.e., the mother would have been 35 in 1970), that mother would now be 77. If a woman had children after the age of 18, then the number of children for women much older than 77 can be determined.

Tables 5.1 to 5.6 display the proportion of women with 0, 1, 2, or 3+ children and the mean number of children for women with at least one child. The data are presented for Manitoba overall and for each RHA. These numbers are presented separately for five–year age groups from 40–44, up to 75–79. For women age 80+, the number of children is difficult to ascertain for reasons described above; many children, or even all children born to a woman, may have turned 18 or left the home prior to the introduction of the Manitoba Health family registration number.

The most apparent trend in these data is the increase in the number of women with no identifiable children as the age group gets younger. For Manitoba, the low percentage is for women age 65–69 at only 9.5%, increasing to 18.4% for those age 40–44. The slightly higher proportions for the oldest age groups (e.g., 12.5% for 75–79) may represent a degree of measurement error. Many mothers may have had children at a young age and they may not have been included in the same Manitoba Health family registration number when it was introduced in 1970.

In addition to this increase in the proportion of women with no children, the family size for women who have had at least one child is decreasing. The average number of children is less than 2.5 for the youngest age group (40–44), compared to just over three for the oldest women (75–79). This change in family size appeared to happen in a very short period of time, as the women age 65–69 had an average of 3.05 children, while the women age 55–59 had an average of 2.50.

There is also a very distinct difference between Winnipeg and the rural RHAs. In Winnipeg, the proportion of women with no children is greater for all age groups; for age 75–79, the proportion

with no children is 14.5% and, for age 40–44 it is 22.6%. Interlake–Eastern RHA has the next highest proportion for age 40–44, but it is only 14.1%. For the same 40–44 age group, the average number of children for those with at least one child is only 2.24 in Winnipeg but is 2.52 in Interlake–Eastern RHA.

Table 5.1: Family Size for Females 40+*, Manitoba

	Number of Children				
Age Groups	0	1	2	3+	Average Number of Children†
40-44	18.4%	14.0%	36.9%	30.8%	2.46
45-49	17.3%	13.1%	37.7%	31.9%	2.47
50-54	16.2%	12.9%	39.0%	32.0%	2.45
55-59	13.9%	12.3%	39.9%	33.8%	2.50
60-64	11.0%	9.8%	36.0%	43.2%	2.76
65-69	9.5%	9.3%	28.8%	52.4%	3.06
70-74	10.4%	12.3%	26.0%	51.4%	3.09
75-79	12.5%	15.8%	25.4%	46.3%	3.05
80+	Cannot be determined				

*On April 1, 2006

† Calculated for women with at least one child

Table 5.2: Family Size for Females 40+*, Western RHA

	Number of Children				
Age Groups	0	1	2	3+	Average Number of Children†
40-44	18.4%	14.0%	36.9%	30.8%	2.46
45-49	17.3%	13.1%	37.7%	31.9%	2.47
50-54	16.2%	12.9%	39.0%	32.0%	2.45
55-59	13.9%	12.3%	39.9%	33.8%	2.50
60-64	11.0%	9.8%	36.0%	43.2%	2.76
65-69	9.5%	9.3%	28.8%	52.4%	3.06
70-74	10.4%	12.3%	26.0%	51.4%	3.09
75-79	12.5%	15.8%	25.4%	46.3%	3.05
80+	Cannot be determined				

*On April 1, 2006

† Calculated for women with at least one child

Table 5.3: Family Size for Females 40+*, Winnipeg RHA

	Number of Children				
Age Groups	0	1	2	3+	Average Number of Children†
40-44	22.6%	16.2%	37.6%	23.6%	2.24
45-49	21.5%	15.4%	38.3%	24.7%	2.25
50-54	19.8%	15.3%	39.5%	25.4%	2.25
55-59	17.1%	14.3%	41.5%	27.1%	2.29
60-64	13.8%	11.7%	39.0%	35.6%	2.49
65-69	12.4%	10.8%	32.3%	44.5%	2.72
70-74	12.3%	13.4%	28.1%	46.3%	2.80
75-79	14.5%	19.6%	25.7%	40.2%	2.63
80+	Cannot be determined				

Data for the former Churchill RHA is included in Northern RHA

*On April 1, 2006

† Calculated for women with at least one child

Table 5.4: Family Size for Females 40+*, Southern RHA

Age Groups	Number of Children				
	0	1	2	3+	Average Number of Children†
40-44	18.4%	14.0%	36.9%	30.8%	2.46
45-49	17.3%	13.1%	37.7%	31.9%	2.47
50-54	16.2%	12.9%	39.0%	32.0%	2.45
55-59	13.9%	12.3%	39.9%	33.8%	2.50
60-64	11.0%	9.8%	36.0%	43.2%	2.76
65-69	9.5%	9.3%	28.8%	52.4%	3.06
70-74	10.4%	12.3%	26.0%	51.4%	3.09
75-79	12.5%	15.8%	25.4%	46.3%	3.05
80+	Cannot be determined				

*On April 1, 2006

† Calculated for women with at least one child

Table 5.5: Family Size for Females 40+*, Eastern RHA

Age Groups	Number of Children				
	0	1	2	3+	Average Number of Children†
40-44	18.4%	14.0%	36.9%	30.8%	2.46
45-49	17.3%	13.1%	37.7%	31.9%	2.47
50-54	16.2%	12.9%	39.0%	32.0%	2.45
55-59	13.9%	12.3%	39.9%	33.8%	2.50
60-64	11.0%	9.8%	36.0%	43.2%	2.76
65-69	9.5%	9.3%	28.8%	52.4%	3.06
70-74	10.4%	12.3%	26.0%	51.4%	3.09
75-79	12.5%	15.8%	25.4%	46.3%	3.05
80+	Cannot be determined				

*On April 1, 2006

† Calculated for women with at least one child

Table 5.6: Family Size for Females 40+*, Northern RHA

Age Groups	Number of Children				
	0	1	2	3+	Average Number of Children†
40-44	9.2%	10.6%	28.1%	52.1%	3.26
45-49	7.6%	10.8%	30.8%	50.8%	3.22
50-54	7.6%	10.4%	31.6%	50.4%	3.22
55-59	7.0%	7.3%	29.7%	56.0%	3.47
60-64	5.2%	6.2%	23.1%	65.4%	4.20
65-69	4.3%	7.7%	13.8%	74.3%	4.92
70-74	7.1%	10.6%	15.3%	67.0%	5.15
75-79	s	s	s	59.1%	5.16
80+	Cannot be determined				

Data for the former Churchill RHA is included in Northern RHA

*On April 1, 2006

† Calculated for women with at least one child

's' indicates data suppressed due to counts between 1 and 5

Family Structure and PCH Admission

Previous studies of the impact of children and spouses on PCH admission have employed what is known as **Cox Proportional Hazards regression analysis**, or "time–to–event" analysis. Using this type of analysis, a group of people not yet residing in a PCH was followed over time; if a person was admitted to a PCH, the date was recorded and the time since the beginning of the study period is calculated. This "time to admission" was compared between individuals with and without children, and between those married and those not married. The study population comprised all people age 65+ as of April 1, 1995 who had not yet been admitted to a PCH, and all people who turned 65 prior to the end of the study period (March 31, 2009). For people under 65 on the study start date, their entry into the analysis did not begin until their 65th birthday.

This analysis resulted in a statistic known as the **Hazard Ratio (HR)**, which represents the difference between the probability of PCH admission in one group compared to the probability in another group, at any point in time over the study period. An HR less than 1 indicates that the probability of admission is lower for the target group (e.g., people with children) than for the reference group (e.g., people with no children), and HR greater than 1 indicates a higher probability of admission. It is important to note that a significant HR could be a result of either a reduced lifetime risk or only a delayed risk. In a survival analysis on mortality, for instance, a significant HR does not indicate that a person will never die, only that their risk of death is lower at any point in time compared to the reference group. Likewise, in the analyses that are presented here, a significantly reduced risk of PCH entry does not necessarily indicate that a person will never enter a PCH. It could mean that PCH admission is only delayed.

The reference groups are: a) individuals without children when examining the impact of number of children and b) individuals who are married when examining the impact of the presence of a spouse. All analyses were also adjusted for additional factors to allow for fair comparisons: age group, sex, and location (Winnipeg vs non–Winnipeg). The HRs for the effect of number of children on PCH admission and the effect of being married on PCH admission are presented in Table 5.7. These variables were entered simultaneously in a regression model along with location and age group. The complete results of the regression model can be found in Appendix 2.

Table 5.7: Adjusted Hazard Ratio for PCH Admission by Number of Children and Marital Status

	Hazard Ratio
Unmarried Females	1.00
Married for Females	0.77
Unmarried Males	1.00
Married for Males	0.60
No Children	1.00
1 Child	0.73
2 Children	0.66
3+ Children	0.62

*Adjusted for age as of April 1, 1995 and Winnipeg vs. Non-Winnipeg

The first thing to note is that all of the HRs are less than 1. This means that being married, or having children, reduced the likelihood of PCH admission for those individuals compared to people who were not married or who had no children. Second, the effect of being married is much greater for males than it is for females, and this difference is significant. That is, a wife reduces the likelihood of PCH admission for her husband much more than a husband does for his wife. Third, while additional children beyond the first child do reduce the likelihood of PCH admission, the greatest effect is having at least one child, compared to no children.

Figures 5.1 and 5.2 present these same results in a graphical form. For illustrative purposes, these figures display the estimated proportion of individuals in Winnipeg who were 75–79 (as of April 1, 1995) that were admitted to a PCH in the follow–up period. The pattern of results is the same for all other age groups, although the estimated proportions are higher for older age groups and lower for younger age groups. At the left side of the figures, none of the people in the study population have been admitted to a PCH, but as time progresses more and more people are admitted to a PCH. The pattern of results is similar for other combinations of age, sex, and location.

For this particular group, approximately half the individuals without children (Figure 5.1) were predicted to have entered a PCH within 14 years after the beginning of the study period, at which time they were age 90–94. This dropped to less than 4 in 10 if the individual had a single identifiable child, and to only 3.5 in 10 with two or more children. The results for the effect of having a spouse indicate that the greatest risk for PCH admission is for unmarried men (approximately half entered a PCH by the end of the study period). For both sexes, being married reduces the risk of PCH entry significantly, with the difference between the sexes narrowing considerably.

Figure 5.1: Probability of PCH Admission Based on Number of Children, Winnipeg, 1995/96–2009/10

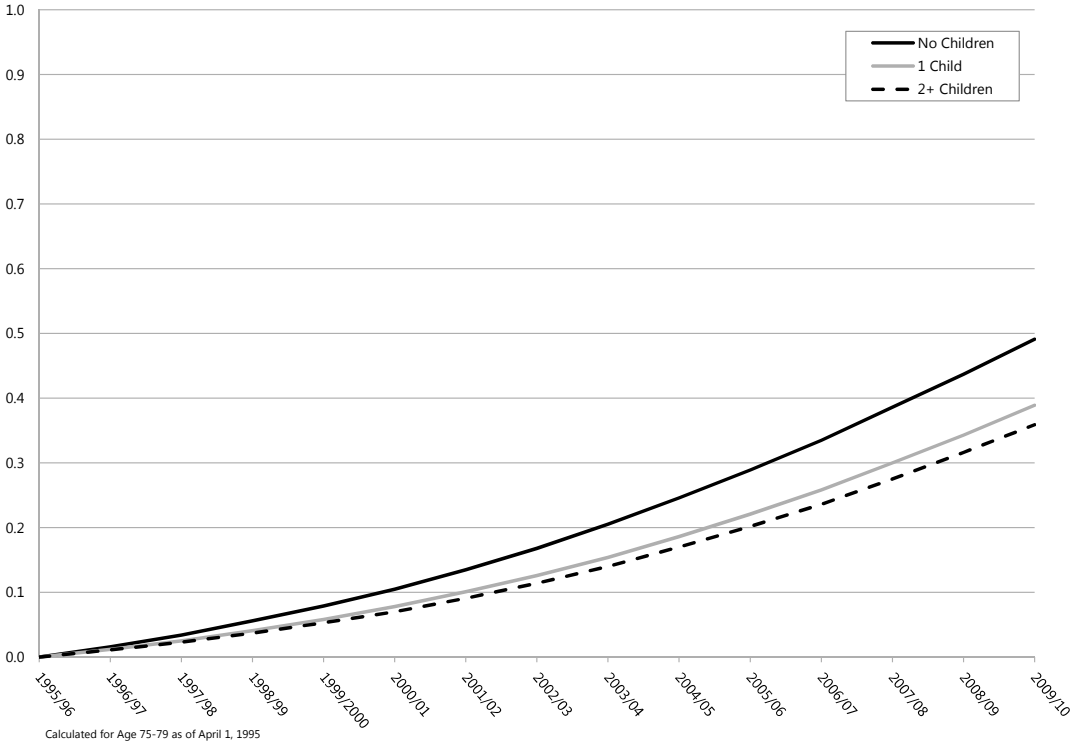
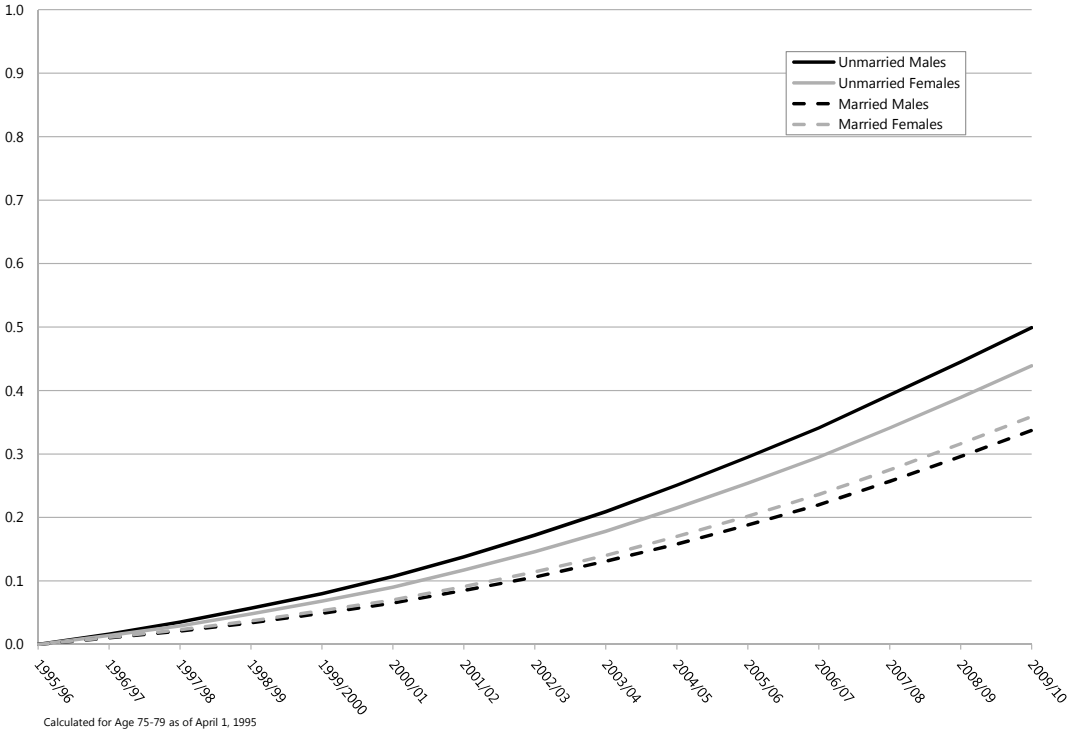


Figure 5.2: Probability of PCH Admission Based on Marital Status, Winnipeg, 1995/96–2009/10



Proximity of Children and Daughters vs. Sons

Additional analyses were carried out to test specific hypotheses about the effect of children that had been reported in the literature on informal support and PCH admission.

The first of these analyses examined whether the effect of children was dependent on the location of the children relative to the parent. The hypothesis here was that a child living in close proximity would provide a greater level of support, thereby delaying or permanently eliminating the probability of PCH admission than a child living further away. A crude measure of geographic location was used: whether the children lived in the same **RHA district** as the parent, another RHA district, or out of the province. RHA districts are sub–regions within RHAs and are, by comparison, relatively small geographic areas. For this analysis, all children were divided into two groups (same RHA district vs. elsewhere) and the number in each group was calculated for every newly admitted PCH resident. The reference groups for this analysis were individuals with no children in the same RHA district and no children elsewhere (i.e., a person with no identifiable children anywhere or at any time in the Manitoba Health Insurance registry).

The results are presented in Table 5.8. The reference group is found in the top left corner with an HR of 1.0. The first column shows the effects of having children in the same RHA district and no children elsewhere. With one child living in the same RHA district, the HR is 0.69, a statistically significant and substantial reduction in the probability of PCH admission. Having two children in the same district and none elsewhere has an even greater effect, with an HR of 0.56, or approaching half the probability of admission compared to a person with no children. The first row shows the effect of having children living outside the RHA district of the parent, but having no children in the same RHA district. As expected, the protective effect is smaller and significantly less than the protective effect of children in the same RHA district. The HR for one child is 0.76, (compared to 0.69 for one child in the RHA district). This difference in HR is statistically significant, as is the difference in HR for two children depending on proximity (0.70 for out of RHA district compare--d to 0.56 for children in the same RHA district).

Thus, the protective effect of having children is much greater when those children reside in the same district compared to when those children reside in a different district. Nonetheless, even children that are not in close proximity provide a significant and substantial protective effect against PCH admission compared to having no children at all.

Table 5.8: Adjusted Hazard Ratios for PCH Admission by Location of Children

	Number of Children in Different RHA District or Out of Province		
Number of Children in Same RHA District	0	1	2+
0	1.00	0.76	0.70
1	0.69	0.64	0.64
2+	0.56	0.53	0.61

*Adjusted for age as of April 1, 1995, sex, Winnipeg vs Non-Winnipeg, married vs unmarried

In addition to proximity of children, there has been some indication that the sex of children may play a role in determining the risk of PCH admission. Freedman (1996) found that having a daughter had a greater impact on reducing the risk of PCH admission than having a son. Charles and Sevak (2001), on the other hand, found that the sex of a child had no differential impact on PCH admission. Noël–Miller (2010) found that the effect of sex of children was dependent on the sex of the parent, such that daughters had a greater impact on mothers.

We examined the differential impact of sons and daughters for PCH admission. We were unable to look at mothers and fathers separately due to data limitations. As with the analysis on proximity of children, the reference group for this analysis was individuals with no identifiable children anywhere or at any time in the Manitoba population registry (i.e., no sons or daughters). All identifiable children were divided into two groups (sons vs. daughters) and the number in each group was calculated for every newly admitted PCH resident. The results are presented in Table 5.9. The first column displays the effects of number of daughters in the absence of any sons. A person with one daughter and no sons had an HR of 0.69, identical to the effect of having one child in the same RHA district, while a person with a single son and no daughters had an HR of 0.75. This difference in the probability of PCH admission between having a son compared to having a daughter was significant; similarly, the effect of two daughters was significantly greater than the effect of two sons. In fact, having a single daughter produced the same effect on probability of PCH admission as having two sons. However, as with the analysis on location of children, both daughters and sons significantly reduced the risk of PCH admission for their parents compared to having no children.

Table 5.9: Adjusted Hazard Ratios for PCH Admission by Sex of Children*

	Number of Male Children		
Number of Female Children	0	1	2+
0	1.00	0.75	0.69
1	0.69	0.63	0.62
2+	0.63	0.58	0.61

*Adjusted for age as of April 1, 1995, sex, Winnipeg vs Non-Winnipeg

Lifetime Risk of PCH Admission

The analyses above describe a reduced risk of PCH admission at any given point in time after the study start; that is, one year later, the risk for those with children is less than those without, two years later the risk is lower, three years later, etc. These analyses do not address lifetime risk. It may be the case that lifetime risk is reduced, but it is also possible that informal support from family merely delays entry rather than prevents it entirely. To address this question, the lifetime risk of entering a PCH prior to death was calculated for those age 75–79 and 80–84 who were not resident in a PCH on April 1, 1995. We restricted analysis to this age group because for younger age groups a large percentage was still alive and resident in the community and therefore did not provide sufficient information regarding lifetime risk. This analysis is presented in Table 5.10. With fifteen years of follow–up time (October 6, 2009), there were few people in the 80–84 age group who were still alive and living in the community; 90% either died without ever being admitted to a PCH or had entered a PCH. For these individuals there was little difference in the "lifetime" risk of PCH admission that depended on the number of children, with the possible exception of having three or more children. Rather, across all groups the percentage of people who were admitted to a PCH is similar.

Among the younger age group (75–79), a larger percentage were still alive and living in the community (about 25%); but as with the 80–84 year–olds, the difference between the proportion admitted to a PCH and the proportion who were deceased in the community was not dependent on number of children. If the presence of children is not preventing an eventual PCH admission, but is delaying PCH admission (as the analyses presented above indicate), the next step is to examine the effect of the number of children *at admission* and *after admission*.

Table 5.10: Probability of Entering a PCH or Dying Before March 31, 2010 by Age Group and Number of Children

Age Groups	Number of Children	Died Before PCH Entry	Entered PCH	Censored: Alive and Out of PCH by End of Study
75-79	Cannot be determined	40.20%	34.20%	25.60%
	1	42.33%	33.22%	24.45%
	2	41.27%	33.67%	25.06%
	3+	45.27%	30.85%	23.88%
80-84	Cannot be determined	42.85%	45.34%	11.81%
	1	45.53%	45.37%	9.50%
	2	45.33%	44.76%	9.92%
	3+	51.66%	38.08%	10.26%

Levels of Care at Admission and Length of Stay in PCH

The simple explanation for the aforementioned findings is that children delay PCH entry by enabling their parents to stay at home at a stage when those without children would already require admission. That is, family support is eliminating the front end of a PCH stay for their spouses and parents. If this is true, then we should also see some differences between residents with children and residents without children:

1. Residents with children should be more frail at PCH admission and therefore require a greater levels of care at admission than those without children.
2. As a consequence of the above, the length of stay in PCH should be shorter for residents with children compared to those without children.

To examine the first question, a **logistic regression** was performed on all PCH admissions from April 1, 1995 to October 6, 2009, examining the likelihood that new PCH admissions are admitted at Levels of Care 3 or 4 (the highest levels) compared to Levels of Care 1 or 2. This analysis produced Odds Ratios (ORs); ORs greater than one reflect increased odds of being admitted at a higher level of care and ORs less than one reflect decreased odds of being admitted at a higher level of care. If children did enable their parents to remain at home when others would require PCH admission, the OR should be greater than one. Table 5.11 presents the results of this analysis. There is a distinct pattern of ORs, such that having more children increases the odds of being admitted at a higher Level of Care.

Table 5.11: Odds Ratios for PCH Admission at Level of Care 3 or 4 Versus Level of Care 1 or 2 by Number of Children, Manitoba, April 1, 1995 to October 6, 2009

Number of Children	Odds Ratio	95% Confidence Interval
0	1.00	-
1	1.21	(0.97 - 1.50)
2	1.28	(1.03 - 1.59)
3+	1.34	(1.08 - 1.66)

Analysis includes Manitoba residents age 65+ as of April 1, 1995 as well as those who turned 65 during the study period.
Adjusted for age, sex, region and marital status

To address the second question, the length of stay in PCH was examined for residents whose PCH stay had ended (i.e., died). A **negative binomial regression** model analysed length of stay (i.e., count of days in PCH) for residents with different numbers of children. After adjusting for the resident's age at PCH admission, region of residence (Winnipeg or non–Winnipeg), sex, and marital status, the analysis indicated that residents with one or more children had a significantly shorter length of stay than residents without children. The number of children (1 vs 2+) did not affect PCH length–of–stay. There was also an effect of sex, with women having longer stays than men, and an effect of being married (shorter stays). As with the analysis on time to PCH admission, the impact of having a spouse was significantly greater for men than for women.

Table 5.12 displays the estimated length of stay for males and females age 75–79 by marital status. The reduction in length of stay for those with children was significant, and very large. For both sexes, whether married or unmarried, the estimated average length of stay was more than a year shorter for those with children compared to those without children. As with previous analyses, there was a dramatic difference in the effect of being married between males (about 300 days shorter in PCH) compared to females (about 150 days).

Table 5.12: Estimated PCH Length of Stay (LOS) by Marital Status and Number of Children, Age 75–79*, Winnipeg, 1995/96–2008/09

		Males		Females	
	Number of Children	Estimated LOS (days)	95% Confidence Interval	Estimated LOS (days)	95% Confidence Interval
Married	0	1,125	(1016 - 1246)	1,538	(1388 - 1704)
	1	782	(755 - 810)	1,069	(1031 - 1109)
	2+	787	(761 - 815)	1,076	(1037 - 1117)
Unmarried	0	1,726	(1561 - 1909)	1,902	(1721 - 2102)
	1	1,200	(1154 - 1248)	1,322	(1280 - 1365)
	2+	1,208	(1160 - 1257)	1,331	(1286 - 1376)

* on April 1, 1995

Summary

The number of children born to women has changed dramatically over the generations. For Manitoba overall, the proportion of women without children has almost doubled for those age 40–44 (18.4%), compared to women 20 years older (9.5%). For those who do have children, family size has also been decreasing, with the proportion of single child families increasing and larger families (3+) decreasing. These changes in the proportion of woman with no identifiable children, and in family size, are more pronounced in Winnipeg than in the rural RHAs.

RHA residents who were married had a significantly lower probability of PCH admission compared to RHA residents who are not married. This effect was greater for men than for women. Unmarried men had the highest risk of PCH admission.

Having at least one child significantly reduced the probability of PCH admission at any given point in time compared to people without any children. Although any children had a significant and substantial effect on the probability of PCH admission, the effect was greater when children were living in close proximity (i.e, same RHA district) or if the children were female (i.e., daughters).

In addition to a reduction in instantaneous probability of PCH admission, the presence of children increased the odds of being admitted at a higher level of care and decreased the average PCH length of stay. These results suggest that informal support from children prevents the initial portion of a PCH stay for those who do end up admitted to a PCH.

Chapter 6: Findings and Policy Implications

The Accuracy of PCH Bed Equivalent Projections

The projections described in this report are dependent on the accuracy of the two main components: the projected PCH use rates and the projected populations. The *current rates* projections do not rely on predicting the future, only that rates of use remain as low as they were in 2008/09. While past PCH use rates are known numbers, how they will change in the future is not certain. As Doupe et al. (2011) pointed out in their report, "accurately projecting PCH use requires, in part, that we can accurately predict how past PCH use rates (i.e., days used per 1,000 population)… will continue to change in the future." (p. 16) The *continuing trends* projections rely on predicting future use patterns and any major changes in PCH use rates (i.e., major medical or pharmaceutical advancements) will concordantly affect PCH bed equivalent requirements.

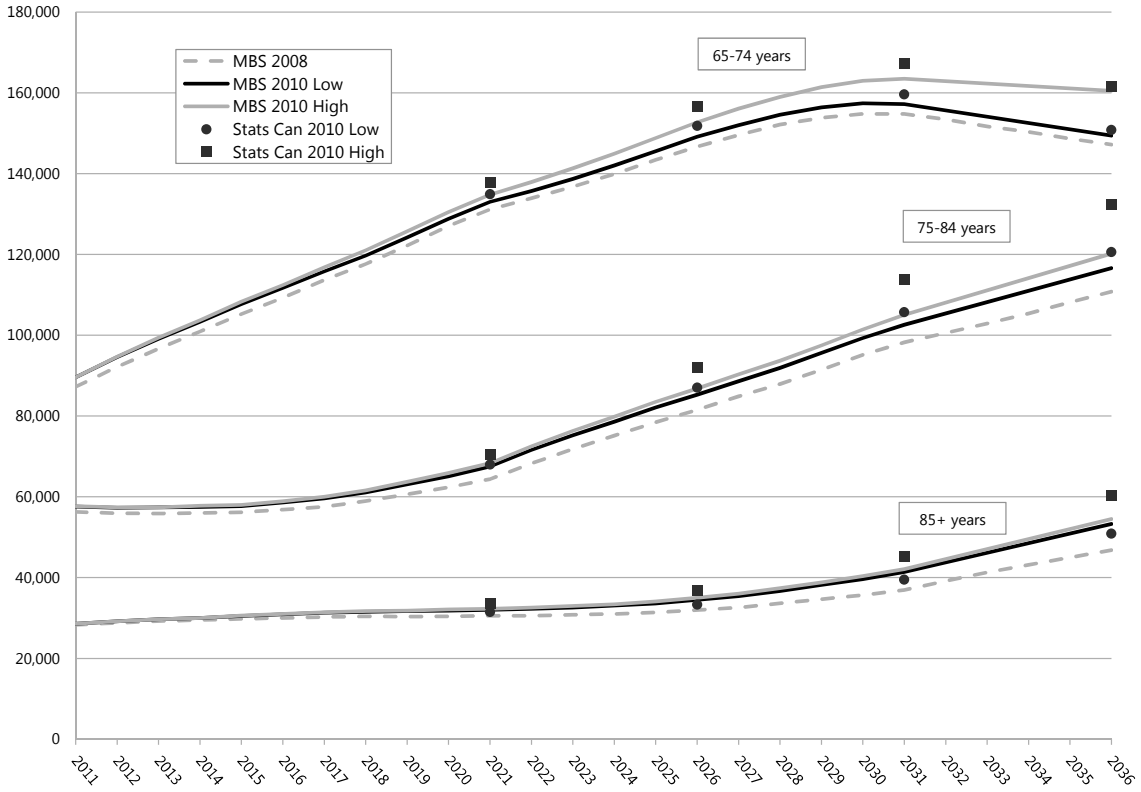
The projected PCH use rates that were used for the *continuing trends* projections provide a measure of the accuracy of our PCH bed equivalent projections for the future. If the PCH bed equivalent *use rates* in the future veer off the projected lines then adjustments must be made to the PCH bed equivalents. For example, Figure 3.3 predicts that Western RHA PCH bed equivalent use rate for age 85+ in 2031 will be about 80,000 days per 1,000 population. If the rate was significantly above that predicted rate, the projected PCH bed equivalents would need to be adjusted upward; if the rate was significantly lower than 80,000 days per 1000 population, the projected PCH bed equivalents would be adjusted downward.

The other major component driving the projected PCH bed equivalents was the population projections. The population projections were taken from a report published by the Manitoba Bureau of Statistics (MBS) in 2008. Since that time, two additional reports projecting the Manitoba population have been released. The first of these additional reports was mentioned briefly in Chapter 1 and projected the Manitoba population to the year 2041. The second is a report from Statistics Canada, also published in 2010, that presented projections for each of Canada's provinces to the year 2036. Neither of these reports contained projections for the individual RHAs of Manitoba, however, and so they could not be used for developing RHA specific PCH bed equivalent projections. However, the total numbers for Manitoba can be compared between these reports and with the MBS 2008 report. This allows for some estimate of the reliability of the population projections that have been used here. These reports present alternative scenarios for the population projections. These alternate scenarios vary the fundamental components of the population projections (e.g., life expectancy, birth rates, immigration rates) in much the same manner as the PCH use rates were varied for the PCH bed equivalent projections. By varying these components, both the 2010 MBS report and the 2010 Statistics Canada report present low, medium, and high projections scenarios.

Figure 6.1 presents the 2008 MBS projection for the province of Manitoba as a whole for the three age groups used in this report, compared with the low and high projections from the MBS 2010 report and the Statistics Canada 2010 report. The projections in all cases are quite similar, at least for the first 10 to 15 years. Although the estimates diverge to a limited degree after 2021, they are quite consistent. No population projection is forecasting a stable number of older adults, and all show the aging of the baby boom generation. Despite this consistency between the population projections, it is somewhat surprising that the MBS 2008 projections are not contained within the boundaries of the low scenario and high scenario projections from the 2010 reports. In fact, the low scenario estimates from the

newer reports project a greater number of older adults than the numbers being used for the PCH bed equivalent projections. Using any alternate population projections as the basis for the PCH bed equivalent projections would result in higher projected need than what has been presented in this report.

Figure 6.1: Manitoba Bureau of Statistics (MBS) and Statistics Canada (Stats Can) Population Projections, 2011–2036



Summary of Findings and Policy Implications

The key message from this report is that the period from 2021 until 2036 will see a dramatic increase in the need for PCH bed equivalent care in the province of Manitoba. This is mainly due to the increase in the number of individuals that fall into the age range where the majority of PCH care is provided (65+) and, in particular, the size of the population age 85+. The timing of the increase in PCH bed equivalent need is closely tied with the aging of the baby boom generation; they began to enter the 65–74 year age group in 2011, the 75–84 year age group in 2021, and the 85+ year age group in 2031. In total, the projected increased need in the capacity of care for the elderly is approximately 5,100 PCH bed equivalents. Manitoba Health's Aging In Place initiative addresses the alternatives, or equivalents, to PCH care that may be able to address the projected need, such as supportive housing or group living. Currently, the province of Manitoba has approximately 9,500 PCH beds. No scenario or alternative conditions suggest that the PCH bed equivalent care required through 2036 will remain what it is today or will decrease.

The timing of increases in PCH bed equivalent needs do vary across the province, however. Using the *continuing trends* projections, Interlake–Eastern RHA and the former South Eastman RHA see the

most immediate increase in needs for PCH bed equivalent care. Northern RHA is not far behind. The amount of PCH bed equivalent care provided in these areas needs to more than double by 2036. On the other hand, the projection for Western RHA has a temporary decrease in PCH bed equivalent care requirements, although there is a relatively small increase in projected PCH bed equivalent care needs between 2031 and 2036. Winnipeg has the largest number of PCH beds and has a very small projected increase through 2021, which begins to accelerate through 2031 and even more through 2036. The projected increase in PCH bed equivalents between 2009 and 2036 is about 56%. Although much smaller than the relative increase in need for Interlake–Eastern and Northern RHAs, this amounts to 3,081 PCH bed equivalents for Winnipeg, the vast majority being required in the 15 years from 2021 to 2036 (2,833 PCH bed equivalents).

The reference to a PCH bed *equivalent*, rather than PCH beds is intentional and necessary. A PCH bed equivalent could either be a PCH bed itself, a supportive housing bed, or some type of enhanced homecare service or services provided to group living, as described in Manitoba Health's Aging In Place initiative. In Winnipeg, these alternative services could currently divert just over 12.5% of PCH days, according to data from a previous report published by MCHP (Doupe et al., 2011). A more optimistic view of the data in that report would indicate that around 19.5% of days may be able to be diverted from traditional PCH care. This would mean that of the 3,014 extra PCH bed equivalents projected for Winnipeg from 2011 to 2036, over half (1,635) could be supportive housing or enhanced homecare. Because of limited supportive housing supply and data, these calculations could not be made for the rural RHAs.

When compared to the results presented in Doupe et al. (2011), the use of smaller geographic areas (RHAs compared to Manitoba overall) and a slightly modified method for developing projections produced minor differences in projected PCH bed equivalents for the province. At the extreme, the difference in 2030 (or 2030/31) between the *continuing trends* projections from this report and "Scenario 2" from Doupe et al. (2011), is an additional 294 PCH bed equivalents, or about 2.5%. The majority of this difference can be attributed to regional differences in projected PCH use rates; the average trend in Manitoba was not representative of trends in all the individual RHAs. Given that these numbers are for 20 years in the future, there is remarkable consistency between the projections for the two reports.

Other additional considerations all indicate that the projections presented here may be slightly conservative. Accounting for in–hospital waiting time adds a very small proportion to the PCH bed equivalent projections. Analyses on family structure (inferred informal support) also suggest that PCH bed equivalent projections may underestimate future PCH need. Because of limitations to the data on number of children to the oldest adults (85+), it was not possible to incorporate these data into projections. However, in a decade, with 10 extra years of data after the introduction of the Manitoba Health registration number, estimates of the family structure of those age 85+ will be more reliable and much more can be known about the effect of family structure on PCH use rates for these oldest individuals. Finally, newer reports from the Manitoba Bureau of Statistics and Statistics Canada indicate that the PCH bed equivalent projections provided in this report may be based on population projections that slightly underestimate the number of older adult Manitobans in the province (Manitoba Bureau of Statistics, 2010; Statistics Canada, 2010). All three of these considerations (in–hospital wait times, family structure, and variable population projections) suggest that the projections may be a slight underestimate in PCH bed equivalent need for the province. In this case, the *current rates* projections may be a more accurate prediction of need than the *continuing trends* projections.

In the presence of these variable influences, it is advisable to revisit these projections periodically. In 2002, a report from MCHP on PCH bed projections indicated that there would be little need for increased PCH bed capacity through 2020, and even a decline. A decade later we see that those projections underestimated the need for PCH bed equivalents in 2020 by about 8.8% (818 beds), but primarily due to an underestimation of demand in Winnipeg (598 bed equivalents). In truth, though, the projected need from 2002 to 2012 was quite accurate—within 200 PCH beds. The error for the period of time after 2012, over a decade away from the start point, serves as a warning sign for these projections; unanticipated changes can alter the demand for PCH beds. Despite this warning, the aging of the baby boom generation cannot be avoided and some form of increased capacity of care will be necessary. With more census information and updated population projections, in another 10 years we will be able to estimate whether the increased PCH bed equivalent need in these projections will be as high as thought for the period from 2021 to 2031 and whether the increased PCH bed equivalent need will be sustained beyond 2036 or decrease after the baby boom generation has transitioned through PCH care.

Reference List

Charles KK, Sevak P. Family Structure and Nursing Home Entry Risk: Are Daughters Really Better? Ann Arbor, MI: Gerald R. Ford School of Public Policy; 2001.

Charles KK, Sevak P. Can family caregiving substitute for nursing home care? Journal of Health Economics. 2005;24(6):1174–1190.

Doupe M, Fransoo R, Chateau D, Dik N, Burchill C, Soodeen R–A, Bozat–Emre S, Guenette W. Population Aging and the Continuum of Older Adult Care in Manitoba. Manitoba Centre for Health Policy. 2011. http://mchp–appserv.cpe.umanitoba.ca/reference/LOC_Report_WEB.pdf. Accessed July 16, 2012.

Freedman VA. Family Structure and the Risk of Nursing Home Admission. Journal of Gerontology: Social Sciences. 1996;51B(2):S61–S69.

Frohlich N, De Coster C, Dik N. Estimating Personal Care Home Bed Requirements. Manitoba Centre for Health Policy . 2002. http://mchp–appserv.cpe.umanitoba.ca/reference/pch2020.pdf. Accessed July 16, 2012.

interRAI. Resident Assessment Instrument Home Care (RAI–HC)© Manual, Canadian Version. 2nd ed. Ottawa, ON: Canadian Institute for Health Information; 2002.

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

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

Manitoba Bureau of Statistics. Manitoba Population Projections 2008–2041. Winnipeg, MB: Government of Manitoba; 2010.

Noël–Miller C. Spousal loss, children, and the risk of nursing home admission. The Journal of Geronotology Series B, Psychological sciences and social sciences. 2010;65B(3):370–380.

Statistics Canada. Population Projections for Canada, Provinces and Territories 2009–2036. Ottawa, ON: Minister of Industry; 2010.

Glossary

Activities of Daily Living (ADL)

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

Administrative Health Data

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

Baby Boom Generation

In Canada this refers to Canadians born between 1946 and 1966 inclusive.

Cluster Analysis

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

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

Cognitive Performance Scale (CPS)

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

Continuing Trends Projection

A regression–based projection of PCH bed equivalents that assumes that recent PCH use rates will continue a period of time into the future. In this study, trends in PCH use rates over the past 25 years were projected forward in time using regression formulas. These regression models considered both linear trends (straight line) and curvilinear trends (decreasing change over time). The *continuing trends* projection combined these age/sex projected PCH use rates with the age/sex specific population projections for each RHA.

Cox Proportional Hazards Regression Analysis

A regression model for analyzing the effect of several risk factors on survival. The probability of the endpoint (e.g., death) is called the hazard. This model assumes that the effects of the predictor variables are constant over time.

http://www.medcalc.org/manual/cox_proportional_hazards.php. Accessed July 6, 2012.

Current PCH Use Rates

In this study, we calculated the average **PCH** use rates in days per 1,000 population over the three–year period prior to the beginning of the projections (fiscal years 2006/07, 2007/08, 2008/09). This rate was used in the ***current rates*** **projections** of **PCH bed equivalents**.

Current Rates Projection

A projection of **PCH bed equivalents** that combine the **current use rates** for age/sex specific groups with the projected age/sex population for a region (**RHA**s in this study). The annual number of days is summed across the six age/sex groups to give a total number of PCH equivalent days required for the region for each year. This total is then divided by 365 to convert the days into the number of beds required for the year.

Fertility Rate

The number of live births in an area during a year per 1,000 women of childbearing age for that year child bearing age is defined as the mid–year female population, age 15 to 44 in the same area for the same year.

Fiscal Years

For most Canadian government agencies and healthcare institutions, the fiscal year is defined as starting April 1 and ending the following year at March 31. For example, the 2005/06 fiscal year would be April 1, 2005 to March 31, 2006 inclusive and may also be denoted as FY 2005.

Hazard Rate

"The probability that if the event in question has not already occurred, it will occur in the next time interval, divided by the length of that interval. The time interval is made very short, so that in effect the hazard rate represents an instantaneous rate" (Spruance et al., 2004).

Spruance SL, Reid JE, Grace M, Samore. Hazard ratio in clinical trials. *Antimicrodial Agents and Chemotherapy.* 2004;48(8):2787–279.

Hazard Ratios

"An estimate of the ratio of the **hazard rate** in the study group versus the control group" (Spruance et al., 2004); usually the result of a survival analysis. The hazard rate is the instantaneous risk associated with the variable under study, under the condition that the event has not yet happened.

Spruance SL, Reid JE, Grace M, Samore. Hazard ratio in clinical trials. *Antimicrodial Agents and Chemotherapy*. 2004;48(8):2787–279.

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

Hospital Abstract
A form/computerized record filled out upon a patient's discharge (separation) from an acute care hospital. The abstract contains information from the patient's medical record based on their stay in hospital, such as gender, residence (postal code), diagnoses and procedure codes, admission and discharge dates, length of stay, and service type (inpatient, day surgery, outpatient). Abstract records are stored in the Hospital Abstracts Database.

Length of Stay
The number of days of care counted from the admission date to the separation (discharge) date for patients within a healthcare facility. This could be in a hospital or **personal care home** (PCH).

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

Logistic Regression
The regression technique used when the outcome is a binary, or dichotomous, variable. Logistic regression models the probability of an event as a function of other factors. These models are only able to state that there is a relationship ("association") between the explanatory and the outcome variables. This is not necessarily a causal relationship, since it is based on observational data for the most recent time period. The explanatory variable may be associated with an increase or decrease (not that it caused the increase or decrease).

Negative Binomial Distribution
A discrete probability distribution appropriate for analyzing count data when an event is relatively rare but highly variable over the entire population. This distribution is often employed in regression analyses when the **Poisson distribution** results in an over–dispersed model.

Negative Binomial Regression
Regression analyses for count data that follows a **negative binomial distribution**, which occurs when an event is relatively rare but is highly variable over the entire population.

Older Adults
People age 65 years and older.

Panelling
The process of evaluating requests for placement into a personal care home. These requests may originate either from a Home Care employee, from an individual, and/or their family.

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

Personal Care Home (PCH) Bed Equivalent
All care provided to older adults that is *currently* being provided via PCHs; in this study current is the period at and immediately prior to 2008/09. This care may be provided by alternative sources in the future, but is *equivalent* to PCH care in 2008/09. Three hundred sixty five days of provided care is considered one PCH bed.

Personal Care Home (PCH) Resident Rates
The number of people in an area residing in a PCH for a defined period of time divided by the total number of people in that area. In this study, this was calculated for each RHA, separately for males and females, and three age groups (65–74, 75–84, 85+).

Personal Care Home (PCH) Use Rates
The number of PCH days of care provided to people in an area divided by the total population in that area. In this study, this was calculated for each RHA, separately for males and females and three age groups (65–74, 75–84, 85+).

Poisson Distribution
The pattern usually followed by a set of results in which the measurements are counts. It is a special case of the binomial distribution (see **Negative Binomial Distribution)** in which the number of individuals is very large and the chance of one of the two possible outcomes occurring is very small (Hassard, T. 1991).

Hassard T. *Understanding Biostatistics*. St. Louis, MI: Mosby–Year Book, Inc. 1991.

Population Health Research Data Repository (Repository)

A comprehensive collection of administrative, registry, survey, and other databases primarily comprised of residents of Manitoba. This repository is housed at the Manitoba Centre for Health Policy (MCHP). It was developed to describe and explain patterns of healthcare and profiles of health and illness, facilitating inter–sectoral research in areas such as healthcare, education, and social services. The administrative health database, for example, holds records for virtually all contacts with the provincial healthcare system, the Manitoba Health Services Insurance Plan (including physicians, hospitals, personal care homes, home care, and pharmaceutical prescriptions), of all registered individuals. MCHP acts as a trustee or steward of the information in the Repository for agencies such as Manitoba Health.

Regional Health Authority (RHA)

Regional governance structure set up by the province to be responsible for the delivery and administration of health services in specified areas. Prior to April 2012, there were 11 RHAs: Winnipeg, Brandon, South Eastman, Assiniboine, Central, Parkland, North Eastman, Interlake, Burntwood, NOR–MAN and Churchill. As of this date, these RHAs were combined to form five RHAs: Western, Winnipeg, Southern, Interlake–Eastern, and Northern.

Regional Health Authority (RHA) Districts

Subdivisions of Regional Health Authorities (RHA) defined primarily based on municipal code and some postal codes for analysis purposes. Districts were created collaboratively by individual RHAs, Manitoba Centre for Health Policy (MCHP), and Manitoba Health. There are 56 districts in Manitoba.

Regression Analysis

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

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

Resident Assessment Instrument (RAI–MDS 2.0©)

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

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

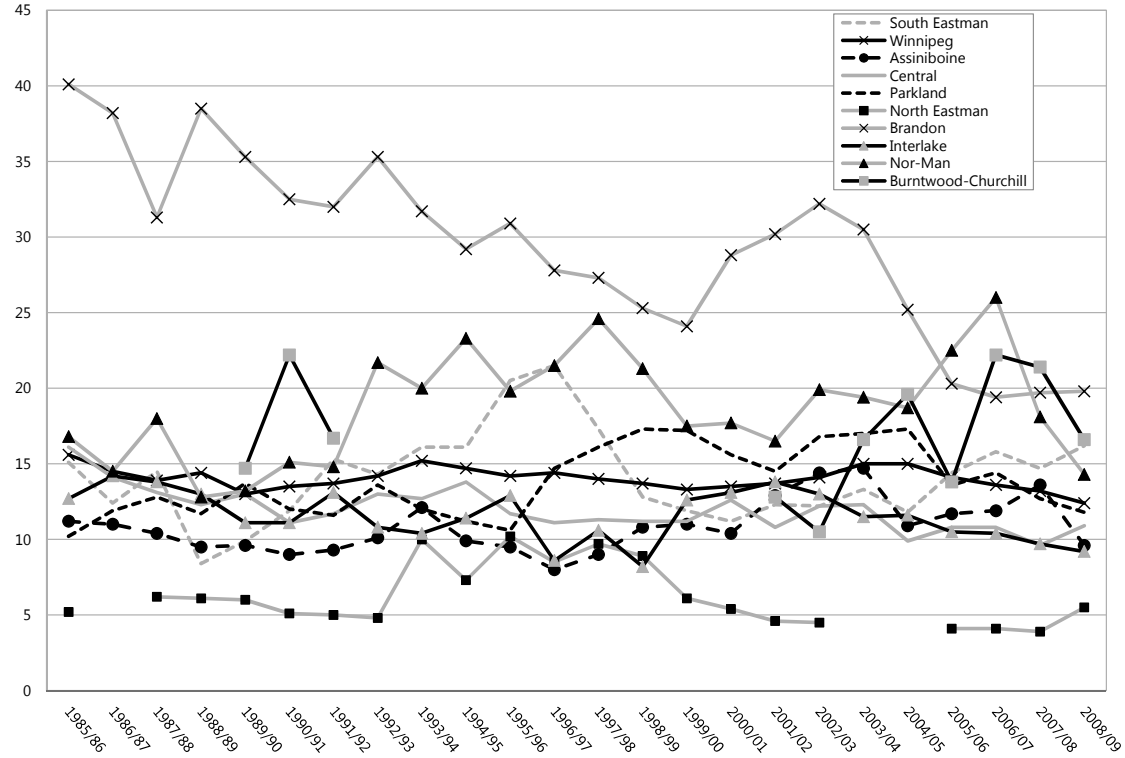
A standardized, multi–dimensional assessment system that focuses on a person's functioning and quality of life by assessing needs, strengths, and preferences (e.g., social supports, functional dependence, and cognitive impairment) in order to develop effective and personalized home care services.

Supportive Housing

A component of Manitoba's Aging in Place strategy. This program "provides personal support services and homemaking in group community residential settings …. It combines apartment living, services such as meals and homemaking, and access to 24–hour support care and supervision.(Winnipeg Regional Health Authority: http://www.wrha.mb.ca/ltc/strategy/housing.php). Accessed July 16, 2012.

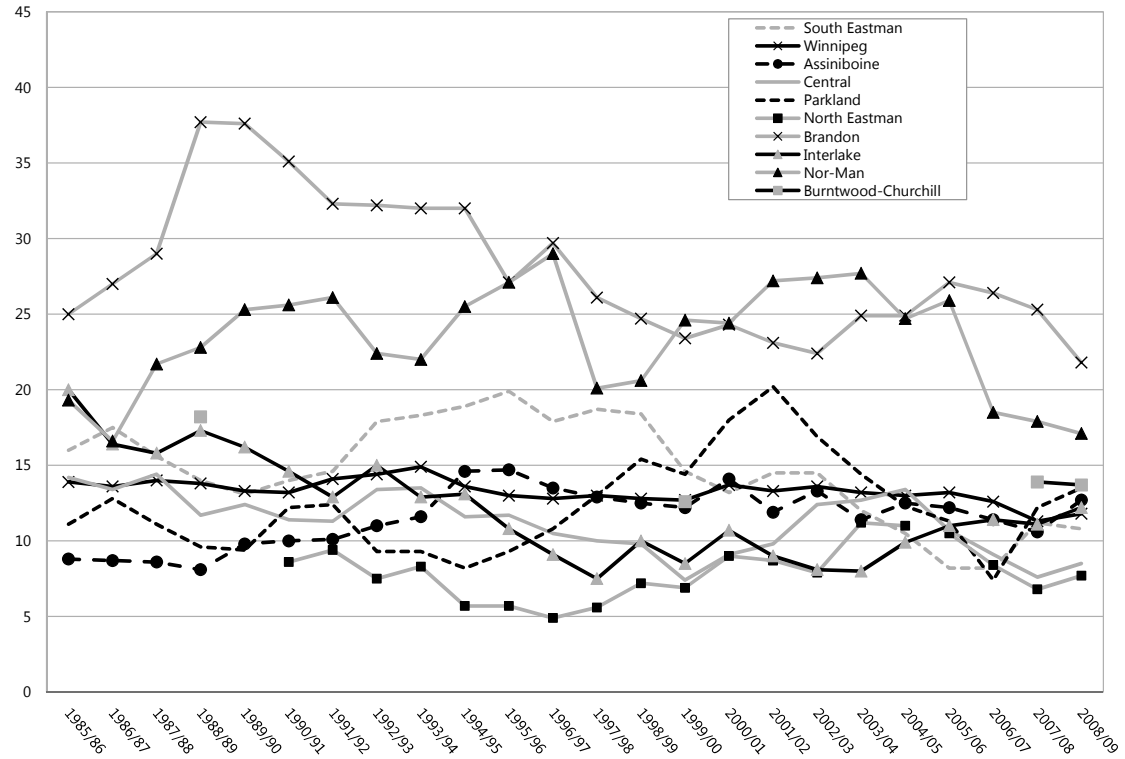
Appendix 1

Appendix Figure A1.1: PCH Residents per 1,000 Population by RHA, Males Age 65–74, 1985/86–2008/09



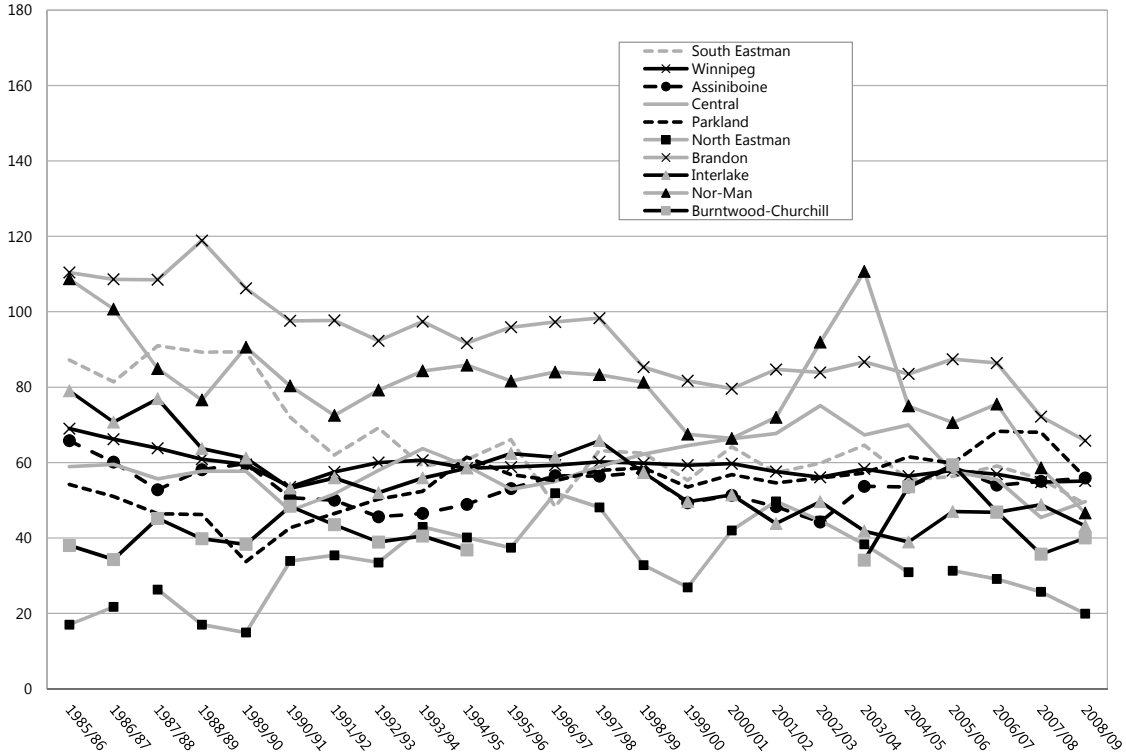
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.2: PCH Residents per 1,000 Population by RHA, Females Age 65–74, 1985/86–2008/09



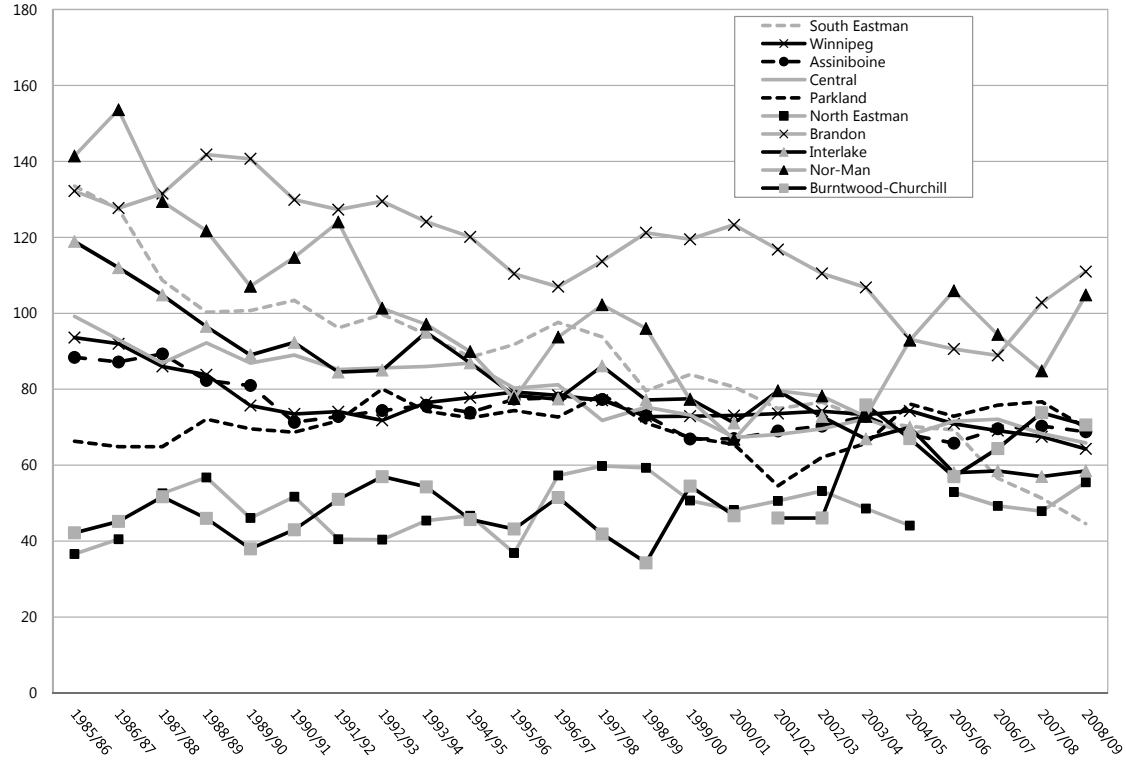
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.3: PCH Residents per 1,000 Population by RHA, Males Age 75–84, 1985/86–2008/09



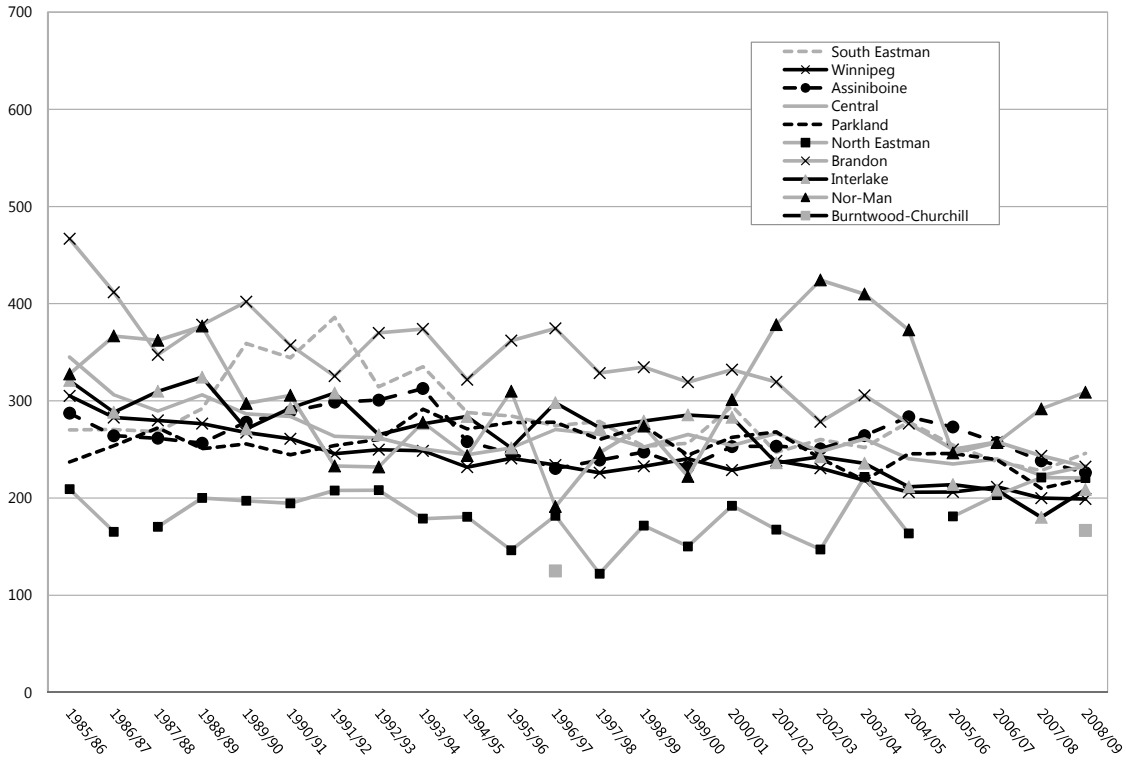
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.4: PCH Residents per 1,000 Population by RHA, Females Age 75–84, 1985/86–2008/09



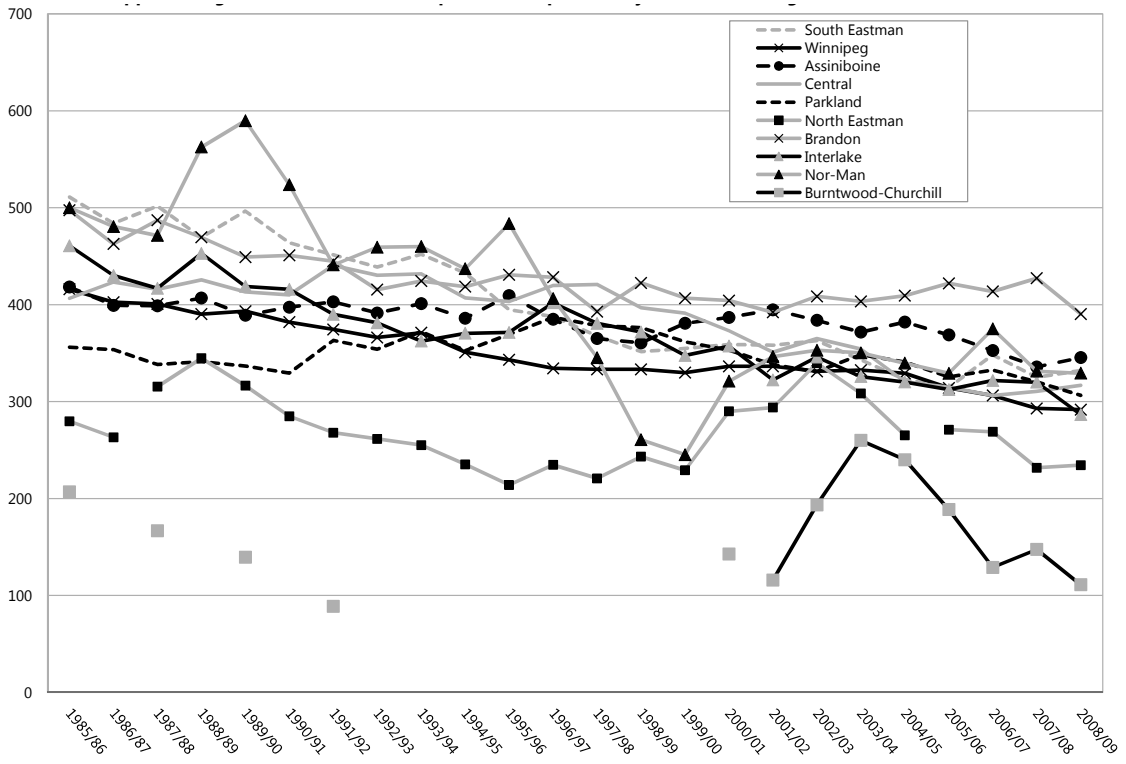
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.5: PCH Residents per 1,000 Population by RHA, Males Age 85+, 1985/86–2008/09



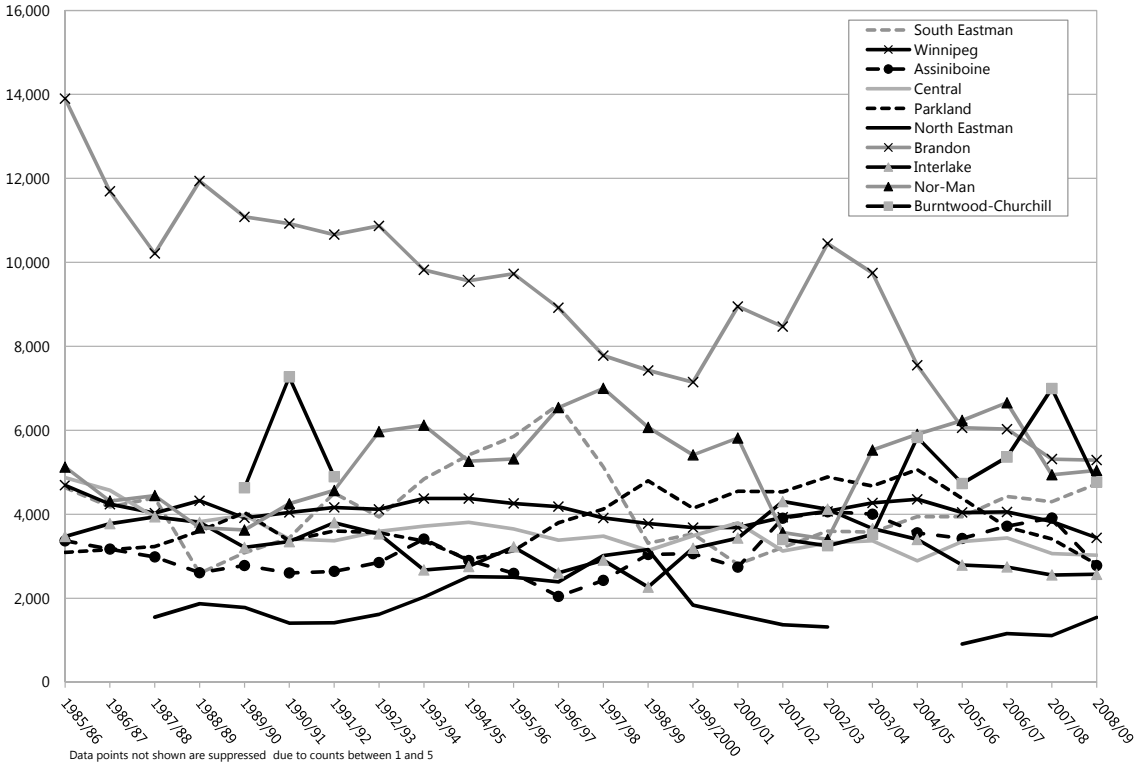
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.6: PCH Residents per 1,000 Population by RHA, Females Age 85+, 1985/86–2008/09



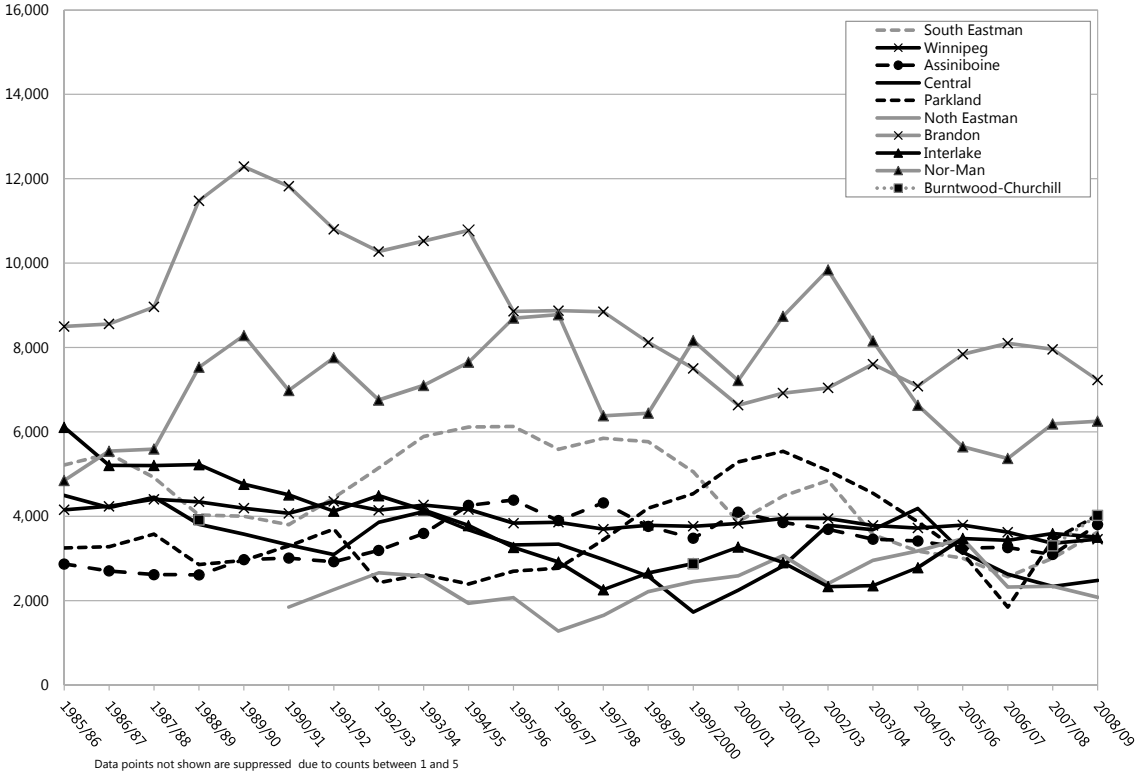
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.7: PCH Days Used by 1,000 Population by RHA, Males Aged 65–74, 1985/86–2008/09



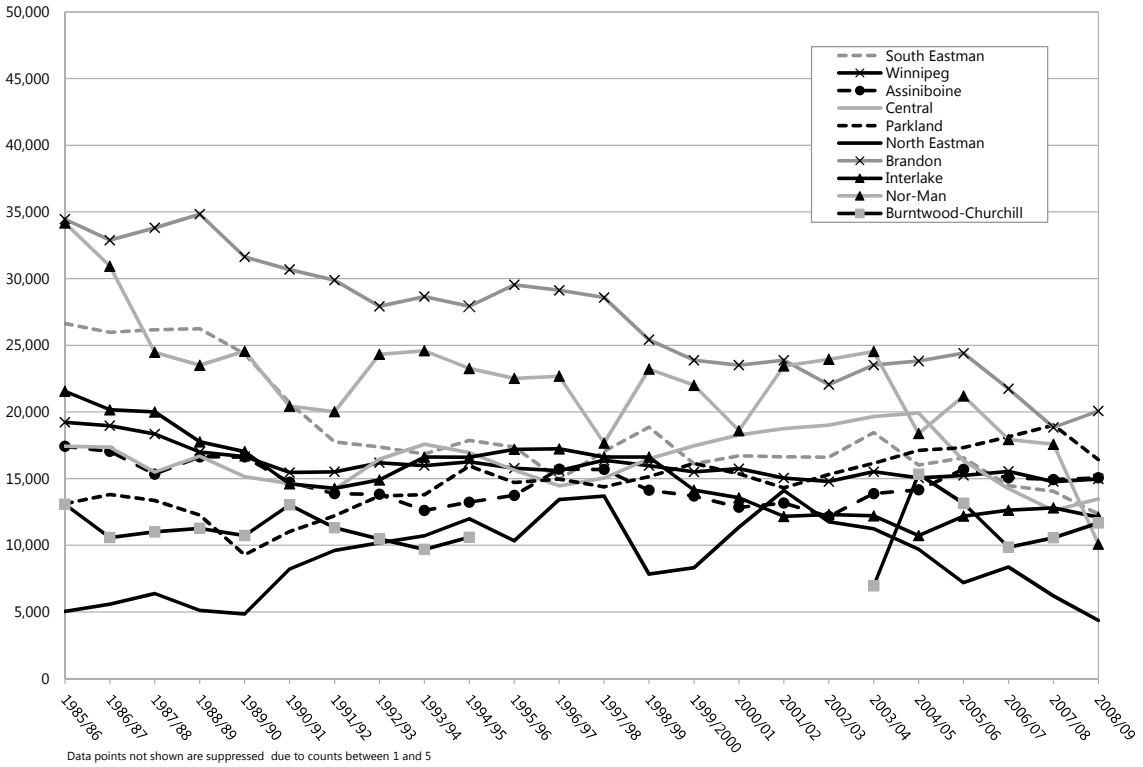
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.8: PCH Days Used by 1,000 Population by RHA, Females Aged 65–74, 1985/86–2008/09



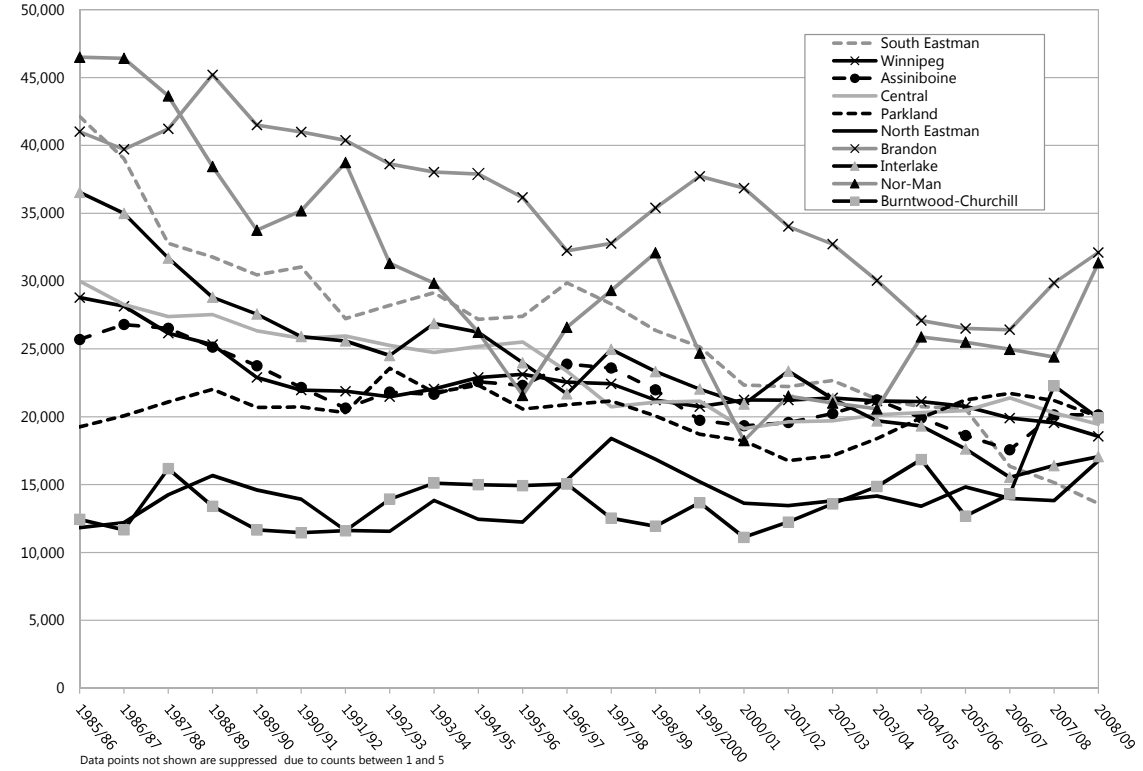
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.9: PCH Days Used by 1,000 Population by RHA, Males Aged 75–84, 1985/86–2008/09



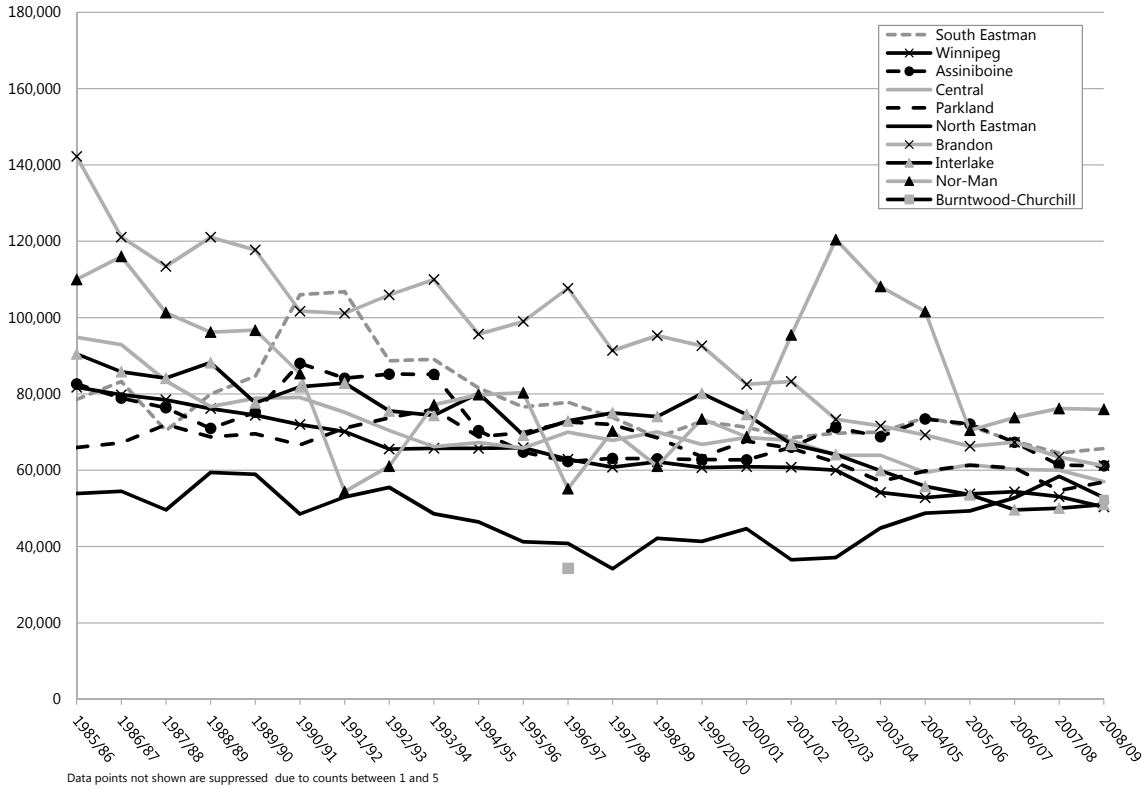
Data points not shown are suppressed due to counts between 1 and 5

Appendx Figure A1.10: PCH Days Used by 1,000 Population by RHA, Females Aged 75–84, 1985/86–2008/09



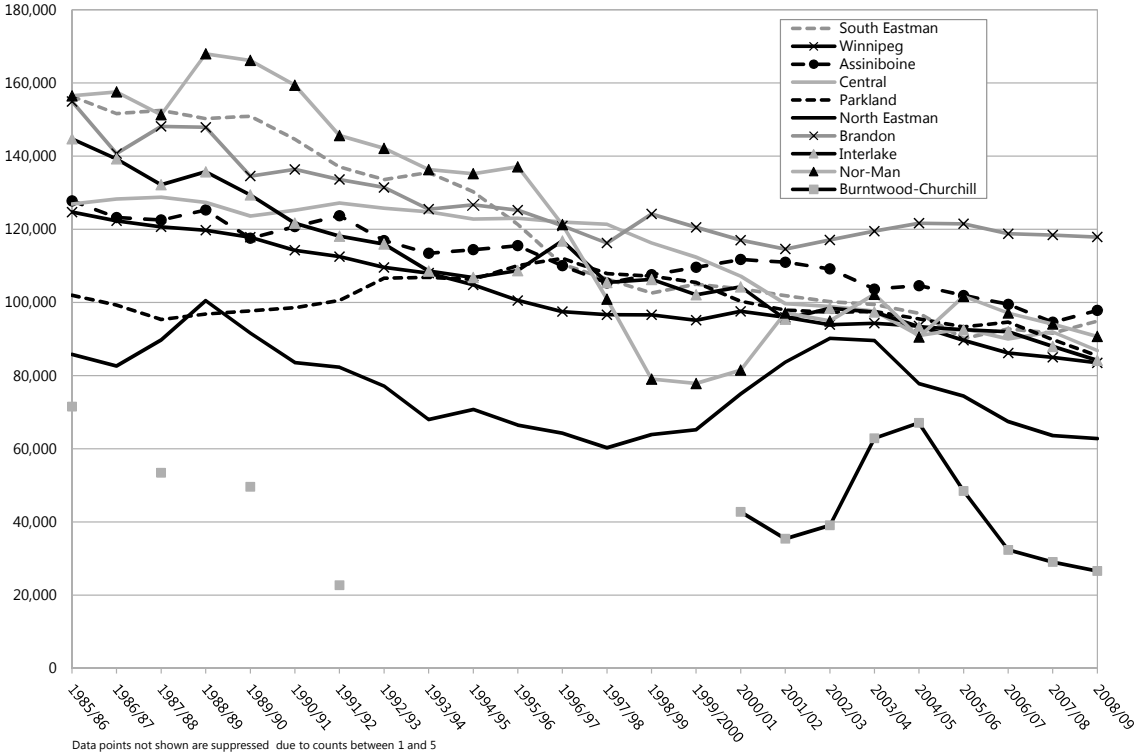
Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.11: PCH Days Used by 1,000 Population by RHA, Males Aged 85+, 1985/86–2008/09



Data points not shown are suppressed due to counts between 1 and 5

Appendix Figure A1.12: PCH Days Used by 1,000 Population by RHA, Females Aged 85+, 1985/86–2008/09



Data points not shown are suppressed due to counts between 1 and 5

Appendix Table A1.1: Actual and Projected Populations for Adults Age 65–74 by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Parkland	1,986	1,944	2,253	2,321	2,121	2,290	1,848	1,998
Assiniboine	3,214	3,283	3,956	4,031	3,765	4,140	3,038	3,423
Brandon	1,630	1,850	2,458	2,726	2,809	3,290	2,543	2,909
Central	3,607	3,748	5,085	5,154	6,255	6,574	5,915	6,300
Winnipeg	23,059	26,264	36,574	40,704	44,877	47,581	43,799	46,446
Interlake	3,681	3,548	4,849	4,993	5,316	5,727	4,651	5,218
North Eastman	2,005	1,845	2,429	2,502	2,712	2,756	2,347	2,538
Nor-Man	729	697	1,134	1,065	1,132	1,240	841	1,018
South Eastman	2,148	2,035	3,058	3,123	4,183	4,272	4,090	4,326
Burntwood-Churchill	840	755	1,379	1,332	1,872	1,890	1,923	2,027
Manitoba	42,899	45,969	63,175	67,952	75,043	79,759	70,995	76,205

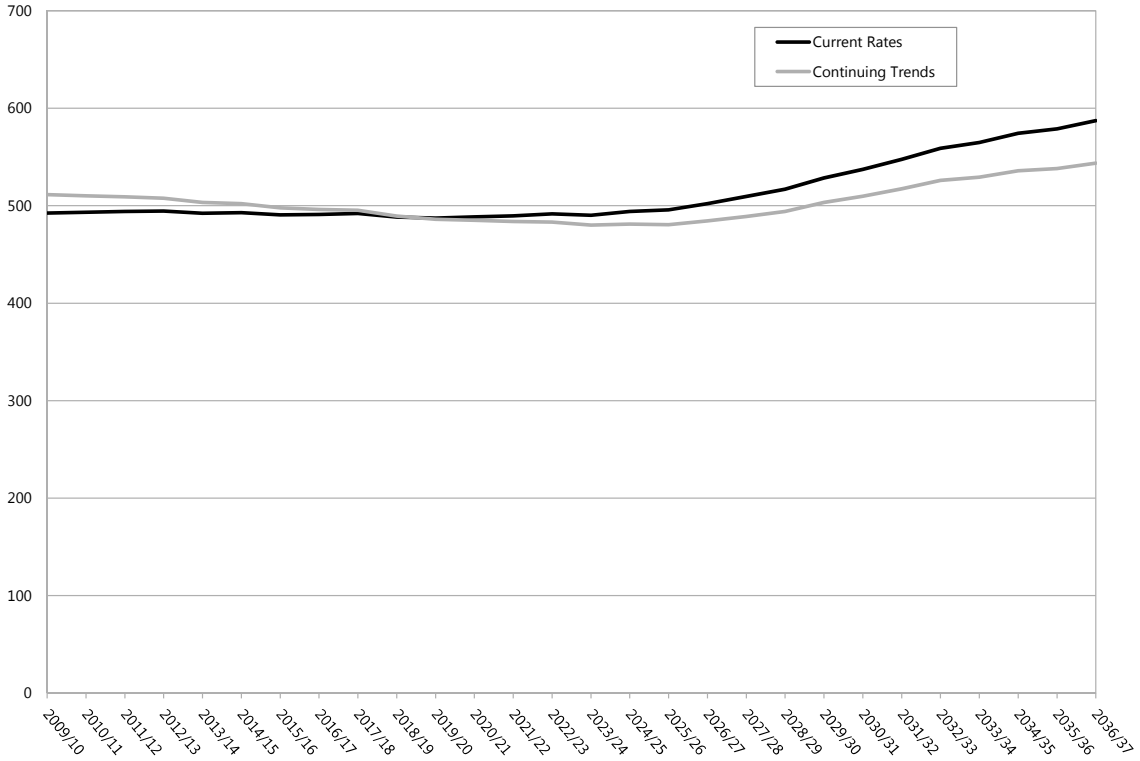
Appendix Table A1.2: Actual and Projected Populations for Adults Age 75–84 by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Parkland	1,288	1,490	1,314	1,456	1,600	1,797	1,638	1,883
Assiniboine	2,142	2,505	2,103	2,523	2,781	3,196	2,913	3,398
Brandon	1,022	1,466	1,137	1,415	1,795	2,167	2,027	2,450
Central	2,147	2,629	2,514	2,997	3,722	4,218	4,360	4,999
Winnipeg	14,038	19,901	15,681	20,081	25,893	32,016	29,959	35,566
Interlake	1,915	2,124	2,512	2,941	3,449	4,045	3,757	4,390
North Eastman	959	951	1,371	1,437	1,738	1,965	1,898	2,093
Nor-Man	301	341	383	397	666	677	770	807
South Eastman	1,126	1,267	1,529	1,701	2,270	2,601	2,766	3,120
Burntwood-Churchill	258	297	459	419	807	826	966	1,019
Manitoba	25,196	32,971	29,004	35,367	44,723	53,509	51,055	59,725

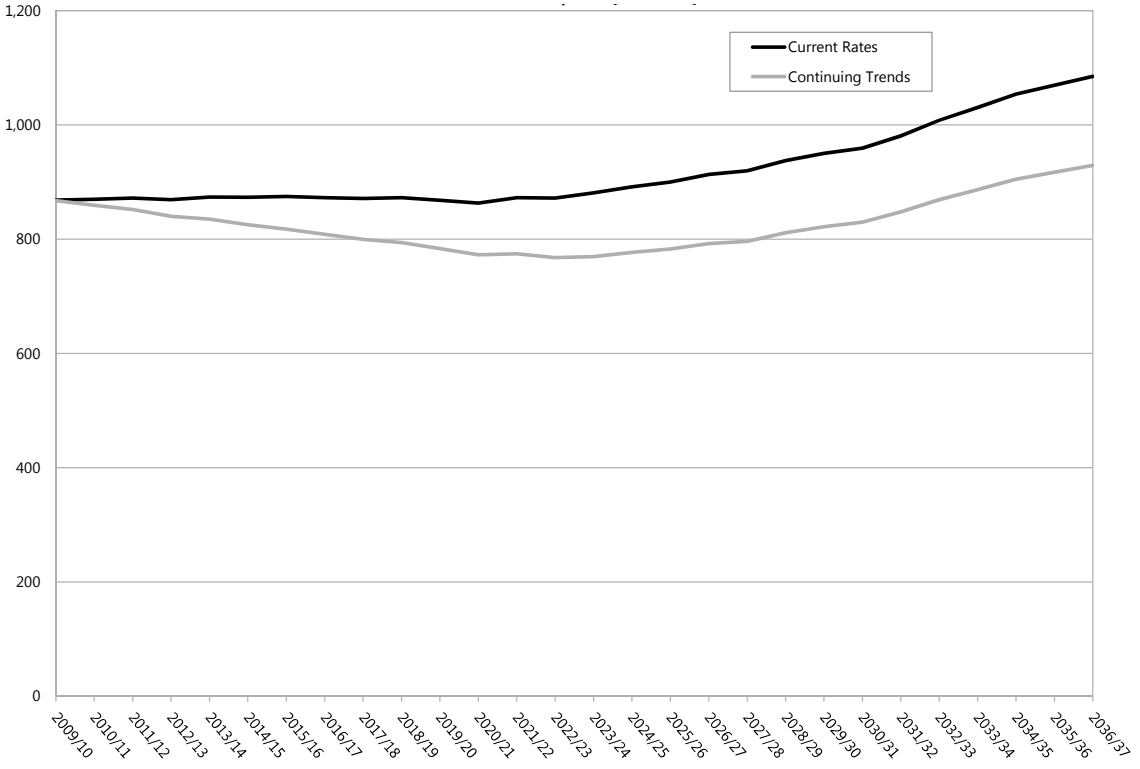
Appendix Table A1.3: Actual and Projected Populations for Adults Age 85+ by RHA

	Males				Females			
RHA	**2011**	**2021**	**2031**	**2036**	**2011**	**2021**	**2031**	**2036**
Parkland	553	1,019	548	874	638	922	722	1,021
Assiniboine	909	1,726	945	1,555	1,073	1,642	1,281	1,888
Brandon	436	926	469	878	575	919	763	1,159
Central	850	1,673	956	1,751	1,267	2,089	1,613	2,451
Winnipeg	5,255	12,235	6,198	11,435	7,945	12,703	10,699	16,292
Interlake	544	1,069	903	1,359	1,272	1,872	1,567	2,308
Noth Eastman	237	421	430	570	650	867	767	1,061
Nor-Man	81	186	74	122	109	154	174	205
South Eastman	370	678	511	845	774	1,180	969	1,463
Burntwood-Churchill	42	65	59	72	129	140	194	211
Manitoba	9,277	19,998	11,093	19,462	14,432	22,488	18,750	28,060

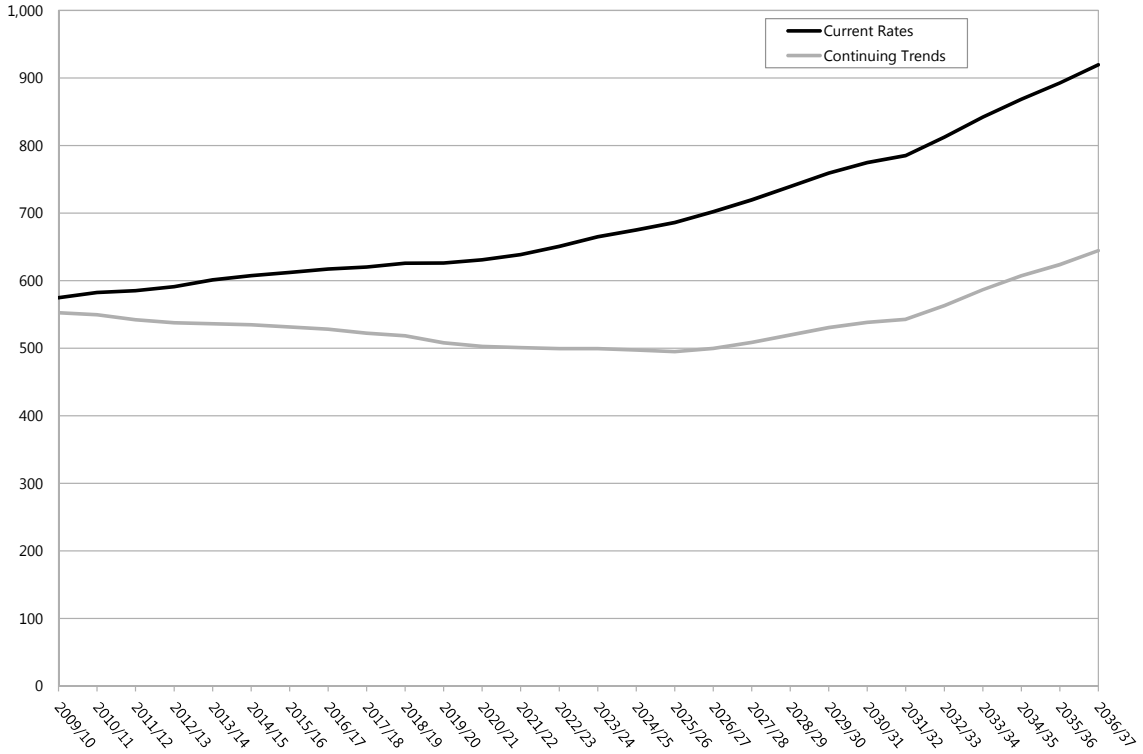
Appendix Figure A1.13: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Parkland RHA, 2009/10–2036/37



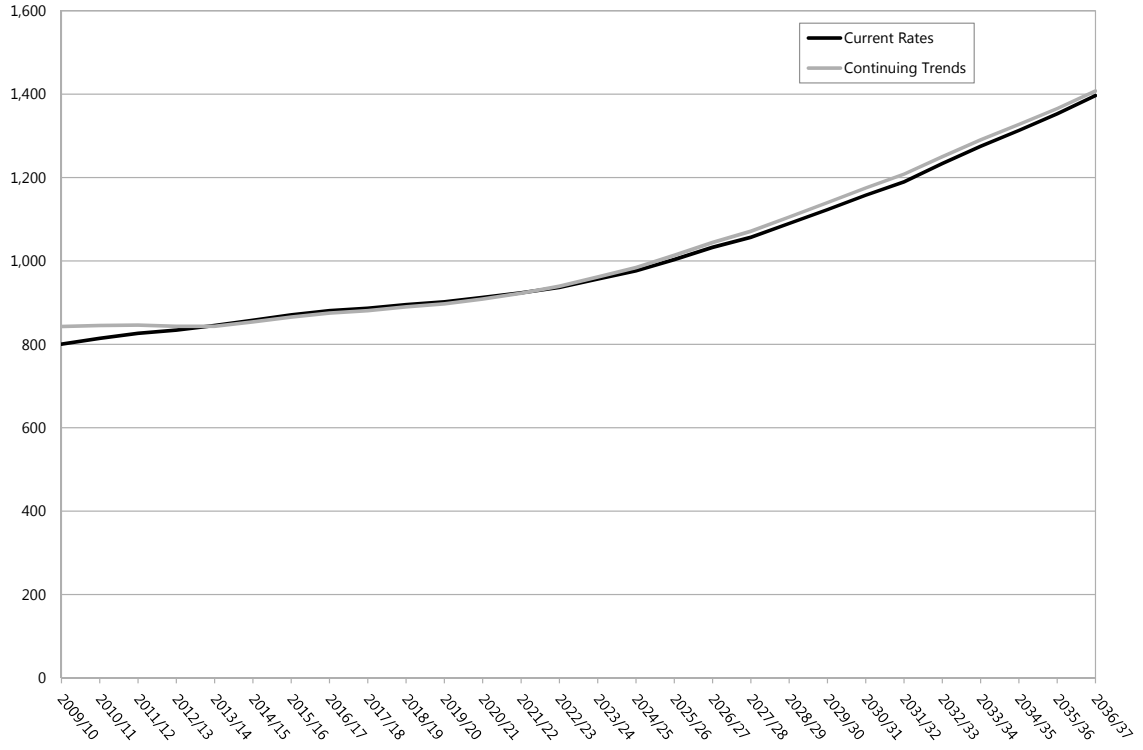
Appendix Figure A1.14: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenario, Assiniboine RHA, 2009/10–2036/37



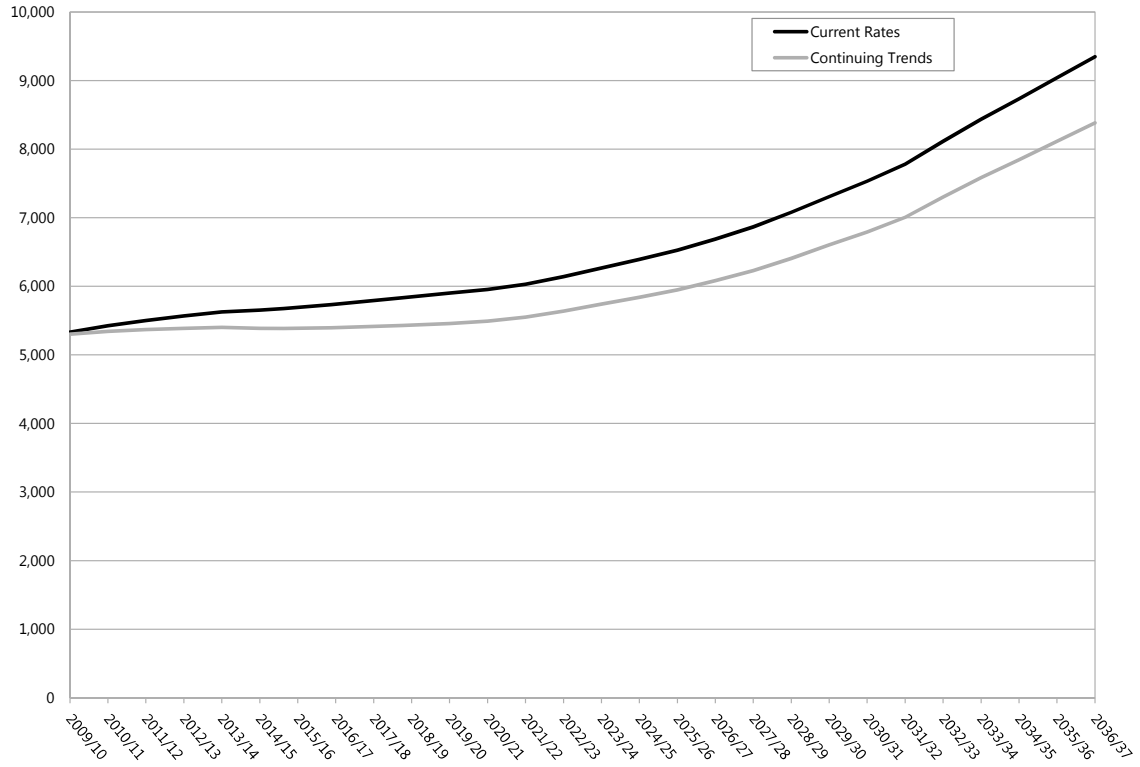
Appendix Figure A1.15: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Brandon RHA, 2009/10–2036/37



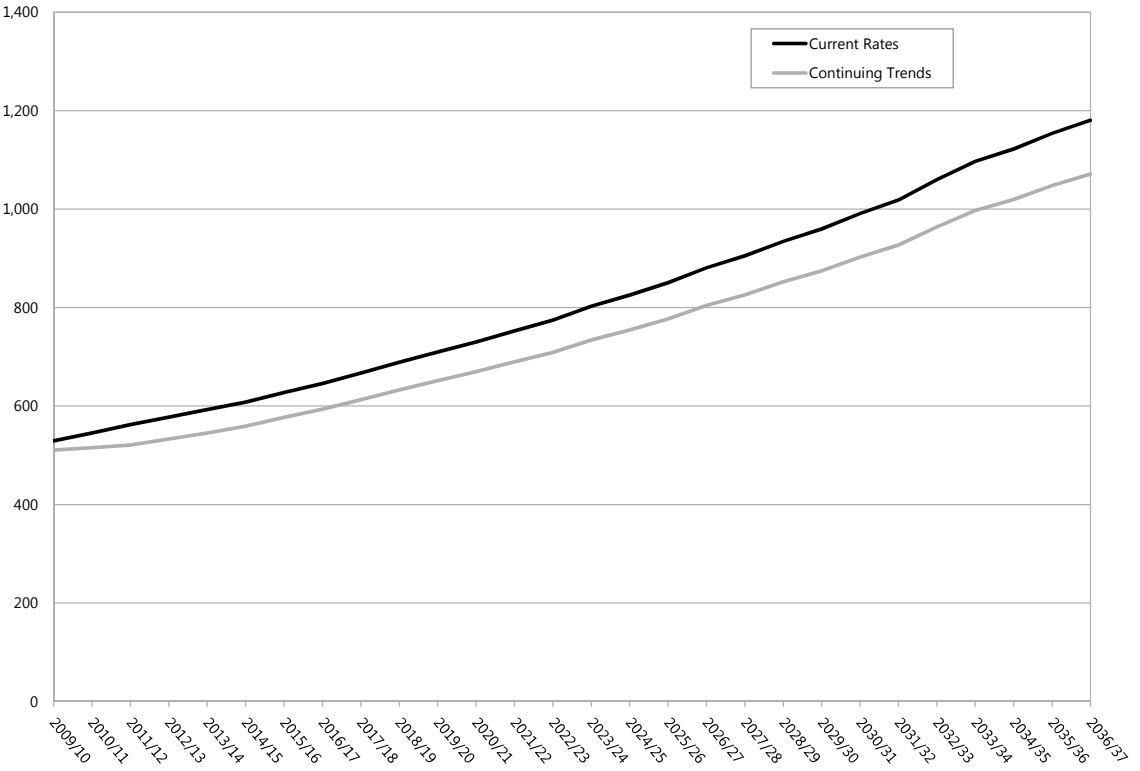
Appendix Figure A1.16: PCHBed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Central RHA, 2009/10–2036/37



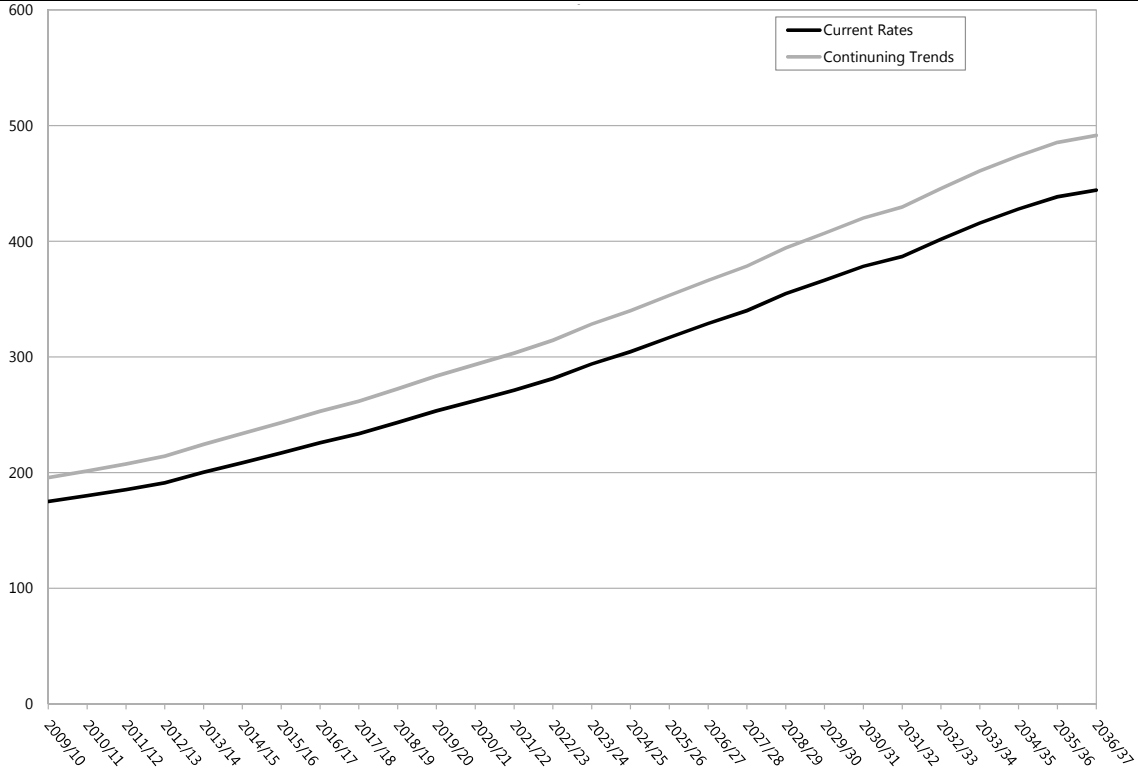
Appendix Figure A1.17: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Winnipeg RHA, 2009/10–2036/37



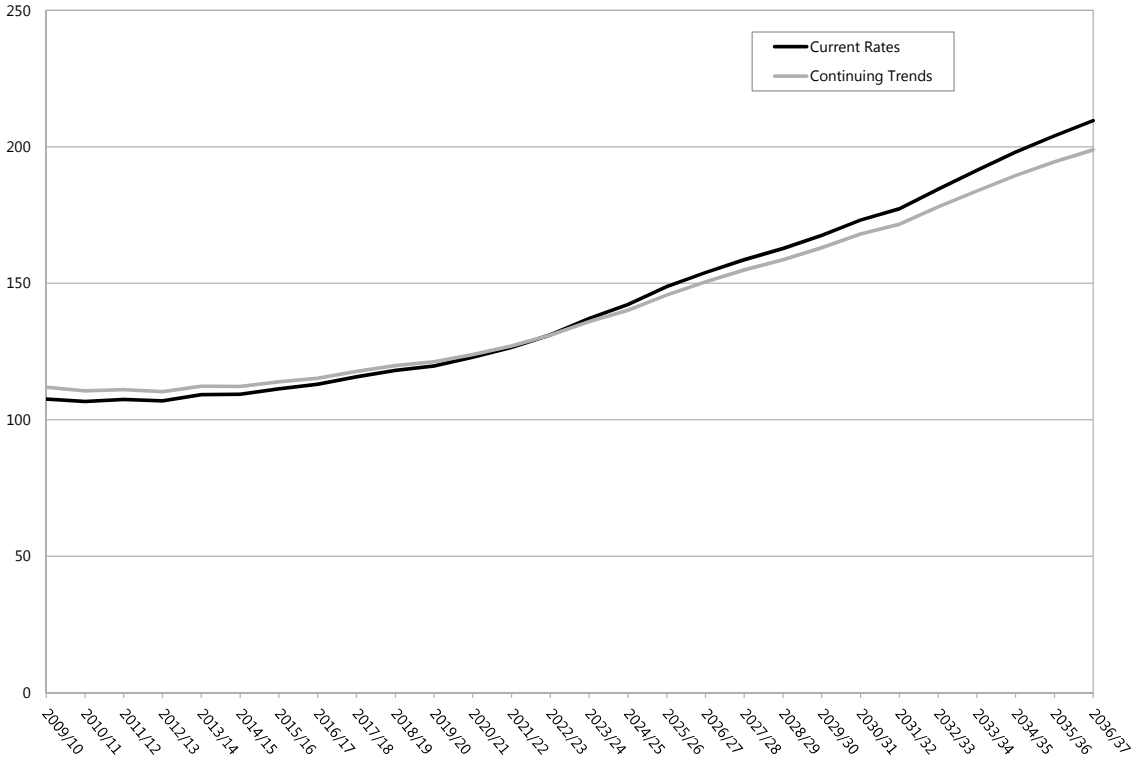
Appendix Figure A1.18: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Interlake RHA, 2009/10–2036/37



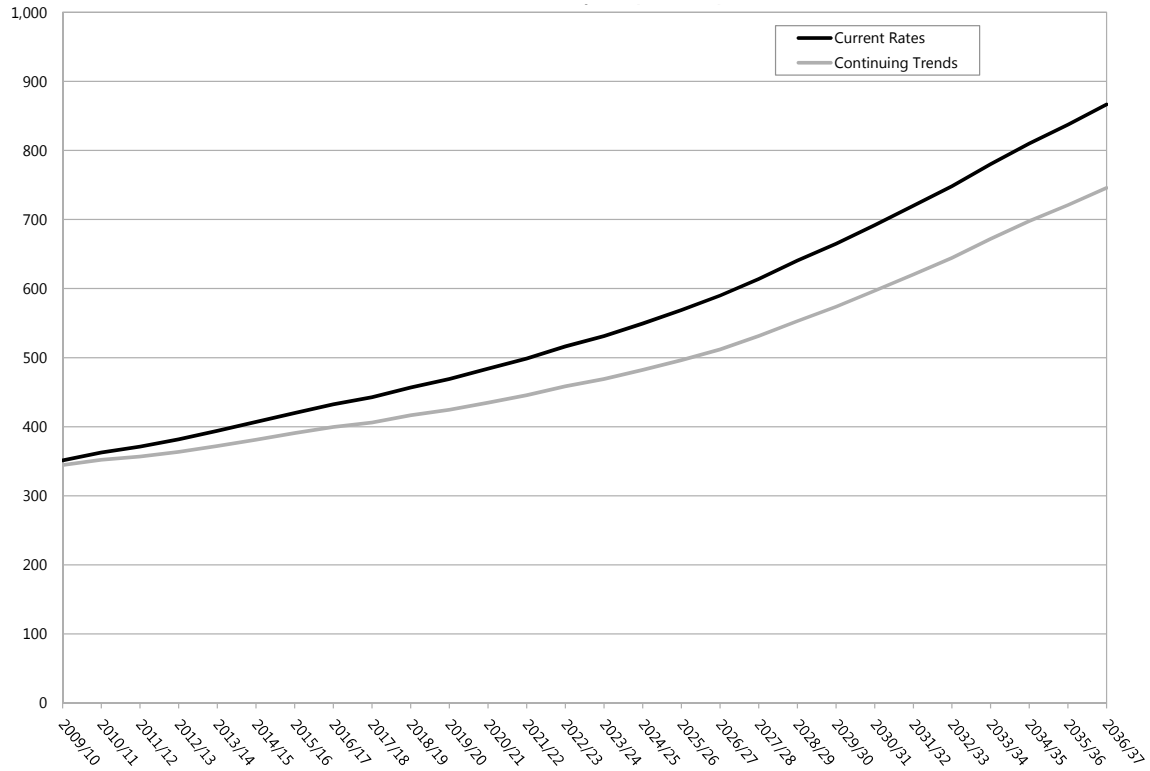
Appendix Figure A1.19: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios,North Eastman RHA, 2009/10–2036/37



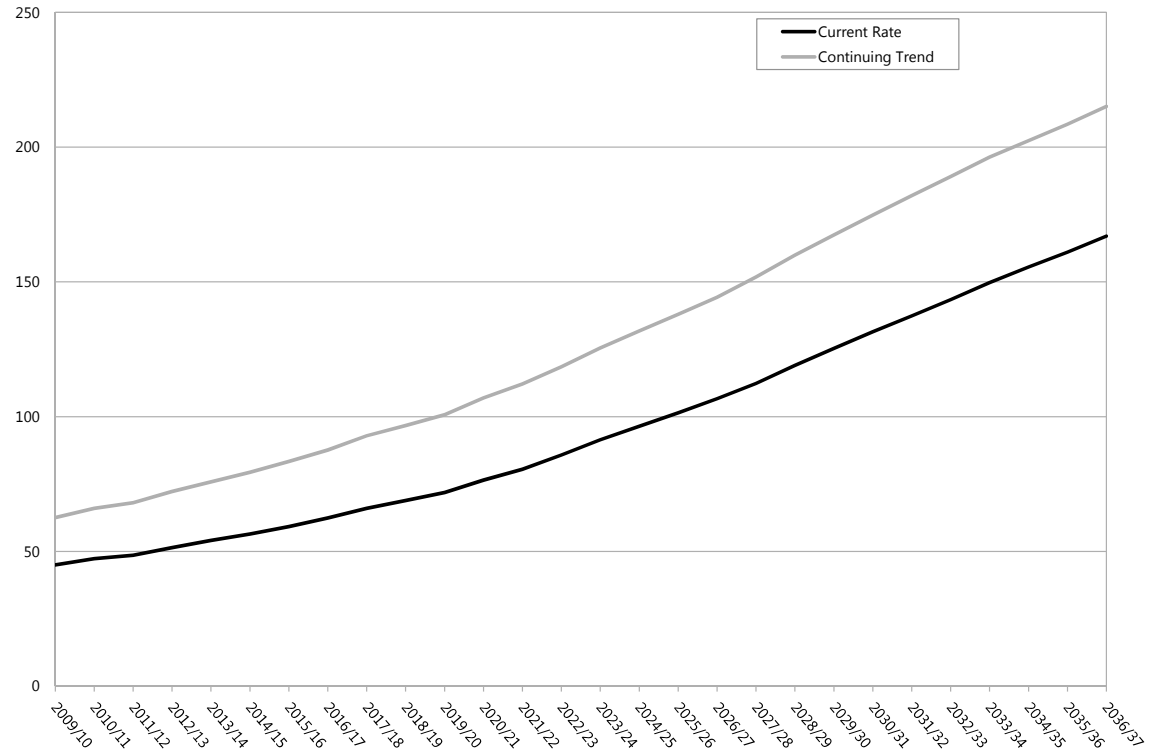
Appendix Figure A1.20: Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, NOR–MAN RHA, 2009/10–2036/37



Appendix Figure A1.21: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, South Eastman RHA, 2009/10–2036/37



Appendix Figure A1.22: PCH Bed Equivalent Projections Based on the *Current Rates* and *Continuing Trends* Scenarios, Burntwood–Churchill RHA, 2009/10–2036/37



Appendix 2

Appendix Table A2.1: Number of Previously Paneled Patients who were Admitted Directly from a Hospital to PCH

	2006/07		2007/08		2008/09	
RHA	People	% of All Admissions from a Hospital	People	% of All Admissions from a Hospital	People	% of All Admissions from a Hospital
Western	56	14.66%	72	18.85%	74	20.33%
Winnipeg	102	15.72%	125	18.66%	84	14.74%
Southern	70	34.83%	49	27.37%	55	27.23%
Interlake-Eastern	23	21.10%	27	23.89%	36	32.73%
Northern	7	20.00%	0	0.00%	9	52.94%
Manitoba	258	18.75%	273	20.19%	258	20.43%

Data for the former Churchill RHA is included in Northern RHA

Appendix 3

Appendix Table A3.1: Cox Proportional Hazards Regression on Time to PCH Admission

Parameter	Hazard Ratio (95% Confidence Interval)	Beta	Standard Error	p-value
Number of Children (ref=0)				
Cannot be determined	0.84 (0.76, 0.92)	-0.1789	0.0494	0.0003
1	0.73 (0.66, 0.81)	-0.3142	0.0499	<.0001
2	0.66 (0.6, 0.73)	-0.4168	0.0501	<.0001
3+	0.62 (0.56, 0.68)	-0.4817	0.0497	<.0001
Age Group (ref=65-69)				
70-74	2.89 (2.79, 2.99)	1.0619	0.0177	<.0001
75-79	5.93 (5.73, 6.14)	1.7802	0.0176	<.0001
80-84	11.2 (10.8, 11.62)	2.4163	0.0186	<.0001
85+	23.42 (22.49, 24.39)	3.1537	0.0207	<.0001
Sex (ref=Male)				
Female	-	-0.1777	0.0163	<.0001
Residence (ref=Non-Winnipeg)				
Winnipeg	0.89 (0.88, 0.91)	-0.1130	0.0106	<.0001
Marital Status of Females (ref=Unmarried Females)				
Married Females	0.77 (0.75, 0.79)	-0.2610	0.0146	<.0001
Marital Status of Males (ref=Unmarried Males)				
Married Males	0.6 (0.58, 0.62)	-0.5168	0.0185	<.0001

Appendix Table A3.2: Logistic Regression on Level of Care 3 or 4 vs. 1 or 2 on Admission to PCH

Parameter	Odds Ratio (95% Confidence Interval)	Beta	Standard Error	p-value
Number of Children (ref=0)				
Cannot be determined	1.06 (0.86, 1.31)	0.0577	0.1088	0.5958
1	1.21 (0.97, 1.5)	0.1892	0.1102	0.0861
2	1.28 (1.03, 1.59)	0.2453	0.1107	0.0267
3+	1.34 (1.08, 1.66)	0.2917	0.1092	0.0076
Age Group (ref=65-69)				
65-69	0.83 (0.74, 0.93)	-0.1827	0.0574	0.0015
70-74	0.75 (0.68, 0.84)	-0.2832	0.0533	<.0001
75-79	0.67 (0.6, 0.74)	-0.4062	0.0532	<.0001
80-84	0.55 (0.49, 0.61)	-0.5995	0.0544	<.0001
85+	0.47 (0.42, 0.52)	-0.7633	0.0571	<.0001
Sex (ref=Male)				
Female	-	-0.0871	0.0333	0.0089
Residence (ref=Non-Winnipeg)				
Winnipeg	0.94 (0.9, 0.98)	-0.0644	0.0217	0.0029
Marital Status (ref=Unmarried)				
Married	-	0.4092	0.0383	<.0001
Sex by Marital Status interaction (ref=Unmarried Males)				
Married Females	-	-0.1766	0.0479	0.0002

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