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Sex Differences in Health Status, Health Care Use, and Quality of Care: A Population-Based Analysis for Manitoba's Regional Health Authorities

November 2005

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

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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

Introduction

Male/female differences in health and health care have been of interest for years, and continue to be central issues in the planning and delivery of health services. However, there is a lack of information available for population-based comparisons of males versus females on a variety of indicators, particularly at the Regional Heath Authority (RHA) level. This atlas-style report provides sex-specific rates for many indicators of health status and health care use. Results are shown for each of Manitoba's 11 RHAs, and their component districts (except Winnipeg), as well as by area-level income, and by age group for each sex. The analysis is primarily descriptive, not explanatory; that is, it shows what the data reveal, not how or why those results have come about.

This report is an overview of male/female differences in health status, health service use, and quality of care, as revealed by analysis of administrative health care data files. It is not a compendium of male-specific and female-specific health issues put together into one report; it is an analysis of the key issues which administrative data can address, analyzing males and females separately. It includes many indicators published in previous reports by the Manitoba Centre for Health Policy (MCHP), but shows results for males and females separately. These differences also vary over the life cycle, so all indicators include analyses of age-specific rates for males and females.

The separation is based on the biological fact of 'sex', not the concept of 'gender.' Sex indicates whether the person is male or female. Gender is a psychological/sociological concept related to differential socialization of males and females, and how a person experiences their roles and relationships with others. There is considerable overlap between sex and gender, but they are not identical. Many of the 'sex' differences shown in this report are due primarily to biological differences, but for others, biology may play a limited role in the explanation of the difference, and gender-related issues may be the true determinants.

The Indicators—Key Concepts

This report uses a population-based analysis. This means that the rates or the prevalence are based upon every person living in Manitoba who has a provincial health card. Furthermore, the results are based on where you live, not where you go for treatment. For example, a person living in a remote area may be hospitalized in Winnipeg, but the hospitalization is attributed back to the remote area.

Context: *The Need To Know* Project

Through a five-year grant provided by the Canadian Institutes of Health Research (CIHR) in 2001, researchers from MCHP, staff from Manitoba Health, and high-level planners from each of the RHAs meet together on an ongoing basis. *The Need To Know* project enables capacity building, both for the academics—on how to do research of relevance to rural and northern RHAs, and for team members—on how to understand, interpret and apply research at the planning and decision-making level.

The Need To Know Team identified sex-specific results as a key piece of missing information in their planning for rural and northern RHAs. This is the third joint research project of *The Need To Know* Team, directed by Dr. Patricia Martens of the MCHP, Department of Community Health Sciences. In creating this report, The Team was also assisted by a Working Group of experts in men's and women's health, who contributed countless hours assisting the Team; their names are listed in the Acknowledgements.

The 'need' for this report

Members of *The Need To Know* team identified sex differences as a key issue for a number of reasons. Most important is the need to ensure that regional policies and programs are well designed to meet the needs of all residents. With limited budgets, it is imperative to be sure that programs are tailored to the population in need of the service. So it's important to know whether an issue affects primarily young males, or elderly females, or all residents, to help focus efforts on key target groups, where those exist. Central to this need, then, is the need to have empirical evidence on the prevalence of different diseases in males and females.

Once disease prevalence has been documented, the next obvious questions are who's getting what kinds of treatments for those diseases, and to what effect? So the need for separate male-female data on the use of health services came to the forefront as well.

Perhaps the key driver behind this need was Manitob Health's designation of women as a target population for RHA planning and programs. As a result of that strategic need, most RHAs received intensive training in 'Gender-Based Analysis.' This training made RHA staff more aware of the importance of separating male and female rates for many indicators, as simple 'age-sex adjusted' rates can conceal important sex and age-related differences in the results. It was also clear that these lessons were expected to be incorporated across all policy and program initiatives—and for that to be effectively done, planners need to have results to work from.

What's in This Report?

The focus of this report is to provide insights to health planners, policy makers, and decision-makers on patterns of sex differences in health status, health care use, and outcomes of care. The following issues are addressed:

- Health status and mortality (Chapter 2)
- Incidence and prevalence of a variety of diseases (Chapter 3)
- The use of physician services (Chapter 4)
- The use of hospital services (Chapter 5)
- Rates of high profile procedures, and diagnostic imaging services (Chapter 6)
- The use of prescription drugs (Chapter 7)
- Rates of immunization coverage (Chapter 8)
- The use of Home Care and Personal Care Homes (PCH) ('nursing homes') (Chapter 9)
- Cardiac care services (Chapter 10)
- Quality of care (Chapter 11)

Major findings and implications:

Sex Differences:

This first comprehensive MCHP report on 'sex differences' reveals a number of important differences and similarities between males and females. Of the 74 indicators comparing the sexes, 27 (36%) showed either no or very small sex differences, and 47 (64%) showed significant sex differences—12 of which were very large. But it's not just those that show large sex differences that are important: having sex-specific rates is valuable for all indicators, as the values even for those that showed no sex difference now serve as empirical evidence of that overall similarity. Producing age-specific rates, and rates by area-level income, were also very helpful, providing new insights into service use patterns that would not have been seen without those separate analyses.

For most indicators of health service use, females have higher rates than males, but this difference is reduced (physician services) or eliminated (hospital use) once services relating to pregnancy, childbirth, and other reproductive health issues are removed. The top causes of physician visits, of hospital use, and of deaths are also similar between males and females, once reproductive health issues are removed.

'Sickness' levels:

There's a common saying in epidemiology, 'Women get sicker, but men die quicker.' Our findings suggest the saying be re-worded to 'Men die quicker, but aren't any sicker.' Males continue to die at younger ages than females, but neither sex appears 'sicker' than the other, according to the indicators in this report. Most major diseases affect both males and females, though often to differing degrees, at different times of life, and with different consequences.

The original saying came from the fact that women visit doctors more often than men, making them appear sicker, but men die at younger ages than women. This report shows that when males and females are compared across a variety of diseases, the burden of illness seems relatively even: for some diseases, there is no sex difference, for some, the rates are higher for males, and for others, the rates are higher for females. Of the 12 diseases/disorders studied in this report:

- Two showed no significant sex difference: respiratory disease (11.3% in males, 11.9% in females) and inflammatory bowel disease (0.39% in males, 0.42% in females).
- Four showed higher rates in females than males: hypertension (25.9% versus 24.0%), arthritis (22.3% versus 19.2%), hip fractures (2.7 versus 2.2 per 1,000 residents per year), and infertility (2.7% versus 1.5%).
- Six showed higher rates in men: heart disease (7.0% versus 4.0%) and related heart attacks (7.2 versus 3.2 per 1,000 residents 40+ per year), strokes (4.1 versus 3.0 per 1,000 residents per year), diabetes (6.8% versus 6.3%) and diabetes-related lower limb amputations (0.4 versus 0.2 per 1,000 residents per year), and renal failure (2.5% versus 1.7%).

It's important to note, however, that mental illness is not included in this report. It was excluded only because a recent MCHP report thoroughly documented the significantly higher burden of mental illness among women than men.[1]

There's also a larger lesson to be learned here: the first part of the old saying, 'Women get sicker,' came from the fact that females visit doctors more frequently than males. Health care use is often taken as an indicator of sickness and need for care, but this finding shows that's not always true: females have higher physician visit rates, but that doesn't mean they're 'sicker' than males.

Furthermore, our quality of care indicators which rely most on patients complying with instructions show better results for women than men. Taken together, these findings suggest that women may visit doctors more often for preventive services and for follow-up care, which may explain both their higher visit rates, and their higher quality of care. Women's more frequent visits might be leading to earlier detection, thus providing earlier and more opportunities for good management, which might in turn be responsible for

[1] *"Patterns of Regional Mental Illness Disorder Diagnoses and Service Use in Manitoba: A Population-Based Study,"* MCHP 2004.

women's lower rates of complications (e.g. diabetes leading to renal failure and lower limb amputation—both higher in men), and lower hospitalization rates (once hospitalizations for reproductive issues are removed).

Treatment after heart attack:
A second major finding dispels another prominent myth: that men are treated more 'aggressively' than women after heart attacks—getting more procedures and surgeries. Cardiac catheterization rates were used for this analysis, as it is the 'gateway' procedure for angioplasty, stent insertion, and bypass surgery. A simple examination of the proportion of heart attack patients getting catheterization shows that the rates are much higher for men than women. The problem is age: it's well known that men suffer heart attacks at younger ages than women. But it's also true that invasive procedures are more commonly done on younger patients (of both sexes). So a more careful examination of heart attack patients by age group reveals that the 'age-specific' intervention rates for males and females are the same—and this holds for every age group. That is, a 60 year old female patient is as likely as her male counterpart to be catheterized after a heart attack. It's not that males get more procedures, it's that younger patients get more.

The 'social gradient' in health:
A third major finding—or rather, set of findings—involves the 'social gradient' in health. This refers to the well-established pattern that those from disadvantaged backgrounds have higher rates of disease and death than those from advantaged backgrounds. This pattern has been documented for centuries, and is particularly relevant from a 'sex differences' perspective because in Manitoba (as in Canada overall), females have lower incomes than males.[2] The pattern is called a 'gradient' because it's not just that those in poverty are in poor health whereas all others are in good health. Rather, there is a continuous association between socioeconomic status and health, such that every step up the socioeconomic ladder is associated with better health for both males and females.

This pervasive pattern is reflected in this report as well, which examines all indicators by 'area-level' income (that is, not individual or household income, but the average income of those living in the same area). The good news is that for both males and females, the key components of the health care system—physician visits and hospital use—respond in accordance with this higher need for care, providing more services to those from lower income areas. However, that is not true for all indicators, and often differs for males versus females, and for rural versus urban residents.
The illness and mortality indicators in this report consistently conform to the social gradient, and will likely be difficult to change. However, health

2 *Income in Canada 2003.* Statistics Canada: Ottawa, May 2005. Catalogue number 75-202-XIE.

service provision is more amenable to strategic intervention. The results reveal individual services (e.g. physician visits, number of different drugs used) and entire programs (hospital use, cardiac care) that provide higher rates of service to populations that have higher needs. However, a number of other indicators show either no relationship, or relationships in the opposite direction, and those should be addressed. For example, the rates of use of specialist physicians appear to be driven more by proximity to Winnipeg than population need, and immunization programs could use a 'shot in the arm' to increase coverage rates, especially among residents of lower income areas.[3]

Other insights:

The results also provide additional insights into the distribution of health and health care among males and females in Manitoba:

- The burden of illness and mortality among northern residents is very high, and evident in both males and females, though females had higher treatment prevalence of hypertension, arthritis, diabetes, and renal failure.
- Treatment prevalence values for arthritis were high: 22.3% of women, and 19.2% of men were affected. (This is the first MCHP report to provide values for arthritis, as the definition has just been validated as part of an ongoing MCHP project).
- Females also had higher rates of knee replacements—suggesting a good association between need (arthritis) and service provision.
- Females had higher treatment prevalence of hypertension, but not of associated heart disease and stroke, which reveals a need for future research. There are a number of potential factors which could be contributing to this difference, most notably different visit rates, diagnoses assigned, other complicating illnesses, 'age and stage' at first diagnosis, and treatments provided.
- Diabetes was somewhat more common in males than females, but rates for two complications of diabetes (lower limb amputations and renal failure) were much higher for males than females. The factors cited above regarding hypertension are likely also involved in this difference of diabetes and complications in males versus females.
- Among heart attack survivors, geography is an issue for timely care for both sexes: residents in or near Winnipeg had higher rates of cardiac catheterization, angioplasty, and stent insertion at the time of hospitalization, though the differences decreased over time.

[3] A portion of the lower rates among residents of lower income areas may be due to data collection issues.

Items of concern:

- Prescription drug use among women: females are more likely to receive at least one drug; to be receiving antibiotics, and to be receiving a higher number of different drugs. They are also more likely to be receiving potentially inappropriate prescriptions for anti-anxiety medications (benzodiazepines among seniors 75+). Yet female AMI patients are less likely to be dispensed the recommended beta-blockers within four months of hospitalization for heart attack.
- The absence of individual-level data for computed tomography (CT) scans done at some rural hospitals is a documented and growing problem for rural imaging services. Without individual-level data to record who received the services, the ability to compare rates, track trends, and monitor outcomes is hindered.
- Under-reporting of data for services provided by salaried physicians is also an ongoing concern: without 'evaluation claims' being entered for all visits, the ability to monitor patterns of service provision (and receipt) are limited. This problem can be particularly important in small, remote areas.

Key Findings by Chapter

A recurring theme in recent MCHP reports, particularly those involving *The Need To Know* Team, is the variation in results within RHAs: the district-level result reveal that the experience of residents is not uniform within or across RHAs. For example, the Springfield district in North Eastman RHA is among the healthiest areas in the province, yet the Northern Remote district is the least healthy. Important differences within and across areas occur in many other indicators, reinforcing the importance of providing results for small areas within each RHA. Only those differences which reach statistical significance are discussed in the report findings.

Chapter 2: Health Status and Mortality

- On average, females live considerably longer than males, with a life expectancy of 81.3 years from birth, versus 75.8 years for males.
- Socioeconomic characteristics have a powerful influence on mortality: all indicators showed strong associations with area-level income.
- Residents of the northern RHAs (Nor-Man, Burntwood, and Churchill) have high mortality rates (e.g. annual total mortality rate almost 50% higher than the provincial average).
- The top five causes of death are the same for males and females: circulatory diseases and cancer continue to be the leading causes, responsible for over 60% of all deaths, followed by respiratory diseases, injury & poisoning, and endocrine/metabolic disorders.

- The much higher rate of potential years of life lost (PYLL) for males shows that more of the deaths of young Manitobans are among males than females (68.1 versus 40.6 potential years of life lost per 1,000 residents age 1 to 74).

Chapter 3: Disease Treatment Prevalence and Incidence

- Hypertension and arthritis had the highest treatment prevalence values, and both were more common among females than males. Hypertension affected 25.9% of females and 24.0% of males age 25 or older. Arthritis affected 22.3% of females and 19.2% of males age 19 or older.
- These were followed by respiratory diseases at 11.3% of males and 11.9% of females (no sex difference), then diabetes and ischemic heart disease (IHD), which were both more common among males than females: diabetes 6.8% of males, 6.3% of females age 20-79; IHD 7.0% of males, 4.0% of females age 19 or older.
- Other indicators showed mixed results regarding male/female differences:
  - Males have higher rates of AMI (7.2 versus 3.1 per 1,000 residents per year), stroke (4.1 versus 3.0 per 1,000 per year), renal failure (2.5% versus 1.7% of residents age 20 or older), and diabetes-related lower limb amputations (.41 versus .20 per 1,000 residents age 20 to 79 per year).
  - Females have higher rates of hip fractures (2.7 versus 2.2 per 1,000 residents per year), and infertility treatment (2.7% versus 1.5% of residents age 15 to 55).
  - There is no significant sex difference in inflammatory bowel disease (IBD) treatment prevalence (0.4% of males and females all ages).
- Socioeconomic status has a strong influence on disease treatment prevalence and incidence: rates for most diseases are considerably higher among residents of lower income areas.
- Age is also a key determinant: in general, disease treatment prevalence values are higher among residents in older age groups, though there are exceptions (total respiratory morbidity, infertility, and inflammatory bowel disease).
- Some diseases show large variation across RHAs and districts (for example, diabetes and total respiratory morbidity), while others showed comparable values across areas (for example, hypertension and arthritis).

Chapter 4: Physician Services

- Females had higher rates of physician service use than males across most indicators, though almost half of this difference was related to pregnancy and other reproductive health issues.

  - Proportion of population with one or more visits per year: females 85.7%, males 78.9%.
  - Ambulatory visit rates: females 5.4, males 4.4 visits per year.
  - Ambulatory visits to specialists: females 1.3, males 1.2 visits per year.
  - Percent with complete physical: females 45.8%, males 37.4%.
- For both males and females, the pattern of specialist physician use was strongly influenced by geography: residents in and near Winnipeg had much higher rates of visits to specialists, and slightly higher consultation rates ('first visits'), most of which were to specialists.
  - Specialist visits:
    - Males: Winnipeg 1.71; Rural South 0.69; North 0.46 per year
    - Females: Winnipeg 1.74; Rural South 0.75; North 0.60 per year
  - Consultations:
    - Males: Winnipeg 0.33; Rural South 0.23; North 0.23
    - Females: Winnipeg 0.37; Rural South 0.29; North 0.32
- The 'reasons for' physician visits were similar for males and females: four of the top five, and 14 of the top 15 causes were the same, though the ordering was different. Males: circulatory, respiratory, musculoskeletal, nervous system, ill-defined; Females: circulatory, respiratory, mental illness, musculoskeletal, ill-defined.
- Overall ambulatory visit rates appear to correspond to need—that is, residents of lower income areas received more visits than residents from higher income areas (the trends were strong for urban residents, but weak for rural residents).
- However, the other physician service indicators, including specialist visits, consultations, etc., show either no relationship with need (rates about the same across high, middle- and low-income areas), or the opposite trend (that is, higher rates for those from higher income areas—which is opposite what would be expected).

Chapter 5: Hospital Services

- For most indicators of hospital use, females had higher rates than males (162.0 versus 126.6 separations per 1,000 residents), though the difference was eliminated once hospital use for childbirth and reproductive health issues were removed (leaving 100.6 separations per 1,000 females, versus 109.6 for males).
  - The differences were larger for separation rates than for days used; in fact, for total hospital days, the female rate was not significantly higher than the male rate (998.1 days per 1,000 females, versus 878.2 for males).
  - The 'reasons for' hospitalizations were similar for males and females, after childbirth and reproductive health issues were

removed: the top 10 of the remaining 16 causes were the same, though the ordering was different.
  - The top five for males were: circulatory, digestive, respiratory, nervous system, and injury & poisoning.
  - For females, pregnancy & birth and genitourinary & breast were the top two, and the next five were: digestive, nervous system, circulatory, cancer, and musculoskeletal.
  - Use of hospital services appeared to be strongly needs-based, for both males and females:
    - By area-level income: almost all indicators showed much higher rates of hospital service use among residents of lower income areas, both urban and rural, consistent with their higher need.
    - By RHA: residents of RHAs with less healthy populations had higher rates of hospital service use, consistent with their higher need.

Chapter 6: Surgical and Diagnostic Procedures

- For some surgical procedures, there was no significant difference in male versus female rates:
  - Total hip replacement: males 1.6, females 1.7 per 1,000 residents age 40 or older (not significantly different).
  - Tonsillectomy/Adenoidectomy: males and females both 4.9 per 1,000 residents age 0-14.
- Knee replacement rates were 28% higher for females than males (2.7 versus 2.1 per 1,000 residents age 40 or older, $p<.001$), consistent with the higher prevalence of arthritis among women.
- Women also had higher rates of cataract surgery: 22.2 versus 20.7 per 1,000 residents 50 or older ($p<.001$).
- Most surgical procedures showed neither positive nor negative relationships with need: cataract surgery, hip replacements, knee replacements and tonsillectomy rates are approximately equal across income groups.
- Rates of sterilization procedures were a striking exception: overall, vasectomy rates were higher than tubal ligation rates, but there were large differences by RHA, and by area-level income. In southern and higher income areas, vasectomy rates were higher and tubal ligations lower, whereas among northern and lower income areas, tubal ligation rates were higher and vasectomies lower.
- Among diagnostic imaging results, several key issues emerged:
  - The rates of CT scans were higher for males than females, whereas Magnetic Resonance Imaging (MRI) scans showed no sex difference.
  - The absence of individual-level data for CT scans done at some rural hospitals is a documented and growing problem for rural

imaging services. Without individual-level data to record who received the services, the ability to compare rates, track trends, and monitor outcomes is hindered.

- For CT scans, the trend among urban residents was as expected: residents of lower income areas had higher rates. However, the pattern was not reflected in rates for rural residents; in fact, the trend was opposite for rural males (though missing data for some rural scans may affect these results).
- MRI scan rates do not correspond to population-based need for health care: residents of lower income areas had lower rates of MRI scans, whereas higher rates would have been expected, given their higher burden of illness.
- Rates of MRI scans also showed a strong geographic effect: residents in and near Winnipeg had rates that were higher than residents of other RHAs. For example: South Eastman and Interlake, at 11 and 9 scans per 1,000 residents, versus Parkland and Assiniboine, at about 5.5 scans per 1,000 residents.

Chapter 7: Pharmaceutical Use

- For several indicators, rates for females were higher than males:
  - Percent of population with one or more prescriptions dispensed: females 69.8%, males 61.1%.
  - Number of different drugs dispensed: females 4.0, males 3.6.
  - Percent of population using antibiotics: females 36.8%, males 30.7%.
  - Percent of population using antidepressants: females 8.6%, males 4.5%.
- For two indicators, male rates were higher than females:
  - Statin use (for cholesterol): males 10.0%, females 7.3%
  - ACE inhibitor use (for hypertension and heart disease): males 9.9%, females 8.8%
- Among sex-specific drug use indicators:
  - The prevalence and incidence of Hormone Replacement Therapy (HRT) use dropped substantially from 1997/98–2003/04. A drop in rates was expected, given the 2002 publication of results from the Women's Health Initiative (WHI) study showing the benefits were smaller, and risks greater, than previously understood.
  - Use rates for Erectile Dysfunction (ED) drugs showed that they were prescribed in large numbers from the time they were approved for sale in 1999, yet still rose slightly by 2003/04.
- Relationships between prescription drug use rates and area-level income varied:

    - Pharmaceutical use showed a negative association: a lower proportion of high-need residents received at least one prescription in the year.
    - The number of different drugs dispensed showed a strong positive association (high need residents received a higher number of different drugs), as did use of statins and ACE inhibitors.
    - Antibiotics and antidepressant use rates showed no significant relationships with area-level income.

Chapter 8: Prevention

- There were no significant sex differences in any of the childhood or adult immunization rates shown in this report. Childhood immunization rates seem to be stabilizing over time, while adult immunization rates are increasing.
    - One-year olds: 82.7% received all recommended immunizations
    - Two-year olds: 70.2% received all recommended immunizations
    - Seven-year olds: 74.2% received all recommended immunizations
    - Adult Influenza: 67.5% of seniors 65 or older had a flu shot in 2003/04.
    - Adult Pneumococcal: 59.3% of seniors 65 or older have received an immunization between 2000/01 and 2003/04 (this is a 'once in a lifetime' shot for most seniors).
- There were strong relationships with area-level income: all childhood immunizations, and adult influenza immunization rates were lower among residents of lower income areas, both urban and rural. Adult pneumococcal immunization rates for rural residents showed the same trend, though urban residents did not.

Chapter 9: Home Care and Personal Care Homes (PCH)

- There was no significant sex difference in the rate of home care cases (30.1 per 1,000 females, versus 28.9 for males), but female clients received more days of home care than males (216 versus 193 days).
- Rates of PCH use were higher for females than males (146.3 per 1,000 females age 75+ were residents of PCH, versus 112.5 for males).
- The distribution of levels of care on admission to PCH was very similar for males and females within each RHA, though rates varied across RHAs. These values reflect an increase in the 'acuity' of PCH admissions compared with previous reports: the proportion of level 3 or 4 admissions increased to 53.9%, compared with 50.1% in 1999/2000-2000/01.

Chapter 10: Cardiac Care

Section 1: Population-based rates of procedures:

- Rates of all cardiac care procedures were higher for males than females (e.g. cardiac catheterizations: 9.9 per 1,000 males age 40 or older, versus 4.5 per 1,000 females), consistent with males' higher rates of heart disease and heart attacks.
- Relationships with area-level income were mixed: among urban residents, most procedures were more frequently performed on residents of lower income areas, consistent with their higher burden of illness. However, in rural areas, the trends appeared to be reversed, though they did not reach statistical significance.
- Some of the highest rates were reported for residents of Nor-Man and Burntwood RHAs, consistent with their higher burden of illness.
- The only RHAs showing lower than average rates of procedures were Brandon and Assiniboine. This may reflect their lower treatment prevalence rates of ischemic heart disease. However, heart attack rates were higher than average among Brandon residents, and marginally high for Assiniboine residents, so those RHAs might consider examining treatment and referral patterns more closely.

Section 2: Heart attack (AMI) cohort analysis:

- Among residents suffering heart attacks, males initially appeared to be treated more aggressively than females, but this difference was completely explained by the younger age of male versus female AMI patients. It's not that males get more procedures, it's that younger patients get more.
- 'Sudden death' rates from AMI were near equal for males and females, and Winnipeg and non-Winnipeg residents alike (27.7% overall).
- While there were no sex differences in age-adjusted treatment rates after AMI, there was a large difference based on geography. Residents of Winnipeg had higher levels of all cardiac care procedures, though the differences decreased over time, and two were no longer different by one year after AMI (stent insertion and bypass surgery). Cardiac catheterization rates at the time of AMI hospitalization were 39% for Winnipeg residents, versus 24% for rural residents; by one year after the AMI, the rates were 50% and 41% respectively.

Chapter 11: Quality of Care:

- Of the six indicators in this chapter, four were 'positive' indicators—in that higher rates reflect better quality of care. Among these four, females had higher rates for three indicators (antidepressant follow-up, asthma care, and eye exams for diabetics). Males had higher rates for one: prescriptions for beta-blockers within four months of heart attack.
- The two indicators of benzodiazepine use were the 'negative' indicators – for which lower rates reflect better quality of care. Among community-

dwelling seniors, females had significantly higher rates of benzodiazepine use: 22.3% of residents age 75+, versus 14.2% for males. Among seniors living in personal care homes, there was no difference in male versus female rates (34.7%). Higher rates for females might have been expected, given their higher treatment prevalence of anxiety disorders (Martens et al., 2004).

- The results showed relatively little variation among RHAs, suggesting that the qualilty of care being delivered is comparable across the province.
- However, of the four 'positive' indicators (for which higher rates indicate better care), only one showed rates above 70% for males and females (beta-blocker use). Others ranged from 33.3% to 63.2%, suggesting there is room for improvement in quality of care provided to both males and females, in all areas of the province.
- Most of the trends with area-level income were relatively weak, and their directions were mixed: some showed slightly better care for residents of higher income areas, while others showed slightly better care for residents of lower income areas. These trends also differed between urban and rural residents, though the differences were not consistent across indicators.

CHAPTER 1: INTRODUCTION AND METHODS

Overview:

There is long-standing and ongoing interest in sex differences in health status and health service use, and this issue continues to play a key role in planning, delivering, and monitoring health services. In Manitoba, we are fortunate to have access to many data sources that can assist in providing a more accurate picture of these kinds of issues.

This report is an overview of male/female differences in health status, health service use, and quality of care, as revealed by analysis of administrative health care data. It includes many indicators previously used by MCHP, and separately reports the results for males and females. It is not a compendium of male-specific and female-specific health issues put together into one report; it is an analysis of the key issues which administrative data can address, with results for males and females shown separately.

'Sex' versus 'gender'

The separation is based on the biological fact of 'sex', not the sociological concept of 'gender.' Sex indicates the simple biological determination: whether the person is male or female. Gender is a psychological/sociological issue related to differential socialization of males and females, and how a person experiences their roles and relationships with others (Walters, 2003). The data files being used for this study contain no information about gender—they only indicate each resident's biological sex. There is considerable overlap between sex and gender, but they are not identical. Some of the 'sex' differences shown in this report may be due primarily to biological differences, but for others, biology may play only a limited role in the explanation of the difference—gender-related issues are the true determinants. Nancy Krieger provides well-chosen and eloquently explained examples demonstrating when sex and/or gender are relevant in health outcomes (Krieger, 2003).

Results are shown for each of Manitoba's 11 RHAs and their component Districts, as well as by income quintile, and by age-specific groups for each sex. The analysis is primarily descriptive, not explanatory; that is, the report shows what the data reveal, not how or why those results have come about.

1.1 The Collaborative Network for This Report

The collaborative researcher/planner group known as *The Need To Know* Team, described below, identified the need for separate results for males and females as a key aspect of planning for rural and northern RHAs. This is the third joint research project of *The Need To Know* Team, directed by Dr. Patricia Martens of MCHP. The MCHP is a unit of the Department of

Community Health Sciences in the University of Manitoba. The mission of MCHP is "to provide accurate and timely information to health care decision-makers, analysts and providers, so they in turn can offer services which are effective and efficient in improving the health of Manitobans."

Through a five-year grant provided by CIHR in 2001, researchers from MCHP, staff from Manitoba Health, and high-level planners from each of the non-Winnipeg RHAs meet together on an ongoing basis. *The Need To Know* project enables capacity building, both for the academics on how to do research of relevance to rural and northern RHAs, and for team members on how to understand, interpret and apply research at the planning and decision-making level.

Through funding and support from both CIHR and Manitoba Health to MCHP, *The Need To Know* Team is completing four research projects of benefit to RHA planners and decision-makers. The Team completed its first joint project in June 2003, called *The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use* (Martens et al., 2003). The second project, selected by the Team members and released in September 2004, was called *Patterns of Regional Mental Illness Disorder Diagnoses and Service Use in Manitoba: A Population-Based Study.* This report on Sex Differences is the third study completed by the Team. In producing this report, the Team was also assisted by a Working Group of experts in men's and women's health, who contributed countless hours in assisting the Team. Please take the time to look at the Acknowledgements section at the front of this report.

1.2 The Geographical Boundaries in This Report

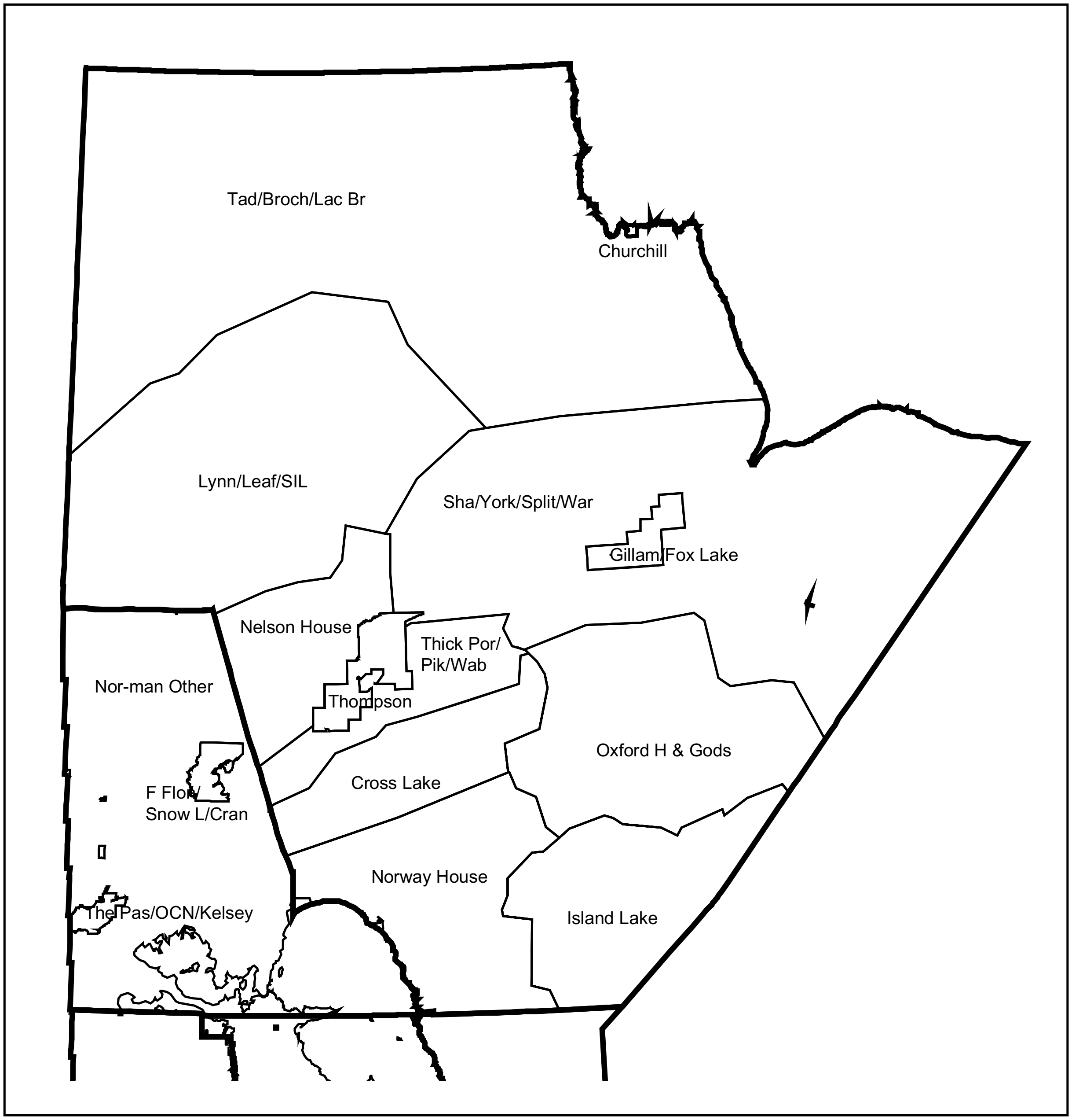
In 1997, the government of Manitoba established 11 RHAs outside Winnipeg to plan, manage, and deliver health services to local residents. Two of these RHAs amalgamated in 2002 to become Assiniboine RHA. This report is focussing on the 10 rural and northern RHAs: Assiniboine, Brandon, Burntwood, Central, Churchill, Interlake, Nor-Man, North Eastman, Parkland, and South Eastman. Winnipeg RHA does have a representative on the Team, but the purpose of the project is to focus on the needs of the non-Winnipeg RHAs. So although rates for Winnipeg are shown for comparative purposes, rates for smaller subdivisions of Winnipeg are not given. Each of *The Need To Know* Team RHA members worked with MCHP and Manitoba Health to define subregional 'districts' for purposes of regional planning. Figure 1.1 illustrates the RHA boundaries, and Figures 1.2 and 1.3 show the district divisions of each non-Winnipeg RHA. Municipalities (and postal codes where necessary) comprising each of the districts are listed in Appendix 1. Most RHAs have between three and 11 districts, except Churchill, which is too small to subdivide (just over 1,000 residents). For a further explanation of the process by which districts were determined, refer to The Manitoba RHA Indicators Atlas Report (Martens et al., 2003), Chapter 1.

Residents of some areas are also served by federally-operated nursing stations (especially in Burntwood and Nor-Man RHAs). Therefore, service use rates will underestimate the true level of service provision, because data for nursing station contacts are not recorded in provincial files. Similarly, some prescription drugs are dispensed from nursing stations, but not coded in the pharmaceutical data system, resulting in an estimated 20% under-counting of prescription drug use among northern residents.

Figure 1.1: Regional Health Authorities (RHAs) of Manitoba

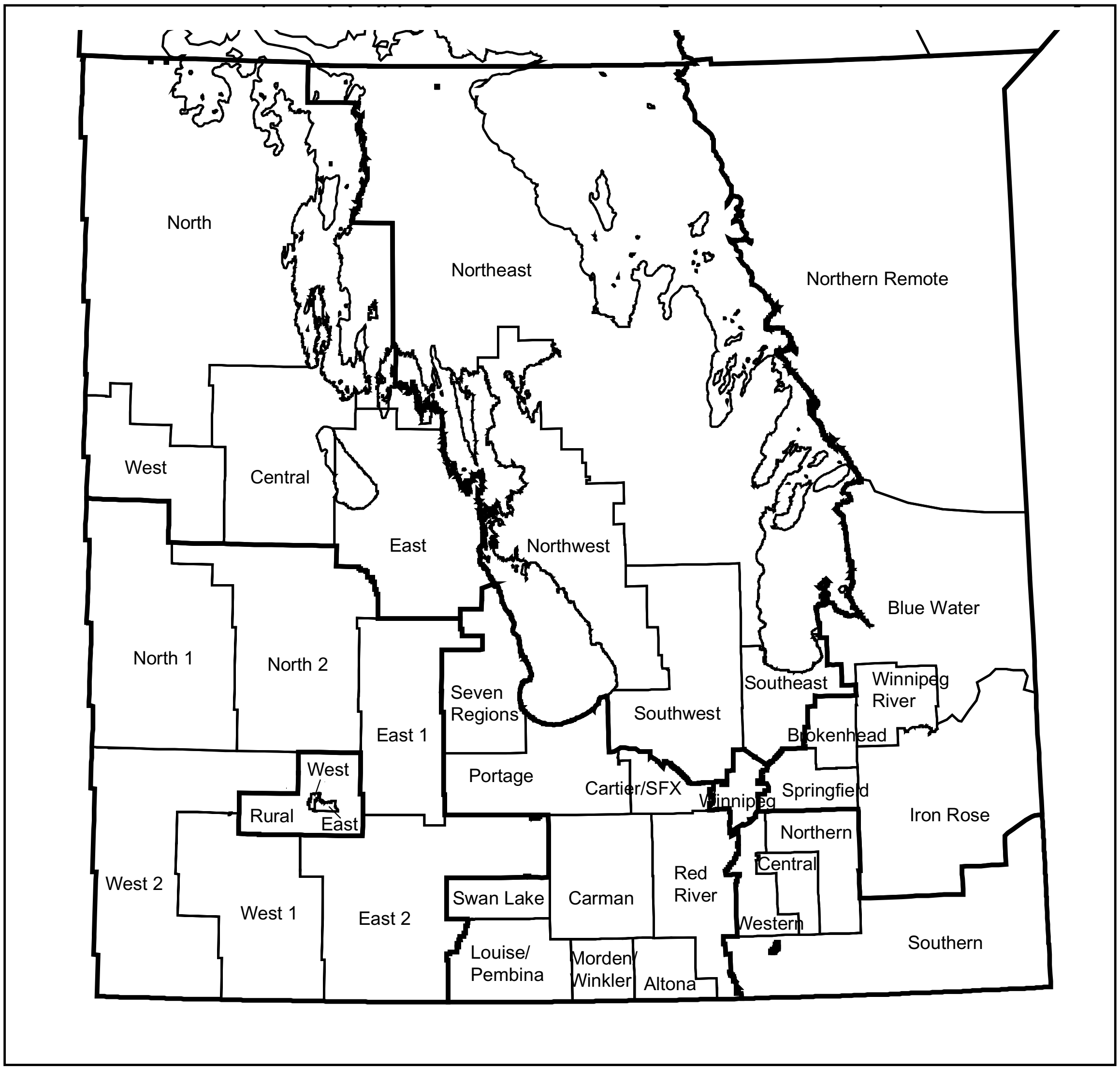
Source: Manitoba Centre for Health Policy, 2005

Figure 1.2: Districts of Northern RHAs Used in This Report



Source: Manitoba Centre for Health Policy, 2005

Figure 1.3: Districts of Southern RHAs Used in This Report



Source: Manitoba Centre for Health Policy, 2005

1.3 What's in This Report?

The focus of this report is to provide insights to policy-makers, decision-makers and planners on patterns of sex differences in health status, health care use, and outcomes of care. The following issues are addressed:

- Health status and mortality (Chapter 2)
- Rates of disease prevalence (Chapter 3)
- The use of physician services (Chapter 4)
- The use of hospital services (Chapter 5)
- Rates of high profile procedures and diagnostic imaging services (Chapter 6)
- The use of prescription drugs (Chapter 7)
- Rates of immunization coverage (Chapter 8)
- The use of home care and personal care homes ('nursing homes') (Chapter 9)
- Cardiac care services (Chapter 10)
- Quality of care (Chapter 11)

For each indicator in each chapter, sex-specific results are shown several ways:

- By geography, using RHAs, their sub-regional Districts, the larger aggregate areas of the Rural South and the North, plus Winnipeg and Manitoba values.
- By income quintile, using Urban (Winnipeg and Brandon) and Rural groupings.
- By age-specific groups, for each sex, using crude rates.

Each indicator is also accompanied by a 'Key Findings' paragraph, which notes the major trends or results for that indicator.

Additional data provided:

Data are provided in appendices for several indicators not shown in the body of the report, because they are sex-specific (i.e. not comparing males and females), or were too rare to show at the RHA level. Appendix 2 contains rates for a group of sex-specific indicators previously reported by MCHP (hysterectomy, caesarean section, screening for breast cancer and cervical cancer, and prostatectomy). Appendix 3 provides indicators of 'Outcomes of Care,' for aggregate areas only (Rural South, Brandon, North, Winnipeg, Manitoba).

1.4 The Indicators—Key Concepts

This report uses a population-based analysis. This means that the rates or the prevalence are based upon every person living in Manitoba who has a provincial health card (see Section 1.8 for the difference between *prevalence*

Graphs in this report are shown by RHA, districts and aggregated regions, as well as by age groups and by neighbourhood income groupings. Where you live, not where you go for treatment, is how the regional rate is determined.

and *rate*). Generally, the population consists of all residents, though some analyses use age restrictions (which are clearly noted). So the rates are not based upon smaller "samples," but the entire population of Manitoba residents.

Furthermore, the information in this report is based on *where you live, not where you go for treatment*. For example, a person living in a remote area may be hospitalized in Winnipeg for a certain illness, but the hospitalization is "attributed back" to the population living in that remote area. The rate of hospitalization of the people in a region like Burntwood includes all the hospitalizations of all the people who live in Burntwood, whether the hospitalizations take place in Burntwood hospitals, or hospitals in other RHAs like Winnipeg or Nor-Man. Thus, the report offers insights into the health and health care use patterns of the population *within a geographical region*, no matter where the people of that region received the care.

Some graphs are shown by "income quintiles" based on allocating the average household income of the enumeration area to each person living in that area. The income quintiles for both urban and rural areas of Manitoba have approximately the same number of people in each of the five quintiles.

Most of the indicators are also given by *neighbourhood income quintile*. This is based on the average household income in a census enumeration area, and each individual within that enumeration area is assumed to have this average household income. The area income levels have been grouped separately by urban (Winnipeg and Brandon) and rural (the rest of the province) "quintiles", meaning five groupings having approximately equal populations, from "lowest income neighbourhoods" (U1 or R1 for urban or rural) to the "highest income neighbourhoods" (U5 or R5). So when we refer to an income grouping, we are really referring to those people living in all the enumeration areas having an average household income which fits into one of the five quintiles for rural or urban Manitoba.

Finally, since age is often a key determinant of health status and health service use, most indicators are also shown using age-specific rates. This allows comparison of the trends among residents of different ages. Age-specific rates are always shown as crude rates (see 1.7 below). In these graphs, the estimates for each age group are used to create the lines connecting age groups, and the vertical bars indicate the confidence interval of the rate. The confidence interval shows the inherent variability in the indicator: if the rates are unstable (usually because of a low number of events or small underlying population), we would expect changes from year to year, so the confidence intervals are large, whereas when rates are stable (frequent events and/or large populations), the confidence intervals are small. If the intervals for males and females do not overlap at all, then we can be confident that the male and female rates are different from each other for that age group. If there is overlap among the intervals, we conclude that the male and female rates are not statistically different from each other.

1.5 The Graphs—Which Comparisons and What Order?

This report is highlighting the non-Winnipeg RHAs: Assiniboine, Brandon, Burntwood, Central, Churchill, Interlake, Nor-Man, North Eastman, Parkland, and South Eastman. Therefore Winnipeg is not included as one of the RHAs, but as a comparison at the bottom of the RHA graphs. The other comparison groups include: "Rural South" (defined as a combined rate for South Eastman, Central, Assiniboine, Parkland, Interlake, and North Eastman RHAs); "North" (defined as a combined rate for Burntwood, Nor-Man and Churchill); and "Manitoba" (the provincial rate). The Manitoba rate is heavily weighted toward the Winnipeg rate, since over half the population of the province resides in Winnipeg. Therefore, the groupings of the Rural South and the North are important comparisons for the non-Winnipeg RHAs.

Each RHA and district graph is ordered in a special way, which is consistent throughout the entire report, and similar to previous MCHP reports. This order is based on the overall health status of the population of the area (males and females combined—for this indicator only), as measured by the premature mortality rate (PMR) of the area over a 10-year period (1991 through 2000; 10 years of data were used because some districts have small population sizes, so more years are required to generate stable estimates).

PMR is a standardized (age- and sex-adjusted) rate of 'premature' death, that is, death before the age of 75 years. PMR is considered the best single indicator of the overall health status of a region's population and need for health care (Carstairs and Morris, 1991; Eyles et al., 1991; Eyles and Birch, 1993). PMR is highly correlated with morbidity and with self-rated health, as well as with socioeconomic risk factors (Martens et al., 2002). This leads to the presumption that populations having a high PMR most likely require more health care services, including preventive services. Figures 1.4 and 1.5 show the PMR by RHA and by district.

All RHA graphs are ordered by population health status, as measured by the regional premature mortality rate. All district graphs are first grouped by RHA, and then ordered by PMR within each RHA.

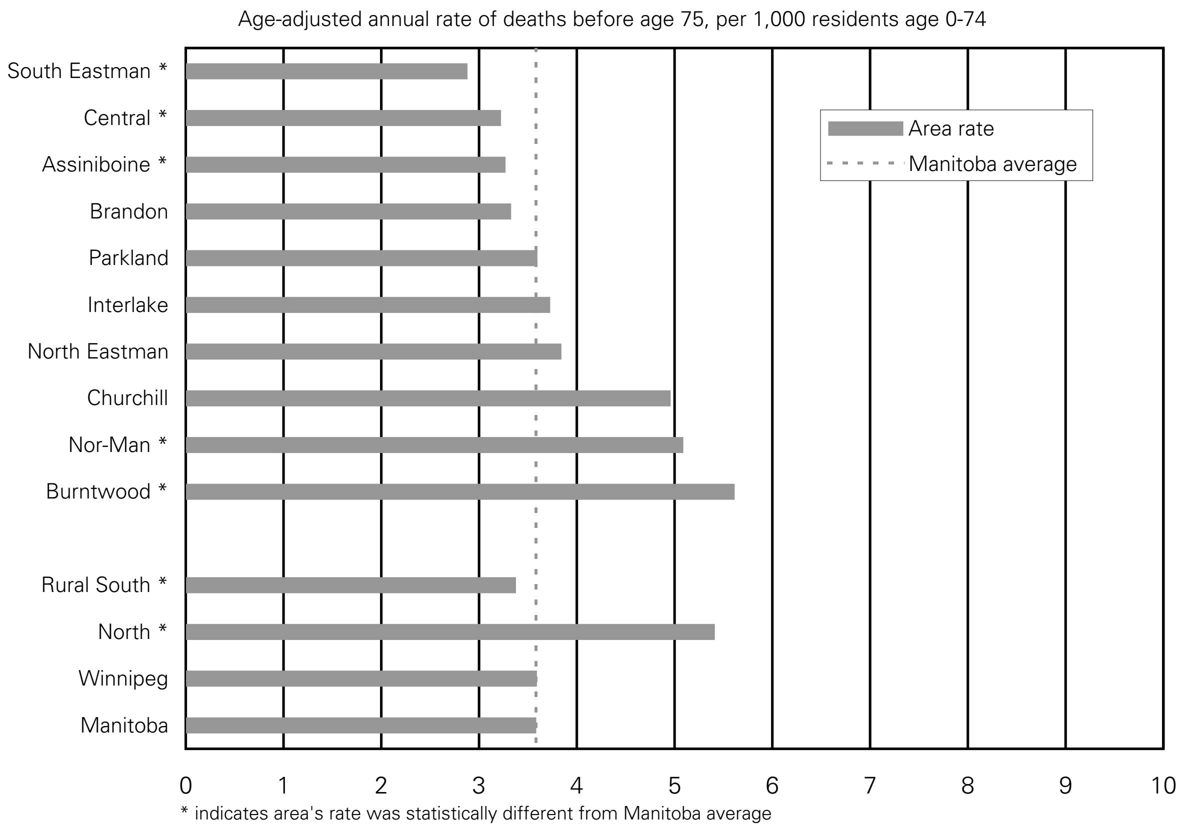
The RHAs having the lowest PMR, that is, the best overall regional health status, are at the top (South Eastman, Central, Assiniboine). PMR increases as you go down the graph, so the areas with the highest PMR, or poorest overall health status, are at the bottom (Churchill, Nor-Man, and Burntwood). In the district graphs, the same order of the RHAs is maintained. However, the districts within each RHA have also been ordered according to PMR. The district with the lowest PMR (the best overall health status) within the RHA is listed first, with the others listed below it in order of increasing PMR (or worsening health status).

Premature Mortality Rates (PMR):

Definition: This is the number of deaths before age 75, per 1,000 residents age 0 to 74 years, over the 10-year period 1994–2003. Values are age-adjusted to reflect the 0 to 74 population of Manitoba (males and females combined).

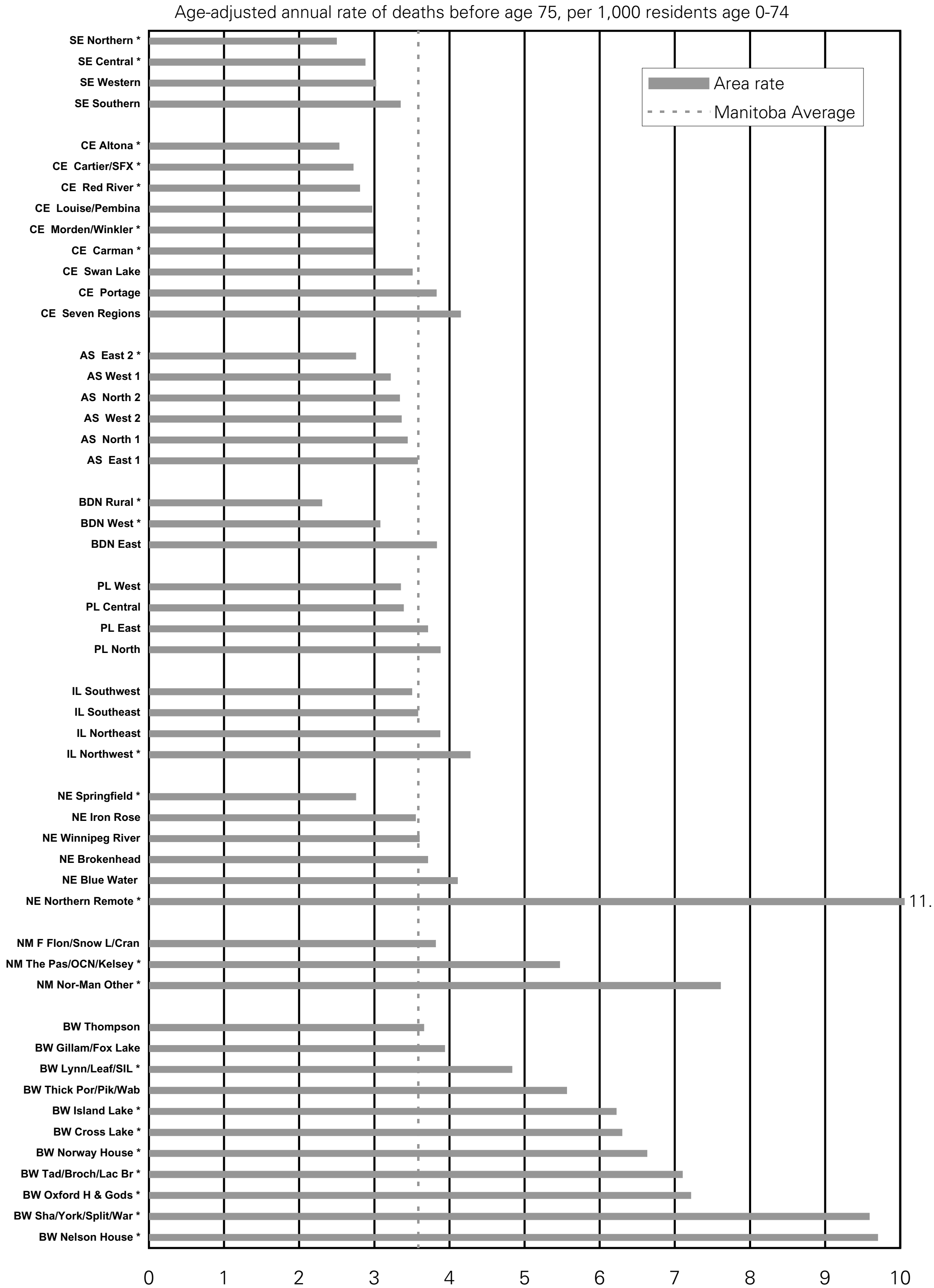
Note: Ten years of data were used instead of the usual five, because values here are calculated separately for males and females in each area, and dividing the population in half would have decreased the 'power' of the statistical analysis to indicate differences among areas and between sexes.

Figure 1.4: Premature Mortality Rates by RHA, 1991 – 2000



Source: Manitoba Centre for Health Policy, 2005

Figure 1.5: Premature Mortality Rates by District, 1991 – 2000



Source: Manitoba Centre for Health Policy, 2005

1.6 Data Sources and Years of Data Used

MCHP houses data collectively referred to as the *Population Health Research Data Repository*. These are derived from administrative claims data, that is, data which are collected in order to administer the universal health care system within Manitoba. However, prior to MCHP using these data, identifying information such as patient and provider name, street address and true health number is removed. Therefore, the Repository contains only anonymized information, which is only "linkable" across files through a fictitious number assigned to the records. The Repository includes information of key interest to health planners, such as mortality and birth information, physician and hospital use, pharmaceutical use, and use of services such as home care and nursing homes (personal care homes). As well, enumeration area information from census data, like average household income for the geographical area, is "attributed" to all people living in that area. This gives insight into how socioeconomic factors affect health patterns or health care use.

For purposes of this report, the following database files of the Population Health Research Data Repository were accessed:

- Hospital claims (records of hospital admissions)
- Medical claims (records of visits to physicians outside of those occurring to a hospital in-patient)
- Physician files to identify the type of provider (e.g. General Practitioner versus specialist)
- Home Care (records of the use of provincial home care services)
- Long-term care – primarily in personal care homes (nursing homes)
- The registry files (records of the time a person is registered as a resident of Manitoba, as well as their age, sex, and area of residence)
- Vital Statistics (records of births and deaths)
- Pharmaceutical claims (pharmaceutical use from the Drug Program Information Network)
- Manitoba Immunization Monitoring System (MIMS) (for rates of childhood and adult immunizations)
- 2001 public use census files (for neighbourhood-level socioeconomic information)

Most indicators are calculated using data from the 2003/04 fiscal year (April 1, 2003 through March 31, 2004). Some indicators use more than one year of data—either because the indicator requires more years to validly calculate the values, or because not enough events happen in a single year to provide stable rates. For indicators relating to mortality, calendar years are used, because Vital Statistics data are organized by calendar year.

1.7 Rates and Prevalence, Standardization, and Statistical Analyses

Standardized rates and prevalence values are shown in the graphs, but crude values are also available in Appendix 4. Most graphs include statistical notations, so that you know if a value is similar to or different from the provincial average.

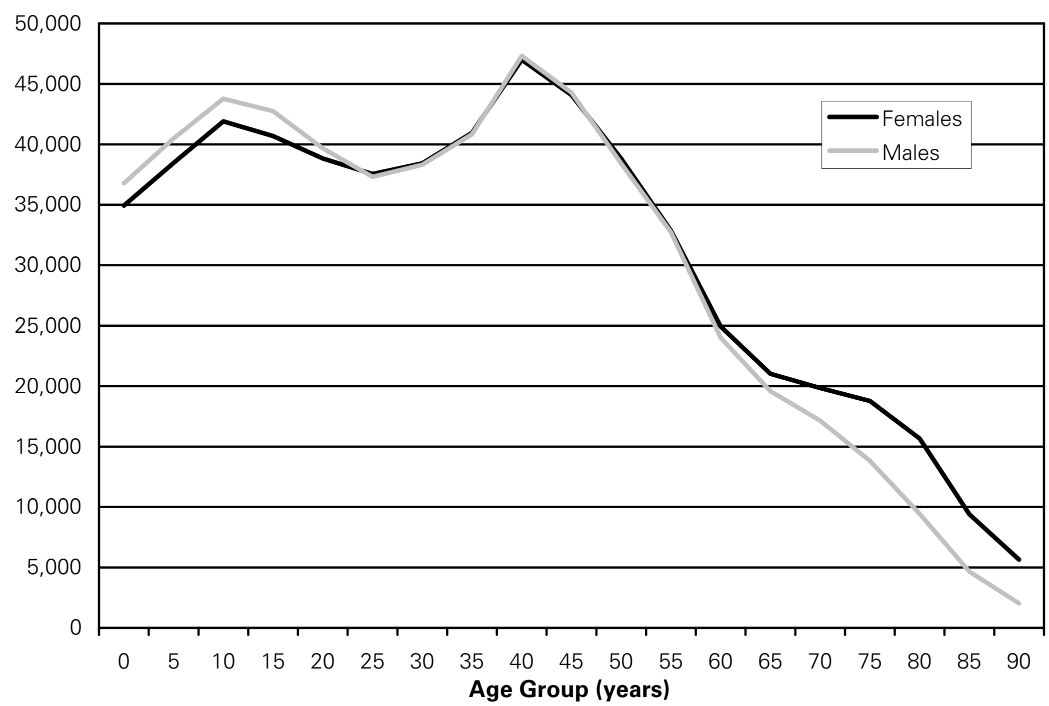
Many of the rates and prevalence values shown in this report are based on one year of data (2003/04), but some use several years of data: for those using more than one year of data, the values shown are annualized to report the rate for an average year.

Most of the indicators are given as *adjusted* or *standardized* values. This means that the rates have been adjusted to create a fair comparison among regions with different age distributions. All rates are standardized to reflect what that area's rate would be if the area's population had the same age distribution as the overall Manitoba population at December 31, 2003 (males and females combined). For most of the analyses, five-year age groupings were used in a direct standardization technique. Rates are *suppressed* (that is, not reported) where the counts on which the rates were based represent five or fewer events or persons (except true zeroes, which are shown). Throughout the report, the letter 's' in brackets beside the RHA or district name indicates a suppressed rate.

These rates can also be fairly compared between sexes, as the age standardization adjusts for the fact that more females than males live into the oldest ages, when health service use rates are sometimes very high. Figure 1.6 shows the age distribution of males and females in Manitoba, revealing the slightly higher number of males in young age groups, and the much higher number of females in the oldest age groups.

Figure 1.6: Manitoba Population by Age and Sex, 2003/04

Number of residents in each age group



Source: Manitoba Centre for Health Policy, 2005

For most indicators, age-specific rates are also shown for each sex, to reveal the patterns for male and female residents of different ages. Crude values (the actual count divided by the actual population) are used in these graphs, as they are age-specific (not age-adjusted). Also, Appendix 4 contains tables listing the overall crude rates/prevalence and actual numbers of events by RHA. This type of information is helpful in giving a realistic look at the effect of the population burden of illness on the region's health care system—actual numbers of the regional population who will require health care services for their illness or condition.

Statistical significance is used to indicate how much confidence to put in the values. If a difference is "statistically significant," then this difference is large enough that we are confident it is not just due to chance. So we would expect to see the rate remain different from the provincial average from year to year, unless some change is implemented. When you see a difference that is not statistically significant (whether the difference is small or large), the rate is considered similar to the provincial average, since it could fluctuate greatly from year to year. This is usually due to the rate being based on small numbers (either a small number of events, or a small underlying population), so it could change substantially from year to year.

The analyses for this report were done using a generalized linear modeling approach, incorporating interaction terms and a non-linear (quadratic) age term. Parameters in the model included age, sex, and area or income quintile as appropriate. Because we were modeling rates not events, we used the logarithm of the population as an offset in the model. Most indicators were developed at the District level, and RHA values were calculated from population-weighted estimate statements. However, for some indicators, RHA-level models were also created, because there was very high variation in District-level results. Therefore, those RHA-level values are not simply averages of their component districts. In such cases, the directly calculated RHA values provide better estimates of the true RHA-level results, because their variances are not unduly influenced by large District-level variation.

Statistical testing was done to provide an indication as to whether or not an area's rate is statistically higher or lower than the provincial average for that sex. In each graph, the notation provided in brackets beside the name of the area indicates statistical significance. Below each graph is an explanation of the statistical notations: an 'm' indicates that area's male rate is different from the provincial average for males; an 'f' indicates that area's female rate is different from the provincial average for females; a 'd' indicates that male and female rates for that area are statistically different from each other. Statistical testing is done in such a way that when a difference is 'statistically significant,' it means that there is 95% certainty that the difference is not due to chance alone. 'Statistically significant' differences occur about 5% of the time merely through chance. This chance finding is called a Type I error—finding a statistical difference when in reality there was no difference.

In situations where statistical testing is done repeatedly on the same data set, one could potentially have a much larger Type I error than the traditionally allowed 5%. To avoid this, a Bonferroni-type correction is used, whereby the traditional 5% ($p<.05$) level of significance is increased (for example, to 1%) for each individual test in the series. This helps keep the overall level of Type I error at the allowable 5% level. However, strict adherence to the Bonferroni technique would mean an unreasonably large difference would be required for differences to be called 'statistically significant'. So a compromise was used: differences between each RHA and the Manitoba average were tested at the 1% level ($p<.01$), and differences at the district level were tested at the 0.5% level ($p<0.005$).

Linear trend tests for income quintile analyses were done using separate contrast statements to test each group (male and female, urban and rural). Three-way and two-way interaction terms were also incorporated.

All data management, programming and analyses were performed using SAS® software.

1.8 Difference Between a 'Rate' and 'Prevalence'

Prevalence refers to the *percentage of the population who has a certain condition* at a given point in time (point prevalence) or over a given period of time (period prevalence). Most indicators in this report use the concept of period prevalence over a one-year or a three-year period. When we look at the prevalence of a disease, we are reporting the proportion of the population living in Manitoba who have a diagnosis in our administrative database for that illness in the period. Prevalence is an indication of the 'commonness' of a condition in the population, and therefore has major implications for the provision of services within a region.

The administrative data used for this report do not directly record who gets or has which diseases, but does record who gets 'treated' for various diseases (i.e. visits a physician or is hospitalized, and gets the appropriate codes). Therefore, we use the phrase 'treatment prevalence' to report the percentage of the population receiving treatment for a given disease.

In contrast, a *rate* refers to a *change in state over time*, and is used to show the frequency of certain events. For example, the physician visit rate shows how often an average resident visits physicians each year. Where an indicator covers a period longer than one year, the rate is *annualized*—that is, given as an annual average.

1.9 Difference in Methodology

Rates for this report were calculated using a more sophisticated statistical approach (generalized modeling) than previous MCHP reports of this type (a simple rate-based approach using linear methods). In the end, the results are very similar to those which would have been produced by the previous method. The previous approach was based on the statistical assumptions of normality and linearity, which are sometimes violated in administrative data. The generalized modeling approach used for this report does not require those assumptions, so can provide more accurate estimates for events. However, more effort is required in specifying the models, and the interpretation of results can also be more complex.

1.10 Summary

There is a wealth of sex-specific information in this report. *The Need To Know* Team hopes that this will prove useful to planners, decision-makers and policy-makers in each of the RHAs of Manitoba, as well as other planners and researchers across Canada and elsewhere. The information can be used in many ways. A region can obtain an overview of the population it is serving, the proportion of the region's population having various diseases or events, the use of health care services, and the quality of care being provided.

Regions can "cross-compare" their information with other regions and within their own districts. Furthermore, regional planners will ask many questions about the context of their profiles—how do the data add to the knowledge that planners have about their region and its services? What factors caused these results to come about? What can or should be done?

Electronic versions of this report, as well as Excel spreadsheets of the graphs, are avilable at Manitoba Centre for Health Policy's website, www.umanitoba.ca/centres/mchp

We hope that this information will be a useful tool in the effort to improve the health of the entire population of Manitoba. If you would like to access an electronic version of this report, which may help you in creating your own summary presentations, you will find this on the website of the Manitoba Centre for Health Policy, under Reports (complete reports). You will also find Excel spreadsheets for the graphs in this report (and graphs from other key reports of interest to RHA planners) by looking under the MCHP link called "Data Extras."

The MCHP website address is http://www.umanitoba.ca/centres/mchp/

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CHAPTER 2: HEALTH STATUS AND MORTALITY

This chapter will provide rates of key indicators of population health status and mortality. The indicators are:

2.1 Life Expectancy
2.2 Total Mortality Rates
2.3 Mortality Rates by Sex & Cause
2.4 Premature Mortality Rates (PMR)
2.5 Potential Years of Life Lost (PYLL)

Key Findings for Chapter 2: Health Status and Mortality

- On average, females live considerably longer than males, with a life expectancy of 81.3 years versus 75.8 years from birth for males.
- Socioeconomic characteristics have a powerful influence on health status: all mortality-related indicators show strong associations with area-level income.
- Residents of the northern Regional Health Authorities (RHA) (Nor-Man, Burntwood, and Churchill) have high mortality rates, reflected in all indicators (e.g. total mortality rate almost 50% higher than the provincial average).
- The top five causes of death are the same for males and females: circulatory diseases and cancer continue to be the leading causes, together responsible for over 60% of all deaths, followed by respiratory diseases, injury & poisoning, and endocrine/metabolic disorders.
- The much higher rate of potential years of life lost (PYLL) for males shows that more of the deaths of young Manitobans are among males than females (68.1 versus 40.6 years per 1,000 residents age 1 to 74).

Introduction:

Life expectancy is perhaps the most widely used indicator of a population's health status, especially for international comparisons. The total mortality rate is another common indicator of health status, tracking the annual death rate within a population. Like life expectancy, it is based on the mortality experience of the entire population.

The premature mortality rate (PMR), by contrast, focusses on the population under 75 years of age. As explained in Chapter 1, it is based on the concept that deaths occurring before age 75 are 'premature.' PYLL also uses only those under age 75, but also excludes infants (0 to 1 year) in its calculations. The PYLL is more sensitive to deaths among younger residents, because it is determined by the number of years below 75 at which each early death occurs. For example, the death of a 45-year-old contributes '30' to the PYLL measure, but only '1' to the premature (and total) mortality rate. So while the PMR is a good indicator of overall health status and need for care, PYLL rates indicate whether premature deaths are occurring to young or middle-aged residents.

Mortality indicators are routinely calculated for calendar years (not fiscal years like most other indicators) because Vital Statistics data are collected and organized by calendar year.

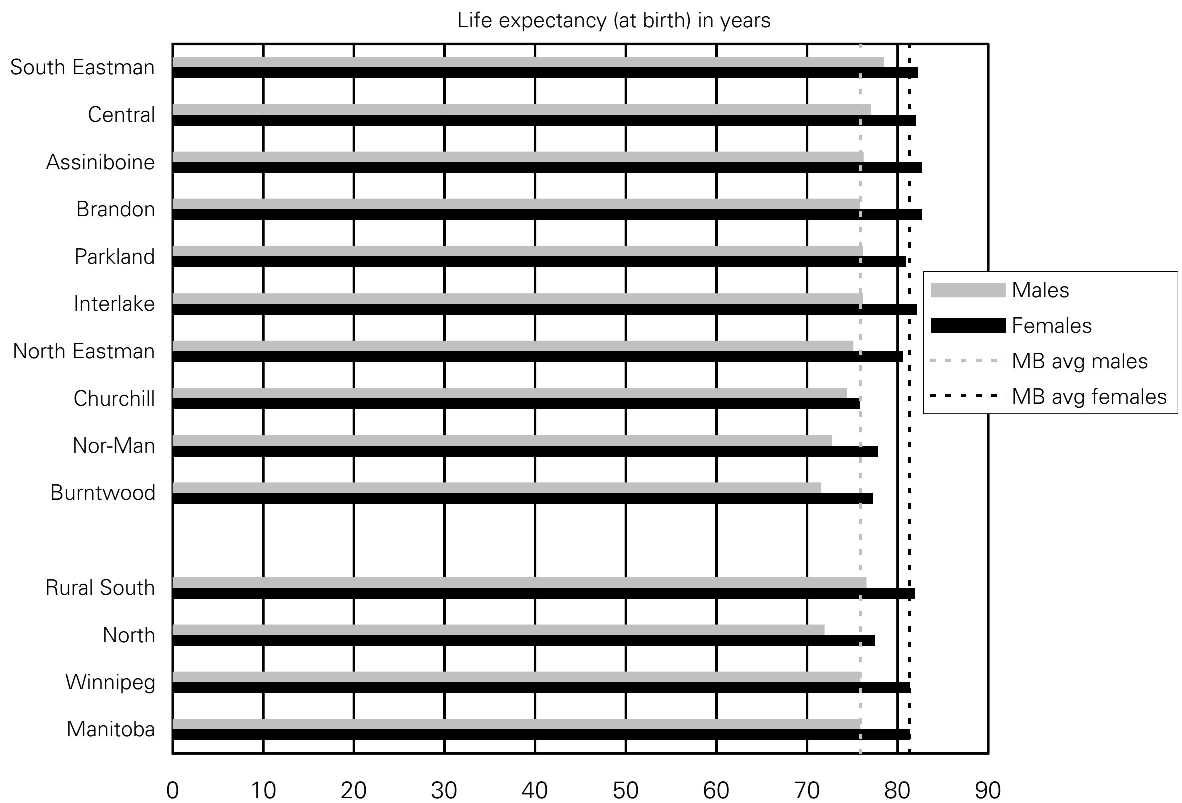
Premature and total mortality rates in this report are higher than in previous Manitoba Centre for Health Policy (MCHP) reports because of a change in method used. Previously, rates were calculated using only deaths for which a cause of death was also known. (That is, the death record had to 'link' across the registry and vital statistics files). The new method uses only the registry file, so that all deaths are counted. The result is that the number of deaths used in the analyses has increased, causing premature and total mortality rates to increase by about 0.3 deaths per 1,000 residents per year.

2.1 Life Expectancy

Definition: This is the expected length of life from birth, based on the patterns of mortality in the population for the preceding five years (1999 to 2003). Values are not age-adjusted; they are calculated directly from the mortality experience of local residents using a 'life table' approach.

Life expectancy values often appear to show only small differences across areas or groups, but in terms of life expectancy, even a few years is a large difference. For example, it has been estimated that eliminating all cancers would increase U.S. life expectancy by 'just' 2.8 years (Manton, 1991).

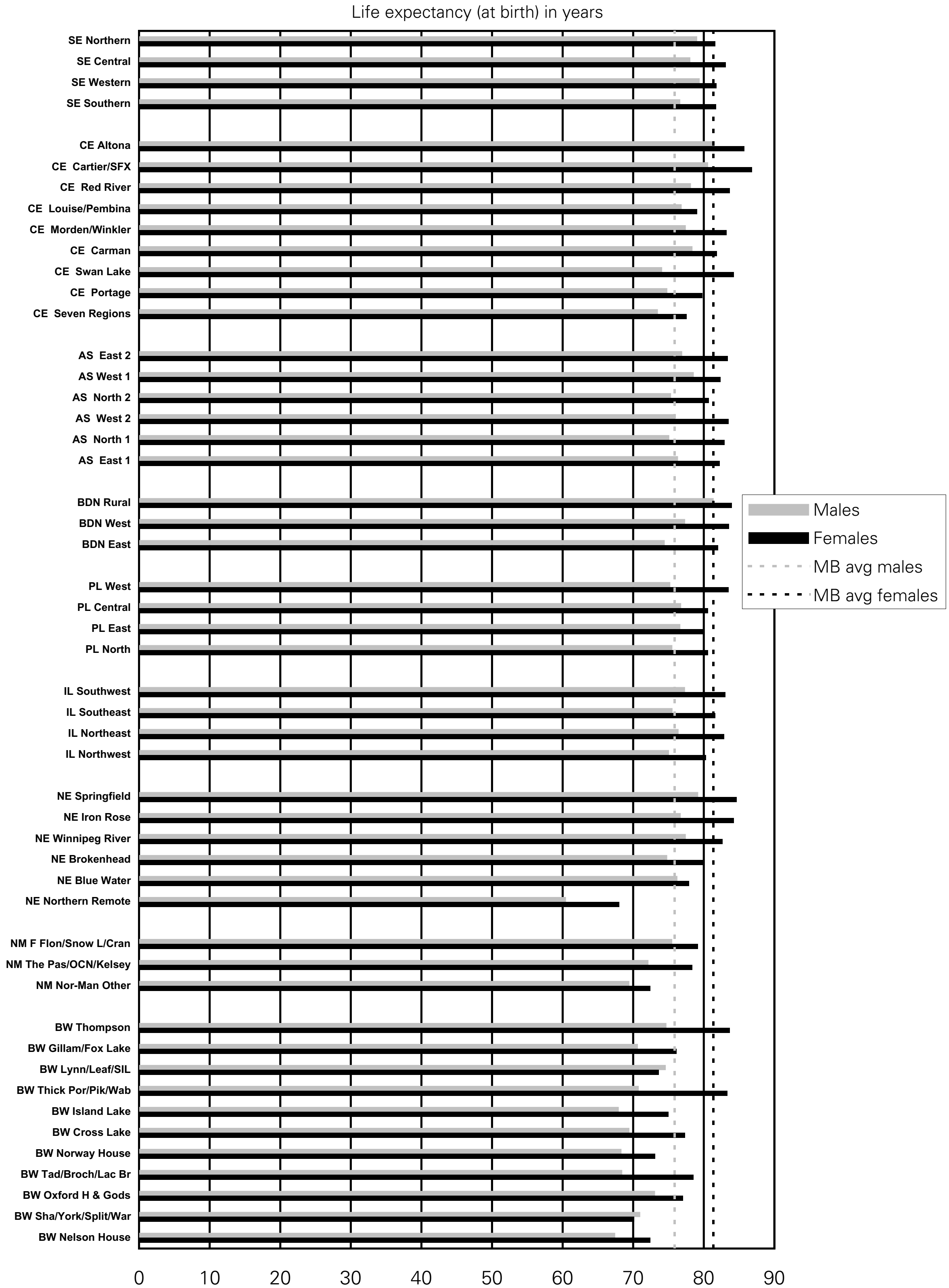
Figure 2.1.1: Life Expectancy by RHA, 1999 – 2003



Statistical testing is not done on life expectancy values

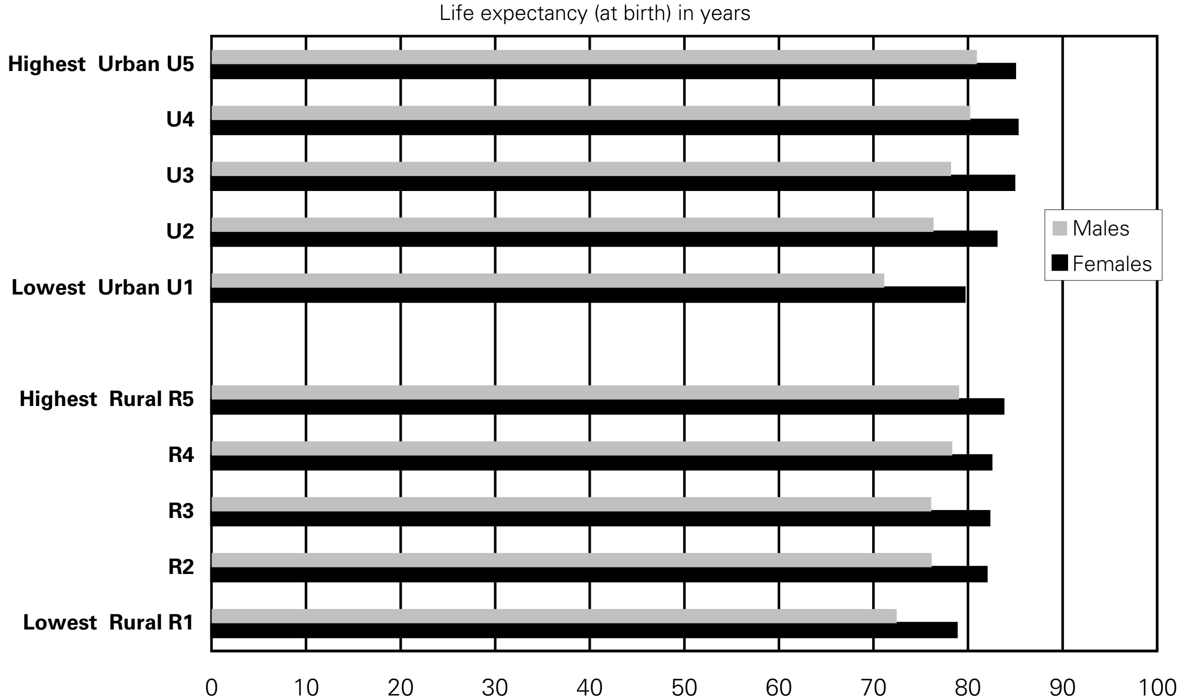
Source: Manitoba Centre for Health Policy, 2005

Figure 2.1.2: Life Expectancy by District, 1999 – 2003



Source: Manitoba Centre for Health Policy, 2005

Figure 2.1.3: Life Expectancy by Income Quintile, 1990 – 2003



Statistical testing is not done on life expectancy values

Source: Manitoba Centre for Health Policy, 2005

Key findings for life expectancy:

- Overall, and for all RHAs, life expectancy at birth is higher for females than males. On average, females in Manitoba can expect to live 81.3 years, and males 75.8 years.
- The values are similar for many RHAs, though values for the three northern RHAs are clearly lower than those in other areas. Within RHAs, there is considerable variation by district—even within some of the 'healthy' RHAs.
- There is a strong relationship between life expectancy and area-level income: in both urban and rural areas, life expectancy for both males and females is higher among residents of higher income areas. The trend is steeper among urban than rural residents. (Statistical testing is not performed on life expectancy values, but the trends are strong).
- The difference between sexes also seems related to area-level income: in urban areas, the male-female difference is 8.5 years among residents of the lowest income areas, versus only 4.1 years among residents of highest income areas. A similar but weaker trend was evident among rural residents (6.3 years for lowest income and 4.7 years for highest income).

Comparison to other findings:

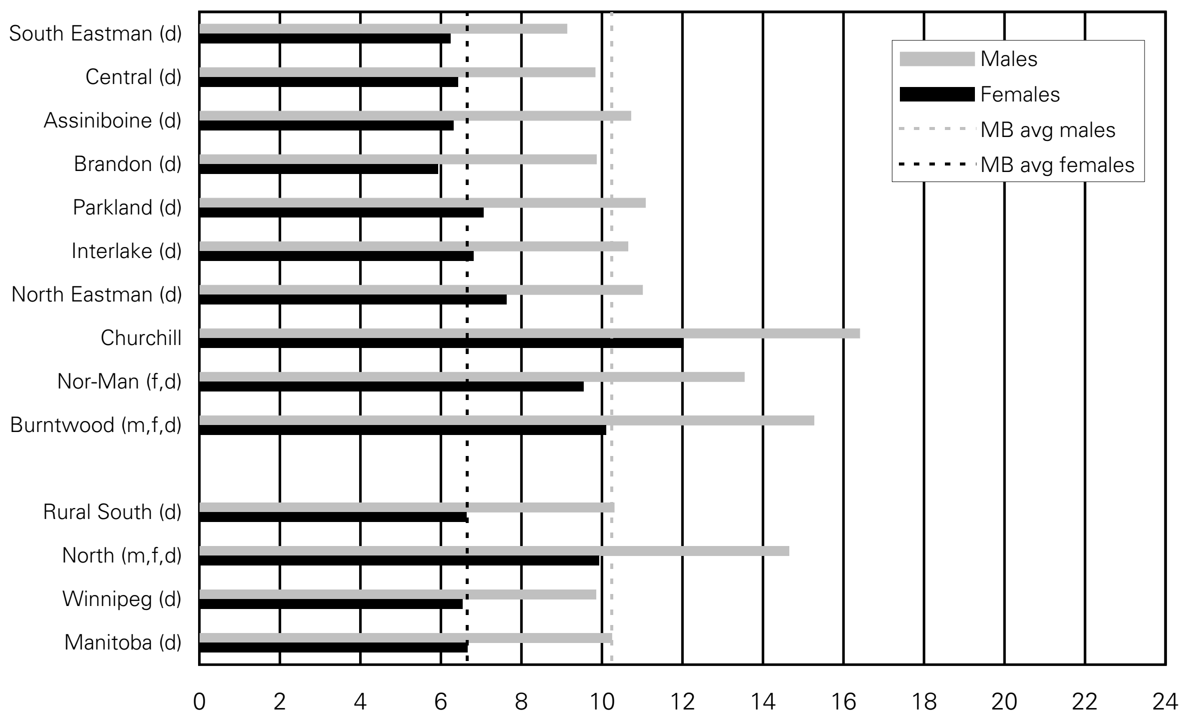
- Life expectancy values for Manitobans are very stable: the values reported here are identical to those from 1996–2000, shown in the RHA Indicators Atlas (Martens et al., 2003). That report also showed results from 1991–1995, and for that period, life expectancy for females was 81.3, and for males 75.4 years.
- These values are very close to Canadian averages of 81.4 for females and 75.9 for males (DesMeules et al., 2004).
- Canadian life expectancy values are consistently in the top 10 of all countries in the world, and the differences between top countries are very small (less than one year) (World Health Organization, 2005).
- The differences in male-female life expectancy by income quintile are consistent with findings of DesMeules et al. (2004), that females might not have a large biological survival advantage over males, but are at lower risk of 'external' preventable deaths (e.g. injury, smoking-related, etc). Deaths by these causes are likely more common among lower income residents, producing the trends noted.

2.2 Total Mortality Rates

Definition: This is the total number of deaths in a population, divided by the total number of residents (including decedents). Rates were calculated for the 10-year period 1994 to 2003 to match the time frame for the premature mortality rates. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 2.2.1: Total Mortality Rates by RHA, 1994 – 2003

Age-adjusted annual rate of deaths per 1,000 residents

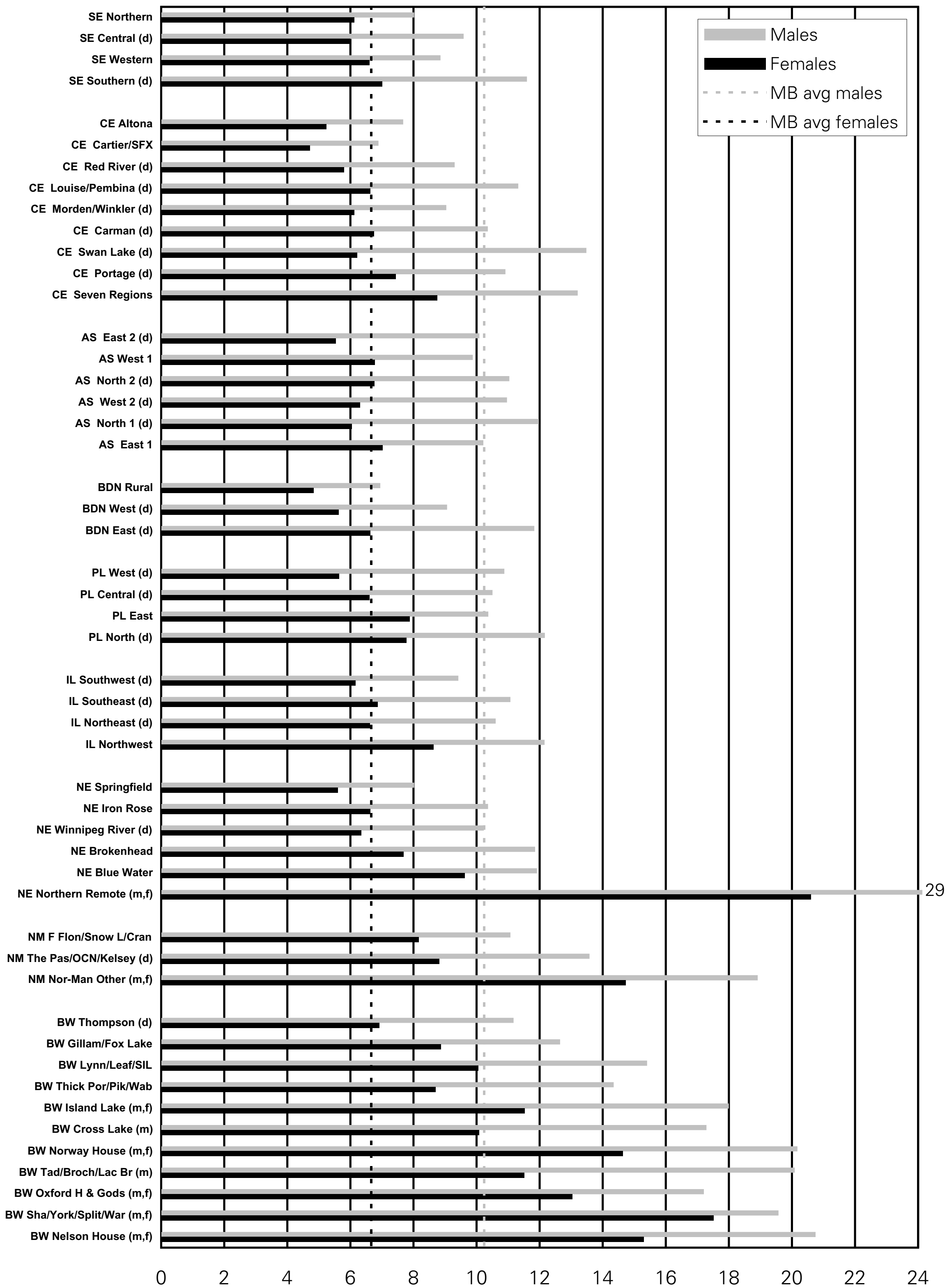


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 2.2.2: Total Mortality Rates by District, 1994 – 2003

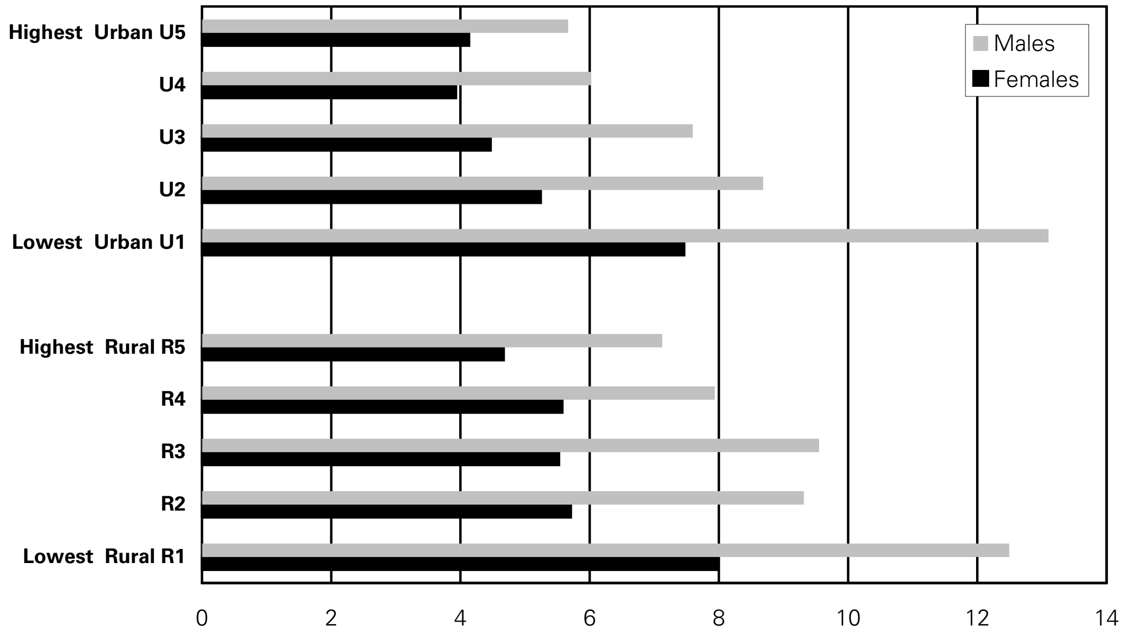
Age-adjusted annual rate of deaths per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 2.2.3: Total Mortality Rates by Income Quintile, 1994 – 2003

Age-adjusted annual rate of deaths per 1,000 residents



Linear Trend Test Results

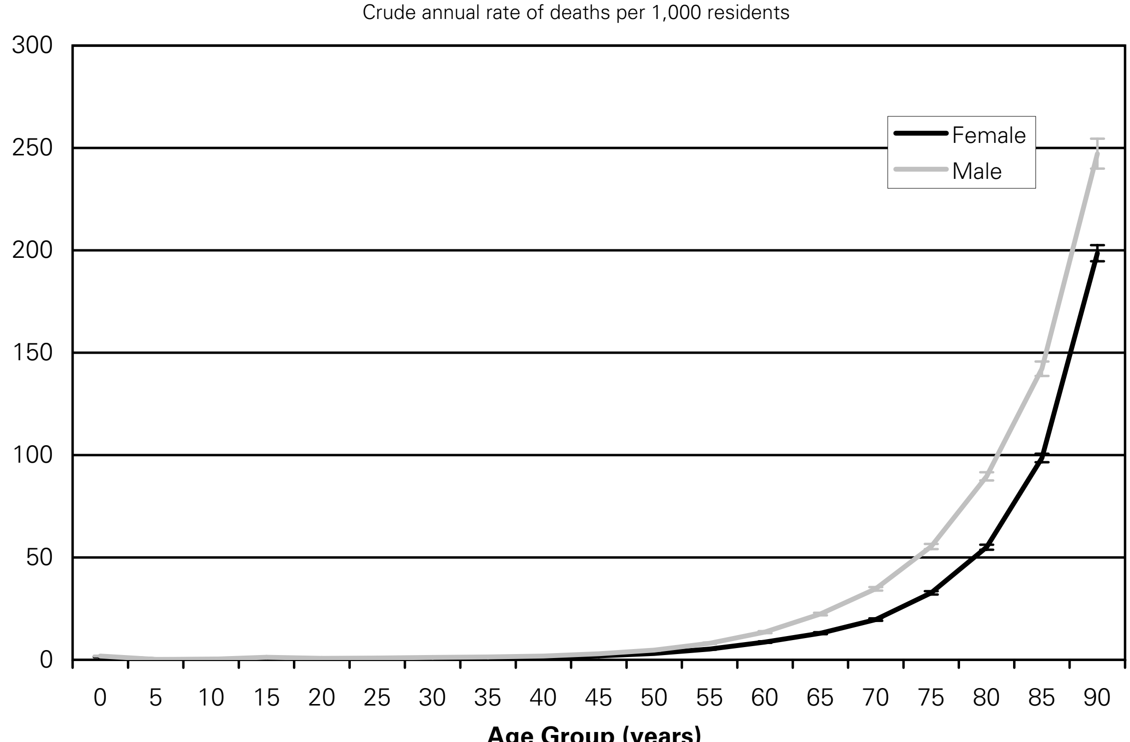
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 2.2.4: Total Mortality Rates by Age and Sex, 1994 – 2003

Crude annual rate of deaths per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for total mortality rates:

Age-adjusted rates:

- Overall, and for all RHAs, total mortality rates for males are much higher than for females (10.2 versus 6.7 deaths per 1,000 residents per year). However, a large portion of this difference is attributable to the age adjustment, because men die on average five years younger than females. The crude rates, shown in Appendix 4, indicate that the crude death rates are closer: 8.6 for males, and 8.1 for females.
- The values vary considerably by area, but the difference between sexes is quite consistent, with age-adjusted male rates about 1.5 times higher than female rates.
- There is a strong relationship between total mortality rates and area-level income: in both urban and rural areas, total mortality rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- For both sexes, total mortality rates by age show the expected trend: deaths are rare among children, youth and young adults. Death rates begin to rise in late adulthood, and rise dramatically with age among the oldest age groups.
- For each age group, the difference in crude mortality rates between males and females is smaller than the difference in the age-adjusted rates (all-age male:female ratio of 1.06 for crude rates, versus 1.54 for adjusted rates).

Comparisons to other findings:

- These values appear slightly higher than those in the RHA Indicators Atlas (Martens et al., 2003), which reported adjusted rates of 8.0 for both 1990 to 1994 and 1995 to 1999. The sex-combined rate from this report is 8.3. This difference is due to the change in methods used, as explained at the beginning of this chapter.
- The crude rates for Manitoba show the expected gradual increase in annual mortality for an aging population: the crude rates were 7.63 in 1990 to 1994, 8.09 in 1995 to 1999, and 8.33 in 1994 to 2003.

2.3 Mortality Rates by Sex and Cause

Definition: This is the crude rate of deaths by cause, using the 17 chapters of the International Classification of Diseases system (ICD-9-CM). The groups are ranked so that the most common causes for each sex are listed first. Not all 17 groups are shown, because deaths for some categories are rare. Results are shown for Manitoba and for the aggregate areas (Rural South, North, Brandon, Winnipeg, Manitoba) due to the relatively small number of deaths in smaller areas.

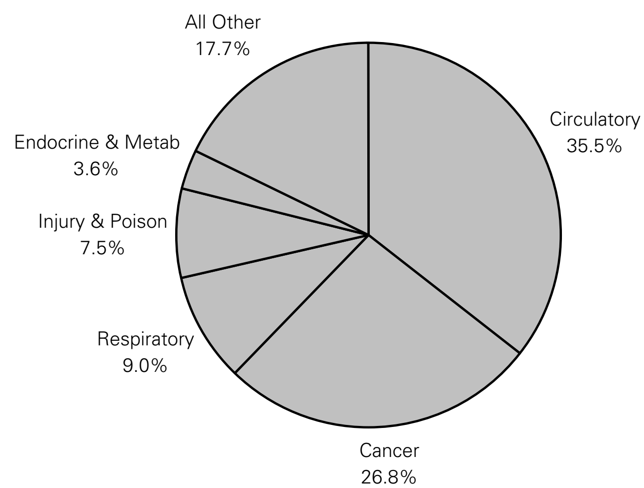
Key findings for mortality by cause:

- For both males and females, the top five causes of death are circulatory disease, cancer, respiratory disease, injury & poisoning, and endocrine/metabolic disorders. Together these causes capture about 80% of all deaths; the remaining 20% are due to a variety of other causes. (The precise values for each of the causes are available on the MCHP website at: www.umanitoba.ca/centres/mchp, under the 'Data Extras' link).
- Injury & poisoning is the fourth leading cause of death for both males and females, but is responsible for a higher proportion of deaths among males (7.5%) than females (4.3%).
- For residents of the Rural South and for Winnipeg residents, the findings are almost identical to the Manitoba overall distributions.
- For residents of the North, the pattern is quite different from other areas, but still similar between males and females. The leading causes of death are circulatory disease (though only about 26% of deaths, versus 36% for other areas), injury & poisoning (about 20% of deaths, versus 6% for other areas), cancer, and respiratory disease. The category 'Unknown' has the fifth highest number of deaths among northern residents (coded for 5.1% of males deaths, and 6.5% of female deaths).

Comparisons to other findings:

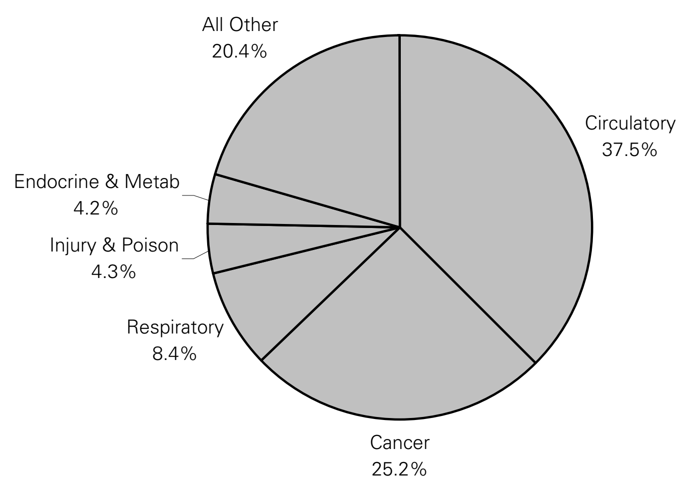
- These results are almost identical to those shown for Manitoba in the RHA Indicators Atlas report (Martens et al., 2003): the top causes and their ordering in both 1990 to 1994 and 1995 to 1999 were the same as in this report: circulatory, cancer, respiratory, injury & poisoning, followed by "all others."
- These results are also similar to Canadian rankings for 2002 (Statistics Canada, 2002):
  - Males: circulatory 32.5%, cancer 31.0%, injury 8.1%, respiratory 8.0%, endocrine 4.3%
  - Females: circulatory 33.4%, cancer 27.8%, respiratory 7.5%, nervous system 5.4%, endocrine 4.6%

Figure 2.3.1: Male Mortality by Cause (ICD-9-CM) Manitoba, 1994 – 2003



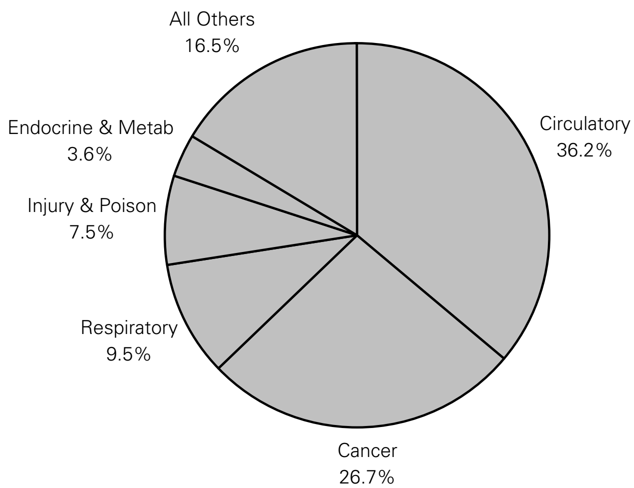
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.2: Female Mortality by Cause (ICD-9-CM) Manitoba, 1994 – 2003



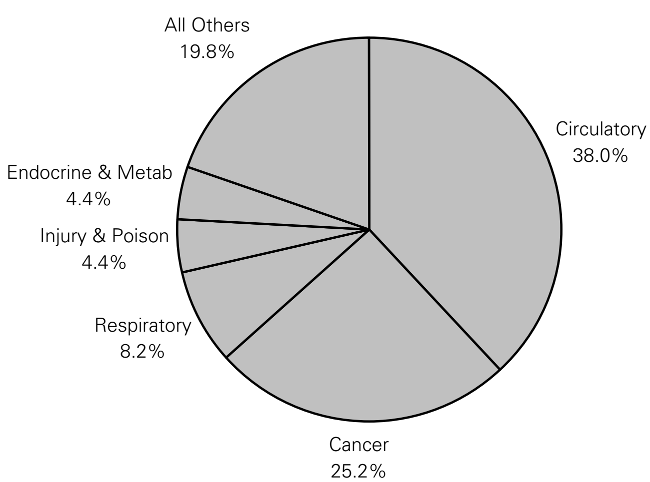
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.3: Male Mortality by Cause (ICD-9-CM)
Rural South, 1994 – 2003



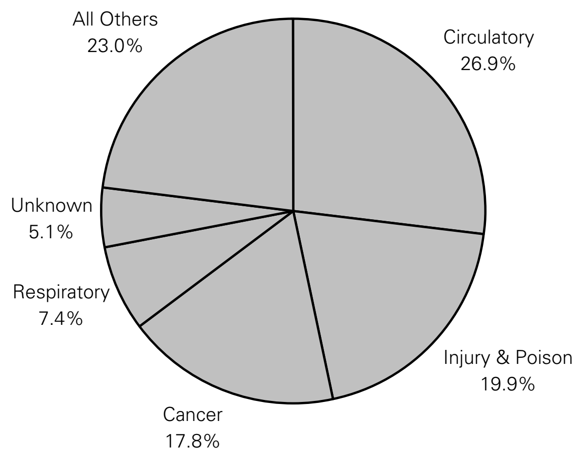
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.4: Female Mortality by Cause (ICD-9-CM)
Rural South, 1994 – 2003



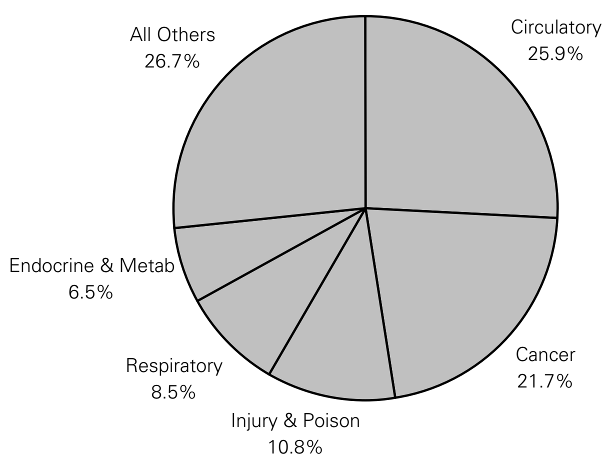
Source: Manitoba Centre for Health Policy, 2005

**Figure 2.3.5: Male Mortality by Cause (ICD-9-CM)
North, 1994 – 2003**



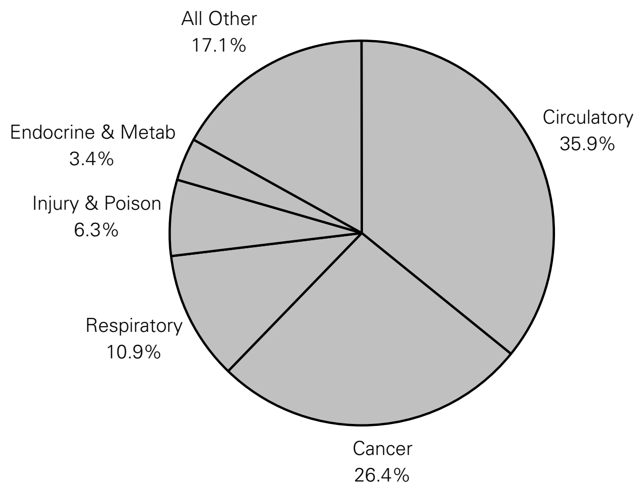
Source: Manitoba Centre for Health Policy, 2005

**Figure 2.3.6: Female Mortality by Cause (ICD-9-CM)
North, 1994 – 2003**



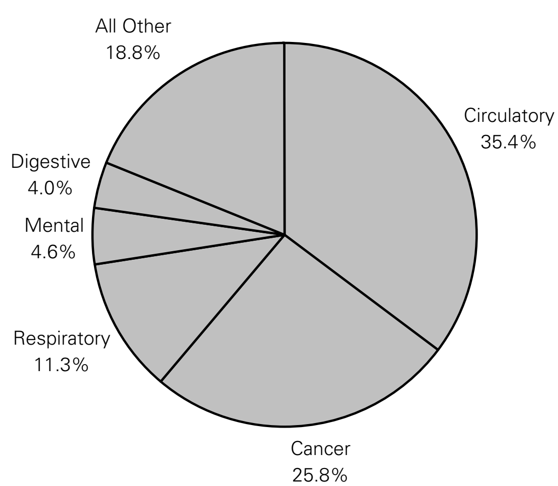
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.7: Male Mortality by Cause (ICD-9-CM)
Brandon, 1994 – 2003



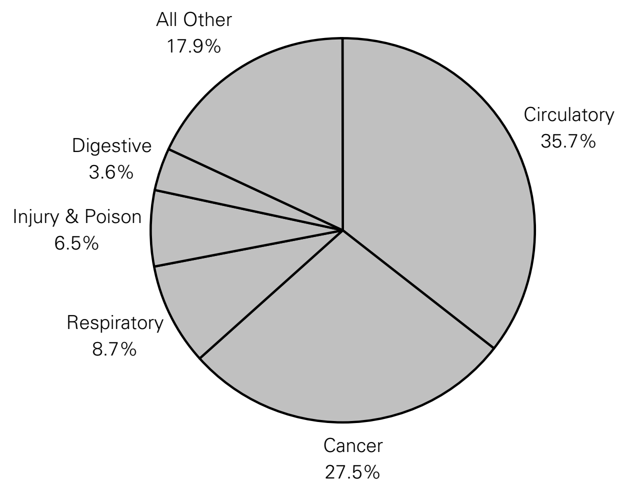
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.8: Female Mortality by Cause (ICD-9-CM)
Brandon, 1994 – 2003



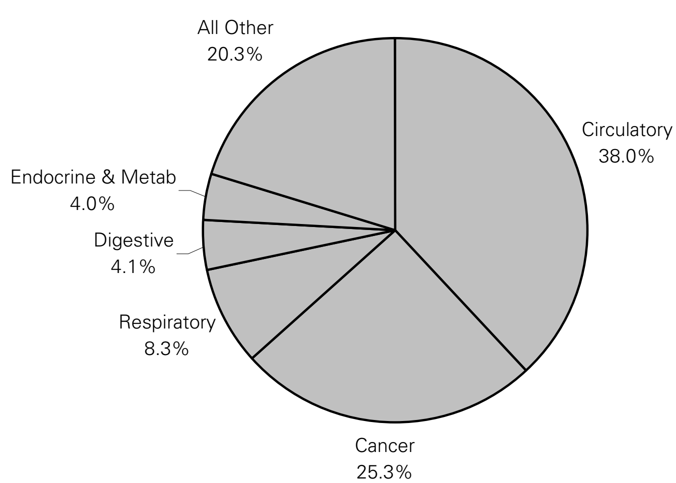
Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.9: Male Mortality by Cause (ICD-9-CM)
Winnipeg, 1994 – 2003



Source: Manitoba Centre for Health Policy, 2005

Figure 2.3.10: Female Mortality by Cause (ICD-9-CM)
Winnipeg, 1994 – 2003



Source: Manitoba Centre for Health Policy, 2005

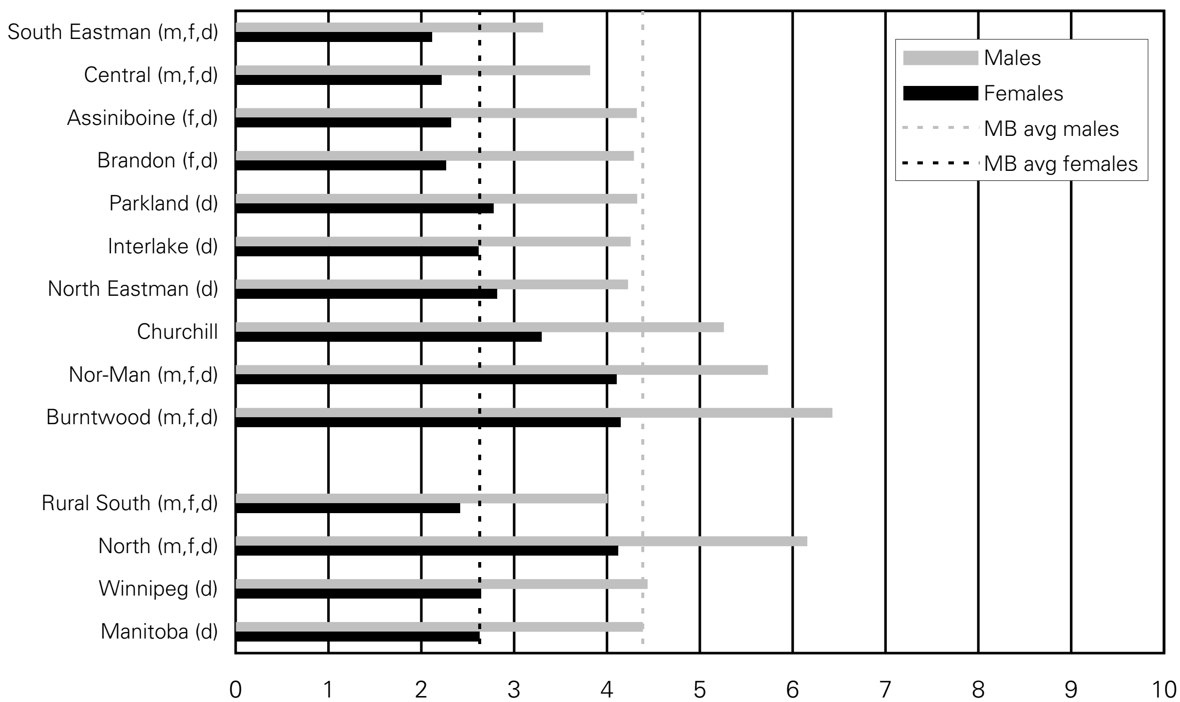
2.4 Premature Mortality Rates (PMR)

Definition: This is the number of deaths before age 75, per 1,000 residents age 0 to 74 years, over the 10-year period 1994 to 2003. Values are age-adjusted to reflect the 0- to 74-year old population of Manitoba (males and females combined). See Chapter 1 for a more thorough explanation and discussion of premature mortality rates.

Note: Ten years of data were used instead of the usual five, because values here are calculated separately for males and females in each area, and dividing the population in half would have decreased the 'power' of the statistical analysis to indicate differences among areas and between sexes.

Figure 2.4.1: Premature Mortality Rates by RHA, 1994 – 2003

Age-adjusted annual rate per 1,000 residents age 0-74

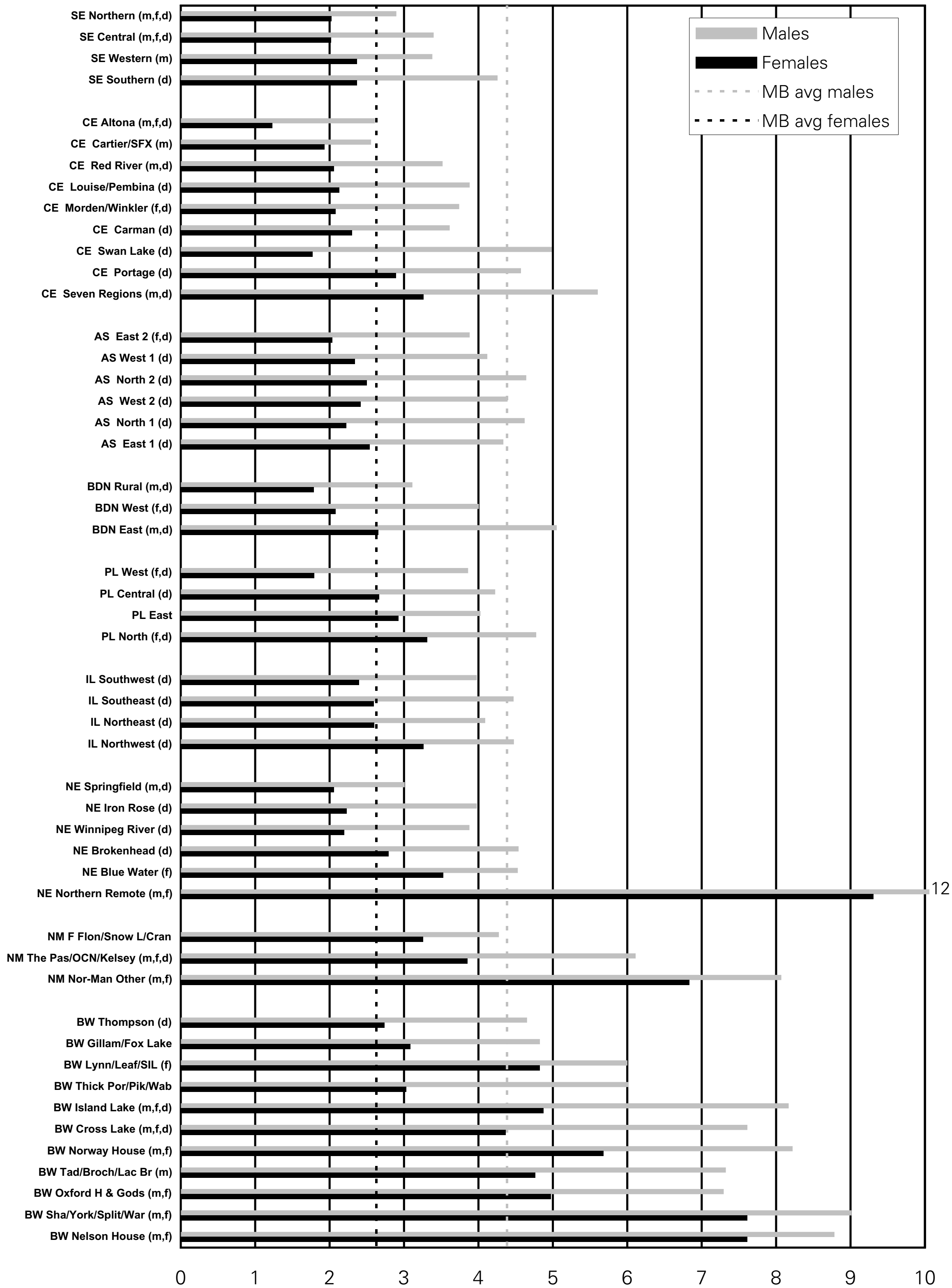


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

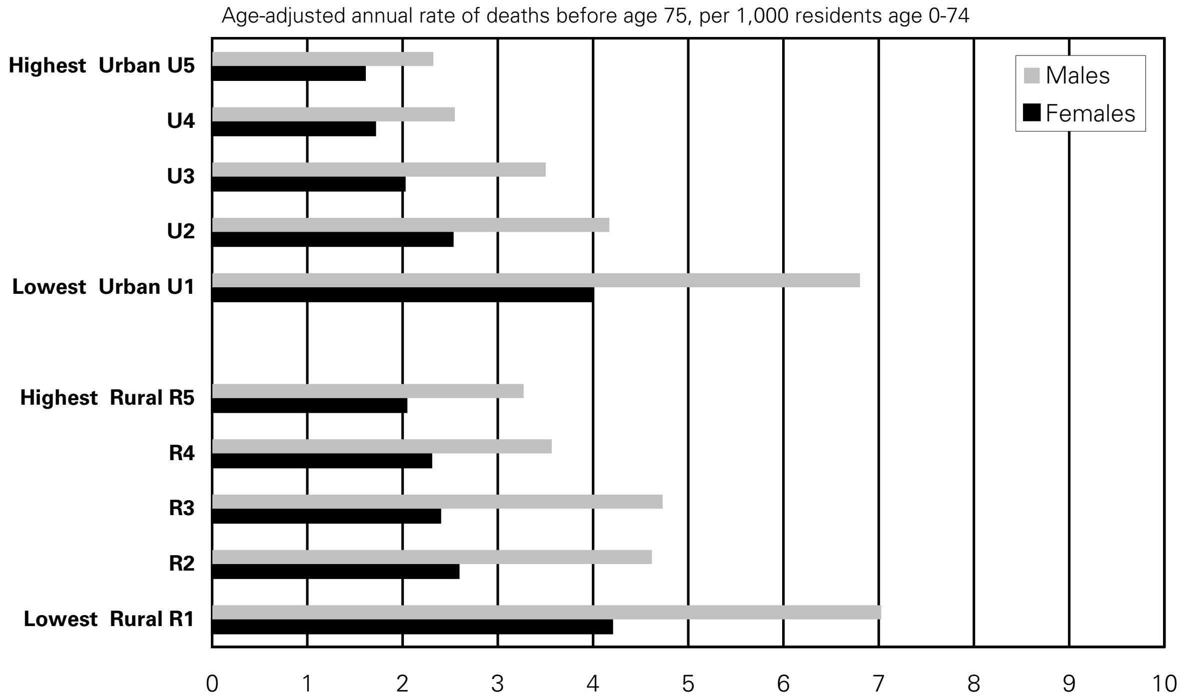
Figure 2.4.2: Premature Mortality Rates by District, 1994 – 2003

Age-adjusted annual rate per 1,000 residents age 0-74



Source: Manitoba Centre for Health Policy, 2005

Figure 2.4.3: Premature Mortality Rates by Income Quintile, 1994 – 2003



Linear Trend Test Results

Female: Urban: Significant ($p<.001$) Rural: Significant ($p<.001$)

Male: Urban: Significant ($p<.001$) Rural: Significant ($p<.001$)

Source: Manitoba Centre for Health Policy, 2005

Key findings for premature mortality rates:

Age-adjusted rates:

- Overall, and for all RHAs and districts, PMRs are much higher for males than females (4.4 versus 2.6 premature deaths per 1,000 residents age 0 to 74).
- Unlike with total mortality rates, this large difference is not caused by age adjustment: it simply reflects that males more often die before reaching age 75.
- The difference between sexes is quite consistent across RHAs and districts, with male rates about 1.7 times higher than female rates.
- For both sexes, the values vary widely by area: the PMR for the RHA with the least healthy population is double that of the RHA with the healthiest population. The variation is even larger at the district level.
- There is a strong relationship between premature mortality rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Comparisons to other findings:

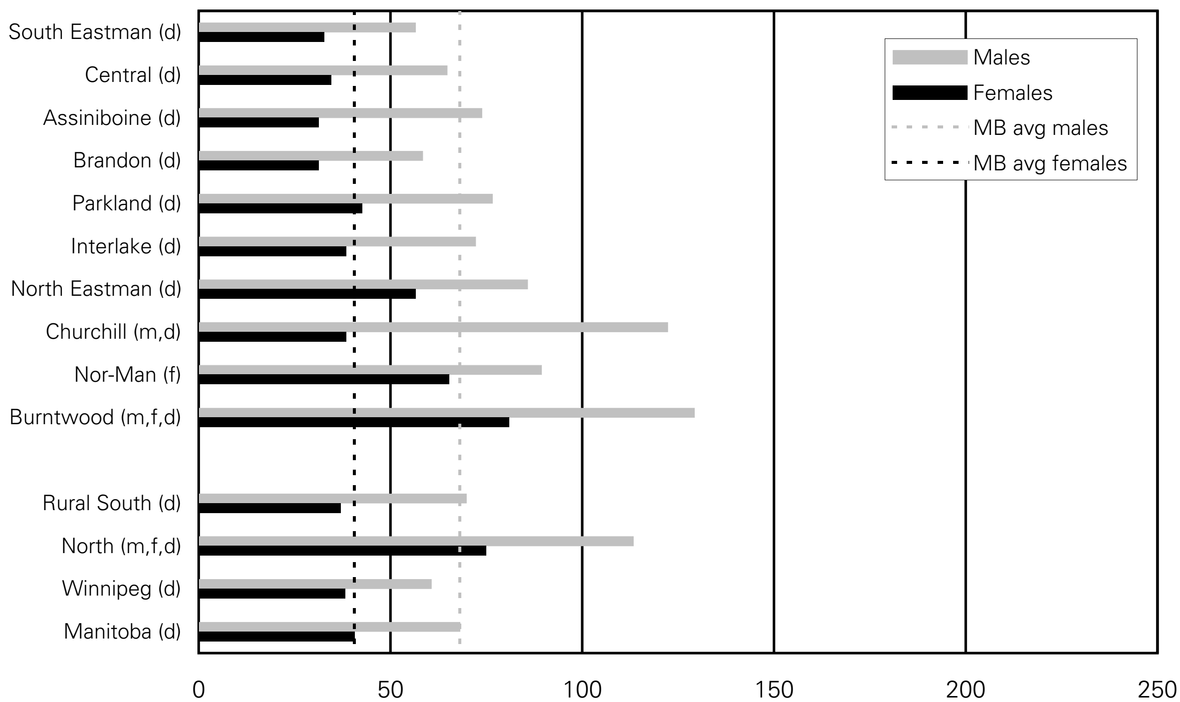
- These values are slightly higher than those shown in the RHA Indicators Atlas report (Martens et al., 2003) because of a change in the method used. However, the patterns across areas and income quintiles are almost identical.
- When either method is used consistently over time, premature mortality rates show a continual slow decline.

2.5 Potential Years of Life Lost (PYLL)

Definition: This is the number of potential years of life lost per 1,000 residents age 1 to 74. For each death before age 75, the PYLL value is calculated as: 75 minus age at death. The rates are age-adjusted to reflect the 1- to 74-year old population of Manitoba (males and females combined). Ten years of data were used, 1994 to 2003, to match the time frame used for premature mortality rates.

Figure 2.5.1: Potential Years of Life Lost by RHA, 1994 – 2003

Age-adjusted annual rate of PYLL per 1,000 residents age 1-74

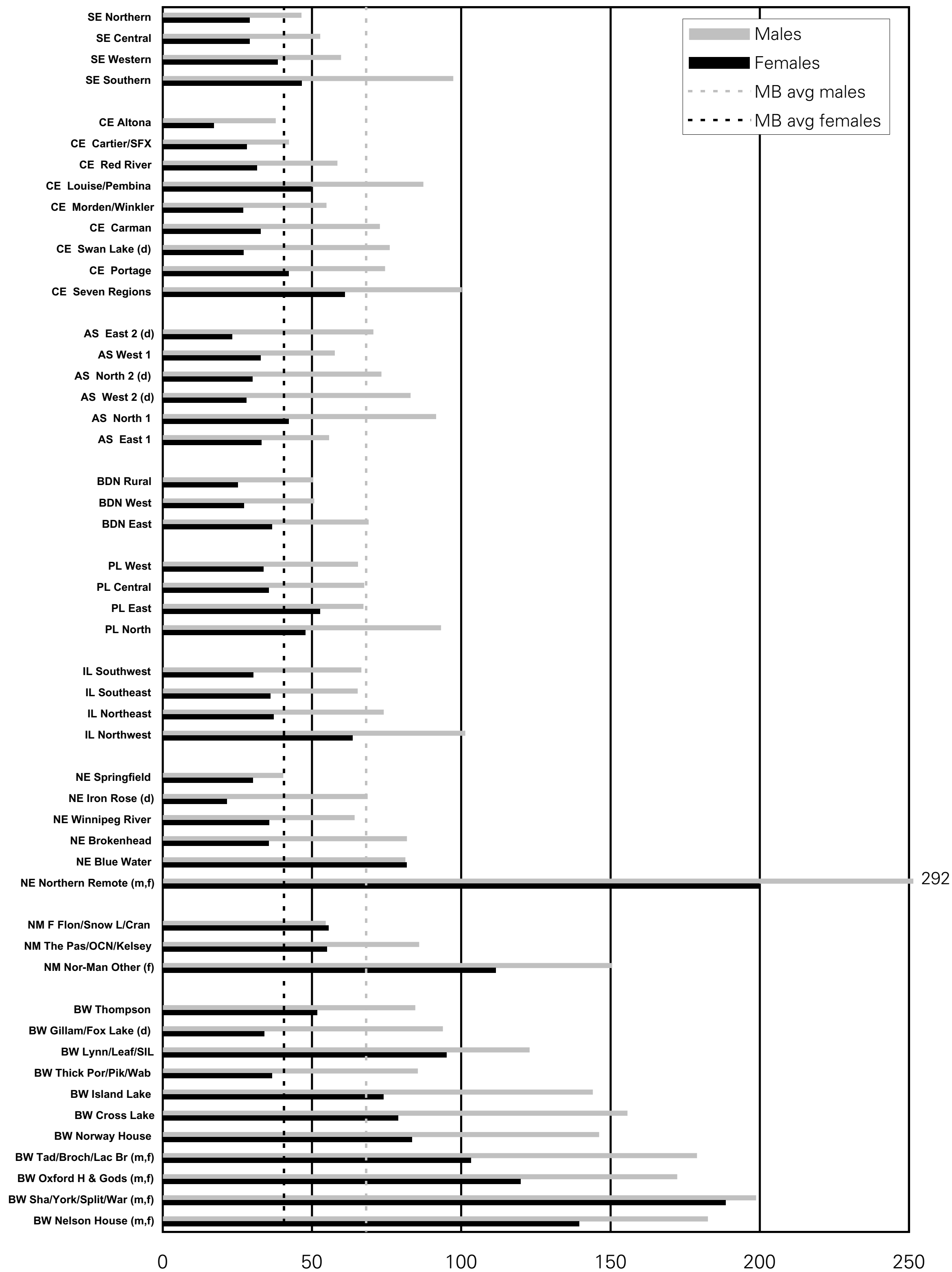


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 2.5.2: Potential Years of Life Lost by District, 1994 – 2003

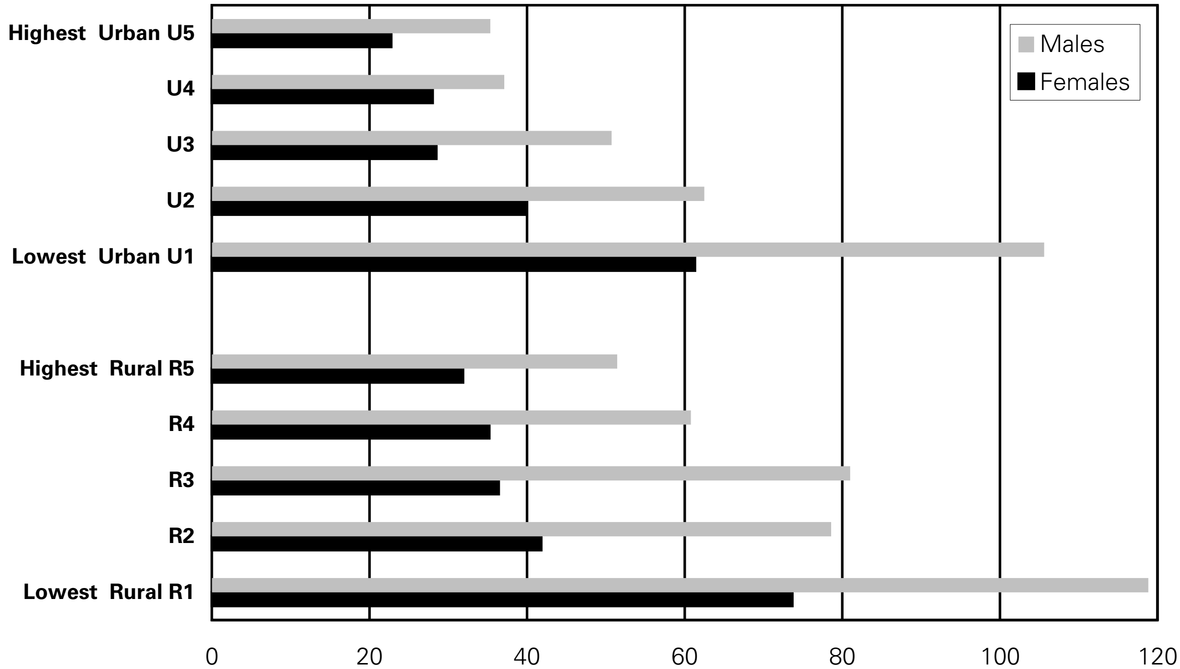
Age-adjusted annual rate of PYLL per 1,000 residents age 1-74



Source: Manitoba Centre for Health Policy, 2005

Figure 2.5.3: Potential Years of Life Lost by Income Quintile, 1994 – 2003

Age-adjusted annual rate of PYLL per 1,000 residents age 1-74



Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Key findings for potential years of life lost rates:

- Overall, and for each RHA, PYLL rates for males are much higher than those for females (68.1 versus 40.6 per 1,000 residents age 1 to 74, $p<.001$).
- PYLL rates vary considerably by area—both across and within RHAs, however, no rates are shown as statistically different because most of the differences are accounted for by age structure, which is a highly significant variable in the model.
- There is a strong relationship between PYLL rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Comparisons to other findings:

- These values are consistent with those in the RHA Indicators Atlas (Martens et al., 2003), revealing a stable rate of PYLL over time for males, and a slowly increasing rate for females (though this trend was not tested statistically). The age-adjusted rates are difficult to compare because of differences in statistical methods, but the crude rates can be validly compared over time: crude rates for males were 67.9 years of life lost per 1,000 residents age 1 to 74 in 1991 to 1995, 66.3 in 1996–2000, and 67.4 in 1994 to 2003. For females, the crude rates were 39.1 in 1991–1995, 40.6 in 1996 to2000, and 41.2 in 1994 to 2003.
- The values are comparable to those published by Statistics Canada, though their values are higher because their calculations include infants (0 to 1 year), whereas our calculations were based on the 'traditional' definition of PYLL which only counts deaths among residents age 1 to 74 (Young, 1998). Their rates for males are 75.3 versus 68.1 reported here, and for females 46.6 versus 40.6 reported here.

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Chapter 3: Disease Treatment Prevalence and Incidence

What's in This Chapter?

This chapter addresses the issue of who 'gets' or 'has' which diseases or disorders. The administrative data used for this report do not directly record who gets or has which diseases, but does record who gets 'treated' for various diseases (that is, visits a physician or is hospitalized, and gets the appropriate codes). Therefore, we use the phrase 'treatment prevalence' to report the percentage of the population receiving treatment for a given disease (see below for more complete explanation). Age-adjusted values are given for all Regional Health Authorities (RHA), for RHA Districts (when possible), and by Urban and Rural Income Quintiles. Crude values by age and sex (that is, without age-standardization) are also provided.

The indicators are grouped (prevalence indicators and incidence indicators), and shown in order of decreasing values; that is, the most common diseases or events are shown first.

Disease treatment prevalence rates, from most to least prevalent:

3.1 Hypertension Treatment Prevalence
3.2 Arthritis Treatment Prevalence
3.3 Total Respiratory Morbidity (TRM) Treatment Prevalence
3.4 Diabetes Treatment Prevalence
3.5 Ischemic Heart Disease (IHD) Treatment Prevalence
3.6 Infertility Treatment Prevalence
3.7 Renal Failure Treatment Prevalence
3.8 Inflammatory Bowel Disease (IBD) Treatment Prevalence

Event/Incidence rates, from highest to lowest:

3.9 Heart Attack (AMI) Incidence (Hospitalization or Death)
3.10 Stroke Incidence Rate (Hospitalization or Death)
3.11 Hip Fracture Incidence (Event Rate)
3.12 Lower Limb Amputation due to Diabetes

Key Findings for Chapter 3: Disease Incidence and Prevalence

- Hypertension and arthritis had the highest treatment prevalence values, and both were more common among females than males. Hypertension affected 25.9% of females and 24.0% of males age 25 or older. Arthritis affected 22.3% of females and 19.2% of males age 19 or older.
- These were followed by respiratory diseases at 11.4% of residents all ages (no sex difference), then diabetes and IHD, which were both more com-

mon among males than females: diabetes 6.8% of males, 6.3% of females age 20 to 79; IHD 7.0% of males, 4.0% of females age 19 or older.

- Other indicators showed mixed results regarding male/female differences:
  - Males have higher rates of acute myocardial infarction (AMI) (7.2 versus 3.1 per 1,000 residents per year), stroke (4.1 versus 3.0 per 1,000 per year), renal failure (2.5% versus 1.7% of residents age 20 or older), and diabetes-related lower limb amputations (.41 versus .20 per 1,000 residents age 20 to 79 per year).
  - Females have higher rates of hip fractures (2.7 versus 2.2 per 1,000 residents per year), and infertility treatment (2.7% versus 1.5% of residents age 15 to 55).
  - There is no significant sex difference in IBD treatment prevalence (0.4% of males and females).
  - Socioeconomic status has a strong influence on disease treatment prevalence and incidence: rates for most diseases are considerably higher among residents of low-income areas. There were two exceptions—but both were for less common diseases: infertility and IBD were both less prevalent among residents of lower income areas.
- Age is also a key determinant: in general, disease treatment prevalence values are higher among residents in older age groups, though again, there are exceptions (TRM, infertility, and IBD).
- Some diseases show large variation across RHAs and districts (for example, diabetes and total respiratory morbidity), while others show relatively equal prevalence in most areas (for example, hypertension and arthritis).

Introduction:

The term **prevalence** refers to the proportion of the population that 'has' a given disease at a given time. The administrative data used for this study do not directly indicate who 'has' a disease, but who received health services 'treatment' for that disease—that is, some combination of physician visits, hospitalizations, or prescription drugs. Therefore, we call our indicators **Treatment Prevalence** values, as they reflect the use of health services for that disease.

The term incidence refers to the number of new cases or events identified in a population in a given time period; that is, the number of people that 'get' the disease. As with prevalence, our data track disease incidence indirectly—through service use.

The diseases/indicators included in this report are primarily those for which valid definitions were available. Specific age ranges are used in many of the indicators, reflecting either the group used for validation studies, or the age ranges over which the disease/event is most likely to occur. Comparisons to other findings are discussed for each indicator, but are often subject to variation due to specific details of the definition—especially in terms of age ranges used, number of data sources and years used, etc.

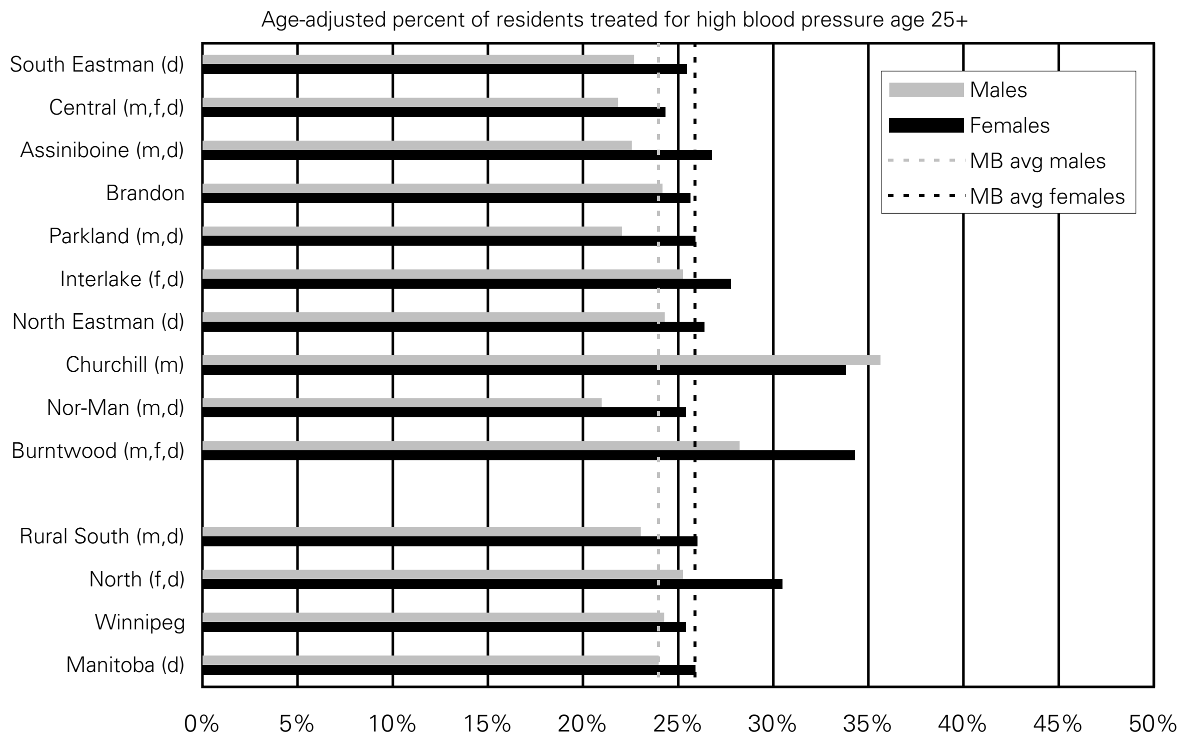
Sexually transmitted infections (STI) were not included, because not all cases are recorded in administrative data. The Communicable Disease Control Unit of Manitoba Health maintains records for STIs, and produces reports for these diseases, in addition to other information, available online at: www.gov.mb.ca/health/publichealth/cdc/index.html.

Finally, it must be kept in mind that residents of remote northern areas served by nursing stations will not have physician claims associated with all their health care contacts, so treatment prevalence values may be under-estimates of actual values.

3.1 Hypertension Treatment Prevalence

Definition: The percentage of residents aged 25 or older who had at least one physician visit for hypertension (ICD-9-CM code 401 or 402) in the three-year period 2001/02 to 2003/04. It is expressed as a percentage because each resident is defined either as having been treated for high blood pressure, or not, in that period. Values are age-adjusted to reflect the 25+ population of Manitoba (males and females combined).

Figure 3.1.1: Hypertension Treatment Prevalence by RHA, 2001/02 – 2003/04

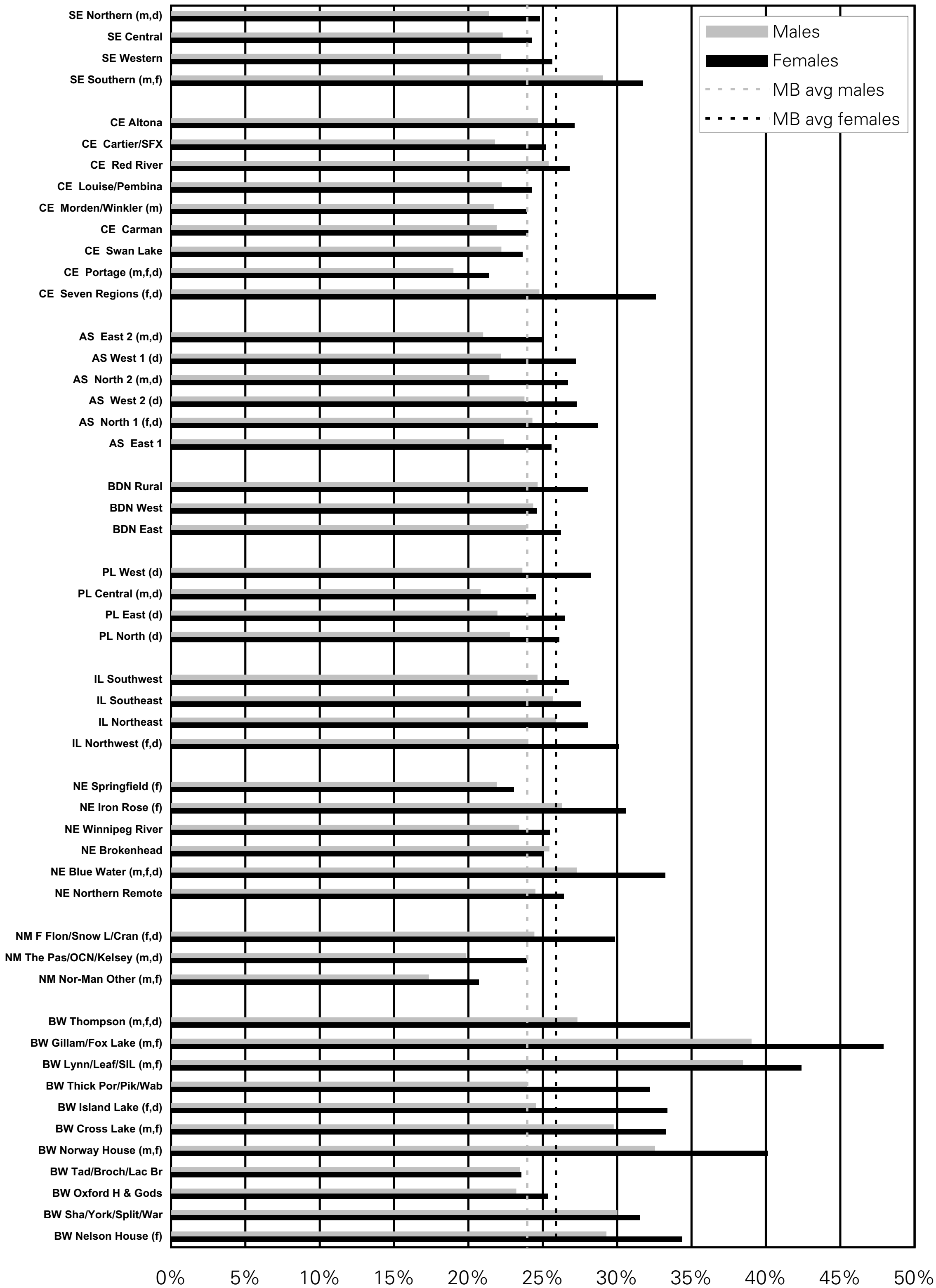


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.1.2: Hypertension Treatment Prevalence by District, 2001/02 – 2003/04

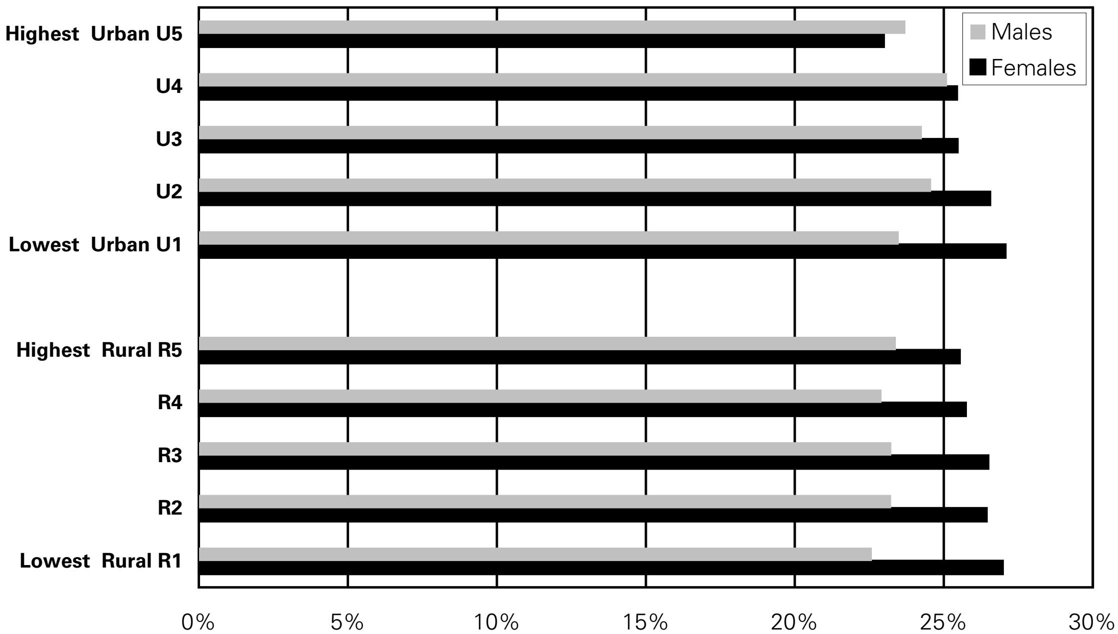
Age-adjusted percent of residents treated for high blood pressure age 25+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.1.3: Hypertension Treatment Prevalence by Income Quintile, 2001/02 – 2003/04

Age-adjusted percent of residents treated for high blood pressure age 25+



Linear Trend Test Results

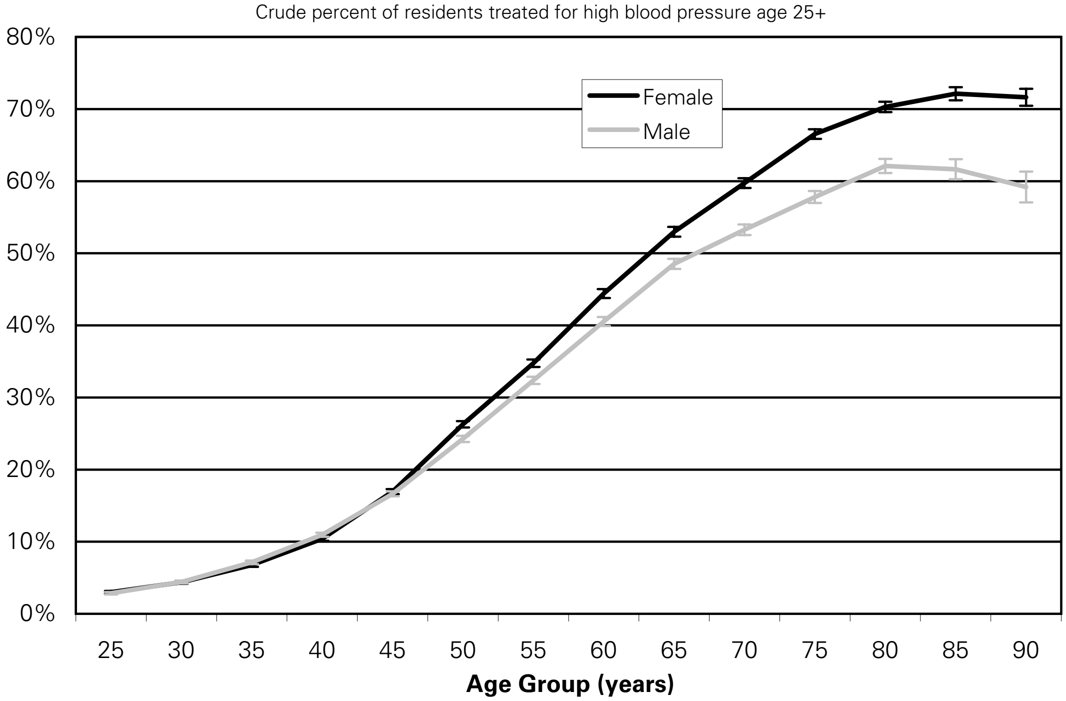
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 3.1.4: Hypertension Treatment Prevalence by Age and Sex, 2001/02 – 2003/04

Crude percent of residents treated for high blood pressure age 25+



Source: Manitoba Centre for Health Policy, 2005

Key findings for hypertension treatment prevalence:

Age-adjusted values:

- Treatment prevalence values for hypertension are very high—almost one in four male and female residents age 25+ are affected.
- Overall and in most RHAs, hypertension treatment prevalence is slightly higher among females than males (25.9% versus 24.0%, $p<0.001$).
- Among females in both urban and rural areas, hypertension is more prevalent among those from low-income areas. There was no association with area income for males (urban or rural)

Age-specific crude rates by sex:

- The treatment prevalence of hypertension is very low among young adults, but rises rapidly with age for both males and females. The difference between males and females also increases with age.

Comparisons to other findings:

- These results are consistent with those in the RHA Indicators Atlas (Martens et al., 2003). It appears that hypertension treatment prevalence continues to rise over time, from about 19% in the mid-1990s, to about 22% in the late 1990s, to about 25% in the early 2000s.
- Note: These are all age-adjusted rates, so these increases are not due to population aging. That is, the gradual aging of the population is accounted for by the statistical adjustment, so the increase in the values suggests the actual treatment prevalence of hypertension is increasing slowly.
- The results also agree with previous results for Manitoba published by Muhajarine et al. (1997), which reported a rate of 26% using the same data source and a similar definition. That report also noted that the values compared well with clinical measures and self-report data from the Manitoba Heart Health Survey, and its national counterpart (Joffres et al., 1992).
- The 25% treatment prevalence reported here is also close to the 28% recently estimated for North Americans using direct blood pressure measurements (interestingly, the prevalence was 44% for Europeans) (Wolf-Maier et al., 2003).

3.2 Arthritis Treatment Prevalence

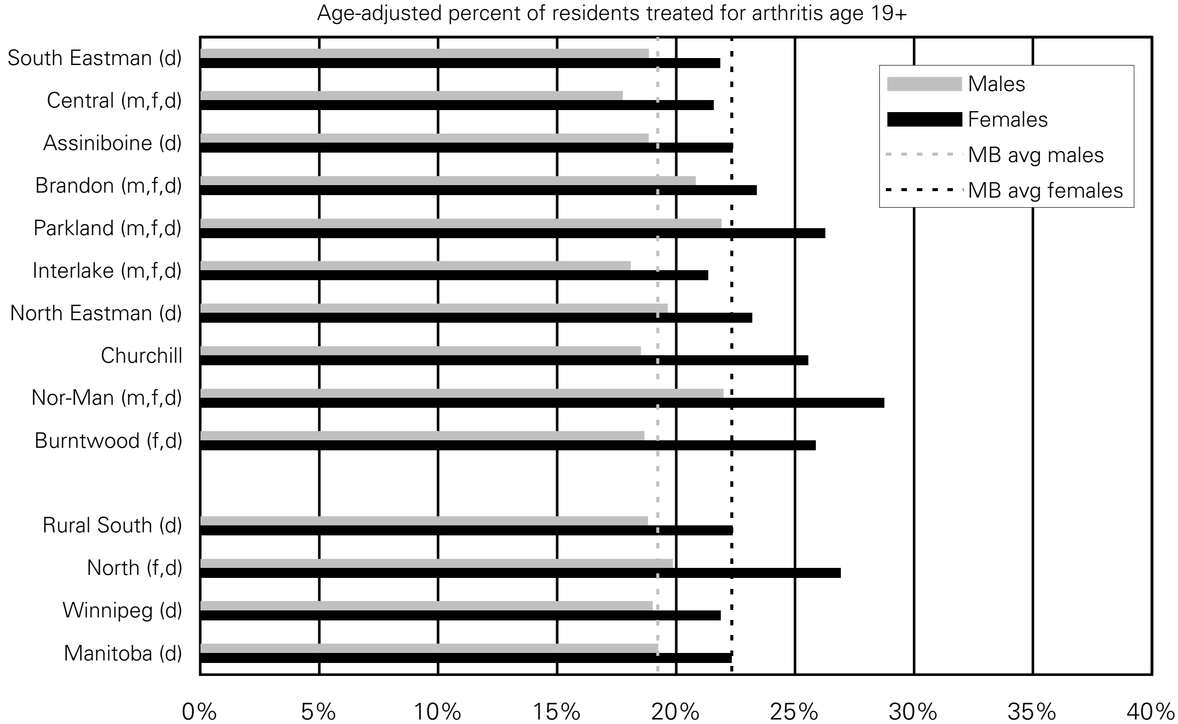
Definition: The percentage of residents aged 19 or older diagnosed with arthritis (osteo or rheumatoid) using a combination of data in physician visits, hospitalizations, and prescription drugs, from 2002/03 to 2003/04:

- One or more hospitalizations, or two or more physician visits, with any ICD-9-CM code of 274, 446, 710-721, 725-729 or 739, OR:
- At least one physician visit with any ICD-9-CM code of 274, 446, 710-721, 725-729 or 739, and two or more prescriptions for arthritis medications (listed in Glossary).

It is expressed as a percentage because each resident is defined either as having been treated for arthritis, or not, in that period. Values are age-adjusted to reflect the 19+ population of Manitoba (males and females combined).

Figure 3.2.1: Arthritis Treatment Prevalence by RHA, 2002/03 – 2003/04

Age-adjusted percent of residents treated for arthritis age 19+

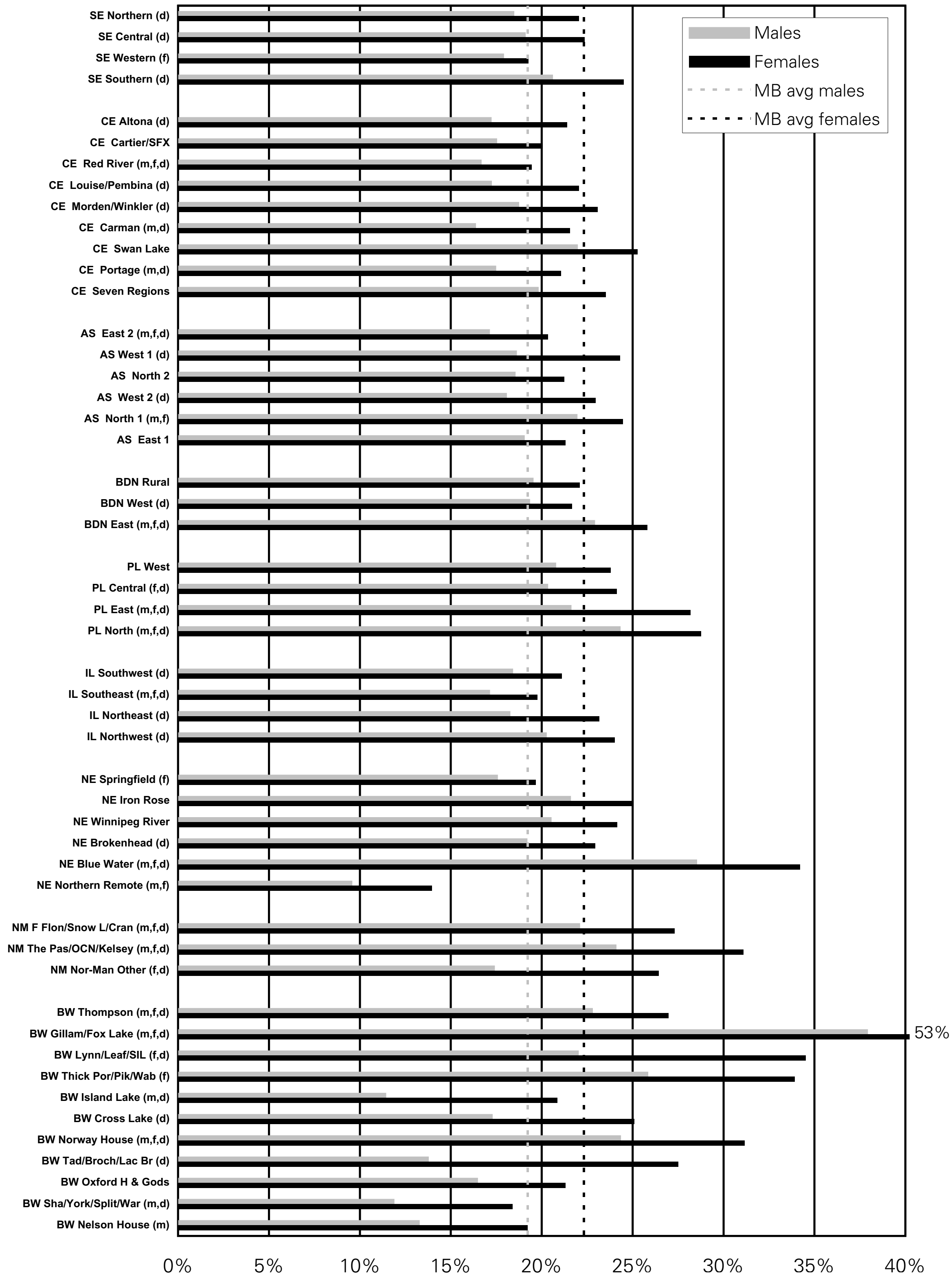


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.2.2: Arthritis Treatment Prevalence by District, 2002/03 – 2003/04

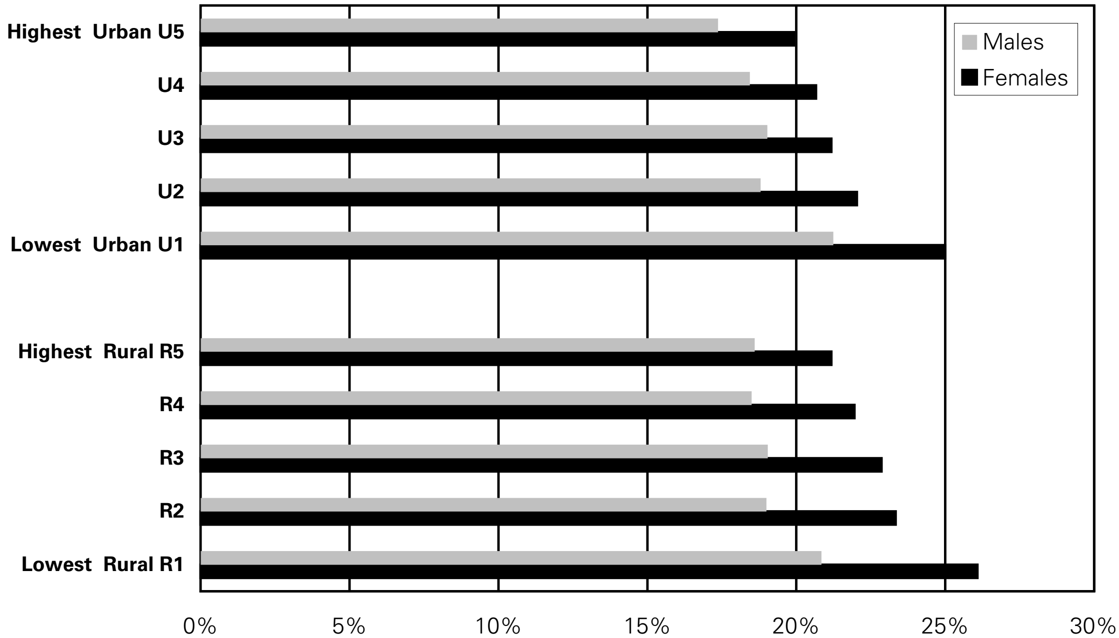
Age-adjusted percent of residents treated for arthritis age 19+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.2.3: Arthritis Treatment Prevalence by Income Quintile, 2002/03 – 2003/04

Age-adjusted percent of residents treated for arthritis age 19+



Linear Trend Test Results

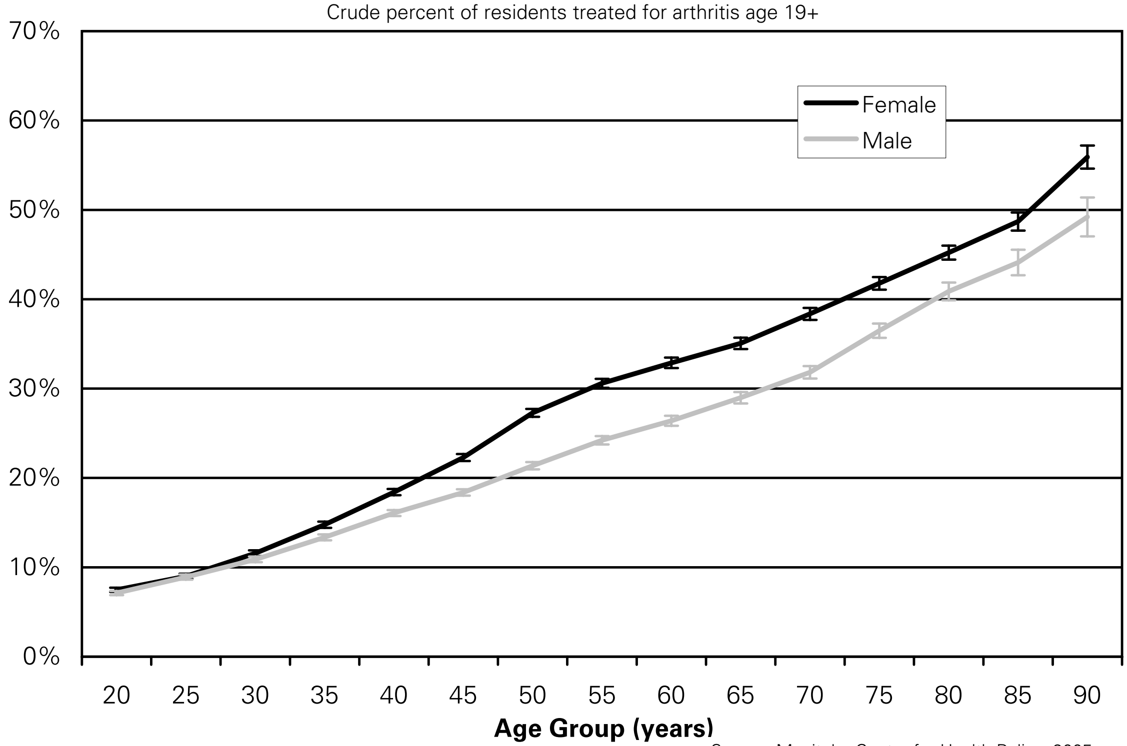
Female: Urban: Significant ($p<.001$) Rural: Significant ($p<.001$)

Male: Urban: Significant ($p<.001$) Rural: Significant ($p<.001$)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.2.4: Arthritis Treatment Prevalence by Age and Sex, 2002/03 – 2003/04

Crude percent of residents treated for arthritis age 19+



Source: Manitoba Centre for Health Policy, 2005

Key findings for arthritis treatment prevalence:

Age-adjusted values:

- Treatment prevalence values for arthritis are very high: about one in five males and females age 19+ are affected.
- Overall, and in all RHAs, the treatment prevalence for arthritis is higher among females than males (22.3% versus 19.2%, $p<0.001$)
- There is a strong relationship between arthritis treatment prevalence and area-level income: in both urban and rural areas, values for both males and females are higher among residents of lower income areas.

Age-specific crude rates by sex:

- For both sexes, arthritis treatment prevalence is low for young adults, and rises steadily with age. The difference between sexes is relatively constant from age 45 onward, though treatment prevalence among females increases slightly relative to males during early middle age, after which time the difference decreases.

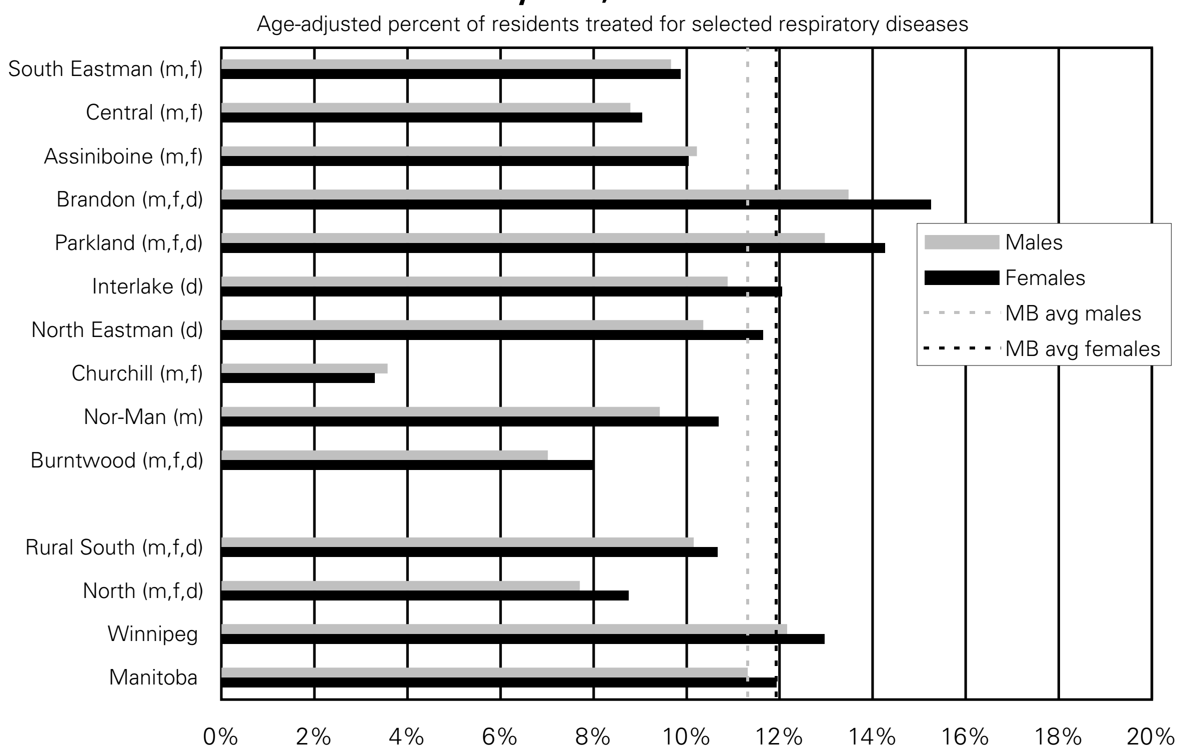
Comparison to other findings:

- The definition used here was taken from another Manitoba Centre for Health Policy (MCHP) report (Lix et al., In press). This definition provides the best characteristics for estimating population prevalence of rheumatoid and osteoarthritis combined: it was found to agree with survey results and other findings.

3.3 Total Respiratory Morbidity (TRM) Treatment Prevalence

Definition: The percentage of residents diagnosed in 2003/04 with any of the following respiratory illnesses: asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction. These diseases were defined by the presence of any of ICD-9-CM codes 466, 490, 491, 492, 493, or 496, from physician visits or hospitalizations. This combination of diagnoses is used to overcome problems resulting from different physicians (or specialists) using different diagnosis codes for the same underlying illness (e.g. asthma versus chronic bronchitis). It is expressed as a percentage because each resident is defined either as having been treated for any of these diseases, or not, in that period. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 3.3.1: Total Respiratory Morbidity Treatment Prevalence by RHA, 2003/04

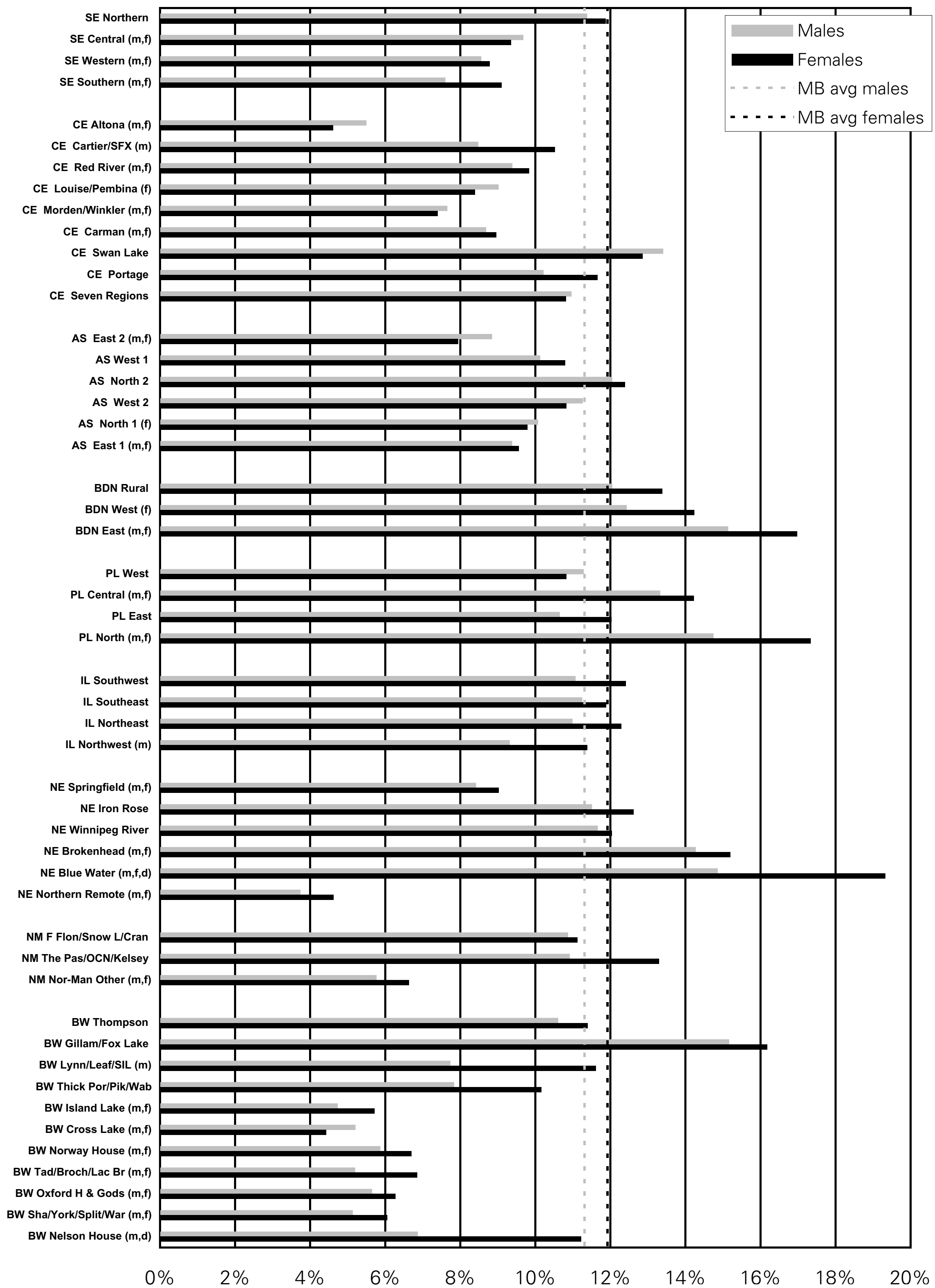


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.3.2: Total Respiratory Morbidity Treatment Prevalence by District, 2003/04

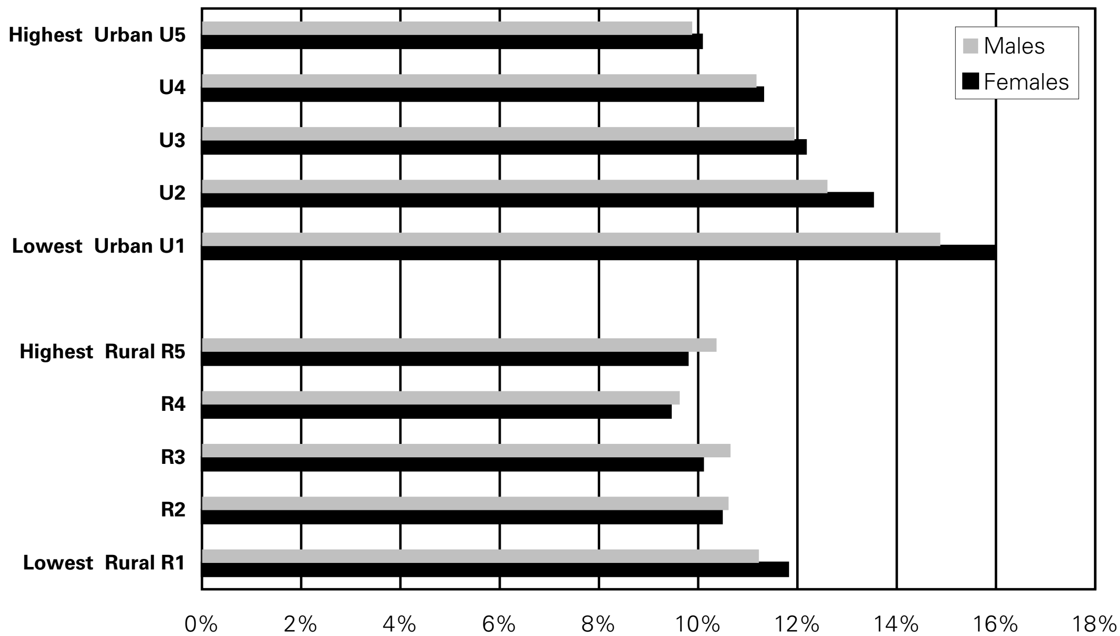
Age-adjusted percent of residents treated for selected respiratory diseases



Source: Manitoba Centre for Health Policy, 2005

Figure 3.3.3: Total Respiratory Morbidity Treatment Prevalence by Income Quintile, 2003/04

Age-adjusted percent of residents treated for selected respiratory diseases



Linear Trend Test Results

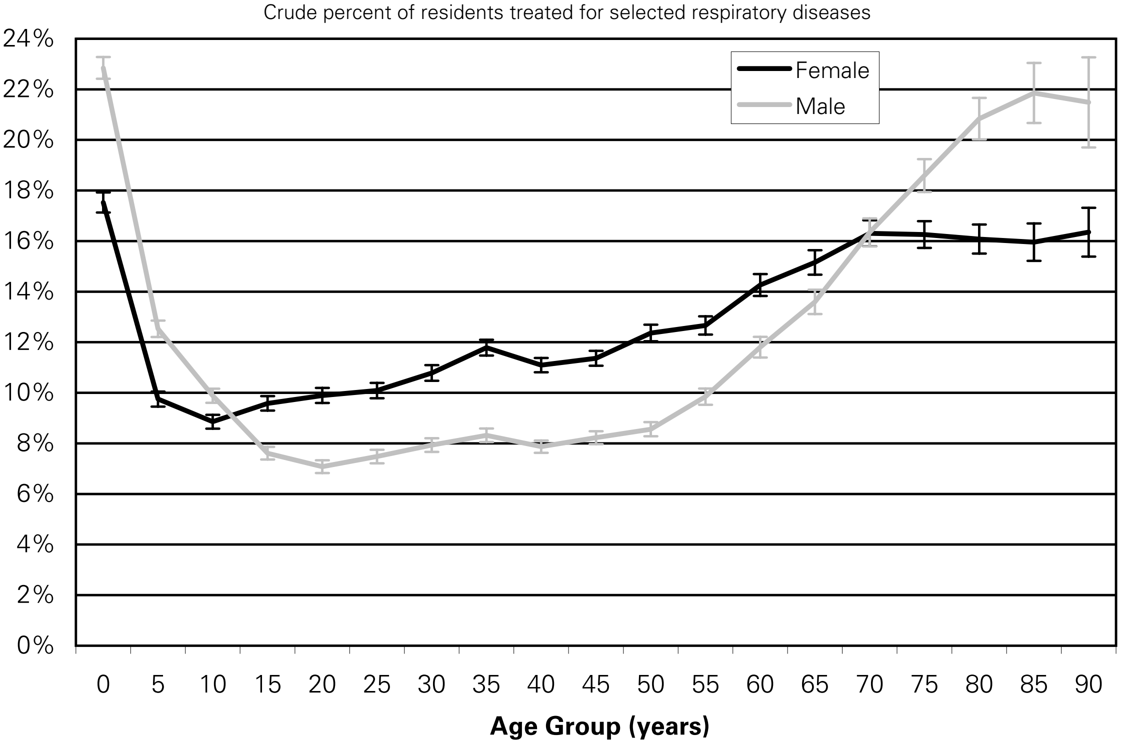
Female: Urban: Significant (p<.001) Rural: Significant (p<.01)

Male: Urban: Significant (p<.001) Rural: Significant (p<.01)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.3.4: Total Respiratory Morbidity Treatment Prevalence by Age and Sex, 2003/04

Crude percent of residents treated for selected respiratory diseases



Source: Manitoba Centre for Health Policy, 2005

Key findings for total respiratory morbidity treatment prevalence:

Age-adjusted values:

- Treatment prevalence for respiratory morbidity is high: more than one in 10 males and females are affected.
- Overall, the treatment prevalence is similar in females and males (11.9% and 11.2%, not significant) in Manitoba, though in some RHAs, female rates are significantly higher than male rates. Rates for Winnipeg residents appear higher than the Manitoba averages, but the differences did not quite reach statistical significance.
- In urban areas, treatment prevalence in both males and females is substantially higher among residents of lower income areas. A similar but weaker trend was seen among rural residents.

Age-specific crude rates by sex:

- The treatment prevalence of respiratory morbidity is high among the very young and the elderly, and relatively stable across the adult age range. These age-related differences are larger among males than females.

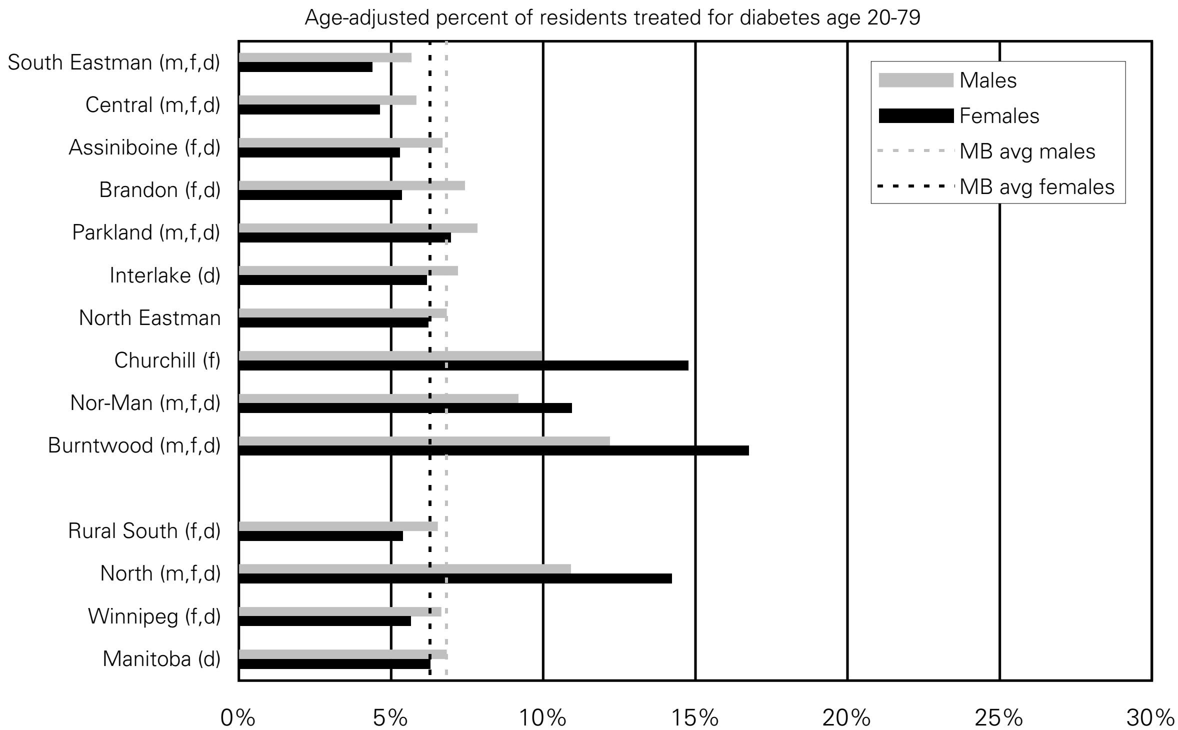
Comparisons with other findings:

- The results are consistent with those in the RHA Indicators Atlas (Martens et al., 2003), which showed that the treatment prevalence was about 12.5% at the end of the 1990s, having dropped from about 14% in the mid 1990s.

3.4 Diabetes Treatment Prevalence

Definition: The percentage of residents aged 20 to 79 diagnosed with diabetes in at least two physician visits or one hospitalization (ICD-9-CM code 250) in the three-year period 2001/02 to 2003/04. The values reflect Type I and Type II diabetes, as physician claims data do not allow separate identification (gestational diabetes cases could also be included if coded as 250). It is expressed as a percentage because each resident is defined either as having been treated for diabetes, or not, in that period. Values are age-adjusted to reflect the 20- to 79-year old population of Manitoba (males and females combined).

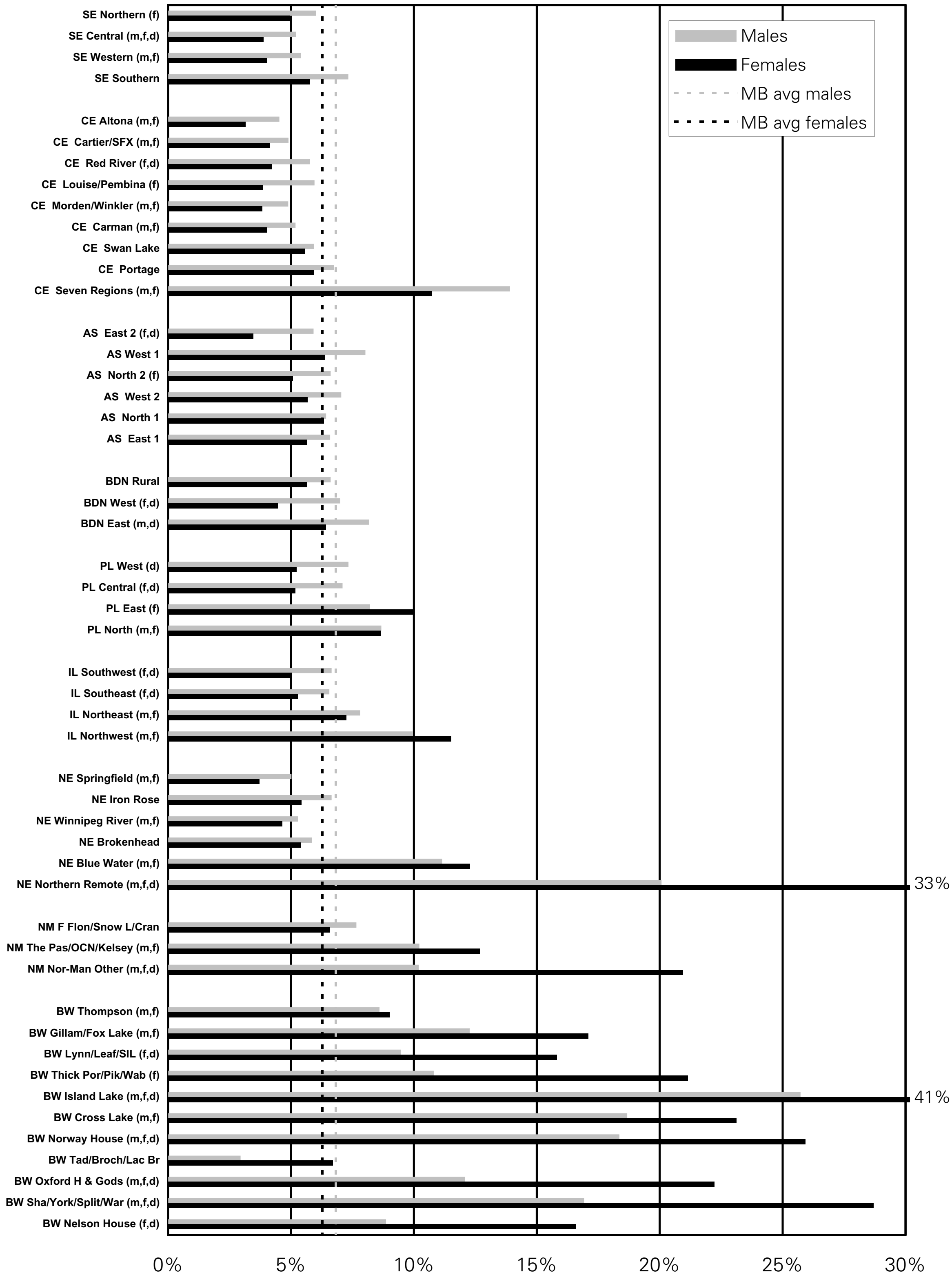
Figure 3.4.1: Diabetes Treatment Prevalence by RHA, 2001/02 – 2003/04



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers Source: Manitoba Centre for Health Policy, 2005

Figure 3.4.2: Diabetes Treatment Prevalence by District, 2001/02 – 2003/04

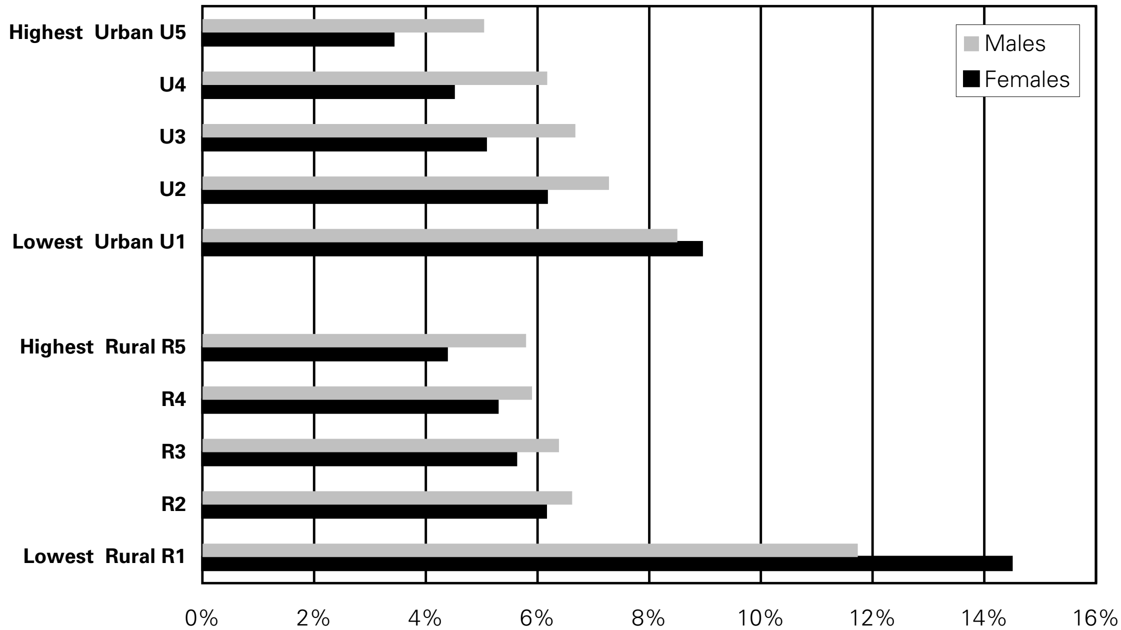
Age-adjusted percent of residents treated for diabetes 20-79



Source: Manitoba Centre for Health Policy, 2005

Figure 3.4.3: Diabetes Treatment Prevalence by Income Quintile, 2001/02 – 2003/04

Age-adjusted percent of residents treated for diabetes age 20-79



Linear Trend Test Results

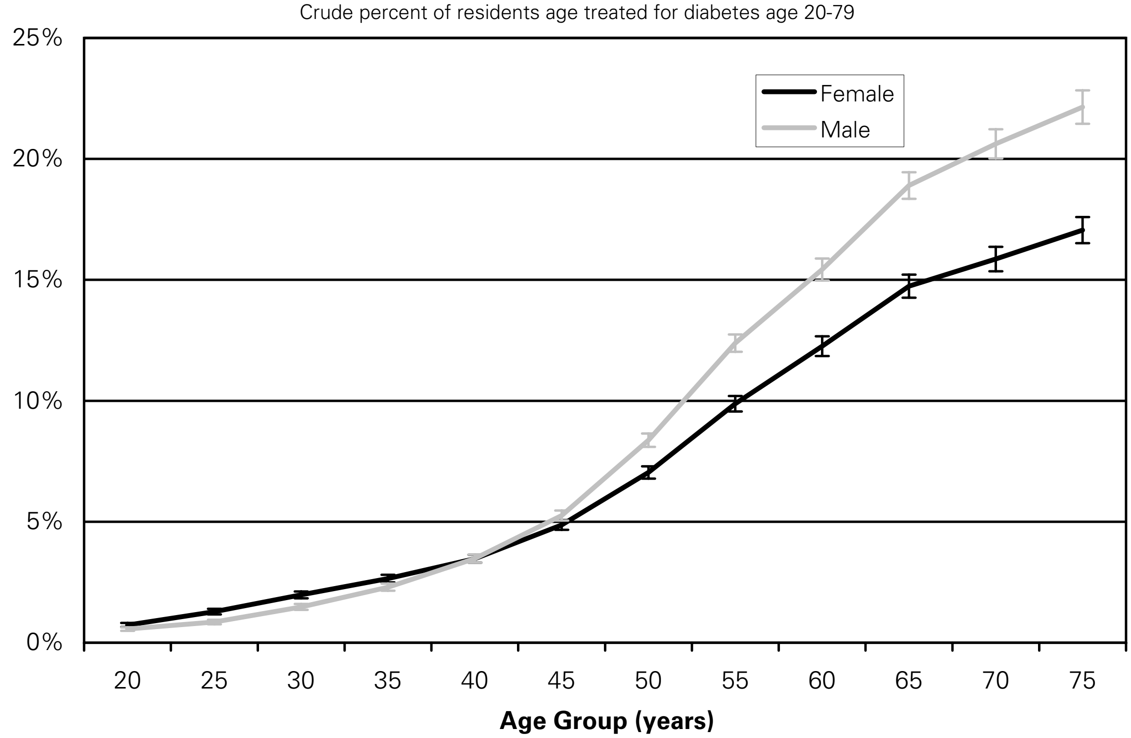
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.4.4: Diabetes Treatment Prevalence by Age and Sex, 2001/02 – 2003/04

Crude percent of residents age treated for diabetes age 20-79



Source: Manitoba Centre for Health Policy, 2005

Key findings for diabetes treatment prevalence:

Age-adjusted values:

- For Manitoba overall, the treatment prevalence of diabetes is higher among males than females, though the difference is modest (6.8% versus 6.3%, $p<0.001$).
- In Burntwood and Nor-Man RHAs, the treatment prevalence is higher for females than males, likely due to the higher Aboriginal populations in those areas (see Green et al, 2003, noted below).
- There is a strong relationship between diabetes treatment prevalence and area-level income: in both urban and rural areas, values for both males and females are higher among residents of lower income areas.

Age-specific crude rates by sex:

- The treatment prevalence of diabetes is very low among young adults, but rises rapidly with age for both males and females. The difference between the sexes increases steadily with age beyond 40, with male rates higher than female rates.

Comparison with other findings:

- These results (6.8% for males, 6.3% for females) are slightly higher than those in the RHA Indicators Atlas (Martens et al., 2003), which reported a treatment prevalence of about 6%, and are about the same as those published by Blanchard et al., 1996.
- The results are also similar to those in MCHP's recent report on the Health of Registered First Nations Residents in Manitoba (Martens et al., 2002).
- Green et al. reported that among Manitoba First Nations residents, the treatment prevalence of diabetes is higher for women than men (Green et al., 2003).
- The values are slightly higher than Canadian averages of 4.9% for females and 5.4% for males (Canadian Institute for Health Information, 2004), consistent with the higher proportion of Aboriginal residents in Manitoba.
- Results for residents age 65+ (see figure 3.4.4) appear to be slightly higher than those reported from the Canadian Study on Aging (Rockwood et al., 1998) (12% among community dwellers; 17.5% among the institutionalized).
- This definition has been shown to provide good population-level prevalence values. Another MCHP report (Lix et al., In press) is focussing on validating definitions of chronic diseases using multiple data sources, and discusses advantages and disadvantages of different definitions of diabetes, some including pharmaceutical use data.

3.5 Ischemic Heart Disease (IHD) Treatment Prevalence

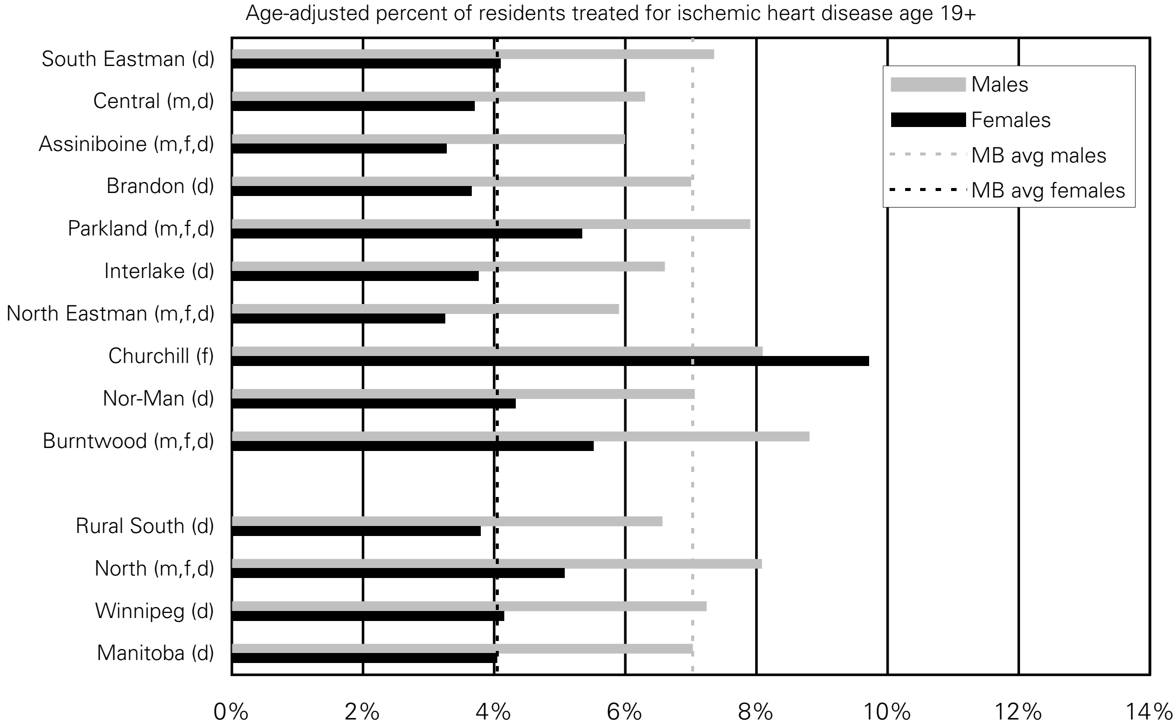
Definition: This is the treatment prevalence of IHD (restriction of blood flow to coronary arteries) in residents age 19+ defined by a combination of data in physician visits, hospitalizations, and prescription drugs, from 2002/03 to 2003/04 fiscal years:

- One or more hospitalizations with a diagnosis code of 410, 411, 412, 413 or 414 in any diagnosis field, OR,
- Two or more physician claims with a diagnosis code of 410, 411, 412, 413 or 414, OR,
- One physician claim with a diagnosis code of 410, 411, 412, 413 or 414 AND two or more prescriptions for IHD drugs (listing in Glossary).

This definition was taken from another MCHP report (Lix et al., In press) because it provides an accurate estimate of population prevalence. Values are age-adjusted to reflect the 19+ population of Manitoba (males and females combined).

Figure 3.5.1: Ischemic Heart Disease Treatment Prevalence by RHA, 2002/03 – 2003/04

Age-adjusted percent of residents treated for ischemic heart disease age 19+

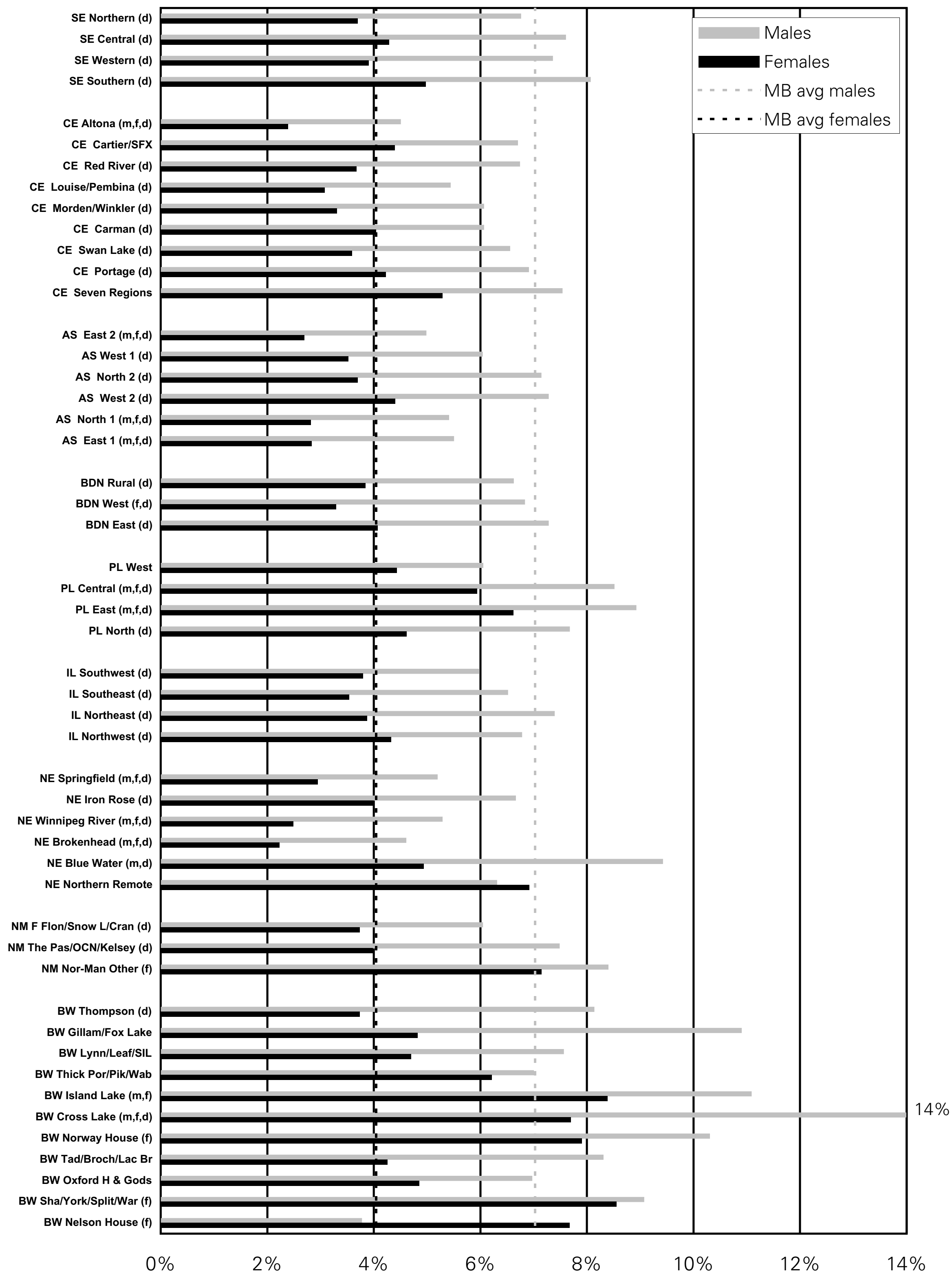


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.5.2: Ischemic Heart Disease Treatment Prevalence by District, 2002/03 – 2003/04

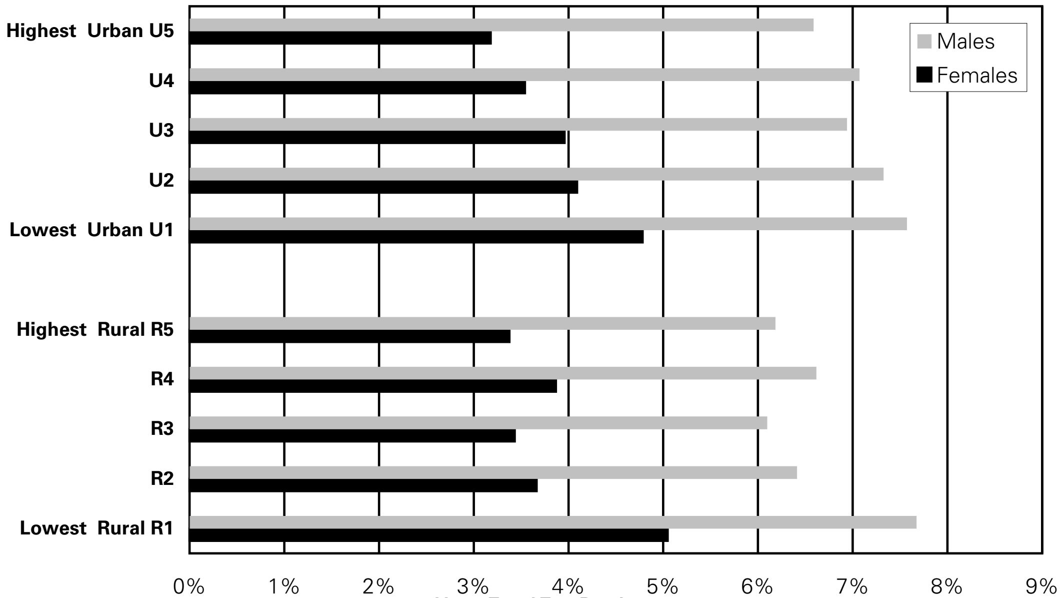
Age-adjusted percent of residents treated for ischemic heart disease age 19+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.5.3: Ischemic Heart Disease Treatment Prevalence by Income Quintile, 2002/03 – 2003/04

Age-adjusted percent of residents treated for ischemic heart disease age 19+



Linear Trend Test Results

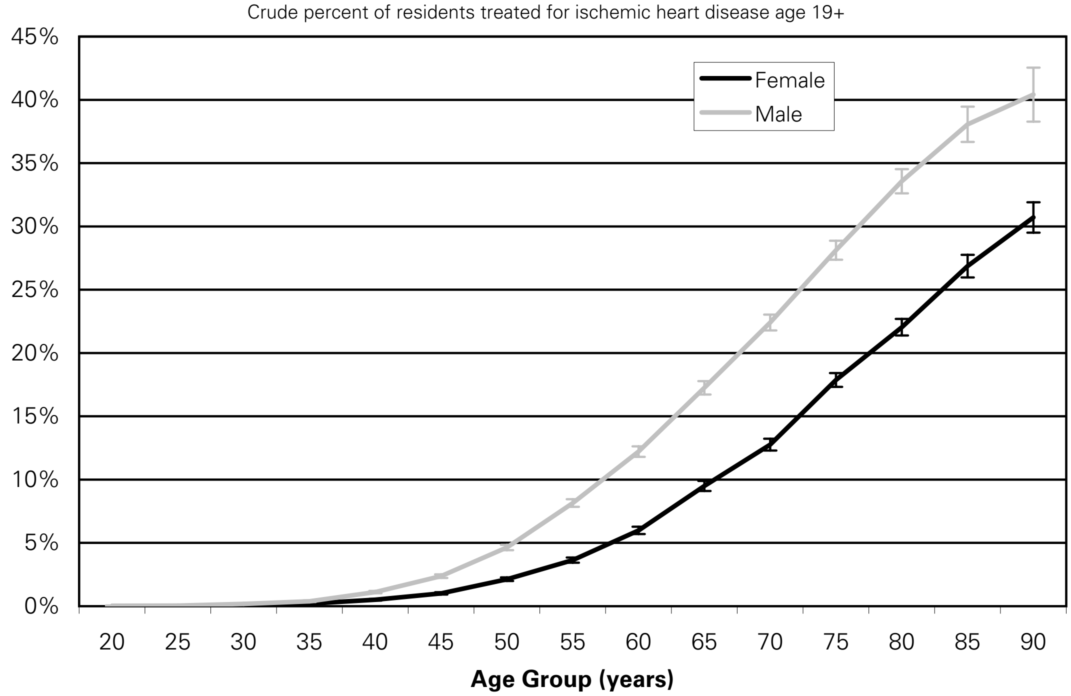
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.5.4: Ischemic Heart Disease Treatment Prevalence by Age and Sex, 2002/03 – 2003/04

Crude percent of residents treated for ischemic heart disease age 19+



Source: Manitoba Centre for Health Policy, 2005

Key findings for ischemic heart disease treatment prevalence:

Age-adjusted values:

- Overall, and for almost all RHAs, the treatment prevalence of IHD is much higher for males than females (7.0% versus 4.0%, p<0.001).
- There is considerable variation among and within RHAs.
- There is a strong relationship between IHD treatment prevalence and area-level income: for urban and rural males and females, values are higher among residents of lower income areas.

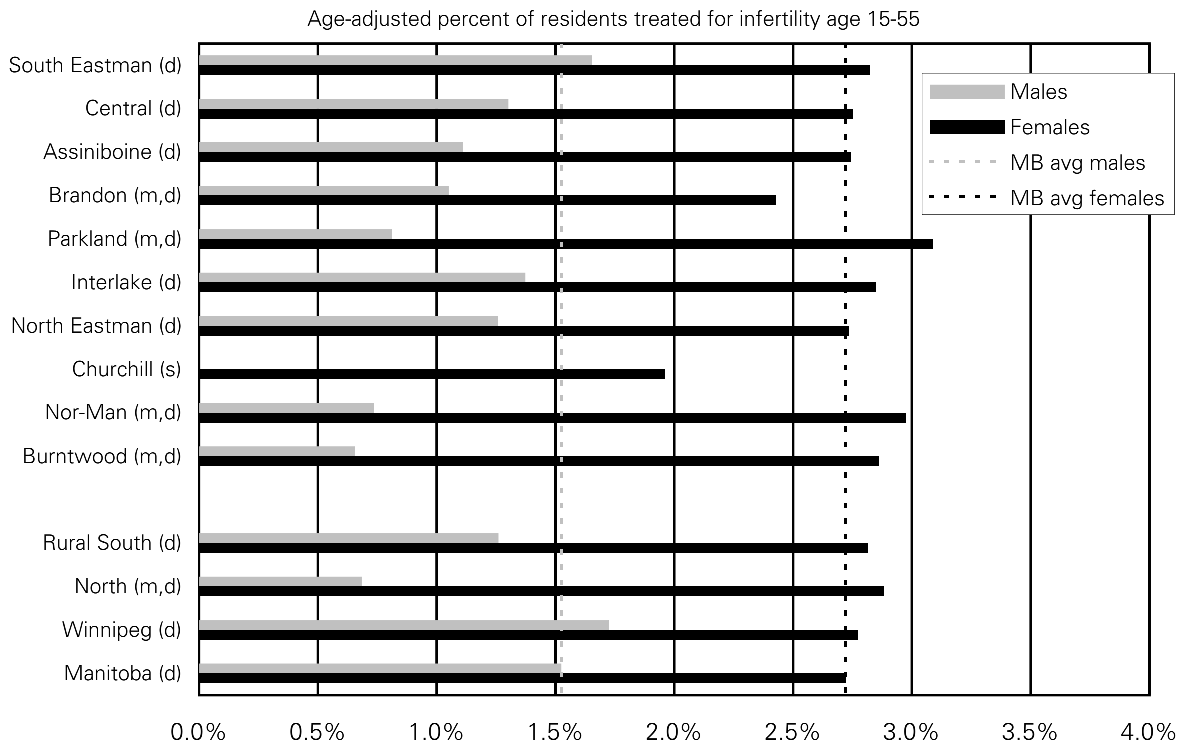
Crude values by age & sex:

- The treatment prevalence of IHD is low among young to middle-age adults, then rises steadily to its highest levels among the elderly. For almost all age groups, treatment prevalence is higher for males than females (see also Chapter 10, Section 2).

3.6 Infertility Treatment Prevalence

Definition: The percentage of residents age 15 to 55 receiving at least one diagnosis of infertility (ICD-9-CM code 606 for males, 628 for females) in physician visits over the five-year period 1999/2000 to 2003/04. It is expressed as a percentage because each resident is defined either as having been treated for infertility, or not, in that period. The coding of infertility in administrative data is known to be incomplete, so not all cases are identified by this indicator. Values are age-adjusted to reflect the 15- to 55-year old population of Manitoba (males and females combined).

Figure 3.6.1: Infertility Treatment Prevalence by RHA, 1999/2000 – 2003/04

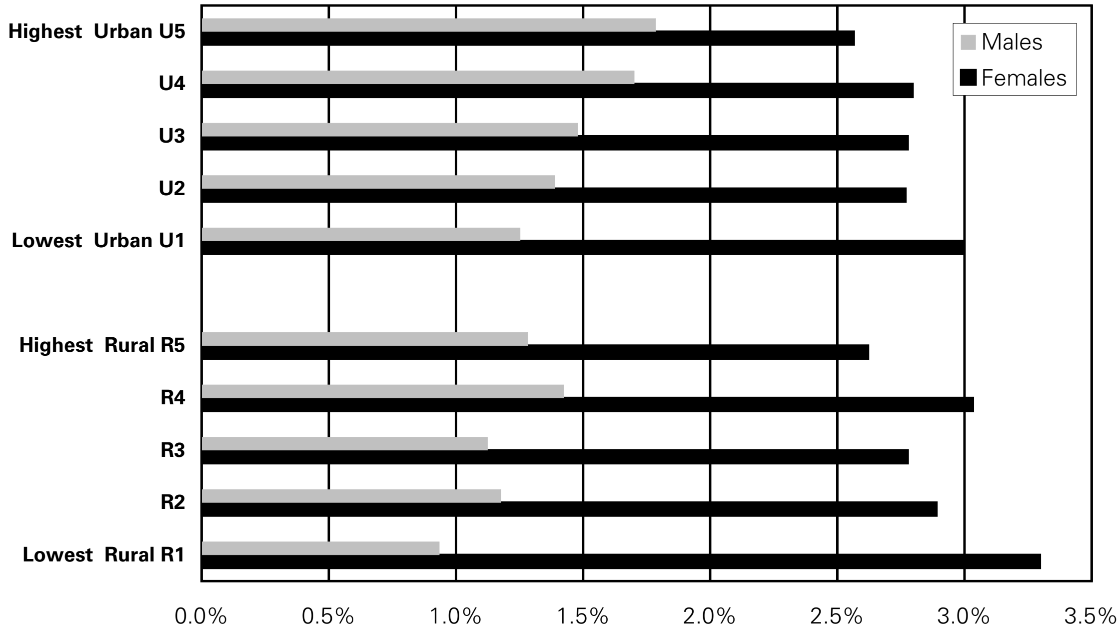


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.6.2: Infertility Treatment Prevalence by Income Quintile, 1999/2000 – 2003/04

Age-adjusted percent of residents treated for infertility age 15-55



Linear Trend Test Results

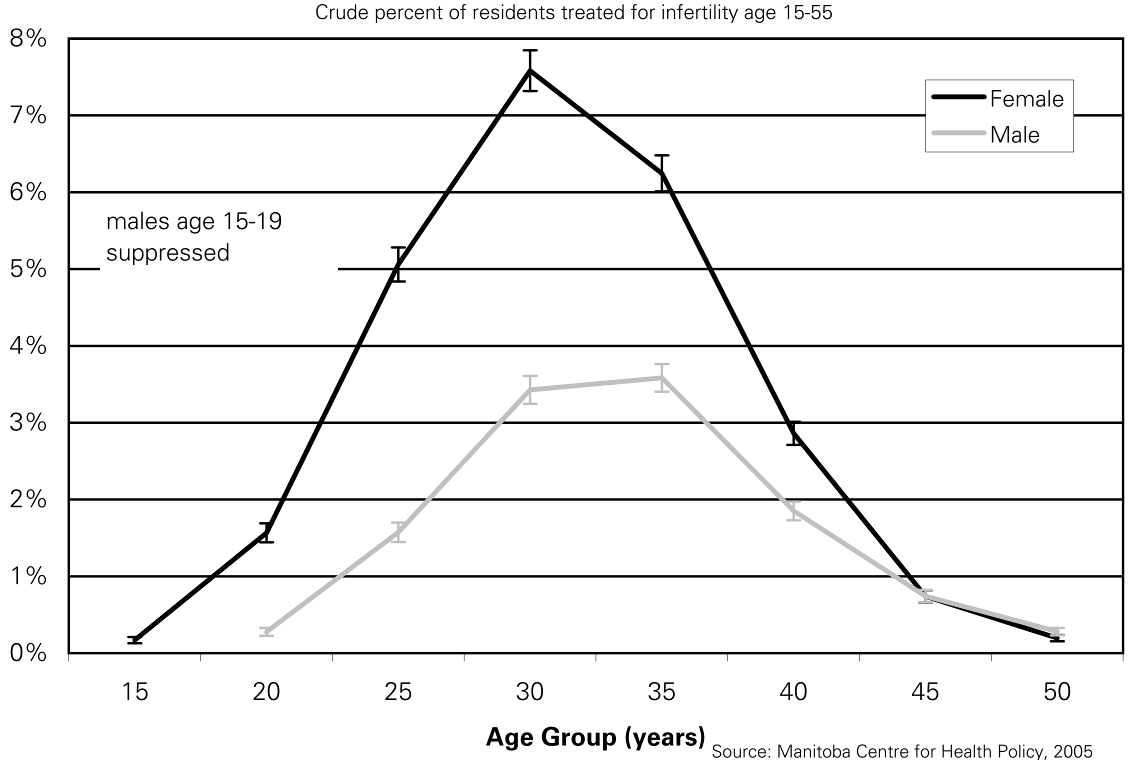
Female: Urban: Not Significant Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.6.3: Infertility Treatment Prevalence by Age and Sex, 1999/2000 – 2003/04

Crude percent of residents treated for infertility age 15-55



Source: Manitoba Centre for Health Policy, 2005

Key findings for infertility treatment prevalence:

Age-adjusted values:

- Overall, infertility treatment prevalence is higher among females than males (2.7% versus 1.5%, p<0.001).
- District level results are not shown because the treatment prevalence is relatively low, due in part to the under-reporting noted above.
- Among males, infertility treatment is significantly more prevalent among those from higher income areas (both urban and rural). For females, the trend was in the opposite direction, but did not quite reach statistical significance (p=.03, just above the cutoff used of p<.01).

Age-specific crude rates by sex:

- In both males and females, infertility treatment prevalence is highest among 25- to 40-year olds, and lower for younger and older age groups (as expected). Values for females are higher than males for most age groups.

Comparisons to other findings:

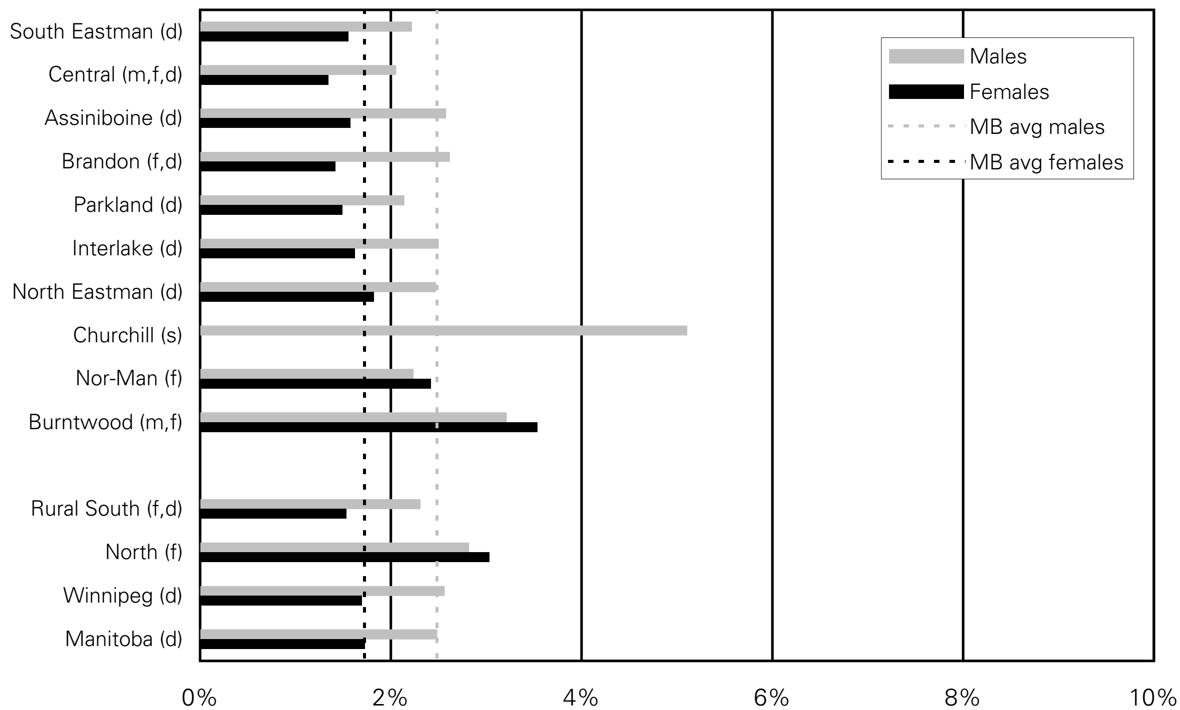
- Survey results from Canada and the U.S. prove that infertility treatment is substantially under-reported in claims data: the prevalence of infertility in surveys is near 8%, as compared with the approximately 2.2% (average for males and females) shown in this report (Collins et al., 1997).

3.7 Renal Failure Treatment Prevalence

Definition: The percentage of residents aged 20 or older diagnosed with renal failure (ICD-9-CM code 584, 585, or 586) in a physician visit or hospitalization in 1999/2000 to 2003/04. Renal failure is often a complication of diabetes, but can have other causes as well. It is expressed as a percentage because each resident is defined either as having been treated for renal failure, or not, in that period. Values are age-adjusted to reflect the 20+ population of Manitoba (males and females combined).

Figure 3.7.1: Renal Failure Treatment Prevalence by RHA, 1999/2000 – 2003/04

Age-adjusted percent of residents treated for renal failure age 20+



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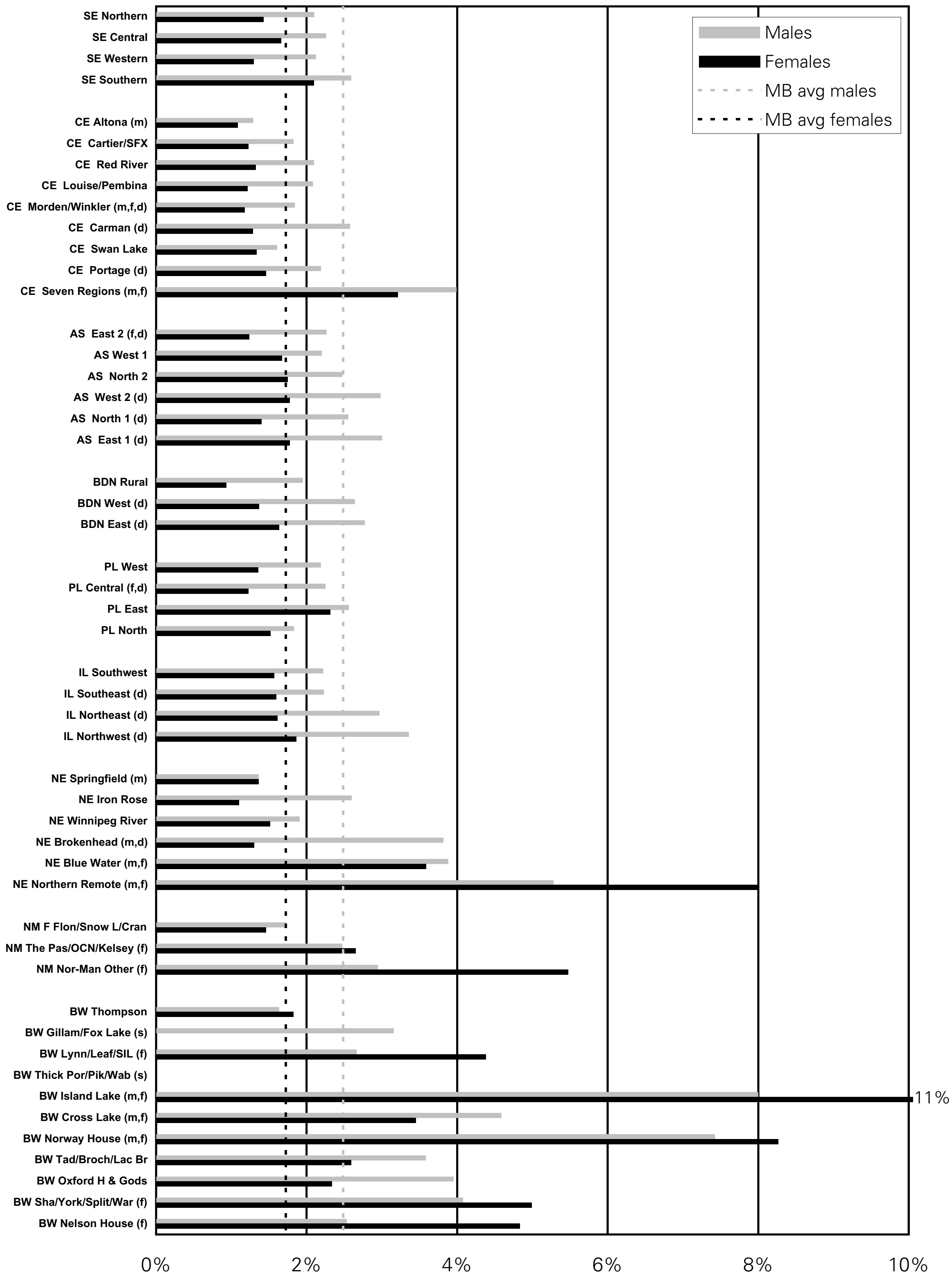
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.7.2: Renal Failure Treatment Prevalence by District, 1999/2000 – 2003/04

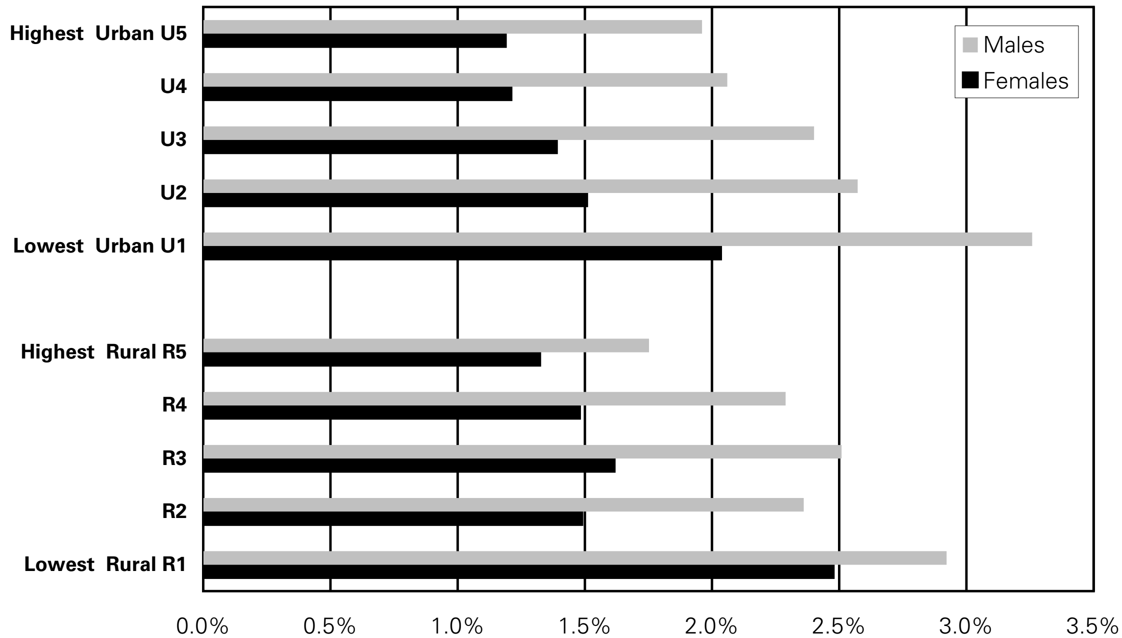
Age-adjusted percent of residents treated for renal failure age 20+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.7.3: Renal Failure Treatment Prevalence by Income Quintile, 1999/2000 – 2003/04

Age-adjusted percent of residents treated for renal failure age 20+



Linear Trend Test Results

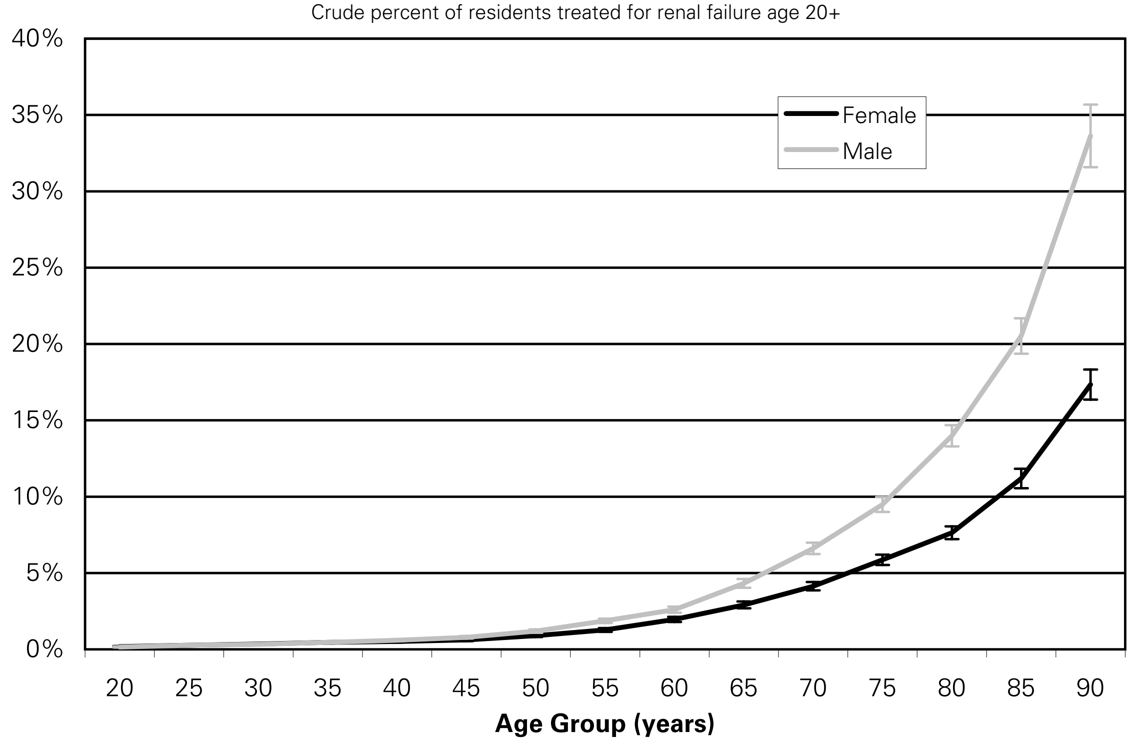
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.7.4: Renal Failure Treatment Prevalence by Age and Sex, 1999/2000 – 2003/04

Crude percent of residents treated for renal failure age 20+



Source: Manitoba Centre for Health Policy, 2005

Key findings for renal failure:

Age-adjusted values:

- Overall, renal failure is more common among males than females (2.5% versus 1.7%, $p<0.001$).
- This difference is reversed in Nor-Man and Burntwood RHAs, where female rates are higher than those for males, as was observed for diabetes treatment prevalence (many cases of renal failure are complications of diabetes).
- There is a strong relationship between renal failure treatment prevalence and area-level income: in both urban and rural areas, values for both males and females are higher among residents of lower income areas.

Age-specific crude rates by sex:

- Renal failure is rare among young residents and more prevalent among older residents. Values are higher for males than females in most age groups, and the difference between sexes increases with age.

Comparison to other findings:

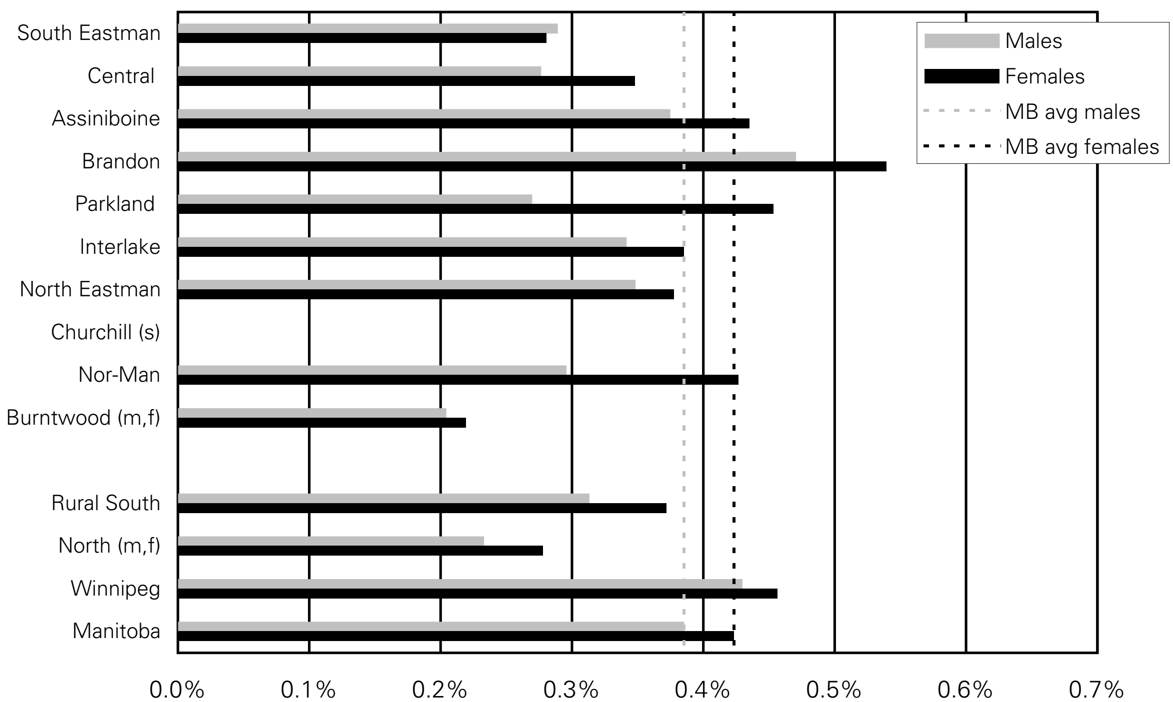
- Other studies have shown that rates of renal failure are higher for Registered First Nations residents, though the data were not sex-specific (Dyck and Tan, 1994).
- An international study reported no sex bias in rates of referral for renal failure treatment among Canadian, U.S. and U.K. family physicians (Wilson et al., 2001).

3.8 Inflammatory Bowel Disease (IBD) Treatment Prevalence (Crohn's and Colitis)

Definition: The percentage of residents receiving at least five diagnoses of Crohn's disease or Colitis (ICD-9-CM codes 555 or 556) in 10 years of hospital or medical claims (1994/95 to 2003/04), for persons resident in Manitoba for at least two years. Persons resident in Manitoba for less than two years were identified as having IBD if they had three or more diagnoses. (See glossary for complete explanation of definition.) It is expressed as a percentage because each resident is defined either as having been treated for IBD, or not, in that period. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 3.8.1: Inflammatory Bowel Disease Treatment Prevalence by RHA, 2003/04

Age-adjusted percent of residents treated for inflammatory bowel disease (Crohn's or Colitis)

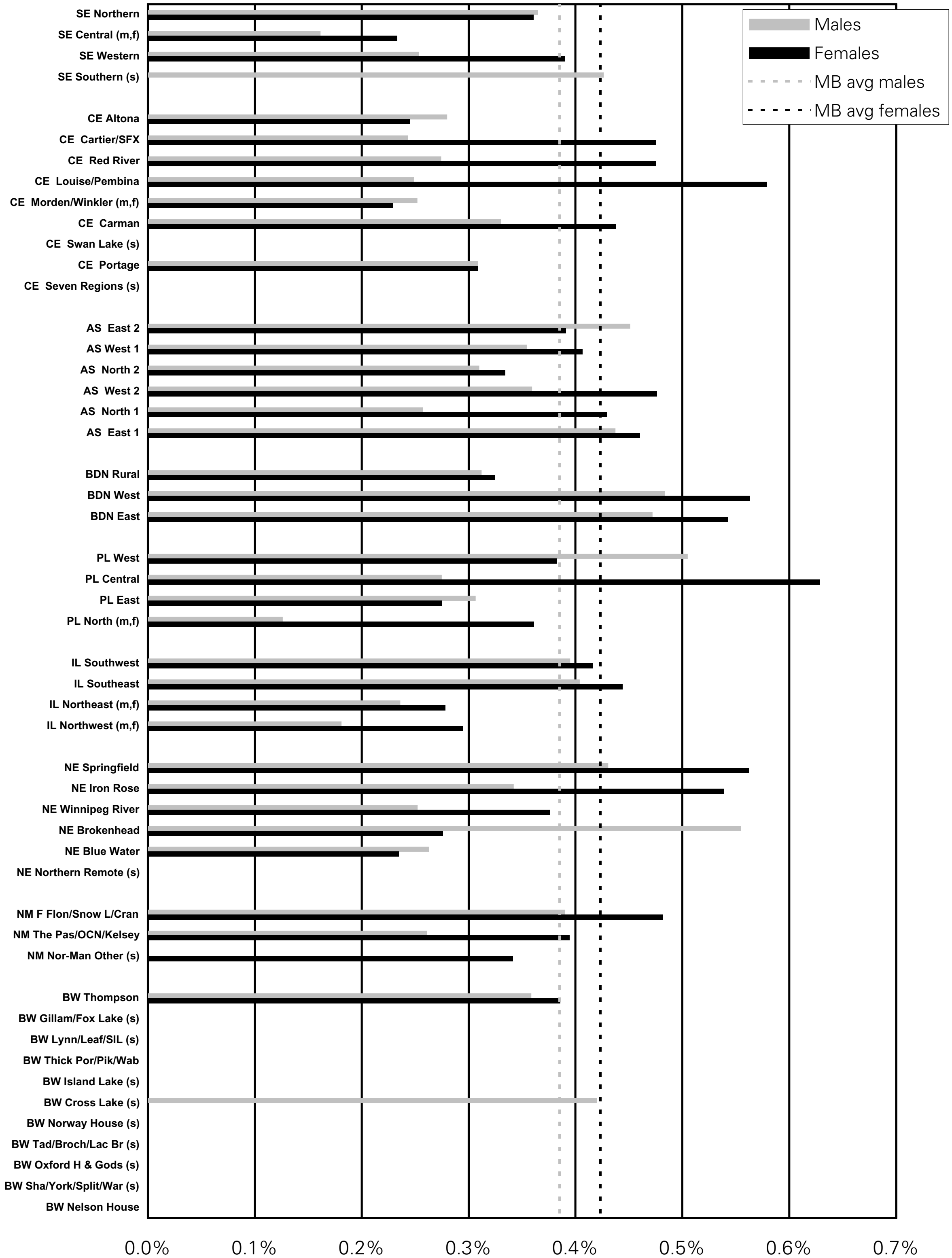


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.8.2: Inflammatory Bowel Disease Treatment Prevalence by District, 2003/04

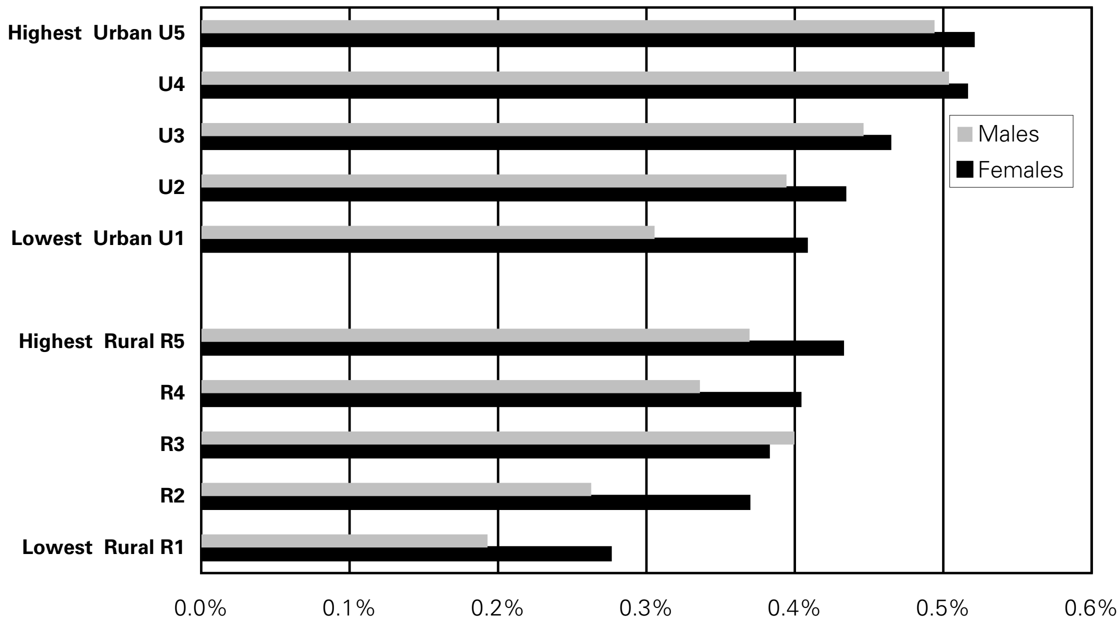
Age-adjusted percent of residents treated for inflammatory bowel disease (Crohn's or Colitis)



Source: Manitoba Centre for Health Policy, 2005

Figure 3.8.3: Inflammatory Bowel Disease Treatment Prevalence by Income Quintile, 2003/04

Age-adjusted percent of residents treated for inflammatory bowel disease (Crohn's or Colitis)



Linear Trend Test Results

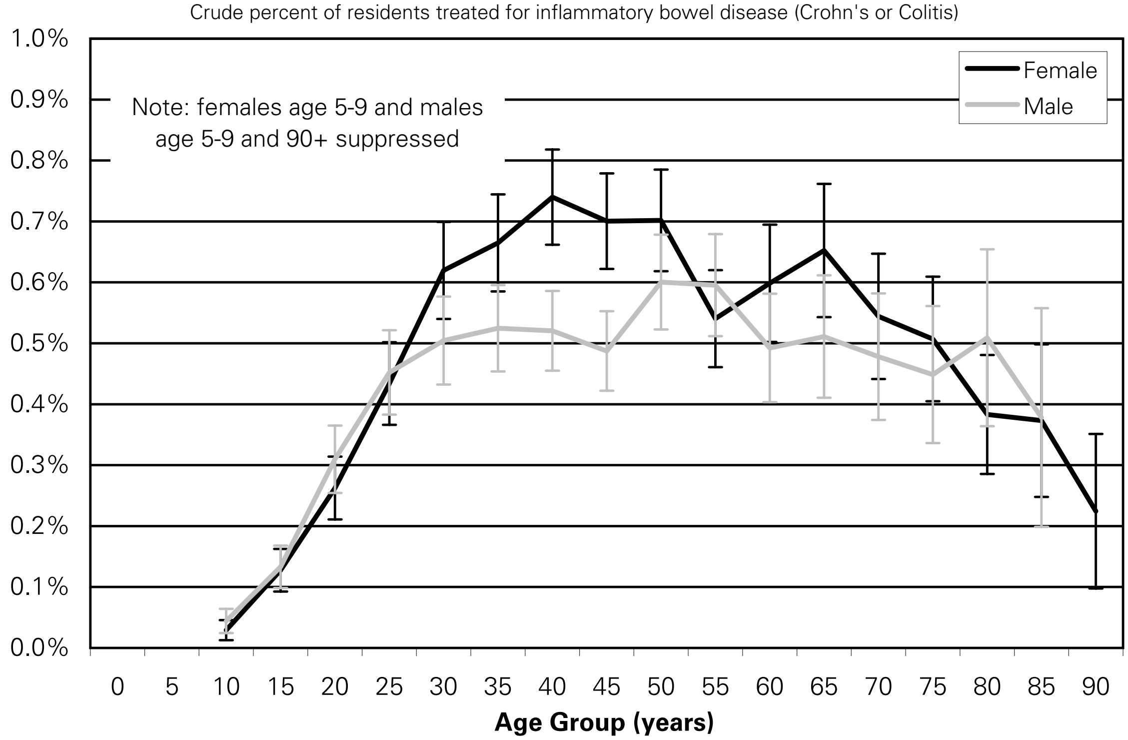
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.8.4: Inflammatory Bowel Disease Treatment Prevalence by Age and Sex, 2003/04

Crude percent of residents treated for inflammatory bowel disease (Crohn's or Colitis)



Source: Manitoba Centre for Health Policy, 2005

Key findings for inflammatory bowel disease treatment prevalence:

Age-adjusted values:

- The treatment prevalence of IBD is much lower than other diseases shown in this report (0.4% of the population are affected).
- Overall, and in all RHAs, IBD treatment prevalence is similar in males and females (0.39% and 0.41%, not significant).
- There is a strong relationship between IBD treatment prevalence and area-level income, but it is opposite that of most other diseases in this report: IBD treatment prevalence is higher among those living in higher income areas.

Age-specific crude rates by sex:

- In both sexes, treatment prevalence rises sharply in young adulthood, is relatively constant through the adult age range, and is lower among the elderly.

Comparison to other findings:

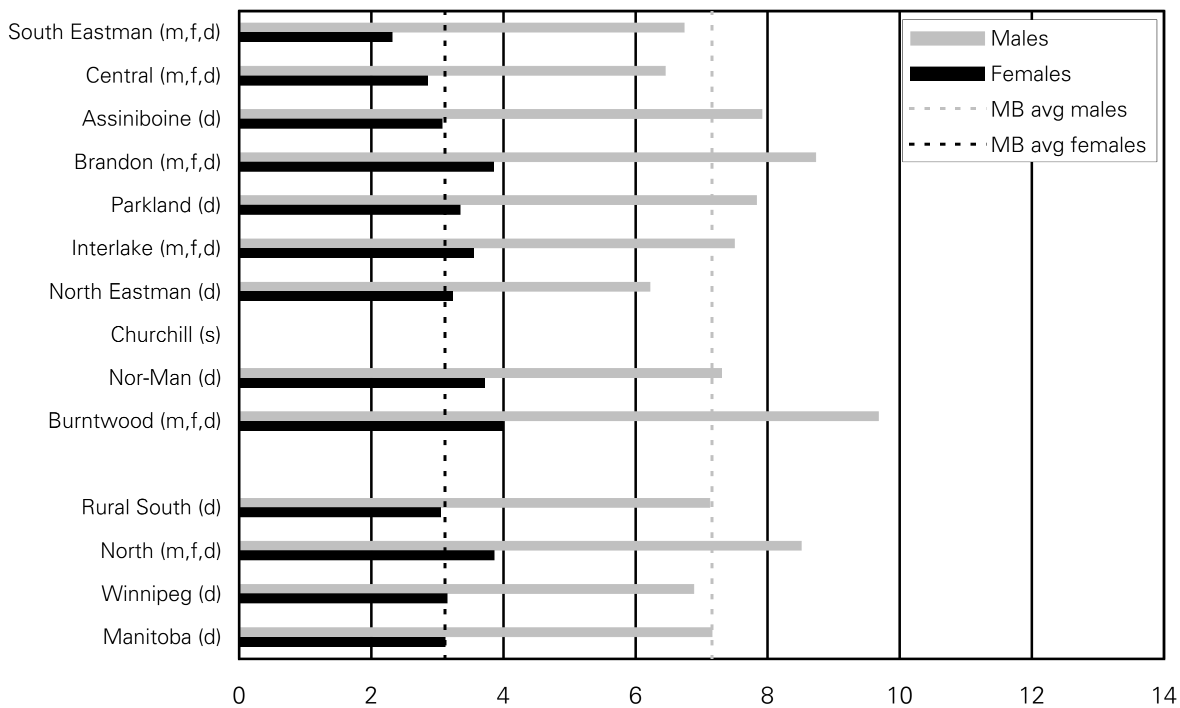
- The definition used here was based on an extensive validation study by Bernstein et al. This definition provides the best characteristics for estimating population prevalence. They reported a rate of 0.37% for the period ending in 1994, which is close to this report's rate of 0.40% (males and females combined) (Bernstein et al., 1999).

3.9 Acute Myocardial Infarction (AMI) Incidence Rates (Hospitalization or Death)

Definition: This is the annual rate of hospitalization or death due to AMI (ICD-9-CM code 410) in residents age 40+, over the five-year period 1999/2000 to 2003/04. Deaths were taken from Vital Statistics files (ICD-10 codes for deaths were converted to ICD-9-CM); hospitalized patients were counted if they stayed three or more days, using the validated definition that those hospitalized for fewer than three days were likely 'ruled out' rather than 'true' AMIs (Tu et al., 1999). Transfers between hospitals are tracked and counted as single episodes. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 3.9.1: Heart Attack (AMI) Rates by RHA, 1998/99 – 2002/03

Age-adjusted rate of death or hospitalization (3+ days) for AMI, per 1,000 residents age 40+

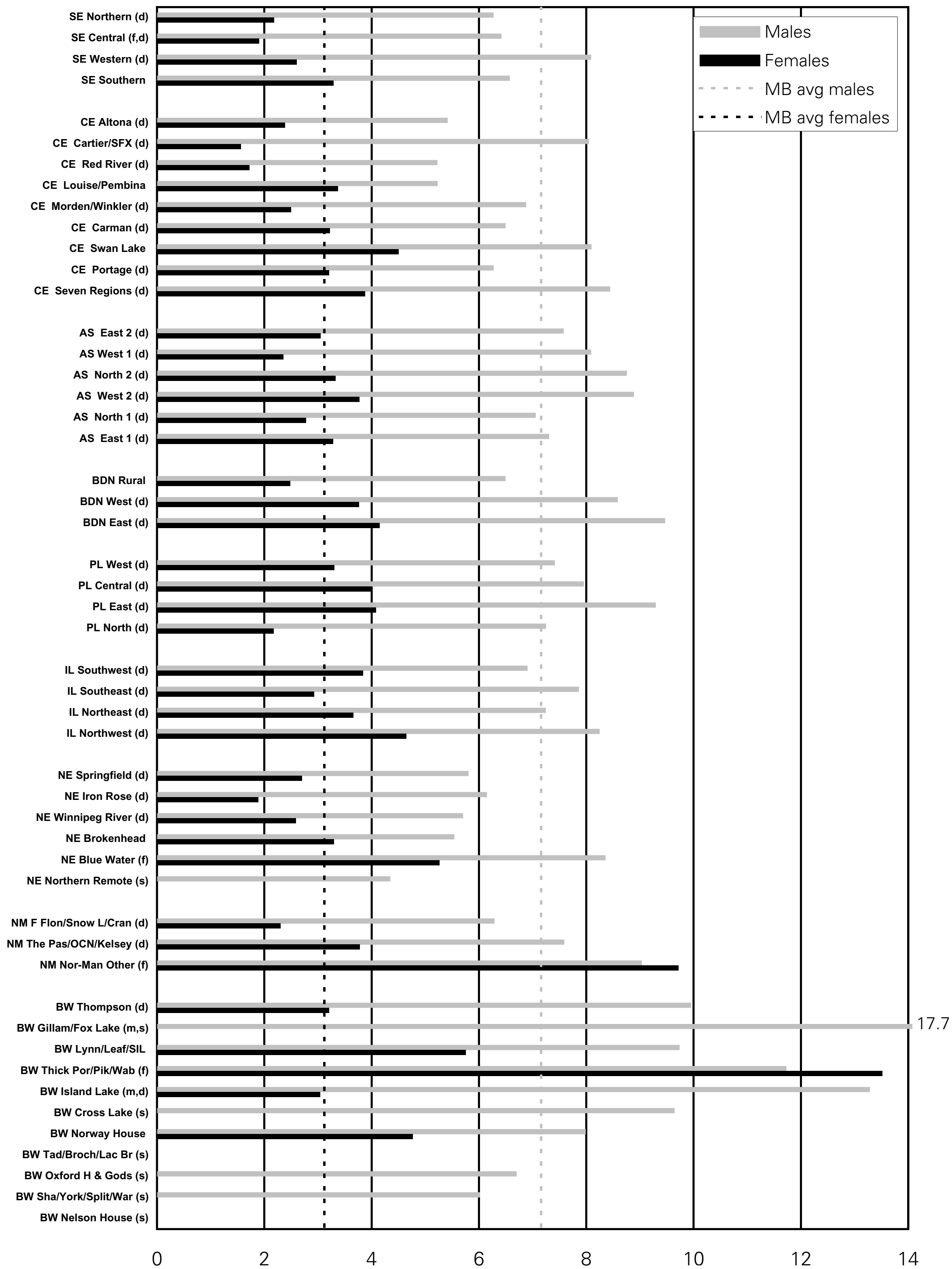


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.9.2: Heart Attack (AMI) Rates by District, 1998/99 – 2002/03

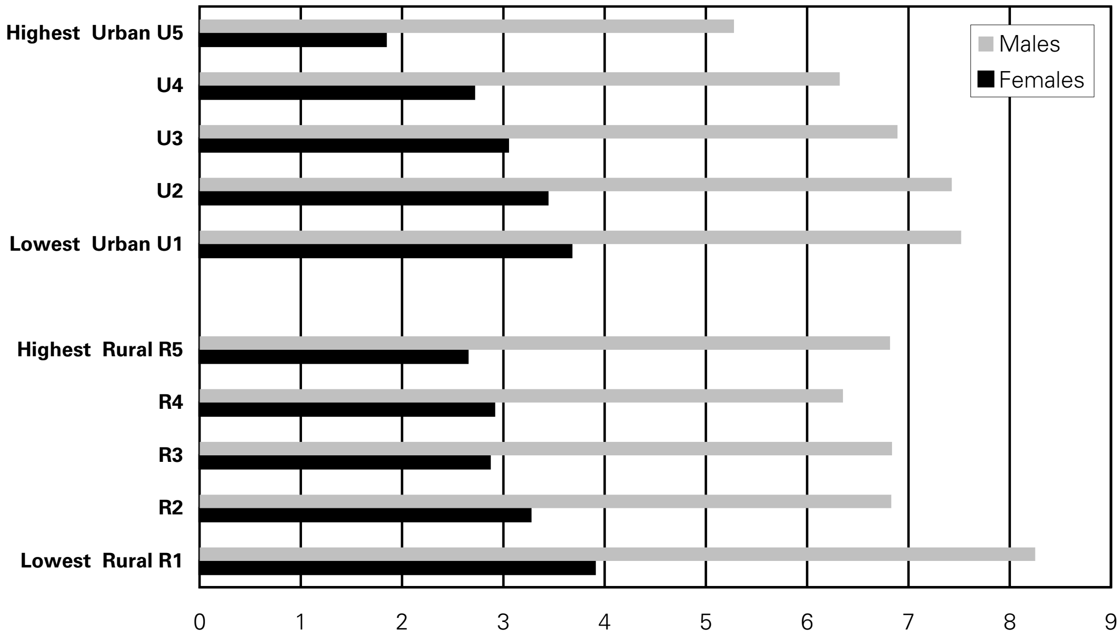
Age-adjusted rate of death or hospitalization (3+ days) for AMI, per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.9.3: Heart Attack (AMI) Rates by Income Quintile, 1998/99 – 2002/03

Age-adjusted rate of death or hospitalization (3+ days) for AMI, per 1,000 residents age 40+



Linear Trend Test Results

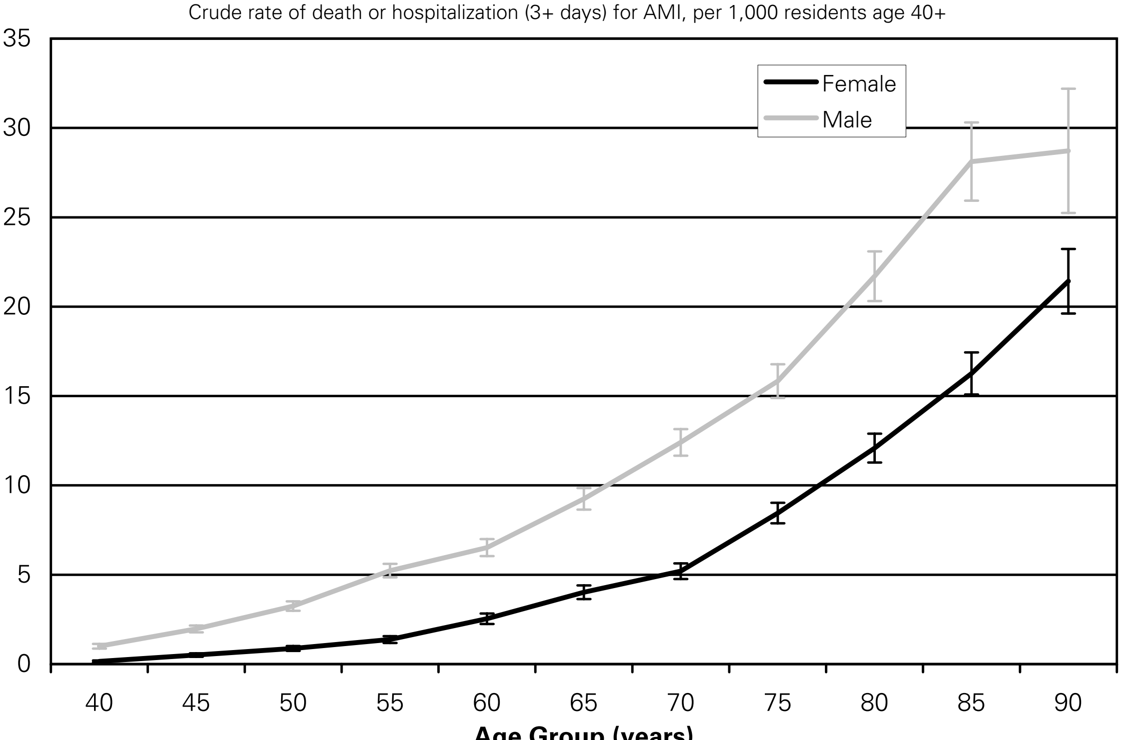
Female: Urban: Significant ($p<.001$) Rural: Significant ($p<.001$)

Male: Urban: Significant ($p<.001$) Rural: Significant ($p<.01$)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.9.4: Heart Attack (AMI) Rates by Age and Sex, 1998/1999 – 2002/03

Crude rate of death or hospitalization (3+ days) for AMI, per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for Acute Myocardial Infarction rates:

Age-adjusted rates:

- Overall, and for every RHA, the AMI rate is much higher among males than females: it is more than double, at 7.1 per 1,000 male residents per year, versus 3.1 per 1,000 females, $p<0.001$.
- There is a strong relationship between AMI rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- AMI rates are low among youngest age groups, then rise steadily to their highest levels among the elderly. For all age groups, AMI rates are substantially higher for males than females (see also Chapter 10).

Comparisons to other findings:

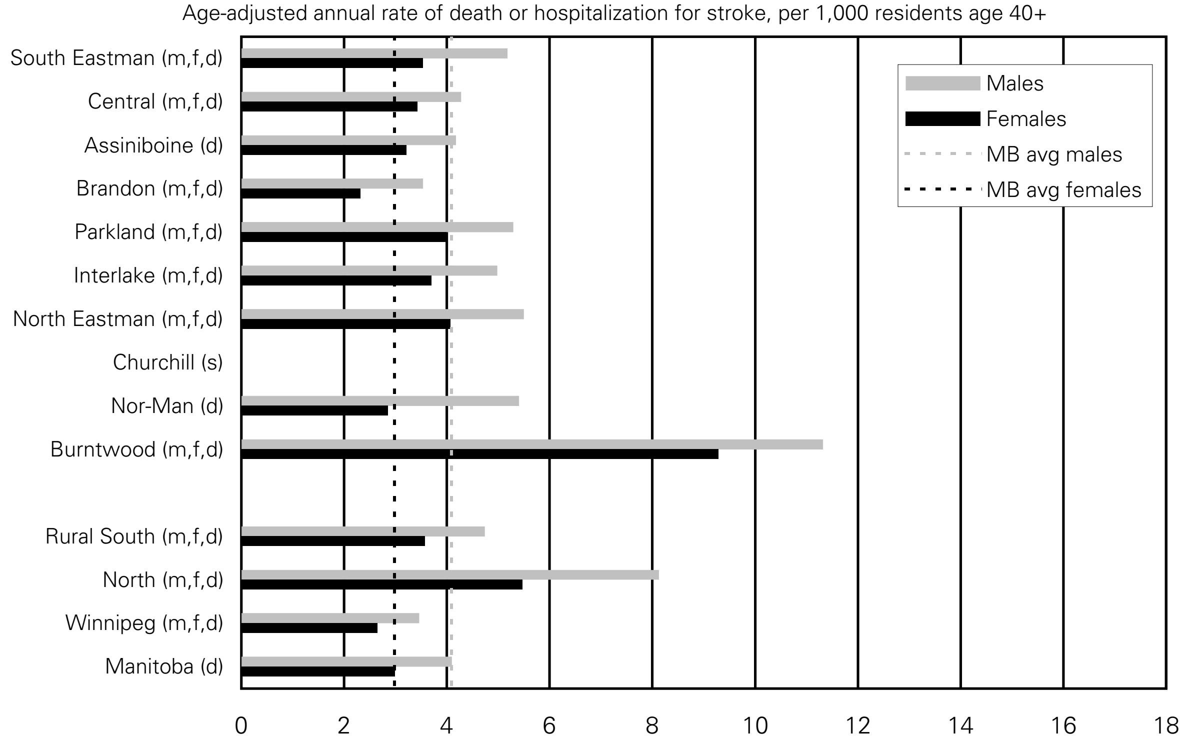
- These results are very close to those reported by the Heart & Stroke Foundation (1999). Overall rates were not published, but analysis of age-specific rates showed good agreement for all age groups.

3.10 Stroke Incidence Rate (Hospitalization or Death)

Definition: The annual rate of hospitalization or death due to stroke (ICD-9-CM codes 431, 434, or 436; ICD-10 codes for deaths were converted to ICD-9-CM), in the five-year period 1998/99 to 2002/03, per 1,000 residents age 40+. This indicator counts events, not people, so a single person can contribute more than one event if they are hospitalized for stroke more than once in the period 1998/99 to 2002/03. This definition likely captures most 'major' strokes (all those resulting in hospitalization or death), but underestimates the 'true' incidence rate because minor strokes could be treated without hospitalization. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 3.10.1: Stroke Incidence Rates by RHA, 1998/99 – 2002/03

Age-adjusted annual rate of death or hospitalization for stroke, per 1,000 residents age 40+

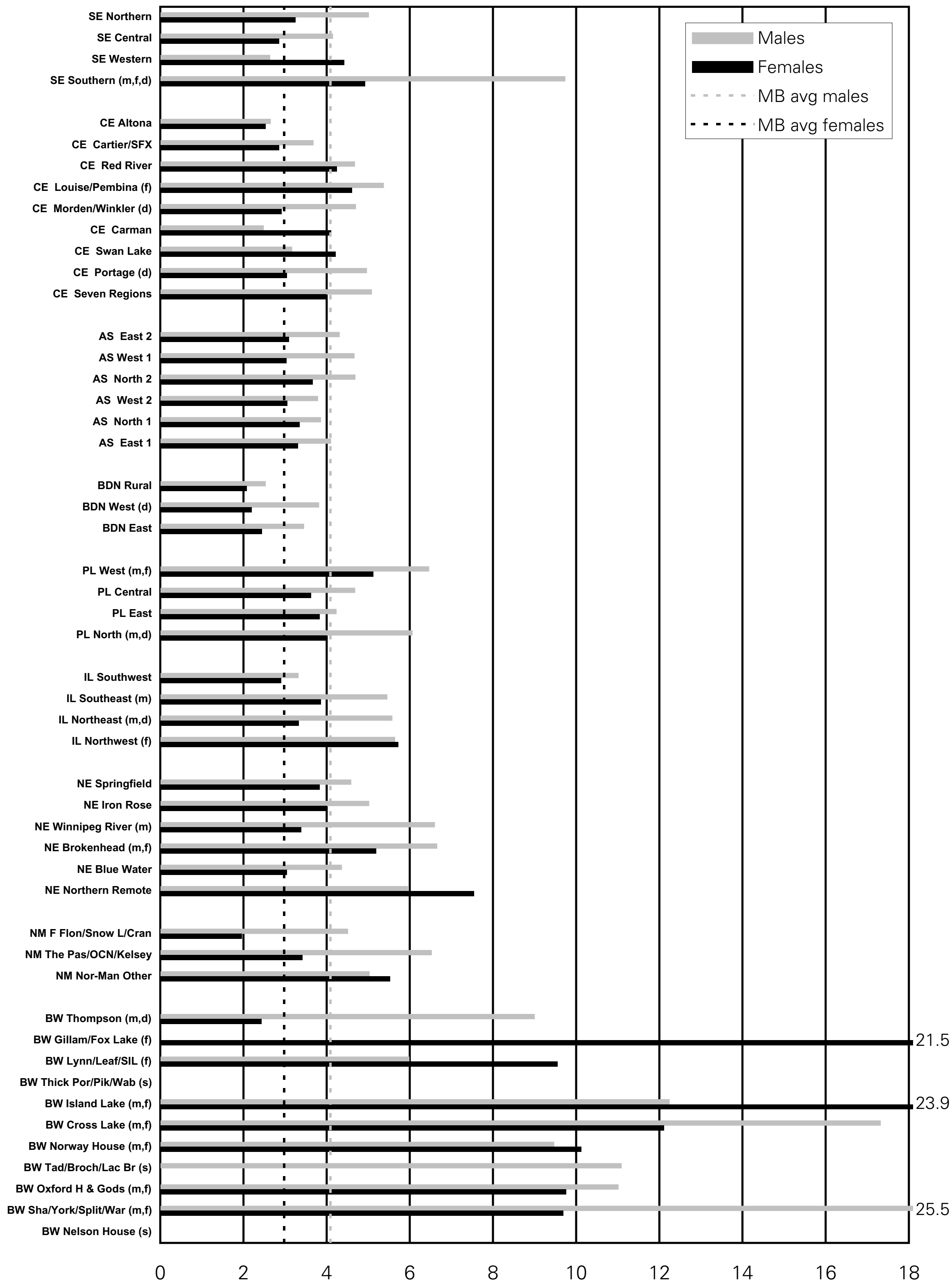


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.10.2: Stroke Incidence Rates by District, 1998/99 – 2002/03

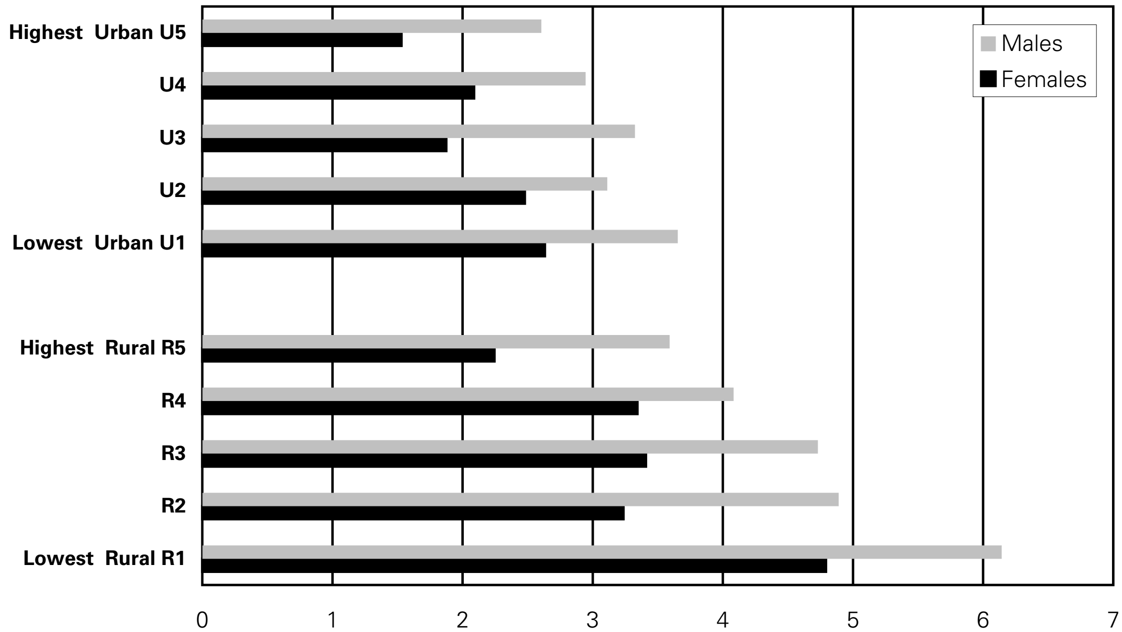
Age-adjusted annual rate of death or hospitalization for stroke, per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 3.10.3: Stroke Incidence Rates by Income Quintile, 1998/99 – 2002/03

Age-adjusted annual rate of death or hospitalization for stroke, per 1,000 residents age 40+



Linear Trend Test Results

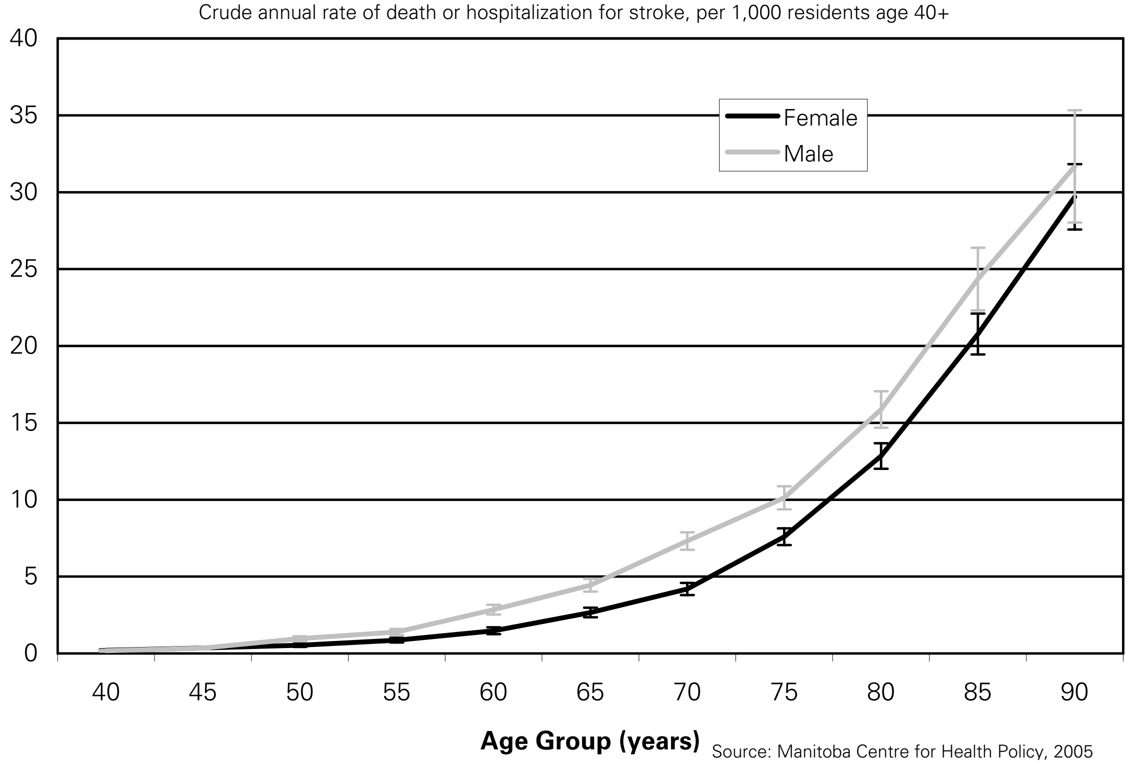
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.10.4: Stroke Incidence Rates by Age and Sex, 1998/99 – 2002/03

Crude annual rate of death or hospitalization for stroke, per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of stroke hospitalization or death:

Age-adjusted rates:

- Overall, stroke incidence (hospitalization or death) rates are substantially higher for males than females (4.1 versus 3.0 per 1,000 residents 40+ per year, $p<0.001$).
- There is a strong relationship between stroke incidence rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Age-specific crude rates by sex:

- Stroke hospitalization or death rates are very low for young adults, but increase exponentially with age. Age-specific rates for males are higher than for females in most age groups.

Comparisons to other findings:

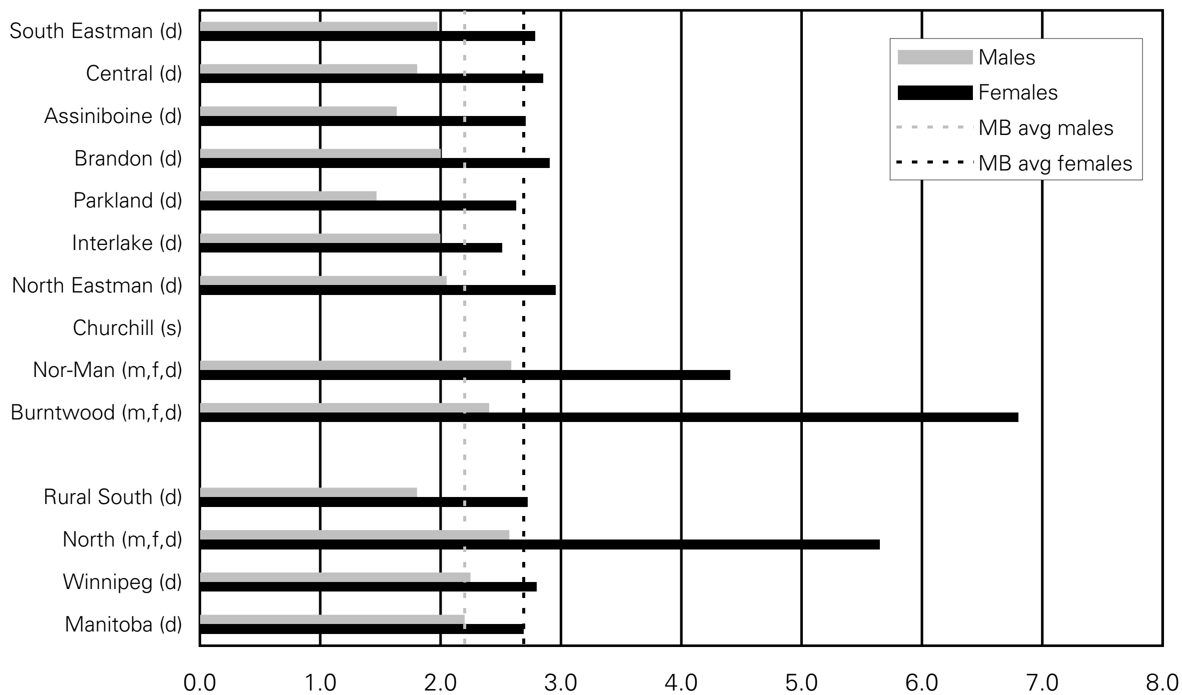
- 'True' stroke incidence rates are difficult to estimate using administrative data because not all cases of stroke will be hospitalized or result in death. An ongoing MCHP project (Lix et al., In press) is comparing alternative definitions of stroke incidence, which may include data from physician claims and/or pharmaceutical records.
- These results are somewhat lower than those reported by the Heart & Stroke Foundation (1999), though their rates included all cerebrovascular disease, not just stroke. Overall rates were not published, but analysis of age-specific rates were graphed.
- The values are higher than the 1.51 per 1,000 reported by Mayo et al. (1994), but their analysis included all residents age 15 or older, and was for the period 1981 to 1989.
- The results are very close to a similar population-based study from Norway, which reported a rate of 3.67 per 1,000 residents, using a similar definition (Ellekjaer et al., 1999).

3.11 Hip Fracture Incidence Rate

Definition: This indicator reports annual hospitalization rates for hip fracture (ICD-9-CM code 820) among residents age 40+, during the five-year period 1999/2000 to 2003/04. In the overwhelming majority of cases, residents experiencing hip fracture will be hospitalized, but it remains possible that some cases might not be hospitalized, and would therefore not be captured by this definition. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 3.11.1: Hip Fracture Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual rate per 1,000 residents age 40+

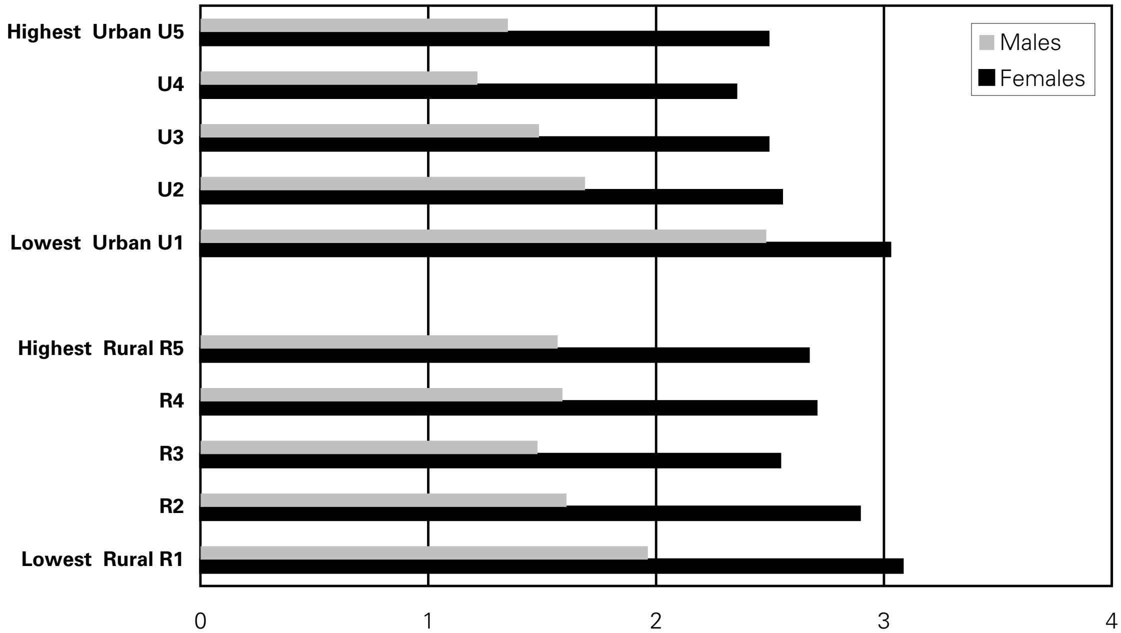


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.11.2: Hip Fracture Rates by Income Quintile, 1999/2000 – 2003/04

Age-adjusted annual rate per 1,000 residents age 40+



Linear Trend Test Results

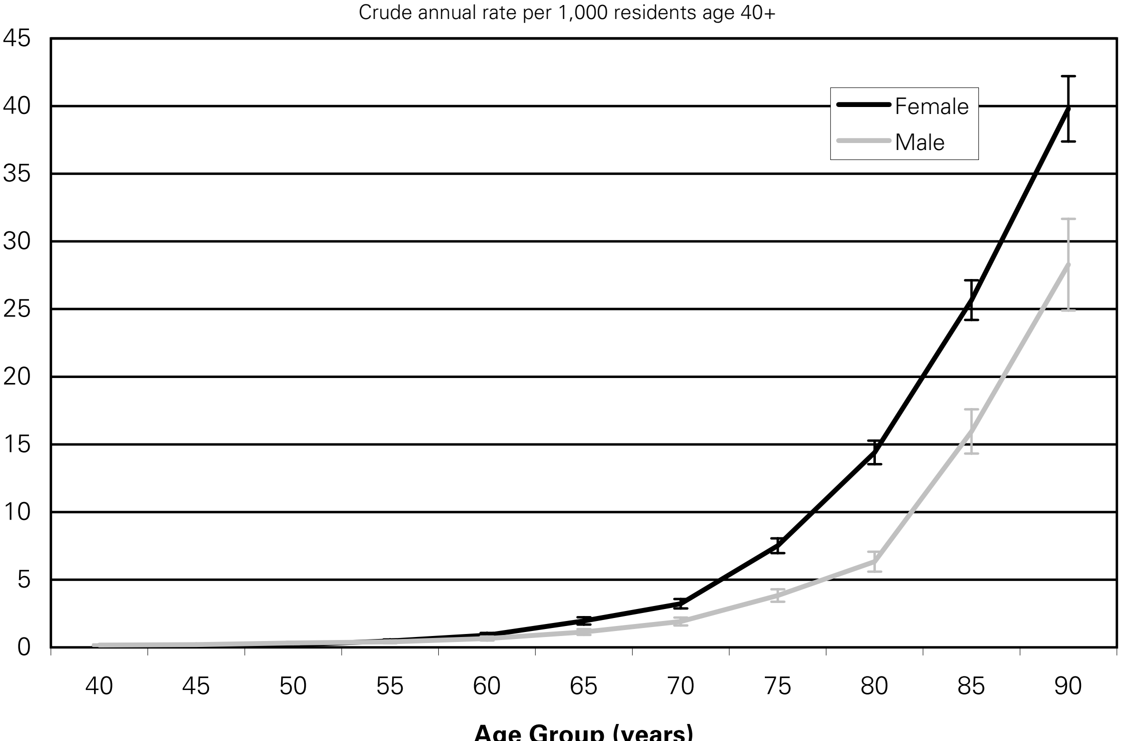
Female: Urban: Significant (p<.01) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.11.3: Hip Fracture Rates by Age and Sex, 1999/2000 – 2003/04

Crude annual rate per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of hip fracture incidence:

Age-adjusted rates:

- Overall, and in all RHAs, the rate of hip fracture hospitalization is higher among females than males (2.7 versus 2.2 per 1,000 residents 40+ per year, p<.001).
- There was a strong relationship with area-level income: urban and rural male and female residents of lower income areas had higher rates of hip fracture.

Age-specific crude rates by sex:

- Hip fracture is rare among young adults, but rates increase exponentially with age. Rates for females are consistently higher than those for males.

Comparison to other findings:

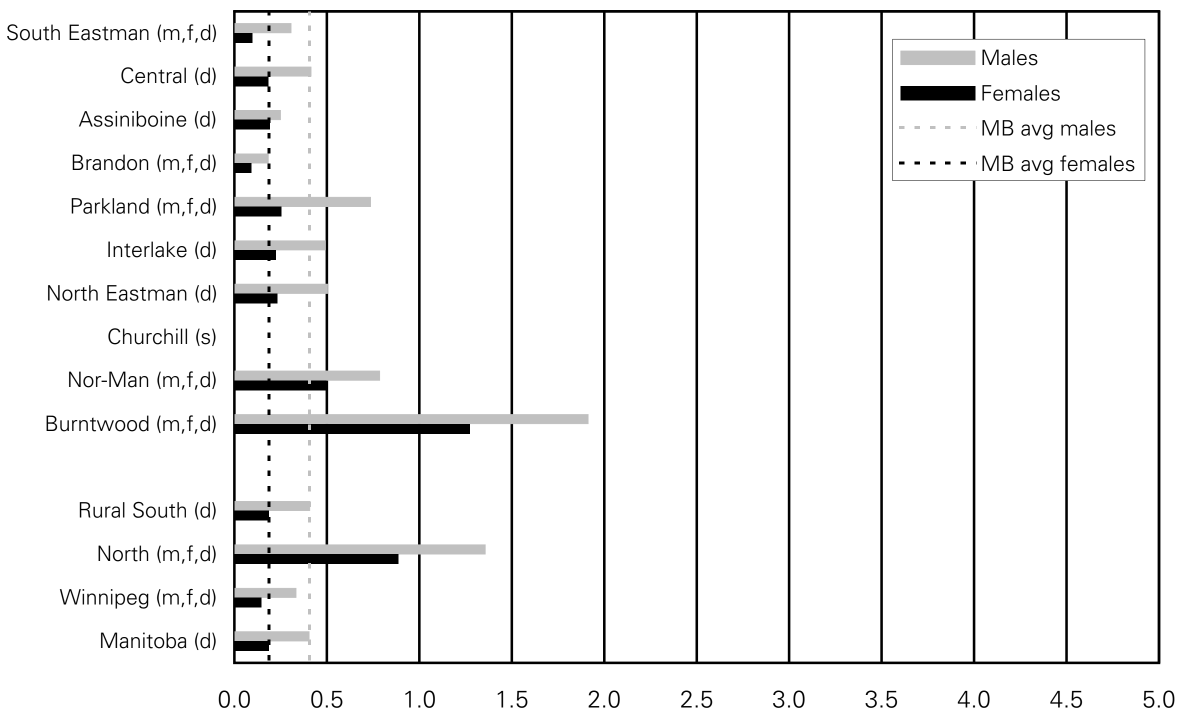
- These values are consistent with those published by Leslie et al. (2004), though they used a cohort-based approach, with residents age 20+ (versus 40+ here). Comparison of age-specific rates revealed very similar values: rates are very low among young adults, and rise dramatically with age.
- The rates are higher than those reported by Martin et al. using a similar definition, and data from Manitoba and Saskatchewan from 1972 through 1984: 2.3 for females; 0.9 for males (Martin et al., 1991).
- A separate study of Saskatchewan residents revealed a rate of 5.5 hip fractures per 1,000 person-years (Ray et al., 1990).
- The results are different from those reported for Ontario from 1981 to 1992 (Jaglal et al., 1996): female rate 4.6 (versus 2.9 here); male rate 1.7 (versus 2.1 here)..

3.12 Lower Limb Amputation Due to Diabetes

Definition: The annual rate of lower limb amputations (ICD-9-CM procedure codes 84.1-84.17) among patients coded with diabetes, over the five-year period 1999/2000 to 2003/04, per 1,000 area residents age 20 through 79. This does not include all amputations, but only those for which there was an existing condition of diabetes coded with the amputation. Amputations due to accidental injury (diagnosis codes 89.5, 89.6, and 89.7) were excluded. Values are age-adjusted to reflect the 20- to 79-year old population of Manitoba (males and females combined).

Figure 3.12.1: Lower Limb Amputation Rates with Comorbid Diabetes by RHA, 1999/00 – 2003/04

Age-adjusted annual rate per 1,000 residents age 20-79

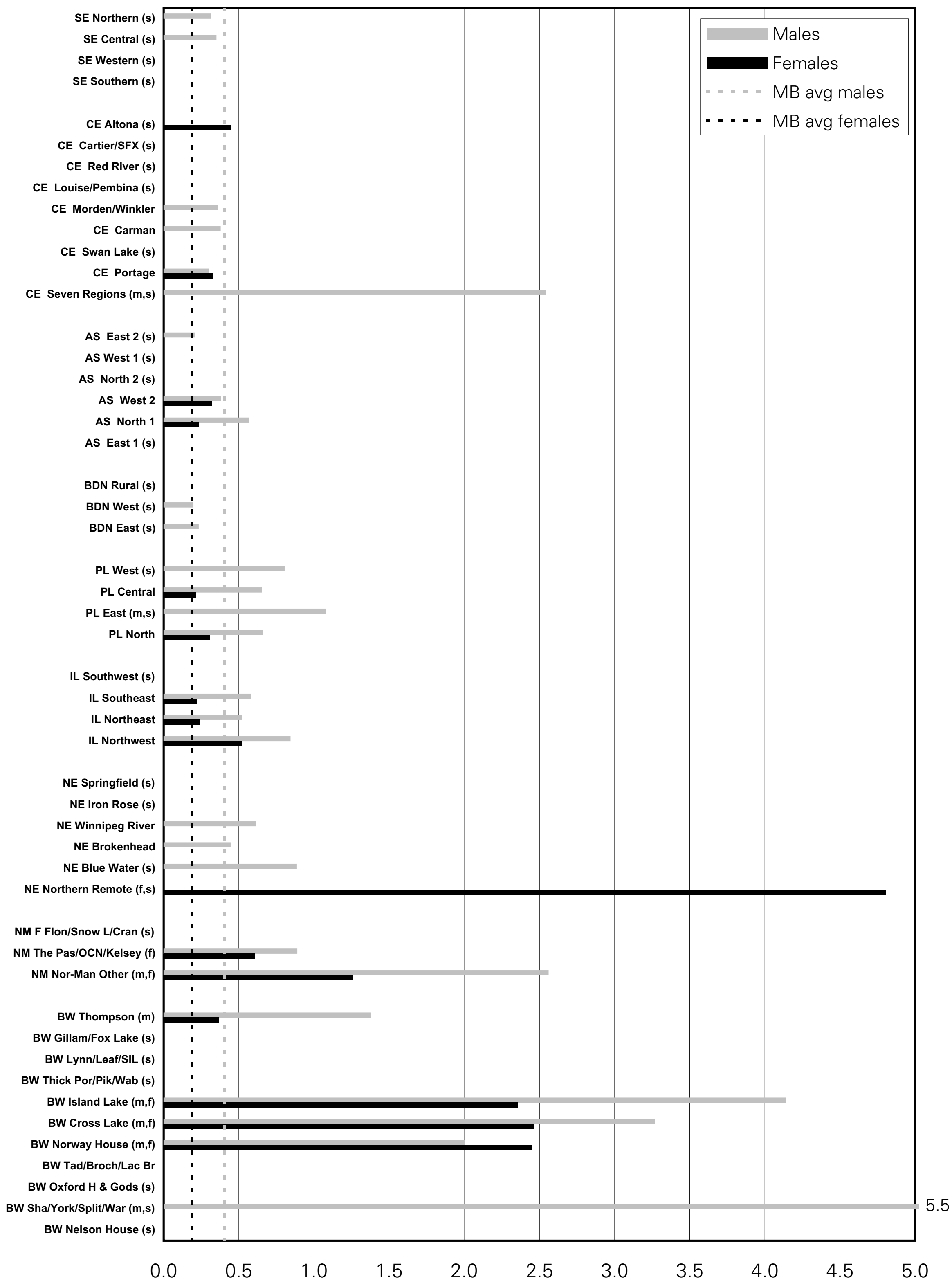


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 3.12.2: Lower Limb Amputation Rates with Comorbid Diabetes by District, 1999/00 – 2003/04

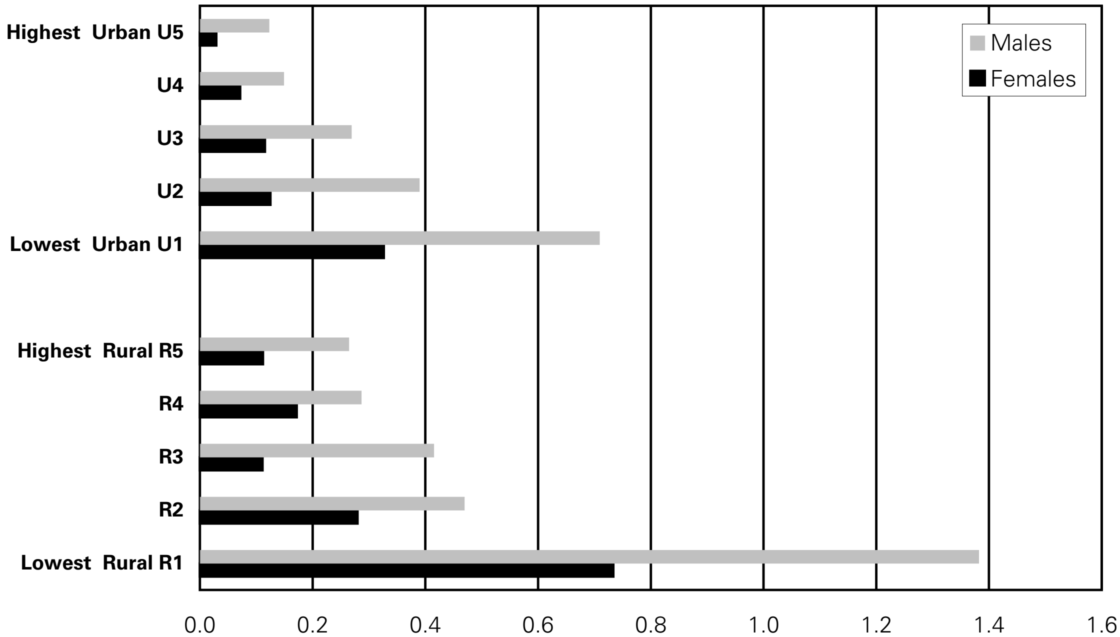
Age-adjusted annual rate per 1,000 residents age 20-79



Source: Manitoba Centre for Health Policy, 2005

Figure 3.12.3: Lower Limb Amputation Rates with Comorbid Diabetes by Income Quintile, 1999/00 – 2003/04

Age-adjusted annual rate per 1,000 residents age 20-79



Linear Trend Test Results

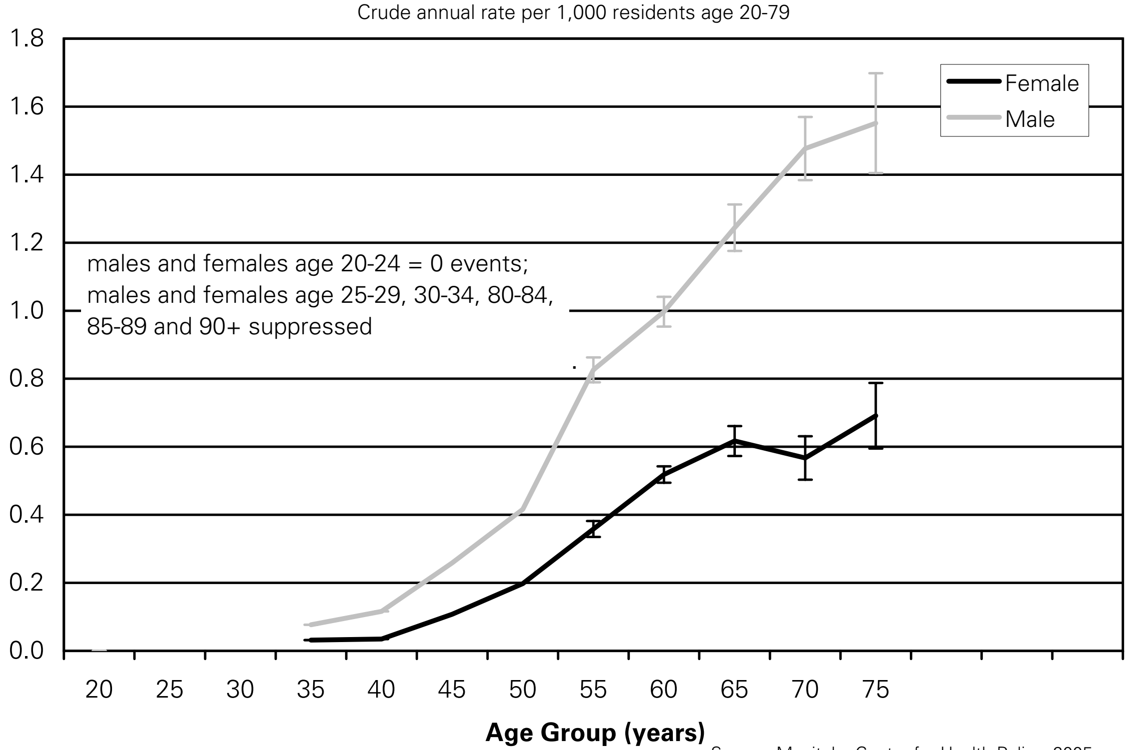
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 3.12.4: Lower Limb Amputation Rates with Comorbid Diabetes by Age and Sex, 1999/00 – 2003/04

Crude annual rate per 1,000 residents age 20-79



Source: Manitoba Centre for Health Policy, 2005

Key findings for lower limb amputations due to diabetes:

Age-adjusted rates:

- Overall, and in several RHAs, amputation rates are higher for males than females (0.41 versus 0.19 per 1,000 residents age 20 to 79, per year, $p<0.001$).
- There is a strong relationship between amputation rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Age-specific crude rates by sex:

- Amputation rates are higher among the older age groups, as is the difference between sexes.

Comparisons to other findings:

- These results are consistent with those in the MCHP First Nations Report, which revealed much higher than expected amputation rates among First Nations residents (Martens et al., 2002).
- The results are also comparable to those reported for Ontario, though the actual values are not the same, for several reasons: first, because different denominators were used (ours is a population-based rate, whereas theirs was an estimate of the number of diabetics in Ontario); second, their analysis was in 1997/98, and rates of diabetes and amputations have both increased over time; third, Manitoba has a larger Aboriginal population, and they experience higher amputation rates (Lawee and Csima, 1992).

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CHAPTER 4: PHYSICIAN SERVICES

This chapter will present indicators of the population's use of physician services, including:

4.1 Use of Physicians
4.2 Ambulatory Visit Rates
4.3 Ambulatory Consultation Rates
4.4 Ambulatory Visit Rates to Specialists
4.5 Complete Physical Exams
4.6 Continuity of Care
4.7 Physician Visit Rates by Cause
4.8 Visit Rates by Physician Specialty

Key Findings for Chapter 4: Physician Services

- Females had higher rates of physician service use than males across most indicators, though almost half of this difference was related to pregnancy and other reproductive health issues.
  - Percent with one or more visits: females 85.7%, males 78.9%.
  - Ambulatory visit rates: females 5.4, males 4.4 visits per year.
  - Ambulatory visits to specialists: females 1.3, males 1.2 visits per year.
  - Percent with complete physical: females 45.8%, males 37.4%.
- For both males and females, the pattern of specialist physician use was strongly influenced by geography: residents in and near Winnipeg had much higher rates of visits to specialists, and slightly higher consultation rates ('first visits'), most of which were to specialists.
  - Specialist visits:
    - Males: Winnipeg 1.71; Rural South 0.69; North 0.46 per year
    - Females: Winnipeg 1.74; Rural South 0.75; North 0.60 per year
  - Consultations:
    - Males: Winnipeg 0.33; Rural South 0.23; North 0.23
    - Females: Winnipeg 0.37; Rural South 0.29; North 0.32
- The 'reasons for' physician visits were similar for males and females: Four of the top five, and 14 of the top 15 causes were the same, though the ordering was different. Males: circulatory, respiratory, musculoskeletal, nervous system, ill-defined; Females: circulatory, respiratory, mental illness, musculoskeletal, ill-defined.
- Overall ambulatory visit rates appear to correspond to need—that is, residents of lower income areas received more visits than residents from higher income areas (the trends were strong for urban residents, but weak for rural residents).

- However, the other physician service indicators, including specialist visits, consultations, etc., show either no relationship with need (rates about the same across high, middle- and low-income areas), or the opposite trend (that is, higher rates for those from higher income areas—which is opposite what would be expected).

Introduction:

What is an 'Ambulatory Visit'? When a patient sees a doctor

The Manitoba Centre for Health Policy's (MCHP) definition of 'ambulatory visits' includes almost all contacts with physicians, but excludes services to residents while admitted to a hospital. It includes office visits, walk-in clinics, home visits, personal care home (nursing home) visits, visits to outpatient departments, and some emergency room visits (where data are available). Visits for prenatal care are typically excluded from the definition of 'ambulatory visits,' but were added in to selected analyses in this report (4.3 visit rates by cause, and 4.8 visit rates by specialty) to show their contribution explicitly.

Most physicians in the province are paid through the 'fee-for-service' system. In order to receive payment for their services, they record the reason (diagnosis) for the visit. There are some physicians, especially in remote rural and northern areas, who are paid by salary. Many of these physicians 'shadow bill' for their services; that is, they fill out an 'evaluation claim' so that the diagnosis code is still recorded in the data system. However, the evaluation claims are not as complete as the fee-for-service billings, since there is less incentive for the physician to complete the forms. As well, many northern and remote communities have access to nurses through nursing stations. These services are not recorded in the medical claims data system, so cannot be included in our analyses. As a result of these data limitations, our rates of physician visits will be undercounted for some northern/remote areas. Specialist physicians are also affected, but to a much lesser degree, because the vast majority of specialists are paid through fee-for-service billing claims.

'Consultations' are a subset of ambulatory visits: they occur when one physician refers a patient to another physician (usually a specialist or surgeon) because of the complexity, obscurity or seriousness of the condition, or when the patient requests a second opinion. A consultation is the first visit to the specialist, after which the patient usually returns to their general practitioner or family practitioner (GP/FP) for continuing care. People in urban areas often have much higher 'total' rates of specialist visits, since they continue to visit the specialist rather than going back to their GP/FP. This is why the consultation rate, rather than the overall specialist visit rate, is used as an indicator for access to specialist care. (The specialist visit rate shows all use of specialists—whether by referral or not.)

As with most of the indicators in this report, visits to physicians were allocated to the area of residence of the patient, not where the visit took place. That is, if a Parkland resident visited a physician in Winnipeg, it is counted as a visit provided to a Parkland resident.

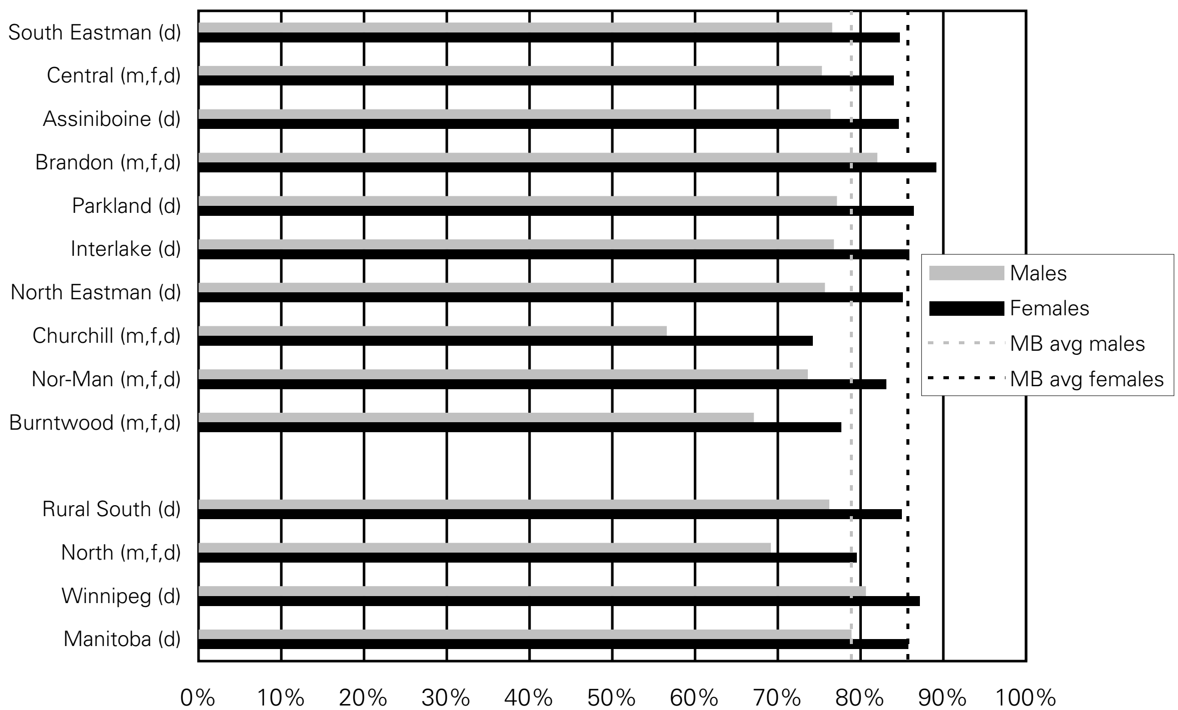
Visits and consultations for Churchill residents appear lower than in previous MCHP reports. This may be due to problems with medical claims data collection and reporting. The local physician supply and the schedule of itinerant specialist services was stable during 2003/04. (Martin, 2005)

4.1 Use of Physicians

Definition: This is the percentage of area residents who had at least one ambulatory visit to a physician during fiscal year 2003/04. This includes visits for any reason, to any type of physician (GP/FPs or specialists). The values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.1.1: Use of Physicians by RHA, 2003/04

Age-adjusted percent of residents with at least one ambulatory visit (to any physician)

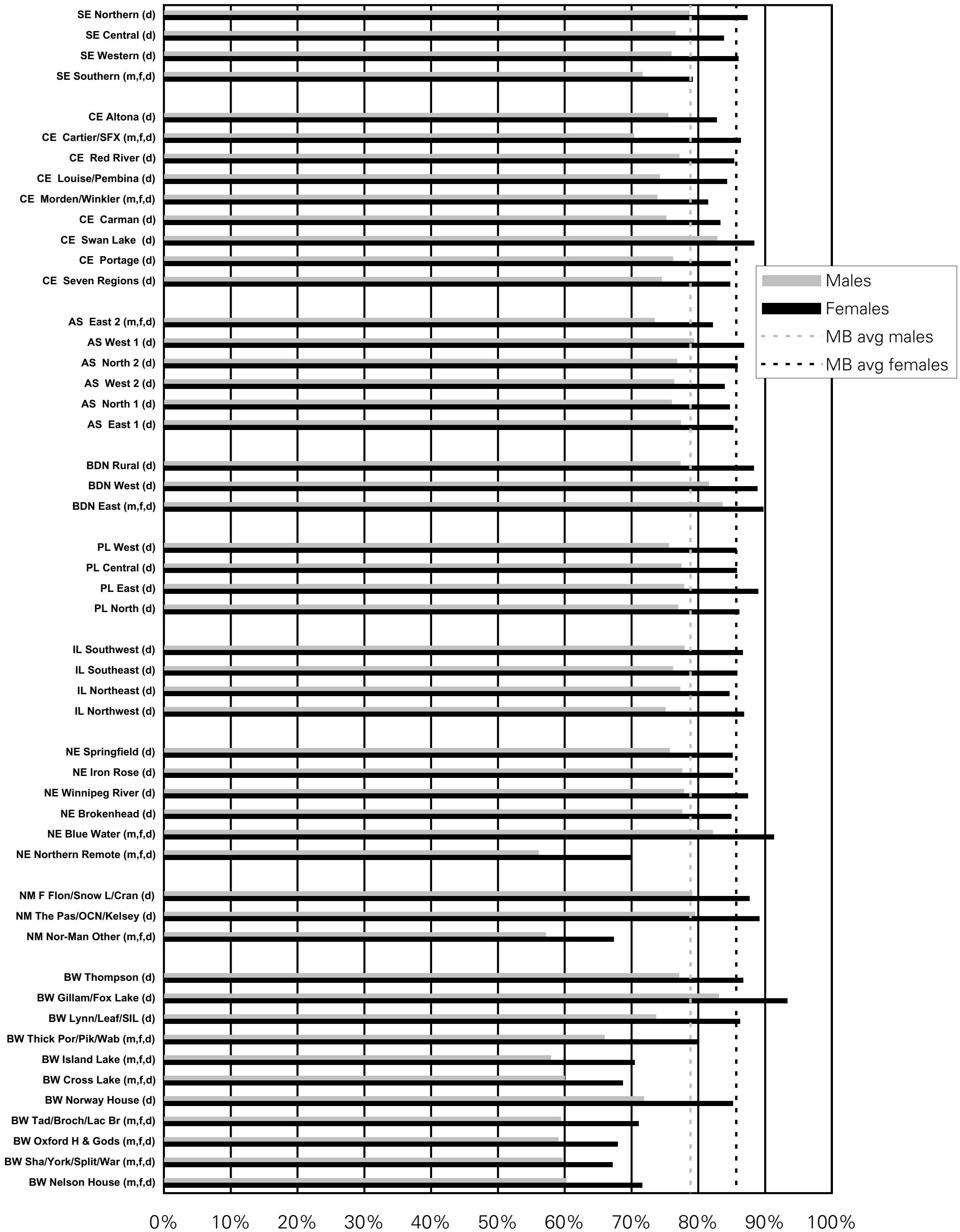


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 4.1.2: Use of Physicians by District, 2003/04

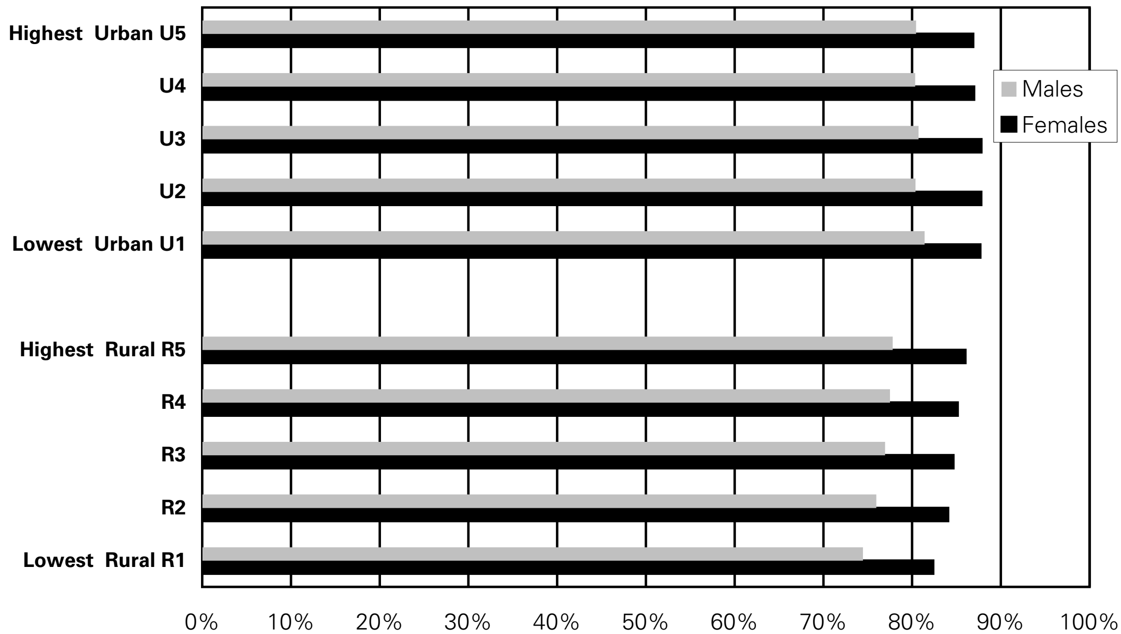
Age-adjusted percent of residents with at least one ambulatory visit (to any physician)



Source: Manitoba Centre for Health Policy, 2005

Figure 4.1.3: Use of Physicians by Income Quintile, 2003/04

Age-adjusted percent of residents with at least one ambulatory visit (to any physician)



Linear Trend Test Results

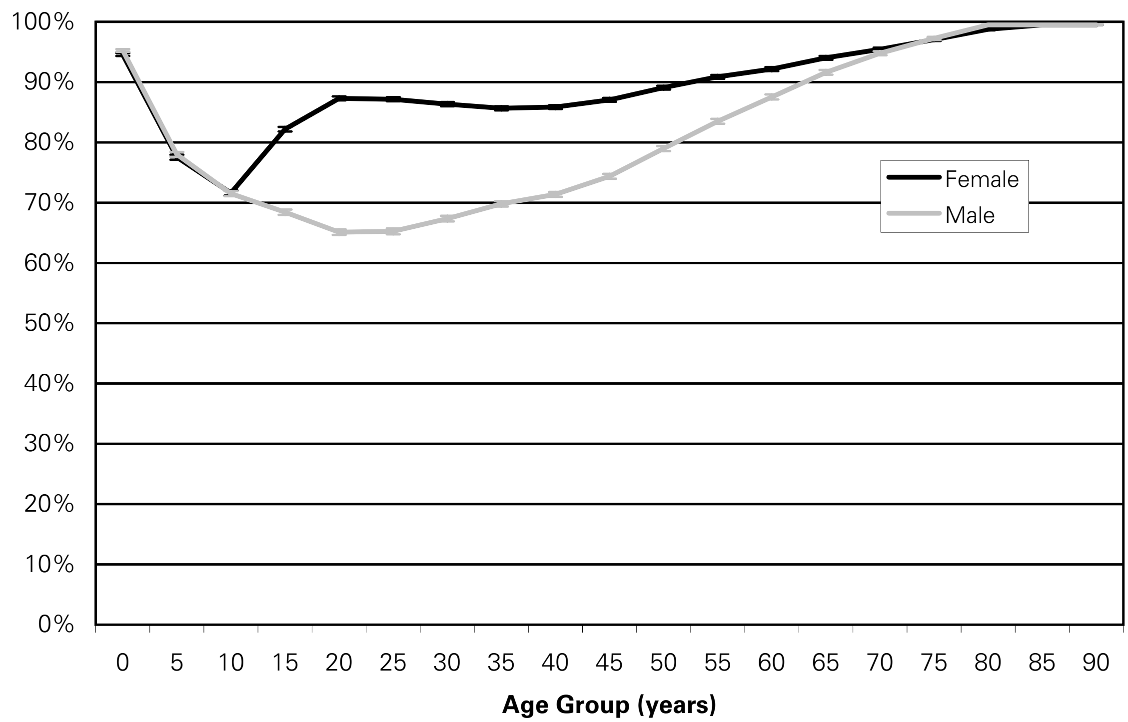
Female: Urban: Not Significant Rural: Significant (p<.01)

Male: Urban: Not Significant Rural: Significant (p<.01)

Source: Manitoba Centre for Health Policy, 2005

Figure 4.1.4: Use of Physicians by Age and Sex, 2003/04

Crude percent of residents with at least one ambulatory visit (to any physician)



Source: Manitoba Centre for Health Policy, 2005

Key findings for use of physicians:

Age-adjusted rates:

- Overall, and for each Regional Health Authority (RHA), a higher proportion of females than males had at least one physician visit in 2003/04 (85.7% versus 78.8%, p<.001).
- In rural areas, there was a significant relationship between physician use and area-level income: a higher proportion of males and females from higher income areas visited physicians. In urban areas, there was no relationship.

Crude rates by age & sex:

- Among both sexes, the youngest and the oldest residents are most likely to have had at least one physician visit in the year. Among males, the percentage drops dramatically for youth and remains low in young adulthood, then gradually increases with age. Among females, the percentage drops only briefly in childhood (approximately ages 5 to 14), but is much higher for 15- to 19- and 20- to 24-year olds. Female values remain relatively constant through young adulthood, and gradually rise starting at about age 45.

Comparison to other findings:

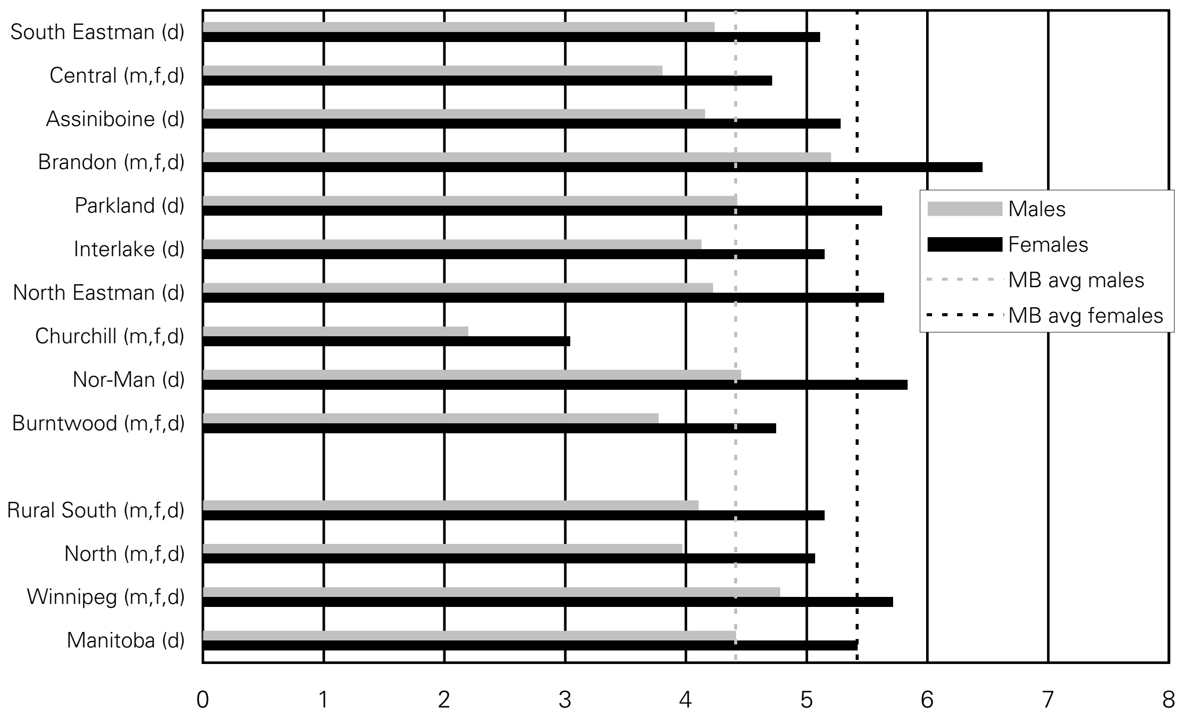
- These values are consistent with previous MCHP reports, including the RHA Indicators Atlas (Martens et al., 2003), which showed rates of 84% in 1995/96, and 82% in 2000/01; the rate for males and females combined in this report is 82%.
- The results are similar to Canadian survey results published by the Canadian Institute for Health Information (2005). Based on 2003 results from the Canadian Community Health Survey (CCHS), 82% of females and 71% of males visited a GP/FP at least once. Our values are higher (85.7% and 78.8%) because they include all physicians, not just GP/FPs.
- The values are also close to those published from the 1998/99 National Population Health Survey (NPHS), which reported that 81% of Canadians age 12 or older visited a physician during the previous year (Canadian Institute for Health Information, 2001).

4.2 Ambulatory Visit Rates

Definition: This is the average number of visits to all physicians (GP/FPs and specialists) per resident in fiscal year 2003/04. It includes almost all contacts with physicians: office visits, walk-in clinics, home visits, personal care home (nursing home) visits, visits to outpatient departments, and some emergency room visits (where data are recorded). Excluded are services provided to patients while admitted to hospital, and visits for prenatal care (though Section 4.7 'Physician Visit Rates by Cause' includes prenatal visits.) Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.2.1: Ambulatory Visit Rates by RHA, 2003/04

Age-adjusted annual rate of ambulatory visits to all physicians, per resident

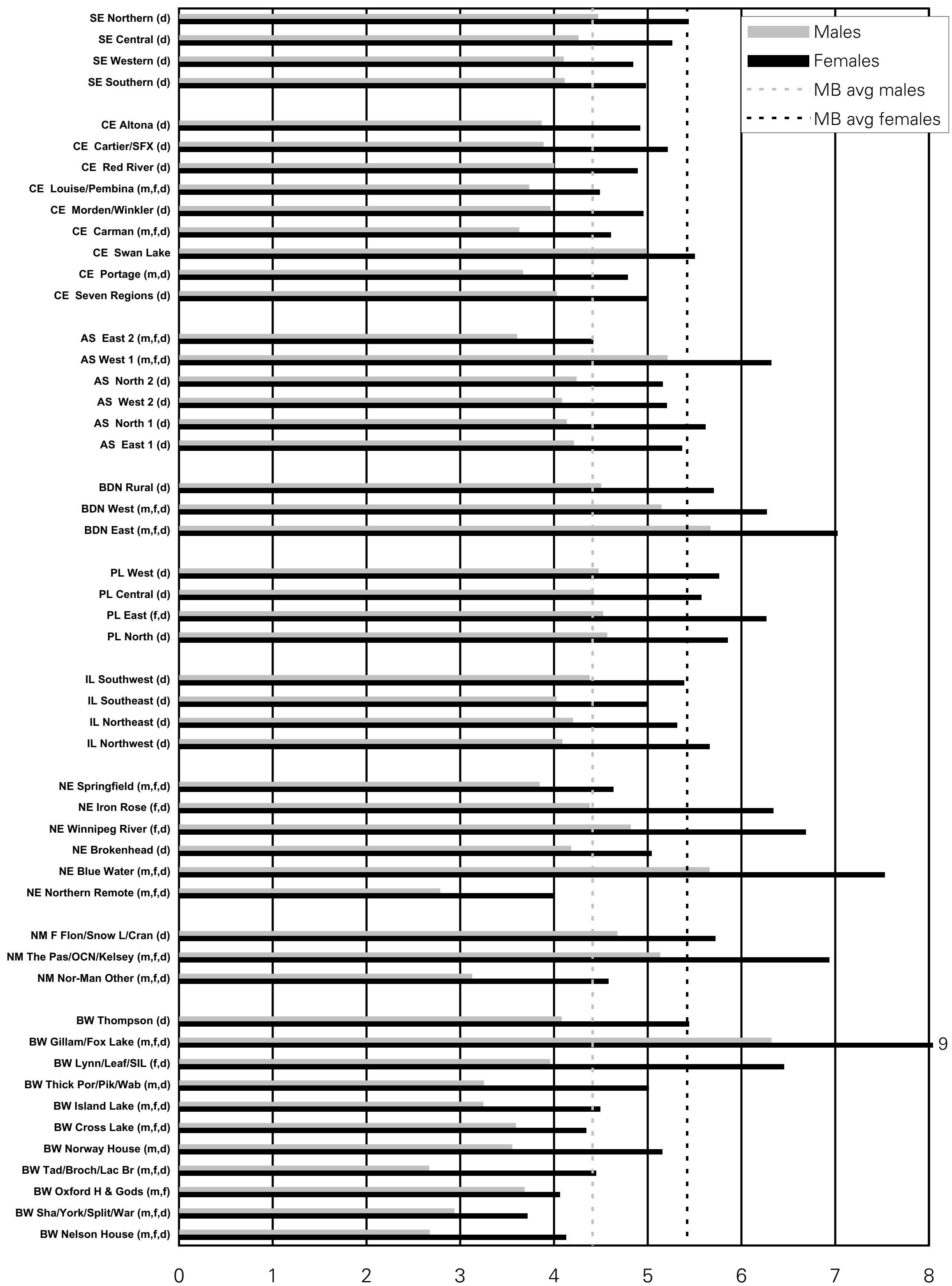


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 4.2.2: Ambulatory Visit Rates by District, 2003/04

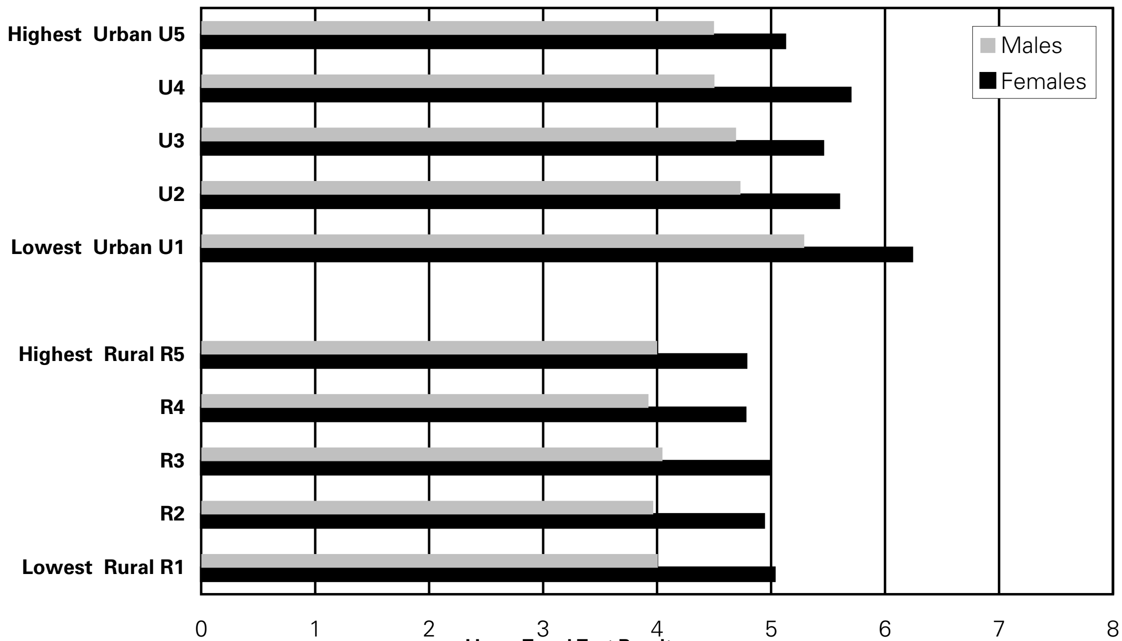
Age-adjusted annual rate of ambulatory visits to all physicians, per resident



Source: Manitoba Centre for Health Policy, 2005

Figure 4.2.3: Ambulatory Visit Rates by Income Quintile, 2003/04

Age-adjusted annual rate of ambulatory visits to all physicians, per resident



Linear Trend Test Results

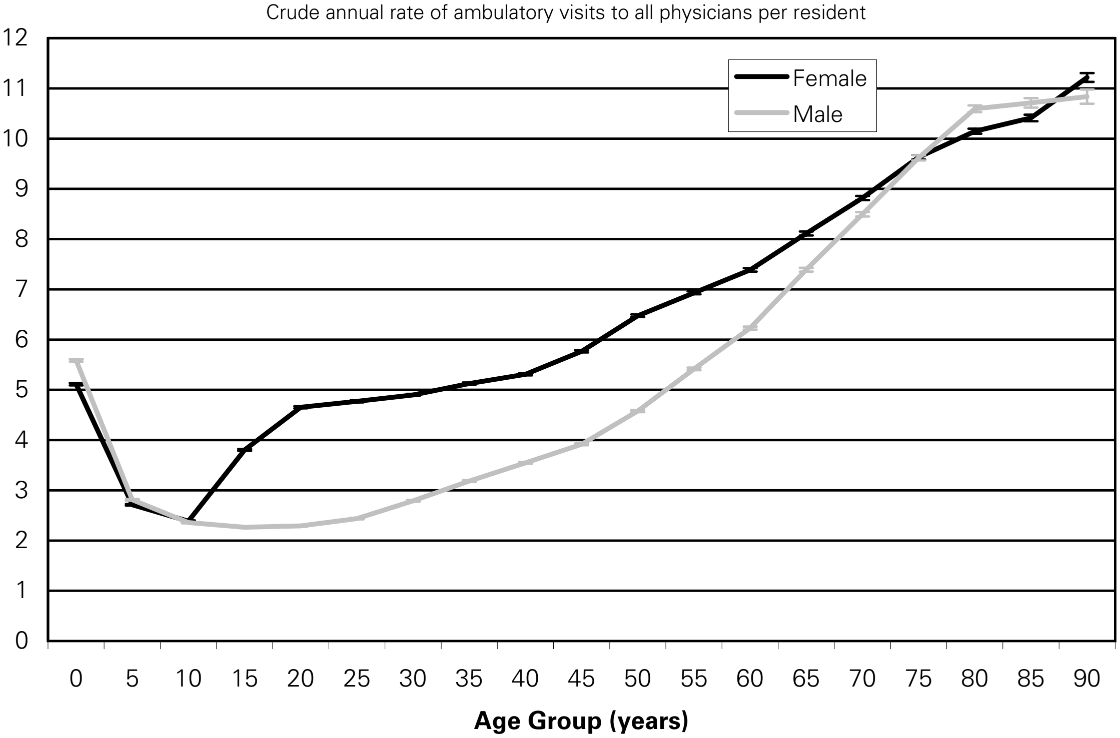
Female: Urban: Significant (p<0.01) Rural: Not Significant

Male: Urban: Significant (p<0.01) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 4.2.4: Ambulatory Visit Rates by Age and Sex, 2003/04

Crude annual rate of ambulatory visits to all physicians per resident



Source: Manitoba Centre for Health Policy, 2005

Key findings for ambulatory visit rates:

Age-adjusted rates:

- Overall, and for each RHA and District, visit rates are significantly higher for females than males. On average, females have one more visit per year than males (5.4 versus 4.4, p<.001). However, a portion of this difference is directly related to pregnancy and reproductive health issues: see Section 4.7 Visit rates by cause.
- For urban residents there was a strong relationship between ambulatory visit rates and area-level income: both males and females from lower income areas had significantly more visits than residents of higher income areas. For rural residents, there was no relationship.

Crude rates by age & sex:

- Among both sexes, ambulatory visit rates are high for young children, drop in childhood, and rise through adulthood to their highest rates among the oldest residents. Among males, the rate drops dramatically for youth and remains low in young adulthood, then increases sharply with age. Among females, the rate drops only briefly in childhood (approximately ages 5 to 14), but then is much higher for 15- to 19- and 20- to 24-year olds. Female rates then rise gradually through adulthood and into old age.

Comparison to other findings:

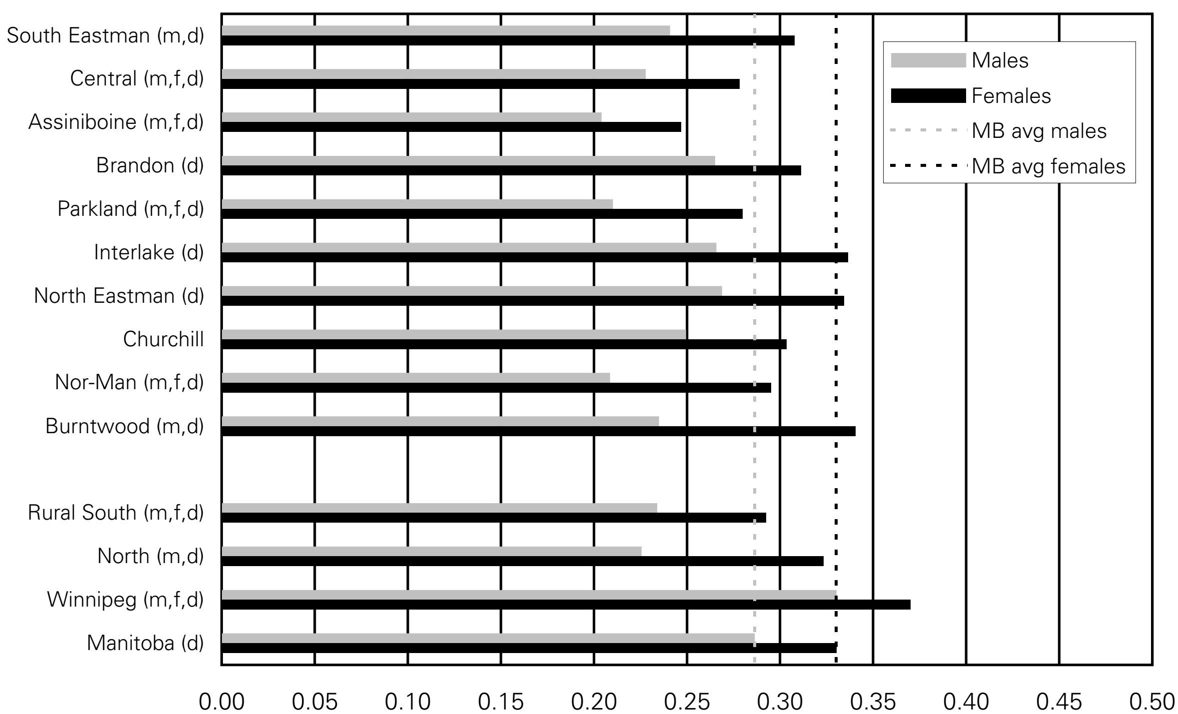
- These results are almost identical to those reported in the RHA Indicators Atlas (Martens et al., 2003), which showed visit rates were 4.9 per resident in 1995/96, and 4.8 in 2000/01; the rate for males and females combined in this report is 4.9 visits per resident per year.
- The values are lower than the 2002/03 Canadian average reported by the Canadian Institute of Health Information (CIHI). Using data from the National Physician Data Base, they reported an average visit rate of 5.7 per resident. Several other provinces were closer to Manitoba's average, and several were higher (notably Ontario at 6.3 visits per resident).

4.3 Ambulatory Consultation Rates

Definition: This is the average number of ambulatory consultations per resident to all physicians in fiscal year 2003/04 (physician claims with prefix seven and tariffs: 8516, 8550, 8553, 8554, 8556, 8557, 8594 or 8595). Consultations are a subset of ambulatory visits: they occur when one physician refers a patient to another physician because of the complexity, obscurity or seriousness of the condition, or when the patient requests a second opinion. A consultation can be with a GP/FP, though most are to specialists, after which the patient usually returns to their regular provider for ongoing management. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.3.1: Ambulatory Consultation Rates by RHA, 2003/04

Age-adjusted annual rate of ambulatory consults per resident

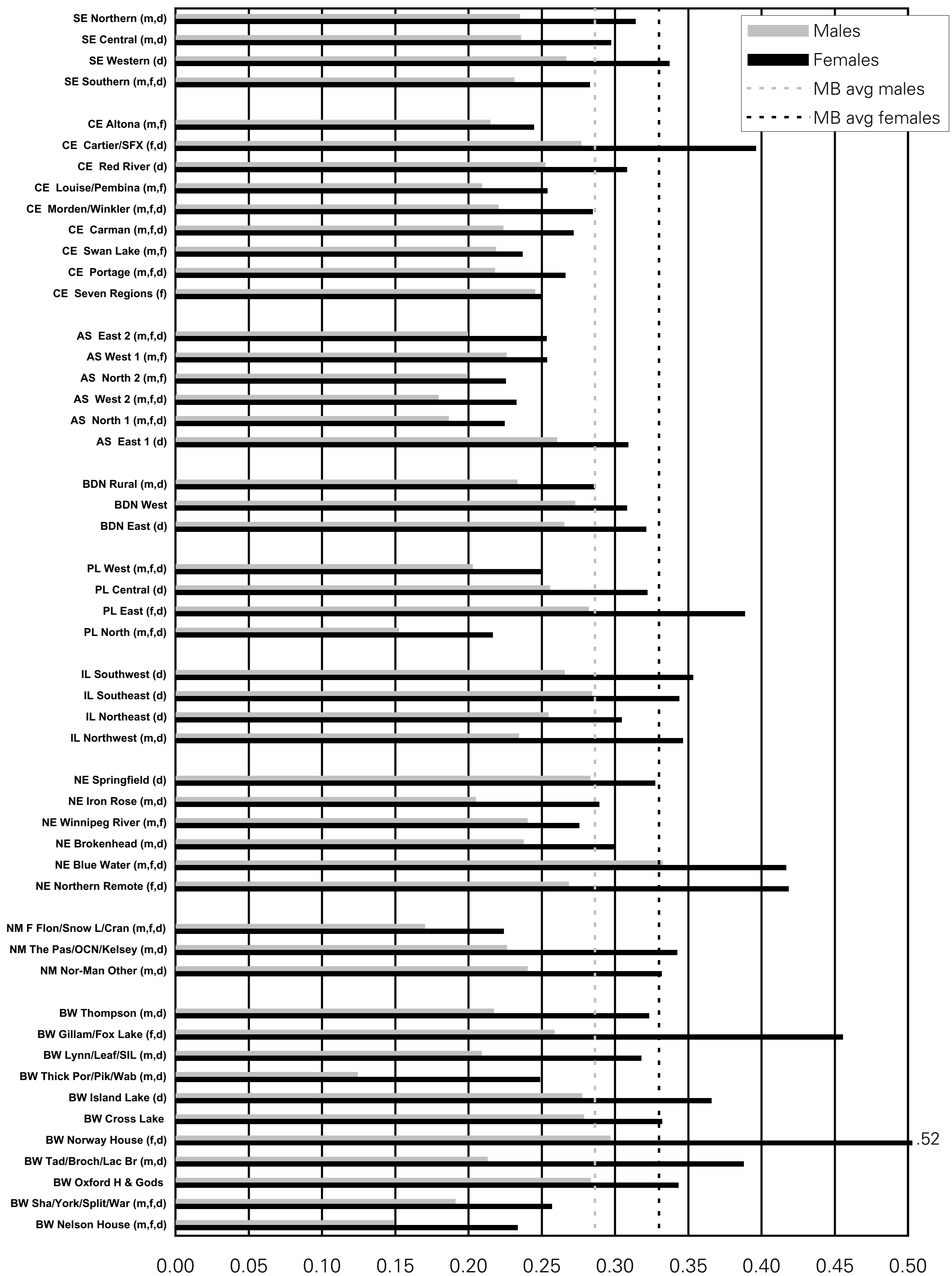


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 4.3.2: Ambulatory Consultation Rates by District, 2003/04

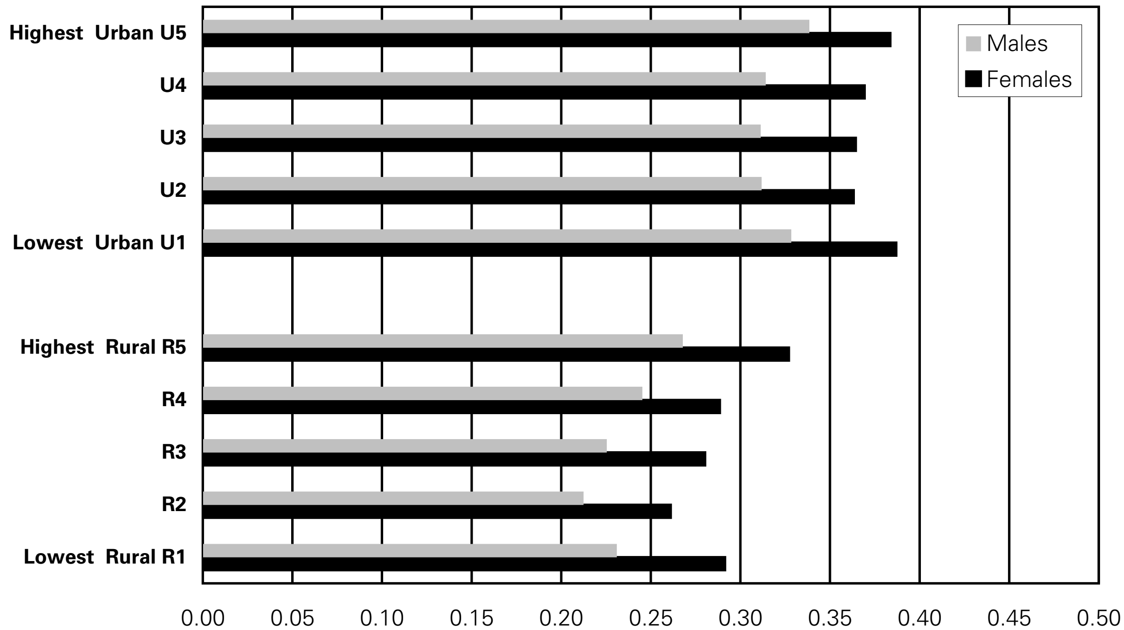
Age-adjusted annual rate of ambulatory consults per resident



Source: Manitoba Centre for Health Policy, 2005

Figure 4.3.3: Ambulatory Consultation Rates by Income Quintile, 2003/04

Age-adjusted annual rate of ambulatory consults per resident



Linear Trend Test Results

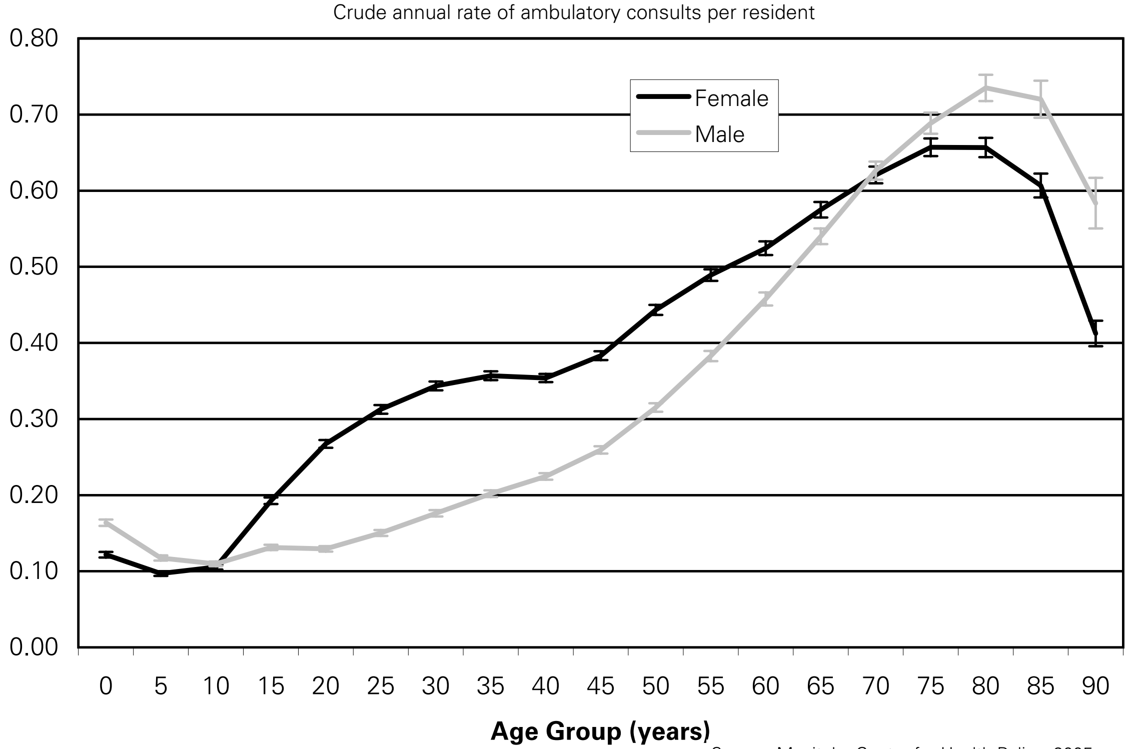
Female: Urban: Not Significant Rural: Significant (p<.001)

Male: Urban: Not Significant Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 4.3.4: Ambulatory Consultation Rates by Age and Sex, 2003/04

Crude annual rate of ambulatory consults per resident



Source: Manitoba Centre for Health Policy, 2005

Key findings for ambulatory consultation rates:

Age-adjusted rates:

- Overall, and for most RHAs and districts, consultation rates were higher for females than males (0.30 versus 0.26, p<.001).
- There was a strong relationship between consultation rates and area-level income: both male and female residents of higher income urban and rural areas had higher consultation rates. This is opposite what would be expected, given the higher burden of illness among residents of lower income areas.

Crude rates by age & sex:

- Among both sexes, ambulatory visit rates are low for children and youth, and rise through adulthood to their highest rates among seniors, then drop again among the very oldest residents. Among females, the rise begins in youth, leveling off somewhat in middle age before rising again among seniors.

Comparison to other findings:

- These values are similar to those reported in the RHA Indicators Atlas (Martens et al., 2003), which showed consultation rates of 0.25 per resident in 1995/96, and 0.27 in 2000/01; the rate for males and females combined in this report is 0.28 per resident, suggesting a gradual increase in the consult rate over time.

4.4 Ambulatory Visit Rates to Specialists

Definition: This is the average number of ambulatory visits per resident to specialist physicians and surgeons in fiscal year 2003/04 (including all paediatricians and medical specialists). MCHP's definition of 'ambulatory visits' includes almost all contacts with physicians, but excludes visits to patients while in hospital (see section 4.2). These values include all visits to specialists—whether by 'consultation' (Section 4.3) or not. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.4.1: Ambulatory Visit Rates to Specialists by RHA, 2003/04

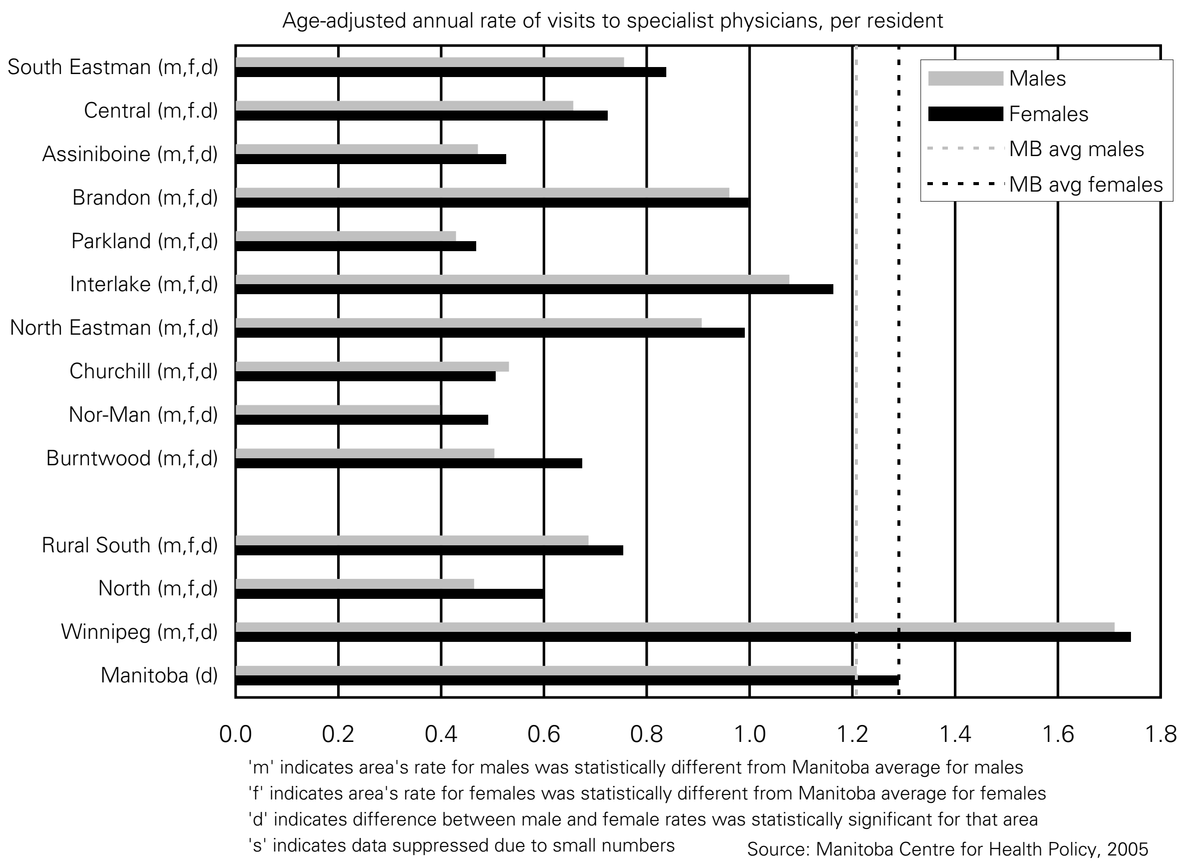
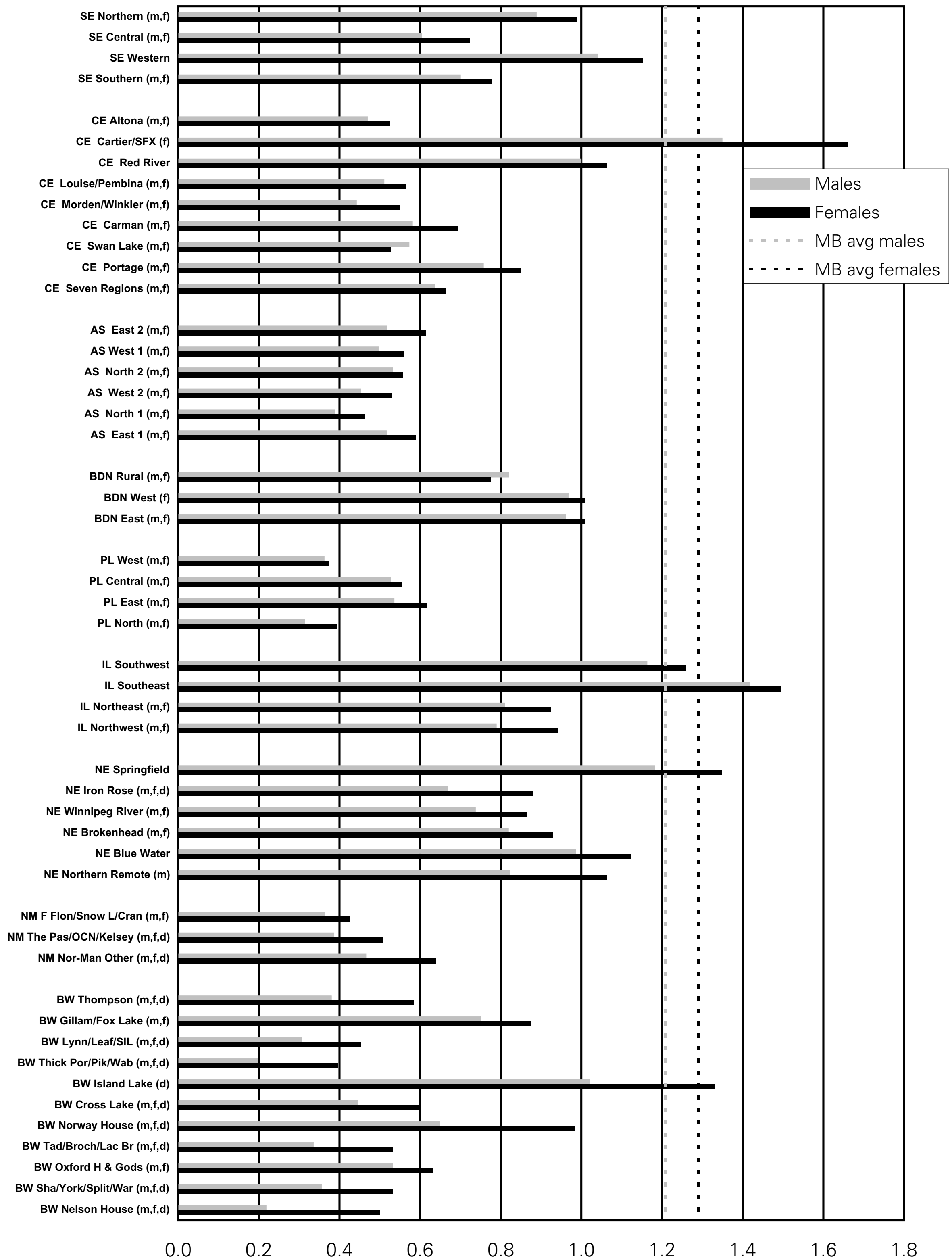


Figure 4.4.2: Ambulatory Visit Rates to Specialists by Distirct, 2003/04

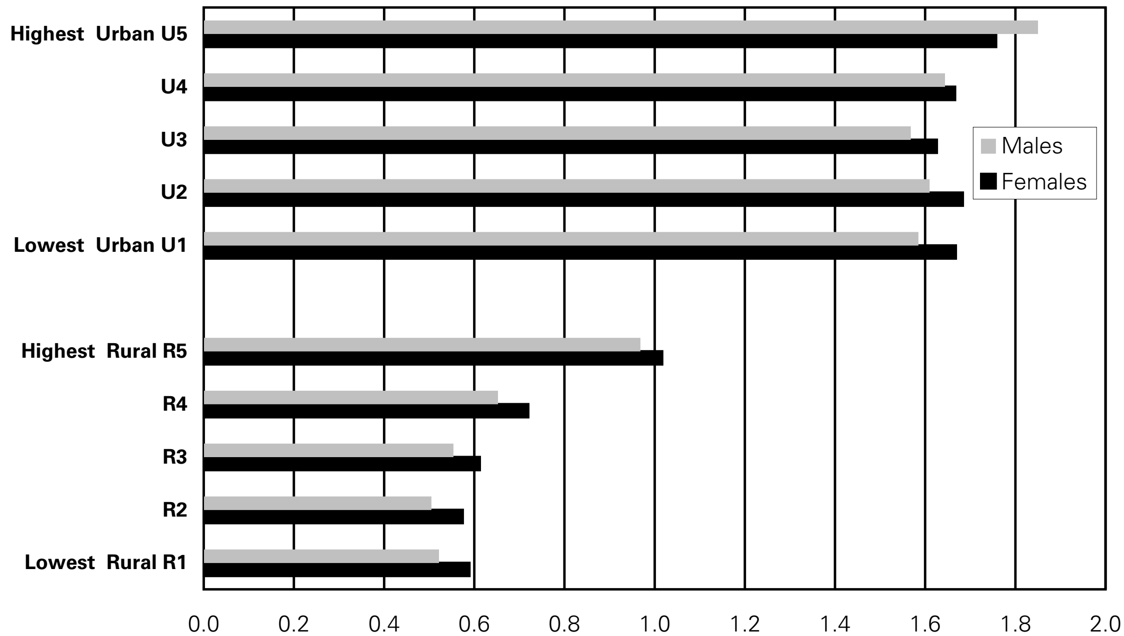
Age-adjusted annual rate of visits to specialist physicians, per resident



Source: Manitoba Centre for Health Policy, 2005

Figure 4.4.3: Ambulatory Visit Rates to Specialists by Income Quintile, 2003/04

Age-adjusted annual rate of visits to specialist physicians, per resident



Linear Trend Test Results

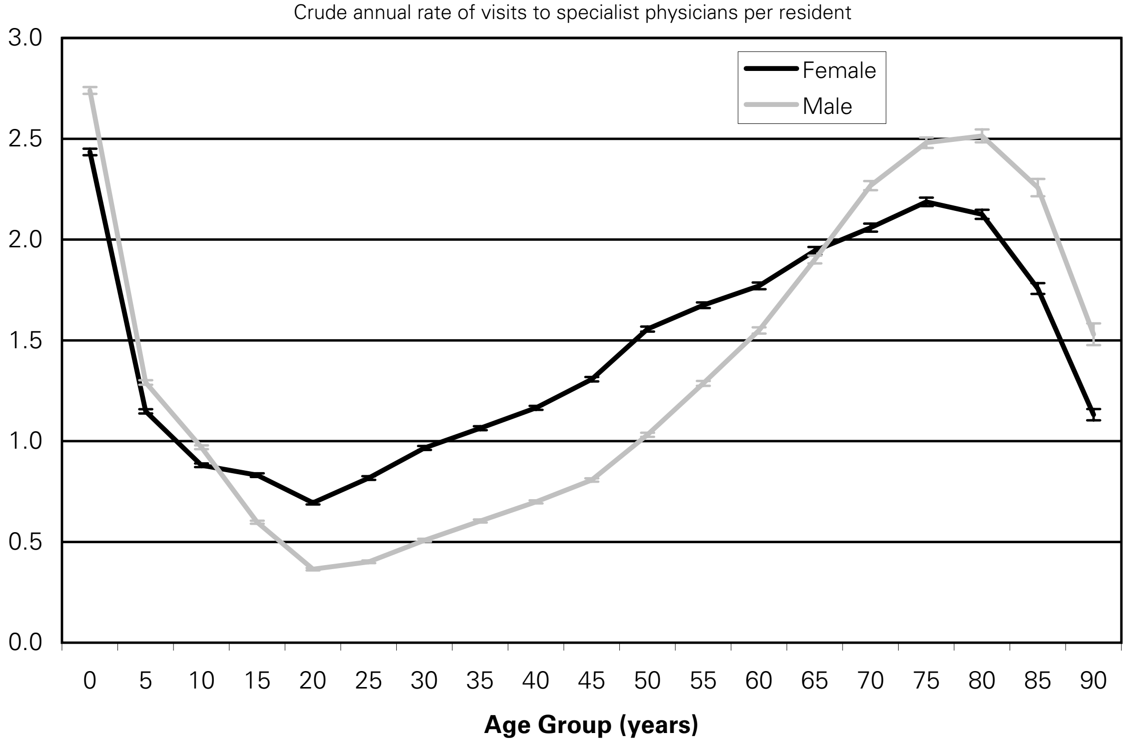
Female: Urban: Not Significant Rural: Significant (p<.001)

Male: Urban: Not Significant Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 4.4.4: Ambulatory Visit Rates to Specialists by Age and Sex, 2003/04

Crude annual rate of visits to specialist physicians per resident



Source: Manitoba Centre for Health Policy, 2005

Key findings for ambulatory visit rates to specialists:

Age-adjusted rates:

- Overall, and in all RHAs, females had higher rates of visits to specialists than males (1.3 versus 1.2, $p<.001$).
- Visit rates to specialists are very high for Winnipeg residents, and elevated for residents of RHAs close to Winnipeg (i.e. Interlake, North Eastman, South Eastman, and to a lesser extent, Central). Rates for Brandon residents were also elevated. As a result, rates for Urban residents (Winnipeg and Brandon) were much higher than those for Rural residents.
- Relationships between area-level income and specialist visit rates were strong for rural residents, both male and female, with rates being higher among those from higher income areas. This is opposite what would be expected, given the higher burden of illness among residents of lower income areas. The influence of geography is also strong here: many of the higher income rural areas are close to Winnipeg, where most specialists are located. The area-level income trends were not significant for urban residents, but urban residents' rates were much higher than those of rural residents.

Crude rates by age & sex:

- Among both sexes, specialist visit rates are highest for young children, drop sharply among youth and young adults, and rise through adulthood before dropping again among the oldest residents. Among females, the drop in youth is not as sharp as for males; rates are higher than those for males through adulthood, but lower than males among the oldest residents.

Comparisons to other findings:

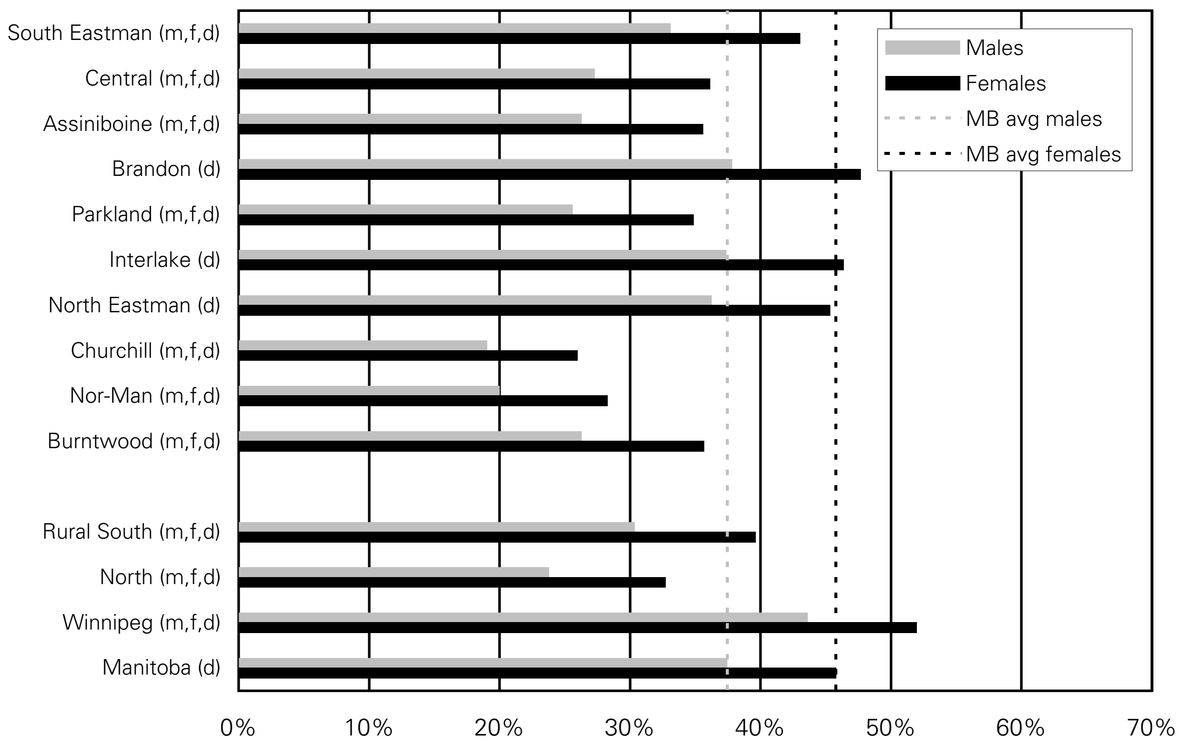
- These values are similar to those reported in the RHA Indicators Atlas (Martens et al., 2003), which showed specialist visit rates of 1.3 per resident in 1995/96, and 1.2 in 2000/01; the rate for males and females combined in this report is 1.2 visits per resident per year.

4.5 Complete Physical Exams

Definition: This is the percentage of residents who received at least one Complete History and Physical Examination in 2003/04. This was defined as an ambulatory visit with any of the following physician tariffs: 78450, 78460, 78495, 78498, 78499, 78500, 78540, 78594. These tariffs refer to 'complete' physical exams—not regional exams or specialty-specific histories. The various tariffs cover different age groups, specialties of physicians, and whether the exam included a Papanicolaou smear or not. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.5.1: Complete Physical Exams by RHA, 2003/04

Age-adjusted percent of residents with a least one complete history & physical exam

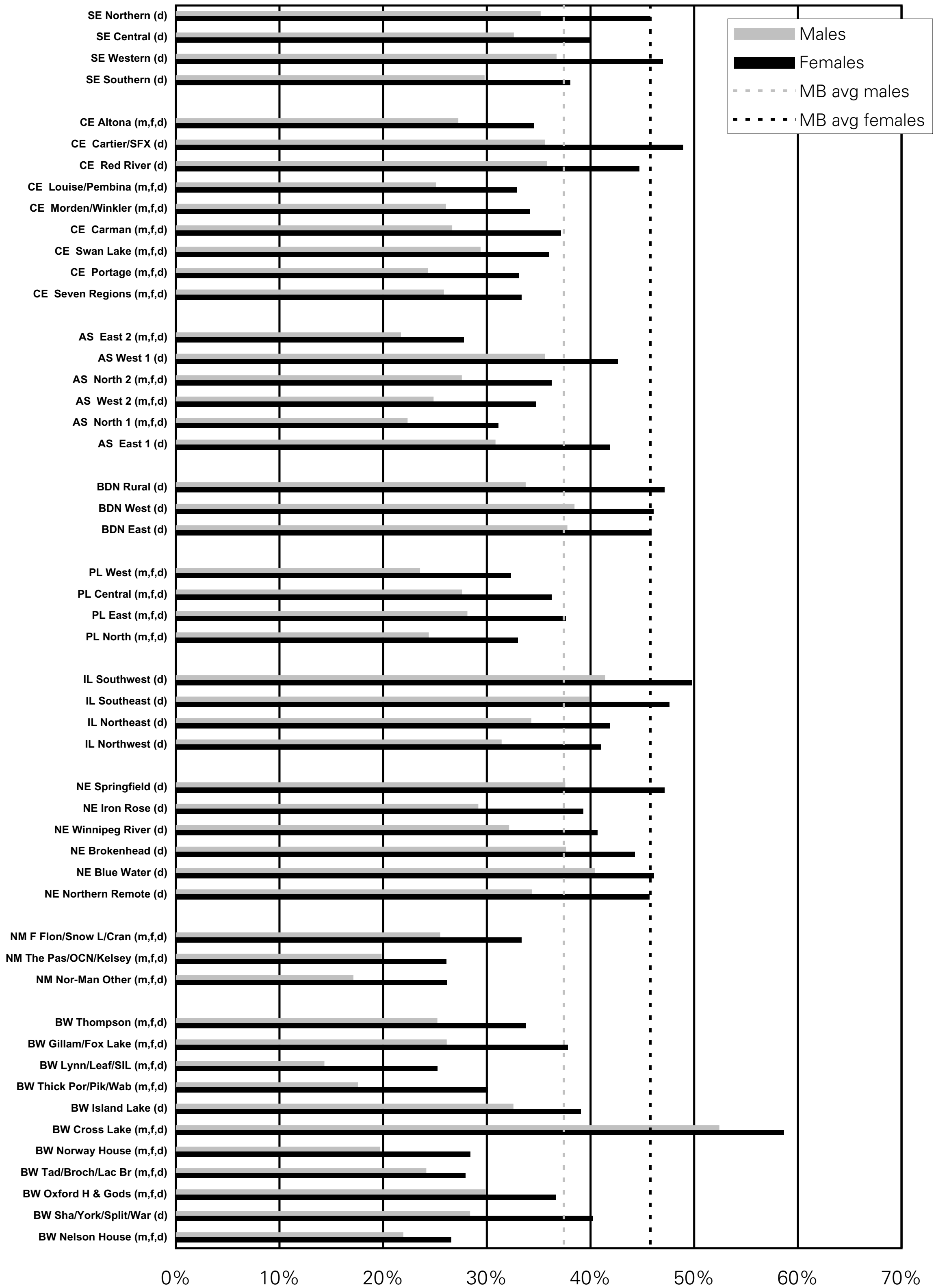


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 4.5.2: Complete Physical Exams by District, 2003/04

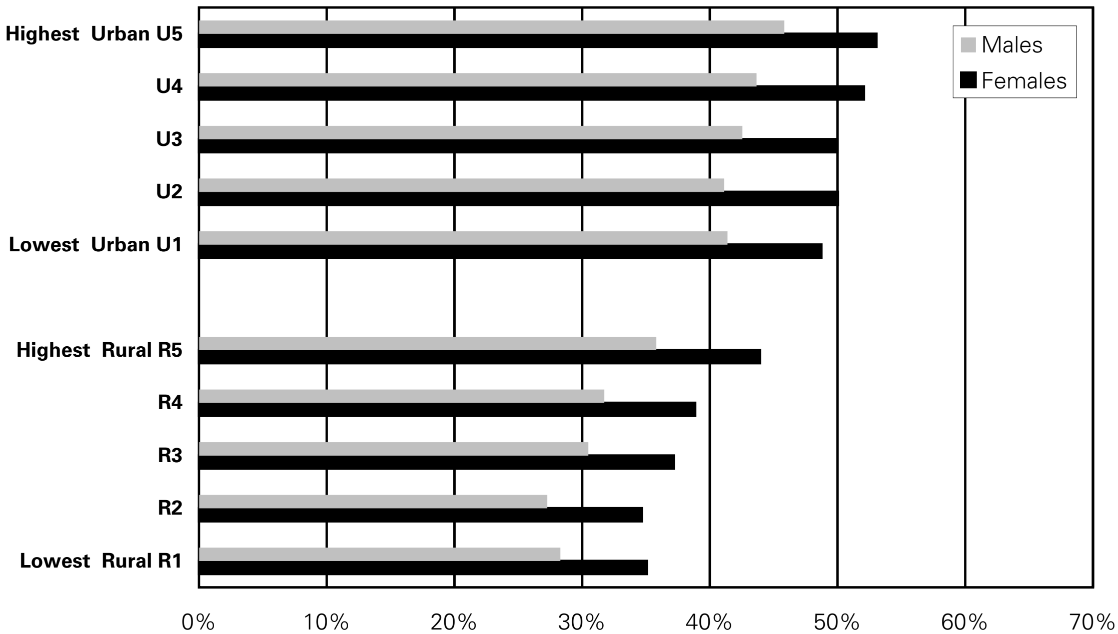
Age-adjusted percent of residents with a least one complete history & physical exam



Source: Manitoba Centre for Health Policy, 2005

Figure 4.5.3: Complete Physical Exams by Income Quintile, 2003/04

Age-adjusted percent of residents with at least one complete history & physical exam



Linear Trend Test Results

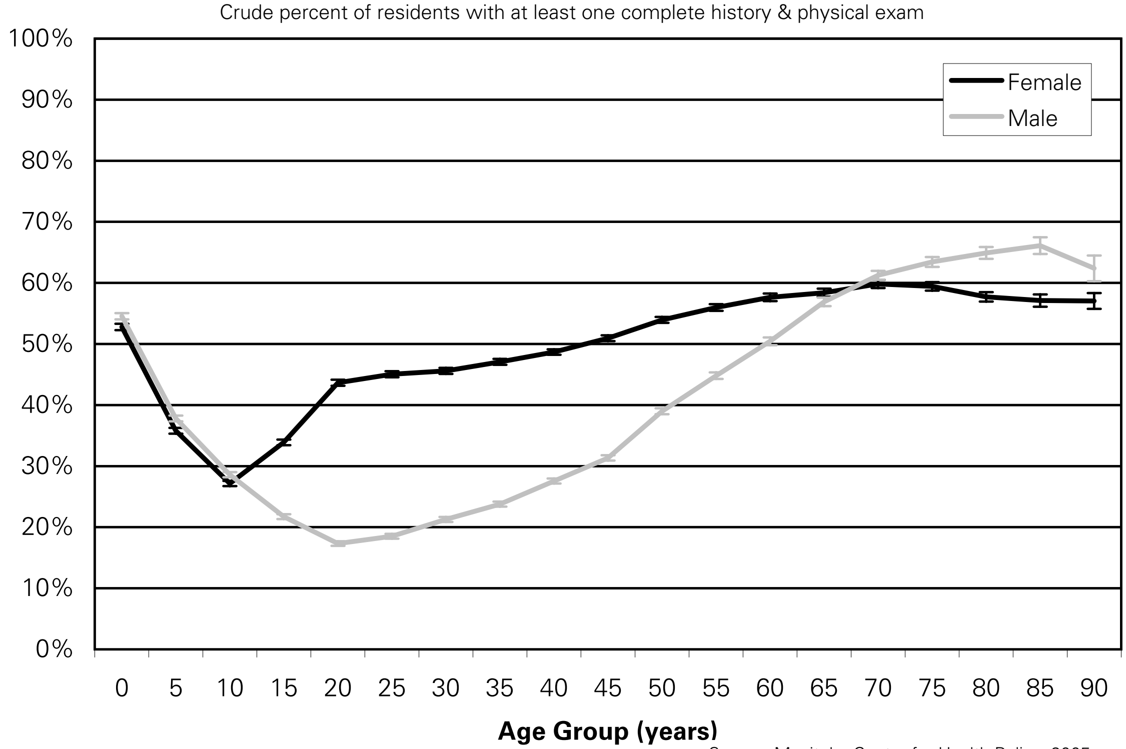
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 4.5.4: Complete Physical Exams by Age and Sex, 2003/04

Crude percent of residents with at least one complete history & physical exam



Source: Manitoba Centre for Health Policy, 2005

Key findings for complete physical exams:

Age-adjusted rates:

- Overall, and for each RHA and District, a higher proportion of females than males received at least one complete history and physical examination in 2003/04 (45.8% versus 37.4%, p<.001).
- Among male and female residents of both urban and rural areas, those from higher income areas were more likely to have had a complete physical in 2003/04.

Crude rates by age & sex:

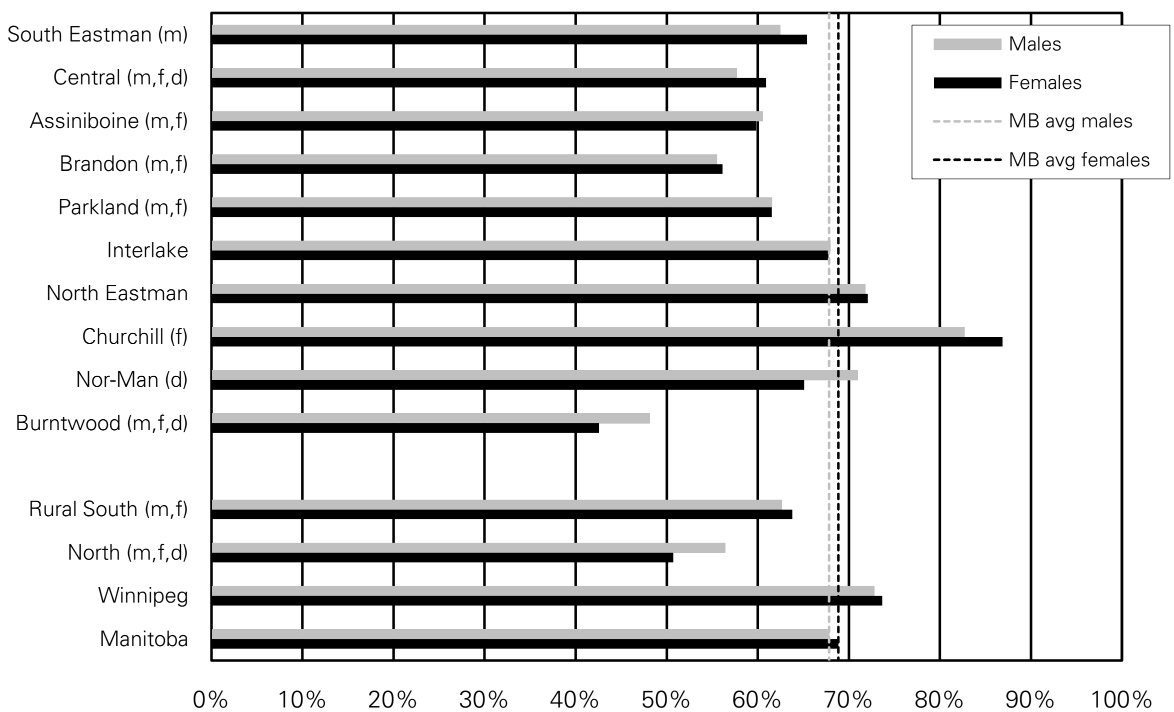
- Among both sexes, rates of complete physical exams are high for young children, drop in childhood, and rise through adulthood. Among males, the rate drops dramatically for youth and remains low in young adulthood, then increases sharply through middle age. Among females, the rate drops only briefly in the 10- to 14-year olds, then is much higher for 15- to 19- and 20-to 24-year olds. Female rates then rise gradually through adulthood, and remain steady into old age.

4.6 Continuity of Care

Definition: This is the percentage of residents receiving more than 50% of their ambulatory visits from the same physician in the two-year period 2002/03–2003/04. This analysis excluded those with less than three visits in the two-year period, because a clear majority cannot be determined for those with 0, 1, or 2 visits (note: this excludes only 18% of the population). For children 0 to 14, the provider could be a GP/FP or a Paediatrician; for those 15 to 59, only GP/FPs were used; for those 60+, it could be a GP/FP or an Internal Medicine specialist. Values were age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 4.6.1: Continuity of Care by RHA, 2002/03 – 2003/04

Age-adjusted percent of residents with at least 50% of visits to the same physician

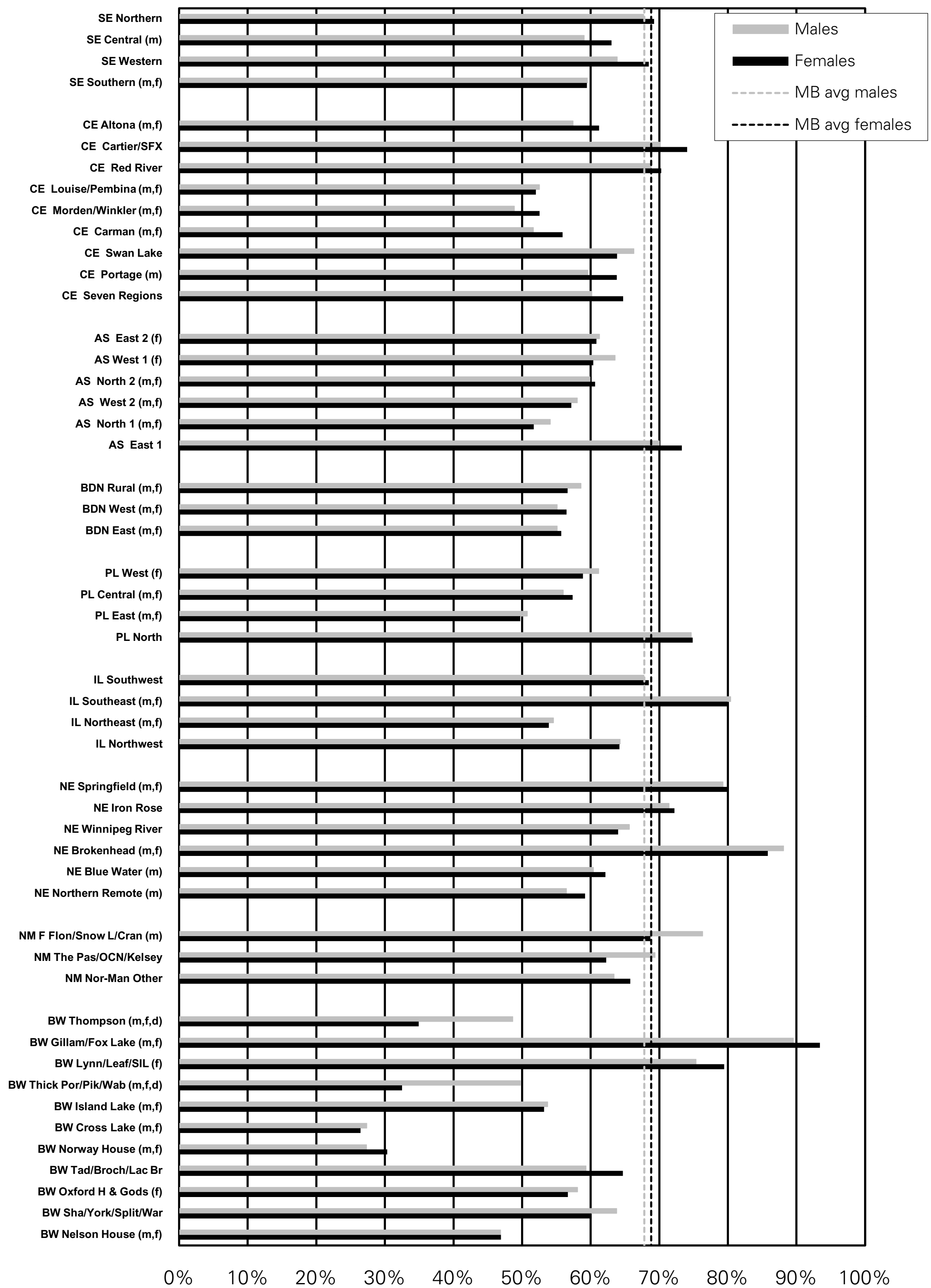


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 4.6.2: Continuity of Care by District, 2002/03 – 2003/04

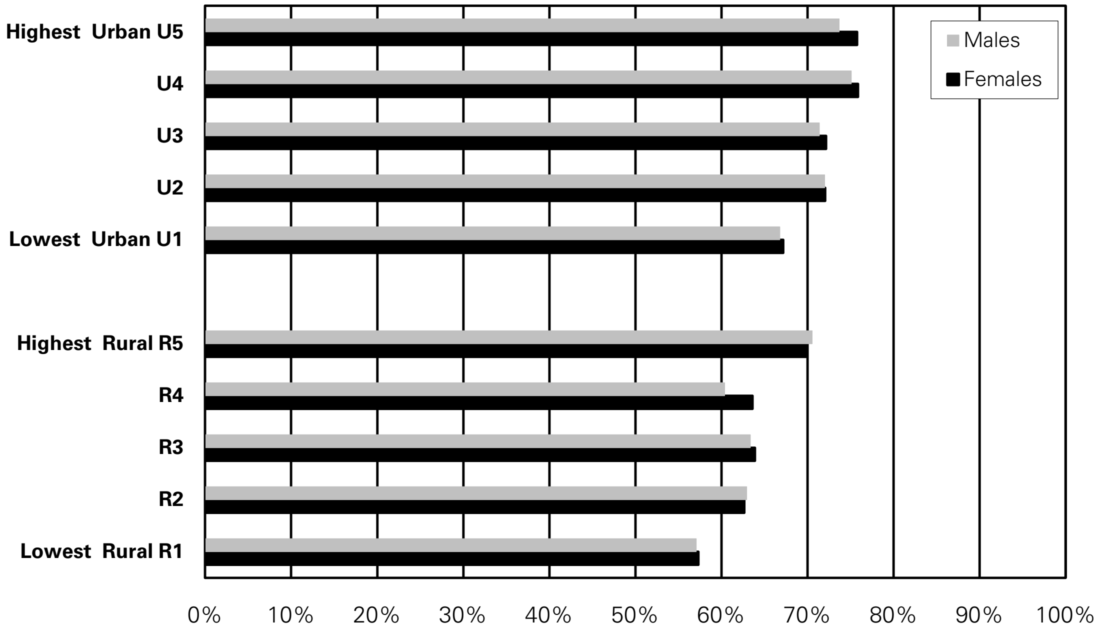
Age-adjusted percent of residents with at least 50% of visits to the same physician



Source: Manitoba Centre for Health Policy, 2005

Figure 4.6.3: Continuity of Care by Income Quintile, 2002/03 – 2003/04

Age-adjusted percent of residents with at least 50% of visits to the same physician



Linear Trend Test Results

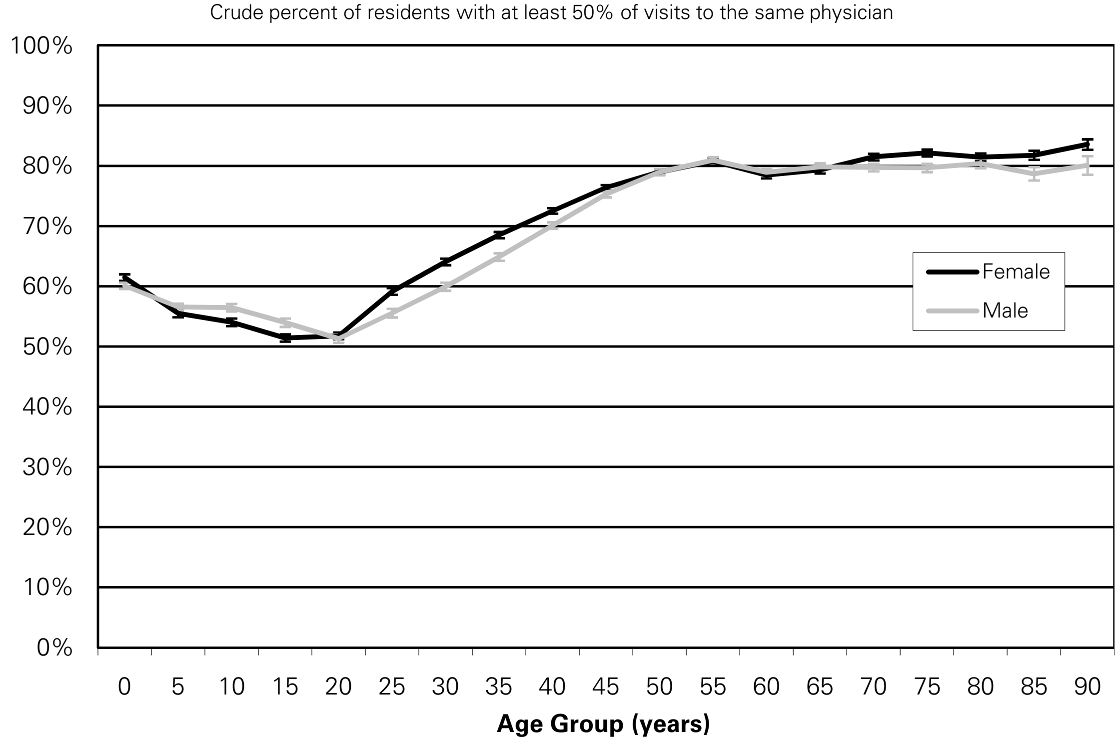
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 4.6.4: Continuity of Care by Age and Sex, 2002/03 – 2003/04

Crude percent of residents with at least 50% of visits to the same physician



Source: Manitoba Centre for Health Policy, 2005

Key findings for continuity of care:

Age-adjusted rates:

- Overall, and for most RHAs, males and females received the same level of continuity of care (72.2% versus 71.8%; not significant).
- Continuity of care was higher among residents of higher income areas; this relationship was significant for males and females in both rural and urban areas.

Crude rates by age & sex:

- Continuity of care was relatively equal across ages for both sexes. Values were lower for children and young adults, and rose slightly through adulthood, reaching a plateau by about age 45.

Comparisons to other findings:

- The results are higher than those reported by Menec et al. (2001), but a higher cut-off was used for their analysis. We show 72% of residents got more than half of their visits from the same provider; their analysis showed 44% got more than three-quarters of their visits from the same provider.

4.7 Physician Visit Rates by Cause

Definition: This shows the 2003/04 visit rates by category of illness, using the 18 Chapters of the ICD-9-CM coding system. The graphs rank the causes by relative frequency of visits: the most common cause of physician visits (circulatory conditions—for both males and females) appears first, and others appear in order of their frequency (separately for each sex, in each area).

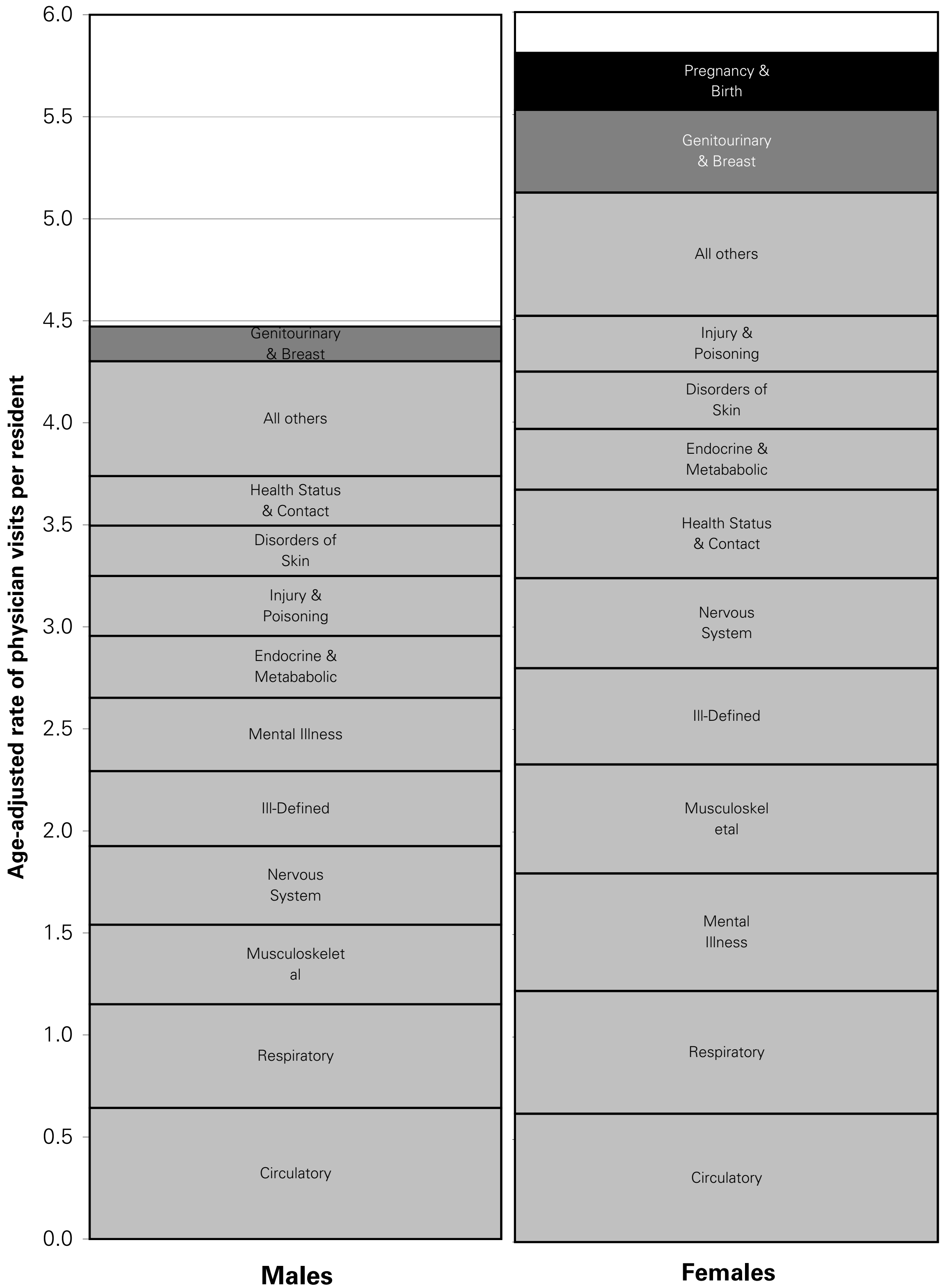
The Manitoba age-adjusted rates are shown in stack-bar graph form so that male and female rates by cause can be directly compared. Visits relating to pregnancy & birth, and to genitourinary & breast disorders were placed at the top so that they can be visually separated from visits for other causes, because these two categories are responsible for much of the difference between male and female visit rates. (Note: the visit rate for females shown here is higher than that in section 4.2 Ambulatory Visits, because prenatal visits were not included in ambulatory visits).

For smaller areas (Rural South, North, Winnipeg, Brandon), the values are shown in pie chart form based on crude rates, because there were too few events in several categories to allow adjusted rates to be accurately calculated.

Key findings for physician visits by cause:

- The values for Manitoba reveal that four of the top five, and 14 of the top 15 reasons for physician visits are the same for males and females, though the ordering is not exactly the same.
- Note: Caution must be used in interpreting the exact ordering, because the difference in rates between adjacent causes can be quite small. For example, among females, the difference between the first cause (circulatory) and the second cause (respiratory) is only 0.03 visits per year (the rates are 0.63 and 0.60, respectively).
- Approximately half of the difference between male and female rates is attributable to pregnancy and birth, and genitourinary and breast disorders, though the rates for several other causes remain higher for females than males.
- Visits for pregnancy and birth comprise 0.275 visits per female per year.
- While the overall trends are similar, there are differences across areas, especially in the North.

Figure 4.7.1: Physician Visit Rates by Cause (ICD-9-CM), Manitoba, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 4.7.2: Physician Visits for Males by Cause (ICD-9-CM), Rural South, 2003/04

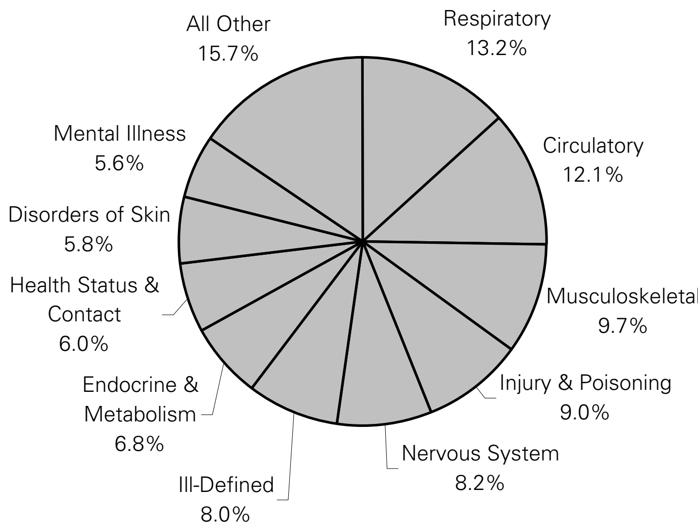


Figure 4.7.3: Physician Visits for Females by Cause (ICD-9-CM), Rural South, 2003/04

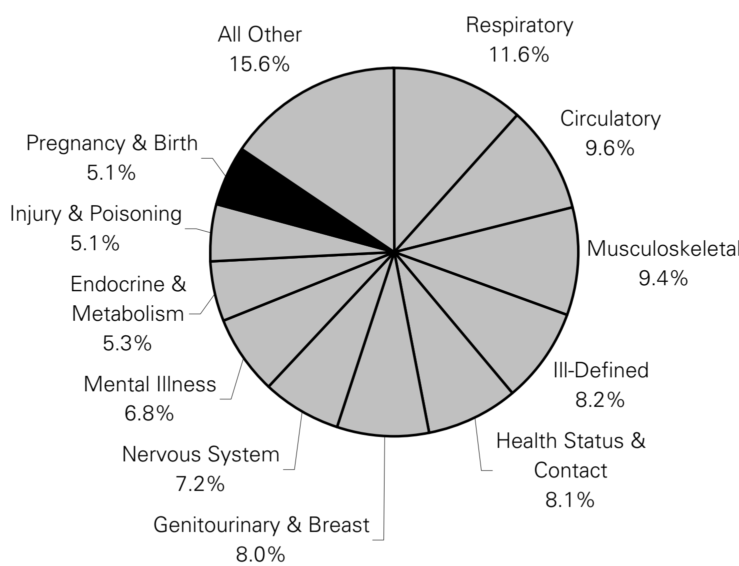


Figure 4.7.4: Physician Visits for Males by Cause (ICD-9-CM), North, 2003/04

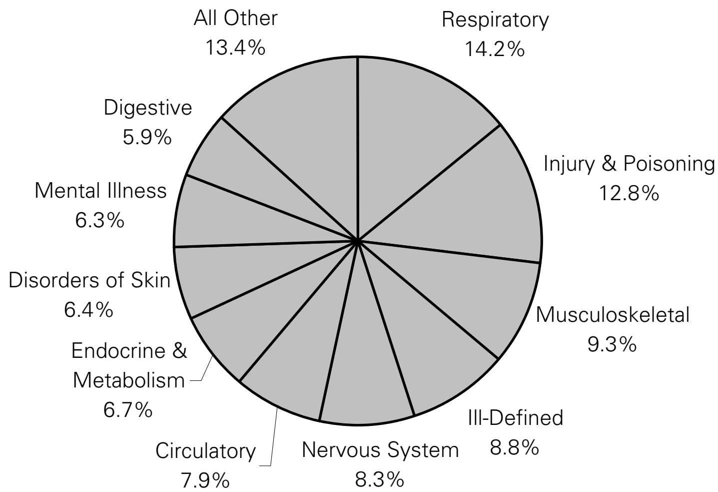


Figure 4.7.5: Physician Visits for Females by Cause (ICD-9-CM), North, 2003/04

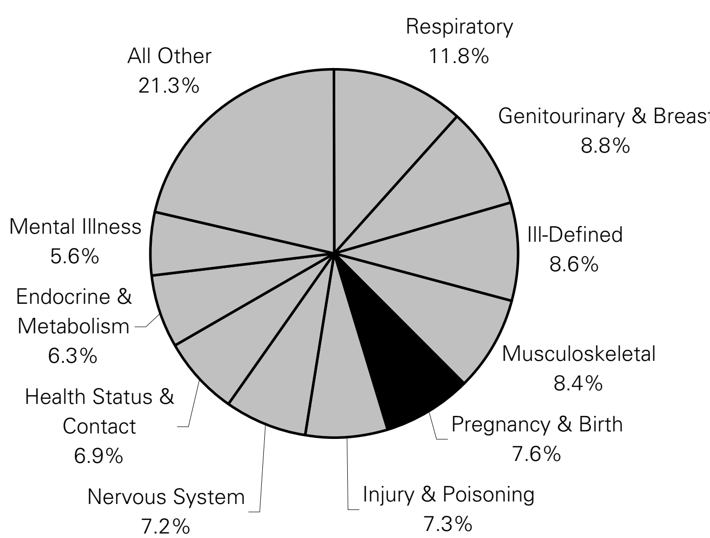


Figure 4.7.6: Physician Visits for Males by Cause (ICD-9-CM), Brandon, 2003/04

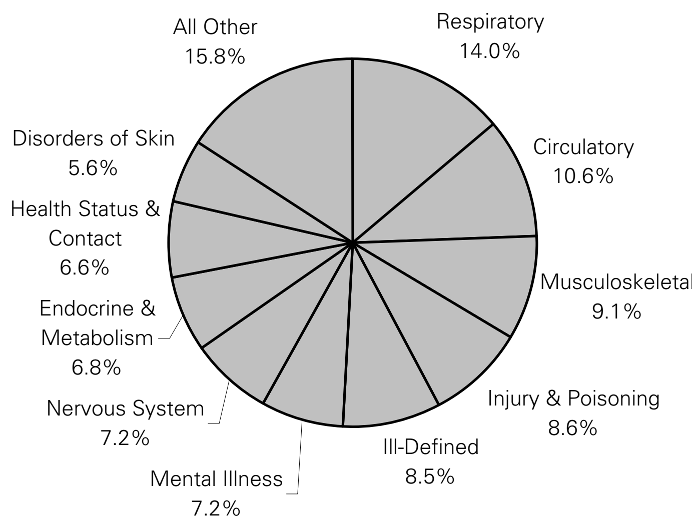


Figure 4.7.7: Physician Visits for Females by Cause (ICD-9-CM), Brandon, 2003/04

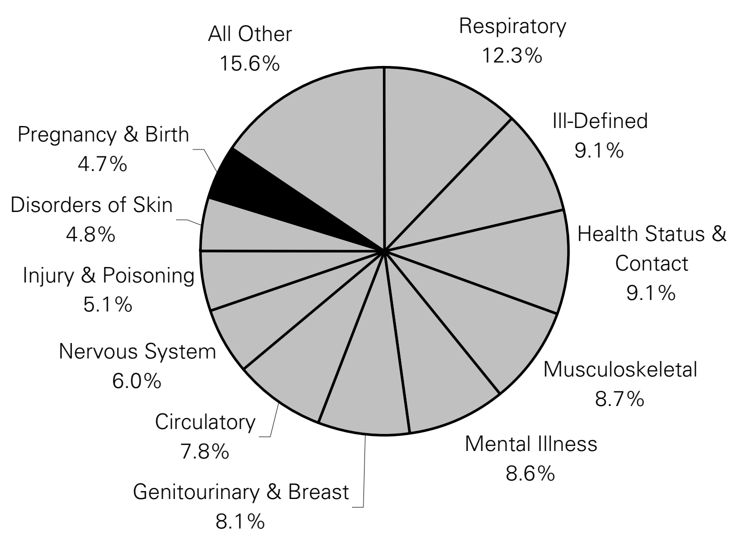


Figure 4.7.8: Physician Visits for Males by Cause (ICD-9-CM), Winnipeg, 2003/04

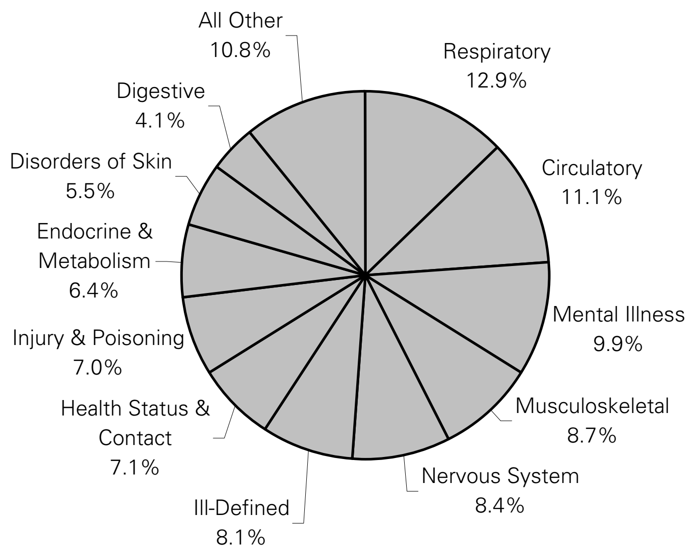
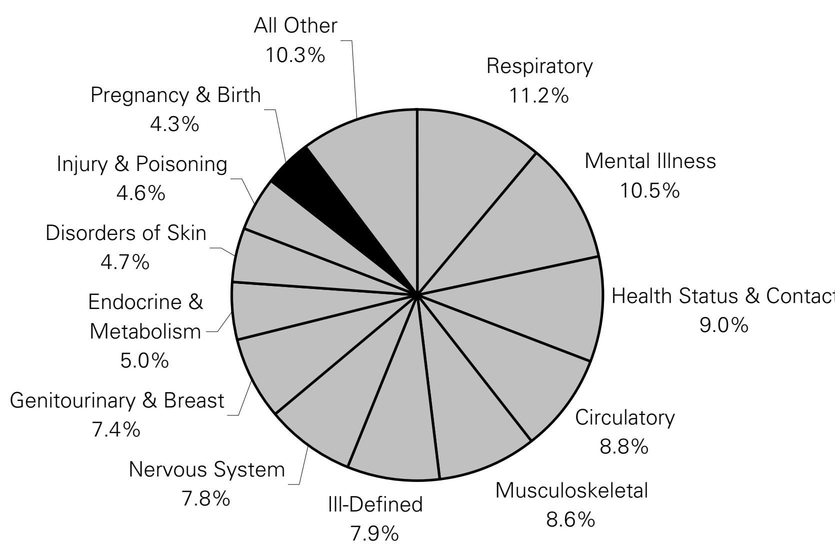


Figure 4.7.9: Physician Visits for Females by Cause (ICD-9-CM), Winnipeg, 2003/04



Comparisons to other findings:

- These results are consistent with those in previous MCHP reports, including the RHA Indicators Atlas (Martens et al., 2003) and the Mental Illness Report (Martens et al., 2004).
- The results are also similar to those from another study using MCHP data (Mustard et al., 1998). In that analysis, extra effort was made to isolate and remove services for sex-specific issues, and care provided in the last year of life. They examined costs associated with physician services, and found that male and female values were almost equal after these adjustments were made.
- Dalhousie University's Population Health Research Unit also published similar analyses, though the results were not separated by sex, and divided the population into four broad age groups. However, it was still clear that respiratory and circulatory diseases were leading causes, along with musculoskeletal, metabolic, mental illness, and nervous system (Capital Health District, 2005).

4.8 Visit Rates by Physician Specialty

Definition: This analysis shows 2003/04 visit rates by the specialty of the physician providing the care. These graphs rank physician groups in order of visit rates: the group of physicians providing the highest visit rates (GP/FPs —for both males and females) appears first, and others appear in order of their frequency (separately for each sex, for each area).

The Manitoba age-adjusted rates are shown in stack-bar graph form so that male and female rates by specialty can be directly compared. Visits to Obstetricians and Gynaecologists were placed at the top so that they could be visually separated from visits to other physicians. The visit rate for females shown here is higher than that in section 4.2 Ambulatory Visits, because prenatal visits were not included in ambulatory visits.

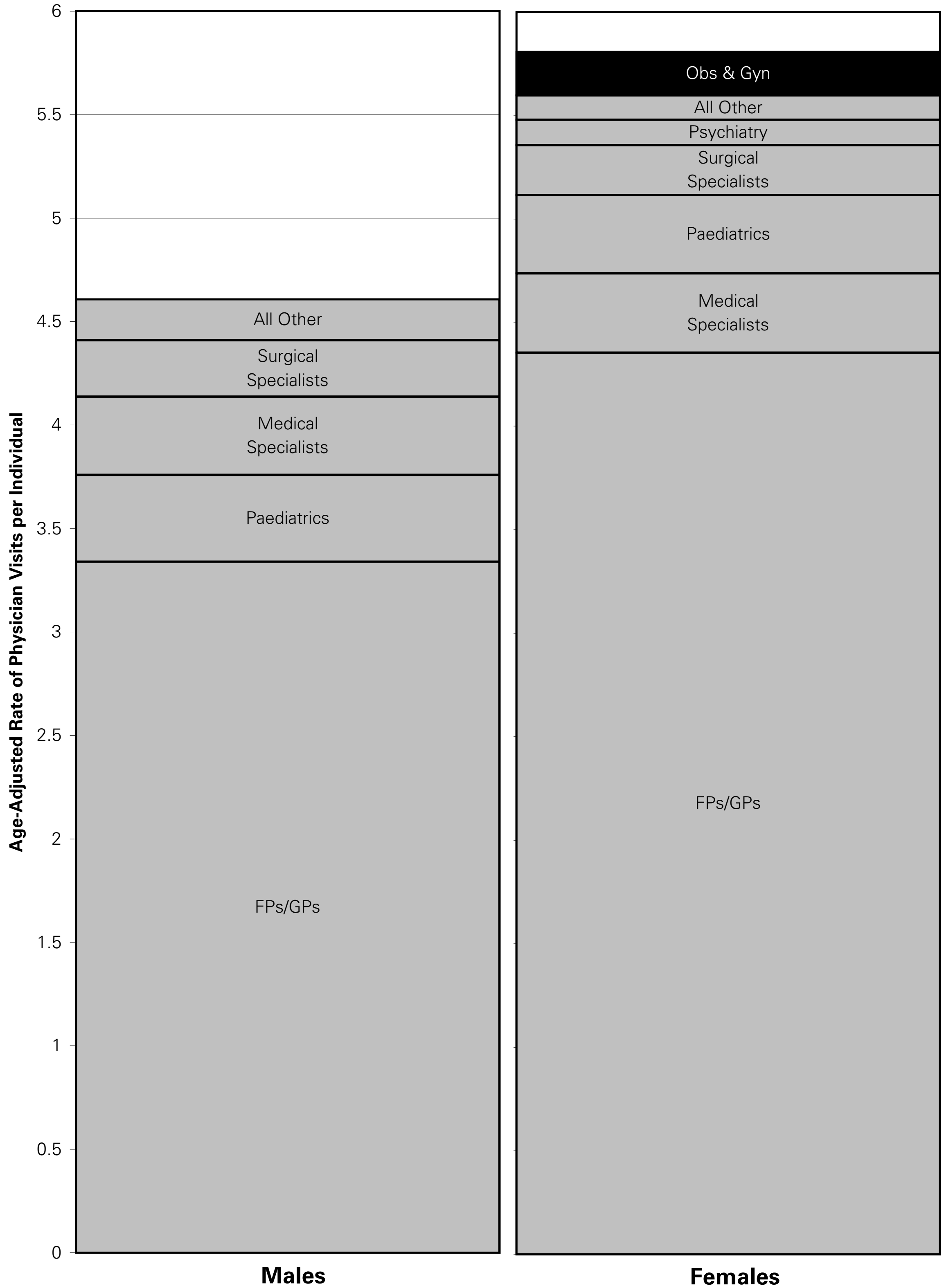
For the aggregate areas (Rural South, North, Winnipeg, Brandon), the values are shown in pie chart form based on crude rates, because there were too few visits to several specialties to allow age-adjusted rates to be accurately calculated.

'Medical Specialists' includes both general internists and subspecialist physicians. 'Paediatricians' includes both general and subspecialist pediatricians. Physician specialty was taken from the 'billing block' field in the medical claims data. (Non-certified specialist physicians, including some foreign-trained specialists, are classified as GPs in medical claims.)

Key findings for visit rates by specialty:

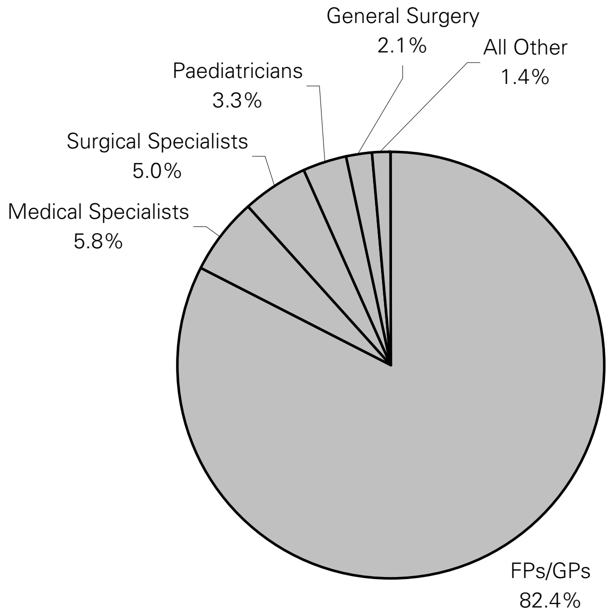
- For both sexes, the vast majority of visits (75.6% for males, 77.3% for females) are provided by GP/FPs, followed by Medical specialists, then Paediatricians.
- The proportion of visits provided by GP/FPs is even higher among rural and especially northern residents (87.6% for males, 87.2% for females).
- For Winnipeg residents, the proportions of visits to GP/FPs are lower: 65.9% for males and 68.2% for females, reflecting the higher rate at which Winnipeg residents visit specialist physicians (see section 4.7).
- Visits for pregnancy and birth comprise 0.275 visits per female per year, just over half of which are to GP/FPs, and just under half to Obstetricians.

Figure 4.8.1: Ambulatory Visits by Physician Specialty, Manitoba, 2003/04



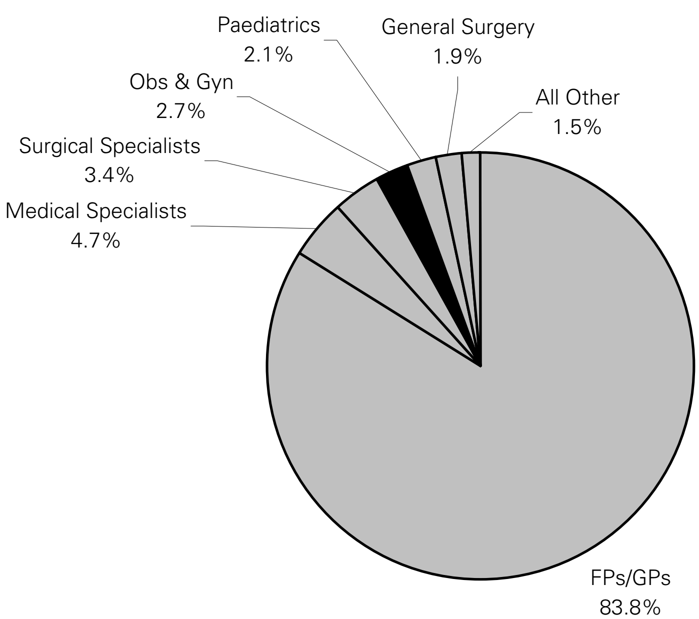
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.2: Ambulatory Visits for Males by Physician Specialty, Rural South, 2003/04



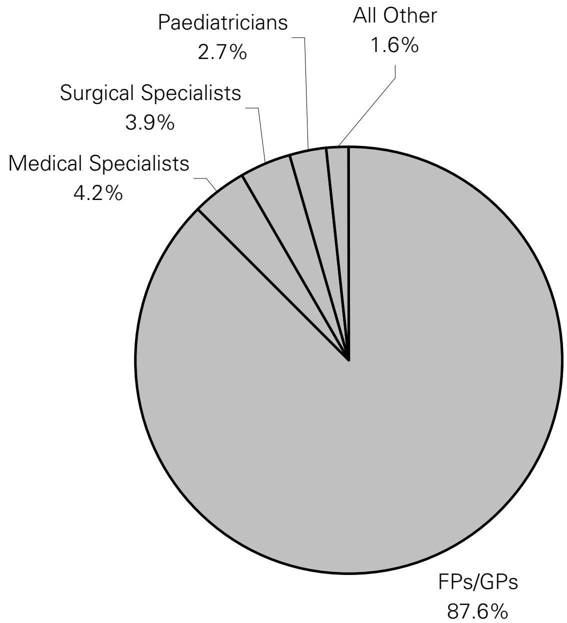
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.3: Ambulatory Visits for Females by Physician Specialty, Rural South, 2003/04



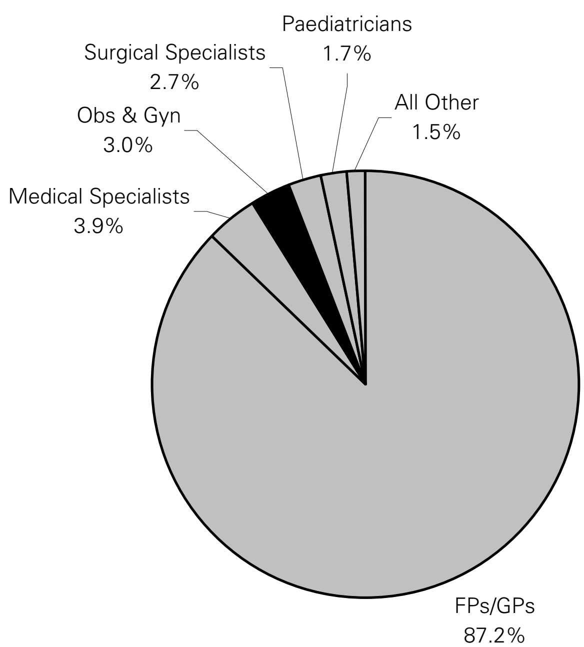
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.4: Ambulatory Visits for Males by Physician Specialty, North, 2003/04



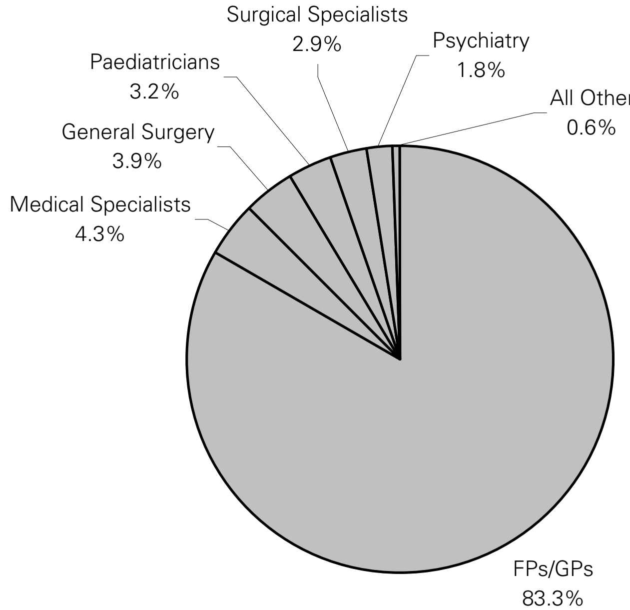
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.5: Ambulatory Visits for Females by Physician Specialty, North, 2003/04



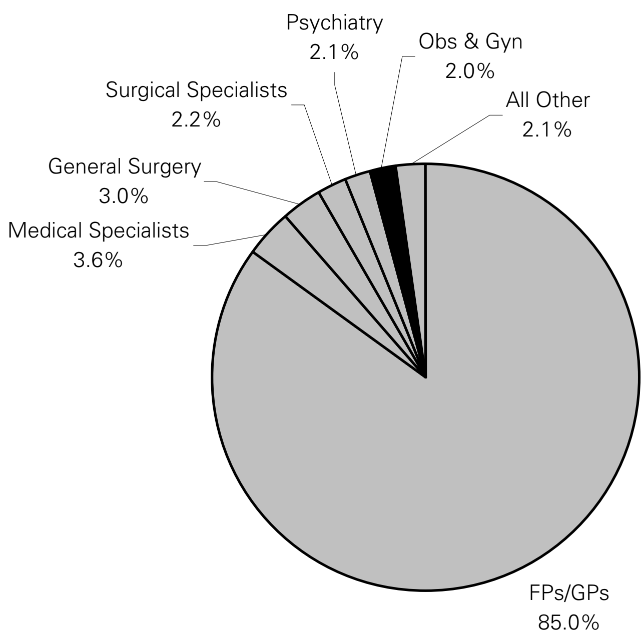
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.6: Ambulatory Visits for Males by Physician Specialty, Brandon, 2003/04



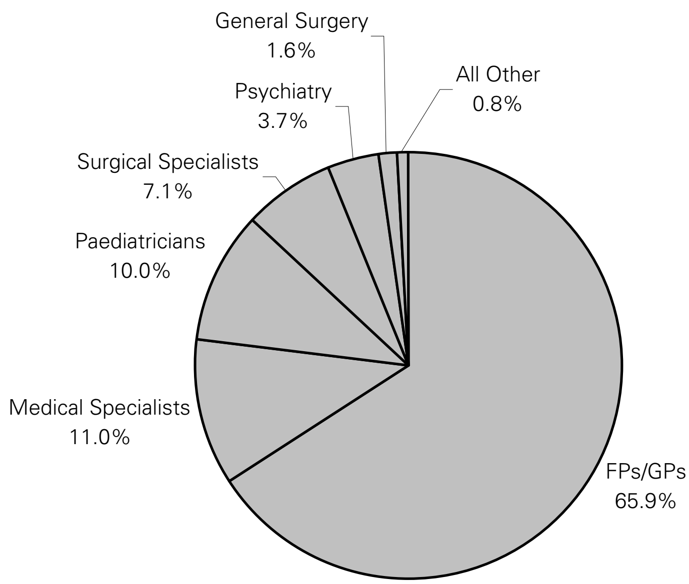
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.7: Ambulatory Visits for Females by Physician Specialty, Brandon, 2003/04



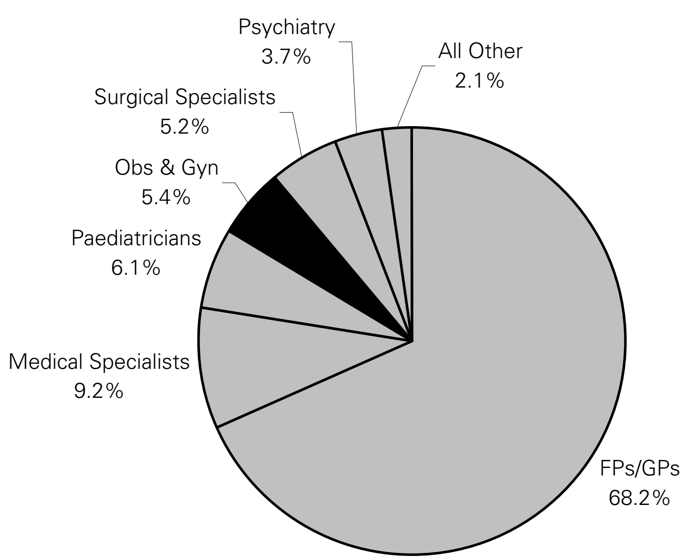
Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.8: Ambulatory Visits for Males by Physician Specialty, Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 4.8.9: Ambulatory Visits for Females by Physician Specialty, Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Comparisons to other findings:

- These results are slightly higher than those reported in the RHA Indicators Atlas (Martens et al., 2003), which showed that 74.2% and 74.5% of all visits were to GP/FPs in 1995/96 and 2000/01, respectively. The combined male/female average in this report shows that 76.6% of visits were to GP/FPs.

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CHAPTER 5: HOSPITAL SERVICES

This chapter provides indicators of use of hospital services, including:

Separations:
5.1 Total Separation Rates
5.2 Separation Rates for Short Stays (0 to 29 days)
5.3 Separation Rates for Short Stays by Cause
5.4 Separation Rates for Long Stays (30+ days)
5.5 Separation rates for Long Stays (30+ days) by Cause
5.6 Separation Rates for Inpatient Care
5.7 Separation Rates for Day Surgery

Days used:
5.8 Total Hospital Days Used
5.9 Hospital Days used for Short Stays (1 to 29 days)
5.10 Hospital Days used for Short Days (0 to 29 days) by Cause
5.11 Hospital Days used for Long Stays (30+ days)
5.12 Hospital Days used for Long (30+) Stays by Cause

Key Findings for Chapter 5: Hospital Services

- For most indicators of hospital use, females had higher rates than males (162.0 versus 126.6 separations per 1,000 residents, p<.001), though the difference was eliminated once hospital use for childbirth and reproductive health issues were removed (leaving 100.6 separations per 1,000 females, versus 109.6 for males).
- The differences were larger for separation rates than for days used; in fact, for total hospital days, the female rate was not significantly higher than the male rate (998.1 days per 1,000 females, versus 878.2 for males).
- The ‘reasons for’ hospitalizations were similar for males and females, after childbirth and reproductive health issues were removed: the top 10 of the remaining 16 causes were the same, though the ordering was different.
- The top five for males were: circulatory, digestive, respiratory, nervous system, and injury & poisoning.
- For females, pregnancy & birth, and genitourinary & breast were the top two, but after those, the next five were: digestive, nervous system, circulatory, cancer, and musculoskeletal.
- Use of hospital services appeared to be strongly needs-based, for both males and females:
- By area-level income: almost all indicators showed much higher rates of hospital use among residents of lower income areas, both urban and rural, consistent with their higher burden of illness.

- By Regional Health Authority (RHA): residents of RHAs with less healthy populations had higher rates of hospital use, consistent with their higher need.

Introduction:

This chapter provides information on the use of hospital services, including 'separation rates' (hospital discharges), and days of stay in hospital. Total rates are provided, then divided into short versus long stays (30+ days). Crude rates and observed numbers for each of the indicators are also given in Appendix 4.

These are population-based rates, so all hospitalizations of area residents are included in each area's rate, regardless of where the hospitalization took place. For example, if a North Eastman resident is hospitalized in Winnipeg, that hospitalization is attributed back to the rate for North Eastman.

These indicators are intended to reflect use of 'acute care' hospitals, so facilities dedicated to chronic care or long term care were excluded (e.g. Deer Lodge, Riverview, Rehabilitation Centre for Children, and Adolescent Treatment Centre).

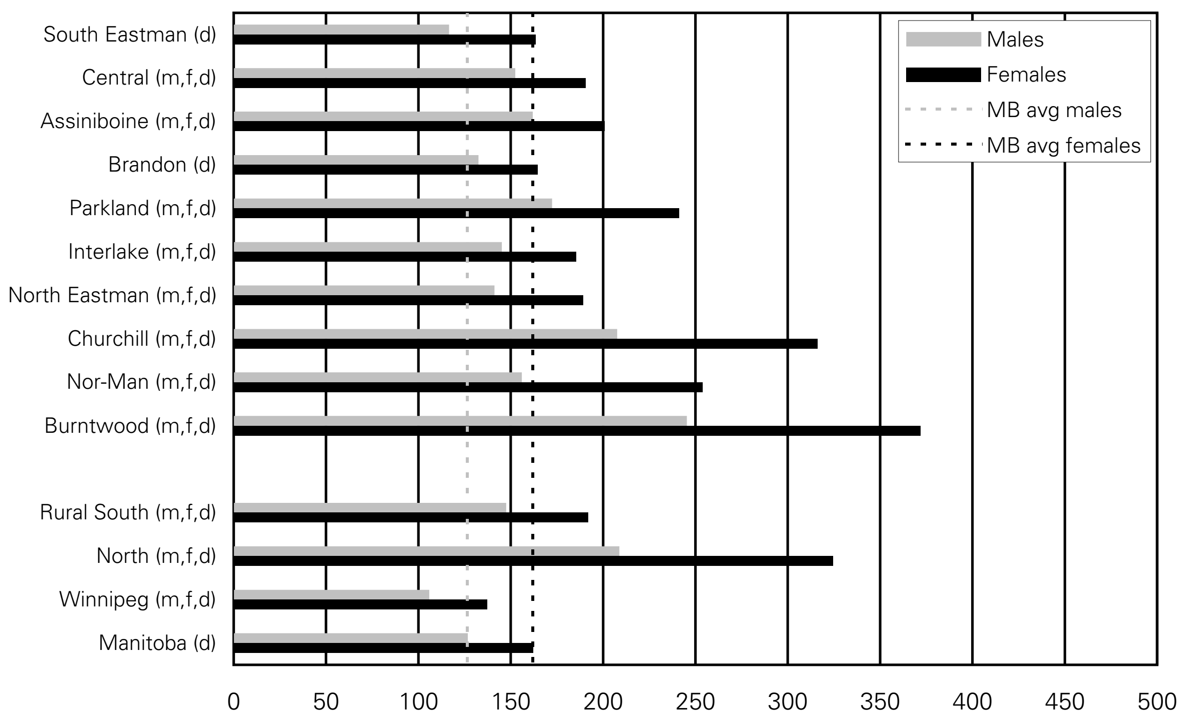
The Churchill Health Centre (hospital) includes some patients that are essentially Personal Care Home (PCH) residents, so they were excluded from hospital analyses using service codes.

5.1 Total Separation Rates

Definition: This is the 2003/04 rate of hospitalizations per 1,000 area residents, counting all cases for which a hospital abstract is created (all inpatient cases plus day surgery cases). Multiple admissions of the same person are counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.1.1: Total Hospital Separation Rates by RHA, 2003/04

Age-adjusted rate of hospital separations per 1,000 residents

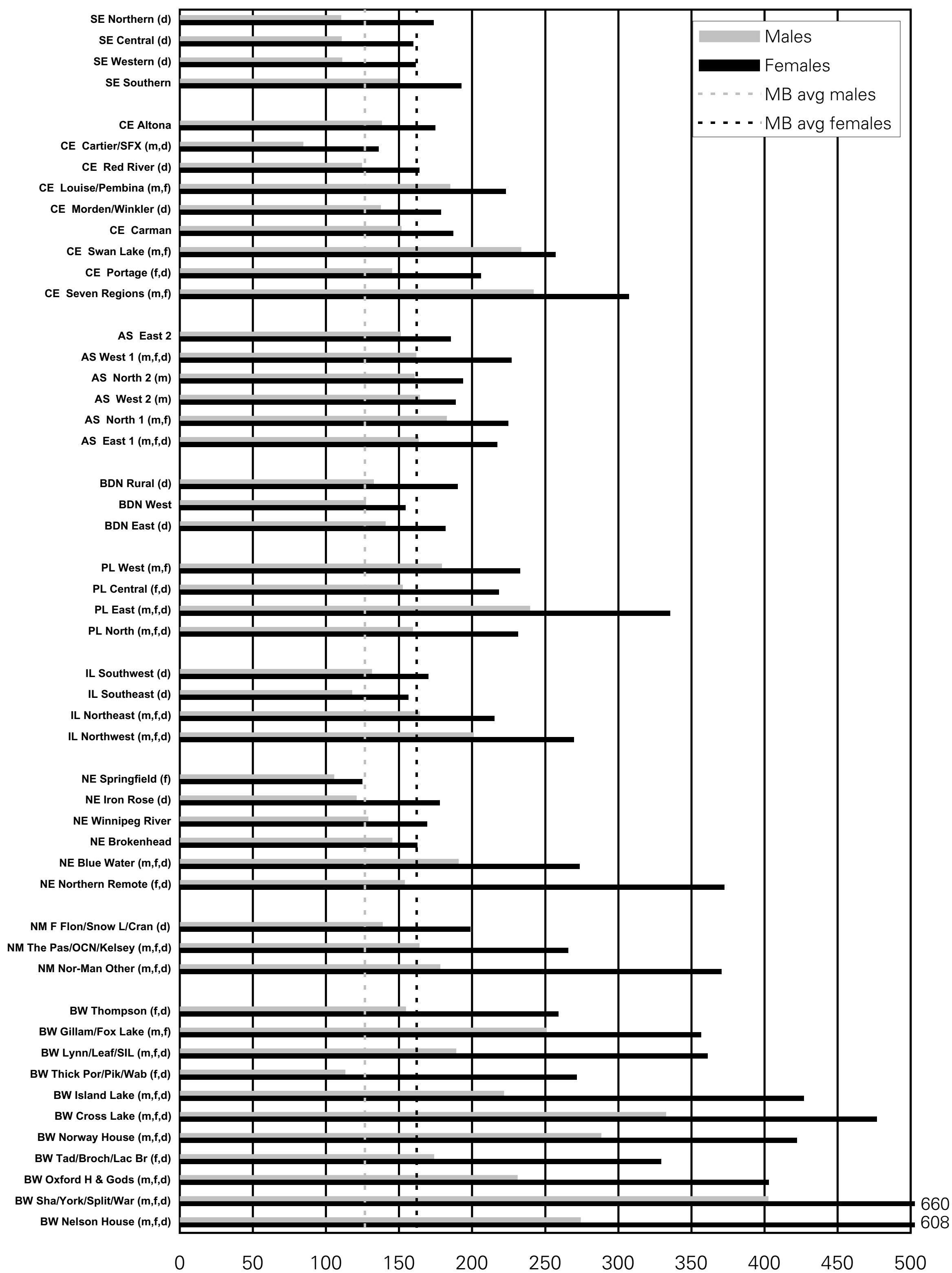


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.1.2: Total Hospital Separation Rates by District, 2003/04

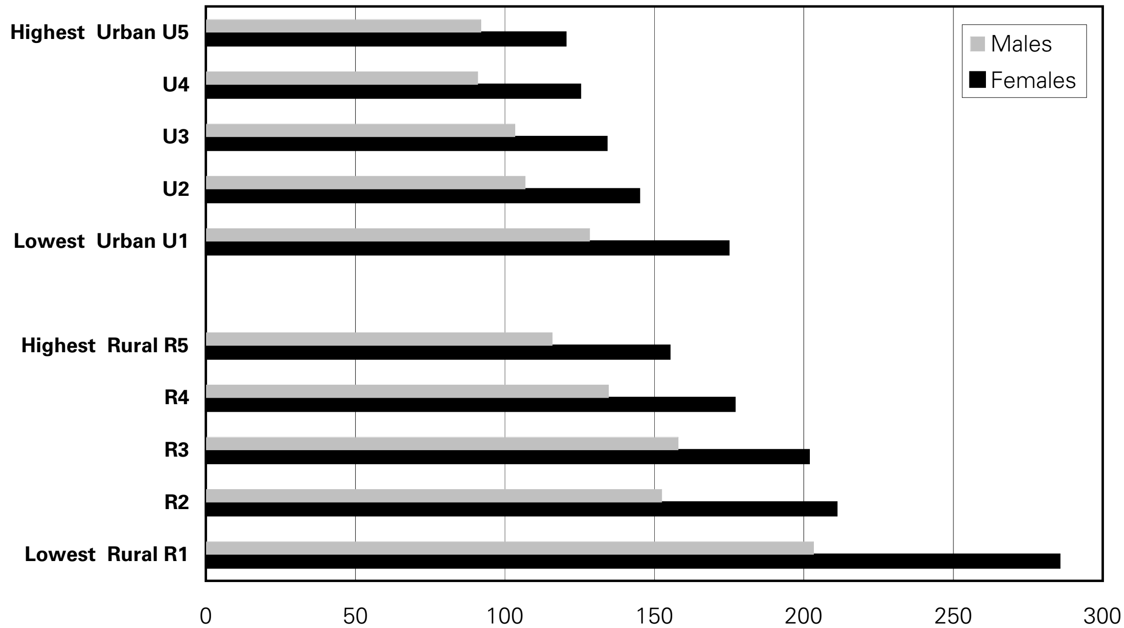
Age-adjusted rate of hospital separations per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.1.3: Total Hospital Separation Rates by Income Quintile, 2003/04

Age-adjusted rate of hospital separations per 1,000 residents



Linear Trend Test Results

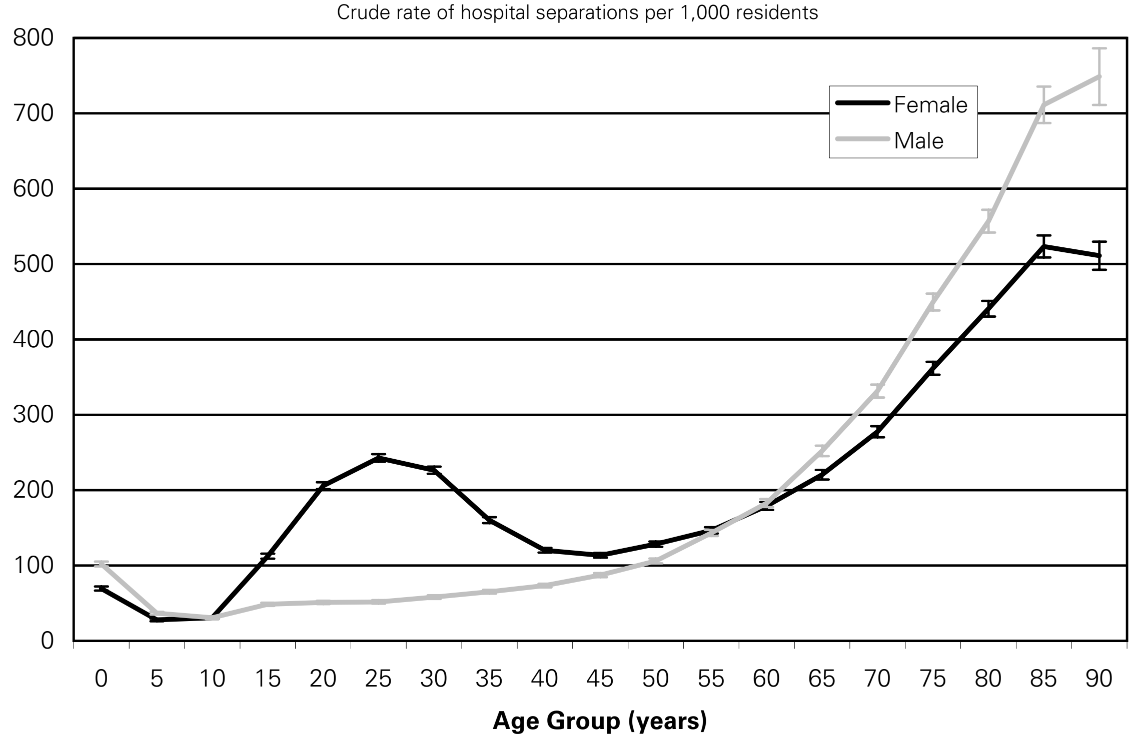
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.1.4: Total Hospital Separation Rates by Age and Sex, 2003/04

Crude rate of hospital separations per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for hosptial separation rates:

Age-adjusted rates:

- Overall, and for each RHA and District, hospitalization rates are higher for females than males (162.0 versus 126.6 separations per 1,000 residents, p<.001), though this difference is eliminated once hospital use for reproductive issues are removed (see Section 5.3 hospitalizations by cause for a more complete discussion of the differences).
- There is a strong relationship between hospitalization rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas, corresponding to their higher illness burden and need for care.

Crude rates by age & sex:

- For males, hospitalization rates are low in childhood, and only slightly higher through young adulthood. Rates begin to rise in middle age, and are dramatically higher in old age. For females, rates are low in childhood but higher during the reproductive years. Rates then drop off somewhat, and begin rising again in middle age, reaching their highest levels in old age.

Comparison to other findings:

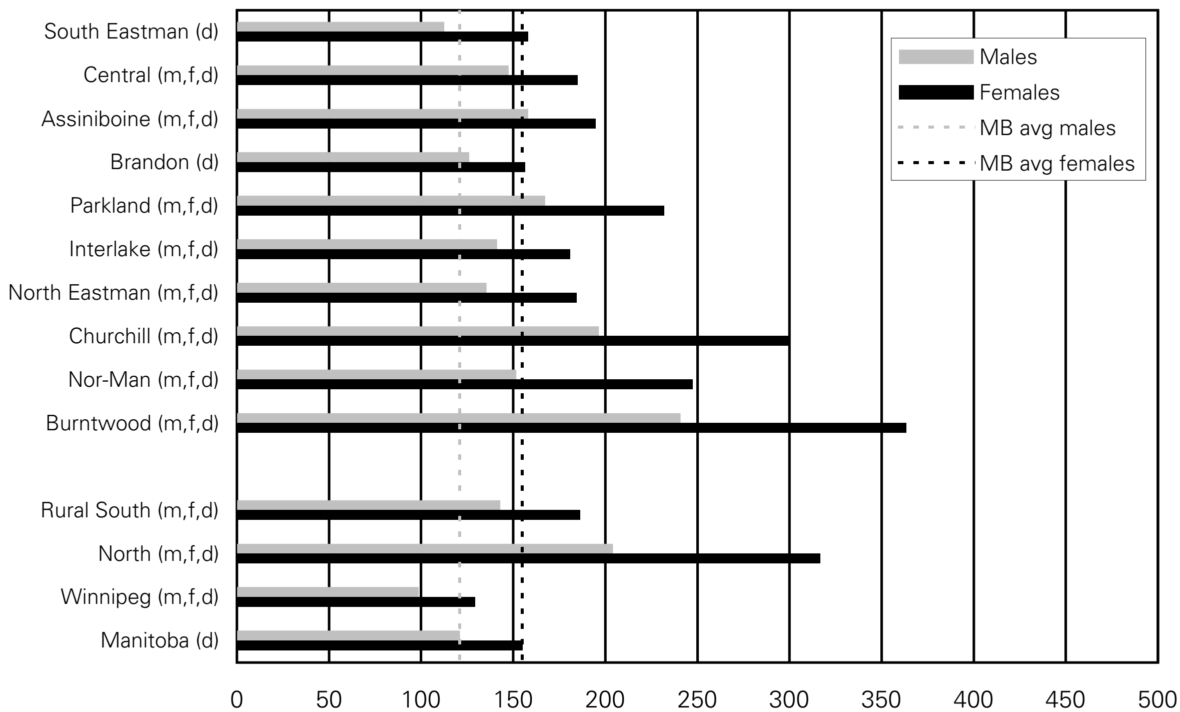
- These hospitalization rates are lower than those in the RHA Indicators Atlas (Martens et al, 2003), because of a change in coding practices. As of April 2001, several high-volume outpatient procedures no longer require outpatient abstracts to be completed (biopsies and removal of minor lumps).

5.2 Separation Rates for Short Stays (0-29 Days)

Definition: This is the 2003/04 rate of hospital separations for stays of 0 to 29 days (i.e. including day surgery cases), per 1,000 area residents. Multiple admissions of the same person are counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.2.1: Hospital Separations for Short Stays by RHA, 2003/04

Age-adjusted rate of hospital separations for stays of less than 30 days, per 1,000 residents

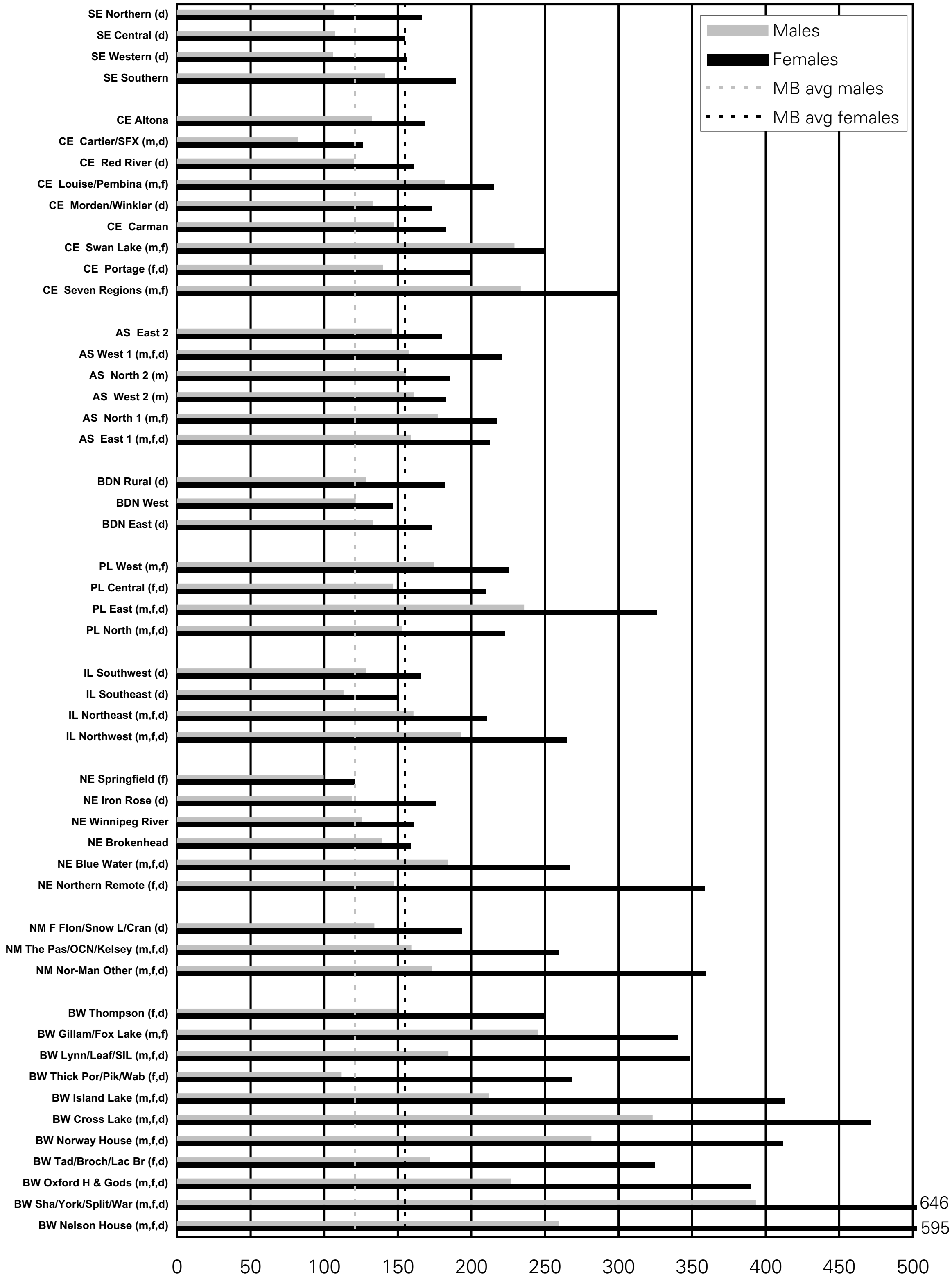


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.2.2: Hospital Separations for Short Stays by District, 2003/04

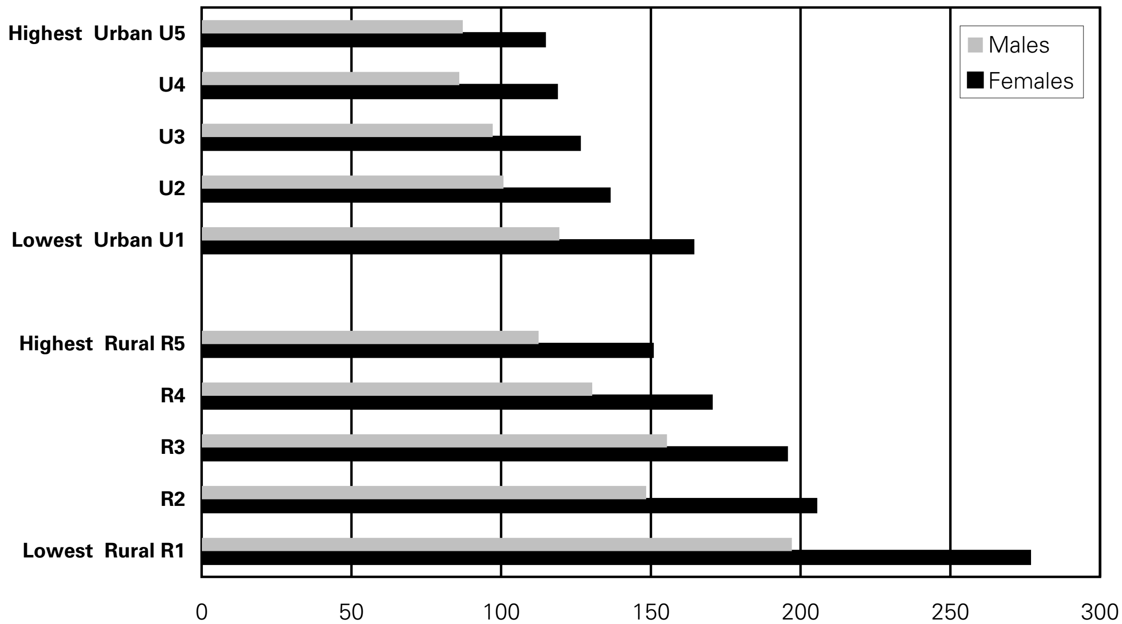
Age-adjusted rate of hospital separations for stays of less than 30 days, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.2.3: Hospital Separations for Short Stays by Income Quintile, 2003/04

Age-adjusted rate of hospital separations for stays of less than 30 days, per 1,000 residents



Linear Trend Test Results

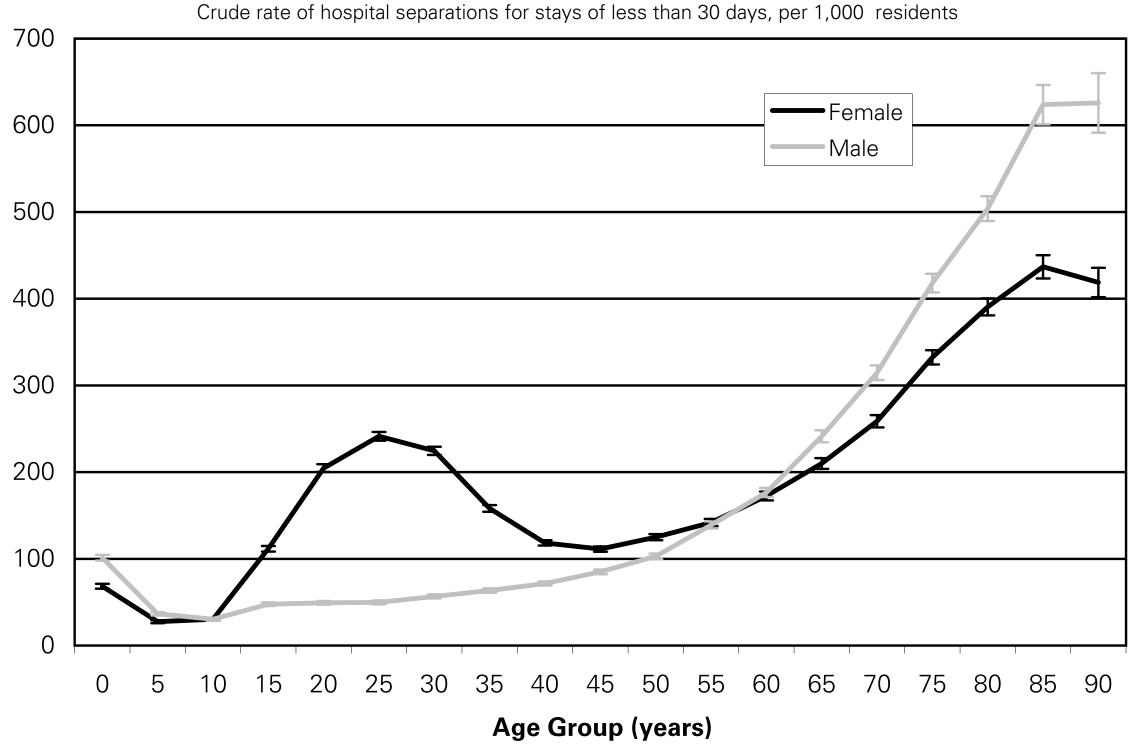
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.2.4: Hospital Separations for Short Stays by Age and Sex, 2003/04

Crude rate of hospital separations for stays of less than 30 days, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for short-stay hospital separation rates:

Age-adjusted rates:

- Overall, and for each RHA and District, short-stay hospitalization rates are higher for females than males (154.8 versus 121.0 per 1,000 residents, $p<.001$).
- For both males and females, short-stay hospitalization rates are generally higher in areas with less healthy residents.
- There is a strong relationship between short-stay hospitalization rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- For males, short-stay hospitalization rates are low in childhood, and only slightly higher through young adulthood. Rates begin to rise in middle age, and are dramatically higher in old age. For females, rates are low in childhood but higher during the reproductive years. Rates then drop off somewhat, and begin rising again in middle age, reaching their highest levels in old age.

Comparison to other findings:

- Black et al. (1999) reported short-and long-stay separation rates by RHA, but used 45 days as the cut-off, versus 30 days for this analysis. Overall trends by RHA are similar to those reported here, though again current values are lower because of the coding change: as of April 2001, several high-volume outpatient procedures no longer require outpatient abstracts to be completed (biopsies and removal of minor lumps).

5.3 Separation Rates for Short Stays by Cause

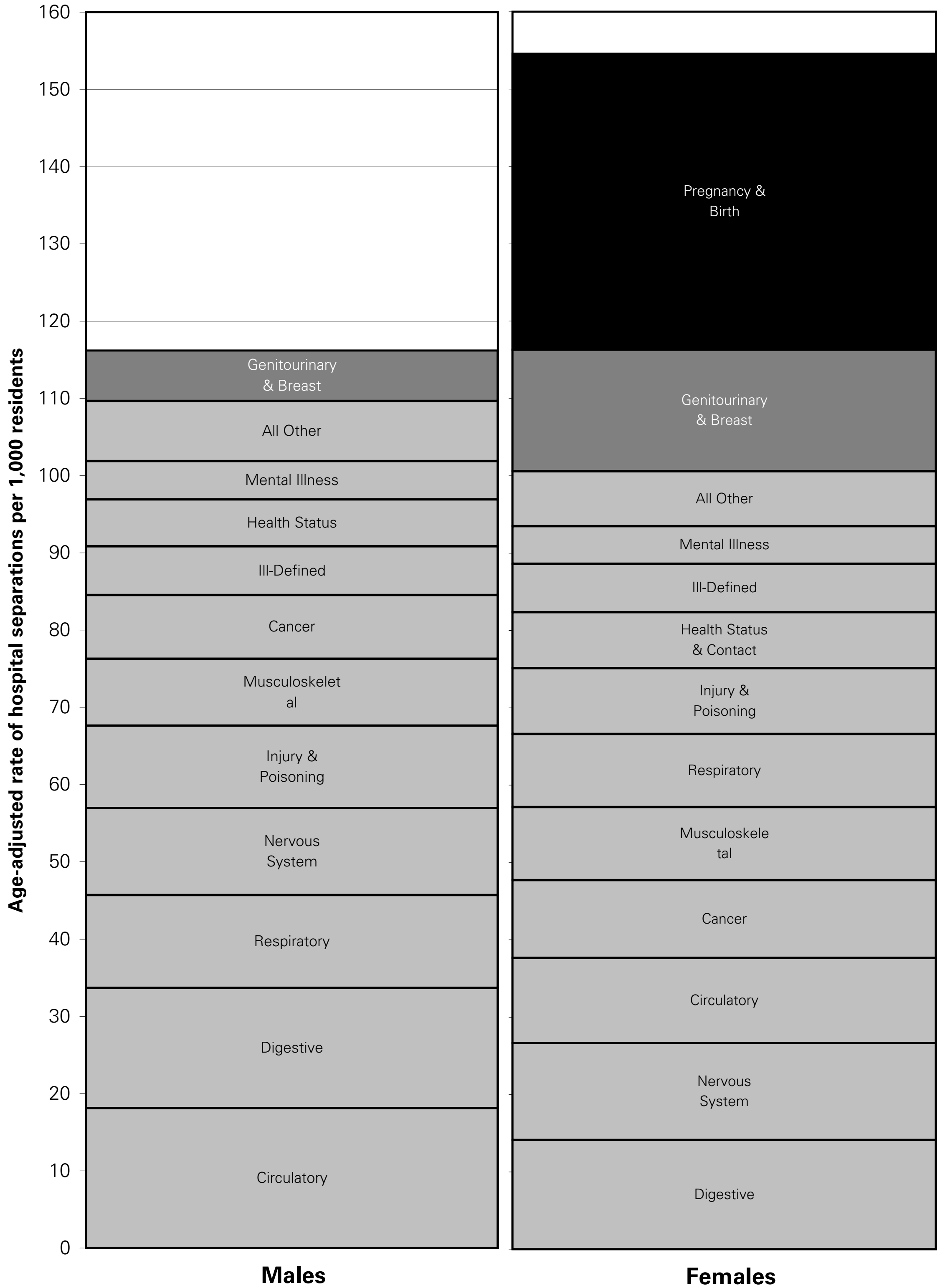
Definition: This is the 2003/04 rate of hospitalizations for short stays by general category of illness, using the 18 chapters of the ICD-9-CM coding system. This analysis categorizes each hospitalization according to the Most Responsible Diagnosis. The statistical method used to calculate rates by cause was different from that used in other analyses, so the 'total' values are not exactly the same as in section 5.2.

These graphs rank causes by relative frequency of hospitalization: the most common cause is shown first, followed by others in order of their frequency (for that sex, in that area). Manitoba rates are shown in stack-bar graph form, so that age-adjusted rates by cause can be fairly compared between sexes. Hospitalizations relating to pregnancy and birth and to genitourinary and breast disorders were placed at the top to allow comparison of male and female rates excluding those causes.

Key findings for short-stay separations by cause:

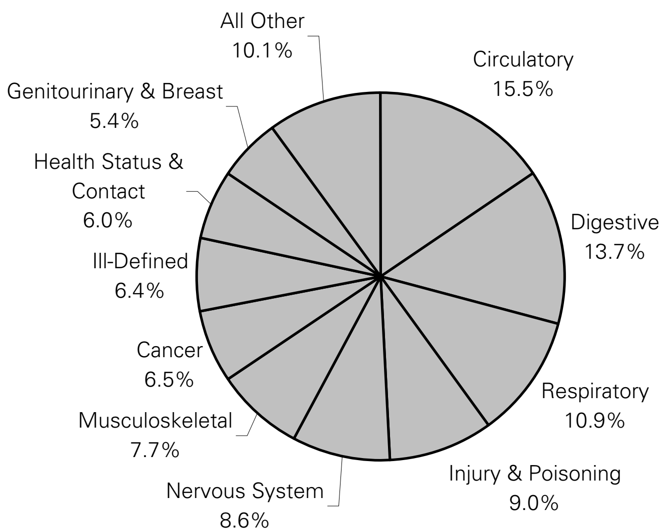
- Overall, female hospitalization rates were higher than those for males, but once hospitalizations for pregnancy & birth and genitourinary & breast disorders were removed, female rates were actually lower than males (100.6 per 1,000 females, versus 109.6 for males).
- For females, pregnancy and birth was by far the most common cause of short-stay hospitalizations, accounting for 24.8% of the total; genitourinary & breast disorders was next, at 10.2%.
- Of the 16 categories remaining after excluding pregnancy & birth and genitourinary and breast, the top 10 were the same for males and females, though the ordering was different:
  - Males: circulatory, digestive, respiratory, nervous system, injury & poisoning, musculoskeletal, cancer, ill-defined, health status & contact, and mental illness.
  - Females: digestive, nervous system, circulatory, cancer, musculoskeletal, respiratory, injury & poisoning, health status & contact, ill defined, and mental illness.
  - Note: Caution must be used in interpreting the exact ordering, because the differences between adjacent causes can be quite small.
- The patterns are generally similar across the regions shown, though there are some differences, particularly among northern residents, where injury & poisoning ranks higher than in other areas.

Figure 5.3.1: Separations for Short Stays by Cause (ICD-9-CM), Manitoba, 2003/04



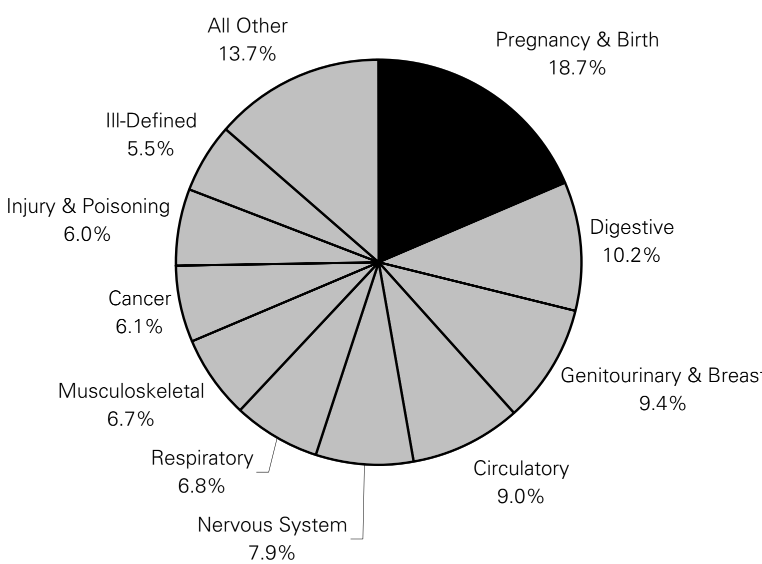
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.2: Crude Separations for Short Stays for Males by Cause (ICD- 9-CM), Rural South, 2003/04



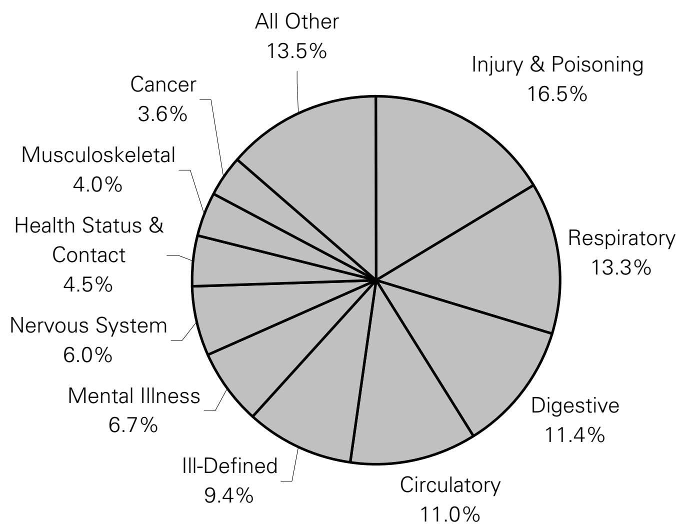
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.3: Crude Separations for Short Stays for Females by Cause (ICD- 9-CM), Rural South, 2003/04



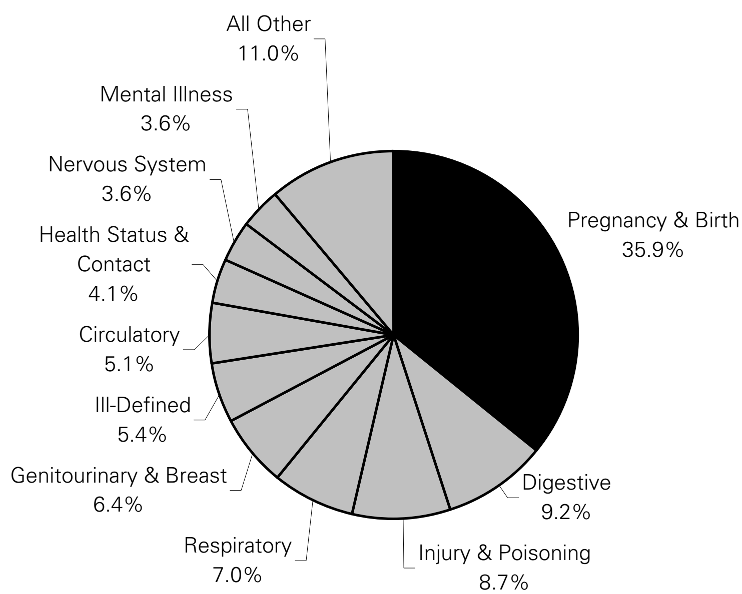
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.4: Crude Separations for Short Stays for Males by Cause (ICD- 9-CM), North, 2003/04



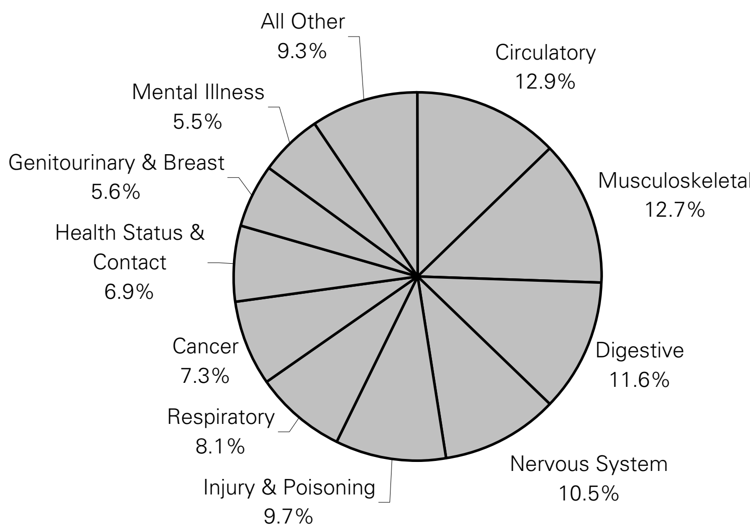
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.5: Crude Separations for Short Stays for Females by Cause (ICD- 9-CM), North, 2003/04



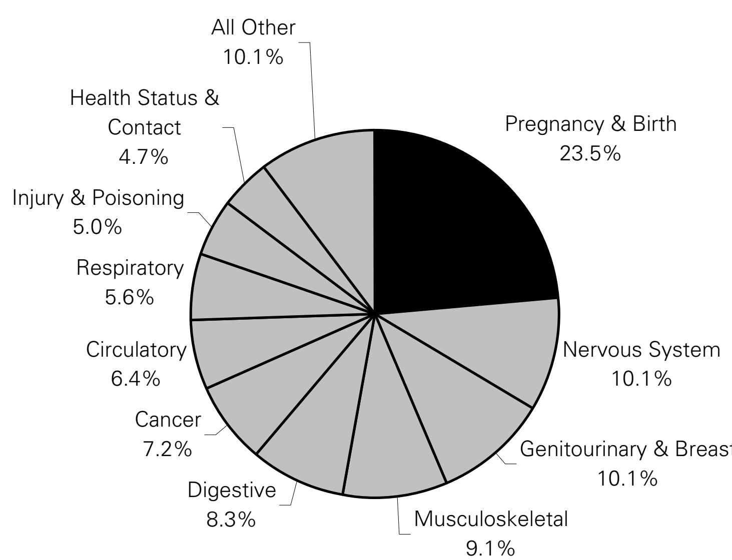
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.6: Crude Separations for Short Stays for Males by Cause (ICD- 9-CM), Brandon, 2003/04



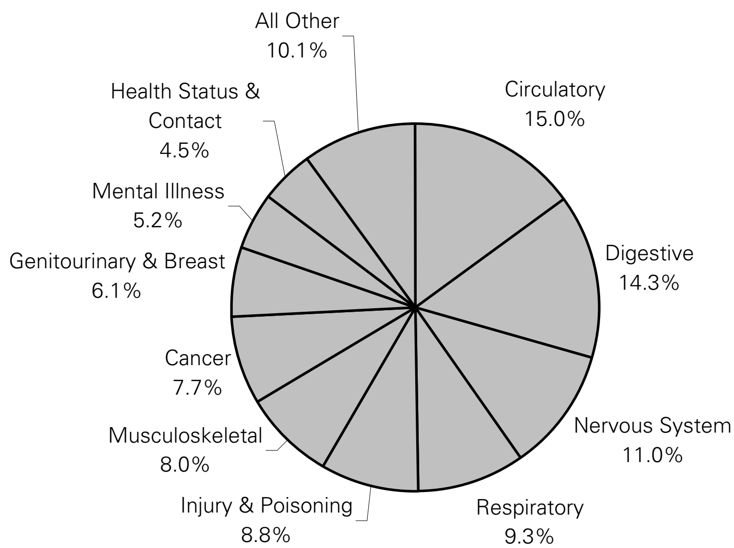
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.7: Crude Separations for Short Stays for Females by Cause (ICD- 9-CM), Brandon, 2003/04



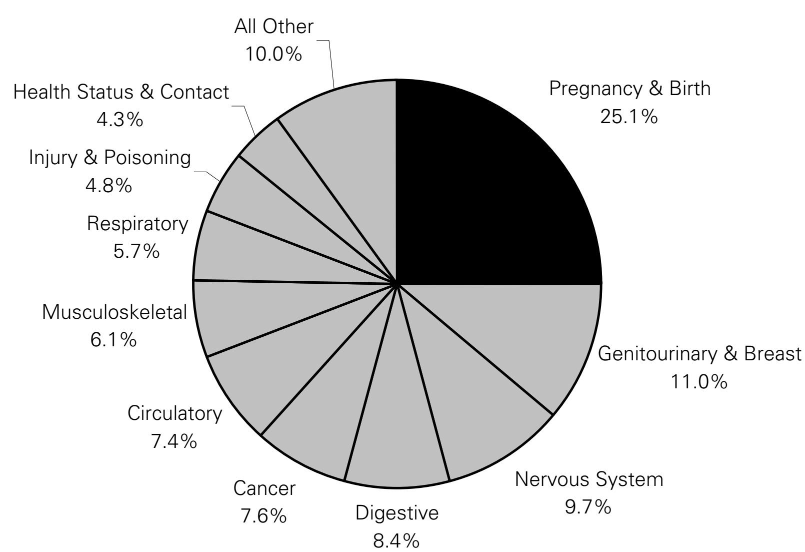
Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.8: Crude Separations for Short Stays for Males by Cause (ICD- 9-CM), Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 5.3.9: Crude Separations for Short Stays for Females by Cause (ICD- 9-CM), Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Comparisons to other findings:

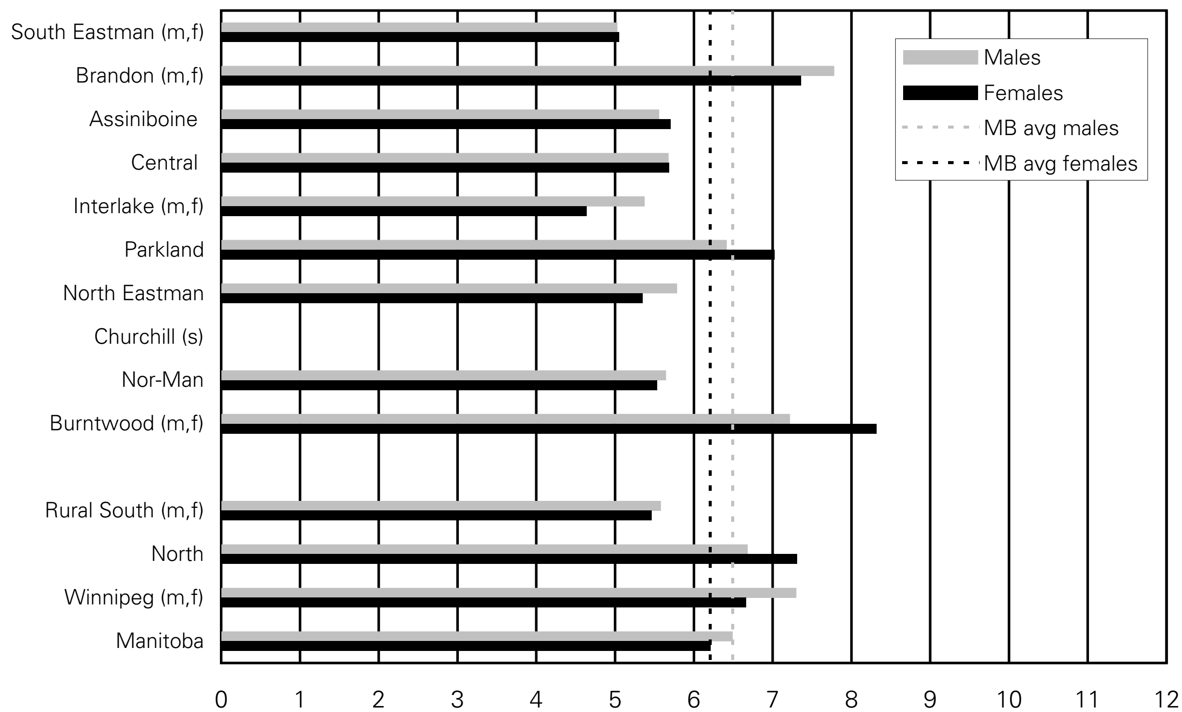
- The values are consistent with those in previous MCHP reports, including the RHA Indicators Atlas (Martens et al., 2003) and the Mental Illness Report (Martens et al., 2004), which showed the same categories of illness to be the top causes of hospitalizations.
- Results from the Canadian Institute for Health Information (CIHI) are similar, though disorders of the nervous system were not among the national top five causes. (CIHI, 2003)
- The results are also similar to those from another study using Manitoba Centre for Health Policy (MCHP) data (Mustard et al.,1998). In that analysis, the objective was to isolate and remove services for sex-specific issues, and care provided in the last year of life. They examined costs associated with hospital services, and found that male and female values were almost equal after these adjustments were made.

5.4 Separation Rates for Long Stays (30+ Days)

Definition: This is the 2003/04 rate of hospital separations for stays of 30 days or more, per 1,000 area residents. PCHs and hospitals dedicated to long-term care were excluded, but chronic care beds within acute care hospitals could not be excluded. Multiple admissions of the same person are counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.4.1: Hospital Separations for Long Stays by RHA, 2003/04

Age-adjusted rate of hospital separations for stays of 30 days or more, per 1,000 residents

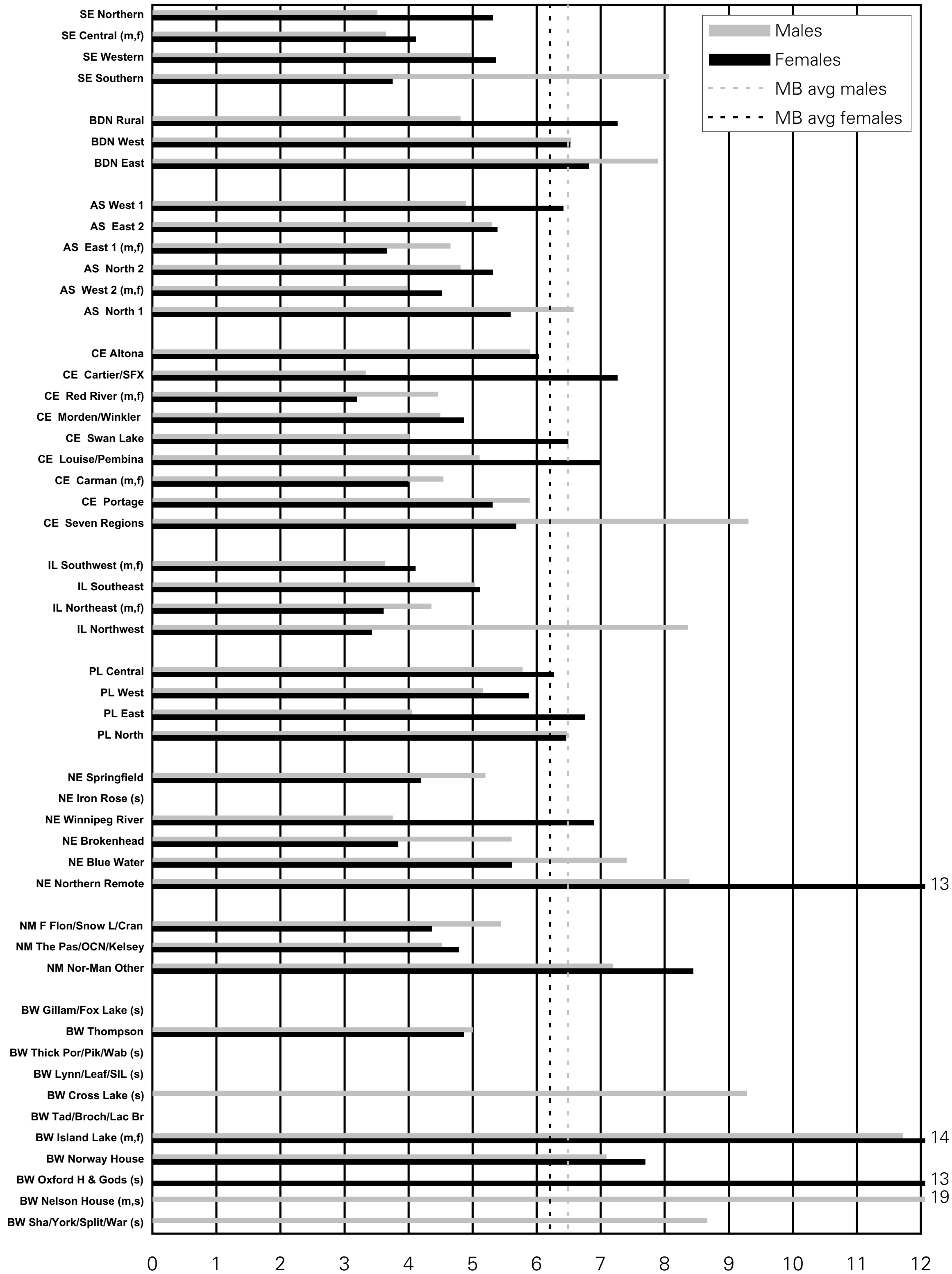


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.4.2: Hospital Separations for Long Stays by District, 2003/04

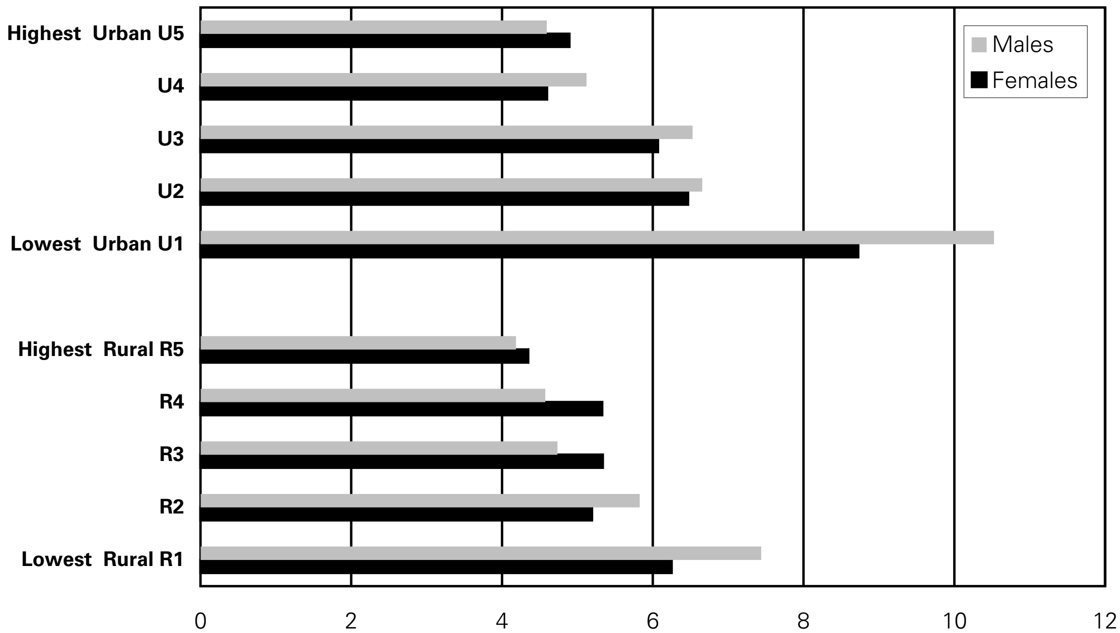
Age-adjusted rate of hospital separations for stays of 30 days or more, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.4.3: Hospital Separations for Long Stays by Income Quintile, 2003/04

Age-adjusted rate of hospital separations for stays of 30 days or more, per 1,000 residents



Linear Trend Test Results

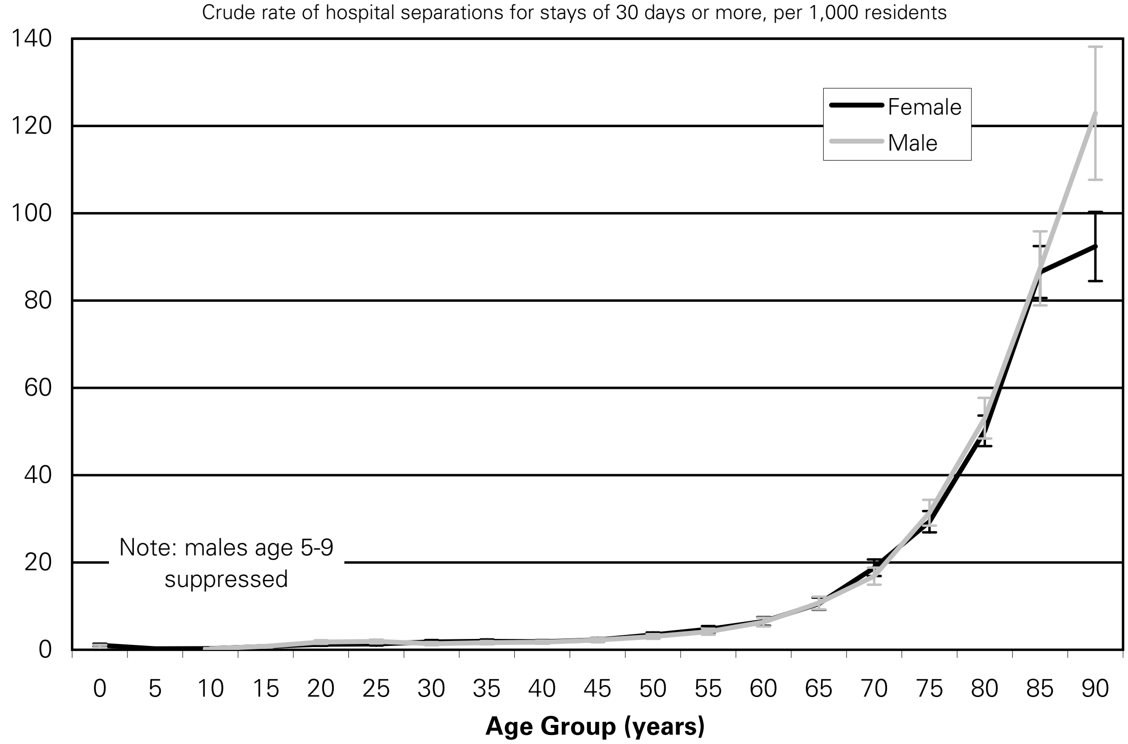
Female: Urban: Significant (p<.001) Rural: Significant (p<.01)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.4.4: Hospital Separations for Long Stays by Age and Sex, 2003/04

Crude rate of hospital separations for stays of 30 days or more, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for long-stay hospital separation rates:

Age-adjusted rates:

- Overall, and for each RHA and District, long-stay hospitalization rates are similar for males and females (6.2 versus 6.5 per 1,000 residents). The provincial rates are strongly affected by rates for Winnipeg residents, making other RHA rates look low by comparison.
- There is a strong relationship between long-stay hospitalization rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- Long stays in hospital are almost exclusively seen among the elderly. Rates for children and adults are very low, but rise dramatically for both sexes after about age 65.

Comparisons to other findings:

- Black et al. (1999) reported short- and long-stay separation rates by RHA, but used 45 days as the cut-off, versus 30 days for this analysis. Overall trends by RHA are similar to those reported here, most notably the lower rates among rural residents compared to Winnipeg.

5.5 Separation Rates for Long Stays (30+ Days) by Cause

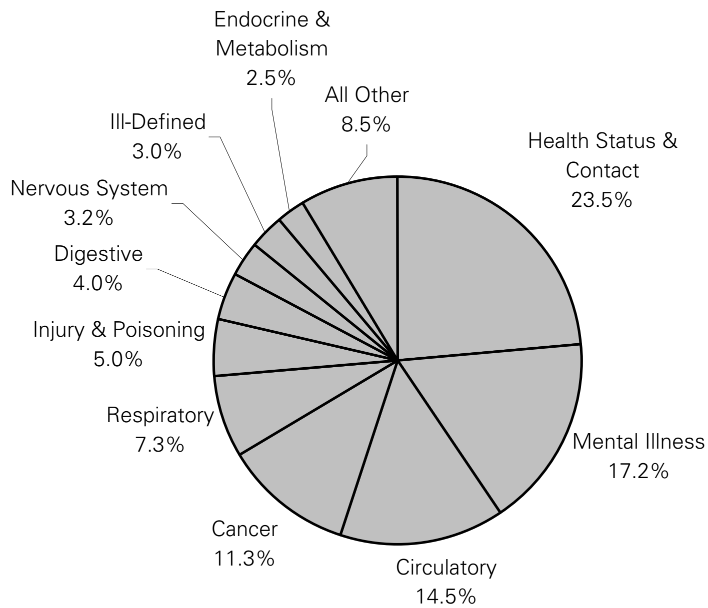
Definition: This analysis shows the distribution of 2003/04 hospitalizations for long stays by general category of illness, using the 18 Chapters of the ICD-9-CM coding system. The analysis categorizes each hospitalization according to the Most Responsible Diagnosis. Long stays (30+ days) in hospital are much less common than short stays, so this analysis includes Manitoba totals only, and shows crude rates, as there were too few events to calculate reliable age-adjusted rates by cause.

The graphs rank the causes by relative frequency of hospitalization: the most common cause is shown first, followed by others in order of their frequency (for that sex). The rates are shown in pie chart form, using crude rates, because age-adjusted rates by cause could not be accurately calculated.

Key findings for separations for long stays by cause

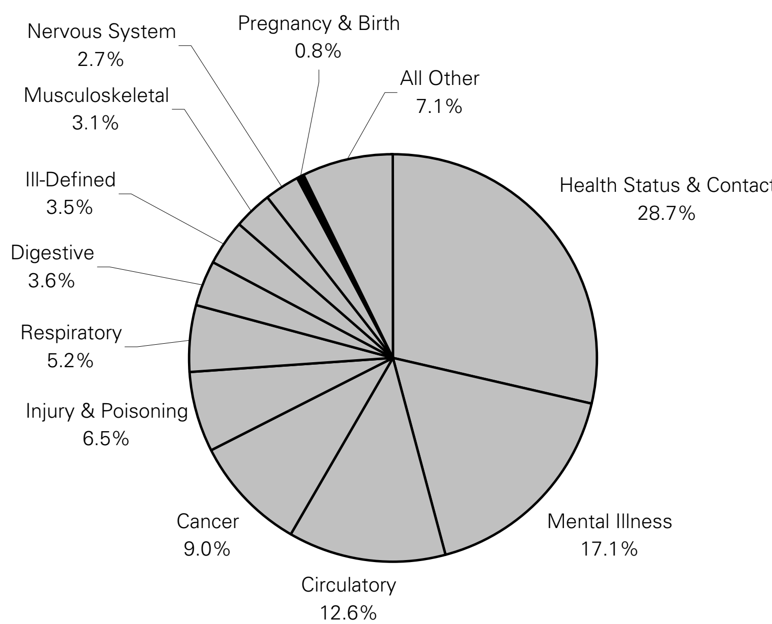
- Four of the top five causes (and their ranking) were the same for males and females: health status and contact, mental illness, circulatory disease, and cancer.
- The most common cause, 'Issues Affecting Health Status and Contact with the Health Care System,' contains a variety of issues, but most of the cases for both males and females are for rehabilitation, followed by recovery after surgery, and awaiting placement in another facility (chronic care or nursing home).

Figure 5.5.1: Crude Separations for Long Stays for Males by Cause (ICD- 9-CM), Manitoba, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 5.5.2: Crude Separations for Long Stays for Females by Cause (ICD- 9-CM), Manitoba, 2003/04

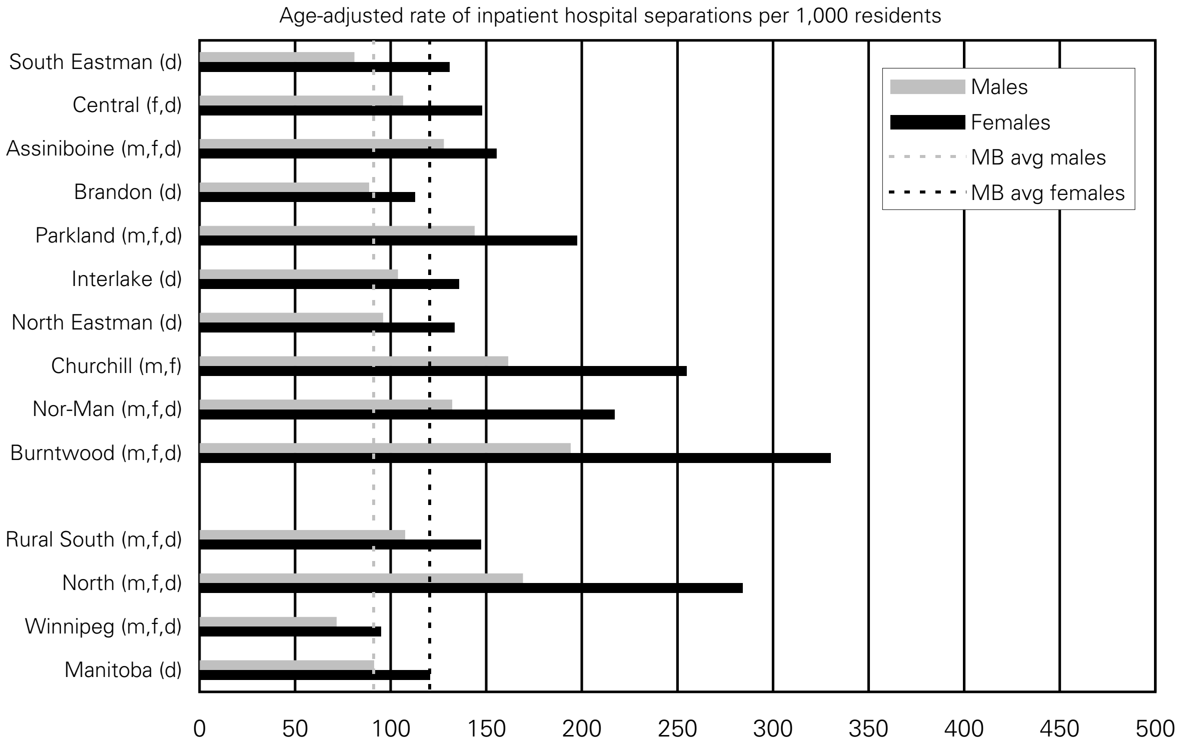


Source: Manitoba Centre for Health Policy, 2005

5.6 Separation Rates for Inpatient Care

Definition: This is the 2003/04 rate of hospital separations for all inpatient cases (that is, all admissions to hospital for at least one day), per 1,000 area residents. Multiple admissions of the same person are counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.6.1: Hospital Separations for Inpatient Care by RHA, 2003/04

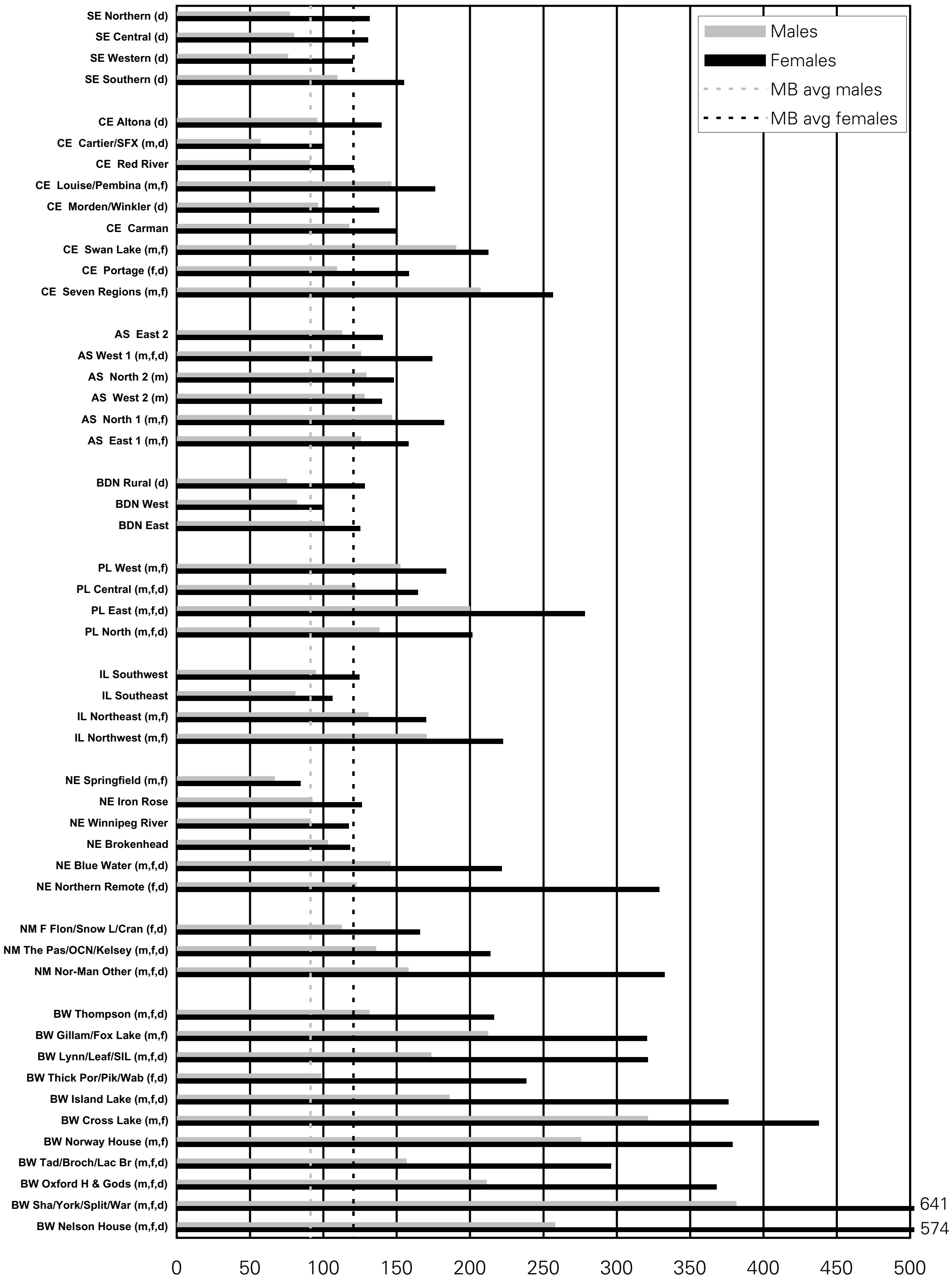


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.6.2: Hospital Separations for Inpatient Care by District, 2003/04

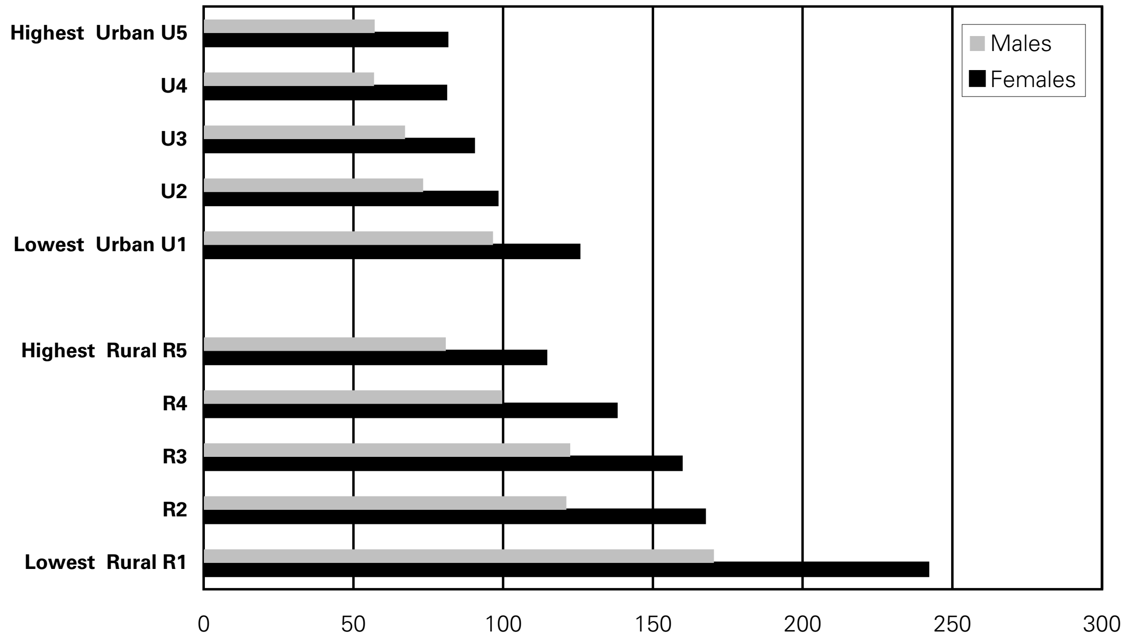
Age-adjusted rate of inpatient hospital separations per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.6.3: Hospital Separations for Inpatient Care by Income Quintile, 2003/04

Age-adjusted rate of inpatient hospital separations per 1,000 residents



Linear Trend Test Results

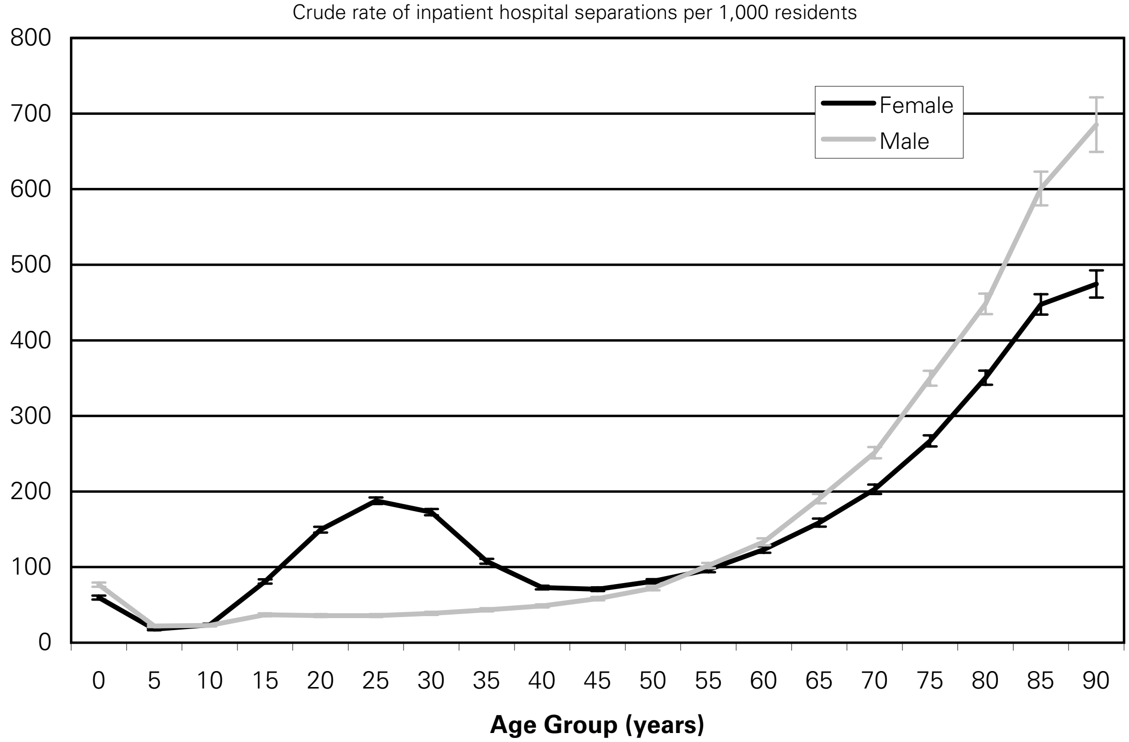
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.6.4: Hospital Separations for Inpatient Care by Age and Sex, 2003/04

Crude rate of inpatient hospital separations per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for separation rates for inpatient care:

Age-adjusted rates:

- Overall, and for each RHA, inpatient hospitalization rates are higher for females than males (120.5 versus 91.2 per 1,000 residents, p<.001). Most of this difference is attributable to childbirth; see Section 5.3.
- There is a strong relationship between inpatient hospitalization rates and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- For males, inpatient hospitalization rates are low in childhood, and only slightly higher through young adulthood. Rates begin to rise in middle age, and are dramatically higher in old age. For females, rates are low in childhood but higher during the reproductive years. Rates then drop off somewhat, and begin rising again in middle age, reaching their highest levels in old age.

Comparisons to other findings:

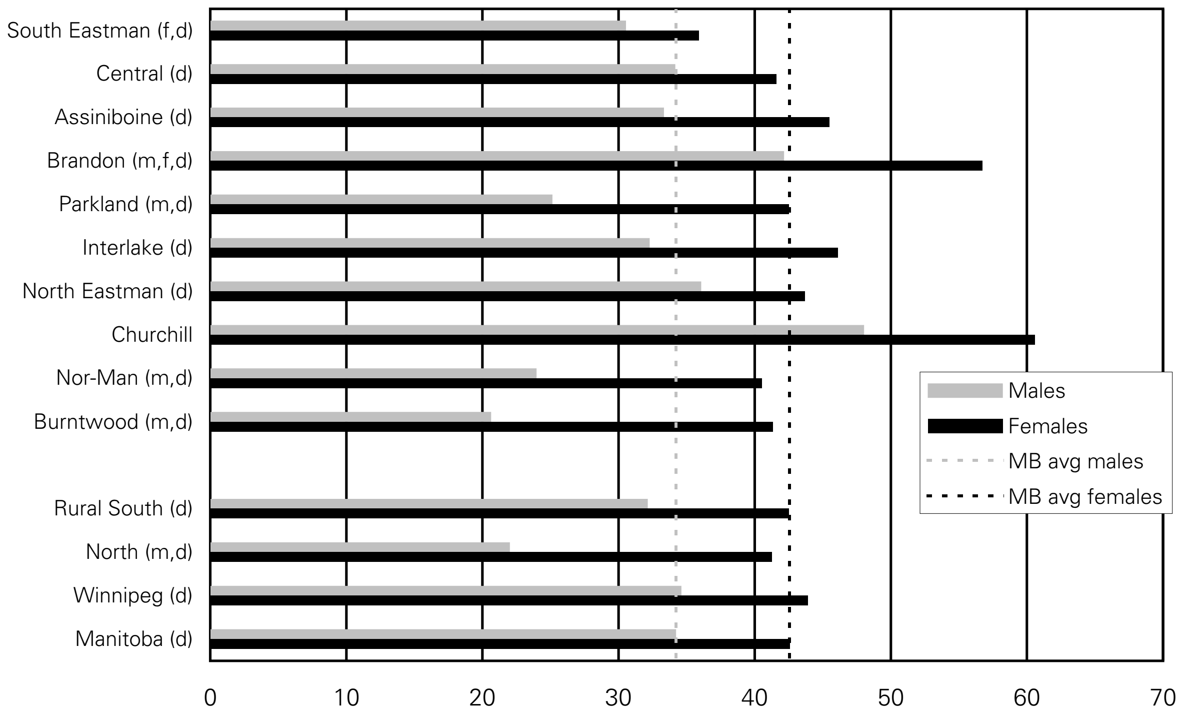
- These values are very close to those published by the CIHI for 2002/03. They report the Manitoba rate as 99.6 inpatient hospitalizations per 1,000 residents per year, versus 102.6 shown here (for 2003/04, sexes combined). The small discrepancy may be related to differences in statistical methods used. The 2002/03 Canadian average was 85.0 inpatient hospitalizations per 1,000 residents per year, indicating that Manitobans are hospitalized more frequently than Canadians generally (CIHI, 2004a).

5.7 Separation Rates for Day Surgery

Definition: This is the 2003/04 rate of hospital separations for day surgery, per 1,000 area residents. Multiple separations of the same person are counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.7.1: Hospital Separations for Day Surgery by RHA, 2003/04

Age-adjusted rate of separations for outpatient surgery per 1,000 residents

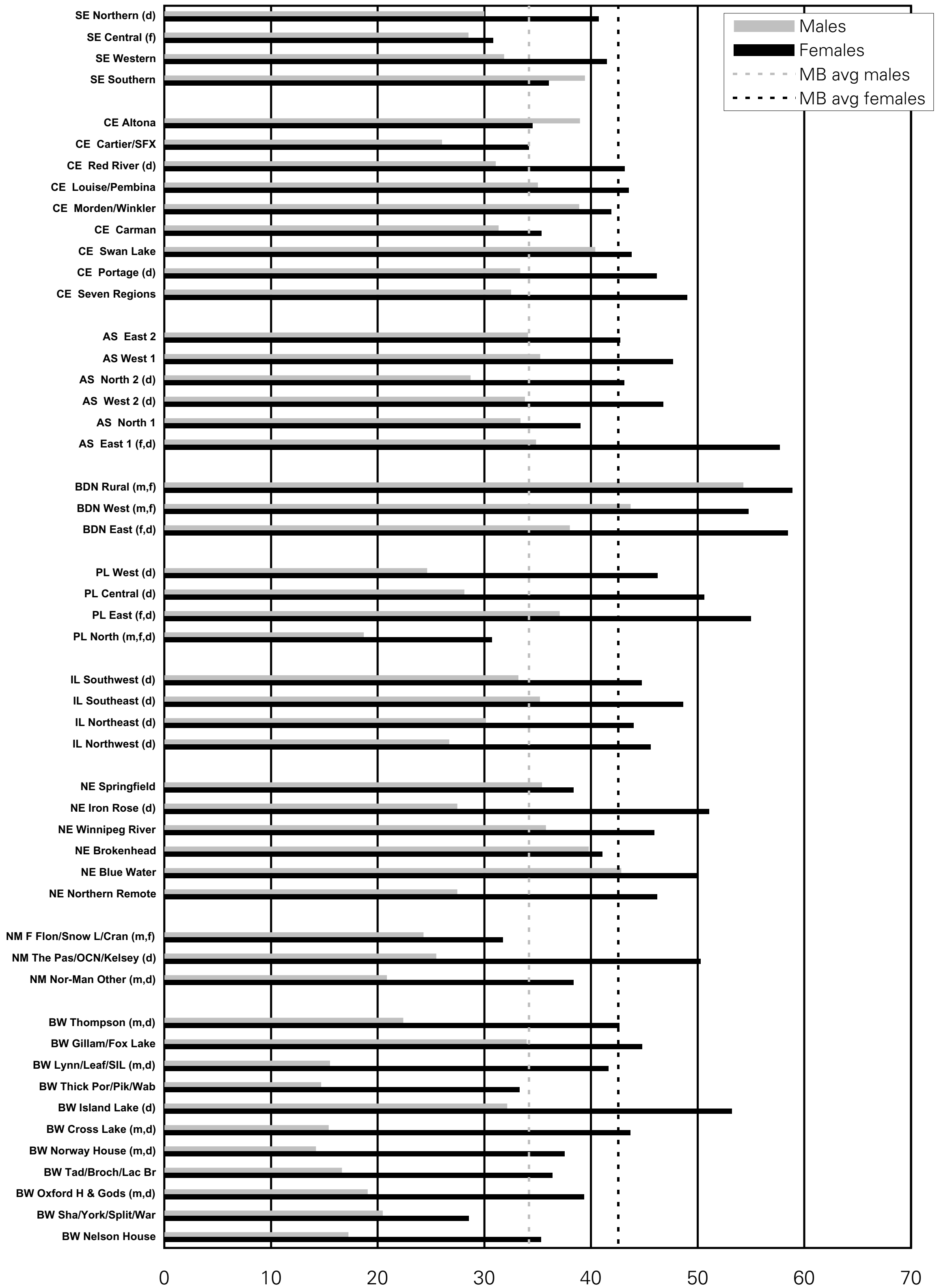


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.7.2: Hospital Separations for Day Surgery by District, 2003/04

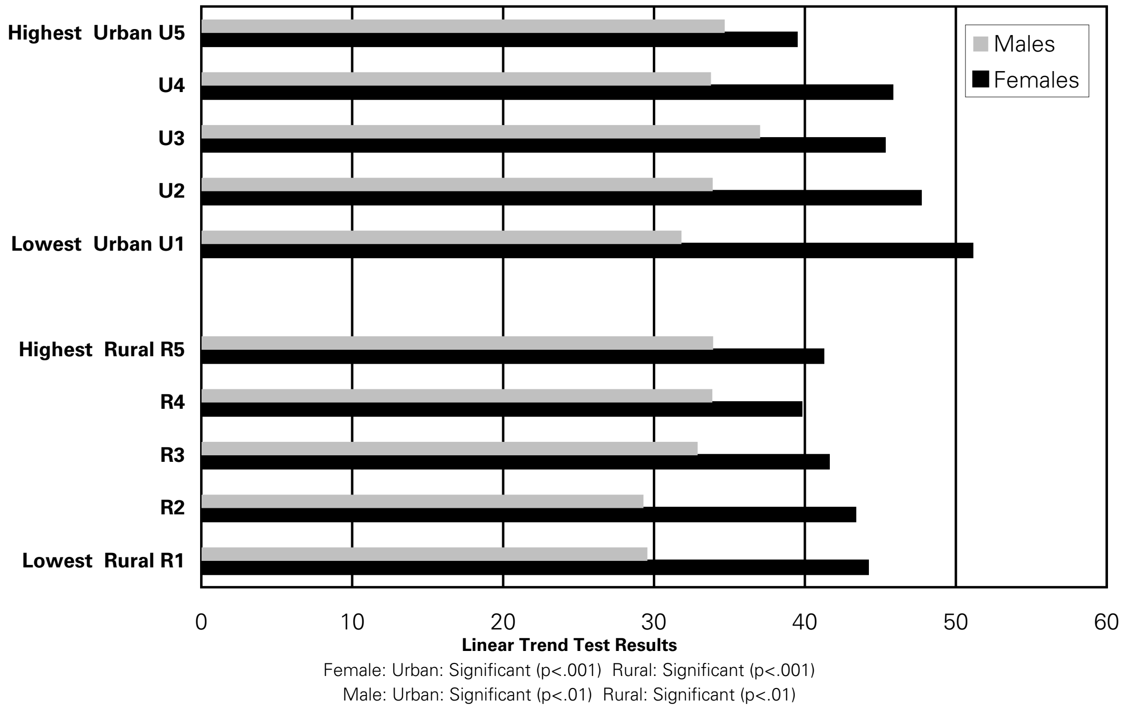
Age-adjusted rate of separations for outpatient surgery per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.7.3: Hospital Separations for Day Surgery by Income Quintile, 2003/04

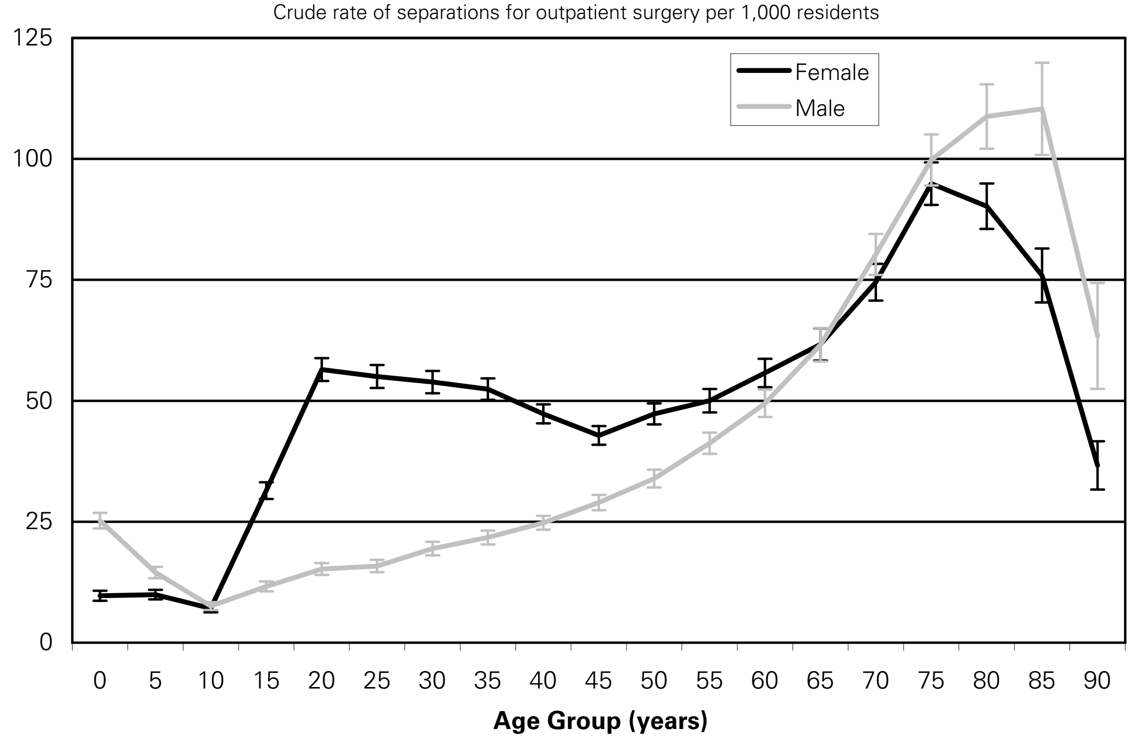
Age-adjusted rate of separations for outpatient surgery per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.7.4: Hospital Separations for Day Surgery by Age and Sex, 2003/04

Crude rate of separations for outpatient surgery per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for day surgery rates:

Age-adjusted rates:

- Overall, and for each RHA, day surgery hospitalization rates were higher for females than males (42.5 versus 34.2 per 1,000 residents, p<.001).
- There are mixed relationships between day surgery rates and area-level income: among females, day surgery rates are higher for those living in lower income areas (though the relationship is only significant among urban females). In males, day surgery rates are higher among those living in higher income areas (though the relationship is only significant among rural males).

Crude rates by age & sex:

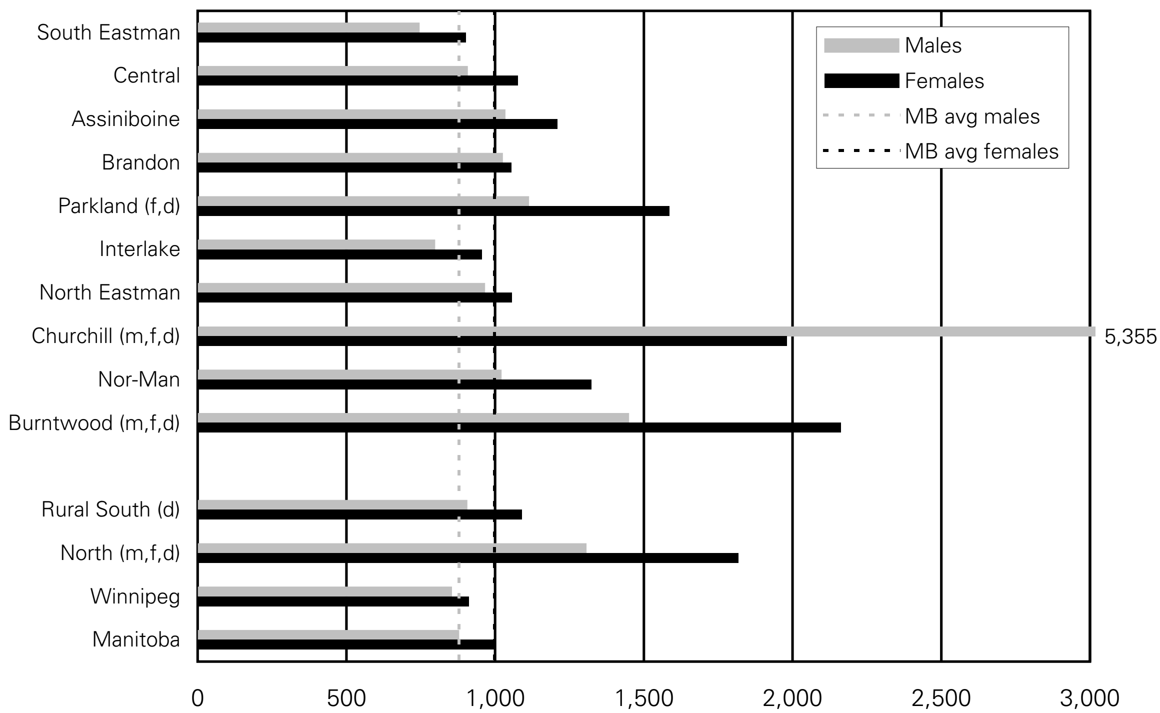
- For males, day surgery rates are low in childhood, rise steadily through adulthood, then sharply among the elderly. For females, rates are low in childhood but much higher during the reproductive years. Rates begin rising again in middle age, reaching their peak at age 75 to 79, after which rates drop sharply.

5.8 Total Hospital Days Used

Definition: This is the 2003/04 rate of all hospital days used per 1,000 area residents. Multiple admissions of the same person are counted as separate events, and all days used are summed together. Outpatients contribute zero days of care (unless they get admitted to hospital). Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.8.1: Total Hospital Days Used by RHA, 2003/04

Age-adjusted rate of total hospital days used per 1,000 residents

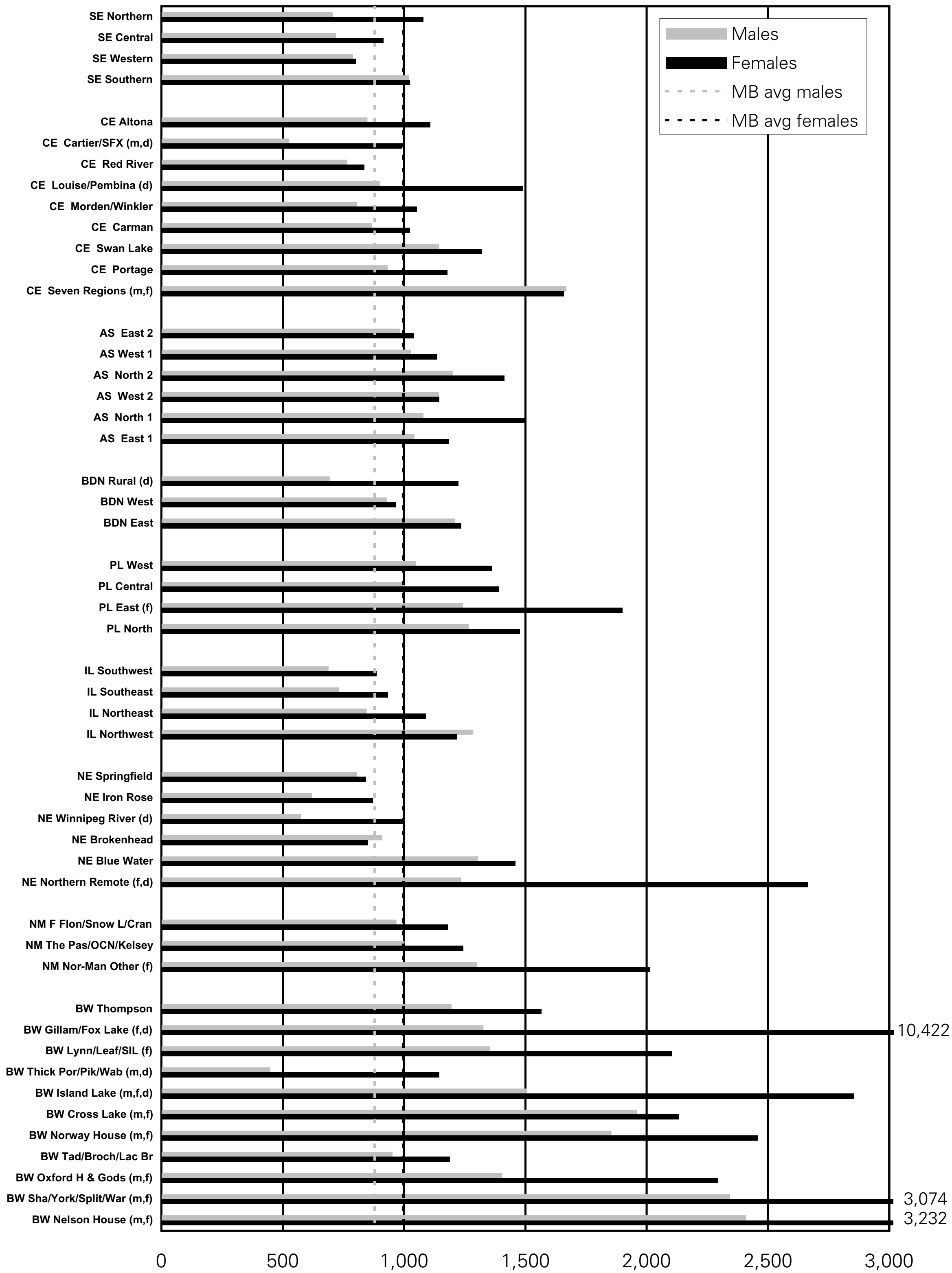


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.8.2: Total Hospital Days Used by District, 2003/04

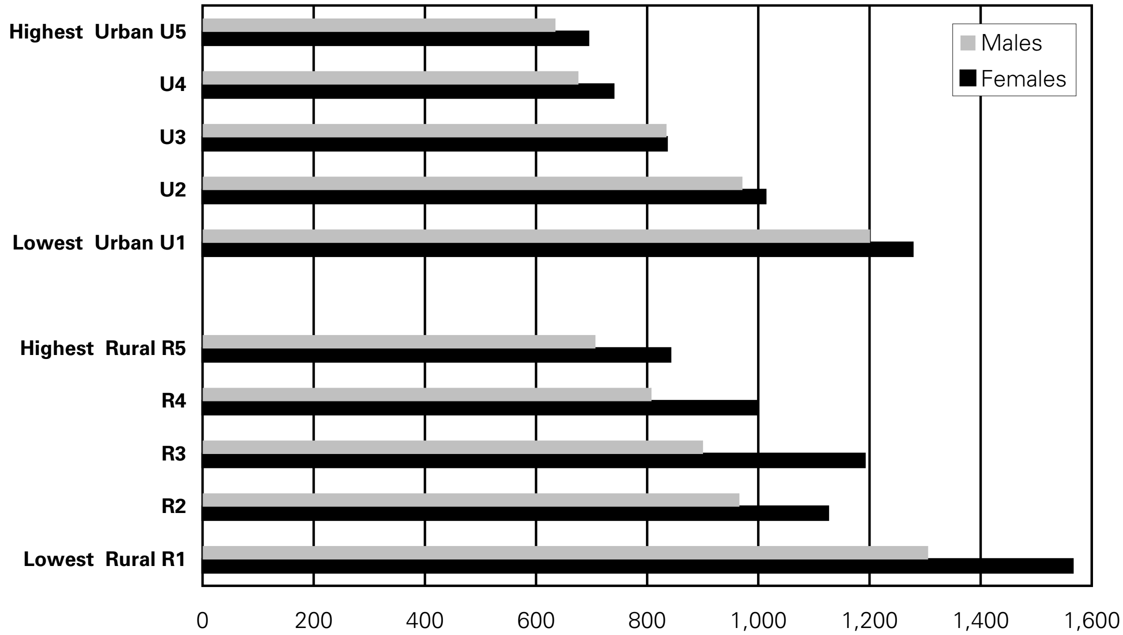
Age-adjusted rate of total hospital days used per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.8.3: Total Hospital Days Used by Income Quintile, 2003/04

Age-adjusted rate of total hospital days used per 1,000 residents



Linear Trend Test Results

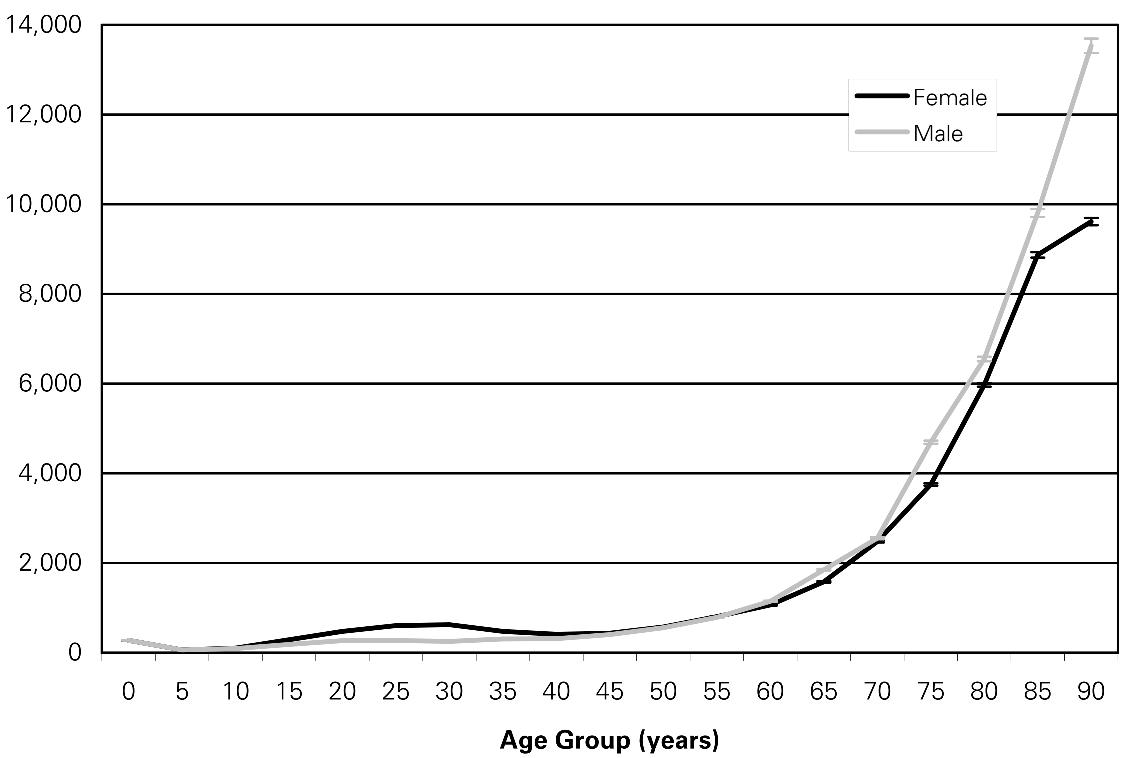
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.8.4: Total Hospital Days Used by Age and Sex, 2003/04

Crude rate of total hospital days used per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for rates of hospital days used:

Age-adjusted rates:

- Overall, the rates of days used are not statistically different for males and females (878.2 versus 998.1 days per 1,000 residents). Females appear to use more days, but the difference only reaches statistical significance in some areas.
- There is a strong relationship between hospital days used and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- For both males and females, total hospital days used is very low among children and adults, but very high among the elderly. The familiar rise for females in reproductive years is visible, but very small using this indicator.

Comparisons to other findings:

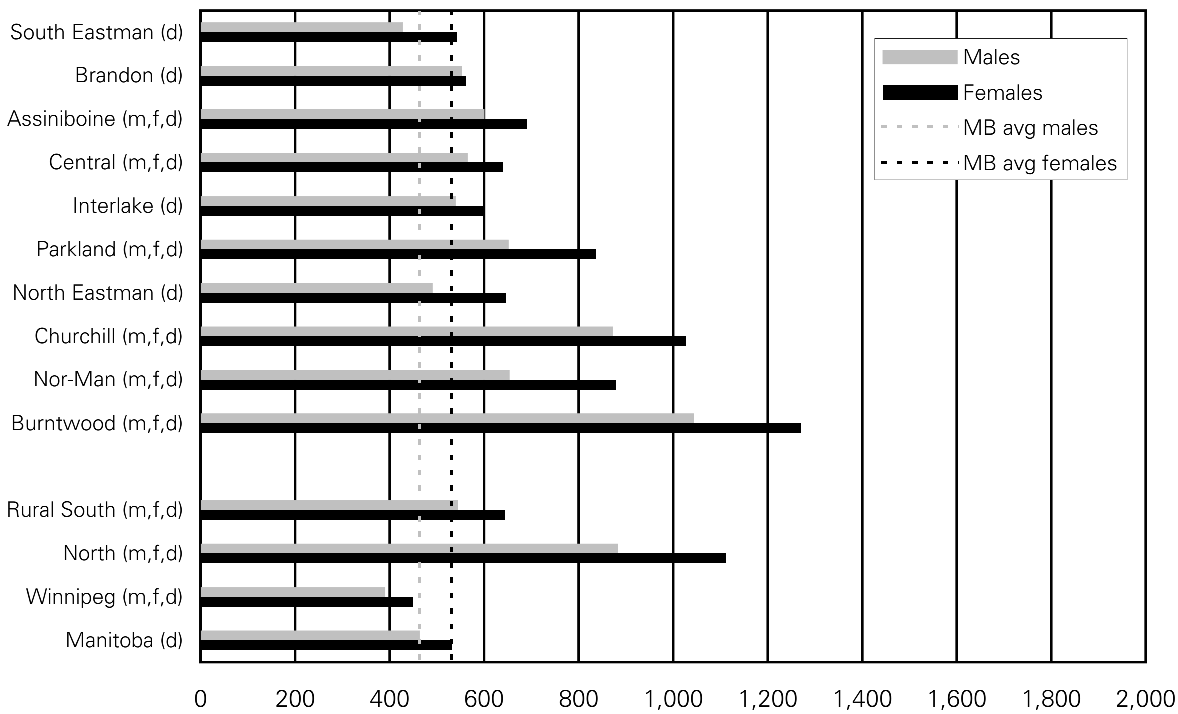
- These values are consistent with those in the RHA Indicators Atlas, reflecting a continually decreasing rate of hospital days used. In 1994/95–1995/96, the rate was 1,098 days per 1,000 residents; in 1999/2000–2000/01, it was 997 days, and in 2003/04, it was 916 days.
- CIHI results report total days, not age-adjusted rates. Their data indicate that in 2002/03, there were a total of 1,102,931 days of hospital care provided in Manitoba. Our results for 2003/04 show a total of 1,064,761 days (CIHI, 2004b).

5.9 Hospital Days Used for Short Stays (1 to 29 Days)

Definition: This is the 2003/04 rate of hospital days used in short stays (1 to 29 days) per 1,000 area residents. Multiple admissions of the same person are counted as separate events, and all days used are summed together. Outpatients contribute zero days of care (unless they get admitted to hospital). Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.9.1: Hospital Days Used for Short Stays by RHA, 2003/04

Age-adjusted rate of hospital days used in stays of less than 30 days, per 1,000 residents

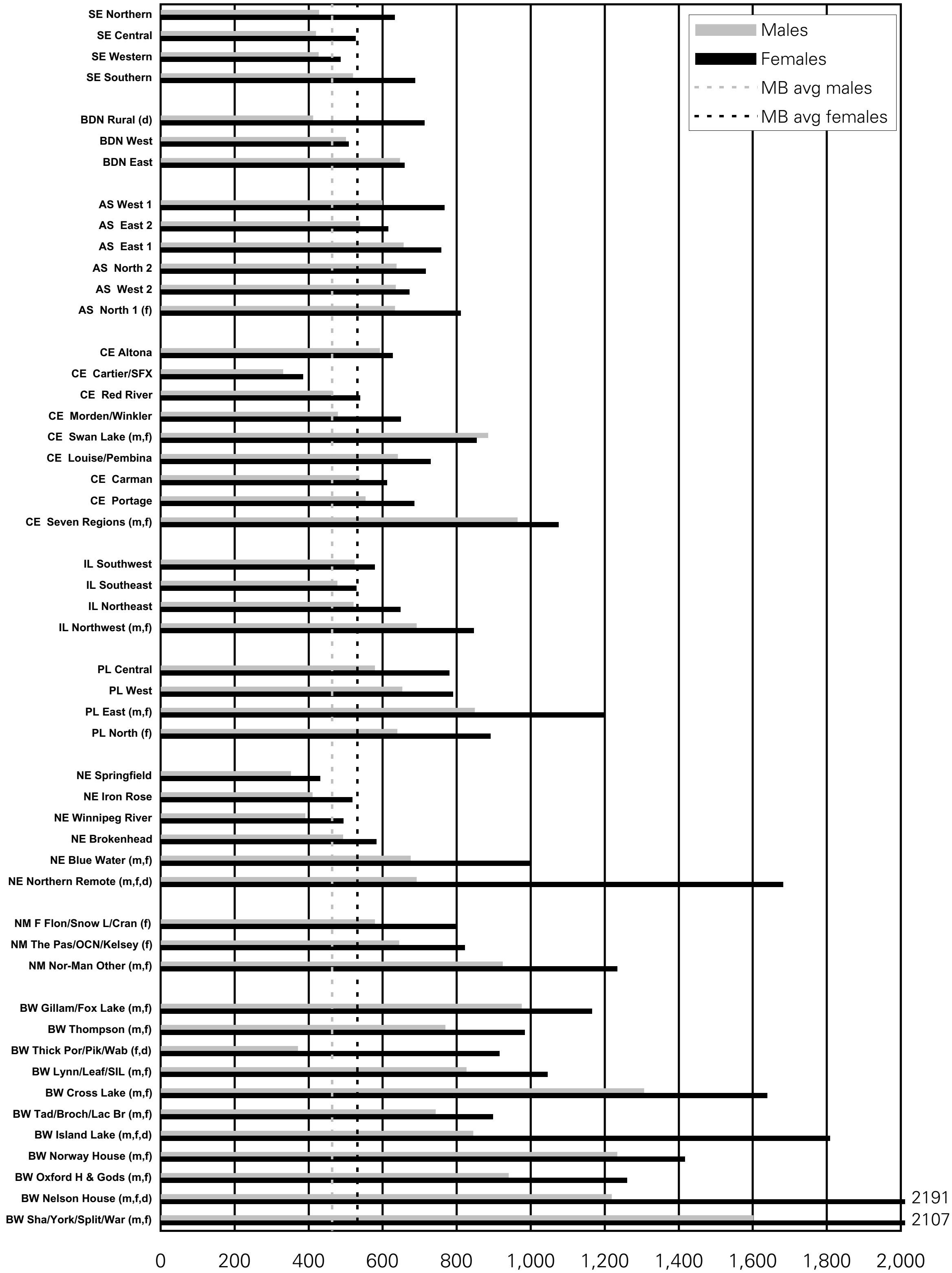


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.9.2: Hospital Days Used for Short Stays by District, 2003/04

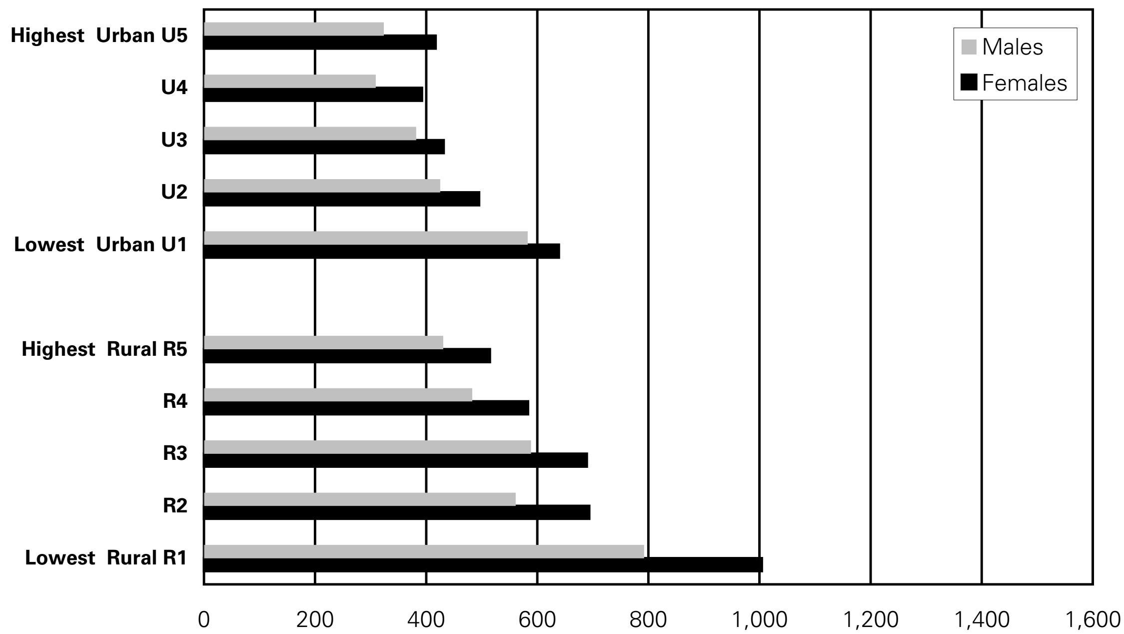
Age-adjusted rate of hospital days used in stays of less than 30 days, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.9.3: Hospital Days Used for Short Stays by Income Quintile, 2003/04

Age-adjusted annual rate of hospital days used in stays of less than 30 days, per 1000 residents



Linear Trend Test Results

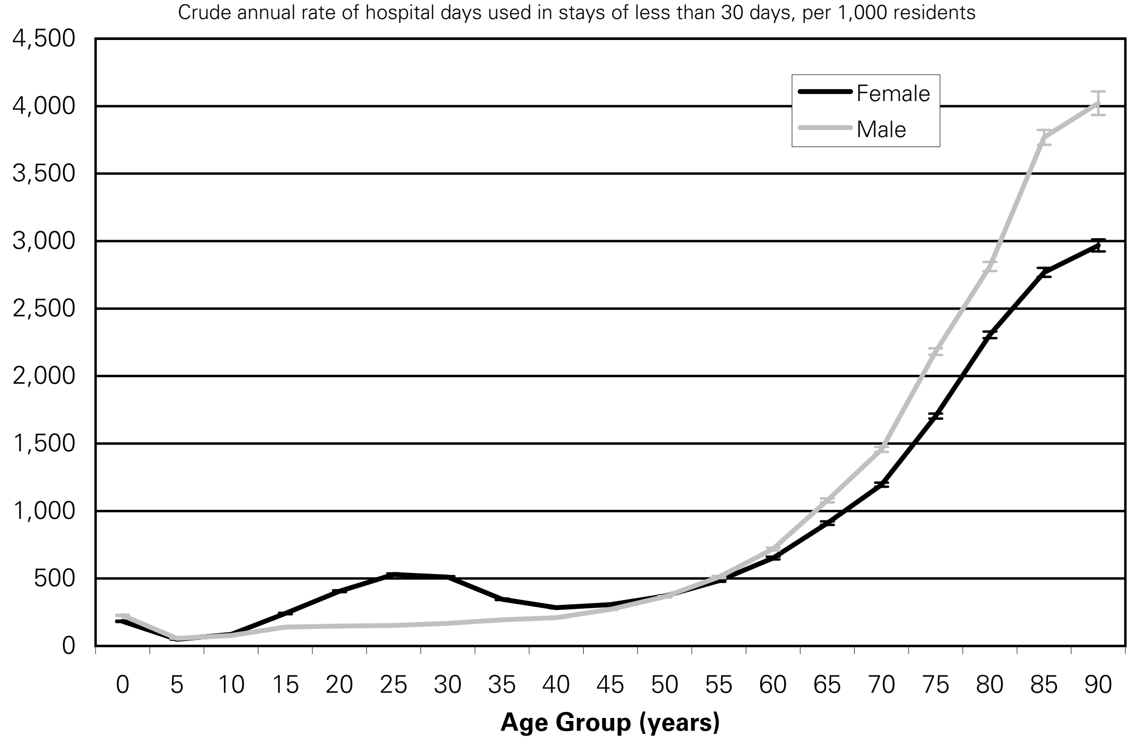
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.9.4: Hospital Days Used for Short Stays by Age and Sex, 2003/04

Crude annual rate of hospital days used in stays of less than 30 days, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for short-stay days:

Age-adjusted rates:

- Females use more days in short stays (1 to 29 days) than males (531.8 versus 463.6, p<.001).
- There is a strong relationship between short-stay days and area-level income: in both urban and rural areas, rates for both males and females are higher among residents of lower income areas.

Crude rates by age & sex:

- For males, short-stay days are very low among children and adults, but very high among the elderly. Among females, rates are low for children and youth, rise during the reproductive years, decline in midlife, and rise sharply in the elderly.

Comparison to other findings:

- These values are consistent with those in the RHA Indicators Atlas, reflecting a continually decreasing rate of hospital days used in short stays. In 1994/95–1995/96, the rate was 589 days per 1,000 residents; in 1999/2000–2000/01, it was 514 days, and in 2003/04, it was 484 days.

5.10 Hospital Days Used in Short Stays (0 to 29 Days) by Cause

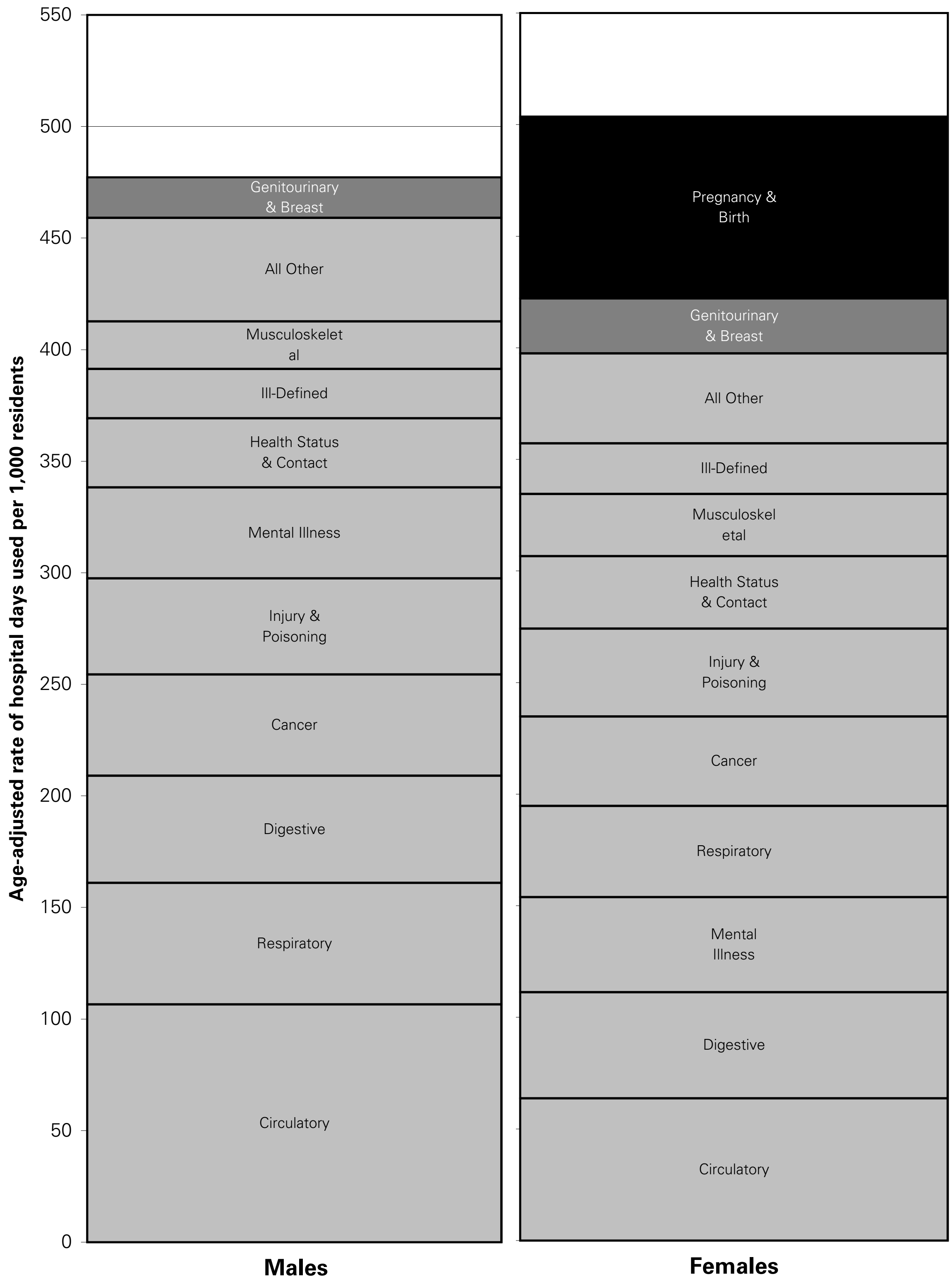
Definition: This analysis shows the 2003/04 rates of days used in short stays (0 to 29 days) by general category of illness, using the 18 chapters of the ICD-9-CM coding system. This analysis categorizes each hospitalization according to the Most Responsible Diagnosis. The statistical method used to calculate rates by cause was different from that used in other analyses, so the 'total' values are not exactly the same as in section 5.9.

These graphs rank the causes by relative frequency of hospitalization: the most common cause is shown first, followed by others in order of their frequency (for that sex, in that area). Manitoba rates are shown in stack-bar graph form, so that age-adjusted rates by cause can be fairly compared between sexes. Hospitalizations relating to pregnancy & birth and to genitourinary & breast disorders were placed at the top of the Manitoba graphs to allow comparison of male and female rates excluding those causes.

Key findings for days used in short stays by cause:

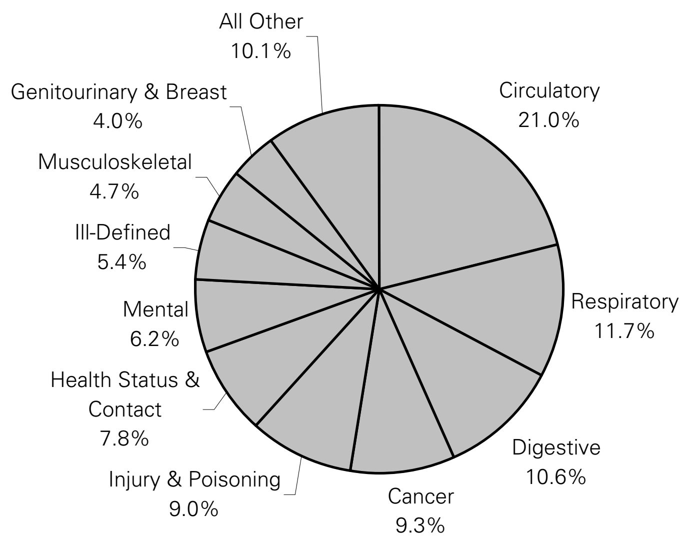
- Overall, female hospitalization rates were higher than those for males, but once hospitalizations for pregnancy & birth and genitourinary & breast disorders were removed, female rates were actually lower than males (397.4 days per 1,000 females, versus 458.9 for males).
- Of the 16 categories remaining after excluding pregnancy & birth & genitourinary and breast, nine of the top 10 were the same for males and females, though the ordering was different.
- Note: Caution must be used in interpreting the exact ordering, because the differences between adjacent causes can be quite small.
- The patterns are generally similar across the regions shown, though there are some differences, particularly among northern residents, where injury & poisoning ranks higher than in other areas.

Figure 5.10.1: Hospital Days Used for Short Stays by Cause (ICD-9-CM), Manitoba, 2003/04



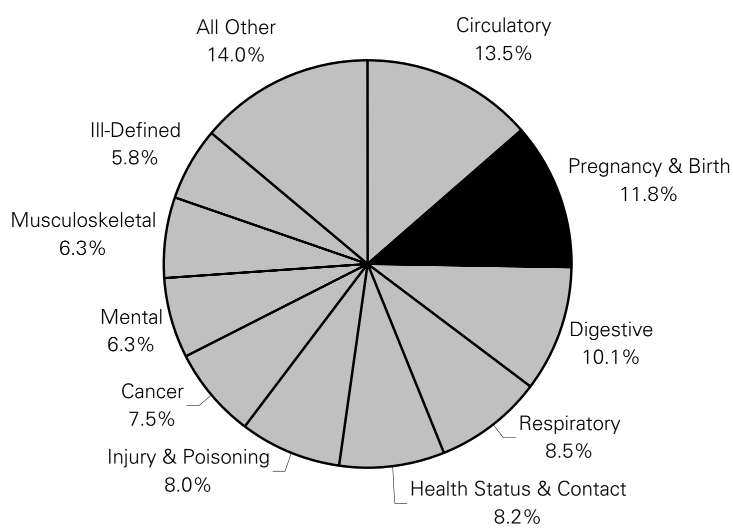
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.2: Crude Hospital Days Used by Males for Short Stays by Cause (ICD-9-CM), Rural South, 2003/04



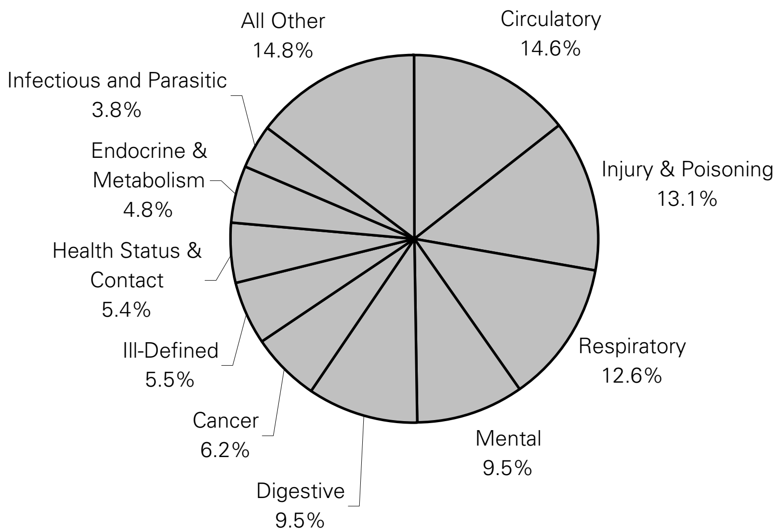
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.3: Crude Hospital Days Used by Females for Short Stays by Cause (ICD-9-CM), Rural South, 2003/04



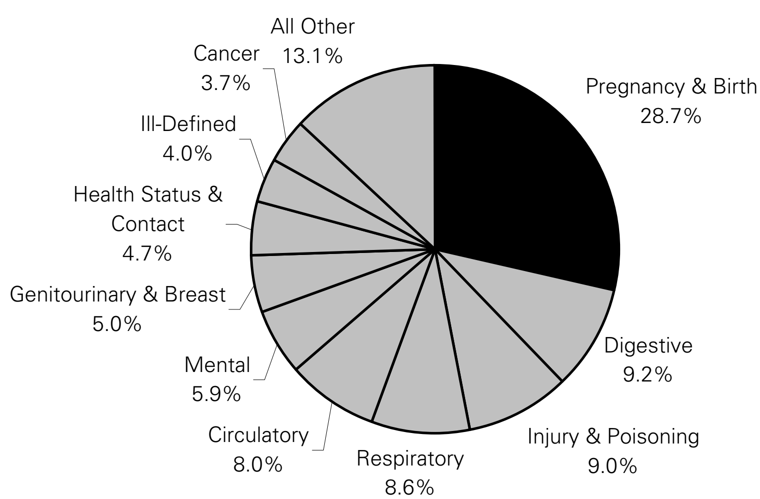
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.4: Crude Hospital Days Used by Males for Short Stays by Cause (ICD-9-CM), North, 2003/04



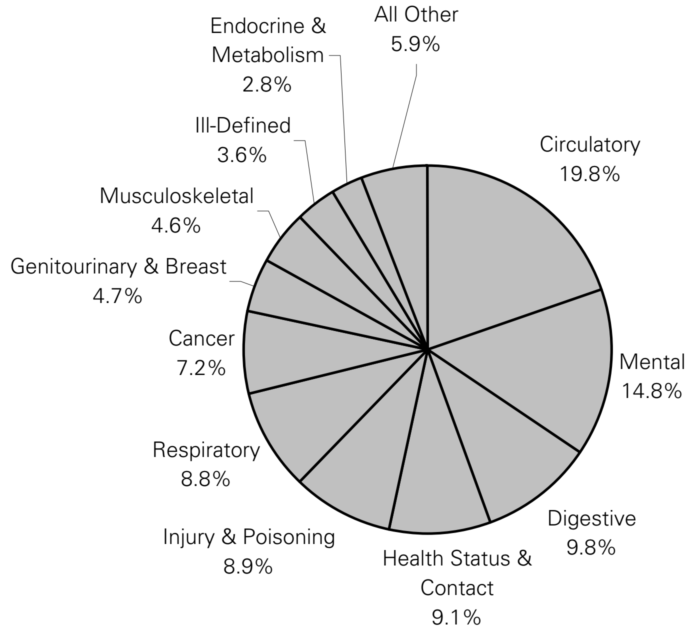
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.5: Crude Hospital Days Used by Females for Short Stays by Cause (ICD-9-CM), North, 2003/04



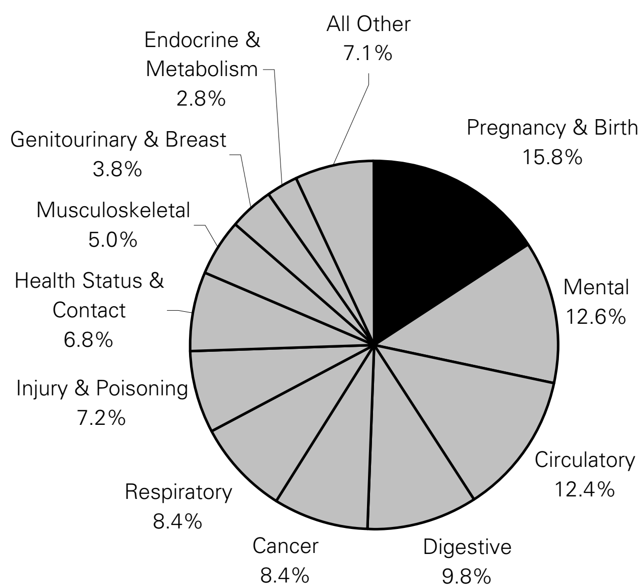
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.6: Crude Hospital Days Used by Males for Short Stays by Cause (ICD-9-CM), Brandon, 2003/04



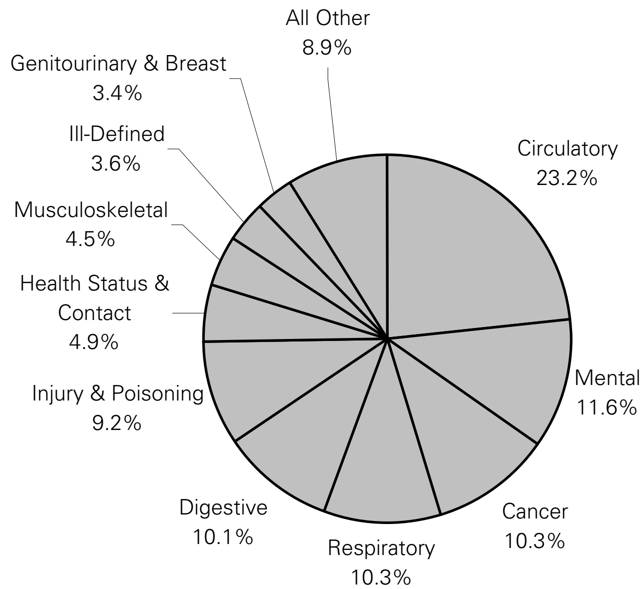
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.7: Crude Hospital Days Used by Females for Short Stays by Cause (ICD-9-CM), Brandon, 2003/04



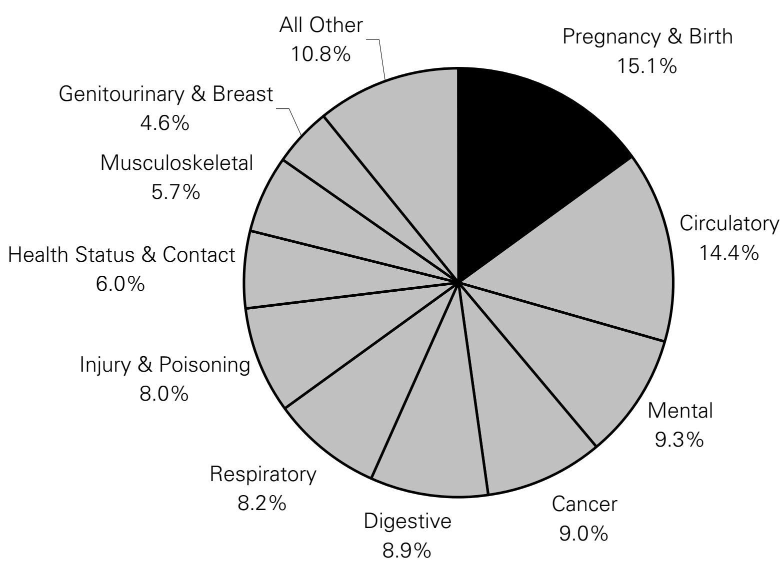
Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.8: Crude Hospital Days Used by Males for Short Stays by Cause (ICD-9-CM), Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 5.10.9: Crude Hospital Days Used by Females for Short Stays by Cause (ICD-9-CM), Winnipeg, 2003/04



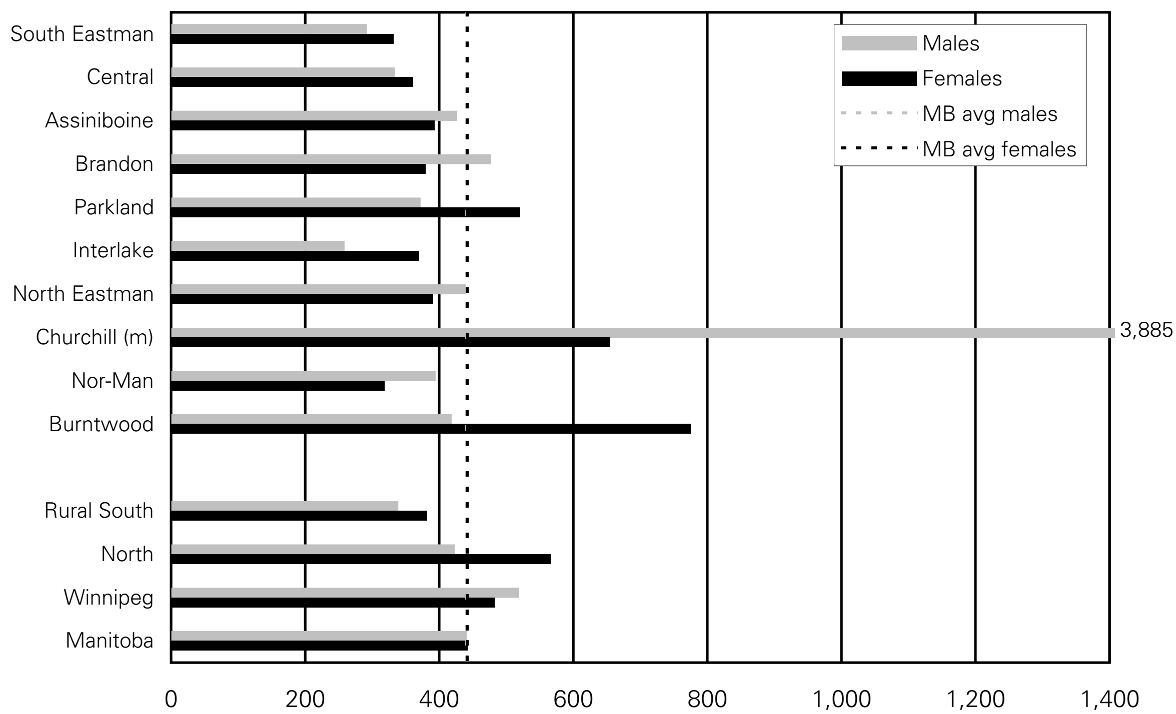
Source: Manitoba Centre for Health Policy, 2005

5.11 Hospital Days Used for Long Stays (30+ Days)

Definition: This is the rate of hospital days used in long stays (30+ days) per 1,000 area residents in 2003/04 by sex, RHA, District and income quintile, regardless of the location of the hospital. Multiple admissions of the same person are counted as separate events, and all days used are summed together. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 5.11.1: Hospital Days Used for Long Stays by RHA, 2003/04

Age-adjusted rate of days used in hospital stays of 30 days or more, per 1,000 residents

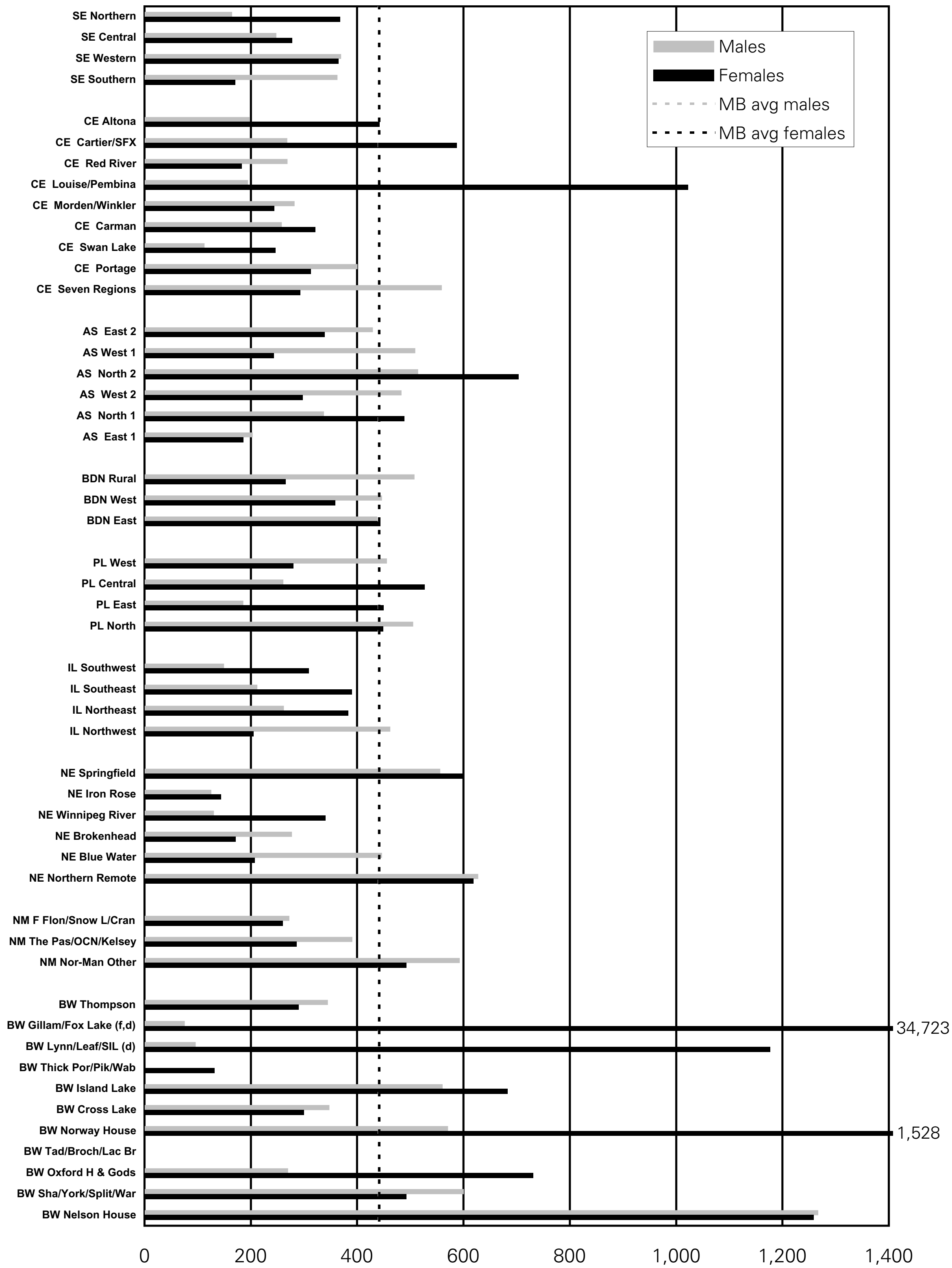


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 5.11.2: Hospital Days Used for Long Stays by District, 2003/04

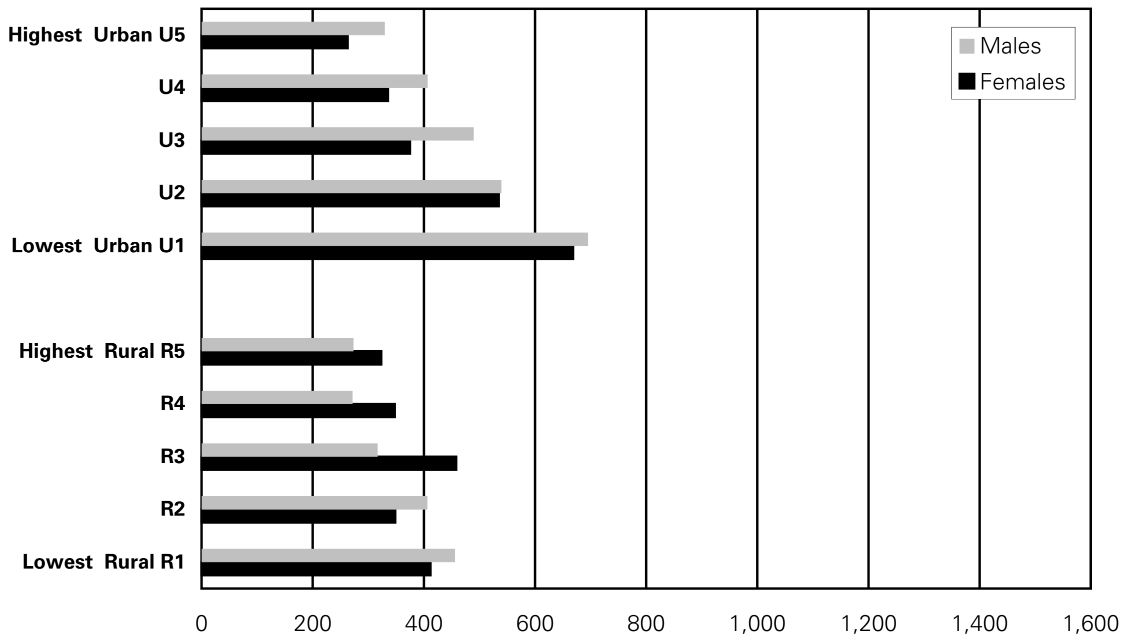
Age-adjusted rate of days used in hospital stays of 30 days or more, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 5.11.3: Hospital Days Used for Long Stays by Income Quintile, 2003/04

Age-adjusted rate of days used in hospital stays of 30 days or more, per 1,000 residents



Linear Trend Test Results

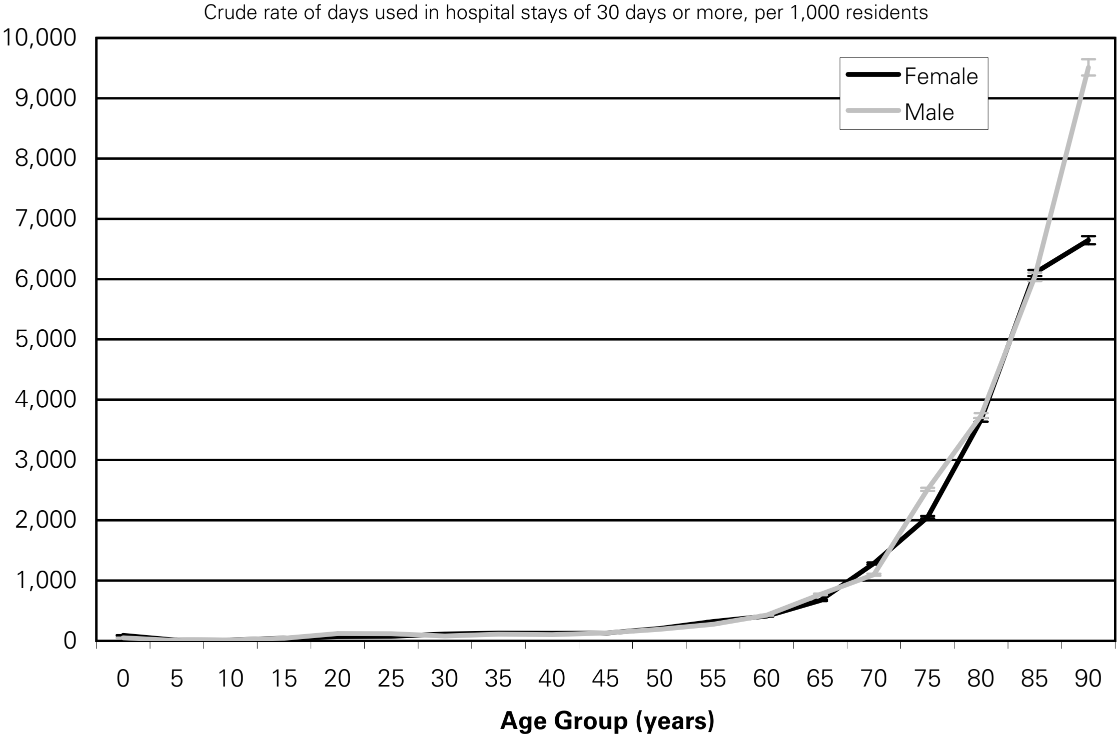
Female: Urban: Significant (p<.001) Rural: Significant (p<.01)

Male: Urban: Significant (p<.001) Rural: Significant (p<.01)

Source: Manitoba Centre for Health Policy, 2005

Figure 5.11.4: Hospital Days Used for Long Stays by Age and Sex, 2003/04

Crude rate of days used in hospital stays of 30 days or more, per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for hospital days used for long stays:

Age-adjusted rates:

- Overall, the rates of long-stay days are similar for males and females (440.7 versus 441.6 days per 1,000 residents, not significant).
- There is a strong relationship between long-stay days and area-level income: rates are higher for lower income residents, both male and female, urban and rural (though the trend is stronger among urban residents).

Crude rates by age & sex:

- For both males and females, long-stay days used are very low among children and adults, but very high among the elderly.

Comparison to other findings:

- These values are consistent with those in the RHA Indicators Atlas, reflecting a continually decreasing rate of hospital days used in long stays. In 1994/95–1995/96, the rate was 509 days per 1,000 residents; in 1999/2000–2000/01, it was 483 days, and in 2003/04, it was 432 days.

5.12 Hospital Days Used in Long Stays (30+ Days) by Cause

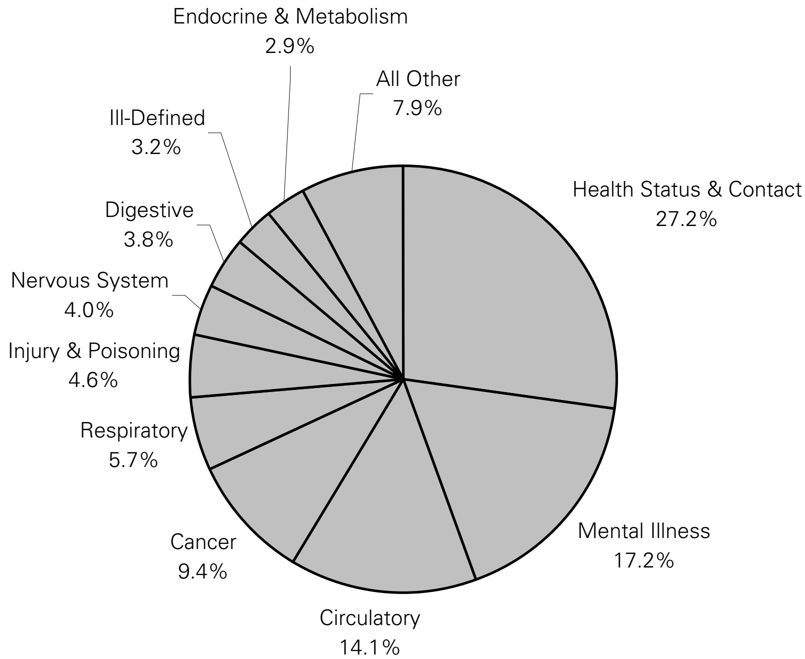
Definition: This analysis shows the distribution of 2003/04 hospital days used for long stays (30+ days) by general category of illness, using the 18 Chapters of the ICD-9-CM coding system. This analysis categorizes each hospitalization according to the Most Responsible Diagnosis. Age-adjusted rates for long-stay days could not be accurately calculated by cause, so crude rates are shown.

The graphs rank the causes by relative frequency of hospitalization: the most common cause is shown first, followed by others in order of their frequency (for that sex). Rates are shown in pie chart form, using crude rates, because age-adjusted rates by cause could not be accurately calculated.

Key findings for days used in long stays by cause:

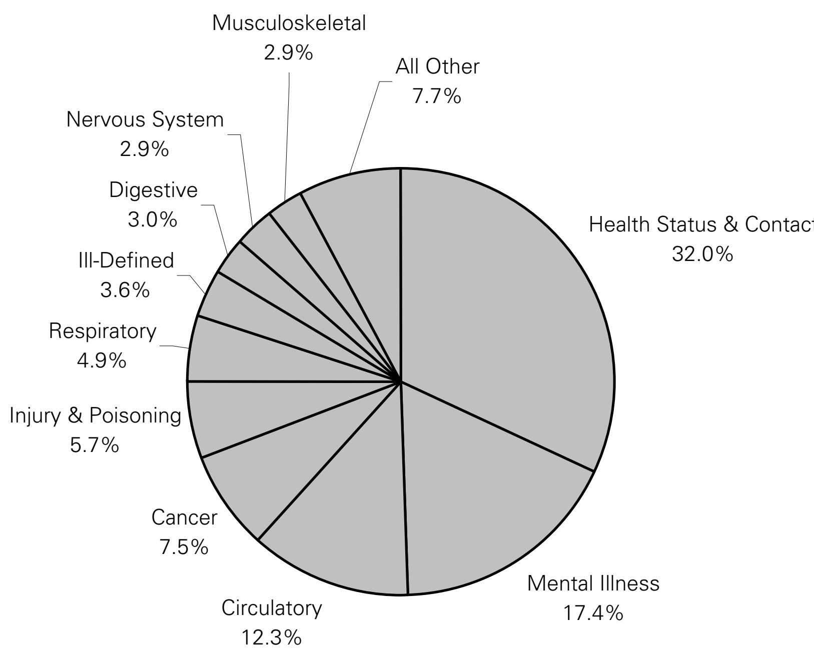
- Four of the top five causes (and their ranking) were the same for males and females.
- The most common cause, 'Issues Affecting Health Status and Contact with the Health Care System,' contains a variety of issues, but most of the cases for both males and females are for rehabilitation, followed (distantly) by recovery from surgery, and waiting for placement in another facility (e.g. Personal Care Home, or long-term care facility).

Figure 5.12.1: Crude Hospital Days Used for Long-Stays by Males by Cause (ICD- 9-CM), Manitoba, 2003/04



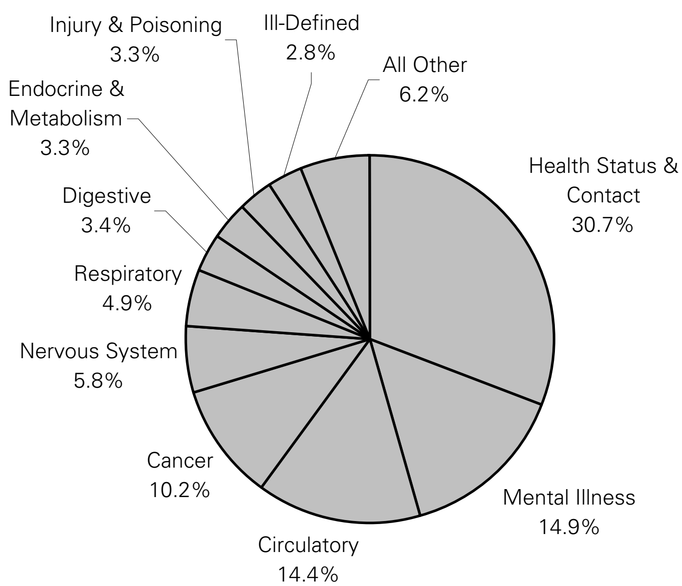
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.2: Crude Hospital Days Used for Long Stays by Females by Cause (ICD- 9-CM), Manitoba, 2003/04



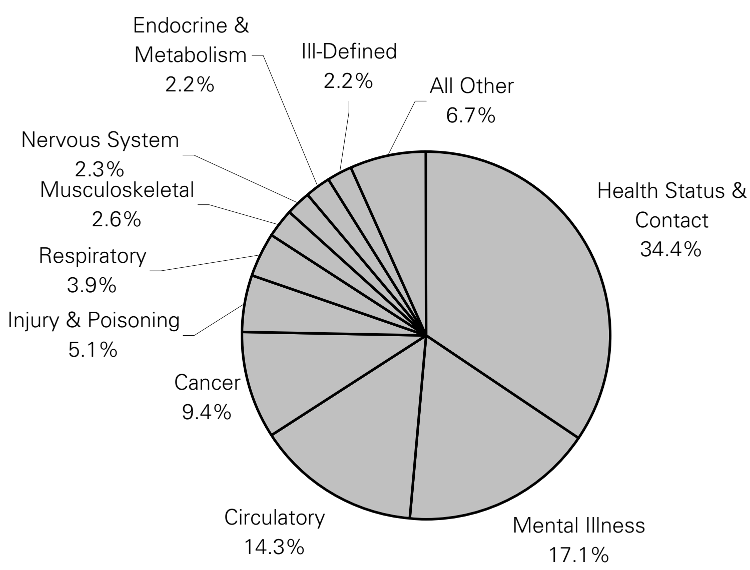
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.3: Crude Hospital Days Used for Long Stays by Males by Cause (ICD- 9-CM), Rural South, 2003/04



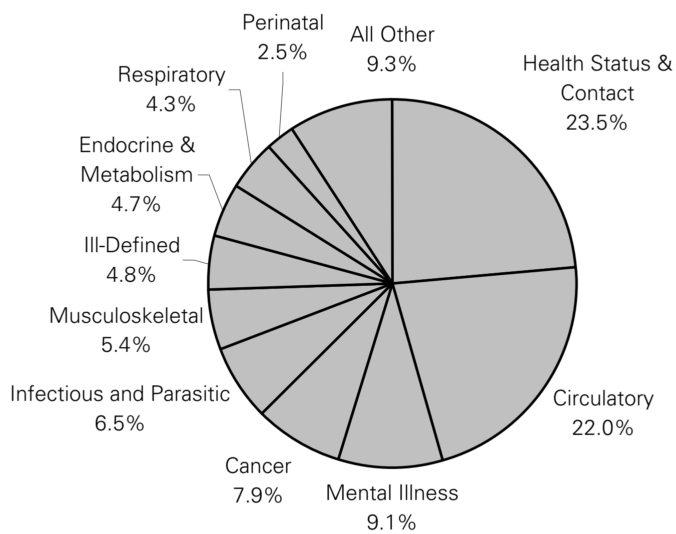
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.4: Crude Hospital Days Used for Long Stays by Females by Cause (ICD- 9-CM), Rural South, 2003/04



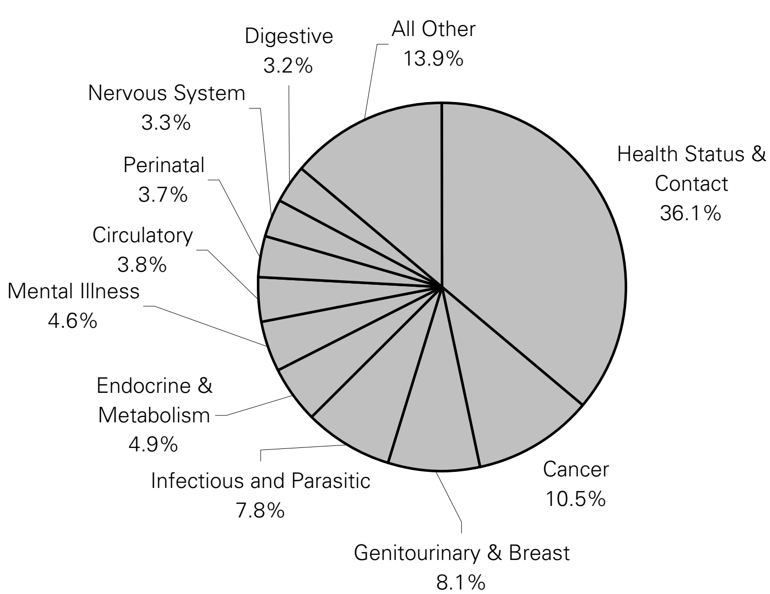
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.5: Crude Hospital Days Used for Long Stays by Males by Cause (ICD- 9-CM), North, 2003/04



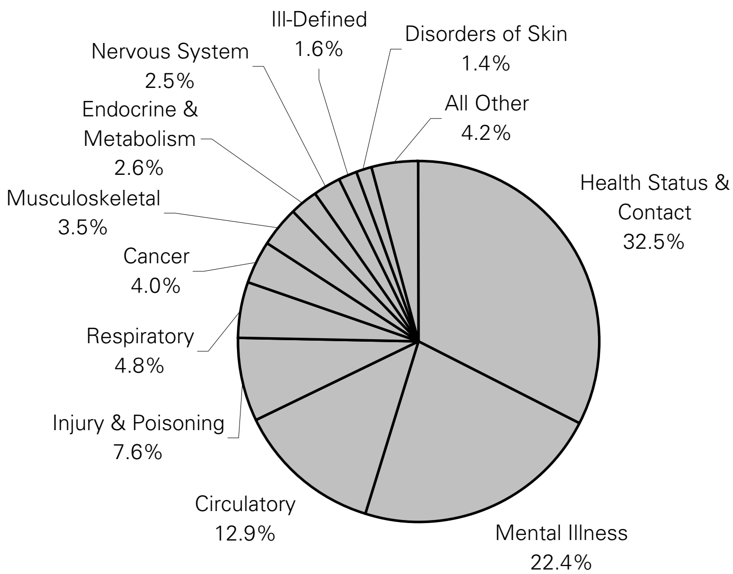
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.6: Crude Hospital Days Used for Long Stays by Females by Cause (ICD- 9-CM), North, 2003/04



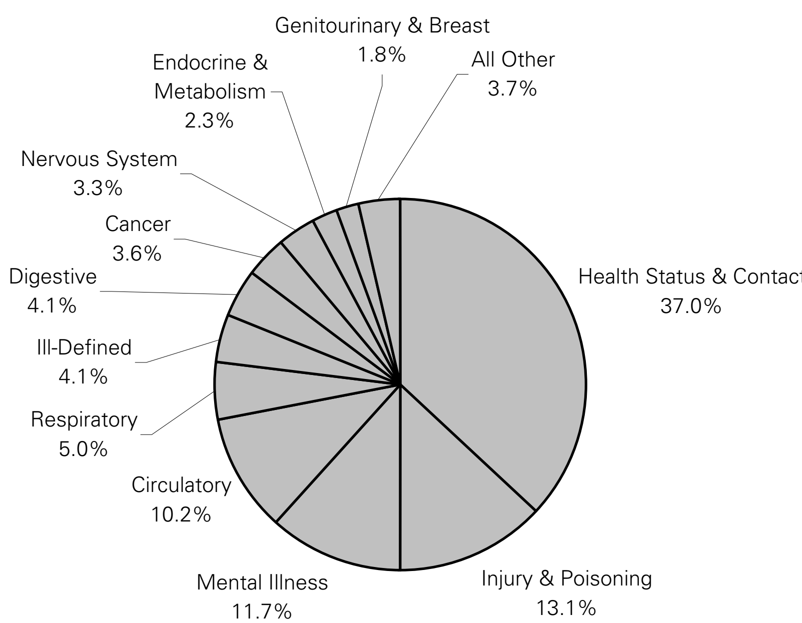
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.7: Crude Hospital Days Used for Long Stays by Males by Cause (ICD- 9-CM), Brandon, 2003/04



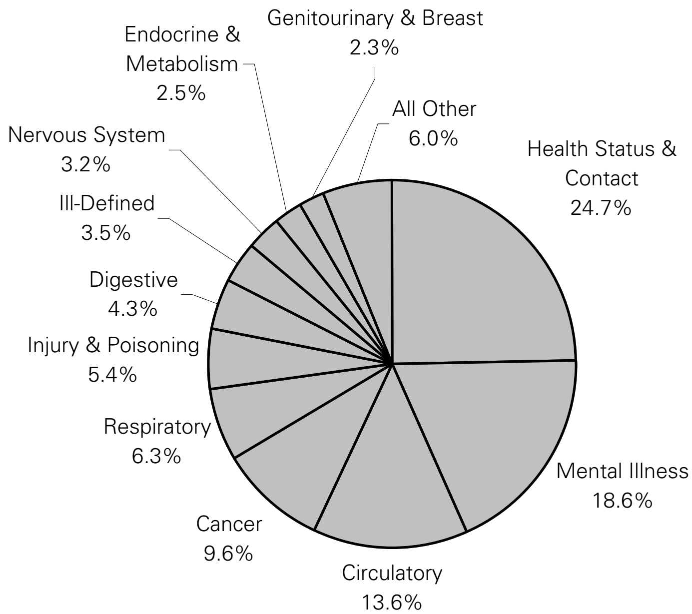
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.8: Crude Hospital Days Used for Long Stays by Females by Cause (ICD- 9-CM), Brandon, 2003/04



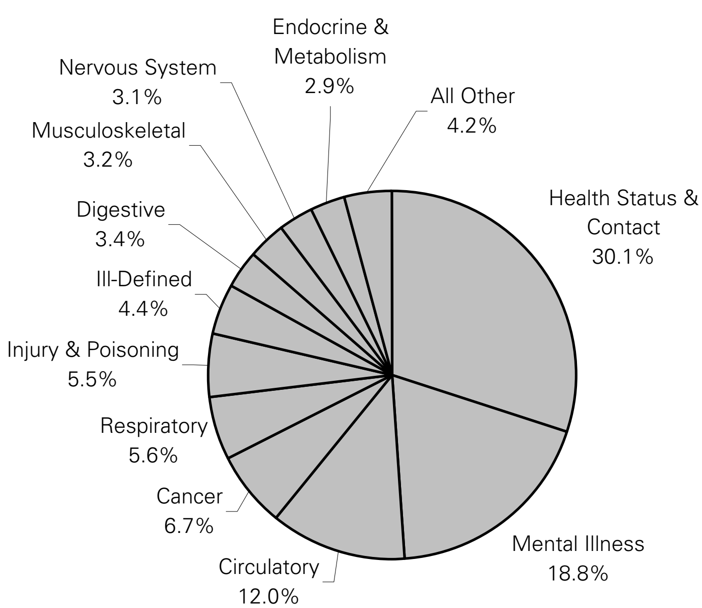
Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.9: Crude Hospital Days Used for Long Stays by Males by Cause (ICD- 9-CM), Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Figure 5.12.10: Crude Hospital Days Used for Long Stays by Females by Cause (ICD- 9-CM),Winnipeg, 2003/04



Source: Manitoba Centre for Health Policy, 2005

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Canadian Institute for Health Information, 2003. Table 5: Hospitalizations by leading diagnoses and gender, Canada, 2001/02. http://secure.cihi.ca/cihiweb/en/media_19nov 2003_tab5_e.html.

Canadian Institute for Health Information, 2004a. Table 2: Age standardized inpatient hospitalization rates (per 100,000 population) for Canada (provinces and territories, 1995/95, 2001/02, 2002/03. http://secure.cihi.ca/cihiweb/en/media_29oct2004_tab2_e.html.

Canadian Institute for Health Information, 2004b. Table 3: Total inpatient hospital days for Canada (provinces and territories), 1995/96, 2001/02, 2002/03. http://secure.cihi.ca/cihiweb/en/media_29oct2004_tab3_e.html

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Martens PJ, Fransoo R, The Need to Know Team, Burland E, Jebamani L, Burchill C, Black C, Dik N, MacWilliam L, Derksen S, Walld R, Steinbach C, Dahl M. *The Manitoba RHA Indicators Atlas: Population-Based Comparison of Health and Health Care Use.* Winnipeg, MB: Manitoba Centre for Health Policy, June 2003. Available at www.umanitoba.ca/centres/mchp/ and go to "Reports".

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CHAPTER 6: SURGICAL AND DIAGNOSTIC PROCEDURES

Introduction:

This chapter contains indicators of selected surgical procedures and diagnostic imaging rates. Additional high-profile procedures relating to heart disease and treatment are shown in Chapter 10: Cardiac Care.

Surgeries:

6.1 Cataract Surgery (Age 50+)
6.2 Hip Replacement
6.3 Knee Replacement
6.4 Sterilization Rates (Vasectomy and Tubal Ligation)
6.5 Tonsillectomy/Adenoidectomy Rates (Age 0 to14)

Diagnostic Imaging:

6.6 Computed Tomography (CT) Scans
6.7 Magnetic Resonance Imaging (MRI) Scans

Key Findings for Chapter 6: Surgical and Diagnostic Procedures

- For some surgical procedures, there was no significant difference in male versus female rates:
  - Total hip replacement: males 1.6, females 1.7 per 1,000 residents age 40 or older (not significantly different).
  - Tonsillectomy/Adenoidectomy: males and females 4.9 per 1,000 residents age 0 to14.
- Women had higher rates of cataract surgery: 22.2 versus 20.7 per 1,000 residents 50 or older (p<.001).
- Knee replacement rates were 28% higher for women than men (2.7 versus 2.1 per 1,000 residents age 40 or older), consistent with the higher prevalence of arthritis among women.
- Most surgical procedures showed neither positive nor negative relationships with need: cataract surgery, hip replacements, knee replacements and tonsillectomy rates were approximately equal across income levels.
- Rates of sterilization procedures were a striking exception: overall, vasectomy rates were higher than tubal ligation rates, but there were large differences by RHA, and by socioeconomic status. In southern and higher income areas, vasectomy rates were higher and tubal ligations lower, whereas among northern and lower income areas, tubal ligation rates were higher and vasectomies lower.

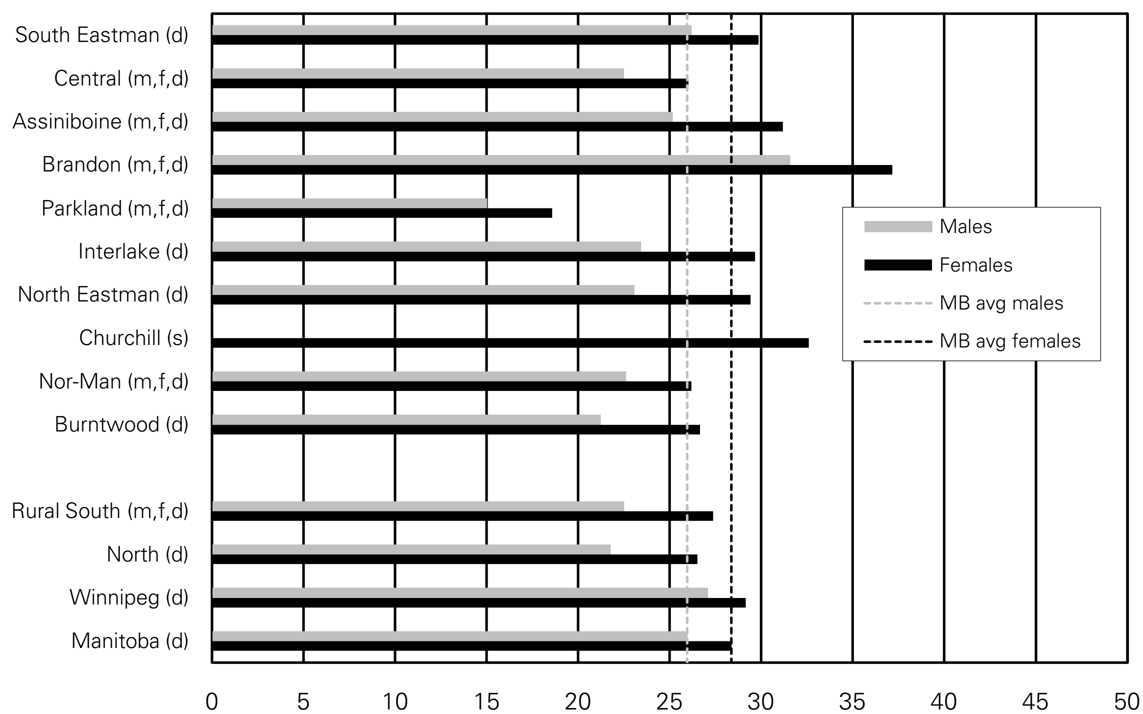
- Among diagnostic imaging results, several key issues emerged:
  - The rates of CT scans were higher for males than females, whereas MRI scans showed no sex difference.
  - The absence of individual-level data for CT scans done at some rural hospitals is a documented and growing problem for monitoring rural imaging services. Without individual-level data to record who received the services, the ability to compare rates, track trends, and monitor outcomes is limited.
  - For CT scans, the trend among urban residents was as expected: residents of lower income areas had higher rates. However, the pattern was not reflected in rates for rural residents; in fact, the trend was opposite for rural males (though missing data for some rural scans may affect these results).
  - MRI scan rates do not correspond to population-based need for health care: residents of lower income areas had lower rates of MRI scans, whereas higher rates would have been expected, given their higher burden of illness.
  - Rates of MRI scans also showed a strong geographic effect: residents in and near Winnipeg had rates that were higher than residents of other RHAs. For example: South Eastman and Interlake, at 11 and nine scans per 1,000 residents, versus Parkland and Assiniboine, at about 5.5 scans per 1,000 residents.

6.1 Cataract Surgery (Age 50+)

Definition: This is the rate of cataract surgeries done in 2001/02–2003/04 per 1,000 residents aged 50 years or older. Hospital abstracts were used to define procedures, using ICD-9-CM procedure codes 13.11, 13.19, 13.2, 13.3, 13.41, 13.43, 13.51 or 13.59. Residents could have more than one procedure in the three-year period, so each procedure is counted as a separate event. Values are age-adjusted to reflect the 50+ population of Manitoba (males and females combined).

Figure 6.1.1: Cataract Surgery Rates by RHA, 2001/02 – 2003/04

Age-adjusted annual rate of cataract surgeries per 1,000 residents age 50+

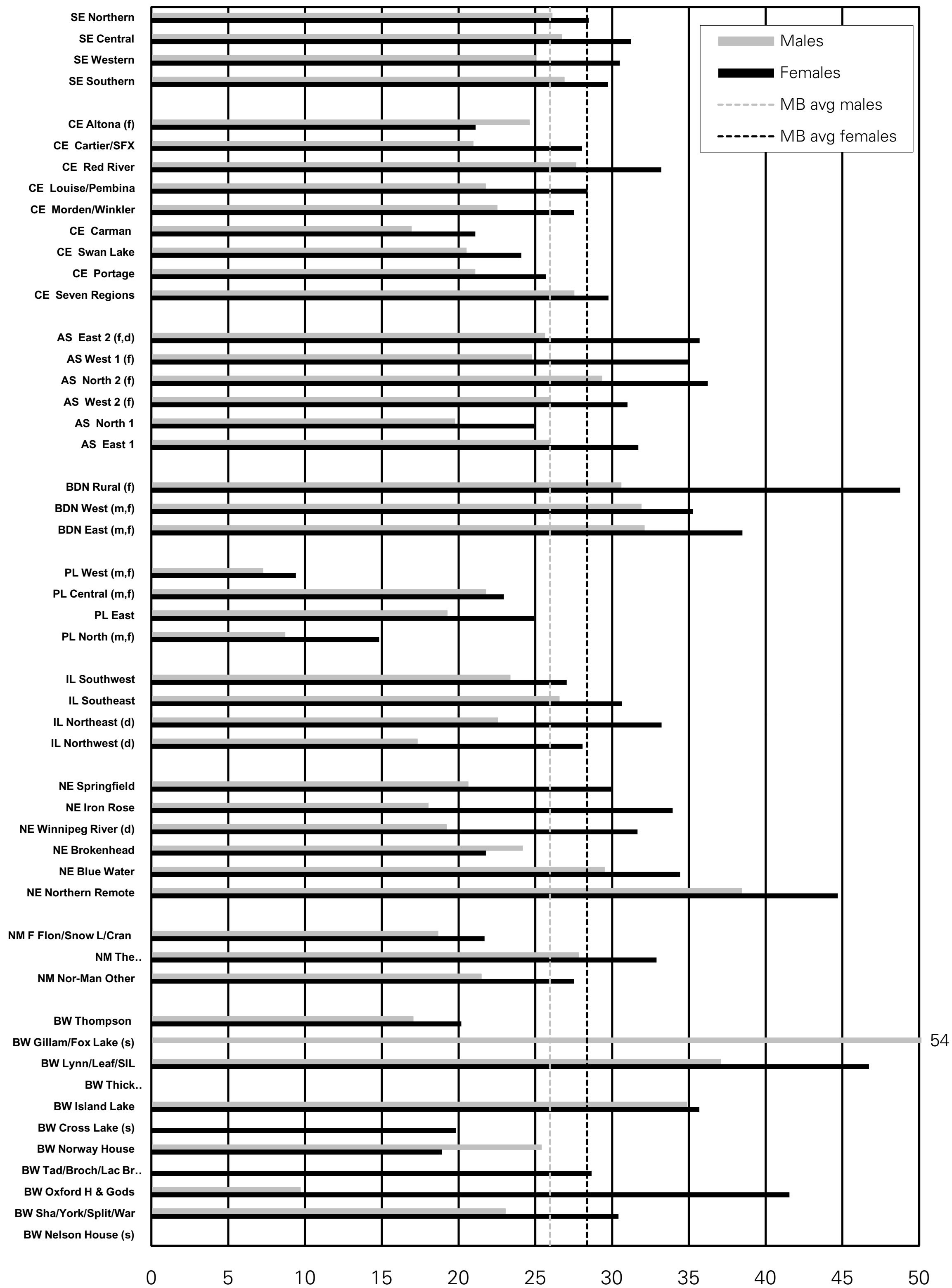


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.1.2: Cataract Surgery Rates by District, 2001/02 – 2003/04

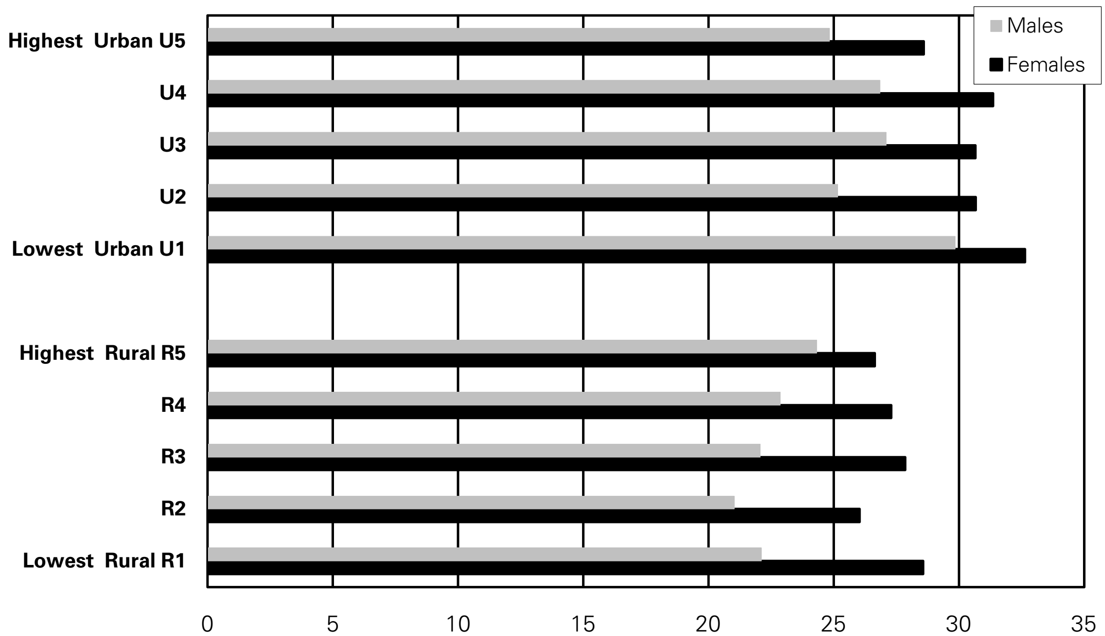
Age-adjusted annual rate of cataract surgeries per 1,000 residents age 50+



Source: Manitoba Centre for Health Policy, 2005

Figure 6.1.3: Cataract Surgery Rates by Income Quintile, 2001/02 – 2003/04

Age-adjusted annual rate of cataract surgeries per 1,000 residents age 50+



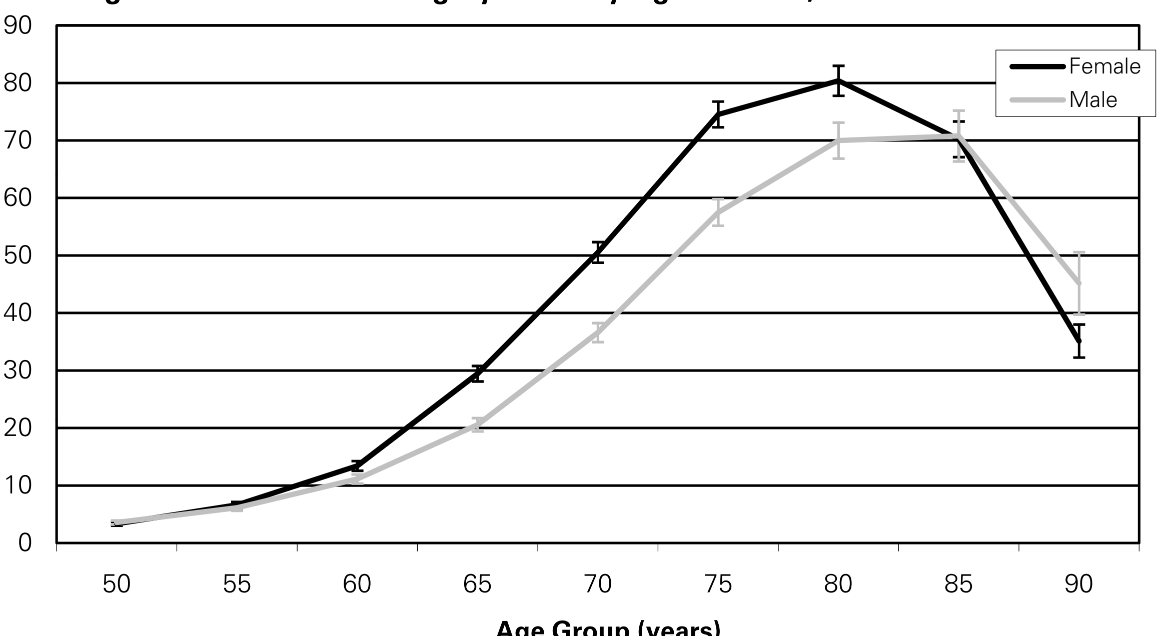
Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 6.1.4: Cataract Surgery Rates by Age and Sex, 2001/02 – 2003/04



Source: Manitoba Centre for Health Policy, 2005

Key findings for cataract surgery rates:

Age-adjusted rates:

- Overall, and in all RHAs, cataract surgery rates are higher for females than males (22.2 versus 20.7 per 1,000 residents 50+, p<.001).
- There is considerable variation in rates across RHAs, with particularly high rates among Brandon residents, and low rates among Parkland residents.
- There is a significant relationship between cataract surgery rates and area-level income for urban residents, where both males and females from lower income areas have higher rates, but no relationship among rural residents.

Age-specific crude rates by sex:

- For both sexes, cataract surgery rates are low below age 65, then increase rapidly to their peak around ages 75 to 85, and drop again among the oldest age groups.
- Cataract surgery rates for females are significantly higher than those for males from age 65 through 80, when the procedure rates are highest.

Comparisons to other findings:

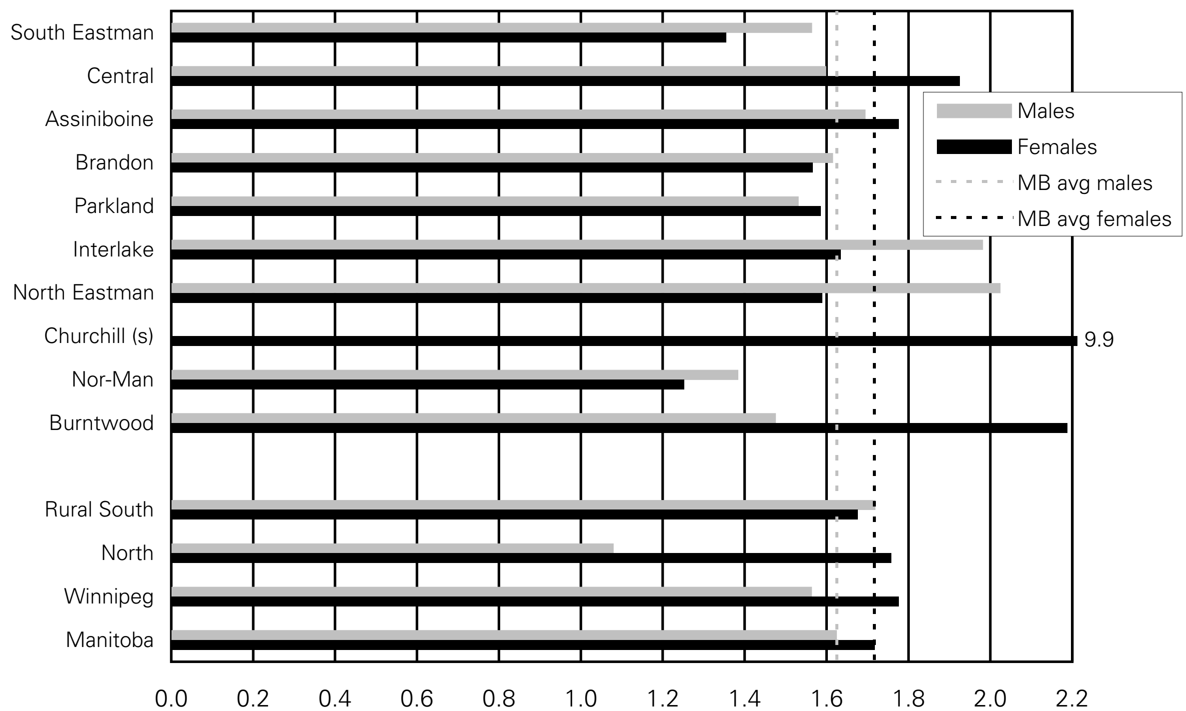
- These results show the cataract surgery rate in 2001/02–2003/04 is lower than that in 1998/99–2000/01, as reported in the RHA Indicators Atlas (Martens et al., 2003). The newest results are closer to those found in 1994/95–1996/97, and may suggest a 'leveling off' of the rate of cataract replacements, which had increased dramatically through the 1990s.
- Crude rates reported in 1988 by Bishara et al. revealed a sex ratio of 2:1 in favour of females. The results here are relatively close (the ratio of crude rates is 1.4:1), but age adjustment makes the rates very similar for males and females. That is, cataract surgery is much more common among the elderly, and there are many more elderly females than males (see Chapter 1) (Bishara et al., 1988).

6.2 Hip Replacement Surgery

Definition: This is the number of total hip replacements performed per 1,000 residents age 40 or older (a total revision of a previous hip replacement is also counted). Hospital abstracts were used to define procedures done in 1999/2000–2003/04, using ICD-9-CM procedure codes 81.50, 81.51, or 81.53. Residents could have more than one procedure in the five-year period, so each procedure is counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 6.2.1: Hip Replacement Surgery Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual rate of hip replacement surgeries per 1,000 residents age 40+

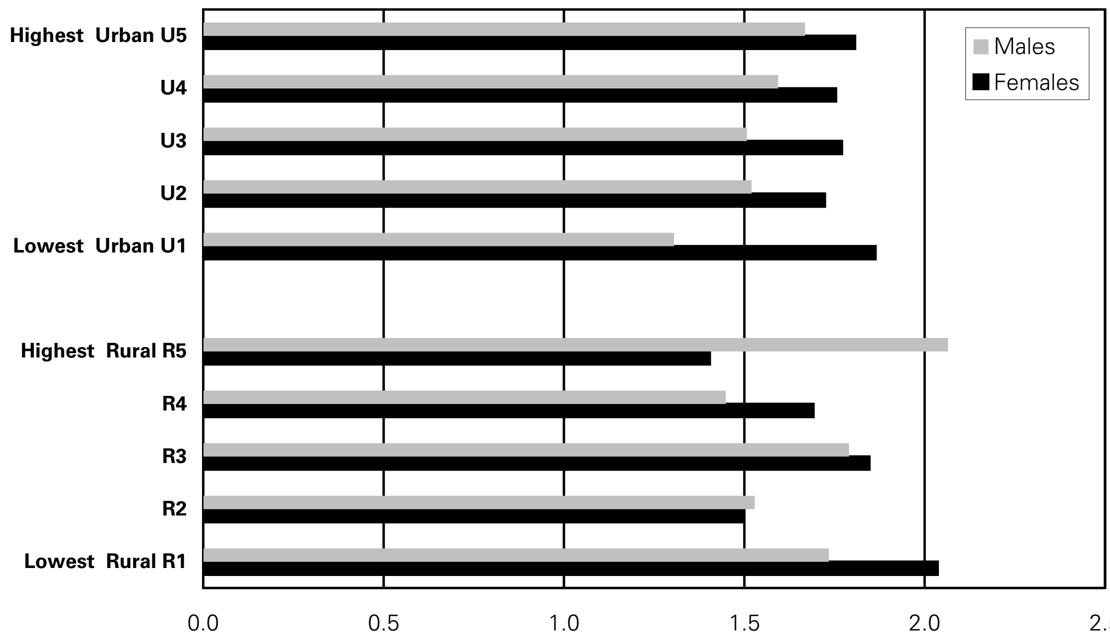


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.2.2: Hip Replacement Surgery Rates by Income Quintile, 1999/2000 – 2003/04

Age-adjusted annual rate of hip replacement surgeries per 1,000 residents age 40+



Linear Trend Test Results

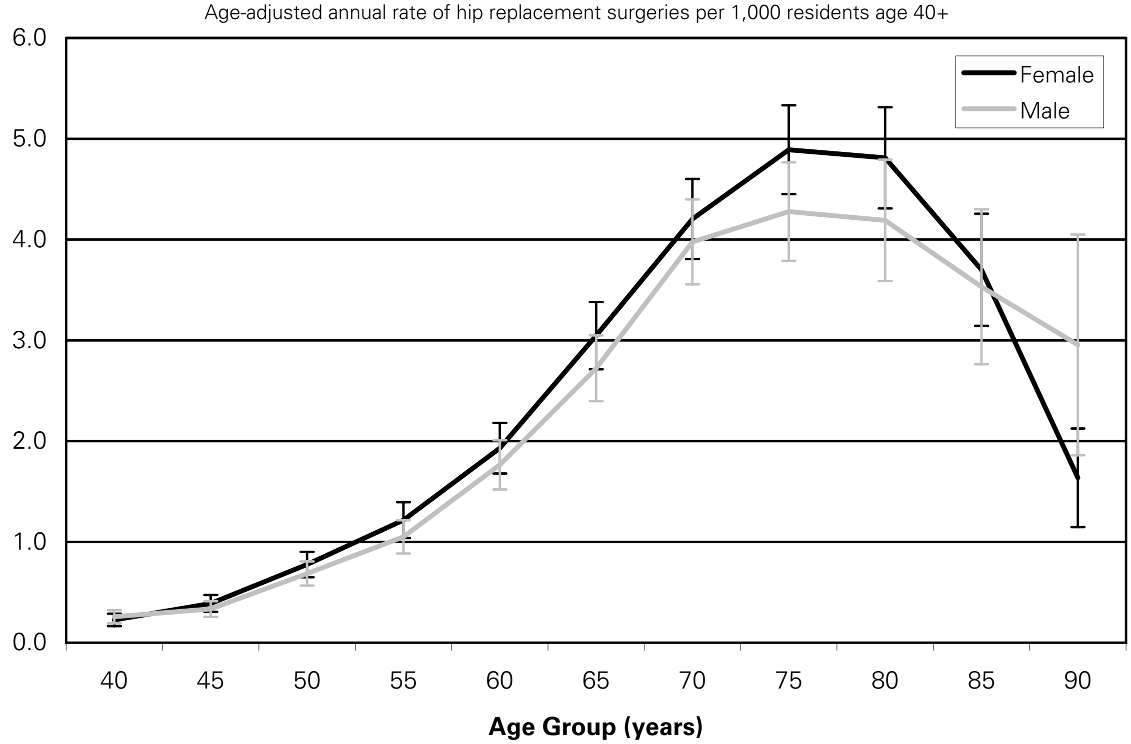
Female: Urban: Not Significant Rural: Not Significant

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 6.2.3: Hip Replacement Surgery Rates by Age and Sex, 1999/2000 – 2003/04

Age-adjusted annual rate of hip replacement surgeries per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for hip replacement surgery rates:

Age-adjusted rates:

- Overall, and for each RHA, hip replacement rates are similar for males and females (1.62 versus 1.72 per 1,000 residents 40+, not significant).
- District level results are not shown because there were too few events and too much variation for the statistical modeling to provide reliable results.
- There is no relationship between hip replacement rates and area-level income: the trends were not significant for urban or rural males or females.

Age-specific crude rates by sex:

- For both sexes, hip replacement rates are low below age 60, then increase rapidly to their peak around ages 70 to 80, and drop again among the oldest residents.

Comparisons to other findings:

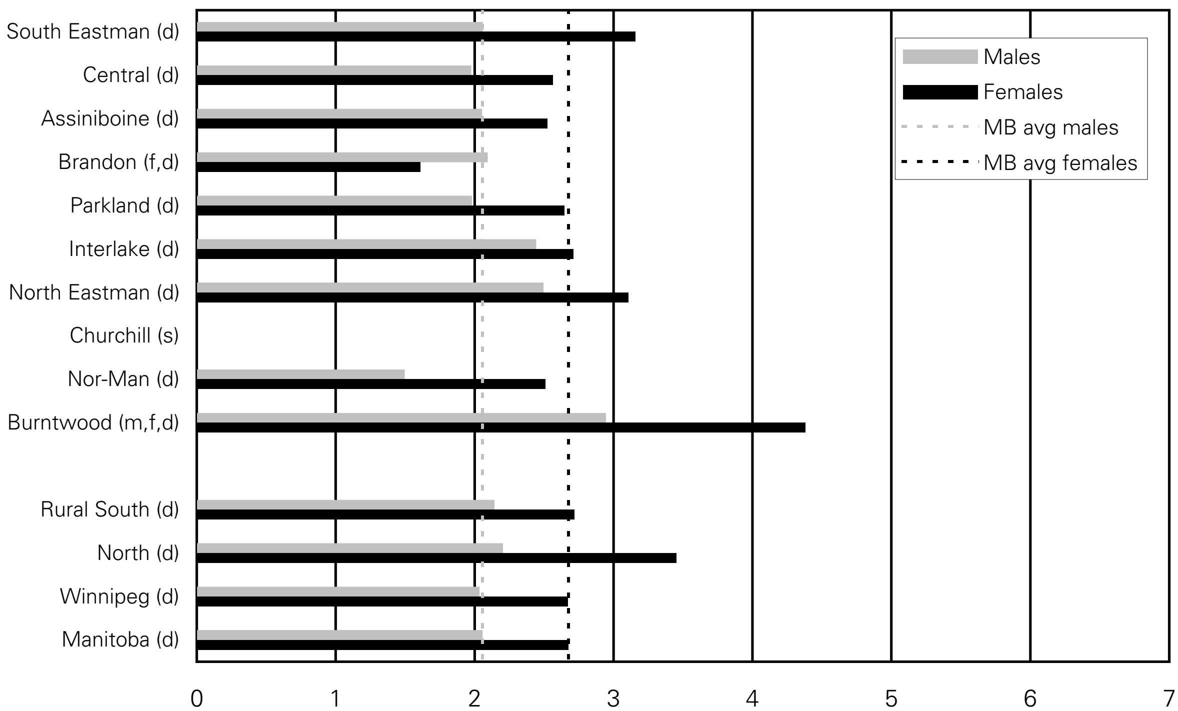
- These rates cannot be directly compared to those in the RHA Indicators Atlas (Martens et al., 2003) because the denominators used were different, but the actual number of hip replacements done was 618 per year in the early 1990s, 820 per year in the late 1990s, and 886 per year in 1999/2000–2003/04 (all ages).
- Arthritis and joint replacement studies support the higher need for arthroplasty among females than males (Hawker et al., 2000), and while this was not seen for hip replacements, it is shown for knee replacements (Section 6.3).
- A much larger sex difference in age-adjusted rates (over 2.5 times) has been reported among residents age 65+ (Papadimitropoulos et al., 1997), though the data were from 1993/94.

6.3 Knee Replacement Surgery

Definition: This is the number of total knee replacements performed per 1,000 residents age 40 years or older. Hospital abstracts were used to define procedures done in 1999/2000–2003/04, using ICD-9-CM procedure codes 81.54 or 81.55. Residents could have more than one procedure in the five-year period, so each procedure is counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 6.3.1: Knee Replacement Surgery Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual rate of knee replacement surgeries per 1,000 residents age 40+

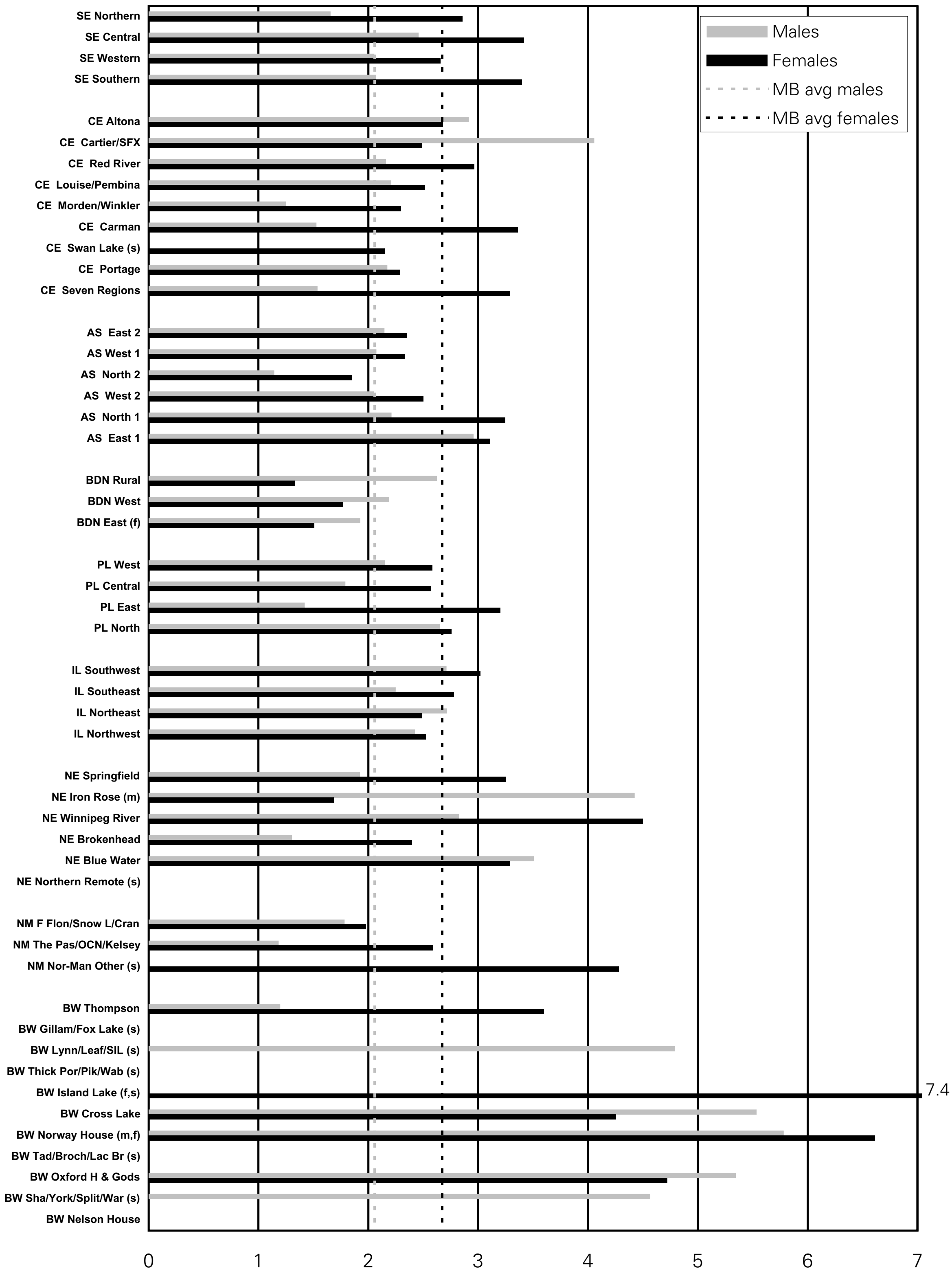


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.3.2: Knee Replacement Surgery Rates by District, 1999/2000 – 2003/04

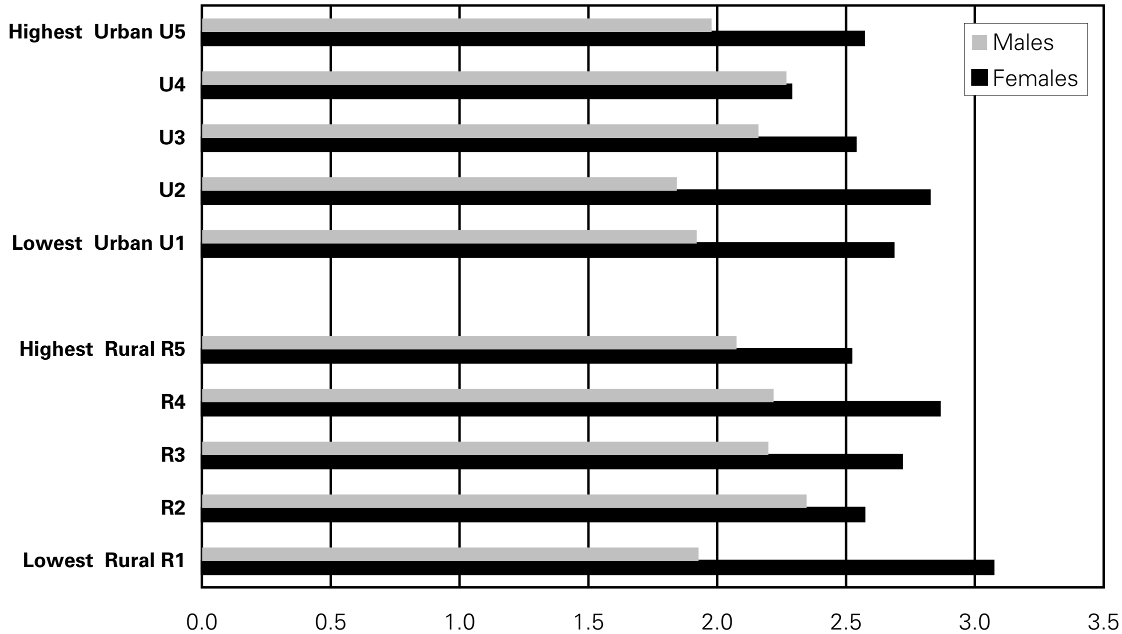
Age-adjusted annual rate of knee replacement surgeries per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 6.3.3: Knee Replacement Surgery Rates by Income Quintile, 1999/2000 – 2003/04

Age-adjusted annual rate of knee replacement surgeries per 1,000 residents age 40+



Linear Trend Test Results

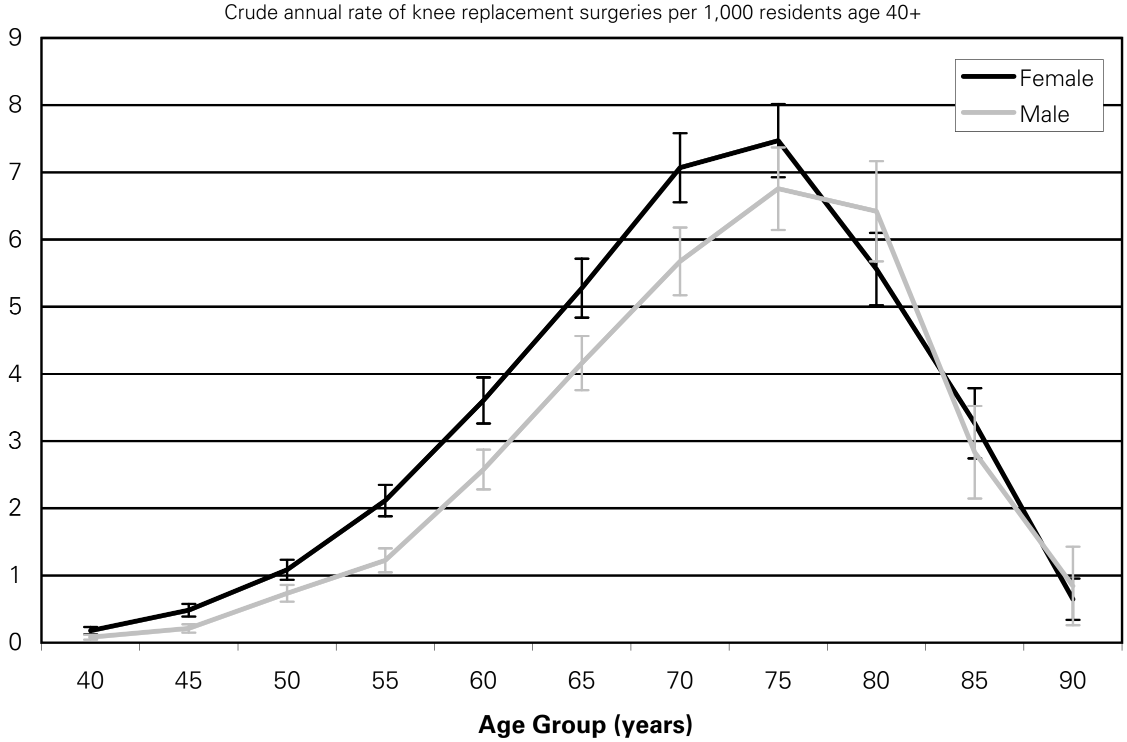
Female: Urban: Not Significant Rural: Not Significant

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 6.3.4: Knee Replacement Surgery Rates by Age and Sex, 1999/2000 – 2003/04

Crude annual rate of knee replacement surgeries per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for knee replacement surgery rates:

Age-adjusted rates:

- Overall, and in all RHAs, knee replacement rates are higher for females than males (2.7 versus 2.1 per 1,000 residents 40+, p=.001).
- Rates are relatively equal across RHAs, except Burntwood, which has higher than average rates.
- There is no relationship between knee replacement rates and area-level income: the trends were not significant for urban or rural males or females.

Age-specific crude rates by sex:

- For both sexes, knee replacement rates are low below age 60, then increase rapidly to their peak around ages 70 to 80, and drop again among the oldest age groups.

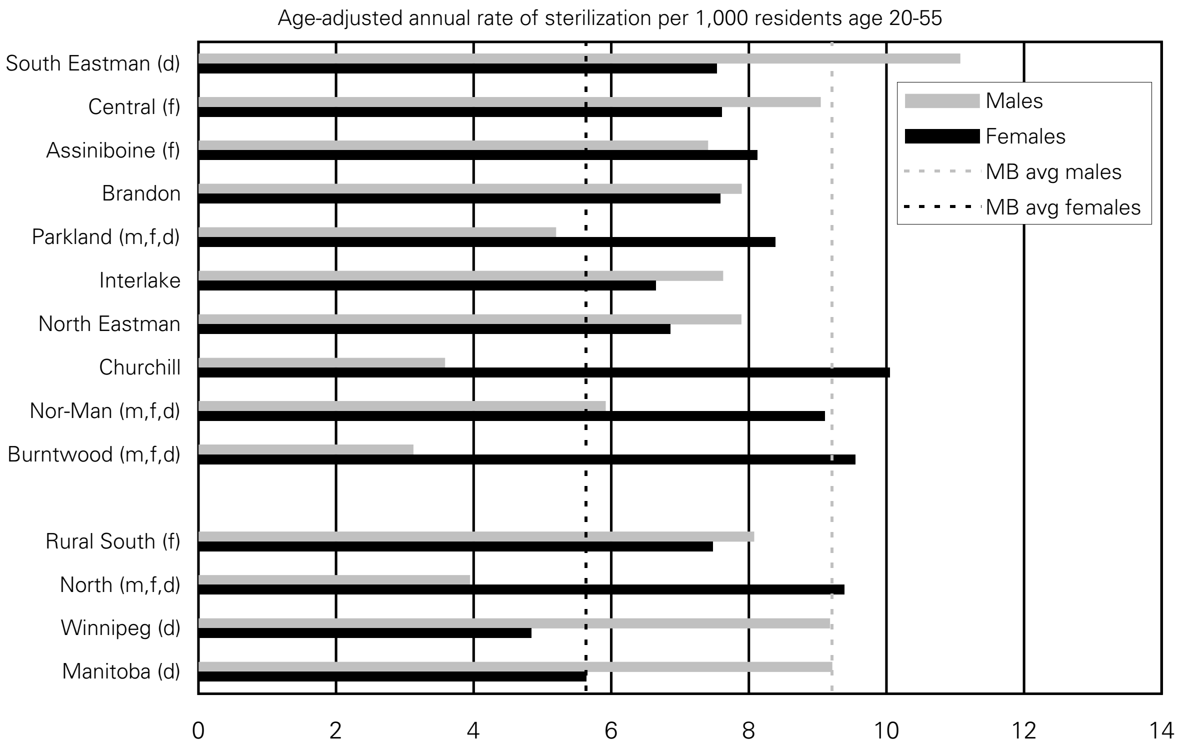
Comparisons to other findings:

- These rates cannot be directly compared to those in the RHA Indicators Atlas (Martens et al., 2003) because this analysis used an age cut-off of 40+, but the actual number of knee replacements performed (479/year in males, 733/year in females) was about 22% higher than in the late 1990s (991/year in both sexes combined). This suggests a continuing increase in the number of procedures done over time.
- Arthritis and joint replacement studies support the higher need for arthroplasty among females than males (Hawker et al., 2000), and these results show that pattern holds for Manitoba.

6.4 Sterilization Rates (Vasectomy or Tubal Ligation)

Definition: This is the rate of sterilization (tubal ligation for females; vasectomy for males) per 1,000 area residents age 20 to 55, over the five-year period 1999/2000–2003/04. For males: tariff code 4241 in physician claims, or ICD-9-CM procedure code 63.7 in hospitalizations. For females: ICD-9-CM procedure 66.2 or 66.3 in hospitalizations. Values are age-adjusted to reflect the 20- to 55-year old population of Manitoba (males and females combined).

Figure 6.4.1: Sterilization Rates (vasectomy or tubal ligation) by RHA, 1999/2000 – 2003/04

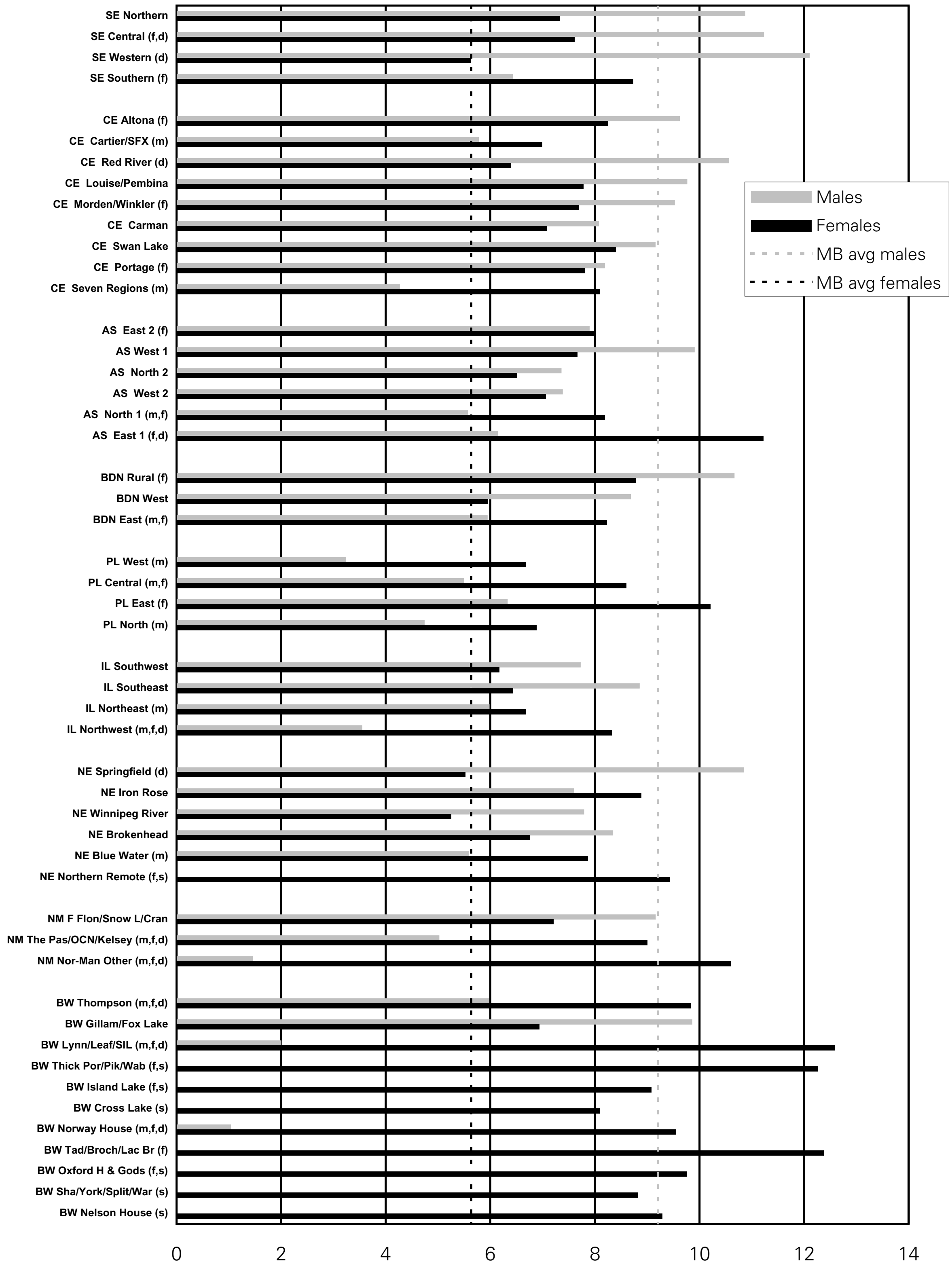


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.4.2: Sterilization Rates (vasectomy or tubal ligation) by District, 1999/2000 – 2003/04

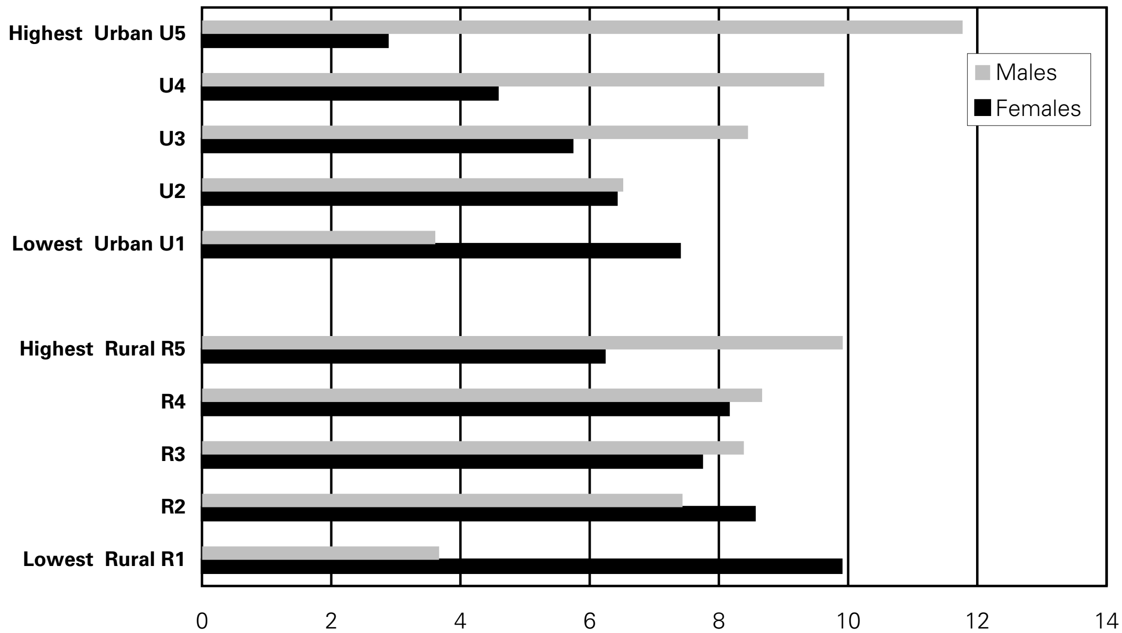
Age-adjusted annual rate of sterilization per 1,000 residents age 20-55



Source: Manitoba Centre for Health Policy, 2005

Figure 6.4.3: Sterilization Rates (vasectomy or tubal ligation) by Income Quintile, 1999/2000 – 2003/04

Age-adjusted annual rate of sterilization per 1,000 residents age 20-55



Linear Trend Test Results

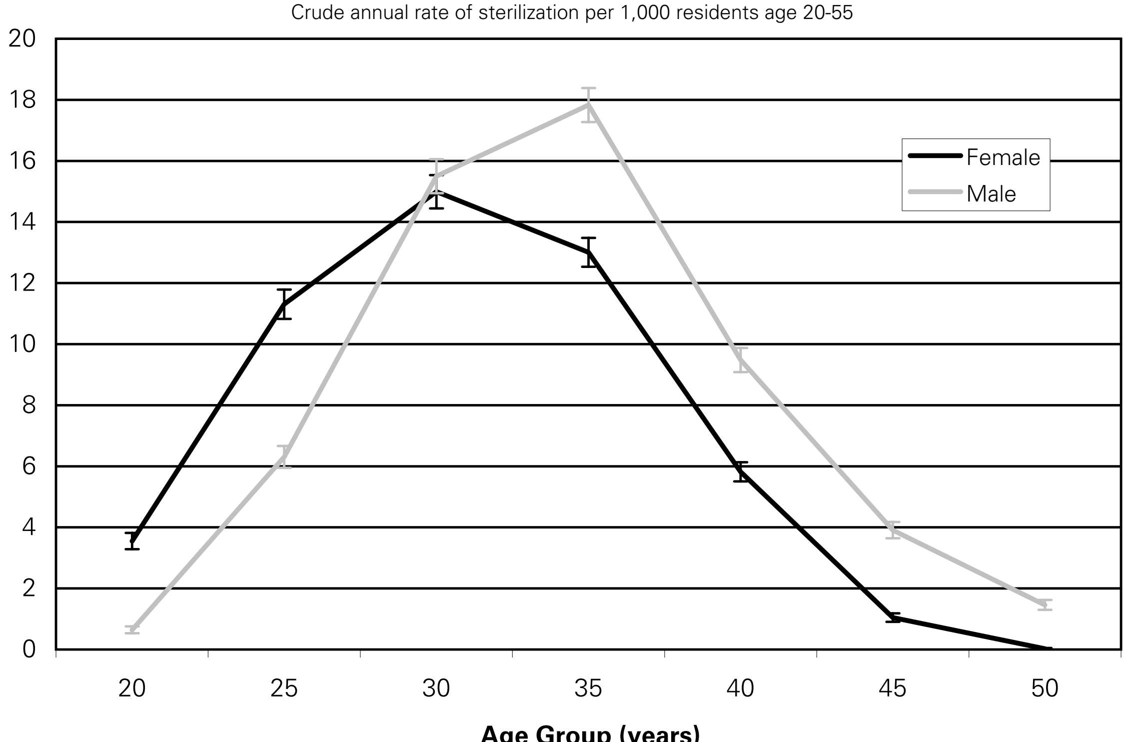
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 6.4.4: Sterilization Rates (vasectomy or tubal ligation) by Age and Sex, 1999/2000 – 2003/04

Crude annual rate of sterilization per 1,000 residents age 20-55



Source: Manitoba Centre for Health Policy, 2005

Key findings for sterilization rates:

Age-adjusted rates:

- Overall, sterilization rates are higher for males than females (9.2 versus 5.6 per 1,000 residents age 20 to 55, p<.001).
- The rates vary substantially by RHA, and females have higher rates in some areas.
- The relationships between sterilization rates and area-level income reveal a striking pattern. The correlations are all strong, but in opposite directions in men and women: in lower income areas, both urban and rural, the rates are higher among females, whereas in higher income areas, male rates are higher.

Age-specific crude rates by sex (20 to 55 years):

- Sterilization rates are highest in 30- to 34- and 35- to 39-year age groups, and lower for both younger and older residents. Among young adults, rates for females are higher than those for males, whereas among those age 35+, rates for males are higher.

Comparisons to other findings:

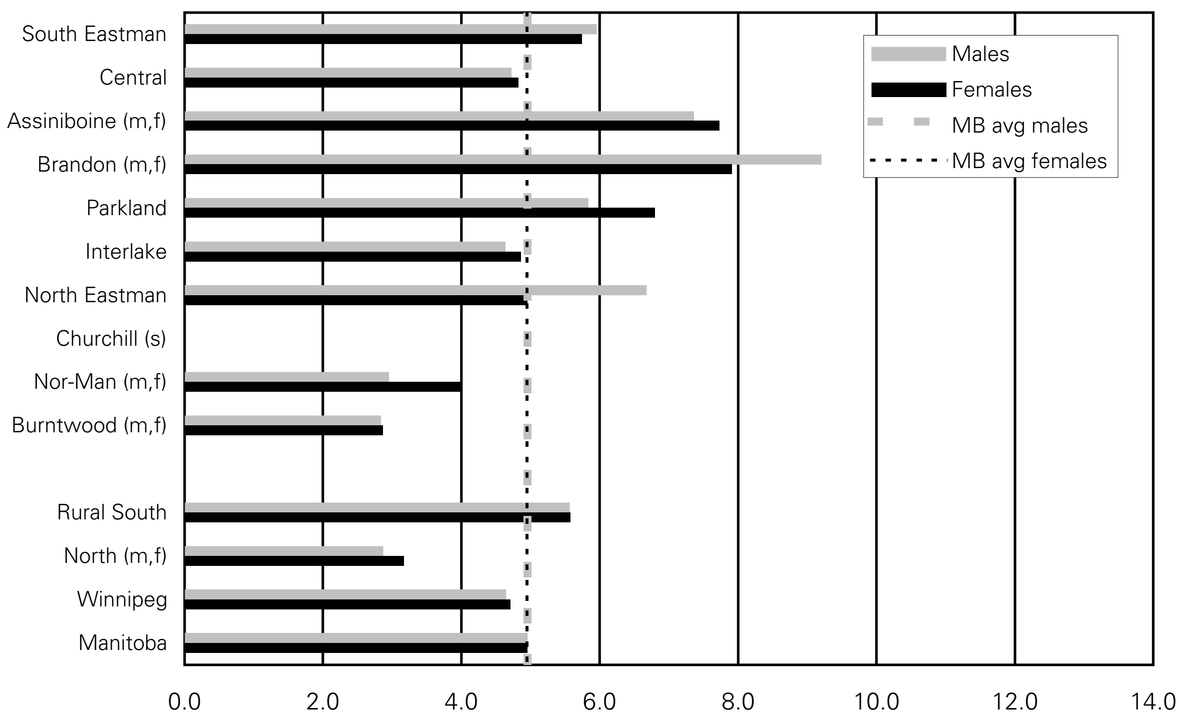
- The number of tubal ligations performed (1,927 per year) was much lower than that reported for Manitoba during the 1970s (4,500 per year).
- A number of studies (most using surveys) reported sharp decreases in tubal ligations over time, and a simultaneous increase in vasectomies—however, population-based rates were not available.
- A study of sterilizations in the U.K. in the 1990s provides more comparable rates. Manitoba's current tubal ligation rates are slightly higher than those found in the U.K. (5.3 per 1,000 in Manitoba, 4.8 in the U.K.), whereas vasectomy rates are almost double those in the U.K. (8.9 in Manitoba, 4.5 in the U.K.) (Rowlands et al., 2003).

6.5 Tonsillectomy/Adenoidectomy Rates (Age 0 to 14)

Definition: This is the number of tonsillectomy and/or adenoidectomy procedures (ICD-9-CM codes 28.2, 28.3, or 28.6) performed in 2001/02–2003/04, per 1,000 children age 0 to 14 years. Tonsillectomy is often called a 'discretionary' procedure, as physician practice patterns can have a large influence on procedure rates. Values are age-adjusted to reflect the 0- to 14-year old population of Manitoba (males and females combined).

Figure 6.5.1: Tonsillectomy/Adenoidectomy Rates by RHA, 2001/02 – 2003/04

Age-adjusted annual rate per 1,000 children age 0-14

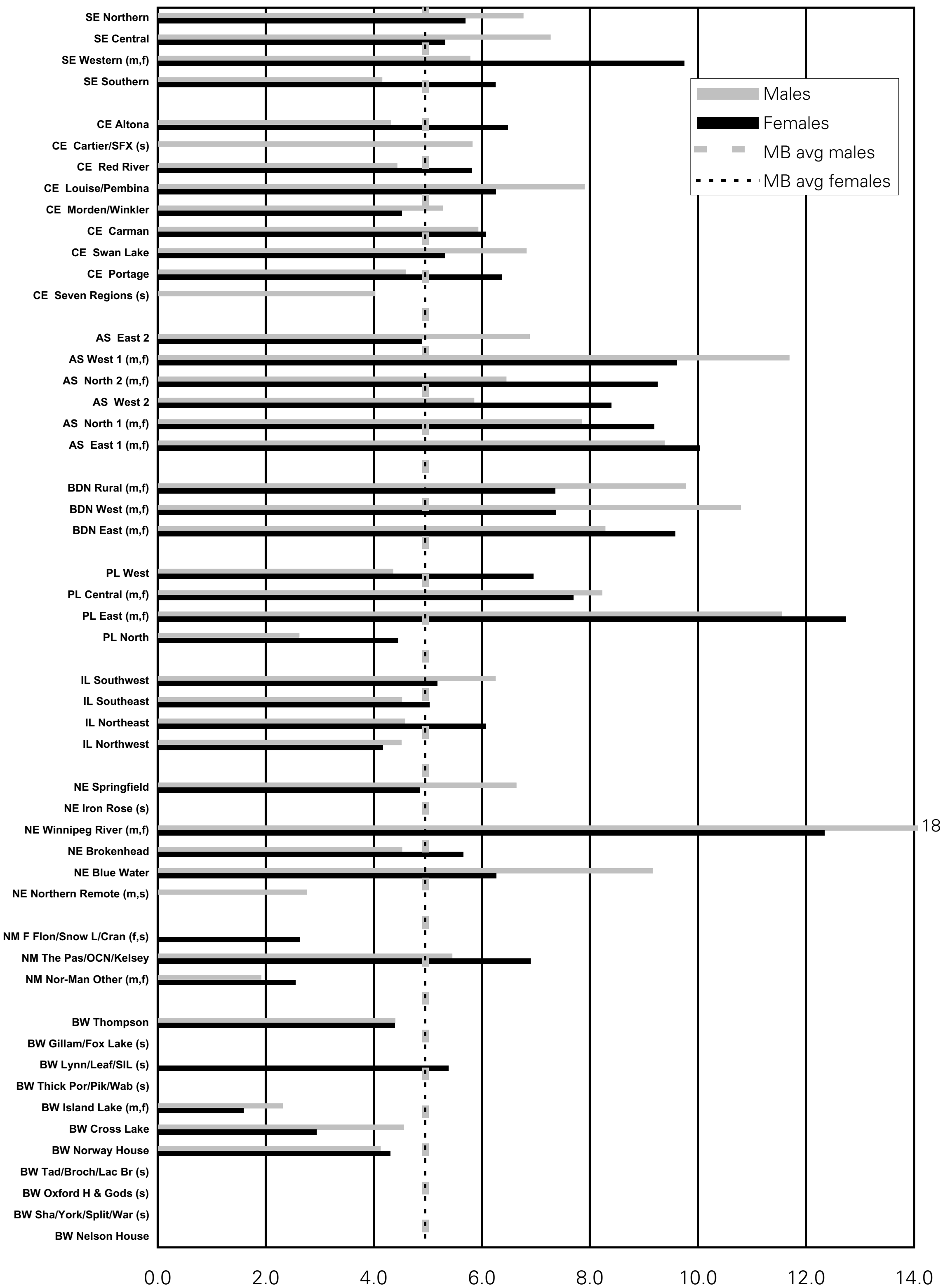


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.5.2: Tonsillectomy/Adenoidectomy Rates by RHA, 2001/02 – 2003/04

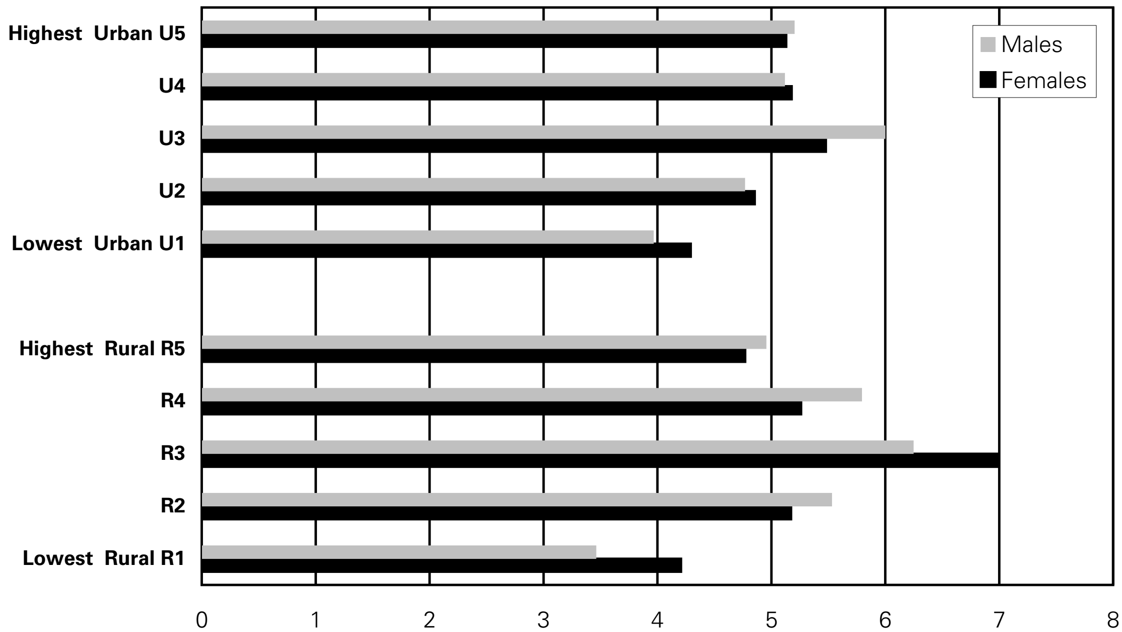
Age-adjusted annual rate per 1,000 children age 0-14



Source: Manitoba Centre for Health Policy, 2005

Figure 6.5.3: Tonsillectomy/Adenoidectomy Rates by Income Quintile, 2001/02 – 2003/04

Age-adjusted annual rates per 1,000 children age 0-14



Linear Trend Test Results

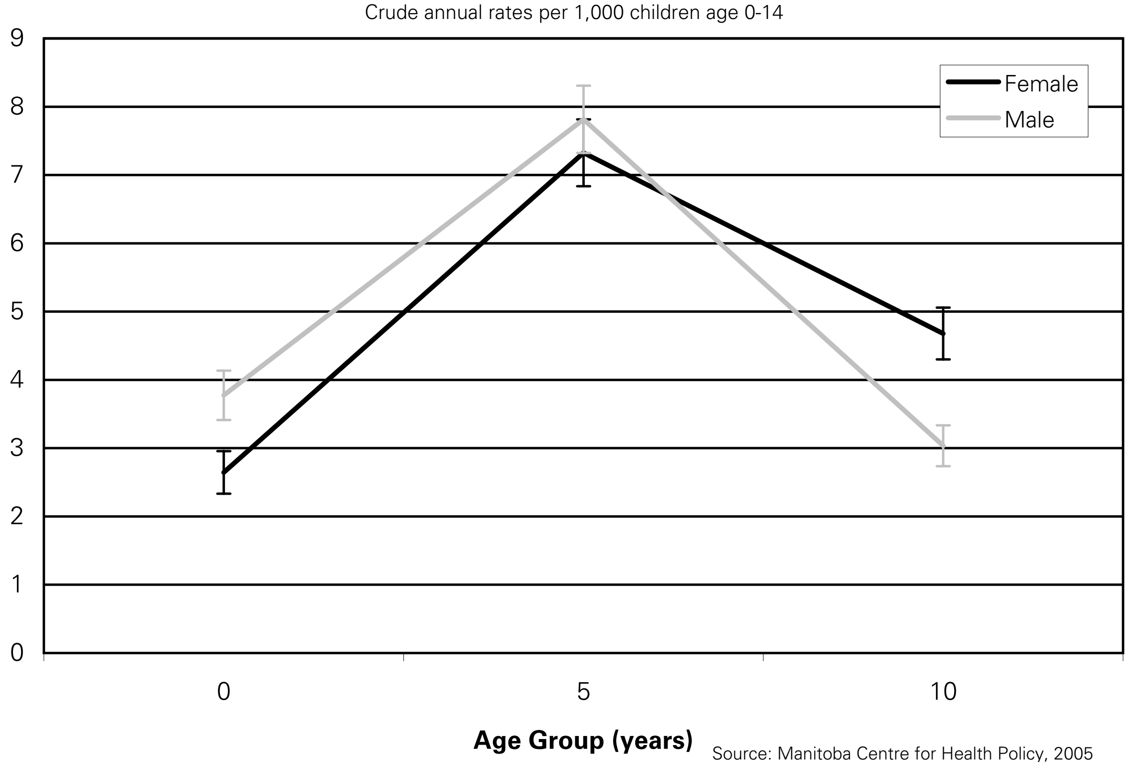
Female: Urban: Not Significant Rural: Not Significant

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 6.5.4: Tonsillectomy/Adenoidectomy Rates by Age and Sex, 2001/02 – 2003/04

Crude annual rates per 1,000 children age 0-14



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of tonsillectomy/adenoidectomy:

Age-adjusted rates:

- Overall, tonsillectomy/adenoidectomy rates are the same for males and females (4.95 per 1,000 children age 0 to 14).
- The rates vary considerably by RHA, with high rates among some southern RHAs, and low rates in northern RHAs.
- There is no relationship between tonsillectomy/adenoidectomy rates and area-level income.

Age-specific crude rates by sex:

- For both sexes, tonsillectomy/adenoidectomy rates are relatively low for 0 to 4 year olds, higher for 5- to 9-year olds, and lower again for 10- to14-year olds.
- The difference between sexes is small, with slightly higher rates for younger males and older females.

Comparisons to other findings:

- These values are consistent with those reported in the RHA Indicators Atlas (6.1 per 1,000 in 1993/94–1995/96, and 5.5 in 1998/99–2000/01), reflecting a continuing slow decrease in the rate of tonsillectomy/adenoidectomy procedures (Martens et al., 2003).

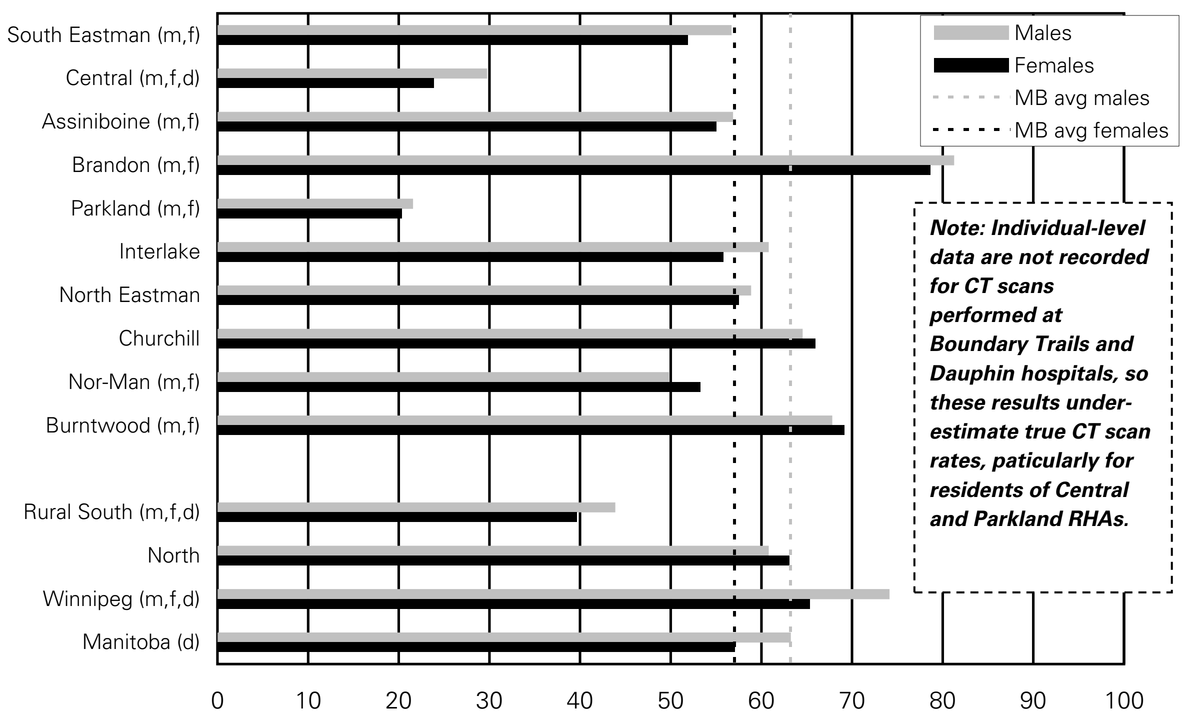
6.6 Computed Tomography (CT) Scans

Definition: This is the rate of CT scans per 1,000 area residents. Data were taken from medical claims for three years: 2001/02–2003/04, using tariff codes 7112–7115 or 7221–7230. The rates count 'person-visits' to the CT scanner—so if a person had several scans on the same day, they were counted as a single 'episode', whereas CT scans for the same resident on other days were counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Note: These results are known to undercount the actual number of procedures provided to residents of some areas because of the lack of individual-level data collection and reporting associated with CT scanners at Boundary Trails and Dauphin hospitals. This will cause significant problems for rates for residents of Central and Parkland RHAs, but will also affect rates for residents of other RHAs using those facilities.

Figure 6.6.1: CT Scan Rates by RHA, 2001/02 – 2003/04

Age-adjusted annual rate of CT Scans per 1,000 residents

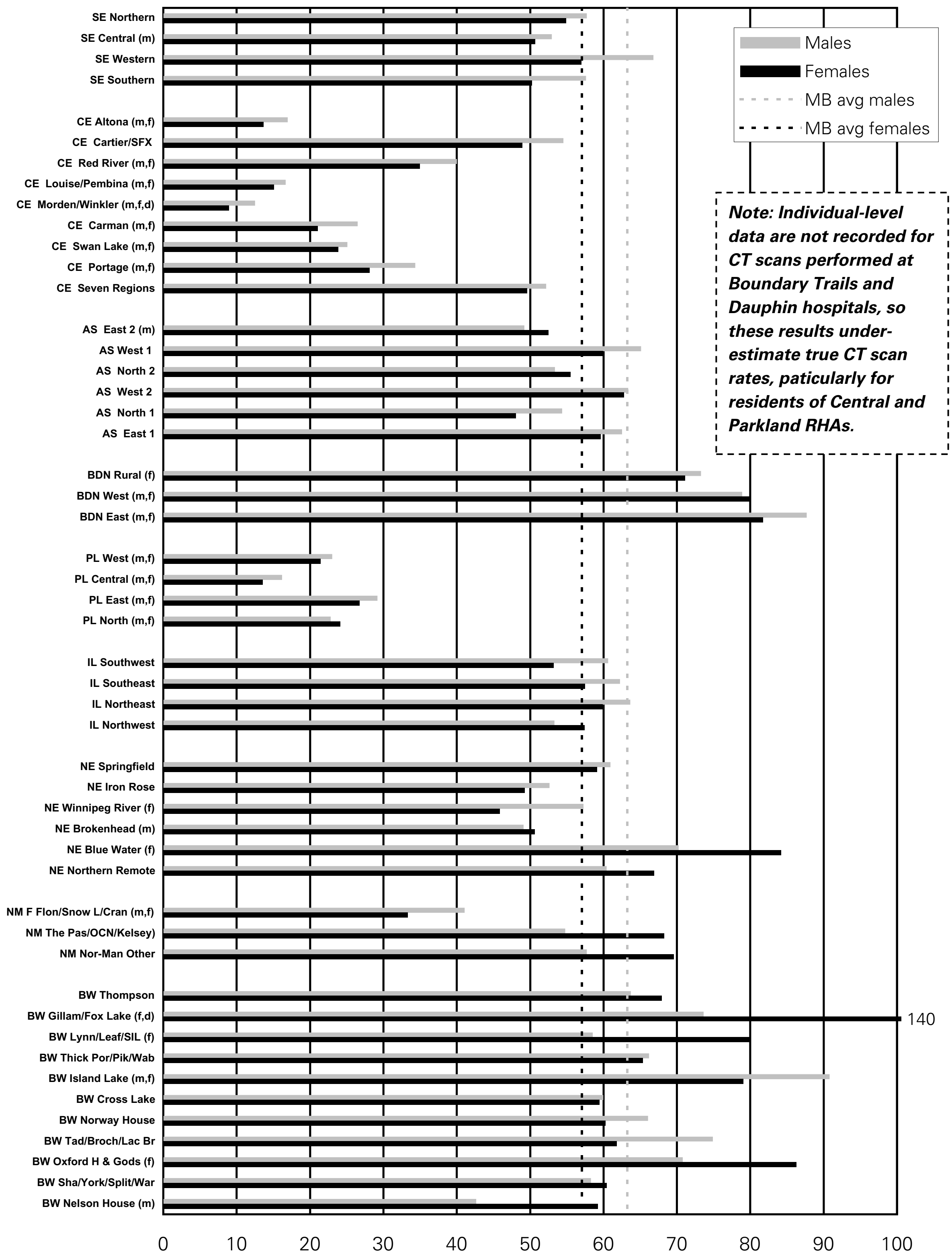


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.6.2: CT Scan Rates by District, 2001/02 – 2003/04

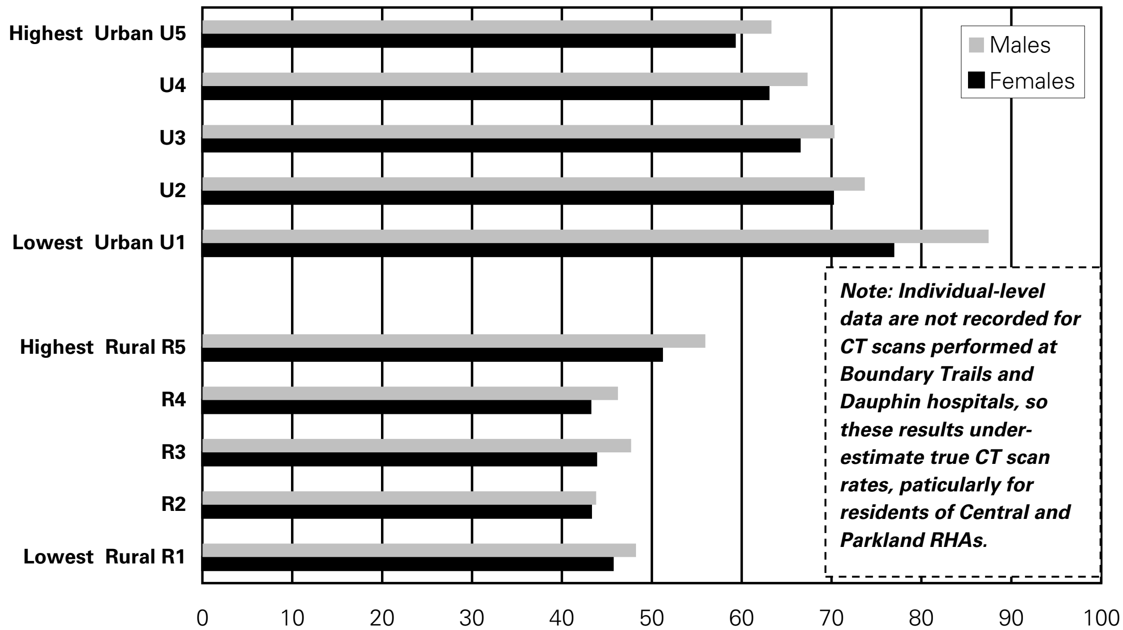
Age-adjusted annual rate of CT Scans per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 6.6.3: CT Scan Rates by Income Quintile, 2001/02 – 2003/04

Age-adjusted annual rate of CT Scans per 1,000 residents



Linear Trend Test Results

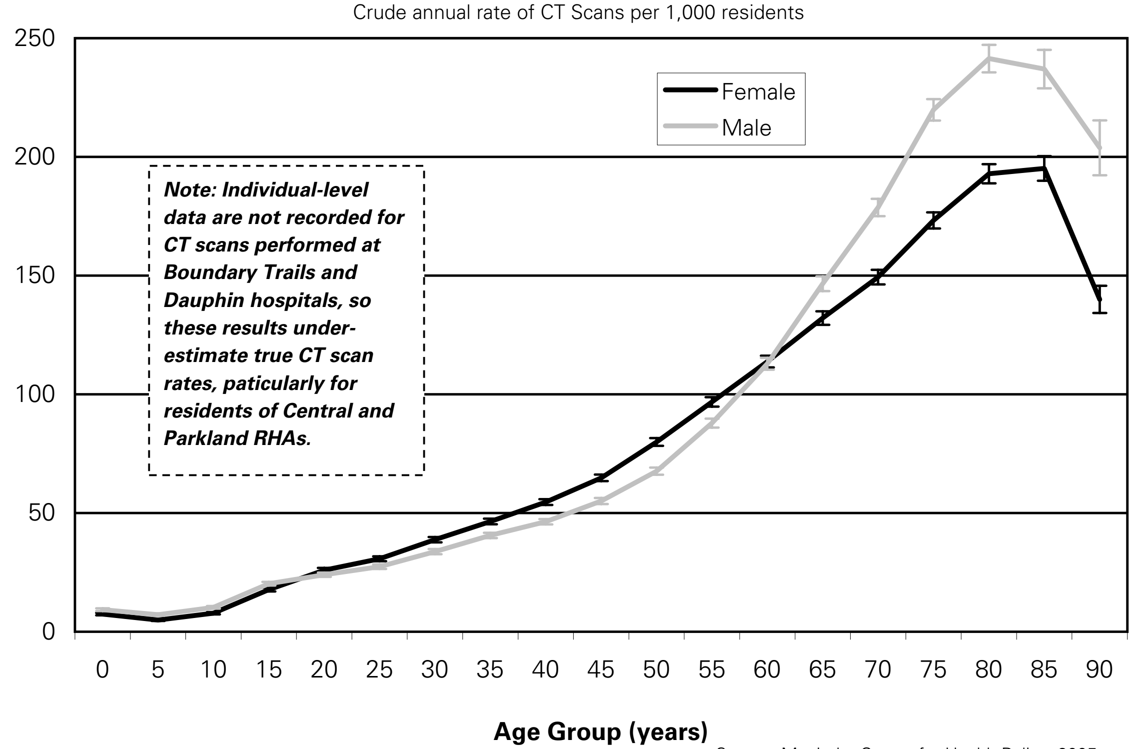
Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 6.6.4: CT Scan Rates by RHA, 2001/02 – 2003/04

Crude annual rate of CT Scans per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of computed tomography scans:

These observations should be interpreted with caution, given the missing data noted above.

Age-adjusted rates:

- Overall, and for the southern RHAs, CT scan rates are higher for males than females (63.2 versus 57.0 per 1,000 residents, $p<.001$).
- Rates are high for Brandon residents, and appear low for Parkland and Central residents, but this may be largely due to the missing data problem noted above.
- There is a strong relationship between CT scan rates and area-level income in urban areas, but not in rural areas. Both males and females from lower income urban areas have higher rates of CT scans. Among rural residents, males from higher income areas have higher CT scan rates, but there was no trend among rural females.

Age-specific crude rates by sex:

- For both sexes, CT scan rates are very low for children and youth. Rates rise steadily through adulthood, and reach their highest levels among the elderly. For most age groups, male and female rates are relatively close to each other, except among the elderly, where male rates are higher than those for females.

Comparisons to other findings:

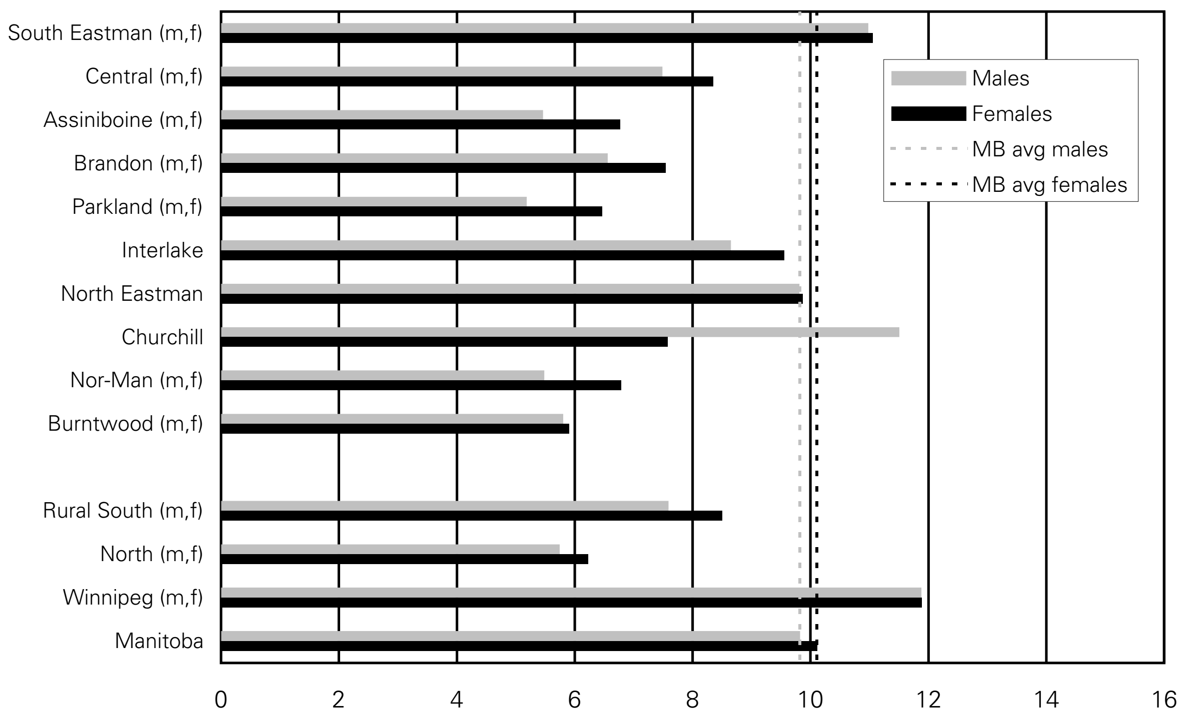
- These rates are lower than the 87.1 per 1,000 reported for Ontario residents in 2003/04 (Laupacis A et al., 2005), but most of this difference is methodological. Our rates count 'person-visits' to the CT suite—so if a patient has three scans (or three body parts scanned) on the same day, it is counted as one episode. Our rates would be 74.1 for males and 66.0 for females if each individual scan was counted separately.

6.7 Magnetic Resonance Imaging (MRI) Scans

Definition: This is the rate of MRI scans per 1,000 area residents in 2001/02–2003/04. Over the time period analyzed, there were only MRI scanners at St. Boniface Hospital and Health Sciences Centre in Winnipeg (the MRI scanner in Brandon began operation in April 2004—just after the period examined here). Data were taken from medical claims, using tariff codes 7501–7528 (individual-level data are entered for each scan). The rates count 'person-visits' to the MRI scanner—so if a person had several scans on the same day, they were counted as a single 'episode', whereas MRI scans for the same resident on other days were counted as separate events. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 6.7.1: MRI Scan Rates by RHA, 2001/02 – 2003/04

Age-adjusted annual rate of MRI scans per 1,000 residents

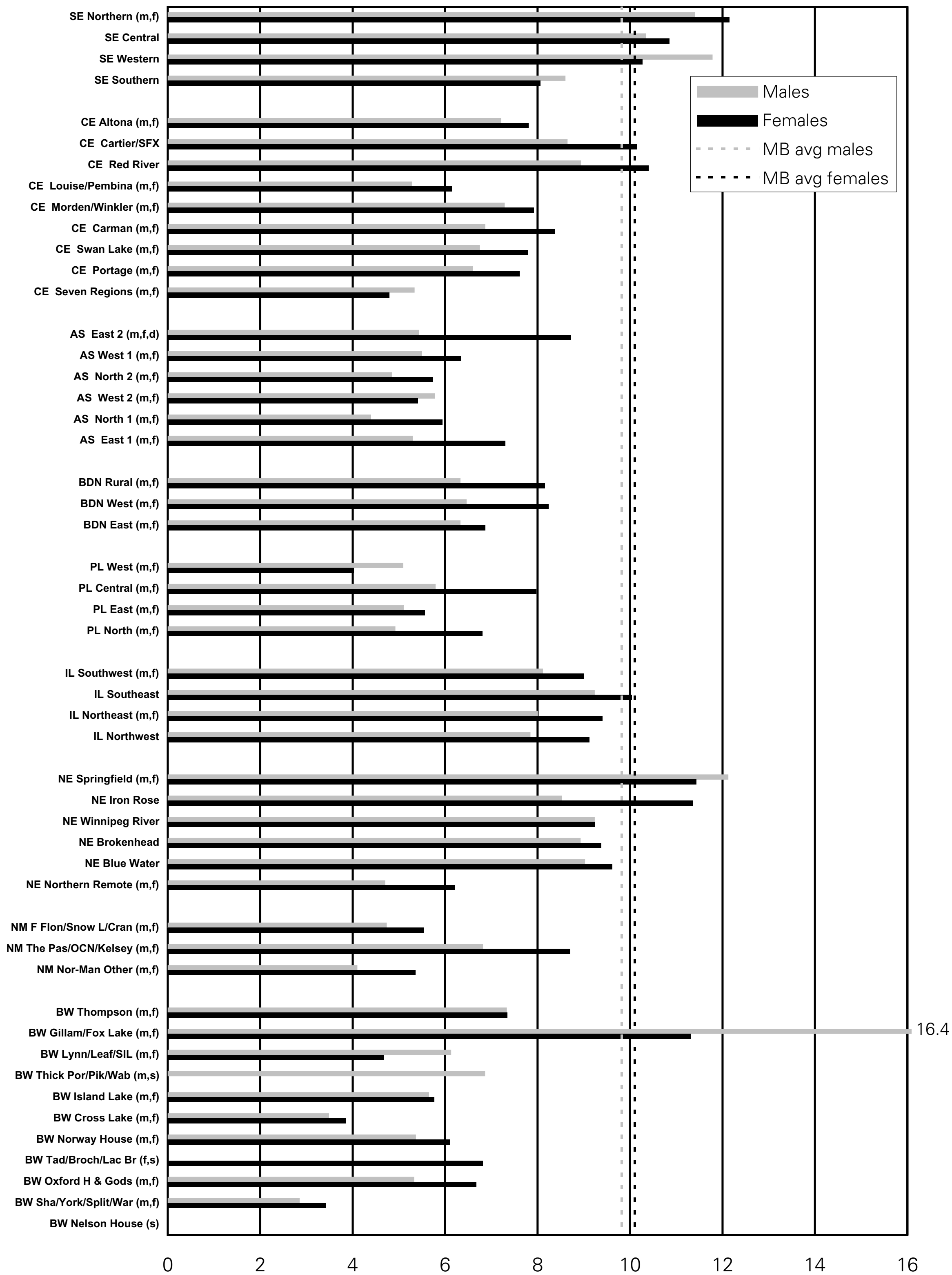


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 6.7.2: MRI Scan Rates by District, 2001/02 – 2003/04

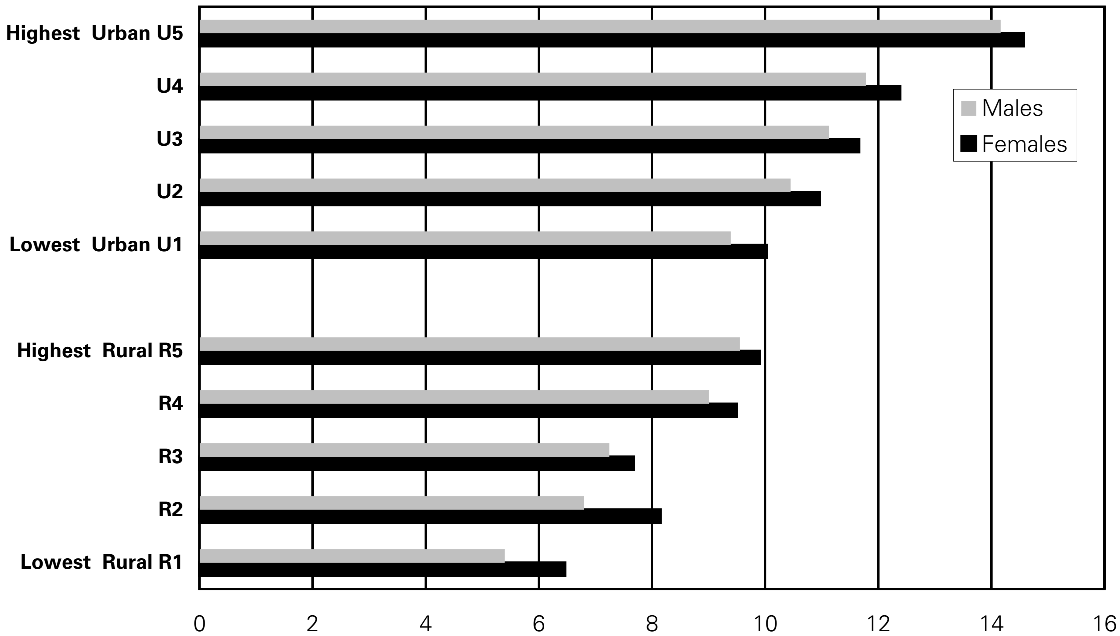
Age-adjusted annual rate of MRI scans per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 6.7.3: MRI Scan Rates by Income Quintile, 2001/02 – 2003/04

Age-adjusted annual rate of MRI scans per 1,000 residents



Linear Trend Test Results

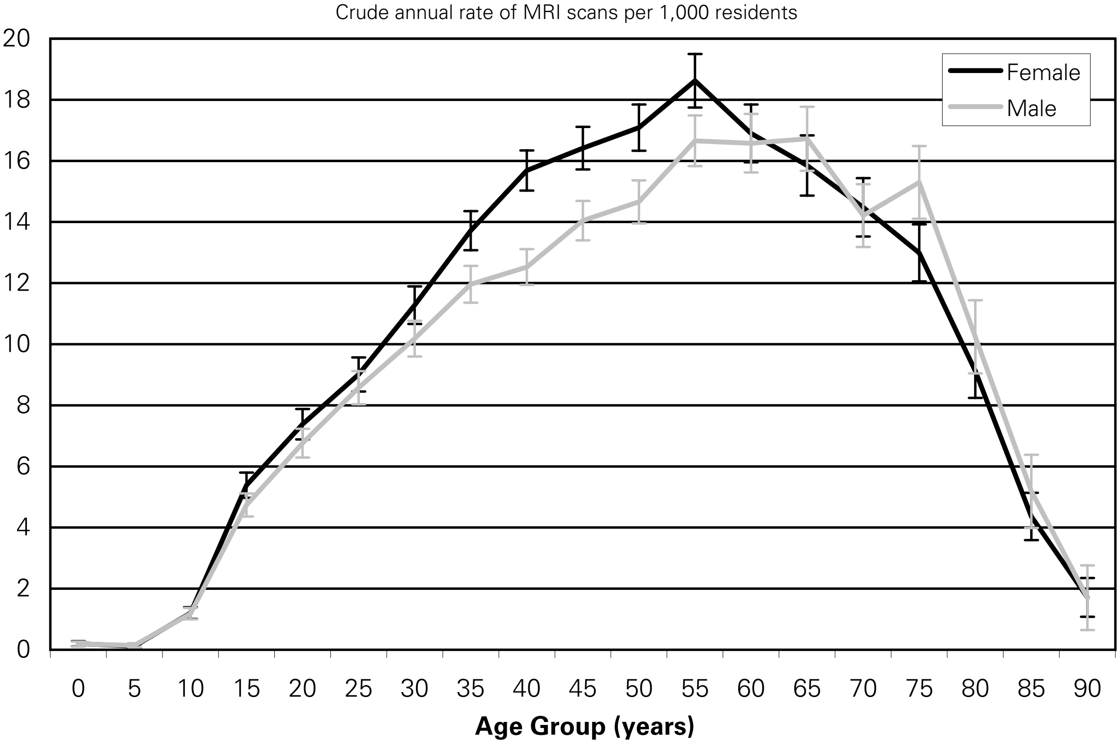
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 6.7.4: MRI Scan Rates by Age and Sex, 2001/02 – 2003/04

Crude annual rate of MRI scans per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of magnetic resonance imaging scans:

Age-adjusted rates:

- Overall, and for each RHA, MRI scan rates are similar for males and females (12.8 versus 13.3 per 1,000 residents age 20+).
- Rates for Winnipeg residents are higher than those for all other RHAs, making the provincial average a less useful comparison for rural and northern RHAs (see the Rural South and North rates).
- There is a strong relationship between MRI scan rates and area-level income: among males and females in both rural and urban areas, residents of higher income areas have higher rates of MRI scans. This is opposite what would be expected, because residents of lower income areas are known to carry a higher burden of illness, and one would expect higher (not lower) MRI rates among those residents.

Age-specific crude rates by sex:

- For both sexes, MRI scan rates rise with age to about age 60, then decline among the older age groups.

Comparisons to other findings:

- These rates are considerably higher than the Manitoba rate of 4.1 MRI scans per 1,000 residents in 1997/98 reported by Frohlich et al. (2001), suggesting an increasing rate of MRI use. Between 1997/98 and 2003/04, a second MRI scanner was installed in Winnipeg, thus allowing many more scans to be performed. Additional MRI scanners have recently been installed in the Brandon Health Centre and at the Boundary Trails Health Centre (Central RHA).

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CHAPTER 7: PHARMACEUTICAL USE

This chapter contains indicators of the use of prescription drugs dispensed from community pharmacies (that is, excluding drugs provided to hospital patients). Section One includes indicators previously developed by Manitoba Centre for Health Policy (MCHP) for population-based drug use analysis. Section Two describes the use of drugs for sexual dysfunction and drugs that are sex-specific. For the sex-specific drugs, changes in use over time are shown instead of male-female comparisons, to reveal changes in prescribing practices. In particular, the use of Hormone Replacement Therapy (HRT) in women was expected to decrease after the July 2002 report by the Women's Health Initiative (WHI) showed that the risks associated with HRT were greater, and the benefits smaller, than previously considered (Writing Group for the Women's Health Initiative Investigators, 2002).

The indicators include:

Section One:

7.1 Pharmaceutical Use
7.2 Number of Different Drugs
7.3 Antibiotic Use
7.4 Antidepressant Use
7.5 Statin Use
7.6 Angiotension Converting Enzyme (ACE) Inhibitor Use

Section Two:

7.7 Androgen Use
7.8 Erectile Dysfunction
7.9 Prevalence of Hormone Replacement Therapy (HRT) Use
7.10 Incidence of Hormone Replacement Therapy (HRT) Use

Key findings for Chapter 7: Pharmaceutical Use

- For several indicators, rates for females were higher than males:
  - Percent of population with one or more prescriptions dispensed: females 69.8%, males 61.1%.
  - Number of different drugs dispensed: females 4.0, males 3.6
  - Antibiotic use: females 36.8%, males 30.7%.
  - Antidepressant use: females 8.6%, males 4.5%.
- For two indicators, male rates were higher than females (both are related to heart disease, which is higher for males):
  - Statin use (for cholesterol): males 10.0%, females 7.3%.
  - ACE inhibitor use (for heart hypertension and heart disease): males 9.9%, females 8.8%.

- Among sex-specific drug use indicators:
  - Prevalence and incidence rates of HRT use dropped substantially from 1997/98 to 2003/04. A drop in rates was expected, given the 2002 publication of results from the WHI study showing the bene fits were smaller, and risks greater, than previously understood.
  - Use rates for Erectile Dysfunction (ED) drugs showed that they were prescribed in large numbers from the time they were approved for sale in 1999, yet still rose slightly by 2003/04.
- Relationships between prescription drug use rates and area-level income varied:
  - Pharmaceutical use showed a negative association: a lower proportion of high-need residents received at least one prescription in the year.
  - The number of different drugs dispensed showed a strong positive association (high-need residents received a higher number of different drugs), as did use of statins and ACE inhibitors.
  - Antibiotics and antidepressant use rates showed no significant relationships with area-level income.

Introduction:

The database from which these analyses are drawn, the Drug Programs Information Network (DPIN), includes information about prescriptions dispensed from all retail pharmacies. Prescriptions dispensed from hospital pharmacies are not included. Also, nursing stations in remote communities dispense some medications without individual prescriptions being entered into the system. It is estimated that about 20% of the prescription drugs used by northern residents are not entered into the DPIN data system. Note that prescription drugs are sometimes used for reasons other than their primary indication. For example, antidepressants are sometimes used for relief of back pain, as sleeping aids, and for prevention of migraine headaches.

7.1 Pharmaceutical Use

Definition: This is the percentage of residents who had at least one prescription dispensed in 2003/04 fiscal year. This includes any prescription medication, so contraceptives would be a common contributor to female but not male rates. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.1.1: Pharmaceutical Use, by RHA, 2003/04

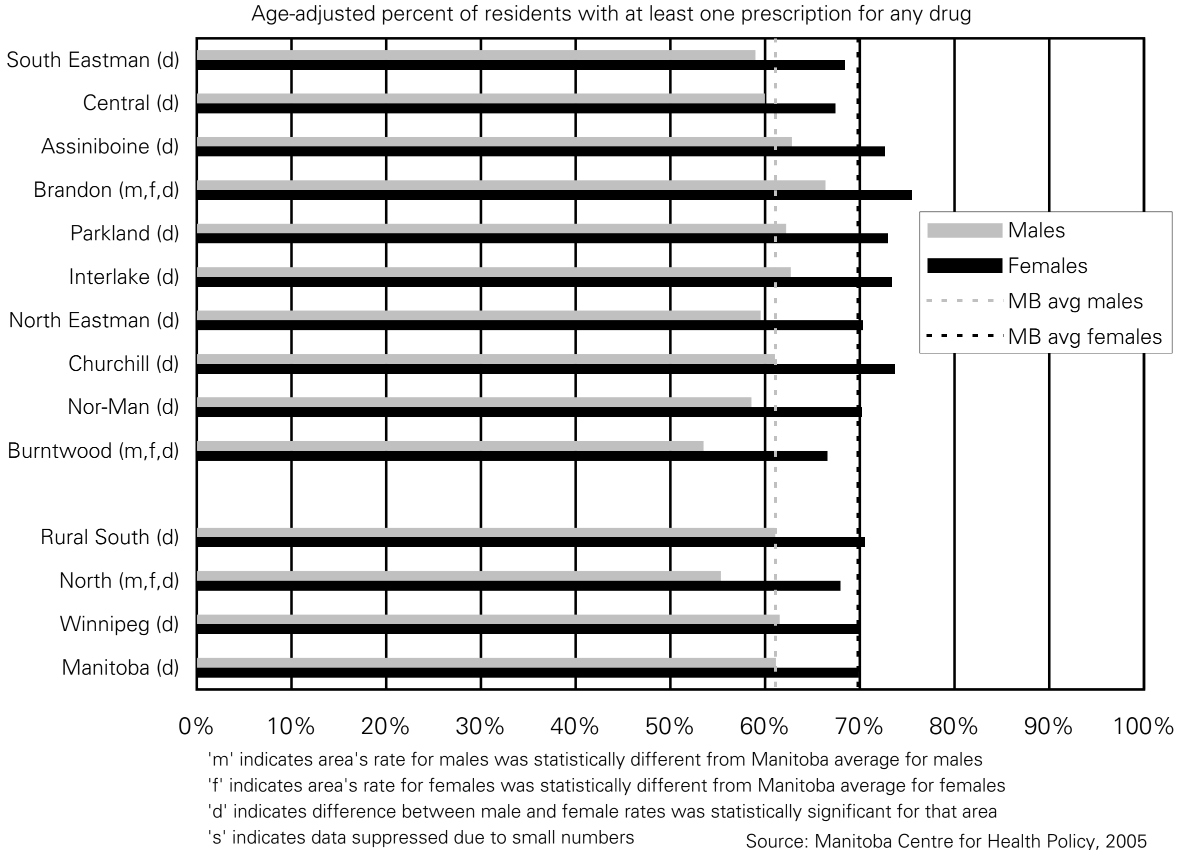
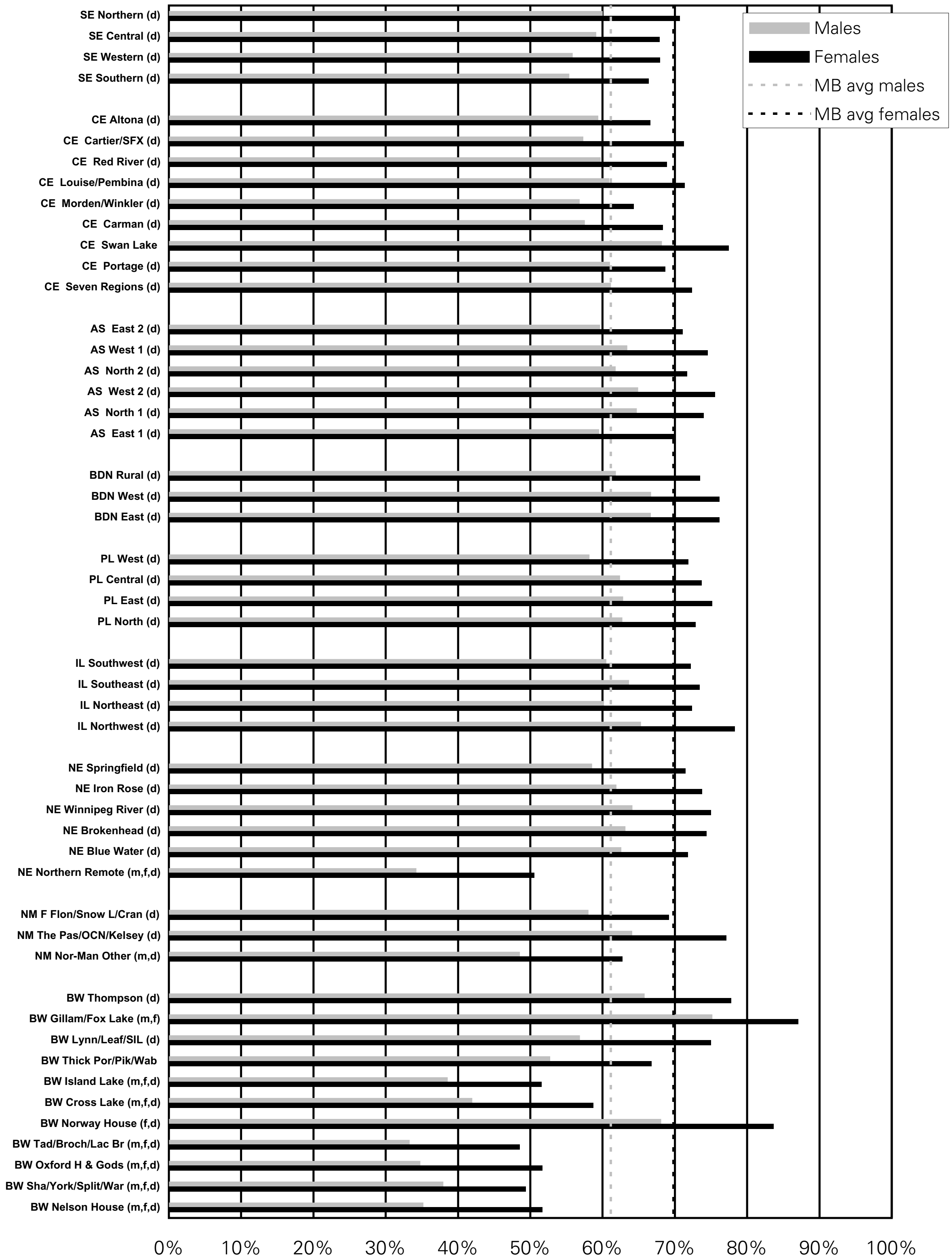


Figure 7.1.2: Pharmaceutical Use, by District, 2003/04

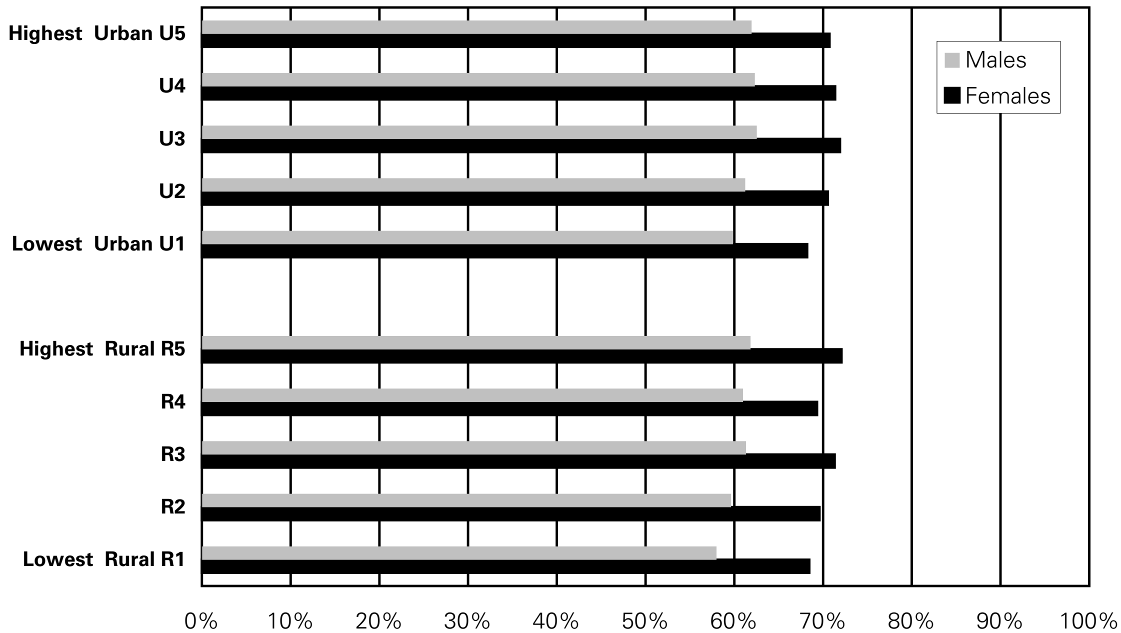
Age-adjusted percent of residents with at least one prescription for any drug



Source: Manitoba Centre for Health Policy, 2005

Figure 7.1.3: Pharmaceutical Use by Income Quintile, 2003/04

Age-adjusted percent of residents with at least one prescription for any drug



Linear Trend Test Results

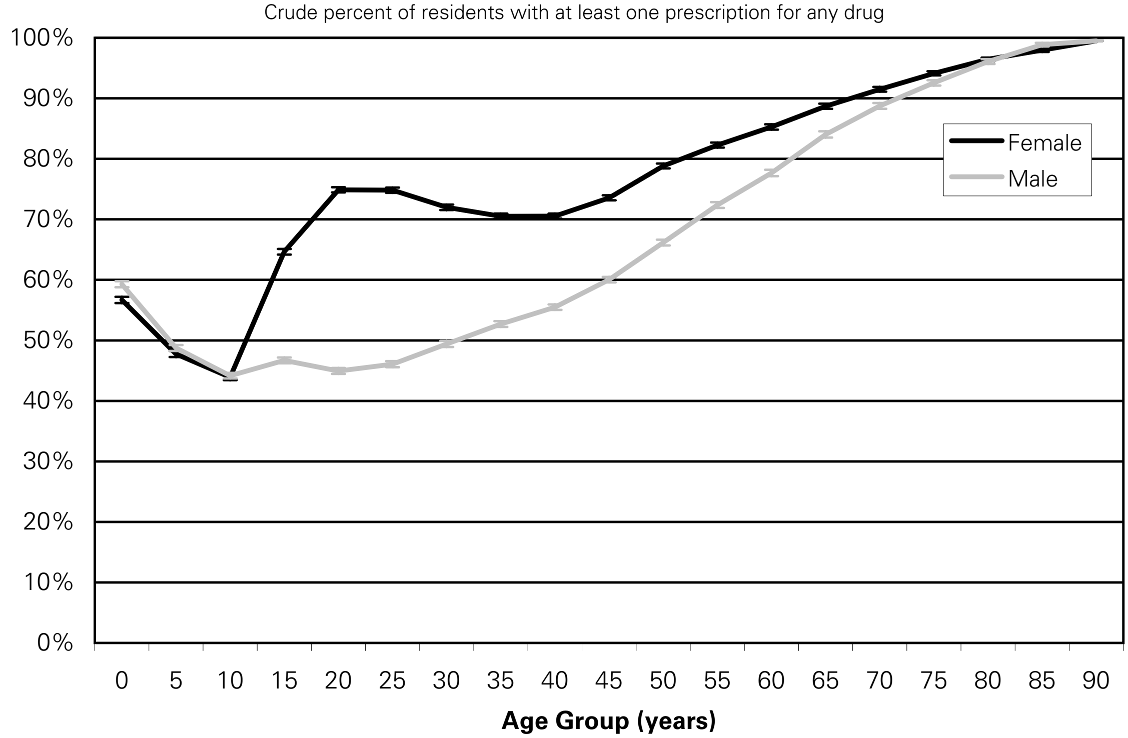
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.1.4: Pharmaceutical Use by Age and Sex, 2003/04

Crude percent of residents with at least one prescription for any drug



Source: Manitoba Centre for Health Policy, 2005

Key findings for pharmaceutical use:

Age-adjusted rates:

- Overall, and for almost all RHA and Districts, a higher proportion of females than males received at least one prescription (69.8% versus 61.1%, p<.001).
- The proportions are relatively consistent across all RHAs and Districts. (Note: The values for Burntwood RHA are lower than average, but this is likely due to the problem of under-reporting of prescriptions among Northern residents—see the introduction of this chapter).
- Relationships between pharmaceutical use and area-level income appear weak, but are statistically significant. A lower proportion of residents from lower income areas received at least one prescription, whereas the opposite trend would have been expected, as residents of lower income areas have higher illness levels.

Age-specific crude rates by sex:

- In females, pharmaceutical use rates are moderate in early childhood, drop in late childhood, then rise sharply in youth and young adulthood. Rates stabilize in adult age ranges, then slowly but steadily increase for the oldest age group. For males, rates are moderate in early childhood, then low through youth and young adulthood, but rise steadily through adulthood, also reaching very high rates for the oldest age groups.

Comparisons to other findings:

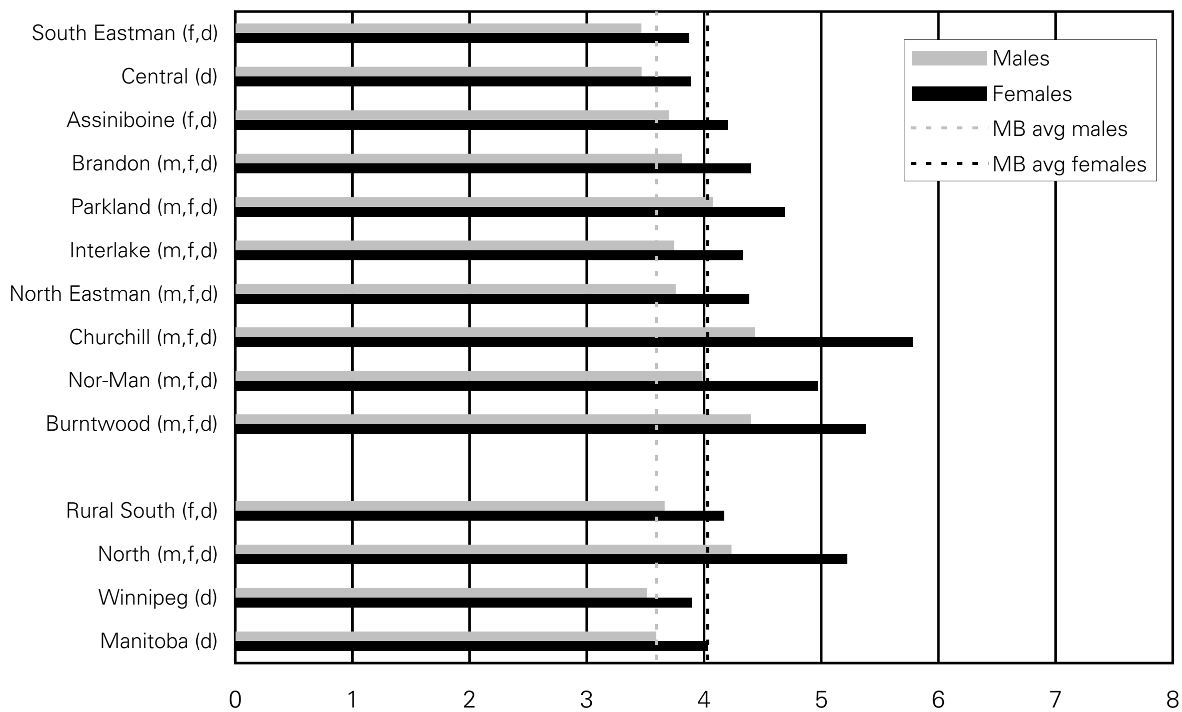
- These values are consistent with those reported in the RHA Indicators Atlas (Martens et al., 2003), which showed the percentage of residents with at least one prescription was 68% in 1999/2000–2000/01.

7.2 Number of Different Drugs Per User

Definition: This is the average number of different drugs dispensed in 2003/04 to each resident who had at least one prescription dispensed in the year. 'Different' drugs means agents in different classes of the Anatomic, Therapeutic, Chemical (ATC) classification system (see glossary)—so getting prescriptions for two types of antidepressants, for example, would not count as two different drugs. This includes any prescription medication, so contraceptives would be a common contributor to female but not male rates. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.2.1: Number of Different Drugs Per User, by RHA, 2003/04

Age-adjusted average number of different drugs used per resident, with one or more prescriptions

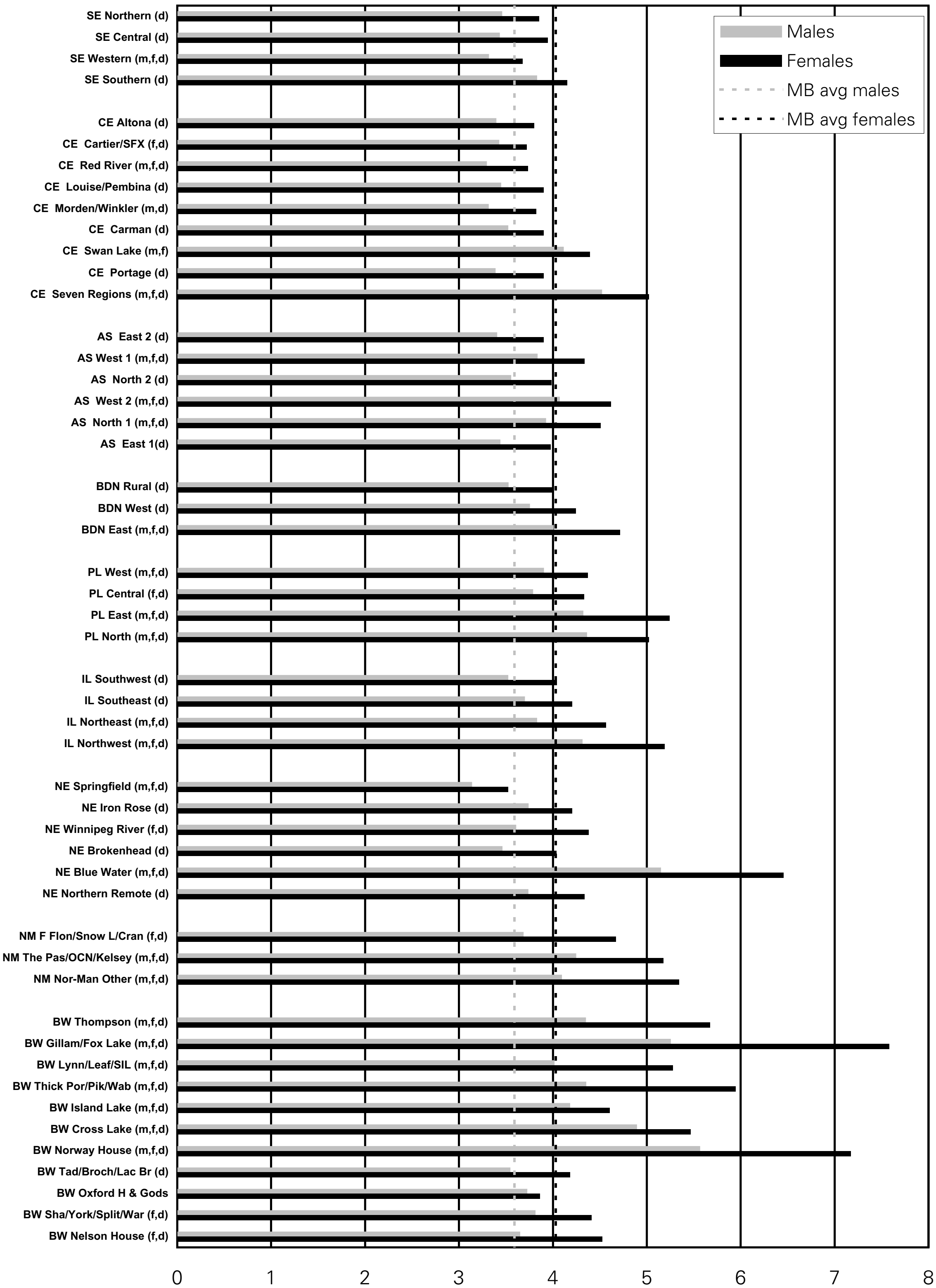


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.2.2: Number of Different Drugs Per User, by District, 2003/04

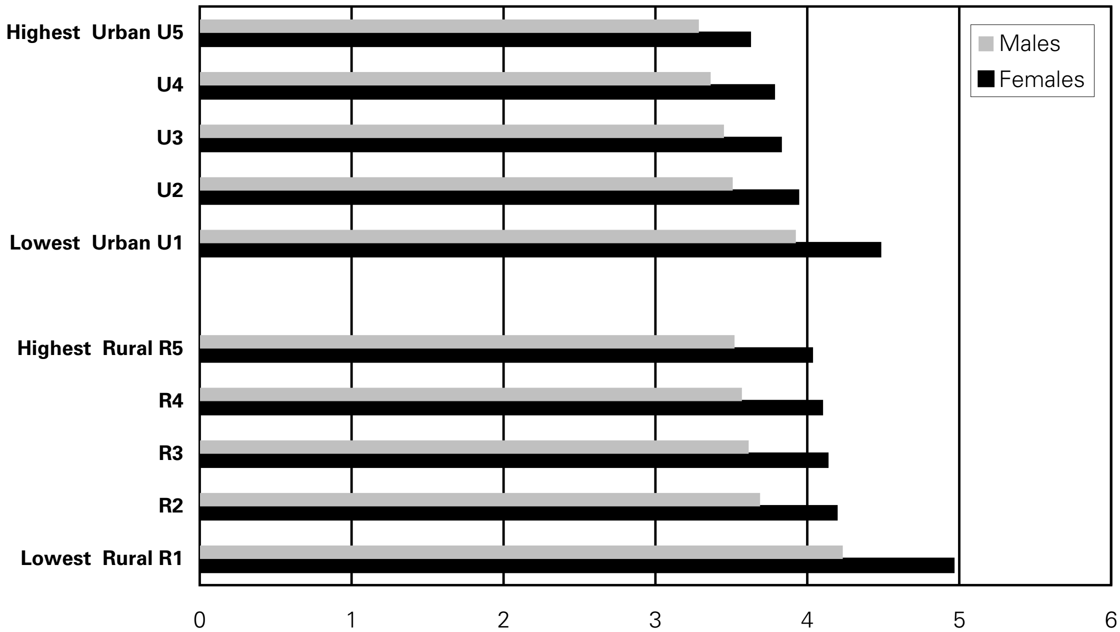
Age-adjusted average number of different drugs used per resident, with one or more prescriptions



Source: Manitoba Centre for Health Policy, 2005

Figure 7.2.3: Number of Different Drugs Per User, by Income Quintile, 2003/04

Age-adjusted average number of different drugs used per resident, with one or more prescriptions



Linear Trend Test Results

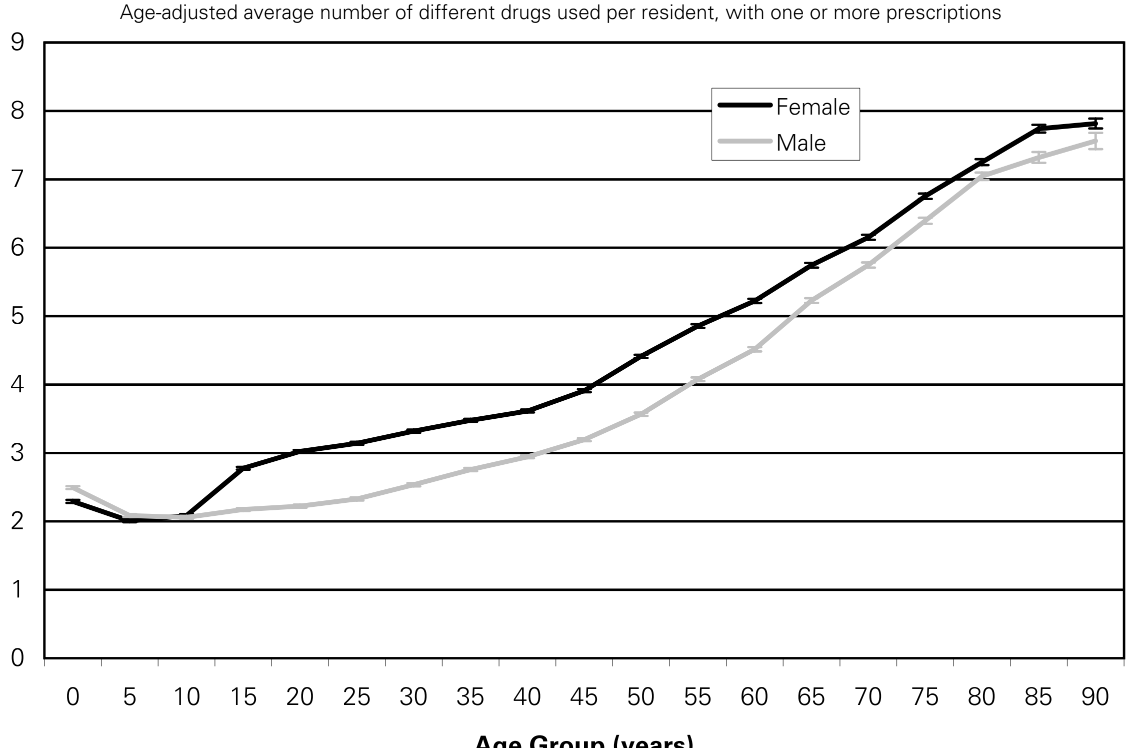
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.2.4: Number of Different Drugs Per User, by Age and Sex, 2003/04

Age-adjusted average number of different drugs used per resident, with one or more prescriptions



Source: Manitoba Centre for Health Policy, 2005

Key findings for number of different drugs per user:

Age-adjusted rates:

- Overall, and for all RHAs, females receive prescriptions for a higher number of different drugs than males (4.0 versus 3.6 different ATC classes of drugs, $p<.001$).
- The values are relatively comparable across RHAs and Districts, though rates among northern RHAs are consistently higher than other RHAs (and recall that prescription rates for northern residents are under-reported).
- The relationship between the number of different drugs prescribed and area-level income is weak but statistically significant. For urban and rural males and females, those from lower income areas receive a higher number of different drugs than those from higher income areas. (The differences in rates are small, except among residents of the lowest income areas, but the very large sample sizes involved make these relationships statistically significant).

Age-specific crude rates by sex:

- For both males and females, the number of different drugs prescribed is low in childhood, youth, and young adulthood, but rises steadily through adulthood to its peak in the oldest age groups.

Comparisons to other findings:

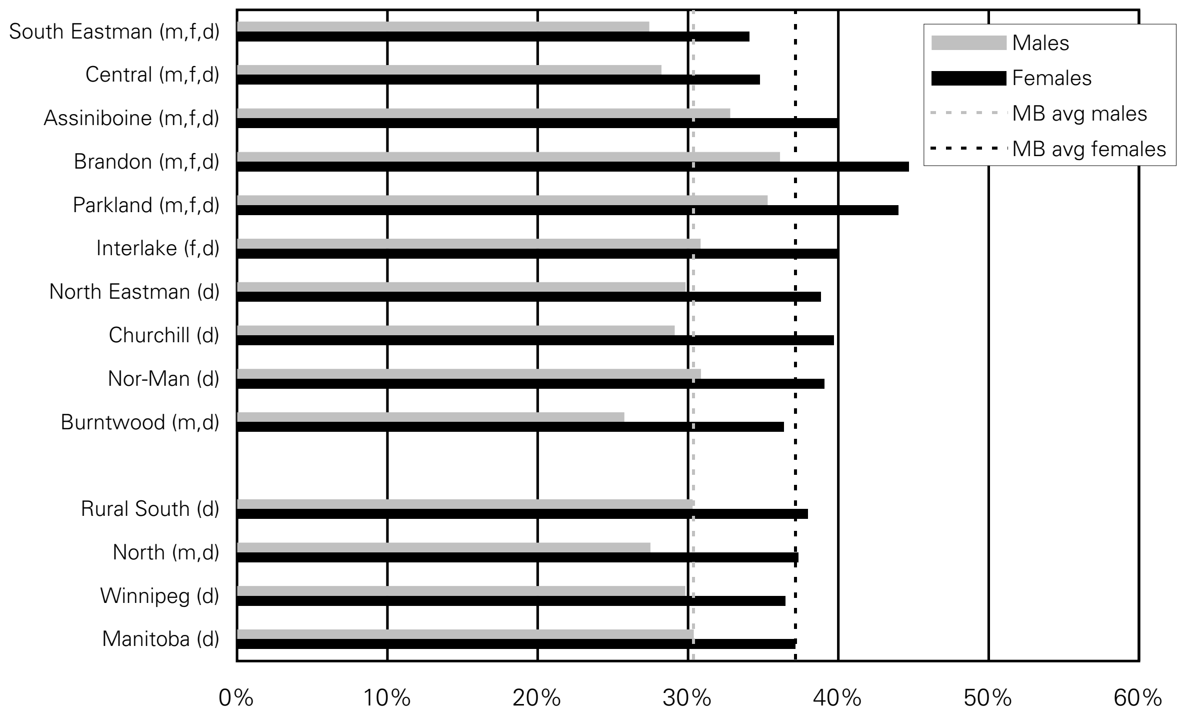
- These results are slightly higher than those reported in the RHA Indicators Atlas (Martens et al., 2003), suggesting a small increase in the number of drugs prescribed per user from 1999/2000–2003/04.

7.3 Antibiotic Use

Definition: This is the percentage of residents who have had at least one prescription for antibiotics (ATC code J01 and G04A) dispensed in 2003/04 fiscal year. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.3.1: Antibiotic Use by RHA, 2003/04

Age-adjusted percent of residents receiving at least one prescription for antibiotics

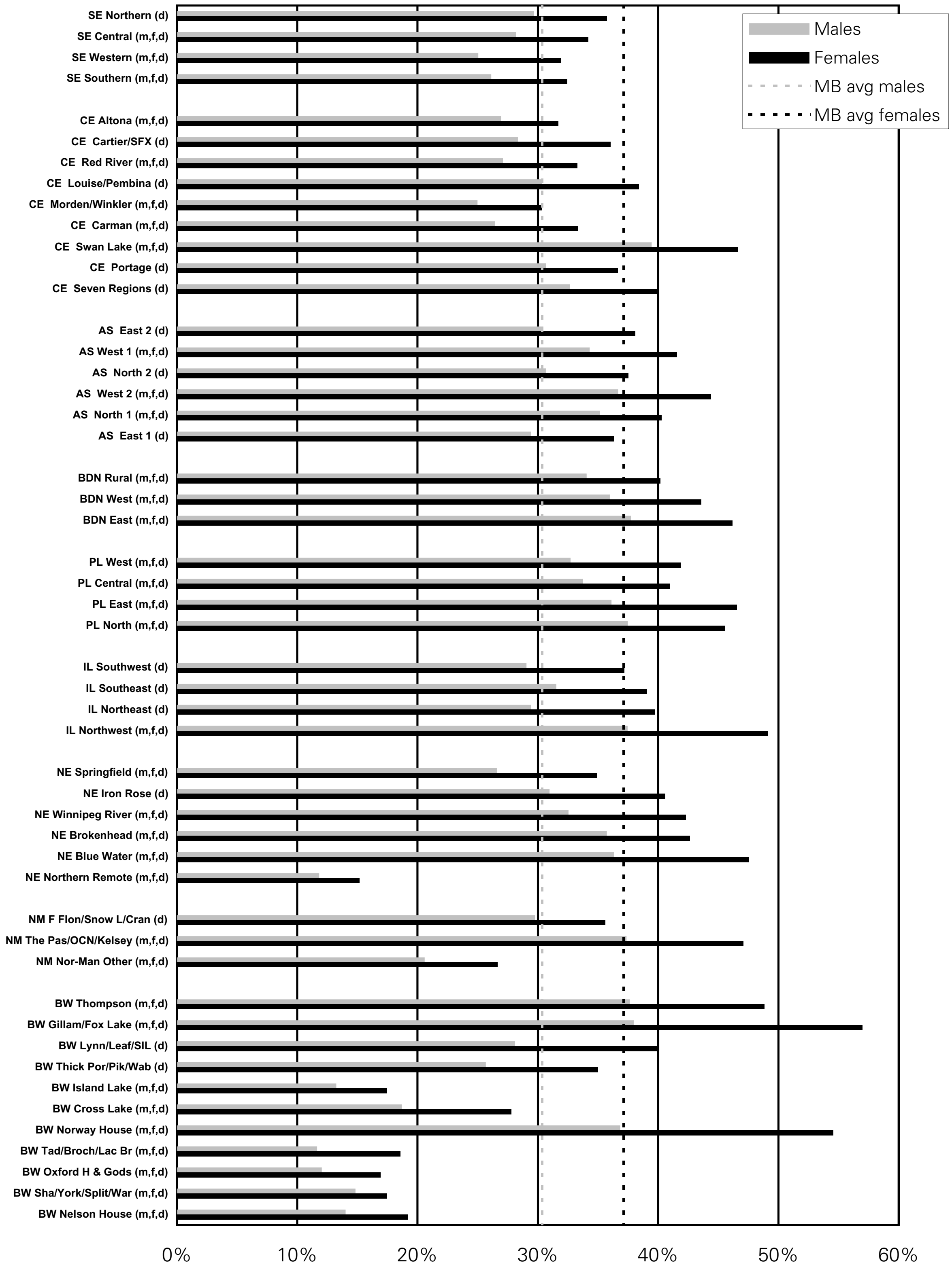


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.3.2: Antibiotic Use by District, 2003/04

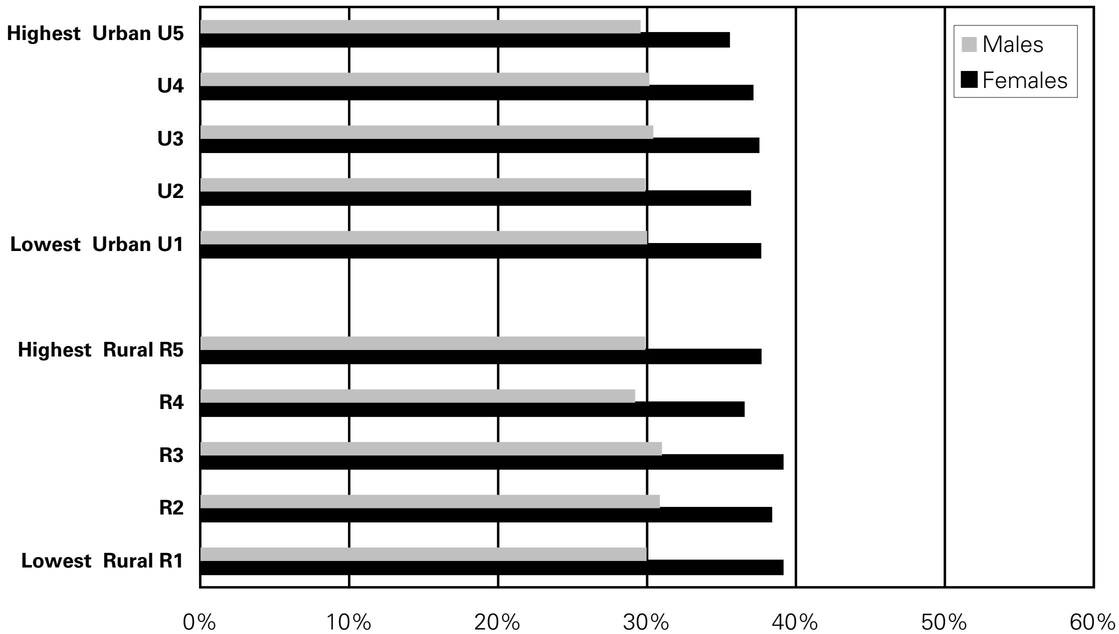
Age-adjusted percent of residents receiving at least one prescription for antibiotics



Source: Manitoba Centre for Health Policy, 2005

Figure 7.3.3: Antibiotic Use by Income Quintile, 2001/02 – 2003/04

Age-adjusted percent of residents filling at least one antibiotic prescription



Linear Trend Test Results

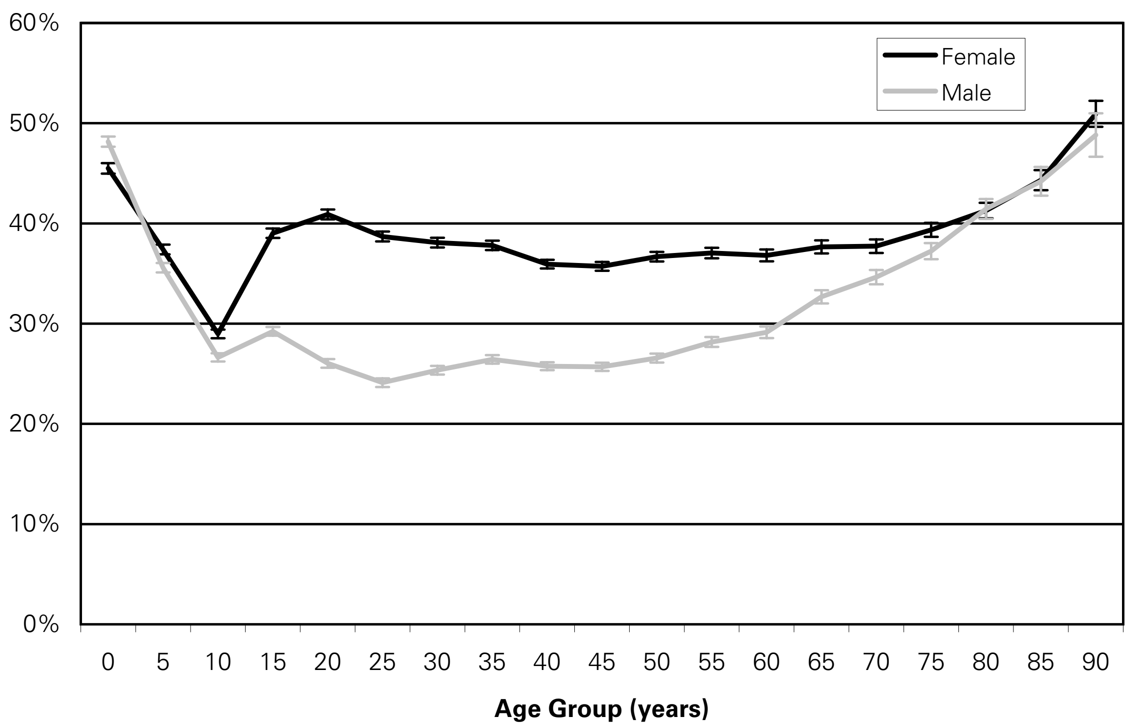
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 7.3.4: Antibiotic Use by Age and Sex, 2003/04

Crude percent of residents filling at least one antibiotic prescription



Source: Manitoba Centre for Health Policy, 2005

Key findings for antibiotic use:

Age-adjusted rates:

- Overall, and for all RHAs and most Districts, a higher proportion of females than males received at least one antibiotic prescription during the year (36.8% versus 30.7%, p<.001).
- There is no strong relationship between antibiotic use and area-level income, though the trend did reach statistical significance among rural females (with a higher proportion of those from lower income areas receiving antibiotic prescriptions in the year).

Age-specific crude rates by sex:

- Among females, antibiotic use is relatively constant across all age groups (just under 40%), with slightly higher values among the very young and the very old, and lower values among youth 10 to 14 years old.
- Among males, there is more variation across age groups: rates are high among the young, then drop sharply among youth and young adults (under 30%). Rates get steadily higher with age, reaching their highest values among the oldest age groups.

Comparisons to other findings:

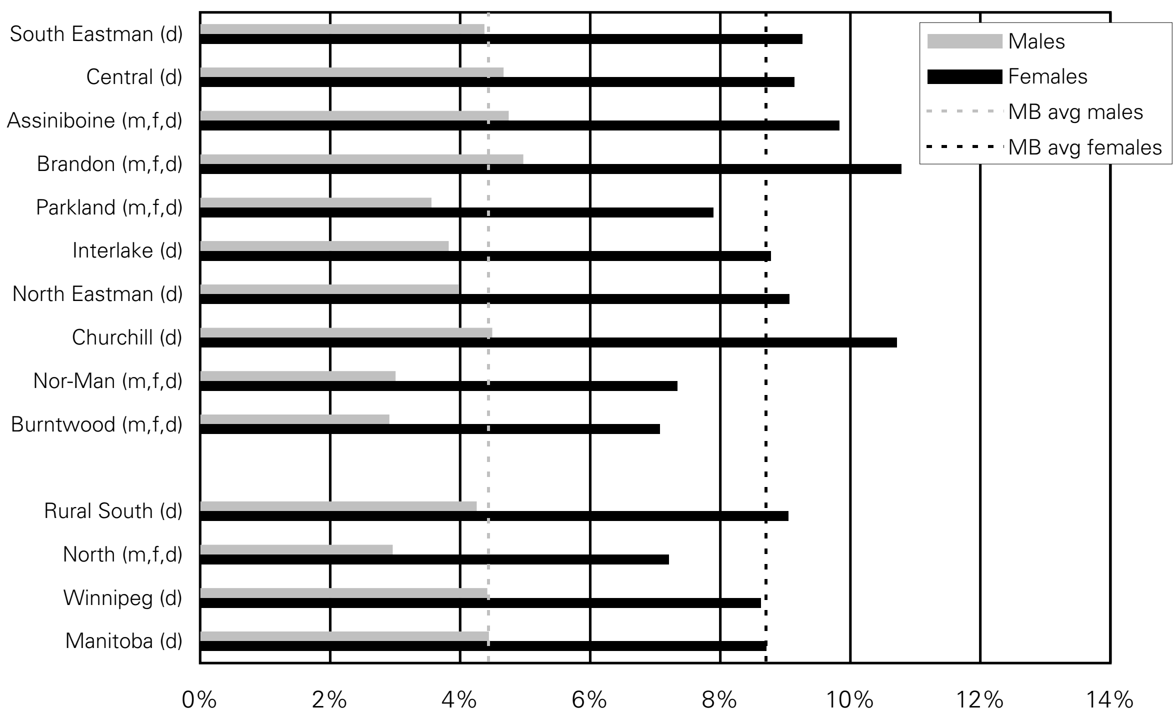
- These results are lower than the 40% reported for Manitoba by Metge et al. (1999), reflecting a slow but steady decline in the rate of antibiotic prescriptions.

7.4 Antidepressant Use

Definition: This is the percentage of residents who have had at least two prescriptions for antidepressants (ATC code N06A) in 2003/04 fiscal year. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.4.1: Antidepressant Use by RHA, 2003/04

Age-adjusted percent of residents with two or more prescriptions for antidepressants

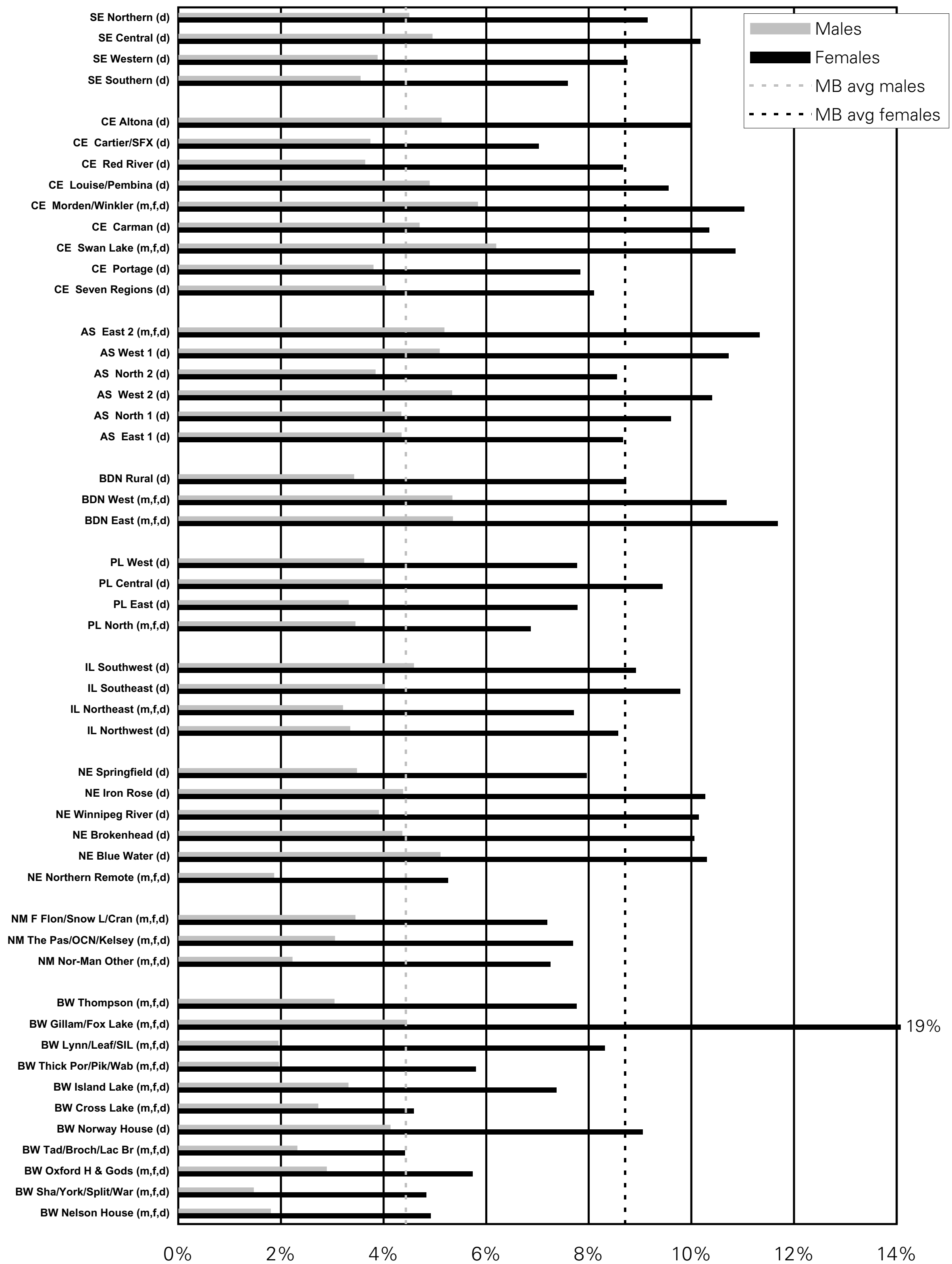


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.4.2: Antidepressant Use by District, 2003/04

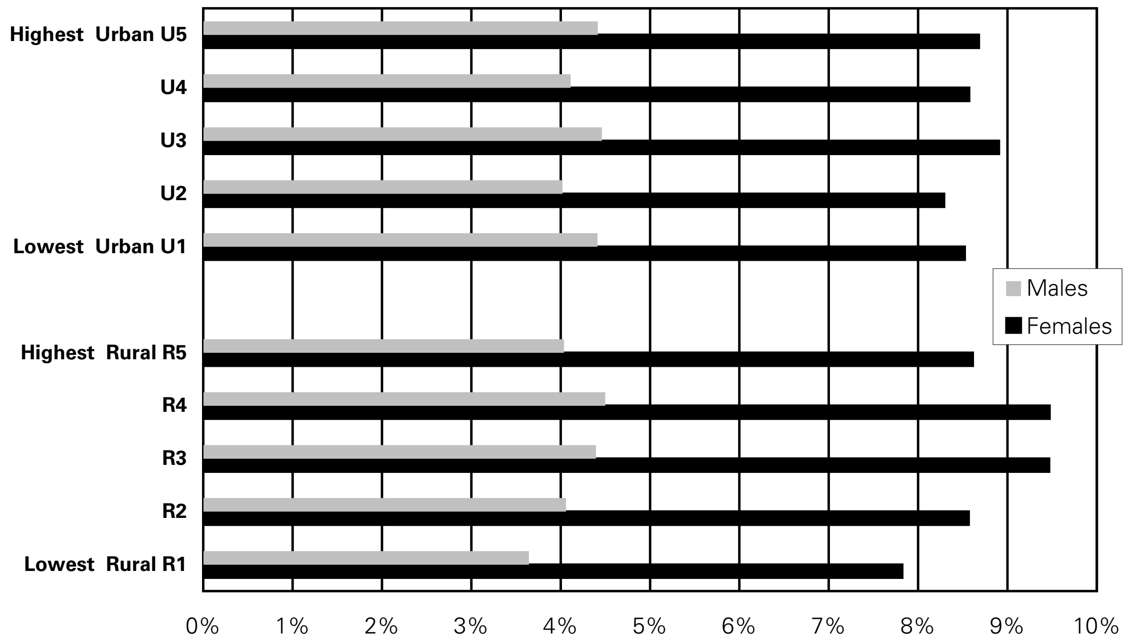
Age-adjusted percent of residents with two or more prescriptions for antidepressants



Source: Manitoba Centre for Health Policy, 2005

Figure 7.4.3: Antidepressant Use by Income Quintile, 2003/04

Age-adjusted percent of residents with two or more prescriptions for antidepressants



Linear Trend Test Results

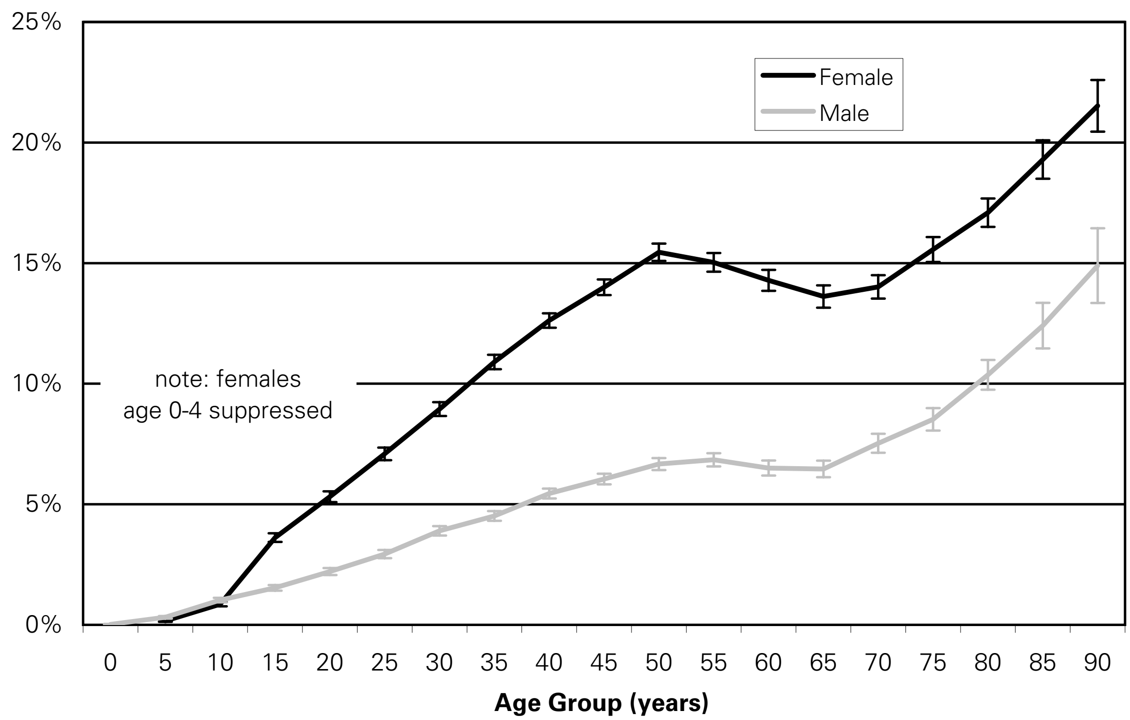
Female: Urban: Not Significant Rural: Significant (p<.001)

Male: Urban: Not Significant Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.4.4: Antidepressant Use by Age and Sex, 2003/04

Crude percent of residents with two or more prescriptions for antidepressants



Source: Manitoba Centre for Health Policy, 2005

Key findings for antidepressant use:

Age-adjusted rates:

- Overall, and for all RHAs and most Districts, almost twice as many females as males are on antidepressants (8.6% versus 4.5%, p<.001).
- Antidepressant use rates appear higher for residents of healthier southern RHAs than northern RHAs.
- There is no relationship between antidepressant use and area-level income: in urban areas. Among rural residents, antidepressant use is higher among those living in higher income areas (males and females).

Age-specific crude rates by sex:

- In both sexes, antidepressant use is very low in childhood, but rises sharply in youth and young adulthood. Rates decline somewhat in middle age, but rise again in the elderly. Rates for females are higher than males for every age group above 15 years.

Comparisons to other findings:

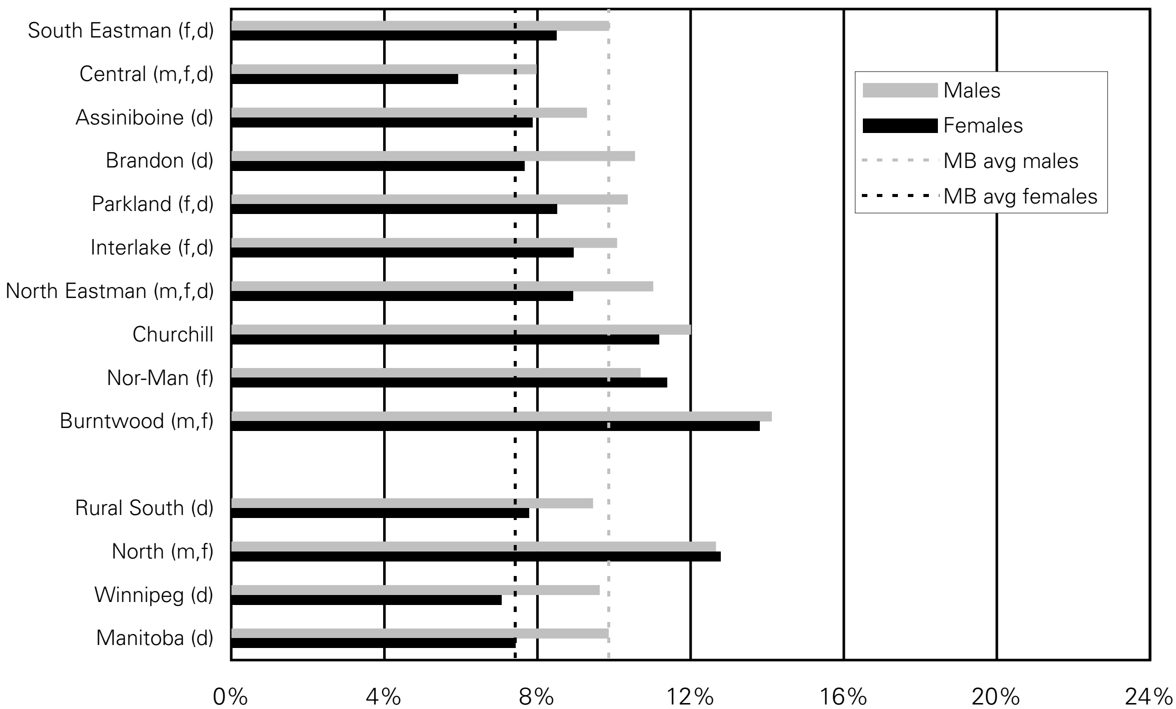
- These rates are consistent with results in the RHA Indicators Atlas (Martens et al., 2003), suggesting a continuing increase in the proportion of residents receiving antidepressants. The age-adjusted rates have climbed from 4.3% in 1996/97–1997/98, to 5.5% in 1999/2000–2000/01, to about 6.5% in 2003/04 (males and females combined).
- These rates are higher than the 5.5% Manitoba rate reported for 1996/97 by Metge et al (1999), suggesting an increasing rate of antidepressant use over time.
- The sex difference in antidepressant use is also consistent with the Mental Illness report (Martens et al., 2004), which showed the treatment prevalence of depression to be almost twice as high in females as males (23.6% versus 12.6% of the population aged 10+).
- A similar sex difference (i.e. doubled rates for females) has also been reported by others (Sloan and Kornstein, 2003).

7.5 Statin Use

Definition: This is the percentage of residents who received at least one prescription for statins (ATC code C10AA) in 2003/04 fiscal year. Statins are used to lower blood cholesterol levels (see glossary). Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.5.1: Statin Use by RHA, 2003/04

Age-adjusted percent of residents age 20+ receiving at least one prescription for statins

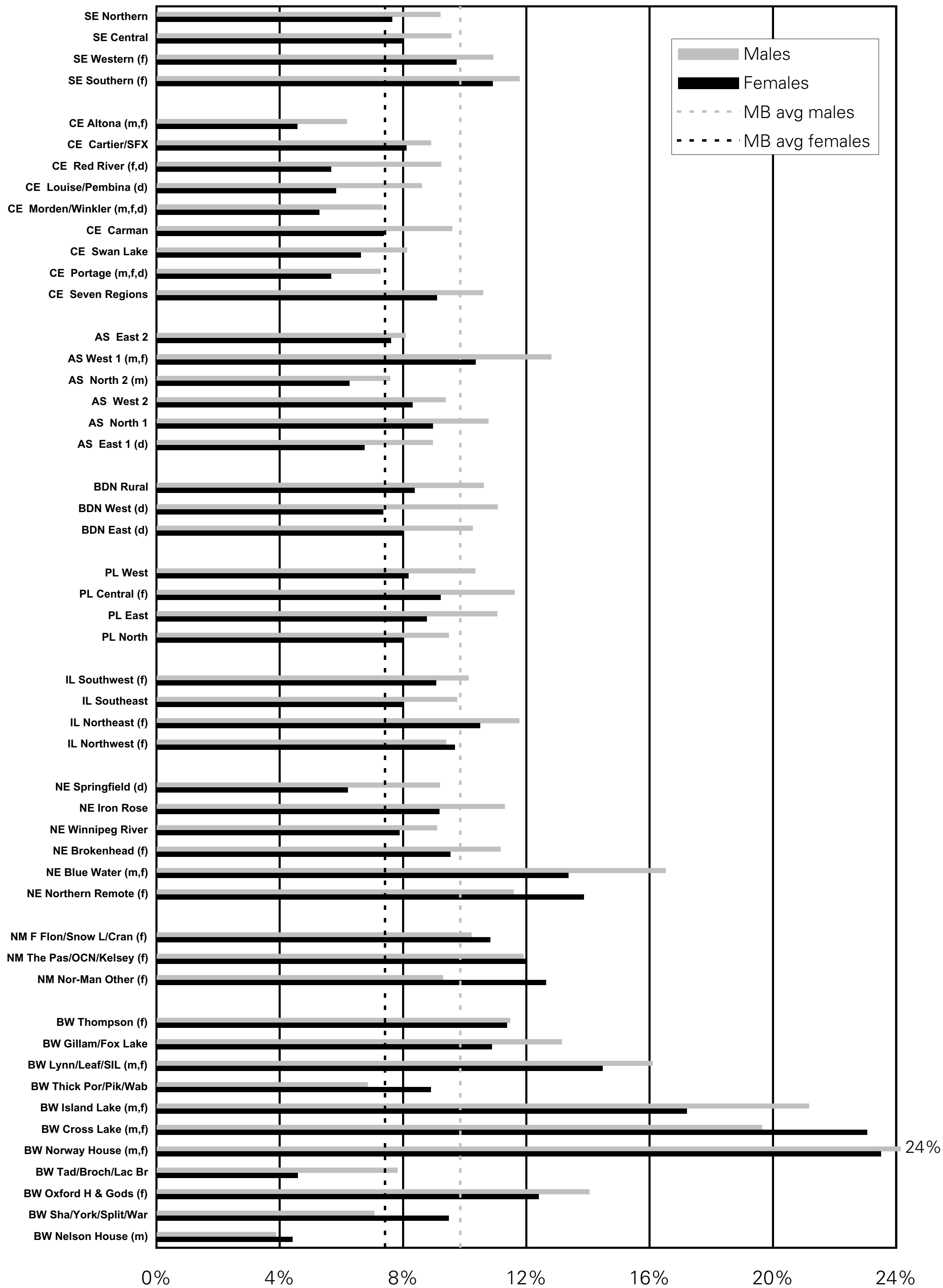


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.5.2: Statin Use by District, 2003/04

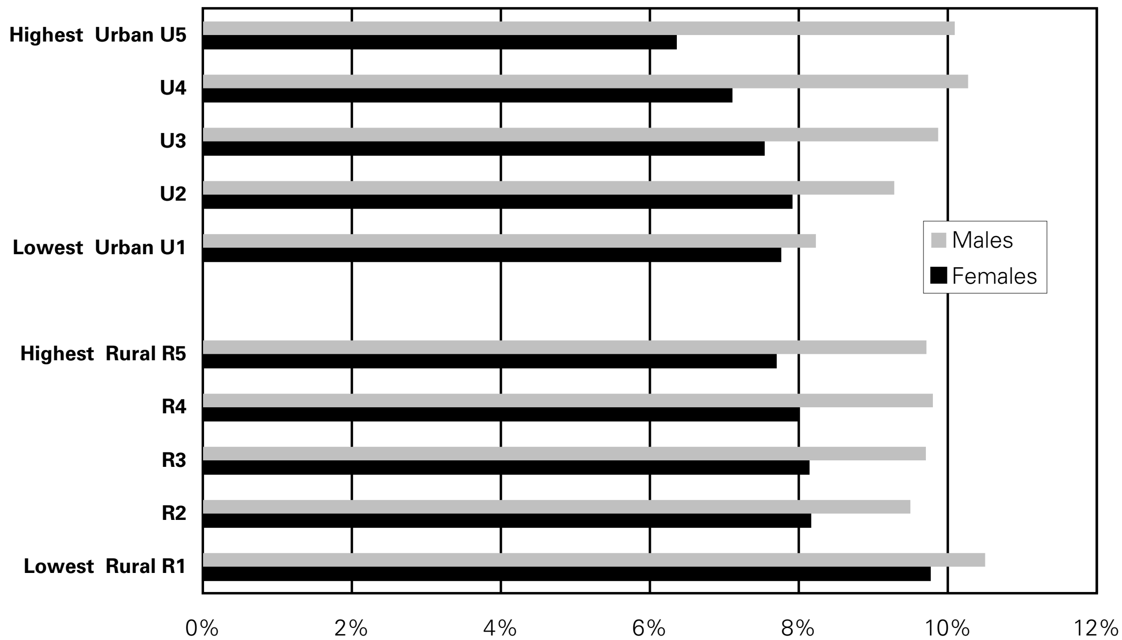
Age-adjusted percent of residents age 20+ with at least one prescription for statins



Source: Manitoba Centre for Health Policy, 2005

Figure 7.5.3: Statin Use by Income Quintile, 2003/04

Age-adjusted percent of residents age 20+ with at least one prescription for statins



Linear Trend Test Results

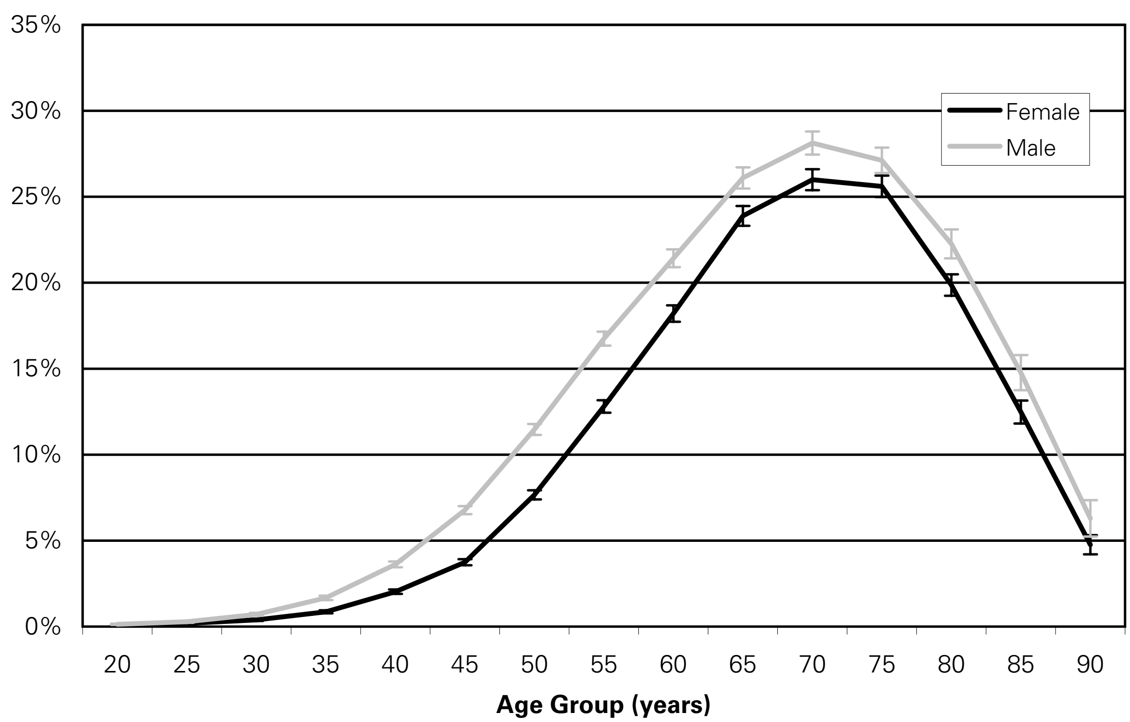
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 7.5.4: Statin Use by Age and Sex, 2003/04

Crude percent of residents age 20+ with at least one prescription for Statins



Source: Manitoba Centre for Health Policy, 2005

Key findings for statin use:

Age-adjusted rates:

- Overall, and in many RHAs, a higher proportion of males than females are on statins (10.0% versus 7.3%, $p<.001$).
- There are mixed relationships between statin use rates and income: among females, both urban and rural residents of lower income areas have higher use rates. Among urban males, residents of higher income areas have higher rates; there is no relationship with income among males in rural areas.

Age-specific crude rates by sex:

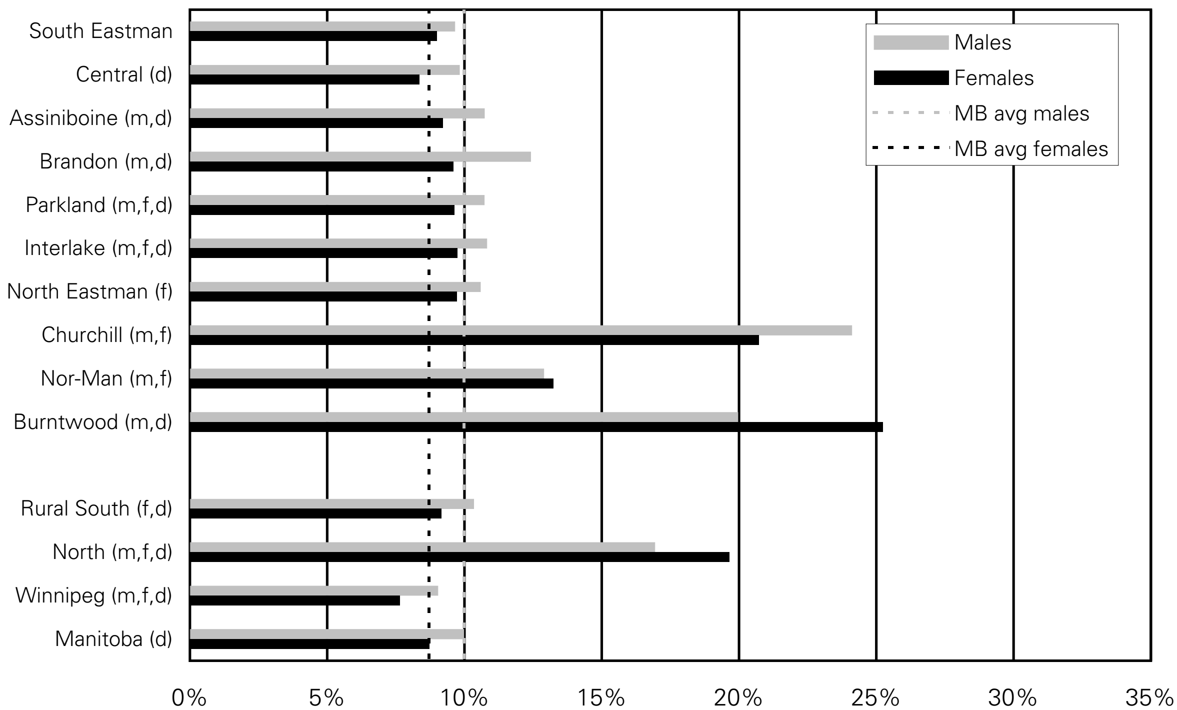
- In both sexes, statin use is very low among young adults, but rises sharply in middle age, then declines sharply in older age groups.

7.6 Angiotensin Converting Enzyme (ACE) Inhibitor Use

Definition: This is the percentage of residents who received at least one prescription for ACE inhibitors (ATC codes C09A, C09B) in 2003/04. The primary use of ACE inhibitors is to lower blood pressure, though they are also used for congestive heart failure, for patients experiencing heart attack, and for diabetes (see glossary). Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 7.6.1: ACE Inhibitors Use by RHA, 2003/04

Age-adjusted percent of residents age 20+ receiving at least one prescription for ACE inhibitors

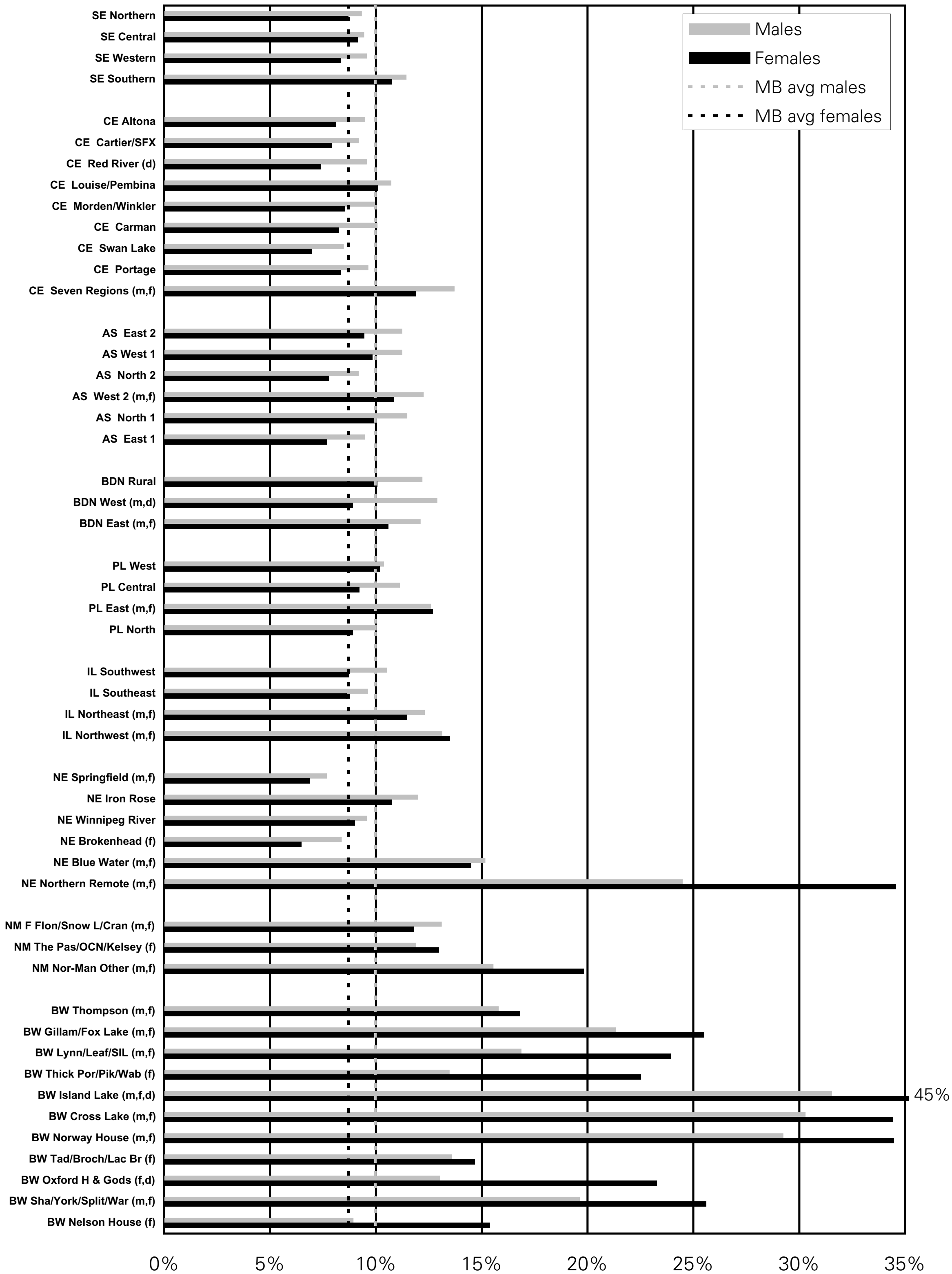


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.6.2: ACE Inhibitors Use by District, 2003/04

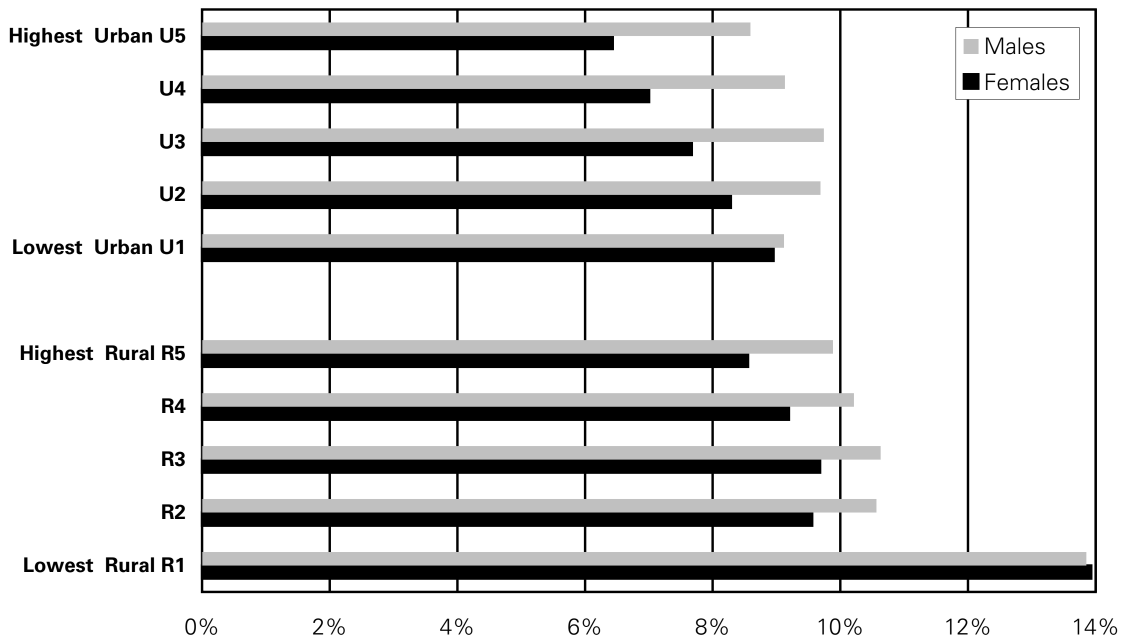
Age-adjusted percent of residents age 20+ receiving at least one prescription for ACE inhibitors



Source: Manitoba Centre for Health Policy, 2005

Figure 7.6.3: ACE Inhibitors Use by Income Quintile, 2003/04

Age-adjusted percent of residents age 20+ receiving at least one prescription for ACE inhibitors



Linear Trend Test Results

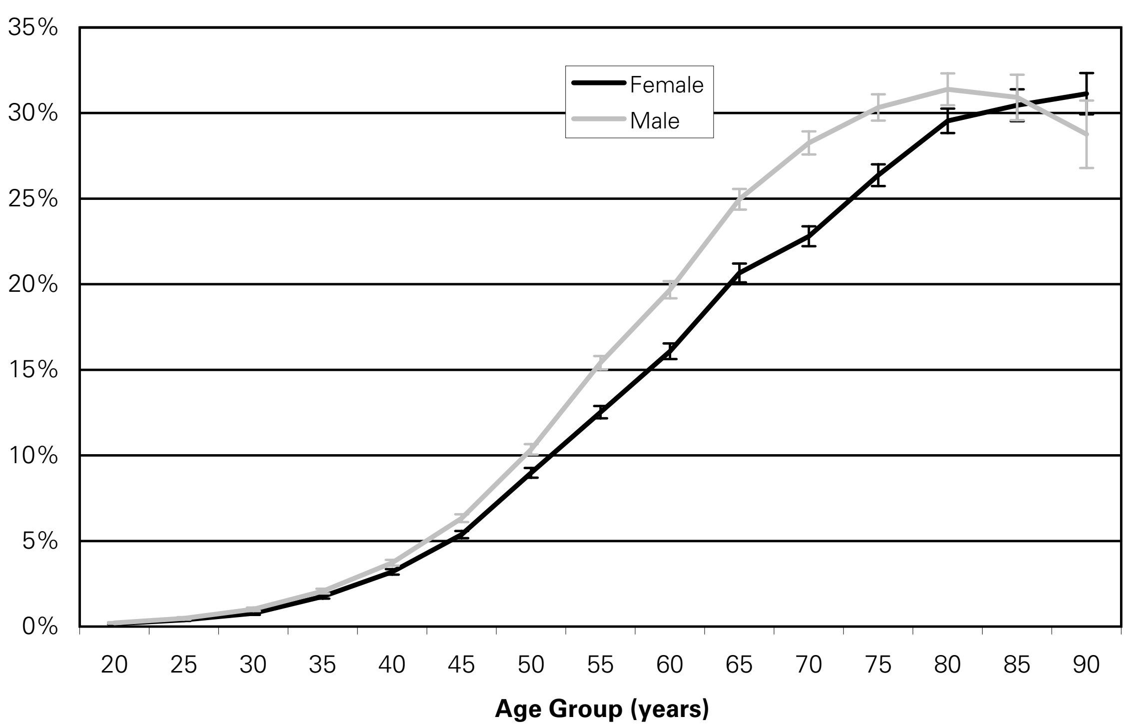
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.6.4: ACE Inhibitors Use by Age and Sex, 2003/04

Crude percent of residents age 20+ receiving at least one prescription for ACE inhibitors



Source: Manitoba Centre for Health Policy, 2005

Key findings for ACE Inhibitor use:

Age-adjusted rates:

- Overall, and for several RHAs, a higher proportion of males than females are on ACE inhibitors (9.9% versus 8.8%, $p<.001$).
- The proportions are higher among residents of northern RHAs.
- There is a strong relationship between ACE inhibitor use and area-level income: a higher proportion of residents from lower income areas are using ACE inhibitors, and this applies to rural and urban males and females.

Age-specific crude rates by sex:

- For both sexes, the proportion of residents using ACE inhibitors is very low among young adults, but rises rapidly in middle age to its highest levels in the oldest age groups.

Comparisons to other findings:

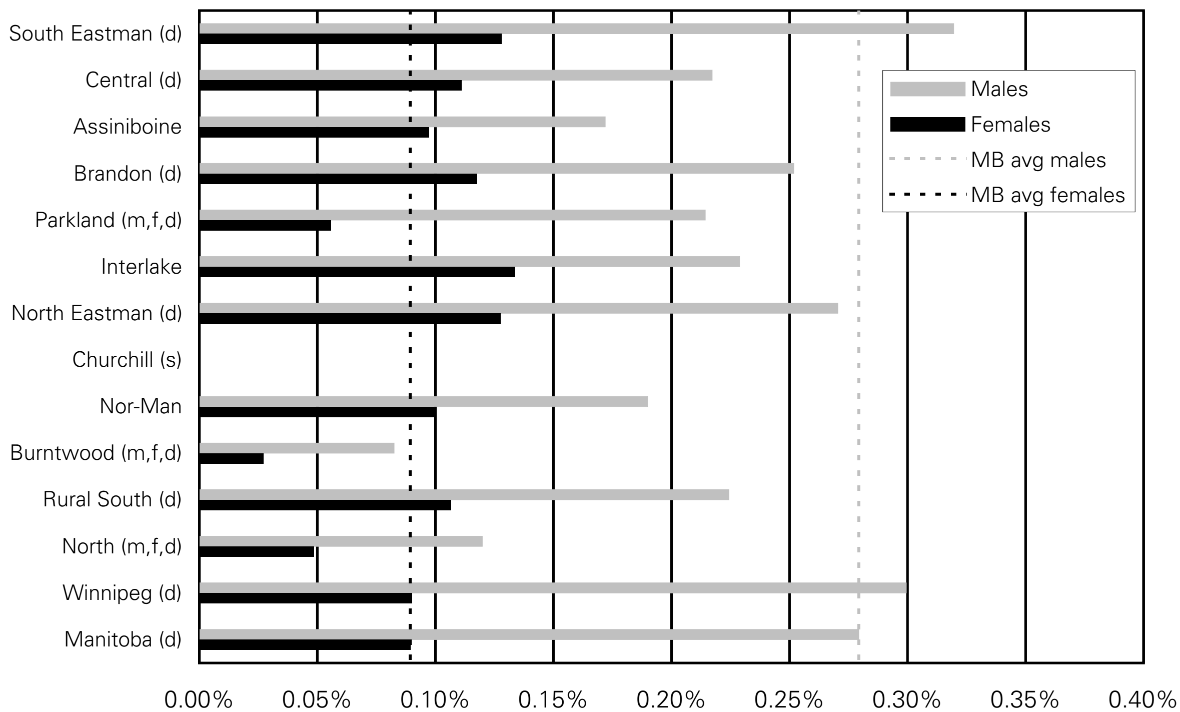
- These rates are considerably higher than the 4.5% Manitoba rate for 1996/97 published by Metge et al. (1999), consistent with the increasing number of patients for which ACE inhibitors are recommended.

7.7 Androgen Use

Definition: This is the percentage of residents who received at least one prescription for androgens (see Glossary for list of drugs included) over five fiscal years, 1999/00–2003/04. The primary uses of androgens in males are for adrenal failure and age-related androgen decline; among women, the primary use is for sexual dysfunction. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 7.7.1: Androgen Use by RHA, 1999/2000 – 2003/04

Age-adjusted percent of residents age 40+ receiving at least one prescription for androgens

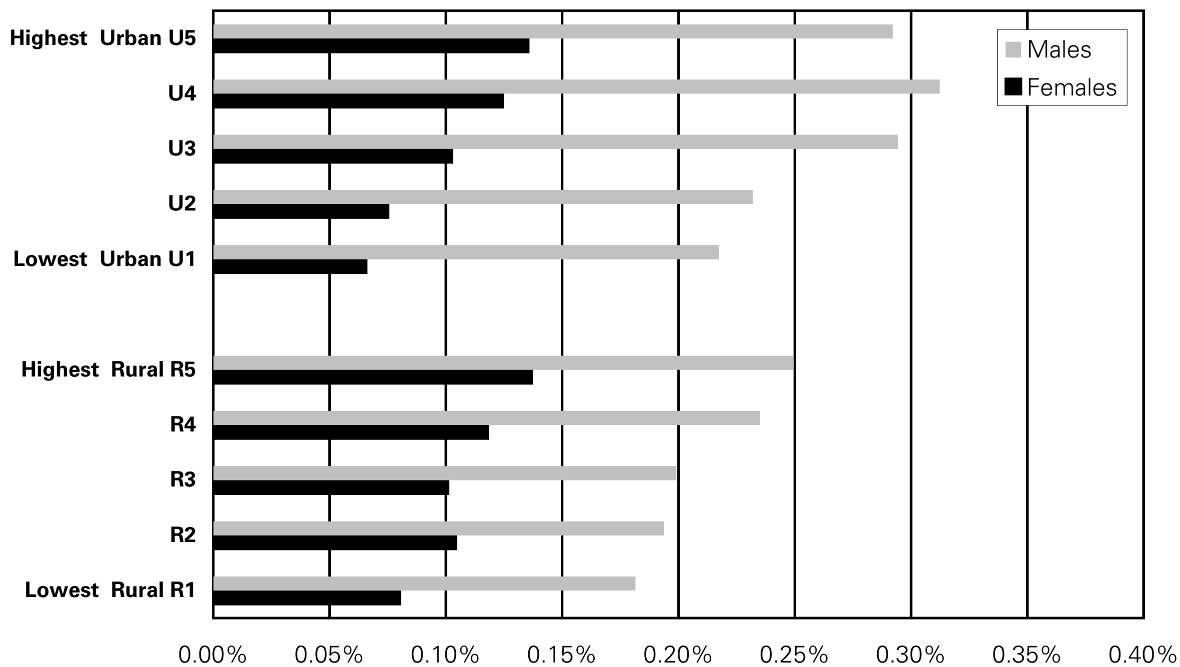


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.7.2: Androgen Use by Income Quintile, 1999/2000 – 2003/04

Crude percent of residents age 40+ receiving at least one prescription for androgens



Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Key findings for androgen use:

Age-adjusted rates:

- Overall, and for several RHAs, a higher proportion of males than females use androgens (0.28% versus 0.09%, p<.001). Higher rates for males are expected, given the primary indications noted above.
- Even using a five-year period, the rates are quite low compared with other prescription drugs or events in this report; District level results could not be shown.
- There is a strong relationship between androgen use and area-level income: higher income residents are more likely to be receiving androgens than lower income residents, though the relationship did not quite meet statistical significance among rural males.

Age-specific crude rates by sex:

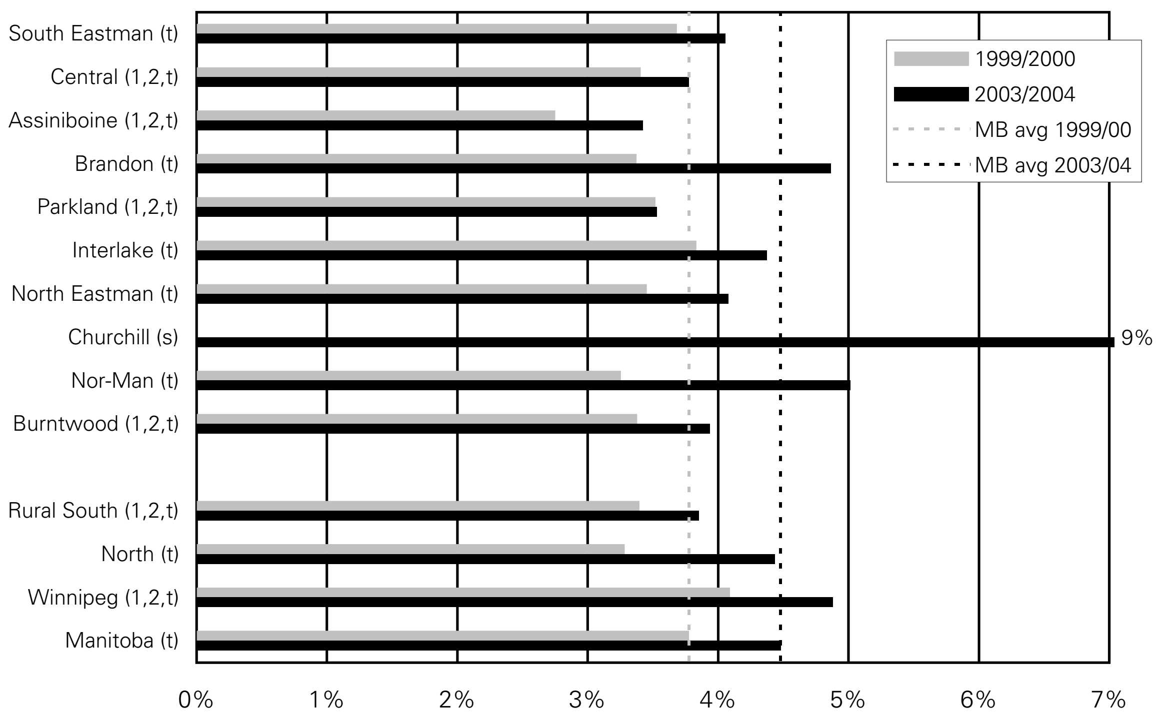
- For both sexes, androgen use rates are moderate among 40 to 44 year olds, but rise rapidly with age. Among females, rates begin to decline after age 50 to 54, whereas among males, rates continue to rise through age 60 to 64 before declining sharply.

7.8 Erectile Dysfunction Drug Use (Males Only)

Definition: This is the percentage of male residents age 40+ who received at least one prescription for erectile dysfunction (ED) drugs. These drugs include Viagra, Levitra, Cialis and similar drugs with ATC code G04BE. Rates are calculated for two separate years, 1990/2000 (the first year of their availability) and 2003/04, to examine the change in use over time. Values are age-adjusted to reflect the male 40+ population of Manitoba.

Figure 7.8.1: Erectile Dysfunction Drug Use by RHA, 1999/2000 and 2003/04

Age-adjusted percent of males age 40+ receiving at least one prescription for erectile dysfunction drugs

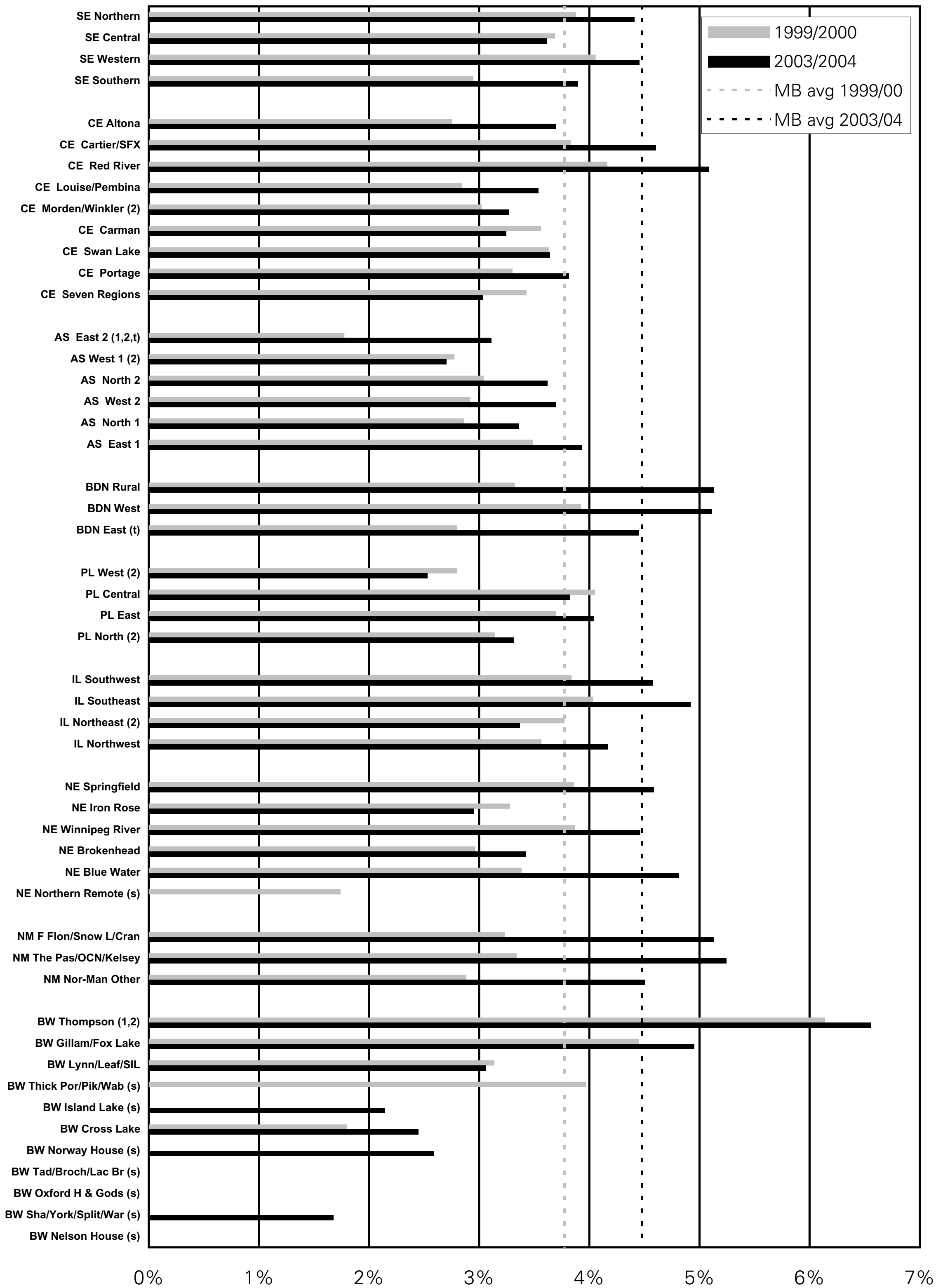


'1' indicates area's rate for time period 1 was statistically different from Manitoba average for time period 1
'2' indicates area's rate for time period 2 was statistically different from Manitoba average for time period 2
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.8.2: Erectile Dysfunction Drug Use by District, 1999/2000 and 2003/04

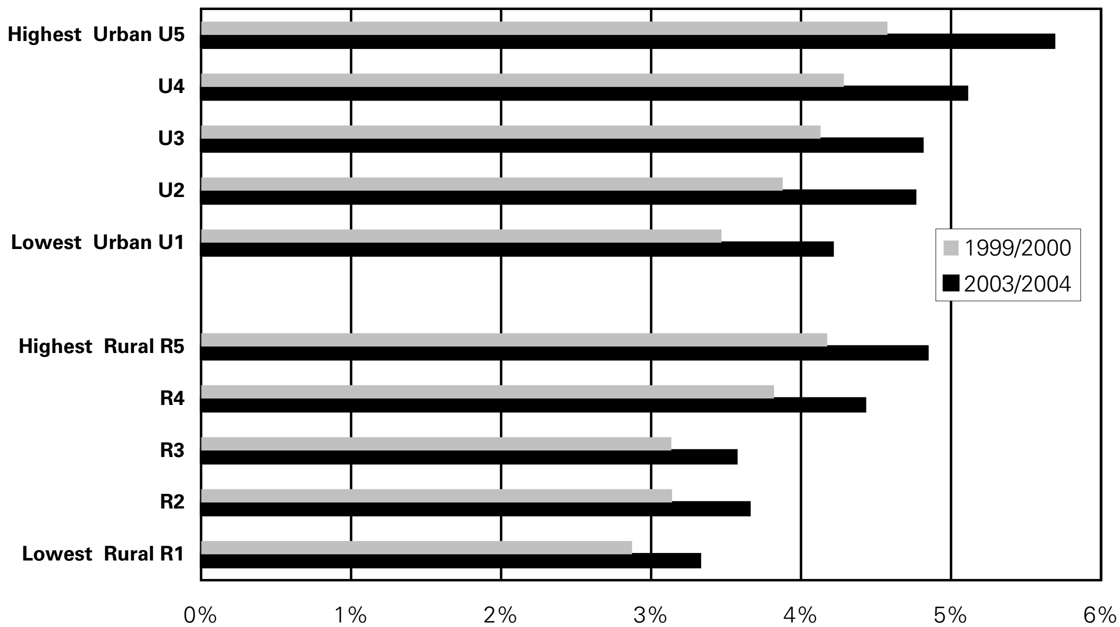
Age-adjusted percent of males age 40+ receiving at least one prescription for erectile dysfunction drugs



Source: Manitoba Centre for Health Policy, 2005

Figure 7.8.3: Erectile Dysfunction Drug Use by Income Quintile, 1999/2000 and 2003/04

Age-adjusted percent of males age 40+ receiving at least one prescription for erectile dysfunction drugs



Linear Trend Test Results

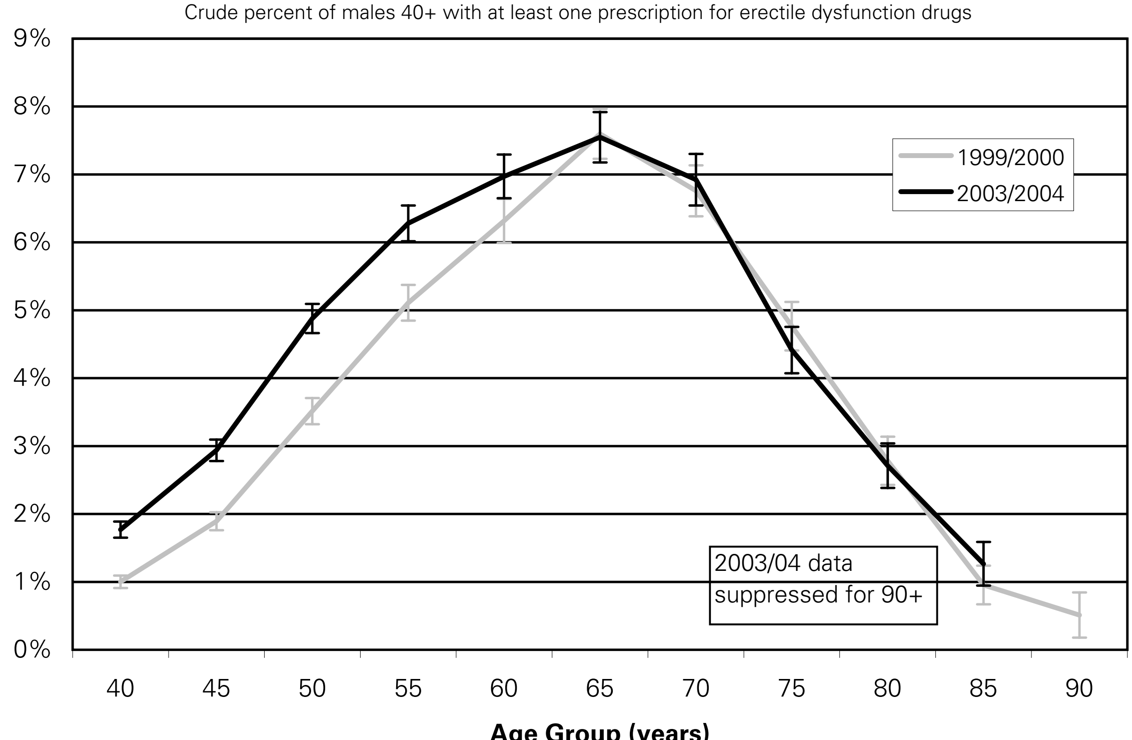
1999/00: Urban: Significant (p<.001) Rural: Significant (p<.001)

2003/04: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.8.4: Erectile Dysfunction Drug Use by Age, 1999/2000 and 2003/04

Crude percent of males 40+ with at least one prescription for erectile dysfunction drugs



Source: Manitoba Centre for Health Policy, 2005

Key findings for erectile dysfunction drug use:

Age-adjusted rates:

- Overall, and for several RHAs, the proportion of males receiving prescriptions for ED drugs increased from 1999/2000–2003/04 (3.8% versus 4.5%, p<.001).
- The 1999/2000 values and rates show rapid uptake of these drugs from their approval for sale in early 1999.
- The proportion of users is relatively comparable across RHAs and Districts.
- There is a strong relationship between ED drug use and area-level income: in both years, a higher proportion of males living in higher income areas (rural and urban) were using drugs for ED.

Age-specific crude rates:

- The proportion of males using drugs for ED rises rapidly from age 40 through 65, then declines sharply among older age groups. The age-specific rates for the two years are quite similar, but reveal the increase from 1999/00 to 2003/04 was entirely among younger men (under 60).

Comparisons to other findings:

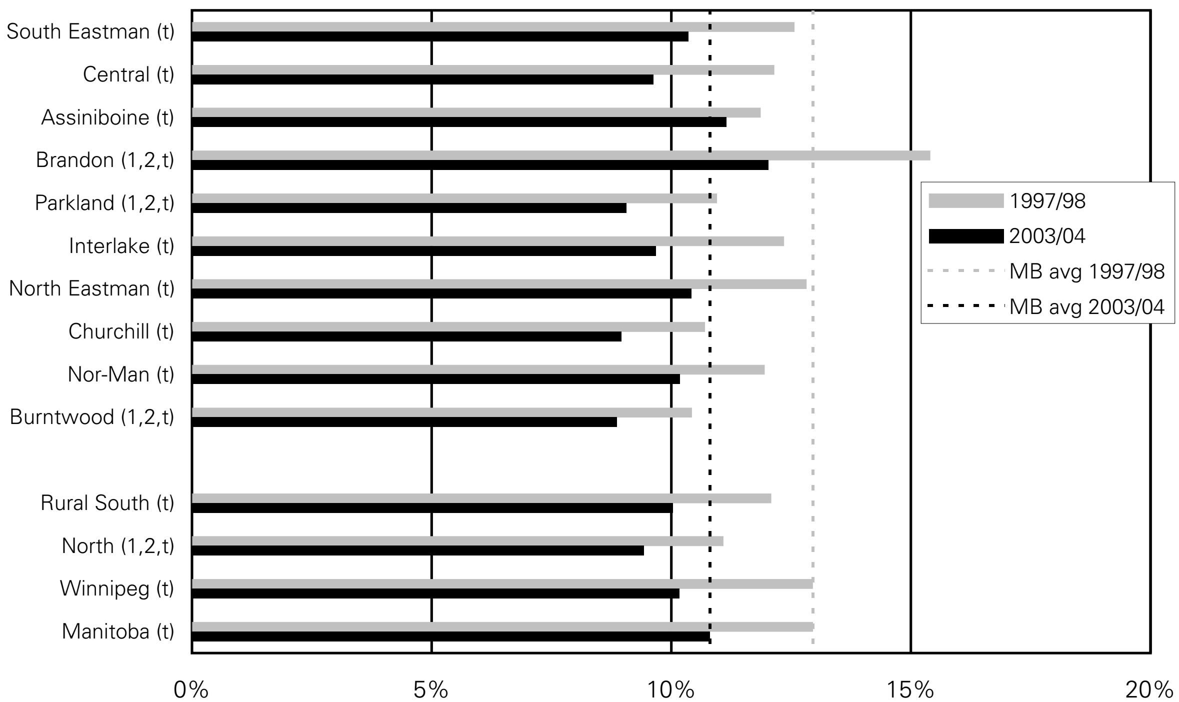
- High and increasing rates of ED drug use may lead to problems in the future, given the recently reported link between use of these medications and blindness.

7.9 Prevalence of Hormone Replacement Therapy (HRT) Use (Females Only)

Definition: This is the proportion of women receiving at least one prescription for Hormone Replacement Therapy (HRT; see Glossary for the list of drugs included). This indicator shows the prevalence—the percentage of all women 40+ who are using HRT—whereas the next indicator (Section 7.10) shows the incidence rate—the rate at which women are starting HRT. The incidence and prevalence of HRT use was expected to decrease after the July 2002 report from the Women's Health Initiative (WHI) (Writing Group for the Women's Health Initiative Investigators, 2002), so this analysis included time periods before (1997/98) and after (2003/04) that report. Values are age-adjusted to reflect the female 40+ population of Manitoba.

Figure 7.9.1: Prevalence of Hormone Replacement Therapy (HRT) Use by RHA, 1997/98 and 2003/04

Age-adjusted percent of female residents using HRT age 40+

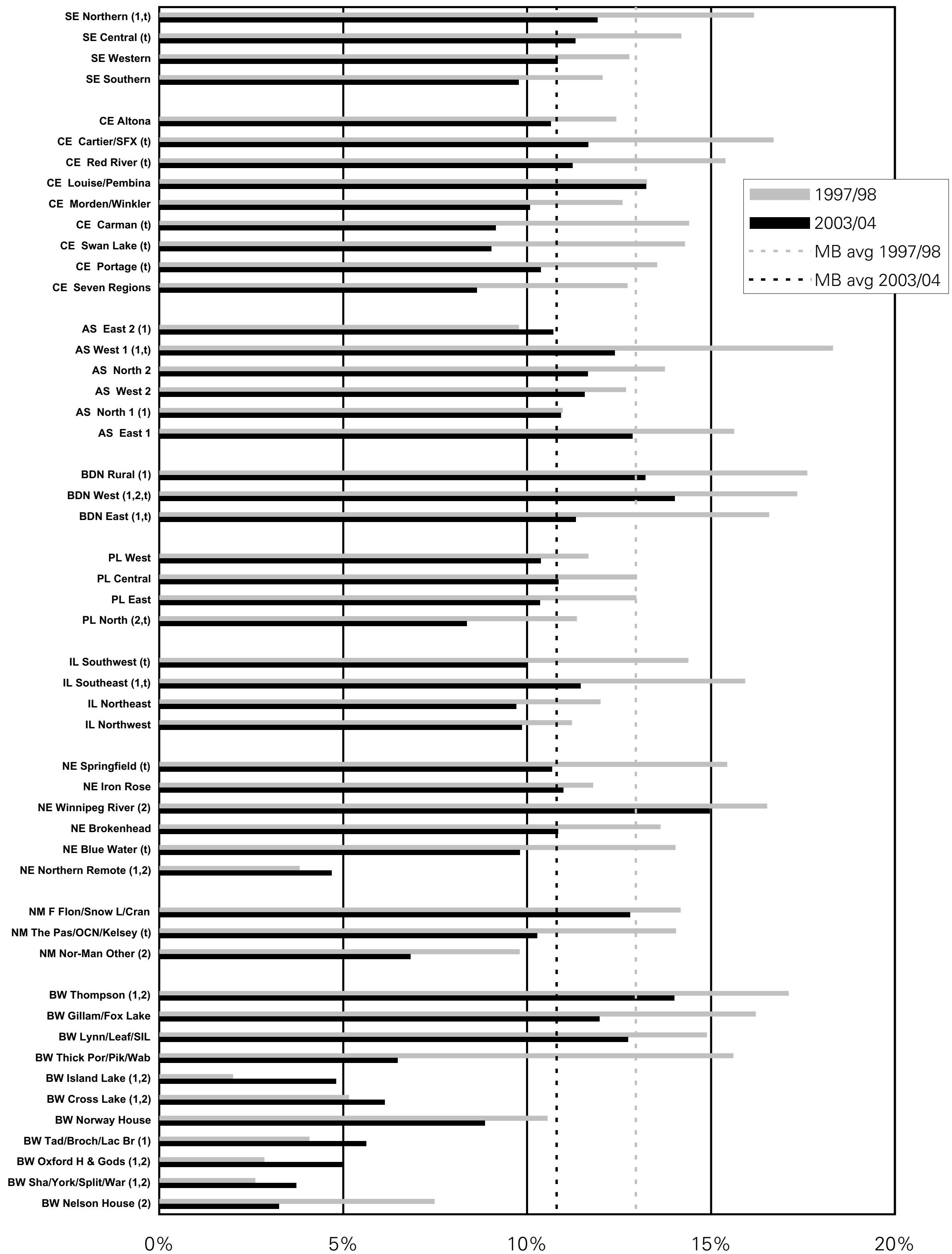


'1' indicates area's rate for time period was statistically different from Manitoba average for the time period 1
'2' indicates area's rate for time period was statistically different from Manitoba average for time period 2
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.9.2: Prevalence of Hormone Replacement Therapy (HRT) Use by District, 1997/98 and 2003/04

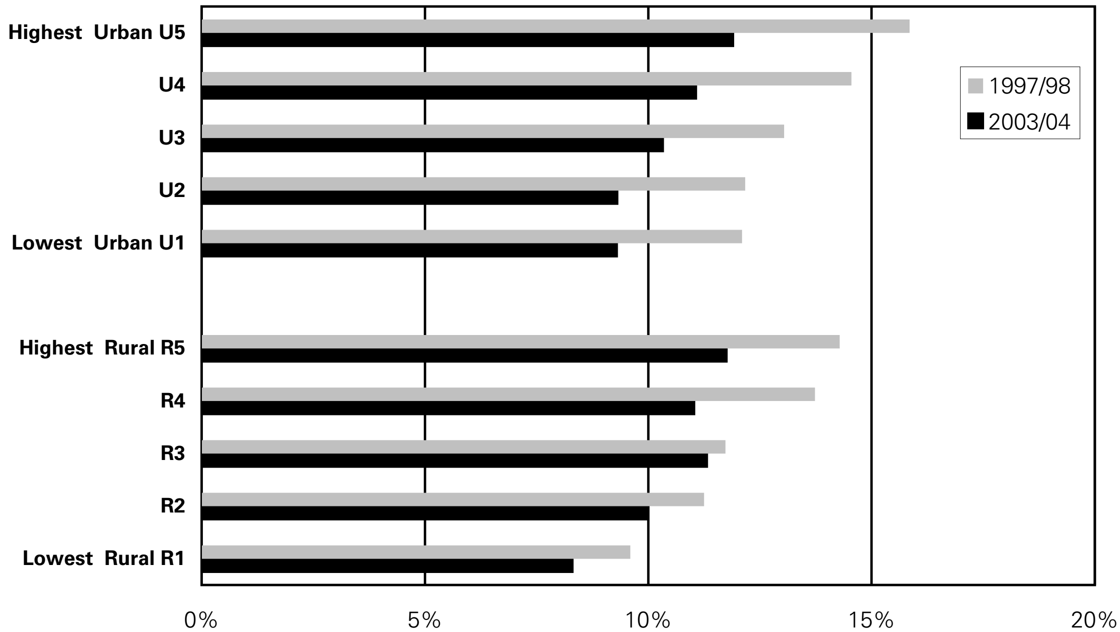
Age-adjusted percent of female residents using HRT age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 7.9.3: Prevalence of Hormone Replacement Therapy (HRT) Use by Income Quintile, 1997/98 and 2003/04

Age-adjusted percent of female residents using HRT age 40+



Linear Trend Test Results

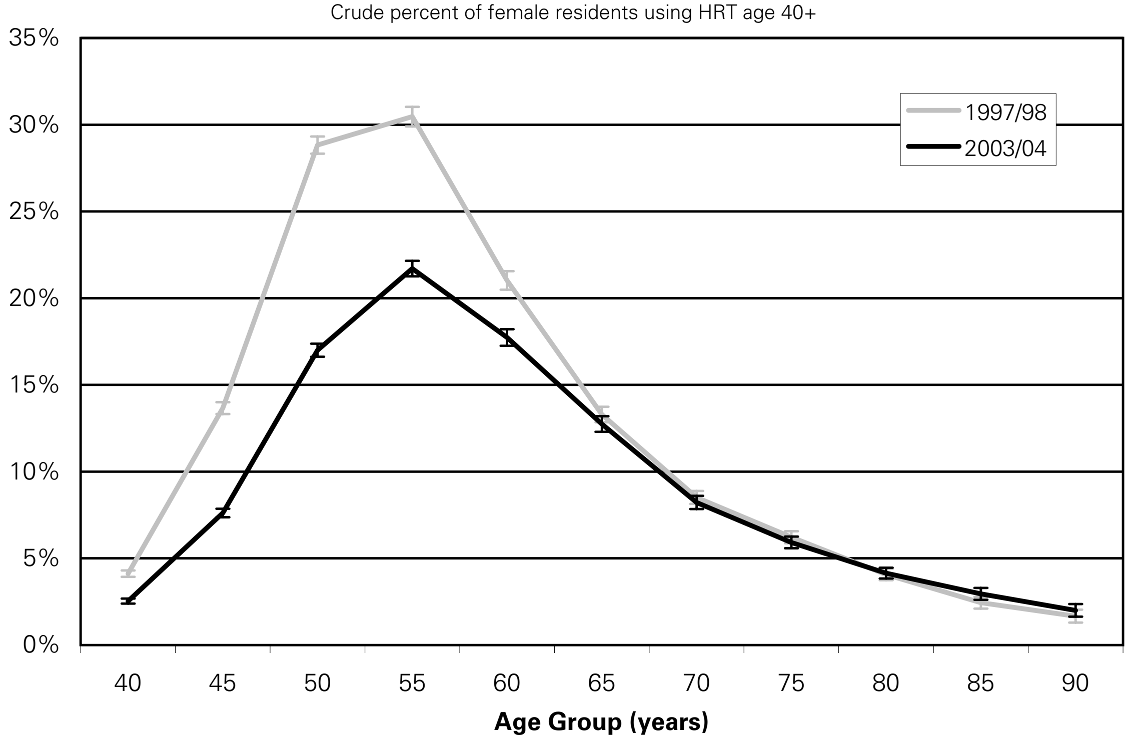
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.9.4: Prevalence of Hormone Replacement Therapy (HRT) Use by Age, 1997/98 and 2003/04

Crude percent of female residents using HRT age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for prevalence of hormone replacement therapy use:

Age-adjusted rates:

- Overall, and for all RHAs and Districts, the proportion of females on HRT drugs was significantly lower in 2003/04 than in 1997/98 (11.0% versus 13.6%, $p<.001$).
- The proportions are relatively consistent across rural and northern RHAs and Districts; values for Winnipeg and Brandon are higher than the provincial average.
- There is a strong relationship between area-level income and HRT use. In both time periods, a higher proportion of urban and rural women from higher income areas were using HRT drugs.

Age-specific crude rates:

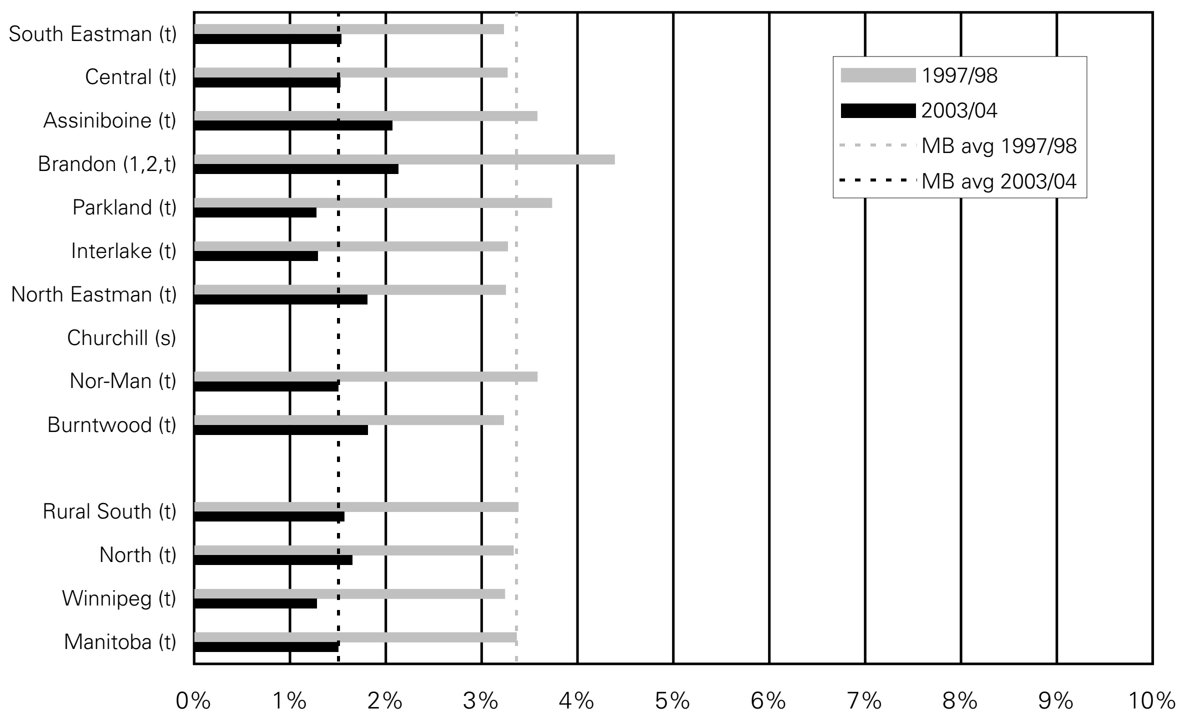
- The proportion of women receiving HRT is quite low among 40 to 44 year olds, rises rapidly to peak around age 55 to 59, then drops steadily with age. The lower use in 2003/04 compared with 1997/98 is most pronounced in younger age groups (that is, below age 60).

7.10 Incidence of Hormone Replacement Therapy (HRT) Use (Females Only)

Definition: This is the proportion of women starting HRT use for the first time in at least one year (that is, women receiving a prescription for HRT, having not received any HRT drugs in the previous fiscal year; see Glossary for the list of drugs included). This indicator shows the incidence rate – the rate at which women are starting HRT, as opposed to the prevalence rate (percentage of women using HRT), shown in the previous Section (7.8). The incidence and prevalence of HRT use was expected to decrease after the July 2002 report from the Women's Health Initiative (WHI) (Writing Group for the Women's Health Initiative Investigators, 2002), so this analysis includes times before (1997/98) and after (2003/04) that report. Values are age-adjusted to reflect the female 40+ population of Manitoba.

Figure 7.10.1: Incidence of Hormone Replacement Therapy (HRT) Use by RHA, 1997/98 and 2003/04

Age-adjusted percent of female residents starting HRT age 40+



'1' indicates area's rate for time period was statistically different from Manitoba average for the time period 1

'2' indicates area's rate for time period was statistically different from Manitoba average for time period 2

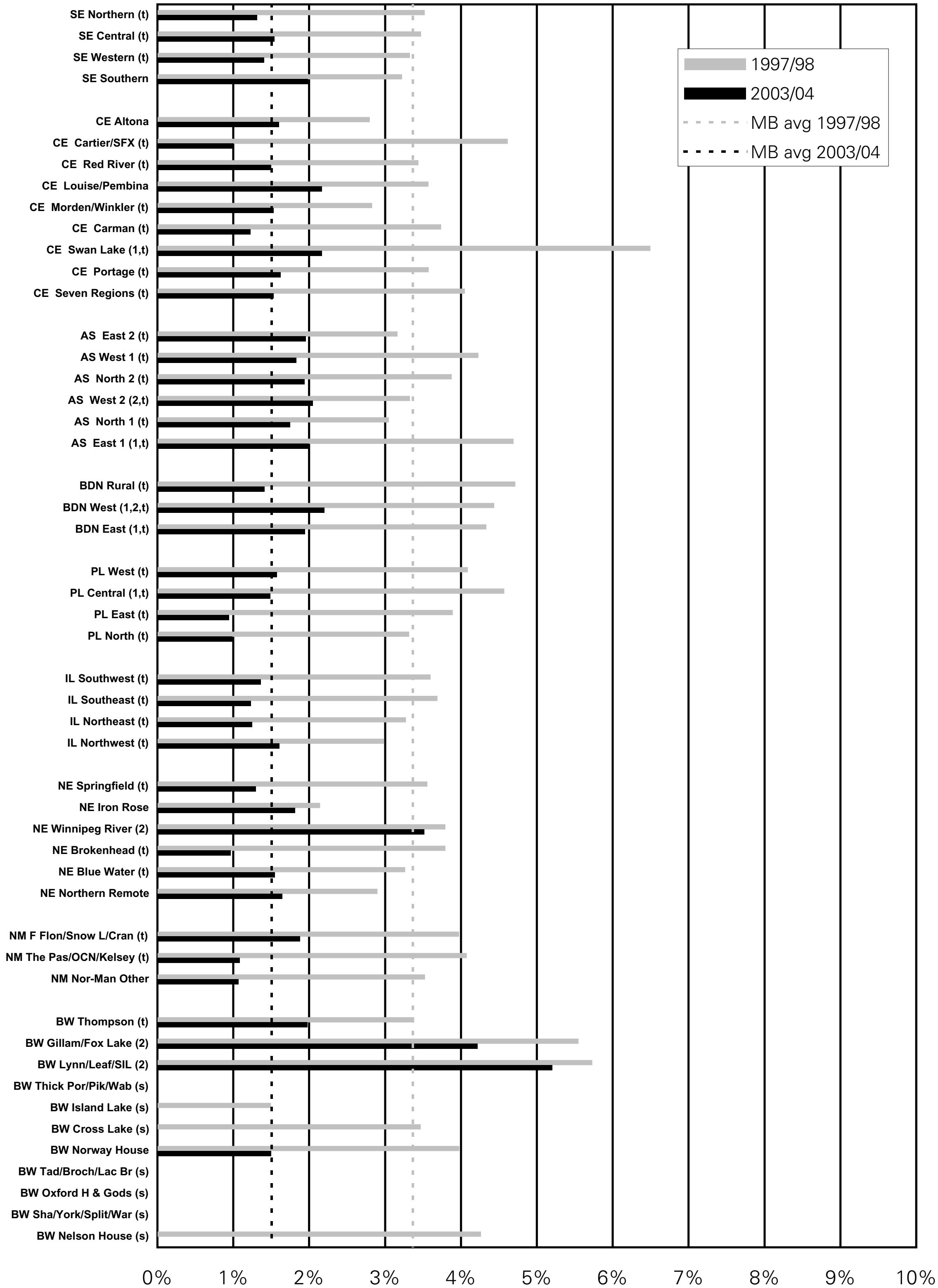
't' indicates change over time was statistically significant

's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 7.10.2: Incidence of Hormone Replacement Therapy (HRT) Use by District, 1997/98 and 2003/04

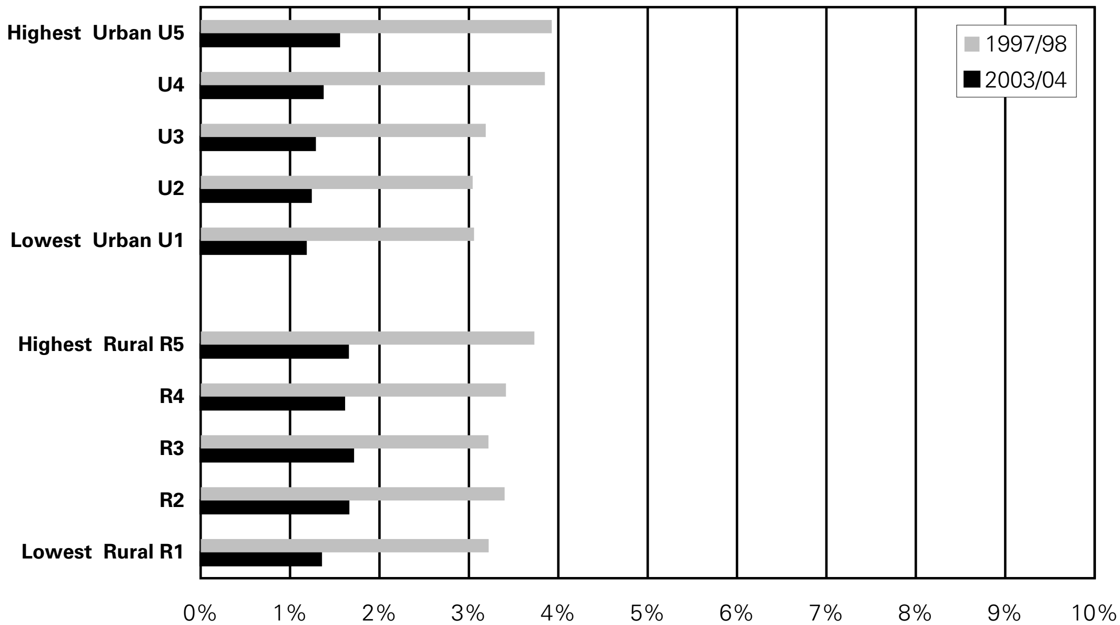
Age-adjusted percent of female residents starting HRT age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 7.10.3: Incidence of Hormone Replacement Therapy (HRT) Use by Income Quintile, 1997/98 and 2003/04

Age-adjusted percent of female residents starting HRT age 40+



Linear Trend Test Results

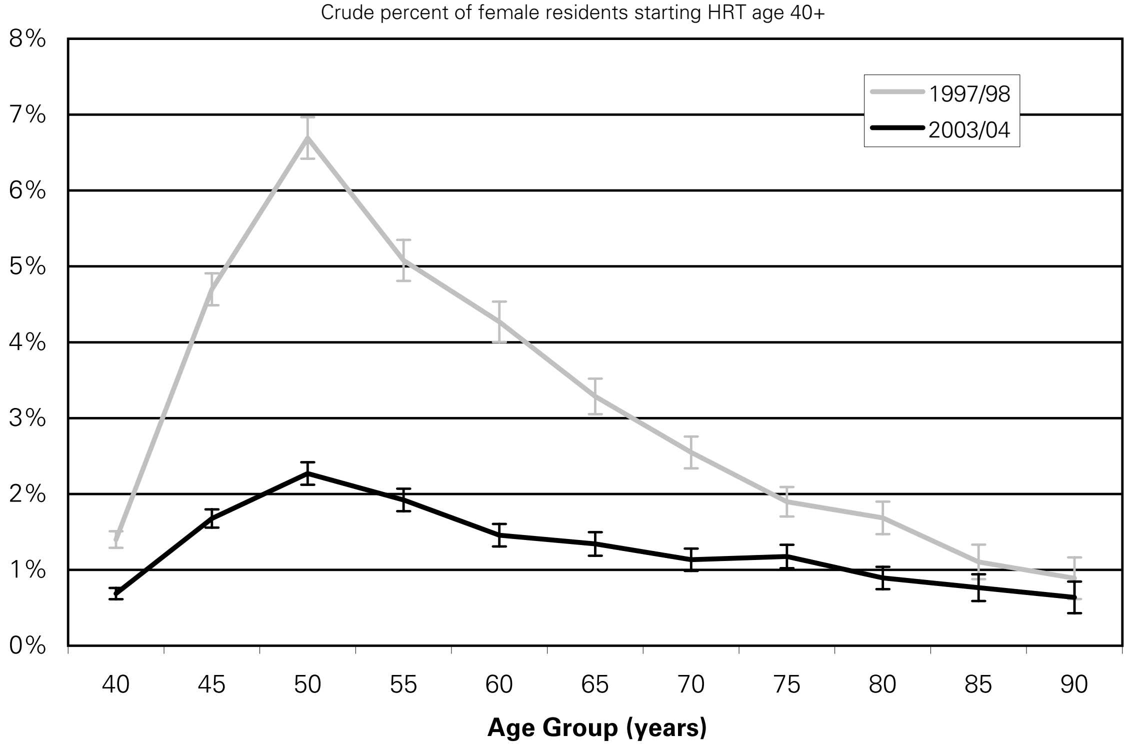
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 7.10.4: Incidence of Hormone Replacement Therapy (HRT) Use by Age, 1997/98 and 2003/04

Crude percent of female residents starting HRT age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for incidence of hormone replacement therapy use:

Age-adjusted rates:

- Overall, and for all RHAs, the HRT incidence rate in 2003/04 was less than half the rate in 1997/98 (1.5% versus 3.4%, p<.001).
- There is a strong relationship between area-level income and HRT incidence rates. In both time periods, a higher proportion of urban and rural women from higher income areas start using HRT.

Age-specific crude rates:

- For almost every age group, incidence rates for 2003/04 are much lower than for 1997/98. The largest rate decreases were among women in younger age groups, particularly around age 50.
- In both periods, the peak ages for HRT incidence are between 50 and 59, with rates lower for both younger and older women.

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CHAPTER 8: PREVENTION

This chapter will report coverage rates of routinely recommended immunizations for children and for seniors 65+.

The indicators are:
8.1 Immunizations for One-Year Olds
8.2 Immunizations for Two-Year Olds
8.3 Immunizations for Seven-Year Olds
8.4 Adult Influenza Immunizations
8.5 Adult Pneumococcal Immunizations

Key findings for Chapter 8: Prevention

- There were no significant sex differences in any of the childhood or adult immunization rates shown in this report. Childhood immunization rates seem to be stabilizing over time, whereas adult immunization rates are increasing.
- One-year olds: 82.7% received all recommended immunizations.
- Two-year olds: 70.2% received all recommended immunizations.
- Seven-year olds: 74.2% received all recommended immunizations.
- Adult Influenza: 67.5% of seniors 65 or older had a flu shot in 2003/04
- Adult Pneumococcal: 59.3% of seniors 65 or older have received an immunization between 2000/01 and 2003/04 (this is a 'once in a lifetime' shot for most seniors).
- There were strong relationships with area-level income: all childhood immunizations and adult influenza immunization rates were lower among male and female residents of lower income areas, both urban and rural. Adult pneumococcal immunization rates for rural residents showed the same trend, though urban residents did not.

Introduction:

These analyses were all performed on data from the Manitoba Immunization Monitoring System (MIMS). This population-based tracking system is used to record all immunizations, including those given by physicians and nurses, and track all eligible residents. Data from remote areas served by federally-operated nursing stations may not be complete, so rates may be under-estimated for some areas.

Targets:

The Public Health Agency of Canada maintains specific target values for childhood and adult immunization rates:

For childhood immunizations, the targets are 95–99%. See: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/97vol23/23s4/23s4d_e.html (Public Health Agency of Canada, 1997).

For adults 65+ the targets are 70% for influenza and 80% for pneumococcal. See: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01vol27/dr2710eb.html (Public Health Agency of Canada, 2001).

Notes for Childhood Immunizations:
In these analyses, only children born in Manitoba and living their entire lives in Manitoba (until the age of immunizations being analyzed) were included. Overall, approximately 90% of children in each age group were included (that is, were born and lived continuously in Manitoba). Results for non-continuous registrants (that is, children who moved into Manitoba after birth) are available from Manitoba Health at: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).

The indicators in this report show the percent of all eligible children who had 'complete' immunizations for the period. Since the recommended schedule of immunizations changes over time, we used the standard at the time; that is, as of 2002/03. (In the fall of 2004, several immunizations were added to the recommended list.)

Childhood immunization rates are not age-adjusted, because they are specific to children of a single age. Records for each child are examined as of their birthday.

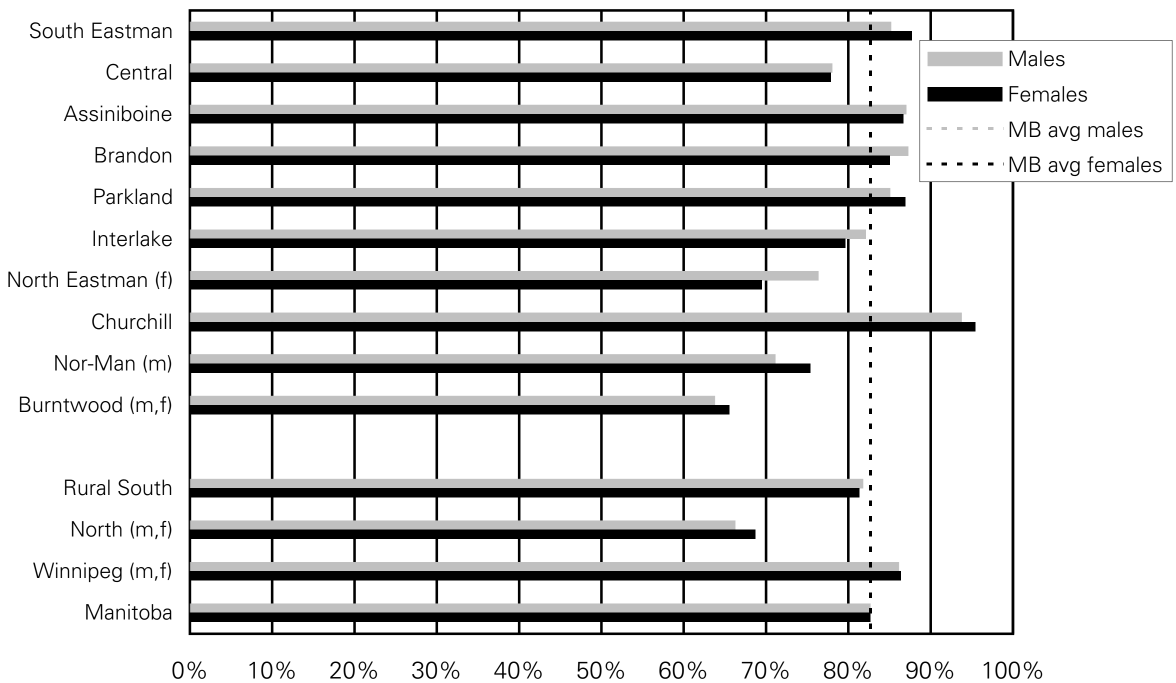
8.1 Immunizations for One-Year Olds

Definition: This is the crude (not age-adjusted) proportion of children born between April 1, 2001 and March 30, 2002, who had complete immunization schedules as of their first birthday. This means:

- Three Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP).
- Three Haemophilus Influenzae B (HIB).

Figure 8.1.1: Proportion of Children Born in 2001/2002 With Complete Immunization at One Year, by RHA

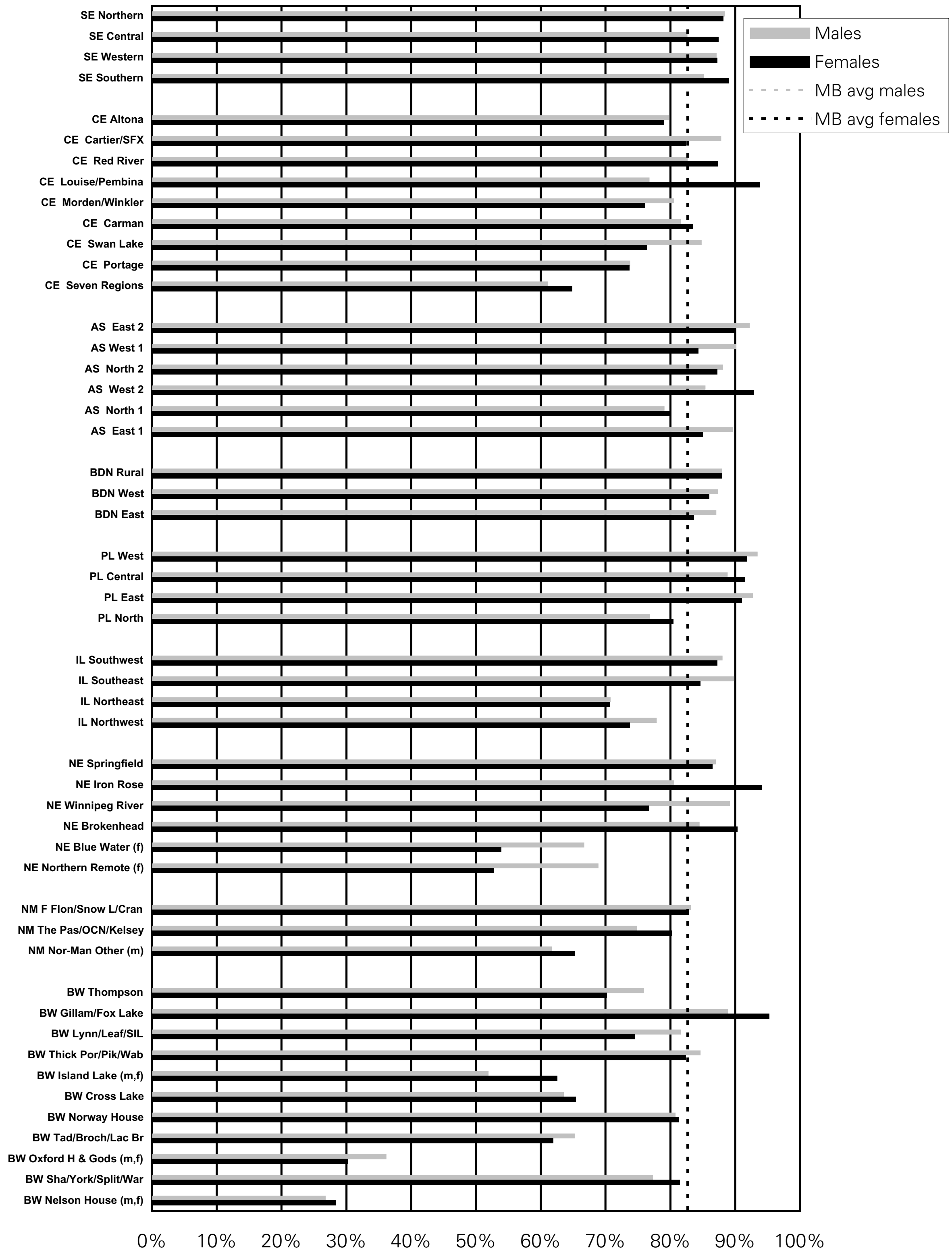
Crude percent of continuously registered one year olds



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS) Source: Manitoba Centre for Health Policy, 2005

Figure 8.1.2: Proportion of Children Born in 2001/2002 With Complete Immunizations at One Year, by District

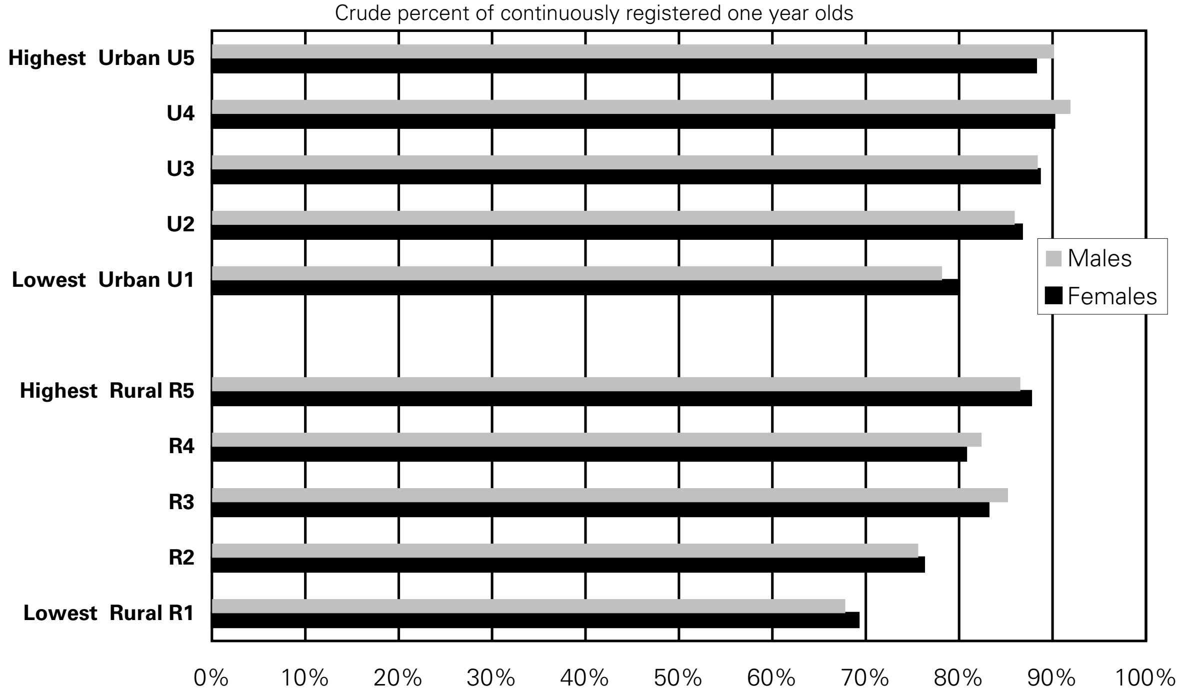
Crude percent of continuously registered one year olds



Source: Manitoba Centre for Health Policy, 2005

Figure 8.1.3: Proportion of Children Born in 2001/2002 With Complete Immunizations at One Year, by Income Quintile

Crude percent of continuously registered one year olds



Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Key findings for one-year old immunizations:

- Overall, and for all RHA and Districts, there is no difference in immunization rates of male versus female one-year olds (82.7% for both).
- There is a strong relationship between area-level income and immunization rates for one-year olds: children from families living in higher income areas have higher immunization rates.

Comparison to other findings:

- These rates are consistent with those published in the RHA Indicators Atlas (Martens et al., 2003). That report showed immunization rates for one-year olds decreased from 84.5% for children born in the mid-1990s to 83.0% for those born in the late 1990s. The current results, 82.7% for children born in 2001/02, suggest the rates may be stabilizing.
- The rates are very close to those reported by Manitoba Health (82.3%). See: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).
- The rates are considerably lower than the 95% or higher targets for most childhood immunizations identified by the Public Health Agency of Canada. See: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/97vol23/23s4/23s4d_e.html (Public Health Agency of Canada, 1997).

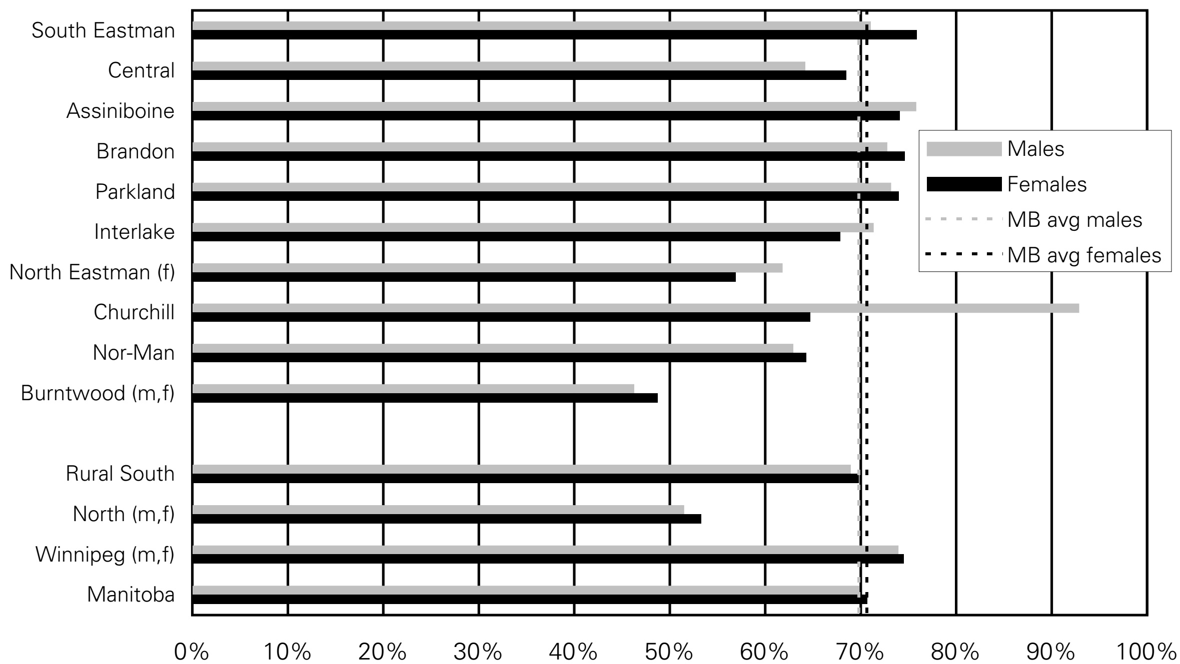
8.2 Immunizations for Two-Year Olds

Definition: This is the crude (not age-adjusted) proportion of children born between April 1, 2000 and March 30, 2001, who had complete immunization schedules as of their second birthday. This means:

- Four Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP).
- Four Haemophilus Influenzae B (HIB).
- One Measles, Mumps and Rubella (MMR)

Figure 8.2.1: Proportion of Children Born in 2000/2001 With Immunizations at Two Years, by RHA

Crude percent of continuously registered two year olds

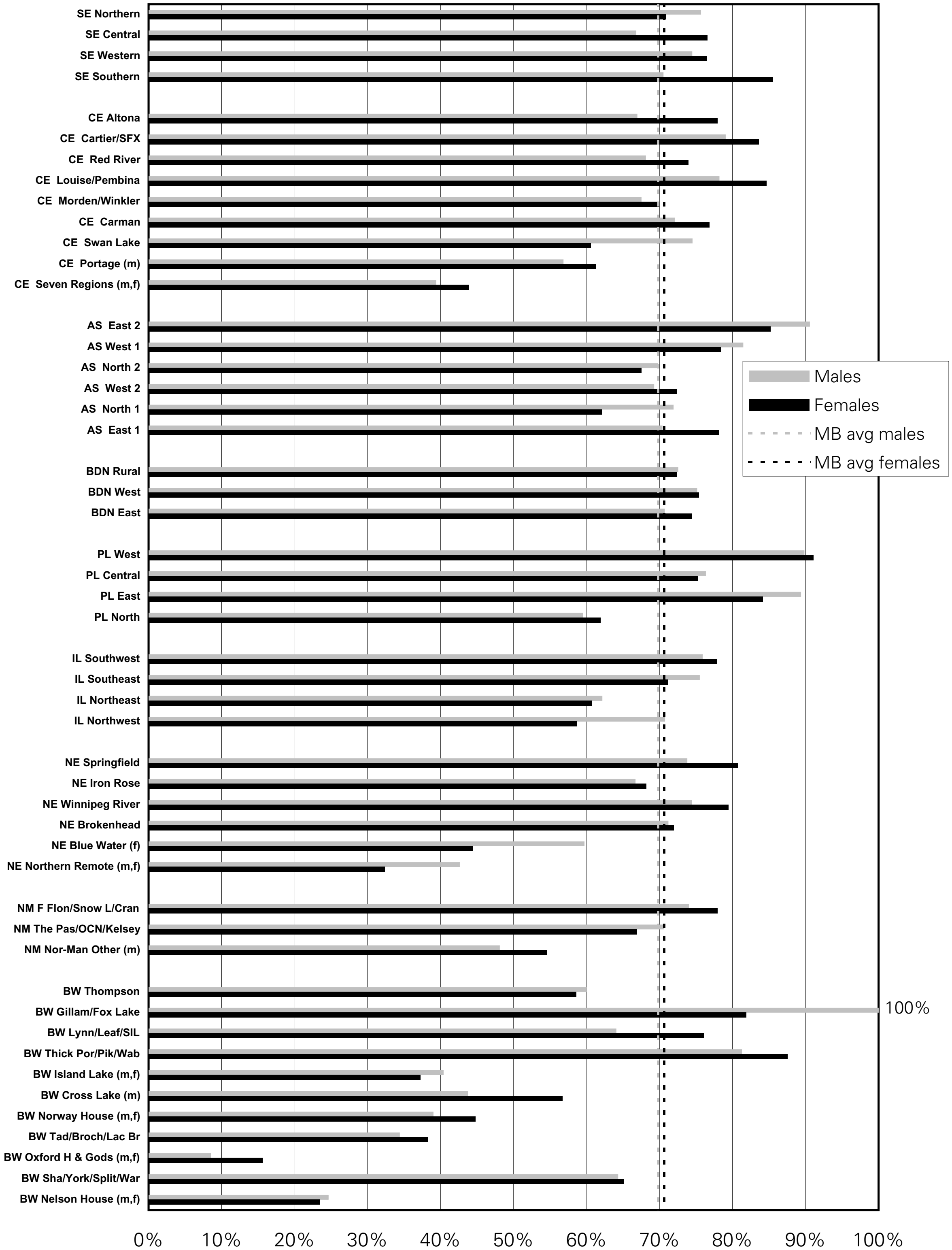


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS)

Source: Manitoba Centre for Health Policy, 2005

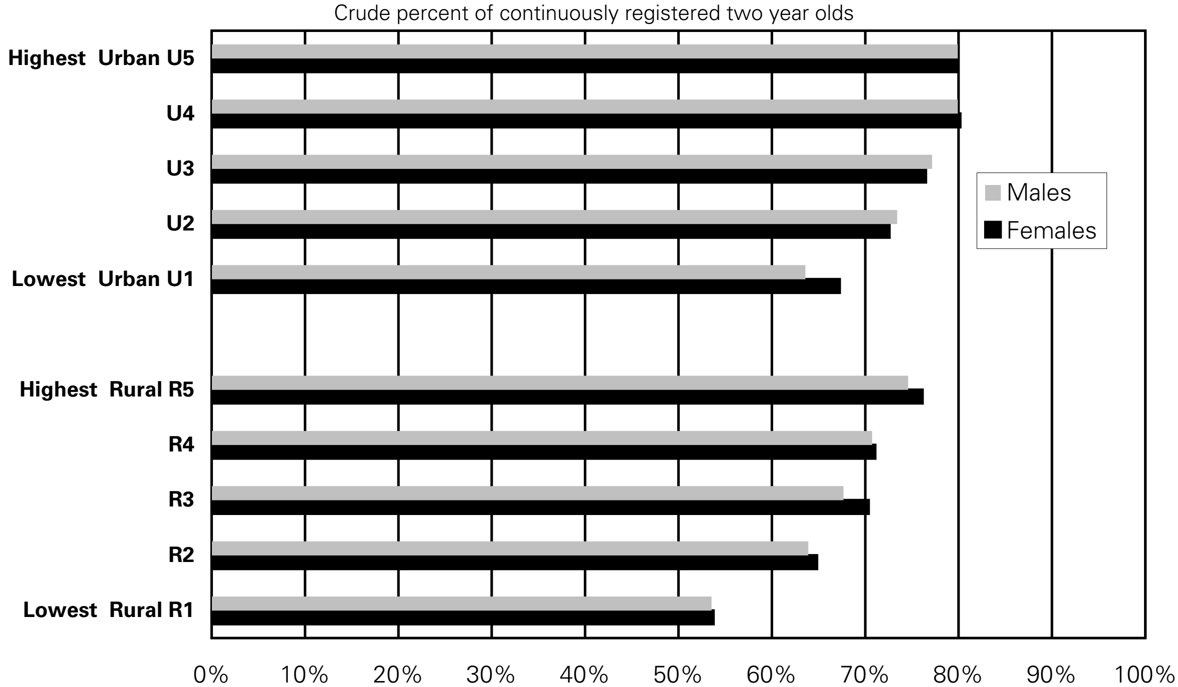
Figure 8.2.2: Proportion of Children Born in 2000/2001 With Complete Immunizations at Two Years, by District

Crude percent of continuously registered two year olds



Source: Manitoba Centre for Health Policy, 2005

Figure 8.2.3: Proportion of Children Born in 2000/2001 With Complete Immunizations at Two Years, by Income Quintile



Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Key findings for two-year-old immunizations:

- Overall, and for all RHAs and Districts, there is no difference in immunization rates of male versus female two-year olds (69.8% for males; 70.7% for females, not significant).
- There is a strong relationship between area-level income and immunization rates for two-year olds: children from families living in higher income areas have higher immunization rates.

Comparison to other findings:

- These rates are consistent with those published in the RHA Indicators Atlas (Martens et al., 2003). That report showed immunization rates for two-year olds decreased slightly from 71.5% for children born in the early 1990s to 70.7% for those born in the late 1990s. The current results, 70% for children born in 2000/01, suggest the rates may still be decreasing slowly.
- The rates are the same as those reported by Manitoba Health (70%). See: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).
- The rates are considerably lower than the 95% or higher targets for most childhood immunizations identified by the Public Health Agency of Canada. See: http://www.phac-aspc.gc.ca/publicat/ccdr rmtc/ 97vol23/23s4/23s4d_e.html (Public Health Agency of Canada, 1997).

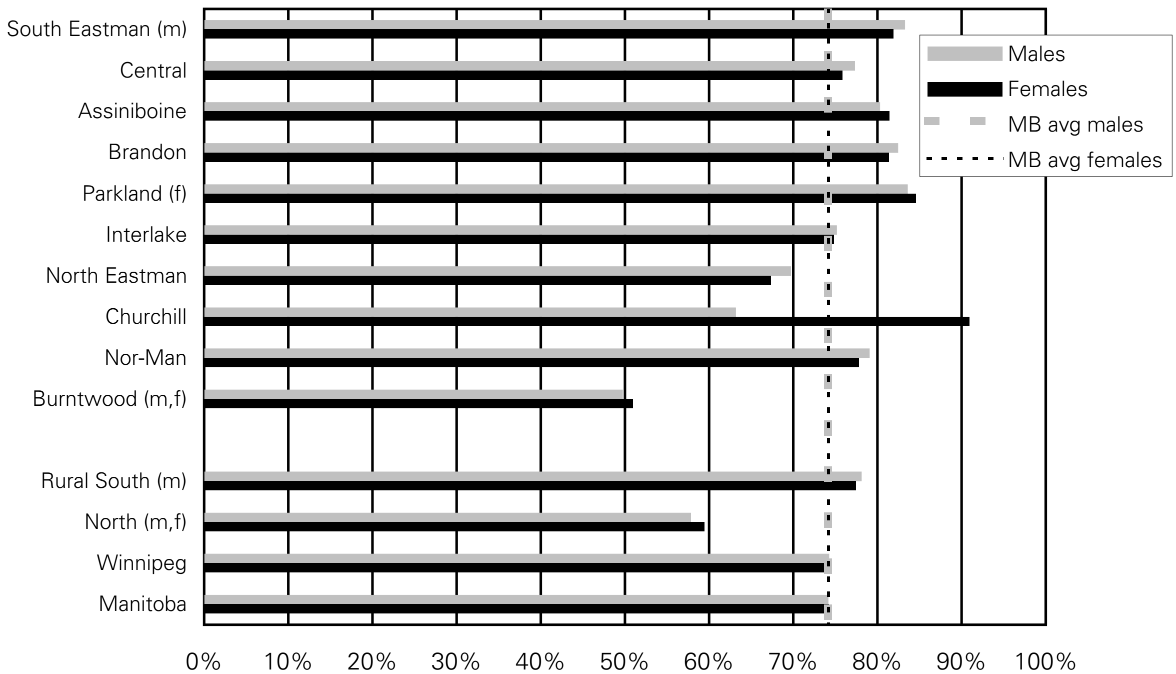
8.3 Immunizations for Seven-Year Olds

Definition: This is the crude (not age-adjusted) proportion of children born between April 1, 1995 and March 30, 1996, who had complete immunization schedules as of their seventh birthday. This means:

- Five Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP).
- Four Haemophilus Influenzae B (HIB).
- Two Measles, Mumps and Rubella (MMR).

Figure 8.3.1: Proportion of Children Born in 1995/1996 With Complete Immunizations at Seven Years, by RHA

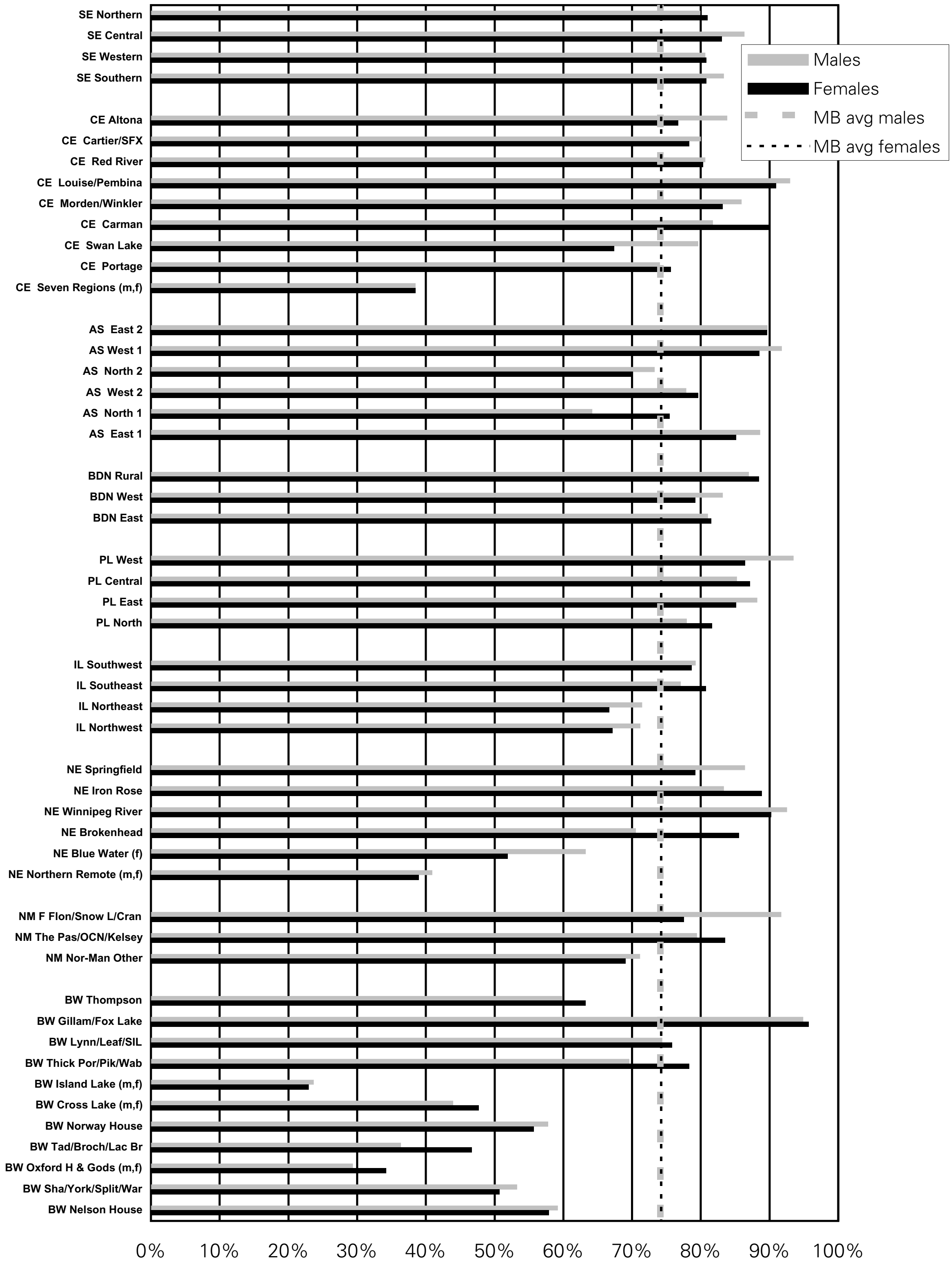
Crude percent of continuously registered seven year olds



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS) Source: Manitoba Centre for Health Policy, 2005

Figure 8.3.2: Proportion of Children Born in 1995/1996 With Complete Immunizations at Seven Years, by District

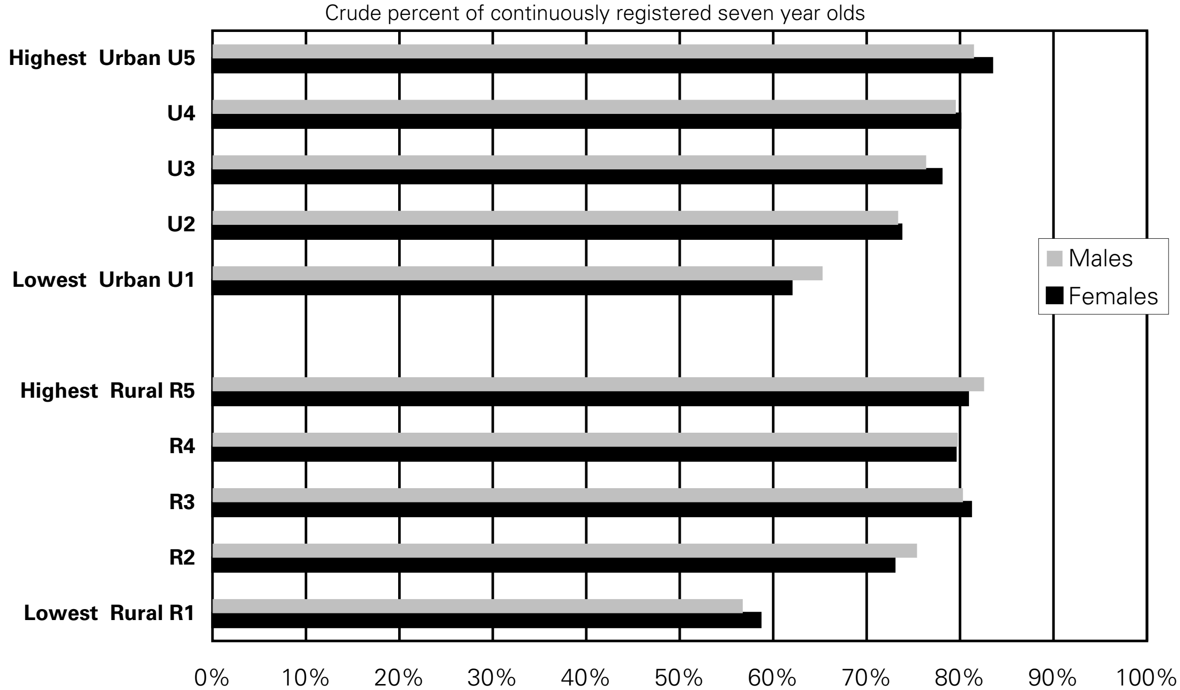
Crude percent of continuously registered seven year olds



Source: Manitoba Centre for Health Policy, 2005

Figure 8.3.3: Proportion of Children Born in 1995/1996 With Complete Immunizations at Seven Years, by Income Quintile

Crude percent of continuously registered seven year olds



Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Key findings for seven-year-old immunizations:

- Overall, and for almost all RHAs and Districts, there is no difference in immunization rates of male versus female seven-year olds (74.2% for both).
- There is a strong relationship between area-level income and immunization rates for seven-year olds: children from families living in higher income areas have higher immunization rates.

Comparison to other findings:

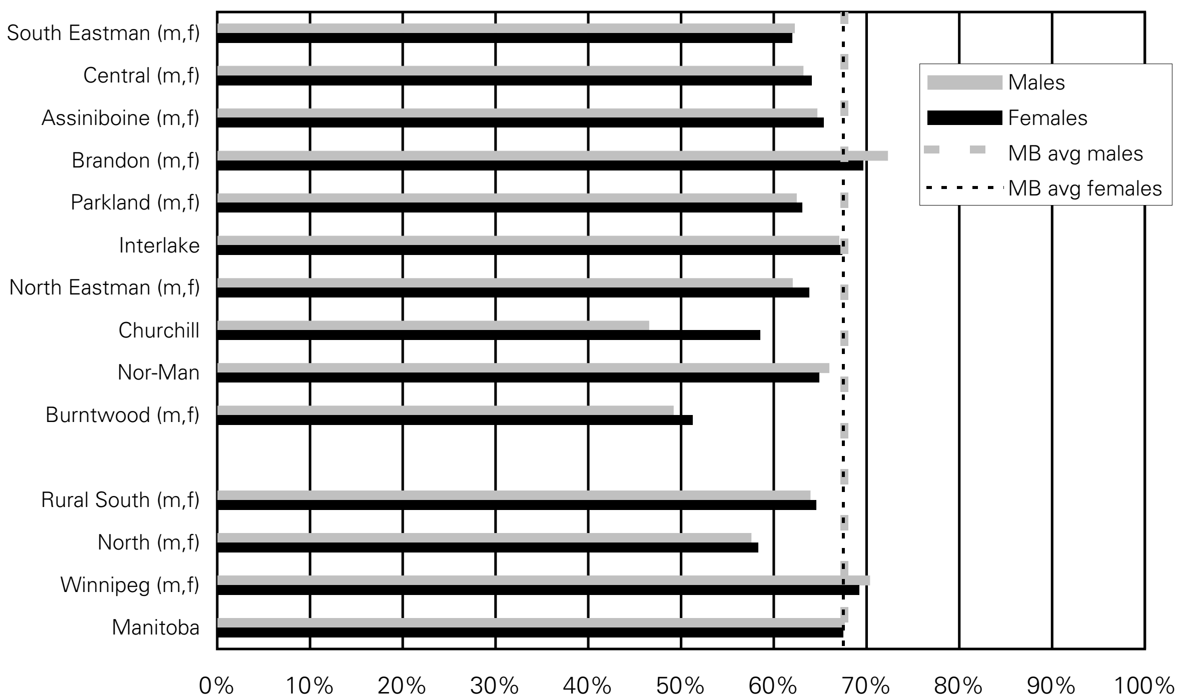
- These rates are consistent with those published in the RHA Indicators Atlas (Martens et al., 2003). That report showed immunization rates for seven-year olds decreased sharply from 82.6% for children born in the late 1980s to 73.3% for those born in the early 1990s. The current results, 74.2% for children born in 1995/96, suggest the rates may be stabilizing.
- The rates are very close to those reported by Manitoba Health (74%). See: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).
- The rates are considerably lower than the 95% or higher targets for most childhood immunizations identified by the Public Health Agency of Canada. See: http://www.phac-aspc.gc.ca/publicat/ccdr- rmtc/97vol23/23s4/23s4d_e.html (Public Health Agency of Canada, 1997).

8.4 Adult Influenza Immunizations

Definition: This is the proportion of residents age 65 or older who received immunization for influenza ('the flu') in 2003/04. Annual 'flu shots' are recommended for all seniors 65+ (along with other target groups not analyzed in this report). Flu shots were defined by codes 8791, 8792, and 8799 in MIMS data. Values are age-adjusted to reflect the 65+ population of Manitoba (males and females combined).

Figure 8.4.1: Adult Influenza Immunization Rates by RHA, 2003/04

Age-adjusted percent of residents who received a flu shot age 65+

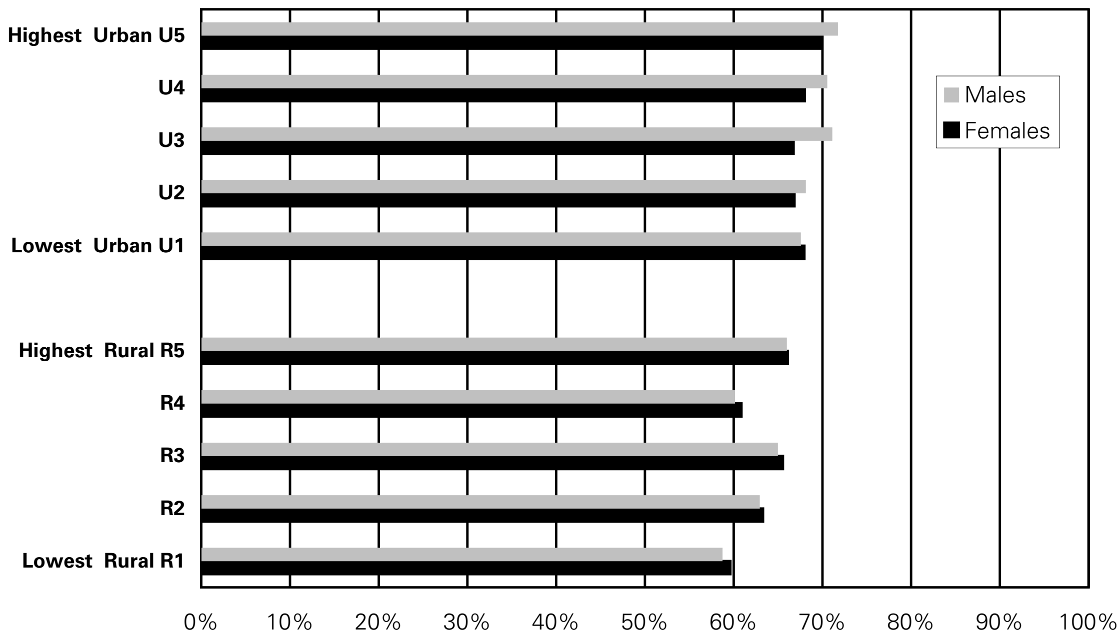


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS)

Source: Manitoba Centre for Health Policy, 2005

Figure 8.4.2: Adult Influenza Immunization Rates by Income Quintile, 2003/04

Age-adjusted percent of residents who received a flu shot age 65+



Linear Trend Test Results

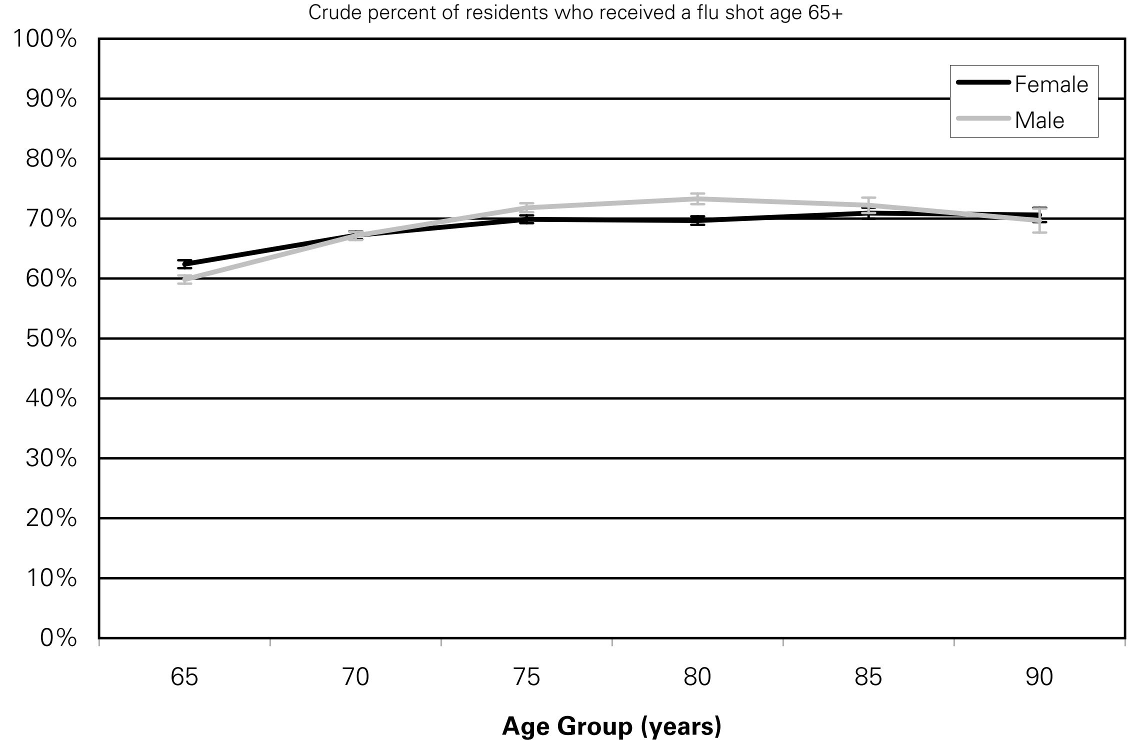
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 8.4.3: Adult Influenza Immunizations Rates by Age and Sex, 2003/04

Crude percent of residents who received a flu shot age 65+



Source: Manitoba Centre for Health Policy, 2005

Key findings for influenza immunizations:

Age-adjusted rates:

- Overall, and for almost all RHAs, there is no difference in immunization rates of males versus females (67.6% versus 67.5%, not significant). District level results could not be accurately calculated.
- There is a relationship between influenza immunization and area-level income: immunization rates are slightly higher among residents of higher income areas, both males and females from rural and urban areas.

Crude rates by age & sex:

- For both sexes, influenza immunization rates are slightly lower for younger seniors (65-69) than the older age groups, which are virtually identical.

Comparison to other findings:

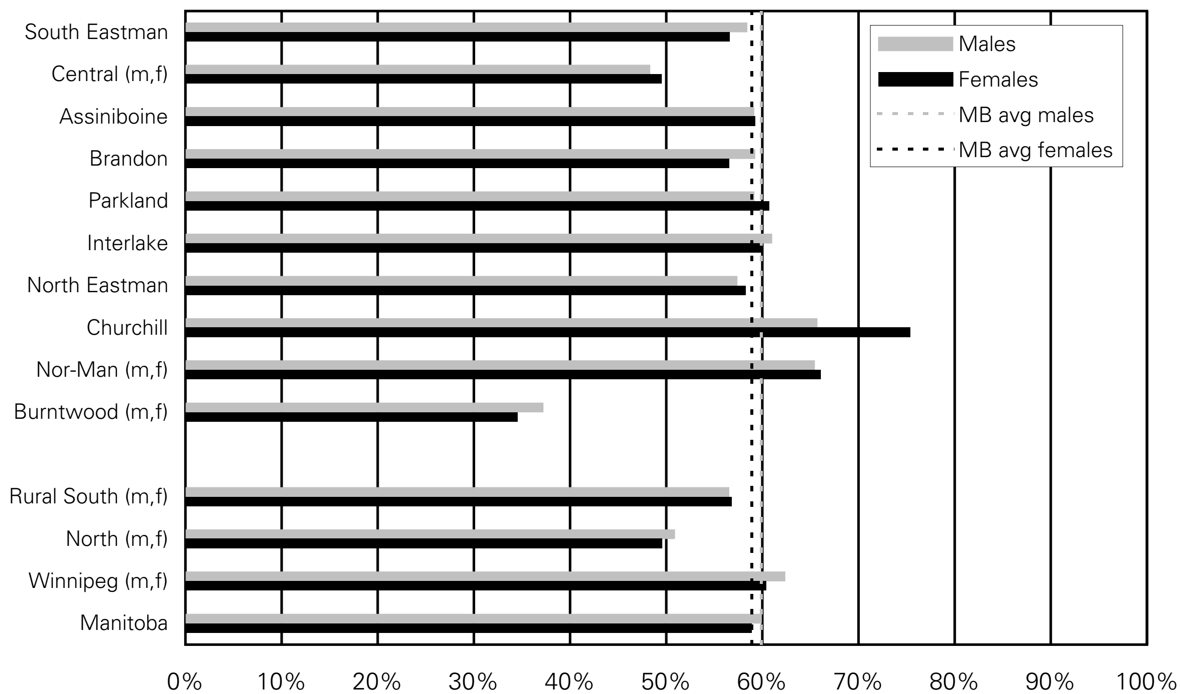
- These rates suggest an increase in influenza immunizations for seniors: the rates reported in the RHA Indicators Atlas (Martens et al., 2003) showed that only 54.7% of seniors age 65+ were immunized in 2000/01, versus 67.5% in 2003/04.
- The rates are the same as those reported by Manitoba Health (67.6%). See: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).
- These rates are very close to the 70% target identified by the Public Health Agency of Canada. See: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01vol27/dr2710eb.html (Public Health Agency of Canada, 2001).

8.5 Adult Pneumococcal Immunizations

Definition: This is the proportion of residents age 65 or older who received a pneumococcal immunization in the four years for which data are available, 2000/01–2003/04. For most seniors, a pneumococcal immunization is considered a 'once-in-a-lifetime' event, so these rates show the 'cumulative' percent of residents who've ever had a pneumococcal immunization, as defined by tariff codes 8681-8684 and 8961 in MIMS data. Values are age-adjusted to reflect the 65+ population of Manitoba (males and females combined).

Figure 8.5.1: Pneumococcal Immunization Rates by RHA, 2000/01 – 2003/04

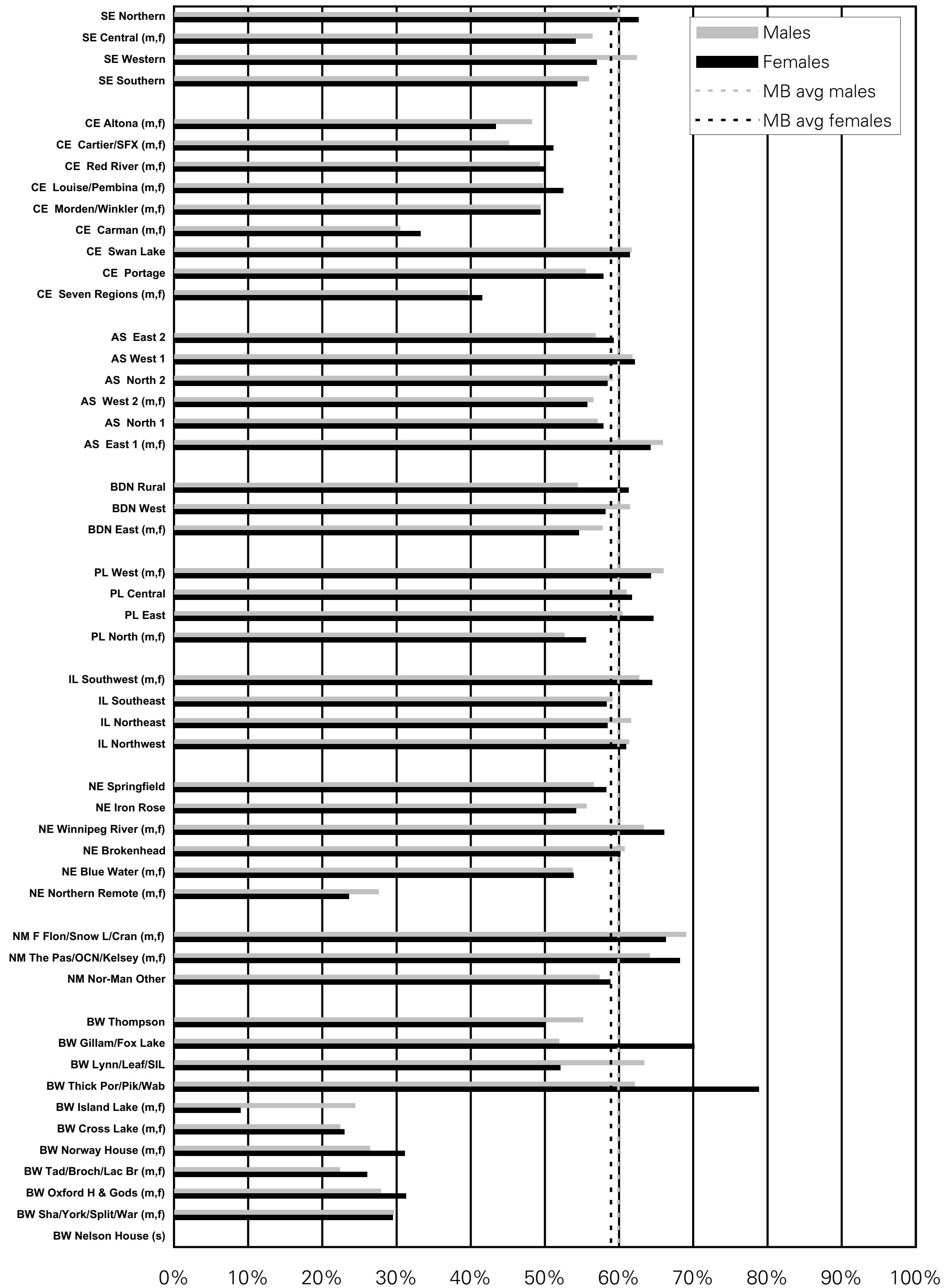
Age-adjusted cumulative percent of residents age 65+ who received a pneumococcal vaccination



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers
Source: Manitoba Immunization Monitoring System (MIMS) Source: Manitoba Centre for Health Policy, 2005

Figure 8.5.2: Pneumococcal Immunization Rates by District, 2000/01 – 2003/04

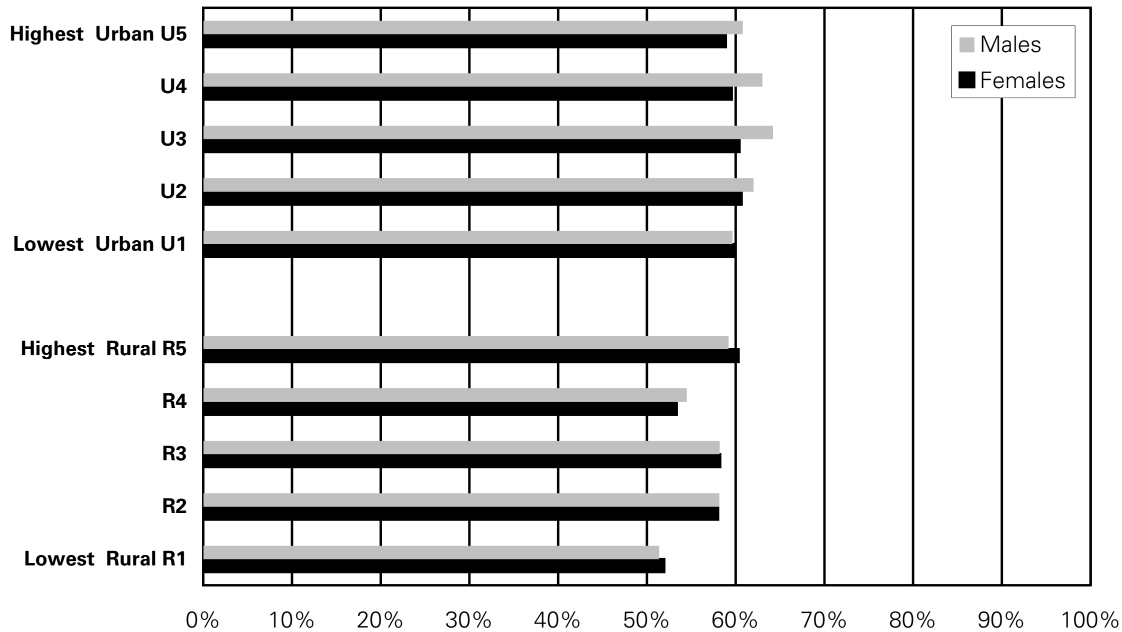
Age-adjusted percent of residents age 65+ who received a pneumococcal vaccination



Source: Manitoba Centre for Health Policy, 2005

Figure 8.5.3: Pneumococcal Immunization Rates by Income Quintile, 2000/01 – 2003/04

Age-adjusted cumulative percent of residents age 65+ who received a pneumococcal vaccination



Linear Trend Test Results

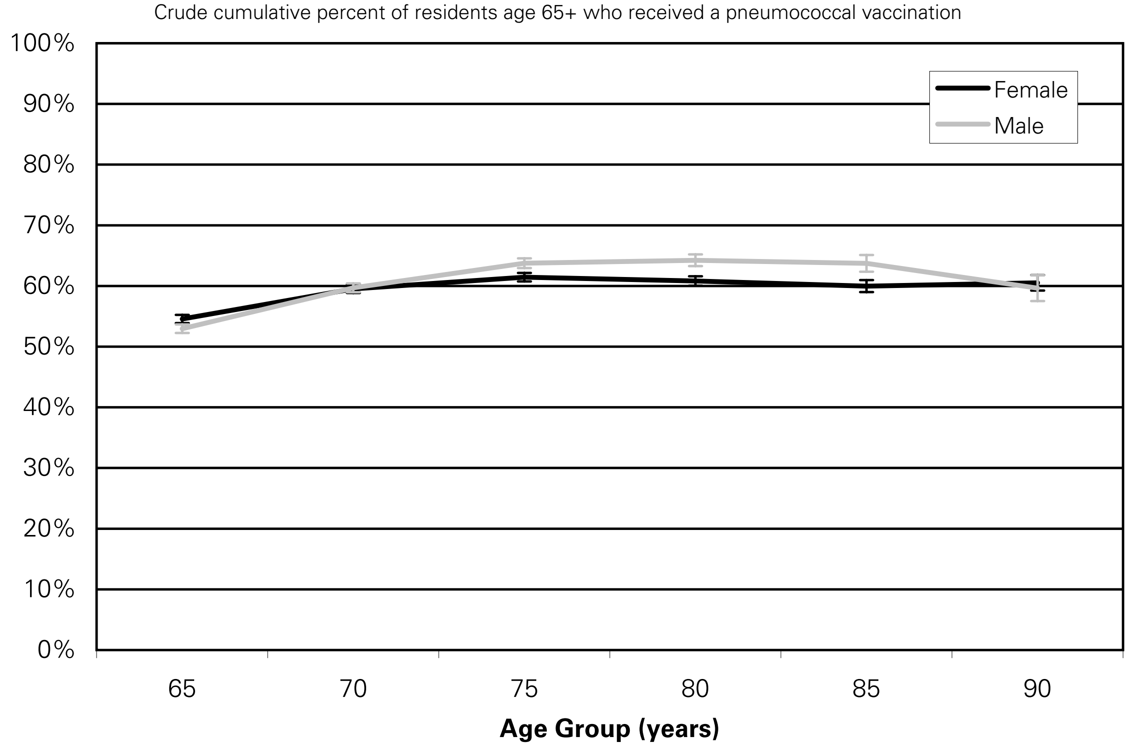
Female: Urban: Not Significant Rural: Significant (p<.001)

Male: Urban: Significant Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 8.5.4: Pneumococcal Immunization Rates by Age and Sex, 2000/01 – 2003/04

Crude cumulative percent of residents age 65+ who received a pneumococcal vaccination



Source: Manitoba Centre for Health Policy, 2005

Key findings for adult pneumococcal immunizations:

Age-adjusted rates:

- Overall, males and females 65+ have similar pneumococcal immunization rates: 59.7% and 59.0% (not significant).
- There was a varied relationship between pneumococcal immunization and area-level income: among rural residents, a lower proportion of those living in lower income areas were immunized, whereas among urban residents, there was no relationship with area-level income.

Crude rates by age & sex:

- For both sexes, pneumococcal immunization rates are slightly lower for younger seniors (65 to 69) than the older age groups, which are virtually identical.

Comparisons to other findings:

- The rates are very close to those reported by Manitoba Health (61%). See: http://www.gov.mb.ca/health/publichealth/cdc/surveillance/mims03.pdf (Manitoba Health, 2003).
- Rates can be expected to increase over time, since this is a 'once-in-a-lifetime' recommendation for most seniors, and the program is ongoing.
- These rates are below the 80% target identified by the Public Health Agency of Canada. See: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01vol27/dr2710eb.html (Public Health Agency of Canada, 2001).

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CHAPTER 9: HOME CARE & PERSONAL CARE HOMES

This chapter shows indicators of the use of Home Care services, and Personal Care Homes (PCH—also known as 'nursing homes'). The indicators include:

Home Care:
9.1 Open Home Care Cases ('Prevalence')
9.2 Home Care Days Used

Personal Care Homes:
9.3 Residents in Personal Care Homes ('Prevalence' of PCH Use)
9.4 Level of Care on Admission to PCH

Key findings for Chapter 9: Home Care & PCH:

- There was no significant sex difference in the rate of home care cases (30.1 per 1,000 females, versus 28.9 for males), but female clients received more days of home care than males (216 versus 193 days).
- Rates of PCH use were higher for females than males (146.3 per 1,000 females age 75+ were residents of PCH, versus 112.5 for males).

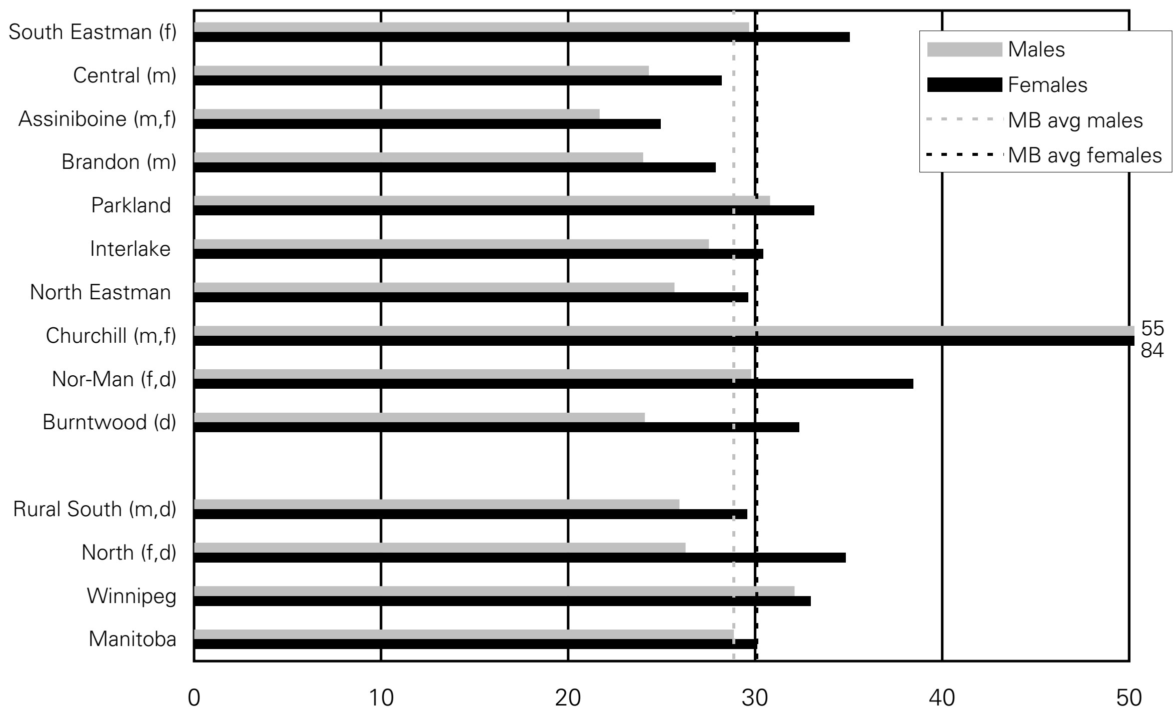
The distribution of levels of care on admission to PCH was very similar for males and females within each RHA, though rates varied across RHAs. These values reflect an increase in the 'acuity' of PCH admissions compared with previous reports: the proportion of level 3 or 4 admissions increased to 53.9%, compared with 50.1% in 1999/2000-2000/01.

9.1 Open Home Care Cases ('Prevalence')

This is the number of open cases of Home Care in the two-year period 2002/03–2003/04, per 1,000 area residents. A person may have more than one home care case in this period, and each would be counted as a separate case. Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 9.1.1: Open Home Care Cases by RHA, 2002/03 – 2003/04

Age-adjusted annual rate of open home care cases over period (prevalence) per 1,000 residents

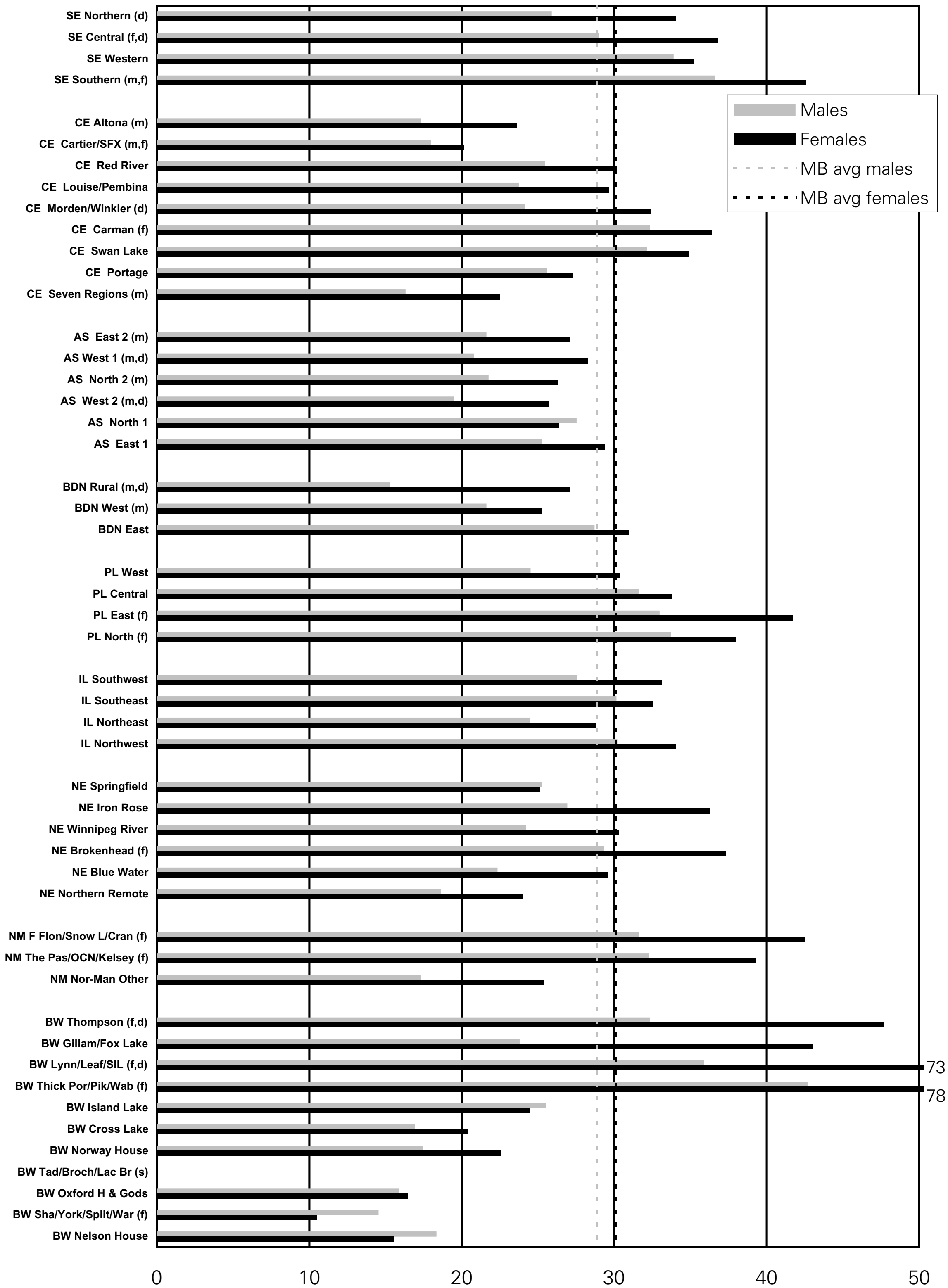


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 9.1.2: Open Home Care Cases by District, 2002/03 – 2003/04

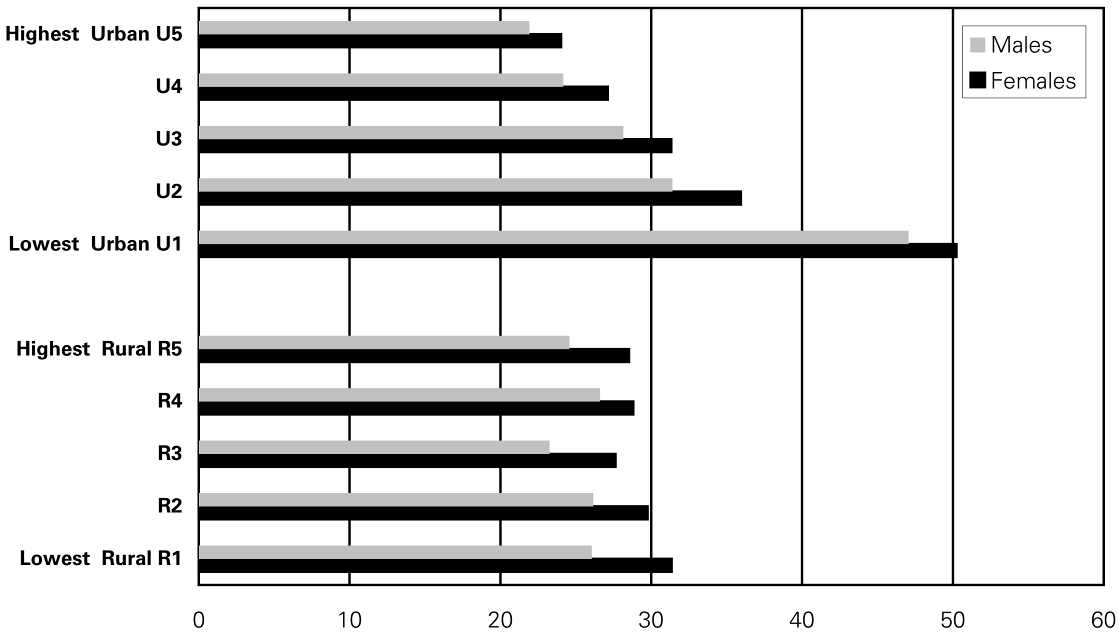
Age-adjusted annual rate of open home care cases over period (prevalence) per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Figure 9.1.3: Open Home Care Cases by Income Quintile, 2002/03 – 2003/04

Age-adjusted annual rate of open home care cases over period (prevalence) per 1,000 residents



Linear Trend Test Results

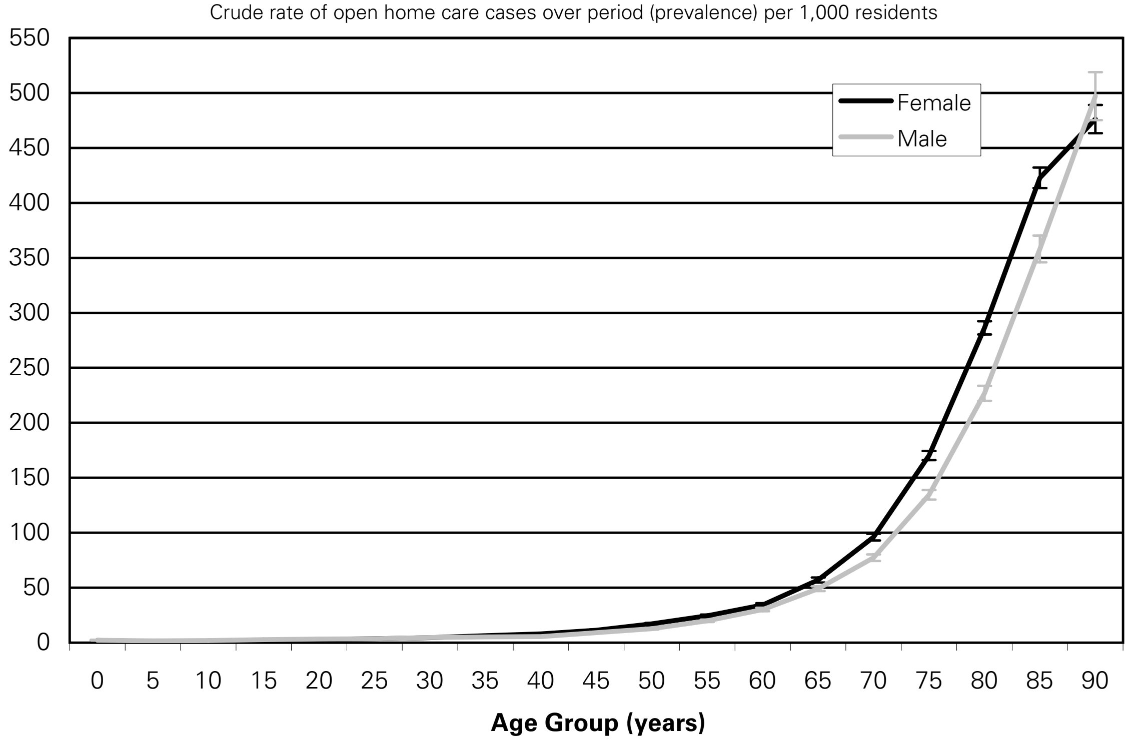
Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 9.1.4: Open Home Care Cases by Age and Sex, 2002/03 – 2003/04

Crude rate of open home care cases over period (prevalence) per 1,000 residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for rate of open Home Care cases:

Age-adjusted rates:

- Overall, males and females have similar rates of use of Home Care (28.9 and 30.1 cases per 1,000 residents, respectively).
- However, there are important differences by RHA: for almost all non-Winnipeg RHAs, rates are significantly higher for females than males; in Winnipeg, the rates are very similar, which strongly influences the Manitoba averages.
- In urban areas, there is a strong relationship between Home Care use and area-level income: males and females from lower income areas have higher rates of open cases. In rural areas, there is no relationship with area-level income.

Crude rates by age & sex:

- Home care use is very low until about age 70, after which time the rates are very high. For most age groups, male and female rates are similar, though females have slightly higher rates from about age 70 through 85.

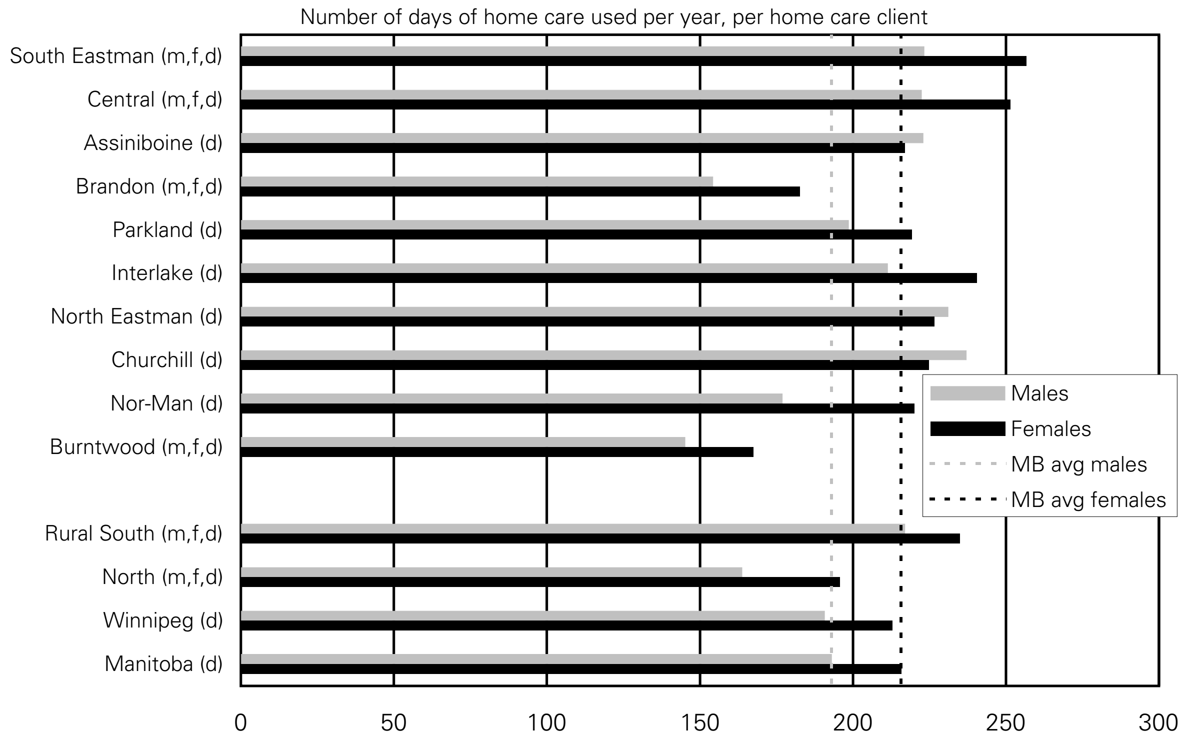
Comparisons to other findings:

- These values are consistent with those reported in the RHA Indicators Atlas (Martens et al., 2003): home care prevalence increased from about 21 cases per 1,000 residents in 1995 to about 26 in 2000. The rate of 25 reported here suggests the rate is stabilizing after significant increases near the end of the 1990s.

9.2 Home Care Days Used

Definition: This is the total number of days of Home Care service provided in the year, divided by the number of registered Home Care clients. It reflects the 'volume' or 'intensity' of Home Care service provision. (In previous MCHP reports, this was called 'Average length of home care cases.') Values are age-adjusted to reflect the total population of Manitoba (males and females combined).

Figure 9.2.1: Home Care Days Used by RHA, 2002/03 – 2003/04

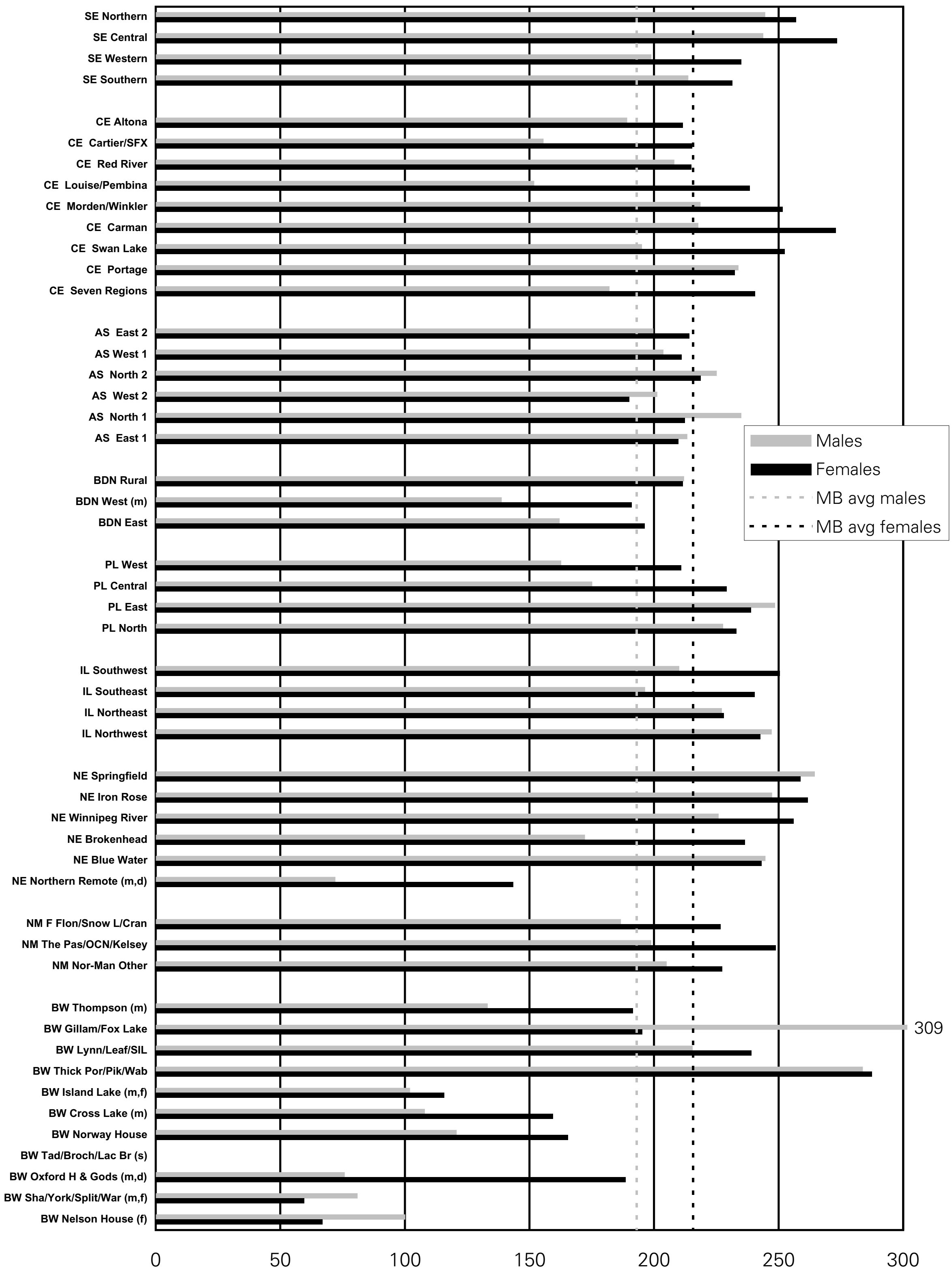


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

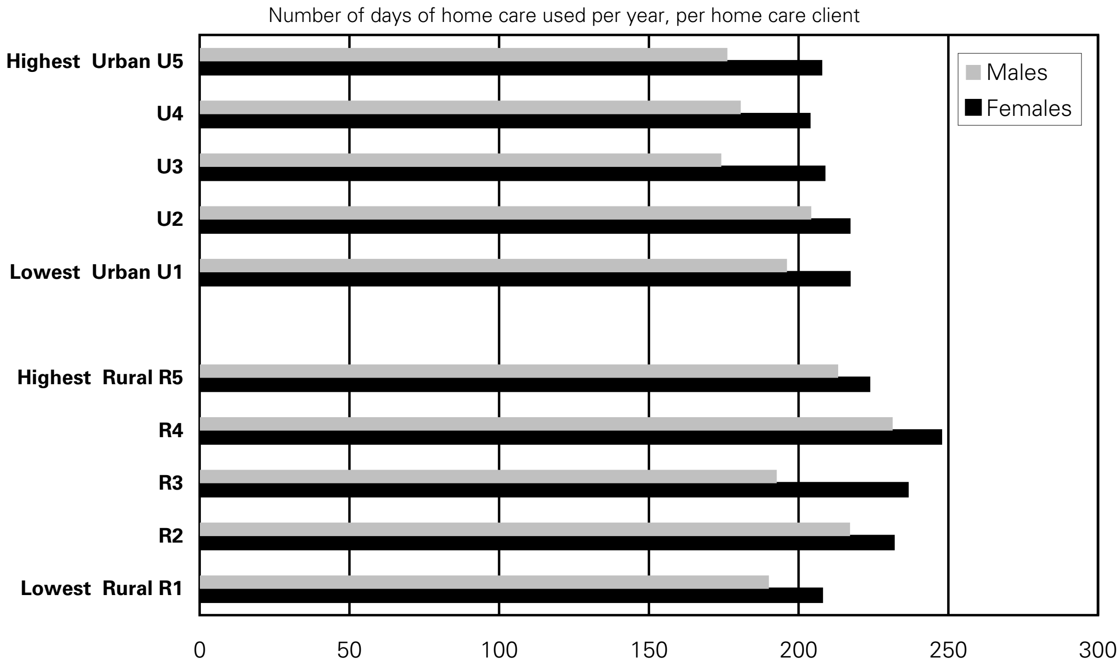
Figure 9.2.2: Home Care Days Used by District, 2002/03 – 2003/04

Number of days of home care used per year, per home care client



Source: Manitoba Centre for Health Policy, 2005

Figure 9.2.3: Home Care Days Used by Income Quintile, 2002/03 – 2003/04



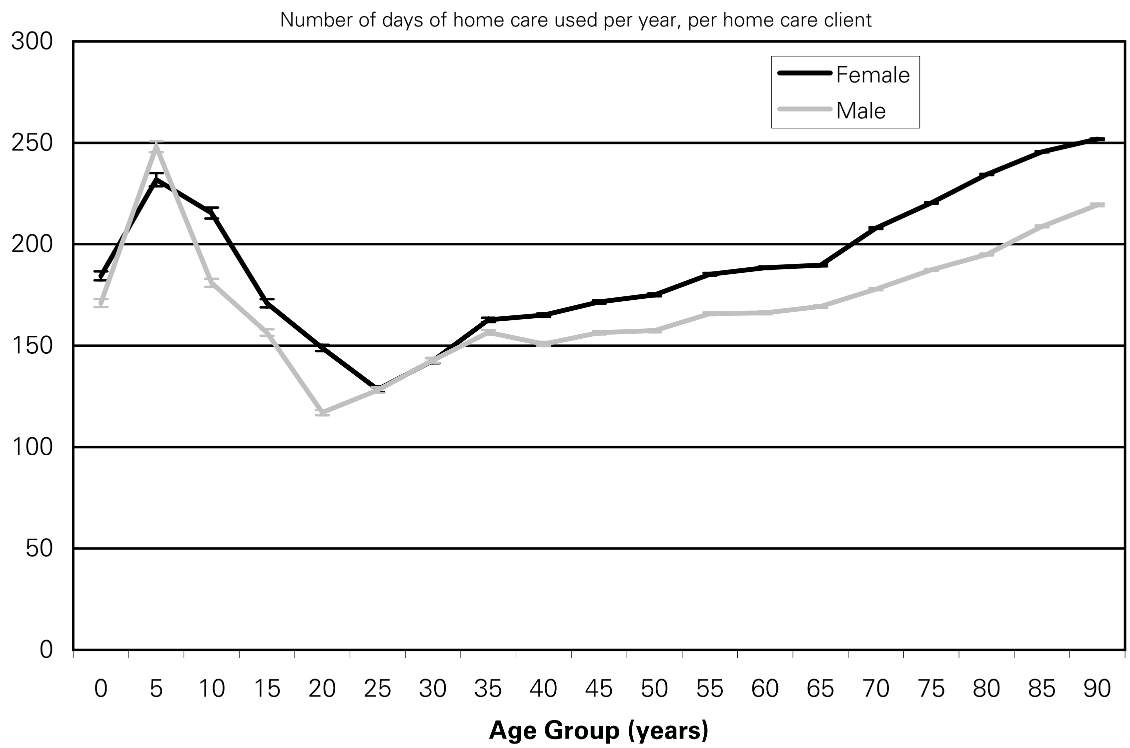
Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 9.2.4: Home Care Days Used by Age and Sex, 2002/03 – 2003/04



Source: Manitoba Centre for Health Policy, 2005

Key findings for Home Care days used:

Age-adjusted rates:

- Overall, the number of days of Home Care provided was higher for females than males (215.7 versus 193.0 days of Home Care in 2003/04, p<.001).
- Relationships with area-level income were reversed for rural and urban Home Care clients: among rural residents, those living in higher income areas received more days of Home Care, whereas for urban clients, those from lower income areas received more days.

Crude rates by age & sex:

- For both sexes, the number of Home Care days used is high among young age groups, drops for youth and young adults, then steadily increases among the oldest age groups. Values for females are higher than males for all age groups past 35 years.

Comparisons to other findings:

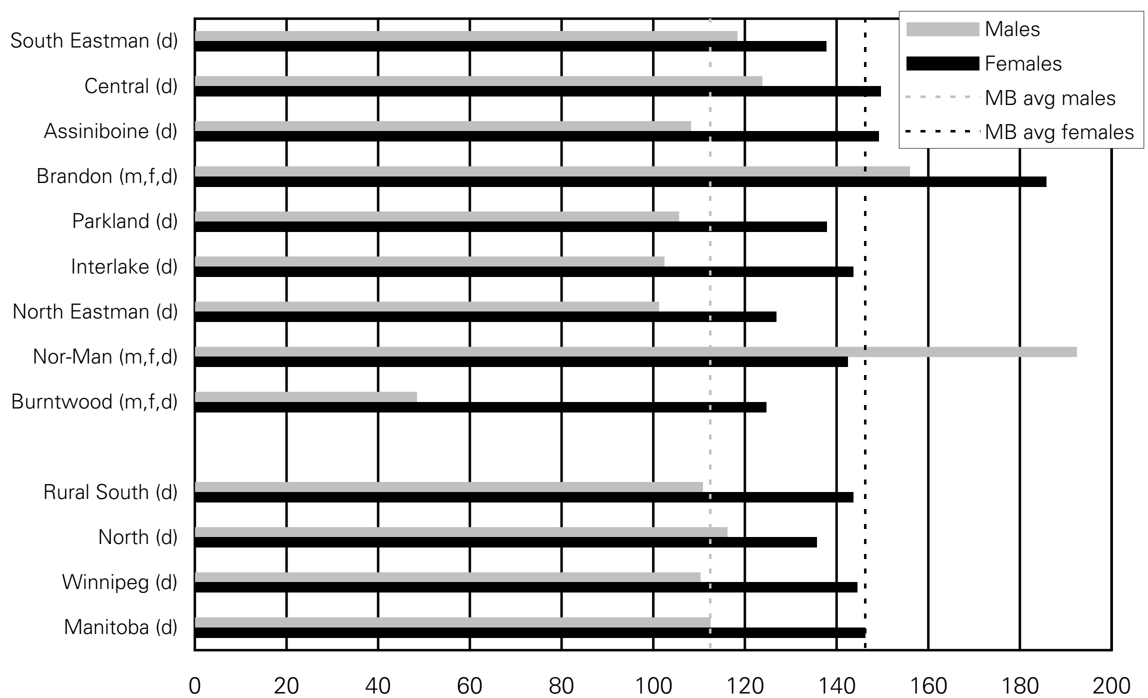
- MCHP has previously reported similar values, though the indicator was called 'Average length of home care cases.' Results from the RHA Indicators Atlas (Martens et al, 2003) showed values of 209 days for 1999/2000–2000/01, slightly lower than current rates.

9.3 Residents in Personal Care Homes ('Prevalence' of PCH Use)

Definition: This is the number of residents age 75+ who were in a provincial PCH for at least one day in 2003/04, per 1,000 area residents age 75+. Values are age-adjusted to reflect the 75+ population of Manitoba (males and females combined).

Figure 9.3.1: Residents in Personal Care Homes by RHA, 2003/04

Age-adjusted rate of residents living in a provincial PCH per 1,000 age 75+



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

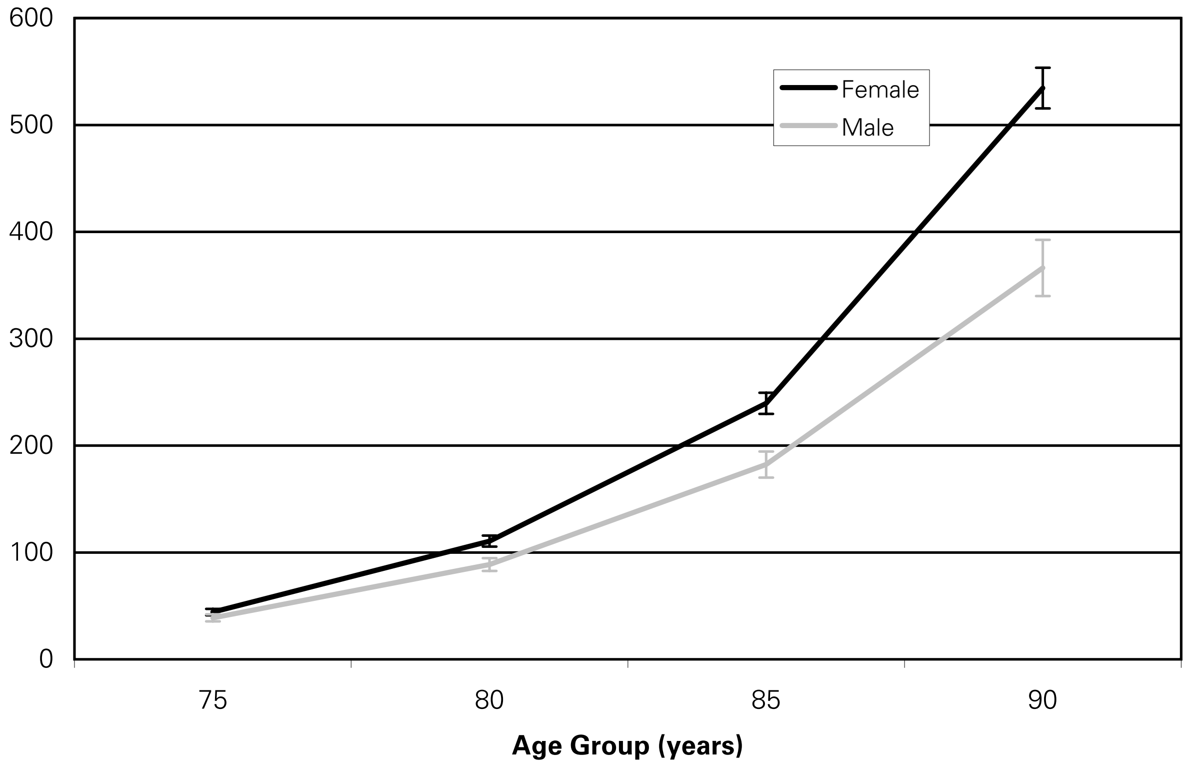
Notes regarding PCH results:

PCH results are not reported at the District level, as many Districts do not contain a PCH. There are federally-operated nursing homes in Manitoba, but individual-level data for their use is not available. The results shown include use of provincial PCH facilities only. Analyses of PCH residents could not be performed by area income because Statistics Canada data do not report average income values for institutionalized persons (including those in PCH).

Churchill RHA is excluded from PCH analyses as there is no PCH data available. The Churchill Health Centre includes a number of residents in a 'virtual' PCH within the hospital, but this is not a licensed PCH, so data are not entered into the PCH system.

Figure 9.3.2: Residents in Personal Care Homes by Age and Sex, 2003/04

Crude annual rate of residents living in a provincial PCH per 1,000 age 75+



Source: Manitoba Centre for Health Policy, 2005

Key findings for residents in personal care homes:

Age-adjusted rates:

- Overall, and for several RHAs, a higher number of females than males are resident in personal care homes (146.3 versus 112.5 per 1,000 residents age 75+).
- Analyses of PCH residents could not be performed by income quintile, as Statistics Canada data do not report area-level average income values for institutionalized persons (including those in PCHs).

Crude rates by age & sex:

- For both sexes, the rate of PCH residents is low for younger age groups (75 to 79), but increases rapidly with age. Rates for females are higher than those for males starting at age 80, and this sex difference is continually larger for older age groups.

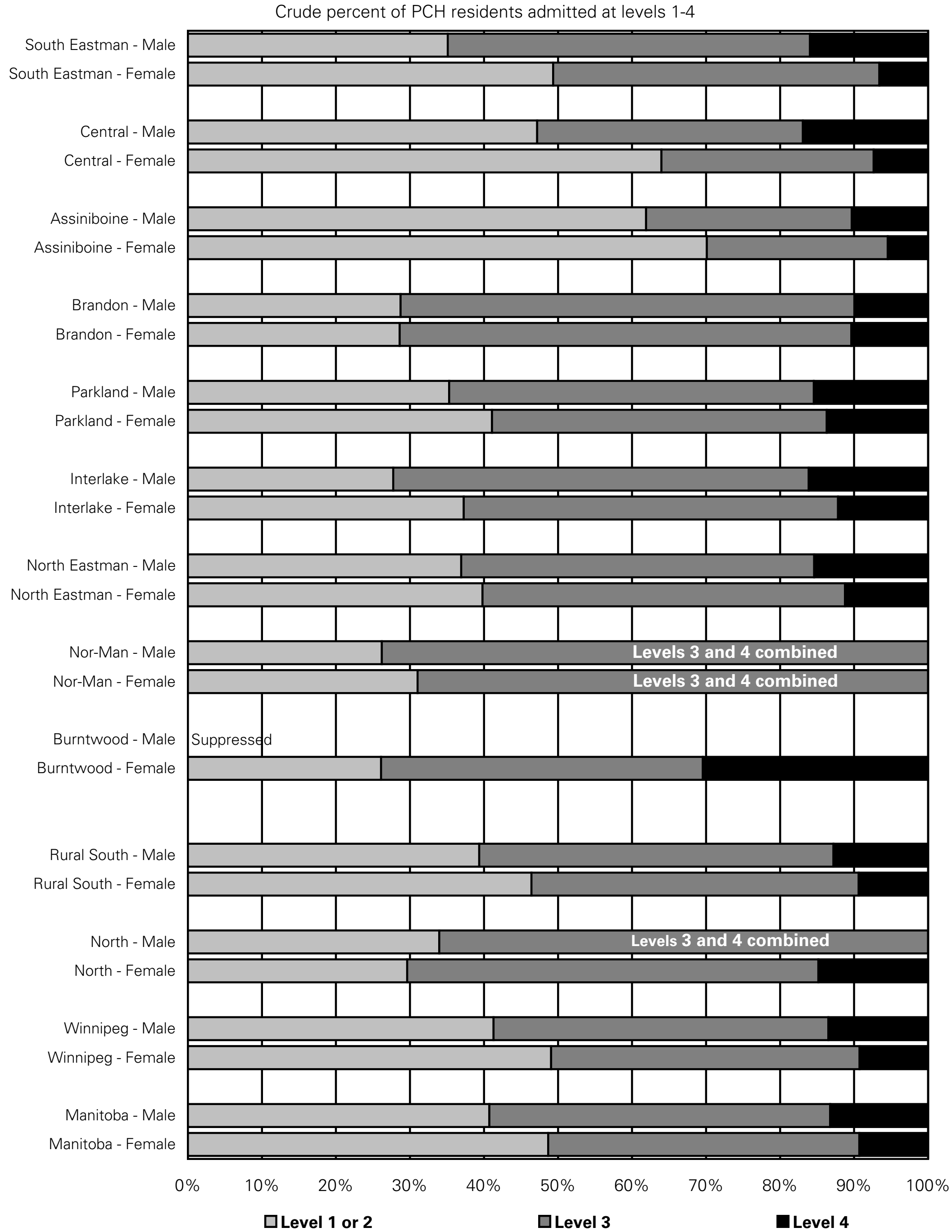
Comparisons to other findings:

- These values are consistent with those reported in the RHA Indicators Atlas (Martens et al., 2003): the rate decreased from 135 in 1995 to 130 by the year 2000. The male and female data in this report, if combined, would yield an average rate of approximately 135 per 1,000 residents age 75+.

9.4 Level of Care on Admission to Personal Care Home (PCH)

Definition: This is the distribution of new cases being admitted to provincial PCHs in 2001/02 - 2003/04, by level of care (1-4) at admission. Level 1 represents the lowest level of need, and Level 4 represents the highest. Levels 1 and 2 are combined throughout, and in some areas Levels 3 and 4 are combined to avoid suppression.

Figure 9.4.1: Level of Care on Admission to Personal Care Homes, by Sex and RHA, 2001/02 - 2003/04



Source: Manitoba Centre for Health Policy, 2005

Key findings for level of care on admission to PCH:

- The average level of care on admission was remarkably similar for males and females within each RHA, though there was variation across RHAs.
- For Manitoba overall, for both sexes, just over 46% of PCH admissions were Levels 1 or 2, over 43.4% were Level 3, and about 10.6% were Level 4.

Comparisons to other findings:

- These values represent a slightly higher distribution of level of care on admission than reported in the RHA Indicators Atlas (Martens et al., 2003). The distribution in 1999/2000–2000/01 was: 50% at Levels 1 or 2, and 50% at Levels 3 or 4. Results for 2001/02–2003/04 show 46% of admissions were at Levels 1 or 2, and 54% were at Levels 3 or 4.

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CHAPTER 10: CARDIAC CARE

This chapter contains indicators of common tests and treatments for heart disease and heart attacks. It is organized into two sections: the first section provides population-based rates of events and procedures, and the second section shows results for a cohort of residents experiencing a heart attack (or AMI—Acute Myocardial Infarction—also called Acute Coronary Syndrome).

The indicators are:

Section One: Population-Based Rates of Procedures:

10.1 Cardiac Catheterization Rates
10.2 Angioplasty Rates
10.3 Coronary Stent Insertion Rates
10.4 Coronary Artery Bypass Graft (CABG) Surgery Rates

Section Two: Heart Attack Cohort Analysis

10.5 Diagnoses Before Heart Attack
10.6 Age Distribution of Heart Attack Patients
10.7 Cardiac Catheterization Rates of Heart Attack Survivors
10.8 Mortality and Cardiac Procedure Rates Among Heart Attack Cohort Members

Key findings for Chapter 10: Cardiac Care

Section One: Population-based rates of procedures:

- Rates of all cardiac care procedures were higher for males than females (e.g. cardiac catheterizations: 9.9 per 1,000 males age 40 or older, versus 4.5 per 1,000 females), consistent with their higher rates of heart disease and heart attacks.
- Relationships with area-level income were mixed: among urban residents, most procedures were more frequently performed on residents of lower income areas, consistent with their higher burden of illness. However, in rural areas, the trends appeared to be reversed, though they did not reach statistical significance.
- Some of the highest rates were reported for residents of Nor-Man and Burntwood Regional Health Authorities (RHA), consistent with their higher burden of illness.
- The only RHAs showing lower than average rates of procedures were Brandon and Assiniboine. This may reflect their lower treatment prevalence rates of ischemic heart disease. However, heart attack rates were higher than average among Brandon residents, and marginally high for Assiniboine residents, so those RHAs might consider examining treatment and referral patterns more closely.

Section Two: Heart Attack Cohort Analysis:

- Among residents suffering heart attacks, males initially appeared to be treated more aggressively than females, but this difference was completely explained by the younger age of male versus female AMI patients. Once age was accounted for, rates for males and females were similar.
- 'Sudden death' rates from AMI were near equal for males and females, and Winnipeg and non-Winnipeg residents alike (27.7% overall).
- While there were no sex differences in age-adjusted treatment rates after AMI, there was a large difference based on geography. Residents of Winnipeg had higher levels of all cardiac care procedures, though the differences decreased over time, and stent insertion and bypass surgery rates were no longer different by one year after AMI. For example, cardiac catheterization rates at the time of AMI hospitalization were 39% for Winnipeg residents, versus 24% for rural residents; by one year after the AMI, the rates were 50% and 41%—closer, but still statistically lower for non-Winnipeg residents.

Introduction:

Some of the same indicators are shown in both sections, but in different ways. This is done for several reasons. Most importantly, while many of the procedures are frequently performed after heart attacks, they are more often performed for investigative or preventive purposes among residents with ischemic heart disease, but who have not yet experienced a heart attack. Therefore, the population-based rates are informative about the use of these procedures among all residents, whether they experienced an acute event or not. Also, the number of residents in the AMI cohort analysis in Section Two is not large enough to allow analyses by district or even by RHA, so those results are shown by larger aggregate areas only (Winnipeg versus non-Winnipeg).

Many of the sex differences revealed in the indicators in Section One are due to the large difference in the age distribution of male versus female heart disease patients—as explained more fully in Section Two. This partially explains why the age-adjusted rates of heart disease and heart attacks, shown in Chapter 3, are so much higher for males than females. That is, the male age-adjusted rates are higher partly because they happen to males at younger ages than females.

Cardiac catheterization is a sort of 'gateway' procedure for the other cardiac care procedures. Catheterization is required for angioplasty and stent insertion, and these are often done at the time of the catheterization, so the patterns in catheterization rates are mirrored in those services. Catheterization is also routinely performed before bypass surgery, to determine which vessels are severely blocked and require bypass.

Everything in this chapter is done on residents age 40+ only, as the procedures are rare among younger residents, making them difficult to estimate accurately with statistical models.

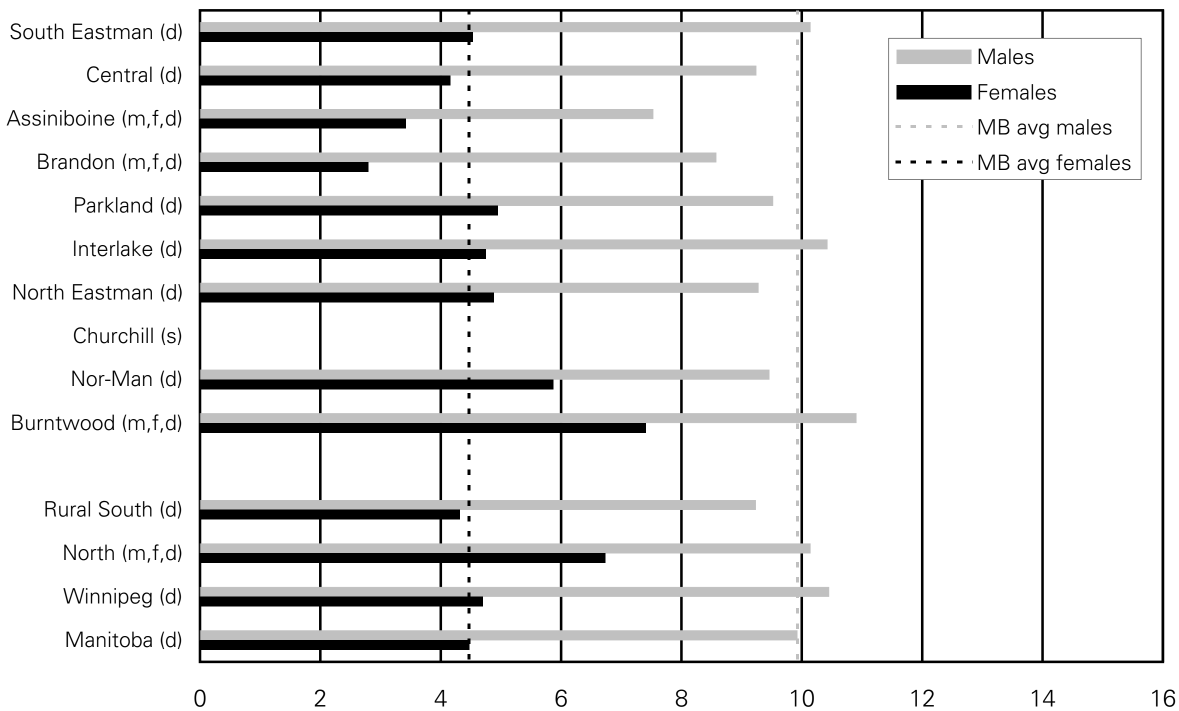
Section One: Population-Based Rates

10.1 Cardiac Catheterization Rates (Population-Based)

Definition: This is the rate of cardiac catheterizations (ICD-9-CM procedure codes 37.21 to 37.23, and 88.52 to 88.57 in hospital abstracts) per 1,000 residents age 40+, over a three-year period (2001/02–2003/04). Cardiac catheterization (or 'angiography') is a diagnostic procedure to identify the extent and location of blockages in coronary arteries. A person could be catheterized more than once in this time frame, and each would be counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 10.1.1: Cardiac Catheterization Rates by RHA, 2001/02 – 2003/04

Age-adjusted annual cardiac catheterization rates per 1,000 residents age 40+

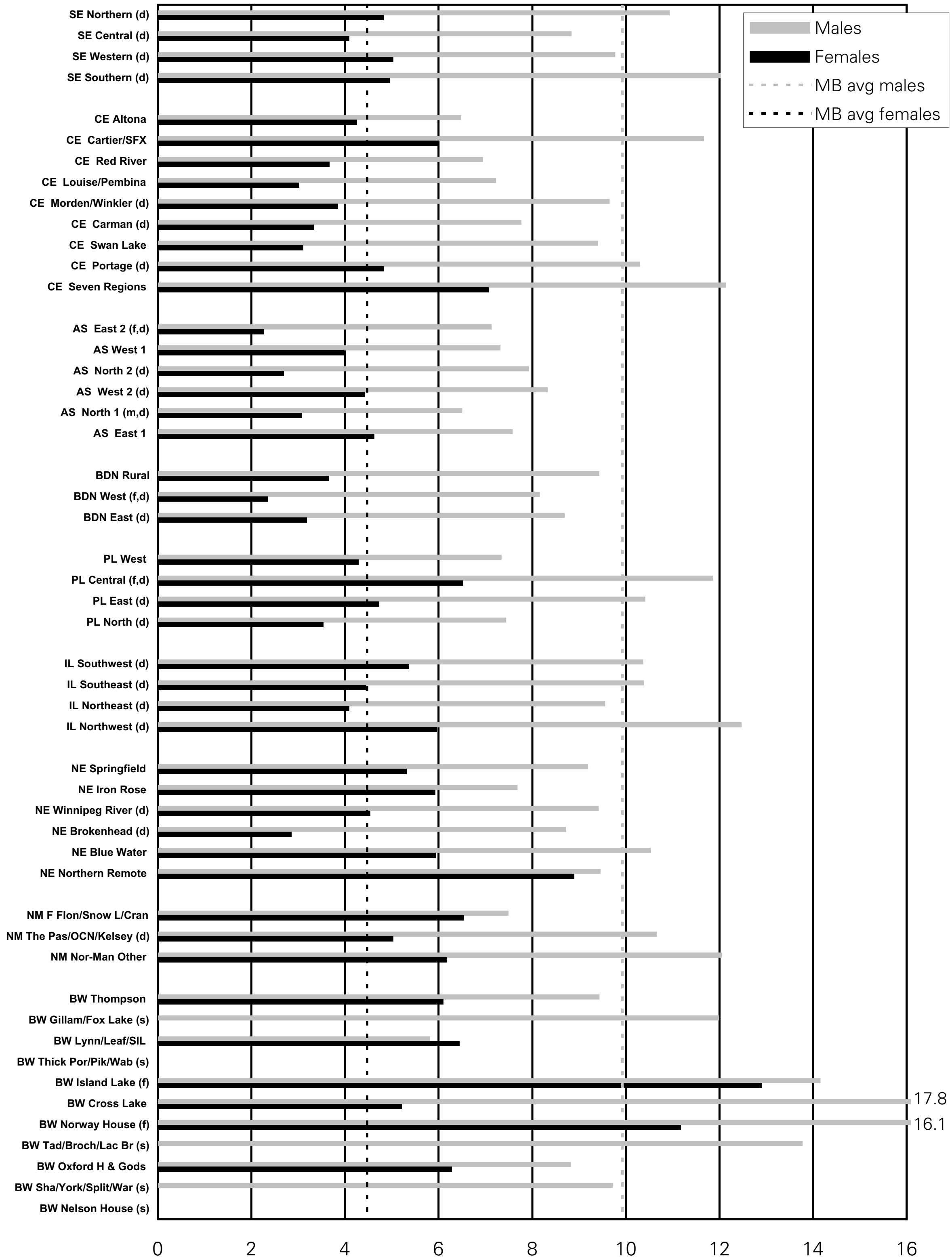


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 10.1.2: Cardiac Catheterization Rates by District, 2001/02 – 2003/04

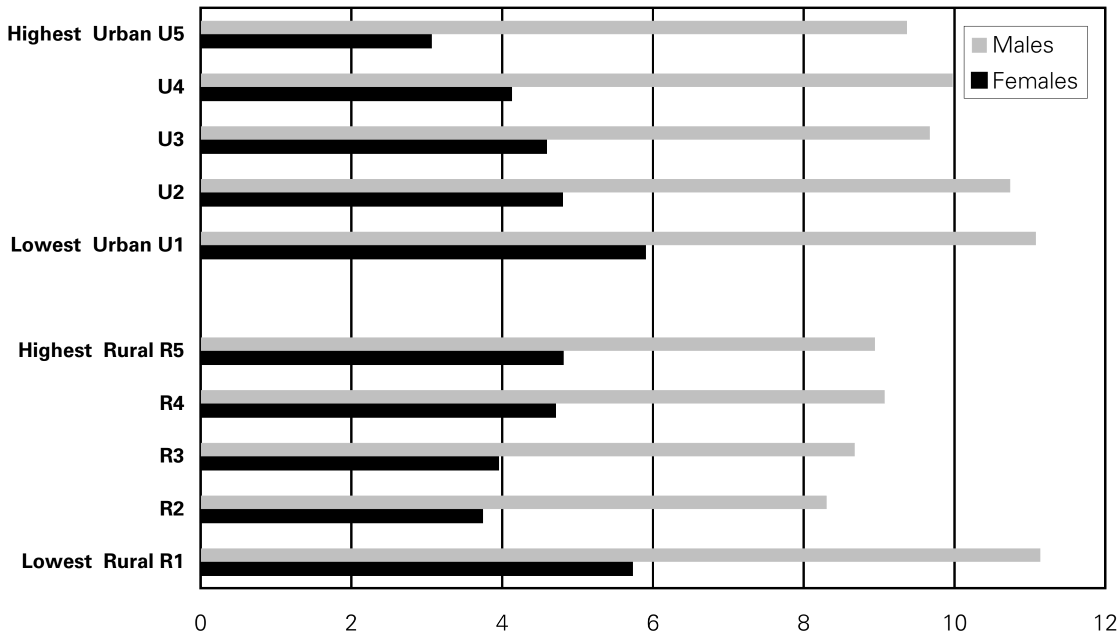
Age-adjusted annual cardiac catheterization rates per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 10.1.3: Cardiac Catheterization Rates by Income Quintile, 2001/02 – 2003/04

Age-adjusted annual cardiac catheterization rates per 1,000 residents age 40+



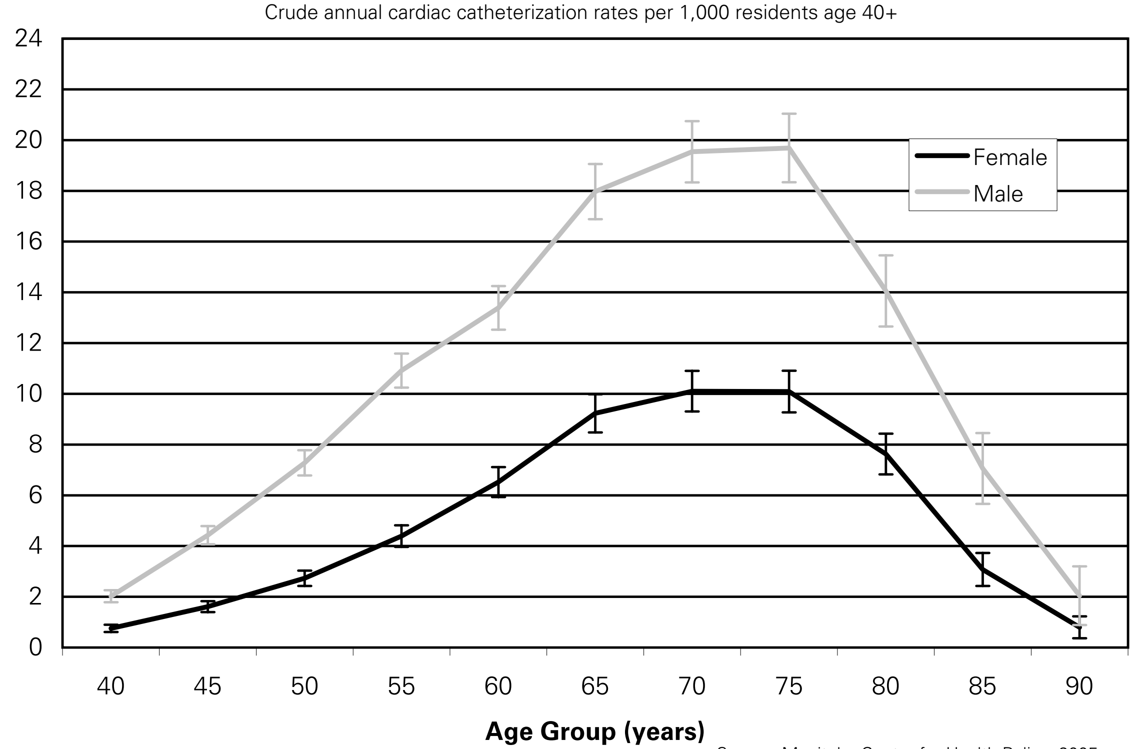
Linear Trend Test Results

Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Not Significant

Figure 10.1.4: Cardiac Catheterization Rates by Age and Sex, 2001/02 – 2003/04

Crude annual cardiac catheterization rates per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for cardiac catheterization rates:

Age-adjusted rates:

- Overall, and for every RHA, the cardiac catheterization rate is much higher among males than females (9.9 versus 4.5 per 1,000 residents 40+, $p<.001$). See also Section Two of this chapter for a more complete examination of sex differences.
- Among urban residents, there is a strong relationship between cardiac catheterization rates and area-level income: rates for both males and females are higher among residents of lower income areas. Among rural residents, the pattern appears to be almost the opposite (i.e. higher rates among higher income areas), except for the high values for the lowest income group, but the trend is not statistically significant.

Crude rates by age & sex:

- For both sexes, cardiac catheterization rates are low among youngest age groups, then rise steadily to their highest levels among 70- to 75-year olds, and drop again among the oldest age groups. For almost all age groups, rates are higher for males than females (see also Section two of this Chapter).

Comparisons to other findings:

- These rates are higher than those in the RHA Indicators Atlas report (Martens et al., 2003) but the 40+ age cut-off used in this report makes the rates difficult to compare directly. For validation, the actual number of procedures was compared: 2,851 per year in 1993/94–1995/96, 3,416 in 1998/99–2000/01, and 4,618 in 2001/02–2003/04 (removing the age restriction from the current analysis), showing a substantial increase in the number of cardiac catheterizations done over time.
- These rates are also higher than the national average of 4.7 per 1,000 reported by the Canadian Cardiovascular Outcomes Research Team (Faris et al., 2004), but their study included residents age 20+ (versus 40+ here), causing the rate to be lower.
- Graham et al., 2005 reported rates for Alberta residents from 1995 to 2002. The age-adjusted average rates by region varied from 4.1 to 6.4 per 1,000 residents age 20+ for males, and 1.7 to 3.1 for females. These values are slightly lower than those reported here, consistent with the higher age cut-off (40+) used in this report.

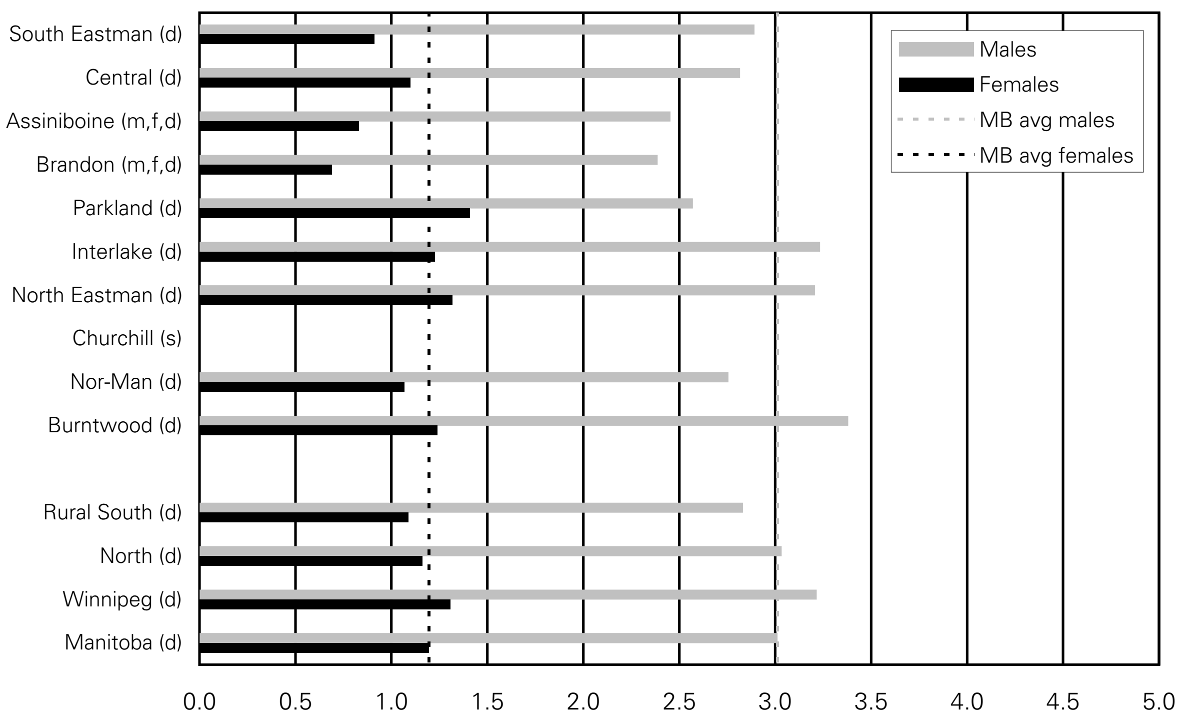
10.2 Angioplasty Rates (Population-Based)

Definition: This is the rate of angioplasty procedures (or PTCA—Percutaneous Transluminal Coronary Angioplasty, ICD-9-CM procedure codes 36.01, 36.02 or 36.05 in hospital abstracts) per 1,000 residents age 40+, over the five-year period 1999/00–2003/04.

Angioplasty is a procedure that uses a balloon-tipped catheter to enlarge a narrowing in a coronary artery. A person could have more than one angioplasty in this time frame, and each would be counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 10.2.1: Angioplasty Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual angioplasty rates per 1,000 residents age 40+

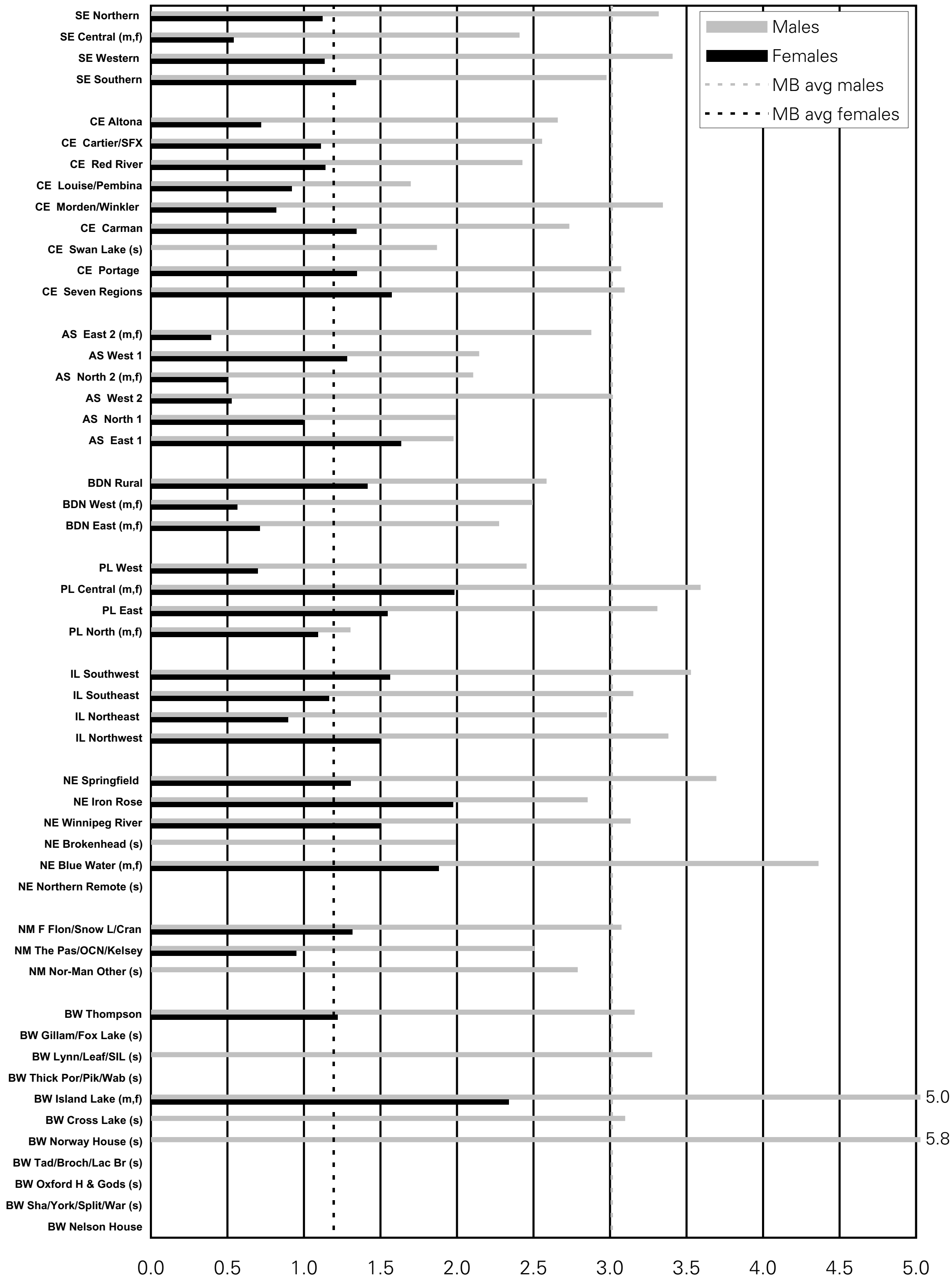


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 10.2.2: Angioplasty Rates by District, 1999/2000 – 2003/04

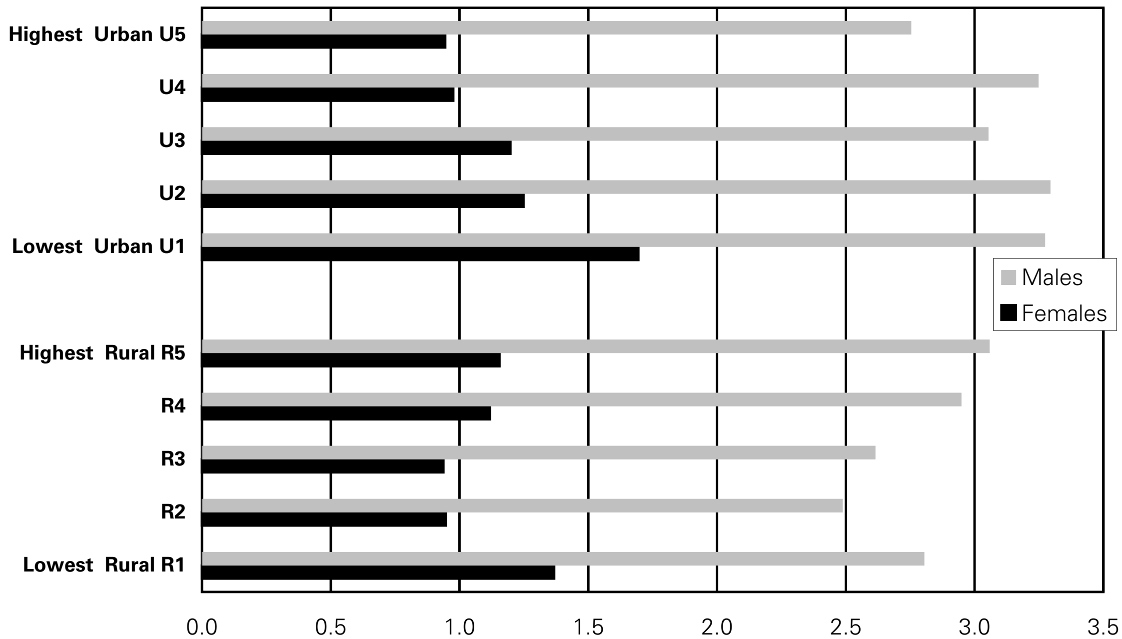
Age-adjusted annual angioplasty rates per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 10.2.3: Angioplasty Procedures by Income Quintile, 1999/2000 – 2003/04

Age-adjusted annual angioplasty rates per 1,000 residents age 40+



Linear Trend Test Results

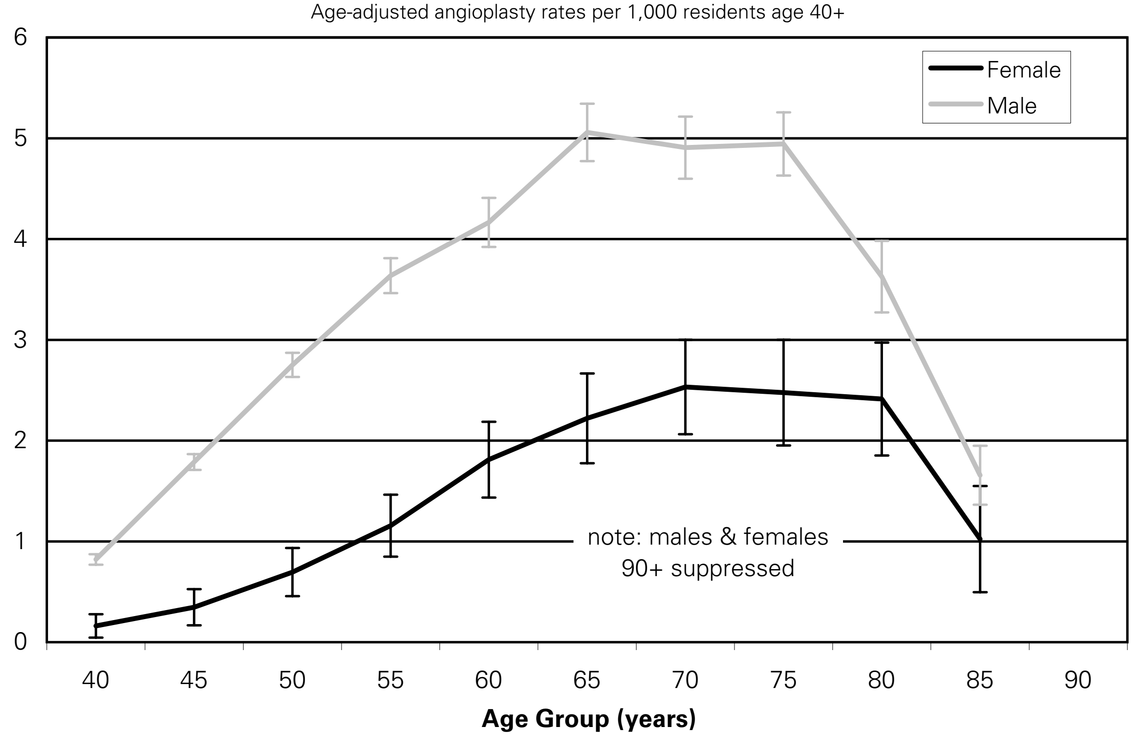
Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 10.2.4: Angioplasty Procedure Rates by Age and Sex, 1999/2000 – 2003/04

Age-adjusted angioplasty rates per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for angioplasty rates:

Age-adjusted rates:

- Overall, and for almost every RHA and District, the angioplasty rate is higher among males than females (3.0 versus 1.2 per 1,000 residents 40+, p<.001). See also Section Two of this chapter.
- Among urban residents, there is a strong relationship between angioplasty rates and area-level income: rates for both males and females are higher among residents of lower income areas. Among rural residents, the pattern appears to be in the opposite direction (that is, higher rates among residents of higher income areas), except for the high values for the lowest income group, so the trend is not statistically significant.

Crude rates by age & sex:

- Angioplasty rates are low among youngest age groups, rise quickly among middle-aged adults, remain steady into the senior years, and drop again among the oldest age groups. For almost all age groups, angioplasty rates are higher for males than females (see also Section Two of this chapter).

Comparisons to other findings:

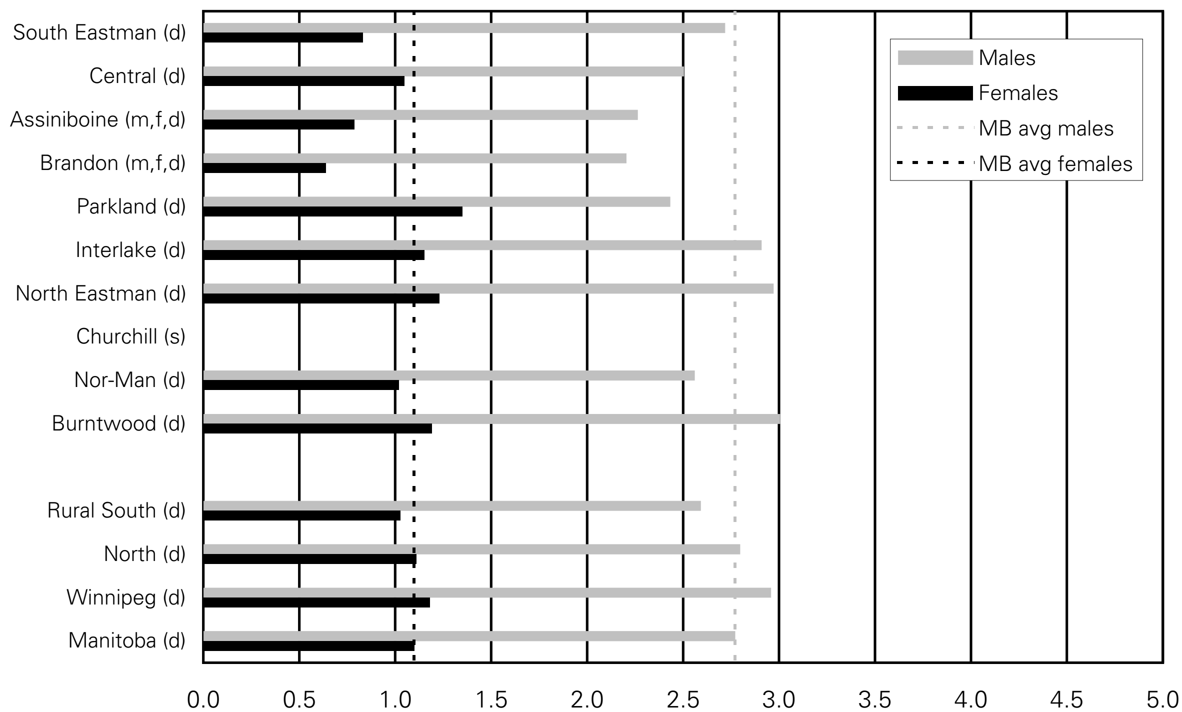
- These rates are higher than those reported in the RHA Indicators Atlas (Martens et al., 2003) because procedure rates are increasing, and because of the 40+ age cut-off used in this report. For validation, the actual number of procedures was compared: 520 per year in 1991/92–1995/96, 754 in 1996/97–2000/01, and 1,341 in 1999/00–2003/04 (removing the age restriction from the current analysis), showing a large increase in the number of angioplasties done over time.
- These rates are also higher than the national average of 1.2 per 1,000 percutaneous coronary interventions (including angioplasties and stent insertions) reported by the Canadian Cardiovascular Outcomes Research Team (Faris et al., 2004), but their study included residents age 20+ (versus 40+ here), causing their rate to be lower.

10.3 Coronary Stent Insertion Rates (Population-Based)

Definition: This is the rate of coronary stent insertions (ICD-9-CM procedure code 36.06 in hospital abstracts) per 1,000 residents age 40+, over the five-year period 1999/00–2003/04. A stent is a small, lattice-shaped, metal tube that is inserted permanently into an artery. The stent helps hold open an artery so that blood can flow through it. A person could have more than one stent insertion in this time frame, and each would be counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 10.3.1: Stent Insertion Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual rate per 1,000 residents age 40+

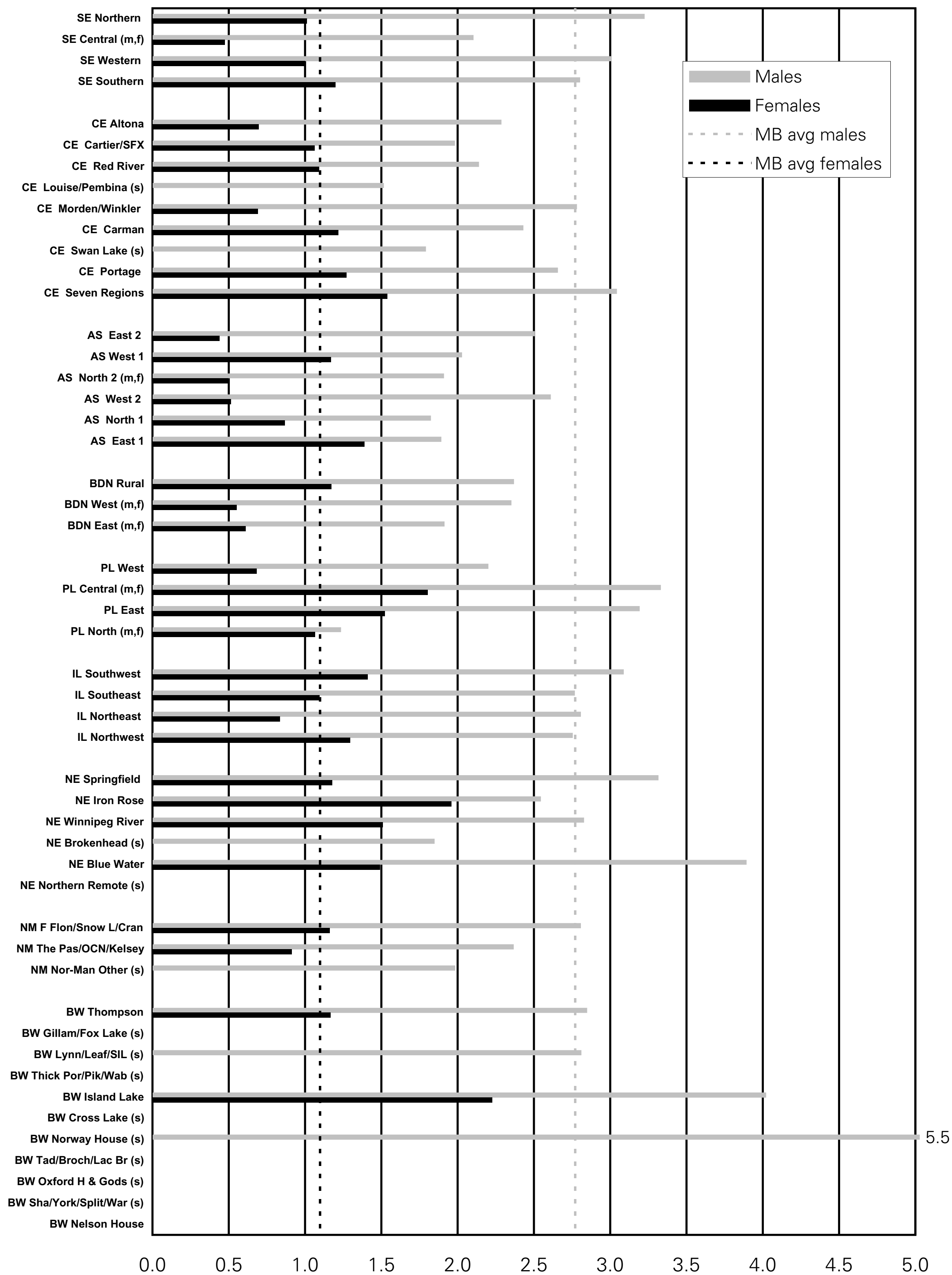


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 10.3.2: Stent Insertion Rates by District, 1999/2000 – 2003/04

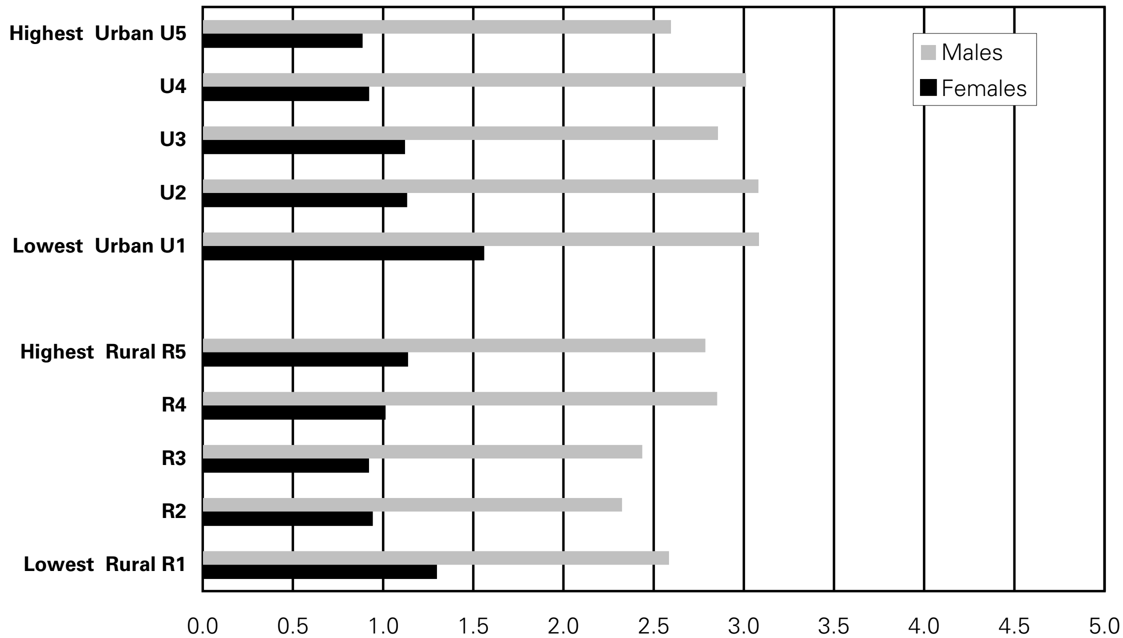
Age-adjusted annual rate per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Figure 10.3.3: Stent Insertion Rates by Income Quintile, 1999/00 – 2003/04

Age-adjusted annual rate per 1,000 residents age 40+



Linear Trend Test Results

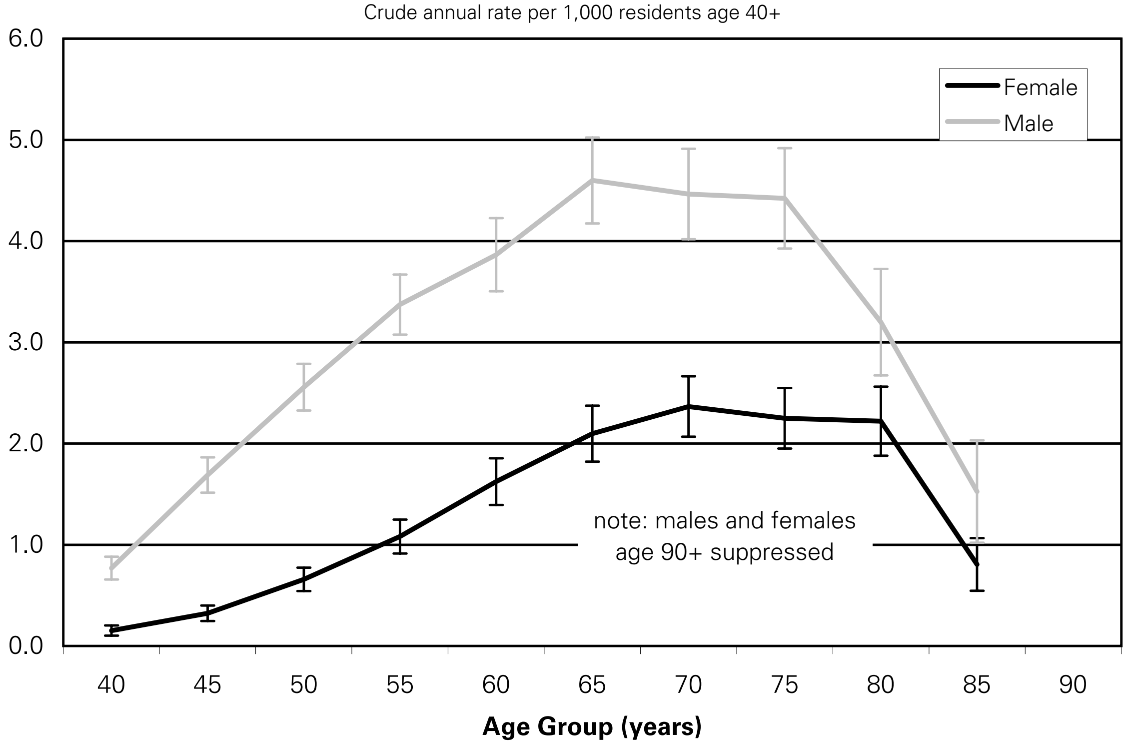
Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Significant (p<.001) Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 10.3.4: Stent Insertion Rates by Age and Sex, 1999/00 – 2003/04

Crude annual rate per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for coronary stent insertion rates:

Age-adjusted rates:

- Overall, and for almost every RHA and District, the coronary stent insertion rate is much higher among males than females (2.8 versus 1.1 per 1,000 residents 40+, p<.001). See also Section Two of this chapter.
- Among urban residents, there is a strong relationship between coronary stent insertion rates and area-level income: rates for both males and females are higher among residents of lower income areas. Among rural residents, the pattern appears to be in the opposite direction (that is, higher rates among residents of higher income areas), except for the high values for the lowest income group, so the trend is not statistically significant.

Crude rates by age & sex:

- Coronary stent insertion rates are low among the youngest age groups but rise quickly among middle aged adults, remain steady into the senior years, and finally drop among the oldest age groups. For all age groups, stent insertion rates are substantially higher for males than females (see also Section Two of this chapter).

Comparisons to other findings:

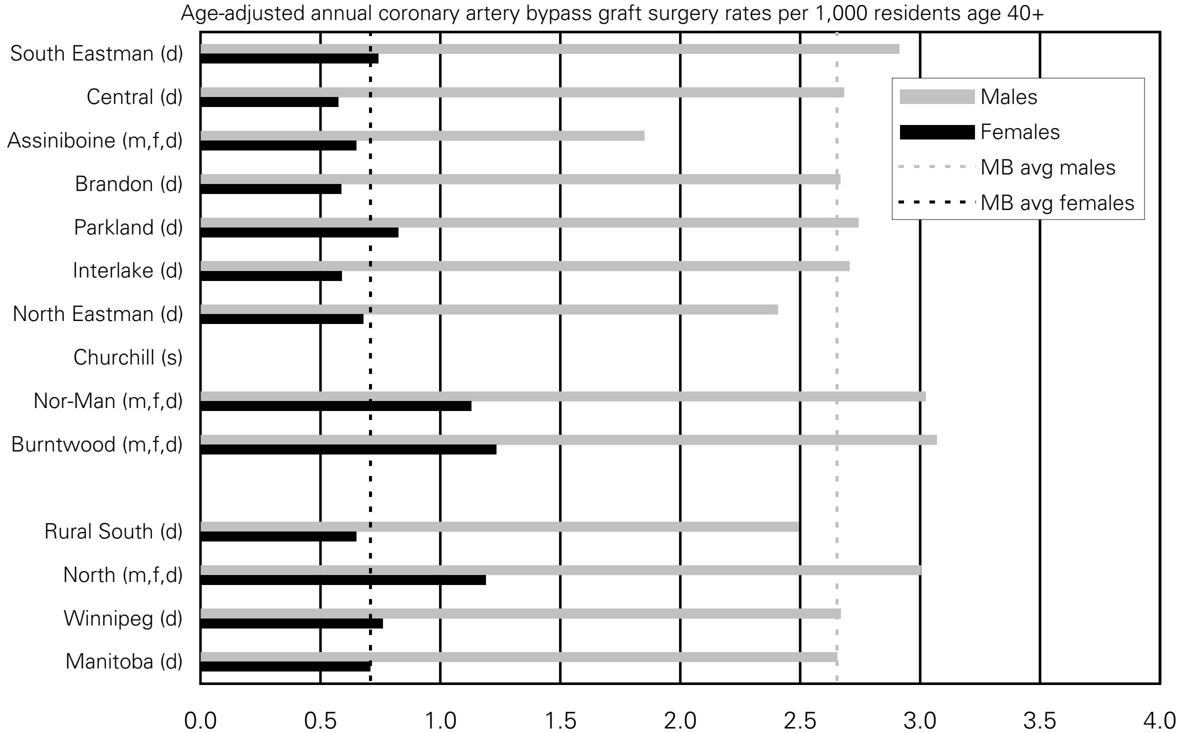
- These rates are higher than the national average of 1.2 per 1,000 percutaneous coronary interventions (including angioplasties and stent insertions) reported by the Canadian Cardiovascular Outcomes Research Team (Faris et al., 2004), but their study included residents age 20+ (versus 40+ here), causing their rate to be lower.

10.4 Coronary Artery Bypass Graft (CABG) Surgery Rates

Definition: This is the rate of CABG surgeries (ICD-9-CM procedure code 36.10-36.14, or 36.19 in hospital abstracts) per 1,000 residents age 40+, over the five-year period 1999/00–2003/04. Bypass surgery provides new routes for blood to flow to the heart, bypassing blocked arteries. A person could have more than one surgery in this time frame, and each would be counted as a separate event. Values are age-adjusted to reflect the 40+ population of Manitoba (males and females combined).

Figure 10.4.1: Coronary Artery Bypass Surgery Rates by RHA, 1999/2000 – 2003/04

Age-adjusted annual coronary artery bypass graft surgery rates per 1,000 residents age 40+

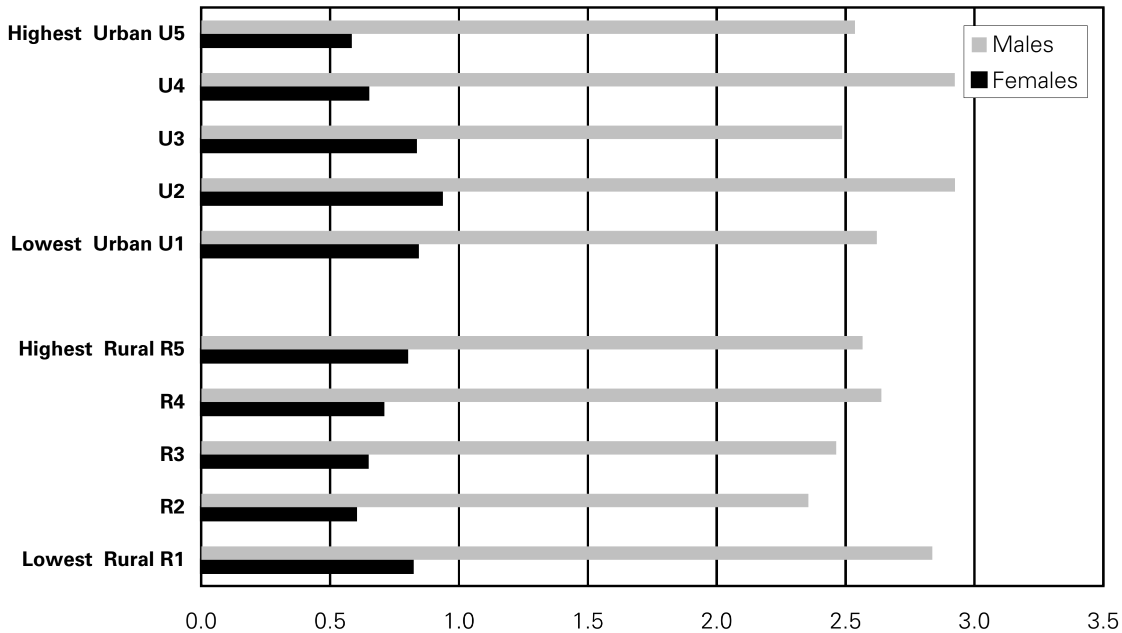


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 10.4.2: Coronary Artery Bypass Surgery Rates by Income Quintile 1999/2000 – 2003/04

Age-adjusted annual coronary arterty bypass graft surgery rates per 1,000 residents age 40+



Linear Trend Test Results

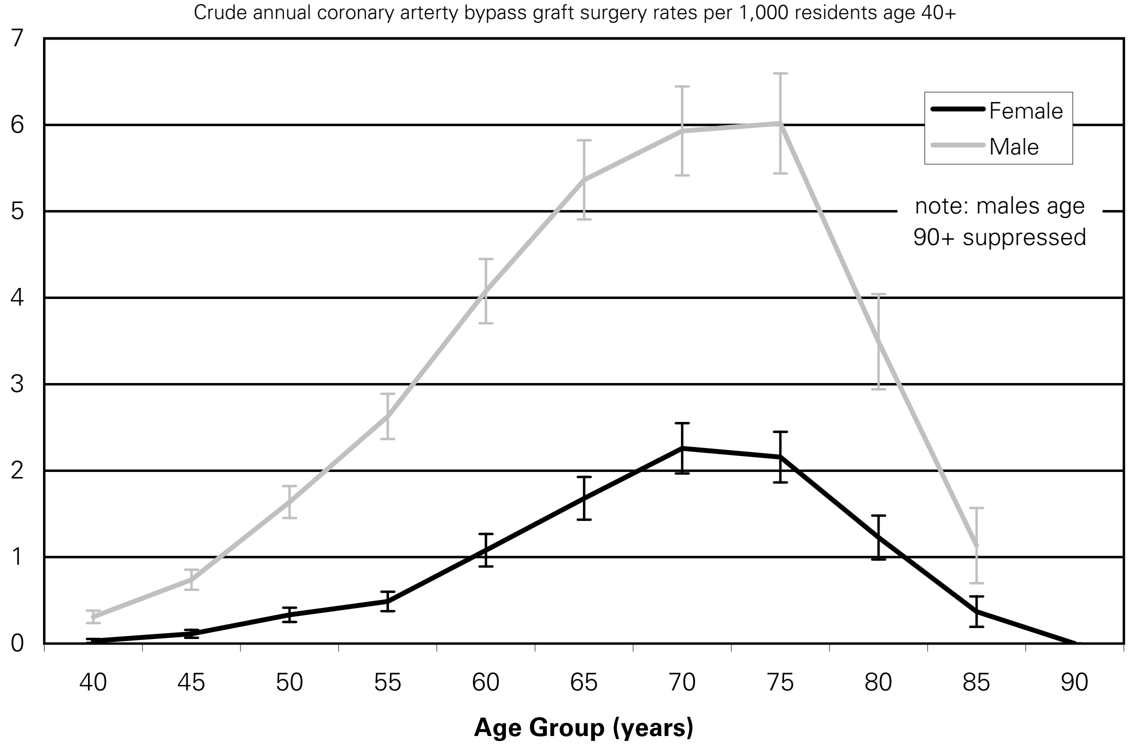
Female: Urban: Significant (p<.001) Rural: Not Significant

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 10.4.3: Coronary Artery Bypass Surgery Rates by Age and Sex, 1999/2000 – 2003/04

Crude annual coronary arterty bypass graft surgery rates per 1,000 residents age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for coronary artery bypass graft surgery rates:

Age-adjusted rates:

- Overall, and for almost every RHA, the bypass surgery rate is much higher among males than females (2.6 versus 0.7 per 1,000 residents age 40+, p<.001). See also Section Two of this chapter.
- Bypass surgery rates vary considerably across RHAs, with the highest rates among residents of the RHAs with the poorest overall health status (Nor-Man and Burntwood).
- Overall, there is not a strong relationship between bypass surgery rates and area-level income, except among urban females, with those from lower income areas having higher surgery rates.

Crude rates by age & sex:

- Bypass surgery rates are low among the youngest age groups but rise quickly among middle-aged adults and into the senior years, and finally drop among the oldest age groups. For all age groups, bypass surgery rates are substantially higher for males than females (see also Section Two of this chapter).

Comparisons to other findings:

- These rates are higher than those reported in the RHA Indicators Atlas (Martens et al., 2003) because procedure rates are increasing, and because of the 40+ age cut-off used in this report. For validation, the actual number of procedures was checked and found to be: 560 per year in 1991/92–1995/96, 827 per year in 1996/97–2000/01, and 828 per year in 1999/00–2003/04 (removing the age restriction from the current analysis), showing an increase, then levelling in the number of bypass surgeries done over time.
- These rates are also higher than the national average of 0.94 per 1,000 reported by the Canadian Cardiovascular Outcomes Research Team (Faris et al., 2004), but their study included residents age 20+ (versus 40+ here), causing the rate to be lower.

Section Two: Heart Attack Cohort Analysis

Introduction:

This section is meant to provide a slightly different view of the cardiac care procedures shown via population-based rates in Section One. In this section, cardiac catheterization is given a more thorough analysis than PTCA, stent insertion, and bypass surgery, as it is the 'gateway' procedure for those procedures – that is, catheterization is required for the others to be performed (simultaneously in some cases, later in other cases).

In the research literature, there are many reports about sex differences in heart disease, treatment rates, and outcomes—often using the phrase 'sex bias', because most studies find that treatment rates are higher for males than females. This cohort analysis was designed to examine trends for males and females in Manitoba experiencing a heart attack (or AMI).

Two key unresolved issues in the literature are:

1) Many AMIs among women are not recognized as such, meaning these women are not treated or followed up as AMI patients should be. This is thought to be due, at least in part, to differences in signs, symptoms, and presentation of female AMI patients, and is thought to result in females more often being diagnosed with psychological issues, rather than 'heart physiology' problems (McSweeney et al., 2003; Jacobs and Eckel, 2005; Tecce et al., 2003).
2) Even among recognized AMI patients, males receive more aggressive medical and surgical treatment than females (Duval, 2003; Tu et al., 1999).

The administrative data used in this report cannot provide a direct answer to the first issue, because AMI patients can only be identified in our data after diagnosis by the health system (that is, the data only 'see' AMIs when they are recognized and coded). However, the data can provide indirect evidence, by examining the diagnoses attributed to recognized AMI patients in the time leading up to the AMI.

The second issue is directly addressed in sections 10.6 through 10.8.

Description of the Acute Myocardial Infarction (AMI) cohort

In this section, all Manitoba residents diagnosed with an Acute Myocardial Infarction (ICD-9-CM code 410) during the three-year period 1999/2000–2001/02 were entered into the 'AMI cohort' for analysis for follow-up. This included those who died from their AMI (using Vital Statistics data), or were hospitalized for three or more days for AMI (using the validated criterion that residents hospitalized for AMI but discharged in less than three days were probably 'rule out' AMIs—see Tu et al 1999). Patients were also excluded if they were hospitalized for AMI in the two years preceding the current AMI, in an attempt to exclude patients experiencing multiple AMIs in a short period.

For this analysis, the smallest areas that could be validly analyzed were Winnipeg and non-Winnipeg totals. There were too few events to calculate age-adjusted rates for districts, RHAs and even the 'North' aggregate area. Rates for Brandon residents were very similar to residents in other rural areas, so they were combined for this analysis.

The indicators are:

10.5 Diagnoses Before Heart Attack
10.6 Age Distribution of Heart Attack Cohort
10.7 Cardiac Catheterization Rates of Heart Attack Survivors
10.8 Mortality and Cardiac Procedure Rates Among Heart Attack Cohort Members

10.5 Diagnoses Before Heart Attack

Definition: This analysis tracks all members of the AMI cohort in the year before their AMI, to see what diagnoses were attributed to them by physicians during ambulatory visits. Note: this includes all ambulatory visits to cohort members, not just 'heart-related' visits, so would be expected to show a range of diagnoses. Table 10.5.1 shows the top 10 diagnoses for each sex.

Table 10.5.1: Top 10 diagnoses in medical claims in the year preceding AMI hospitalization or death (heart attack cohort)

Males			Females		
Rank	Diagnosis (ICD-9-CM code)	Percent	Rank	Diagnosis (ICD-9-CM code)	Percent
1	Essential Hypertension (401)	7.7%	1	Essential Hypertension (401)	8.3%
2	Diabetes Mellitus (250)	7.6%	2	Diabetes Mellitus (250)	6.7%
3	Other Forms Chronic Ischemic Heart Disease (414)	5.9%	3	Heart Failure (428)	4.1%
4	Heart Failure (428)	4.4%	4	Other Forms Chronic Ischemic Heart Disease (414)	4.0%
5	Symptoms Involving Respiratory System (786)	3.1%	5	Osteoarthrosis & Allied Disorders (715)	2.8%
6	Chronic Airway Obstruction (496)	2.5%	6	Symptoms Involving Respiratory System (786)	2.3%
7	Osteoarthrosis & Allied Disorders (715)	2.0%	7	General Symptoms (780)	2.2%
8	Angina Pectoris (413)	1.8%	8	Chronic Airway Obstruction (496)	1.7%
9	General Symptoms (780)	1.7%	9	Cataract (366)	1.7%
10	Cardiac Dysrhythmias (427)	1.5%	10	Other Organic Psychotic Conditions (Chronic) (294)	1.6%

Source: Manitoba Centre for Health Policy, 2005

Key findings for diagnoses before heart attack:

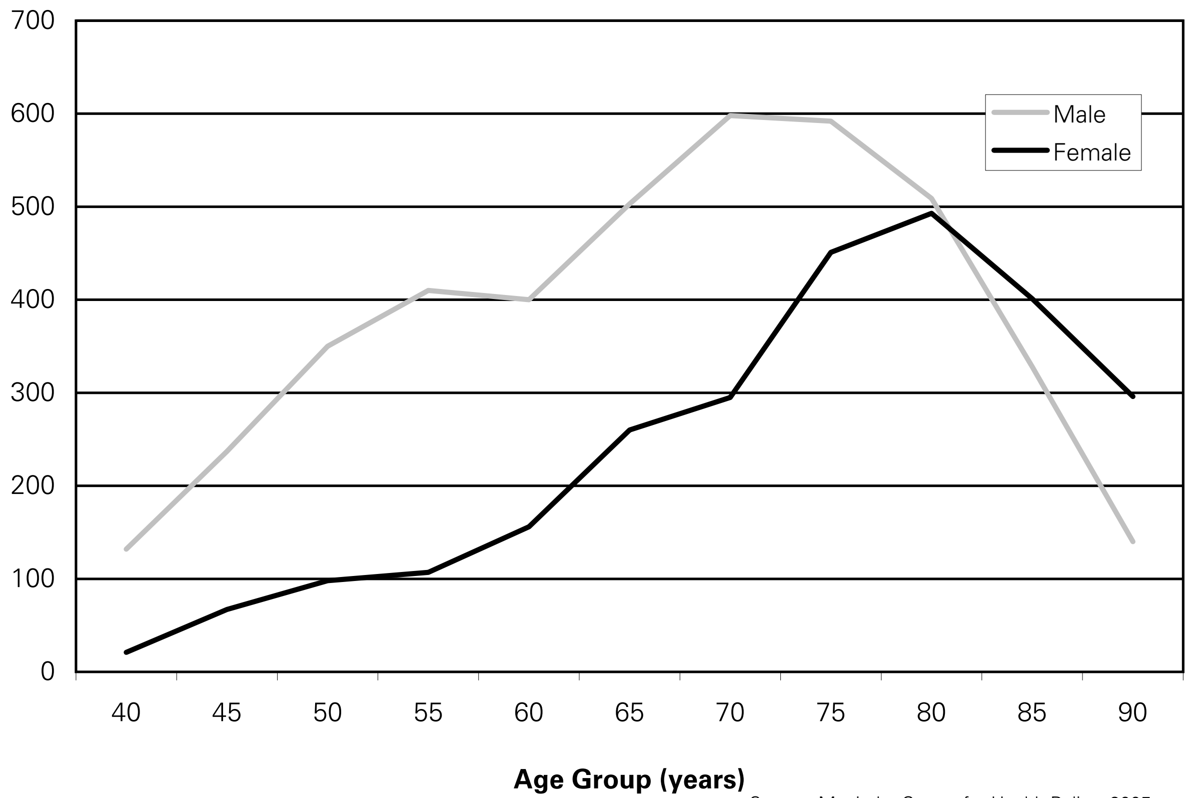
- Four of the top five, and eight of the top ten diagnoses attributed to AMI cohort members in the year before their AMI were the same for males and females.
- Most of these diagnoses, and especially the top five for each sex, are for problems directly related to heart disease.

10.6 Age Distribution of Heart Attack Cohort

Definition: This shows the age distribution of male and female heart attack cohort members, including hospitalized cases and deaths due to AMI.

Figure 10.6.1: Heart Attack (AMI) Cohort Size by Age and Sex

Number of AMI deaths plus AMI hospitalizations (3+ days), age 40+



Source: Manitoba Centre for Health Policy, 2005

Key findings for age distribution of heart attack cohort:

- There are many more 'recognized' AMIs among males than females (4,199 versus 2,645 in the three-year cohort).
- In the age groups from 40 through 80 years, males experience many more AMIs than females.
- In the oldest age groups, there were more AMIs among women, but only because there were many more females than males in the population. Figure 3.9.4 in Chapter 3 showed that even in these oldest age groups, the heart attack rate is higher in males than females.
- These results are consistent with other research showing male AMI patients are on average 7 to 10 years younger than females (Tecce et al., 2003; Williams et al., 2004; Adams et al., 1995).

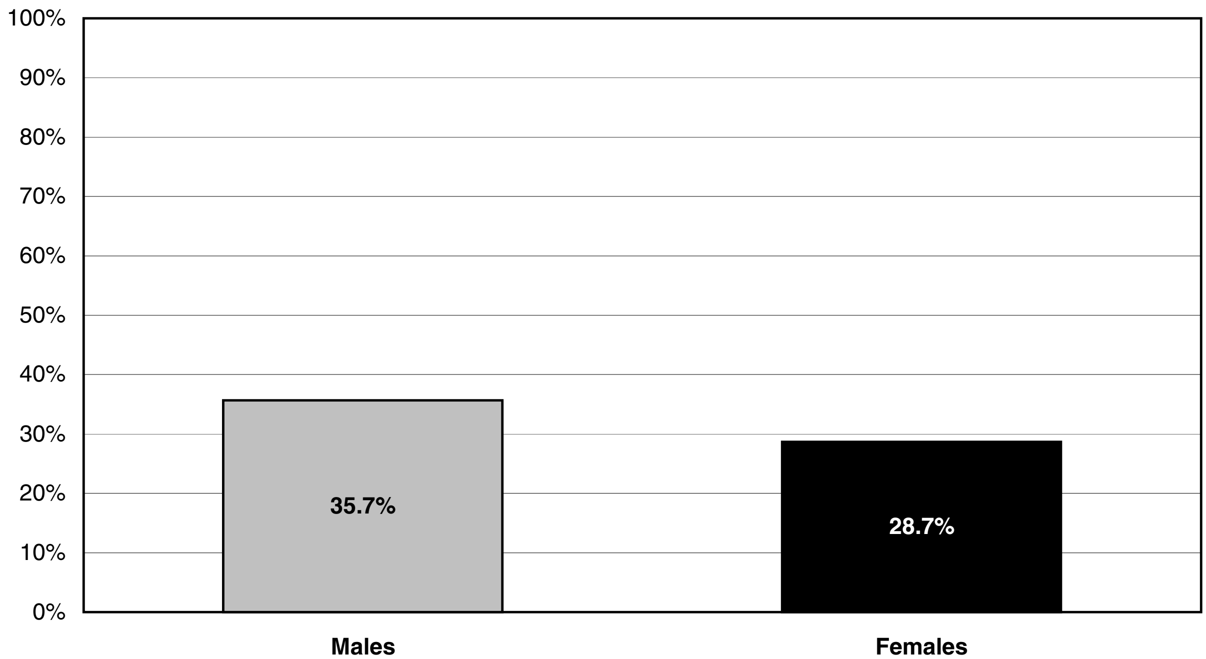
10.7 Cardiac Catheterization Rates of Heart Attack Survivors

Definition: This is the proportion of AMI cohort members who received cardiac catheterization while hospitalized for their AMI. This includes all cohort members who survived their AMI and were hospitalized (mortality rates are discussed in section 10.8).

As in Section 10.1, cardiac catheterization was defined by ICD-9-CM procedure codes 37.21 to 37.23, and 88.52 to 88.57 in hospital abstracts.

Figure 10.7.1: Cardiac Catheterization Rates of AMI Cohort Members, by Sex, Manitoba

Crude percent of AMI patients receiving cardiac catheterization during AMI hospitalization



* Male and female rates significantly different (p<.001)

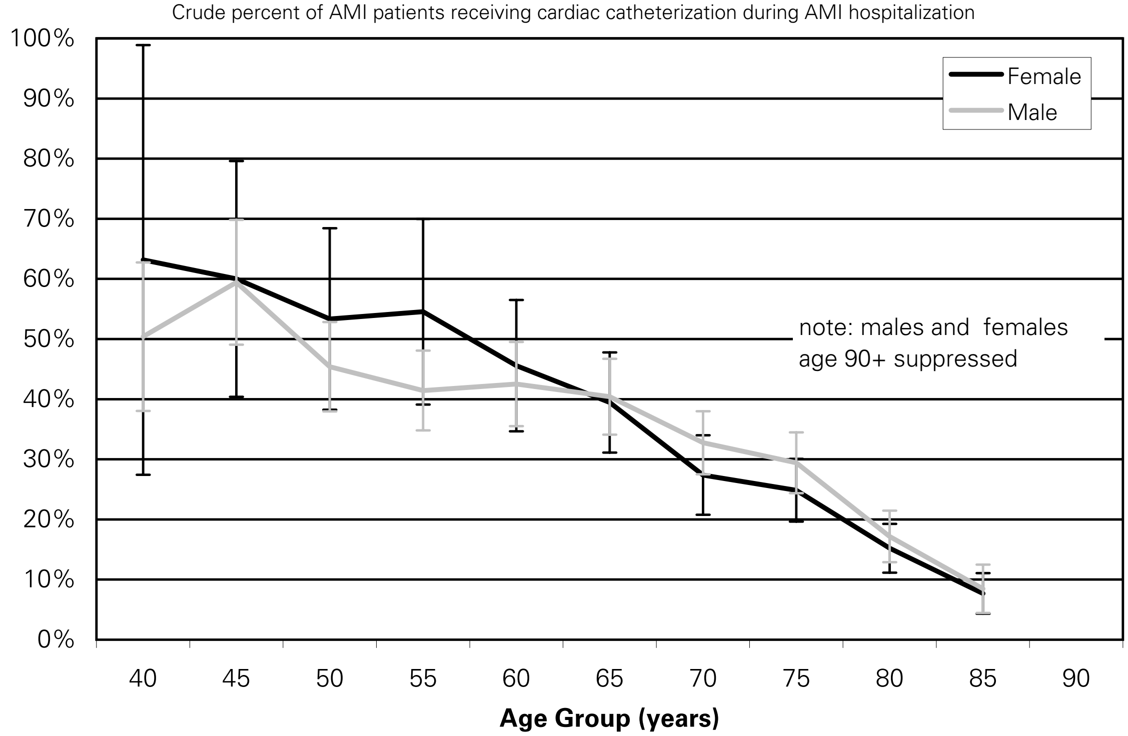
Source: Manitoba Centre for Health Policy, 2005

Key findings for catheterization rates of heart attack survivors:

- As shown in Figure 10.7.1, males overall have a higher rate of catheterization during AMI hospitalization (35.7% versus 28.7%, p<.001).
- These results are consistent with many other studies which have suggested that male AMI patients are treated more aggressively than females (Duval, 2003; Tu et al., 1999).
- Several of these reports have characterized this difference as a 'sex bias' in heart attack treatment rates, in favour of males.
- However, these results are almost completely confounded by the age difference in male versus female patients. Figure 10.7.2 shows the age-specific catheterization rates, and reveals that within every age group, catheterization rates for male and female AMI patients are very similar.

Figure 10.7.2: Cardiac Catheterization Rates of AMI Cohort Members, by Age and Sex

Crude percent of AMI patients receiving cardiac catheterization during AMI hospitalization



Source: Manitoba Centre for Health Policy, 2005

- The apparent contradiction between the results in the two figures is explained completely by the age difference in male versus female AMI patients: a large number of AMIs among males happen in the younger age groups, where catheterization rates for both sexes are highest, whereas among females, most AMIs happen in the older age groups, where catheterization rates are lowest.
- That is, it's not that male AMI patients are catheterized more often than female AMI patients, but rather that young AMI patients are catheterized more often than older AMI patients—and many of the female AMI patients are in those older age groups, making the 'all-age' average for females much lower.
- This means that there is a 'sex difference' but not a 'sex bias' in cardiac catheterization rates. The difference is completely driven by the younger age of male versus female AMI patients.
- Other researchers have also documented similar findings, consistent with the sex difference being explained by age differences rather than 'sexism.' (Williams et al., 2004; Adams et al., 1995; Alter et al., 2002).

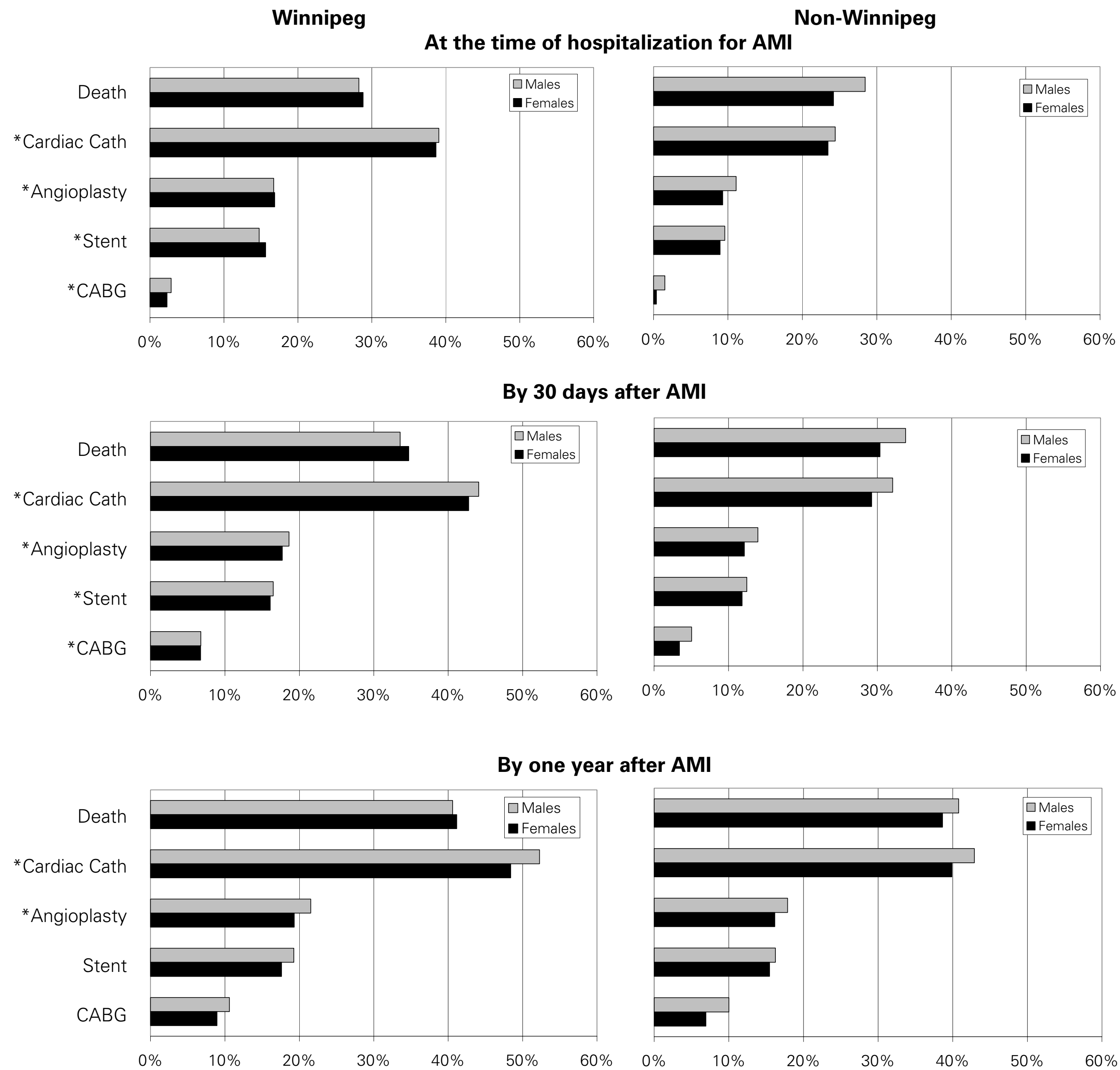
10.8 Mortality and Cardiac Procedure Rates Among Heart Attack Cohort Members

Definition: These are the rates of death and of key cardiac procedures among AMI survivors, by sex and area (Winnipeg versus non-Winnipeg), and over time. The values are age-adjusted to the Manitoba 40+ population.

'Index hospitalization' refers to the hospitalization episode at the time of the AMI. If the patient was admitted to one hospital and transferred to another (often to one of the teaching hospitals in Winnipeg), the two records were combined into one episode of care. The total length of stay had to be three days or more, using the validated definition that stays for less than two days were 'rule out' AMIs (unless the patient died—in which case, it is counted as a death due to AMI).

The results are shown in Figure 10.8.1.

Figure 10.8.1: Age-Adjusted Rates of Mortality and Cardiac Procedures, AMI Cohort, 2000/01 – 2002/03



For all indicators, male and female rates were not statistically different.
*Rates for Non-Winnipeg residents were lower than Winnipeg (p<.01).

Source: Manitoba Centre for Health Policy, 2005

Figure 10.8.1: Rates for Winnipeg residents are shown in the left column of graphs, and non-Winnipeg residents are in the right column. The top row figures are during the index hospitalization, the middle row are as of 30 days after the AMI, and the bottom row are as of one year after the AMI.

Overall, the age-adjusted rates of death and key cardiac procedures showed no statistically significant differences between males and females.

While there were no between-sex differences, there were large differences between Winnipeg and non-Winnipeg residents for almost all procedures except mortality.

- Mortality rates were similar at all time points (male and female, Winnipeg and non-Winnipeg).
- For all procedures, rates were significantly higher for Winnipeg residents, at all time points, except stent insertion rates and bypass surgery rates at one year.
- For most procedures, the difference between Winnipeg and non-Winnipeg rates decreased over time. That is, by one year after the AMI, the Winnipeg versus non-Winnipeg differences were smaller than at index hospitalization.

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CHAPTER 11: QUALITY OF CARE

This chapter will report on several indicators of quality of care, including:

Four 'positive' indicators, for which higher rates indicate better care:

11.1 Antidepressant Prescription Follow-Up
11.2 Asthma Care: Controller Medication Use
11.3 Diabetes Care: Annual Eye Exams
11.4 Post-Myocardial Infarction Care: Beta-Blocker Prescribing

Two 'negative' indicators, for which lower rates indicate better care:

11.5 Potentially Inappropriate Prescribing of Benzodiazepines for Community Dwelling Older Adults (75+)
11.6 Potentially Inappropriate Prescribing of Benzodiazepines for Older Adults in Personal Care Homes (PCH)

Key Findings for Chapter 11: Quality of Care:

- Of the six indicators in this chapter, four were 'positive' indicators—in that higher rates reflect better quality of care. Among these four, females had higher rates for three indicators (antidepressant follow-up, asthma care, and eye exams for diabetics). Males had higher rates for one: prescriptions for beta-blockers within four months of heart attack.
- The two indicators of benzodiazepine use were the 'negative' indicators—for which lower rates reflect higher quality of care. Among community-dwelling seniors, females had significantly higher rates of benzodiazepine use: 22.3% of residents age 75+, versus 14.2% for males. Among seniors living in PCHs, there was no difference in male versus female rates. Higher rates for females were expected, given that anxiety disorders are more common among females than males (Martens et al., 2004).
- The results showed relatively little variation among RHAs, suggesting that the quality of care being delivered is comparable across the province.
- However, of the four 'positive' indicators (for which higher rates indicate better care), only one showed rates above 70% for males and females (beta-blocker use). Others ranged from 33.3% to 63.2%, suggesting there is room for improvement in quality of care for both males and females, in all areas of the province.
- Most of the trends with area-level income were relatively weak, and their directions were mixed: some showed slightly better care for residents of higher income areas, while others showed slightly better care for residents of lower income areas. These trends also differed between urban and rural residents, though the differences were not consistent across indicators.

Introduction

In this chapter, all indicators show the simple or 'crude' percent of eligible patients receiving the care, by sex. That is, these rates are not age-adjusted like the indicators in other chapters of this report, because age is not relevant in determining whether or not the patient got the recommended care (nor is it relevant in comparing males versus females on these quality measures).

These indicators were adapted from a previous MCHP report, "Using Administrative Data to Develop Indicators of Quality in Family Practice" (Katz et al., 2004). The results shown in this report will be different from those in that report, for several reasons:

- This report provides population-based data by area—not by provider, as in the previous report.
- The previous report excluded patients who could not be 'assigned' to a General Practitioner or Family Practitioner (GP/FP), or who were assigned to physicians whose practices had less than a certain number of those kind of patients (these cases were excluded from that report, whereas all eligible patients are included in this report).
- For this report, some of the details of the analyses were modified to allow minor improvements to the methods.

Virtually all previous work on these indicators were not population-based studies, but analysis of physician practices, so comparative findings from other studies are not shown. Refer to the previous report (Katz et al., 2004).

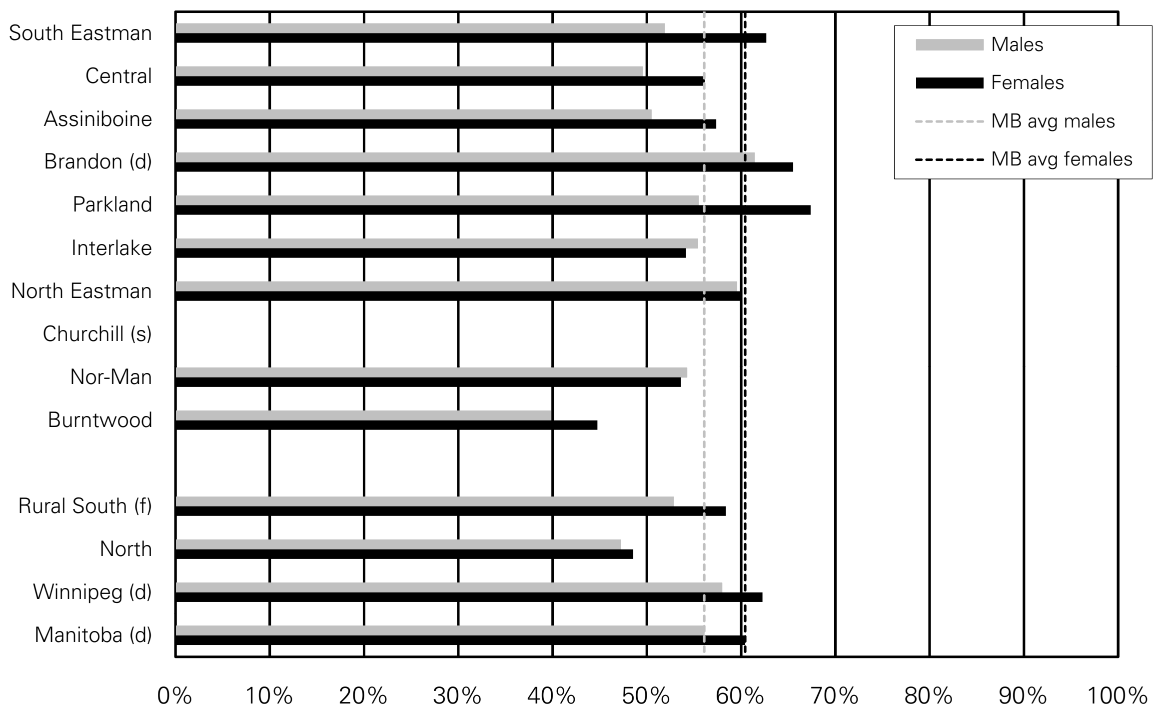
In addition to these quality of care indicators, four other indicators of 'outcomes' of care were also analyzed, adapted from an Ontario hospital report (Canadian Institute for Health Information, 2003). However, the events were relatively rare, so results could not be shown at the District or even RHA levels. Therefore, results for aggregate regions (Rural South and Brandon, North, Winnipeg, Manitoba) were put into Appendix 3. The indicators are: rates of complications related to pneumonia, cholecystectomy, and heart attack, and rate of readmissions for AMI.

11.1 Antidepressant Prescription Follow-Up

Definition: This is the crude percentage of patients with a new prescription for antidepressants (ATC codes N06AA, N06AB, N06AF, N06AG, N06AX) and a diagnosis of depression (ICD-9 CM codes 296 or 311) within two weeks of each other, who then had three subsequent ambulatory visits within four months of the prescription being filled.

Figure 11.1.1: Newly Depressed Patients Who had at Least 3 Physician Visits in 4 Months 2003/04, by RHA

Crude percent of patients with at least 3 visits

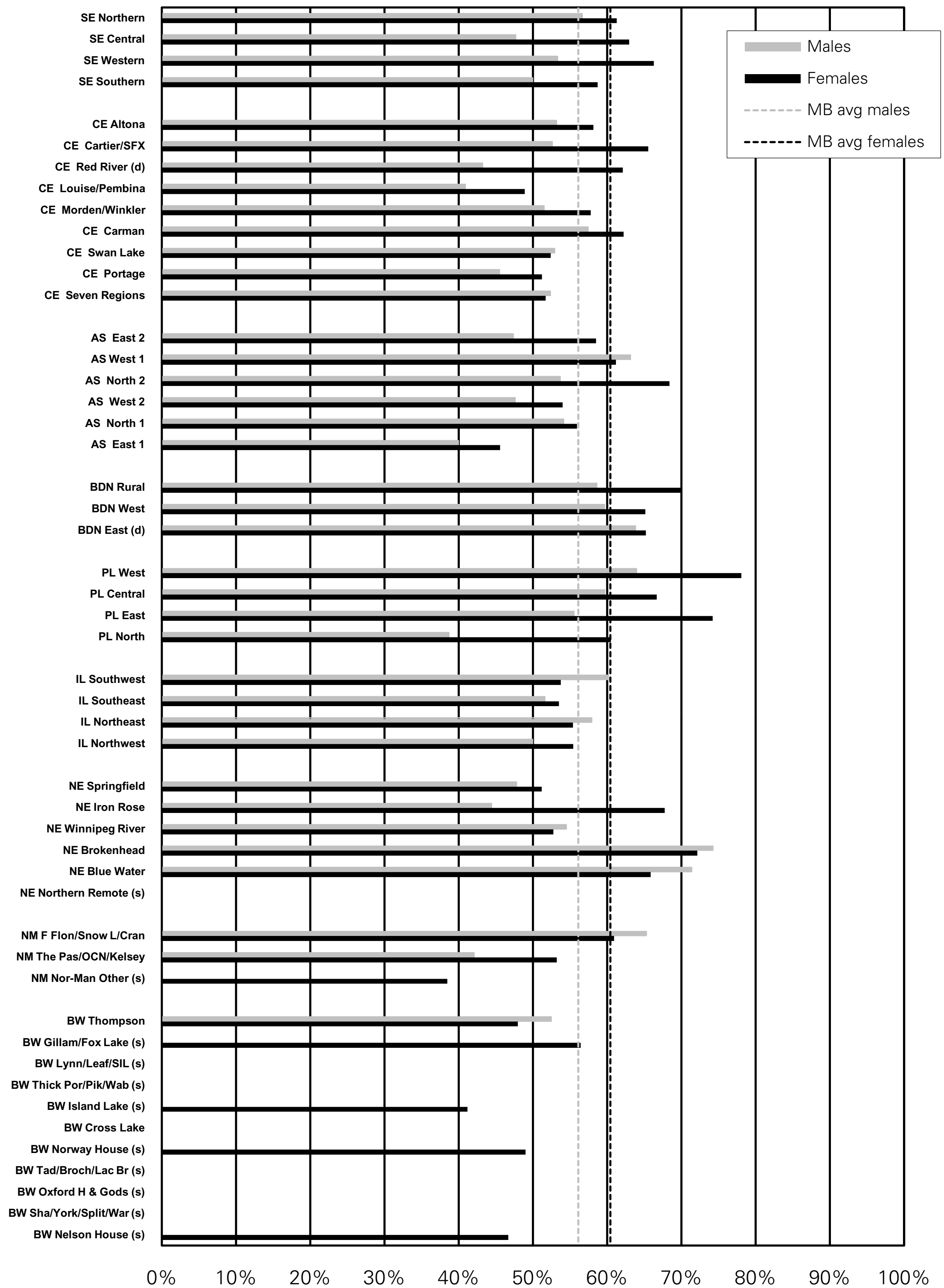


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 11.1.2: Newly Depressed Patients Who had at Least 3 Physician Visits in 4 Months 2003/04, by District

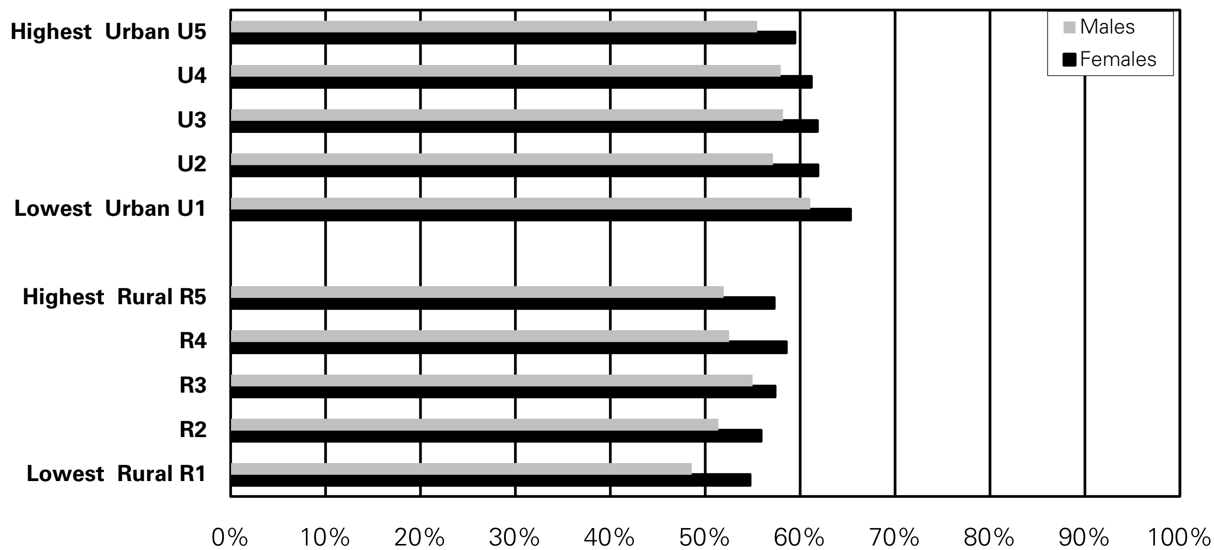
Crude percent of patients with at least 3 visits



Source: Manitoba Centre for Health Policy, 2005

Figure 11.1.3: Newly Depressed Patients Who had at Least 3 Physician Visits in 4 Months, by Income Quintile, 2003/04

Crude percent of patients with at least 3 visits



Linear Trend Test Results

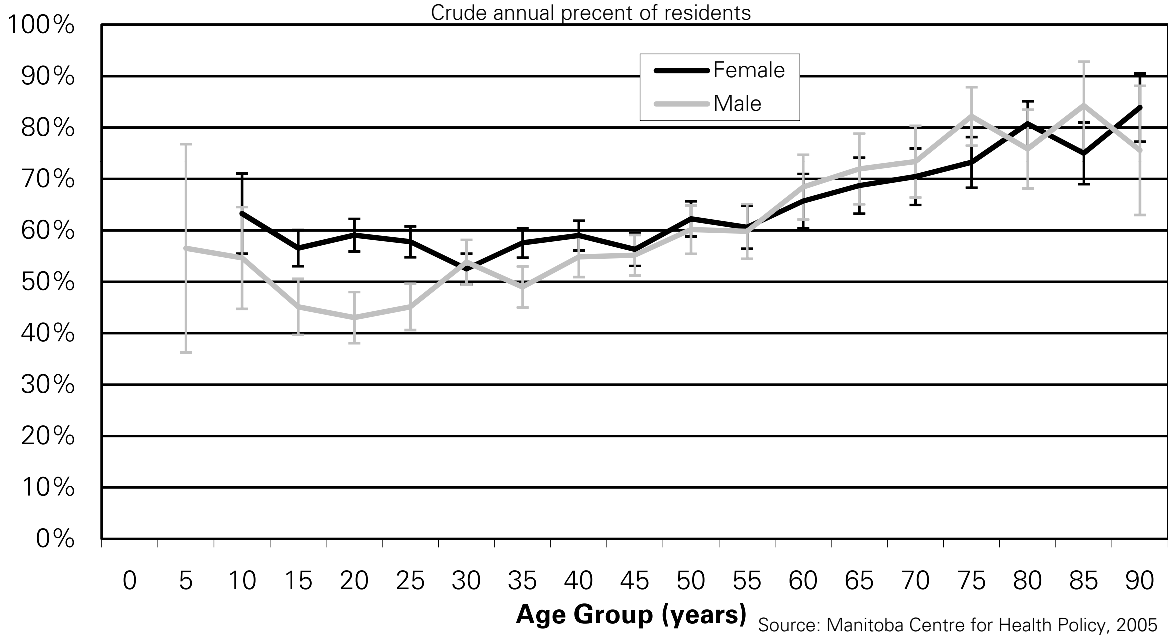
Female: Urban: Significant (p<.01) Rural: Not Significant

Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 11.1.4: Newly Depressed Patients Who had at Least 3 Physician Visits in 4 Months by Age and Sex, 2001/02

Crude annual precent of residents



Source: Manitoba Centre for Health Policy, 2005

Key findings for antidepressant follow-up:

Crude values by area & income group:

- Overall, and in almost all RHAs, a higher proportion of female patients receive three or more follow-up visits within four months (63.2% versus 58.7%, $p<.001$)
- In urban areas, the proportion of patients with appropriate care was higher among residents of lower income areas (both males and females). There was no association with area-level income in rural areas.

Crude values by age & sex:

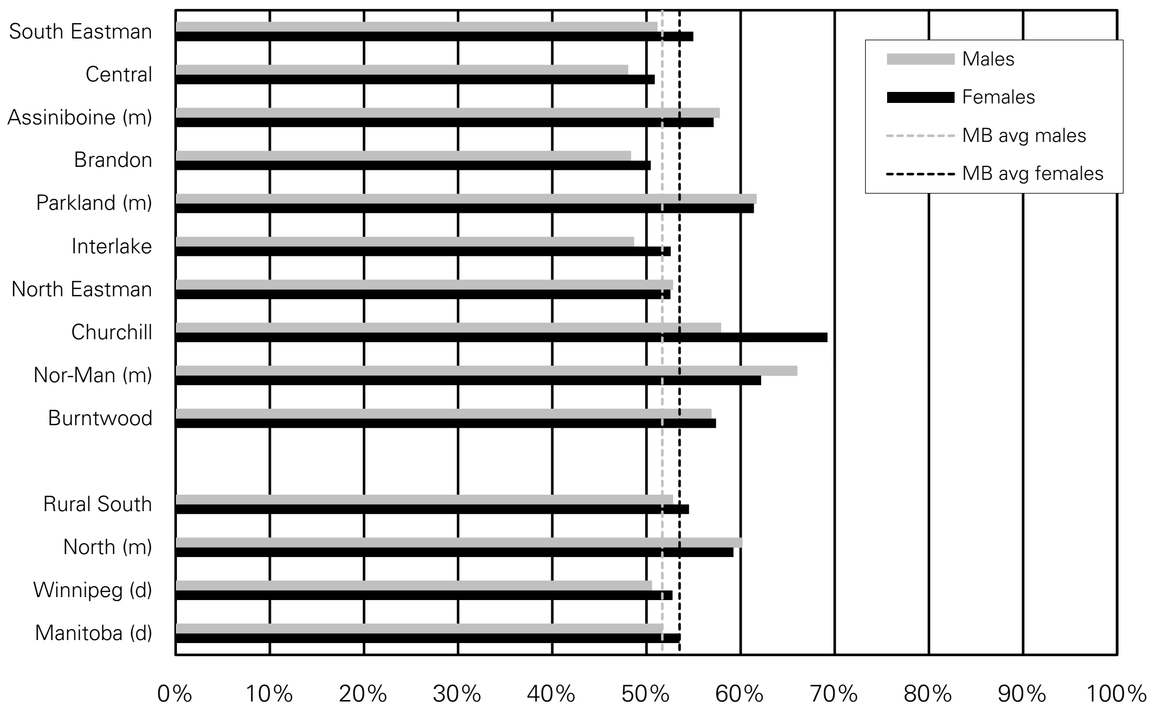
- For both males and females, the proportion of patients receiving appropriate care is lowest among young patients, and increases with age. Female rates were higher than male rates in several young adult age groups, while male rates were higher in two older adult age groups.

11.2 Asthma Care: Controller Medication Use

Definition: This is the crude percentage of asthmatics (defined as those with a repeat prescription for Beta 2-agonists, ATC codes R03AA, R03AB or R03AC) who filled a prescription for medications recommended for long-term control of asthma in 2003/04. These include inhaled corticosteroids (ATC code R03BA), or Leukotriene modifiers (ATC code R03DC).

Figure 11.2.1: Proportion of Asthmatics on Appropriate Long-Term Medications by RHA, 2003/04

Crude percent of asthmatics receiving 1+ prescriptions for inhaled steroids

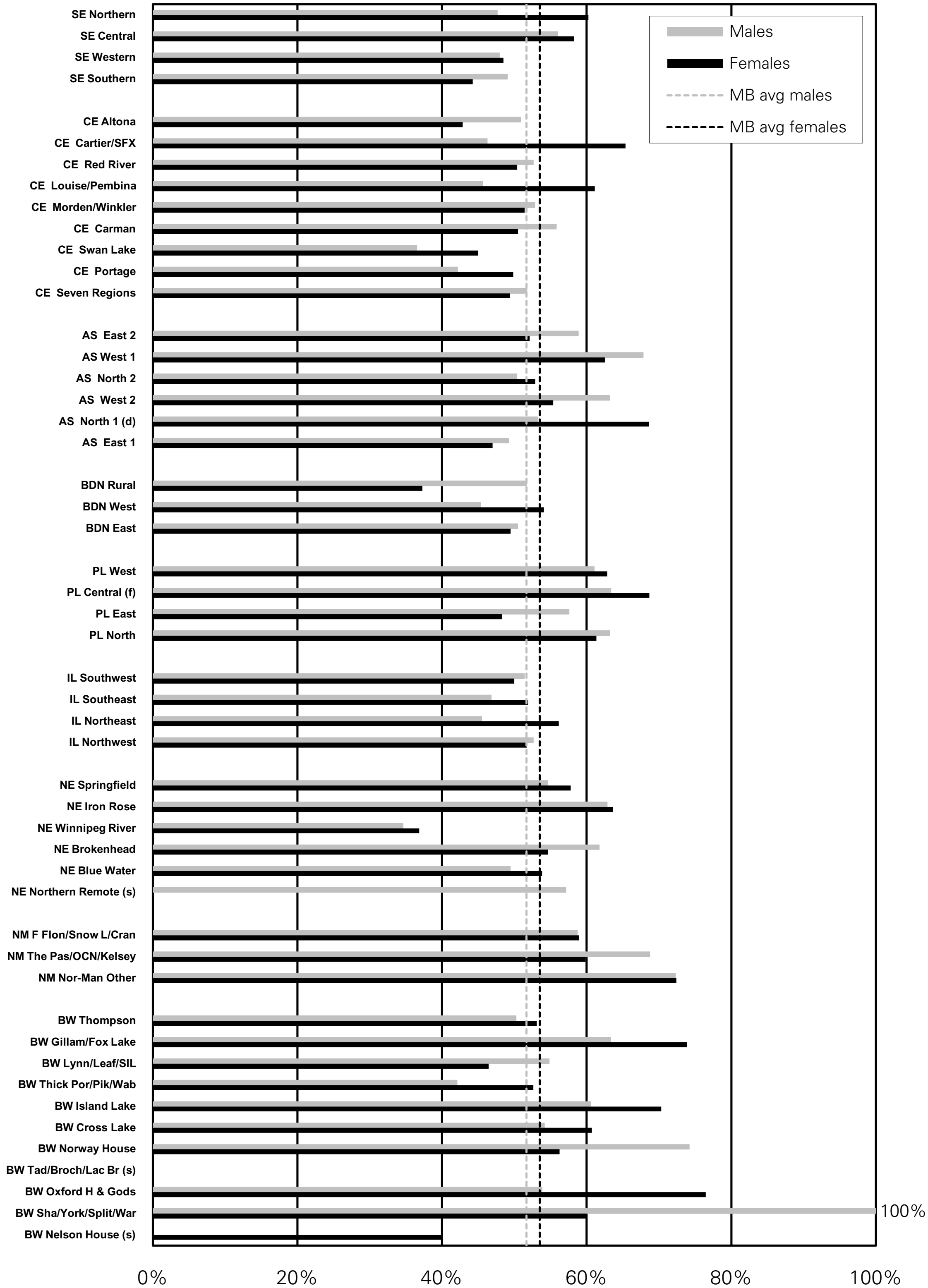


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 11.2.2: Proportion of Asthmatics on Appropriate Long-Term Medications by District, 2003/04

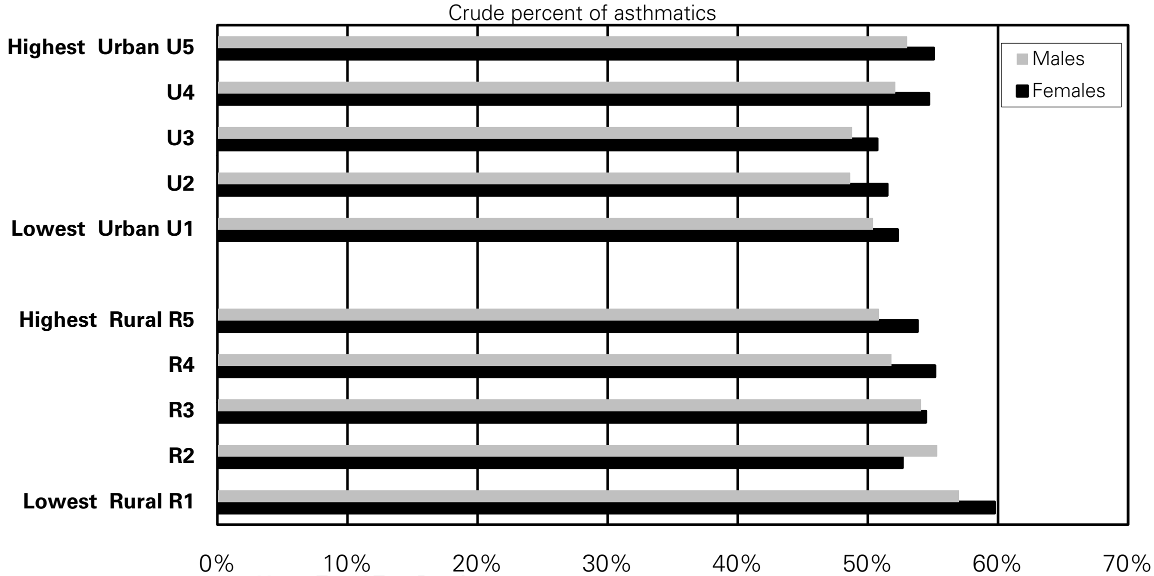
Crude percent of asthmatics receiving 1+ prescriptions for inhaled steroids



Source: Manitoba Centre for Health Policy, 2005

Figure 11.2.3: Proportion of Asthmatics on Appropriate Long-Term Medications, by Income Quintile, 2003/04

Crude percent of asthmatics

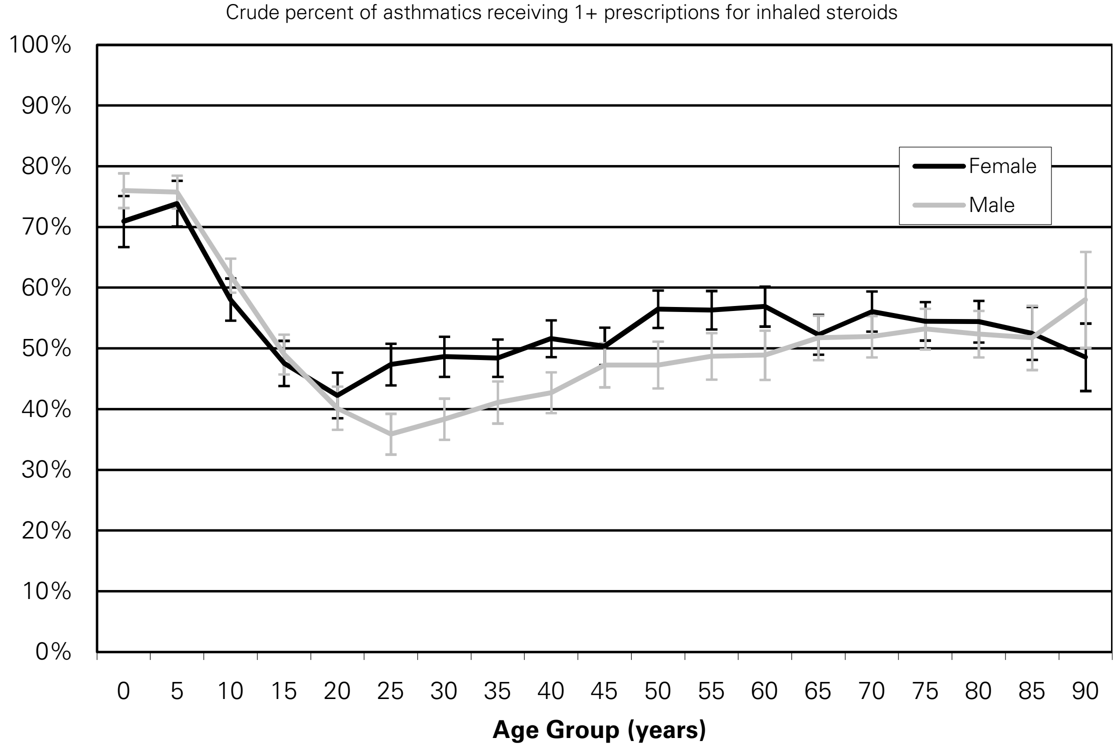


Linear Trend Test Results
Female: Urban: Not Significant Rural: Not Significant
Male: Urban: Not Significant Rural: Significant ($p<.001$)

Source: Manitoba Centre for Health Policy, 2005

Figure 11.2.4: Proportion of Asthmatics on Appropriate Long-Term Medications, by Age and Sex, 2003/04

Crude percent of asthmatics receiving 1+ prescriptions for inhaled steroids



Source: Manitoba Centre for Health Policy, 2005

Key findings for asthma care:

Crude values by area & income group:

- Overall, and in most RHAs, a slightly higher proportion of female patients with asthma received the recommended long-term controller medications (53.5% versus 51.7%, p<.01)
- Overall, there was not a strong relationship between asthma care and area-level income, though among rural males, patients from low-income areas had higher rates.

Crude values by age & sex:

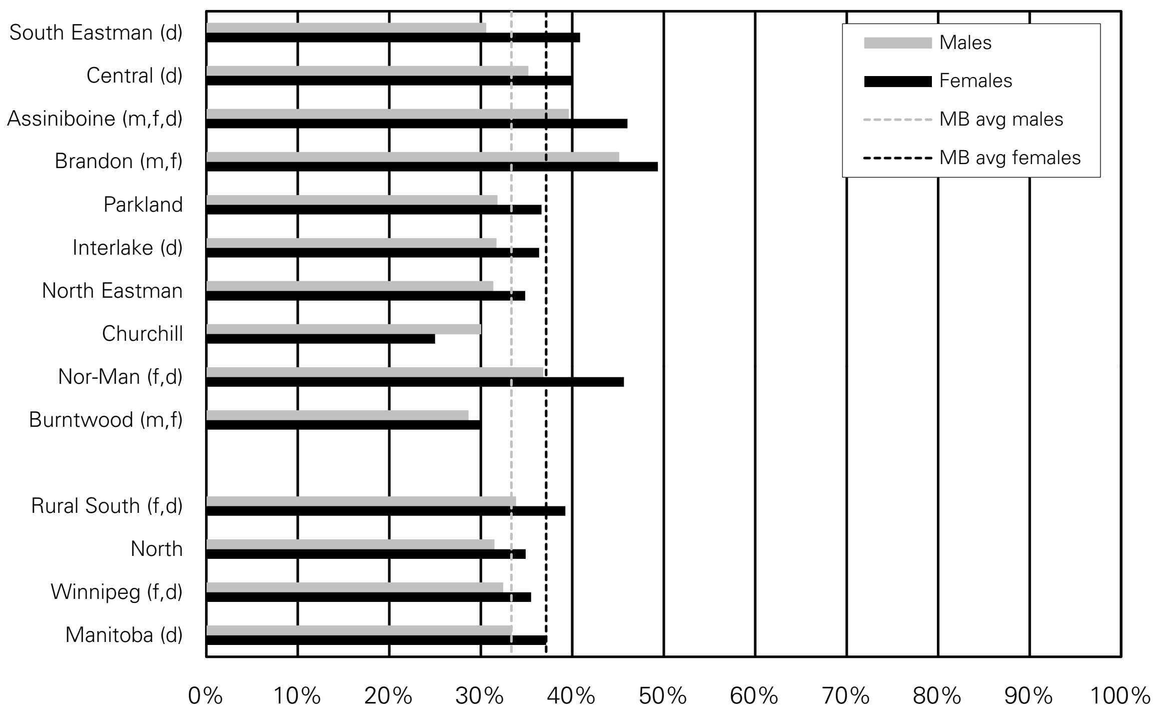
- For both males and females, the proportion of patients receiving appropriate care is highest among young children. The rates are lowest for young adults, and somewhat higher and steady for all other adult age groups. Female rates were higher than male rates in several age groups in adulthood.

11.3 Diabetes Care: Annual Eye Exams

Definition: This is the percentage of diabetics age 20 to 79 that had an eye exam in 2003/04. Diabetics were defined using the same algorithm as in Chapter 3, Section 3.4. Annual eye exams are recommended for all diabetic patients, and are covered by Manitoba Health. However, there is confusion about coverage among patients and providers, and this affects the data, because if the patient pays the provider directly, the provider would not submit a claim to Manitoba Health. In such cases, the service is being provided, but there is no record in the claims data. Therefore, these results need to be interpreted with caution.

Figure 11.3.1: Diabetics Who had an Eye Exam, by RHA, 2003/04

Crude percent of diabetics who had eye examinations

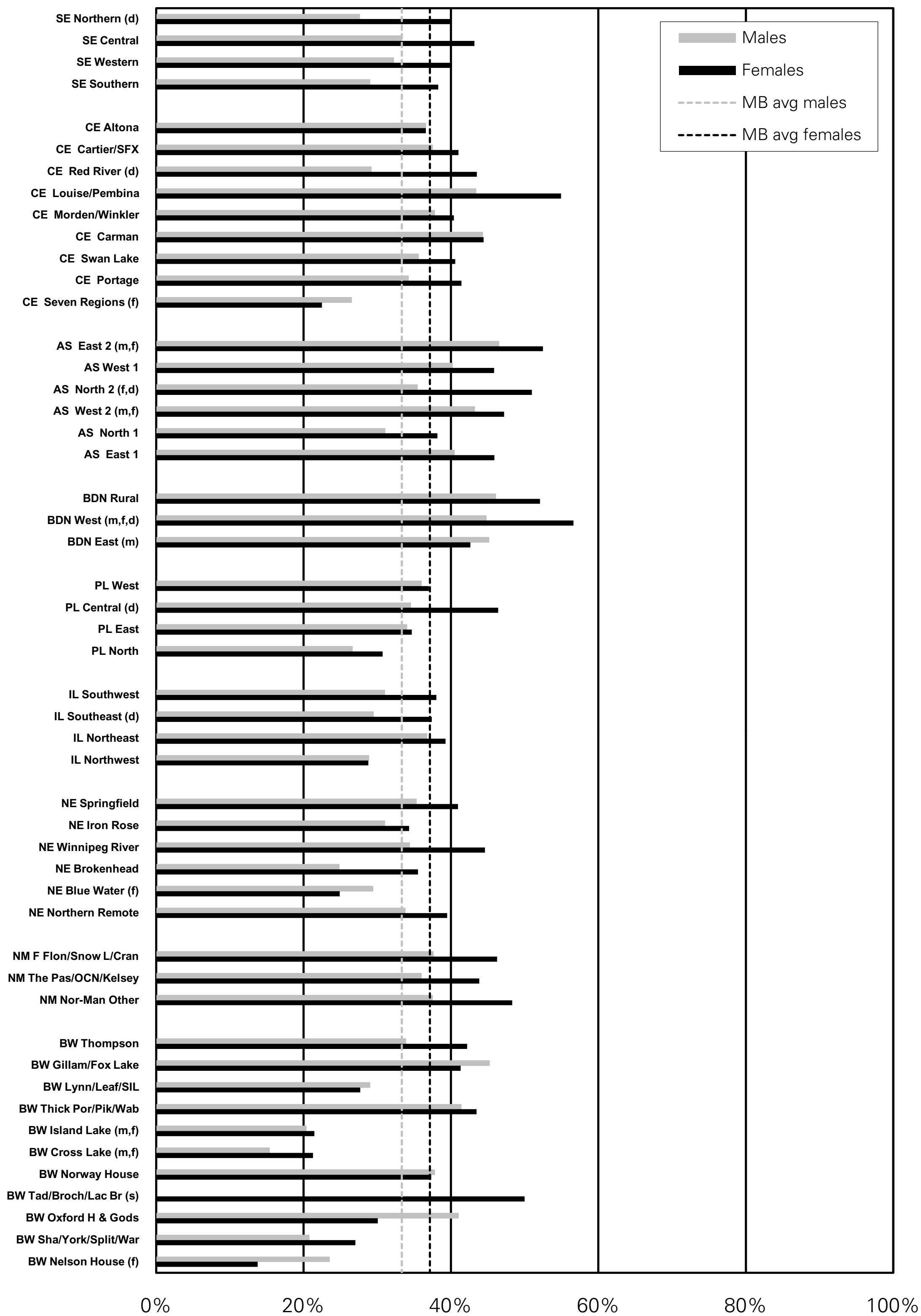


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 11.3.2: Diabetics Who had an Eye Exam, by District, 2003/04

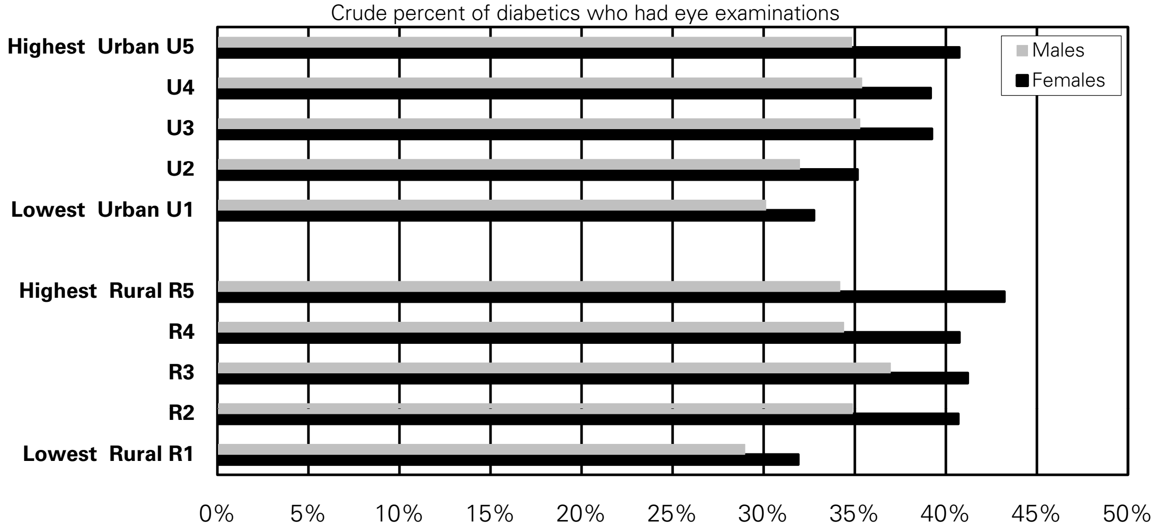
Crude percent of diabetics who had eye examinations



Source: Manitoba Centre for Health Policy, 2005

Figure 11.3.3: Diabetics Who had an Eye Exam, by Income Quintile, 2003/04

Crude percent of diabetics who had eye examinations



Linear Trend Test Results

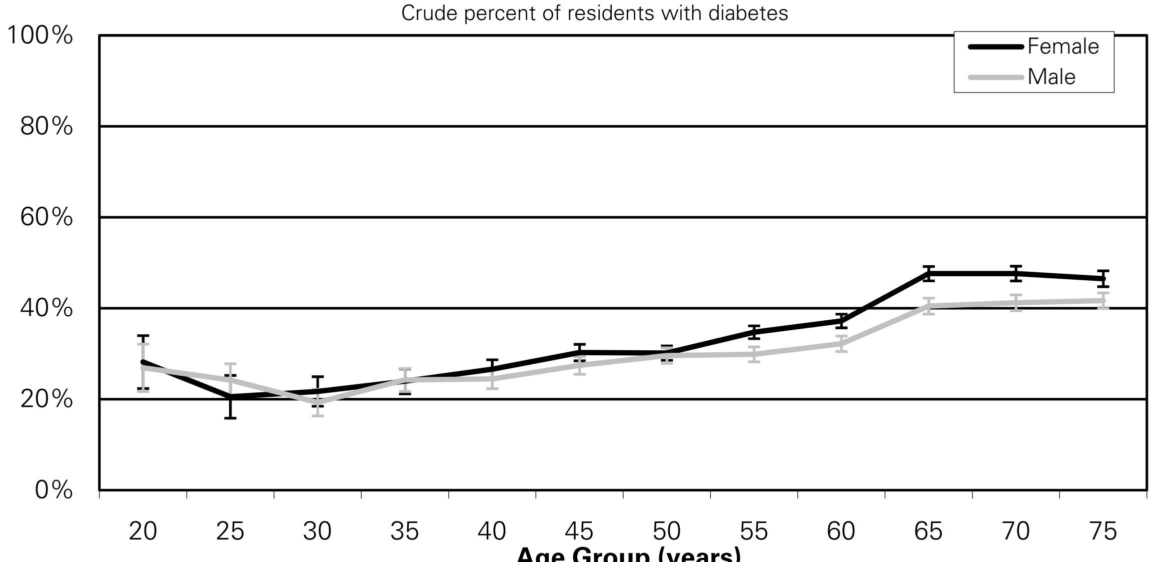
Female: Urban: Significant (p<.001) Rural: Significant (p<.001)

Male: Urban: Significant (p<.001) Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 11.3.4: Proportion of Diabetics Who had an Eye Exam by Age and Sex, 2003/04

Crude percent of residents with diabetes



Source: Manitoba Centre for Health Policy, 2005

Key findings for diabetes care:

Crude values by area & income group:

- Overall, and in almost all RHAs, a higher proportion of female patients with diabetes received an eye exam during fiscal year 2003/04 (37.1% versus 33.3%, p<.001).
- There was a strong relationship with area-level income: among urban and rural males and females, a higher proportion of those from higher income areas had an eye exam.

Crude values by age & sex:

- For both males and females, the proportion of patients receiving appropriate care is lower among young patients, and increases steadily with age. Female rates were slightly higher than male rates among adults 55+.

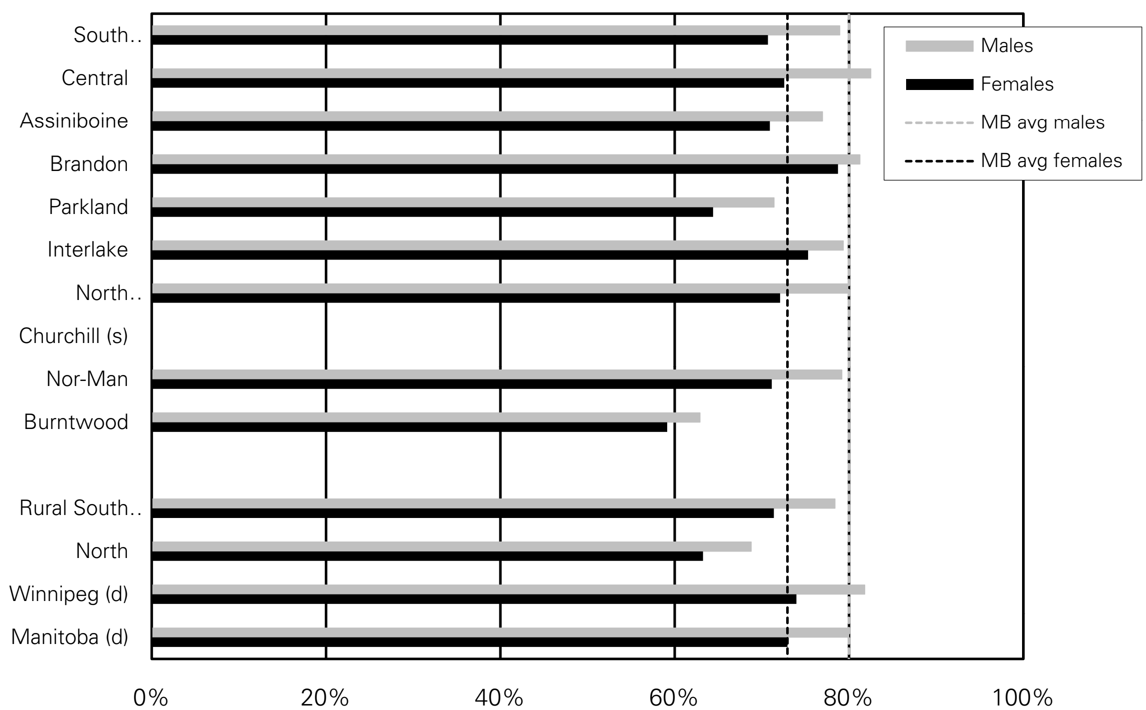
11.4 Post-Acute Myocardial Infarction Care: Beta-Blocker Prescribing

Definition: This is the crude percentage of patients with a diagnosis of AMI (ICD-9 CM diagnosis code 410) in five years of hospital files (1999/2000 to 2003/04) who received at least one dispensed prescription for a beta-blocker (ATC codes C07AA, C07AB) within four months of their AMI.

Exclusions include those with a diagnosis of asthma (ICD-9 CM diagnosis code 493), COPD (ICD-9 CM diagnosis codes 491 or 492) or peripheral vascular disease (ICD-9 CM diagnosis code 443 or 459).

Figure 11.4.1: Heart Attack (AMI) Patients Who Received a Prescription for Beta-Blockers, by RHA, 1999/2000 – 2003/04

Crude percent of AMI patients who received a prescription for a beta-blocker within 4 months

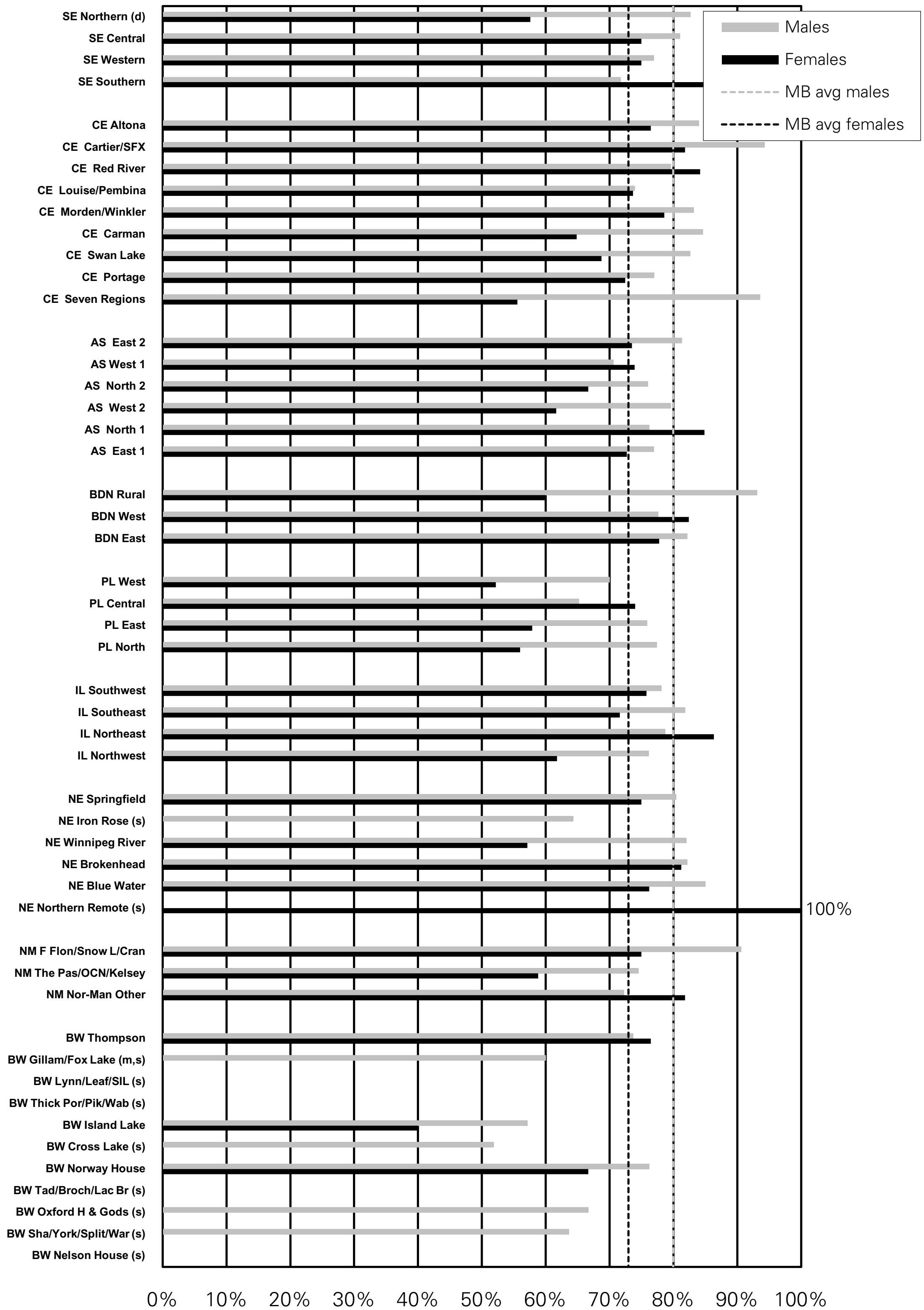


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

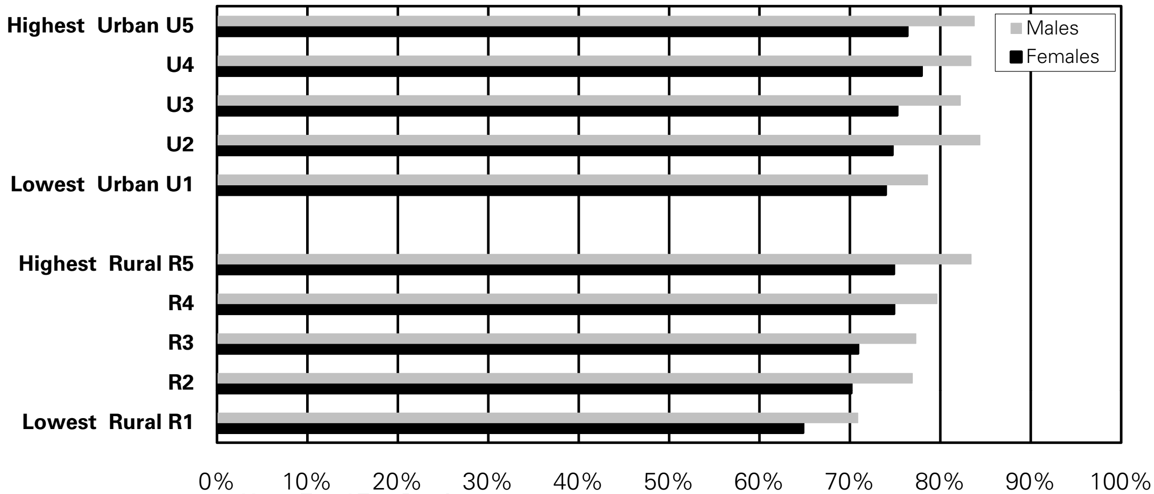
Figure 11.4.2: Heart Attack (AMI) Patients Who Received a Prescription for Beta-Blockers, by District, 1999/2000 – 2003/04

Crude percent of patients who received a prescription for beta-blockers



Source: Manitoba Centre for Health Policy, 2005

Figure 11.4.3: Heart Attack (AMI) Patients Who Received a Prescription for Beta-Blockers by Income Quintile, 1999/2000 – 2003/04

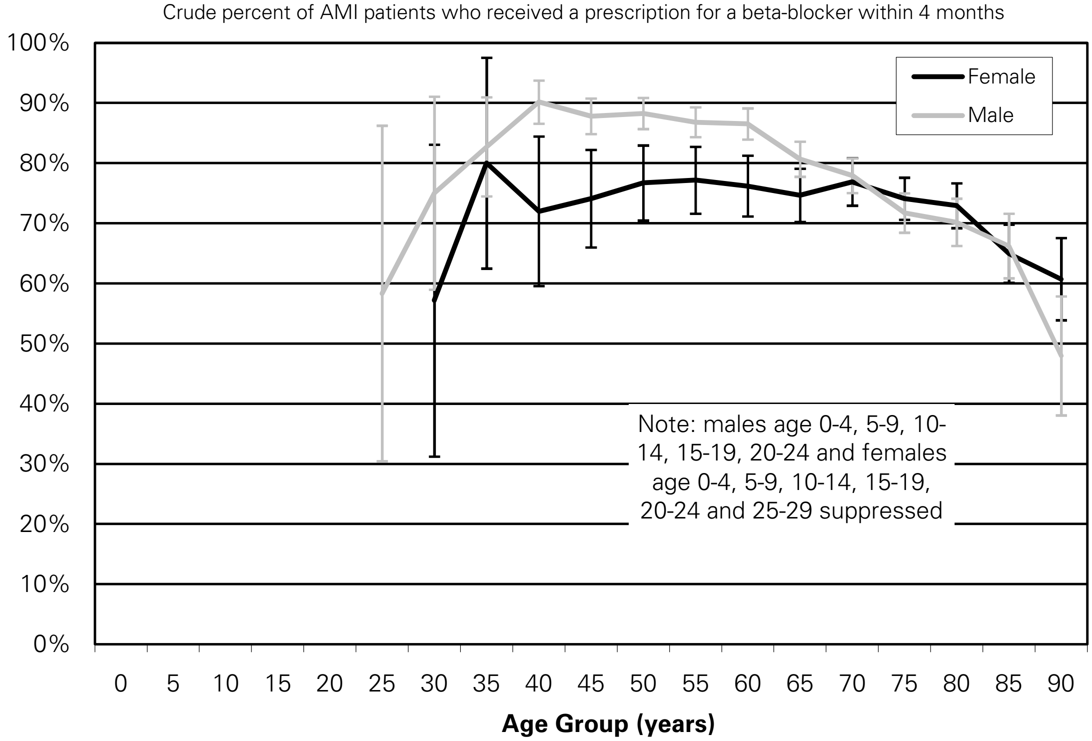


Linear Trend Test Results
Female: Urban: Not Significant Rural: Significant (p<.01)
Male: Urban: Not Significant Rural: Significant (p<.001)

Source: Manitoba Centre for Health Policy, 2005

Figure 11.4.4: Heart Attack (AMI) Patients Who Received a Prescription for Beta-Blockers, by Age and Sex, 1999/2000 – 2003/04

Crude percent of AMI patients who received a prescription for a beta-blocker within 4 months



Source: Manitoba Centre for Health Policy, 2005

Key findings for beta-blocker prescribing:

Crude values by area & income group:

- Overall, a higher proportion of male AMI patients received a beta-blocker prescription within four months (79.8% versus 72.7%, p<.001).
- AMI patients from higher income areas appear to be more likely to have received a prescription for a beta-blocker within four months: the relationship is strong among male and female rural residents, but only marginal for urban males (p=0.011), and not significant for urban females.

Crude values by age & sex:

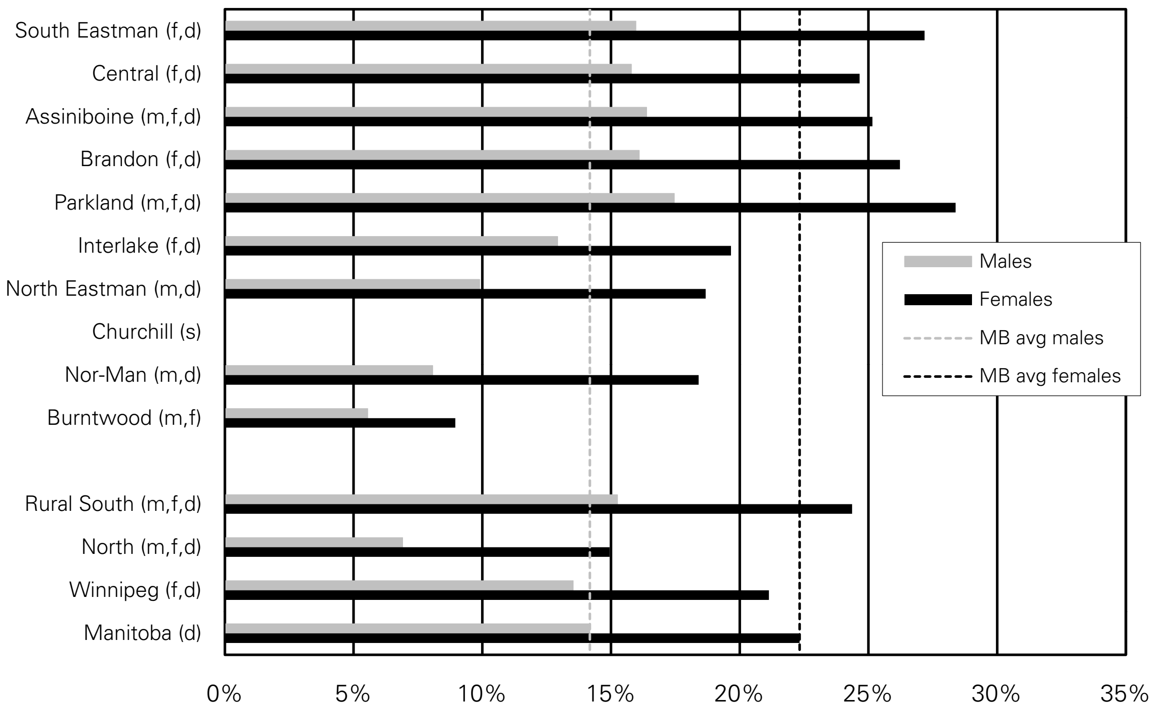
- For both sexes, beta-blocker prescription rates are relatively consistent across age groups, except among the oldest patients, for whom rates are lower. In several age groups in adulthood, rates for males are higher than those for females.

11.5 Potentially Inappropriate Prescribing of Benzodiazepines to Community Dwelling Older Adults (75+)

Definition: This is the crude percentage of community-dwelling seniors (that is, not resident in a PCH) age 75+ who have had at least two prescriptions, or a greater than 30 day supply of benzodiazepines in 2003/04. Long-term use of these drugs is not recommended for older patients (see Katz et al, 2004).

Figure 11.5.1: Community-Dwelling Seniors with Benzodiazepine Prescriptions by RHA, 2003/04

Crude percent of non-PCH seniors with 2+ prescriptions or greater than a 30 day supply, age 75+

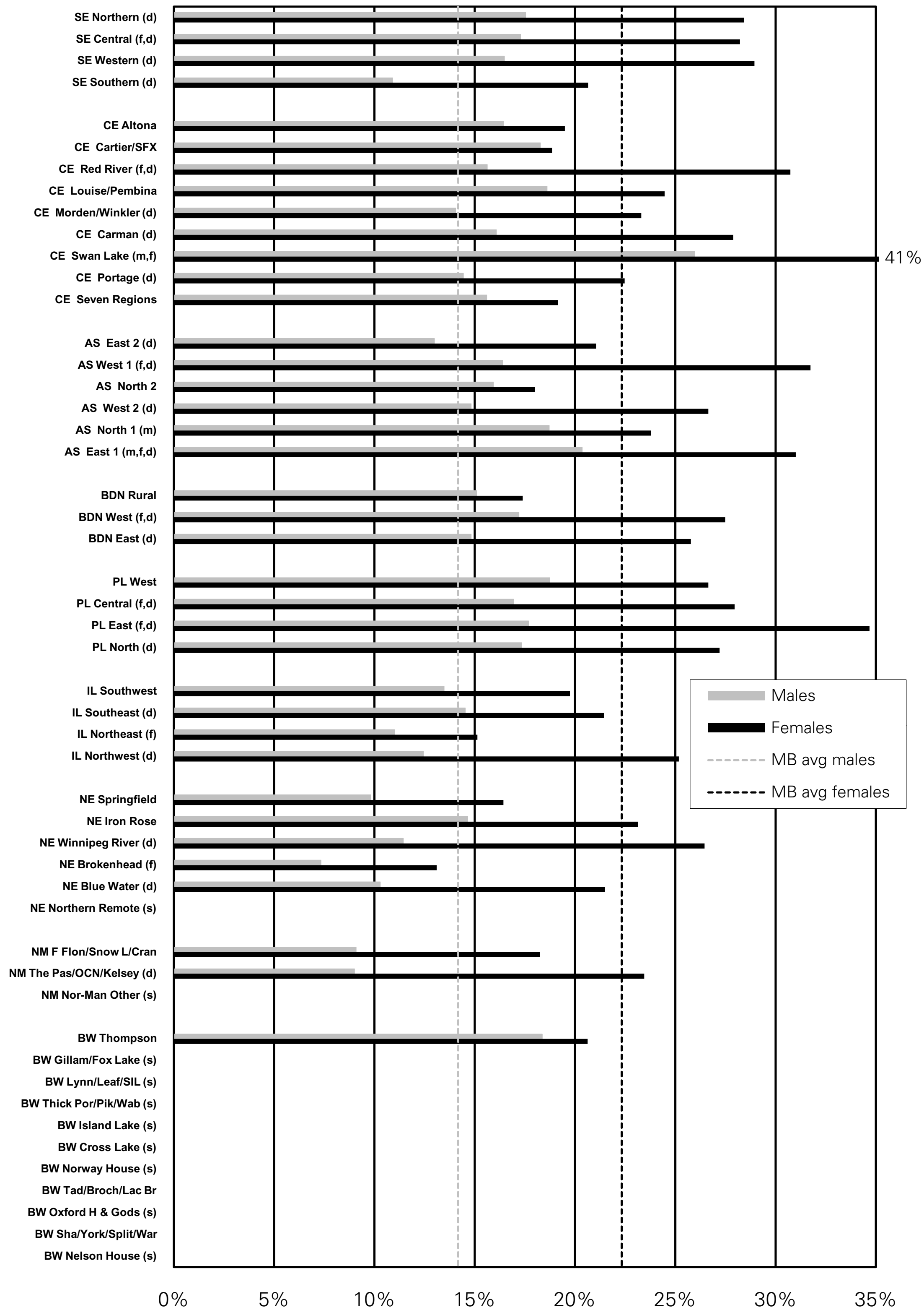


'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 11.5.2: Community-Dwelling Seniors with Benzodiazepine Prescriptions by District, 2003/04

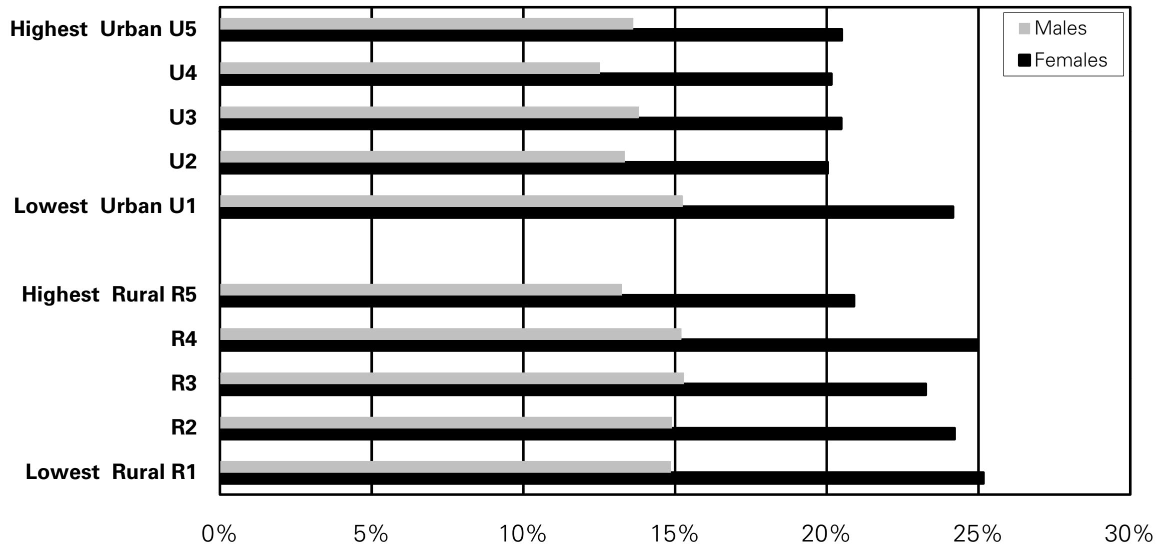
Crude percent of non-PCH seniors with 2+ prescriptions or greater than a 30 day supply, age 75+



Source: Manitoba Centre for Health Policy, 2005

Figure 11.5.3: Community-Dwelling Seniors with Benzodiazepine Prescriptions by Income Quintile, 2003/04

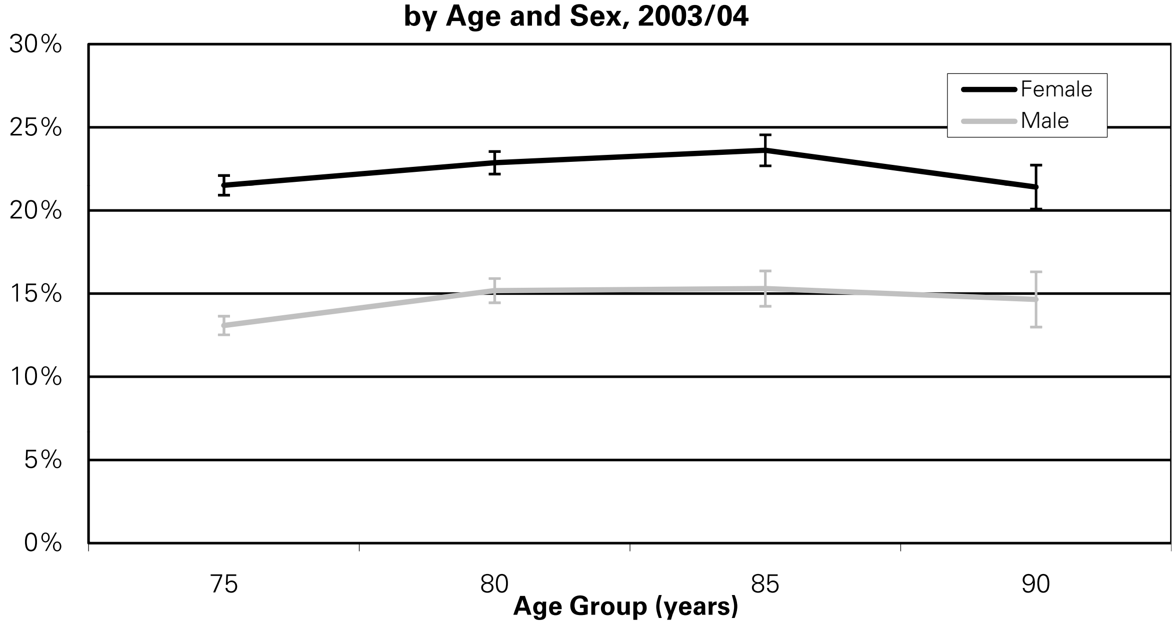
Crude percent of non-PCH seniors with 2+ prescriptions or greater than a 30 day supply, age 75+



Linear Trend Test Results
Female: Urban: Significant (p<.001) Rural: Not Significant
Male: Urban: Not Significant Rural: Not Significant

Source: Manitoba Centre for Health Policy, 2005

Figure 11.5.4: Community-Dwelling Seniors with Benzodiazepine Prescriptions by Age and Sex, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Key findings for benzodiazepine use:

Crude values by area & income group:

- Overall, and in almost all RHAs, more females than males received prescriptions for benzodiazepines (22.3% versus 14.2%, p<.001).
- There was a weak association between benzodiazepine use and area-level income: the relationship reached statistical significance only among urban females (p<.001), and was marginally significant among rural females (p=.018) and urban males (p=.022). In all three cases, those living in higher income areas were less likely to be receiving benzodiazepines.

Crude values by age & sex:

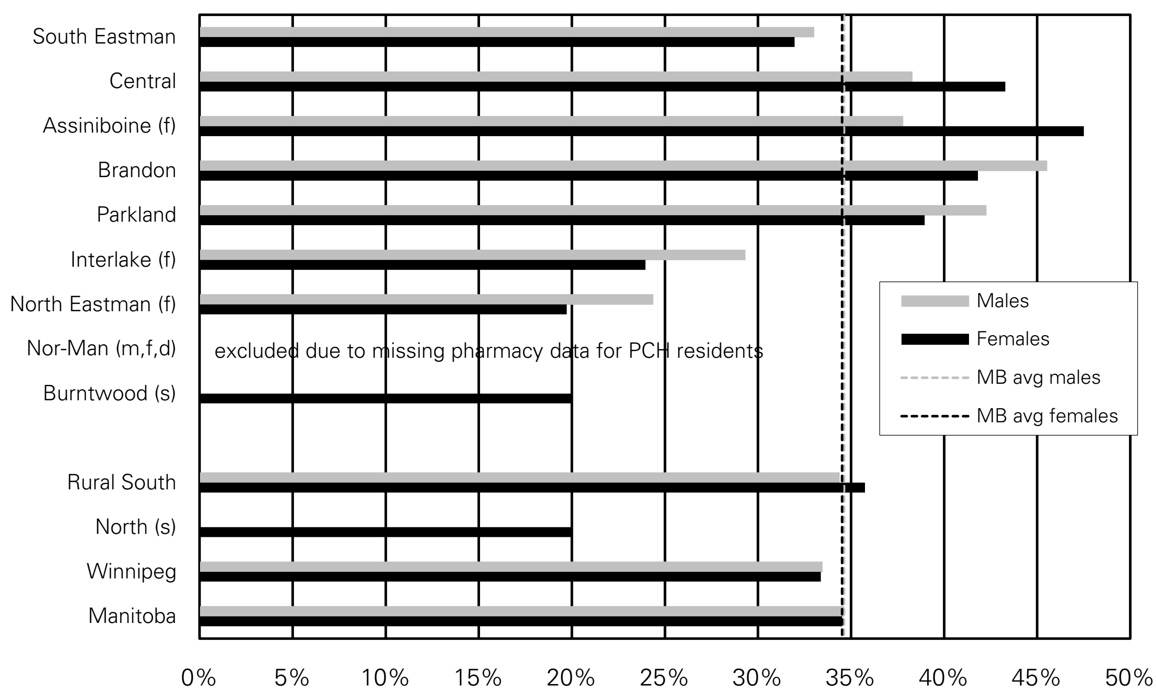
- For both males and females, the proportion of patients receiving benzodiazepine prescriptions was similar for all four age groups (75 to 79, 80 to 84, 85 to 89, and 90+).
- In all age groups, rates for females were higher than those for males.

11.6 Potentially Inappropriate Prescribing of Benzodiazepines to Older Adults in Personal Care Homes (PCH)

Definition: This is the crude percentage of PCH residents age 75+ who had at least two prescriptions, or a greater than 30 day supply of benzodiazepines in 2003/04. Long-term use of these drugs is not recommended for older patients (see Katz et al, 2004).

Figure 11.6.1: PCH-resident Seniors with Benzodiazepine Prescriptions by RHA, 2003/04

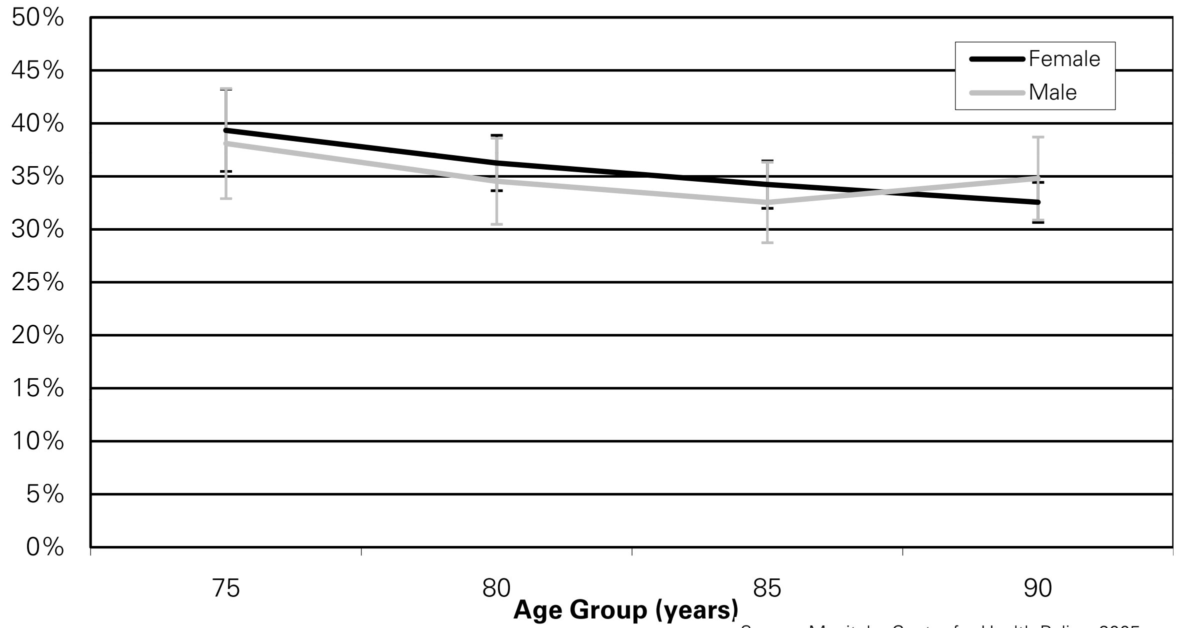
Crude percent of PCH seniors with 2+ prescriptions or greater than a 30 day supply, age 75+



'm' indicates area's rate for males was statistically different from Manitoba average for males
'f' indicates area's rate for females was statistically different from Manitoba average for females
'd' indicates difference between male and female rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Source: Manitoba Centre for Health Policy, 2005

Figure 11.6.2: PCH-resident Seniors with Benzodiazepine Prescriptions by Age and Sex, 2003/04



Source: Manitoba Centre for Health Policy, 2005

Key findings for benzodiazepine use among PCH residents:

Crude values by area:

- There was no difference in the proportion of male versus female PCH residents age 75+ receiving prescriptions for benzodiazepines (34.7% versus 34.5%, not significant).
- Analysis by income quintile was not done for this indicator, as PCH residents (and other institutionalized individuals) are not included in the Canadian census.

Crude values by age & sex:

- For both males and females, the proportion of patients receiving benzodiazepine prescriptions was similar for all four age groups (75 to 79, 80 to 84, 8 to 89, and 90+). In all age groups, rates for females and males were similar.

REFERENCES

Canadian Institute for Health Information. *Hospital Report 2003 Acute Care.* Toronto, ON: Ontario Hospital Association and the Government of Ontario. Available at : http://www.hospitalreport.ca/HospitalReport2003AcuteCare.html.

Katz A, DeCoster C, Bogdanovic B, Soodeen R. *Quality Indicators in Family Practice. Winnipeg, MB: Manitoba Centre for Health Policy,* March 2004. Available at www.umanitoba.ca/centres/mchp/ and go to "Reports".

Martens PJ, Fransoo R, McKeen N, *The Need to Know* Team, Burland E, Jebamani L, Burchill C, DeCoster C, Ekuma O, Prior H, Chateau D, Robinson R, Metge C. *Patterns of Regional Mental Illness Disorder Diagnoses and Service Use in Manitoba: A Population-Based Study.* Winnipeg, MB: Manitoba Centre for Health Policy, September 2004. Available at www.umanitoba.ca/centres/mchp/ and go to "Reports".

GLOSSARY

Angiotensin Converting Enzyme (ACE) Inhibitor Use
This is the percentage of residents who received at least one prescription for ACE Inhibitors (ATC codes C09A, C09B) in 2003/04. The primary use of ACE inhibitors is to lower blood pressure. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Acute Myocardial Infarction (AMI)
Also known as a heart attack, an acute myocardial infarction occurs when the heart muscle (the myocardium) experiences sudden (acute) deprivation of circulating blood. The interruption of blood is usually caused by narrowing of the coronary arteries leading to a blood clot. The clogging is usually initiated by cholesterol accumulating on the inner wall of the blood vessels that distribute blood to the heart muscle.

The rate of Acute Myocardial Infarctions (AMI) in residents age 40+ in 1998/99-2002/03 is defined by hospitalization (for three or more days) with ICD-9 CM diagnosis code 410 in the most responsible diagnosis field, OR, by death due to AMI, as coded in Vital Statistics. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined). Since vital statistics data are coded in ICD-10, they were converted to ICD-9-CM using the conversion table from the Canadian Institute for Health Information (CIHI). Hospitalizations for less than three days were excluded as likely 'rule out' AMI cases (see Chapter 10); transfers were tracked to ensure all 'true' AMI cases staying at least three days in hospital(s) were counted.
Note: This analysis counts the actual number of events of AMIs over the five-year period (a person can have more than one in the five-year period). This differs from previous MCHP reports where people were limited to one AMI per year.

Adjusted Rates
Most of the values shown in this report were statistically adjusted to control for different age and sex distributions of different areas – so that the rates for all areas (and for males versus females) could be fairly compared. The adjusted values shown are those which the area would have had if their age and sex distribution was the same as that for Manitoba overall. Statistical models were used to calculate these rates, and to compare male and female rates to provincial averages, as well as comparing males and females within each area. Appendix 4 provides crude (that is, unadjusted) rates and the observed number of events for all indicators.

Age Calculations

For most indicators in this report, age is calculated as of December 31 of each study year for both the numerator and the denominator. Exceptions include when there are more years of study in the numerator than in the denominator, such as diabetes treatment prevalence, in which case age is calculated as of December 31 of the denominator year. Other exceptions include cohort analyses, such as the AMI cohort, where age is calculated as of the time of an event.

Ambulatory Consultation Rate

This is the average number of ambulatory consultations to all physicians (predominantly specialists) per resident in fiscal year 2003/04. 'Consultations' are a subset of ambulatory visits: they occur when one physician refers a patient to another physician (usually a specialist or surgeon) because of the complexity, obscurity or seriousness of the condition, or when the patient requests a second opinion. A consultation can be with either a GP/FP or a specialist, after which the patient usually returns to their general practitioner or family practitioner (GP/FP) for ongoing management. The definition of a consult is a physician claim with tariff prefix = 7 and tariff codes 8516, 8550, 8553, 8554, 8556, 8557, 8594 or 8595.

The rate of consultations is a measure of 'initial' access to specialist care. People in urban areas often have much higher overall rates of specialist care, since they may continue to see the specialist rather than being referred back to their GP/FP. That is why the consultation rate, rather than the overall specialist visit rate, is used as an indicator for access to specialist care. (The specialist visit rate shows all use of specialists-whether by referral or not.)

Ambulatory Visit Rate (Physician Visits)

This is the average number of visits to all physicians (GP/FPs and specialists) per resident in fiscal year 2003/04. It includes almost all contacts with physicians: office visits, walk-in clinics, home visits, personal care home (nursing home) visits, visits to outpatient departments, and some emergency room visits (where data are recorded). Excluded are services provided to patients while admitted to hospital, and visits for prenatal care (though Section 4.7 'Physician Visit Rates by Cause' includes prenatal visits.)

This report used the August 2004 revision of programming code for ambulatory visits, which is simpler than previous MCHP programs, but provides virtually identical results. The new definition is summarized below:

Limited to prefix 7-Calls

> Includes only out of hospital claims (confirmed by checking that the person was not an inpatient at any hospital at that time).
>
> Includes only pattern of practice codes (as below)

00 Complete history and exam
01 Regional history and exam
02 Subsequent visit
05 Consultation
22 Eye test-warning or note written to the log
42 LTC-warning or note written to the log in this case
Excludes claims for pre/post partum care

Ambulatory Visit Rates to Specialists
This is the average number of ambulatory visits to specialist physicians per resident in fiscal year 2003/04. Values are adjusted to reflect the total population of Manitoba (males and females combined). Specialists include psychiatrists, pediatricians, obstetricians, gynecologists, surgeons, medical specialists and surgical specialists.

Androgen Use
This is the percentage of residents 40+ who received at least one prescription for androgens (male hormones) over five fiscal years, 1999/00–2003/04. Androgens included are Testosterone and Andropause drugs. Some androgens are naturally produced in the body and are necessary for the normal sexual development of males. Androgens are used for several reasons, such as: (i) to replace the hormone when the body is unable to produce enough on its own, (ii) to stimulate the beginning of puberty in certain boys who are late starting puberty naturally, (iii) to treat certain types of breast cancer in females. (Medline Plus; URL: http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202036.html)

Angioplasty
Also called Percutaneous Transluminal Coronary Angioplasty (PTCA), angioplasty is a procedure using a balloon-tipped catheter to enlarge a narrowing in a coronary artery. PTCA was defined as a hospitalization with ICD-9-CM procedure codes of 36.01, 36.02, or 36.05 present in any procedure field. Only claims occurring at Health Sciences Centre or St. Boniface General Hospital were included, to avoid double-counting for patients transferred to those facilities for the procedure.

Antibiotic Use
This is the percentage of people who have had at least one prescription for antibiotics (ATC codes J01 and G04A) in 2003/04 fiscal year. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Antidepressant Prescription Follow-Up

This is the crude percentage of patients with a new prescription for antidepressants (ATC codes N06AA, N06AB, N06AF, N06AG, N06AX) and a diagnosis of depression (ICD-9 CM codes 296 or 311) within two weeks of each other (it is assumed that the Rx date comes after the physician visit) who then had three subsequent ambulatory visits within four months of the prescription being filled. Note that to be included in the analysis, patients had to be alive for the entire follow-up period. One fiscal year of pharmaceutical data are used (01/12/2002–30/11/2003), but one year and four months of physician claims are used (01/12/2002–31/03/2004). Patients are defined as newly depressed over 01/12/2002–30/11/2003, with no prescription for antidepressants in one year previous to first prescription. There is a four month lag in follow-up period (01/12/2002–31/03/2004) to prevent those who are identified as newly depressed at the end of 2003/04 fiscal year from being counted as not having three ambulatory visits in four months (when they may have, but just not within the fiscal year).

Antidepressant Use

This is the percentage of residents who have had at least two prescriptions for antidepressants (ATC code N06A) in 2003/04 fiscal year. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Antidepressants are medicines used to help people who have depression. Most antidepressants are believed to work by slowing the removal of certain chemicals from the brain. These chemicals are called neurotransmitters, and are needed for normal brain function. Antidepressants help people with depression by making these natural chemicals more available to the brain. Antidepressants are typically taken for at least four to six months. In some cases, patients and their doctors may decide that antidepressants are needed for a longer time. (familydoctor.org; URL: http://familydoctor.org/012.xml)

Arthritis Treatment Prevalence

The percentage of residents aged 19 or older diagnosed with arthritis (rheumatoid or osteo-arthritis) using a combination of data in physician visits, hospitalizations, and prescription drugs, from 2002/03-2003/04:
- One or more hospitalizations, or two or more physician visits, with any ICD-9-CM code of 274, 446, 710-721, 725-729 or 739, ***or***:
- At least one physician visit with any ICD-9-CM code of 274, 446, 710-721, 725-729 or 739, and two or more prescriptions for arthritis medications (listed below).

It is expressed as a percentage because each resident is defined either as having been treated for arthritis, or not, in that period. Values are adjusted to reflect the population of Manitoba 19+ (males and females combined). This definition was taken from an MCHP report on Chronic Diseases

Definitions (Lix et al., 2005 "Defining and Validating Chronic Disease: An Administrative Data Approach". Winnipeg, MB: Manitoba Centre for Health Policy, In press..

Arthritis drugs included in this study are:

(i) Disease-modifying anti-rheumatic drugs (DMARDs)
- sulfasalazine (ATC Code A07EC01)
- minocycline (ATC Code J01AA08)
- cyclophosphamide (ATC Code L01AA01)
- methotrexate (ATC Code L01BA01)
- cyclosporine (ATC Code L04AA01)
- leflunomide (ATC Code L04AA13)
- azathioprine (ATC Code L04AX01)
- methotrexate (ATC Code L04AX03)
- sodium aurothiomalate (ATC Code M01CB01)
- auranofin (ATC Code M01CB03)
- aurothioglucose (ATC Code M01CB04)
- penicillamine (ATC Code M01CC01)
- hydroxychloroquine (ATC Code P01BA02)

(ii) Biologic response modifiers
- etanercept (ATC Code L04AA11)
- infliximab (ATC Code L04AA12)
- anakinra (ATC Code L04AA14)
- adalimumab (ATC Code L04AA17)

(iii) Narcotic analgesics in combination with acetaminophen
- oxycodone (ATC Code N02AA05)
- pentazocine (ATC Code N02AD01)
- codeine in combination (ATC Code N02BA51)
- acetaminophen (ATC Code N02BE01)
- acetaminophen in combination with codeine (ATC Code N02BE51)
- hydrocodone (ATC Code R05DA03)
- codeine (ATC Code R05DA04)
- opium alkaloids with morphine (ATC Code R05DA05)

(iv) Intra-articular glucocorticosteroids (some restrictions on route of administration apply)
- methylprednisolone (ATC Code H02AB04)
- prednisolone (ATC Code H02AB06)
- prednisone (ATC Code H02AB07)
- triamcinolone (ATC Code H02AB08)
- cortisone (ATC Code H02AB10)

(v) Nonsteroidal Anti-inflammatory drugs
- valdecoxib (ATC Code M01AH03)
- Phenylbutazone (ATC Code M01AA01)
- indometacin (ATC Code M01AB01)

- sulindac (ATC Code M01AB02)
- tolmetin (ATC Code M01AB03)
- diclofenac (ATC Code M01AB05)
- etodolac (ATC Code M01AB08)
- ketorolac (ATC Code M01AB15)
- diclofenac in combination (ATC Code M01AB55)
- piroxicam (ATC Code M01AC01)
- tenoxicam (ATC Code M01AC02)
- meloxicam (ATC Code M01AC06)
- ibuprofen (ATC Code M01AE01)
- naproxen (ATC Code M01AE02)
- ketoprofen (ATC Code M01AE03)
- fenoprofen (ATC Code M01AE04)
- flurbiprofen (ATC Code M01AE09)
- tiaprofenic acid (ATC Code M01AE11)
- oxaprozin (ATC Code M01AE12)
- mefenamic acid (ATC Code M01AG01)
- celecoxib (ATC Code M01AH01)
- rofecoxib (ATC Code M01AH02)
- nabumetone (ATC Code M01AX01)
- antiinflammatory agents for topical use (ATC Code M02AA)
- capsicum (ATC Code M02AB01)
- dimethyl sulfoxide (ATC Code M02AX03)

(vi) Other
- hyaluronic acid (ATC Code M09AX01)
- diflunisal (ATC Code N02BA11)
- acetylsalicylic acid (ATC Code N02BA01)
- choline salicylate (ATC Code N02BA03)

Asthma Care: Controller Medication Use
This is the crude percentage of asthmatics (defined as a repeat prescription, i.e. two or more, for Beta 2-agonists, ATC codes R03AA, R03AB or R03AC) who filled a prescription for medications recommended for long-term control of asthma over 2003/04 fiscal year. These include inhaled corticosteroids (ATC code R03BA), or Leukotriene modifiers (ATC code R03DC).

Anatomical Therapeutic Chemical (ATC) Classification
A widely used drug classification system, derived from W.H.O.'s Collaborating Centre for Drug Statistics Methodology. The drugs are divided into different groups at five levels according to the organ or system on which they act and/or therapeutic and chemical characteristics: 1) anatomical group; 2) therapeutic main group; 3) therapeutic/pharmacological subgroup; 4) chemical/therapeutic/pharmacological subgroup; and 5) subgroup for chemical substance. (MCHP Glossary)

Benzodiazepines
See Potentially Inappropriate Prescribing of Benzodiazepines to Older Adults (75+).

Bypass Surgery – CABG (Coronary Artery Bypass Graft)
This is the rate of surgeries performed per 1,000 area residents age 40+ in 1999/00–2003/04 fiscal years. CABG is defined as ICD-9-CM procedure codes 36.1 to 36.16 or 36.19 in any procedure field (coded in a tertiary hospital only, to avoid double-counting of transferred patients).
CABG surgery is performed on patients with significant narrowing or blockage of heart arteries (coronary artery disease) to create new routes around narrowed and blocked arteries, permitting increased blood flow to deliver oxygen and nutrients to the heart muscles.

Calendar Year
A calendar year runs from January 1 to December 31.

Cardiac Catheterization
This is the rate of cardiac catheterizations per 1,000 residents age 40+ in 2001/02–2003/04 fiscal years. Cardiac Catheterization is defined by ICD-9-CM procedure codes 37.21 to 37.23, and 88.52 to 88.57 in any procedure field in a hospital abstract. A person could be catheterized more than once in this time frame, and each would be counted as a separate event. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined).

The most accurate method (the "gold standard") for evaluating and defining coronary artery disease (CAD), cardiac catheterization is used to identify the exact location and severity of CAD. During cardiac catheterization, a small catheter (a thin hollow tube with a diameter of 2–3 mm) is inserted through the skin into an artery in the groin or the arm. Guided with the assistance of a fluoroscope (a special x-ray viewing instrument), the catheter is then advanced to the opening of the coronary arteries, the vessels supplying blood to the heart. When the catheter is used to inject radiographic contrast (a solution containing iodine, which is easily visualized with x-ray images) into each coronary artery, the cardiac catheterization is termed coronary angiography. Coronary angiography is usually performed in conjunction with cardiac catheterization. The images that are produced are called the angiogram. Angiographic images accurately reveal the extent and severity of all coronary arterial blockages.

Cataract Surgery
This is the rate of cataract replacements per 1,000 residents age 50+ in 2001/02–2003/04. Cataract surgery is defined from hospital records, using ICD-9-CM procedure codes 13.11, 13.19, 13.2, 13.3, 13.41, 13.43, 13.51

or 13.59 in any procedure field. Values are adjusted to reflect the population of Manitoba age 50+ (males and females combined). Note: this definition uses information from hospital records only, not physician claims. Therefore, procedures performed in private clinics outside Manitoba are not included in this analysis. The number of such procedures has always been relatively low, and has been declining since 2001.

Cataracts occur when the lens of the eye becomes cloudy and normal vision is impaired. There are many causes of cataracts including (but not limited to) cortisone medication, trauma, diabetes, and aging. The symptoms of cataracts include double or blurred vision and unusual sensitivity to light and glare. The clouded lens is removed in its entirety by surgery and replaced with an intraocular lens made of plastic, an operation that takes about an hour and usually does not need overnight stay in hospital.

Colitis
See Inflammatory Bowel Disease

Complete Physical Exams
This is the percentage of residents who received at least one Complete History and Physical Examination in fiscal year 2003/04. This was defined as an ambulatory visit with any of the following physician tariff codes: 8450, 8460, 8495, 8498, 8499, 8500, 8540, or 8594. These tariff codes refer to 'complete' physical exams of the entire body-not regional exams or specialty-specific histories. (The various physician tariff codes cover different age groups, specialties of physicians, and whether the exam included a Papanicolaou smear or not.) Values are adjusted to reflect the total population of Manitoba (males and females combined).

Computed Tomography (CT) Scans
This is the rate of CT scans performed per 1,000 area residents, regardless of the location of the scan. Data are taken from medical claims for 2001/02–2003/04, using physician tariff codes 7112-7115 or 7221-7230. Values are adjusted to reflect the total population of Manitoba (males and females combined).
Note: These results undercount the actual number of procedures provided to residents of many areas because of the lack of individual-level data collection & reporting associated with rural CT scanners (Brandon, Dauphin, Thompson, Boundary Trails, Steinbach, Selkirk and The Pas).

Computerized tomography (CT) scans are pictures of structures within the body created by a computer that takes the data from multiple X-ray images and turns them into pictures on a screen. The CT scan can reveal some soft-tissue and other structures that cannot even be seen in conventional X-rays.

Using the same dosage of radiation as that of an ordinary X-ray machine, an entire slice of the body can be made visible with about 100 times more clarity with the CT scan.

Continuity of Care
This is the percentage of residents receiving at least 50% of their ambulatory visits from the same physician, among those with at least three visits in the two year period 2002/03–2003/04. For children 0 to 14, it could be a GP/FP or a Pediatrician; for those 15 to 59, only GP/FPs were used; for those 60+, it could be a GP/FP or an Internal Medicine specialist. Values are adjusted to reflect the total population of Manitoba (males and females combined). Residents with less than three ambulatory visits over the two-year period are excluded.

Crohn's Disease
See Inflammatory Bowel Disease

Crude Rate
The number of persons with a given condition, divided by the number of persons living in that area, and multiplied by 1,000 to give a rate per 1,000. In contrast to adjusted rates, crude rates are helpful in figuring out how many people are walking through the door for treatment.

Data Suppression
Data was suppressed when the cell count was five or less. Data is not suppressed when the actual event count is zero.

Days of Hospital Care
The total number of days of hospital care used by all residents of a given region within 2003/04 fiscal year. Analysis in this report was separated into short stay days and long stay days; stays less than 30 days were considered short stays, while stays of 30 days or more were considered long stays.

Diabetes Care: Annual Eye Exams
This is the percentage of diabetics age 20 to 79 that had an eye exam in 2003/04 fiscal year. A person is considered diabetic with the presence of diagnosis code 250 in one hospitalization or two physician claims in three years, 2001/02–2003/04.

Diabetes Treatment Prevalence
The percentage of residents aged 20 to 79 diagnosed with Diabetes in at least two physician visits or one hospitalization (ICD-9-CM code 250) during the three year period 2001/02–2003/04. The values reflect Type I and Type II diabetes, as physician claims data do not allow separate identifica-

tion (gestational diabetes cases would also be included if coded as 250). It is expressed as a percentage because each resident is defined either as having been treated for diabetes, or not, in that period. Values are adjusted to reflect the 20- to 79-year old population of Manitoba (males and females combined).

Diabetes mellitus is a chronic condition in which the pancreas no longer produces enough insulin (Type I Diabetes) or when cells stop responding to the insulin that is produced (Type II Diabetes), so that glucose in the blood cannot be absorbed into the cells of the body. The most common endocrine disorder, Diabetes Mellitus affects many organs and body functions, especially those involved in metabolism, and can cause serious health complications including renal failure, heart disease, stroke, and blindness. Symptoms include frequent urination, fatigue, excessive thirst, and hunger. Type I Diabetes begins most commonly in childhood or adolescence and is controlled by regular insulin injections. The more common form of diabetes, Type II, can usually be controlled with diet and oral medication. Another form of diabetes called gestational diabetes can develop during pregnancy and generally resolves after the baby is delivered.

Erectile Dysfunction (ED)
Erectile dysfunction (ED) is the failure of the penis to achieve rigid erection; it is the more widely accepted medical term for impotence. (American Foundation for Urologic Disease; URL: http://www.afud.org/conditions/edglossary.asp). ED prevalence is the percentage of male residents age 40+ who received at least one prescription for erectile dysfunction drugs. These drugs include Viagra, Levitra, Cialis and similar drugs with ATC code G04BE. Prevalence is calculated for two separate years, 1990/2000 (the first year of their availability) and 2003/04, to examine the change in use over time. Values are adjusted to reflect the male population of Manitoba age 40+.

Fiscal Year
The fiscal year starts on April 1 and ends the following March 31. For example, the 2003/04 fiscal year would be April 1, 2003 to March 31, 2004, inclusive.

General Practitioner/Family Practitioner (GP/FP)
A physician who operates a general or family practice, and is not certified in another specialty in Manitoba.

Heart Attack – see Acute Myocardial Infarction

Hip Fracture Hospitalization Rate
This indicator reports hospitalization rates for hip fracture (ICD-9-CM code 820) among residents age 40+, during the five year period 1999/2000–2003/04. In the overwhelming majority of cases, residents experiencing hip fracture will be hospitalized, but it remains possible that some cases might not be hospitalized, and would therefore not be captured by this definition. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined).

Hip Replacement
This is the number of total hip replacements (or total revisions of previous replacements) performed per 1,000 residents age 40+. Hospital abstracts were used to define procedures done in 1999/00–2003/04 using ICD-9-CM procedure codes 81.50, 81.51 or 81.53. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined).

During hip replacement surgery, the ball and socket of the hip joint are completely removed and replaced with artificial materials. A metal ball with a stem (a prosthesis) is inserted into the femur (thigh bone) and an artificial plastic cup socket is placed in the acetabulum (a "cup-shaped" part of the pelvis). The prosthesis may be fixed in the central core of the femur with cement. Alternatively, a "cementless" prosthesis is used which has microscopic pores that allow bony ingrowth from the normal femur into the prosthesis stem. The "cementless" hip lasts longer and is especially an option for younger patients.

Home Care
The Manitoba Home Care Program, established in 1974, is the oldest comprehensive, province-wide, universal home care program in Canada. Home Care is provided to Manitobans of all ages assessed as having inadequate informal resources to return home from hospital or to remain at home in the community. Home care services are provided free-of-charge. Reassessments at pre-determined intervals are the basis for decisions by case managers to discharge individuals from the Program or to change the type or amount of services delivered by the Home Care Program.

Home Care Days Used
This is the average annual number of days Home Care cases were open, among Manitoba residents registered in the Home Care program during 2002/03–2003/04. This indicator counts 'in-year' days only—that is, the number of days in the year that their home care case was open (maximum 365 per year). Cases still open at the end of 2003/04 were included.

Hormone Replacement Therapy (HRT) Use

Hormone Replacement Therapy (HRT) is medication containing one or more female hormones, commonly estrogen plus progestin (synthetic progesterone). Some women receive estrogen-only therapy (usually women who have had their uterus removed). HRT is most often used to treat symptoms of menopause such as "hot flashes," vaginal dryness, mood swings, sleep disorders, and decreased sexual desire. This medication may be taken in the form of a pill, a patch, or vaginal cream.

The incidence of HRT is the proportion of women starting HRT use for the first time (that is, women receiving a prescription for HRT, having not received any HRT drugs in the previous fiscal year.) Prevalence is the proportion of women using HRT medication.

HRT drugs included in this study are

(i) Natural and Semi-synthetic Estrogens
- -Ethinylestradiol (ATC Code G03CA01)
- -Estradiol (ATC Code G03CA03)
- -Estrone (ATC Code G03CA07)
- -Conjugated estrogens (ATC Code G03CA57)

(ii) Progestogens and Estrogens, fixed combinations
- -Norethisterone and estrogen (ATC Codes G03AA05, G03FA01)

(iii) Progestogens and Estrogens, sequential preparations
- -Norethisterone and estrogen (ATC Code G03FB05)

Based on early studies, many physicians used to believe that HRT might be beneficial for reducing the risk of heart disease and bone fractures caused by osteoporosis (thinning of the bones) in addition to treating menopausal symptoms. The results of the Women's Health Initiative (WHI) study have led physicians to revise their recommendations regarding HRT.
Website for the Women's Health Initiative: www.whi.org

Hospital Days used for Long Stays (30+ Days)

This is the rate of hospital days used in long stays (30+ days) per 1,000 area residents in 2003/04. Multiple admissions of the same person are counted as separate events, and all days used are summed together. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Personal Care Homes and Long-Term Care facilities are excluded (Riverview, Deer Lodge, Rehab Centre for Children and Adolescent Treatment Centre). Note that only inpatient separations are included as they have a length of stay > 0. Inpatient separations are defined by transact = 1.

Hospital Days used for Short Stays (1-29 Days)

This is the rate of hospital days used in short stays (1 to 29 days) per 1,000 area residents for 2003/04. Multiple admissions of the same person are counted as separate events, and all days used are summed together. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Personal Care Homes and Long-Term Care facilities are excluded (Riverview, Deer Lodge, Rehab Centre for Children and Adolescent Treatment Centre). Note that only inpatient separations are included as they have a length of stay > 0. Inpatient separations are defined by transact = 1.

Hospital Separation(s)
A separation from a health care facility occurs anytime a patient (or resident) leaves because of death, discharge or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions, are used because hospital abstracts for inpatient care are based on information gathered at the time of discharge. In this report, both inpatient hospital stays and surgical outpatient records are included. The words 'separation', 'discharge', and 'stay' are used interchangeably.

Hypertension Treatment Prevalence (High Blood Pressure)
The percentage of residents aged 25 or older who had at least one physician visit for hypertension in the three-year period 2001/02–2003/04. It is expressed as a percentage because each resident is defined either as having been treated for high blood pressure, or not, in that period. Hypertension is defined as the presence of ICD-9-CM diagnosis codes 401 or 402. with a tariff prefix of seven in three years of medical claims. Values are adjusted to reflect the population of Manitoba age 25+ (males and females combined).

Primary hypertension is often referred to as high blood pressure. The “tension” in hypertension describes the vascular tone of the smooth muscles in the artery and arteriole walls. It accounts for over 90% of all cases of hypertension in the U.S. and develops without apparent causes. Hypertension is a major health problem, especially because it often has no symptoms. If left untreated, hypertension can lead to heart attack, stroke, enlarged heart, or kidney damage.

Hysterectomy
A surgical operation to remove the uterus and, sometimes, the cervix. Removal of the body of the uterus without removing the cervix is referred to as a subtotal hysterectomy. Removal of the entire uterus and the cervix is referred to as a total hysterectomy. In this report, hysterectomy was defined as any hospitalization with ICD-9-CM codes of 68.4, 68.5 or 68.9 present in any procedure field.

Immunization
An intervention to initiate or increase resistance against infectious disease. The recommended immunization schedule for children changes over time; the guidelines used for this report were those recommended as of 2002/03:
One-year olds:
- 3 Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP)
- 3 Haemophilus Influenzae B (HIB)

Two-year olds:
- 4 Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP)
- 4 Haemophilus Influenzae B (HIB)
- 1 Measles, Mumps and Rubella (MMR)

Seven-year olds:
- 5 Diphtheria, acellular Pertussis, Tetanus, and Polio (DaPTP)
- 4 Haemophilus Influenzae B (HIB)
- 2 Measles, Mumps and Rubella (MMR)

Analyses for this report include only children born and continuously resident in Manitoba (approximately 90% overall; see introduction of Chapter 8).

Immunizations for Influenza
This is the proportion of residents age 65 or older who received immunization for influenza ('the flu') in 2003/04. Annual 'flu shots' are recommended for all seniors 65+, along with other target groups not analyzed in this report. Flu shots were defined by physician tariff codes 8791, 8792, 8799 in Manitoba Immunization Monitoring System (MIMS) data. This definition is slightly different than that reported by Manitoba Health: our analysis did not include physician tariff code 8793, but on re-analysis, it was determined that no claims were entered using that tariff. Values are adjusted to reflect the population of Manitoba age 65+ (males and females combined).

Influenza vaccinations are the most effective preventive measure to prevent influenza and the complications arising from it in high-risk populations, such as seniors. The Canadian National Advisory Committee on Immunization (1999) recommends influenza vaccination for people at high risk. This includes people aged 65 and above, adults and children with certain chronic medical conditions, nursing home residents, health care workers who are in contact with people in the high-risk groups, and household contacts of people at risk who either cannot be vaccinated or may respond inadequately to vaccination. Influenza vaccination is available free of charge in Manitoba for the target groups identified by the National Advisory Committee on Immunization.

Immunizations for Pneumonia
This is the proportion of residents age 65 or older who received a pneumococcal immunization in the four years for which data are available,

2000/01–2003/04. For most seniors, a pneumococcal immunization is considered a 'once in a lifetime' event, so these rates show the 'cumulative' percent of residents who've ever had a pneumococcal immunization, as defined by physician tariff codes 8681-8684 and 8961 in MIMS data. Values are adjusted to reflect the population of Manitoba age 65+ (males and females combined).

Pneumonia is an inflammation of the lungs caused by a bacterial, viral, or fungal infection. Lobar pneumonia affects a section (lobe) of a lung. Bronchial pneumonia (or bronchopneumonia) affects patches throughout both lungs. Bacterial pneumonia in adults is commonly caused by a bacterium called Streptococcus pneumoniae or Pneumococcus.
(from MEDLINEplus® Medical Encyclopedia).

Incidence
Incidence is the number of new cases of a given event over a specified time period. The incidence rate uses only new cases in the numerator; individuals with a history of the condition are not included. The denominator for incidence rates is the population at risk. Even though individuals who have already developed the condition should be excluded from the denominator, incidence rates are often expressed based on the average population rather than the population at risk. In the case of chronic conditions, where most people appear to be at risk, the distinction between populations at risk and the whole population appears to be less critical.

Income Quintiles
An income quintile divides the population into five income groups (from lowest income to highest income) such that 20% of the population is in each group. The quintiles are based on enumeration area (EA) or dissemination area (DA) level average household income values from a public-use census files. We have created income quintiles within two population groups: urban (Winnipeg and Brandon) and rural (other Manitoba areas). Each person within an EA is "attributed" the average household income of the EA, so this is not an individual income but rather an area-level income measure.

Infertility Treatment Prevalence
The percentage of residents age 15 to 55 receiving at least one diagnosis of Infertility (ICD-9-CM code 606 for males, 628 for females) during ambulatory visits to physicians in 1999/00–2003/04. It is expressed as a percentage because each resident is defined either as having been treated for Infertility, or not, in that period. Values are adjusted to reflect the total population of Manitoba. The coding of infertility in medical records is known to be incomplete, so not all cases are identified by this indicator. Values are adjusted to reflect the 15- to 55-year old population of Manitoba (males and

females combined).
The inability to conceive after a year of unprotected intercourse in women under 35, or after six months in women over 35, or the inability to carry a pregnancy to term. Also included are diagnosed problems such as anovulation, tubal blockage, low sperm count, etc.
(The InterNational Council on Infertility Infomation Dissemination, Inc. URL: http://www.inciid.org/article.php?cat=glossary&id=62)

Inflammatory Bowel Disease (IBD) Treatment Prevalence
The percentage of residents diagnosed with Crohn's Disease and/or Colitis. Only residents who had been in the province for all of 2003/04 are included. Persons resident in Manitoba for two years or more were identified as having IBD if they had at least five diagnoses of Crohn's disease or Colitis (ICD-9-CM codes 555 or 556) in 10 years of hospital or medical claims (1994/95-2003/04). Persons resident in Manitoba for less than two years were identified as having IBD if they had three or more diagnoses. Values are adjusted to reflect the total population of Manitoba (males and females combined). This definition was developed and validated by a clinical research group (see Chapter 3).

Influenza Vaccinations
Influenza vaccinations are the most effective preventive measure to prevent influenza and the complications arising from it in high-risk populations, such as seniors. The Canadian National Advisory Committee on Immunization (1999) recommends influenza vaccination for people at high risk. This includes people aged 65 and above, adults and children with certain chronic medical conditions, nursing home residents, health care workers who are in contact with people in the high-risk groups, and household contacts of people at risk who either cannot be vaccinated or may respond inadequately to vaccination. Influenza vaccination is available free of charge in Manitoba for the target groups identified by the National Advisory Committee on Immunization. For this report, influenza vaccinations were defined as the presence of any of the following tariff codes: 8791, 8792, or 8799 in the medical services (physician claims) data.

International Classification of Disease (ICD) Chapters
The 9th version of the ICD coding system (with Clinical Modifications) was developed by the World Health Organization (WHO) and is used to classify diseases, health conditions and procedures. The chapters are (1) Infectious and parasitic Diseases, (2) Neoplasms (i.e. Cancer), (3) Endocrine, Nutritional and Metabolic Diseases, (4) Diseases of the Blood and Blood-forming Organs, (5) Mental Disorders, (6) Diseases of the Nervous System and Sense Organs, (7) Diseases of the Circulatory System, (8) Diseases of the Respiratory System, (9) Diseases of the Digestive System,

(10) Diseases of the Genitourinary System, (11) Complications of Pregnancy, Childbirth and the Puerperium, (12) Diseases of the Skin and Subcutaneous Tissue, (13) Diseases of the Musculoskeletal System and Connective Tissue, (14) Congenital Anomalies, (15) Certain Conditions Originating in the Perinatal period, (16) Symptoms, Signs and Ill-Defined Conditions, and (17) Injury and Poisoning. Analyses performed 'by cause' also include an 18th group for services related to pregnancy and childbirth.

Ischemic Heart Disease (IHD) Treatment Prevalence
The proportion of residents age 19+ diagnosed with Ischemic Heart Disease (IHD), defined by a combination of data in physician visits, hospitalizations, and prescription drugs, from 2002/03–2003/04 fiscal years:

- One or more hospitalizations with one of diagnosis codes 410, 411, 412, 413 or 414 in any diagnosis field over two years of data, OR,
- Two or more physician claims with one of diagnosis codes 410, 411, 412, 413 or 414 over two years of data, OR,
- One or more physician claim with one of diagnosis codes 410,
- 411, 412, 413 or 414 AND 2+ Rx for IHD drugs over two years of data.

IHD drugs included in this study are:

- Cardiac therapy (ATC Code C01)
- Beta-blocking agents (ATC Code C07)
- Calcium channel blockers (ATC Code C08)
- Agents acting on the rennin-angiotensin system(ATC Code C09)
- Serum lipid reducing agents (ATC Code C10)

Values are adjusted to reflect the population of Manitoba age 19+ (males and females combined).

Ischemia is a condition in which the blood flow (and thus oxygen) is restricted to a part of the body. Cardiac ischemia is the name for lack of blood flow and oxygen to the heart muscle. Thus, the term 'ischemic heart disease' refers to heart problems caused by narrowed heart arteries. When arteries are narrowed, less blood and oxygen reaches the heart muscle. This is also called coronary artery disease and coronary heart disease. It can ultimately lead to heart attack.

Knee Replacement
This is the number of total knee replacements performed per 1,000 residents in 1999/00–2003/04 age 40 years or older. Knee replacement procedures are defined as ICD-9-CM procedure codes 81.54 or 81.55 in any procedure field in the hospital abstracts. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined)

In knee replacement surgery, parts of the knee joint are replaced with artificial parts. The surgery is done by separating the muscles and ligaments around the knee to expose the inside of the joint. The ends of the thigh bone (femur) and the shin bone (tibia) are removed as is often the underside of the kneecap (patella). The artificial parts are then cemented into place. The new knee typically has a metal shell on the end of the femur, a metal and plastic trough on the tibia, and sometimes a plastic button in the kneecap.

Level of Care on Admission to Personal Care Homes (PCH)
This is the distribution of new cases being admitted to provincial PCHs (i.e. nursing homes) in 2003/04, by level of care (1–4) at admission. Level 1 represents the lowest level of need, and Level 4 represents the highest.

Life Expectancy at Birth
This is the expected length of life from birth, based on the mortality of the population, using Vital Statistics records for the preceding five years (1999-2003). Values are not adjusted like other indicators; they are calculated directly from the mortality experience of local residents using a 'life table' approach. Statistical testing for differences across areas and between sexes cannot be done on life expectancy values.

Linear Trend Test
To test associations between indicator values and area-level income data, contrasts were calculated from the parameter estimates of the model to estimate linear trends for each sex and income area (either urban or rural). To test for a linear trend among five categorical levels of income within each urban or rural area, the contrast coefficients have the pattern: -2 -1 0 1 2. The end points are given an equal weight that is higher than the weight given to the second and fourth quintiles. The contrast must be balanced and sum to zero, thus the third level of income is ignored. The first and last quintiles as well as the second and fourth quintiles are compared to see if there is a linear increase or decrease. The p-value generated from the contrast indicates if there is a statistically significant linear trend present for the specified sex and income area.

Long-Stay Days
The total number of days of hospital care used for stays of 30 days or longer in 2003/04 fiscal year.

Long-Stay Days by Cause
The total number of days of hospital care used for stays of 30 days or longer in 2003/04 fiscal year by ICD-9 CM chapters. Note that the most responsible diagnosis (DX01) is used to define cause of hospitalization.

Lower Limb Amputations with Comorbid Diabetes

The removal of the lower limb (below or including the knee) by amputation, in combination with a diagnosis of diabetes, per 1,000 area residents age 20 through 79 (denominator includes both diabetics and non-diabetics). Amputation is defined by ICD-9-CM procedure codes 84.1-84.17 in any procedure field over five years of hospitalizations, 1999/00–2003/04. The hospital abstract for the amputation must be combined with a diagnosis of diabetes in any diagnosis field, defined by ICD-9 CM diagnosis code 250. This definition does not include all amputations, but only those for which there was an existing condition of diabetes coded with the amputation. Amputations due to accidental injury (defined by ICD-9-CM diagnosis codes 895, 896, 897) were excluded. Values are adjusted to reflect the 20 to 79 year old population of Manitoba (males and females combined).

Magnetic Resonance Imaging (MRI) Scans

This is the rate of MRI scans performed per 1,000 area residents during 2001/02–2003/04 fiscal years. There are MRI scanners at St. Boniface Hospital and Health Sciences Centre in Winnipeg, plus one in Brandon (another unit has been approved for installation at Boundary Trails Health Centre, but was not operational in 2003/04). Data are taken from medical claims, using physician tariff codes 7501-7528. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Another way to take pictures of the inside of the body, MRI uses magnetism and radio waves. It produces much more detailed images than X-rays because of its ability to separate different types of soft tissues. MRI uses the magnetic properties of the nuclei of the atoms in the body. When radio waves are sent to a specific part of the body, the atoms emit their own radio waves, or energy. This energy is detected, and a computer translates the energy into images. MRI can be used to look at any area of the body, and is especially useful in diagnosing disease within the soft tissues of the head, spinal cord, kidneys, urinary tract, pancreas, and liver. MRIs are also the procedure of choice to detect sports injuries involving tendon and ligament damage. (URL: http://www.nlm.nih.gov/medlineplus/mriscans.html)

Modeling and Estimation of Rates

To estimate and compare rates of events in this report, the count of events for each indicator was modeled using a Poisson or negative binomial distribution, depending on which distribution provided the best model fit. Relative risks were estimated for each region and for each sex within each region. Parameters included in the model consisted of region, sex, age, a region by sex interaction, and if age was modeled as a continuous variable, then both the linear and quadratic terms were included. The reference groups for region and sex were Manitoba and male/female combined sex, respectively. If age was modeled as a categorical variable, then the oldest age group was used as a reference group. To estimate relative risks of rates rather than events, the log of the population count in each region by sex by age stratum was included in the model as an offset.

Contrasts were calculated from the parameter estimates of the model to calculate relative risks for each region as well as for each sex within each region. These contrasts also compared the relative risk for each region (or for each sex within each region) to the overall provincial relative risk. The values obtained from the contrasts were actually a linear combination of the natural logarithm of the parameter estimates, so an exponential transformation was necessary to obtain a tangible relative risk of events. Finally, the estimated rates were calculated by multiplying the Manitoba overall crude rate by the appropriate relative risk estimate.

Mortality Rates
See Total Mortality Rates

Mortality Rates by Cause
This is the adjusted rate of deaths in 1994–2003 calendar years by chapters of the International Classification of Diseases system (ICD-9-CM). Not all chapters are given if deaths for some categories are rare.

North
"North" is an aggregate geography which includes all of the northern RHAs; that is, Nor-Man, Burntwood, and Churchill.

Number of Different Drugs
This is the average number of different drugs prescribed in 2003/04 to each resident who had at least one prescription in the year. Each pharmaceutical agent that falls under a different fourth-level ATC class is counted as a new drug for each resident (see also Anatomical Therapeutic Chemical Classification). A person could have several prescriptions for one particular drug, but this would only count as one drug. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Open Home Care Cases ('Prevalence')
This is the number of open cases of home care service per year in the two year period 2002/03–2003/04, per 1,000 area residents. A person may have more than one home care case in this period, and each would be counted as a separate case. Values are adjusted to reflect the total population of Manitoba (males and females combined).

The Manitoba Home Care Program, established in 1974, is the oldest comprehensive, province-wide, universal home care program in Canada. Home care is provided without fees to Manitobans of all ages assessed as having inadequate informal resources to return home from hospital or to remain in the community. Reassessments at pre-determined intervals are the basis for decisions by case managers to discharge individuals from the program or to change the type or amount of services delivered by the home care program.

Personal Care Homes (PCHs)
Personal care homes, sometimes referred to as nursing homes, are residential facilities for persons with chronic illness or disability, predominantly older residents. In Manitoba, personal care homes can be proprietary (for profit) or non-proprietary. Non-proprietary homes can be secular or ethnocultural (associated with a particular religious faith or language other than English) as well as either freestanding or juxtaposed with an acute care facility.

Pharmaceutical Drug Use
This is the percentage of residents who have had at least one prescription dispensed in 2003/04 fiscal year. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Physician Visits
See 'Ambulatory Visits'

Post-Acute Myocardial Infarction (AMI) Care: Beta-Blocker Prescribing
This is the crude percentage of patients with a diagnosis of Acute Myocardial Infarction (ICD-9 CM diagnosis code 410) in five years of hospital abstracts (01/04/1999–30/11/2003) who filled at least one prescription for a beta-blocker (ATC codes C07AA, C07AB) within four months of their AMI. To be included in the denominator, patients had to be alive for the entire follow-up period. Five fiscal years of pharmaceutical data are used (01/04/1999–31/03/2004), but only four years and eight months of hospital abstracts are used (01/04/1999–30/11/2003). There is a four month lag of pharmaceutical data to prevent those who had their AMI at the end of 2003/04 fiscal year being counted as not receiving beta-blockers, when they may have. Exclusions include those with a diagnosis of asthma (ICD-9 CM diagnosis code 493), COPD (ICD-9 CM diagnosis codes 491 or 492) or peripheral vascular disease (ICD-9 CM diagnosis code 443 or 459).

Beta-blockers, properly known as beta-adrenergic blocking drugs, have been shown to lower the risk of subsequent heart attacks. These are identified by the Anatomical Therapeutic Chemical (ATC) drug classification codes: C07AA, C07AB.

Potentially Inappropriate Prescribing of Benzodiazepines to Older Adults (75+)
The crude percentage of seniors age 75+ who had at least two prescriptions for Benzodiazepines or a greater than a 30 day supply in 2003/04 fiscal year. Separate rates are provided for community-dwelling seniors, and those resident in Personal Care Homes (PCH).

The benzodiazepine family of depressants is used therapeutically to produce sedation, induce sleep, relieve anxiety and muscle spasms, and to prevent seizures. In general, benzodiazepines act as hypnotics in high doses, anxiolytics in moderate doses, and sedatives in low doses. Short-acting benzodiazepines are generally used for patients with sleep-onset insomnia (difficulty falling asleep) without daytime anxiety. Benzodiazepines with a longer duration of action are utilized to treat insomnia in patients with daytime anxiety. Repeated use of large doses or; in some cases, daily use of therapeutic doses of benzodiazepines is associated with amnesia, hostility, irritability, and vivid or disturbing dreams, as well as tolerance and physical dependence. The withdrawal syndrome is similar to that of alcohol and may require hospitalization. Abrupt cessation of benzodiazepines is not recommended and tapering-down the dose eliminates many of the unpleasant symptoms.

Potential Years of Life Lost (PYLL)
This is the number of potential years of life lost among area residents dying between the ages of 1 and 74 years, per 1,000 residents age 1 to 74 in 1994–2003 calendar years. For each death before age 75, the PYLL value is calculated as: 75-age at death. For example, a person dying at age 25 has lost 50 (75 minus 25) years of life. The rates are adjusted to reflect the 1- to 74-year old population of Manitoba (males and females combined).

PYLL is an indicator of early death (before age 75), which gives greater weight to deaths occurring at a younger age than to those at later ages. PYLL emphasizes the loss to society of the potential contribution that younger individuals can make. By emphasizing the loss of life at an early age, PYLL focuses attention on the need to deal with the major causes of early deaths, such as injury, in order to improve health status.

Premature Mortality Rate (PMR)
This is the rate of deaths among residents 0 to 74 years, per 1,000 residents age 0 to 74 years, over 1994–2003 calendar years. Values are adjusted to reflect the 0 to 74 population of Manitoba (males and females combined). Ten years of data were used instead of the usual five, because values here are calculated separately for males and females in each area, and dividing the population in half decreases the 'power' of the statistical analysis to indicate differences among areas and between sexes

Premature mortality rates are often used as an overall indicator of population health, and are correlated with other commonly used measures (see Chapter 2).

Prevalence
The term prevalence refers to the proportion of the population that 'has' a given disease at a given time. The administrative data used for this study do not directly indicate who 'has' a disease, but rather who received health services 'treatment' for that disease; that is, they received some combination of physician visits, hospitalizations, or prescription drugs. Therefore, we call our indicators **Treatment Prevalence** values, as they reflect the use of health services for that disease.

Region of Residence
Virtually all analyses in this report allocate health service use to the area where the patient who received the service lived, regardless of where the service was provided. For example, if a resident of Interlake RHA travels to Winnipeg for a physician visit, that visit contributes to the visit rate for Interlake residents.

With claims-based analyses, more than one record per person is possible. The residence information on the first-occurring record for a given year was generally used. For individual-based analyses (selecting one record per person; e.g., Diabetes and Hypertension), the most recent or most frequently-occurring residence information was used.

Renal Failure Treatment Prevalence
The percentage of residents aged 20 or older diagnosed with renal failure (ICD-9-CM code 584, 585, or 586) in a physician visit or hospitalization in 1999/00-2003/04. Renal failure is often a complication of diabetes, but can have other causes as well. It is expressed as a percentage because each resident is defined either as having been treated for renal failure, or not, in that period. Values are adjusted to reflect the population of Manitoba age 20+ (males and females combined).

Renal failure is loss of the ability of the kidneys to excrete wastes, concentrate urine, and conserve electrolytes (Medline Plus URL: http://www.nlm.nih.gov/medlineplus/ency/article/000501.htm#top).

Residents in Personal Care Homes ('prevalence' of PCH use)
This is the number of residents age 75+ who were in a provincial PCH for at least one day in 2003/04 fiscal year, per 1,000 area residents age 75+. Values are adjusted to reflect the population of Manitoba age 75+ (males and females combined).

Rural South
"Rural South" is an aggregate area which includes all Manitoba RHAs south of the 53rd parallel, and excludes the two urban centres of Winnipeg and Brandon. The RHAs included are: South Eastman, Central, Assiniboine, Interlake, North Eastman, and Parkland.

Separation Rates for Day Surgery
This is the rate of hospital separations for day surgeries (in which a patient is not admitted to hospital), per 1,000 area residents in 2003/04 fiscal year. Multiple admissions of the same person are counted as separate events. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Separation rates for inpatient care
This is the rate of hospital separations for all inpatient cases (that is, those admitted to hospital for at least one day), per 1,000 area residents in 2003/04 fiscal year. Multiple admissions of the same person are counted as separate events. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Separation Rates for Long Stays (30+ days)
This is the rate of hospital separations for stays of 30 days or more, per 1,000 area residents in 2003/04 fiscal year. Personal Care Homes and hospitals dedicated to long-term care are excluded, though chronic care beds within acute care hospitals could not be accurately excluded, so are included in these rates. Multiple admissions of the same person are counted as separate events. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Separation Rates for Short Stays (0 to 29 days)
This is the rate of hospital separations for stays of 0 to 29 days (i.e. including day surgery cases), per 1,000 area residents in 2003/04. The majority of hospitalizations are for short stays. Multiple admissions of the same person are counted as separate events. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Short Stay Days
The total number of days of hospital care used by all residents of a given region for stays of 1 to 29 days in 2003/04 fiscal year.

Statin Use
This is the percentage of residents who received at least one prescription for statins (ATC code C10AA) in 2003/04 fiscal year. Statins are used to lower blood cholesterol levels. Values are adjusted to reflect the total population of Manitoba (males and females combined).

The major effect of statins is to lower LDL-cholesterol levels. Statins inhibit an enzyme, HMG-CoA reductase, that controls the rate of cholesterol production in the body. These drugs lower cholesterol by slowing down the production of cholesterol and by increasing the liver's ability to remove the LDL-cholesterol already in the blood. (National Heart, Lung, and Blood Institute; URL: http://nhlbisupport.com/chd1/meds1.htm)

Statistical Testing

Statistical testing was performed via contrasts in the model to determine whether regional rates were statistically significantly different from the Manitoba rate for each sex, and whether males and females within each area were statistically significantly different from each other. For RHA-level analyses, contrasts with significance level 0.01 were used; for district-level analyses, contrasts with significance level 0.005 were used.

Stent

A stent is a wire mesh tube used to prop open an artery during angioplasty. The stent is collapsed to a small diameter and put over a balloon catheter. It's then moved into the area of the blockage. when the balloon is inflated, the stent expands, locks in place and forms a scaffold. This holds the artery open. The stent stays in the artery permanently, holds it open, improves blood flow to the heart muscle and relieves symptoms (usually chest pain). (http://www.americanheart.org/presenter.jhtml?identifier=4721)

Sterilization

This is the rate of sterilization surgery (tubal ligation for females; vasectomy for males) in 1999/00–2003/04 fiscal years per 1,000 area residents age 20 to 55. Values are adjusted to reflect the 20-55 year old population of Manitoba (males and females combined). Vasectomies are defined by physician tariff code 4241 in physician claims, or ICD-9 CM procedure code 63.7 in any procedure field in hospitalizations. Tubal ligations are defined by ICD-9 CM procedure codes 66.2 or 66.3 in any procedure field of hospitalizations.

Vasectomy is a simple, painless procedure that is very effective in preventing sperm from mixing with seminal fluid, thus reducing the chance of pregnancy. Tubal ligation prevents the transport of the egg to the uterus by sealing the fallopian tubes, commonly called "having one's tubes tied." This operation can be performed laparoscopically or in conjunction with a Cesarean section, after the baby is delivered. Tubal ligation is considered permanent but reversals can be done in many cases.

Stroke Incidence (Hospitalization or Death)

This is the rate of hospitalization or death due to stroke in 1998/99–2002/03 per 1,000 residents age 40 or older. Stroke is defined by ICD-9-CM diagnosis codes 431, 434, or 436 in the most responsible diagnosis field for hospitalization, or as the cause of death in Vital Statistics files. This indicator counts events, not people, so a single person can contribute more than one event if they are hospitalized for stroke more than once in the 5 year period. This definition likely captures most 'major' strokes (all those resulting in hospitalization or death), but underestimates the total incidence rate because minor strokes do not result in death or hospitalization. Values are adjusted to reflect the population of Manitoba age 40+ (males and females combined). Since vital statistics data are coded in ICD-10, they were converted to ICD-9-CM using the conversion table from the Canadian Institute for Health Information (CIHI).

A stroke occurs when there is a sudden death of brain cells due to a lack of oxygen when the blood flow to the brain is impaired by blockage or rupture of an artery to the brain. Symptoms of a stroke depend on the area of the brain affected. The most common symptom is weakness or paralysis of one side of the body with partial or complete loss of voluntary movement or sensation in a leg or arm. Other common symptoms include speech problems, weak face muscles, numbness and tingling. A stroke involving the base of the brain can affect balance, vision, swallowing, breathing and consciousness.

Suppression
Data was suppressed when the number of persons or events involved was five or less, though data is not suppressed when the actual count is zero.

Tonsillectomy / Adenoidectomy Rates
This is the number of tonsillectomy and/or adenoidectomy procedures performed in 2001/02–2003/04 per 1,000 children aged 0 to 14 years. These procedures are defined by ICD-9-CM procedure codes 28.2, 28.3, or 28.6 in any procedure field in the hospital abstracts. Values are adjusted to reflect the 0 to 14 year old population of Manitoba (males and females combined).

Tonsils are small masses of lymphoid tissue on both sides of the back of the throat. Tonsillectomy is the surgical removal of tonsils. A tonsillectomy may be performed in cases of recurrent tonsillitis, or to treat sleep apnea and some speech disorders. Adenoids are masses of lymphoid tissue in the upper part of throat behind the nose. Adenoidectomy is the surgical removal of the adenoids.

Total Hospital Days Used
This is the rate of hospital days used per 1,000 area residents, counting all hospital admissions. Multiple admissions of the same person are counted as separate events, and all days are summed together. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Total Mortality Rate
This is the adjusted rate of deaths in calendar years 1994–2003 (i.e. the

number of deaths divided by the number of residents). Values are adjusted to reflect the total population of Manitoba (males and females combined)

Total Respiratory Morbidity (TRM) Treatment Prevalence
The percentage of residents diagnosed in 2003/04 with any of the following respiratory illnesses: asthma, chronic or acute bronchitis, emphysema, or chronic airway obstruction. These diseases were defined by the presence of at least one of ICD-9-CM codes 466, 490, 491, 492, 493, or 496, from physician visits or hospitalizations. This combination of diagnoses is used to overcome problems resulting from different physicians (or specialists) using different diagnosis codes for the same underlying illness (e.g. asthma versus chronic bronchitis). It is expressed as a percentage because each resident is defined either as having been treated for any of these diseases, or not, in that period. Values are adjusted to reflect the total population of Manitoba (males and females combined).

Total Separation Rates
This is the rate of hospitalizations per 1,000 area residents in 2003/04, counting all cases for which a hospital abstract is created (all inpatients, whether short or long stay, plus day surgery cases). Multiple admissions of the same person are counted as separate events. Values are adjusted to reflect the total population of Manitoba (males and females combined).

A separation from a health care facility occurs anytime a patient leaves because of death, discharge or transfer. The number of separations is the most commonly used measure of the utilization of hospital services. Separations, rather than admissions, are used because hospital abstracts for inpatient care are based on information coded at the time of discharge.

Use of Physicians
This is the percentage of area residents who had at least one ambulatory visit to a physician during fiscal year 2003/04. This includes visits for any reason, to any type of physician (GP/FP or specialist). This is adjusted to reflect the total population of Manitoba (males and females combined).
Urban
"Urban" is an aggregate geography which includes the two urban centres in Manitoba, Winnipeg and Brandon.

Visit Rates
See Ambulatory Visits.

APPENDIX 1: DEFINITION OF RHA DISTRICTS

Eleven Regional Health Authorities (RHAs) have been defined within Manitoba. The RHAs have the responsibility for providing for the delivery and administration of health services in specified geographic areas. The specific area definitions and responsibilities are outlined in The Regional Health Authorities Act (L.M. 1996 c. 53 - Chap. R34).

This appendix provides an overview of the RHA districts, including a discussion of the consultation and development of the districts, and a discussion of limitations and district assignment. Where necessary, specific municipal postal codes used are listed.

Andrea Zajac (Manitoba Health, Regional Support Services) provided initial district definitions June 5, 2000. The initial districts were created in consultation between Regional Support Services and each RHA during 1999/2000. Further clarifications of districts, especially for RHAs with unorganized territories were made during the summer and fall of 2001. Final discussions happened as part of *The Need to Know* Team meeting September 18, 2001. There have been two subsequent changes made to the districts after the joining of South Westman and Marquette into Assiniboine as of July 2002, and this report reflects the districts subsequent to the amalgamation. In the spring of 2004 updates where made to the central districts to better reflect delivery of services and programs within the region.

The use of these district definitions prior to 1996/97 fiscal may not be valid, or should be used with some caution. Users should also be aware of changes to postal codes over time - additions, retirement and movement. The definitions of districts based on postal codes will need to be confirmed each year.

MCHP assigns districts for the regional health authorities using the following process:

1. Assign districts initially based on municipal code as provided by Manitoba Health. First Nations (A-code municipal areas) are assigned based on postal/municipal code combination,
2. Within some areas, assign districts based on six-digit postal code. It is important to understand that postal codes alone can only be used where there is a clear distinction between communities, and where it is unlikely that individuals will use postal boxes from other communities or live on rural routes that are outside of the district.

Because of the potential cross over between districts in rural and northern areas (see point 2 above), only communities in the unorganized territories sections of Burntwood, Nor-Man and North Eastman have been assigned by postal code. Districts within Brandon and Winnipeg are also defined based on postal code, since the error associated with rural routes and postal centres is minimized because of the population size. For purposes of the present report, Winnipeg is not subdivided into districts (since the purpose of the report is to focus on rural and northern RHAs).

Further Notes:

1. The assignment of communities that fall within the unorganized territories of Burntwood are assigned by postal code. Some of these are assigned back to municipal code defined areas.
2. Assignment of Brandon districts (municipal area 026) is based on six-digit postal code. The division follows the provincial electoral boundary—north along 18th Street to the Assiniboine River, east along the Assiniboine River to 1st Street, north along 1st Street to boundary of the City of Brandon.
3. Assignment of unorganized territories and First Nations communities is based on six-digit postal code in North Eastman.
4. In Nor-Man, Cranberry Portage is divided from Kelsey by postal code.

Definitions of Districts within each RHA:

Assiniboine RHA

North 1

RM of Archie
RM of Birtle
Town of Birtle
RM of Boulton
RM of Ellice
Village of St. Lazare
RM of Hamiota
Village of Hamiota
RM of Miniota
RM of Rossburn
Town of Rossburn
RM of Russell
Town of Russell
Village of Binscarth
RM of Shellmouth
RM of Shoal Lake
Town of Shoal Lake
RM of Silver Creek
Birdtail Sioux First Nation
Gamblers First Nation
Waywayseecappo First Nation

North 2
RM of Blanshard
RM of Clanwilliam
Town of Erickson
RM of Harrison
RM of Minto
Town of Minnedosa
RM of Odanah
RM of Saskatchewan
Town of Rapid City
RM of Strathclair
RM of Park - Marquette
Keeseekoowenin First Nation
Rolling River First Nation

East 1
RM of Glenella
RM of Langford
Town of Neepawa
RM of Lansdowne
RM of North Cypress
Town of Carberry
RM of Rosedale

East 2
RM of Argyle
RM of Oakland
Village of Wawanesa
RM of Riverside
RM of Roblin
Village of Cartwright
RM of South Cypress
Village of Glenboro
RM of South Norfolk
Village of Treherne
RM of Strathcona
RM of Turtle Mountain
Town of Killarney
RM of Victoria

West 1
RM of Cameron
Town of Hartney
RM of Glenwood
Town of Souris

RM of Morton
Town of Boissevain
RM of Sifton
Town of Oak Lake
RM of Whitewater
RM of Winchester
Deloraine

West 2
RM of Albert
RM of Arthur
Town of Melita
RM of Brenda
Village of Waskada
RM of Daly
Town of Rivers
RM of Edward
RM of Pipestone
RM of Wallace
Town of Virden
Village of Elkhorn
RM of Woodworth
Oak Lake Sioux First Nation
Sioux Valley First Nation

Brandon RHA
Brandon Rural
Whitehead RM
Cornwallis RM
Elton RM

Brandon West
R7B, R7C, R7A (some)

Brandon East
R7A (most)

Burntwood RHA
Thompson
Thompson City
Lynn Lake, Leaf Rapids, South Indian Lake
Lynn Lake LGD
Leaf Rapids Town

Gillam, Fox Lake
Gillam LGD
Fox Lake First Nation

Nelson House
Nelson House First Nation

Norway House
Norway House Cree Nation

Cross Lake
Cross Lake First Nation

Island Lake
Garden Hill First Nation
Red Sucker Lake First Nation
St. Theresa Point First Nation
Wasagamack First Nation

Thicket Portage, Pikwitonei, Wabowden
Thicket Portage First Nation
Pikwitonei First Nation
Wabowden First Nation

Tadoule Lake, Brochet, Lac Brochet
Sayisi Dene (Tadoule Lake) First Nation
Barren Lands (Brochet) First Nation
Northlands (Lac Brochet) First Nation

Oxford House, Gods Lake
Oxford House First Nation
Gods Lake First Nation
Gods River First Nation

Shamattawa, York Factory, Split Lake, War Lake
Shamattawa First Nation
York Factory First Nation
Split Lake Cree Nation
War Lake First Nation

Central RHA
Seven Regions
Lakeview RM
Westbourne RM

Gladstone Town
Alonsa RM
Sandy Bay First Nation

Cartier/SFX
Cartier RM
Headingley RM
St. Francois Xavier RM

Portage
Macgregor Village
North Norfolk RM
Portage RM
Portage City
Dakota Tipi First Nation
Dakota Plains First Nation
Long Plain First Nation

Carman
Carman Town
Dufferin RM
Grey RM
Roland RM
St. Claude Village
Thompson RM

Swan Lake
Lorne RM
Notre Dame de Lourdes Village
Somerset Village
Swan Lake First Nation

Morden/Winkler
Stanley RM
Morden Town
Winkler City

Louise/Pembina
Crystal City Village
Louise RM
Manitou Village
Pembina RM
Pilot Mound Village

Altona
Altona Town
Gretna Village
Plum Coulee Village
Rhineland RM
Red River
Emerson Town
MacDonald RM
Montcalm RM
Morris RM
Morris Town
Roseau River First Nation

Churchill RHA
Churchill
Churchill

Interlake RHA
Northeast
Bifrost RM
Riverton Village
Gimli RM
Gimli Town
Dunnottar Village
Winnipeg Beach Town
Fisher LGD
Arborg Village
Unorganized Territories
Peguis First Nation
Fisher River
Jackhead First Nation

Northwest
Coldwell RM
Eriksdale RM
St. Laurent RM
Siglunes RM
Grahamdale LGD
Lake Manitoba First Nation
Fairford First Nation
Little Saskatchewan First Nation
Lake St. Martin First Nation
Dauphin River First Nation

Southeast
St. Andrews RM
Selkirk Town
St. Clements RM
Brokenhead Ojibway Nation
Southwest
Rockwood RM
Stonewall Town
Teulon Village
Rosser RM
Woodlands RM
Armstrong LGD

Nor-Man RHA

Flin Flon, Snow Lake, Cranberry Portage
Snow Lake Town
Flin Flon City
Cranberry Portage

The Pas, OCN, Kelsey
The Pas Town
Kelsey RM (Consol LGD)
Opaskwayak Cree Nation

Nor-Man Other
Unorganized Territories
Cormorant
Grand Rapids LGD
Sherridon
Grand Rapids First nation
Mosakahiken Cree Nation
Chemahawin First Nation
Mathias Colomb Cree Nation

North Eastman RHA

Bluewater
Alexander LGD (includes Belair)
Bissett
Black River
Manigotagan
Pine Falls Town
Powerview Village
Traverse Bay
Victoria Beach RM

Wanipagow
Sagkeeng (Fort Alexander) First Nation
Little Black River First Nation
Hollow Water First Nation

Brokenhead
Brokenhead
Beausejour Town
Garson Village

Iron Rose
Rennie
Reynolds RM (includes Hadashville)
Seven Sisters Falls
Whitemouth RM
Whiteshell

Springfield
Springfield RM

Northern Remote
Princes Harbour
Loon Straits
Pauingassi
Berens River First Nation
Bloodvein First Nation
Little Grand Rapids First Nation
Poplar River First Nation
Unorganized Territories

Winnipeg River
Lac Du Bonnet RM
Lac Du Bonnet Village
Pinawa LGD
Pointe du Bois
Seddon's Corner

Parkland RHA

Central District
Dauphin RM
Dauphin Town
Ethelbert RM
Ethelbert Town
Gilbert Plains RM

Gilbert Plains Village
Mossey River RM
Winnipegosis Village

East District
Lawrence RM
McCreary RM
Ochre River RM
Ste. Rose RM
Ste. Rose Du Lac Village
McCreary Village
Alonsa LGD
Waterhen First Nation
Ochi-Chak-Ko-Sipi (Crane River) First Nation
Ebb & Flow First nation

North District
Minitonas RM
Minitonas Village
Swan River RM
Swan River Town
Benito Village
Bowsman Village
Mountain LGD North
Mountain LGD South
Unorganized Territories
Sapotaweyak Cree Nation
Pine Creek First Nation
Wuskwi Sipihk (Indian Birch) First Nation

West District
Grandview RM
Grandview Town
Hillsburg RM
Shell River RM
Robin Town
Park LGD North
Tootinaowaziibeeng Treaty Reserve (Valley River) First Nation

South Eastman RHA
Central
Hanover RM
Steinbach Town

Northern
La Broquerie RM
Ste. Anne RM
Tache RM
Ste. Anne Village
Southern
Franklin RM
Piney LGD
Stuartburn LGD
Unorganized Territories
Buffalo Point First Nation

Western
De Salaberry RM
St. Pierrie Jolys Village
Ritchot RM
Niverville Village

Winnipeg
Winnipeg sub-areas are not part of this report.

APPENDIX 2: RATES OF SEX-SPECIFIC INDICATORS

Appendix Table 2.1: Hysterectomy 1999/00 – 2003/04 (females age 25+)

Region	number observed per year	crude rate per 1000	adjusted rate per 1000
South Eastman	106	6.34	6.09
Central	159	5.26	5.79
Assiniboine	140	5.77	5.48
Brandon	100	6.05	5.99
Parkland	92	6.26	6.26
Interlake	124	4.98	4.63
North Eastman	65	5.21	4.80
Churchill			
Nor-Man	39	5.44	4.87
Burntwood	56	5.31	4.89
Rural South	686	5.57	5.46
North	97	5.34	4.86
Winnipeg	971	4.16	4.23
Manitoba	1,854	4.74	4.74

income quintile groups	number observed per year	crude rate per 1000	adjusted rate per 1000
R1	118	4.82	5.10
R2	172	5.87	5.99
R3	172	5.85	6.05
R4	156	5.57	5.60
R5	162	5.52	4.74
U1	173	3.55	4.03
U2	223	4.35	4.56
U3	235	4.61	4.63
U4	226	4.69	4.79
U5	211	4.52	3.98

age groups	number observed per year	crude rate per 1000
25-29	21	0.55
30-34	93	2.40
35-39	237	5.35
40-44	387	8.41
45-49	377	8.81
50-54	234	6.23
55-59	124	4.19
60-64	100	4.22
65-69	88	4.17
70-74	84	4.09
75-79	67	3.41
80-84	29	1.92
85-89	11	1.20
90+	2	0.33

Appendix Table 2.2: Caesarean Sections 1999/00 – 2003/04 (percent of births)

Region	number observed per year	crude percent	adjusted percent
South Eastman	121	17.60%	17.68%
Central	254	19.24%	19.39%
Assiniboine	152	21.90%	22.02%
Brandon	128	22.56%	23.37%
Parkland	102	20.31%	21.53%
Interlake	133	17.19%	17.11%
North Eastman	64	13.92%	14.27%
Churchill	3	19.23%	19.95%
Nor-Man	97	22.43%	24.49%
Burntwood	161	15.35%	17.09%
Rural South	826	18.62%	18.70%
North	261	17.45%	19.00%
Winnipeg	1,351	18.73%	18.11%
Manitoba	2,567	18.71%	18.71%

income quintile groups	number observed per year	crude percent	adjusted percent
R1	280	16.36%	18.10%
R2	214	19.14%	19.82%
R3	200	18.95%	19.47%
R4	201	18.57%	18.76%
R5	189	19.87%	18.99%
U1	345	16.95%	18.16%
U2	318	18.43%	18.30%
U3	323	20.98%	20.14%
U4	270	20.10%	18.66%
U5	220	19.63%	17.20%

age groups	number observed per year	crude percent
10-14		
15-19	133	11.25%
20-24	438	14.45%
25-29	733	17.93%
30-34	762	21.52%
35-39	410	26.23%
40-44	87	30.08%
45-49	2	25.58%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 2.3: Breast Cancer Screening 2002/03 – 2003/04 (females age 50-69)

Region	number observed per year	crude percent	adjusted percent
South Eastman	1,504	60.38%	60.06%
Central	2,722	61.41%	61.15%
Assiniboine	2,552	66.46%	66.53%
Brandon	1,616	67.21%	66.86%
Parkland	1,483	64.19%	63.92%
Interlake	2,648	62.23%	62.11%
North Eastman	1,364	61.49%	61.37%
Churchill	20	46.43%	46.20%
Nor-Man	598	58.38%	58.25%
Burntwood	629	49.68%	49.14%
Rural South	12,271	62.79%	62.59%
North	1,246	53.44%	52.89%
Winnipeg	20,380	59.01%	59.17%
Manitoba	35,513	60.38%	60.38%

income quintile groups	number observed per year	crude percent	adjusted percent
R1	1,800	52.17%	52.13%
R2	2,850	63.30%	63.19%
R3	3,034	63.95%	63.90%
R4	2,715	61.98%	61.86%
R5	3,066	65.29%	65.06%
U1	2,867	47.30%	47.50%
U2	3,864	55.02%	55.34%
U3	4,732	61.69%	61.89%
U4	5,041	63.75%	63.78%
U5	5,463	66.93%	67.10%

age groups	number observed per year	crude percent
50-54	11,648	60.01%
55-59	9,763	59.44%
60-64	7,688	61.67%
65-69	6,414	61.02%

Appendix Table 2.4: Cervical Cancer Screening 2001/02 – 2003/04 (females age 18-69)

Region	number observed per year	crude percent	adjusted percent
South Eastman	3,860	65.22%	64.82%
Central	6,068	60.36%	60.20%
Assiniboine	4,372	61.98%	62.89%
Brandon	4,009	73.96%	73.84%
Parkland	2,566	59.59%	60.23%
Interlake	5,408	66.60%	67.31%
North Eastman	2,683	63.41%	64.12%
Churchill	50	43.57%	42.96%
Nor-Man	1,321	51.38%	50.70%
Burntwood	1,774	41.67%	40.32%
Rural South	24,956	62.89%	63.19%
North	3,145	45.30%	43.94%
Winnipeg	52,360	69.94%	69.87%
Manitoba	84,471	66.56%	66.56%

income quintile groups	number observed per year	crude percent	adjusted percent
R1	4,027	47.57%	47.04%
R2	5,213	58.09%	58.45%
R3	5,677	61.58%	62.38%
R4	5,928	63.28%	63.49%
R5	7,212	69.39%	69.22%
U1	9,319	62.34%	60.94%
U2	10,860	67.54%	67.07%
U3	11,676	72.33%	72.66%
U4	12,126	73.58%	73.71%
U5	12,321	75.08%	75.18%

age groups	number observed per year	crude percent
15-19	3,939	72.65%
20-24	8,962	69.24%
25-29	8,977	71.73%
30-34	9,139	71.35%
35-39	10,254	75.14%
40-44	10,607	67.70%
45-49	9,896	67.36%
50-54	8,355	64.56%
55-59	6,222	56.82%
60-64	4,549	54.74%
65-69	3,569	50.93%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 2.5: Prostatectomy 2001/02– 2003/04 (males age 50+)

Region	number observed per year	crude rate per 1000	adjusted rate per 1000	income quintile groups	number observed per year	crude rate per 1000	adjusted rate per 1000	age groups	number observed per year	crude rate per 1000
South Eastman	33	4.75	4.87	R1	45	4.30	4.08	50-54	36	0.94
Central	76	5.86	5.60	R2	82	5.97	5.26	55-59	85	2.73
Assiniboine	61	5.11	4.45	R3	79	5.67	5.22	60-64	130	5.60
Brandon	35	5.51	5.28	R4	56	4.45	4.36	65-69	179	9.19
Parkland	49	6.66	5.63	R5	73	5.75	6.78	70-74	158	9.17
Interlake	54	4.52	4.59	U1	95	5.71	5.20	75-79	156	11.27
North Eastman	41	6.72	6.85	U2	123	6.96	6.60	80-84	129	14.02
Churchill	0	0.00	0.00	U3	133	6.79	6.60	85-89	66	14.26
Nor-Man	9	3.31	3.95	U4	132	6.79	7.52	90+	18	9.37
Burntwood	12	3.58	5.00	U5	128	6.25	7.28			
Rural South	315	5.48	5.15							
North	21	3.39	3.33							
Winnipeg	585	6.63	6.78							
Manitoba	956	6.04	6.04							

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Source: Manitoba Centre for Health Policy, 2005

APPENDIX 3: OUTCOMES OF CARE INDICATORS

Appendix Table 3.1: AMI Complications 1999/00 – 2003/04 (age 15-84)

Region	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
Rural South	25	21	61.68	103.00	65.55	92.00
North	4	2	94.74	122.45	123.09	136.59
Winnipeg	40	38	90.74	148.85	95.60	131.49
Manitoba	69	61	77.41	128.34	82.56	114.89

income quintile groups	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
R1	8	5	94.04	112.20	103.15	110.32
R2	5	4	58.57	86.21	58.77	72.38
R3	4	3	41.57	78.82	43.88	71.46
R4	5	5	67.04	138.89	73.36	126.05
R5	4	4	60.40	141.73	71.76	136.79
U1	12	15	102.25	176.47	105.32	150.19
U2	10	9	93.81	138.55	99.27	120.76
U3	10	7	87.43	109.32	90.46	96.94
U4	6	5	73.81	128.71	83.90	121.56
U5	5	3	72.95	133.93	78.44	120.49

age groups	number observed per year		crude rate per 1,000	
	Males	Females	Males	Females
15-19	0	0	0.00	0.00
20-24	0	0	0.00	0.00
25-29	0	0	0.00	0.00
30-34	0	0	0.00	0.00
35-39		0		0.00
40-44				
45-49				
50-54	3		37.22	
55-59	5	2	49.90	91.60
60-64	5	4	54.88	87.38
65-69	9	7	80.07	116.44
70-74	12	11	88.24	151.43
75-79	15	16	103.11	142.86
80-84	17	19	145.97	157.72

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 3.2: AMI Readmission Rate 2-30 Days Post-AMI 1999/00 – 2003/04 (age 15-84)

Region	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
Rural South	38	19	102.68	116.50	104.59	109.52
North	3	3	81.52	170.73	90.48	176.30
Winnipeg	39	24	86.08	99.83	88.61	94.62
Manitoba	80	46	92.96	109.07	95.56	103.37

income quintile groups	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
R1	9	5	117.81	163.64	121.73	159.74
R2	6	4	74.94	117.65	74.50	108.71
R3	8	4	107.97	134.97	109.04	126.55
R4	8	4	120.74	121.02	123.92	114.03
R5	5	2	74.77	95.24	80.35	94.49
U1	12	8	109.29	101.33	111.15	93.45
U2	9	6	85.82	103.56	88.48	97.80
U3	10	5	94.80	79.73	96.80	75.28
U4	6	4	61.18	99.01	64.49	97.61
U5	7	3	88.08	110.24	90.55	105.86

age groups	number observed per year		crude rate per 1,000	
	Males	Females	Males	Females
15-19	0	0	0.00	0.00
20-24		0		0.00
25-29				
30-34				
35-39				
40-44	3		85.00	
45-49	4		54.05	
50-54	7	3	78.48	102.19
55-59	6	2	52.04	71.94
60-64	10	5	94.52	127.45
65-69	11	7	103.90	124.56
70-74	13	6	112.42	93.75
75-79	14	11	123.05	126.95
80-84	11	9	120.45	100.22

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 3.3: Rate of Cholecystectomy Complications 1999/00 – 2003/04 (age 15-84)

Region	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
Rural South	18	20	67.06	24.88	47.25	27.07
North		5		23.93		39.01
Winnipeg	20	30	55.59	29.09	44.21	30.94
Manitoba	40	55	58.34	26.93	45.07	29.89

income quintile groups	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
R1	3	7	52.63	30.82	46.16	42.49
R2	6	4	103.09	24.00	71.06	25.41
R3	3	5	51.61	27.84	36.08	28.20
R4	3	3	56.29	17.44	39.33	19.66
R5	2	2	38.02	15.00	31.50	18.15
U1	5	7	66.09	29.48	53.12	30.10
U2	5	9	66.16	37.35	50.15	38.60
U3	6	6	77.69	26.94	56.07	28.74
U4	3	7	31.25	32.14	27.60	36.79
U5	3	3	43.36	18.87	36.58	21.01

age groups	number observed per year		crude rate per 1,000	
	Males	Females	Males	Females
15-19				
20-24		2		13.24
25-29		2		10.52
30-34		3	37.63	14.61
35-39		4		17.09
40-44	2	3	33.90	15.55
45-49		4		18.15
50-54	4	5	48.72	25.93
55-59	2	4	28.82	23.58
60-64	4	4	55.05	30.79
65-69	5	4	84.64	38.85
70-74	7	6	113.33	71.26
75-79	7	7	138.89	103.66
80-84	5	6	176.06	153.85

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 3.4: Rate of Pneumonia Complications 1999/00 – 2003/04 (age 15-84)

Region	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
Rural South	37	32	55.91	59.28	54.05	61.12
North	6	8	48.87	61.31	60.88	74.18
Winnipeg	42	38	93.49	87.42	88.90	84.16
Manitoba	85	79	69.03	70.43	67.73	71.95

income quintile groups	number observed per year		crude rate per 1,000		adjusted rate	
	Males	Females	Males	Females	Males	Females
R1	11	10	58.64	55.68	61.76	65.64
R2	11	11	62.29	66.59	59.58	67.11
R3	8	8	45.84	57.58	43.26	57.22
R4	5	4	41.67	45.26	41.22	47.72
R5	5	3	67.02	52.12	72.63	56.43
U1	12	12	90.78	78.95	89.17	79.14
U2	8	9	77.78	83.81	73.97	80.03
U3	9	8	89.07	98.77	82.34	97.74
U4	7	4	105.57	68.84	100.10	66.11
U5	5	5	85.71	98.04	82.29	90.61

age groups	number observed per year		crude rate per 1,000	
	Males	Females	Males	Females
15-19		0		0.00
20-24				
25-29	0	0	0.00	0.00
30-34				
35-39				
40-44	2		34.04	
45-49	3		61.22	
50-54	3	2	60.50	35.14
55-59	3	3	47.62	40.82
60-64	8	6	80.00	68.52
65-69	7	9	55.19	86.08
70-74	11	11	71.07	81.66
75-79	22	19	92.35	94.81
80-84	24	24	92.74	114.64

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Source: Manitoba Centre for Health Policy, 2005

APPENDIX 4: CRUDE RATES AND OBSERVED NUMBERS

Appendix Table 4.1: Premature mortality, Life Expectancy

Region	Population		Premature Mortality Rate (Age 0-74)				Life Expectancy	
			Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Total Years	
	2003/04		1994-2003				1999-2003	
	Males	Females	Males		Females		Males	Females
South Eastman	29,101	28,388	77	2.94	48	1.91	78.44	82.24
Central	49,878	49,463	165	3.61	102	2.31	77.03	81.93
Assiniboine	34,639	35,021	169	5.15	93	2.94	76.23	82.61
Brandon	22,915	24,952	90	4.20	54	2.38	75.83	82.62
Parkland	21,427	21,469	104	5.09	67	3.44	76.14	80.89
Interlake	38,208	37,509	162	4.53	98	2.86	76.14	82.11
North Eastman	20,242	19,542	85	4.47	52	2.89	75.08	80.55
Churchill	530	501	2	3.69	1	2.23	74.39	75.81
Nor-Man	12,699	12,310	54	4.33	36	3.07	72.76	77.78
Burntwood	23,211	22,146	81	3.58	49	2.28	71.50	77.26
Rural South	193,495	191,392	761	4.24	459	2.66	76.53	81.86
North	36,440	34,957	138	3.84	87	2.55	71.91	77.46
Winnipeg	320,487	338,505	1,274	4.23	867	2.82	75.88	81.31
Manitoba	573,337	589,806	2,262	4.20	1,467	2.74	75.88	81.34

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.2: Total Mortality, Potential Years of Life Lost

Region	Total Mortality Rate (Age 0-74)				Potential Years of Life Lost (Age 1-74)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	1994-2003				1994-2003			
	Males		Females		Males		Females	
South Eastman	168	6.16	145	5.50	2,661	51.70	1,526	31.09
Central	398	8.24	381	7.92	5,342	59.42	2,949	33.89
Assiniboine	441	12.30	393	10.89	4,895	75.45	2,362	37.71
Brandon	204	9.01	199	8.06	2,554	60.65	1,472	32.94
Parkland	271	12.18	237	10.76	3,144	78.13	1,756	45.57
Interlake	334	8.86	270	7.35	5,074	71.87	2,845	42.20
North Eastman	159	8.04	120	6.32	3,011	80.50	1,879	53.17
Churchill	3	5.48	2	4.57	104	97.80	35	36.65
Nor-Man	91	7.10	75	6.09	1,991	81.08	1,313	56.40
Burntwood	105	4.55	70	3.21	4,493	101.22	2,592	61.74
Rural South	1,770	9.26	1,546	8.21	24,127	68.06	13,318	39.17
North	199	5.47	148	4.26	6,587	94.10	3,940	59.50
Winnipeg	2,681	8.47	2,830	8.44	38,273	64.38	24,799	40.89
Manitoba	4,853	8.57	4,723	8.10	71,541	67.42	43,528	41.16

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.3: Hypertension, Arthritis, Total Respiratory Morbidity

Region	Hypertension (Age 25+)				Arthritis (Age 19+)				Total Respiratory Morbidity			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	2001/02-2003/04				2002/03-2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	1,210	20.9%	1,420	24.6%	1,770	17.6%	2,095	21.2%	2,617	9.0%	2,664	9.4%
Central	2,128	21.4%	2,669	26.0%	2,972	17.3%	3,900	22.3%	4,174	8.4%	4,421	8.9%
Assiniboine	1,970	25.8%	2,697	33.6%	2,615	20.3%	3,429	25.8%	3,391	9.8%	3,537	10.1%
Brandon	1,147	23.4%	1,519	27.3%	1,696	20.2%	2,284	24.0%	2,916	12.7%	3,713	14.9%
Parkland	1,174	25.1%	1,536	31.6%	1,856	23.6%	2,387	29.7%	2,730	12.7%	3,114	14.5%
Interlake	2,173	26.0%	2,546	30.1%	2,591	18.5%	3,174	22.7%	3,884	10.2%	4,339	11.6%
North Eastman	1,081	24.8%	1,161	27.5%	1,512	20.7%	1,744	24.7%	2,087	10.3%	2,338	12.0%
Churchill	28	25.4%	26	24.6%	30	15.9%	39	21.8%	17	3.2%	15	3.0%
Nor-Man	440	18.0%	544	22.6%	849	20.2%	1,095	26.5%	1,156	9.1%	1,273	10.3%
Burntwood	728	19.1%	810	22.7%	1,070	15.8%	1,346	20.9%	1,604	6.9%	1,700	7.7%
Rural South	9,737	23.9%	12,030	28.9%	13,315	19.2%	16,727	24.0%	18,883	9.8%	20,413	10.7%
North	1,196	18.8%	1,379	22.7%	1,949	17.4%	2,479	23.1%	2,777	7.6%	2,988	8.5%
Winnipeg	16,062	22.5%	21,057	26.9%	21,877	18.2%	29,689	22.7%	36,688	11.4%	44,132	13.0%
Manitoba	28,142	22.8%	35,985	27.3%	38,836	18.6%	51,178	23.2%	61,264	10.7%	71,246	12.1%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.4: Diabetes, Ischemic Heart Disease, Infertility

Region	Diabetes (Age 20-79)				Ischemic Heart Disease (Age 19+)				Infertility (Age 15-55)			
	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent
	2001/02-2003/04				2002/03-2003/04				1999/00-2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	1,024	5.4%	771	4.2%	1,189	5.9%	756	3.8%	288	1.7%	479	3.0%
Central	1,902	5.9%	1,566	4.9%	1,985	5.8%	1,461	4.2%	375	1.3%	756	2.8%
Assiniboine	1,815	7.7%	1,499	6.5%	1,845	7.2%	1,286	4.8%	195	1.0%	463	2.6%
Brandon	1,140	7.3%	936	5.4%	1,055	6.3%	780	4.1%	144	1.1%	369	2.6%
Parkland	1,296	9.0%	1,168	8.3%	1,477	9.4%	1,213	7.5%	88	0.8%	309	2.8%
Interlake	2,098	7.9%	1,815	7.0%	1,805	6.4%	1,175	4.2%	293	1.4%	584	2.8%
North Eastman	1,082	7.8%	1,008	7.7%	838	5.7%	458	3.2%	137	1.2%	289	2.7%
Churchill	30	8.3%	40	11.7%	15	4.0%	19	5.4%			7	2.3%
Nor-Man	660	8.2%	768	9.9%	397	4.7%	269	3.3%	54	0.7%	213	3.0%
Burntwood	1,231	9.4%	1,616	13.1%	543	4.0%	333	2.6%	92	0.7%	370	2.9%
Rural South	9,217	7.1%	7,827	6.2%	9,139	6.6%	6,349	4.5%	1,376	1.3%	2,880	2.8%
North	1,921	8.9%	2,424	11.9%	955	4.3%	621	2.9%	149	0.7%	590	2.9%
Winnipeg	15,006	6.6%	13,682	5.7%	14,945	6.2%	12,189	4.7%	3,139	1.6%	5,970	3.0%
Manitoba	27,284	6.9%	24,869	6.2%	26,094	6.2%	19,939	4.5%	4,808	1.4%	9,809	2.9%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.5: Renal Failure, Inflammatory Bowel Disease, Heart Attack (AMI)

Region	app				Inflammatory Bowel Disease				Heart Attack (AMI) (Age 40+)			
	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	1999/00-2003/04				2003/04				1998/99-2002/03			
	Males		Females		Males		Females		Males		Females	
South Eastman	348	1.8%	294	1.5%	77	0.27%	79	0.29%	61	5.75	24	2.29
Central	656	2.0%	545	1.6%	127	0.26%	165	0.34%	121	6.20	69	3.33
Assiniboine	773	3.1%	632	2.4%	134	0.39%	155	0.45%	150	8.75	76	4.11
Brandon	390	2.4%	319	1.7%	104	0.47%	136	0.56%	77	8.16	49	4.43
Parkland	395	2.6%	349	2.2%	58	0.28%	99	0.47%	90	8.67	48	4.42
Interlake	655	2.4%	498	1.8%	131	0.35%	152	0.41%	117	6.76	65	3.68
North Eastman	350	2.4%	265	1.9%	76	0.38%	79	0.41%	48	5.39	26	3.05
Churchill	11	3.0%			0	0.00%			0	0.00	0	0.00
Nor-Man	121	1.5%	156	1.9%	36	0.29%	49	0.41%	24	5.14	14	3.19
Burntwood	233	1.8%	260	2.1%	39	0.17%	40	0.19%	33	5.55	13	2.37
Rural South	3,177	2.3%	2,583	1.9%	603	0.32%	729	0.39%	587	7.00	308	3.55
North	365	1.7%	420	2.0%	75	0.21%	92	0.27%	58	5.35	27	2.74
Winnipeg	5,120	2.2%	4,696	1.8%	1,275	0.41%	1,546	0.47%	795	5.87	558	3.56
Manitoba	9,052	2.2%	8,018	1.8%	2,057	0.37%	2,503	0.44%	1,517	6.33	943	3.56

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.6: Stroke, Hip Fracture, Lower Limb Amputation

Region	Stroke (Age 40+)				Hip Fracture (Age 40+)				Lower Limb Amputation (Age 20-79)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	1998/99-2002/03				1999/00-2003/04				1999/00-2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	42	3.98	37	3.48	14	1.30	30	2.70	5	0.29	2	0.09
Central	77	3.97	87	4.19	30	1.49	80	3.81	13	0.40	6	0.19
Assiniboine	80	4.66	87	4.72	30	1.75	84	4.53	7	0.30	6	0.25
Brandon	30	3.12	31	2.77	14	1.47	43	3.84	3	0.18	2	0.09
Parkland	61	5.85	62	5.68	14	1.37	43	3.94	13	0.91	5	0.32
Interlake	72	4.14	66	3.78	24	1.37	49	2.71	14	0.54	6	0.25
North Eastman	38	4.28	31	3.66	13	1.40	23	2.59	8	0.56	3	0.25
Churchill	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Nor-Man	15	3.21	10	2.34	6	1.26	16	3.44	5	0.64	3	0.41
Burntwood	29	4.91	23	4.40	5	0.83	15	2.79	15	1.17	9	0.74
Rural South	370	4.41	371	4.27	125	1.47	308	3.49	60	0.47	28	0.22
North	44	4.16	34	3.46	12	1.09	31	3.09	20	0.97	12	0.61
Winnipeg	374	2.76	479	3.05	195	1.41	577	3.62	70	0.31	36	0.15
Manitoba	818	3.41	914	3.46	346	1.42	960	3.57	153	0.39	77	0.19

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.7: Use of Physicians, Ambulatory Visit Rate, Complete Physical Exams

Region	Use of Physicians				Ambulatory Visit Rate				Complete Physical Exams			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	21,697	74.6%	23,932	84.3%	105,395	3.62	137,254	4.83	8,521	29.3%	11,848	41.7%
Central	36,794	73.8%	41,639	84.2%	171,908	3.45	232,401	4.70	11,983	24.0%	17,744	35.9%
Assiniboine	26,535	76.6%	30,381	86.8%	139,971	4.04	193,319	5.52	8,834	25.5%	12,960	37.0%
Brandon	18,538	80.9%	22,618	90.6%	109,733	4.79	162,654	6.52	7,834	34.2%	12,039	48.2%
Parkland	16,630	77.6%	19,057	88.8%	95,086	4.44	131,122	6.11	5,314	24.8%	7,709	35.9%
Interlake	28,976	75.8%	32,614	86.9%	147,516	3.86	196,041	5.23	13,284	34.8%	17,544	46.8%
North Eastman	15,295	75.6%	16,761	85.8%	81,472	4.02	105,840	5.42	6,863	33.9%	8,817	45.1%
Churchill	293	55.3%	366	73.1%	991	1.87	1,374	2.74	91	17.2%	118	23.6%
Nor-Man	9,196	72.4%	10,193	82.8%	48,063	3.78	64,584	5.25	2,251	17.7%	3,228	26.2%
Burntwood	15,045	64.8%	16,597	74.9%	62,830	2.71	84,396	3.81	5,124	22.1%	6,699	30.2%
Rural South	145,927	75.4%	164,384	85.9%	741,348	3.83	995,977	5.20	54,799	28.3%	76,622	40.0%
North	24,534	67.3%	27,156	77.7%	111,884	3.07	150,354	4.30	7,466	20.5%	10,045	28.7%
Winnipeg	252,136	78.7%	301,220	89.0%	1,414,089	4.41	2,000,216	5.91	128,259	40.0%	181,318	53.6%
Manitoba	441,135	76.9%	515,378	87.4%	2,377,054	4.15	3,309,201	5.61	198,358	34.6%	280,024	47.5%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.8: Continuity of Care, Ambulatory Consult Rate, Ambulatory Visit Rate to Specialists

Region	Continuity of Care				Ambulatory Consult Rate				Ambulatory Visit Rate to Specialists			
	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual
	2002/03-2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	12,668	67.0%	15,068	68.4%	5,583	0.19	7,629	0.27	18,503	0.64	22,939	0.81
Central	20,870	64.7%	25,434	65.6%	9,566	0.19	12,596	0.25	29,432	0.59	35,825	0.72
Assiniboine	16,453	67.9%	19,308	66.1%	6,505	0.19	8,657	0.25	15,537	0.45	19,595	0.56
Brandon	10,450	61.5%	13,028	59.8%	5,108	0.22	7,395	0.30	17,717	0.77	22,846	0.92
Parkland	10,396	67.9%	12,138	66.0%	4,237	0.20	6,047	0.28	8,922	0.42	10,593	0.49
Interlake	18,674	74.2%	21,803	71.9%	8,808	0.23	12,151	0.32	37,183	0.97	44,365	1.18
North Eastman	10,450	76.7%	11,606	75.1%	4,553	0.22	5,736	0.29	16,375	0.81	19,550	1.00
Churchill	225	83.6%	285	83.8%	107	0.20	118	0.24	236	0.45	227	0.45
Nor-Man	5,978	73.2%	6,414	67.7%	2,112	0.17	3,042	0.25	4,036	0.32	5,080	0.41
Burntwood	7,175	57.0%	7,582	51.3%	3,337	0.14	4,989	0.23	8,910	0.38	12,201	0.55
Rural South	89,511	69.1%	105,357	68.3%	39,252	0.20	52,816	0.28	125,952	0.65	152,867	0.80
North	13,378	63.6%	14,281	58.1%	5,556	0.15	8,149	0.23	13,182	0.36	17,508	0.50
Winnipeg	168,707	75.8%	213,616	75.6%	81,933	0.26	120,162	0.35	473,112	1.48	595,945	1.76
Manitoba	282,046	72.3%	346,282	71.7%	131,849	0.23	188,522	0.32	629,963	1.10	789,166	1.34

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.9: Total Hospital Separations, Separations for Short Stays, Separations for Long Stays

Region	Total Hospital Separations				Separations for Short Stays				Separations for Long Stays			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	2,805	96.39	4,225	148.83	2,705	92.95	4,106	144.64	101	3.47	122	4.30
Central	6,534	131.00	9,146	184.91	6,305	126.41	8,836	178.64	230	4.61	306	6.19
Assiniboine	6,021	173.82	7,965	227.43	5,800	167.44	7,651	218.47	217	6.26	310	8.85
Brandon	2,784	121.49	4,218	169.04	2,636	115.03	4,004	160.47	148	6.46	214	8.58
Parkland	3,926	183.23	5,570	259.44	3,773	176.09	5,344	248.92	153	7.14	226	10.53
Interlake	5,127	134.19	6,725	179.29	4,953	129.63	6,534	174.20	174	4.55	179	4.77
North Eastman	2,581	127.51	3,332	170.50	2,490	123.01	3,238	165.69	91	4.50	94	4.81
Churchill	86	162.26	126	251.50	83	156.60	121	241.52				
Nor-Man	1,553	122.29	2,629	213.57	1,517	119.46	2,582	209.75	39	3.07	47	3.82
Burntwood	3,526	151.91	5,974	269.76	3,465	149.28	5,909	266.82	60	2.58	67	3.03
Rural South	26,994	139.51	36,963	193.13	26,026	134.50	35,709	186.58	966	4.99	1,237	6.46
North	5,165	141.74	8,729	249.71	5,065	139.00	8,612	246.36	102	2.80	119	3.40
Winnipeg	29,941	93.42	48,370	142.89	28,139	87.80	45,717	135.06	1,803	5.63	2,668	7.88
Manitoba	64,884	113.17	98,280	166.63	61,866	107.91	94,042	159.45	3,019	5.27	4,238	7.19

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.10: Hospital Separations for Inpatient Care, Hospital Separations for Day Surgery

Region	Hospital Separations for Inpatient Care				Hospital Separations for Day Surgery			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2003/04				2003/04			
	Males		Females		Males		Females	
South Eastman	2,009	69.04	3,273	115.30	797	27.39	960	33.82
Central	4,977	99.78	7,144	144.43	1,557	31.22	2,004	40.52
Assiniboine	4,862	140.36	6,212	177.38	1,173	33.86	1,732	49.46
Brandon	1,890	82.48	2,795	112.02	894	39.01	1,428	57.23
Parkland	3,364	157.00	4,561	212.45	565	26.37	1,005	46.81
Interlake	3,923	102.67	4,998	133.25	1,196	31.30	1,732	46.18
North Eastman	1,871	92.43	2,510	128.44	708	34.98	829	42.42
Churchill	65	122.64	98	195.61	22	41.51	26	51.90
Nor-Man	1,293	101.82	2,181	177.17	263	20.71	441	35.82
Burntwood	3,156	135.97	5,282	238.51	374	16.11	700	31.61
Rural South	21,006	108.56	28,698	149.94	5,996	30.99	8,262	43.17
North	4,514	123.87	7,561	216.29	659	18.08	1,167	33.38
Winnipeg	20,411	63.69	32,614	96.35	9,548	29.79	15,786	46.63
Manitoba	47,821	83.41	71,668	121.51	17,097	29.82	26,643	45.17

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.11: Total Hospital Days Used, Hospital Days Used for Short Stays, Hospital Days Used for Long Stays

Region	Total Hospital Days Used				Hospital Days Used for Short Stays				Hospital Days Used for Long Stays			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	18,447	633.90	21,397	753.73	10,184	349.95	13,488	475.13	8,256	283.70	8,263	291.07
Central	39,708	796.10	54,428	1100.38	23,948	480.13	30,726	621.19	15,815	317.07	23,430	473.69
Assiniboine	43,914	1267.76	55,196	1576.08	24,784	715.49	30,415	868.48	18,915	546.06	24,161	689.90
Brandon	22,248	970.89	29,619	1187.04	11,179	487.85	13,958	559.39	11,141	486.19	15,786	632.65
Parkland	28,823	1345.17	36,701	1709.49	15,610	728.52	20,189	940.38	13,269	619.27	16,562	771.44
Interlake	29,545	773.27	32,381	863.29	19,096	499.79	21,118	563.01	10,406	272.35	10,867	289.72
North Eastman	14,975	739.80	17,243	882.36	8,998	444.52	10,839	554.65	5,977	295.28	6,410	328.01
Churchill	1,443	2722.64	879	1754.49	293	552.83	407	812.38	1,150	2169.81	472	942.12
Nor-Man	7,527	592.72	10,199	828.51	5,592	440.35	7,568	614.78	2,059	162.14	2,670	216.90
Burntwood	14,685	632.67	22,183	1001.67	11,143	480.07	16,164	729.88	3,317	142.91	6,093	275.13
Rural South	175,412	906.55	217,346	1135.61	102,620	530.35	126,775	662.38	72,638	375.40	89,693	468.64
North	23,655	649.15	33,261	951.48	17,028	467.29	24,139	690.53	6,526	179.09	9,235	264.18
Winnipeg	233,133	727.43	330,087	975.13	113,622	354.53	153,331	452.97	119,720	373.56	177,396	524.06
Manitoba	454,448	792.64	610,313	1034.77	244,449	426.36	318,203	539.50	210,025	366.32	292,110	495.26

Appendix Table 4.12: Cataract Surgery, Hip Replacement, Knee Replacement

Region	Cataract Surgery (Age 50+)				Hip Replacement (Age 40+)				Knee Replacement (Age 40+)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2001/02-2003/04				1999/00-2003/04				1999/00-2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	109	15.69	159	22.17	12	1.12	13	1.22	20	1.85	32	2.94
Central	216	16.63	318	22.24	29	1.44	37	1.76	37	1.88	57	2.72
Assiniboine	260	21.67	455	33.63	27	1.58	37	2.00	39	2.28	56	3.03
Brandon	169	26.29	302	38.86	13	1.37	16	1.43	20	2.07	19	1.70
Parkland	80	10.85	121	15.03	15	1.46	19	1.70	24	2.33	35	3.19
Interlake	184	15.43	281	22.66	30	1.70	27	1.53	43	2.43	49	2.73
North Eastman	94	15.35	123	20.53	14	1.55	12	1.32	22	2.40	26	2.95
Churchill	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00
Nor-Man	33	11.82	44	16.06	4	0.88	4	0.88	5	1.13	9	2.07
Burntwood	33	9.93	41	14.00	5	0.90	7	1.21	12	1.96	15	2.83
Rural South	943	16.44	1,457	23.72	128	1.50	145	1.64	186	2.18	256	2.90
North	68	10.76	88	15.10	10	0.87	12	1.14	18	1.62	26	2.52
Winnipeg	1,544	17.50	2,699	24.84	165	1.19	267	1.68	255	1.84	432	2.71
Manitoba	2,724	17.20	4,545	24.75	315	1.29	440	1.63	479	1.96	732	2.72

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.13: Sterilization, Tonsillectomy/Adenoidectomy

Region	Sterilization (Age 20-55)				Tonsillectomy/Adenoidectomy (Age 0-14)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	1999/00-2003/04				2001/02-2003/04			
	Males		Females		Males		Females	
South Eastman	175	12.60	108	8.11	42	6.13	39	5.77
Central	223	9.54	190	8.42	56	4.67	53	4.77
Assiniboine	120	7.45	130	8.48	49	7.22	51	7.78
Brandon	97	8.42	100	7.97	41	8.67	34	7.31
Parkland	53	5.41	80	8.44	24	5.52	28	6.65
Interlake	143	7.75	130	7.27	36	4.58	36	4.85
North Eastman	80	8.25	70	7.50	28	6.44	21	5.05
Churchill			3	11.42	0	0.00	0	0.00
Nor-Man	40	6.10	61	9.83	10	3.02	13	4.12
Burntwood	38	3.46	123	11.65	22	2.76	21	2.76
Rural South	795	8.69	708	8.06	236	5.58	228	5.66
North	79	4.43	187	10.98	32	2.84	34	3.17
Winnipeg	1,346	7.87	1,035	5.95	283	4.50	276	4.61
Manitoba	2,317	7.94	2,030	6.97	593	4.88	573	4.95

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.14: MRI Scans, CT Scans

Region	MRI Scans				CT Scans			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2001/02-2003/04				2001/02-2003/04			
	Males		Females		Males		Females	
South Eastman	805	28.20	809	29.09	1,614	56.57	1,515	54.45
Central	917	18.58	1081	22.04	1,499	30.35	1,371	27.96
Assiniboine	529	15.15	702	19.93	2,745	78.65	2,911	82.67
Brandon	413	18.13	576	23.14	2,222	97.62	2,698	108.40
Parkland	343	15.93	434	20.10	599	27.81	597	27.63
Interlake	906	23.85	1083	29.02	2,608	68.66	2,598	69.61
North Eastman	537	26.66	565	29.10	1,328	65.92	1,302	67.08
Churchill	18	33.23	13	25.95	31	58.93	31	61.21
Nor-Man	184	14.48	225	18.21	598	47.03	677	54.87
Burntwood	318	13.73	305	13.80	1,079	46.64	1,141	51.70
Rural South	4037	20.97	4674	24.55	10,392	53.99	10,293	54.06
North	519	14.28	542	15.53	1,708	46.96	1,849	52.96
Winnipeg	9600	30.16	11593	34.45	23,253	73.05	26,706	79.37
Manitoba	14569	25.56	17385	29.63	37,575	65.93	41,546	70.82

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.15: Pharmaceutical Use, Number of Different Drugs, Antibiotic Use

Region	Pharmaceutical Use				Number of Different Drugs				Antibiotic Use			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	15,995	55.0%	19,155	67.5%	50,546	3.21	69,482	3.67	7,880	27.1%	9,649	34.0%
Central	28,484	57.1%	34,170	69.1%	92,746	3.30	129,940	3.86	14,139	28.3%	17,549	35.5%
Assiniboine	21,791	62.9%	26,760	76.4%	82,188	3.82	118,460	4.48	11,417	33.0%	14,386	41.1%
Brandon	14,682	64.1%	19,413	77.8%	52,885	3.65	83,812	4.38	8,210	35.8%	11,356	45.5%
Parkland	13,463	62.8%	16,460	76.7%	55,360	4.20	79,578	4.95	7,639	35.7%	9,709	45.2%
Interlake	23,344	61.1%	28,060	74.8%	84,838	3.68	120,755	4.36	11,640	30.5%	15,119	40.3%
North Eastman	11,801	58.3%	13,915	71.2%	42,769	3.70	59,571	4.34	5,978	29.5%	7,554	38.7%
Churchill	309	58.3%	356	71.1%	1,138	3.79	1,726	5.02	152	28.7%	197	39.3%
Nor-Man	7,065	55.6%	8,550	69.5%	24,769	3.57	38,290	4.56	3,887	30.6%	4,797	39.0%
Burntwood	10,825	46.6%	13,240	59.8%	39,520	3.70	59,804	4.58	5,744	24.7%	7,499	33.9%
Rural South	114,878	59.4%	138,520	72.4%	408,447	3.61	577,786	4.23	58,693	30.3%	73,966	38.6%
North	18,199	49.9%	22,146	63.4%	65,427	3.65	99,820	4.58	9,783	26.8%	12,493	35.7%
Winnipeg	189,325	59.1%	245,628	72.6%	620,984	3.36	962,736	4.00	93,846	29.3%	125,550	37.1%
Manitoba	337,084	58.8%	425,707	72.2%	1,147,743	3.47	1,724,154	4.12	170,532	29.7%	223,365	37.9%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.16: Antidepressant Use, Statin Use, ACE Inhibitor Use

Region	Antidepressant Use				Statin Use (Age 20+)				ACE Inhibitor Use (Age 20+)			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	1,150	4.0%	2,519	8.9%	1,713	8.8%	1,508	7.8%	1,652	8.4%	1,627	8.4%
Central	2,105	4.2%	4,669	9.4%	2,533	7.5%	2,095	6.1%	3,137	9.3%	3,064	9.0%
Assiniboine	1,687	4.9%	3,875	11.1%	2,659	10.5%	2,533	9.7%	3,157	12.5%	3,158	12.1%
Brandon	1,104	4.8%	2,835	11.4%	1,631	9.9%	1,440	7.7%	1,935	11.8%	1,901	10.2%
Parkland	824	3.8%	1,905	8.9%	1,818	11.8%	1,612	10.2%	1,936	12.5%	1,955	12.4%
Interlake	1,531	4.0%	3,647	9.7%	2,916	10.6%	2,697	9.8%	3,090	11.3%	2,964	10.8%
North Eastman	837	4.1%	1,879	9.6%	1,653	11.5%	1,300	9.4%	1,548	10.8%	1,399	10.1%
Churchill	22	4.2%	49	9.8%	32	8.8%	28	8.1%	59	16.3%	49	14.1%
Nor-Man	350	2.8%	862	7.0%	733	8.9%	754	9.3%	845	10.3%	887	11.0%
Burntwood	491	2.1%	1,206	5.4%	1,151	8.7%	1,027	8.2%	1,543	11.7%	1,792	14.4%
Rural South	8,134	4.2%	18,494	9.7%	13,292	9.8%	11,745	8.6%	14,520	10.7%	14,167	10.4%
North	863	2.4%	2,117	6.1%	1,916	8.8%	1,809	8.7%	2,447	11.2%	2,728	13.1%
Winnipeg	13,660	4.3%	31,957	9.4%	20,607	8.7%	19,482	7.6%	19,815	8.4%	20,992	8.2%
Manitoba	23,761	4.1%	55,403	9.4%	37,446	9.1%	34,476	7.9%	38,717	9.5%	39,788	9.2%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.17: Androgens, Erectile Dysfunction

Region	Androgens (Age 40+)				Erectile Dysfunction (Age 40+)			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	1999/00-2003/04				Males			
	Males		Females		1999/00		2003/04	
South Eastman	174	0.32%	78	0.14%	378	3.7%	463	4.0%
Central	178	0.18%	130	0.12%	635	3.3%	775	3.7%
Assiniboine	126	0.15%	90	0.10%	490	2.9%	609	3.5%
Brandon	110	0.23%	69	0.12%	317	3.4%	485	4.9%
Parkland	103	0.20%	30	0.05%	379	3.7%	382	3.7%
Interlake	197	0.22%	135	0.15%	675	4.0%	827	4.5%
North Eastman	128	0.28%	62	0.14%	311	3.6%	407	4.2%
Churchill			0	0.00%			17	8.3%
Nor-Man	47	0.20%	23	0.10%	140	3.1%	241	4.9%
Burntwood	28	0.09%	8	0.03%	182	3.1%	233	3.7%
Rural South	906	0.21%	525	0.12%	2,868	3.5%	3,463	3.9%
North	79	0.14%	31	0.06%	325	3.1%	491	4.3%
Winnipeg	1,811	0.26%	838	0.11%	5,294	4.0%	6,896	4.8%
Manitoba	2,906	0.24%	1,463	0.11%	8,804	3.7%	11,335	4.5%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.18: Hormone Replacement Therapy Use: Prevalence & Incidence

Region	HRT Prevalence (Age 40+)				HRT Incidence (Age 40+)			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	Females				Females			
	1997/98		2003/04		1997/98		2003/04	
South Eastman	1,402	14.3%	1,316	11.3%	336	3.4%	177	1.5%
Central	2,626	13.3%	2,233	10.2%	679	3.4%	334	1.5%
Assiniboine	2,283	12.6%	2,109	11.3%	627	3.5%	348	1.9%
Brandon	1,765	16.7%	1,472	12.6%	455	4.3%	233	2.0%
Parkland	1,286	11.8%	1,081	9.8%	415	3.8%	135	1.2%
Interlake	2,400	14.6%	2,038	10.9%	582	3.5%	251	1.3%
North Eastman	1,194	15.0%	1,124	12.1%	282	3.6%	171	1.8%
Churchill	18	12.2%	18	9.8%	0	0.0%	0	0.0%
Nor-Man	572	13.7%	532	11.4%	169	4.0%	69	1.5%
Burntwood	601	12.2%	598	10.5%	178	3.6%	115	2.0%
Rural South	11,191	13.5%	9,901	10.9%	2,921	3.5%	1,416	1.6%
North	1,191	12.9%	1,148	10.9%	349	3.8%	186	1.8%
Winnipeg	21,469	14.4%	16,643	10.1%	5,117	3.4%	2,078	1.3%
Manitoba	35,616	14.1%	29,164	10.5%	8,842	3.5%	3,913	1.4%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.19: Childhood Immunizations - 1 Year, 2 Year, 7 Year

Region	Childhood Immunizations - 1 Year				Childhood Immunizations - 2 Year				Childhood Immunizations - 7 Year			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	Children Born in Fiscal Year 2001/02				Children Born in Fiscal Year 2000/01				Children Born in Fiscal Year 1995/96			
	Males		Females		Males		Females		Males		Females	
South Eastman	638	85.2%	650	87.7%	500	71.0%	553	75.9%	651	83.2%	574	81.9%
Central	1,094	78.0%	975	77.9%	883	64.2%	865	68.5%	1,042	77.3%	994	75.8%
Assiniboine	577	87.0%	567	86.7%	507	75.8%	491	74.1%	615	80.3%	603	81.4%
Brandon	514	87.3%	432	85.0%	390	72.8%	370	74.6%	413	82.4%	432	81.4%
Parkland	416	85.1%	391	86.9%	349	73.2%	344	74.0%	397	83.6%	420	84.5%
Interlake	670	82.1%	611	79.7%	560	71.3%	529	67.8%	714	75.2%	667	74.8%
North Eastman	365	76.4%	296	69.5%	296	61.8%	265	56.9%	368	69.7%	350	67.3%
Churchill	15	93.8%	21	95.5%	13	92.9%	11	64.7%	12	63.2%	20	90.9%
Nor-Man	298	71.1%	300	75.4%	268	62.9%	250	64.3%	313	79.0%	318	77.8%
Burntwood	641	63.8%	682	65.6%	481	46.3%	482	48.7%	523	49.7%	491	50.9%
Rural South	3,760	81.8%	3,490	81.4%	3,095	68.9%	3,047	69.8%	3,787	78.1%	3,608	77.4%
North	954	66.3%	1,003	68.7%	762	51.5%	743	53.3%	848	57.8%	829	59.4%
Winnipeg	6,255	86.1%	5,900	86.3%	5,314	73.9%	5,039	74.5%	5,491	74.2%	5,212	74.5%
Manitoba	11,483	82.7%	10,825	82.7%	9,561	69.8%	9,199	70.7%	10,539	74.1%	10,081	74.2%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.20: Immunizations: Adult Influenza, Adult Pneumonia

Region	Adult Influenza (Age 65+)				Adult Pneumonia (Age 65+)			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed	CRUDE Percent	Number Observed	CRUDE Percent
	2003/04				2000/01-2003/04			
	Males		Females		Males		Females	
South Eastman	1,759	61.6%	2,022	61.9%	1,650	57.8%	1,847	56.6%
Central	3,623	62.9%	4,718	64.4%	2,766	48.0%	3,640	49.7%
Assiniboine	3,818	64.6%	4,932	65.8%	3,490	59.1%	4,466	59.6%
Brandon	2,015	72.0%	2,806	70.0%	1,655	59.1%	2,284	56.9%
Parkland	2,282	62.4%	2,784	63.5%	2,163	59.1%	2,679	61.1%
Interlake	3,351	66.3%	3,883	67.2%	3,052	60.4%	3,461	59.9%
North Eastman	1,564	61.0%	1,613	63.3%	1,448	56.5%	1,473	57.8%
Churchill	12	44.4%	17	56.7%	17	63.0%	22	73.3%
Nor-Man	589	64.9%	691	64.6%	585	64.4%	704	65.8%
Burntwood	392	47.9%	409	50.1%	297	36.3%	276	33.8%
Rural South	16,397	63.6%	19,952	64.8%	14,569	56.5%	17,566	57.0%
North	993	56.6%	1,117	58.3%	899	51.3%	1,002	52.3%
Winnipeg	25,445	70.0%	37,279	69.5%	22,541	62.0%	32,564	60.7%
Manitoba	44,850	67.3%	61,154	67.7%	39,664	59.5%	53,416	59.1%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.21: Open Home Care Cases, Average Length of Home Care Cases

Region	Open Home Care Cases				Average Length of Home Care Cases			
	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per 1000	Number Observed per Year	CRUDE Rate per Individual	Number Observed per Year	CRUDE Rate per Individual
	2002/03-2003/04				2002/03-2003/04			
	Males		Females		Males		Females	
South Eastman	561	19.48	864	30.74	81,052	395.38	132,212	546.33
Central	946	19.07	1,555	31.60	164,434	394.80	285,163	491.66
Assiniboine	867	24.93	1,496	42.62	143,330	411.28	251,451	474.44
Brandon	429	18.76	785	31.49	74,236	296.94	135,490	333.72
Parkland	717	33.36	1,166	54.16	113,361	370.46	218,594	548.54
Interlake	858	22.53	1,277	34.15	145,882	403.55	234,255	574.15
North Eastman	380	18.83	534	27.44	57,689	372.19	101,561	582.01
Churchill	11	19.70	17	33.53	799	228.29	659	131.80
Nor-Man	188	14.79	318	25.78	32,984	392.67	50,902	466.99
Burntwood	175	7.55	234	10.60	23,988	219.07	33,311	261.26
Rural South	4,328	22.43	6,891	36.12	705,748	393.72	1,223,235	524.32
North	373	10.26	569	16.29	57,771	293.25	84,872	351.44
Winnipeg	7,293	22.84	13,211	39.16	1,055,276	302.89	2,050,216	423.86
Manitoba	12,422	21.74	21,455	36.49	1,893,030	330.75	3,493,812	446.92

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.22: Residents in Personal Care Homes

Region	Residents in Personal Care Homes (Age 75+)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2003/04			
	Males		Females	
South Eastman	125	104.25	238	141.75
Central	315	114.71	660	161.25
Assiniboine	312	104.63	752	173.31
Brandon	179	134.99	456	203.30
Parkland	179	97.34	413	160.51
Interlake	179	89.05	428	153.08
North Eastman	80	85.56	150	133.45
Churchill	n/a	n/a	n/a	n/a
Nor-Man	53	155.43	80	151.52
Burntwood	9	37.97	30	113.64
Rural South	1,190	101.61	2,641	159.06
North	62	107.27	110	138.89
Winnipeg	1,536	94.03	4,628	155.00
Manitoba	2,967	99.07	7,835	158.29

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.23: Cardiac Catheterization, Angioplasty

Region	Cardiac Catheterization (Age 40+)				Angioplasty (Age 40+)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	2001/02-2003/04				1999/00-2003/04			
	Males		Females		Males		Females	
South Eastman	106	9.44	49	4.38	30	2.78	10	0.88
Central	177	8.71	90	4.21	53	2.68	23	1.08
Assiniboine	133	7.71	69	3.71	42	2.41	16	0.88
Brandon	81	8.21	32	2.81	23	2.34	8	0.69
Parkland	105	10.02	58	5.30	29	2.75	17	1.51
Interlake	186	10.29	86	4.71	55	3.13	21	1.19
North Eastman	86	9.14	44	4.83	29	3.15	11	1.29
Churchill	0	0.00	0	0.00	0	0.00	0	0.00
Nor-Man	40	8.24	24	5.21	12	2.43	4	0.97
Burntwood	55	8.88	34	6.05	17	2.85	6	1.03
Rural South	793	9.14	397	4.43	238	2.79	98	1.11
North	96	8.54	59	5.73	29	2.64	10	1.00
Winnipeg	1,368	9.70	754	4.65	420	3.04	201	1.26
Manitoba	2,337	9.39	1,242	4.54	710	2.91	317	1.18

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.24: Coronary Stent Insertion, Coronary Artery Bypass Graft

Region	Coronary Stent Insertion (Age 40+)				Coronary Artery Bypass Graft (Age 40+)			
	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000	Number Observed per Year	CRUDE Rate per 1,000
	1999/00-2003/04				1999/00-2003/04			
	Males		Females		Males		Females	
South Eastman	29	2.62	9	0.80	30	2.71	8	0.71
Central	48	2.40	22	1.04	48	2.44	12	0.58
Assiniboine	39	2.24	15	0.83	34	1.95	13	0.72
Brandon	21	2.15	7	0.64	25	2.55	7	0.60
Parkland	27	2.60	16	1.44	30	2.90	10	0.89
Interlake	50	2.82	20	1.13	47	2.68	11	0.60
North Eastman	27	2.91	11	1.20	22	2.42	6	0.66
Churchill	0	0.00	0	0.00	0	0.00	0	0.00
Nor-Man	11	2.27	4	0.93	12	2.48	4	0.97
Burntwood	15	2.55	5	0.99	14	2.32	5	0.92
Rural South	218	2.56	93	1.05	211	2.48	60	0.68
North	26	2.43	10	0.96	26	2.37	10	0.95
Winnipeg	388	2.81	183	1.15	341	2.47	127	0.80
Manitoba	653	2.68	292	1.09	603	2.47	203	0.75

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.25: AMI Cohort - Winnipeg & Non-Winnipeg

Region	Indicator	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
		Number Observed Per Year		Crude Percent		Number Observed Per Year		Crude Percent		Number Observed Per Year		Crude Percent	
		1999/00 - 2001/02*											
		Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Winnipeg	Death	185	172	25.6%	33.8%	219	207	30.3%	40.8%	266	245	36.7%	48.1%
	Cardiac Cath	243	119	42.9%	32.7%	270	134	47.7%	36.9%	319	152	56.3%	41.7%
	Angioplasty	108	49	19.1%	13.6%	119	53	21.0%	14.6%	137	58	24.2%	16.0%
	Stent	96	45	17.0%	12.5%	106	48	18.7%	13.2%	123	53	21.8%	14.5%
	CABG	17	8	3.0%	2.1%	41	21	7.3%	5.9%	65	28	11.5%	7.8%
Non-Winnipeg	Death	171	100	25.6%	27.3%	203	125	30.4%	34.4%	246	159	36.8%	43.7%
	Cardiac Cath	138	57	26.2%	19.6%	179	73	34.0%	25.0%	240	100	45.5%	34.2%
	Angioplasty	65	21	12.3%	7.3%	81	28	15.3%	9.7%	103	38	19.5%	13.1%
	Stent	56	20	10.6%	7.0%	72	27	13.6%	9.4%	93	36	17.6%	12.4%
	CABG	8		1.6%		28	9	5.4%	3.0%	56	18	10.7%	6.1%

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*years from which cohort was created

Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.26: AMI Cohort - Cardiac Catheterization: Age & Income

income quintile groups	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
U5	145	40	49.7%	40.0%	168	41	57.5%	41.0%	188	47	64.4%	47.0%
U4	168	68	48.8%	40.7%	182	75	52.9%	44.9%	213	84	61.9%	50.3%
U3	155	97	39.0%	39.3%	168	116	42.3%	47.0%	210	130	52.9%	52.6%
U2	158	92	39.3%	33.5%	179	101	44.5%	36.7%	219	118	54.5%	42.9%
U1	145	79	35.3%	21.6%	168	88	40.9%	24.1%	204	105	49.6%	28.8%
R5	90	25	38.8%	31.3%	102	31	44.0%	38.8%	134	36	57.8%	45.0%
R4	72	38	27.9%	25.3%	93	49	36.0%	32.7%	119	64	46.1%	42.7%
R3	75	28	24.8%	17.2%	102	36	33.8%	22.1%	136	55	45.0%	33.7%
R2	73	24	22.3%	13.0%	97	34	29.6%	18.4%	140	48	42.7%	25.9%
R1	59	32	21.9%	20.4%	85	41	31.6%	26.1%	106	58	39.4%	36.9%

Cardiac Catheterization												
age groups	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
40-44	64	12	50.4%	63.2%	70	13	55.1%	68.4%	90	14	70.9%	73.7%
45-49	124	36	59.0%	60.0%	129	39	61.4%	65.0%	156	42	74.3%	70.0%
50-54	145	47	46.5%	54.0%	164	51	52.6%	58.6%	208	58	66.7%	66.7%
55-59	149	49	40.8%	53.8%	166	54	45.5%	59.3%	213	66	58.4%	72.5%
60-64	141	63	42.7%	45.3%	159	69	48.2%	49.6%	198	81	60.0%	58.3%
65-69	153	89	40.1%	40.3%	179	101	46.9%	45.7%	223	125	58.4%	56.6%
70-74	152	66	33.9%	27.6%	195	78	43.5%	32.6%	241	111	53.8%	46.4%
75-79	132	83	29.8%	24.9%	171	109	38.6%	32.7%	205	132	46.3%	39.6%
80-84	64	59	17.5%	16.3%	82	75	22.5%	20.7%	103	89	28.2%	24.5%
85-89	18	20	8.7%	7.4%	27	27	13.0%	10.0%	32	32	15.4%	11.9%
90+					6		6.7%		6		6.7%	

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*years from which cohort was created

Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.27: AMI Cohort - Angioplasty: Age & Income

income quintile groups	Angioplasty											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
U5	65	20	22.3%	20.0%	71	20	24.3%	20.0%	78	23	26.7%	23.0%
U4	80	34	23.3%	20.4%	87	34	25.3%	20.4%	101	35	29.4%	21.0%
U3	67	34	16.9%	13.8%	76	40	19.1%	16.2%	100	45	25.2%	18.2%
U2	65	32	16.2%	11.6%	71	36	17.7%	13.1%	84	40	20.9%	14.5%
U1	63	36	15.3%	9.9%	69	38	16.8%	10.4%	76	42	18.5%	11.5%
R5	50	13	21.6%	16.3%	59	14	25.4%	17.5%	75	15	32.3%	18.8%
R4	44	15	17.1%	10.0%	50	21	19.4%	14.0%	60	26	23.3%	17.3%
R3	35	10	11.6%	6.1%	49	12	16.2%	7.4%	59	21	19.5%	12.9%
R2	30	10	9.1%	5.4%	39	15	11.9%	8.1%	55	21	16.8%	11.4%
R1	18	8	6.7%	5.1%	25	13	9.3%	8.3%	29	18	10.8%	11.5%

age groups	Angioplasty											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
40-44	43		33.9%		47		37.0%		58		45.7%	
45-49	76	14	36.2%	23.3%	83	15	39.5%	25.0%	100	15	47.6%	25.0%
50-54	63	23	20.2%	26.4%	75	24	24.0%	27.6%	89	28	28.5%	32.2%
55-59	72	16	19.7%	17.6%	82	18	22.5%	19.8%	101	24	27.7%	26.4%
60-64	76	33	23.0%	23.7%	85	36	25.8%	25.9%	92	37	27.9%	26.6%
65-69	65	43	17.0%	19.5%	77	45	20.2%	20.4%	93	54	24.3%	24.4%
70-74	51	26	11.4%	10.9%	65	29	14.5%	12.1%	77	40	17.2%	16.7%
75-79	47	31	10.6%	9.3%	56	44	12.6%	13.2%	67	49	15.1%	14.7%
80-84	19	20	5.2%	5.5%	20	24	5.5%	6.6%	32	30	8.8%	8.3%
85-89	6		2.9%		7		3.4%		9		4.3%	
90+	0		0.0%									

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*years from which cohort was created

Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.28: AMI Cohort - Coronary Stent Insertions: Age & Income

income quintile groups	Coronary Stent Insertions											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
U5	57	19	19.5%	19.0%	63	19	21.6%	19.0%	69	22	23.6%	22.0%
U4	70	31	20.3%	18.6%	76	31	22.1%	18.6%	90	32	26.2%	19.2%
U3	57	32	14.4%	13.0%	65	37	16.4%	15.0%	87	41	21.9%	16.6%
U2	61	30	15.2%	10.9%	67	33	16.7%	12.0%	80	37	19.9%	13.5%
U1	59	32	14.4%	8.8%	65	33	15.8%	9.0%	71	36	17.3%	9.9%
R5	39	13	16.8%	16.3%	48	14	20.7%	17.5%	64	15	27.6%	18.8%
R4	42	15	16.3%	10.0%	47	21	18.2%	14.0%	57	26	22.1%	17.3%
R3	31	10	10.3%	6.1%	45	12	14.9%	7.4%	55	20	18.2%	12.3%
R2	24	9	7.3%	4.9%	33	14	10.1%	7.6%	48	20	14.6%	10.8%
R1	15	6	5.6%	3.8%	22	11	8.2%	7.0%	26	15	9.7%	9.6%

age groups	Coronary Stent Insertions											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
40-44	40		31.5%		44		34.6%		53		41.7%	
45-49	72	13	34.3%	21.7%	79	14	37.6%	23.3%	96	14	45.7%	23.3%
50-54	55	22	17.6%	25.3%	66	23	21.2%	26.4%	81	26	26.0%	29.9%
55-59	62	15	17.0%	16.5%	72	17	19.7%	18.7%	91	23	24.9%	25.3%
60-64	70	32	21.2%	23.0%	79	35	23.9%	25.2%	86	36	26.1%	25.9%
65-69	56	40	14.7%	18.1%	67	42	17.5%	19.0%	83	51	21.7%	23.1%
70-74	42	21	9.4%	8.8%	54	24	12.1%	10.0%	64	34	14.3%	14.2%
75-79	41	29	9.3%	8.7%	51	41	11.5%	12.3%	60	46	13.5%	13.8%
80-84	13	20	3.6%	5.5%	14	24	3.8%	6.6%	26	28	7.1%	7.7%
85-89					6		2.9%		8		3.8%	
90+	0		0.0%									

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*years from which cohort was created

Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.29: AMI Cohort - Coronary Artery Bypass Graft (CABG): Age & Income

income quintile groups	Coronary Artery Bypass Graft (CABG)											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
U5	11		3.8%		22		7.5%		31	6	10.6%	6.0%
U4	8	7	2.3%	4.2%	28	11	8.1%	6.6%	52	15	15.1%	9.0%
U3	11	7	2.8%	2.8%	32	23	8.1%	9.3%	50	28	12.6%	11.3%
U2	16	6	4.0%	2.2%	33	18	8.2%	6.5%	50	27	12.4%	9.8%
U1	6		1.5%		23	10	5.6%	2.7%	34	17	8.3%	4.7%
R5		0		0.0%	15		6.5%		32	6	13.8%	7.5%
R4		0		0.0%	12		4.7%		29	9	11.2%	6.0%
R3		0		0.0%	14	6	4.6%	3.7%	25	10	8.3%	6.1%
R2	8		2.4%		18		5.5%		41	8	12.5%	4.3%
R1					12	6	4.5%	3.8%	19	11	7.1%	7.0%

age groups	Coronary Artery Bypass Graft (CABG)											
	At Index Hospitalization				At 30 Days Post AMI				At 1 Year Post AMI			
	Number Observed		Crude Percent		Number Observed		Crude Percent		Number Observed		Crude Percent	
	1999/00 - 2001/02*											
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
40-44		0		0.0%	10	0	7.9%	0.0%	14	0	11.0%	0.0%
45-49		0		0.0%	7		3.3%		15		7.1%	
50-54	6		1.9%		30	8	9.6%	9.2%	47	11	15.1%	12.6%
55-59	10		2.7%		27	8	7.4%	8.8%	53	13	14.5%	14.3%
60-64	12		3.6%		28	8	8.5%	5.8%	49	14	14.8%	10.1%
65-69	13		3.4%		28	22	7.3%	10.0%	49	33	12.8%	14.9%
70-74	14		3.1%		39	16	8.7%	6.7%	63	23	14.1%	9.6%
75-79	10	10	2.3%	3.0%	28	17	6.3%	5.1%	51	26	11.5%	7.8%
80-84	6		1.6%		9	8	2.5%	2.2%	20	12	5.5%	3.3%
85-89	0		0.0%									
90+		0		0.0%		0		0.0%		0		0.0%

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*years from which cohort was created

Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.30: Quality of Care: Antidepressant Follow-up, Asthma Care, Diabetic Eye Exams

Region	Antidepressant Follow-up				Asthma Care				Diabetic Eye Exams			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	2003/04				2003/04				2003/04			
	Males		Females		Males		Females		Males		Females	
South Eastman	113	56.5%	219	63.5%	287	51.0%	251	54.7%	313	30.6%	313	40.6%
Central	178	52.7%	402	56.6%	498	48.1%	486	50.7%	668	35.1%	625	39.9%
Assiniboine	128	56.1%	272	54.9%	579	58.0%	506	57.2%	718	39.6%	687	45.8%
Brandon	136	60.4%	340	71.0%	314	47.9%	375	50.3%	512	44.9%	461	49.1%
Parkland	60	52.6%	143	63.3%	349	61.3%	345	61.3%	411	31.7%	427	36.6%
Interlake	135	57.7%	312	58.9%	490	48.6%	556	52.6%	664	31.6%	659	36.3%
North Eastman	77	53.8%	185	63.6%	207	52.9%	226	52.6%	337	31.1%	351	34.8%
Churchill					10	55.6%	9	69.2%	9	30.0%	10	25.0%
Nor-Man	43	57.3%	97	60.6%	167	66.3%	168	62.0%	243	36.8%	351	45.7%
Burntwood	38	49.4%	109	52.7%	247	56.9%	289	57.3%	349	28.4%	484	30.0%
Rural South	691	55.0%	1,533	59.0%	2,410	52.8%	2,370	54.5%	3,112	33.8%	3,063	39.1%
North	86	54.4%	211	56.0%	424	60.2%	466	59.1%	601	31.3%	845	34.9%
Winnipeg	1,578	60.7%	3,335	65.1%	3,990	50.6%	4,755	52.9%	4,853	32.3%	4,851	35.5%
Manitoba	2,491	58.7%	5,419	63.2%	7,138	51.7%	7,966	53.5%	9,078	33.3%	9,220	37.1%

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Source: Manitoba Centre for Health Policy, 2005

Appendix Table 4.31: Quality of Care: Beta-Blocker Prescribing, Benzodiazepine Prescribing

Region	Beta-Blocker Prescribing				Benzodiazepines in Community (age 75+)				Benzodiazepine in PCHs (age 75+)			
	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent	Number Observed per Year	CRUDE Percent
	1997/98-2003/04				2003/04				2002/03			
	Males		Females		Males		Females		Males		Females	
South Eastman	205	79.5%	71	71.0%	187	16.0%	414	27.2%	34	33.0%	70	32.0%
Central	380	81.9%	187	73.9%	418	15.8%	913	24.7%	49	38.3%	100	43.3%
Assiniboine	376	78.0%	167	70.5%	471	16.4%	966	25.2%	82	37.8%	229	47.5%
Brandon	241	80.9%	145	78.8%	207	16.1%	514	26.2%	66	45.5%	166	41.8%
Parkland	215	71.2%	108	63.5%	312	17.5%	657	28.3%	30	42.3%	67	39.0%
Interlake	385	79.4%	191	77.3%	257	12.9%	491	19.7%	51	29.3%	97	24.0%
North Eastman	143	79.0%	64	70.3%	90	9.9%	198	18.7%	19	24.4%	29	19.7%
Churchill							0	0.0%	n/a	n/a	n/a	n/a
Nor-Man	78	78.8%	38	67.9%	26	8.1%	90	18.4%	0	0.0%	0	0.0%
Burntwood	119	63.3%	58	59.8%	14	5.6%	23	8.9%			6	20.0%
Rural South	1,704	78.5%	788	71.8%	1,735	15.3%	3,639	24.4%	265	34.4%	592	35.7%
North	200	68.3%	97	62.2%	40	6.9%	113	14.9%			6	20.0%
Winnipeg	2,751	81.6%	1,501	73.4%	2,186	13.5%	5,747	21.1%	366	33.5%	1,308	33.4%
Manitoba	4,896	79.8%	2,531	72.7%	4,168	14.2%	10,013	22.3%	699	34.7%	2,072	34.5%

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Source: Manitoba Centre for Health Policy, 2005

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