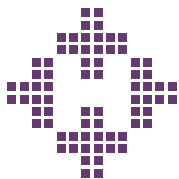


The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time?

September 2002



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

Verena H. Menec, PhD
Leonard MacWilliam, MSc, MNRM
Ruth-Ann Soodeen, MSc
Lori Mitchell, MA

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

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EXECUTIVE SUMMARY

Why This Report?

The Canadian population is aging; that is a fact. What impact the increase in the senior population will have on the health care system is subject to debate, however. One view is that the aging population will have a major negative effect on the health care system, with the increasing health expenditures being no longer sustainable given the current organization and funding of the health care system in Canada (Foot, 1996).

A more optimistic alternative to this "apocalyptic" scenario has also been proposed, however. This more moderate view takes several important factors into account. First, most seniors have few health problems and disabilities and continue to live independent and healthy lives into old age. Second, research indicates that the health of seniors is improving (e.g., Chen & Miller, 2000). Such improvements in health could offset (or at least reduce) the impact of the aging population. Third, increases in health care use may be driven not so much by an increasing number of seniors, but rather by a health care system which does much more to them now than was the case even a decade ago (Barer et al., 1995). Thus changes in the health care system have the potential to either magnify (if more and more is done to an increasing number of seniors) or reduce (if health care policy leads to a decrease in use) the impact of the aging population.

Clearly, the question of what impact the aging population will have on the health care system is of interest to both policy makers and the public. The Manitoba Centre for Health Policy was therefore asked by Manitoba Health to address this issue. The present report addresses three main questions:

- 1) How healthy are seniors in Manitoba?
- 2) Has the health of Manitoba's seniors improved? and
- 3) Has the health care use of seniors in Manitoba changed over time?

Focus of the Report

This report focuses on individuals aged 65 or older living in Manitoba. The term "seniors" will be used throughout this report to refer to these individuals. Whenever possible, seniors were further divided into those 65 to 74, 75 to 84, and 85 years or older. We refer to these age groups as young-old, middle-old, and oldest-old seniors, respectively.

A major emphasis of this report was the question of whether the health status and health care use of Manitoba's seniors has changed over time. We

therefore generally present trends over time - typically over a 13 to 15 year period. When possible, we present findings at four time points - 1985, 1990, 1995, and 2000, or the most recent year for which data were available (e.g., 1998 or 1999).

Summary of Findings

The Aging Population

The demographic make-up of the Manitoba population has undergone considerable changes in the past 15 years. While there were about 134,000¹ Manitobans aged 65 years or older in 1985 - or 12.1% of the total population, there were about 155,600 by the year 2000 - or 13.5% of the total population. It is projected that by 2020, seniors aged 65 or over will constitute 17.8% of the population.

Between 1985 and 2000, the increase in the number of seniors was driven by individuals aged 75 or older. The increase in the number of individuals 85+ years old has been particularly large, with a growth of 59%. During that time period, the number of individuals aged 65 to 74 remained virtually constant. In contrast, between 2000 and 2020, the greatest increase is expected among the young-old (those aged 65 to 74), with their numbers expected to increase by about 49,000 (a 62% increase). At the same time, the increase in the number of individuals aged 75 and over will slow down. The pattern will reverse again in about 2040 when the baby boomers reach the 75+ age range.

Most Seniors are Healthy and Live Independently in the Community

Most seniors are healthy and require few health care resources, particularly seniors aged 65 to 74. About two-thirds of seniors aged 65 to 74 reported being in good to excellent health, the majority were independent and did not require assistance with everyday activities, and most had no disabilities. Although virtually all seniors in that age bracket saw a physician at least once every year, only 15% were hospitalized, 7% used home care and only 1% lived in a Personal Care Home (PCH) in 1999.

Health declines and health care use clearly increases with age. Nevertheless, even among individuals aged 85 and over, a substantial proportion are still healthy and independent. For example, 70% to 80% of 85+ year old seniors living in the community reported being in good to excellent health and about one in five needed no help with basic activities of daily living. Similarly, in 1999 only about a third of 85+ year olds - about 6500 individuals - lived in a PCH.

The Health of Seniors Has Been Improving for Some Indicators

The health of Manitoba's seniors has been improving in a number of ways. Life expectancy has increased substantially for men (albeit not women) between 1985 and 1999. In 1985, men who lived to age 65 could expect to live 18.3 years longer; in 1999, they could expect to live 19.7 years longer - an increase of 1.4 years. Similarly, life expectancy at age 75 increased by .8 years for men (from 11.8 years of life remaining in 1985 to 12.6 in 1999).

¹ Population figures are rounded to the nearest 100 to simplify presentation.

Mortality rates have correspondingly declined for men age 65 to 74 and 75 to 84 (by 19% versus 10%, respectively, between 1984-86 and 1997-1999). This appears to have been due primarily to a decline in deaths due to heart disease. Consistent with this, hospitalization rates for acute myocardial infarction also declined significantly for both men and women aged 65 to 74 and 75 to 84 (by anywhere from 15% to 28%).

Health Care Use Has Declined

Rates of hospitalization days, as well as the proportion of seniors who were hospitalized declined, particularly among individuals aged 85 and over. For example, while 47% of people aged 85 and over were hospitalized in 1985 the percentage dropped to 32% by 1999. This is, in part, due to the major shift to outpatient surgery that occurred in the nineties. Physician use among seniors aged 85 and over also declined - from about ten visits to family and general practitioners per person to about seven visits per person. Moreover, age (and level of care) at admission to PCHs increased, indicating that seniors live in the community longer. Length of stay in PCHs has correspondingly decreased. This suggests that there is greater turnover in PCHs as seniors are increasingly older and frailer when admitted to a PCH. That seniors are able to stay in the community longer is likely due to a combination of better health and function, but also increased use of home care. Indeed, rates of home care days increased from 17% to 27% (depending on the age group) between 1995 and 1999.

A Minority of Seniors Use Most Hospital Days

Although seniors' hospital use declined from 1985 to 1999, they still consume a greater share of hospital resources than younger individuals. In 1999, 38% of inpatient hospitalizations involved seniors and they used 64% of all hospital days and were responsible for almost two-thirds of inpatient costs. However, this large share of hospital days - and cost - can be traced back to a small number of individuals. In 1999, 5% of seniors used 78% of all the hospital days that were consumed by seniors. These 5% of patients had very long lengths of stay averaging 91 days.

Chronic Diseases Are on the Rise

Although most seniors live relatively independently - and longer than ever - in the community, cancer and chronic diseases are common; and increasingly so. In 1997-99, 2% of seniors were newly diagnosed with cancer, 40% to 50% of seniors had hypertension, and about a quarter to a third had ischemic heart disease. Diabetes and asthma were also quite common.

Cancer incidence rates increased for men and women aged 65 to 74 over the past 15 years (by 18% vs. 13%), although the data suggest that rates are

starting to level off or even decrease in the most recent years. Moreover, hypertension, diabetes, and asthma diagnosis rates generally increased from 1985 to 1999. Dementia diagnosis rates also increased substantially.

Falls and Hip Fractures Are Still Common

Hospitalization rates for falls are high, particularly among the oldest-old women, and rates have not changed significantly in the last 14 years. In 1999, 75 per 1000 women aged 85 and over were admitted because of a fall. Given that hip fractures are a common consequence of falls, hip fracture rates among the oldest-old women were also high - 28 per 1000 women age 85 and over in 1999.

High Profile Surgical Procedures, Prescription Drug Use and Drug Costs Have Increased

Total knee replacements, total hip replacements and coronary artery bypass operations increased substantially from 1990 to 1999 (by 75%, 66%, and 54%, respectively). Moreover, the number of prescriptions per person increased for all age groups between 1995 and 1999. The increase was particularly large among individuals aged 85 and over, with an increase of 80%. The cost of prescriptions also increased from 1995 to 1999. Indeed, it increased more than the number of prescriptions per person. For example, among the 85+ year olds, the prescription cost per person more than doubled, increasing from \$353 to \$717.

Conclusions

- The population is aging; that is a fact. However, the effect of the aging population on the health care system is more likely to move like a glacier than an avalanche. From 2000 to 2020, the increase in the senior population will be driven by individuals aged 65 to 74. These seniors are generally in good health and require relatively few health care services.
- The increase in individuals aged 75 to 84 and 85+ will be relatively small between 2000 and 2020. Indeed, the health care system has had to cope with a larger increase in seniors aged 75 or older between 1985 and 2000 than will be the case from 2000 to 2020. Although seniors aged 75 or older consume more health care resources than younger seniors, it is important to recognize that many of them remain healthy and independent into old age. For example, even among the oldest-old, only about a third of seniors (about 6500 individuals) lived in a PCH in 1999.
- There are also signs that the health of seniors in Manitoba, including the health of the oldest-old, has been improving. Thus, although the number of seniors will increase, they may require fewer health care services than was the case in the past.
- While the health of seniors has improved in terms of some indicators, chronic diseases (hypertension, diabetes, asthma and dementia diagnoses) and cancer are on the

rise, although the data suggest that cancer incidence rates are levelling off or even decreasing in the most recent time periods. Whether these trends reflect actual increases in incidence or prevalence or changes in practice patterns is not clear (e.g., greater emphasis on cancer screening or changes in how physicians diagnose patients such as changes in diagnostic criteria as is the case for diabetes). Regardless, diagnoses tend to lead to treatment, which may in part account for the increased drug use. The question of whether increased cancer screening and drug use result in better health in the long run is an important one that will need to be addressed.

- Falls are a particular concern for seniors. A large proportion of falls lead to serious injury such as hip fractures, that can seriously impair function, possibly necessitating admission to a nursing home. The present report shows that hospitalizations for falls and hip fractures are quite common among the oldest-old seniors, particularly among women. This suggests a continuing need for programs focusing on injury prevention.
- Although seniors used nearly two-thirds of all hospital days - and contributed nearly two-thirds to inpatient cost - this was due to a small number of individuals. Many of the hospital days used by these individuals likely did not require care in acute care hospitals. Although waiting times for admission to personal care homes have declined substantially over the years, timely discharge of patients to PCHs and chronic care facilities should remain a priority. As suggested by a previous Manitoba Centre for Health Policy report, factors associated with delays in getting diagnostic tests or consultations, as well as factors linked to delays in the referral process to home care should also be reviewed (Bruce et al., 2001). Similarly, alternatives to acute care, such as increasing the capacity for patients requiring rehabilitation or palliative care should be examined.
- The majority of seniors - even seniors aged 85 and over - live in the community and seniors are living in the community longer than ever. This suggests that, as the number of seniors rises further, there will be an increasing need for home care services. The need for alternative types of housing, such as supportive housing, is also likely to increase.
- Similarly, expansion of community-based programs needs to be considered, including primary health care services focusing on injury prevention, health promotion, and chronic disease management. In addition, other community programs, such as shared meal programs, handyman services, social programs, and transportation are important. Such support services are not care services, but are nevertheless essential in allowing seniors to live independently in the community (Havens & Kyle, 1993).

- Many seniors receive support from family members. As seniors stay in the community longer, this can place an increasing burden on family members. Indeed, we found that respite care - temporary admission to a PCH to relieve family members - increased significantly for men between 1985 and 1999. This upward trend can be expected to continue, as spouses and children are also aging and may increasingly require relief when the caregiver burden becomes too great. Such relief might be provided, as is currently the case, by temporarily admitting individuals to PCHs or through home care services in people's homes. Whether the support provided to informal caregivers is sufficient and to what extent it will meet future need will have to be reviewed.

- Although population projections and changes in health status are important, they are clearly not the only factors that determine health care use. One critical issue is how much treatment seniors receive and whether more and more treatment is provided - and whether more intensive treatment is in fact appropriate. The present report suggests a few areas that will require close scrutiny. The issue of cost-effectiveness of prescription drugs is a critical one that will have to be addressed as drug costs escalate. Second, knee replacements, hip replacements, and coronary artery bypass surgery have increased markedly over the past 10 years. The challenge will be to determine for whom - and under what conditions - these procedures are most appropriate.

1.0 WHY THIS REPORT?

The Canadian population is aging; that is a fact. What impact this will have on the health care system is subject to debate, however. One view is that the increasing senior population will have a major negative effect on the health care system. Indeed, the aging population is already blamed for current pressures on the health care system, ranging from overcrowding of emergency rooms (Mackenzie & Wild, 1998) to the escalation of health care costs (Northcott, 1994). Even more dire consequences are predicted for the future, with the increasing health expenditures, it is argued, being no longer sustainable given the current organization and funding of the health care system in Canada (Foot, 1996). The term "apocalyptic demography" has been coined to refer to this doomsday scenario (Gee & Gutman, 2000).

The logic behind the apocalyptic demography is quite straightforward: health declines with age and, consequently, health care use increases with age. As the number of seniors rises, they will therefore require more health care services and, consequently, will place an increasing burden on the health care system. While nobody would question that health declines and health care use increases with age, at the heart of the population aging debate is the question of the magnitude of the problem that the increasing senior population will pose for the health care system. As Barer and his colleagues (1995) put it, the question is whether the effects of the demographic trends move like glaciers or like avalanches. Proponents of the apocalyptic scenario clearly favour the avalanche view.

A more optimistic alternative to the apocalyptic scenario has also been proposed, however. This more moderate view takes several important factors into account. First, most seniors have few health problems and disabilities and continue to live independent and healthy lives into old age (National Advisory Council on Aging, 2001). Second, the health of seniors is improving. Canadian and international studies show that seniors of today are healthier and have fewer disabilities than their counterparts in the past (e.g., Chen & Miller, 2000; Doblhammer & Kytir, 2001; Manton, 1991). This is consistent with the compression of morbidity hypothesis (Fries, 1983), which predicts that people not only live longer, but that the onset of chronic diseases will occur later and later, with morbidity being compressed into a shorter period of time before death. Thus, although the number of seniors will increase, improvements in health are likely to offset (or at least reduce) their impact on the health care system.

Third, increases in health care use may be driven not so much by an increasing number of seniors, but rather by a health care system which does much more to them now than was the case even a decade ago (Barer et al., 1995). Indeed, research indicates that the aging population has contributed only

minimally to the increase in health care cost (Evans et al., 2001). Thus changes in the health care system have the potential to either magnify (if more and more is done to an increasing number of seniors) or reduce (if health care policy leads to a decrease in use) the impact of the aging population.

Clearly, the question of what impact the aging population will have on the health care system is of interest to both policy makers and the public. The Manitoba Centre for Health Policy was therefore asked by Manitoba Health to address this issue. The present report focuses on three main questions:

- 1) How healthy are seniors in Manitoba?
- 2) Has the health of Manitoba's seniors improved? and
- 3) Has the health care use of seniors in Manitoba changed over time?

2.0 METHODS

2.1 Focus of the Report

This report focuses on individuals aged 65 or older living in Manitoba. The term "seniors" will be used throughout the report to refer to these individuals. Whenever possible, seniors were further divided into those 65 to 74, 75 to 84, and 85 years and older. We refer to these three age groups as young-old, middle-old, and oldest-old seniors, respectively. For a few indicators we combined the two oldest age groups because the numbers would have otherwise been too small and, therefore, too unreliable. In these instances, we present data for individuals aged 65 to 74 and 75+.

The focus of the report is Manitoba as a whole. The question of whether there are regional variations in seniors' health status and health care use over time was beyond the scope of the report.

The main research questions were whether the health status and health care use of Manitoba's seniors has changed over time. We therefore generally present trends over time - typically over a 13 to 15 year period. When possible, we present findings at four time points - 1985, 1990, 1995, and 2000, or the most recent year for which data were available (e.g., 1998 or 1999). Although we plot findings at four time points only, it should be noted that we examined patterns for all years, to ensure that the plotted years were not unusual. Some exceptions exist in terms of the years we were able to include. For example, we used 1986 and 1996 census data to determine the relative affluence of different neighbourhoods in which seniors lived. Similarly, home care data and pharmaceutical data were available only from 1995 onward.

2.2 Data Sources

This report was primarily based on anonymized (no names, no addresses) administrative data contained in the Population Research Repository, which is housed at the Manitoba Centre for Health Policy. We used the full range of databases including: hospital files, physician data, vital statistics data, personal care home data, home care data, pharmaceutical files, and census data. In addition, we obtained cancer data from the Manitoba Cancer Registry maintained by CancerCare Manitoba.

Administrative data were supplemented in a few instances by survey data, specifically the Aging in Manitoba database and the National Population Health Survey. Aging in Manitoba (AIM) is a longitudinal study that started in 1971, with participants being interviewed on as many as five occasions. For the present purposes, data from the surveys conducted in 1983 and 1996 were used. The National Population Health Survey (NPHS) is a

national survey that started in 1994 and is conducted on a bi-yearly basis. We used Manitoba data from the 1996 survey here, focusing on people aged 65 or over only. AIM and NPHS data were used to add information related to well-being not available in the administrative data, such as seniors' perceptions of their own health, function, and disability.

2.3 Health Status and Health Care Use Indicators

This report includes a range of indicators that measure seniors' health status and health care use. Definitions are provided in Appendix A. We chose indicators that we could reliably measure with the data available. Moreover, indicators had to be relevant to a large segment of the senior population, rather than a small subgroup only. Furthermore, we generally focused on indicators that we could measure over time, although in a few instances we present data for one time point only (e.g., indicators related to functional impairment).

2.4 How We Interpret Findings

We used trend tests to determine if changes in health or health care use were statistically significant over time (see Appendix A for details). Rates that did not change in a statistically significant way over time are described as having remained constant. It should be noted that some rates, when graphed, appear to have decreased or increased, even though statistical tests indicated that they did not change. This can happen when the numbers are small and there is a lot of variability in the data. It is important not to over-interpret graphed data in these instances.

To put changes in health status or health care use into context, we report the percent change from 1985 to the most recent year of data. While this indicates by how much the earliest and most recent years differ, it is important to keep in mind that there may be some fluctuation for the years in between. For example, the percent change might be larger (or smaller) had we compared 1985 to 1990 or 1995.

2.5 A Note on Rates

Throughout this report we present age-specific crude rates. Rates are essentially proportions. They are calculated by dividing, say deaths among seniors aged 85 and over during a given time period by the population aged 85 and over during the same time period. This provides a measure of the proportion of the population in the age group that died.

Age-specific crude rates were calculated for two reasons: First, we wanted to examine patterns separately for the three age groups (65 to 74, 75 to 84, and 85+) because their health status and health care use differs considerably.

Second, age-specific crude rates allow fair comparisons across years by taking population changes into account.

It is important to have a clear understanding, however, of what changes in these age-specific crude rates mean. An upward trend indicates that the number of people with, for instance, a chronic disease, has increased over and beyond population increases. A downward trend indicates that, proportionally, the number of cases (numerator) has either declined or has increased to a slightly lesser extent than the population (denominator). In other words, while the age-specific crude rate can show a decrease over time, it is possible that the number of cases actually increased.

An example will illustrate this point. Let us assume that in a population of 100, 20 individuals had a chronic disease, resulting in a rate of 0.2 (20/100). Over time, the population increased to 150 and the number of individuals with the disease is now 23, for a new rate of 0.15 (23/150). The rate declined, but the number of cases increased. Thus, in thinking about the impact of the aging population on the health care system, it is important to keep in mind that although we may show a decline in rates, there may still be a net increase in actual cases that the health care system has to deal with.

The same issue applies to comparisons of rates between different age groups. While rates among individuals aged 85 and over are often higher than for any other age group, in some instances the actual number of cases is in fact lower. Rates are higher in those cases because the population aged 85 and over (i.e. the denominator) is quite small.

2.6 How This Report Is Organized

The findings in this report are presented in three sections. In section one, we provide a description of the population. This includes an overview of the demographic changes that have occurred in Manitoba and across the country, as well as the demographic changes expected for Manitoba by the years 2010 and 2020 (as projected by the Manitoba Bureau of Statistics). We also present a brief description of the socio-economic characteristics and marital status - both factors related to the need for health care - of Manitoba's seniors. In section two, we focus on health status indicators, including life expectancy, mortality, hospitalizations for acute myocardial infarction (heart attacks) and hip fractures (we refer to these as demand-driven hospitalizations), cancer incidence, chronic diseases, and self-rated health, functional impairment, and pain and disabilities. In section three, we describe seniors' health care use. We examine trends in hospital use, physician use, home care use, personal care home (nursing home) use, and prescription drug use.

All years are based on the fiscal year (April 1 to March 31), except for the mortality and cancer data, which are based on calendar years (January 1 to December 31). For mortality rates, we present three-year data, because the number of deaths can fluctuate considerably from one year to the next. Thus, instead of presenting mortality rates for 1985 only, we included data from 1984 through to 1986; similarly, we present data for 1989 to 1991, 1994 to 1996, and 1997 to 1999. We used the same approach for cancer incidence rates (rates of new cancer cases). Graphs showing death rates and cancer incidence therefore display time periods on the horizontal axis, rather than individual years. Similarly, we used three (fiscal) years of data to identify individuals with chronic diseases (e.g., diabetes and hypertension; see Appendix A for details). Again, the graphs therefore show the time periods during which we identified diagnoses for chronic diseases on the horizontal axis, rather than single years.

2.7 Data Limitations

Some data limitations should be highlighted. First, some inconsistency exists in the years that we were able to include. For example, we were able to examine some indicators up to the year 2000, but others only up to 1997. Second, we were not able to examine in detail some important indicators of health status. For example, arthritis - perhaps the most common chronic disease of seniors - is not easily captured using administrative data. Similarly, we could not look at Alzheimer's disease - a form of dementia that is very much in the public eye - although we do present data on dementia in general.

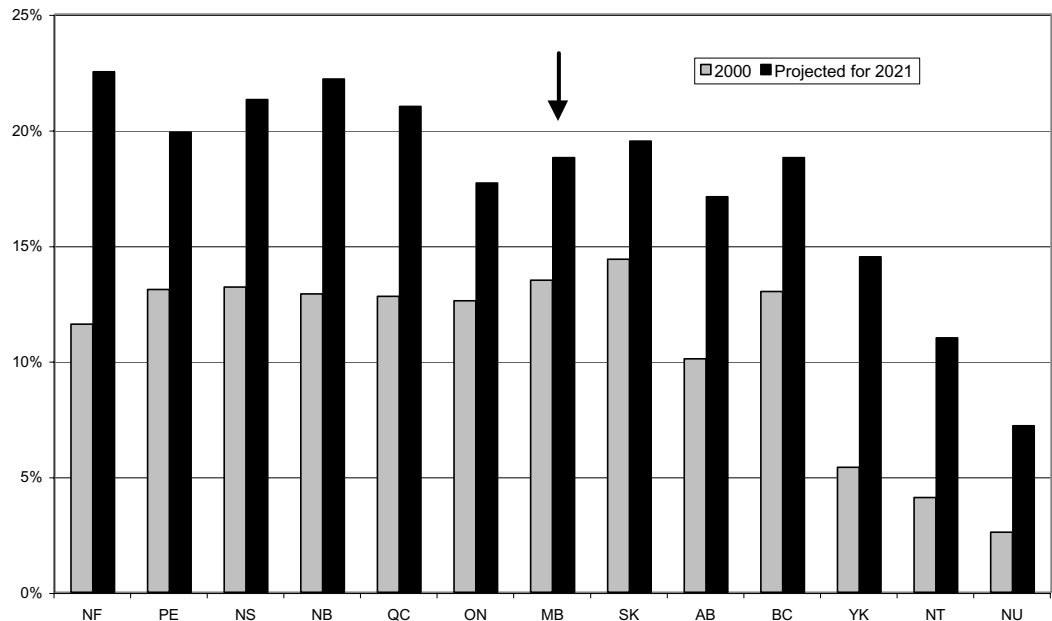
Third, rates for chronic diseases are based on contacts with the health care system. They may therefore underestimate true prevalence (the number of existing cases) because not everybody may seek medical attention. It is also at times not easy to determine the reasons for certain trends, as they may reflect changes in disease prevalence or changes in how physicians use diagnoses. For example, while memory loss might have been interpreted as a normal part of aging in the past, it may now be diagnosed as dementia. Similarly, diagnostic criteria for certain diseases, specifically diabetes, have changed, with the threshold for diagnosing being lower now than in the past (Meltzer et al., 1998). This means that people will now be diagnosed with diabetes who would not have been diagnosed with it in the past.

3.0 THE POPULATION

3.1 Population Projections for Canada

Like the populations of all developed nations, the Canadian population has been aging, and will continue to age. Population aging refers to an increase in the proportion of seniors in the general population. Figure 1 shows the percentage of people aged 65 or older in 2000 and projections for 2021 across the provinces and territories (see Health Canada, 2002). Noteworthy is the marked variability in projected demographic shifts across the provinces and territories. For example, while the percentage of seniors is expected to increase from 11.6% to 22.5% in Newfoundland - a 10.9% increase - only a 5.1% increase is projected for Saskatchewan and Ontario.

**Figure 1: Per cent of Population Age 65+,
by Provinces and Territories, 2000 and Projected for 2021**



Data source: Statistics Canada

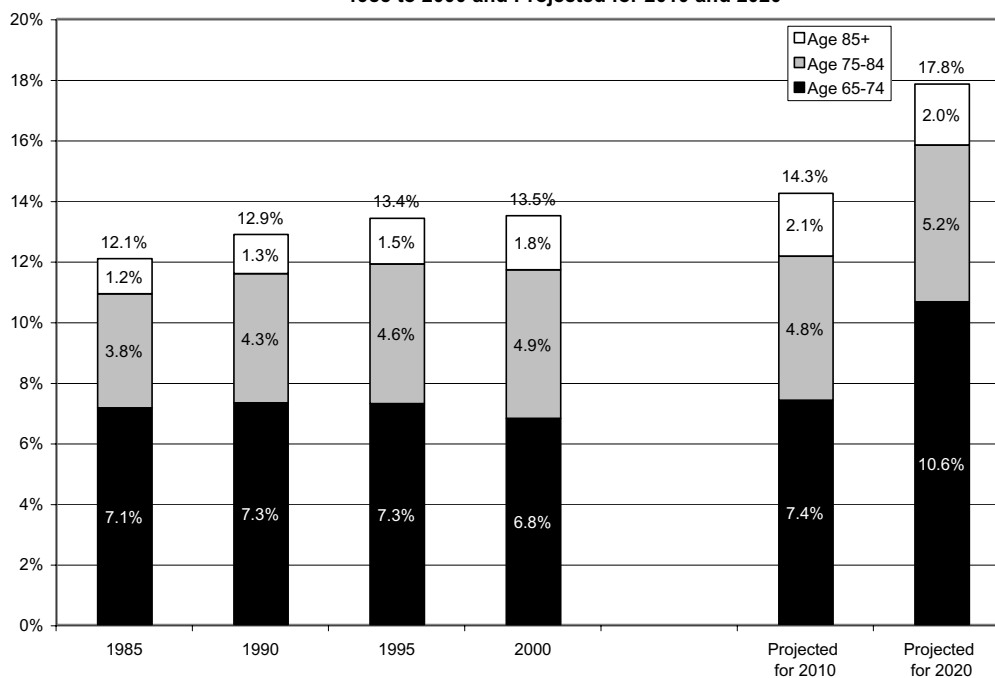
In Manitoba, the proportion of seniors is expected to increase from 13.5% in 2000 to 18.8% in 2021 - a 5.3% increase. Thus, the projected increase in seniors in Manitoba is comparable to that for Saskatchewan and Ontario and is considerably smaller than that expected for the Atlantic provinces, Alberta, Yukon, and the Northwest Territories. This suggests that population aging - at least in the next 20 years - may not have as much of an impact in Manitoba as in other provinces or territories. Also noteworthy is that Manitoba already has a slightly larger proportion of seniors than other provinces or territories; only one province - Saskatchewan - had an even higher proportion in 2000. Thus, the health care system in Manitoba has

already had to deal with a slightly larger proportion of seniors than other provinces and territories.

3.2 Population Projections for Manitoba

Figure 2 shows the proportion of seniors in the Manitoba population from 1985 to 2000, and projections for 2010 and 2020,² as estimated by the Manitoba Bureau of Statistics. While individuals aged 65 or older constituted 13.5% of the total population in 2000, the percentage is expected to increase to 14.3% by 2010 and 17.8% by 2020.³ This represents an increase of 57,800 individuals aged 65 or over (a 37% increase relative to 2000) between 2000 by 2020.

Figure 2: Per cent of the Manitoba Population Age 65+, 1985 to 2000 and Projected for 2010 and 2020



Data source: Population Research Repository and Manitoba Bureau of Statistics

In Figure 3 we provide a more detailed look at the changing age structure of the Manitoba population by overlaying the population pyramid for the year 2000 with that projected for 2020. Clearly evident are the projected decreases in the number of children and young adults and the corresponding increase in older adults and seniors, as the baby boom bulge moves up the age ladder.

² Projections are provided here for 2020 rather than 2021, the year provided by Statistics Canada, in order to be consistent with other reports produced by the Manitoba Centre for Health Policy.

³ Note that there are slight inconsistencies between census figures generated by Statistics Canada versus those from Manitoba. While Statistics Canada projects (using a medium growth scenario) that seniors will constitute 18.8% of the Manitoba population in 2021, the Manitoba Bureau of Statistics projects the proportion to be at 18.3% in 2021 (17.8% in 2020).

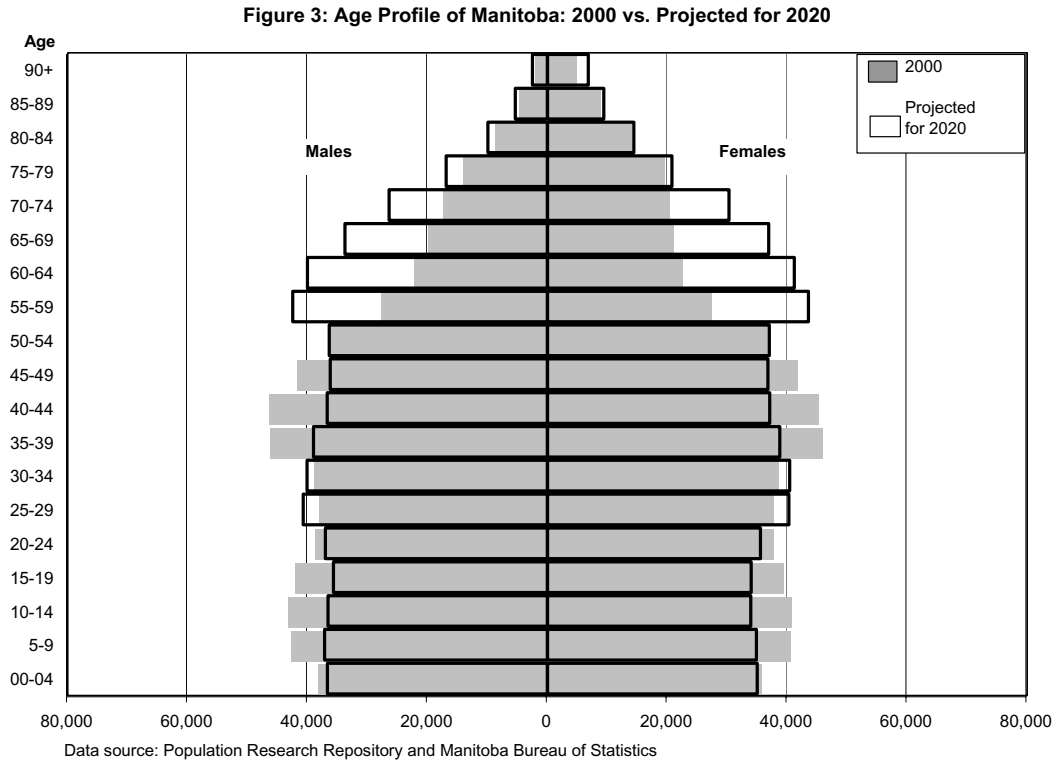
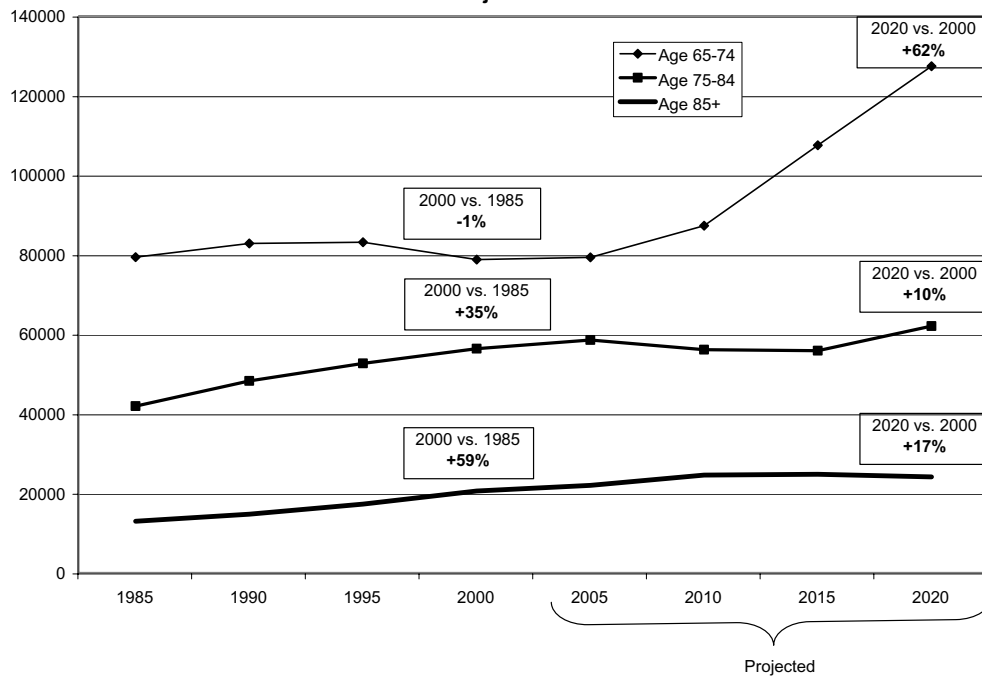


Figure 4 shows the actual increases in the number of seniors from 1985 to 2000 and the increases expected between 2000 and 2020. While there were about 134,000³ Manitobans aged 65 years and older in 1985, there were about 155,600 by the year 2000 (a 16% increase). As Figure 4 shows, this was due to an increase in the number of individuals aged 75 and older, with the number of people aged 65 to 74 remaining virtually constant (and even slightly declining) over the 15 years. The increases in the older age groups were substantial: in 2000 there were about 14,400 more individuals between the ages of 75 and 84 than in 1985 (a 35% increase) and about 7,600 more individuals aged 85 and over (a 59% increase).

Between 2000 and 2020, the number of individuals aged 65 or over is expected to increase by close to 58,000 (a 37% increase). This is due to a dramatic increase in the number of seniors aged 65 to 74, as the baby boom generation reaches that age range. The number of individuals aged 65 to 74 is expected to increase by almost 49,000, relative to 2000 (a 62% increase). In contrast, the number of people aged 75 to 84 is expected to grow much less dramatically (by 5700 individuals or a 10% increase). Similarly, the increase in the number of individuals aged 85 and over is expected to slow down, with an expected increase of 3500 individuals projected from 2000 to 2020 (a 17% increase).

³ Population figures are rounded to the nearest 100.

Figure 4: Number of People Age 65+ in Manitoba, 1985 to 2000 and Projected for 2005 to 2020



Thus Figure 4 makes two important points: first, in the past 15 years the increase in the senior population has been driven by individuals aged 75 or over; second, between 2000 and 2020, the increase will be driven by seniors aged 65 to 74. The pattern will reverse itself again if we look even further into the future, as the baby boomers continue to age and move into the 75+ year old age bracket. Thus, from about 2040 on, the number of seniors aged 75 or over can be expected to increase quite substantially again.

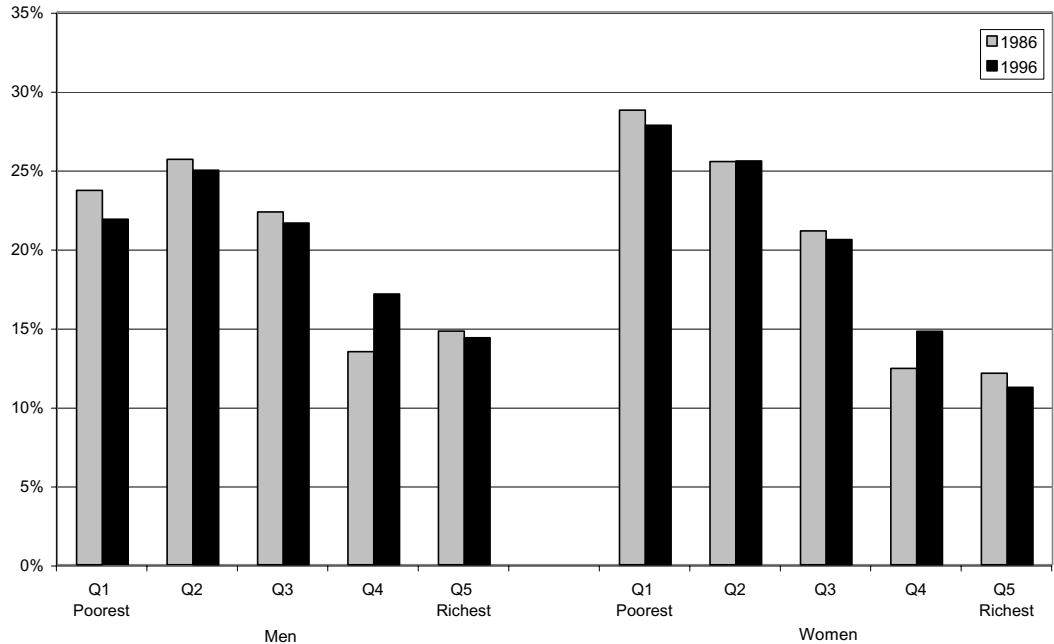
3.3 Population Factors Related to Need for Health Care

3.3.1 Income

Income is an important determinant of health (e.g., Wilkinson, 1996; Ross et al., 2000). The relation between income and health takes the form of a gradient, with the richest people being healthier than people in the mid-income range, who in turn, are healthier than the poorest individuals. We examined potential changes in seniors' income by using Census data, which provide a measure of the relative affluence of the neighbourhood in which people live. Areas were grouped into five categories containing 20% of the entire population (not just the senior population). These five categories are referred to as income quintiles, with income quintile 1 (Q1) including the poorest neighbourhoods and quintile 5 (Q5) the richest. By examining what percentage of seniors fall into each of the quintiles, we are able to see how they differ from the general population.

Figure 5 shows that seniors lived in less affluent neighbourhoods than the general population. This trend is particularly evident for women: 29% of women aged 65 or older lived in the poorest neighbourhoods in 1986.

Figure 5: Per cent of Population Age 65+ in Each Income Quintile, 1986 vs. 1996



Data source: Population Research Repository. Data are based on fiscal years.

Note: Income quintiles rank neighbourhoods in terms of their relative affluence, with quintile 1 (Q1) being the poorest, and quintile 5 (Q5) the richest neighbourhoods.

The average household income in these poorest neighbourhoods was \$18,906. Only 12% of women lived in the richest neighbourhoods, which had an average household income of \$54,122. In 1996, 28% of women lived in the poorest neighbourhoods (average household income = \$25,513), and only 11% in the most affluent neighbourhoods (average household income = \$77,567).

Although the trend for seniors, and particularly women, to cluster into relatively poorer neighbourhoods is still evident in 1996, a slight shift towards seniors living in more affluent neighbourhoods occurred. As can be seen in Figure 5, there is a small increase in the percentage of seniors in quintile four, and a corresponding decrease in the percentage of seniors living in the poorer neighbourhoods. For example, 4% more men lived in the second-most affluent neighbourhoods in 1996 than in 1986.

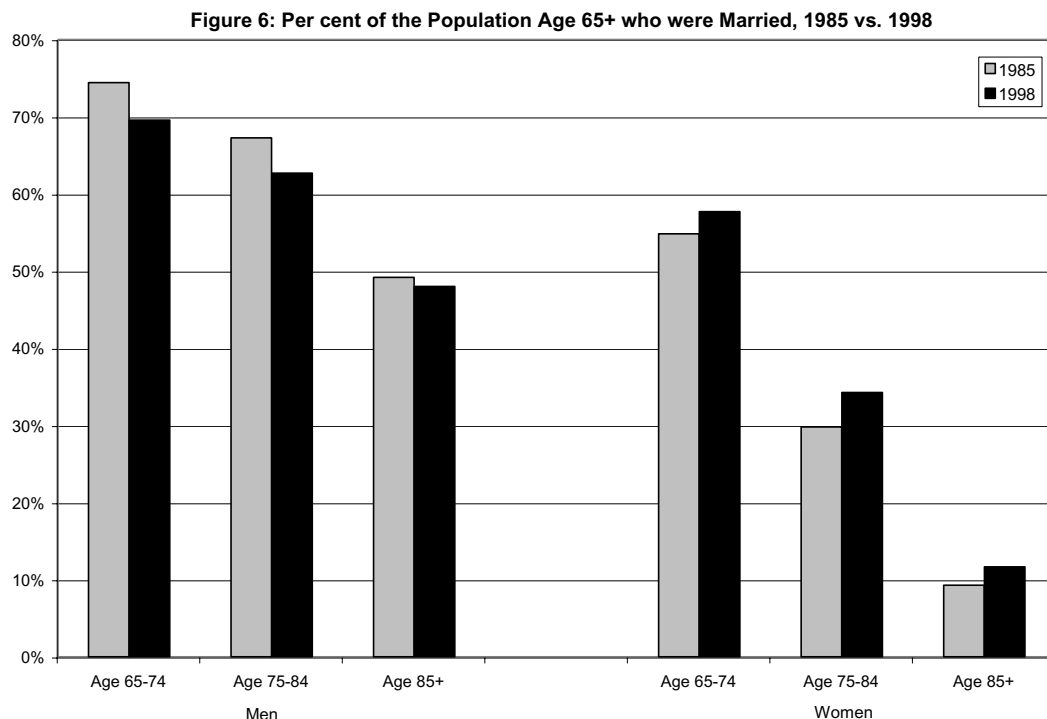
We also examined main sources of income among seniors, drawing on data from the National Population Health Survey conducted in 1996. Seniors' benefits were, not surprisingly, the main source of income among seniors

(for anywhere from 79% to 90% of seniors). A sizeable proportion of seniors, however, still reported employment as their main source of income - 16% of men and 12% of women aged 65 to 74. Among individuals aged 75 or over, 6% of men and 10% of women reported employment as their main source of income. The remainder reported other main sources of income.

3.3.2 Marital Status

Marital status is related to emotional and economic well-being. Marital status is also related to use of health care resources, as spouses may provide care in the case of illness or disability, thereby reducing the need for formal services. Individuals who are not married are twice as likely to be admitted to nursing homes than their married counterparts (Carriere & Pelletier, 1995).

Figure 6 shows that the percentage of individuals who were married was considerably higher among men than women in all age groups in both 1985 and 1998. The gender discrepancy was particularly large among people aged 75 or older. For example, 49% of men aged 85 or older were married in 1985 versus 9% of women in that age bracket. This gender difference can be explained in terms of both the shorter life expectancy of men and the fact that women tend to marry men who are older than themselves, which means by the time they reach the age of 75 most of them are widowed. The need for formal care services would therefore be correspondingly higher for older women than men.



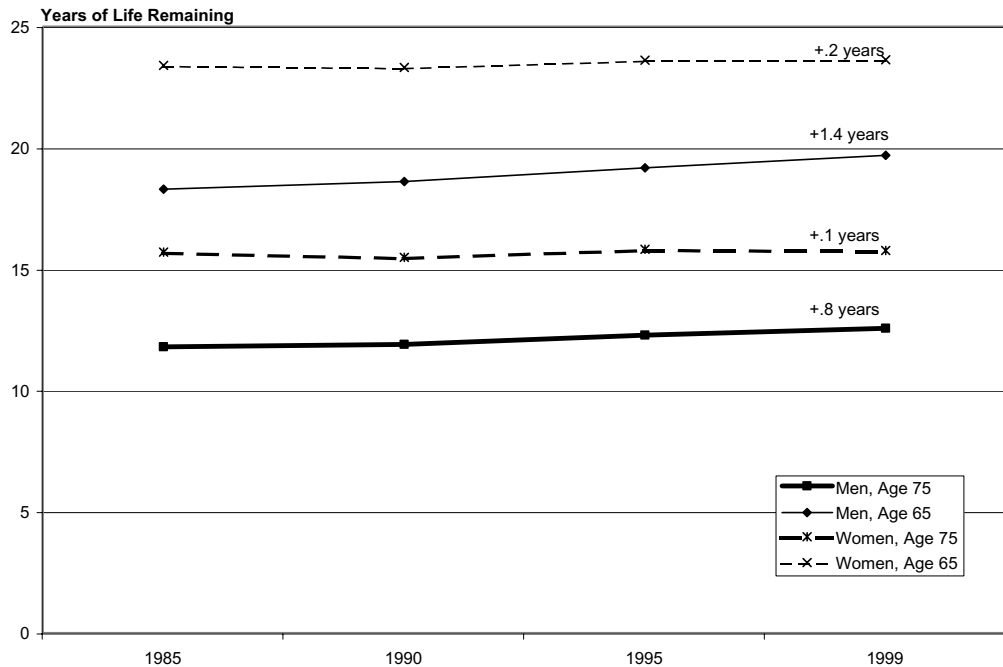
Data source: Population Research Repository. Data are based on fiscal years.

4.0 HEALTH STATUS

4.1 Life Expectancy

Life expectancy is one of the most commonly used measures of the health of a population. Life expectancy measures the average number of years a person can be expected to live at a given age, assuming that death rates remain constant. In Figure 7 we present life expectancy at age 65 and 75. In 1999, for example, women who lived to the age of 65 could be expected to live, on average, another 23.6 years. Thus, they could expect to live to just over 88 years of age. Men who lived to 65, in contrast, had on average only 19.7 years of life remaining. Similarly, women who lived to 75 could expect to live 15.8 years longer in 1999, compared to 12.6 years for men.

Figure 7: Life Expectancy at Age 65 and Age 75, 1985 to 1999



Data source: Population Research Repository. Data are based on calendar years.

The increases in life expectancy for men at ages 65 and 75 were substantial between 1985 and 1999: Life expectancy at age 65 increased by 1.4 years; at age 75, it increased by .8 years. In comparison, over the same time period, life expectancy at birth increased by 2.6 years for men, and one year for women (Roos et al., 2001).

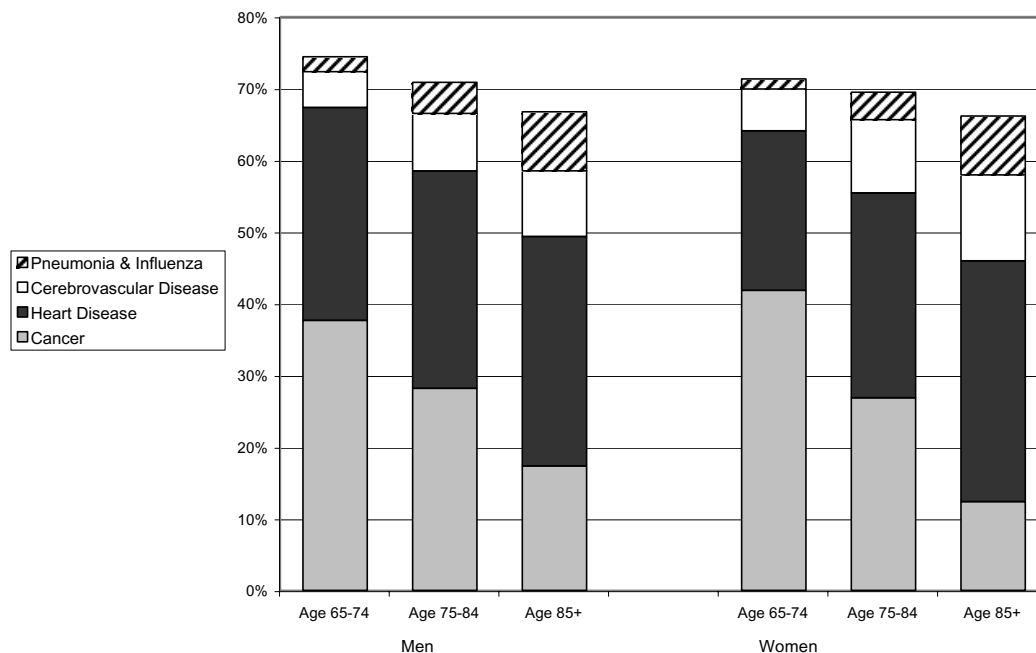
4.2 Mortality

4.2.1 Leading Causes of Death

Mortality is clearly an important indicator of the health of a population. Figure 8 shows leading causes of death in Manitoba among the senior pop-

ulation for 1997 to 1999.⁴ As is the case nationally and internationally (e.g., Sahyoun et al., 2001), about two-thirds of all deaths among seniors in Manitoba were due to chronic diseases. Specifically, heart disease (which includes heart attacks) and cancer were the top two causes of death for both men and women for all age groups. For example, among men aged 65 to 74, cancer and heart disease constituted 67% of all deaths; among women in the same age bracket they constituted 64% of all deaths.

Figure 8: Leading Causes of Death, 1997 to 1999



Data source: Population Research Repository. Data are based on calendar years.

Note: The definition of heart disease includes heart attacks, and other forms of heart disease; the definition of cerebrovascular disease includes stroke.

The percentage of deaths due to heart disease and cancer decreased with age, although they still made up nearly half of all deaths among people age 85 and over - 49% among men and 46% among their female counterparts. Deaths due to other causes, particularly deaths due to cerebrovascular disease (mainly stroke), and pneumonia and influenza increased with age. Pneumonia and influenza were particularly common among men and women aged 85 and over (8% both for men and women).

4.2.2 Other Important Causes of Death

Although cancer, heart disease, cerebrovascular disease (mainly stroke) and pneumonia and influenza were the top four causes of death among seniors, several other causes of death were quite common. Between 3% and 7% of deaths (depending on the age group) were due to chronic lung disease (which includes asthma and chronic bronchitis). Deaths due to injuries were

⁴ Mortality rates are given for a three-year period, because deaths fluctuate considerably from one year to the next.

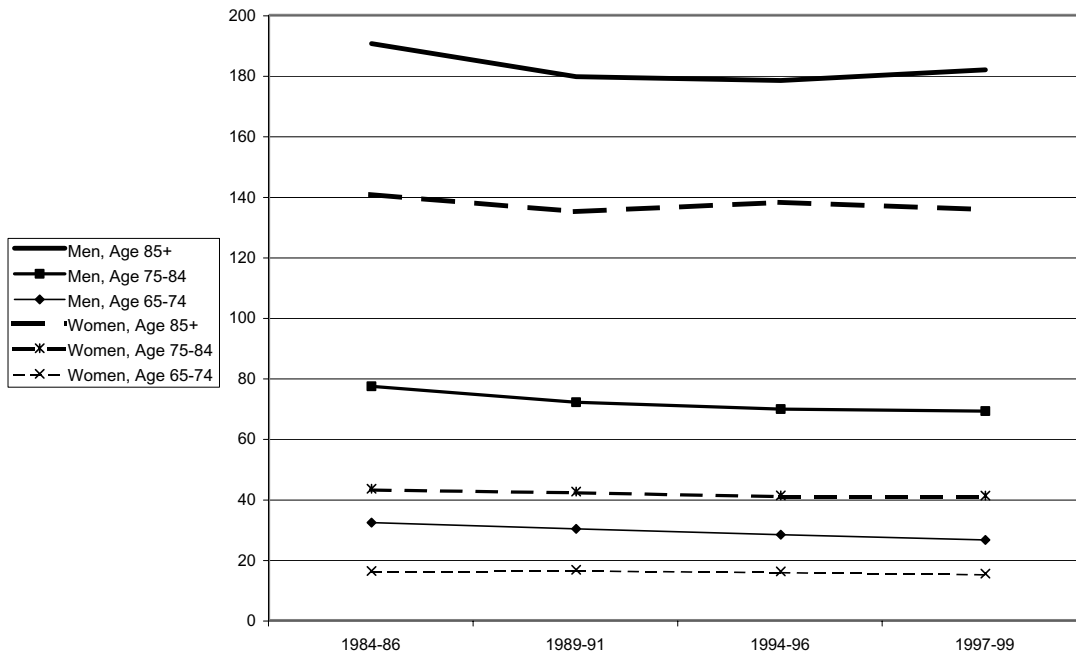
also relatively common. For example, 4% of all deaths among men aged 85 and over and 3% among their female counterparts were due to injury.

4.2.3 Trends in Mortality Rates Over Time

Given that heart disease and cancer were the two leading causes of death among seniors, we focused specifically on trends over time for these causes of death. In addition, we present trends for mortality due to any cause.

Overall Mortality Rates. In Figure 9 we present overall mortality rates (i.e. all causes) from 1984-86 to 1997-99. Mortality rates declined significantly for men aged 65 to 74 and 75 to 84. This is consistent with the increase in life expectancy that we observed among men (see Figure 7). Between 1984-86 and 1997-99, overall mortality rates among men aged 65 to 74 declined by 19% and, for men aged 75 to 84 by 10%. Mortality rates remained constant for men aged 85 or older and declined only minimally⁵ for women.

Figure 9: Mortality Rates: All Causes (per 1000 Age-Specific Population), 1984-86 to 1997-99



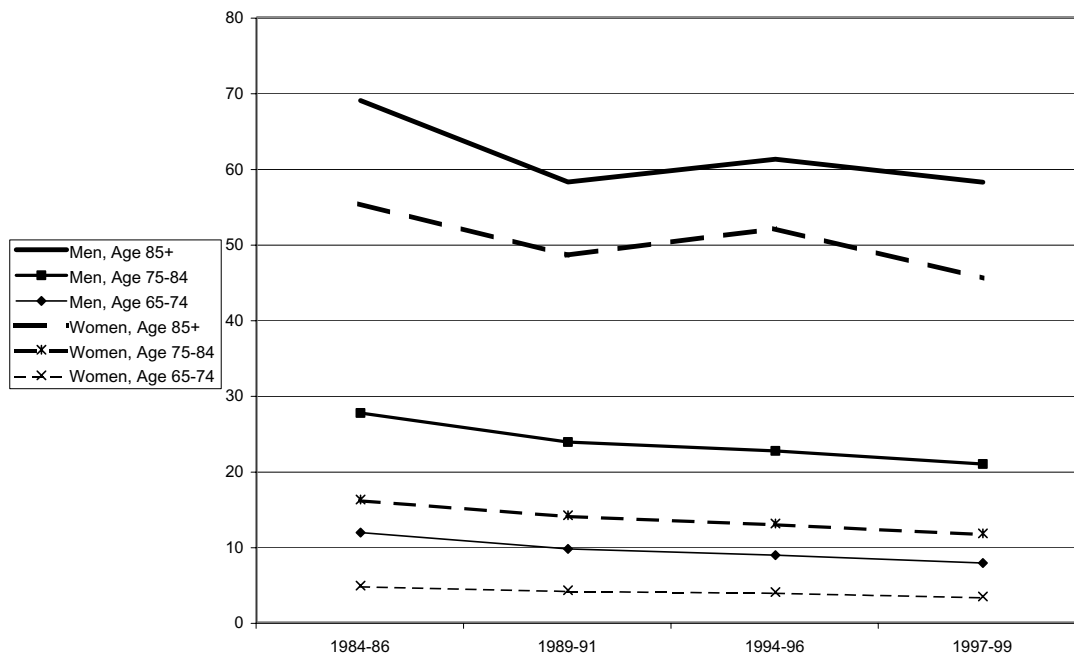
Data source: Population Research Repository. Data are based on calendar years.

Mortality Due to Heart Disease. Mortality rates for heart disease declined significantly for both men and women for all age groups, with the exception of men aged 85 or older (see Figure 10). This is consistent with data from across Canada and the United States that show that deaths due to heart disease have been declining (Heart and Stroke Foundation, 1999; Sahyoun et al., 2001). Death rates for men and women aged 65 to 74 and 75 to 84

⁵ We interpret significance here based on trend analyses, using a significance level of .001 as our criterion. Marginally significant declines of all cause mortality emerged among women aged 65-74 ($p=.04$) and 75-84 ($p=.01$).

declined by 25% to 33% between 1984-86 and 1997-99. Death rates for women aged 85+ declined by 16%.

Figure 10: Mortality Rates: Heart Disease (per 1000 Age-Specific Population), 1984-86 to 1997-99

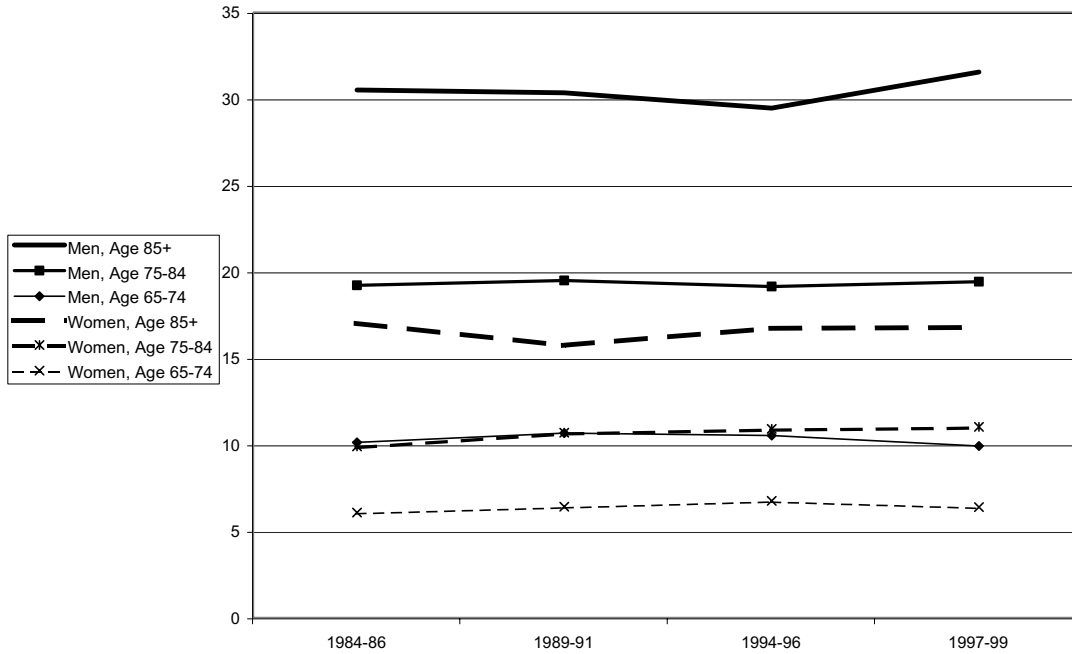


Data source: Population Research Repository. Data are based on calendar years.

A pronounced age gradient is also evident, with mortality rates for individuals aged 85 or older - not surprisingly - being substantially higher than for younger seniors. Mortality rates for heart disease are also consistently higher for men than women in all age groups.

Mortality Due to Cancer. Figure 11 shows mortality rates for all cancers. Mortality rates for cancer remained stable over the years for both men and women across all age groups. Noteworthy is the gender gap, with cancer mortality rates being higher among men than women in each age group. This gender difference is consistent with national data that show consistently higher mortality rates for men than women across all ages (not only among seniors) (Statistics Canada, 2001).

Figure 11: Mortality Rates: Cancer (per 1000 Age-Specific Population), 1984-86 to 1997-99



Data source: Population Research Repository. Data are based on calendar years.

4.3 Demand-Driven Hospitalizations

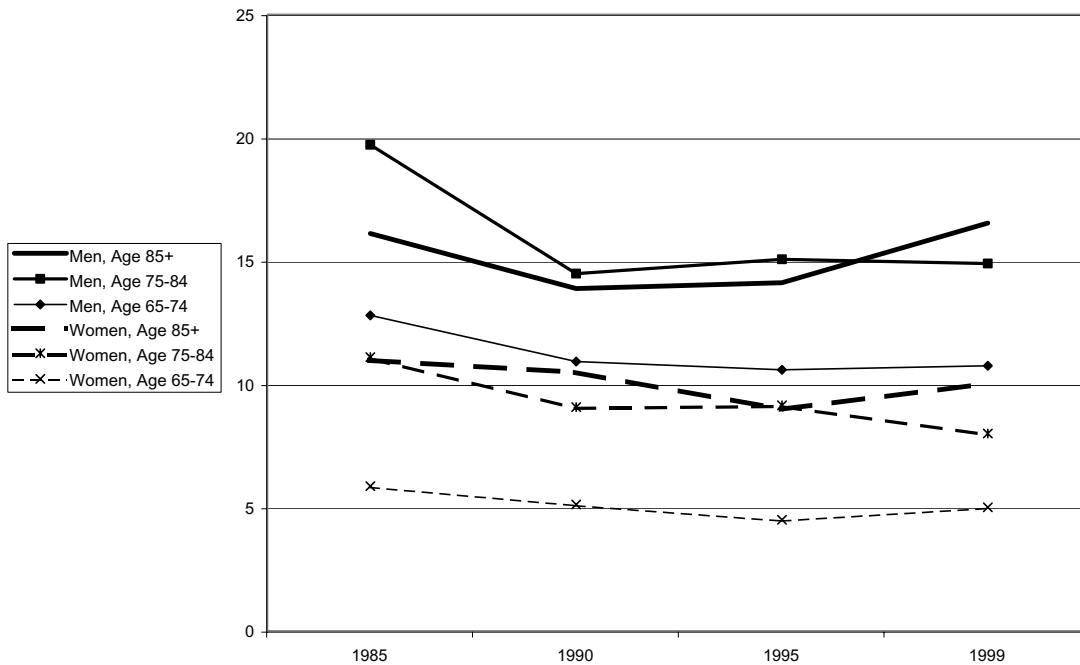
Hospitalizations for certain conditions, such as acute myocardial infarction (AMI) and hip fractures, can be considered indicators of the health of a population. Unlike hospitalizations for other conditions (e.g., certain surgical procedures like prostatectomy), they show relatively little variation across geographic regions and therefore reflect professional consensus on the need for hospitalization, rather than availability of beds or differences in physician practice patterns (Wennberg et al., 1984). Such hospitalizations have been referred to as demand-driven.

We focus in this report on hospitalizations for AMI and hip fractures, as they are particularly relevant in the context of the health of seniors. We also present data for falls in this section, as hip fractures are a common consequence of falls.

4.3.1 Hospitalizations for Acute Myocardial Infarction

Figure 12 shows hospitalization rates for acute myocardial infarction (AMI) from 1985 to 1999. AMI rates decreased significantly for men and women aged 65 to 74 and 75 to 84. The trends for individuals aged 85 or older (both men and women) were not statistically significant. Hospitalization rates decreased by 15% to 16% for men and women aged 65 to 74 and by 24% to 28% for men and women aged 75 to 84.

Figure 12: Hospitalization Rates for Acute Myocardial Infarction (per 1000 Age-Specific Population), 1985 to 1999



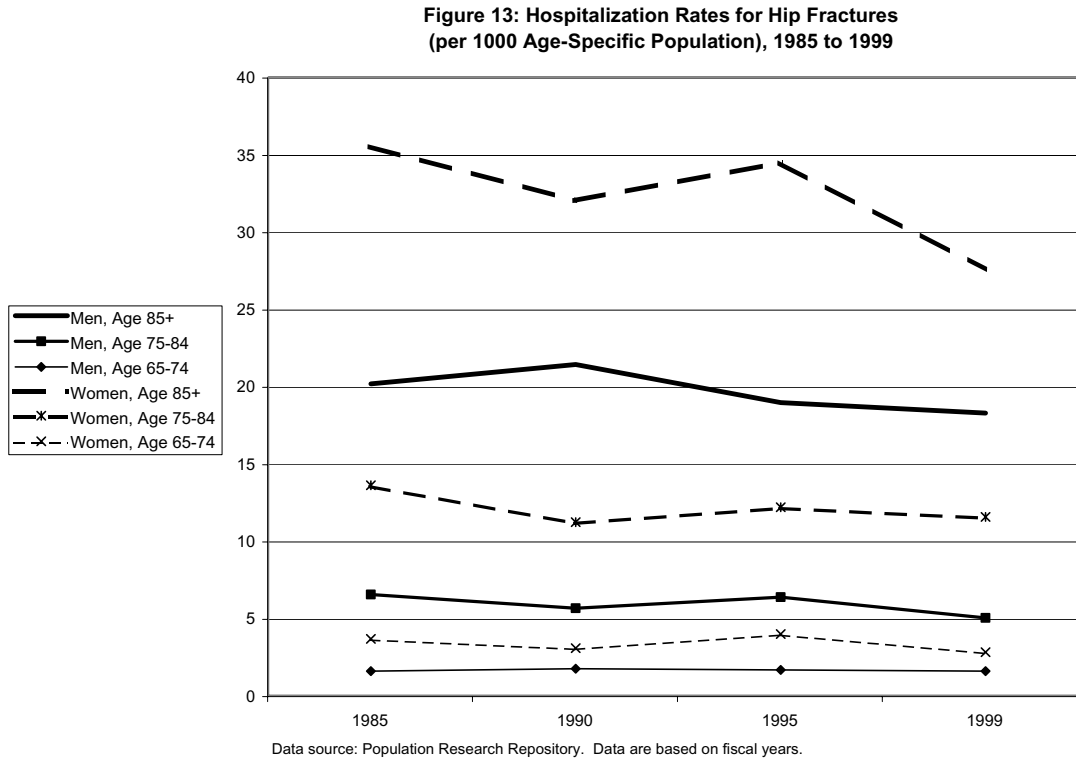
Also apparent is the gender difference, with rates being higher for men than women. Indeed, rates for the youngest men are similar to those of the oldest-old women. For example, in 1999, 11 per 1000 men aged 65 to 74 were hospitalized for AMI, compared to five per 1000 women aged 85 and over.

While AMI rates declined among young-old and middle-old seniors, indicating that a smaller proportion of individuals now are hospitalized for an AMI than in the past, it is noteworthy that the actual number of hospitalizations for AMIs remained virtually constant - 1548 in 1985 versus 1504 in 1999 (for all seniors combined). Thus, the need for health care services has not declined.

4.3.2 Hospitalizations for Hip Fractures

Like hospitalizations for AMI, admissions for hip fracture have been referred to as demand-driven (Wennberg et al., 1984). Any trends over time can be interpreted as changes in the need for health care, rather than changes in physician practice patterns or the health care system (e.g., availability of beds). Hip fractures are a particular concern for seniors, as many do not fully recover from them, leaving them with reduced functional abilities. Reduced independence due to functional impairment then often leads to admission to a nursing home.

Figure 13 shows that hospitalization rates for hip fractures remained relatively constant from 1985 to 1999 in Manitoba. A slight decrease in rates emerged among women aged 85 and over, although this trend did not reach statistical significance.⁶



It is noteworthy that the rates for women aged 85 and over were markedly higher than rates of any other age or gender group, including rates for the oldest-old men. In 1999, for example, 28 per 1000 women aged 85+ were hospitalized for hip fractures, compared to 18 per 1000 men in that age bracket.

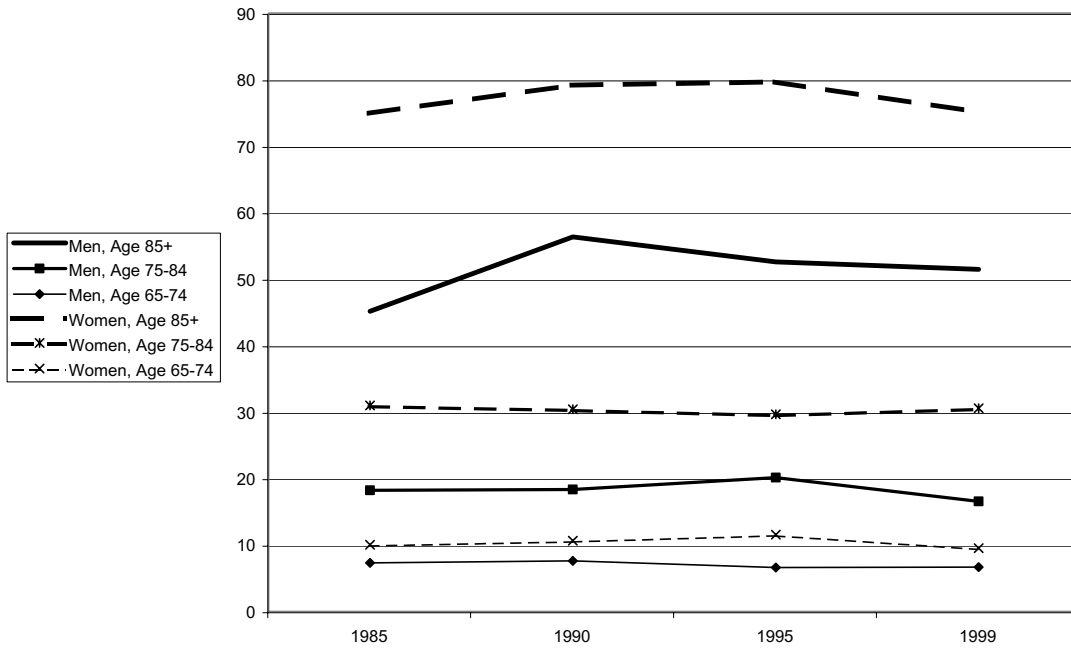
4.3.3 Hospitalizations for Falls

The most common cause of injuries requiring hospitalization among seniors are falls (Canadian Institute for Health Information, 2002). Hip fracture is one of the consequences of falls, particularly among the oldest-old. In 1999, for example, we found that 57% of falls leading to hospitalization involved fractures in Manitoba.

Figure 14 shows that hospitalization rates for falls have remained constant over a 14-year time period for all age groups and both genders. Particularly noteworthy are the high rates for women aged 85+. This is consistent with the finding presented above that showed that women aged 85 and over are at high risk of hip fractures.

⁶ The trend for 85+ year old women was marginally significant at $p = .004$ and did not quite meet our $<.001$ criterion.

Figure 14: Hospitalization Rates for Falls (per 1000 Age-Specific Population), 1985 to 1999



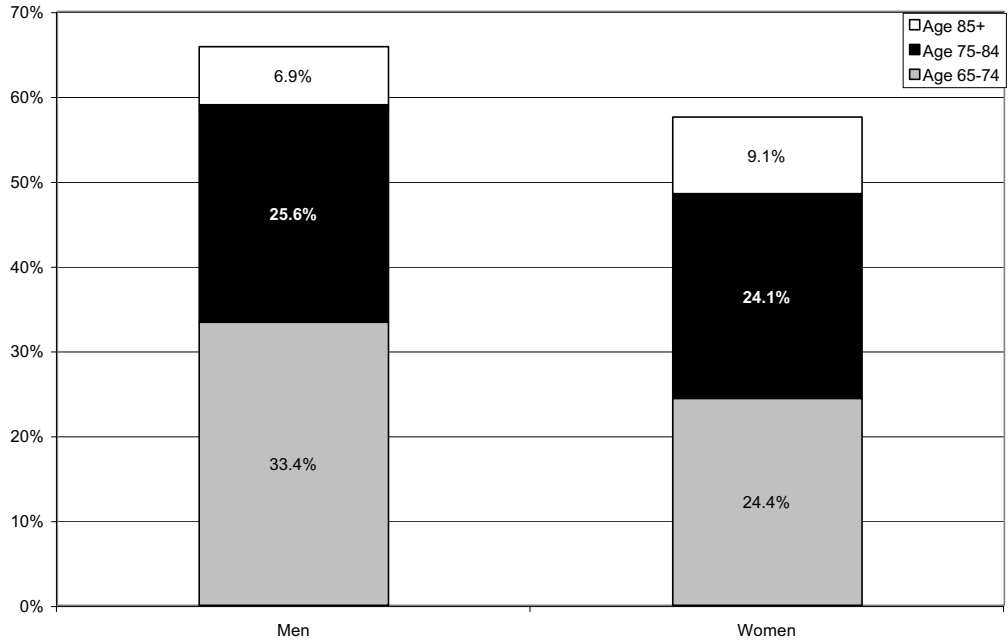
Data source: Population Research Repository. Data are based on fiscal years.

4.4 Cancer Incidence

Cancer is a disease of older adults. As such, it is an important indicator of the health status of seniors. In this report, we present cancer incidence - the number of new cancer cases, as determined by CancerCare Manitoba.

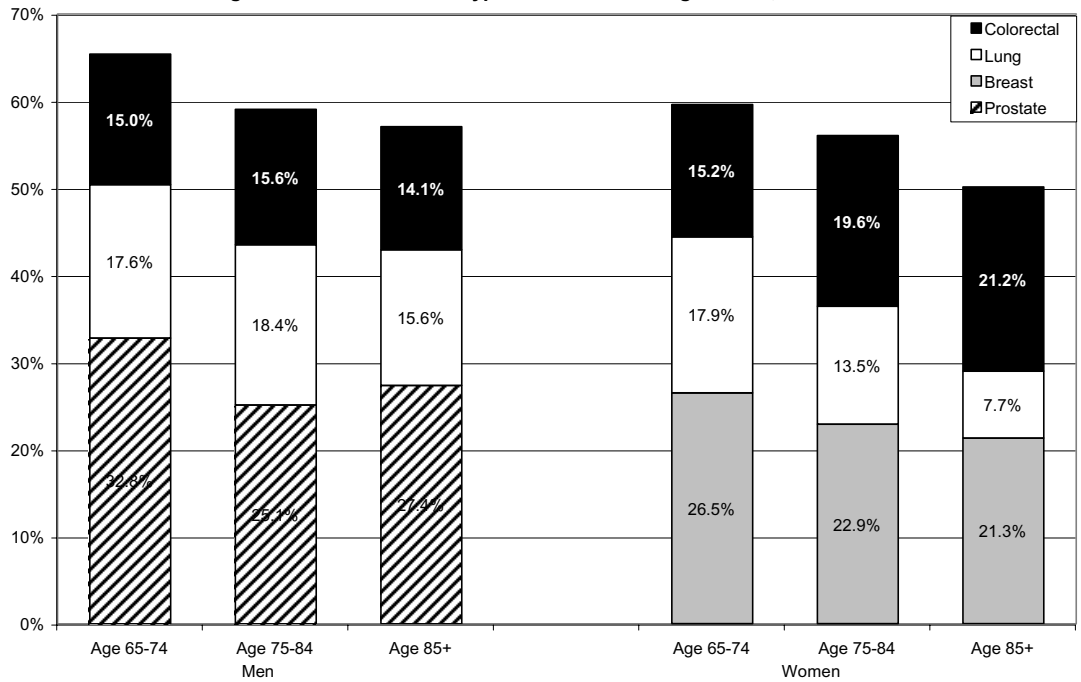
Figure 15 shows that, from 1997 to 1999, 66% of all cancers among male Manitobans involved individuals who were 65 years or older; among females, 58% of all cancers occurred in seniors. Gender-specific cancers - breast cancer in women and prostate cancer in men - constituted the largest proportion of all cancers, as can be seen in Figure 16. Among men aged 65 to 74, prostate cancer made up 33% of all cancers; among women in the same age bracket, breast cancer constituted 27% of all cancers. The percentages decreased somewhat with age, but even among individuals aged 85 or older, breast and prostate cancers were the most common types of cancer.

Figure 15: Per cent of Total Cancers Involving People Aged 65+, 1997 to 1999



Data source: CancerCare Manitoba. Data are based on calendar years.

Figure 16: Most Common Types of Cancer Among Seniors, 1997 to 1999



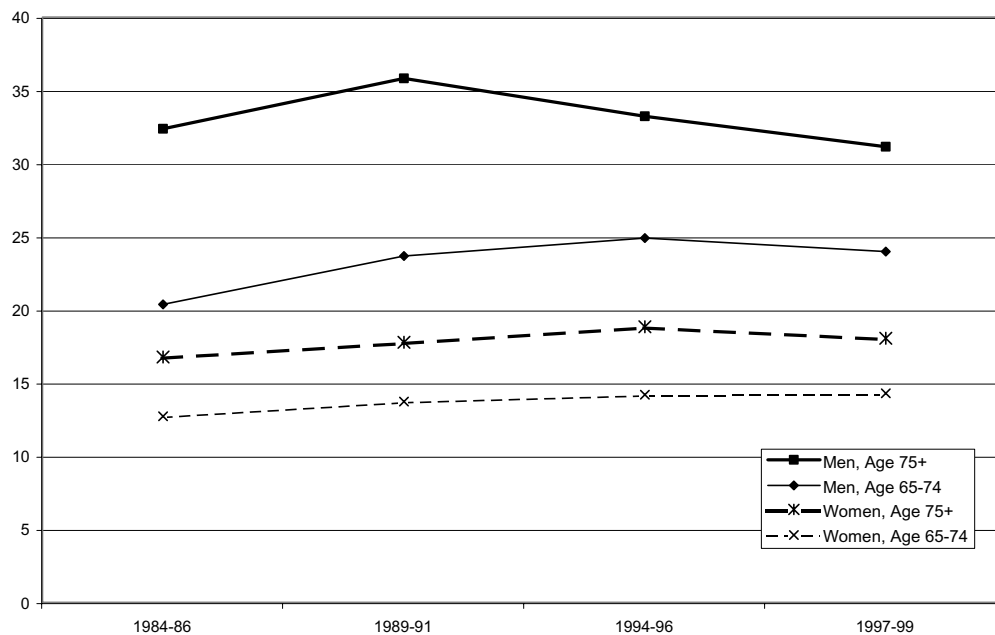
Data source: CancerCare Manitoba. Data are based on calendar years.

Lung cancer and colorectal cancer also constituted a large percentage of all cancers among seniors. A clear gender difference is apparent for lung cancer. While the proportion of lung cancer cases was similar across age groups for men, for women the percentage decreased with age. Among women aged 65 to 74, lung cancer constituted 18% of all cancers; among 85+ year old women it constituted only 8%. This gender difference can be explained in terms of smoking patterns, with women born at the beginning of the 20th century being less likely to smoke than men. The proportion of colorectal cancer was also relatively high for seniors of all ages, but particularly for women aged 85 and over (21% of all cancers).

4.4.1 Trends in Cancer Incidence Rates Over Time

Cancer rates from 1984-86 to 1997-99 are shown in Figure 17. Trends for the 75 to 84 and 85+ year olds are combined, as incidence for the oldest-old seniors was small. Cancer rates increased significantly for both men and women aged 65 to 74. For young-old men, cancer rates increased by 18% between 1984-86 and 1997-99; for young-old women they increased by 13%. It is interesting to note, however, that rates are levelling off and even decreasing slightly in the most recent time period. Cancer rates for men and women aged 75 years or older did not change significantly over time.

Figure 17: Cancer Incidence (per 1000 Age-Specific Population), 1984-86 to 1997-99



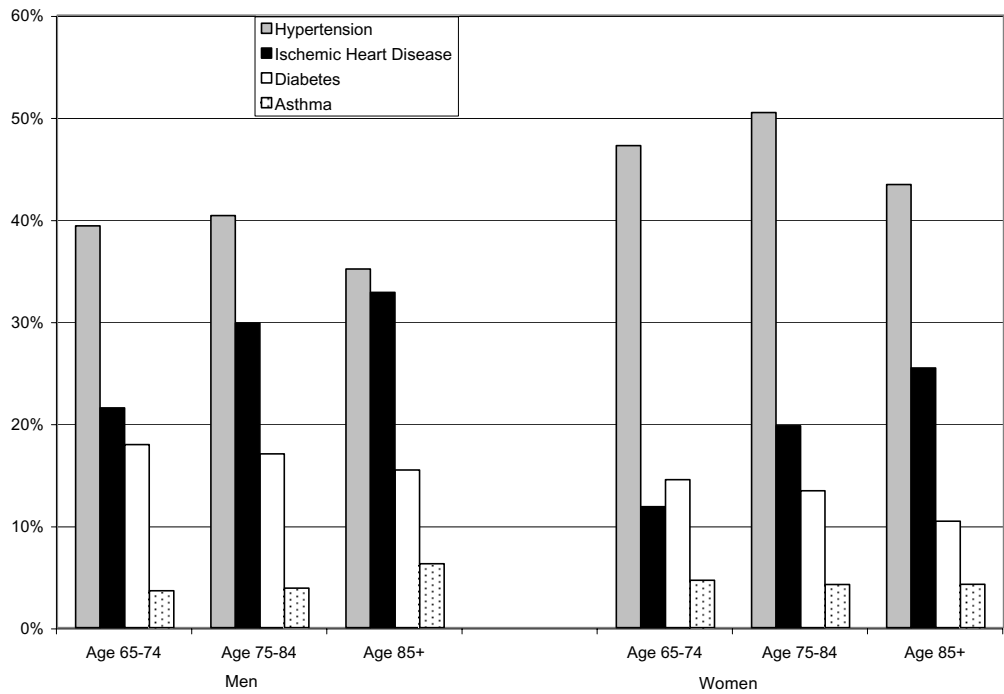
Data source: CancerCare Manitoba. Data are based on calendar years.
 Note: Cancer incidence refers to the number of new cases reported.

4.5 Chronic Diseases

Chronic diseases are important indicators of health status. For the present purposes, we examined patterns for four chronic diseases: hypertension (because it can lead to serious health problems, including coronary heart disease and stroke); ischemic heart disease (which includes angina pectoris and acute myocardial infarction); diabetes; and asthma (which is one of the most frequent causes of emergency medical, i.e., non-surgical, hospitalizations, Menec et al., 1999).

Figure 18 shows that close to half of all seniors had a diagnosis of hypertension. The proportion of individuals with hypertension was considerably higher among women than men for all age groups - anywhere from 43% to 51% among women, depending on the age group, and 35% to 41% among men. A substantial proportion of men and, to a lesser extent women, had a diagnosis for ischemic heart disease, with the proportion increasing with age. For example, while 22% of men aged 65 to 74 were diagnosed with ischemic heart disease, the proportion increased to 33% among men aged 85 or older. Diabetes diagnoses were also quite common among Manitoba seniors, and more so among men than women, with 18% of men aged 65 to 74, for instance, having a diagnosis of diabetes. Furthermore, asthma was fairly common among both male and female seniors. For instance, 6% of men aged 85 or older were diagnosed with asthma versus 4% of women in that age bracket.

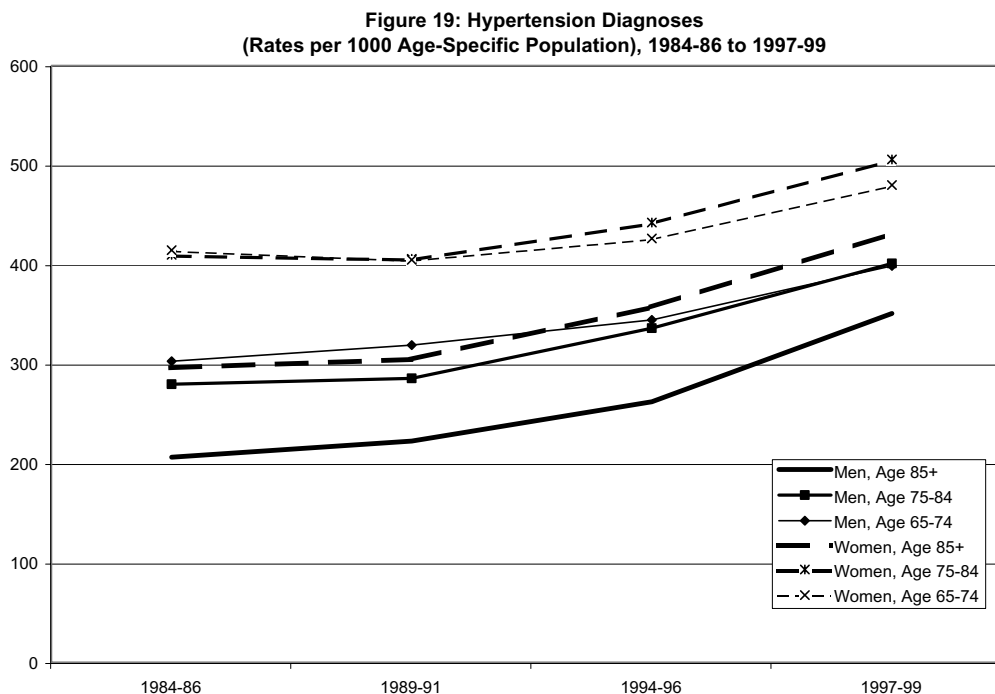
Figure 18: Per cent of Population Age 65+ with Select Chronic Diseases, 1999



Data source: Population Research Repository. Data are based on fiscal years.

4.5.1 Trends in Chronic Disease Rates Over Time

Hypertension. Have rates of chronic diseases changed over time? Figure 19 displays hypertension rates from 1984-86 to 1997-99. A marked (statistically significant) increase is evident for all age groups and both genders. For men, rates increased anywhere from 32% (among the 65 to 74 year olds) to 70% (among the 85+ year olds). For women, increases ranged from 16% (among the 65 to 74 year olds) to 45% (among the 85+ year olds).

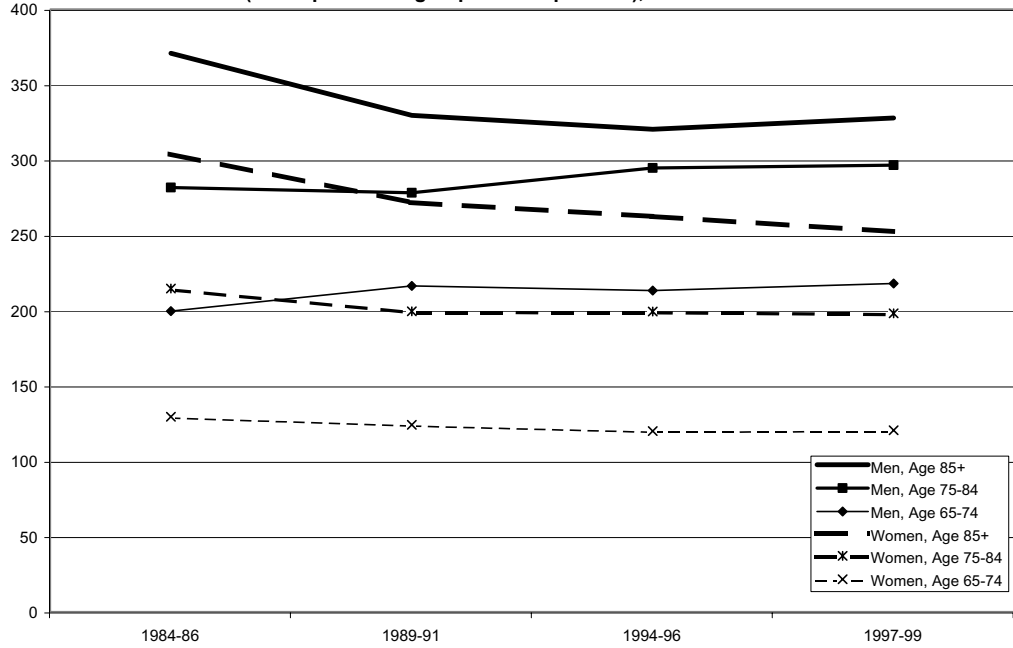


Data source: Population Research Repository. Data are based on fiscal years.

Note: Hypertension diagnoses were identified from physician and hospital data and reflect treatment prevalence. In interpreting the findings, it is important to keep in mind that trends may reflect actual increases in prevalence or changes in how people were diagnosed.

Ischemic Heart Disease. Rates for ischemic heart disease increased significantly among men age 65 to 74 (by 10%) and 75 to 84 (by 5%). See Figure 20. They decreased for the oldest men (by 12%) and among women of all ages (by 7% among women aged 65 to 74 and 75 to 84 and by 17% among women aged 85+).

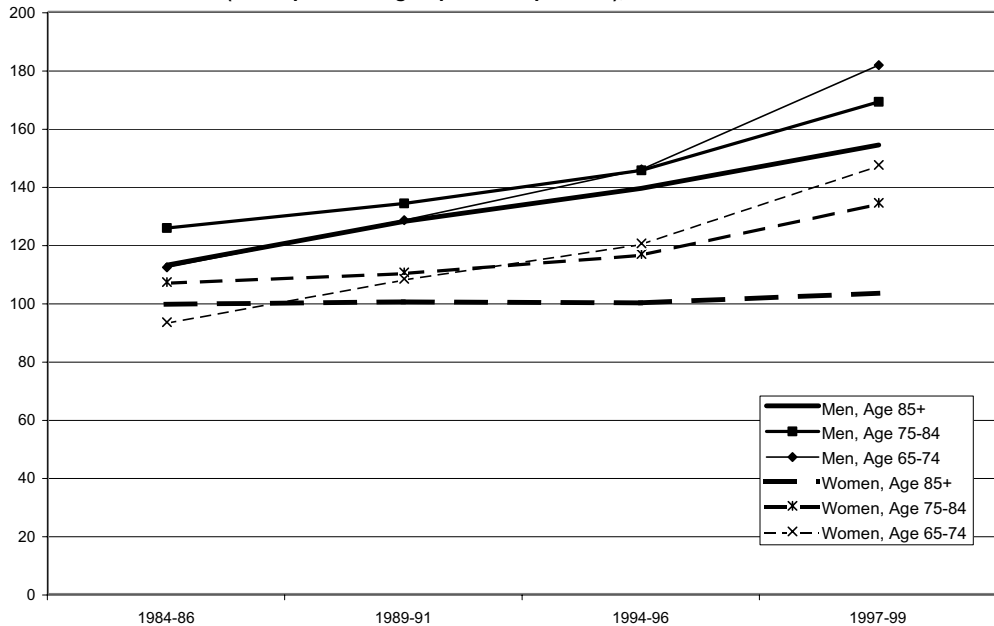
Figure 20: Ischemic Heart Disease Diagnoses
(Rates per 1000 Age-Specific Population), 1984-86 to 1997-99



Data source: Population Research Repository. Data are based on fiscal years.
Note: Ischemic heart disease diagnoses were identified from physician and hospital data and reflect treatment prevalence. In interpreting the findings, it is important to keep in mind that trends may reflect actual increases in prevalence or changes in how people were diagnosed.

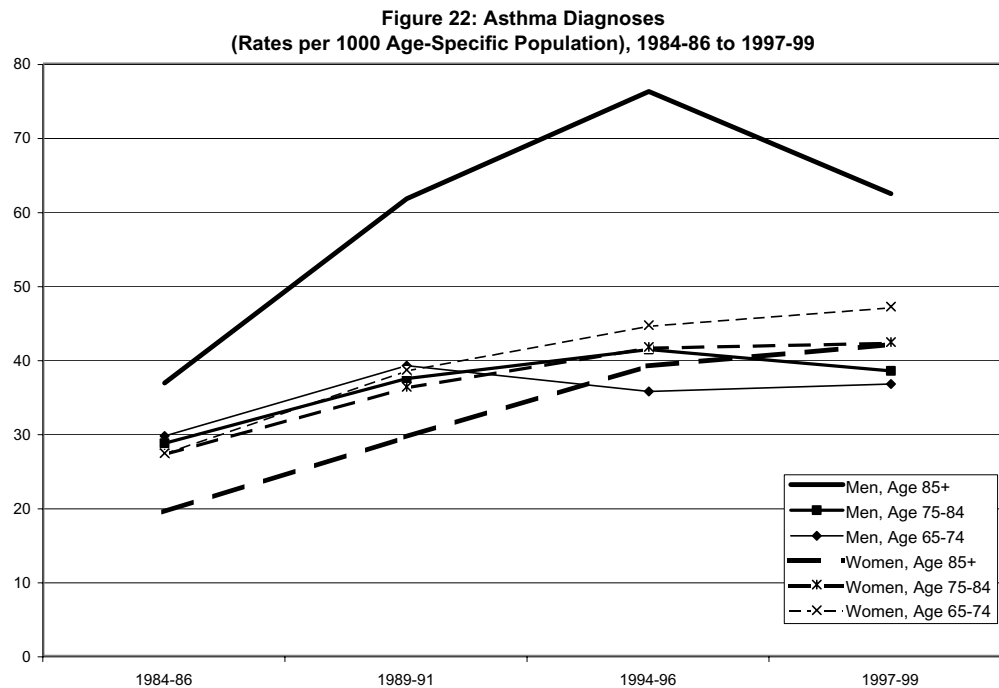
Diabetes. Figure 21 shows trends in diabetes rates. Rates increased significantly for men of all ages (anywhere from 34% to 63%), as well as for young-old and middle-old women (from 25% to 58%). Rates did not change significantly among women aged 85 or older.

Figure 21: Diabetes Diagnoses
(Rates per 1000 Age-Specific Population), 1984-86 to 1997-99



Data source: Population Research Repository. Data are based on fiscal years.
Note: Diabetes diagnoses were identified from physician and hospital data and reflect treatment prevalence. In interpreting the findings, it is important to keep in mind that trends may reflect actual increases in prevalence or changes in how people were diagnosed.

Asthma. Asthma rates increased for men and women of all age groups, as displayed in Figure 22. Rates increased from 23% to 68% among men, and from 56% to 110% among women. Also striking are the high asthma rates among the oldest men throughout the 15-year time period.



Data source: Population Research Repository. Data are based on fiscal years.

Note: Asthma diagnoses were identified from physician and hospital data and reflect treatment prevalence. In interpreting the findings, it is important to keep in mind that trends may reflect actual increases in prevalence or changes in how people were diagnosed.

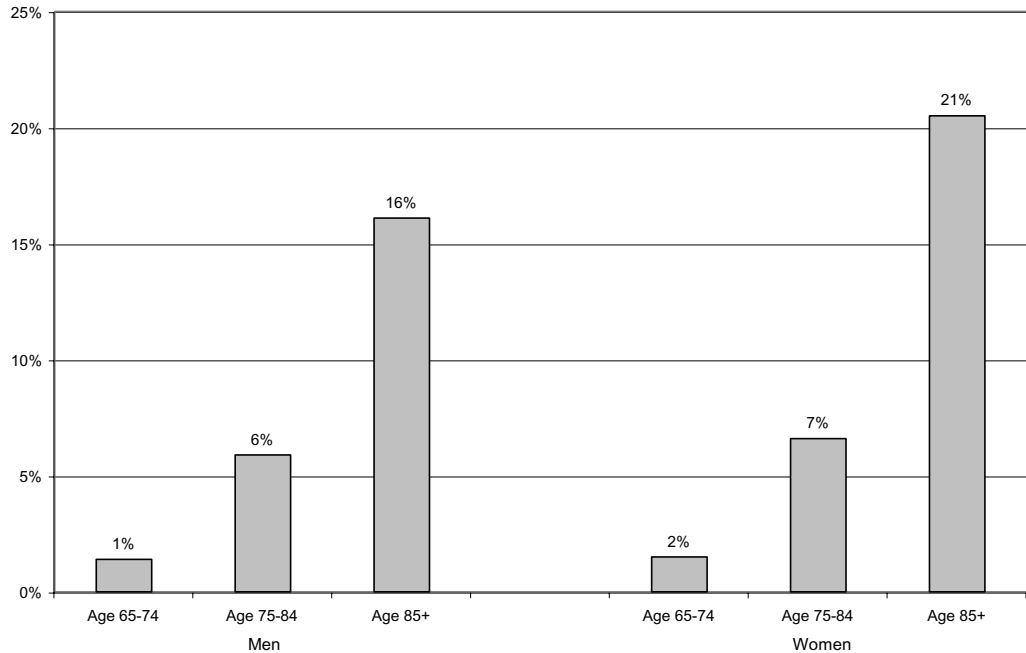
In sum, chronic diseases generally increased markedly. It is important to keep in mind, however, that rates were based on encounters with the health care system. Thus, changes in rates may, in part, reflect changes in physician diagnosing rather than changes in actual prevalence. For example, increased awareness of a particular disease or changes in diagnostic criteria, as has been the case for diabetes (Meltzer et al., 1998), may result in more individuals being identified as having the disease.

4.5.2 Dementia

Dementia is a "clinical syndrome characterized by loss of cognitive and emotional abilities severe enough to interfere with daily functioning and the quality of life" (Geldmacher & Whitehouse, 1996). The most prevalent form of dementia is Alzheimer's disease, which is characterized by progressive memory impairment. Vascular dementia - permanent cognitive impairment resulting from cerebrovascular disease (e.g., stroke) - is another common type of dementia (Hill et al., 1996). Dementia is a strong predictor of institutionalization. Indeed, research indicates that about half of individuals with dementia live in an institution (Tully & Mohl, 1996).

Figure 23 shows the proportion of the senior population that had a dementia diagnosis for 1999. Striking is the age effect, with dementia rates being markedly higher for individuals aged 85 or older than their younger counterparts. Moreover, rates were higher among women than men, particularly among the 85+ year old. This age and gender difference is consistent with previous research using the Canadian Study of Health and Aging in which dementia diagnoses were based on clinical assessments (Hill et al., 1996).

Figure 23: Per cent of Population Age 65+ With Dementia Diagnoses, 1999



Data source: Population Research Repository. Data are based on fiscal years.
Note: Dementia diagnoses were identified from physician and hospital data.

The number of individuals with dementia has been increasing in Canada as the senior population has increased (Hill et al., 1996). It is expected to rise even more as the senior population continues to grow. Our data also show a marked increase in the number of Manitobans diagnosed with dementia between 1985 and 2000. Dementia diagnosis rates have also increased. This indicates that the increases in dementia diagnoses exceeds population growth. In other words, more individuals are being diagnosed with dementia now than was the case 15 years ago. This increase may reflect a rise in dementia prevalence or, alternatively, changes in how physicians diagnose individuals. For example, while signs of memory impairment may have been attributed to normal aging in the past, it may now be recognized as dementia and be diagnosed as such.

Having said that, given that our figures are based on diagnoses, they are likely to underestimate the actual prevalence of dementia. One might expect that milder forms of dementia may not be recognized and may therefore not be picked up with diagnoses. Indeed, our rates are lower than those generated based on the Canadian Study of Health and Aging, a population-based study on dementia. For instance, while our data show that 205 women aged 85 and over per 1000 population were diagnosed with dementia, the Canadian Study on Health and Aging shows a prevalence of 371 per 1000 women in that age group. Thus, about a third of women (and men) aged 85+ have dementia (Hill et al., 1996).

4.6 Self-Rated Health, Functional Impairment, and Disability

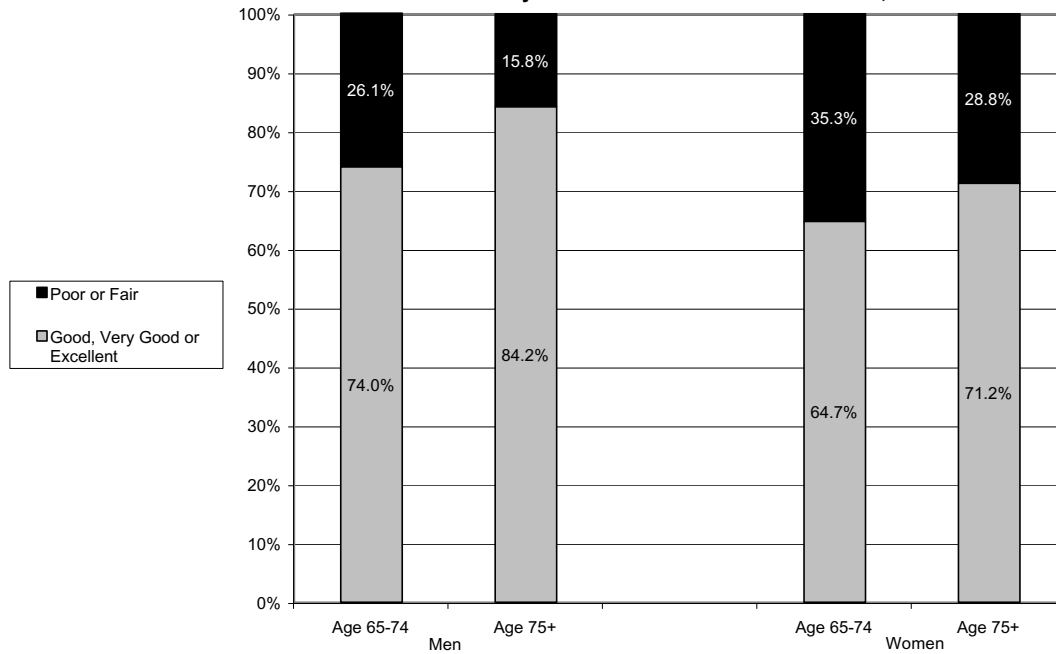
In this section we examine subjective perceptions of health status, functional impairment, and the presence of pain and certain disabilities that may interfere with engaging in everyday activities. Self-rated health is an important variable as it predicts mortality. Individuals who rate their health as poor or fair live less long than people who rate their health as good or excellent (e.g., Mossey & Shapiro, 1982). Functional impairment and disability are related to living independently and, therefore, predict nursing home admission (e.g., Shapiro & Tate, 1988).

Indicators were derived from surveys - the National Population Health Survey and the Aging in Manitoba study (see Appendix A for description of these studies). This section is meant to provide primarily a snapshot at one point in time.

4.6.1 Self-Rated Health

Figure 24 shows that the majority of seniors thought they were in good to excellent health. This was true for younger (age 65 to 74) and older seniors (age 75+). Among the 65 to 74 year old men, 74% perceived themselves in good to excellent health, compared to 65% of women in that age group. The proportion of seniors who perceived themselves as being in good to excellent health was even higher among the 75+ year olds - 84% among men versus 71% among women.

Figure 24: Per cent of Population Age 65+ Who Reported Being in Good/Very Good/Excellent vs. Poor/Fair Health, 1996



Data source: National Population Health Survey, 1996

Note: the question was: In general, would you say your health is: Excellent, Very good, Good, Fair, or Poor?

4.6.2 Functional Impairment

Functional impairment is typically assessed in terms of the ability to engage in everyday activities. Activities are divided into two categories: 1) instrumental activities of daily living (IADLs) which include activities such as doing heavy housework, light housework, laundry, shopping, and preparing a hot meal, and 2) basic activities of daily living (ADLs), which include activities like getting in and out of bed, washing or bathing, eating, and using the toilet.

Table 1 shows the percentage of seniors who reported having difficulties with instrumental and basic activities of daily living in 1983 versus 1996. Note that because the 1996 survey included only 72+ year old individuals, the age range for the 1983 survey was restricted to that age range as well to allow meaningful comparisons.

Table 1: Functional Status, 1983 Versus 1996

	Men		Women	
	Age 72-84	Age 85+	Age 72-84	Age 85+
1983				
Instrumental Activities of Daily Living				
Difficulties with none or 1 task	48.2%	13.9%	21.0%	3.7%
Difficulties with 2 to 3 tasks	24.3%	23.1%	47.5%	20.3%
Difficulties with 4+ tasks	27.4%	63.0%	31.5%	76.1%
Basic Activities of Daily Living				
No Difficulties	63.6%	34.1%	58.3%	17.4%
Difficulties with some tasks	36.4%	65.9%	41.7%	82.6%
1996				
Instrumental Activities of Daily Living				
Difficulties with none or 1 task	53.8%	22.8%	28.3%	5.4%
Difficulties with 2 to 3 tasks	23.8%	20.2%	48.8%	24.3%
Difficulties with 4+ tasks	22.4%	57.0%	22.9%	70.3%
Basic Activities of Daily Living				
No Difficulties	68.6%	38.0%	61.1%	18.7%
Difficulties with some tasks	31.4%	62.0%	38.9%	81.3%

Data source: Aging in Manitoba Study

Note: The youngest participants in the 1996 survey were 72 years old.

To allow meaningful comparison, the age range was therefore restricted to 72+ year olds for the 1983 survey as well.

A strong age gradient is apparent, with the 85+ year old age group experiencing more IADL difficulties than the 72 to 84 year olds. For example, among women, 70% of the 85+ year olds required assistance with four or more IADLs in 1996, compared to 23% among the 72 to 84 year olds. Men had generally fewer IADL difficulties, with only 57% of the 85+ year olds having difficulties with four or more IADLs. Similarly, difficulties with basic activities of daily living increased systematically with age. For instance, while 31% of men aged 72 to 84 had difficulties with some basic activities in 1996, the proportion increased to 62% among their 85+ year old counterparts.

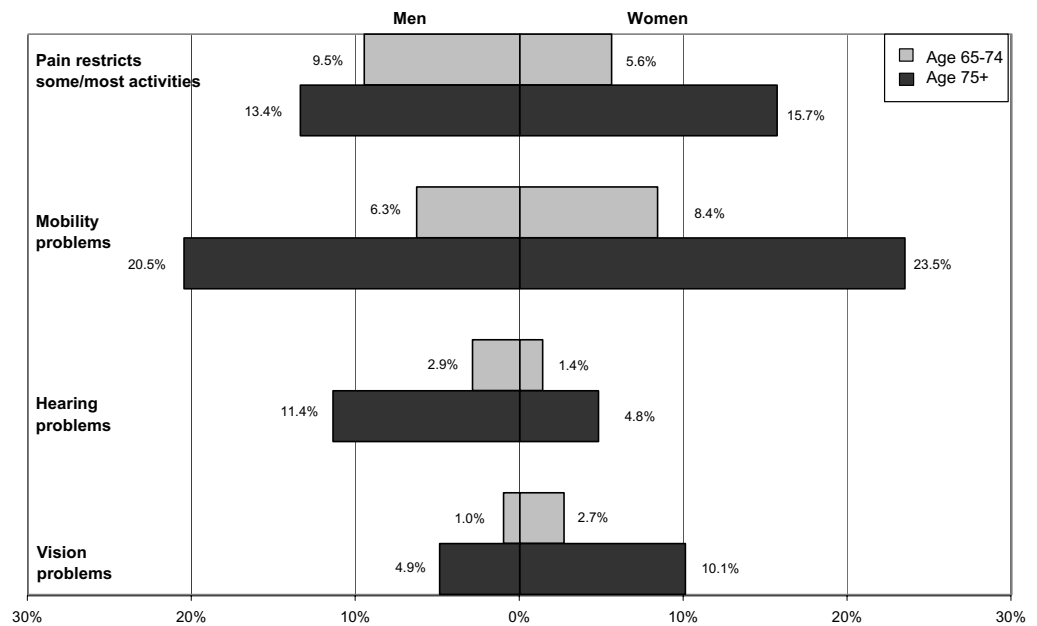
Table 1 also shows that seniors generally had fewer IADL and ADL difficulties in 1996 as compared to 1983. For example, among 85+ year old men, 63% had difficulties with four or more IADL tasks in 1983, compared to 57% in 1996. Among 85+ year old women, 76% reported difficulties with four or more IADL tasks in 1983, compared to 70% in 1996. Similarly,

the proportion of seniors with difficulties with ADL tasks decreased slightly. For example, 66% of oldest-old men and 83% of oldest-old women had difficulties with some ADL tasks in 1983, compared to 62% versus 81% in 1996.

4.6.3 Pain and Disabilities

Figure 25 shows the proportion of seniors who reported having: pain severe enough to prevent some or most activities, mobility problems (i.e. they required mechanical support such as a cane, braces, or crutches to walk or were not able to walk at all), hearing problems (uncorrected), and vision problems (uncorrected). All of these factors impede daily activities and can therefore reduce independence.

Figure 25: Per cent of Population Age 65+ With Pain and Disabilities



Data source: National Population Health Survey, 1996

Note: Mobility problems include not being able to walk or needing mechanical support; hearing and vision problems include uncorrected problems only.

For all indicators, a large age gap is evident; the percentage of individuals experiencing disabilities was considerably larger among seniors aged 75 or older than those aged 65 to 74. For example, 16% of women aged 75+ experienced pain severe enough to restrict some to most activities, compared to 6% of women aged 65 to 74 years. Similarly, 24% of women aged 75 or older experienced some mobility problems, compared to 8% of younger women.

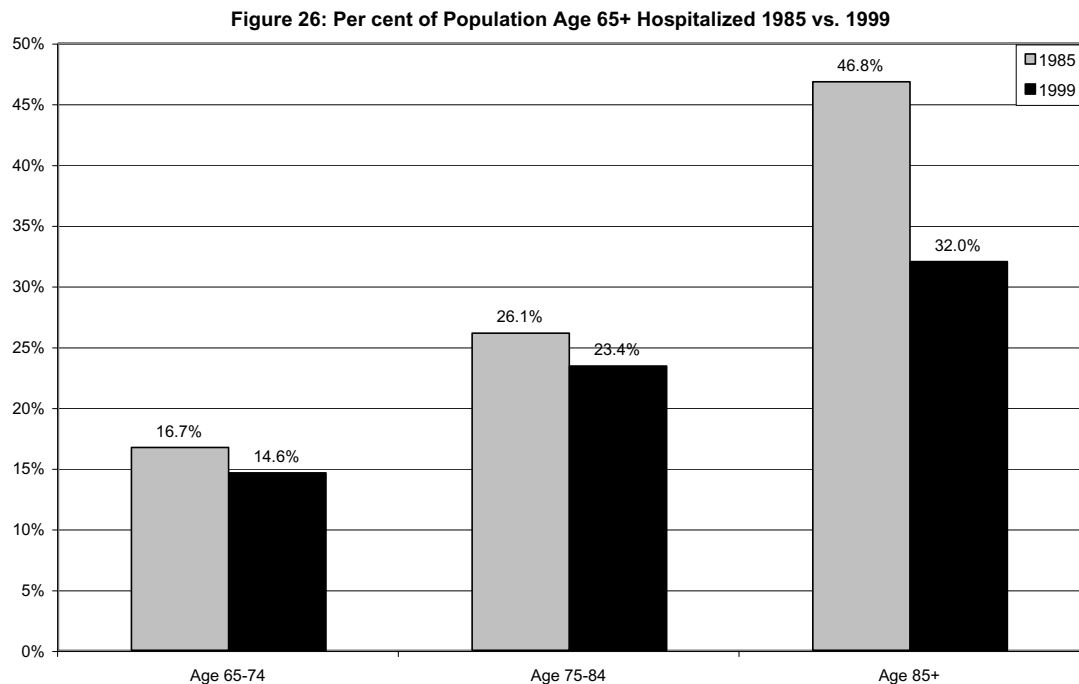
5.0 HEALTH CARE USE

5.1 Hospital Use

We examined hospital use in two different ways: Hospital separations - or discharges from hospital (we refer to these as hospitalizations) are an indicator of volume; hospital days, which take both the number of separations and patients' length of stay into account are an indicator of total resource use.

5.1.1 Proportion of Seniors Who Were Hospitalized

Figure 26 shows the percentage of the senior population hospitalized at least once for 1985 versus 1999. In this analysis, individuals were counted only once, even if they had more than one hospitalization. This therefore provides a person-based, rather than separation-based measure and reflects how many people actually used hospitals.



Data source: Population Research Repository. Data are based on fiscal years.

Note: In this analysis we count people who were hospitalized in 1985 or 1999. People are counted only once, although some of them were admitted more than once in a given year.

The percentage of seniors who were hospitalized decreased from 1985 to 1999 for all age groups. This was particularly the case among individuals aged 85 and over where there was a 14.8% decrease in the number of people being hospitalized. This is likely in part due to changes in hospital use and the increased emphasis on outpatient surgery, as described in a subsequent section on trends in hospital use (section 5.1.4). Given that the popu-

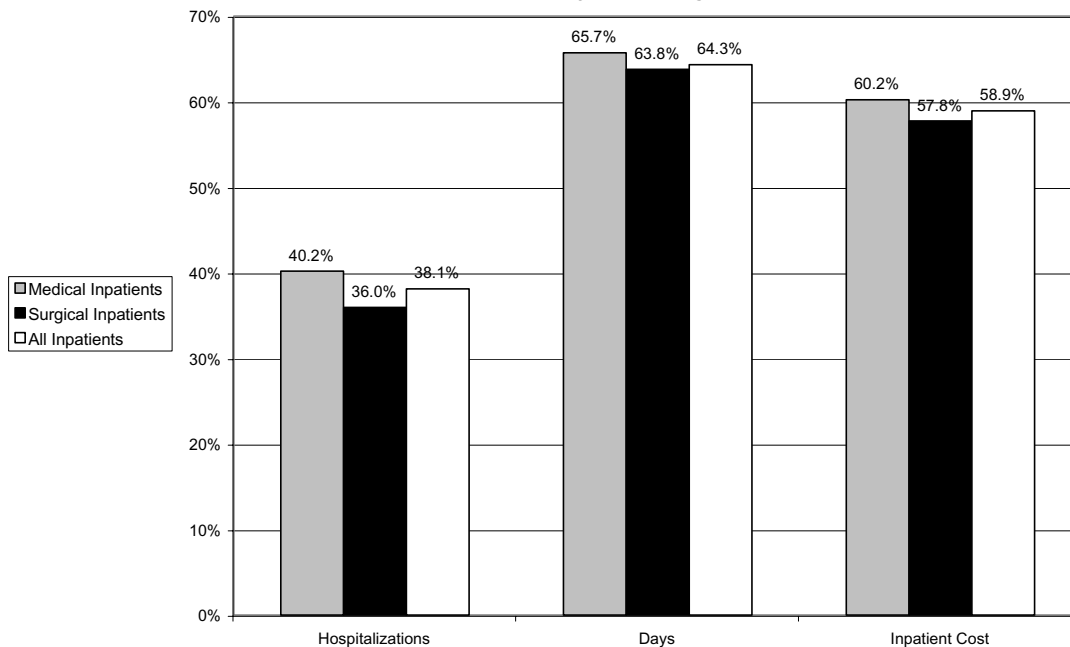
lation aged 85+ increased over this time period substantially, the actual number of individuals hospitalized not surprisingly also increased. However, the actual number of individuals hospitalized rose by only 6% - far below the 59% population increase in that 85+ year old age group.

Also noteworthy is that the percent hospitalized clearly increased with age - for example, 15% of seniors aged 65 to 74 were hospitalized in 1999, compared to 32% of seniors aged 85 or older.

5.1.2 Hospital Separations, Days, and Inpatient Cost

Figure 27 shows the percentage of all hospitalizations (separations), as well as hospital days consumed by seniors in 1999⁷. In addition to providing percentages for all inpatients, findings are presented for medical inpatients - essentially all non-surgical inpatients - and surgical patients. Seniors (aged 65 or over) constituted 40% of all medical separations, 36% of all surgical separations, and 38% of all inpatient separations (i.e., medical and surgical combined). This far exceeds the percentage of 65+ year olds in the general population, which was at 13.5% in 1999. In other words, the risk of being hospitalized is far greater for seniors than younger adults or children.

Figure 27: Per cent of Total Hospitalizations, Hospital Days, and Inpatient Cost Used by Patients Age 65+, 1999



Data source: Population Research Repository. Data are based on fiscal years.

The contribution of seniors to hospital days is even greater, with patients aged 65+ consuming 66% of medical and 64% of surgical days (64% of all hospital days). Seniors consume a majority of hospital days because they

⁷ Findings are virtually identical for earlier years.

have considerably longer lengths of stay than younger individuals - this is the case for both medical and surgical patients. In 1999, the average length of stay for patients younger than 65 years of age was six days, compared to 17 days for patients aged 65 or over.

Given that inpatient cost is driven to a large extent by average length of hospital stay, seniors also contributed nearly two-thirds to the overall inpatient cost: 60% of the cost for medical inpatients, 58% of the cost for surgical inpatients, and 59% of the cost for all inpatients involved seniors in 1999.

5.1.3 A Minority of Seniors Use Most Hospital Days

Although seniors consumed two thirds of total hospital days - and almost two-thirds of total inpatient costs - it is important to highlight that a very small proportion of seniors used most of these days. Table 2 shows what percentage of the senior population used what percentage of total hospital days consumed by seniors. We present findings in terms of percentiles, which means that percentages add to 100%. For example, the 95th percentile represents the upper 5% of seniors.

Table 2: Five Per cent of Seniors Use the Majority of Seniors' Hospital Days

1985		
Senior Population (Percentiles)	Hospital Days	% of All Days
1 st -77 th percentile	0	0%
78-89 th percentile	109,826	11.0%
90-94 th percentile	157,096	15.8%
95 th percentile or higher	728,121	73.2%
Total	995,043	100.0%

1998		
Senior Population (Percentiles)	Hospital Days	% of All Days
1 st -80 th percentile	0	0%
80-89 th percentile	71,154	7.8%
90-94 th percentile	132,089	14.5%
95 th percentile or higher	706,746	77.7%
Total	909,989	100.0%

Data source: Population Research Repository. Data are based on fiscal years

In 1985, 77% of seniors were never hospitalized. They therefore did not contribute any hospital days, as shown in column two of Table 2. Eleven per cent of seniors (78th to 89th percentile) used 109,826 days, which constituted 11% of all of seniors' hospital days. The next 5% of the senior

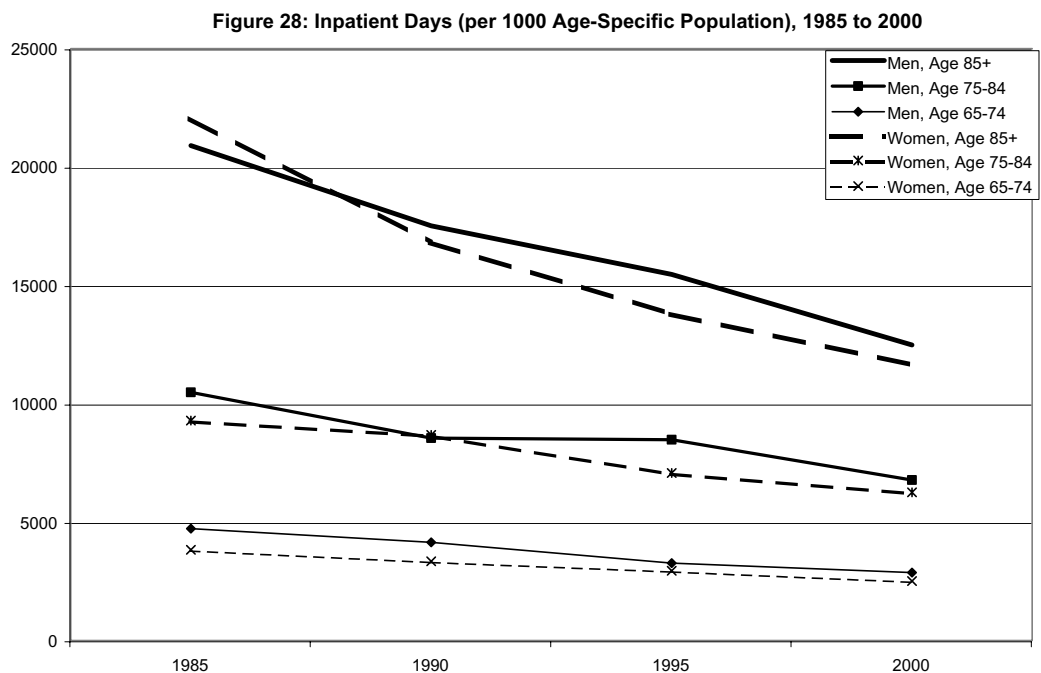
population used 16% of hospital days and, finally, the remaining 5% of the senior population used 73% of all of seniors' hospital days. These seniors used almost three quarters of all days because they had very long lengths of stay - 108 days on average.

The pattern was if anything even stronger in 1998, with 5% of the senior population using 78% of all of seniors' hospital days. Again, the lengths of stay of these 5% of seniors were very long - 91 days on average - although the average length of stay was shorter than in 1985.

5.1.4 Trends in Hospital Use Over Time

Over the past ten years, major changes have occurred in the way hospitals are used (Brownell et al., 1999). The average length of stay of inpatients, and consequently, the overall hospital days consumed have decreased substantially. At the same time, there has been a major shift from inpatient to outpatient surgery. The net result of these changes has been that, although inpatient separations have decreased, the total number of hospital separations has actually increased. Trends are presented here for both inpatient days and outpatient surgery to reflect these changes.

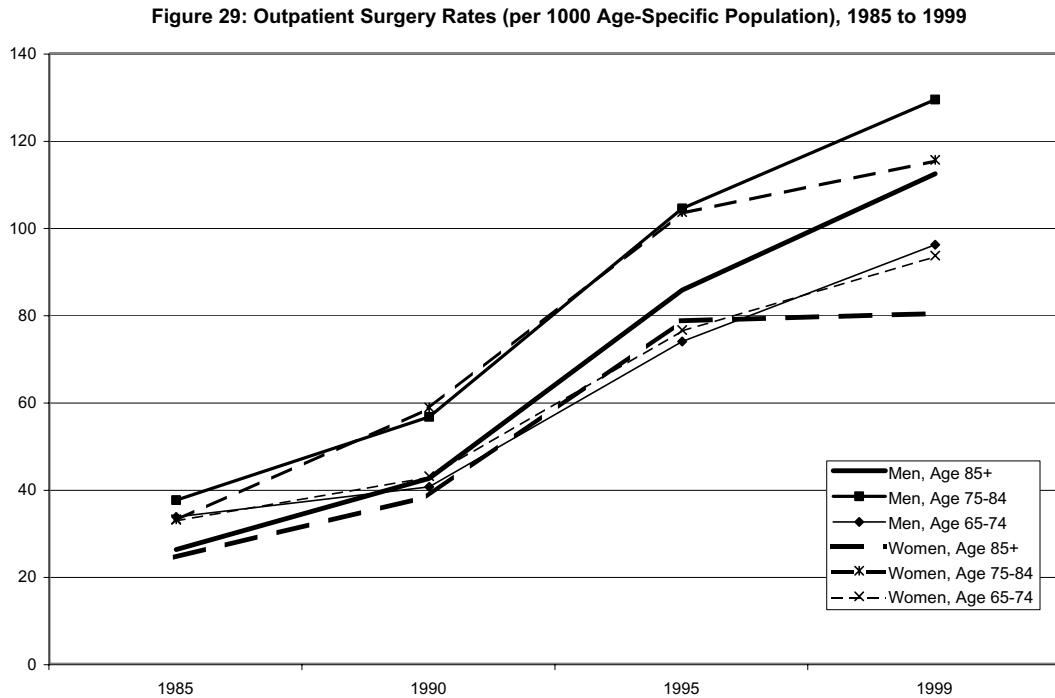
Figure 28 shows the decrease in rates of inpatient days for seniors over the past 15 years. There were significant decreases for all age groups and both genders. Rates of hospital days decreased by 35% to 40% among men, and by 33% to 47% among women. The largest decrease in days occurred among 85+ year old women.



Data source: Population Research Repository. Data are based on fiscal years.

Note: Inpatient days are based both on the number of hospitalizations and patients' length of stay. It is therefore an indicator of overall hospital use.

Concurrent with the decrease in days and inpatient separations (data not shown), we see a dramatic increase in outpatient surgery among seniors of all ages and both genders (see Figure 29). Rates of outpatient surgery more than tripled for all age groups and both genders. These dramatic increases among seniors parallel those for individuals below 65 years of age.



Data source: Population Research Repository. Data are based on fiscal years.

Most of the outpatient surgery involved individuals below the age of 65. In 1985, seniors used 16% of all outpatient surgery; by 1999 they used 27% of outpatient surgery. The increase in the number of outpatient procedures involving seniors aged 85 and over was particularly large. While there were 324 outpatient surgeries conducted for individuals 85+ year old in 1985, by 1999 there were 1858 (a 473% increase). This increase far exceeds the 59% population growth in that age group. The rise in outpatient surgery among the oldest-old was primarily due to a dramatic increase in cataract surgery over the 14-year time period.

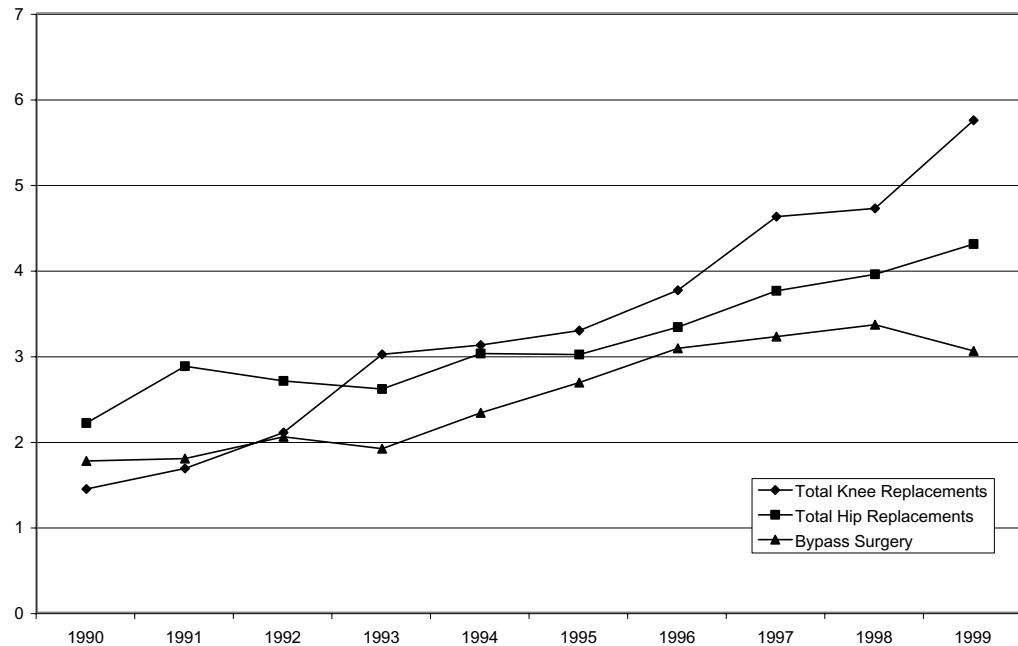
5.1.5 Specific Surgical Procedures

Certain specific surgical procedures are of interest because they are quite common and are frequently in the public eye. We examined three surgical procedures: total knee replacements, total hip replacements, and coronary artery bypass surgery. The majority of the three surgical procedures involved seniors. In 1999, 73% of all knee replacements, 70% of all hip

replacements, and 56% of bypass surgeries were performed on seniors. Research conducted in the United States shows that hip replacement and bypass surgery rates vary considerably across geographic regions (even when taking population differences into account), suggesting that there are no uniformly agreed-upon criteria by which these procedures are performed (Wennberg, 2001).

Figure 30 shows age-sex standardized rates for Manitobans aged 65 or over from 1990 to 1999. Rates increased considerably for all three procedures over this time period. Rates for knee replacements were four times as high in 1999 as they were in 1990, hip replacements increased by 95% and bypass surgery increased by 72%. It is important to note here that by age-standardizing rates, we essentially eliminate the effects of population aging. Thus, increased rates are not due to the fact that there are more older seniors in 1999 than there were in 1990 - particularly more seniors aged 85 and over - but rather they indicate that a greater proportion of seniors was undergoing these procedures.

Figure 30: Select Surgical Procedures for Age 65+ (Age-Sex Adjusted Rates per 1000 Population), 1990 to 1999



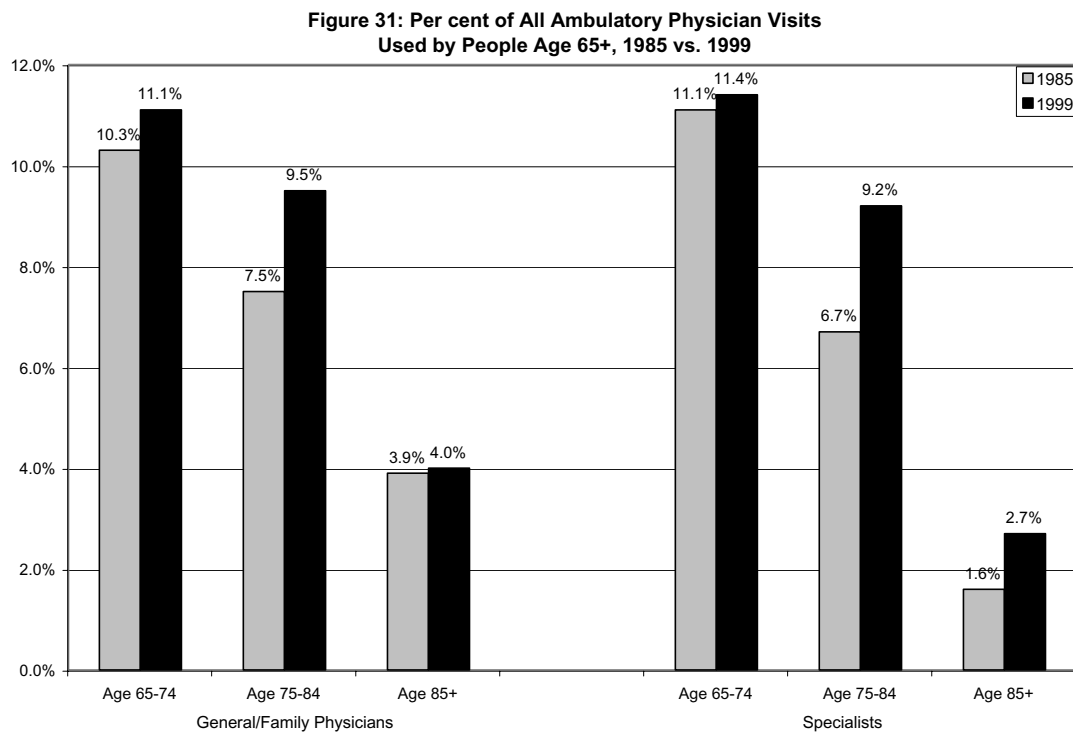
Data source: Population Research Repository. Data are based on fiscal years.
Note: Rates have been age-sex adjusted to the 1999 senior population

5.2 Physician Use

Visits to physicians, particularly to general or family physicians, often represent an entry point for people into the health care system. In this report we

examine ambulatory physician visits - essentially all visits that occurred outside hospitals - to general or family physicians versus specialists.

Figure 31 shows the percentage of all ambulatory physician visits that were made by seniors. In 1985, for example, 22% of all ambulatory visits to general or family physicians were made by seniors (10% by young-old, 8% by middle-old, and 4% by the oldest-old seniors). The percentage increased slightly by 1999, with seniors making 25% of all visits to general or family physicians. The percentages were similar for visits to specialists (19% vs. 23%) and, again, there was a slight increase over time in the proportion of visits that were made by seniors. To put these proportions into context, in 1999, seniors constituted 13.5% of the entire population. Thus, they made more physician visits than younger individuals, although the difference is clearly not as dramatic as for hospital use where seniors contributed 38% of all hospitalizations and 64% of all hospital days.



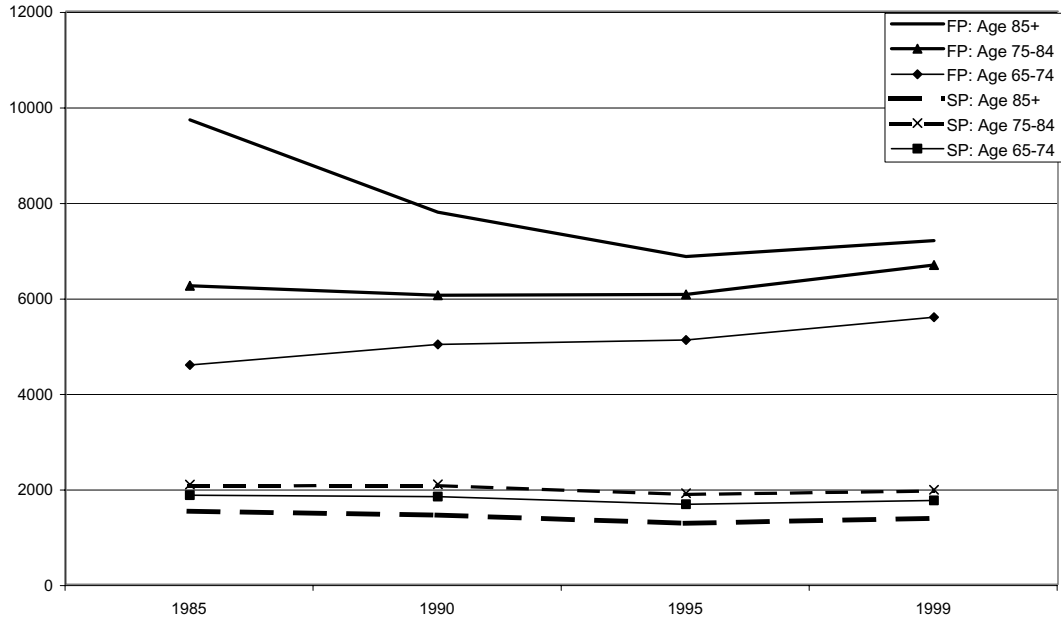
Data source: Population Research Repository. Data are based on fiscal years.

5.2.1 Trends in Physician Visits Over Time

Figure 32 shows ambulatory visit rates to general or family physicians versus specialists from 1985 to 1999. Visit rates to general or family physicians increased significantly among individuals aged 65 to 74 (by 22%) and 75 to 84 (by 7%). For example, visit rates increased from 4594 per 1000 young-old seniors in 1985 (or about 4.6 per person) to 5593 per 1000 in 1999

(about 5.6 visits per person). They decreased, however, among seniors aged 85 and over (by 26%) - from about 10 visits per person to about seven visits per person.

Figure 32: Ambulatory Physician Visits to General/Family Physicians and Specialists (per 1000 Age-Specific Population), 1985 to 1999



Data source: Population Research Repository. Data are based on fiscal years.
 FP= General/Family Physician
 SP= Specialists

Visit rates to specialists decreased significantly for all age groups (by 5% to 9%), although the decrease amounted to less than one visit per person and visit rates to specialists were quite low to begin with. For example, the rate of specialist visits was 2088 per 1000 young-old seniors in 1985 (about two visits per person), compared to 1981 in the year 1999 (just under two visits per person). Visit rates were even lower among individuals aged 85+ and decreased from 1556 per 1000 population in 1985 (about 1.5 visits per person) to 1410 per 1000 population in 1999 (about 1.4 visits per person).

It should be noted here that Figure 32 shows rates per 1000 population and not average number of visits per person who had a visit (that is users). Although most seniors made at least one physician visit per year, a small proportion did not. In 1985, 86% of seniors aged 65 to 74, 90% of individuals aged 75 to 84, and 88% of seniors aged 85 and over made at least one physician visit. By 1998, the percentages increased to above 90% for all age groups (91%, 94%, 93% for people aged 65 to 74, 75 to 84, and 85+, respectively).

The median number of visits (the median is the mid-point) among users ranged from six to eight across the three age groups in 1985 and 1998. For instance, in 1998, the median number of visits for people aged 85+ was eight, which means that 50% of 85+ year old individuals had less than eight visits and 50% had eight or more visits.

5.3 Home Care Use

The Manitoba Home Care Program provides services to individuals living in the community. It has a two-fold mandate: 1) to provide home care services to persons assessed as having inadequate informal resources to return home from hospital or to remain at home in the community; and 2) to assess and place individuals in long-term care facilities if and when home care services cannot maintain them at home safely and economically and to provide them with home care services until they are placed.

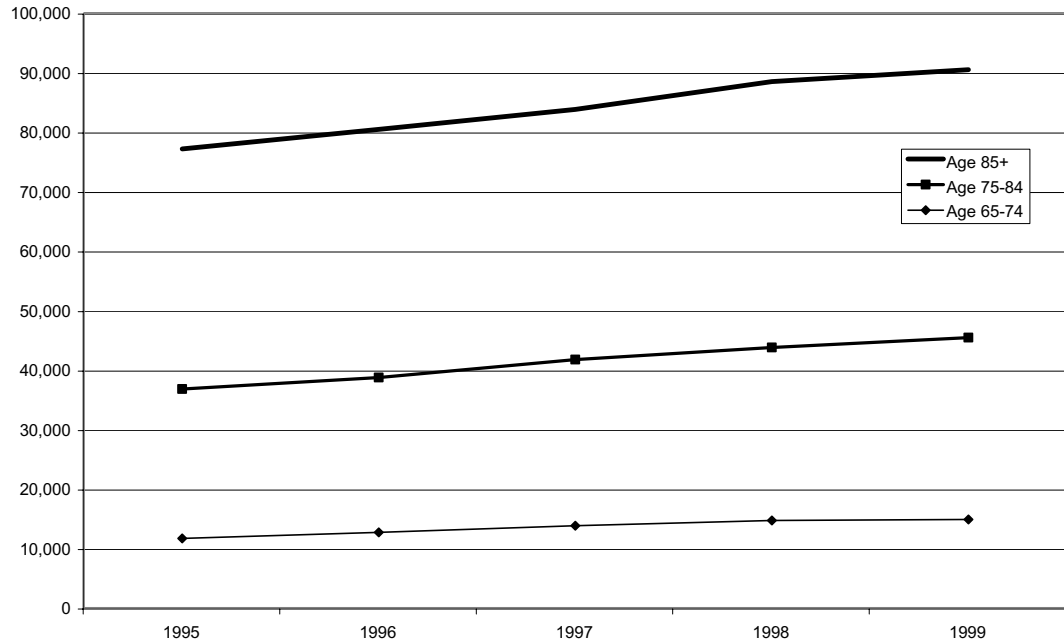
A previous report by the Manitoba Centre for Health Policy provided a comprehensive look at home care use in Manitoba (Roos et al., 2001). The report shows that between 1990 and 1997, Manitoba experienced a 34% growth in the number of home care clients and a 119% increase in home care expenditures. A number of reasons likely account for this growth, including a 24% decrease in hospital beds, a 7% reduction in the ratio of Personal Care Home beds to the population aged 75 or older, and a 20% increase in the number of persons aged 75 or older who are the predominant users of home care.

5.3.1 Trends in Home Care Use Over Time

Given the recent report by the Manitoba Centre for Health Policy on home care (Roos et al., 2001), we focus here only on trends for two indicators: the rate of new home care clients in each year and the number of days open to home care. Days open to home care are based both on the number of people that receive home care and the length of time they received home care. This measure therefore provides an overall indicator of home care use.

Rates of new home care clients remained constant from 1995 to 1999 for seniors of all ages. However, Figure 33 shows that days open to home care increased steadily over the five years for all age groups from 1995 to 1999 (by 27% for seniors aged 65 to 74, 24% for individuals aged 75 to 84, and by 17% for the 85+ year olds). This reflects an increase in the length of time people were using home care.

Figure 33: Number of Days Open to Home Care (per 1000 Age-Specific Population), 1995 to 1999

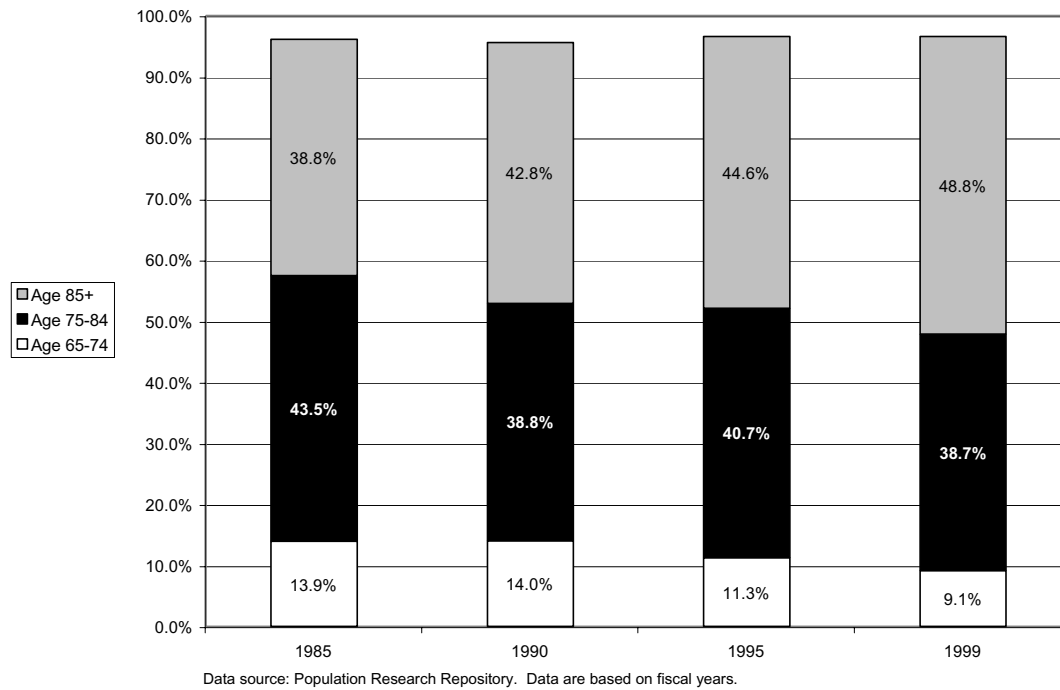


Data source: Population Research Repository. Data are based on fiscal years.

5.4 Personal Care Home Use

Personal care homes (PCHs) - or nursing homes - represent a care option for individuals who can no longer be safely cared for at home. Admission to PCHs occurs on the basis of a standardized assessment and can occur from a hospital or the community.

PCHs are, not surprisingly, predominantly used by seniors. Figure 34 shows that 96% to 97% of PCH admissions involved seniors. In 1999, 9% of admissions were for individuals aged 65 to 74, 39% for people aged 75 to 84, and 49% involved 85+ year old persons. The remainder - 3% - were younger than 65 years old. While the proportion of seniors admitted to PCHs has not changed over time, clearly evident is a shift in the age at which people are admitted to PCHs. While 39% of admissions involved individuals aged 85+ in 1985, the proportion increased to 49% by 1999. The proportion of people aged 75 to 84 who were admitted correspondingly decreased. Thus, age at admission increased steadily between 1985 and 1999. The mean age at admission increased from 81.3 in 1985 to 83.1 in 1999.

Figure 34: Per cent of PCH Admissions by Age, 1985 to 1999

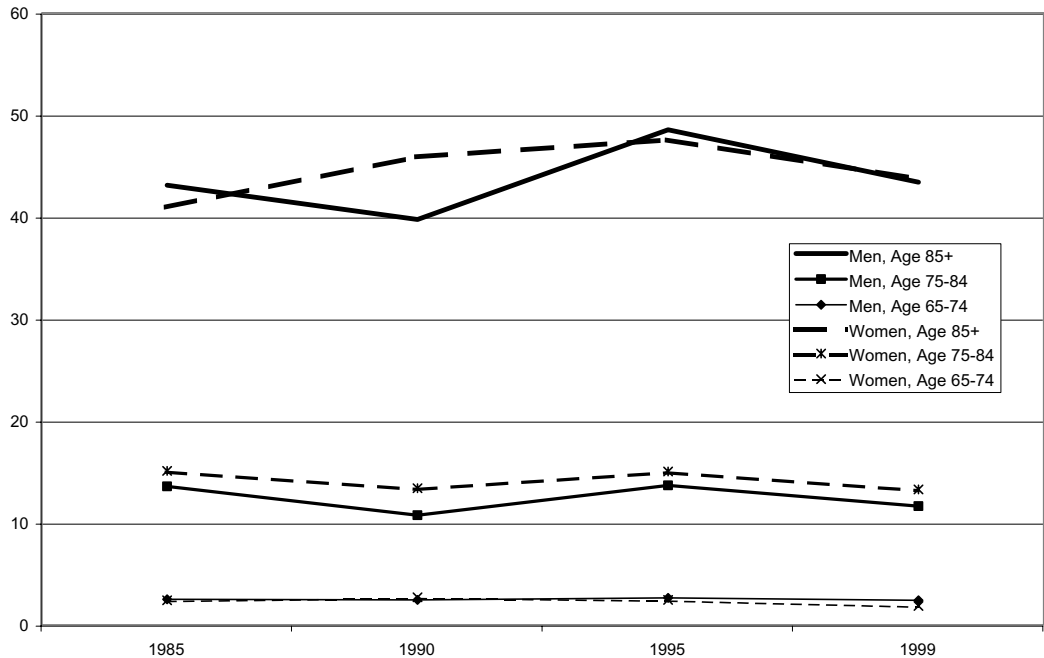
5.4.1 Changes in Personal Care Home Use Over Time

We examined four indicators of PCH use: admission rates, average length of stay in PCH, number of PCH residents per 1000 population, and PCH days per 1000 population. PCH admissions tell us how many people were newly admitted to PCHs in a given year. Average length of stay is a measure of how many days individuals, on average, stayed in PCHs. We report here median lengths of stay, that is, the mid-point, which means that 50% of residents had lengths of stay below the median and 50% had lengths of stay above or at the median. Rates of PCH residents indicate how many people were in PCHs during a given year. It should be noted that individuals can be counted as a PCH resident in several years. PCH days (per 1000 population) are a measure of overall PCH use as they are based on both the number of PCH residents and length of stay.

Figure 35 shows that rates of PCH admissions did not change significantly from 1985 to 1999. Clearly evident in the figure is that admission rates were markedly higher among seniors aged 85 and over, relative to younger seniors. It should be noted here that although rates did not change over time, the actual number of admissions increased substantially - not surprisingly given the aging population. While 1346 people (of all ages) were admitted to PCHs, in 1985, 1774 were admitted in 1999 (a 32% increase). The increase in the number of people aged 85 or above was particularly large:

543 in 1985 versus 895 in 1999 (a 65% increase). This corresponds quite closely to the 59% increase in the population aged 85+.

Figure 35: PCH Admission Rates (per 1000 Age-Specific Population), 1985 to 1999

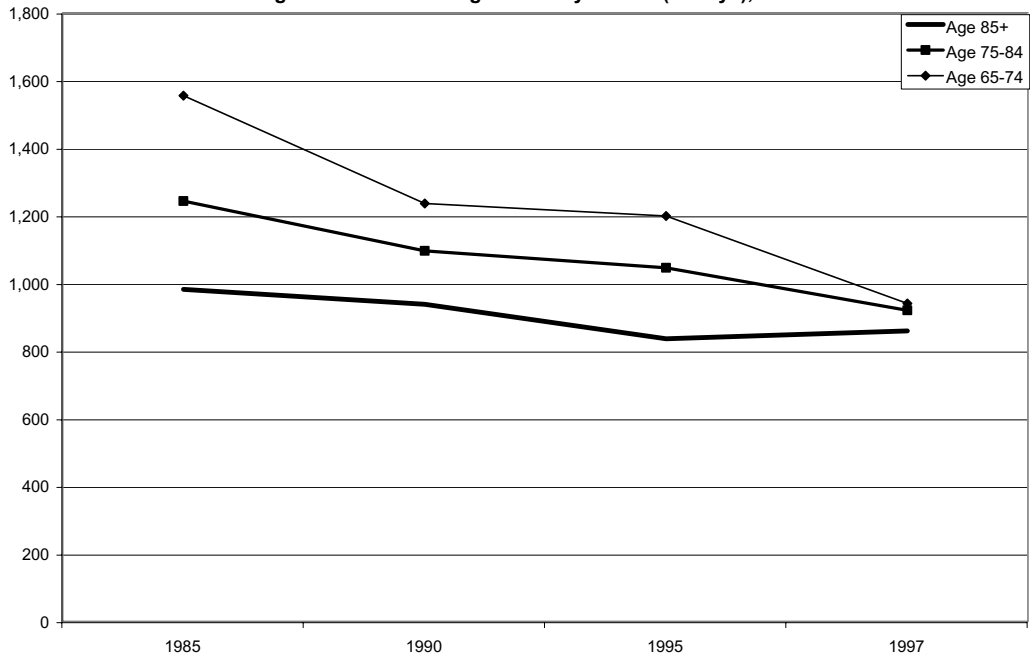


Data source: Population Research Repository. Data are based on fiscal years.

Figure 36 shows that lengths of stay decreased for all age groups. We present length of stay up to 1997 only, given that it can be determined only at discharge and the data for more recent years are therefore incomplete. Median lengths of stay decreased quite substantially between 1985 and 1997. For example, the median length of stay for individuals aged 65 to 74 was 1555 days (over four years) in 1985, but dropped to 940 days (about two and a half years) by 1997. Also, as can be seen in Figure 36, median lengths of stay were, not surprisingly, consistently shorter for older seniors.

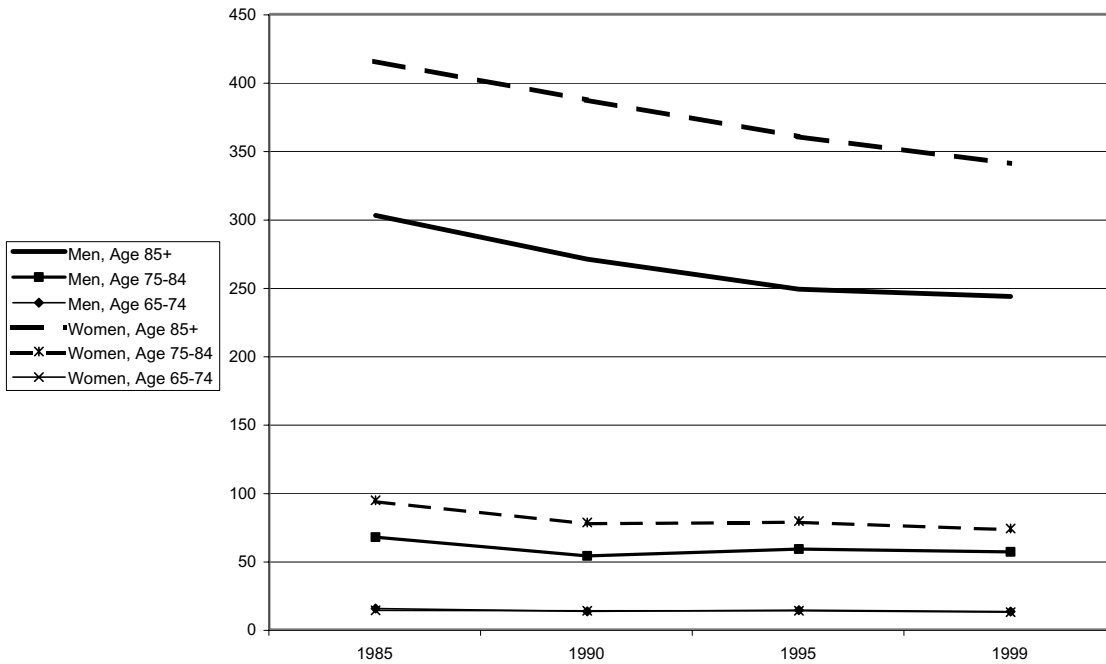
Figure 37 shows that rates of PCH residents decreased significantly for the older age groups (75 to 84 and 85+), but not for seniors aged 65 to 74. This is consistent with the above finding that lengths of stay have decreased over the years. In other words, although the proportion of people admitted to PCHs stayed the same over the years, those admitted stayed for shorter periods of time and, therefore, the proportion of seniors in PCHs decreased. Another way of putting this is that the turnover in PCHs has increased. This is related to the age at admission which, as we saw earlier, has risen.

Figure 36: Median Lengths of Stay in PCH (in Days), 1985 to 1997



Data source: Population Research Repository. Data are based on fiscal years.
 Note: Data are presented up to 1997 only because length of stay can be determined only at discharge. The information is therefore incomplete for more recent years.

Figure 37: PCH Residents (per 1000 Age-Specific Population), 1985 to 1999

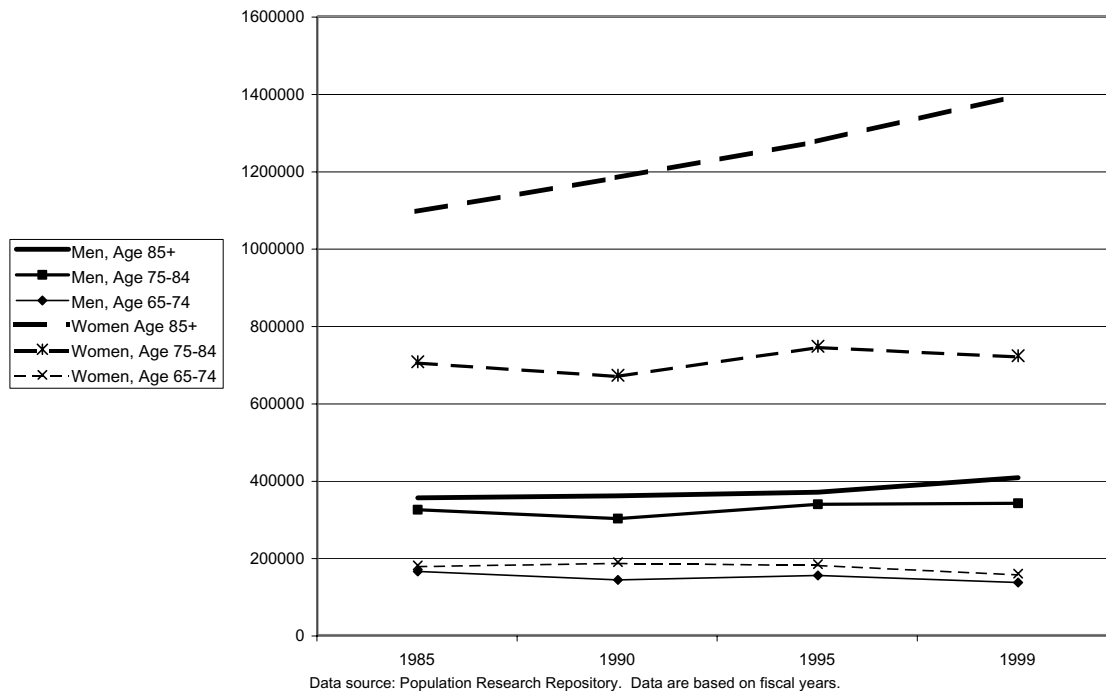


Data source: Population Research Repository. Data are based on fiscal years.

Consistent with the findings that both median length of stay and rates of PCH residents decreased, PCH days (per 1000 population) - a measure of overall PCH use - also declined for men and women in the two older age groups (data not shown). The decrease was particularly pronounced among the oldest-old. For women aged 85+, PCH days declined from 125 per 1000 population in 1985 to 99 per 1000 population in 1999 (a 21% decrease), for men in that age bracket PCH days per 1000 population declined from 83 to 64 (a 23% decrease).

Noteworthy is that while rates decreased, the actual number of PCH days increased - a reflection of the increase in the senior population (see Figure 38). Overall, the number of PCH days increased from approximately 2.8 million in 1985 to about 3.2 million in 1999. The increase, as can be seen in Figure 38, was particularly large for 85+ year-old women. The number of PCH days used by men and women aged 85+ increased by 24% from 1985 to 1999. Although substantial, this was still well below the 59% population increase in that age group.

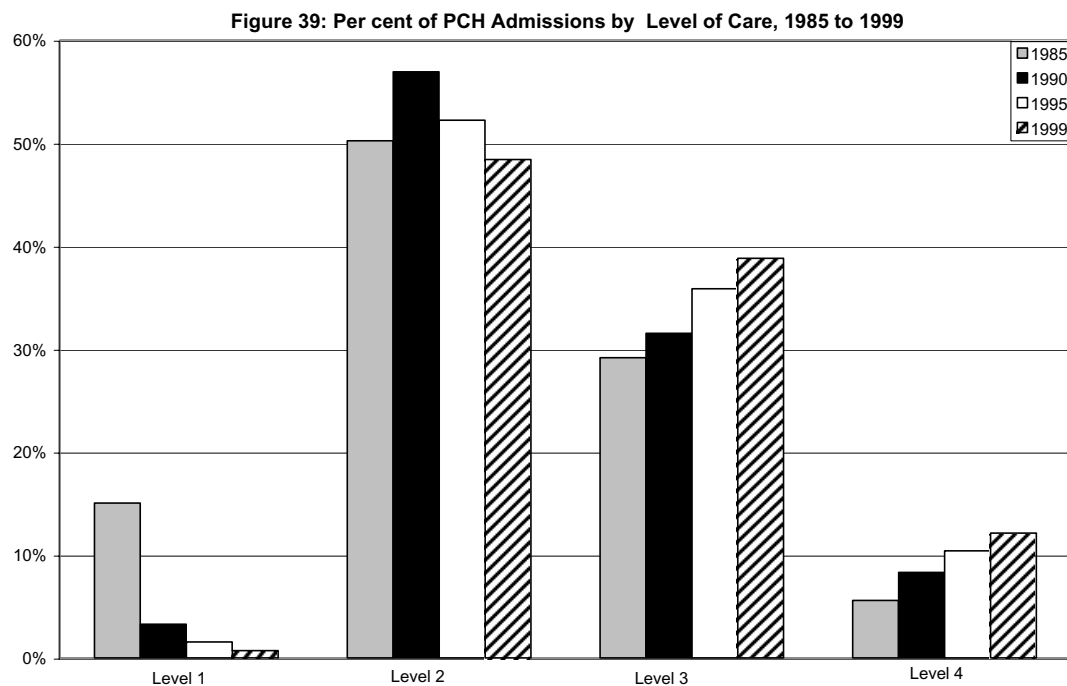
Figure 38: Actual Number of PCH Days, 1985 to 1999



5.4.2 Level of Care at Admission

Figure 39 shows PCH admissions by level of care. Manitoba has four level of care designations based on nursing time required. Persons in Level 1 require half an hour of nursing time, people in Level 2 two hours, and persons in Levels 3 and 4 at least three and half hours per 24-hour period. The

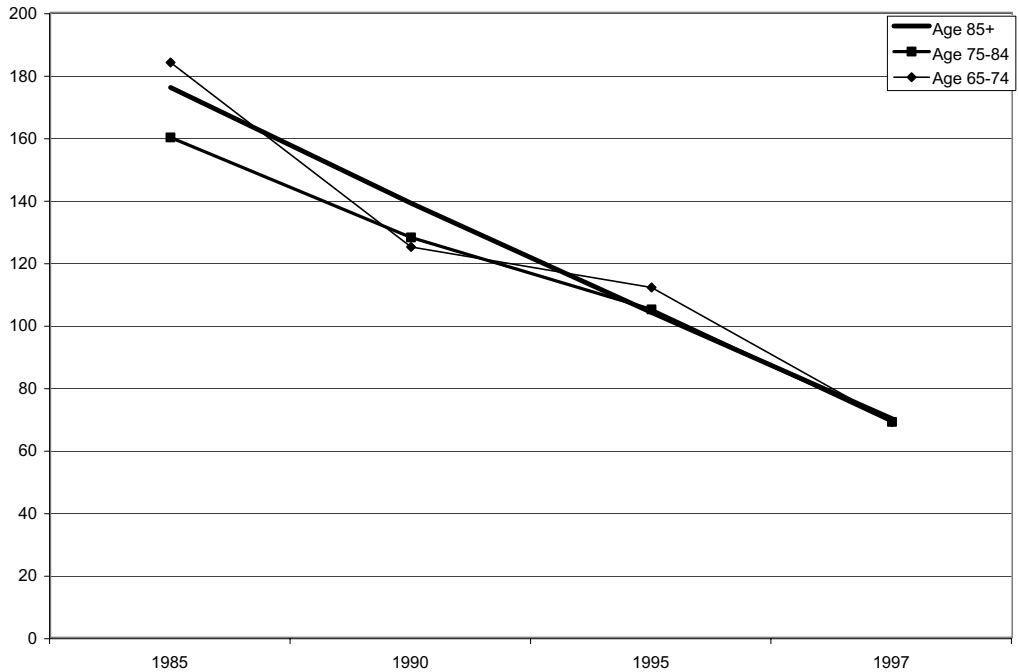
percentage of individuals in Levels 1 and 2 decreased from 1985 to 1999 while, correspondingly, the percentage of persons in Levels 3 and 4 increased. For example, while 6% of admissions were at Level 4 in 1985, the proportion increased to 12% by 1999. Thus, we increasingly see more dependent individuals admitted to PCHs who require more nursing care. This is again consistent with the finding that people are older now when they are admitted to PCHs than in the past.



Data source: Population Research Repository. Data are based on fiscal years.

5.4.3 Waiting Times for Admission

Earlier it was noted that the number of people aged 85 and over admitted to PCHs increased substantially from 1985 to 1999. Was this perhaps at the expense of younger individuals who had to wait longer before being admitted to PCHs? Figure 40 shows that that was not the case. Indeed, waiting times for PCH admission (from the time of being panelled) decreased considerably between 1985 and 1997 for all age groups. For example, while the median waiting time for individuals aged 65 to 74 was 184 days (about six months) in 1985, in 1997 it was 69 days (just over two months).

Figure 40: Median Waiting Times for PCH Admission (in Days), 1985 to 1997

Data source: Population Research Repository. Data are based on fiscal years.

5.4.4 Respite Care in Personal Care Homes

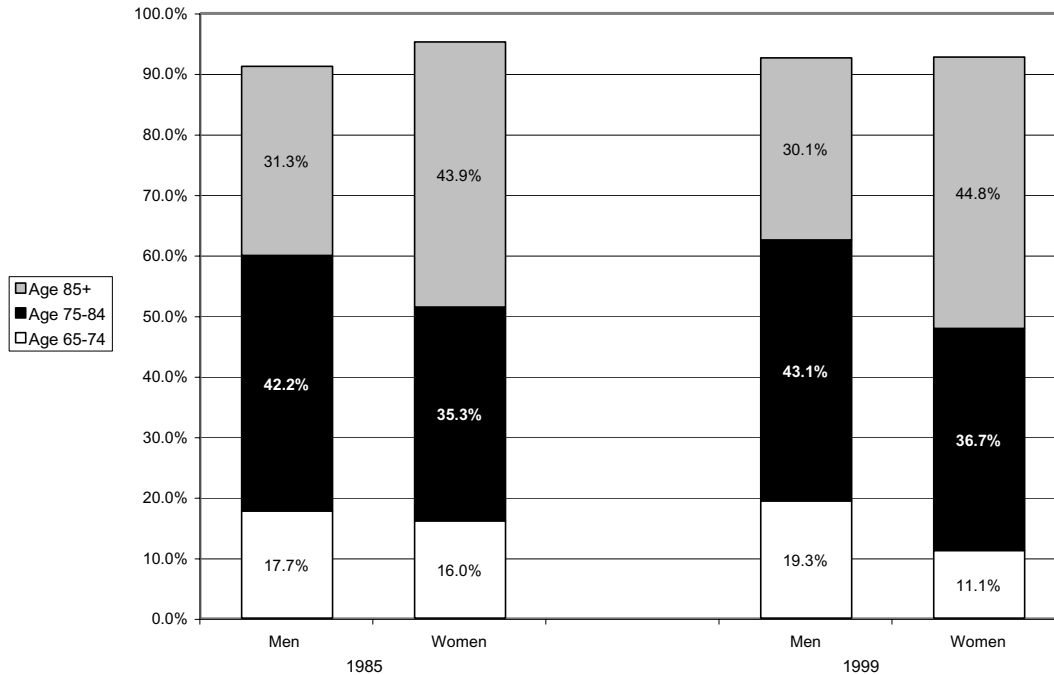
Many dependent seniors are cared for in the community by family members. If care needs are intensive, family members may periodically require relief. Respite care refers to short-term admission to a PCH for the purpose of providing relief to families who care for a dependent person in the community. Specifically, the purpose of respite care is to: 1) provide a period of relief to families and/or care providers who are committed to supporting a dependent person in the community; and 2) to support and maximize community living status for dependent persons. In 2000, 63 PCH beds in Manitoba were classified as respite care beds (33 of those were in Winnipeg).

We were interested in respite care because our analyses of PCH use indicated that seniors are living in the community longer, likely with the help of spouses or children. As people live longer, such informal care givers are also aging. One might therefore expect that the need for respite care would also increase in order to give temporary relief from care giving responsibilities.

Figure 41 shows that most respite care was provided for seniors: 91% to 95% in 1985 and 1999. Individuals aged 75 to 84 and 85+ were the predominant users of respite care. For example, in 1985, 18% of respite care among men was used by 65 to 74 year old, 42% by 75 to 74 year olds and

31% by 85+ year olds. Compared to men, the proportion of 85+ year old women that received respite care was higher (44% in 1985). This reflects the gender difference in life expectancy in that fewer men than women live to the age of 85 or beyond.

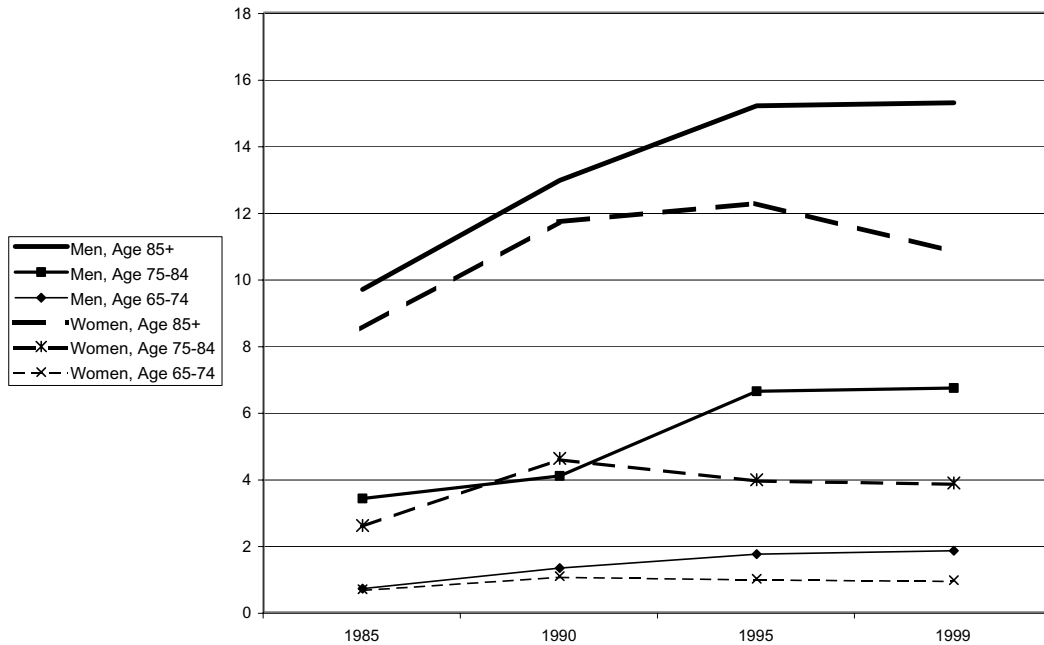
Figure 41: Per cent of Respite Care Used by People Age 65+, 1985 vs. 1999



Data source: Population Research Repository. Data are based on fiscal years.

Figure 42 shows trends in the number of individuals receiving respite care from 1985 to 1999. Rates increased significantly among men (for all age groups), but not among women. Rates were particularly high for men aged 85 and over and they increased by 58% between 1985 and 1999. Although the average length of stay of respite care residents remained relatively constant across the years (27 days on average), the increase in respite care residents also meant that there was a significant increase in overall respite care days for men. No similar increase in either rates of respite residents or days emerged for women.

These gender differences are likely due to care giver roles and age differences among spouses. Men are likely to be cared for by their wives, who are typically younger than they are. As men live longer, their spouses are also aging and may increasingly require relief from care giving responsibilities. In contrast, as we saw earlier (see Figure 6), by the time women reach the age of 75, the majority are widowed and can no longer rely on a spouse for the provision of care.

Figure 42: Respite Care Residents (per 1000 Age-Specific Population), 1985 to 1999

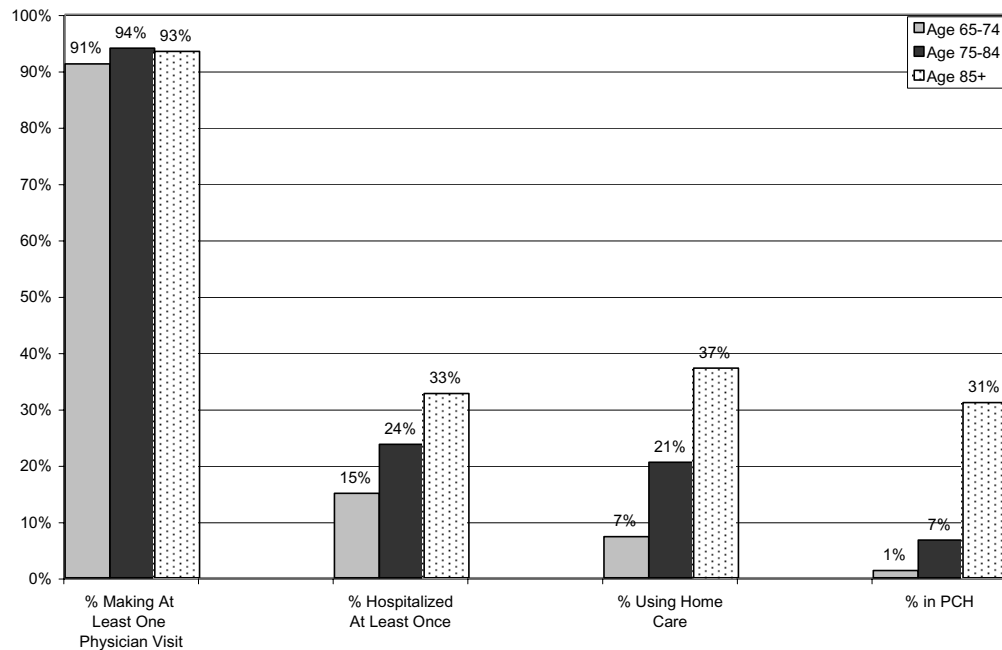
Data source: Population Research Repository. Data are based on fiscal years.

5.5 Most Seniors Do Not Require Health Care Services

Figure 43 summarizes the proportion of seniors who used health care services in 1999. As the figure shows, virtually all seniors made at least one physician visit in 1999. This can be interpreted as a positive finding given that many seniors have chronic health problems that may require ongoing monitoring.

The proportion of seniors who were hospitalized at least once was considerably lower. Even among 85+ year-old individuals, only 33% were hospitalized. Similarly, about a third of individuals age 85 and over made use of home care services, and just under a third were admitted to a personal care home. Conversely, this means that the majority of seniors - and even seniors 85 years and older - were not hospitalized, did not use home care, and did not live in a PCH. It is further important to reiterate that, in terms of hospital use, a small minority of seniors used most of the hospital days, which again highlights the fact that many seniors do not place an undue burden on the health care system.

Figure 43: Per cent of Population Age 65+ Using Health Care Services, 1999



Data source: Population Research Repository. Data are based on fiscal years.

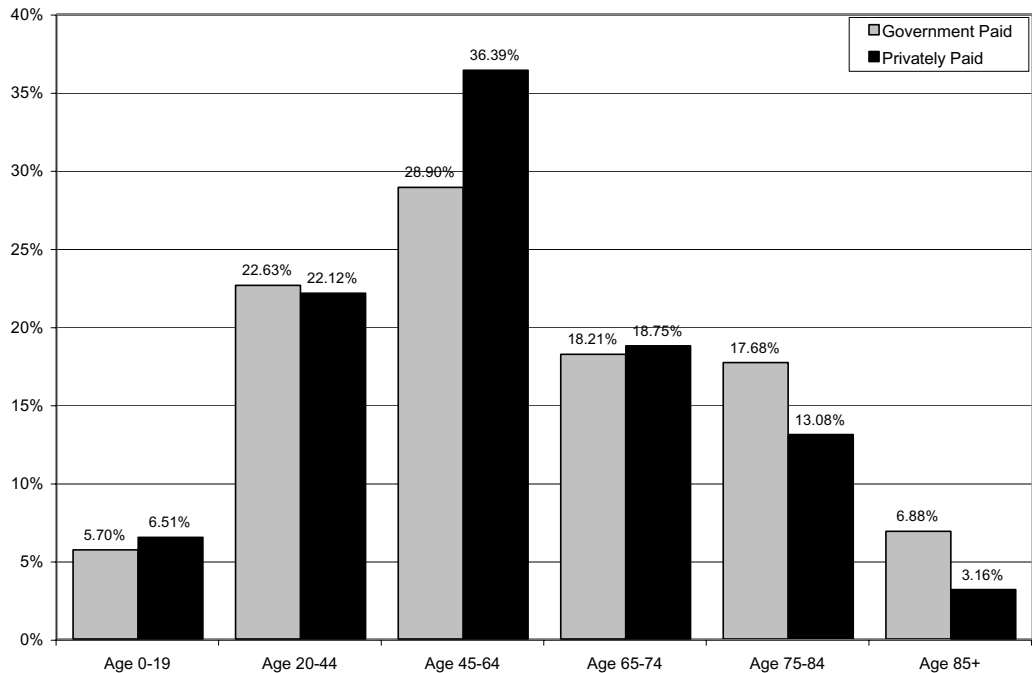
5.6 Prescription Drug Use

Prescription drug use among seniors is an important issue for several reasons. First, rates of prescription drug use increase with age. In 1996, for example, the prescription rate was 20 per 1000 individuals aged 85 and over, compared to about 13 per 1000 seniors between the ages of 65 and 69 and less than 10 per 1000 people who were less than 55 years of age (Metge et al., 1999). Second, prescription drug use has been increasing. The number of prescriptions per Manitoba resident has increased by 15% from 1995 to 1998, and the number of different drugs used increased by 8% over the same time period (Roos et al., 2001). Third, and perhaps most importantly, there has been an increasing concern about prescription drug use because of escalating costs of pharmaceuticals. Between 1995 and 1998, the dollars per person spent on drugs increased by 24% - from \$173 to \$215 (Roos et al., 2001).

Most Manitobans pay for pharmaceuticals out of their own pocket or through private insurance co-payments and premiums. Some families have a portion of their drugs paid by the government. Under the Pharmacare program, reimbursement is provided for drug costs that exceed a given deductible. The deductible is income-dependent - 2% of income for low-income families and 3% for all other families.

Looking at total drug costs, seniors contributed 39% in 1999 (data not shown). Figure 44 shows a breakdown of the percentage of total pharmaceutical costs used by different age groups, differentiating between privately paid versus government paid costs. The pattern differed somewhat for government paid versus privately paid costs. While seniors' contribution to government paid costs was 43%, it was 35% in the case of privately paid costs. This can be explained in terms of greater prescription drug use among seniors, which means that they would be more likely to exceed the deductible and be reimbursed for drug costs. As well, many seniors would qualify for the lower deductible of low-income families.

Figure 44: Total Pharmaceutical Costs (Government Paid Versus Privately Paid) by Age, 1999



Data source: Population Research Repository. Data are based on fiscal years.

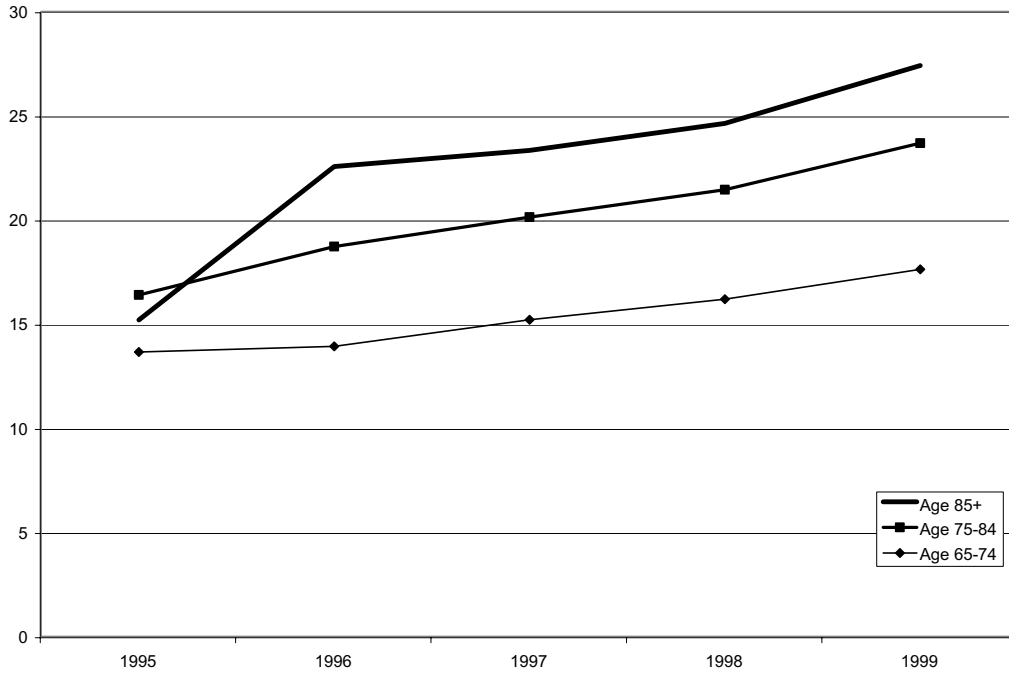
5.6.1 Trends in Prescription Drug Use and Drug Costs Over Time

Figure 45 shows that the number of prescriptions per person increased substantially for all age groups between 1995 and 1999. Among individuals aged 65 to 74 years old, the number of prescriptions per person increased by 28%. Among seniors aged 75 to 84, there was a 45% increase, and among the 85+ year olds there was an 80% increase.

Figure 46 shows the corresponding increase in cost per person. Again, a marked increase is evident among all age groups. Drug costs increased by 41% among seniors aged 65 to 74 and by 62% among individuals aged 75 to 84. The increase was particularly large among seniors aged 85 and over,

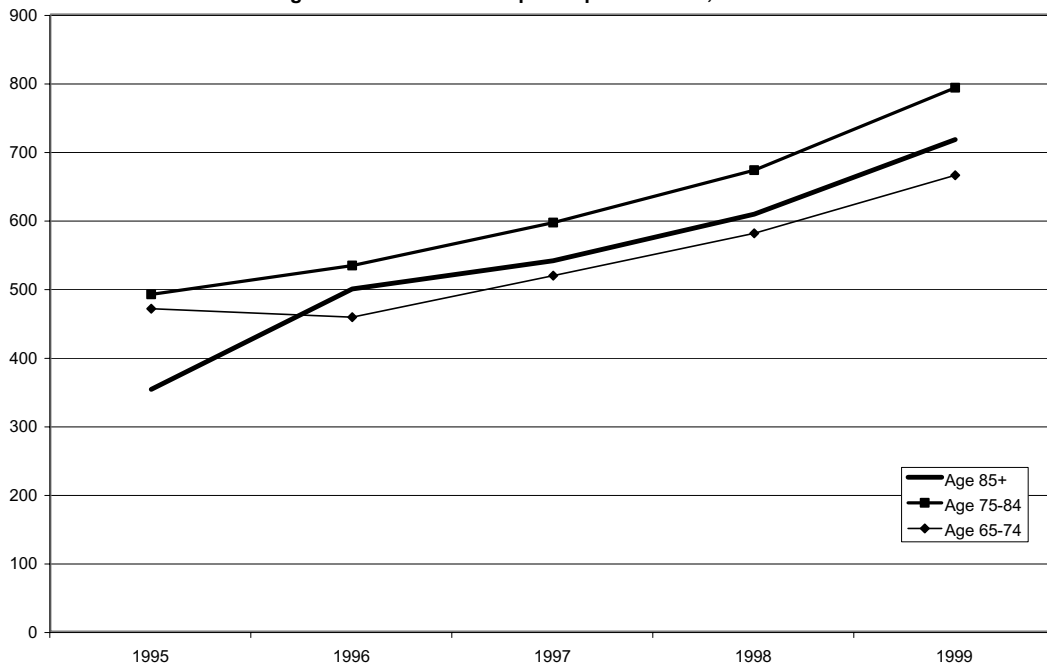
for whom the prescriptions cost per person more than doubled during the five-year time span, increasing from \$353 to \$717 (a 103% increase). For all age groups, the increase in cost exceeded the increase in the number of prescriptions substantially, indicating that the cost of drugs has risen.

Figure 45: Number of Prescriptions per Resident, 1995 to 1999



Data source: Population Research Repository. Data are based on fiscal years.

Figure 46: Cost of Prescriptions per Resident, 1995 to 1999



Data source: Population Research Repository. Data are based on fiscal years.
 Note: Cost includes both government and private expenditures.

6.0 DISCUSSION

6.1 The Aging Population

The demographic make-up of the Manitoba population has undergone considerable changes in the past 15 years. While there were about 134,000⁸ Manitobans aged 65 years or older in 1985 - or 12.1% of the total population, there were about 155,600 by the year 2000 - or 13.5% of the total population. It is projected that by 2020, seniors age 65 or over will constitute 17.8% of the population.

Although there is no doubt that the population is aging, in thinking about the impact on the health care system, it is important to have a clear understanding of the changing demographics, as the increase in the number of seniors is not uniform across all age groups. Between 1985 and 2000, the increase in the number of seniors was driven by individuals aged 75 or over. The increase in the number of individuals aged 85 and over was particularly large, with a growth of 59%. During that time period, the number of individuals aged 65 to 74 remained virtually constant.

In contrast, between 2000 and 2020, the greatest increase is expected among the young-old (those age 65 to 74), with their numbers expected to increase by about 49,000 (a 62% increase). At the same time, the increase in the number of individuals age 75 and above will slow down. During that 20-year time period the number of seniors aged 75 and above is expected to increase by 9000 individuals. In comparison, between 1985 and 2000, the number of 75+ year-old individuals increased by 22,000. The demographic trends will reverse again in about 2040 when the baby boomers reach the 75+ age range and their number will again increase relatively more than that for younger seniors.

6.2 Most Seniors are Healthy and Live Independently in the Community

Most seniors are healthy and require few health care resources, particularly seniors aged 65 to 74. About two-thirds of seniors aged 65 to 74 reported being in good to excellent health, the majority were independent and did not require assistance with everyday activities, and most had no disabilities. Although virtually all seniors in that age bracket saw a physician at least once every year, only 15% were hospitalized, 7% used home care and only 1% lived in a personal care home in 1999.

Health declines and health care use clearly increases with age. Nevertheless, even among individuals aged 85 and over, a substantial proportion are still healthy and independent. For example, 70% to 80% of 85+ year old seniors living in the community reported being in good to excellent health and

⁸ Population figures are rounded to the nearest 100 to simplify presentation.

about one in five needed no help with basic activities of daily living. Similarly, in 1999 only about a third of individuals aged 85+ year old were hospitalized, used home care or were admitted to nursing homes.

This suggests that the projected, marked increase in seniors aged 65 to 74 in the next 20 years will predominantly involve a group of relatively healthy individuals. Conversely, the increase in the number of older seniors age 75 and above, who are less healthy and, consequently, the heavier consumers of the health care system, are expected to increase much less in the next 20 years.

6.3 The Health of Seniors Has Been Improving for Some Indicators

The health of Manitoba's seniors has been improving in a number of ways. Life expectancy has increased substantially for men (albeit not women) between 1985 and 1999. Men who lived to age 65 could expect to live 18.3 years longer in 1985 versus 19.7 years in 1999 - an increase of 1.4 years. Similarly, life expectancy at age 75 increased by .8 years for men (from 11.8 years of life remaining in 1985 to 12.6 in 1999).

All cause mortality rates have correspondingly declined for men age 65 to 74 and 75 to 84 (by 19% versus 10%, respectively, between 1984-86 and 1997-1999). This appears to have been due primarily to a decline in deaths due to heart disease. Consistent with this, hospitalization rates for acute myocardial infarction also declined significantly for both men and women aged 65 to 74 and 75 to 84 (anywhere from 15% to 28%). These decreases may be due both to better treatment of heart disease and healthier lifestyles.

6.4 Health Care Use Has Decreased

Decreases in health care use also suggest, at least in part, improvements in health, although changes in the health care system, such as the shift to outpatient surgery also clearly play a role. In this respect, rates of hospital days and the proportion of seniors who were hospitalized declined, particularly among individuals aged 85 and over. For example, while 47% of people aged 85 and over were hospitalized in 1985 the percentage dropped to 33% by 1998. Physician use among seniors aged 85 and over also declined substantially - from about ten visits to general or family physicians per person to about seven visits per person.

Moreover, age (and level of care) at admission to PCHs increased, indicating that seniors live in the community longer. Length of stay in PCHs has correspondingly decreased. This indicates that there is greater turnover in PCHs, as seniors are increasingly older and frailer at admission. That seniors are able to stay in the community longer is likely to a combination of better

health and function, but also increased used of home care. Indeed, rates of home care days increased by 17% to 27% (depending on the age group) between 1995 and 1999.

Although rates have declined for some indicators, it is important not to lose sight of the fact that that this does not necessarily mean a decline in actual numbers. For example, the actual number of hospitalizations for acute myocardial infarction has remained virtually constant (1548 in 1985 versus 1504 in 1999), the number of seniors who were hospitalized increased from 30,321 in 1985 to 31,720 in 1999, and the number of PCH days increased from 2.8 million in 1985 to 3.2 million in 1999.

6.5 A Minority of Seniors Use Most Hospital Days

Although seniors' hospital use has declined from 1985 to 1999, they still consume a greater share of hospital resources than younger individuals. In 1999, 38% of inpatient hospitalizations involved seniors; however, they used 64% of all hospital days. This is because average lengths of stay were considerably longer for seniors than younger individuals. Given that inpatient cost is to a large extent driven by length of stay, seniors therefore also contributed 60% to inpatient costs.

However, this large share of hospital days - and cost - can be traced back to a small number of individuals. In 1999, 5% of seniors used 78% of all the hospital days that were consumed by seniors. These 5% of patients had very long lengths of stay averaging 91 days. The majority of these hospital days likely did not require care in acute care hospitals. A previous report by the Manitoba Centre for Health Policy (De Coster et al., 1996) shows that only 27% of patients in hospital for 30 days or more still required acute care.

A subsequent report examined more specifically the reasons for long hospital stays, defined as stays longer than 30 days (Bruce et al., 2001). Findings indicate that 52% of days spent in hospital that were classified as non-acute were spent waiting for PCH or chronic care placement. An additional 24% of non-acute days were assigned to patients receiving rehabilitation services, such as physiotherapy. It is important to note that this category does not include patients who were transferred to rehabilitation units, but rather only patients who occupied beds designated for acute care. Other factors associated with non-acute days by long-stay patients included "in-hospital" factors, such as delays in response for consultations or time spent waiting for diagnostic tests (9%), palliative care (7%), and waiting for home care (5%). These findings suggest the need to take a close look at possible alternatives to acute care, such as rehabilitation, convalescent or palliative care bed capacity. They also suggest that the factors that contribute to delays in arranging services and referring patients to home care should be reviewed.

6.6 Cancer Incidence and Chronic Diseases Are on the Rise

Although most seniors live relatively independently - and longer than ever - in the community, cancer and chronic diseases are common; and increasingly so. In 1997-99, 2% of seniors were newly diagnosed with cancer, 40% to 50% of seniors had hypertension, and about a quarter to a third had ischemic heart disease. Diabetes and asthma were also quite common.

Cancer incidence rates increased for men and women aged 65 to 74 over the past 15 years (by 18% and 13%, respectively), although the data suggest that rates are starting to level off or even decrease in the most recent years. Moreover, hypertension, diabetes, and asthma diagnosis rates generally increased from 1985 to 1999. Dementia diagnosis rates also increased substantially.

The difficulty in interpreting these trends is that it is not clear whether they truly reflect increases in disease incidence or prevalence or changes in screening or physician diagnosing. Greater emphasis on cancer screening may allow detection of cancer at an earlier stage. Similarly, lowered thresholds for diagnosing certain diseases, such as diabetes (Meltzer et al., 1998), or increased awareness of a disease may result in more people being diagnosed with that disease. For example, while memory impairment might have been attributed to normal aging in the past, it may now be recognized and diagnosed as dementia. Regardless of the reasons for the increases, however, increases in diagnosis would tend to lead to increases in treatment. This may, in part, account for the rise in drug use. The question of whether increased screening or drug use result in better health in the long run is an important one that will need to be examined.

6.7 Falls and Hip Fractures Are Common

Hospitalization rates for falls are high, particularly among the oldest-old women, and rates have not changed significantly in the last 14 years. In 1999, 75 per 1000 women aged 85 and over were admitted to hospital because of a fall. Given that hip fractures are a common consequence of falls, hip fracture rates among the oldest-old women are also high - 28 per 1000 women age 85 and over in 1999. Falls and the serious injuries (such as hip fractures) that can result from them are an important issue, as many seniors never fully recover. Reduced functional capacity following a fall-related injury often leads to nursing home admission. The present findings therefore suggest the need for continued emphasis on fall prevention among seniors, particularly the oldest old.

6.8 Hip Replacements, Knee Replacements and Bypass Surgery Have Increased

Total knee replacements, total hip replacements and coronary artery bypass operations increased substantially from 1990 to 1999 (by 75%, 66%, and 54%, respectively). There do not appear to be uniformly accepted criteria as to when these procedures are most appropriate, particularly in the case of hip replacements and bypass surgery (Wennberg, 2001). For whom and under what conditions these procedures are most appropriate and beneficial is clearly an important question that will need to be addressed. Given the aging population - and increasing number of potential candidates for these procedures - this becomes an increasingly pressing issue; especially since coronary artery bypass operations are among the costliest (per case) procedures (Finlayson, 1999).

6.9 Prescription Drug Use and Drug Cost Have Increased

The number of prescriptions per person increased for all age groups between 1995 and 1999. The increase was particularly large among individuals aged 85 and over, with an increase of 80%. The cost of prescriptions also increased from 1995 to 1999. Indeed, it increased more than the number of prescriptions per person. For example, among the 85+ year olds, the prescription cost per person more than doubled, increasing from \$353 to \$717. Whether this increase reflects introduction of more effective drugs or use of more costly, but not necessarily more effective drugs, is difficult to assess. It is an issue that will clearly require systematic research.

7.0 CONCLUSIONS

- The population is aging; that is a fact. However, the effect of the aging population on the health care system is more likely to move like a glacier than an avalanche. From 2000 to 2020, the projected increase in the senior population will be driven by individuals aged 65 to 74. These seniors are generally in good health and require relatively few health care services.
- The increase in individuals aged 75 to 84 and 85+ will be relatively small between 2000 and 2020. Indeed, the health care system has had to cope with a larger increase in seniors aged 75 or older between 1985 and 2000 than will be the case from 2000 to 2020. Although seniors aged 75+ consume more health care resources than younger seniors, it is important to recognize that many of them remain healthy and independent into old age. For example, in 1999, only about a third of seniors aged 85 and over lived in a PCH.
- There are also signs that the health of seniors in Manitoba, including the health of the oldest old, has been improving. Thus, although the number of seniors will increase, they will likely require fewer health care services than was the case in the past.
- While the health of seniors has improved in terms of some indicators, cancer and chronic diseases (hypertension, diabetes, asthma, and dementia diagnoses) are on the rise. Whether this reflects actual increases in incidence or prevalence or changes in practice patterns is not clear (e.g., greater emphasis on cancer screening or changes in how physicians diagnose patients such as changes in diagnostic criteria as is the case for diabetes). Regardless, diagnoses tend to lead to treatment, which may in part account for the increased drug use. The question of whether increased cancer screening and drug use result in better health in the long run is an important one that will need to be addressed.
- Falls are a particular concern for seniors. Many falls lead to serious injury such as hip fractures, that can impair function, possibly necessitating admission to a nursing home. The present report shows that hospitalizations for falls and hip fractures are quite common among the oldest seniors, particularly among women aged 85 and over. This suggests a continuing need for programs focusing on injury prevention.
- Although seniors used nearly two-thirds of all hospital days - and contributed nearly two thirds to inpatient cost - this was due to a small number of individuals. Many of the hospital days used by these individuals likely did

not require care in acute care hospitals. Although waiting times for admission to personal care homes have declined substantially over the years, timely discharge of patients to PCHs and chronic care facilities should therefore remain a priority. As suggested by a previous Manitoba Centre for Health Policy report, factors associated with delays in getting diagnostic tests or consultations, as well as factors linked to delays in the referral process to home care should also be reviewed (Bruce et al., 2001). Similarly, alternatives to acute care, such as increasing the capacity for patients requiring rehabilitation or palliative care should be examined.

- The majority of seniors - even seniors aged 85 and over - live in the community and seniors are living in the community longer than ever. This suggests that, as the number of seniors rises further, there will be an increasing need for home care services. The need for alternative types of housing, such as supportive housing, is also likely to increase.

- Similarly, expansion of community-based programs needs to be considered, including primary health care services focusing on injury prevention, health promotion, and chronic disease management. In addition, other community programs, such as shared meal programs, handyman services, social programs, and transportation are important. Such support services are not care services, but are nevertheless essential in allowing seniors to live independently in the community (Havens & Kyle, 1993).

- Many seniors receive support from family members. As seniors stay in the community longer, this can place an increasing burden on family members. Indeed, we found that respite care - temporary admission to a PCH to relieve family members - increased significantly for men between 1985 and 1999. This upward trend can be expected to continue, as spouses and children are also aging and may increasingly require relief when the care giving burden becomes too great. Such relief might be provided, as is currently the case, by temporarily admitting individuals to PCHs or through home care services in people's homes. Whether the support provided to care giver is sufficient now and to what extent it will meet future need will have to be reviewed.

- Although population projections and changes in health status are important, they clearly are not the only factors that determine health care use. One critical issue is how much treatment seniors receive and whether much more treatment is provided - and whether more intensive treatment is in fact appropriate. The present report suggests a few areas that will require close scrutiny. First, drug use - and even more so drug costs - have increased substantially. The issue of cost-effectiveness of drugs is a critical one that will have to be addressed as drug costs escalate. Second, knee

replacements, hip replacements, and coronary artery bypass surgery have increased markedly over the past 10 years. The challenge will be to determine for whom - and under what conditions - these procedures are most appropriate.

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APPENDIX A - GLOSSARY

Age-specific crude rates

Crude rates were calculated for each of the three age groups: 65 to 74, 75 to 84, and 85+ by dividing cases (the numerator) by the population in each age group, as determined at the end of the calendar year (December). One-year rates were based on fiscal year data (April 1 to March 31). Three-year rates were based on three fiscal years in the case of chronic disease diagnoses (see e.g., description of diabetes), but three calendar years (January 1 to December 31) for mortality and cancer.

Aging in Manitoba Study

Aging in Manitoba (AIM) is the largest and longest running study on aging in Canada. Separate representative samples of seniors living in Manitoba (identified using an age-gender stratified area-probability sampling procedure) were interviewed in 1971, 1976, and 1983, respectively. Survivors from the 1971 and 1976 cohorts were surveyed again in 1983. In 1983, a total of 5278 seniors were interviewed. In 1990, 3228 survivors of the three cohorts were re-interviewed and, in 1996, 1868 survivors were again surveyed. All interviews were conducted on a face to face basis in participants' homes. For the present purposes, data from the 1983 and 1996 phases were used. The youngest participants in 1996 were 72 years old. Comparisons between the 1983 and 1996 phases were therefore made for two age groups only: those 72-84 versus those 85+ years old.

Asthma

Asthma was defined on the basis of a diagnosis for asthma. Individuals with at least one hospitalization or two physician visits for asthma (ICD-9-CM=493) over a three-year period were identified as having asthma.

Cancer Incidence

This analysis presents the cancer incidence rate (the rate of new cases of cancer being diagnosed) based on Manitoba Cancer Registry data provided by CancerCare Manitoba (sites 140-172, 174-208). Non-malignant skin cancers were excluded. Cancer is a legally notifiable disease, and the registry is credited with having high quality data. Cancer incidence data are presented for three-year time periods to provide more stable results.

Causes of Death

We examined deaths due to all causes as well as deaths due to certain specific causes. The following causes of death were identified from Vital Statistics data:

- Heart disease (ICD-9-CM=401.0-429.9)
- Cancer (ICD-9-CM=140.0-239.9)

- Cerebrovascular disease (ICD-9-CM=430.0-438.9)
- Pneumonia and influenza (ICD-9-CM=480.0-487.9)
- Chronic lung disease (chronic obstructive pulmonary disease) (ICD-9-CM=490.0-496.9)
- Injuries (ICD-9-CM=800.0-999.9)
- Diabetes (ICD-9-CM=250.0-250.9)

Dementia

Dementia was defined on the basis of a diagnosis for dementia. Individuals with at least one hospitalization or one physician visit for dementia (ICD-9-CM=290-292, 294, 331 & 797) over a one-year period were identified as having dementia.

Diabetes

For this analysis, a diabetic was defined as any individual having at least one hospitalization or two physician visits for diabetes in three fiscal years (ICD-9-CM=250). This definition was chosen among several for its ability to closely match clinical measures and survey results (Robinson et al, 1997).

Disabilities and Pain

The prevalence of disabilities and pain was derived from the National Population Health Survey. Areas examined were: 1) the proportion of seniors who indicated that pain or discomfort prevented some or most activities; 2) the proportion of seniors who had uncorrected vision problems; 3) the proportion of seniors who had uncorrected hearing problems; and 4) the proportion of seniors who either required mechanical supports, such as braces, a cane, or crutches to be able to walk around the neighbourhood or couldn't walk at all. Weighted proportions are provided for all indicators.

Functional Impairment

Functional impairment was measured by asking participants whether they were able to engage in various basic (ADLs) and instrumental activities of daily living (IADLs). Questions were taken from scales routinely used in the gerontological literature. The ADL scale included the 14 items: going up and down the stairs, getting about the house, going out of doors in good weather, going out of doors in any weather, getting in and out of bed, washing or bathing or grooming, dressing and putting shoes on, cutting toenails, eating, taking medication or treatment, using toilet, nursing care, watching television or listening to radio/reading/writing, and using the telephone. IADLs were measured with nine items: doing light housework, doing heavy housework, making a cup of tea or coffee, preparing a hot meal, shovelling and yard work, shopping, managing financial matters, doing laundry, and major house or household repairs.

For each question, participants indicated whether they were capable of engaging in the activity without help (0) or whether they needed assistance (1). Summary scores were created by adding affirmative responses to the ADL and IADL items, respectively.

Home Care Clients

Any Manitoban who was registered as a Home Care client in the Manitoba Support Services Payroll (MSSP) data for at least one day between April 1, 1995 to March 31, 2000 was included in the MCHP Home Care client file. We identified individuals as new clients if they were not registered for home care on April 1 of the particular year, but were subsequently registered with the Program during the year.

Home Care Days

The number of days "open" in the Home Care Program provides information on the length of home care episodes within a given fiscal year. Home care days were expressed in terms of rates per 1000 age-specific population.

Hospitalization for Hip Fractures

Hospitalizations (discharges) for hip fractures were identified from hospital discharge abstracts (ICD-9-CM=820, 821 or 733.14).

Hospitalization for Falls

Hospitalizations (discharges) for falls were identified from hospital discharge abstracts using e-codes (ICD-9-CM=E880-E888). E-codes are used to define environmental events, circumstances, and conditions as the cause of injury, poisoning, and other adverse effects related to injury hospitalizations and mortality.

Hospital Days per 1000 Age-Specific Population

The number of hospital days in a given year divided by the age-specific population as of December 31 of that year multiplied by 1000.

Hospitalization Rates

The number of hospital discharges in a given year divided by the age-specific population as of December 31 of that year.

Hypertension

A person was defined as hypertensive if they had at least one hospitalization or two physician visits for hypertension in three fiscal years (ICD-9-CM=401-405). This definition was chosen among several for its ability to closely match clinical measures and survey results (Robinson et al, 1997).

Income Quintiles

Income quintiles are presented for urban areas only, with "urban" being defined based on the Statistics Canada definition. According to this definition, towns like Dauphin or The Pas are classified as urban. Postal codes in urban areas were sorted by average household income value (lowest to highest income), which was assigned based on publicly available census data from 1996 that provided household income at the Enumeration Area level. Next, postal code population values (specific to year 1996) were classified by average income from lowest income to highest income, so that approximately 20% of the population were present in each class. Each class of postal codes formed an income quintile, with the lowest income quintile representing areas with the lowest average income, and the highest income quintile representing areas with the highest average income.

Inpatient Cost

All cases that are discharged from hospital are assigned a relative weight using an algorithm developed by the Canadian Institute for Health Information, such that cases that are more costly receive a higher weight than those that are less costly. The total cost of providing inpatient care in all hospitals in Manitoba is divided by the total weights for all cases-this results in the cost per weighted case. The estimated cost of a particular case (or group of cases) is calculated by multiplying the cost per weighted case by the weight that has been assigned to the case (or cases).

Ischemic Heart Disease

Ischemic heart disease refers to any condition in which the heart muscle is damaged or works inefficiently because of a lack of blood supply. It includes angina pectoris and acute myocardial infarction. A person was defined as having ischemic heart disease if they had at least one hospitalization or two physician visits for ischemic heart disease in three fiscal years (ICD-9-CM=410-414).

Levels of Care at Admission to PCHs

Manitoba has four levels of care designations based on nursing time required. Persons in Levels 3 and 4 require at least 3.5 hours of nursing time over a 24-hour period; Level 2 care provides 2 hours; and Level 1 provides 0.5 hour.

Life Expectancy

Life expectancy is defined as the average years of life an individual of a given age is expected to live if current age-sex-specific mortality rates remain stable. Estimates of life expectancy at age 65 and 75 were calculated each year between 1985 and 1999. The estimates were based on the mortality experience over successive 5 years of Manitoba vital statistics data. For

example, estimates of 1985 life expectancy were based on 1981-1985 mortality data while estimates for 1986 were based on 1982-1986 deaths.

Marital Status

Seniors were categorized as married (which includes common-law relationships) or non-married. This category 'non-married' includes individuals who were never married, widowed and divorced or separated.

Mortality Rates

Mortality rates were derived from Manitoba Department of Vital Statistics data. Average annual rates based on three years of data are reported, as the number of deaths fluctuates from one year to the next.

National Population Health Survey

The National Population Health Survey (NPHS) is a Statistics Canada survey that is conducted every two years. The NPHS, which started in 1994/95, collects information about the health of the Canadian population. It covers household and institutional residents in all provinces and territories. For the present purposes, the 1996/97 survey was used focusing on Manitoba residents aged 65 or over. The NPHS comprises two sections: 1) a general or household survey asked of each household member; and 2) a health section, in which only one (randomly selected) family member age 13 years or older was selected.

PCH Admission Rates

Measures the rates of PCH admissions, expressed in thousands.

PCH Days

PCH days are the total number of days occupied by residents of PCHs in a given year.

PCH Residents

PCH residents are people who lived in a personal care home during the year in question. Only residents receiving care at Levels 1 to 4 were included. Individuals can be counted as residents in several years.

PCH Waiting Times

PCH waiting times measure the median (the median is the mid-point) waiting time for admission to a PCH. Waiting times were determined from the date of being panelled to the date of admission.

Pharmaceutical Cost Per Person

Provides a summary measure that describes total expenditures on pharmaceuticals per person and includes the portions paid by government and indi-

viduals. This summary measure does not include the amount individuals spend on pharmaceuticals available without a prescription and over-the-counter. The numerator is influenced by the number of pharmaceutical claims submitted in a particular year for residents of a specific region, the ingredient price of the drugs that are dispensed, as well as the associated dispensing fees; the denominator consisted of the population for that year. Note, as this measure of expenditures only includes those dispensed in retail pharmacies, the costs of drugs dispensed in hospitals, including some very expensive outpatient drugs such as cyclosporin (to prevent transplant rejection) will not be included.

Physician Ambulatory Visits

This rate serves as a measure of the total ambulatory utilization of physician services by people aged 65 year or older. It is defined as the total number of ambulatory physician visits made by Manitobans, divided by the age-specific population.

Prescriptions Per Person

This rate is a measure of intensity of drug use by Manitoba residents. It is defined as the average number of prescriptions dispensed per person. The numerator consists of the total number of prescriptions (pharmaceutical claims submitted) dispensed in a particular year; the denominator is the Manitoba population for that year.

Procedure Rates

These analyses examine the rates of "high profile" procedures (i.e., bypass surgery, total hip replacement, and total knee replacement surgery) in Manitoba. These surgical procedures were classified as "high profile" because they have been noted in the popular press as being potentially rationed in Canada. All procedures were identified from hospital separation abstracts from 1990/91 through 1999/2000. The rates of bypass surgery, total hip or total knee replacements per 1,000 residents were calculated as age-sex adjusted rates (using the direct method).

Respite Care

Respite care refers to temporary care provided in PCHs to give relief to informal care givers like spouses. Respite care days were identified from PCH files (Level of care 5).

Self-Rated Health

Self-rated health was assessed in the National Population Health Survey with a single item, namely: "In general, would you say your health is: excellent, very good, good, fair, poor".

Trend Tests

Trend tests were conducted using Chi-square statistics which test whether or not rates across the years differed. A significant statistic indicates that there is a linear upward or downward trend over time. Given that we conducted multiple tests, a Bonferroni adjustment was used to avoid Type I errors, with each trend analysis evaluated for significance at $p < .001$.