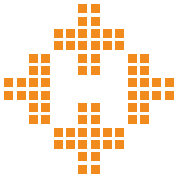
Revised November 18, 2004

Patterns of Regional Mental Illness Disorder Diagnoses and Service Use in Manitoba: A Population-Based Study

September 2004



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

Patricia Martens, PhD
Randy Fransoo, MSc
Nancy McKeen, PhD, RN
The Need to Know Team
(funded through CIHR)
Elaine Burland, MSc
Laurel Jebamani, MSc
Charles Burchill, MSc
Carolyn De Coster, PhD, RN
Okechukwu Ekuma, MSc
Heather Prior, MSc
Dan Chateau, PhD
Renée Robinson, MSc, RPN
Colleen Metge, BSc (Pharm), PhD

ISBN 1-896489-19-2

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2nd Printing 10/26/2004 Rev

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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.

ACKNOWLEDGEMENTS

This Mental Health report was possible only through a true Team effort, including *The Need To Know* Team members, MCHP staff and researchers, Manitoba Health, Canadian Institutes of Health Research (CIHR), our special Working Group of mental health experts, and many other individuals and organizations who contributed to this report.

The authors of this report would like to acknowledge the contributions of the individuals and organizations whose efforts and expertise made it possible to produce this report:

- The Working Group members for this report, who worked alongside *The Need To Know* Team, providing clinical guidance and research expertise: Eckhard Goerz, Renée Robinson, Christine Ogaranko, Dr. John Walker, Dr. Marni Brownell.
- Individual members of *The Need To Know* Team since its inception in the spring of 2001 up to July 2004:

  The RHA representatives, both past and present, including: Jody Allen, Val Austen-Wiebe, Jim Bentley, Dr. Shelley Buchan, Mieke Busman, Maggie Campbell, Cynthia Carr, Donna Champagne, Connie Chapen*, Dr. Eilish Cleary, Sue Crockett, Bev Cumming, Susan Derk, Dr. Albert De Villiers, Marion Ellis, Tannis Erickson, Margaret Fern, Doreen Fey, Pattie Fries, Bonnie Frith, Catherine Hynes, Betty MacKenzie, Nancy McPherson, Debbie Nelson, Carmel Olson, Dr. Jan Roberts, Pam Seitz, Faye White.

  The Manitoba Health representatives, both past and present, including: Valdine Berry, Lorraine Dacombe Dewar, Shirley Dzogan, Rachel McPherson, Dr. Shahin Shoostari, Heather Sparling, Deborah Malazdrewicz.

  The MCHP staff members who contribute to the ongoing support and planning of Team meetings, including Darlene Harder, Linda Kostiuk and Carole Ouelette.

  The evaluator of *The Need To Know* project, Sarah Bowen, whose extremely valuable input throughout the process continues to enrich and maximize the productivity of the team and its research activities.

- The RHA CEOs for their support, as well as their input into the topic for the second "Team" collaborative research project.
- Dr. Kurt Skakum, who assisted in expertise regarding drugs and mental illness disorders.
- Dr. Eilish Cleary for her research on validation of depression diagnoses.
- The Medical Examiner's Office for assisting with information regarding suicide rates in Manitoba.

- MCHP personnel and others who helped us immensely in the reviewing, editing and production of this report, as well as in the provision of advice on some of the mental health data: Eileen Bell, Dr. Marni Brownell, R.J. Currie, Shelley Derksen, Janine Harasymchuk, Dr. Alan Katz, Dr. Anita Kozyrskyj, Leonard MacWilliam, Jennifer Magoon, Dr. Verena Menec, Pat Nicol, Dr. Les Roos, Dr. Noralou Roos, Dr. Evelyn Shapiro, Marina Yogendran.

The authors are indebted to Health Information Services of Manitoba Health, and the Office of Vital Statistics in the Agency of Consumer and Corporate Affairs, for the provision of data. The authors are also indebted to the Chief Provincial Psychiatrist Dr. Hugh Andrew, as well as the Medical Directors of psychiatric facilities in Manitoba (Dr. Jack Kettler, Dr. Amil Pandey, Dr. Samia Barakat, Dr. B. Armstrong, Dr. Keith Hildahl, Dr. Kathryn Funk, Dr. Charles Wilson, Dr. Tom Medd, Dr. W. Lebedin, Dr. Sukhbir S. Sandhu, Dr. D. Hershberg) for their assistance in using the Mental Health Management Information System (MHMIS) data.

We acknowledge the Canadian Institutes of Health Research (Community Alliances for Health Research program) for co-funding *The Need To Know* Team's five-year collaboration (2001-2006).

We also acknowledge the financial support of the Department of Health of the Province of Manitoba. The results and conclusions are those of the authors and no official endorsement by Manitoba Health was intended or should be inferred. This report was prepared at the request of Manitoba Health as part of the contract between the University of Manitoba and Manitoba Health.

**The Need To Know* Team members would like to acknowledge the contribution of Connie Chapen until her death in July 2004. One of the founding Team members in 2001, Connie added her special strengths and talents in sharing her knowledge about rural issues. We miss her greatly.

TABLE OF CONTENTS

LIST OF TABLES

List of Appendix Tables

List of Figures

EXECUTIVE SUMMARY

Introduction

Mental illness is a profound problem in our province, yet there is a lack of regional information available on the prevalence of mental disorders and the corresponding use of health care resources. *The Need To Know* Team therefore identified the need for population-based information on mental illness as a critical aspect of planning for rural and northern regional health authorities (RHAs). This report is designed to provide an overview of population-based indicators on the prevalence of mental illness, and the patterns of health care use of those diagnosed with mental illness.

The Need To Know Team, funded through the Canadian Institutes of Health Research (CIHR) and directed by Dr. Patricia Martens, is comprised of researchers from the Manitoba Centre for Health Policy's (MCHP) academic research unit, and high-level planners of each of the non-Winnipeg RHAs and Manitoba Health. The collaboration is designed to create research of relevance to rural and northern RHAs, and enable capacity building for the academics, the RHA Team members, and Manitoba Health staff on how to understand, interpret and apply research at the planning and decision-making level. A Working Group of mental health experts collaborated on the development of this report, and helped the Team gain valuable insights along the way.

The contents of the report, indicators and comparisons

Within this report, both the prevalence of mental illness diagnoses, as well as the health care use patterns of such services as physicians, hospitals, home care, personal care homes (PCHs) and pharmaceuticals, are examined at a population-level. The report also includes information on the Mental Health Management Information System (MHMIS) and its usefulness in yielding population-based information.

Every indicator is given separately for males and females, since patterns can differ substantially between sexes. Geographical comparisons are given for the majority of indicators, including comparisons by RHA, by districts within each RHA, and by aggregate areas. The “North” refers to an aggregate of Burntwood, Churchill and Nor-Man RHAs, and the “Rural South” refers to an aggregate of South Eastman, Central, Assiniboine, Interlake, North Eastman, and Parkland RHAs. Because the focus of *The Need To Know* Team is the rural and northern RHAs, Winnipeg rates are given only as a comparative grouping (without the sub-regional divisions).

For many of the indicators in this report, two further socio-demographic comparisons are provided: (a) by age grouping, and (b) by five neighbour-

hood income groupings (called “income quintiles”) based on the average household income of the area.

What population is described in this report?

This report is a *population-based* report. This means that the prevalence and the rates are based upon every person registered to receive health care benefits through Manitoba Health. For most analyses, the population consists of all people 10 years of age or older, who lived in Manitoba for at least one year during the five fiscal years of 1997/98 through 2001/02. All indicators are age-adjusted to reflect the overall Manitoba population age structure.

Where people *live*, not where they go for treatment, is how the information is presented in this report. 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. By doing this, 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.

The key comparisons by mental disorder grouping—”cumulative” versus “no disorder”

In most of the graphs of this report, the rates of service use of those having one or more of the *cumulative mental illness disorders* is compared to the rate of service use of those having *no disorder*. The “cumulative disorders” group includes those diagnosed with one or more of the following mental illness conditions: depression, anxiety disorders, substance abuse, schizophrenia, and personality disorders. The “no disorders” group are those people having no diagnostic indication for a mental disorder during the five-year period. There is a third group which is occasionally referred to in this report—those having “other disorders”. This group has at least one mental illness diagnosis in the five-year period, but not one of the five “cumulative” disorders. For example, someone who has dementia only, with no other mental illness comorbidity, would be in the “other” group.

Why “treatment prevalence” rather than just prevalence?

“Prevalence” refers to that proportion of the population who has a certain condition during a given period of time (in our case, in a five-year time period). The data used for this report does not indicate who 'has' which disorder, but rather *who received treatment* for a disorder from a physician, hospital or mental health service. Therefore, the results indicate treatment for the disorder rather than the prevalence per se, so we refer to the results as “treatment prevalence”.

The data sources used for this report

The Population Health Research Data Repository, housed at MCHP, was the main source of data used in this report. This includes anonymized hospital claims, medical claims, home care and personal care homes (also known as nursing homes) data, the registry files, vital statistics, pharmaceutical claims, and public use data from the 2001 Census of Canada. In addition, we obtained special permission to use the anonymized Mental Health Management Information System (MHMIS), which records institutional mental health services for Brandon, Eden and Selkirk Mental Health Centres, as well as community mental health services. For selected indicators, we also used aggregate data from the Canadian Community Health Survey (CCHS) Cycle 1.1 2000-2001.

Key findings:

Treatment Prevalence for Selected Mental Illness Disorders (Chapter 2)

- Of all Manitobans aged 10+, the five-year treatment prevalence is as follows: 24% are in the "cumulative disorders" group, 13% in the "other" group, and 63% have no diagnosed mental illness.
- The treatment prevalence is higher for females compared with males for the following: "cumulative disorders" (29.1% versus 18.8%), depression (23.6% versus 12.6%), anxiety disorders (8.66% versus 4.59%), personality disorder (1.0% versus 0.8%), dementia for age 55+ (11.6% versus 8.9%), and "other disorders" (14.0% versus 11.5%). Treatment prevalence for substance abuse is lower for females compared to males (5.3% versus 6.3%). The treatment prevalence of schizophrenia is similar for females and males (1.2%). The treatment prevalence of ADD/ADHD in children ages four to 18 is lower in females compared to males (1.3% versus 4.6%). Older adults have a particularly high treatment prevalence of dementia at ages 80-84 (males: 26.3%, females: 30.6%), and increasing with age.
- In general, the treatment prevalence of most of the mental health disorders is lower in the Rural South, but higher in the North, Winnipeg and Brandon compared to the provincial average. The district of Brandon East has very high treatment prevalence for most mental illness disorders. In the North, the higher treatment prevalence of cumulative disorders is due mostly to the high treatment prevalence of substance abuse compared to the provincial average (males: 14.1% in the North versus 6.3% provincially, females: 15.3% in the North versus 5.3% provincially).
- In the urban areas (Winnipeg and Brandon), there is a strong relationship between neighbourhood income and the prevalence of mental illness, with poorer areas having the highest treatment prevalence. The one exception is the childhood treatment prevalence of ADD/ADHD, where there is no relationship with neighbourhood income. In contrast, for the

Rural South and the North there are varying relationships between prevalence and neighbourhood income, but in most instances the effects are small.

- Of those treated for any mental illness, almost one-third (29%) also had at least one other mental illness diagnosis (co-morbidity), but this varies by condition (51% in the group treated for depression, 75% for schizophrenia, 89% for personality disorders).

The Mental Health Management Information System (MHMIS)(Chapter 3)

- There are many fields in the MHMIS system with substantial amounts of uncollected data, and RHAs may be using different definitions for fields. Winnipeg MHMIS data are extremely limited for comparative purposes, due to the fact that only adult community mental health programs are captured.
- In order to do comparative population-based analyses of mental health services in Manitoba, standardized data collection fields, using the same definitions, must be maintained in every RHA.
- Useful population-based comparative information can be derived by linking MHMIS to the Population Health Research Data Repository, once the validity issues of MHMIS are addressed. Preliminary findings, despite the flaws in data collection, show that MHMIS clients are more likely to be female, community/outpatient cases, with a burden of serious mental illnesses (see Chapter 3 for more detailed descriptions). Urban MHMIS clients are more likely to reside in the poorest neighbourhoods, whereas this gradient is not observed for rural MHMIS clients. People admitted to hospital for mental illness reasons are likely to have been previous MHMIS clients, especially in Brandon (67%) and the North (61%).

Use of Physician Services (Chapter 4)

- Males and females in the “cumulative disorders” group visit physicians more than twice as often as those with no mental illnesses (males: 7.1 versus 3.1 visits per person per year, females: 8.7 versus 4.0). Visits for mental illness do not make up the entire difference in rates: people with mental illness visit physicians almost twice as often for every kind of physical illness as well (for example, respiratory illnesses).
- About one in 10 physician visits for all Manitobans was coded as being 'for' mental illness (8.7% for males, 10.0% for females). Among those with mental illness, about one in five of their visits was 'for' mental illness, that is, had a mental illness diagnosis (21.6% for males, 19.3% for females).
- The 'total burden' of mental illness on the medical care system is high: males in the “cumulative disorders” group account for about 35% of all visits for males, even though they comprise only 19% of the male population. Females in the “cumulative disorders” group account for about

47% of all visits for females, even though they comprise only 29% of the female population.

- There is no relationship between neighbourhood income and all-cause physician visit rate, except for urban people in "cumulative disorders" group where there is higher use in the lowest neighbourhood income group.
- There is a strong income gradient in the use of psychiatrists for both urban and rural residents, with the highest rates being in the highest neighbourhood income areas for both males and females.
- Population-based visit rates to psychiatrists are much higher in the urban areas compared to the non-urban areas (Winnipeg 0.8 visits per person, Brandon: 0.4 visits per person, North about 0.04 visits per person, Rural South 0.2 visits per person).

Use of Hospital and Mental Health Centre Services by those with a mental illness diagnosis (Chapter 5)

- Males and females in the "cumulative disorders" group were hospitalized more than twice as often as those in the "no disorders" group (males: 0.25 versus 0.10 hospital separations per person per year, females: 0.30 versus 0.15). Those in the "cumulative group" were also physically sicker, with hospitalization rates for every physical illness nearly double those of the "no disorders" group.
- For all hospitalizations of Manitobans, about one in ten had a mental illness diagnosis as the most responsible cause (13% for males, 8% for female hospitalizations).
- Those in the "cumulative disorders" group used short-stay days in acute facilities at more than double the rate of those with no disorders. For long-stay days, the rate difference was even higher: four-fold for females, and almost seven-fold for males.
- The 'total burden' on the acute hospital system attributable to mental illness is high: males in the "cumulative disorders" group used 36.7% of all separations, despite comprising only 19% of the male population. They also used 41.3% of all short-stay hospital days, and 52.3% of all long-stay days. Females in the "cumulative disorders" group used 44.1% of all separations, despite comprising only 29% of the female population. They also used 47.1% of all short-stay hospital days, and 51.7% of all long-stay days.
- There is a strong income gradient in hospital separation rates for males and females in both the "cumulative" and "no disorder" groups for both urban and rural areas, with the highest rates in the lowest neighbourhood income areas.
- Those diagnosed with schizophrenia and with personality disorders have a substantially higher use of acute hospital and mental health centre services than any other mental disorder group.

- Churchill RHA females appear to be hospitalized, and use hospital short and long-stay days for mental disorders, at a much higher rate than the provincial average.

Home Care Use by those with a mental illness diagnosis (Chapter 6)

- People in the "cumulative disorders" group used home care services at a rate 2.5 times higher than people in the "no disorders" group (open home care cases: 47 versus 16 cases per thousand for males, 61 versus 28 cases per thousand for females).
- Those living in the lowest income urban neighbourhoods had the highest rate of home care use, but this relationship was not evident in rural areas.
- Once a Manitoba resident is receiving home care, the average length of a case is not dependent upon mental illness conditions (187.6 days for "cumulative disorder" group, 191.8 days for "no disorders" group).
- Those aged 55+ with dementia diagnoses are more likely to have an open home care case compared to those in the "cumulative disorders" group, who in turn are more likely than those in the "no disorders" group (Males: dementia 300, cumulative 162, no disorder 57 cases per thousand males age 55+; females: dementia 338, cumulative 191, no disorders 91 cases per thousand females age 55+).

Personal Care Home (Nursing Home) Use by those with a mental illness diagnosis (Chapter 7)

- Individuals aged 75+ in the "cumulative disorders" group are about five times more likely to be personal care home (PCH) residents compared to those with no mental disorder (34.7% versus 6.9%), for both males (30.5% versus 5.3%) and females (37.3% versus 7.8%).
- Among PCH residents, 43% had one or more of the five "cumulative" mental illness disorders, 67% had dementia, 35% had depression, and 83% had at least one mental illness diagnosis (that is, "any" disorder).
- Out of the 20,207 Manitoba residents aged 75+ with a diagnosis of dementia, 54.2% of males and 66.9% of females were PCH residents for some time during 1997/98-2001/02.
- Out of the 16,778 Manitoba residents aged 75+ with a diagnosis of depression, 31.0% of males and 37.7% of females were PCH residents for some time during 1997/98-2001/02.
- Over eight times the proportion of people aged 75+ in the "cumulative disorders" group were admitted to PCHs compared to those with no mental disorder (57.5 per thousand versus 6.9 per thousand)—both for males (56.6 versus 6.0 per thousand) and females (58.0 versus 7.4 per thousand). There was a similar waiting time (around 10 weeks) for people aged 75+ for those in the "cumulative" and "no" disorders groups, and similar median length of stay (2.7 versus 3.1 years).

- In the five years *prior* to their admission in 2002/03, 39% of all people admitted to PCH had one or more of the five "cumulative" mental illness disorders, 46% had dementia, and 75% had at least one mental illness diagnosis.

Pharmaceutical Use for Mental Illness Disorders (Chapter 8)

- A greater proportion of people in the "cumulative mental disorders" group had at least one prescription per year compared to those in the "no mental disorders" group (females: 87.6% versus 68.2%, males: 76.1% versus 53.9%).
- About 1.5 times the number of different drugs were used for those in the "cumulative disorders" group compared with those in the "no mental disorders" group, for both females and males (females: 5.2 versus 3.4 drugs per user per year, males: 4.2 versus 2.9 drugs per user per year). There was also a strong relationship with neighbourhood income, with those living in lower income areas being prescribed a higher number of different drugs.
- Those in the cumulative disorders group are being dispensed about 1.6 times the defined daily doses or DDDs (all drugs included) compared with those having no mental disorder, for both males (388 versus 235 per year) and females (440 versus 273 DDDs per year). For both males and females diagnosed with depression, anxiety disorder, schizophrenia or personality disorder, their mental-illness-specific drugs represent about three-quarters of their total DDDs dispensed in a year.
- Female adolescents were twice as likely as males to be prescribed Selective Serotonin Reuptake Inhibitors (SSRIs) for depression (1.70% females versus 0.76% of males provincially). Winnipeg RHA had a significantly higher percentage of adolescents prescribed SSRIs (1.86% females, 0.86% males), whereas the Rural South (1.58% females, 0.64% males) and the North (1.11% females, 0.65% males) were lower. Only 17% of all SSRIs dispensed to adolescents were fluoxetine, the only SSRI currently recommended for adolescent depression, though the data reflect 1997/98-2001/02, which was before this issue became a concern. However, this needs further monitoring to determine current prescribing practices for adolescents.

Suicide and Suicide Attempts by those with a mental illness diagnosis (Chapter 9)

- The age- and sex-adjusted *suicide rate* is 1.3 per 10,000 Manitobans per year, with male rates three times higher than females rates (males 2.01 per 10,000 per year and females: 0.63 per 10,000 per year). The most common suicide method for males is by hanging (37.4% of suicides), and for females, by poisoning (50.9% of suicides).
- Potential Years of Life Lost (PYLL) due to suicide is 44.3 years lost per 10,000 residents in Manitoba. North Eastman and Burntwood have

higher PYLLs, indicating that suicide accounts for a greater loss of young people there than elsewhere.

- When risk factors are considered simultaneously in a regression analysis, the key factors predicting suicide are: being male, having a mental illness diagnosis in the previous year, being young, and having poorer health. Region of residence and average household income are not statistically significant predictors of suicide when other risk factors (such as having a mental illness diagnosis or other health problems) are simultaneously considered.
- The *suicide-attempt* rate is 8.0 per 10,000 Manitoba residents per year, with females attempting twice as often as males (10.4 versus 5.7 per 10,000 per year. The most common means of attempting suicide was by poisoning (usually a drug overdose) for both males (71.7%) and females (87.0%).
- Burntwood, Nor-Man, North Eastman, and Brandon have higher attempt rates than the Manitoba average, and South Eastman, Central, and Interlake have lower than average attempt rates.
- Self-reports from the 2000-2001 Canadian Community Health Survey Cycle 1.1 suggest that there are about four times more suicide attempts in the province than are coded in the administrative databases.
- When risk factors are considered simultaneously in a regression analysis, the key factors predicting a suicide attempt are having a mental illness diagnosis in the previous year, poor health, being young, female, and living in a low-income area.

Overall observations and recommendations:

The burden of mental illness

Knowing that 37% of the population aged 10+ had at least one health care contact coded with a mental illness diagnosis over the five-year period from 1997/98-2001/02, mental health services are critical to the health care system of the province. Moreover, 24% of Manitobans were diagnosed as having one or more of the "cumulative" mental disorders (depression, anxiety disorders, substance abuse, schizophrenia, and personality disorders). One in ten visits to physicians, and one in ten hospitalizations are related to issues of mental illness. Those having diagnoses for mental illness are also using home care and personal care homes at much higher rates compared to the rest of Manitobans. Given the fact that mental illness is a critical area of interest to health care planners and policy-makers throughout the province, there are several issues arising from this report that should be addressed.

Is our health care system "needs-based" in its response to people with mental illnesses?

If health services for mental illness were truly "needs-based", one would expect the rate of health care service use to be higher for people living in the lower income neighbourhoods, since that is where the prevalence is highest.

As well, one would expect those RHAs having the poorest overall health status to show the highest health services use rates. For those people having mental illness diagnoses (i.e., the "cumulative" mental disorders group):

- The rates of hospitalization 'for' mental illness *do* show a strong needs-based relationship, with people in low-income areas and areas of poor overall health status having the highest hospitalization rates.
- Overall physician visits 'for' mental illness reasons *do not* show a needs-based relationship in urban areas, where rates are similar in all income areas. In rural Manitoba, the relationship with physician visits 'for' mental illness is exactly the opposite of what would be expected, with those living in the lower income areas and in areas of poorer overall health status (such as the North) having lower visit rates.
- Visit rates to psychiatrists *do not* show needs-based patterns. In fact, psychiatrist visit rates show the exact opposite pattern by neighbourhood income and by health status. Those in the highest income areas, and in the areas of best overall health status, have the highest psychiatrist visit rates. That is, those who are most likely in need of psychiatric care are the least likely to access it. Psychiatrist visit rates are especially low in the rural and remote areas of the province (although these visits may be underestimated due to missing data from salaried psychiatrists). As well, the most frequent users of psychiatrists are 35-55 year olds, with low rates for young adults, and extremely low rates for people aged 60 or higher. Given the fact that a high proportion of the elderly have mental illness diagnoses, and very high visit rates to physicians for reasons of mental illness, it is particularly surprising that the psychiatrist visit rate in this age group is so low. It is therefore important for health planners to look at issues of access to psychiatrists for older adults.
- Home care use is *somewhat needs-based*, with highest rates of open home care cases in the lowest urban income areas. This expected gradient is not as apparent for non-urban areas (although there appears to be a trend in the expected direction). Home care rates are generally low in the North compared to the other areas of the province.

Is appropriate care in appropriate settings being given to people with mental illnesses?

The providers of health care services must consider issues of appropriateness—is the most appropriate health care provider giving the most appropriate service to an individual in the most appropriate setting and in a timely manner? In the 1990s, there was much discussion surrounding the topic of community-based mental health care, and the de-institutionalization of mental health services. For example, Brandon Mental Health Centre downsized, and finally closed in 1998.

In this report, we were able to examine the patterns of health care use by people with mental illness diagnoses, both in acute care settings and in men-

tal health centres. For Brandon (especially the district of Brandon East) and the RHAs near Brandon (Assiniboine and Parkland), there are high rates of acute care hospital use 'for' mental illness (this includes use of dedicated psychiatric beds within acute hospitals). These higher-than-average acute care hospitalization rates are not evident for people living in Central or Interlake RHAs, where Eden and Selkirk Mental Health Centres are located. Residents of these RHAs appear to use the Mental Health Centres rather than the acute care hospitals. It appears that the acute care hospital system is responding to the need of people with mental illness in certain regions like Brandon (many of whom may be former residents of the Brandon Mental Health Centre), but the question remains whether this is the most appropriate care from the most appropriate health care providers.

Personal Care Homes (PCH) are another institutional setting which deserve attention: at least three-quarters of PCH residents and new admissions have a mental illness diagnosis. PCH managers need to ensure that appropriate referrals for treatment are being made, and that PCH staff are appropriately trained. Care provided in PCHs must address both physical and mental health needs of residents.

Are there ways to identify who may be at risk for suicide?

In our analyses of individuals who attempted or completed suicide, risk factors such as age, sex, RHA and neighbourhood income were important factors. These cannot be modified, but they can give us important information about who is likely to attempt or complete suicide. Another highly predictive risk factor was having a diagnosis of a mental illness in the previous year—in other words, persons completing or attempting suicide are highly likely to have contacted a health care provider for mental health issues in the year prior to the event. This is a 'window of opportunity' for the health care system to intervene. Therefore it is important to ensure that the referral system for those at high risk of attempting suicide is adequate in all parts of the province. North Eastman RHA has elevated rates of suicide, whereas Nor-Man and Burntwood have elevated rates of suicide attempts. Knowing that psychiatric referral rates are very low for young adults and for those living in rural and remote areas of the province, planners need to examine ways to ensure access to psychiatric services throughout the province (including appropriate prescriptions for depressed adolescents).

Do we have adequate data to monitor and evaluate mental health services in Manitoba?

Adequate data collection is critical to ensure evaluation of the way in which our health care system addresses issues of mental illness. Given the fact that this report was based mainly on administrative claims data available through the Population Health Research Data Repository housed at MCHP, along with MHMIS data, we have been able to do extensive research into the pat-

terns of mental illness and health care use. The data proved to be extremely useful despite its limitations, and demonstrated a high degree of validity. However, there are some key recommendations for future data collection to facilitate future reports on mental health services:

- It is important to ensure that Vital Statistics data are updated to include post-mortem cause of death as determined by the Medical Examiner's Office, since underreporting of suicide is a concern.
- Manitoba needs a mental health database system that contains mandated fields which are consistently and accurately coded throughout the province. MHMIS contains useful information which is able to be linked to various other databases for further analyses of health care use and outcomes. A consistent province-wide system is critical—whether this be MHMIS or a different system—to enhance comparability among RHAs. At present there are different systems in different RHAs (notably Winnipeg makes limited use of MHMIS), and differences as to which fields are coded, defined, and put into the system by the health care providers.
- Salaried psychiatrists in the mental health care system need to submit "shadow billing" claims to Manitoba Health so that these services are visible in administrative database analyses. Otherwise, psychiatrist visit rates throughout the province appear lower than what is actually being provided.

How will this research facilitate evidence-based mental health services planning and policy-making?

The Need To Know Team, comprised of high-level planners from every RHA in Manitoba, has been instrumental in making this report a reality—from conception of the topic, to analysis, to interpretation of the data, and finally to dissemination—and to ensure that it is implemented by the decision-makers in each region. This report is being highlighted by Team members in various ways, such as at the annual MCHP Rural and Northern Health Care Day workshop, at MCHP briefings to Manitoba Health, at RHA planning meetings and Board meetings, and at various academic conferences throughout Canada. *The Need To Know* Team realizes the importance of evidence-based decision-making, and will work towards ensuring that this report will be widely-used in discussions about mental health services planning in Manitoba.

The entire document, as well as each graph in Excel spreadsheet format, is available at MCHP's website www.umanitoba.ca/centres/mchp/ under "Reports". Hard copies of the report may be requested through the website form, or by contacting MCHP directly.

CHAPTER 1: INTRODUCTION AND METHODS

1.1 The Collaborative Network for This Report

Mental illness is a profound problem in our province, yet there is a lack of regional information available on the prevalence and the resource use of those experiencing this health problem. According to a recent national report on mental illness in Canada (Health Canada, 2002), which relied solely on hospital data and vital statistics data, there is a need to understand the use of community services beyond the acute care settings. In Manitoba, we are fortunate to have access to many data sources (community, hospital, and mental health facilities) that can assist in providing a more accurate picture of the extent and implications of mental illness. The collaborative researcher/planner group known as *The Need To Know* Team, described below, identified the need for population-based information on mental illness as a critical aspect of planning for rural and northern regional health authorities (RHAs). This report is designed to provide an overview of population-based indicators on the prevalence of mental illness and the patterns of health care use of those having mental illness diagnoses, in order to assist in the planning and decision-making processes of Manitoba's RHAs. This is the second joint research project of *The Need To Know* Team, directed by Dr. Patricia Martens of the Manitoba Centre for Health Policy in the Department of Community Health Sciences.

The Manitoba Centre for Health Policy (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 the Canadian Institutes of Health Research (CIHR) in 2001, researchers from MCHP, planners 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 three 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 present report is the Team's second project, selected by the Team

members and deemed critical to the future planning of the RHAs. The Team was also assisted by a Working Group of mental health experts, 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 eleven non-Winnipeg RHAs. Two of these amalgamated in 2002 to become Assiniboine RHA. This report is focusing on these ten 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 upon the needs of the non-Winnipeg RHAs. So although rates for Winnipeg are shown for comparative purposes, rates for smaller sub-divisions of Winnipeg are not given. Each of *The Need To Know* Team RHA members worked with MCHP and Manitoba Health to define sub-regional "districts" for purposes of regional planning. Figure 1.2.1 illustrates the RHA geographical boundaries, and Figures 1.2.2 and 1.2.3 show the district divisions of each non-Winnipeg RHA. Municipalities (and postal codes where necessary) comprising each of the districts are listed in Appendix 2. Most RHAs have between three and 11 districts, with the exception of the RHA of Churchill. Due to its very small population (just over 1,000 residents), any further subdivision would result in unstable rates. 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.

1.3 What's in This Report?

The focus of this report is to give insight to policy makers, decision-makers and planners on patterns of mental illness diagnoses, and health care use of those having mental illness diagnoses. The following issues are addressed:

- Prevalence of mental illness diagnoses (Chapter 2)
- The Mental Health Management Information System (MHMIS) database information (Chapter 3)
- The use of physician services (Chapter 4)
- The use of hospital services (Chapter 5)
- The use of home care (Chapter 6)
- The use of personal care homes, or "nursing homes" (Chapter 7)
- The use of pharmaceuticals (Chapter 8)
- Suicide and suicide attempts (Chapter 9)

Figure 1.2.1 Regional Health Authorities (RHAs) of Manitoba

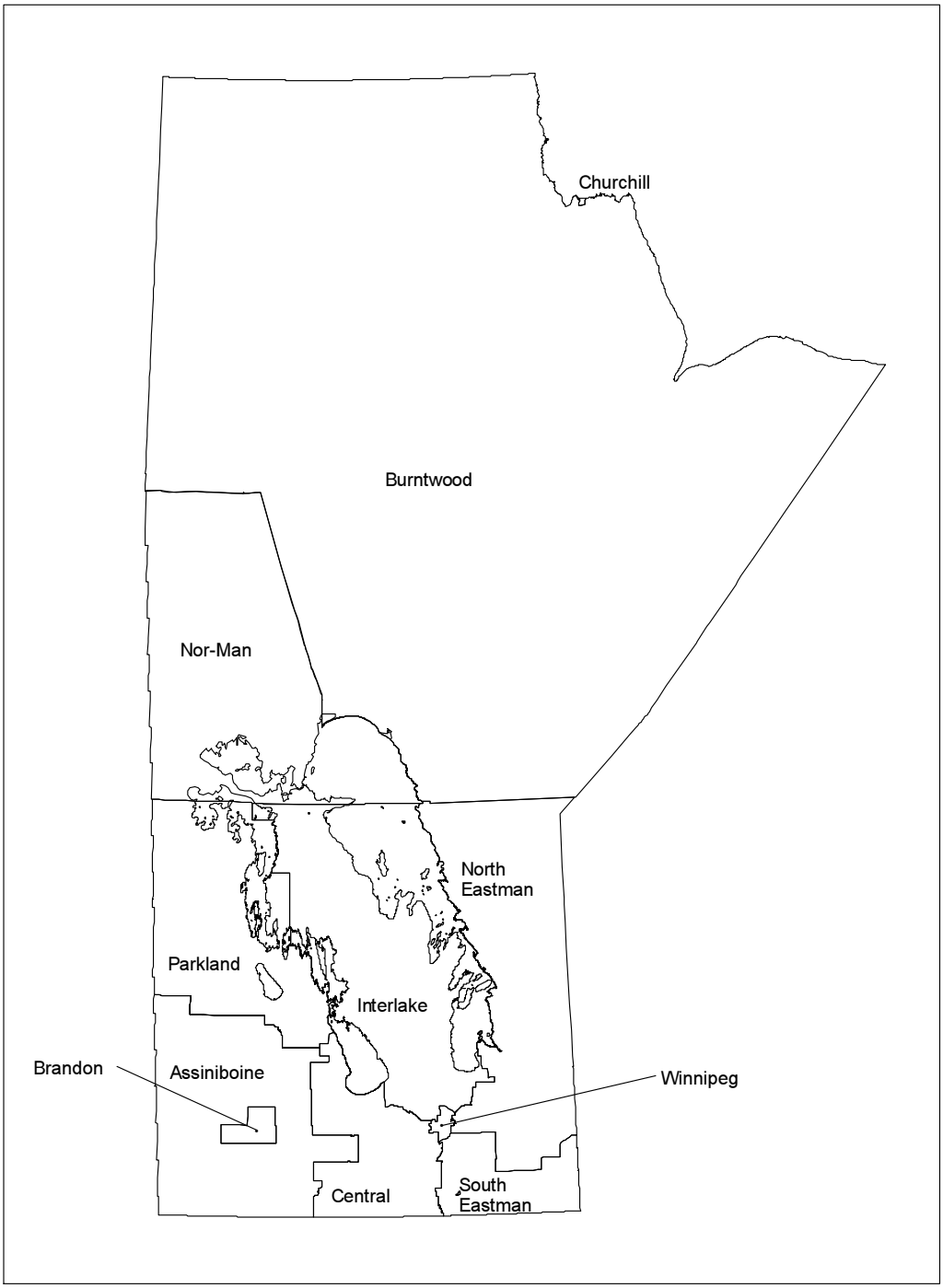


Figure 1.2.2 Districts of Northern RHAs Used in This Report

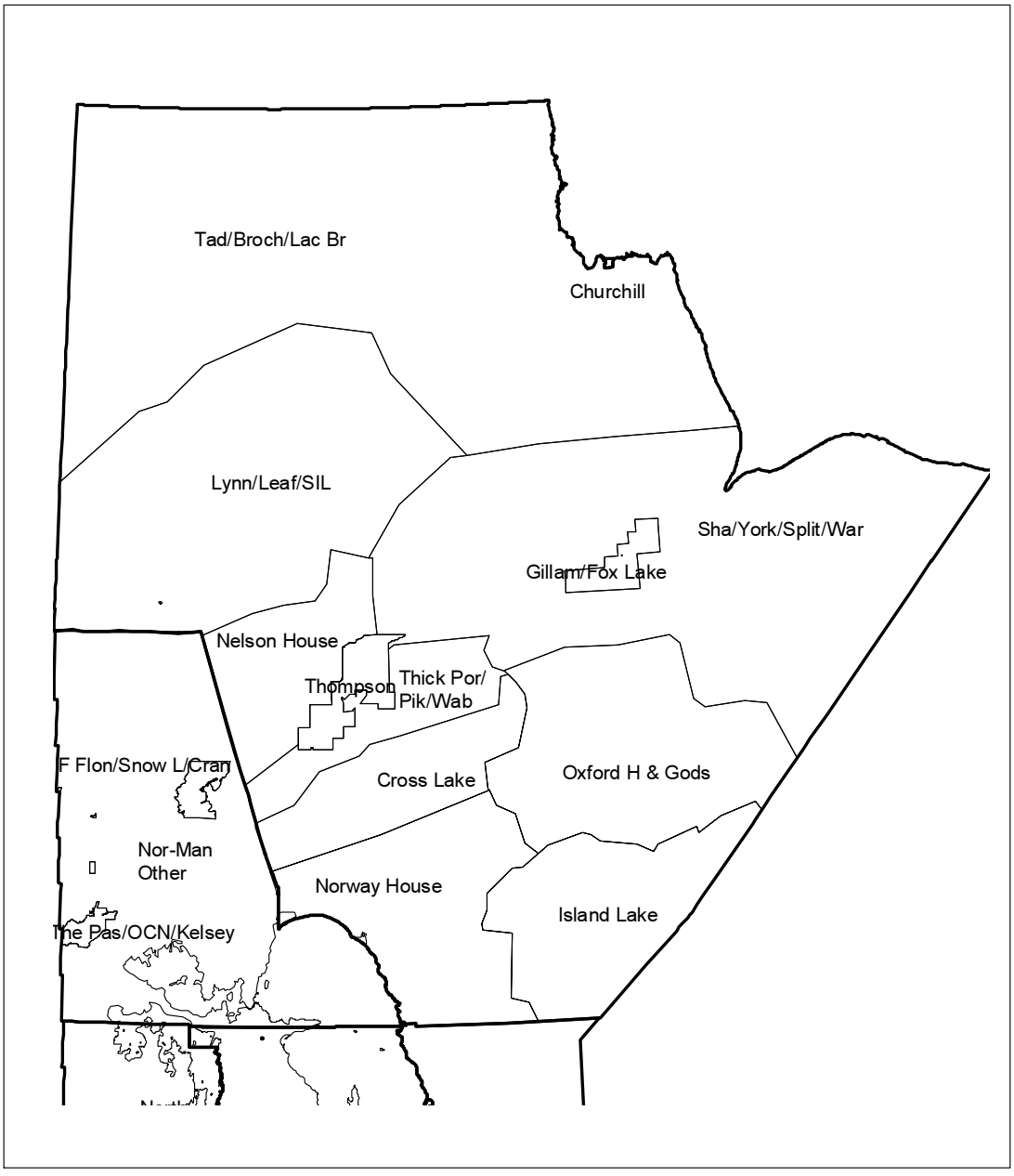
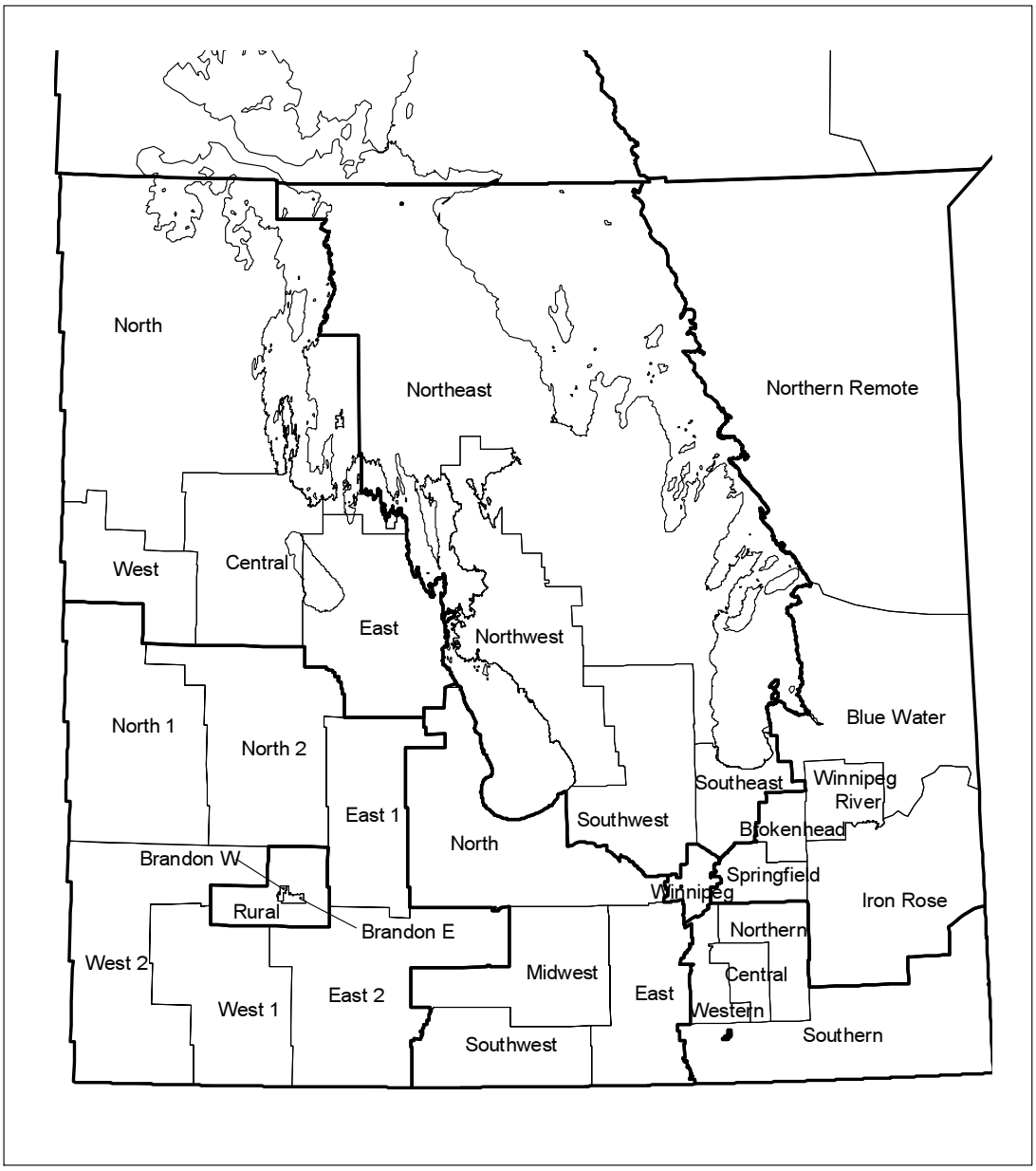


Figure 1.2.3 Districts of Southern RHAs Used in This Report



Every indicator is given separately for males and females, since patterns can differ substantially between sexes. As well, geographical comparisons are given for most of the indicators, including:

- Comparison by RHA.
- Comparison within each RHA by sub-regional "districts".
- Comparison to aggregate areas—the provincial rate, as well as rates for Winnipeg, the Rural South, and the North (see the following section for a description of these).

Graphs in this report are shown by RHA, districts and aggregate regions, as well as by age groups and by neighbourhood income groupings. Most analyses only include Manitobans at least 10 years old who lived in Manitoba for at least one year during the five fiscal years 1998/99 through 2001/02. Where you live, not where you go for treatment, is how the regional rate is determined.

For many of the indicators in this report, two further socio-demographic comparisons are given:

- Comparison by age groups.
- Comparison by neighbourhood income groupings (called "income quintiles").

1.4 The Indicators—Key Concepts

This report is a population-based report. What does this mean? First, it means that the rates or the prevalence are based upon every single person living in Manitoba who has a provincial health card (see Section 1.8 for the difference between *prevalence* and *rate*). Generally (unless otherwise stated) the population consists of all people 10 years of age or older, who lived in Manitoba for at least a year during the five-year period from fiscal year 1998/99 through 2001/02. So the rates are not based upon smaller "samples," but rather the entire population fitting these criteria.

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 that hospitalization took place in a Burntwood hospital, or a hospital in another RHA 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 quintile groupings", 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 quintile groupings.

Many of the indicators are also given by *neighbourhood income grouping*. This is based upon 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/Brandon) and rural (the rest of the province) "quintiles", meaning five groupings having approximately equal populations in each of the groupings, 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.

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, except as a comparison at the bottom of the RHA graphs. The other comparison groups include: "**Rural South**" (defined as a combined rate of 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 RHA. Therefore, the other groupings of the Rural South and the North are important comparisons for the non-Winnipeg RHAs.

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

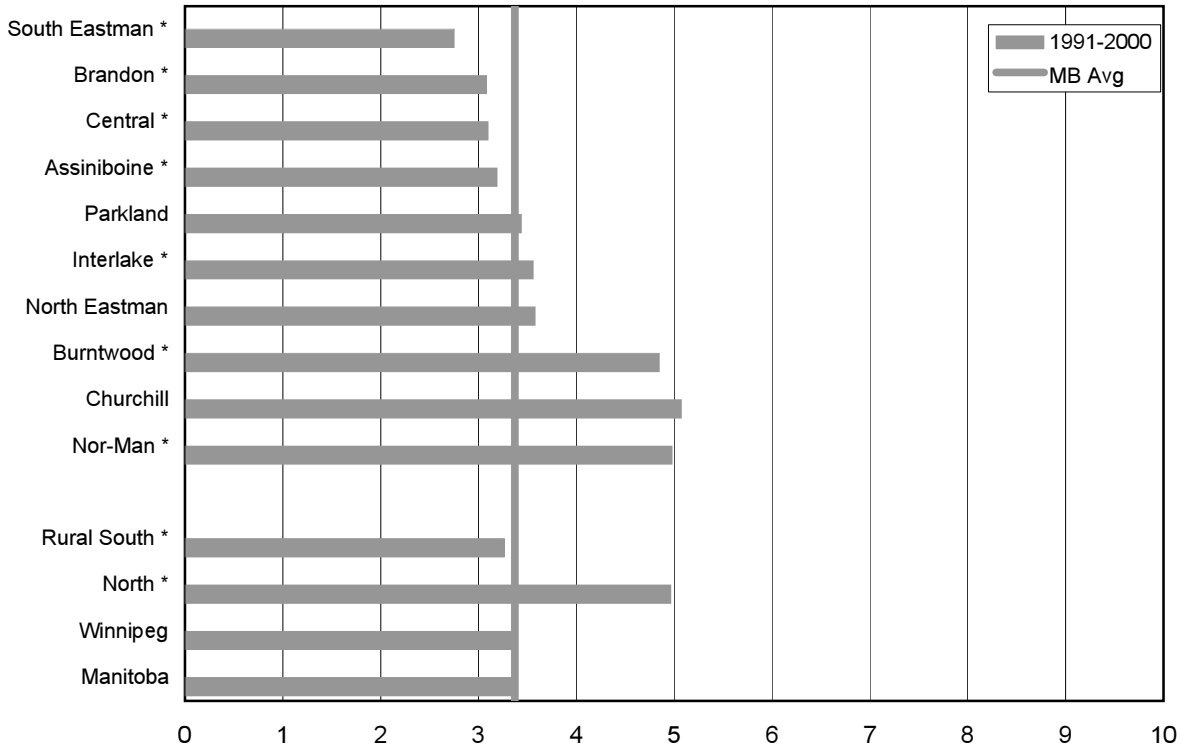
Each RHA and district graph is ordered in a special way, which is consistent throughout the entire report. This order is based upon the overall population health status of the area, as measured by the premature mortality rate of the area over a ten-year period (1991 through 2000). See Figures 1.5.1 and 1.5.2 for the PMR by RHA and by district. Premature mortality rate (PMR) is a standardized (age- and sex-adjusted) rate of "premature" death, that is, death before the age of 75 years.

MCHP has frequently used PMR as a surrogate for the overall health status of a region's population. Knowing that people who live in areas of socioeconomic risk usually experience more health problems, MCHP looks not only at health care use rates but also at the relationship between these rates and the "need" for health care (Black et al., 1995; Roos, 1999; Roos et al., 1999). PMR, or death before the age of 75 years, is used as a "surrogate" for the underlying health status of a group of people, and thus their "need" for health care (Eyles et al., 1991; Eyles and Birch, 1993). PMR has proven to be an important framework for MCHP's analyses of regional health care use patterns (Black et al., 1999; Brownell et al., 2001; Martens et al., 2002, Martens et al., 2003). One would expect populations with poorer overall health status to require greater health care services.

Each regional graph shows the RHAs in order of increasing overall PMR. The RHAs having the lowest PMR, that is, the best overall regional health status, are at the top (South Eastman, Brandon, Central). PMR increases as you go down the left-hand side of the graph, so the areas with the highest PMR, or poorest overall health status, are at the bottom (Burntwood,

Figure 1.5.1: Premature Mortality Rates by RHA

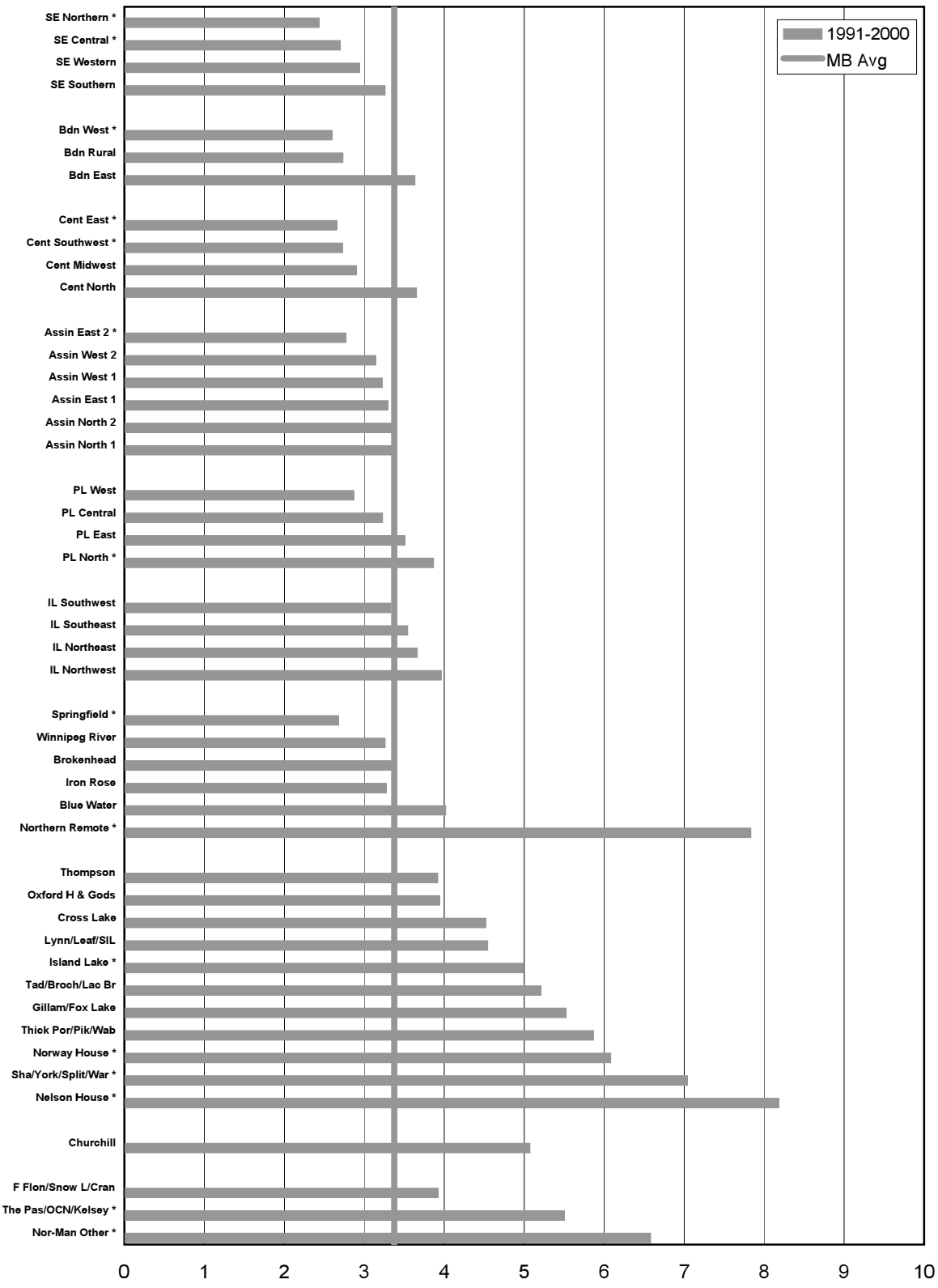
Age- and sex-adjusted rate of deaths per 1000 residents aged 0-74



* indicates area's rate was statistically different from Manitoba average

Figure 1.5.2: Premature Mortality Rates by District

Age- and sex-adjusted rate of deaths per 1000 residents aged 0-74



Churchill, and Nor-Man). In the district graphs, the same order of the RHAs is maintained. However, the districts within each RHA have 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).

Using a PMR framework, it is helpful to ask a question about the relationship between underlying health status of a region and its underlying mental illness diagnoses and use patterns. In other words, if a region's overall health status is poor, do we also see higher prevalence of mental illness, or greater use of mental health resources in the region? So as you look at graphs throughout this report, you can observe whether or not there is this relationship. If you look from top to bottom (that is, from South Eastman to Nor-Man), do you also see corresponding increasing or decreasing rates (in other words, an underlying relationship with PMR)?

1.6 The Data Sources and Years of Data Used

The use of premature mortality rate (PMR) as a surrogate for the underlying health status of a group of people, and thus their need for health care, has proven to be an important framework for MCHP's analyses of health care use patterns.

MCHP houses sets of data collectively referred to as the *Population Health Research Data Repository*. These are derived from administrative claims data, that is, data which are obtained in order to administer the universal health care system within Manitoba. However, prior to MCHP using these data, identifying information such as name, street address and true health number is removed. Therefore, the Repository contains 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 service provided—a family physician/general practitioner, or a specialist (such as a psychiatrist).
- Home care (records of the use of provincial home care services).
- Personal care homes (records of the use of 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).
- The MHMIS system (Mental Health Management Information System, which is a record of mental health community services, and institutional services for Selkirk and Eden Mental Health services).
- The 2001 census files (for socioeconomic information at the neighbourhood level).

Depending upon the source of data, rates and prevalence are generated for either fiscal years or calendar years. For example, "1997/98-2001/02" represents the fiscal years April 1, 1997 to March 31, 2002, and 2000-2001 represents calendar years January 1, 2000 to December 31, 2001. Most health care use data are reported in fiscal years, whereas mortality data are usually reported by calendar years.

Occasionally, we also report data derived from the Canadian Community Health Survey (CCHS) Cycle 1.1, such as some overall stress-related indicators in Chapter 2. The CCHS Cycle 1.1 is a Statistics Canada survey of a sample of the population in 2000-2001, but for purposes of the graphs presented in this report (see Chapter 2), we relied solely on the CCHS individual files of those people who agreed to have their data available to provincial health departments for research purposes. We developed a statistical technique to age- and sex-adjust the CCHS rates in order to make statistical comparisons by region despite the fact that the regions may have very different age/sex distributions (see the Glossary on CCHS for further explanation). One of the major limitations of the CCHS data in Manitoba is that all people living in First Nations communities are excluded from the sample, with the result that in some regions (such as Burntwood RHA), more than half of the region's population is excluded. This could result in the possibility of non-generalizable results.

MCHP obtained ethical approval from the University of Manitoba's Faculty of Medicine Human Research Ethics Board to access the Population Health Research Data Repository for purposes of this report. As well, we obtained permission to use the Mental Health Management Information System from each of the Medical Directors for all the Psychiatric Facilities in Manitoba, as well as the Chief Provincial Psychiatrist, Dr. Hugh Andrews.

1.7 Rates and Prevalence, Standardization, and Statistical Analyses

Despite the fact that many of the rates and prevalence graphs in this report are based on several years of data, most graphs are presented as *annualized* rates/prevalence, that is, the average value for **one** year (based on an average over all the years of data used). Exceptions are indicated when they occur.

Standardized rates and prevalence are given in the graphs, but crude values are available in the Appendix. All graphs present annualized values, that is, the average yearly value as calculated over the number of years used in the analysis. Most graphs include statistical test notations, so that you know if a value is similar to or different than the provincial average.

Most of the indicators are given as *standardized rates (or standardized prevalence)*. This means that the rate has been adjusted to create a fair comparison among regions with different age distributions. All rates are standardized to reflect what the rate would be if each area's population had the same age and sex distribution as the Manitoba population at December 31, 2001. For most of the analyses, the age groupings used for the direct standardization technique were: 10-14, 15-24, 25-39, 40-54, and 55+ years. Rates are *suppressed* (that is, not reported) where the counts upon which the rates are based represent five events or less. Throughout the report, the letter "s" in brackets beside the RHA or district name on the left-hand side of the graph indicates a suppressed rate.

The Appendix contains tables listing the *crude rates or prevalence* (the actual count divided by the actual population), without any adjustment for age and sex distributions. These tables also include the 'observed' number of events for each indicator. 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 indicates how much confidence to put in the results. 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 either higher or lower than the provincial average from year to year, unless some change is implemented. When you see a large difference that is NOT statistically significant, it is telling you that this rate is considered similar to the comparison (usually the provincial average), since that 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 from year to year and may be higher, similar or lower than the comparison the next time it is measured.

Most of the graphs contain information about *statistical comparisons*. Statistical comparison tests of age-standardized rates and prevalence used Hotelling's t^2 methodology developed by Carriere and Roos (1997). This simply gives an indication as to whether or not an area's rate is statistically higher or lower than the comparison group, or if the rate should be considered similar to the comparison group when no statistical difference is noted. In each graph, the notation provided in brackets beside the name of the RHA or district indicates statistical significance. Below each graph is an explanation of the statistical notations.

Many of the graphs use the notation "m" which means that the RHA's (or district's) *male rate is significantly different than the overall Manitoba average male rate*. An "f" means that the RHA's (or district's) female rate is signifi-

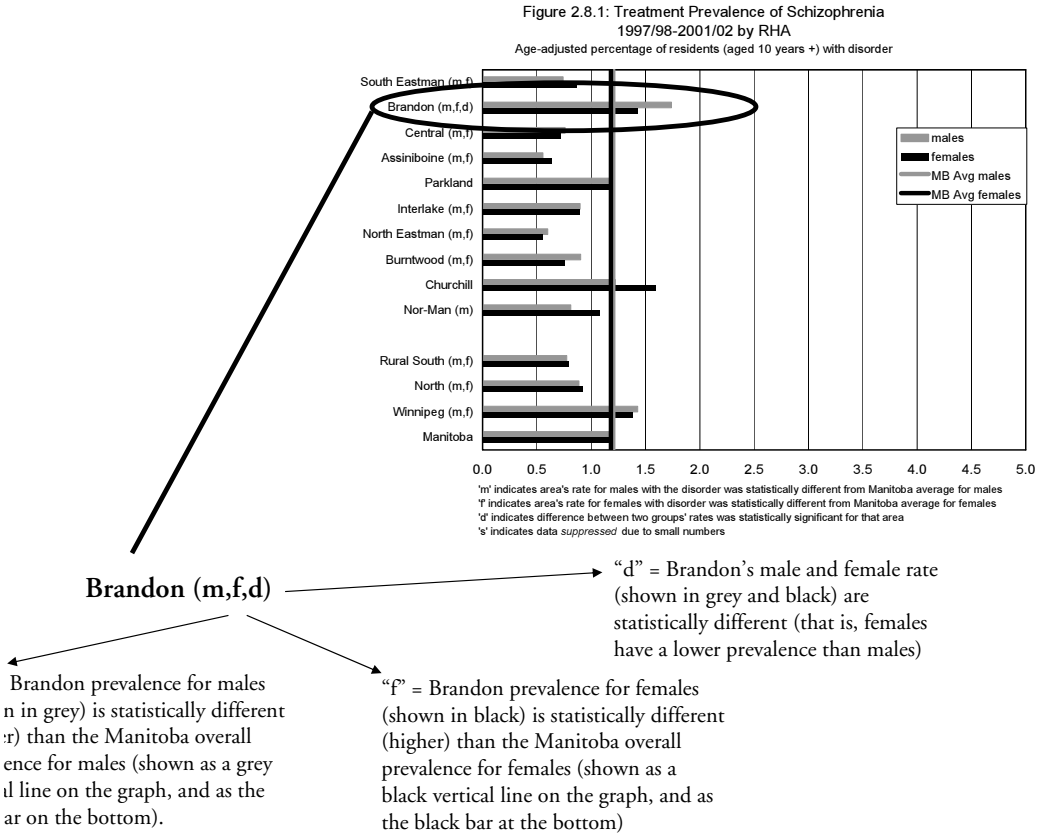
cantly different than the Manitoba overall average female rate. A "d" means that there is a statistically significant *difference between the male and female rate* within that RHA or district.

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 one sees is not due to chance alone. So "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 much larger Type I error, one uses a Bonferroni correction factor whereby the traditional $p<.05$ (5%) level of significance is stiffened for each individual test in the series of tests. This helps keep the overall level of Type I error at the allowable 5% level. So when we tested for differences between each RHA and the Manitoba overall average, the statistical criterion of $p<.01$ was applied for each single test, to give an approximate overall $p<.05$, or 5%, level of Type I error. Similarly, when testing for differences between each district and the Manitoba overall average, the criterion of $p<.005$ was applied to each single test. The standard statistical criterion of $p<.05$ was used for testing differences between males and females within each RHA (or other "within RHA comparisons). All data management, programming and analyses were performed using SAS® software.

Here is an example of how to read statistical notations, taken from Chapter 2 and illustrating the treatment prevalence of schizophrenia for Brandon RHA.

Brandon's treatment prevalence of schizophrenia is shown in Chapter 2, Figure 2.8.1. Beside the name "Brandon" is shown the bracketed information (m, f, d). This means that the Brandon prevalence of schizophrenia is statistically **different** (in this case, higher) than the provincial prevalence for both males and females (as indicated by the "m" for males, and the "f" for females). The provincial prevalence is shown at the bottom of the graph, but also in the two vertical lines (the grey for males, the black for females). Brandon male prevalence of schizophrenia at 1.74% of the male population is higher than the provincial male prevalence of 1.20%. Similarly, Brandon's female prevalence of 1.43% is also higher than the provincial female prevalence of 1.18%. The "d" indicates that the prevalence of schizophrenia is significantly different for males and females in the RHA of Brandon (in this case, the female prevalence is lower).



The prevalence has been "adjusted" or "standardized" to make a fair comparison amongst all the RHAs, by using the same age distribution as the entire province in 2001, attributed to Brandon. However, if you look in the Appendix, you will find the crude prevalence, that is, the actual numbers of males and females who were diagnosed with schizophrenia, divided by the population of Brandon, to give an accurate picture of the burden on the health care system in Brandon. There are 352 Brandon males diagnosed with schizophrenia, for a crude prevalence of 1.71%, and 315 females for a crude prevalence of 1.39%. The crude and standardized prevalence values are very close, since Brandon and the province have very similar age structures.

Figure 2.8.2 (see Chapter 2) shows the treatment prevalence of schizophrenia for the three districts of Brandon RHA. These are very different from each other, with the prevalence of each being: Brandon West (male 0.78%, female 0.69%, and both lower than the provincial average), Brandon Rural (male 0.27%, female 0.78% with only the male prevalence lower than the provincial average), Brandon East (male 3.13%, female 2.35%, with both higher than the provincial average, and males higher than females for that

district). So within the RHA of Brandon, there are dramatically different district prevalence values, indicating very different underlying needs for mental illness services.

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). In our report, we are using the concept of period prevalence over a five-year period of time. When we look at the prevalence of mental illness disorder diagnoses, we are reporting the proportion of the population living in Manitoba who are at least 10 years old, who have lived in Manitoba for at least a year, and who have a diagnosis in our administrative database for a certain mental illness in the five-year fiscal period from 1997/98 to 2001/02. Prevalence is an indication of the extent of a condition in the population, and therefore has major implications for the provision of services within a region. For example, the five-year period prevalence of schizophrenia in Manitoba was found to be 1.2% for both males and females in Manitoba. This does NOT tell us anything about the number of new cases of schizophrenia in Manitoba—rather it includes all new cases as well as existing cases.

In contrast, a *rate* refers to a *change in state over time*. For example, females with no mental illness diagnoses have a rate of hospital use of 0.15 visits per person per year, compared with females with at least one of the cumulative mental illness diagnoses, who have double the rate at 0.30 visits per person per year.

1.9 Key Comparisons by Mental Disorder Grouping—"Cumulative" Versus "No Disorder"

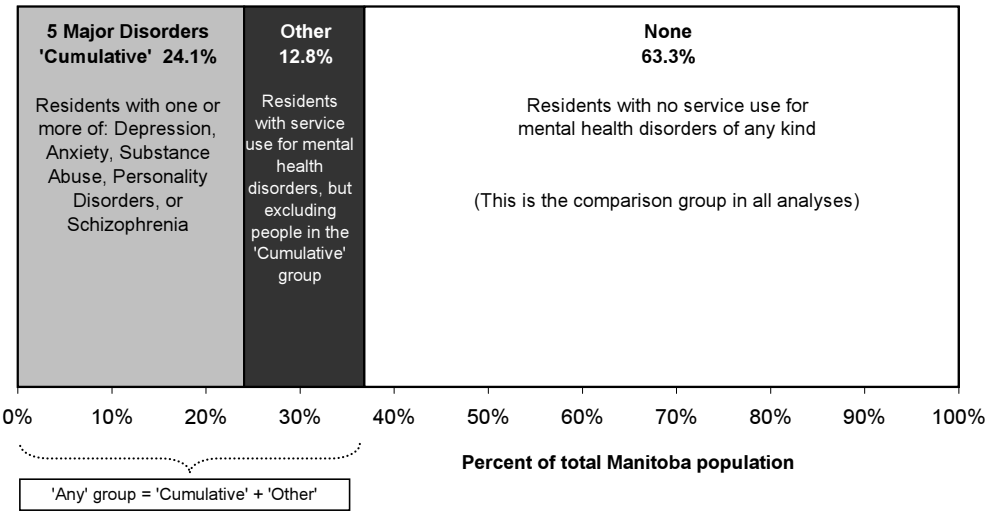
The cumulative disorders group refers to those people having one or more of the following conditions: depression, anxiety disorder, substance abuse, schizophrenia, and personality disorder.

In many of the health care service use comparisons within this report, the rates of service use of those having one or more of the *cumulative mental illness disorders* is compared to the rate of service use of those having *no disorder*. The *cumulative disorders group* refers to those people having one or more of the following conditions: depression, anxiety disorder, substance abuse, schizophrenia, and personality disorder. The *no disorders group* refers to those people who have no diagnoses for any mental illness condition in the five-year period of time. There is also a third grouping of people having *other disorders*—people having mental illness diagnoses for psychiatric disorders that are not included in the cumulative disorders group. For example, people with a diagnostic coding for dementia, but for none of the cumulative disorders, would be in the "other disorders" group. However, if a person had a diagnostic coding for dementia, but also for depression or substance abuse, this person would be included in the "cumulative disorders" group instead.

The terms and diagnoses criteria are further explained in Chapter 2. As well, Appendix 6 goes into greater detail into the validity of the measures for mental illness diagnoses.

The following chart shows the proportion of Manitobans in each of the three categories. See Section 2.5 in Chapter 2 for the proportion of males and females in each category.

Figure 1.9.1: Percent of Residents (aged 10 years +) Within Each Category of Mental Illness Groupings



Throughout the report, health service use patterns are often compared using the population groupings of "cumulative mental illness disorders" compared to "no disorders", and these groupings are illustrated in the chart given, as well as in Chapter 2.

1.10 Summary

Electronic versions of this report, as well as Excel spreadsheets of the graphs, are available on MCHP's website: www.umanitoba.ca/centres/mchp

There is a wealth of information on mental illness—both prevalence and use of the health care system—contained 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 throughout Canada. 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 mental illness diagnoses, the use of health care services, and the rate of suicide and suicide attempts.

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?

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: TREATMENT PREVALENCE FOR SELECTED MENTAL ILLNESS DISORDERS

2.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

This chapter contains information on the treatment prevalence of various categories of mental illness disorders, by sex, region of the province (RHAs and districts), age and neighbourhood income grouping. The concept of "treatment prevalence" is further defined within this section. Where applicable, comparative Canadian data are also reported for each diagnostic group.

The treatment prevalence indicators are:

- Cumulative Disorders (Section 2.2)
- Other Mental Illness Disorders (Section 2.3)
- Categories of Mental Illness Disorders (Section 2.4)
- Depression (Section 2.5)
- Anxiety Disorders (Section 2.6)
- Substance Abuse (Section 2.7)
- Schizophrenia (Section 2.8)
- Personality Disorders (Section 2.9)
- Dementia (Section 2.10)
- Comorbidity Issues of the Cumulative Disorders (Section 2.11)
- ADD/ADHD (Section 2.12)
- Premature Mortality Rate comparisons (Section 2.13)
- Other Mental Illness from Self-Reports in the Canadian Community Health Survey (Section 2.14)

Study population and sources of information

For most analyses, all residents aged 10 or older, living in Manitoba for at least one year in the five fiscal years 1997/98-2001/02, were included in the study population (n=507,193 males and 522,039 females). Age was determined at the midpoint of the five-year time period used in the analyses, December 31, 1999.

The Population Health Research Data Repository was the main source of information in this report. This repository is a collection of administrative database files. Health administrative data are routinely collected for purposes of billing by physicians and hospitals, or for purposes of monitoring or managing a program. Its original intent was not to do studies on illness conditions, so it was not designed with that in mind. However, each hospital or physician record contains a coding for the visit, using ICD-9-CM codes which relate to diagnoses. Most of the time, this reflects a reason for the visit, and is therefore representative of the "illness" of the patient.

Our definitions of mental illness conditions, using these claims data, were chosen to reflect an administratively-derived prevalence which would approximate self-reported prevalence or previous published reports wherever possible. So at the individual level, our definitions may not do the best job when comparing a person's *individual* diagnosis in a clinical setting using claims data. But at the *population* level, our definitions yield population treatment prevalence estimates that approximate those derived from surveys or clinical studies. In other words, we may include people who have simply had a "rule-out" visit, yet we may miss people whose visit did not result in a billing claim code of a mental illness diagnosis, and people who had a mental illness but were not seen by a health care provider in the five-year period for a mental illness condition (as recorded in the administrative billing claims for the visit).

On the other hand, administrative claims estimates of mental illness in the population are often considered too low, based upon self-reported surveys. People may visit a physician for a variety of problems, and may not receive a coding for a mental illness condition even though this was discussed as part of the visit. This would result in an underestimate of the prevalence. Then there are many people who may be affected by a mental illness but do not seek help from the health care system. So this will once again result in an underestimate of the true population prevalence. One possibility exists whereby prevalence could be overestimated. There are times when a physician is ruling out an illness, and may put down a coding for the illness only to determine at a later time that the person did not have this illness. Validity issues are further discussed in Appendices 3 and 6.

A further problem of physician billing data is that the codings are limited to only "three digits", with no decimal places. Many mental illness conditions may be grouped under the "three digit" code, such as 296 (affective psychoses), for both depression (296.2, 296.3) and bipolar disorder (296.4-296.8). So at times it is impossible to distinguish certain mental illness conditions from physician claims data. In the situation where there is a major problem distinguishing mental illness diagnoses in the physician billing claims, we have also added in specific pharmaceutical information. For example, in the case of "depression", a physician billing claim of 300 is not specific enough, since this code includes both depression (300.4) and anxiety disorders (300.0, 300.2 and 300.3). But if it appears that this person also received certain antidepressant or mood stabilizer drugs, then the person would be classified as part of the "depressed" group (see Glossary for further details). Hospital abstract data contains the decimal coding, and are therefore much more specific for purposes of disentangling the grouped diagnostic categories.

The concepts of period prevalence and "treatment prevalence"

Prevalence simply refers to that proportion of the population who satisfy the coding requirements to be placed into a certain mental illness diagnostic category. Prevalence data provide an indication of the extent of a condition, and may have implications for the provision of services needed in a community. This measure is given as a proportion (or percentage), and does not describe changes over time, or new cases, and should not be described as a rate. In epidemiologic terms, we have calculated a *period prevalence* (Young, 1998). Over a period of time, in this case the five years, we are determining the percentage of individuals with a particular condition in the population at any time during that time period. The *treatment prevalence* refers to the percentage of the population satisfying the diagnostic coding criteria for a particular mental illness category. We refer to the term "treatment prevalence", rather than just "prevalence", since it depends on a person seeing a physician, using a mental health service, or being hospitalized with a mental illness—in other words, receiving a diagnostic coding for a mental illness from a health care service provider. Therefore, the person must have been "treated" somewhere within our health care system (i.e., given a mental illness diagnostic coding for a health care services visit).

The diagnostic categories and groupings

The research group for this report included *The Need to Know* Team, as well as selected mental health experts comprising our Working Group (see Chapter 1 for a description). The team chose *five major mental disorders* of interest to regional planners, which could be detected using administrative data claims. These five include: depression, anxiety disorder, substance abuse, schizophrenia, and personality disorder. The *cumulative* group refers to the proportion of the cohort having one or more of these five disorders. The *other* group refers to the proportion of the population who have at least one diagnosis for a mental illness disorder during the five years, but either do not have "enough" diagnostic codes to be classified in the five disorders (cumulative) group, or have a code for another mental illness condition not included in the cumulative diagnoses. For example, those persons having dementia, but not any of the cumulative disorders, would be in the *other* group. The *any* group refers to a *combination* of the *cumulative* and the *other* groups.

The Need to Know Team was also interested in a few select mental disorders beyond the major five, because of their relevance to distinct age groups—ADD/ADHD for children, and dementia for older adults. Moreover, the Canadian Community Health Survey Cycle 1.1 (CCHS 1.1) included general stress-related questions in a self-report survey of Canadians in the years 2000-2001. Although of limited usefulness for specific mental disorders, some selected questions are included in this chapter. The Canadian Community Health Survey (CCHS) Cycle 1.1 was conducted by Statistics

Canada in order to provide cross-sectional estimates of health determinants, health status and health system utilization of Canadians. The CCHS asked a sample of Canadians age 12 and up about a range of health issues, and contains a section on mental health and well-being. The mental health section includes information on general psychological well-being, various specific mental illnesses such as depression and anxiety disorders, and mental health services such as medication use, social support, and health services use. Data collection for Cycle 1.1 began in September 2000, and took place over a period of one year. This consisted of a region-level health survey conducted with 130,000 Canadians, excluding those living in First Nations Communities, Military Bases, and some remote areas. This report used the Share File for Cycle 1.1 of the CCHS respondents who gave permission for their information to be used for provincial health-related research. There were 8,120 respondents in Manitoba included in this data set. All rates and confidence intervals derived from the CCHS and included in this report were calculated using a modified version of the statistical analysis program provided by Statistics Canada.

What graphs are shown for each mental illness category

For each mental disorder, age-standardized treatment prevalence was calculated separately for males and females, by Regional Health Authority (RHA), by sub-regions of the RHAs called districts, over various age groups, and by income quintile groupings. This report is focusing on the non-Winnipeg RHAs. Therefore *Winnipeg* RHA is shown as a comparison at the bottom of the RHA graphs. Aggregate comparison groups include: *Rural South* (defined as a combined prevalence for South Eastman, Central, Assiniboine, Parkland, Interlake, and North Eastman RHAs), *North* (defined as a combined prevalence for Burntwood, Nor-Man and Churchill RHAs), and *Manitoba* (the overall provincial prevalence).

Refer to Chapter 1 for maps of the RHAs and districts. The district boundaries are further described in Appendix 2. The RHA graphs (as well as the districts within each RHA) are ordered in a special way, by decreasing overall health status as measured by the Premature Mortality Rate (PMR) of the region. See Chapter 1 for a discussion on the use of PMR as a surrogate for regional overall health status.

For the age distribution graphs, the treatment prevalence is given for each five-year age category (10-14, 15-19, 20-24, etc.). Our study is a cross-sectional study—in other words, it is like taking a snapshot of the population in this five-year period. So the age distribution graphs show what percentage of each age group met the conditions for the specific mental illness under discussion. It is possible that this reflects changing surveillance patterns by age group. For example, older adults in personal care homes may not receive diagnoses of mental disorders if the physician concentrates on their physical

conditions for visit codings. As well, young adults may not be identified as having a mental illness until they visit a health care provider who is able to diagnose the problem. Age groups who seek health care professional assistance more readily, such as the middle-aged people, would presumably be more likely to be diagnosed in our administrative data claims.

For the neighbourhood income quintile graphs, income was based on 2001 census data at the enumeration area level, with the average household income of the enumeration area attributed to every person living within that enumeration area.

For the neighbourhood income quintile graphs, income was based on 2001 census data at the enumeration area level, with *the average household income of the enumeration area attributed to every person living within that enumeration area.* The urban quintile groups represent Manitobans living in Winnipeg and Brandon enumeration areas. Approximately 20% of those living in Winnipeg and Brandon are assigned to each of the five *urban income quintile* groupings (U1 lowest, to U5 highest), based on the average household income of their area. All other RHAs are included in the rural quintile groupings, with approximately 20% of the rural population being assigned to each of the five *rural income quintile* groupings (R1 lowest, to R5 highest). The treatment prevalence of each mental illness disorder is shown for males and females in each urban and rural income quintile. On these graphs, you will note an "Income Unknown" category. This represents a group of individuals who cannot be assigned a neighbourhood income from census data, and are therefore excluded from all neighbourhood income quintile groupings R1-R5 and U1-U5. This includes people who are: residents of long-term care facilities, personal care (nursing) homes and psychiatric facilities, residents of federal and long-term prisons, wards of the Public Trustee and Child and Family Services, or residents of areas reporting no average household income in the census.

Adjusted and crude prevalence, and actual numbers

Appendix 1 contains the crude treatment prevalence for the RHAs, as well as the actual numbers of the cohort with a particular diagnosis.

The treatment prevalence shown for the RHA, district and neighbourhood income quintile graphs is adjusted for age (and sex in the CCHS survey results). When a region's prevalence is *age-adjusted* (or "*standardized*"), it means that the age distribution is made equivalent to that of the entire province (at December 31, 2001). This age-adjustment allows different regions to be compared fairly, despite very different age structures. For example, Burntwood has a very young population compared to the province as a whole. So Burntwood's age-standardized prevalence reflects the value as if Burntwood had the same age structure as the entire province. A *crude* prevalence is not age-adjusted. It is merely the proportion of the population, without any adjustment for age distribution differences. Appendix 1 contains the *crude* treatment prevalence for the RHAs, as well as the *actual numbers* of the cohort with a particular diagnosis. See Chapter 1 for a further discussion on adjusted (standardized) rates, crude rates, and statistical testing of rates.

Example:

Rather than giving an example of one particular RHA, the following is a summary table of treatment prevalence of the various mental disorders, by aggregate areas (North, Rural South) and urban centres (Winnipeg, Brandon).

Table 2.1.1: Treatment prevalence of mental disorders: Overall findings

Mental Illness Categories	Treatment prevalence by Aggregate Areas of Manitoba (H=higher than Manitoba average; L=lower; S=similar)				Income Gradient of Treatment (- means negative association, + means positive association; N means no association)*	
Disorders	**Rural South**	**North**	**Winnipeg**	**Brandon**	**Urban Income Quintiles**	**Rural Income Quintiles**
The two main aggregate groupings of mental disorders						
Cumulative Disorders	L	H	H	H (females); S (males)	-	N
Other disorders	L	L	H	H (males); S (females)	N	+ (small)
The separate disorders in the Cumulative Disorders category						
Depression	L	L	H	H	-	+ (small)
Anxiety Disorders	L	S	H	S	-	N
Substance Abuse	L	H (very high)	L (but very close to provincial average)	H (females); S (males)	-	- (but erratic pattern)
Schizophrenia	L	L	H	H	-	- (small)
Personality Disorder	L	L	H	H	-	- (but erratic pattern)
Other selected disorders						
Dementia	L	L	H	S	-	N
ADD/ADHD	L	L	H	H (males); S (females)	N	N
Indicators derived from the CCHS Cycle 1.1 survey						
Positive Mood Balance	S	L	S	H		
Work Stress	S	S	S	S		
Probable Depression and Felt Depressed	L	S	S	S		

*note: a "negative association" means that as neighbourhood income increases, the treatment prevalence of the mental illness decreases. Similarly, a "positive association" means that as neighbourhood income increases, the treatment prevalence also increases.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *How is the prevalence of a mental illness likely to influence the need for health care?*
- *Is the treatment prevalence for mental disorders related to the overall health status of the RHAs (in other words, do you see a pattern as you go down the RHA graphs, which are ordered by Premature Mortality Rate)?*
- *Are there differences in treatment prevalence between males and females, and if so, why do you think this difference exists? Are there particular age patterns which appear in the data, and what are the possible reasons behind these age patterns of the mental illness?*
- *Is one particular RHA or district showing a high or low treatment prevalence, and is this a statistically significant difference? Why do you think this difference exists—more surveillance in certain areas of the province? Migration effects of people with mental illness who are more likely to live in a certain area?*

- *Is there a pattern within one particular RHA across all mental illness diagnoses -for example, is the prevalence high for all the disorders?*
- *Do the mental health services of the area reflect the underlying need for services, according to the regional prevalence of mental disorders?*
- *Which particular mental disorders show income-related patterns, and why do you suppose that is? Are there "contrary" findings—in other words, situations where you actually see higher rates in the higher neighbourhood income groups—and why?*

Overall key findings from this chapter:

Trends of treatment prevalence by areas of the province

- In general, the treatment prevalence of most of the mental illness disorders is lower in the Rural South, but higher in Winnipeg and Brandon compared to the provincial average. In the North, the treatment prevalence of the cumulative disorders is higher than average, mainly driven by the extremely high treatment prevalence for substance abuse since most other disorders are lower than average.
- In the urban areas (Winnipeg and Brandon), most mental illness disorders show the highest prevalence in the lowest neighbourhood income group. The one exception to this is the childhood treatment prevalence of ADD/ADHD, where there is no relationship with income quintile.
- In the rural areas (all other RHAs besides Winnipeg and Brandon), there are varying relationships between mental illness disorder treatment prevalence and income quintiles. In some instances there is no relationship (cumulative disorders, anxiety, dementia, ADD/ADHD). In other instances, the higher the neighbourhood income group, the lower the prevalence (substance abuse, schizophrenia, personality disorder) but this is actually a relatively small difference amongst groups. In still other instances, the higher the neighbourhood income group, the higher the prevalence ("other disorders" category, depression)—but once again the gradient is small.
- The district of Brandon East has very high treatment prevalence for most mental illness disorders.
- The CCHS Cycle 1.1, because of its relatively low sample sizes, does not show much difference throughout the province on self-reported mental health measures. Most aggregate areas show results close to the average, with the exception of lower depression in the Rural South, lower "positive mood balance" in the North, and higher "positive mood balance" in Brandon.

Trends of treatment prevalence comparing males and females

- The five-year treatment prevalence of cumulative disorders in Manitoba is 1.55 times higher for females compared to males (29.1% versus 18.8%). Females have a higher treatment prevalence than males for the following: depression (23.6% versus 12.6%), anxiety disorders (8.66%

versus 4.59%), personality disorder (1.0% versus 0.8%), dementia (11.6% versus 8.9% for those aged 55+), and "other disorders" (14.0% versus 11.5%). Males have a higher treatment prevalence of substance abuse compared to females (6.3% versus 5.3%). The treatment prevalence of schizophrenia is similar comparing females and males (1.2% versus 1.2%). The treatment prevalence of ADD/ADHD in children aged 4 through 18 years is lower in females compared to males (1.3% versus 4.6%).

- There is an excessively high premature mortality rate (PMR) for males in the "cumulative disorders" group compared to the males in the "no disorder" group (6.5 versus 4.5 deaths per thousand, $p<.05$), but no such difference exists for females (3.1 versus 3.3 deaths per thousand, NS).

The "income not found" group—those in long-term care facilities, prisons, and wards of the public trustee and Child and Family Services

- In the group that cannot be assigned a neighbourhood income from census data (residents of long-term care facilities, personal care homes and psychiatric facilities, prisons, and wards of the public trustee and Child and Family Services), the treatment prevalence of certain conditions is particularly high: schizophrenia is six to eight times higher than the provincial average (8.5% versus 1.2% for males, 5.6% versus 1.2% for females), personality disorder is three to five times higher (4.02% versus 0.81% for males, 2.86% versus 0.98% for females), dementia for ages 55 or older is about five times higher (43.8% versus 8.9% for males, 52.5% versus 11.6% for females), and ADD/ADHD for ages 4 through 18 is at least three time higher (13.6% versus 4.6% for males, 4.8% versus 1.3% for females).

Comorbidity of mental illness diagnoses

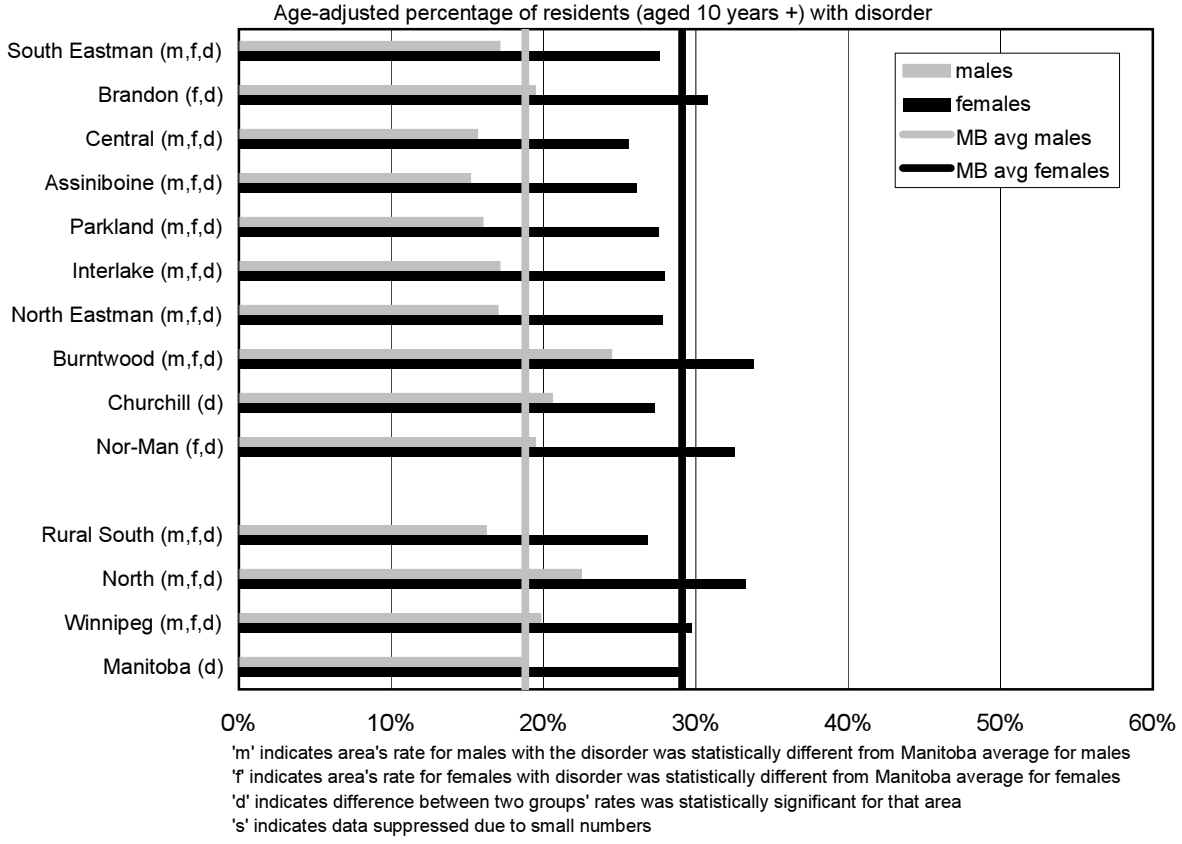
- About 63.1% of the population had no mental illness conditions, and 36.9% had one or more (26.2% had only one mental illness condition, and 10.7% had comorbid conditions) in the five-year period from 1997/98 through 2001/02. Of those treated for any mental illness, almost one-third (29%) had a comorbid mental illness condition.
- Comorbidity varies by diagnosis. Of those in the group treated for depression (18.01% of the population), about *half* (9.05%) had at least one other diagnosis. Of those in the group treated for anxiety (6.60% of the population), about *three-quarters* (4.92%) had at least one other diagnosis. Of those in the group treated for substance abuse (5.78% of the population), about *half* (2.99%) had at least one other diagnosis. Of those in the group treated for schizophrenia (1.16% of the population), about *three-quarters* (0.89%) had at least one other diagnosis. Of those in the group treated for personality disorder (0.86% of the population), *almost all* (0.81% of the population) had at least one other diagnosis. Of

those in the group treated for dementia (2.67% of the population), about *two-thirds* (1.81% of the population) had at least one other diagnosis. Of those in the group treated for any other mental illness condition not listed above (16.75% of the population), about *one-third* (5.26%) had at last one other diagnosis.

2.2 Treatment Prevalence of Cumulative Disorders

Definition: The treatment prevalence of "cumulative disorders" is an age-adjusted percentage of the population aged 10 or greater that have one or more of the following mental illness diagnoses, as defined using our administrative database definitions in the five-year period from 1997/98 to 2001/02. The five cumulative disorders are: depression, anxiety disorders, substance abuse, schizophrenia, and personality disorder. The numerator is the number of people in a five-year period, with the denominator being the entire cohort. Treatment prevalence for cumulative disorders is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is grouped into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.2.1: Treatment Prevalence of Cumulative Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.2.2: Treatment Prevalence of Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

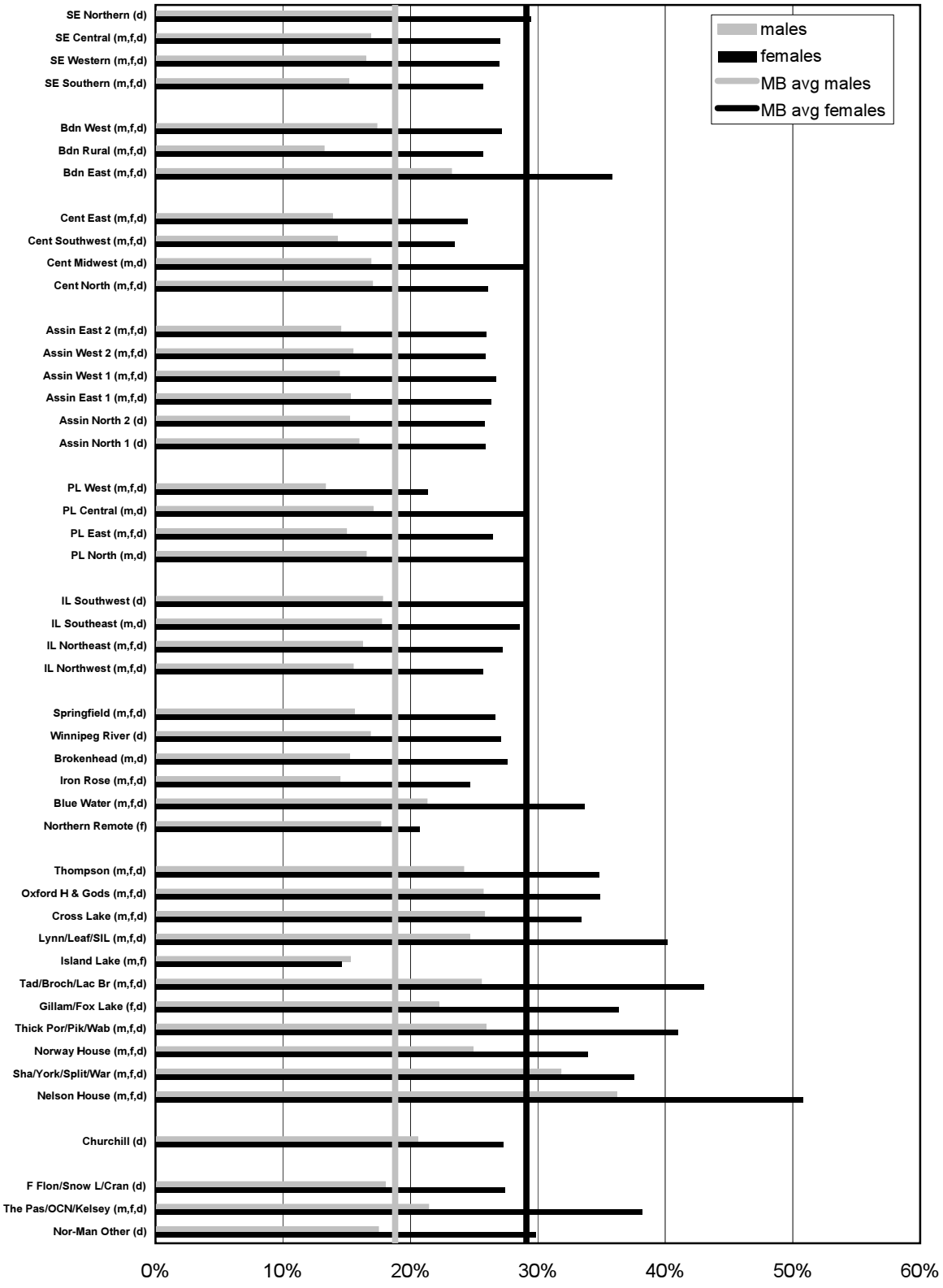


Figure 2.2.3: Treatment Prevalence of Cumulative Disorders by Age and Sex, 1997/98-2001/02

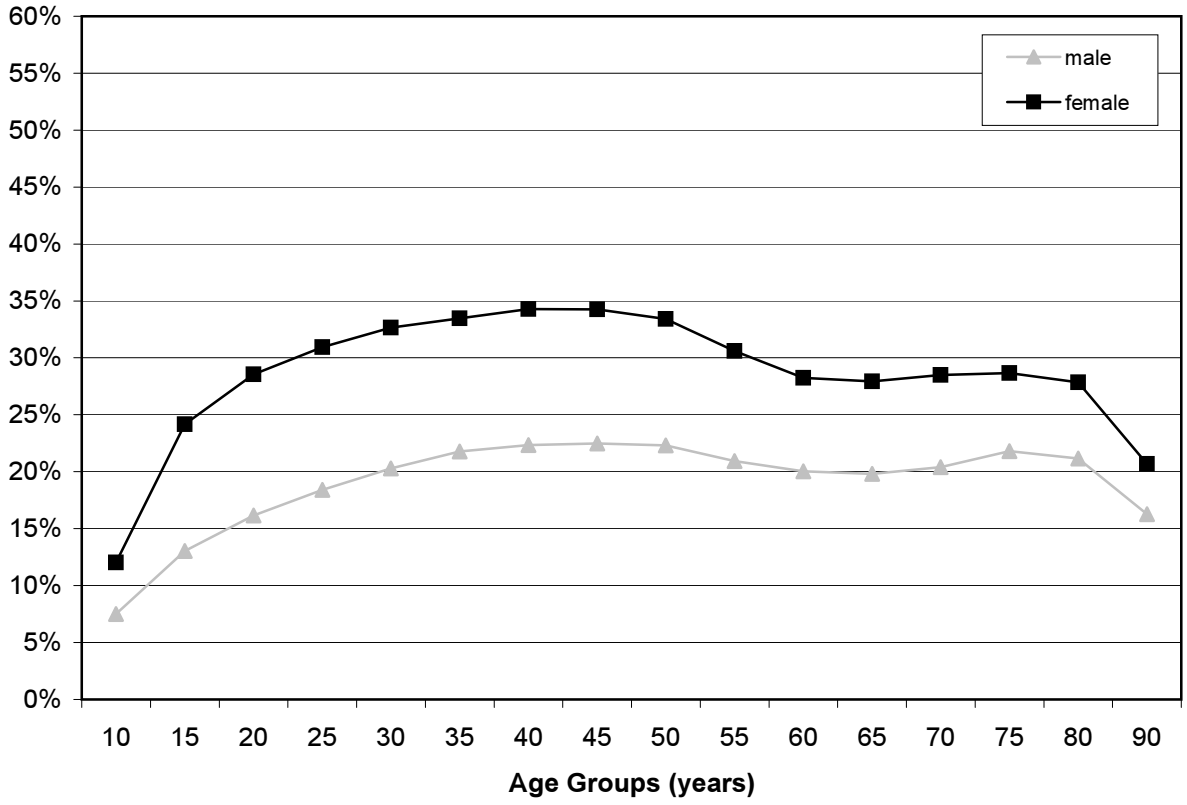
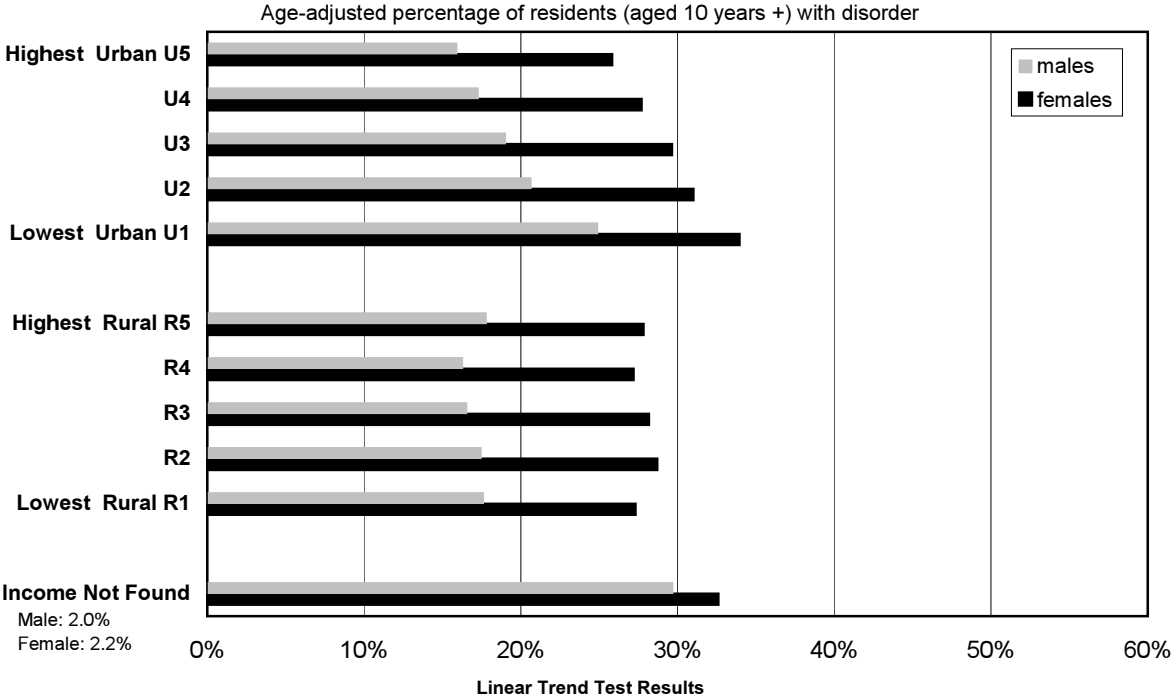


Figure 2.2.4: Treatment Prevalence of Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder



Linear Trend Test Results

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

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

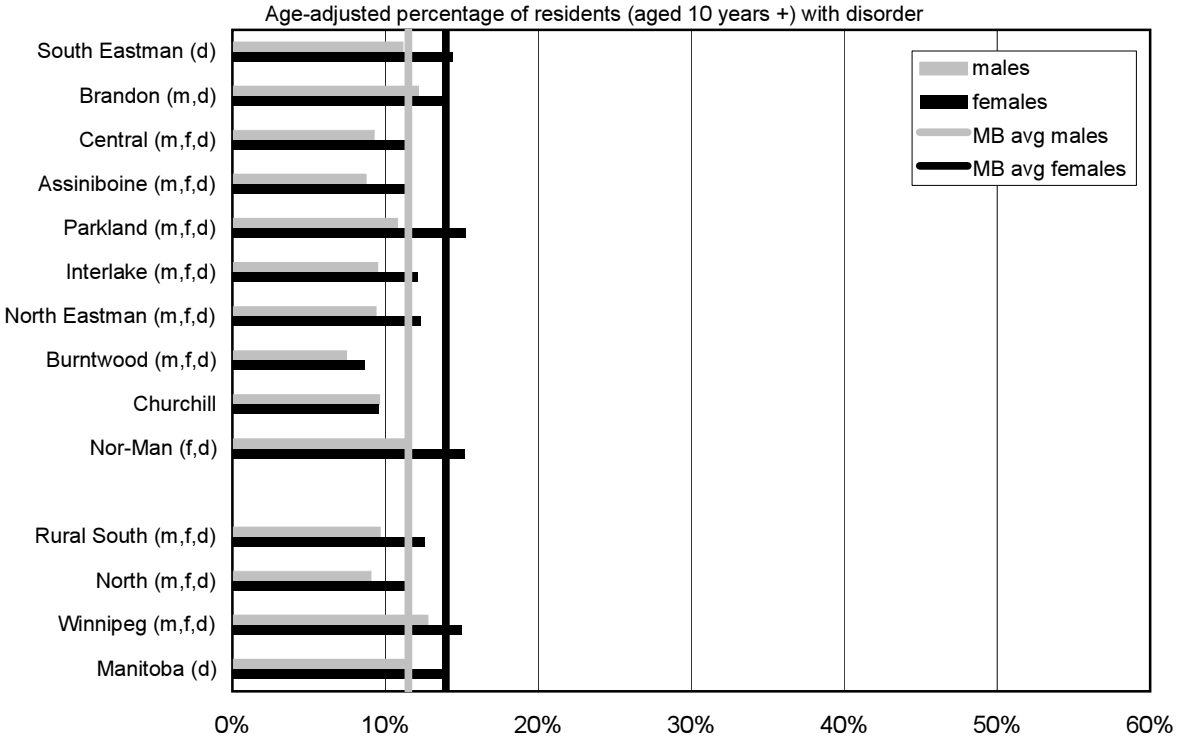
Key findings:

- The five-year treatment prevalence of cumulative disorders in Manitoba is 1.55 times higher for females compared to males (29.1% versus 18.8%), with similar findings in all RHAs and most districts.
- For both males and females, the five-year treatment prevalence of cumulative disorders is lower in the Rural South and higher in the North compared with the Manitoba average.
- The highest prevalence of cumulative disorders occurs in the mid-range ages (ages 30 to 50), with a noticeable drop in prevalence for females and a slight drop for males at ages 55 and older.
- In the urban area (Winnipeg/Brandon) of Manitoba, there is a marked gradient in the treatment prevalence of cumulative disorders by neighbourhood income group, with the highest prevalence in the lowest income quintile for both males (25% versus 16%) and females (34% versus 26%). However, there is no such relationship in rural Manitoba. In each income quintile, both in urban and rural areas, there is a similar sex differential, with the prevalence ratios being around 1.4 to 1.6 times greater for females.

2.3 Treatment Prevalence of Other Mental Illness Disorders

Definition: The treatment prevalence of *other disorders* is an age-adjusted percentage of the population aged 10 or greater that have one or more ICD-9-CM code for any psychiatric condition in either hospital abstracts or physician claims in the five-year period from 1997/98 to 2001/02, **excluding** those people who are in the *cumulative disorders* group (that is, fitting the criteria for one or more of the following conditions: depression, anxiety states, substance abuse, personality disorder, schizophrenia). For example, those persons having none of the cumulative disorders, but another disorder such as dementia or ADD/ADHD, will be part of the *other disorders* group. The numerator is the number of people in a five-year period fitting the criterion for *other disorders*, with the denominator being the entire cohort. Treatment prevalence for "other disorders" is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is grouped into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.3.1: Treatment Prevalence of Other Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.3.2: Treatment Prevalence of Other Disorders by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

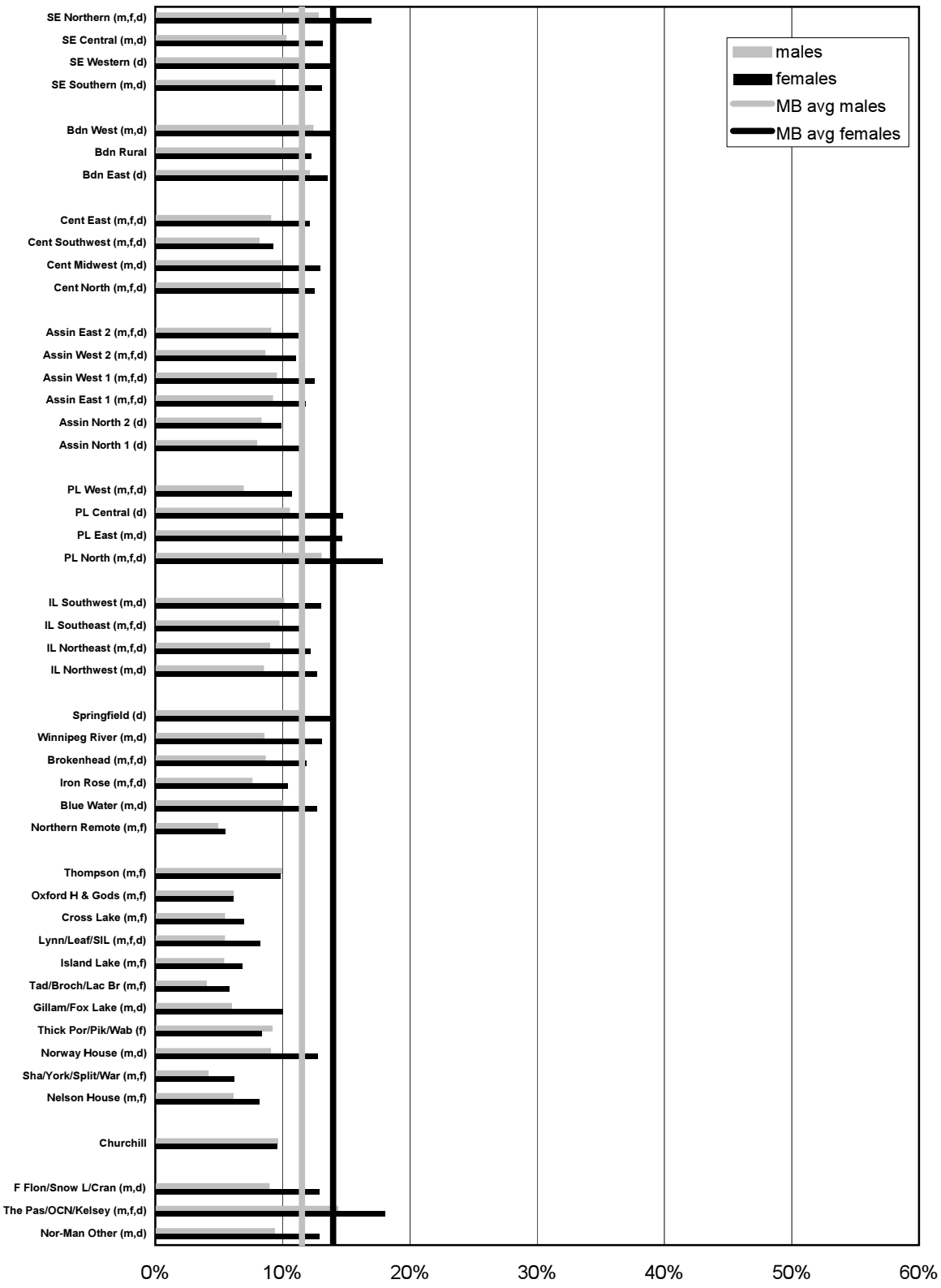


Figure 2.3.3: Treatment Prevalence of Other Disorders by Age and Sex, 1997/98-2001/02

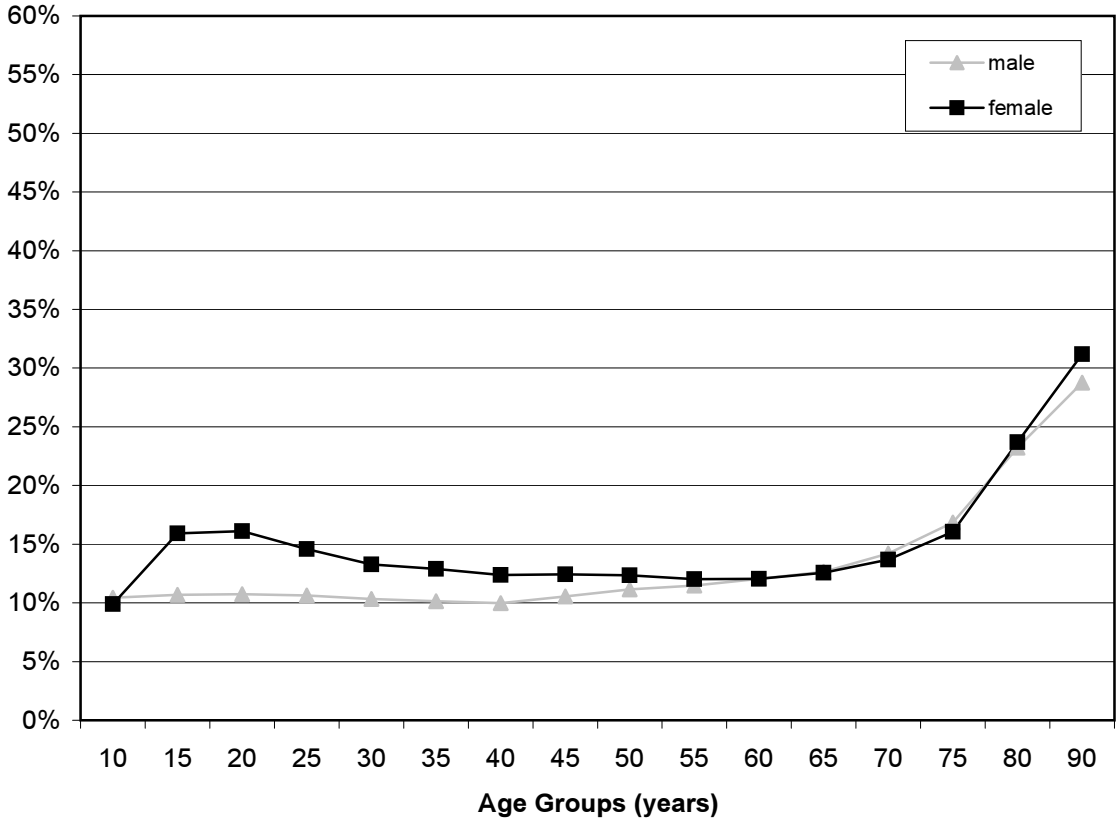
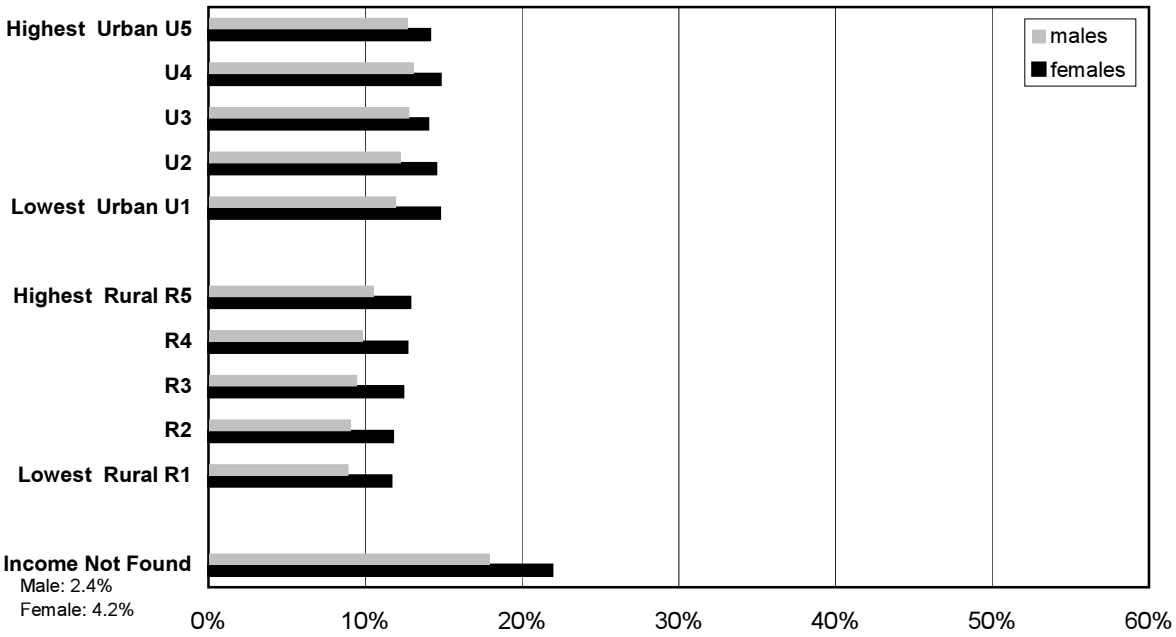


Figure 2.3.4: Treatment Prevalence of Other Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder



Linear Trend Test Results

Female: Urban: Not Significant Rural: Significant (p<.05)
Male: Urban: Not Significant Rural: Significant (p<.05)

Key findings:

- Consistent across most RHAs, males have a lower five-year treatment prevalence of "other disorders" compared to females in Manitoba (11.5% males, 14.0% females).
- The treatment prevalence of "other disorders" for both males and females is lower in the Rural South (9.7% males, 12.6% females) and the North (9.1% males, 11.3% females), and higher in Winnipeg (12.8% males, 15.0% females) compared to the provincial average (11.5% males, 14.0% females).
- The treatment prevalence of "other disorders" remains relatively stable in all age groups, except in older adults aged 80 and above where there is a dramatic increase.
- The income gradient of "other disorders" is non-existent in the urban areas, with only a minor gradient in the rural areas (with the highest neighbourhood income grouping showing a slightly elevated prevalence of other disorders compared to the lowest neighbourhood income grouping—12.9% versus 11.6% for females, 10.5% versus 8.9% for males). The "income unknown" group has elevated prevalence of other disorders—about 1.5 times the provincial rate, at 21.9% for females and 17.9% for males.

2.4 Treatment Prevalence of All Manitoban Males and Females in Each Mental Illness Category of Cumulative, Other, Any and None

Definition: The age-adjusted treatment prevalence of "cumulative" and "other" disorders have been discussed in Sections 2.3 and 2.4. The remaining population of Manitoba consists of those having "no disorders", that is, having no ICD-9-CM code for psychiatric conditions in the five-year period from 1997/98 to 2001/02. Bar charts show the percentage of the entire population of Manitoba which represents each of the categories of "cumulative", "other", "any" (a summation of the first two), or "none". These are given separately for males and females. Throughout many of the graphs of this report, health care use rates (such as physician visits or home care use) are shown as a comparison of the visit rate of the "cumulative" group compared to the "no disorders" group within RHAs, districts and aggregate areas.

Figure 2.4.1: Percent of Residents (aged 10 years +) Within Each Category of Mental Illness Groupings

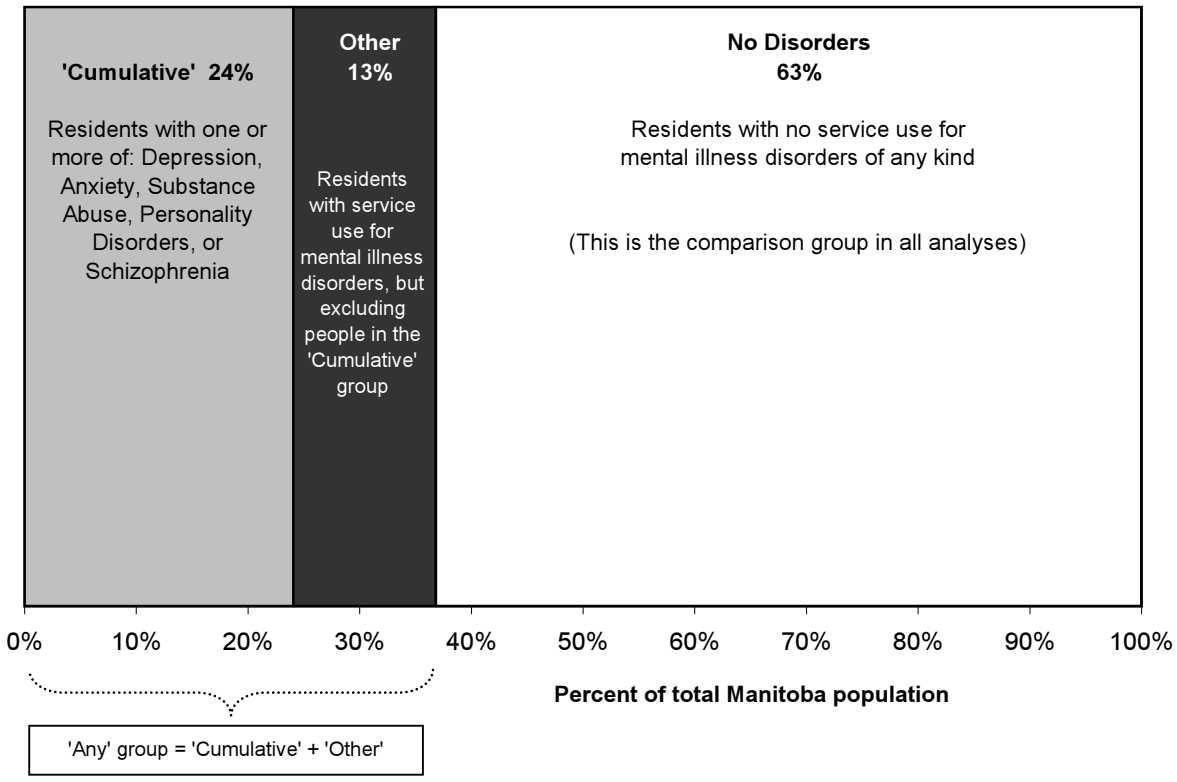


**Figure 2.4.2: Percent of Males (aged 10 years +)
Within Each Category of Mental Illness Groupings**

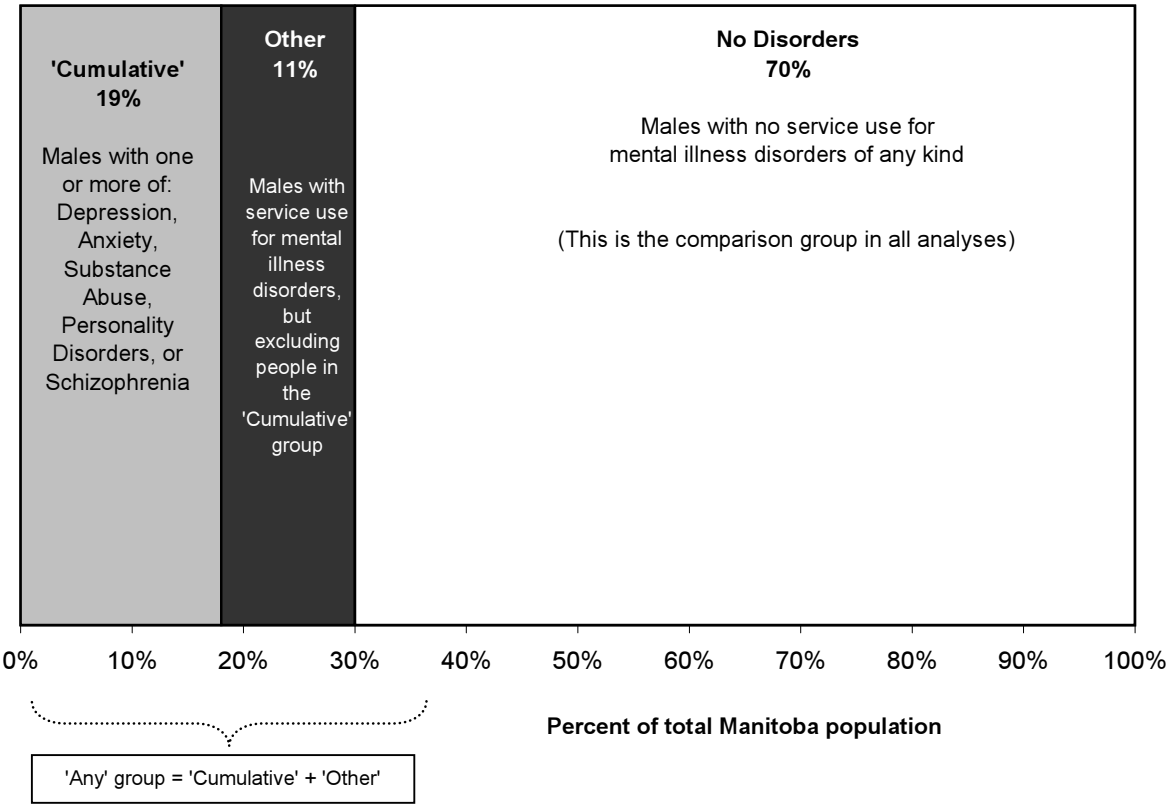
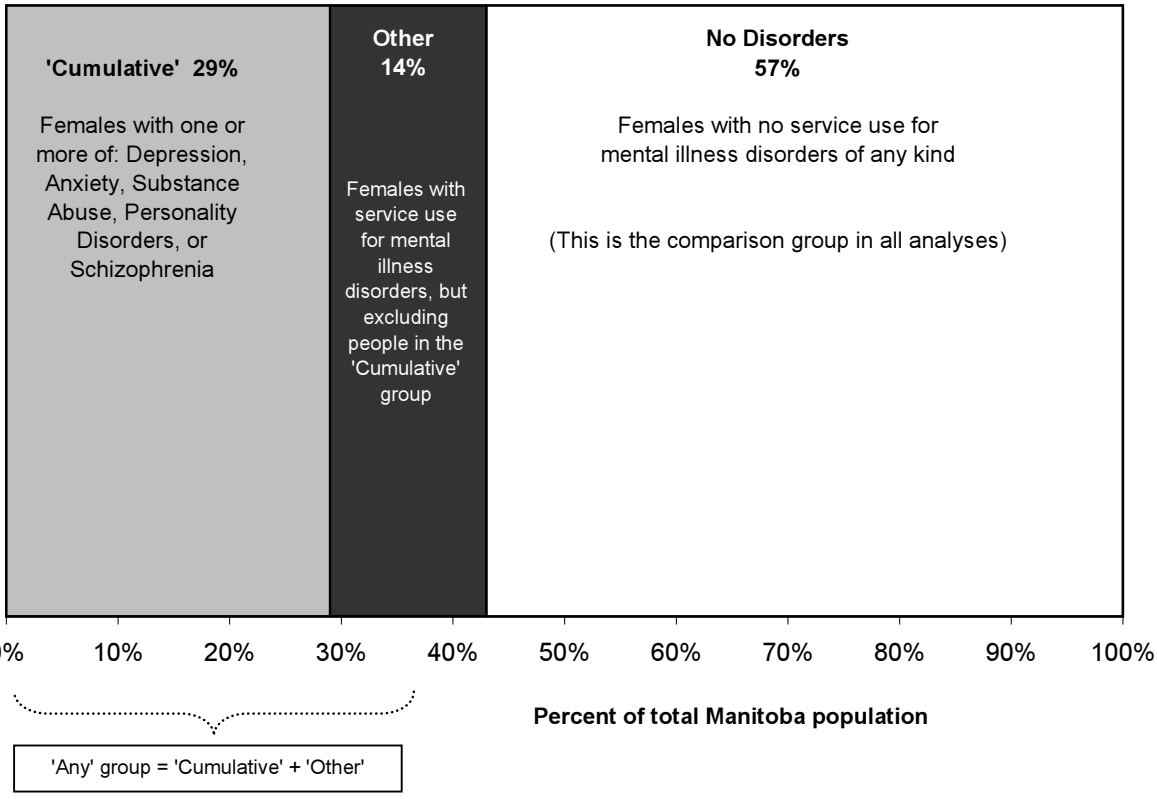


**Figure 2.4.3: Percent of Females (aged 10 years +)
Within Each Category of Mental Illness Groupings**



Key findings:

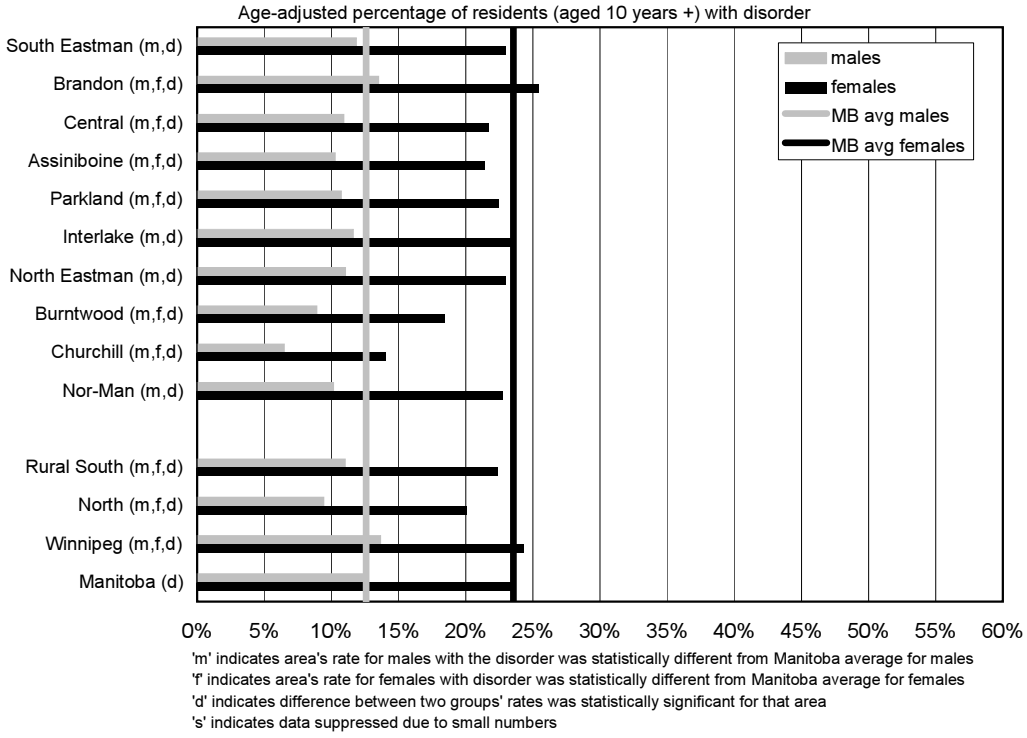
- Consistent with the finding of higher treatment prevalence of mental disorders amongst Manitoba females, 29% of the female cohort has one or more of the cumulative disorders compared with only 19% of males. The "other disorders" category is similar between females (14%) and males (12%). But there is a much smaller percentage of females in the "no mental disorders" category—57% of females, compared with 70% of males.

2.5 Treatment Prevalence of Depression

Definition: The treatment prevalence of depression is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02:
From the hospital or MHMIS files: Any of ICD-9-CM codes 296.2-296.8 (affective psychoses), 300.4 (neurotic depression), 309 (adjustment reaction), or 311 (depressive disorder), ICD-9-CM code 300 (neurotic disorders) plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine).
From the physician files: Any of ICD-9-CM codes 296, 309, or 311, ICD-9-CM code 300 plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine.

The numerator is the number of people with depression in a five-year period, with the denominator being the entire cohort. Treatment prevalence for depression is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is "grouped" into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.5.1: Treatment Prevalence of Depression by RHA, 1997/98-2001/02



Note: Through the use of the above definition, people are considered "depressed" if they have certain administrative claims data codings. The 1996 National Population Health Survey (NPHS) included a diagnostic tool which yields a probability of depression for the respondent. A comparison of treatment prevalence for depression from both the administrative database definition and the NPHS diagnostic tool was completed by Dr. Eilish Cleary, of *The Need to Know* Team. This is discussed in Appendix 3.

Figure 2.5.2: Treatment Prevalence of Depression by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

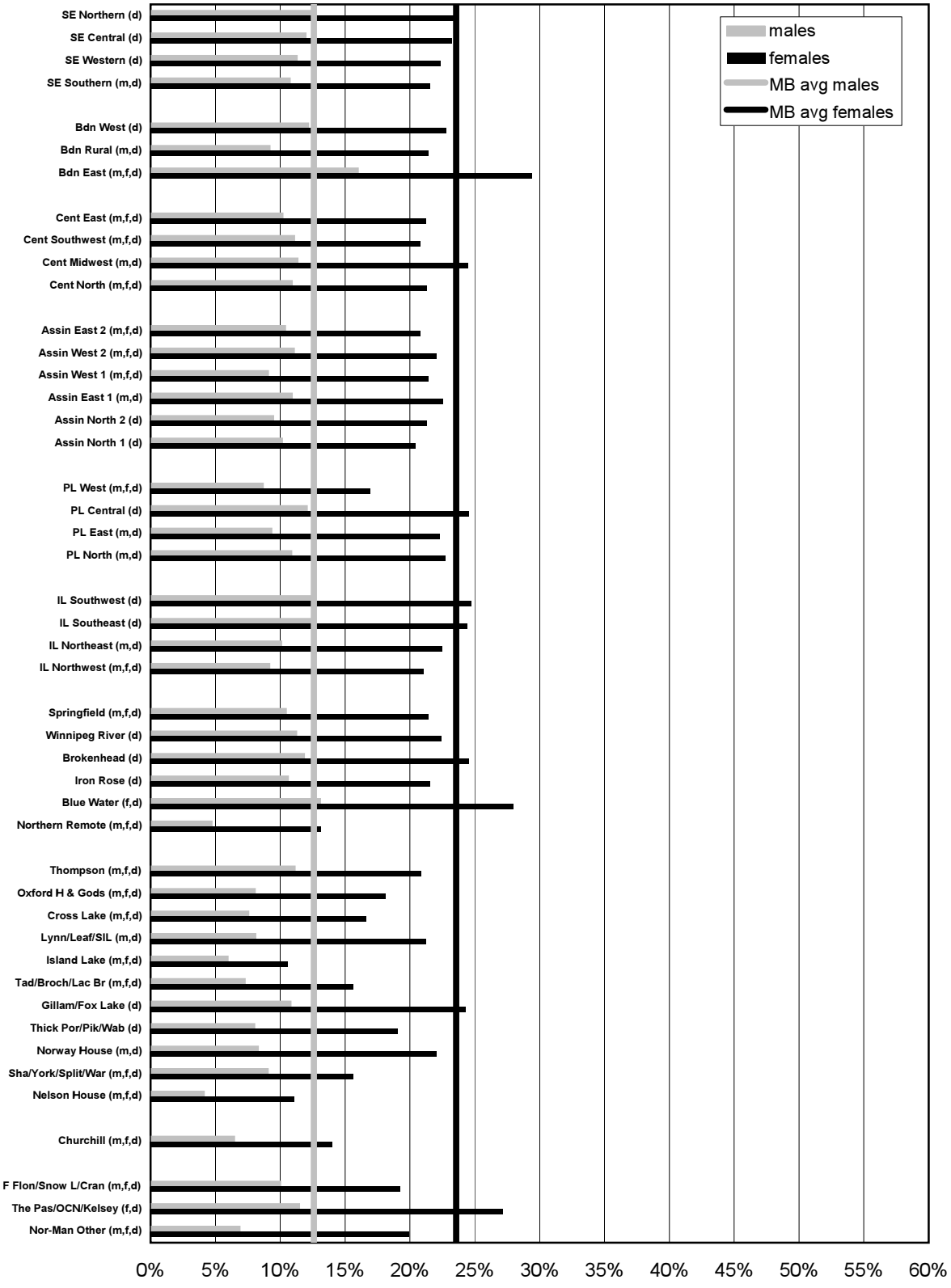


Figure 2.5.3: Treatment Prevalence of Depression by Age and Sex, 1997/98-2001/02

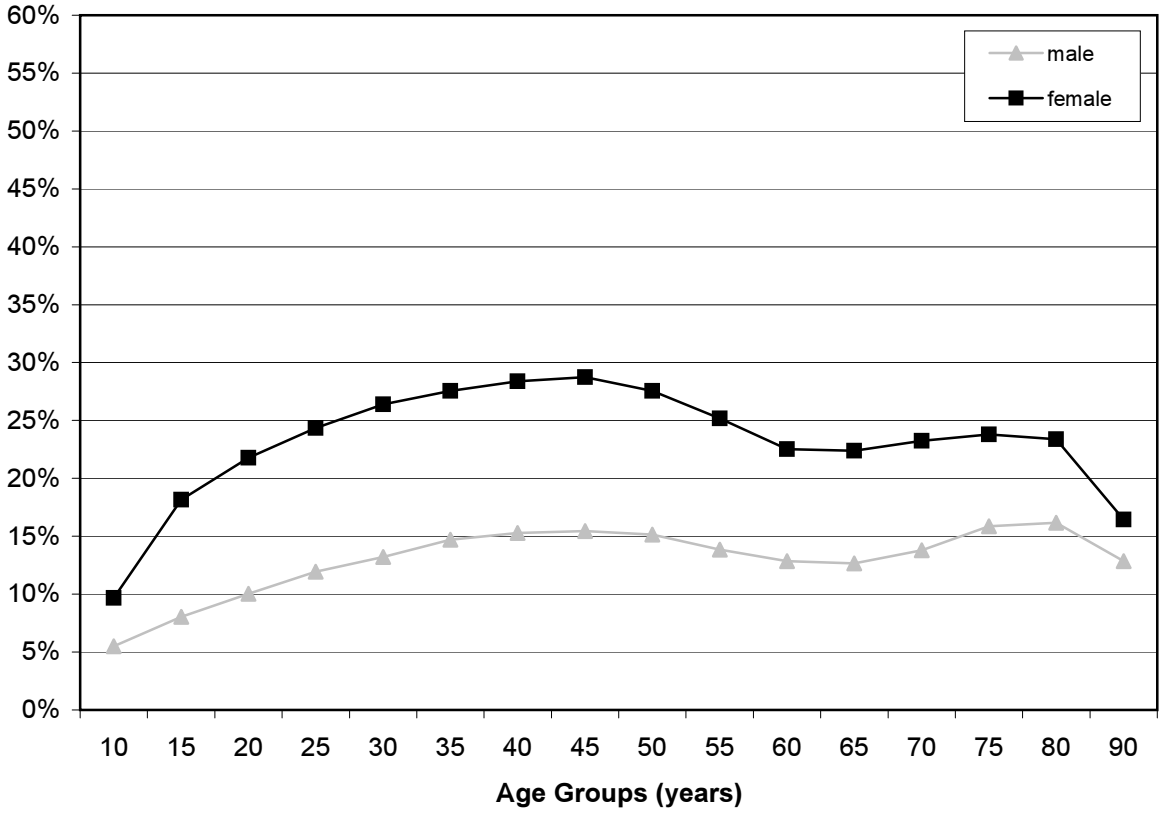
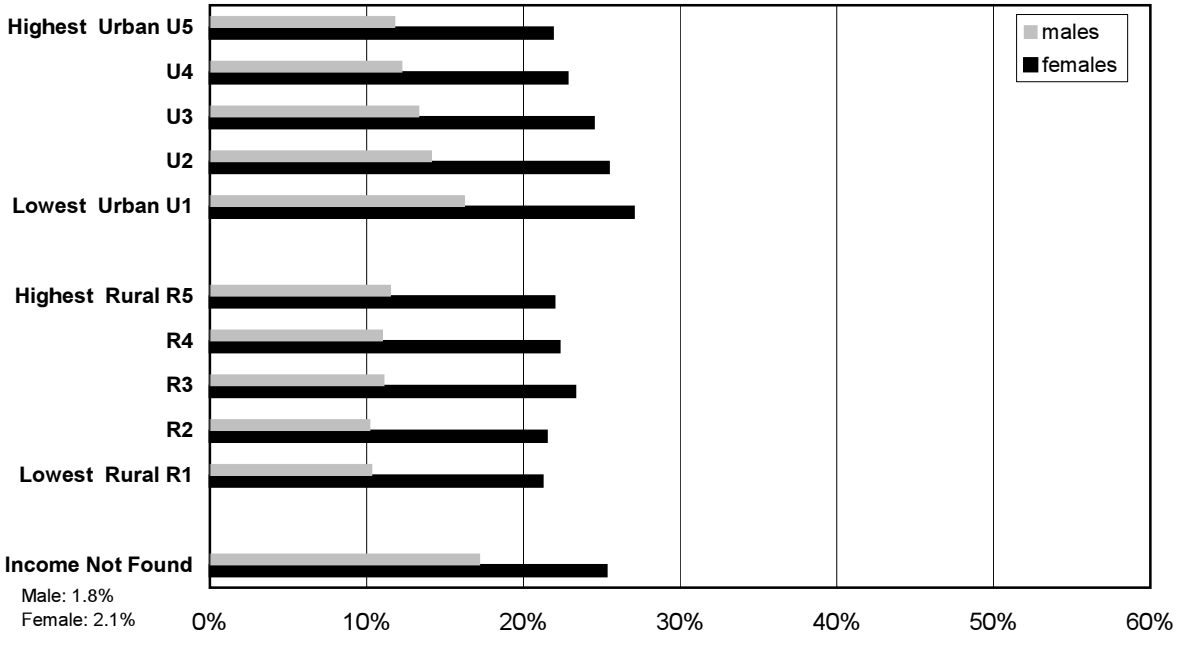


Figure 2.5.4: Treatment Prevalence of Depression by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder



Linear Trend Test Results

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

Key findings:

- The five-year treatment prevalence of depression in Manitoba is 1.9 times higher for females compared to males (23.6% versus 12.6%), with similar findings in all RHAs and most districts.
- For both males and females, the five-year treatment prevalence of depression is lower in the Rural South (males 11.0%, females 22.4%) and the North (males 9.4%, females 20.1%), and slightly higher in the two urban areas of Winnipeg (males 13.7%, females 24.3%) and Brandon (males 13.5%, females 25.4%) compared with the Manitoba average.
- The highest treatment prevalence of depression occurs in the mid-range ages (ages 35 to 54), with a noticeable drop in prevalence for females at ages 55 and older.
- In the urban area (Winnipeg/Brandon) of Manitoba, there is a significant gradient in the treatment prevalence of depression by neighbourhood income group, with the highest prevalence in the lowest income quintile for both males (16% versus 12%) and females (27% versus 22%). However, there is a much less evident relationship in rural Manitoba, with similar prevalence in each neighbourhood income grouping for both males and females. Although not statistically significant, the gradient may go slightly in the opposite direction, with a slightly higher treatment prevalence for depression in the highest neighbourhood income group compared with the lowest (males: 12% versus 10%, females 22% versus 21%). In each income quintile, both in urban and rural areas, there is a similar sex differential, with the prevalence ratios being 1.8 to 2.1 times higher for females.

Table 2.5.1: Literature comparisons of depression prevalence

	Population prevalence (%)		
Depression	**Overall (95% CI)**	**Male (95% CI)**	**Female (95% CI)**
Our study:			
Five-year treatment prevalence of depression	18.20% (18.09-18.29)	12.59% (12.47-12.71)	23.56% (23.41-23.71)
One-year treatment prevalence of depression	6.76% (6.70-6.82)	4.35% (4.28-4.43)	9.06% (8.96-9.17)
Other studies:			
Lifetime prevalence of *major* depressive episode	8% for 18+ age[1] ; 8.6% ± 1.0%[3] ; 7.9%[2]	4.4%[2]; 5.9 ± 1.2%[3]	11.4 ± 1.6%[3] ; 11.5%[2]
One-year prevalence of *major* depressive episode	4.6%[3] ; 4.3%[5]; 4.1 ± 0.8%[4]	2.9%[3] ; 2.8 ± 0.8%[4]	5.7%[3] ; 5.4 ± 1.0%[4]
Six-month prevalence	3.2±0.6%[3]	2.5±0.8%[3]	3.9±1.0%[3]
One-month prevalence of depression D, and of major depression MD	D 5.5±1.2%, MD 2.6%[2]	D 3.2±1.4%, MD 1.5%[2]	D 7.8±2.0%, MD 3.6%[2]

Note: [1] Canadian Psychiatric Association 2001; [2] Murphy et al. 2000; [3] Spaner et al. 1994; [4] Offord et al. 1996; [5] Statistics Canada 1999

Comparison to Canadian findings in other studies:

- According to several Canadian studies, females are more likely to experience depression than males (Baron and Campbell, 1993; Beaudet, 1999; Murphy et al., 2000; Spaner et al., 1994; Wade and Cairney, 1997). This pattern is particularly prevalent among adolescents and young adults (Baron and Campbell, 1993; Beaudet, 1999). Despite claims that the prevalence of depression is increasing, one study in Atlantic Canada (Murphy et al., 2000) showed similar overall rates over several years, but differing age by sex distributions. Some researchers have found that adolescents and young adults are more likely to suffer from depression than older adults (Beaudet, 1999; Wade and Cairney, 1997), although there is contradictory evidence that depression is more common among older adults than adolescents, particularly among females (Spaner et al., 1994). The strongest predictors for depression are neighbourhood income and marital status; sex and education level also have a significant predictive value (Wade and Cairney, 1997). I*n our study, after controlling for age, income quintile group was a strong predictor of depression for both males and females living in urban areas, with the lowest neighbourhood income group having the highest prevalence. However, this was not apparent in the rural income quintile groups, where there was very little difference in prevalence amongst the different neighbourhood income groupings. If anything, there was a very slight gradient in the opposite direction, whereby treatment prevalence for depression was slightly lower in the lowest neighbourhood income grouping for both males and females. The sex difference was significant throughout all Manitoba RHAs, with females consistently higher than males (1.9 times higher provincially, and ranging from 1.8 to 2.2 times higher in every RHA and aggregate area). Our research shows a much higher treatment prevalence for depression in the mid-life ages than in adolescence.*
- In Edmonton (Spaner et al., 1994), the highest prevalence of depression is among 45-54 year old females (17.0 ± 5.4%), and then drops off substantially. In males, there is a similar prevalence from ages 25 through 54—around 8 to 12%—after which it drops. *In our data, we found a similar trend of elevated treatment prevalence for depression in the mid-life age groups of 40 to 54 for females, with a substantial drop in older age categories. For males, the prevalence was similar for ages 35 through 54, with a slight drop in older age groupings but then an additional rise beginning around age 70.*
- There is a high risk of having comorbid mental illnesses along with major depression. Comorbidities of major depression include: lifetime panic disorder (OR 4.7 to 18.5), lifetime alcohol abuse/dependence (OR 2.1 to 3.3), and lifetime drug abuse/dependence (OR 2.6 to 11.9) (Lepine, 2001). Spaner et al. (1994) found that in those with recurrent major depressive disorders, they were twice as likely to have substance abuse disorders (35.7 versus 14.8%), 1.6 times as likely to have schizo-

phrenia/schizophreniform (2.5 versus 1.6%), 2.8 times more likely to experience antisocial personality disorders (10.5 versus 3.8%), and higher prevalence ratios for three anxiety disorders (obsessive compulsive disorder 12.2 versus 1.6%, panic disorder 11.0 versus 6.9%, phobia 22.7 versus 8.1%). Comparing those with a major depressive disorder to all other people in the study, they were 2.2 times more likely to have one or more mental illness diagnosis (including affective disorders, substance abuse, schizophrenia, anxiety disorders, somatization disorder, antisocial personality disorders). *In our study, we found substantial comorbidity with those who were treated for depression. Out of the entire cohort of people with at least one diagnosis of depression (n=186,611), 50.1% had no other comorbidity. The rest were treated for single or multiple comorbid conditions: 25.1% for anxiety disorder, 13.5% for substance abuse, 5.4% for dementia, 4.1% for personality disorder, and 3.7% for schizophrenia.*

- After controlling for various socioeconomic factors in the 1996 Canadian National Population Health Survey (NPHS), the relationship between age and depression (using a generalized distress scale or a diagnostic instrument) shows a steady decline across age groups (Wade and Cairney, 1997). This differs from a reported U-shape in the USA. *In our data, there appears to be the highest treatment prevalence of depression in the 35-50 age groups for females at around 28-29%, dropping after the age of 50 to a plateau of around 22 to 24% in the over-sixty age category. Males, on the other hand, show a steadily increasing prevalence up to the 35 to 50 age categories of up to around 15%, after which the prevalence hovers between about 13% and 16% in the later ages.*
- Health Reports Winter 1999 (Statistics Canada): Using NPHS data from 1994/95, 1996/97 and 1998/99: 4.3% of Canadians aged 12 or older reported symptoms of at least one major depressive episode in the year before they were surveyed in 1998/99 (5.2% in 1994/95, 4.1% in 1995/96). Depression was twice as high among women than men (5.7% versus 2.9% in 1998/99) in all age categories. The lowest prevalence for females was in age 65+. Daily smoking was associated with elevated depression in females (OR 1.46, 95% CI 1.08-1.98) and males (OR 1.90, 1.25 to 2.89), for females with chronic conditions such as back problems, high blood pressure, migraines and/or ulcers (1.77, 1.34-2.34), and for females with low emotional support (1.47, 1.06-2.04) and low mastery (1.80, 1.38-2.33). *In our data, we found a similar trend with females having 1.9 times the treatment prevalence of depression of males overall (23.56% versus 12.59%). The "gap" is greatest in the 15-19 year age group, with females 2.3 times higher than males (18.2% versus 8.0%), and least in the aged 70 and older groups. The lowest treatment prevalence for depression occurred in the aged 10-14 group for both males and females.*

2.6 Treatment Prevalence of Anxiety States

Definition: The treatment prevalence of "anxiety states" is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02:

From the hospital or MHMIS files:

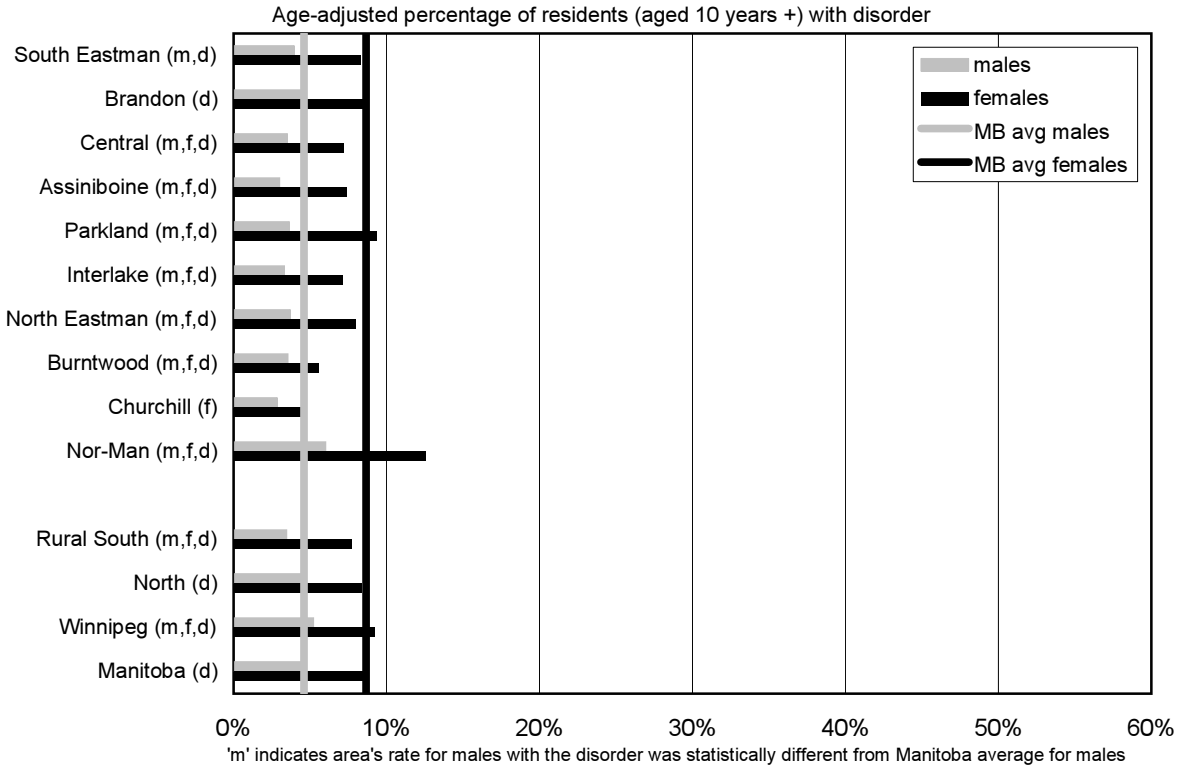
- The presence of one or more ICD-9-CM codes 300.0 (anxiety states), 300.2 (phobic disorders), or 300.3 (obsessive-compulsive disorders)

From the physician files:

- A physician coding of 300 at least 3 times in the five-year span.

The numerator is the number of people with anxiety states in a five-year period, with the denominator being the entire cohort. Treatment prevalence for anxiety states is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is "grouped" into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.6.1: Treatment Prevalence of Anxiety Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.6.2: Treatment Prevalence of Anxiety Disorders by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

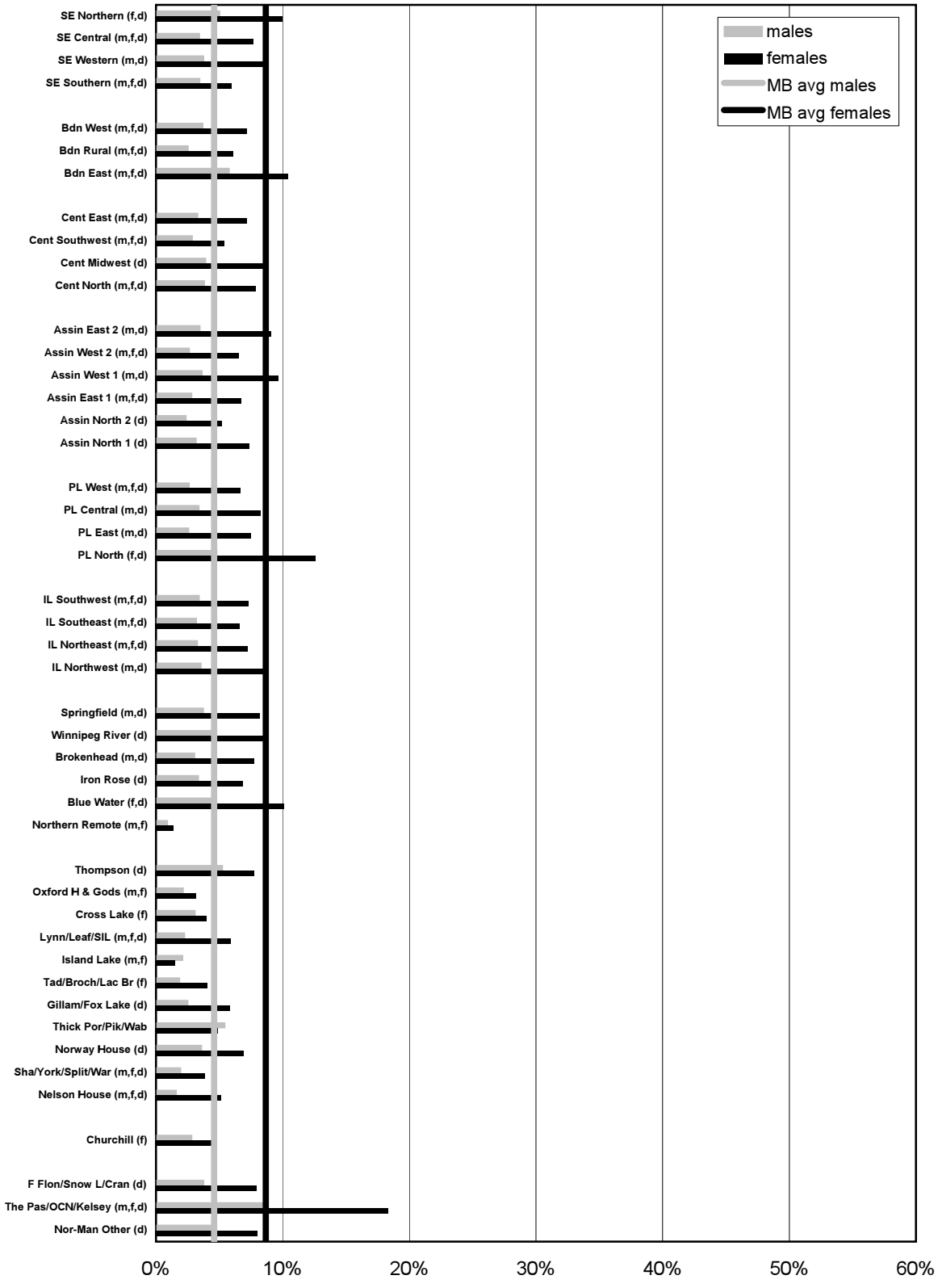


Figure 2.6.3: Treatment Prevalence of Anxiety Disorders by Age and Sex, 1997/98-2001/02

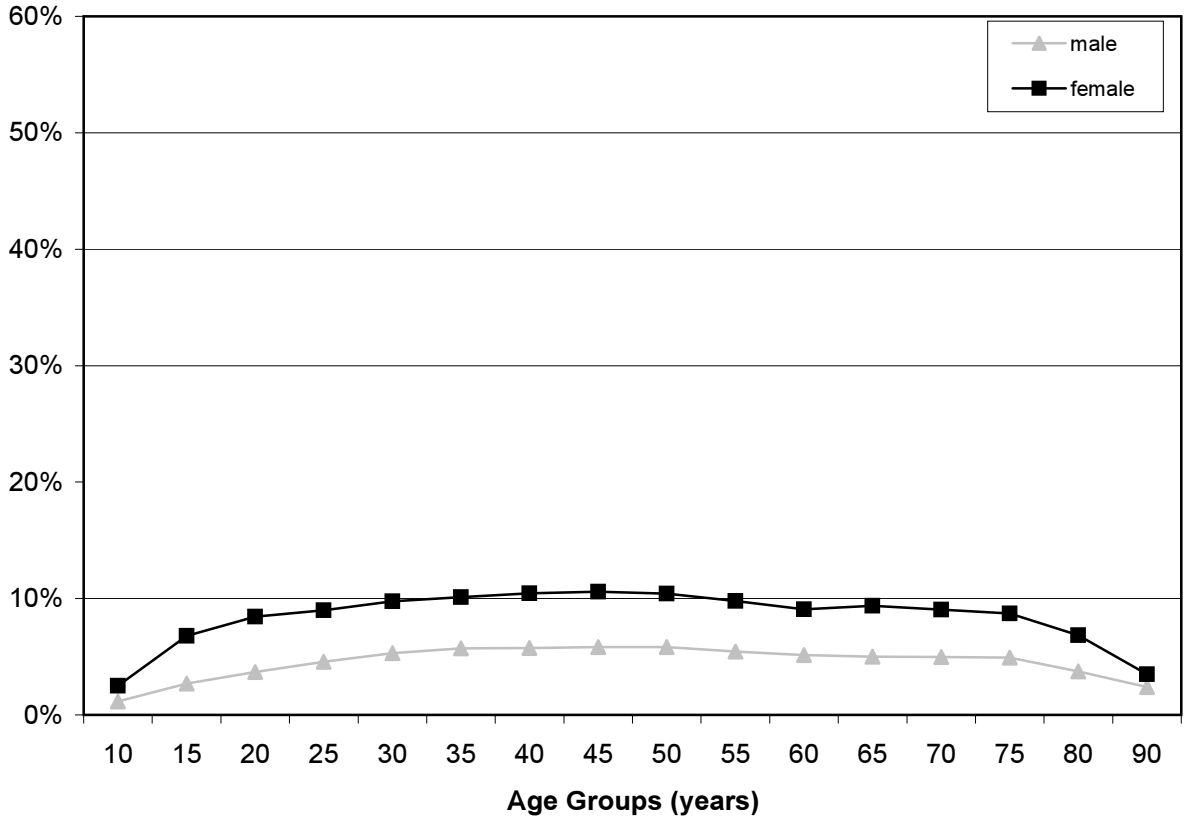
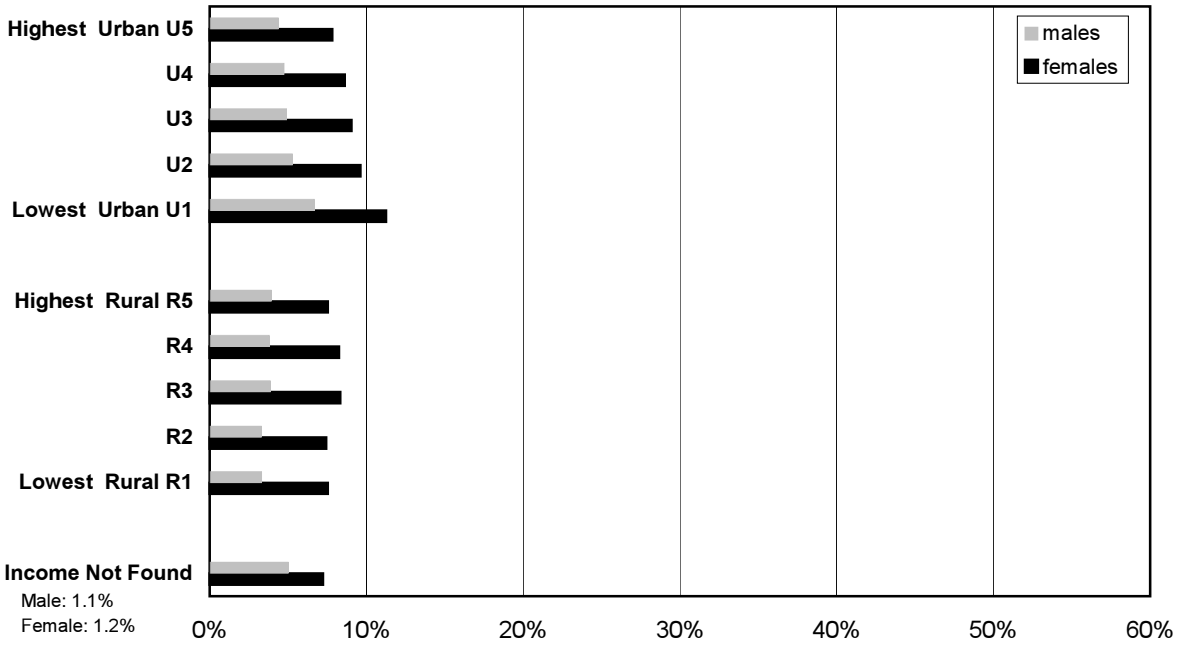


Figure 2.6.4: Treatment Prevalence of Anxiety Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder



Linear Trend Test Results

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

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

Key findings:

- The five-year treatment prevalence of anxiety disorders in Manitoba is 1.9 times higher for females compared to males (8.66% versus 4.59%), with a range from 1.5 to 2.6 times higher across various RHAs.
- For both males and females, the five-year treatment prevalence of anxiety disorders is lower in the Rural South, similar in the North and Brandon, and slightly higher in Winnipeg compared with the Manitoba average.
- The treatment prevalence of anxiety disorders appears to be a relatively stable rate around 8% to 10% from aged 25 through 75. Age patterns for males and females are similar, although females have a consistently higher prevalence (around 4% higher) throughout.
- In urban areas (Winnipeg/Brandon) of Manitoba, there is a significant gradient in the treatment prevalence of anxiety disorders by neighbourhood income group, with the highest prevalence in the lowest income quintile for both males (6.7% versus 4.4%) and females (11.2% versus 7.8%). However, there is a much less evident relationship in rural Manitoba. For females, the prevalence at the highest and lowest neighbourhood income groupings is the same (7.5%). For males, there is a very slight gradient effect which, though statistically significant, is probably not clinically significant—3.9% of males in the highest income quintile, versus 3.3% in the lowest. In each income quintile, both in urban and rural areas, there is a similar sex differential, with the prevalence ratios being 1.7 to 1.8 times higher for females in urban income groupings, and 1.9 to 2.3 times higher for females in rural income groupings.

Table 2.6.1: Literature comparisons of the prevalence of anxiety states

	Population prevalence (%)		
Anxiety states	**Overall (95% CI)**	**Male (95% CI)**	**Female (95% CI)**
Our study:			
Five-year treatment prevalence of anxiety disorders	6.65% (6.61-6.73)	4.59% (4.52-4.67)	8.66% (8.56-8.76)
One-year treatment prevalence of anxiety disorders	1.34% (1.31-1.36)	0.96% (0.92-0.99)	1.70% (1.65-1.75)
Other studies:			
One-year prevalence of anxiety disorders (one or more)	12.2 ± 1.2% (Offord et al. 1996)	8.9 ± 1.6% (Offord et al. 1996)	15.5 ± 1.8% (Offord et al. 1996)
Prevalence of generalized anxiety disorder	France 11.9%; England 7.1%; Germany 7.9%, all centres studied by WHO 7.9% (from Lepine 2001)		
Lifetime L, one-year OY prevalence of all phobias	L 8.9±1.0%, OY 6.2% (Dick et al. 1994)	L 6.1±1.4% (Dick et al. 1994)	L 11.7±1.6% (Dick et al. 1994)

Comparison to Canadian estimates:

- Anxiety disorders are also more prevalent among women than men (Dick et al., 1994a; Dick et al., 1994b; Horwath and Weissman, 2000; Lepine, 2001; Ohayon and Shapiro, 2000). *In our study, we found elevated treatment prevalence for anxiety disorders in females, at approximately double the rate of males (8.66 versus 4.59% for five-year prevalence).*
- The most common anxiety disorder diagnosed in Canadian hospitals is agoraphobia with panic attacks, at 25.4% of hospitalizations for anxiety disorders (Swinson et al., 1992).
- There is a high prevalence of comorbidity for depression and anxiety disorders, estimated at 6% to 17% worldwide (Lepine, 2001). According to Dick et al. (1994), the most common diagnoses in people with phobias is alcohol abuse (24.5%), depression (19.9%) and drug abuse (16.7%). *In our report, out of the 68,479 persons with a diagnosis of anxiety disorder, 25.2% have no comorbidities. The rest exhibit single or multiple comorbidities, so a person could be in one or more of the following comorbidity groupings: 68.5% had comorbid depression, 14.4% comorbid substance abuse, 4.0% comorbid dementia, 5.9% comorbid personality disorder, and 4.0% had comorbid schizophrenia.*
- The prevalence for all phobias increase between ages 25-54 and decline sharply thereafter, but prevalence of social phobia remains fairly constant from 18-54 and then declines (Dick et al., 1994). According to Offord et al. (1996), the one-year prevalence of anxiety disorders is similar for males (around 10 to 11%) ages 15 through 44, with a decline to around 5% in ages 45 to 64 years. Similar trends are also evident for females, although prevalence is higher for females (around 16 to 19%, dropping to around 11%). *Although our report found lower treatment prevalence rates, we see relatively consistent patterns through the age groups, with declines only evident in the older age groups.*

2.7 Treatment Prevalence of Substance Abuse

Definition: The treatment prevalence of substance abuse is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of any of ICD-9-CM codes 291 (alcoholic psychoses), 292 (drug psychoses), 303 (alcohol dependence), 304 (drug dependence), or 305 (nondependent abuse of drugs) in physician claims or hospital abstracts.

The numerator is the number of people in a five-year period treated for substance abuse, with the denominator being the entire cohort. Treatment prevalence for substance abuse is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is "grouped" into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.7.5 compares the CCHS Cycle 1.1 measure of alcohol dependence (Kessler and Mroczek) with the prevalence of substance abuse. For the purposes of the CCHS analysis, individuals were classified as alcohol dependent if their probability was 0.85 or higher (see Glossary). *Note that CCHS does not survey those living in First Nations Communities, Military Bases, and some remote areas.* Therefore, the comparison for northern RHAs may be particularly problematic.

Figure 2.7.1: Treatment Prevalence of Substance Abuse by RHA, 1997/98-2001/02

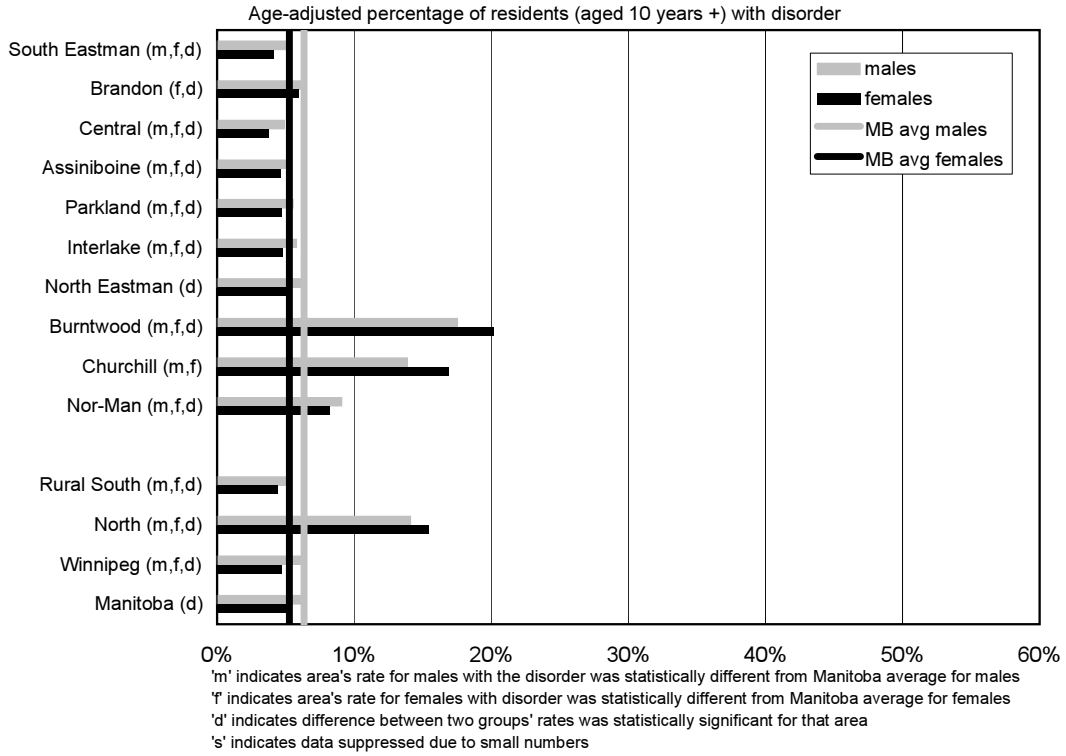


Figure 2.7.2: Treatment Prevalence of Substance Abuse by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

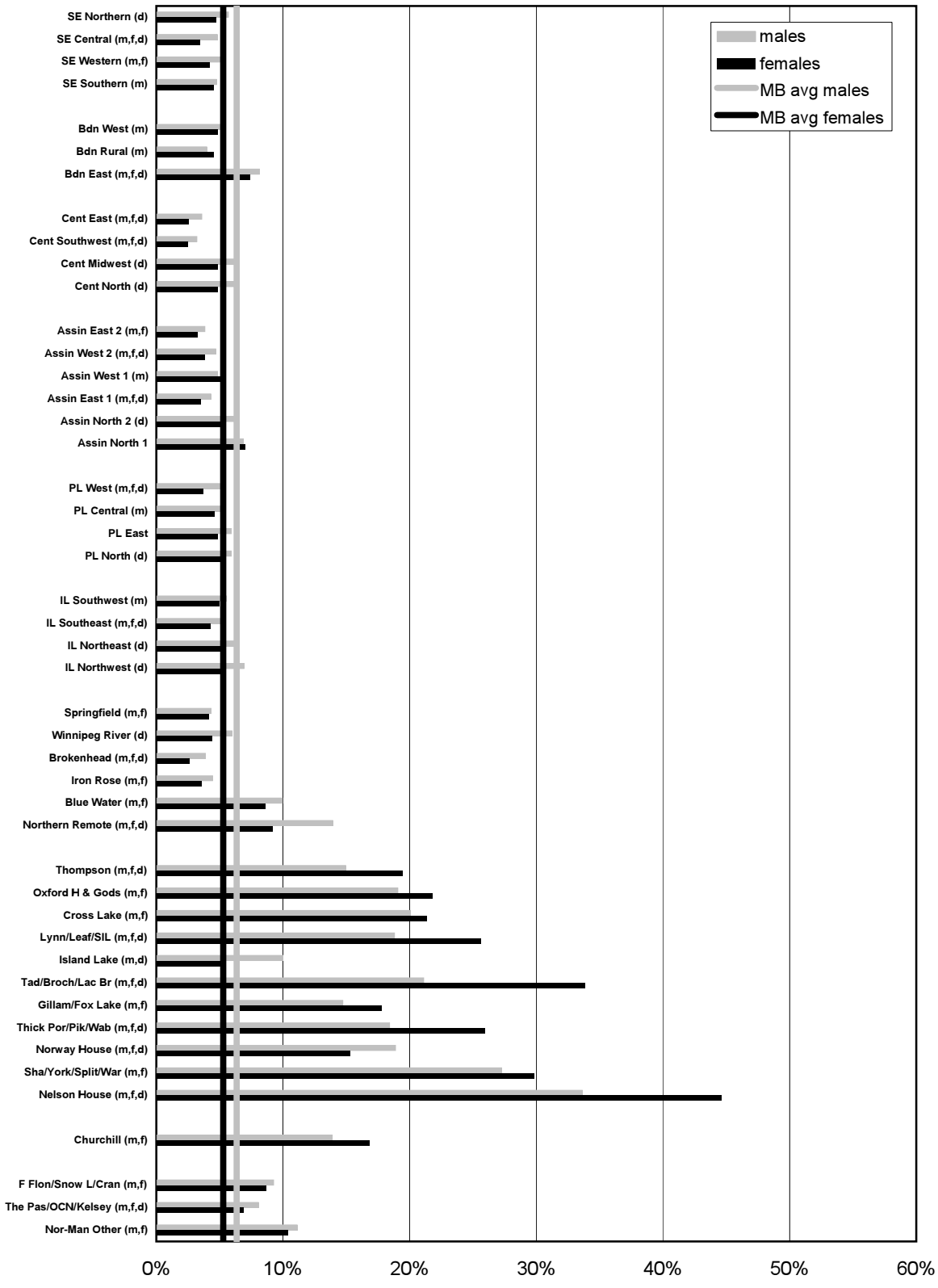


Figure 2.7.3: Treatment Prevalence of Substance Abuse by Age and Sex, 1997/98-2001/02

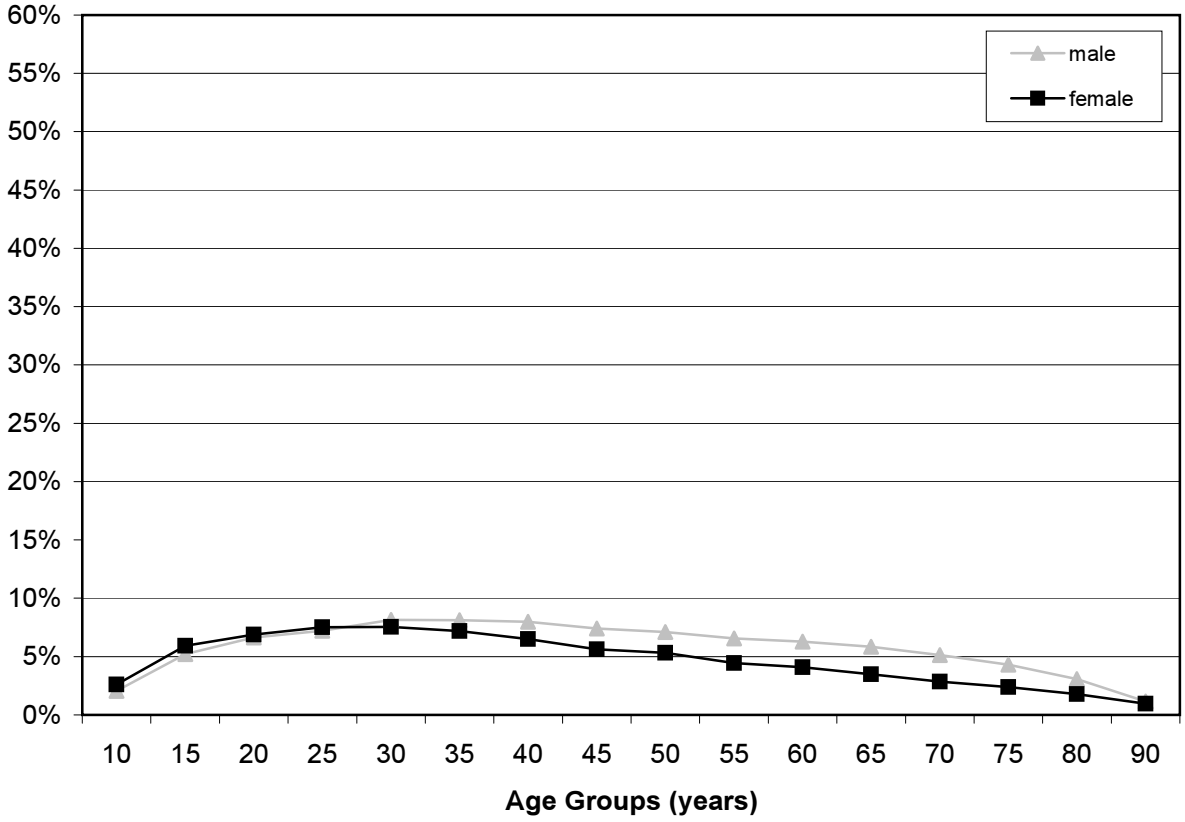
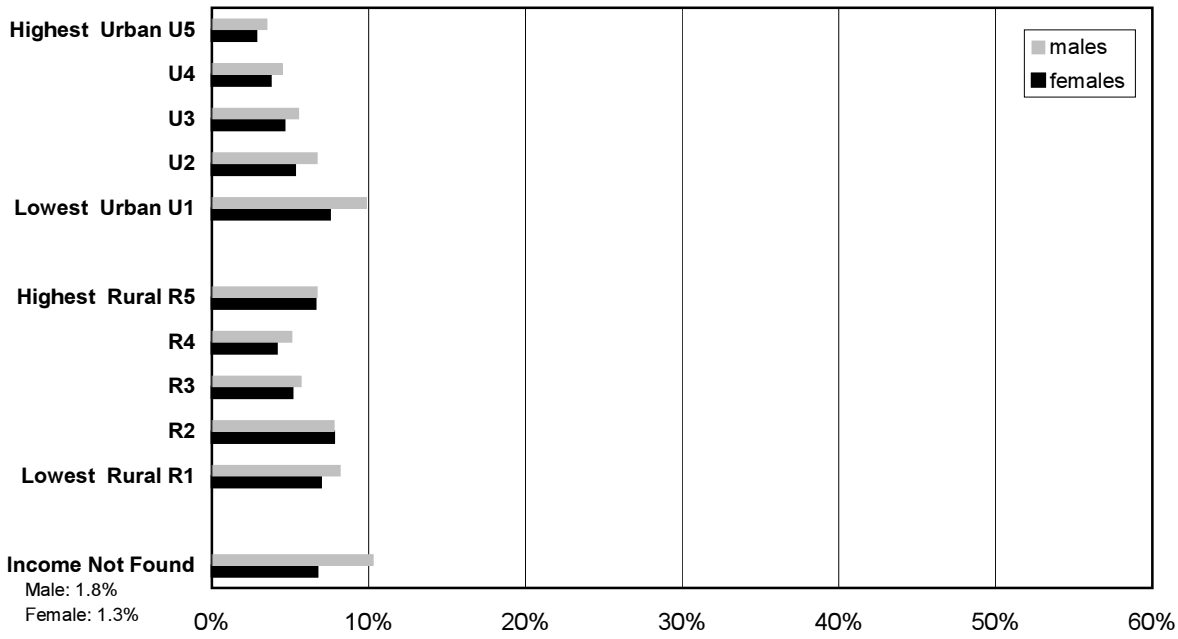


Figure 2.7.4: Treatment Prevalence of Substance Abuse by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

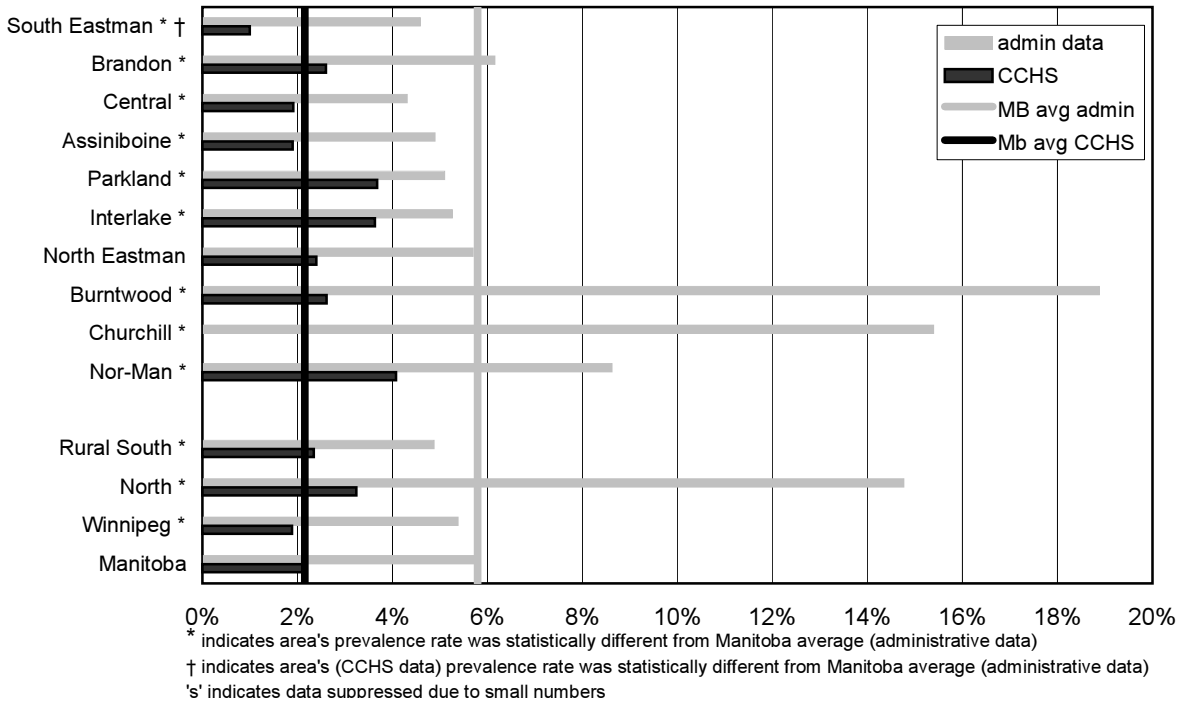


Linear Trend Test Results

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

Figure 2.7.5: Treatment Prevalence of Substance Abuse Compared to Alcohol Dependence Derived from CCHS Cycle 1.1 Data, by RHA

Age- and sex-adjusted percentage of residents (aged 10 years +) with disorder



* indicates area's prevalence rate was statistically different from Manitoba average (administrative data)

† indicates area's (CCHS data) prevalence rate was statistically different from Manitoba average (administrative data)

's' indicates data suppressed due to small numbers

Note: The administrative data treatment prevalence for substance abuse is given for all RHAs. However, for the CCHS Cycle 1.1 data, Statistics Canada aggregated Burntwood and Churchill RHAs, so the CCHS prevalence of alcohol dependence shown here for Burntwood RHA is actually for the combination of Burntwood and Churchill RHAs.

Key findings:

- Treatment prevalence for substance abuse is particularly high in the North, at approximately three times the population prevalence of the Manitoba average (14.1% of males in the North, compared with 6.3% provincially, 15.4% of females in the North, compared with 5.3% provincially).
- Treatment prevalence is slightly *lower* for females compared to males in the Rural South (4.4% versus 5.4%) and in Winnipeg (4.7% versus 6.1%), but slightly *higher* in the North (15.4% versus 14.1%).
- In the cohort of Manitobans used for this study, the treatment prevalence is highest (around 6 to 8%) in the 20-40 age categories, and lower in the older age categories for both males and females.
- In the urban areas of Winnipeg and Brandon, there is a higher treatment prevalence for substance abuse at the lowest neighbourhood income compared to the highest neighbourhood income categories (females 7.5% to 2.8%, males 9.9% to 3.5%). There is a consistent gradient, with a 28% decrease in prevalence for each increase in income quintile. The rural income quintile groups show a somewhat inconsistent pattern,

with lower treatment prevalence at higher income quintiles, except in the highest neighbourhood income grouping, where prevalence is high.

- The CCHS estimate of alcohol dependency prevalence was 2.2%, whereas the administrative claims data treatment prevalence of substance abuse is 5.8% provincially. This may indicate that about half of the substance abuse problems could be alcohol-related. However, the limitation to a direct comparison is that the CCHS survey is a one-year period prevalence, whereas our estimate is a five-year prevalence. However, the CCHS data on alcohol dependency show similar patterns by RHA, with higher prevalence in the North.

Comparison to Canadian estimates:

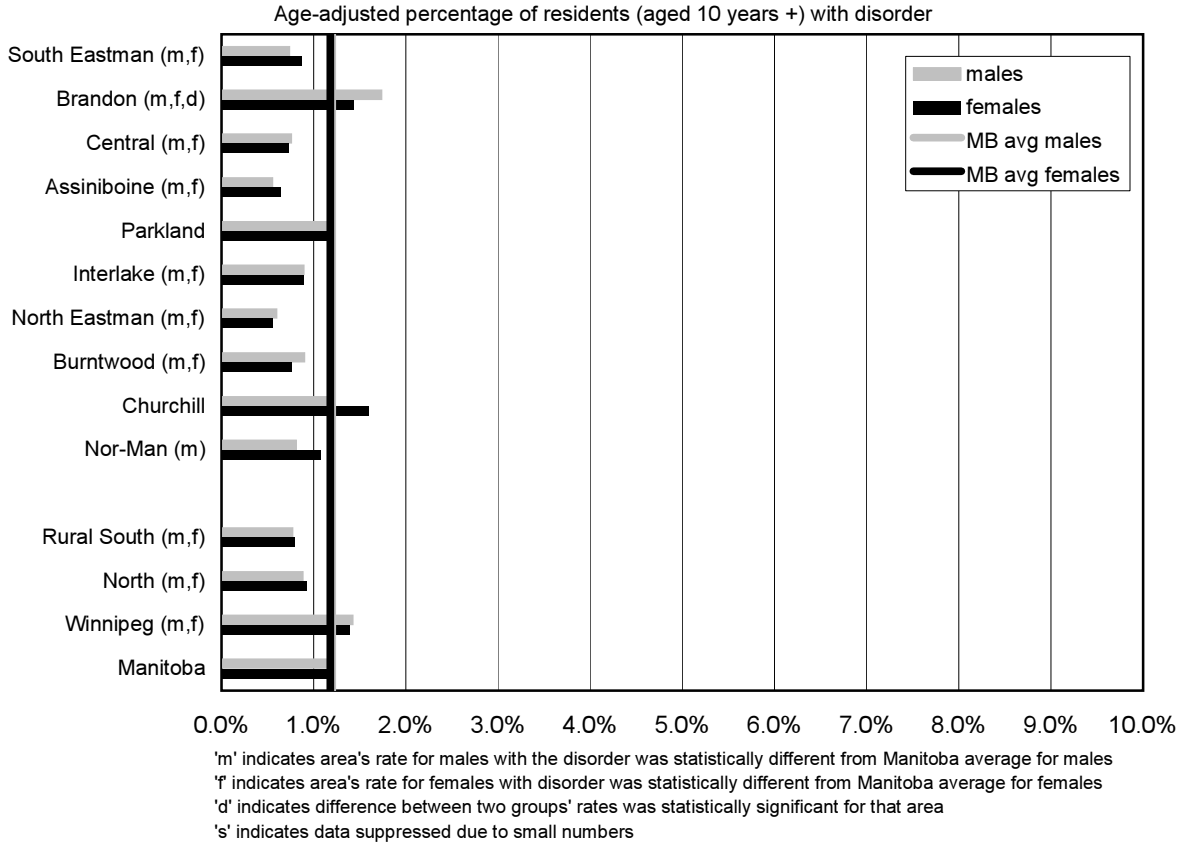
- The one-year prevalence for adults in the 1990/91 Ontario Health Survey for respondents aged 15 through 64 years was estimated at 5.2% (Ross et al., 1999). *In our study, the five-year treatment prevalence is 6.3% for males and 5.3% for females.*
- The prevalence of substance abuse appears to be slightly more prevalent among males than females, although the differences are not usually significant (Adlaf and Ivis, 1998; Patton et al., 2001; Thomas and Rockwood, 2001; Vega et al., 2002). However, females appear to abuse sleeping pills and tranquilizers more often than males (Graham and Vidal-Zeballos, 1998). The most commonly-abused substance appears to be alcohol, at 71.6% of abusers, followed by cannabis, at 22.5% of abusers (Vega et al., 2002). A Manitoba study of high school students found that 26% drank alcohol once a week or more, while 15.8% reported using cannabis more than once per month (Patton et al., 2001). *In our study, the five-year treatment prevalence of substance abuse appears slightly higher for males than females at the provincial level, at 6.3% for males and 5.3% for females. Male/female patterns appear consistent throughout Winnipeg, Brandon, and the Rural South—only in the North does the prevalence appear higher for females than males, but once again fairly similar at 14.1% for males and 15.4% for females.*

2.8 Treatment Prevalence of Schizophrenia

Definition: The treatment prevalence of schizophrenia is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of ICD-9-CM code 295 (schizophrenic disorders) in either hospital abstracts or physician claims.

The numerator is the number of people in a five-year period treated for schizophrenia, with the denominator being the entire cohort. Treatment prevalence for schizophrenia is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is "grouped" into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.8.1: Treatment Prevalence of Schizophrenia by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.8.2: Treatment Prevalence of Schizophrenia by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

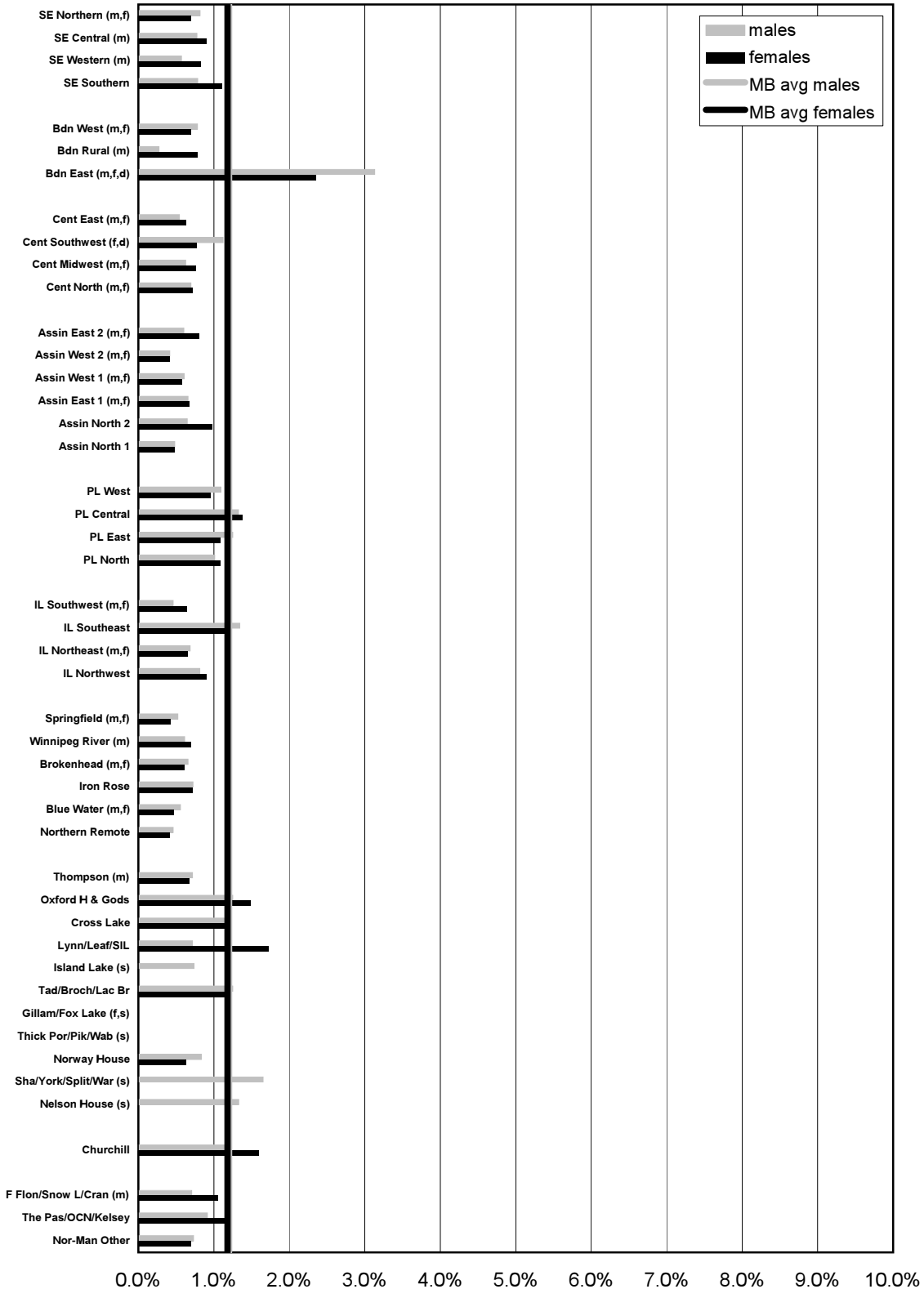


Figure 2.8.3: Treatment Prevalence of Schizophrenia by Age and Sex, 1997/98-2001/02

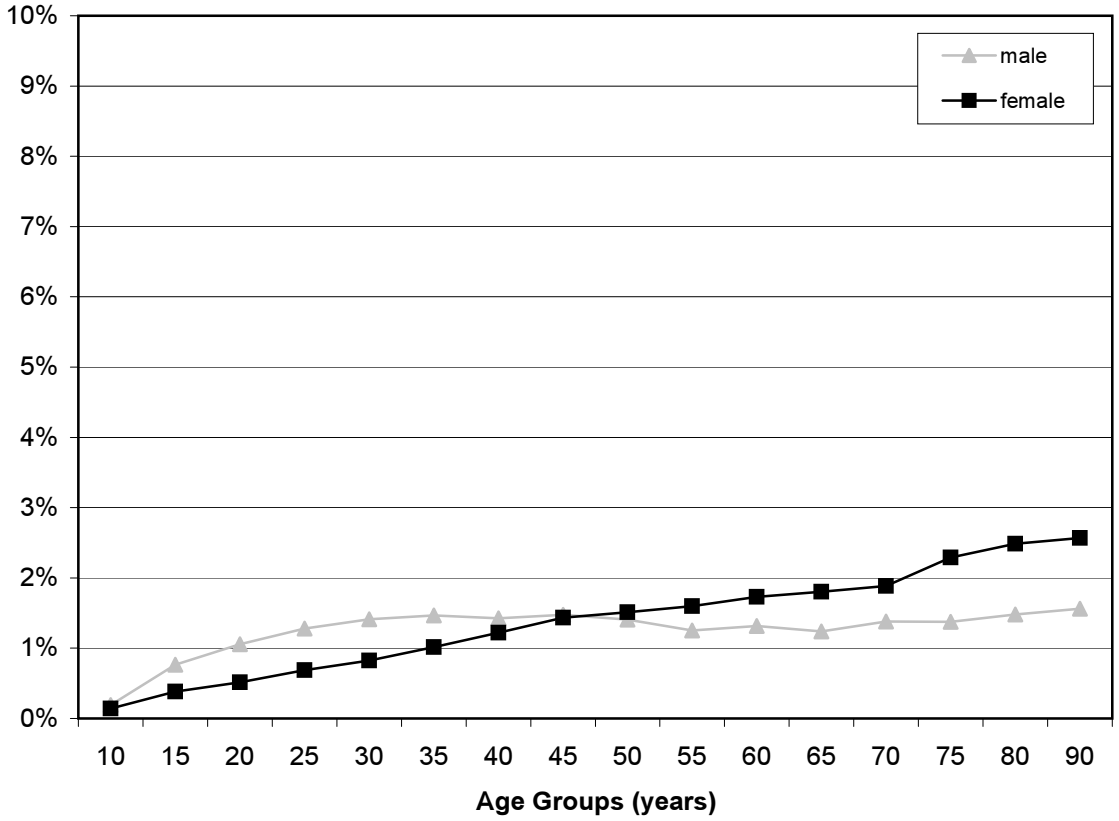
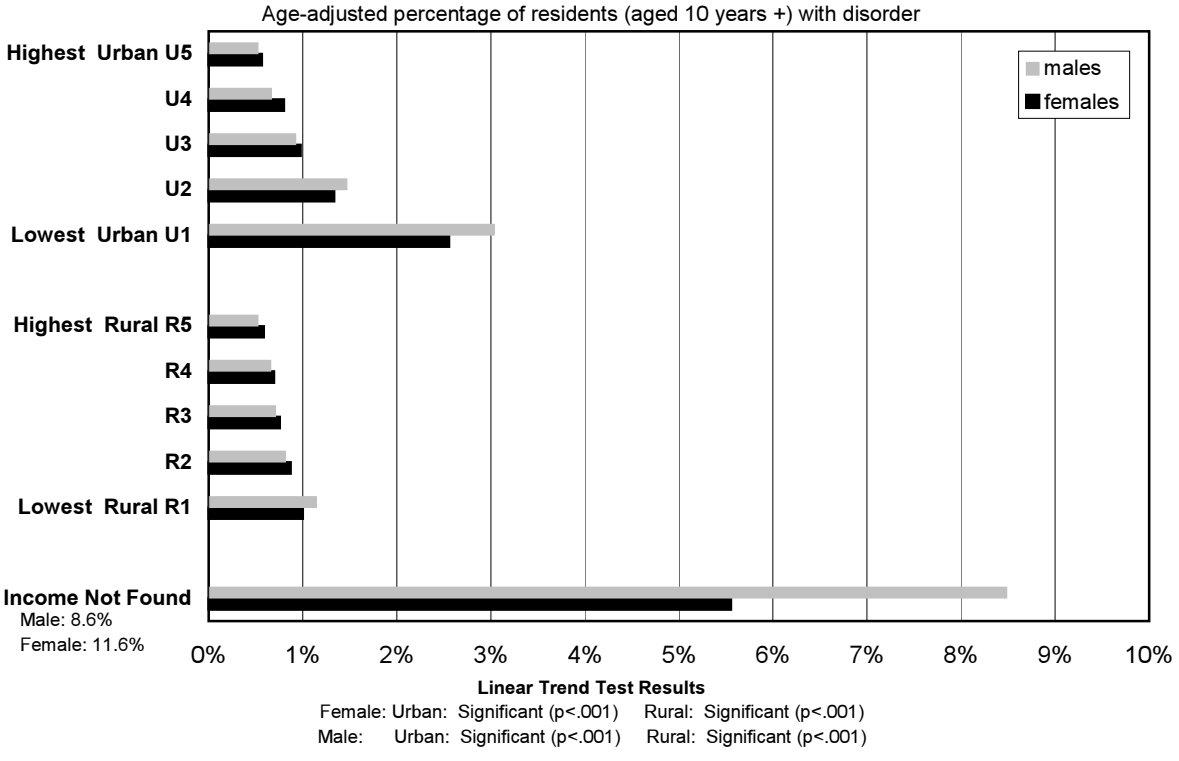


Figure 2.8.4: Treatment Prevalence of Schizophrenia by Income Quintile, 1997/98-2001/02



Key findings:

- The two urban centres of Winnipeg (1.4% for both males and females) and Brandon (1.7% males, 1.4% females) have statistically significantly higher treatment prevalence of schizophrenia than the provincial average (1.2% for males and females), in contrast with lower prevalence in the Rural South (0.8% for both) and North (0.9% for both).
- The treatment prevalence of males and females appears similar throughout the province, with the only exception being Brandon where the prevalence in males is higher than for females (1.7% versus 1.4%). The district of Brandon East has very high prevalence for both males (3.1%) and females (2.4%), approximately double the provincial average.
- For males in our cohort, the prevalence of schizophrenia is highest around aged 35, and maintains a similar pattern (at around 1.3 to 1.5%) from aged 35 up. In contrast, the female prevalence appears to increase steadily throughout the age categories, to a high of around 2.5% in the 80 and older categories.
- The treatment prevalence of schizophrenia is highly associated with neighbourhood income, with the highest prevalence in the lowest income quintile group. For both males and females in the urban income groupings, there is a 40-50% difference from one income quintile to the next for each of the quintile groupings. In the rural neighbourhood income groupings, the prevalence is generally much lower (more similar to the highest neighbourhood income groups in the urban areas), and the difference between neighbourhood income categories much smaller. In the group which cannot be assigned a neighbourhood income from census data (residents of long-term care facilities, personal care homes and psychiatric facilities, prisons, and wards of the public trustee and Child and Family Services), the treatment prevalence of schizophrenia is six to eight times higher than the provincial average (8.5% versus 1.2% for males, 5.6% versus 1.2% for females).

Comparison to Canadian estimates:

- Adult lifetime prevalence of schizophrenia has been estimated at 0.25% (Woogh, 2001), 0.3% (Offord et al., 1996), and 1% (Hafner and Heiden, 1997). It also appears to be slightly more common among males than females (Woogh, 2001), although this finding is not consistent across studies (Hafner and an der Heiden, 1997). *In our study, the overall provincial five-year treatment prevalence for schizophrenia is similar for males and females, at 1.2% which is higher than previously reported estimates. However, prevalence appears lower in the North (0.9%) and Rural South (0.8%), but higher in Winnipeg (1.4%) and Brandon (1.4% females, 1.7% males).*
- The prevalence of schizophrenia, according to diagnostic criteria, appears to have declined in Canada from the mid-1980s to the late 1990s (Woogh, 2001). Schizophrenia patients usually develop their first

symptoms between the ages of 25 and 35, with the age of onset being older for females than males (Hafner and an der Heiden, 1997). *In our study, the age of diagnosis for males appears to correspond with reported literature, with the peak around 30 years old being maintained thereafter. However, with females, the prevalence appears to increase steadily in our cohort, implying that the age of diagnosis is definitely older in females.*

2.9 Treatment Prevalence of Personality Disorders

Definition: The treatment prevalence of personality disorder is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of ICD-9-CM code 301 (personality disorders) in hospital abstracts or physician claims.

The numerator is the number of people aged 10 or older with a diagnosis of personality disorder in a five-year period, with the denominator being the entire cohort aged 10 or older. Treatment prevalence for personality disorder is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is grouped into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.9.1: Treatment Prevalence of Personality Disorders by RHA, 1997/98-2001/02

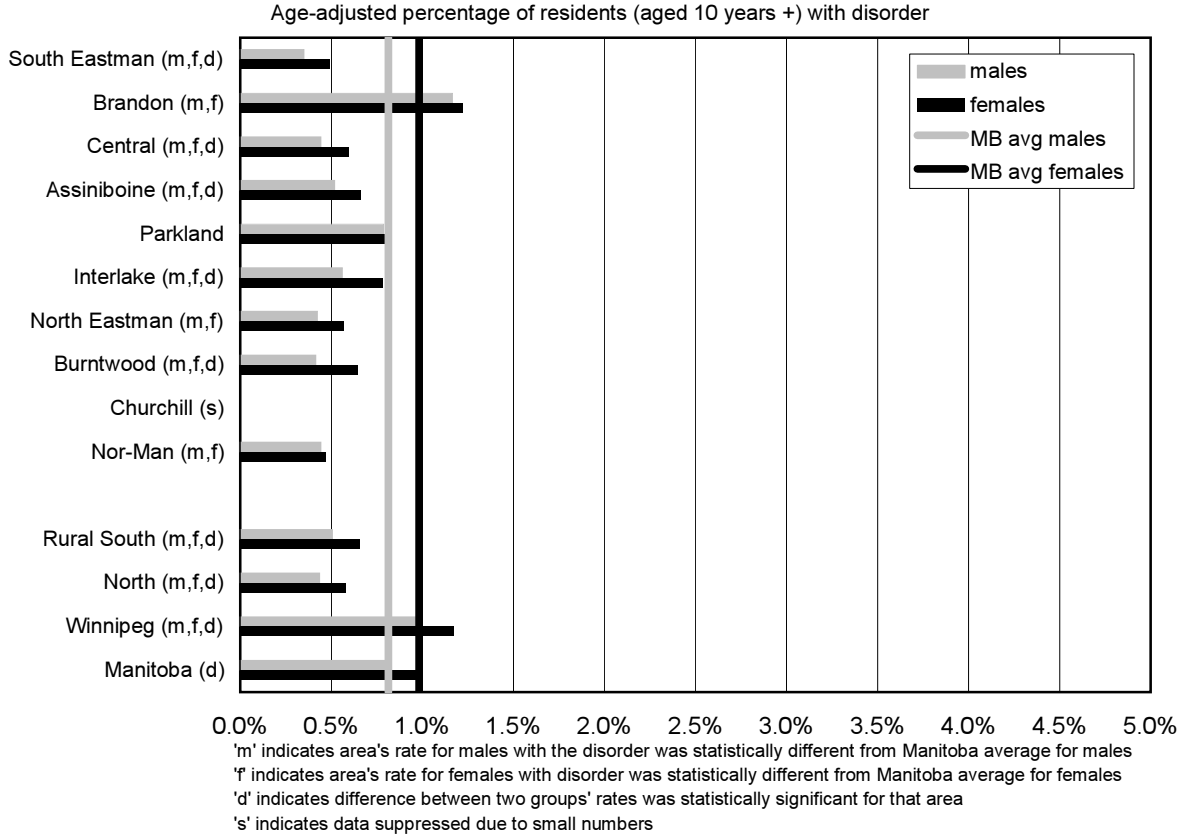


Figure 2.9.2: Treatment Prevalence of Personality Disorders by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder

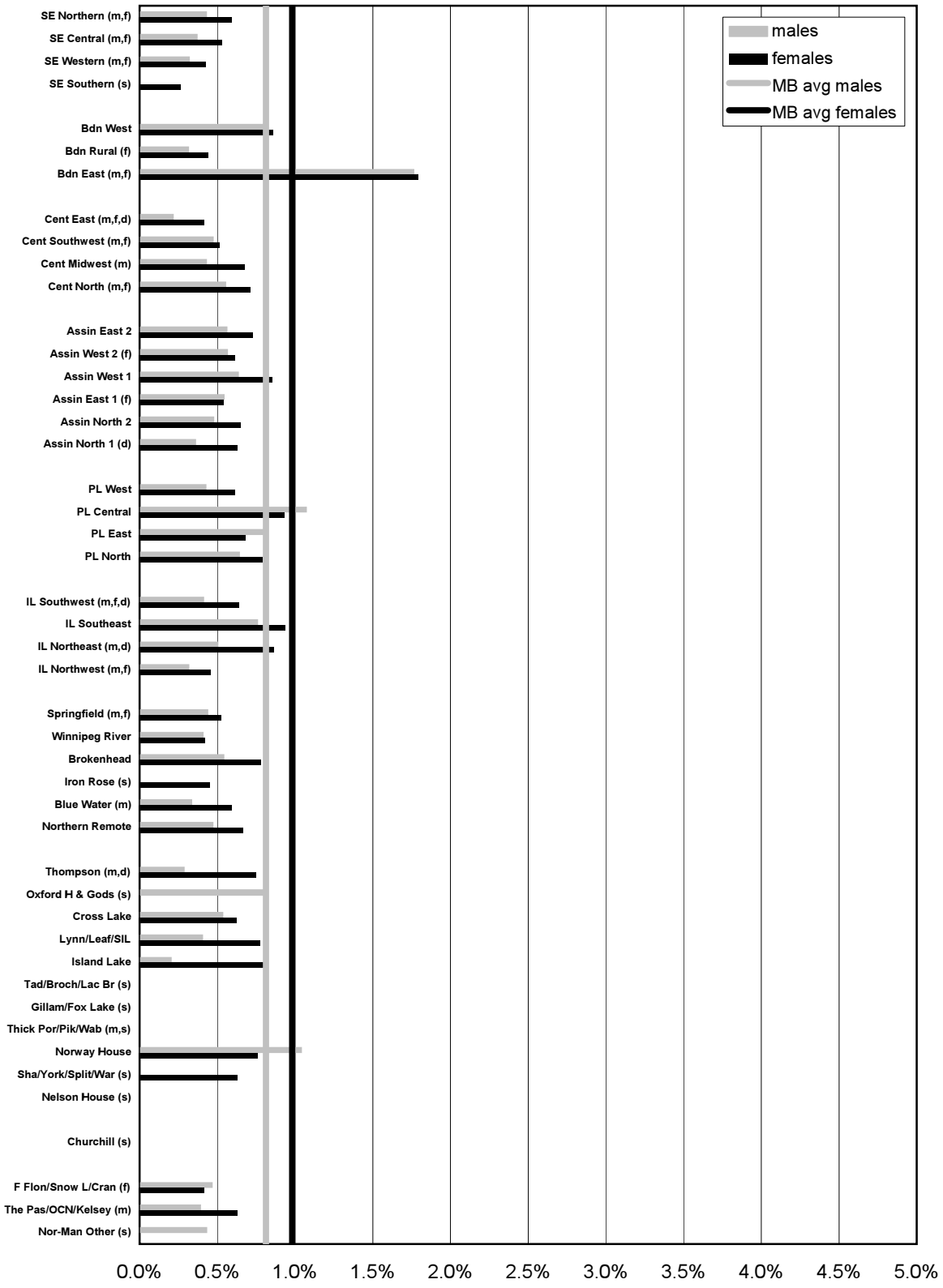


Figure 2.9.3: Treatment Prevalence of Personality Disorders by Age and Sex, 1997/98-2001/02

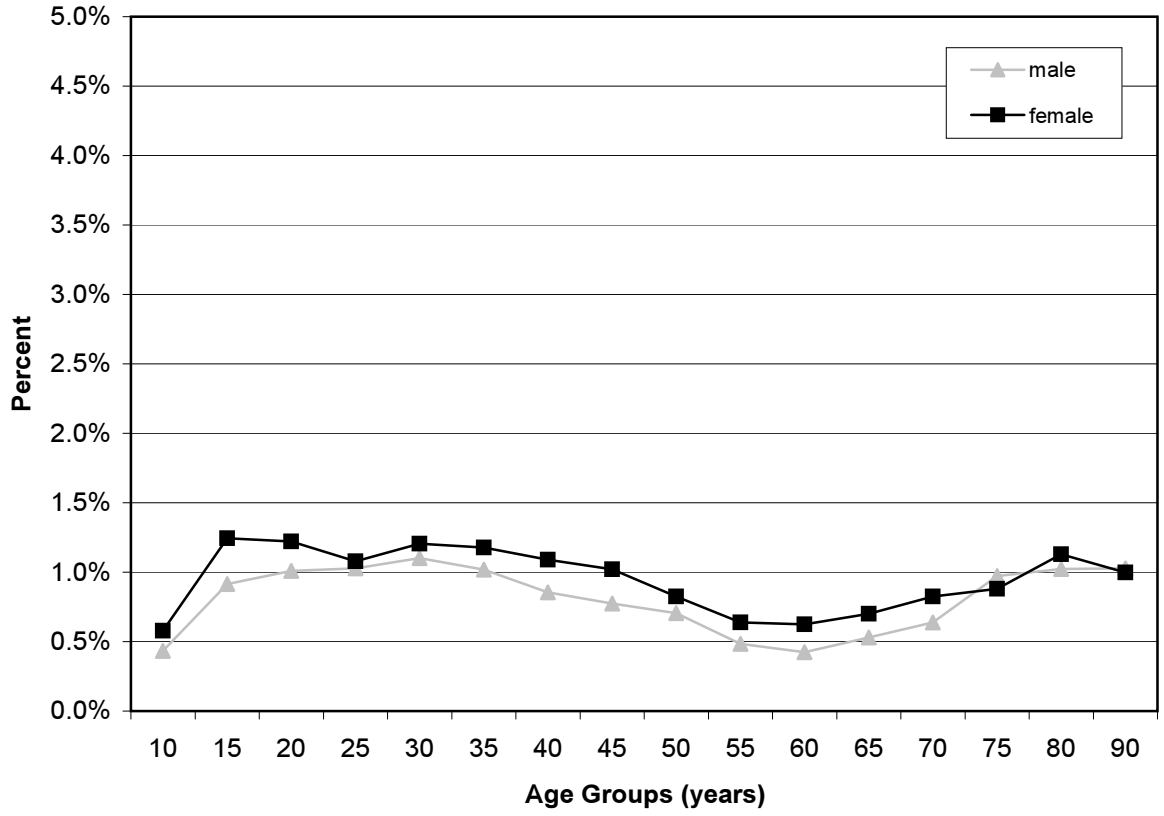
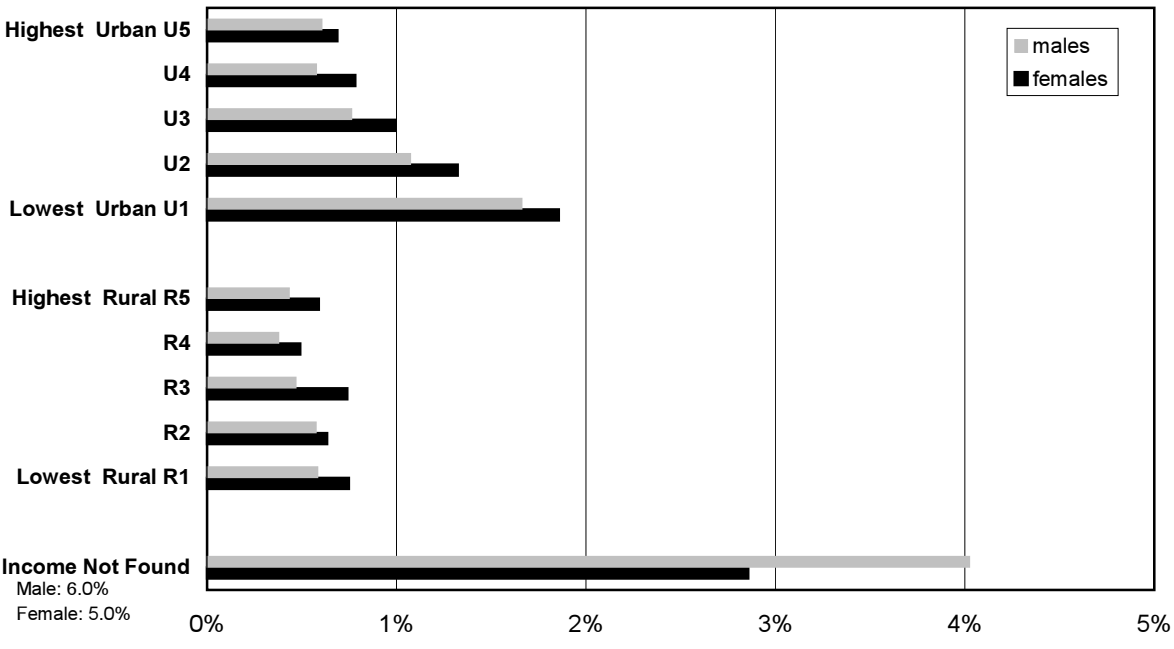


Figure 2.9.4: Treatment Prevalence of Personality Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 10 years +) with disorder



Linear Trend Test Results

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

Key findings:

- The treatment prevalence for personality disorders appears to be the highest in Winnipeg (1.0% males, 1.2% females) and Brandon (1.2% for both males and females), at approximately double that in the Rural South (0.5% males, 0.7% females) and the North (0.4% males, 0.6% females). The district of Brandon East has the highest treatment prevalence for personality disorder in the province, at 1.8% for both males and females. At the provincial level, there is a slightly higher prevalence of personality disorder in females compared to males (1.0% vs. 0.8%).
- Our cohort appears to show a relatively young onset of diagnosis for personality disorders, with the prevalence for both males and females around 1% in the 15-19 year old age group and maintained throughout middle-age. A decline in the prevalence during the late 50s may indicate diagnostic differences over the past few decades, but by aged 70-74, the prevalence is once again around 1%. There are very little differences by sex in the age distribution of personality disorder diagnoses.
- There is a strong relationship between neighbourhood income grouping and treatment prevalence for personality disorders in urban areas, with the lowest neighbourhood income grouping having the highest prevalence for both males and females. Each decrease in income quintile results in an approximate 27% increase in prevalence. In the rural neighbourhood income groupings, the treatment prevalence shows no gradient, and is similar to the prevalence in the highest urban neighbourhood income grouping. The group for which neighbourhood income is unassigned (institutionalized persons or wards of the public trustee) shows rates at least three times the provincial average, at 4.0% for males and 1.9% for females.

Comparison to Canadian estimates:

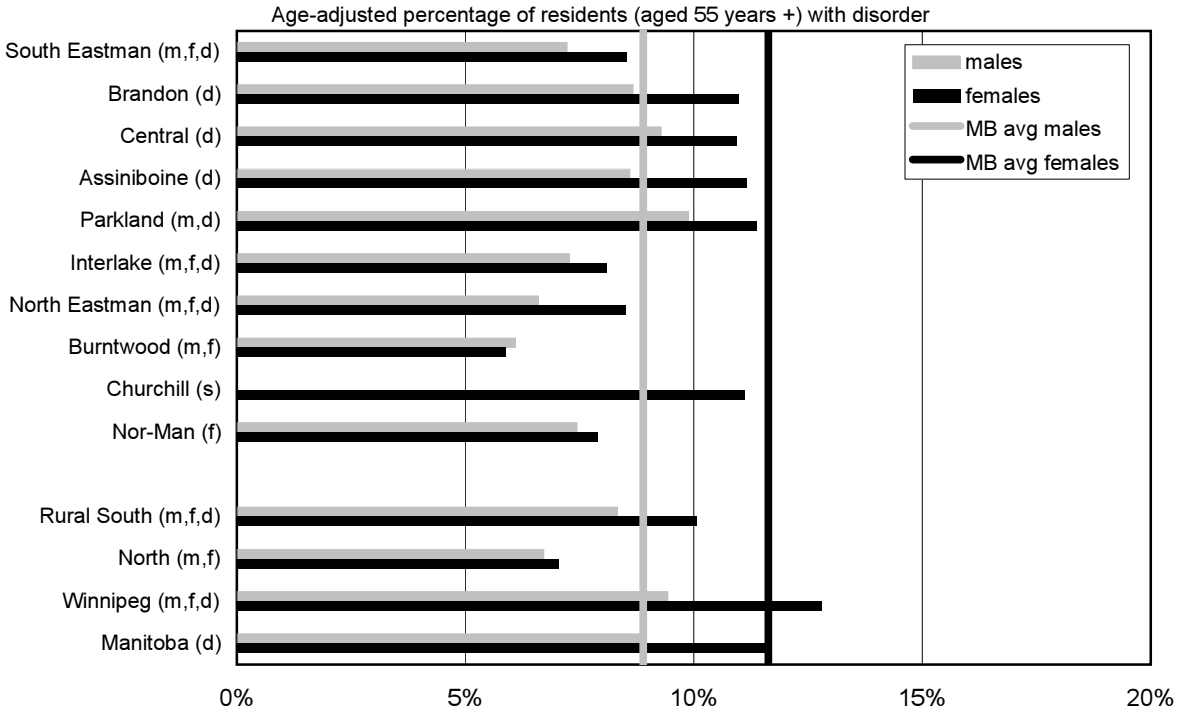
- In the USA, the estimated lifetime prevalence for personality disorders is 6 to 9% (Samuels et al., 1994). *Our study indicates a much lower five-year treatment prevalence of personality disorder, at 0.8% for males and 1.0% for females.*
- There is very little information on the epidemiology of personality disorders in the general Canadian population. Most personality disorder studies focus on psychiatric patient populations. Thus, our review of personality disorder literature is based on studies from Europe, Australia, and the U.S. as well as Canada. Personality disorders appear to be slightly more common among males than females (Jackson and Burgess, 2000; Torgerson et al., 2001; Swanson et al., 1994). *In our report, the Rural South, North, and Winnipeg show a slightly higher treatment prevalence of personality disorders for females compared to males (1.0% for females and 0.8% for males), although the percentages are close. However, the treatment prevalence of personality disorders appears to have very similar age distributions and neighbourhood income relationships for both males and females in Manitoba.*

2.10 Treatment Prevalence of Dementia

Definition: The treatment prevalence of dementia is an age-adjusted percentage of the population aged 55 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of any of ICD-9-CM codes 290-292 (organic psychotic conditions), 294 (other organic psychotic conditions), 331 (cerebral degenerations), or 797 (senility) in either hospital abstracts or physician claims.

The numerator is the number of people aged 55 or older with dementia in a five-year period, with the denominator being the entire cohort aged 55 or older. Treatment prevalence for dementia is given by RHA, by district, by age distribution, and by income quintile grouping for males and females. Except in the age distribution graph, prevalence is age-adjusted where necessary to reflect the overall Manitoba age distribution. The income quintile treatment prevalence is given by "urban" (Winnipeg and Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is grouped into each neighbourhood income strata from lowest to highest neighbourhood income levels.

Figure 2.10.1: Treatment Prevalence of Dementia by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.10.2: Treatment Prevalence of Dementia by District, 1997/98-2001/02

Age-adjusted percentage of residents (aged 55 years +) with disorder

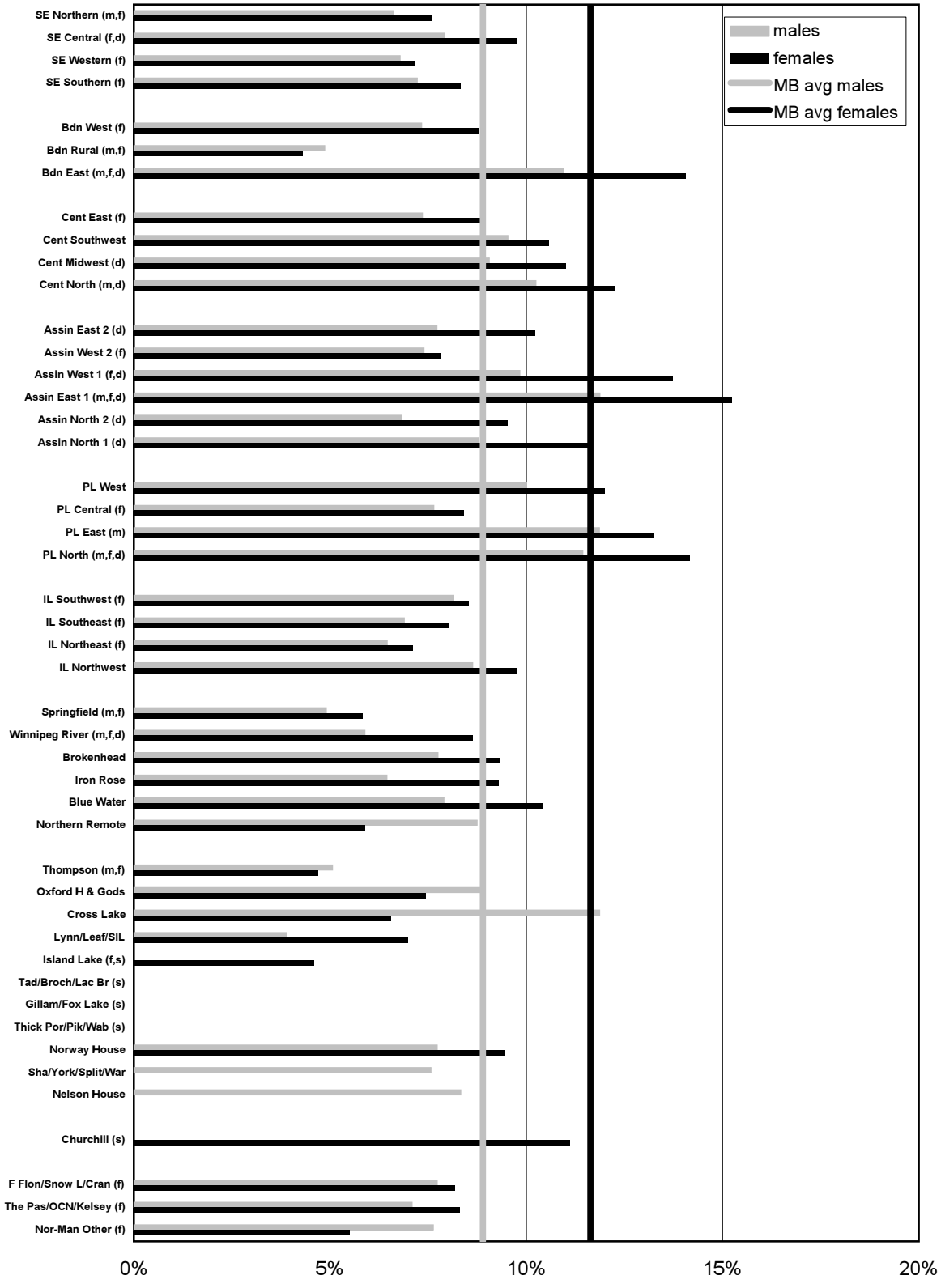


Figure 2.10.3: Treatment Prevalence of Dementia by Age and Sex, 1997/98-2001/02

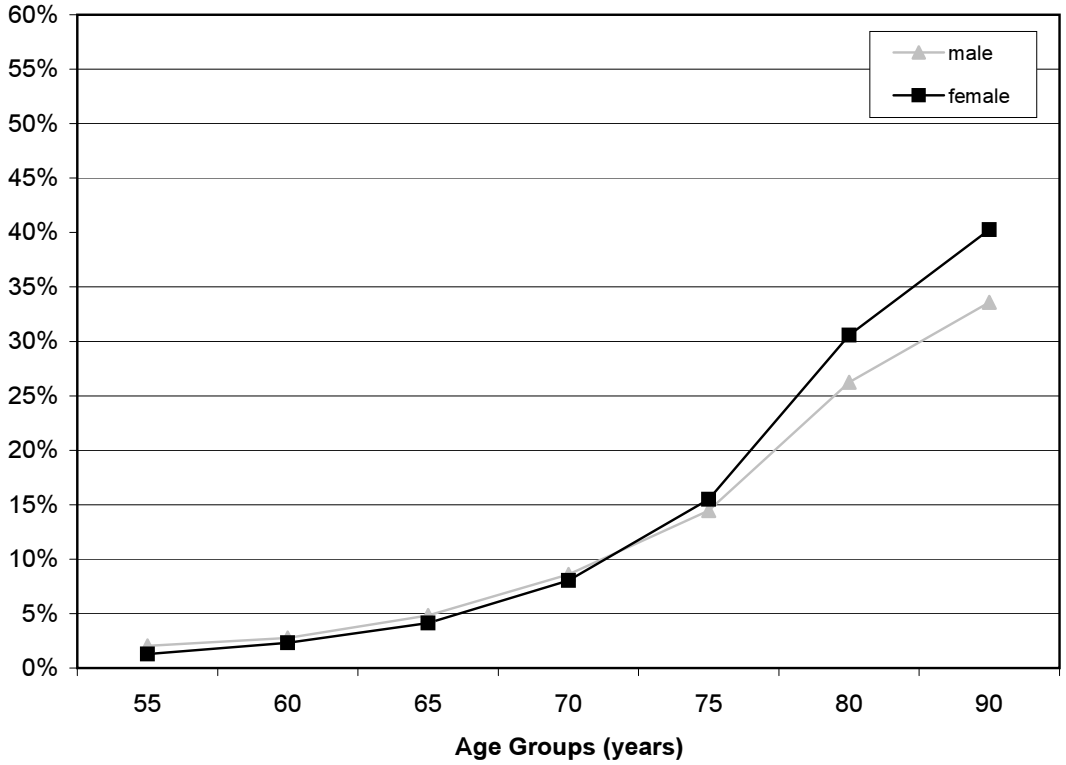
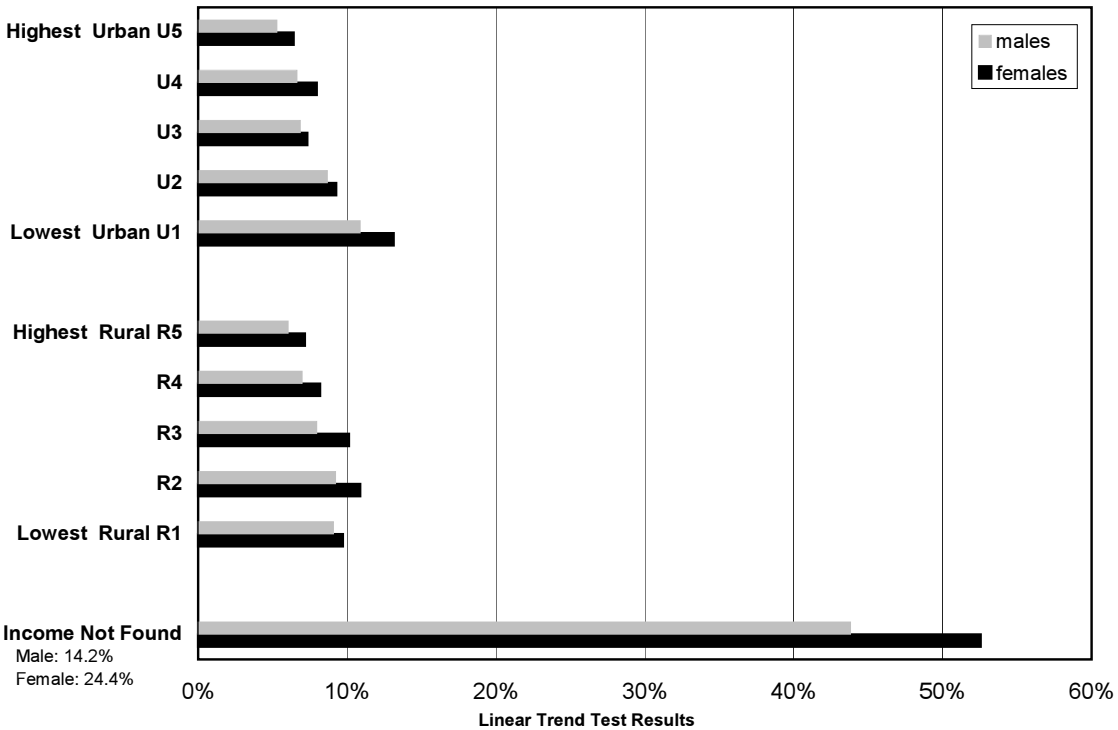


Figure 2.10.4: Treatment Prevalence of Dementia by Income Quintile, 1997/98-2001/02

Age-adjusted percentage of residents (aged 55 years +) with disorder



Linear Trend Test Results

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

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

Key findings:

- The treatment prevalence of dementia is higher in females than males (11.6% females, 8.9% males), and this pattern is present in the Rural South (10.1% females, 8.3% males), as well as the two urban centres of Winnipeg (12.8% females, 9.4% males) and Brandon (11.0% females, 8.7% males). Only in the North is the prevalence similar between sexes (7.0% females, 6.7% males). Both the Rural South and the North show lower prevalence for both males and females than the provincial average.
- The treatment prevalence of dementia varies substantially by RHA and by districts, with some RHAs and districts having values half of the provincial average (such as Burntwood RHA, and Brandon Rural district), and other districts having elevated prevalence (such as Brandon East district, and districts within Assiniboine and Parkland).
- The treatment prevalence of dementia shows a steady pattern of increase with age, from a low of around 1% at age 55-59, through to over one-third of the population aged 90 or more. There is a higher proportion of females than males aged 80+ with a diagnosis of dementia.
- There is stronger evidence of a neighbourhood income gradient of dementia in the urban income quintiles than in the rural income quintiles, with the lowest urban income grouping showing the highest prevalence of dementia.

Comparison to Canadian estimates:

- The estimated prevalence of dementia for those aged 65 or more is 8%, with 6.9% for males and 8.6% for females (Canadian Study of Health and Aging Working Group 1994). *Our study points to even higher dementia prevalence, since we include ages 55 or more, and even then our comparative numbers show higher prevalence for both males (8.9%) and females (11.6%) than this study reports.*
- Dementia appears to be slightly more prevalent among women than men (Canadian Study of Health and Aging Working Group, 1994; Canadian Study of Health and Aging Working Group, 2000). Dementia rates increase dramatically with age (Canadian Study of Health and Aging Working Group, 1994; Canadian Study of Health and Aging Working Group, 2000). *In our report, we find higher treatment prevalence for dementia in females (11.6%) compared to males (8.9%), in the population aged 55 or older. There is also a dramatic increase in dementia prevalence by age.*

2.11 Comorbidity of Selected Mental Disorders

Definition: This table shows the total number, as well as the percentage of the total, for the cohort aged 10 or greater that have one or more of the following mental illness diagnoses, as defined using our administrative database definitions (see Glossary, or the pertinent sections of Chapter 2) in the five-year period from 1997/98 to 2001/02: depression, anxiety disorder, substance abuse, schizophrenia, personality disorder, dementia, or a category of "other" meaning all other mental illness diagnoses. Reading along a row in the table, a "1" indicates the presence of that particular condition, and a "0" the absence of that condition. Comorbidity rows representing small numbers of people (five or less) were suppressed.

Table 2.11.1: Comorbidities among specified mental illness disorders, 1997/98-2001/02

Depression	Anxiety	Substance Abuse	Schizo-phrenia	Personality Disorder	Dementia	Other	Total Number	Percent
0	0	0	0	0	0	0	649,525	63.11
0	0	0	0	0	0	1	118,252	11.49
0	0	0	0	0	1	0	8,796	0.86
0	0	0	0	0	1	1	5,530	0.54
0	0	0	0	1	0	0	557	0.05
0	0	0	0	1	0	1	190	0.02
0	0	0	0	1	1	0	58	0.01
0	0	0	0	1	1	1	175	0.02
0	0	0	1	0	0	0	2,772	0.27
0	0	0	1	0	0	1	883	0.09
0	0	0	1	0	1	0	282	0.03
0	0	0	1	0	1	1	312	0.03
0	0	0	1	1	0	0	58	0.01
0	0	0	1	1	0	1	86	0.01
0	0	0	1	1	1	1	23	0
0	0	1	0	0	0	0	28,712	2.79
0	0	1	0	0	0	1	2,526	0.25
0	0	1	0	0	1	0	1,014	0.1
0	0	1	0	0	1	1	578	0.06
0	0	1	0	1	0	0	98	0.01
0	0	1	0	1	0	1	42	0
0	0	1	0	1	1	0	10	0
0	0	1	0	1	1	1	28	0
0	0	1	1	0	0	0	217	0.02
0	0	1	1	0	0	1	191	0.02
0	0	1	1	0	1	0	32	0
0	0	1	1	0	1	1	38	0
0	0	1	1	1	0	0	24	0
0	0	1	1	1	0	1	35	0
0	1	0	0	0	0	0	17,246	1.68
0	1	0	0	0	0	1	2,178	0.21
0	1	0	0	0	1	0	217	0.02
0	1	0	0	0	1	1	214	0.02
0	1	0	0	1	0	0	96	0.01
0	1	0	0	1	0	1	38	0
0	1	0	0	1	1	1	7	0
0	1	0	1	0	0	0	127	0.01
0	1	0	1	0	0	1	80	0.01
0	1	0	1	0	1	0	5	0
0	1	0	1	0	1	1	16	0
0	1	0	1	1	0	0	9	0
0	1	0	1	1	0	1	10	0
0	1	1	0	0	0	0	968	0.09
0	1	1	0	0	0	1	214	0.02
0	1	1	0	0	1	0	38	0
0	1	1	0	0	1	1	24	0
0	1	1	0	1	0	0	21	0
0	1	1	0	1	0	1	6	0
0	1	1	1	0	0	0	15	0
0	1	1	1	0	0	1	19	0
0	1	1	1	1	0	1	6	0
1	0	0	0	0	0	0	93,431	9.08
1	0	0	0	0	0	1	17,581	1.71
1	0	0	0	0	1	0	2,946	0.29
1	0	0	0	0	1	1	3,154	0.31
1	0	0	0	1	0	0	1,378	0.13

Table 2.11.1 (Continued): Comorbidities among specified mental illness disorders, 1997/98-2001/02

Depression	Anxiety	Substance Abuse	Schizo-phrenia	Personality Disorder	Dementia	Other	Total Number	Percent
1	0	0	0	1	0	1	661	0.06
1	0	0	0	1	1	0	62	0.01
1	0	0	0	1	1	1	213	0.02
1	0	0	1	0	0	0	1,639	0.16
1	0	0	1	0	0	1	1,049	0.1
1	0	0	1	0	1	0	145	0.01
1	0	0	1	0	1	1	309	0.03
1	0	0	1	1	0	0	191	0.02
1	0	0	1	1	0	1	223	0.02
1	0	0	1	1	1	0	14	0
1	0	0	1	1	1	1	86	0.01
1	0	1	0	0	0	0	11,341	1.1
1	0	1	0	0	0	1	2,758	0.27
1	0	1	0	0	1	0	409	0.04
1	0	1	0	0	1	1	430	0.04
1	0	1	0	1	0	0	449	0.04
1	0	1	0	1	0	1	286	0.03
1	0	1	0	1	1	0	17	0
1	0	1	0	1	1	1	45	0
1	0	1	1	0	0	0	232	0.02
1	0	1	1	0	0	1	301	0.03
1	0	1	1	0	1	0	26	0
1	0	1	1	0	1	1	62	0.01
1	0	1	1	1	0	0	71	0.01
1	0	1	1	1	0	1	168	0.02
1	0	1	1	1	1	1	20	0
1	1	0	0	0	0	0	25,554	2.48
1	1	0	0	0	0	1	7,620	0.74
1	1	0	0	0	1	0	671	0.07
1	1	0	0	0	1	1	784	0.08
1	1	0	0	1	0	0	1,179	0.11
1	1	0	0	1	0	1	749	0.07
1	1	0	0	1	1	0	31	0
1	1	0	0	1	1	1	97	0.01
1	1	0	1	0	0	0	567	0.06
1	1	0	1	0	0	1	516	0.05
1	1	0	1	0	1	0	24	0
1	1	0	1	0	1	1	100	0.01
1	1	0	1	1	0	0	150	0.01
1	1	0	1	1	0	1	276	0.03
1	1	0	1	1	1	1	38	0
1	1	1	0	0	0	0	4,270	0.41
1	1	1	0	0	0	1	2,190	0.21
1	1	1	0	0	1	0	175	0.02
1	1	1	0	0	1	1	200	0.02
1	1	1	0	1	0	0	472	0.05
1	1	1	0	1	0	1	456	0.04
1	1	1	0	1	1	0	16	0
1	1	1	0	1	1	1	36	0
1	1	1	1	0	0	0	136	0.01
1	1	1	1	0	0	1	218	0.02
1	1	1	1	0	1	0	9	0
1	1	1	1	0	1	1	28	0
1	1	1	1	1	0	0	90	0.01
1	1	1	1	1	0	1	240	0.02
1	1	1	1	1	1	1	14	0

Table 2.11.2: The percentage of the population having zero, one or more than one mental illness diagnosis, 1997/98-2001/02

The number of conditions diagnosed in administrative claims data	The percentage of the population aged 10 or more with groups of comorbidities (actual number in brackets), N=1,029,201		
	Cumulative disorders (depression, anxiety, substance abuse, schizophrenia, personality disorder)	The cumulative disorders plus dementia	The cumulative disorders plus dementia plus any other mental illness diagnosis
0 of the conditions	75.99% (782,103)	74.60% (767,777)	63.11% (649,525)
1 of the conditions	17.01% (175,026)	17.53% (180,402)	26.21% (269,766)
2 or more of the conditions	7.00% (72,072)	7.87% (81,022)	10.68% (109,910)

Key findings:

- About 63.1% of the population had no mental illness conditions, 26.2% had only one mental illness condition, and 10.7% had more than one condition in the five-year period from 1997/98 through 2001/02.
- Of those in the group treated for depression (18.01% of the population), about *half* (9.05%) had at least one other diagnosis.
- Of those in the group treated for anxiety (6.60% of the population), about *three-quarters* (4.92%) had at least one other diagnosis.
- Of those in the group treated for substance abuse (5.78% of the population), about *half* (2.99%) had at least one other diagnosis.
- Of those in the group treated for schizophrenia (1.16% of the population), about *three-quarters* (0.89%) had at least one other diagnosis.
- Of those in the group treated for personality disorder (0.86% of the population), *almost all* (0.81% of the population) had at least one other diagnosis.
- Of those in the group treated for dementia (2.67% of the population), about *two-thirds* (1.81%) had at least one other diagnosis.
- Of those in the group treated for any other mental illness condition not listed above (16.75% of the population), about *one-third* (5.26%) had at last one other diagnosis.

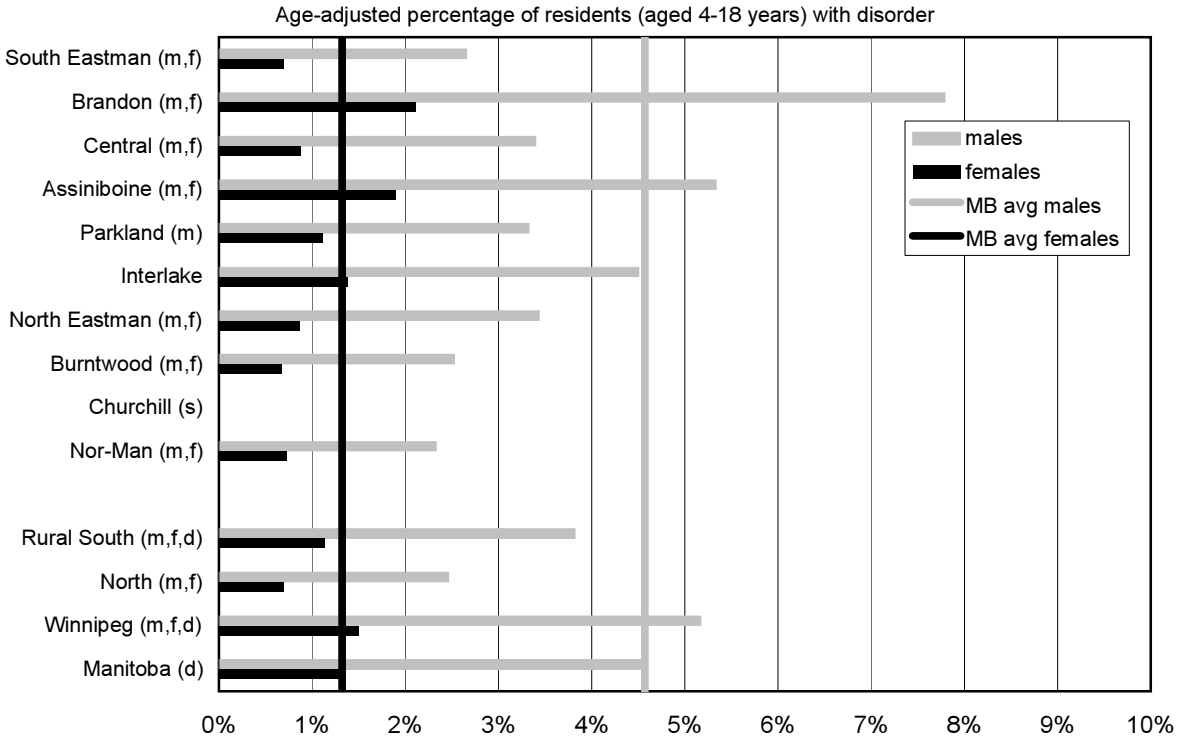
Comparison to Canadian estimates:

- A U.S. study indicates that 54% of those with a lifetime history of at least one mental illness also had at least one other mental illness or addiction to substances (Kessler and Ahangang, 1999; Health Canada, 2002:16). *In our study, of the approximately 37% of the population with at least one mental illness diagnosis, about 26.2% had only one mental illness condition but 10.7% had more than one condition in the five-year period 1997/98 through 2001/02. So in our study, 29% of those people with at least one mental illness diagnosis in the five years also had at least one other mental illness (or substance abuse).*

2.12 Treatment Prevalence of ADD/ADHD

Definition: The treatment prevalence of Attention Deficit Disorder (ADD) and Attention Deficit Hyperactive Disorder (ADHD) is a crude percentage of the population aged four through 18 years old (age determined in 2001/02) who had at least one ICD-9-CM code of 314 (hyperkinetic syndrome) in either physician claims or hospital abstracts, or a prescription for a psychostimulant (Cylert, Desoxyn Dexedrine, Dupram, Ritalin, PMS-Methylphenidate, Vivarin) during the one-year period. Children with a diagnosis of conduct disorder (312) or 347 (Catalepsy and Narcalepsy) are removed from this cohort. This definition has been validated by Dr. Marni Brownell of MCHP in previous studies. Note that the MHMIS (Mental Health Management Information System) database used in this study added about 14% more cases than the administrative database alone, whereas in all other mental illness diagnoses, the MHMIS added very few individuals to those showing a mental illness diagnosis coding in the administrative databases alone (see Appendix 6).

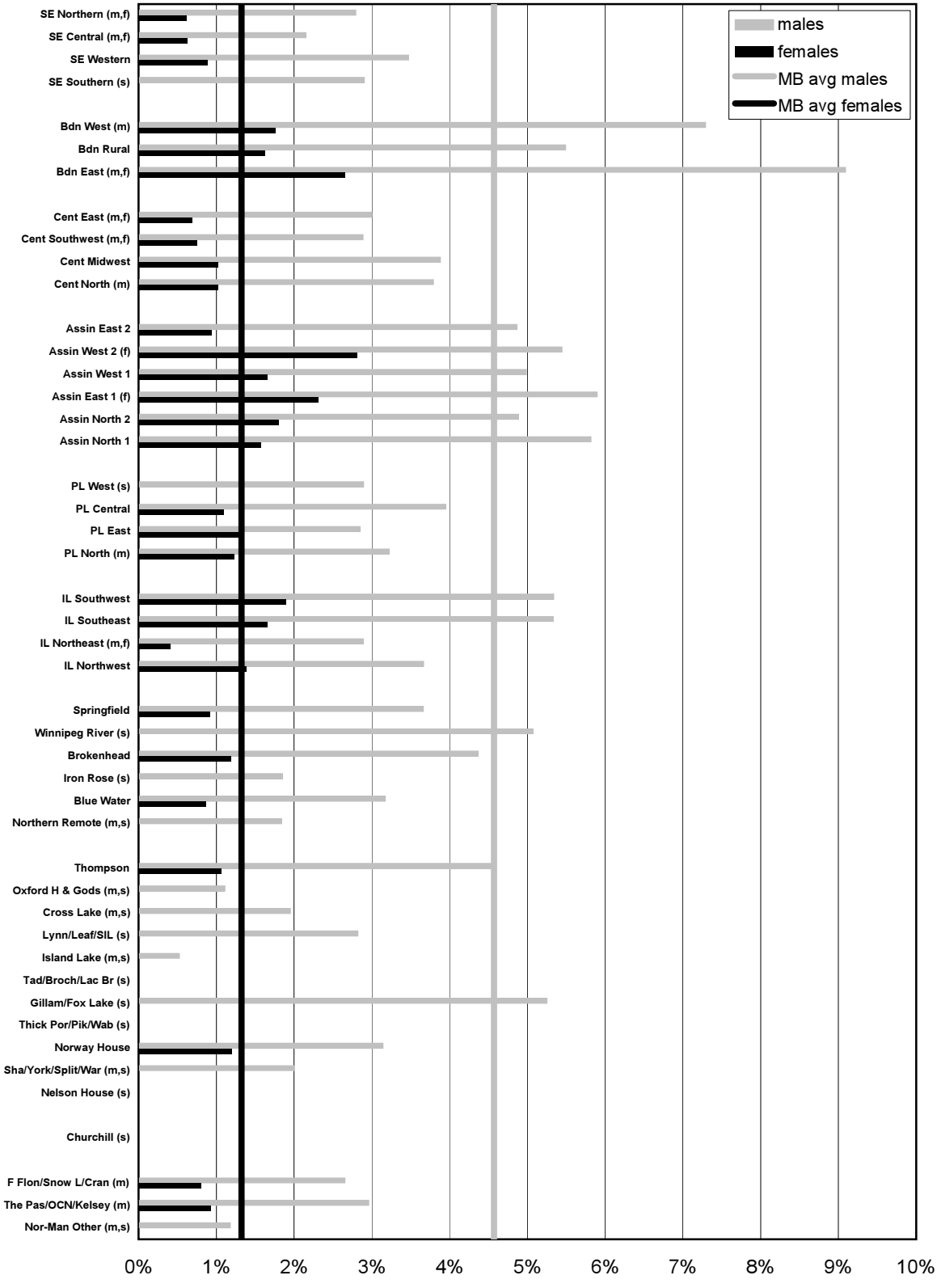
Figure 2.12.1: Treatment Prevalence of ADD/ADHD Disorders by RHA, 2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 2.12.2: Treatment Prevalence of ADD/ADHD Disorders by District, 2001/02

Age-adjusted percentage of residents (aged 4-18 years) with disorder



Key findings:

- The provincial treatment prevalence of ADD/ADHD in children aged four through 18 years is higher for males than for females (4.6% versus 1.3%).
- Treatment prevalence for ADD/ADHD is significantly higher in Winnipeg (5.2% males, 1.5% females) and Brandon (7.8% males, 2.1% females), but lower in the Rural South (3.8% males, 1.1% females) and the North (2.5% males, 0.7% females) compared to the provincial average.
- The treatment prevalence of ADD/ADHD for males peaks at between 6% and 7% at ages 10 through 13 for males. In contrast, females show a relatively stable peak prevalence from around age eight to 12, at around 2%.
- There is no relationship between the underlying treatment prevalence of ADD/ADHD regionally, and the underlying regional health status. This diagnosis rather appears to be highest in the urban areas of Winnipeg and Brandon (and RHAs close to the urban areas, such as Interlake and Assiniboine).
- There is no relationship between the treatment prevalence of ADD/ADHD and the neighbourhood income, with fairly consistent prevalence in all urban income categories, and lower but somewhat consistent prevalence in all rural income categories. In the "income unknown" group, where children are wards of the public trustee, there is an extremely high treatment prevalence of ADD/ADHD, at 13.6% for males, and 4.8% for females—both being four times the provincial average. This group represents approximately three to 4% of the males and females ages four through 18 years.

Canadian comparisons:

- The treatment prevalence of ADD/ADHD in Manitoba children aged 19 or younger in fiscal year 1995/96 was 1.5% overall, with 2.4% for males and 0.6% for females (Brownell and Yogendran, 2001). *In our study using the same definition, we looked at the years 1997/98 through 2001/02, and the treatment prevalence appears to have doubled, at 4.6% for males and 1.3% for females. This could indicate a surveillance bias, in that more children are being diagnosed due to awareness of physicians, or it could indicate a true increase in the condition.*
- Boys are more likely than girls to be diagnosed with ADD/ADHD, and are also more likely to receive a psychostimulant prescription to treat it (Brownell and Yogendran, 2001; Miller et al., 2001; Romano et al., 2002). *In our study, males had over three times the treatment prevalence of ADD/ADHD compared with females.*

Key findings:

- The provincial treatment prevalence of ADD/ADHD in children aged four through 18 years is higher for males than for females (4.6% versus 1.3%).
- Treatment prevalence for ADD/ADHD is significantly higher in Winnipeg (5.2% males, 1.5% females) and Brandon (7.8% males, 2.1% females), but lower in the Rural South (3.8% males, 1.1% females) and the North (2.5% males, 0.7% females) compared to the provincial average.
- The treatment prevalence of ADD/ADHD for males peaks at between 6% and 7% at ages 10 through 13 for males. In contrast, females show a relatively stable peak prevalence from around age eight to 12, at around 2%.
- There is no relationship between the underlying treatment prevalence of ADD/ADHD regionally, and the underlying regional health status. This diagnosis rather appears to be highest in the urban areas of Winnipeg and Brandon (and RHAs close to the urban areas, such as Interlake and Assiniboine).
- There is no relationship between the treatment prevalence of ADD/ADHD and the neighbourhood income, with fairly consistent prevalence in all urban income categories, and lower but somewhat consistent prevalence in all rural income categories. In the "income unknown" group, where children are wards of the public trustee, there is an extremely high treatment prevalence of ADD/ADHD, at 13.6% for males, and 4.8% for females—both being four times the provincial average. This group represents approximately three to 4% of the males and females ages four through 18 years.

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- Boys are more likely than girls to be diagnosed with ADD/ADHD, and are also more likely to receive a psychostimulant prescription to treat it (Brownell and Yogendran, 2001; Miller et al., 2001; Romano et al., 2002). *In our study, males had over three times the treatment prevalence of ADD/ADHD compared with females.*

2.13 Premature Mortality Rate Comparisons

Definition: Deaths are considered 'premature' when they occur before age 75. The Premature Mortality Rate (PMR) indicates the number of premature deaths per thousand residents of the area. The numerator is the number of people in the cohort who died before age 75, and the denominator is the entire cohort. The PMR is often used as an indicator of general health status, and the need for health care services (see Chapter 1, Section 1.5). PMR is age-adjusted to reflect the population age distribution of Manitoba. The cohort used for this study only included people age 10 or more, with Manitoba Health coverage for at least one year during the five-year period from 1997/98 through 2001/02.

Table 2.13.1: Comparison of the premature mortality rate of those in the cumulative disorders group with those in the no disorders group

Cohort of people aged 10 or more, 1997 through 2001	Premature Mortality Rate (99% CI)		
	All	Males only	Females only
All people	3.9 (3.8-4.0)	4.7 (4.6-4.8)	3.1 (3.0-3.2)
Those who have one or more of the cumulative mental illness disorders	4.8 (4.5-4.8)*	6.5 (6.1-6.8)*	3.1 (2.6-3.8)
Those who have no mental illness disorders	3.9 (3.8-4.0)	4.5 (4.3-4.6)	3.3 (3.1-3.4)

*statistically different than the overall ("all people") rate for that column

NOTE: The overall PMR for the entire population of Manitoba is 3.3 deaths per thousand (Martens et al., 2003), but this includes all people aged zero and up. In this report, the cohort only includes people aged 10 and up. The Manitoba overall age- and sex-adjusted PMR for the entire population aged 10 or more for 1997/98-2001/02 was 3.8 deaths per thousand (95% CI 3.8-3.9), statistically similar to our cohort's PMR of 3.9 deaths per thousand (3.8-4.0). Our cohort only included people residing in Manitoba for at least a year during the five-year period 1997/98-2001/02.

Key findings:

- Overall, there is a higher PMR for the cumulative disorders group compared with those in the "no mental disorders" group. However, this difference is driven mainly by the excessively high male PMR in the cumulative group at 6.5 deaths per thousand (99% CI 6.1-6.8) compared to the male "none" group at 4.5 (99% CI 4.3-4.6). For females, there is no statistical difference between the PMR of the cumulative group (3.1 deaths per thousand, 99% CI 2.6-3.8) compared with the "none" group (3.3 deaths per thousand, 99% CI 3.1-3.4).

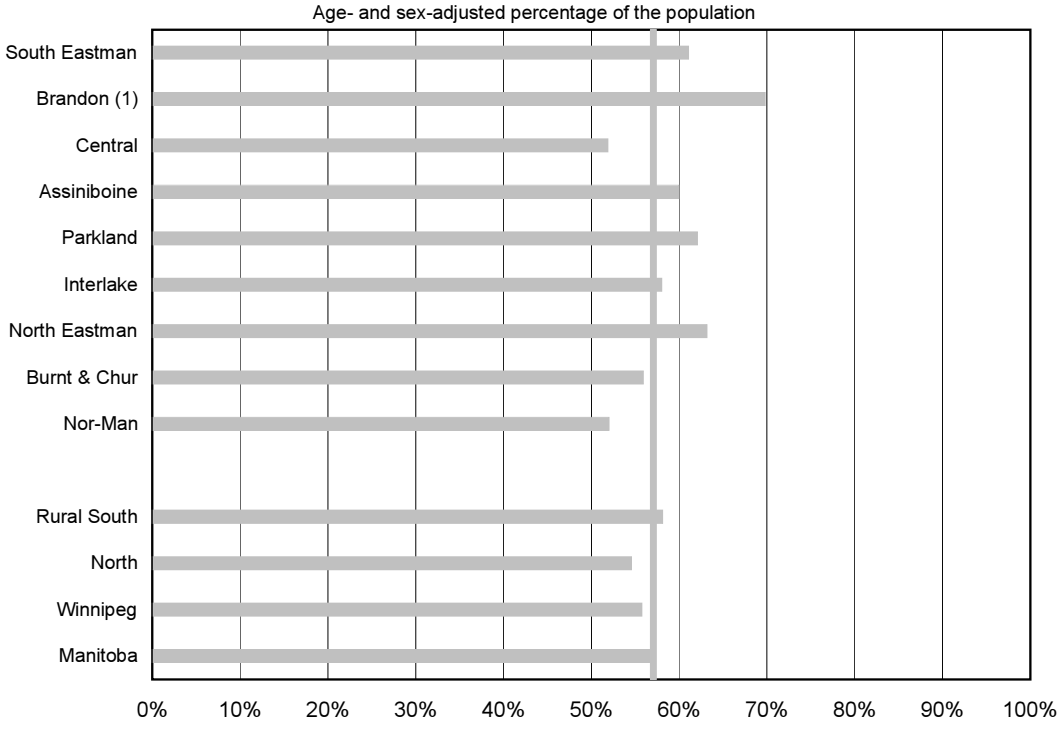
2.14 Prevalence of Selected Mental Health Measures from the Canadian Community Health Survey (CCHS) 2000-2001

The CCHS Cycle 1.1 is a national survey (*n*=8,120 in the shared file for Manitoba) with results generalizable to the regional health authorities of Manitoba (with the exception of Churchill, which has been grouped with Burntwood RHA). One of the limitations of the CCHS is the exclusion of people living in First Nations communities from the sample surveyed. Because of the relatively small sample sizes in the CCHS, many of the rates are either suppressed due to small number of events (s), or considered relatively unstable rates due to the high variation in responses (v). In order to make fair comparisons amongst the RHAs, each rate was age- and sex-adjusted (see Chapter 1).

Figure 2.14.1 Prevalence of "Positive Mood Balance"

Definition: This is an age- and sex-adjusted percentage (prevalence) of the population with a "positive mood balance". This indicator is derived from the CCHS 1.1 survey, using a scale called the Bradburn Affect Balance Scale developed by Norman Bradburn. It is designed to indicate the psychological reactions of people in the general population to events in their daily lives. An indicator of happiness or of general well-being, this scale measures an individual's ability to cope with the stresses of everyday living. This scale is not concerned with detecting psychiatric or psychological disorders. Those with a "negative mood balance" are much rarer, and the numbers are too low to report.

Figure 2.14.1: Prevalence of Positive Mood Balance: CCHS



'1' indicates area's rate for those positive was statistically different from Manitoba average positive
'v' indicates rate unstable due to high variation in responses
's' indicates data suppressed due to small numbers

Figure 2.14.2 Prevalence of "Work Stress"

Definition: This is an age- and sex-adjusted percentage (prevalence) of the population who scored 25 or higher on the Work Stress scale (that is, the percentage of people in each region scoring in the top 10th percentile). Those who were aged 15 through 75, who worked at a job or business at anytime in the past 12 months, were included. This indicator is derived from the CCHS 1.1 survey. It is a scale based on a respondent's answers to 12 items, based on a larger pool of items developed by Karasek, and includes six sub-scales of work-related stress. It reflects a respondent's perceptions of work, including job security, social support, monotony, physical effort required, and extent of participation in decision-making. Scale scores range from zero to 48, with high scores indicating high work stress. A score of 25 represents the 90th percentile, that is, 90% of respondents scored lower than 25.

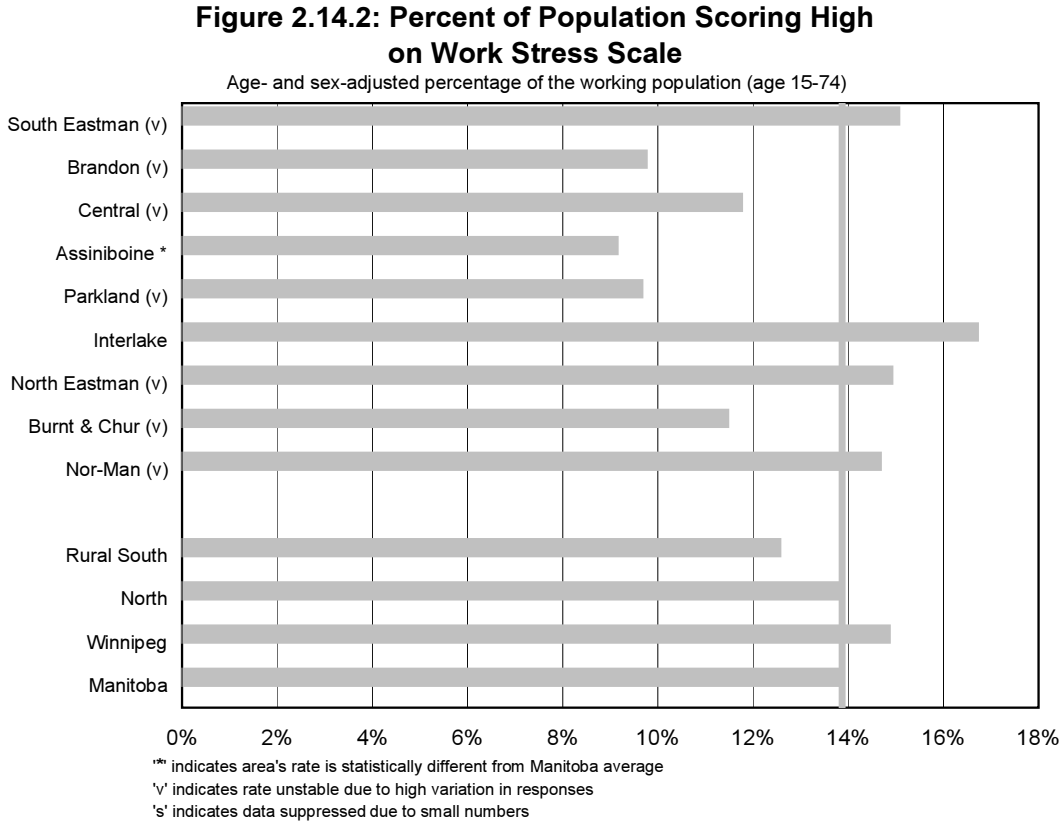
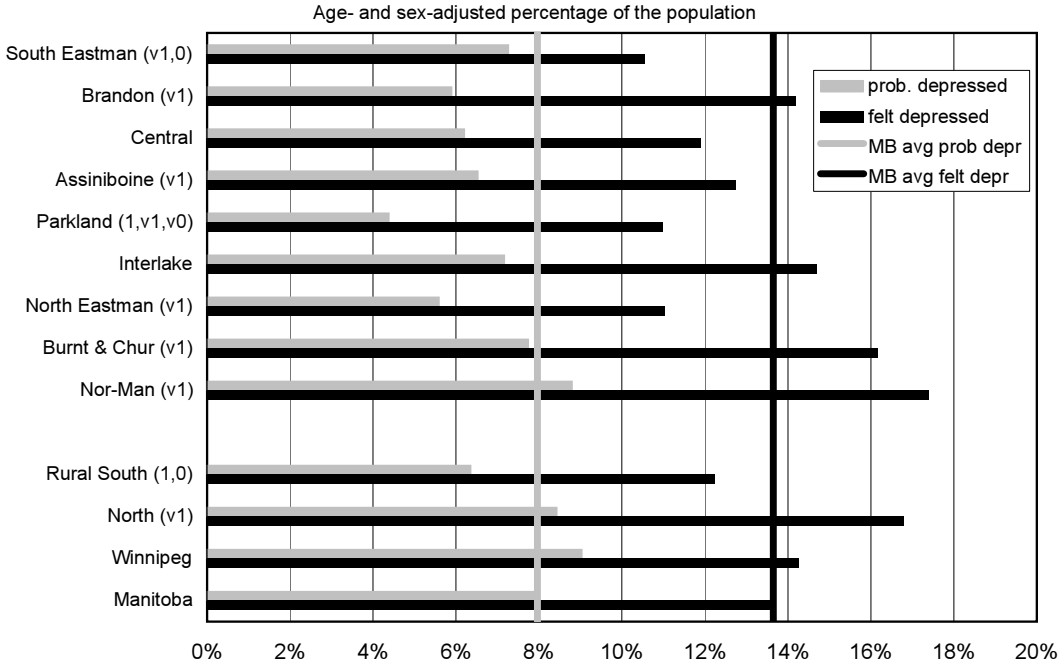


Figure 2.14.3 Prevalence of "Probably Depressed" or "Felt Depressed"
Definition: This is based upon the CCHS 1.1 short form score of Depression, based on the work of Kessler and Mroczek. This is a subset of items from the Composite International Diagnostic Interview (CIDI) that measure a major depressive episode, designed to produce diagnoses according to the definitions of the DSM-III-R and the ICD-10. The short form used in the CCHS 1.1 operationalizes Criteria A through C of the DSM-II-R diagnosis of major depressive episode. This is explained more thoroughly at the following internet site: National Comorbidity Survey at www.hcp.med.harvard.edu/ncs/

These questions asks about periods of sadness, depression, or losing interest in everyday things within the past 12 months, and could include normal periods of sadness (for example, death of a loved one) as well as serious depression. One of the questions asks about whether they experienced a time when they felt sad, blue or depressed for two weeks or more in a row. The *black line* on the graph shows the age- and sex-adjusted percentage of the population responding "yes" to that question. The probability of depression is calculated based upon answers to a series of questions. If a person's score is greater than four, there is a 0.90 (90%) probability of the person having a major depressive episode within the last 12 months. The *grey line* on the graph shows the age- and sex-adjusted percentage of the population having 90% probability of a major depressive episode within the last 12 months.

Figure 2.14.3: Prevalence of 'Probably Depressed' or 'Felt Depressed': CCHS 2000



'1' indicates area's rate for those probably depressed was statistically different from Manitoba average probably depressed
'0' indicates area's rate for those felt depressed was statistically different from Manitoba average felt depressed
'v' indicates rate unstable due to high variation in responses ('v1' for probably depressed; v0 for felt depressed)
's' indicates data suppressed due to small numbers

Key findings:

- The only RHA showing a higher-than-average positive mood balance is Brandon (69.8% compared to the provincial average of 57.1%). This is an indicator of happiness or of general well-being, and measures an individual's ability to cope with the stresses of everyday living. At the aggregate level, there are similar results in Winnipeg (55.8%), Rural South (58.1%), and the North (54.6%).
- The prevalence of Work Stress is similar throughout the province—although there is a trend to the least stress in Rural South, followed by the North, followed by Winnipeg, these are not statistically significantly different. The variation in scores shows very little relationship to the underlying health status of the region. The only RHA showing a significantly smaller percentage of people experiencing high work stress is Assiniboine (9.2%, compared with the provincial average of 13.9%). This is somewhat surprising, given the high degree of stress noted in the farming communities in the past several years, due to severe financial difficulties in agriculture.
- Both the prevalence of those scoring "felt depressed" and "probably depressed" appear to have a strong relationship with the underlying health status of the population—going down the graph, those RHAs with the poorest health status have the highest prevalence of depression, although very few individual RHA results are statistically higher or lower than the provincial average.
- Using aggregate areas, the Rural South shows a consistent effect of lower one-year self-reported depression (6.4% probably depressed, 12.2% felt depressed within the past 12 months), whereas other areas are similar to the provincial average of 8.0% "probably depressed" and 13.6% "feeling depressed" within the past 12 months. In Section 2.5 of Chapter 2, the treatment prevalence of depression as measured through administrative claims data is lower in the Rural South, and higher in Winnipeg and Brandon, when compared to the provincial average. This is similar to the CCHS findings. However, the treatment prevalence of depression is lower in the North, contrary to the CCHS where the North is similar to the provincial average (with a trend to being higher, though not statistically significant). This may indicate that either the claims data in the North are missing (salaried physicians who may not put in every claim, or a greater use of nurse practitioners who do not submit claims), or other mental illness diagnoses may be preferentially used by northern physicians. The North's treatment prevalence for substance abuse is much higher than the provincial average, and this may be an alternative diagnosis that could result in self-reported feelings of depression.

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CHAPTER 3: THE MENTAL HEALTH MANAGEMENT INFORMATION SYSTEM (MHMIS)

3.1 What's in This Chapter?

MHMIS contains comprehensive case management information for all Manitoba residents who receive clinical, social, or rehabilitation services from the Mental Health division of Manitoba Health.

Because of uncertainties in the way in which much of the information is collected in different settings, no statistical testing is done for the graphs in this chapter. All findings must be viewed with caution due to the limitations of the MHMIS data source.

Indicators that are presented in this chapter include:

- A description of the Mental Health Management Information System (Section 3.2)
- An overview of Client, Case and Encounter information in MHMIS data: completeness and descriptions (Section 3.3)
- MHMIS client age and mental illness profiles (Section 3.4)
- Population-based prevalence of individuals having MHMIS contact (Section 3.5)
- Rate of MHMIS cases (Section 3.6)
- Median length of MHMIS case (Section 3.7)
- Proportion of the population in MHMIS prior to, during, and after a mental health hospitalization (Section 3.8)

The Mental Health Management Information System (MHMIS) contains comprehensive case management information for all Manitoba residents who receive clinical, social, or rehabilitation services from the Mental Health and Addictions Policy, Program and Agency Relations Unit of the Mental Health and Addictions Branch, Health Living Division of Manitoba Health (see Section 3.2 for a detailed description of MHMIS). The purpose of this chapter is to explore validity issues of MHMIS, and to explore its use in providing RHA-specific information. Because of uncertainties in the way in which much of the information is collected in different settings, no statistical testing is done for the graphs in this chapter (since differences may be due to the extent that data were collected, and not representative of the actual population's service use in an RHA). So although we do present "findings", these must all be viewed with caution due to the limitations of MHMIS, the source of the data.

Overall Chapter Key Findings:

The MHMIS system itself

- There are many fields in the MHMIS system with substantial amounts of uncollected data, and RHAs may be using different definitions for fields. Winnipeg MHMIS data are extremely limited, and are not considered valid for use in this report.
- In order to do comparative population-based analyses of mental health services in Manitoba, standardized baseline data collection fields, using the same definitions, must be maintained in every RHA.

Clients are individuals, but Client data is unique only within facilities/regions, so it is possible for an individual to have different Client files in different regions or facilities. Case data is associated with a specific client, and documents the client's activity within the case, as well as any legal or clinical status changes. An Encounter is any contact with a mental health care provider.

Who is a client of MHMIS?

(NOTE: all information is solely based on the data input by RHA, which could vary according to the way in which information is inputted within each region. Therefore, these are simply descriptions of the information existing within MHMIS, for purposes of regions being able to discuss the validity of the database.)

- Females are more likely than males to be clients of MHMIS. Because Winnipeg is least likely to use MHMIS, percentages are underestimated for Winnipeg (0.6% of males, 0.7% of females). The percentages are much higher for the Rural South (2.0% of males, 3.2% of females), Brandon (3.7% of males, 4.7% of females), and the North (2.2% of males, 3.7% of females).
- There is a slightly higher percentage of young people ages 10 through 19 years old that are clients of MHMIS (between 3-4% for males, and 5% for females), and then the percentage is relatively stable (between 2-3% for males, 3-4% for females) until around age 75, where there is a substantial rise in contact (between 5-11% for males, 5-7% for females).
- Using the definitions for mental illness in this report, clients of MHMIS are highly likely to have serious mental illnesses. Clients of MHMIS are 3.5 times more likely to be in the "cumulative mental disorders" group compared to the overall Manitoba population (85% of MHMIS versus 24% of the Manitoba population), and over ten times as likely to have such serious conditions as personality disorders (10% versus 0.9%) and schizophrenia (17% versus 1.2%).
- The majority of MHMIS cases are community cases (which include outpatient cases), with the rate being 1.5 times higher for females compared to males (19.4 versus 13.6 per thousand per year). In contrast, inpatient case rates are lower, and similar between females and males (females 1.5, males 1.7 per thousand per year). RHAs with particularly high inpatient case rates are Interlake and Churchill, and those with high community case rates are Brandon (especially for males), Central, Assiniboine, Parkland and Nor-Man.
- The two non-Winnipeg mental health facilities vary substantially in the percentage of inpatient (including partial hospitalization) versus outpatient cases: 79% inpatient cases in Selkirk, and 17% in Eden.
- Of those people admitted to hospital in 1999/2000 with the most responsible diagnosis being a mental illness, most were clients of MHMIS previous to this admission (50% in Rural South, 67% in Brandon, 61% in the North), with the vast majority (80-90%) being community or outpatient clients rather than inpatient clients.
- There is a strong neighbourhood income-related gradient in the prevalence of MHMIS clients in urban areas (increasing likelihood with decreasing neighbourhood income), but very little gradient in the rural areas.

3.2 A Description of the Mental Health Management Information System (MHMIS)

The Mental Health Management Information System (MHMIS) contains comprehensive case management information for all Manitoba residents who receive clinical, social, or rehabilitation services from the Mental Health and Addictions Policy, Program and Agency Relations Unit of the Mental Health and Addictions Branch, Health Living Division of Manitoba Health. These services may be provided to inpatients or outpatients at provincial mental health institutions, or they may be provided through regional community mental health centres. The accuracy of MHMIS data has been established in previous research (Robinson and Tataryn, 1997), but not on a population level. For the purposes of this report, we are examining MHMIS data to determine the nature and usefulness of available data, as well as examine population-based rates of mental health service use. We examined five years of data (1997/98-2001/02), using a cohort of Manitobans age 10 and up with at least one year of coverage.

In certain instances, MHMIS data may not be complete. Winnipeg child and adolescent mental health services are not entered into MHMIS. Selkirk and Winnipeg have their own information systems for mental health data; although they also enter data into MHMIS, the reliability of this double entry is not known. Winnipeg in particular appears to have a very low reporting rate; only the Adult Community Mental Health Program of the WRHA uses MHMIS. Acute care facilities (including outpatient services), child and adolescent services including Manitoba Adolescent Treatment Centre (MATC), Addictions Foundation of Manitoba (AFM), psychogeriatric program data, and grant funded community agencies do not report into MHMIS (personal communication with Christine Ogaranko, Manitoba Health). Services in acute care hospitals and those provided through physician billings are also not included. The Health Sciences Centre (HSC), MATC, and St. Boniface General Hospital do not report to MHMIS, although HSC temporarily recorded to MHMIS during a pilot study that was not subsequently implemented. Similarly, the Brandon Mental Health Centre (BMHC) closed in 1998 and stopped recording to MHMIS.

Description and definitions of client, case and encounter

There are three levels of MHMIS data: *Client* data, *Case* data, and *Encounter* data. See Section 3.3 for a complete description of Client, Case and Encounter data, including an overview plus the completeness of the MHMIS database for each of these areas. *Clients* are individuals, but Client data is unique only within facilities/regions, so it is possible for an individual to have different Client files in different regions or facilities. For the purposes of our report, we also created an *Individual* variable, similar to the Client

variable in MHMIS, but irrespective of region. Unless otherwise noted, individual data is used in this report instead of Client data. For purposes of the linkage of MHMIS with the Population Health Research Data Repository housed within the Manitoba Centre for Health Policy, all identifying information such as names, street addresses and a person's personal health information number was removed prior to receipt by MCHP, and an encrypted number allowed linkage with other files in the Repository. *Case* data is associated with a specific client, and *documents the client's activity within the case*, as well as any legal or clinical status changes. A client may have many cases within a given region or facility. An *Encounter* is any contact with a mental health care provider. Encounter data includes information on the region or facility in which the encounter occurred, as well as information on the provider, the case in which the encounter was provided, and the type of encounter.

Facilities Providing Services

Outside of Winnipeg, there are three mental health centres in Manitoba—Eden (in Winkler within Central RHA), Selkirk (in Selkirk within Interlake RHA), and Brandon (in Brandon within Brandon RHA). When looking at Brandon data in this chapter, it should be kept in mind that it will be affected by the fact that this mental health centre closed in 1998, the second year of the five-year window of time for the analyses of this chapter.

Eden Mental Health Centre (**EMHC**) is a provincially funded 40-bed facility run by representatives from Manitoba Mennonite churches. It provides community mental health services, psychiatric assessment and treatment, inpatient treatment, residential housing, vocational and consultation services. It is located in Winkler, Manitoba, within Central RHA.

Selkirk Mental Health Centre (**SMHC**) is a provincially-funded psychiatric hospital which functions as an operating unit of Manitoba Health, providing mental health services to residents of the Interlake, North Eastman, South Eastman, Burntwood, Nor-Man and Churchill RHAs. As a provincially run facility SMHC provides treatment and rehabilitation services on a medium to long term basis to individuals with the most challenging needs. This includes psychogeriatric, forensic, and psychosocial rehabilitation. SMHC also has an acute unit equivalent to a psychiatric unit in a general hospital that provides short term treatment to individuals experiencing an acute episode of mental illness. The acute unit accommodates individuals from regions that do not have an acute psychiatric unit such as Churchill, North Eastman, South Eastman, and Nunavut through a contractual arrangement. It has 261 inpatient beds, as well as eight community residence beds. It is located in Selkirk, Manitoba, within Interlake RHA.

Brandon Mental Health Centre (**BMHC**) was a provincially-funded psychiatric hospital located in Brandon RHA. Procedures to close the facility were initiated in 1994, when community-based staff began to be recruited. The number of patients in the hospital declined each subsequent year until it closed in 1998. When looking at Brandon data in this chapter, it should be kept in mind that it will be affected by the fact that BMHC closed in the second year of our time period.

Winnipeg Facilities: These are excluded from the analyses, since the only facility to enter data (Health Sciences Centre) only temporarily recorded to MHMIS during a pilot study that was not subsequently implemented.

Community Services Funded and Supported by RHAs

There are numerous offices from which community mental health services are provided. Community mental health services are managed and operated by the Regional Health Authorities, some of these services are provided by grant funded agencies. Services provided are varied, and can include behaviour therapy, child/adolescent services, addictions services, employment development, geriatric programs, eating disorder services, as well as other services. Table 3.2.1 provides a breakdown of these by RHA. It is not known how many of these are regularly reporting into MHMIS.

Table 3.2.1: Number of sub-offices recording data based on sub-office codes in MHMIS, by RHA, 1997/98-2001/02

RHA	Number of Sub-Offices
Central	10
North Eastman	8
South Eastman	5
Interlake	13
Nor-Man	5
Parkland	4
Burntwood	4
Churchill	2
Brandon	3
Assiniboine	1
Winnipeg	18

3.3 An Overview of Client, Case and Encounter Information in MHMIS Data: Completeness and Descriptions

There are three levels of MHMIS data: *Client* data, *Case* data, and *Encounter* data. This section provides information on the completeness of MHMIS data, as well as a snapshot of the data from the facility/region perspective, allowing an overview of the client, case and encounter information in each facility/region. The following information is based on information in MHMIS over the full five-year period only for those individuals covered for at least one year and aged 10 and over. Demographic and other personal information for clients for 1997/98 to 2001/02 is taken from the most recent records for the client found in the MHMIS data, including all legal and status changes. Pending cases[1] are not included; if all cases are pending for a client then the client is not included. Winnipeg facility data are not included. *Because the completeness of MHMIS data is suspected to be variable between different RHAs, statistical testing has not been done to compare different areas.*

Client information

Clients are individuals, but Client data is unique only within facilities/regions, so it is possible for an individual to have different Client files in different regions or facilities (see Section 3.2 for further explanation). The client data available in MHMIS include general demographic variables such as date of birth, sex, and postal code, as well as information about legal status (whether the client is voluntary or involuntary), marital status, referral source, and living arrangements. Other available variables include education and employment status, religion, place of birth, First Nations status, occupation, financial status, party responsible for the client, next of kin, referral information, and external agency involvement, but these are not mandatory fields and may not be complete. Table 3.3.1 shows the degree of completeness of selected data fields in MHMIS, including Client information. Brief descriptions are given for each of these fields for those records which were complete.

[1] A case would be in pending status if a case is opened without all of the required information, therefore changes cannot be made to the case until the required information is completed (required elements could include such things as case manager, or diagnosis made by a physician).

Table 3.3.1: Completeness of client and case data fields in the MHMIS

Field in MHMIS	Degree of completeness in MHMIS	Description
Client information (n=38,570)		
Marital Status (Required)	100%	Married: 28% Never Married: 39% Unknown: 10% See Appendix 4 for more details.
Occupation (Optional)	23%	(n=8,853) Unskilled labour force: 24% Technical/sales/clerical: 15% Homemaker: 13% Professional: 10%
Education (Optional)** Education ranges from none to grade 13.	36%	(n=14,034) At least grade 12: 40% At least grade 9 and higher: 76% See Appendix 4 for more details.
Employment (Optional)	36%	(n=13,888) nine categories possible unemployed: 35% full-time employed: 22% retired: 12% students: 12%
Case information (n=48,438)		
Legal Status (Required)	100%	Voluntary status: 97% Involuntary status: 3% (follows the forms used in the Mental Health Act Regulation, Government of Manitoba, 1999)
Financial Affairs (Optional) records the individual or agency who is legally responsible for handling the client's financial affairs.	100% (but defaults to Not Applicable N/A)	N/A: 67% Responsible for themselves: 24% Financial affairs handled by parents: 4%
Referral From (Optional)	76%	Private: 32% Health provider: 30% Health facility: 22% Other health and family programs: 6% (see Appendix 4 for detailed table)
Referral To (Optional or Required) This field is required when an individual is transferred or referred to another facility, provider, or program, or transferred within-facility, denoted by specific codes in the close type field. See Case Closed below for more detail.	It was considered a required field for 1672 cases.	All which were coded: To a facility: 62% To a health provider: 19% To some other health and family program: 13%

Table 3.3.1: Completeness of client and case data fields in the MHMIS

Field in MHMIS	Degree of completeness in MHMIS	Description
Primary Diagnosis Code (DSM or ICD – Required) There are fields for both ICD-9-CM codes and DSM-IV codes. Only one is required to be filled in; for example, if the DSM field is filled in, the ICD field will be filled in subsequently by converting the DSM code to the appropriate ICD code.	99% had an ICD-9-CM diagnosis code.	Schizophrenic disorders (295): 37% Neurotic disorders (300): 31% Other ill-defined and unknown causes of morbidity/mortality (799)*: 12% See Appendix 4 for more details.
Living Arrangements (Optional for our study time period; required as of Oct 1, 2003)	100%	N/A: 61% Immediate family: 17% Independent: 14%
Programs (Required) Each case can have up to five programs coded.	99% at least one program coded; 9% of these have more than one program coded.	N=54,749 programs coded Community Mental Health Workers: 46% Child/Adolescent: 13% Psychogeriatrics: 9% No program specified: 9% See Appendix 4 for more details.
Primary Therapist (may be the same as the case manager if the field is blank).	80%	Registered Psychiatric Nurse: 46% Social worker: 23% Community mental health worker: 15% See Appendix 4 for more details.
Therapies (Required)*** Coded as (a) assessment; (b) treatment; and (c) rehabilitation. More specific client-focused therapeutic activities are coded within each of these, but not reported here.	99.9% had at least one therapy coded; 67% had two or more therapies coded	n=119,453 total codes for all cases Treatment: 46% Assessment: 41% See Appendix 4 for more details.
Case Closed (Required when case closes)		N= 38205 cases closed Discharges: 81% Client Refusing Services: 9% Transfer within facility: 3% Died: 2% 1.6% closed January 19, 2001 due to the change from DSM III to DMS IV and had no corresponding open case on January 20, 2001 in our data. These were likely old cases that had not been closed prior to the change.

*It should be noted that this last code is quite common when cases are first opened but often changes with a status change record within a short time of the open date.
**Compared with 2001 Canada Census data, which has 89% of individuals age 20 and over either attending or completed grade 9, MHMIS data indicates that 81% age 20 and up have or are in grade 8-13.
***Assessment: Activities related to establishing case status and/or doing assessment for the purpose of developing treatment/care plan. Treatment: Interventions aimed at ameliorating or minimizing manifestations of disorder (the focus is change oriented). Rehabilitation: Interventions aimed at improving skills and increasing supports to enhance person's capacity to function (focus is change oriented). Care and support: Interventions to relieve symptoms or effects of disorder and mobilize supports (focus is maintenance). Discharge: Activities related to discharge planning and post discharge monitoring. Management of case: Activities related to accessing and coordinating necessary services for individual.

Table 3.3.2 compares each RHA's number of individuals in MHMIS with the client services provided in the region. There were 38,570 clients in the MHMIS data, but only 33,591 individuals (in other words, some "clients" could have been clients in two or more RHAs, thus were counted more than once). Of the total clients, 41% (*n*=15,769) are males and 59% (*n*=22,801) are females. Twenty percent (*n*=7,815) of the clients are associated with institutions such as HSC, SMHC, BMHC, and EMHC. The remaining 80% (*n*=30,755) are community-based. It should be kept in mind, however, that there might be some double counting of individuals between different regions and facilities.

Table 3.3.2: Individuals by region of residence, and clients/cases/encounters by region of service by RHA and by facility

RHAs	By Region of Residence	By Region of Service						
	Individuals	Clients			Cases**			Encounters
	(difference of individuals and clients)*	Community clients	Facility clients	Total clients*	New cases	Closed cases	Open cases	
Central	4,838 (-1,124)	2,659	3,303	5,962	2,892	3,026	3,464	55,394
North Eastman	1,509 (124)	1,385		1,385	1,309	1,192	1,572	6,502
South Eastman	1,962 (111)	1,851		1,851	1,760	1,811	2,168	12,428
Interlake	3,008 (-1,471)	2,814	1,665	4,479	2,880	2,891	3,574	20,158
Nor-Man	2,103 (-186)	2,289		2,289	2,899	2,885	3,191	18,499
Parkland	2,977 (-239)	3,216		3,216	3,137	3,086	3,954	19,334
Burntwood	2,346 (57)	2,289		2,289	2,811	2,711	3,116	5,600
Churchill	55 (19)	36		36	35		35	35
Brandon	3,539 (-2,180)	4,733	986	5,719	4,622	4,195	5,640	82,419
Assiniboine	4,759 (-35)	4,794		4,794	4,528	4,210	5,526	43,106
Winnipeg	6,495 (-55)	4,689	1,861	6,550	3,297	3,144	5,345	7,666
Total	**33,591 (-4,979)**	**30,755**	**7,815**	**38,570**	**30,170**	**29,151**	**37,585**	**330,491**

Facilities	Description of the open cases			Cases: new, closed, open**			Encounters
	Inpatient and partial hospitalization	Out-patient	Total Open cases	New cases	Closed cases	Open cases	
Selkirk	1,710	457	2,167	1,619	1,835	2,167	9,128
Brandon	1,004	225	1,229	908	1,075	1,229	9,534
Eden	826	3,950	4,776	3,612	3,466	4,776	38,007

* Clients are individuals, but Client data is unique only within facilities/regions, so it is possible for an individual to have different Client files in different regions or facilities. The "individuals" were based upon the Population Health Research Data Repository.

** To be consistent with the terminology which MCHP uses for such other situations as home care, we use "new" cases instead of the MHMIS reference to "opened" cases, in order to distinguish these from the MCHP term, "open cases", which are what MHMIS would refer to as "total cases". "New" is an incidence (i.e. coming in to the system); "open" is a prevalence (i.e. in the system).

Case information

Case data is associated with a specific client, and *documents the client's activity within the case*, as well as any legal or clinical status changes. A client may have many cases within a given region or facility. Theoretically, clients may have only one case open at any given time, but cases for the same client often overlap. *The definition for a case varies by RHA; it depends on the services available in the region, case-mix composition, and the scope of the RHA's definition of case.* A case can be one of three types: inpatient, partial hospitalization, outpatient, or community mental health. Outpatient and community mental health cases can be single contact, consult, active (short-term involvement with frequent therapist input), maintenance (long-term involvement with little therapist input), assessment (brief therapeutic intervention with minimal therapist input), follow-up, emergency, pending (where the status of the case is undetermined—excluded from our analyses), community nursing, or respite (temporary relief).

There are diagnosis fields for both DSM diagnoses and ICD-9-CM diagnoses in case data. For DSM diagnoses, there are fields for five axes[2] of disorders. DSM-III-R was used until January 19, 2001; from January 20, 2001 onward, DSM-IV is used. For ICD diagnoses, there are fields for primary diagnosis and secondary diagnosis, as well as several medical diagnosis fields for physical conditions potentially relevant to the understanding or management of the case. Cases that were still open January 19, 2001 were closed at midnight and re-opened January 20, 2001 with a new case number. These cases were counted as a single episode in this study. There were a small number of closed cases that did not appear to have a corresponding open case on January 20, 2001.

The case manager (staff member responsible for the case), primary therapist, and secondary therapists (if any) are also noted. Up to five therapy codes are also entered, providing details of the treatment given to the client. Therapy codes combine information about general areas identifying the focus of client service (such as assessment, treatment, and rehabilitation) and specific therapeutic activities (such as psychosocial assessment, medical psychotherapy, behavioural therapy, resource counselling, and life skills training). There is also room for up to five program codes, meant to reflect any community-based programs the client is involved in. At least one program code is necessary for the case to be opened on MHMIS. Program codes include crisis intervention programs, addictions programs, employment services, supported housing programs, and forensic adult programs. Table 3.3.1 includes information on various fields within Case information, and the completeness of these fields.

There were 48,438 MHMIS cases in Manitoba during 1997/98 to 2001/02. During this period there were 38,904 new cases (that is, they were opened

[2] The five "axes" for DSM are as follows: Axis 1 is clinical disorders and other conditions that may be a focus of clinical attention; Axis 2 is personality disorders, mental retardation; Axis 3 is general medical conditions; Axis 4 is psychosocial and environmental problems; Axis 5 is a global assessment of functioning.

during that time), and 38,206 cases closed (see Table 3.3.2). Pending cases are not included in the open or closed case counts. Community of residence was determined by Sub Office code rather than place of residence. The average number of cases per client in Manitoba was 1.3, with a range from 0.97 in Churchill to 1.45 in Eden. The gender distribution was similar to that found for the clients: 41% (19,667) were male and 59% (28,771) were female. There was a wide range in the male/female ratio among facilities/regions, from a low of 0.56 (Central) to a high of 1.16 (SMHC). In the community there are more female cases, while in SMHC and BMHC there are more male cases. The vast majority of cases were treated in the community (77% or 37,680). Another 12% (6,268) of cases were inpatients and 10% (4,623) were outpatients. Inpatients, partial hospitalization, and outpatients are only associated with the psychiatric facilities (see Table 3.3.2).

Legal and Clinical Status Changes

Clinical. Seventy percent of cases had no associated clinical status change over the period, 18% had one change, and the remaining had two or more changes. The number of status changes is quite variable over facilities/regions. For example, 63% of Brandon's records had at least one status change and up to 13 changes. Interlake had the fewest records with status changes, with over 99% having no changes. In contrast, 70% of Selkirk Mental Health Facility's cases had at least one status change. Eden Mental Health Centre had 48% of its cases with at least one status change.

Legal. Very few MHMIS cases had associated legal status changes, with 99.6% of all records having no changes at all.

Encounter information

An *Encounter* is any contact with a mental health care provider. Encounter data includes information on the region or facility in which the encounter occurred, as well as information on the provider, the case in which the encounter was provided, and the type of encounter. Encounter types include scheduled and unscheduled face-to-face, scheduled and unscheduled phone call, within-facility consult, and no show. Up to three therapy codes are also listed, and are the same possible codes as the therapy codes for case data.

Legal and clinical status changes, in addition to any other corrections or changes to client, case, or encounter information, is required to be updated by the 15th of the month following the new information. There appears to be differences in how much data is completed and updated between regions and facilities.

There were 330,491 total encounters recorded for cases between 1997/98 and 2001/02. See Table 3.3.2 for Encounter information by RHA, and

Table 3.3.2 for facility information. The range among regions and facilities went from 35 in Churchill to 82,419 in Brandon. Brandon's 82,419 encounters represent 25% of all encounters recorded in MHMIS for our time period. Central 55,394 (13% of encounters), Assiniboine 43,106 (13%), and Eden 38,007 (12%) also had high numbers of encounters. There was an average of seven encounters per case in the time period, with a range of one to 16. Central and Brandon had the highest number of encounters recorded for each case, at 16 and 15 respectively; Assiniboine and Eden each had an average of eight encounters per case. Overall there were an average of nine encounters per client recorded, ranging from one to 20. *It should be kept in mind that, like cases, the definition of encounters varies substantially among RHAs.*

3.4 MHMIS Clients: Age and Mental Illness Profiles

The following information was derived from an anonymized linkage of the MHMIS with the Population Health Research Data Repository, and is based upon the individuals (rather than the client records, which may contain duplicate client files for a single individual).

Mental illness disorders of MHMIS clients

The cohort of people aged 10 or older, living in Manitoba at least one year during the five-year period 1997/98-2001/02, was grouped by various mental illness conditions. This is extensively described in Chapter 2. There is a group called "cumulative disorders", referring to those persons who have a diagnosis of one or more of the following conditions: depression, anxiety disorder, substance abuse, personality disorder, and schizophrenia. Some persons may have only one of these diagnoses, but others may have comorbid conditions. Another group called "other disorders" contains all those who have any mental illness diagnosis within the five-year period, but not part of the cumulative disorders group. Table 3.4.1 provides an indication of the prevalence for cumulative disorders, other disorders, and each of six selected disorders—both within the entire cohort, and within those persons appearing as clients of MHMIS between 1997/98 and 2001/02. Note that 83.5% of those in MHMIS would be considered in the "cumulative disorders" group, and a further 9.7% in the "other disorders" group. The remaining 6.7% have disorders not listed as a mental illness ICD-9-CM coding, such as "undefined condition" which is a 799 code.

Table 3.4.1: Prevalence of mental illness disorders for those aged 10+ in the population compared with MHMIS individuals

Mental Illness Disorder	Five-year Prevalence in entire population (% of cohort)	Five-year Prevalence in MHMIS (% of individuals)	Ratio: MHMIS to population prevalence
Cumulative disorders group	24%	83.5%	3.5
Other mental illness disorders group	13%	9.7%	0.75
Separate disorders:			
Depression	18%	71%	3.9
Anxiety	7%	28%	4.0
Substance Abuse**	6%	20%	3.3
Personality Disorders	0.9%	10%	11.1
Schizophrenia	1.2%	17%	14.0
Dementia	3%	12%	4.0
Comorbidity with any other mental illness	11%	37%	3.4

*cumulative disorders consist of depression, anxiety, substance abuse, personality disorders, and schizophrenia. See Chapter 2 for description of "cumulative" plus each disorder. Comorbidity of all mental illness disorders is discussed in Section 2.11.

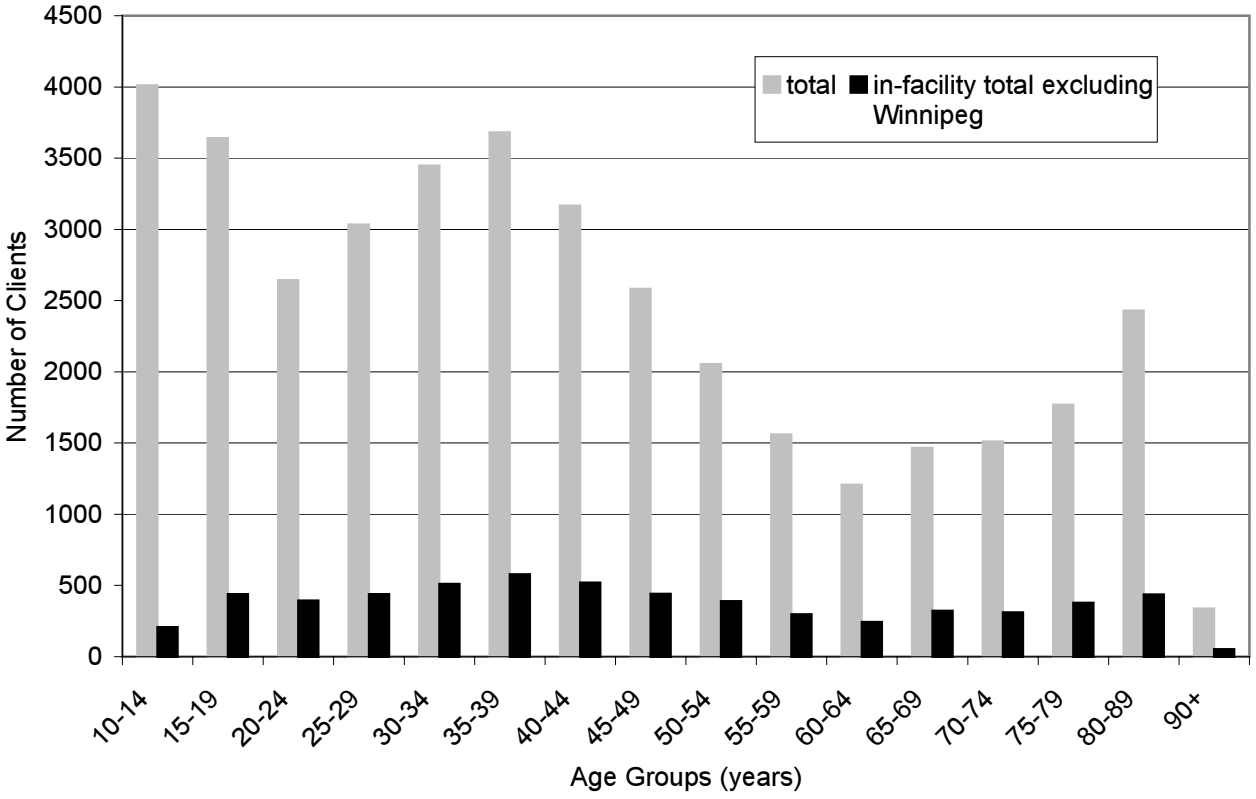
**Note: individuals diagnosed with only substance abuse (no comorbid mental illness conditions) may not show up in MHMIS, as they are sent to Addictions Foundation of Manitoba instead. Therefore, the prevalence of substance abuse in MHMIS may be underestimated (in the population, about half of those diagnosed with substance abuse had no other mental illness condition – see Section 2.11 in Chapter 2).

Age distribution of clients

Young people less than 20 years old are the most frequent clients in the MHMIS, with another peak occurring in the mid- to late- 30s (see Figure 3.3.1). This does not hold true for in-facility clients, where there is still a peak in the mid- 30s but youth ages 10 through 19 do not show the same peak. It is important to note that Winnipeg does not record MHMIS information for children and adolescents that are recipients of care by Child and Family Services. A table showing the age distribution by specific RHA and facility is given in Appendix 4.

Figure 3.4.1: Age Distribution of Clients in MHMIS: Total and In-Facility Only, 1997/98-2001/02

Number of clients by five-year age categories



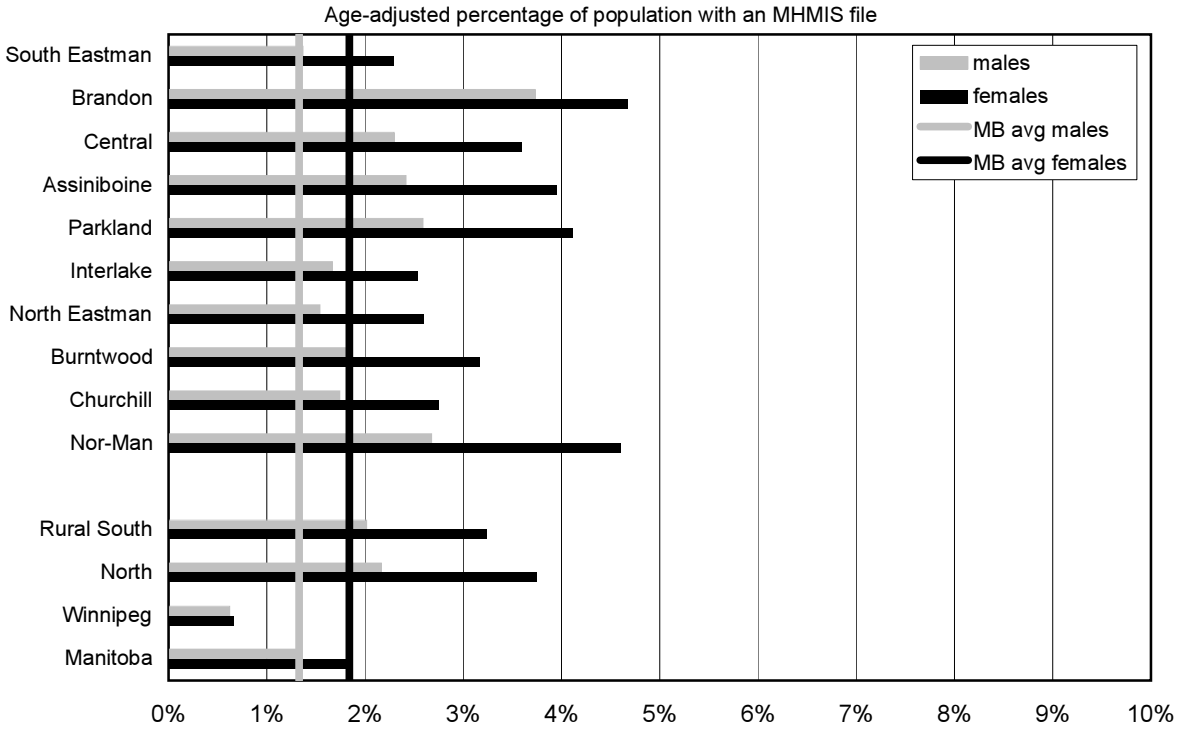
Population-based rates of MHMIS utilization

Sections 3.5 through 3.8 are based on the Manitoba Population and all rates represent population-based rates/prevalence. These are based on an annual average based on five years of data from 1997/98-2001/02. The population is comprised of all Manitobans age 10+ with at least one year of coverage from 1997/98 to 2001/02. The age and location of residence are all set at December 1999 (the middle year). It should be noted that many long term mental health centre residents likely become residents of the area in which the centre is located. All rates presented are directly standardized to the 2001 population.

3.5 Population-Based Prevalence of Individuals Having Contact with MHMIS

Definition: This is the age-adjusted average annual percentage of the population with an MHMIS file. This is given by RHA, district, age, sex, and income quintile groups. Note that due to the uncertainty of the MHMIS database, no statistical testing has been done for these percentages. It should also be noted that there may be a migration effect in regions where there is a long-term mental health care facility.

Figure 3.5.1: Prevalence of Individuals in MHMIS by RHA 1997/98-2001/02



's' indicates data suppressed due to small numbers

**because of concerns about missing data, statistical testing was not performed

Figure 3.5.2: Prevalence of Individuals in MHMIS by District 1997/98-2001/02

Age-adjusted percentage of population with an MHMIS file

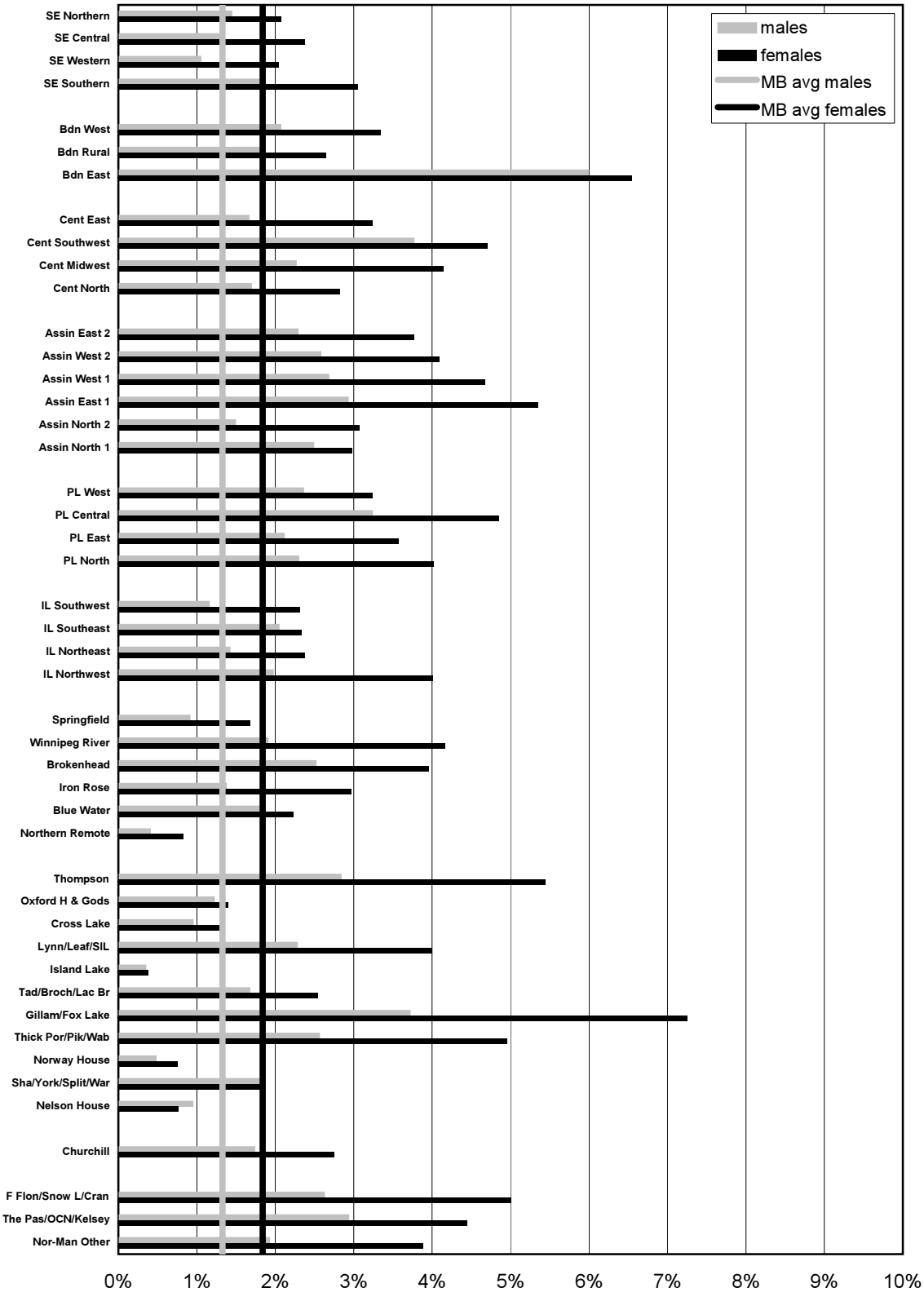


Figure 3.5.3: Prevalence of Individuals in MHMIS by Age and Sex, 1997/98-2001/02

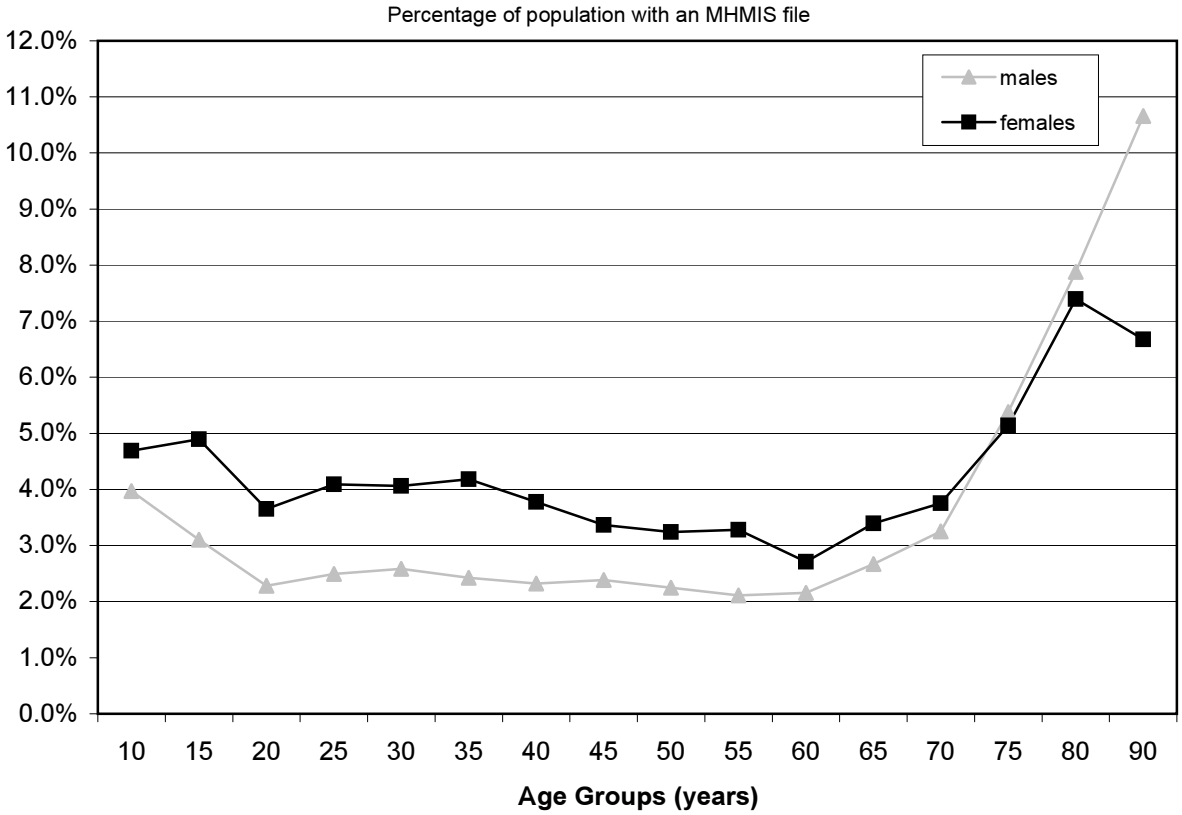
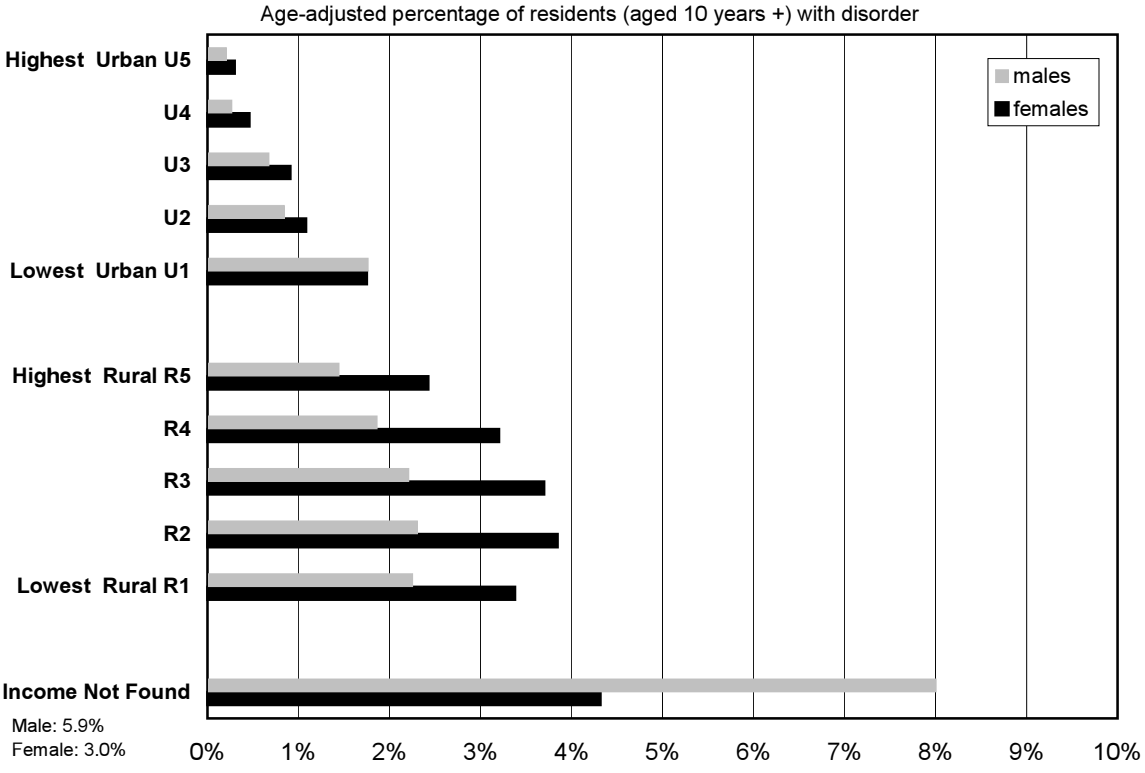


Figure 3.5.4: Prevalence of Individuals in MHMIS by Income Quintile, 1997/98-2001/02



**because of concerns about missing data, statistical testing was not performed

Key findings:

NOTE: *All information is solely based on the data input by RHA, which could vary according to the way in which information is inputted within each region. Therefore, these are simply descriptions of the information existing within MHMIS, for purposes of regions being able to discuss the validity of the database.*

- During any given year, 1.5% of the Manitoba population had some contact with the MHMIS system. Over a five-year period the overall percentage rises to 3.3%. In our report, the percentage of the population with any mental illness diagnosis in a five-year period was 37% (called "any disorder"), and in the one-year period 1999/2000 was 15%). It is also lower than Mustard's (1994) finding that 11% of the population age 18+ had a mental illness diagnosis for a 12-month period in 1991/92. So relatively few people in the "any mental illness disorders" group are clients of MHMIS.
- During any given year, 1.3% of males, 1.8% of females had some contact with the MHMIS system. However, this could be skewed by the lack of MHMIS data in Winnipeg RHA. The percentages are much higher for the Rural South (2.0% of males, 3.2% of females), Brandon (3.7% of males, 4.7% of females), and the North (2.2% of males, 3.7% of females).
- For all regions, the percentage of individuals contacting MHMIS is higher for females than males (1.8% females, 1.3% males, but this includes Winnipeg which is very low). These vary substantially between non-Winnipeg regions, ranging from 3.2% (males) and 5.5% (females) in South Eastman to 7.0% (males) and 11.8% (females) in Nor-Man. Brandon East and Gilliam/Fox districts appear to have high population prevalence of contact with MHMIS, although this may be an artifact of the way in which MHMIS data is inputted by various mental health providers in Manitoba.
- There is a slightly higher percentage of young people ages 10 through 19 years old that have contacts (between 3-4% for males, and 5% for females), and then the percentage is relatively stable (between 2-3% for males, 3-4% for females) until around age 70, where there is a substantial rise in contact.
- There is a strong neighbourhood income-related gradient in the prevalence people in contact with MHMIS in urban areas, but very little gradient in the rural areas.

3.6 Rate of MHMIS Cases

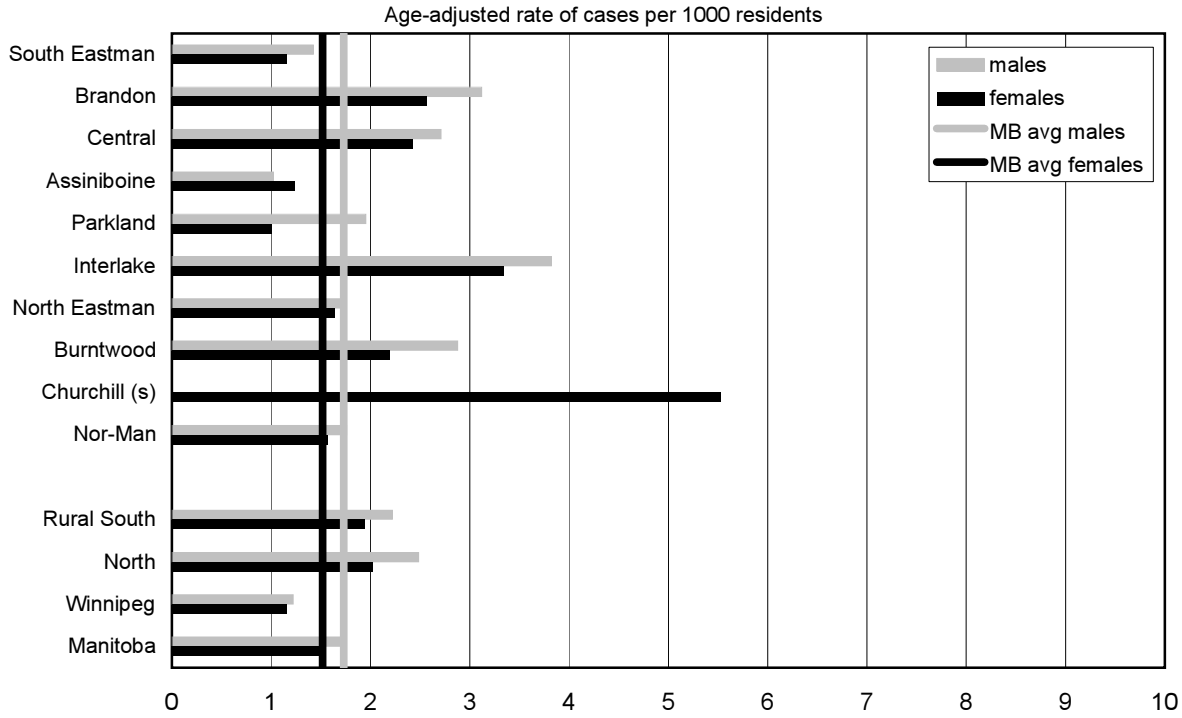
Definition: This is the age-adjusted rate of all MHMIS cases (that is, all existing cases—new and open) per 1,000 population per year in the 1997/98-2001/02 time period. The numerator is the number of cases in MHMIS in the region, and the denominator is the population aged 10 or more who were residents of Manitoba for at least one year during the five-year period.

We examined cases by *community* (which includes both outpatient and community-based cases) and *inpatient*. Outpatient and community-based cases were combined because of the small number of outpatient cases. They were combined with community-based cases because they appeared to be characteristically more similar to those than to inpatient cases. They are also considered similar to community-based cases by the facilities themselves (Ekhard Goerz, personal communication, 2004). Eden acts as a community centre for its outpatients. The overall number of cases by RHA is not reported, but can be calculated as the combined total of inpatient and community.

It should be kept in mind that the definition of cases varies among RHAs. For this reason, rates are not comparable across RHAs and statistical testing has not been conducted.

Partial outpatient records have not been provided because of very low numbers. *District level inpatient data have not been completed for cases (including case days).* With only two inpatient facilities (SMHC, EMHC) reporting into MHMIS, many district numbers are suppressed. Many inpatient clients may move residence to be closer to these facilities for ongoing long term care, which would result in higher rates in the RHAs where these facilities are located. The region of residence is assigned as of 1999.

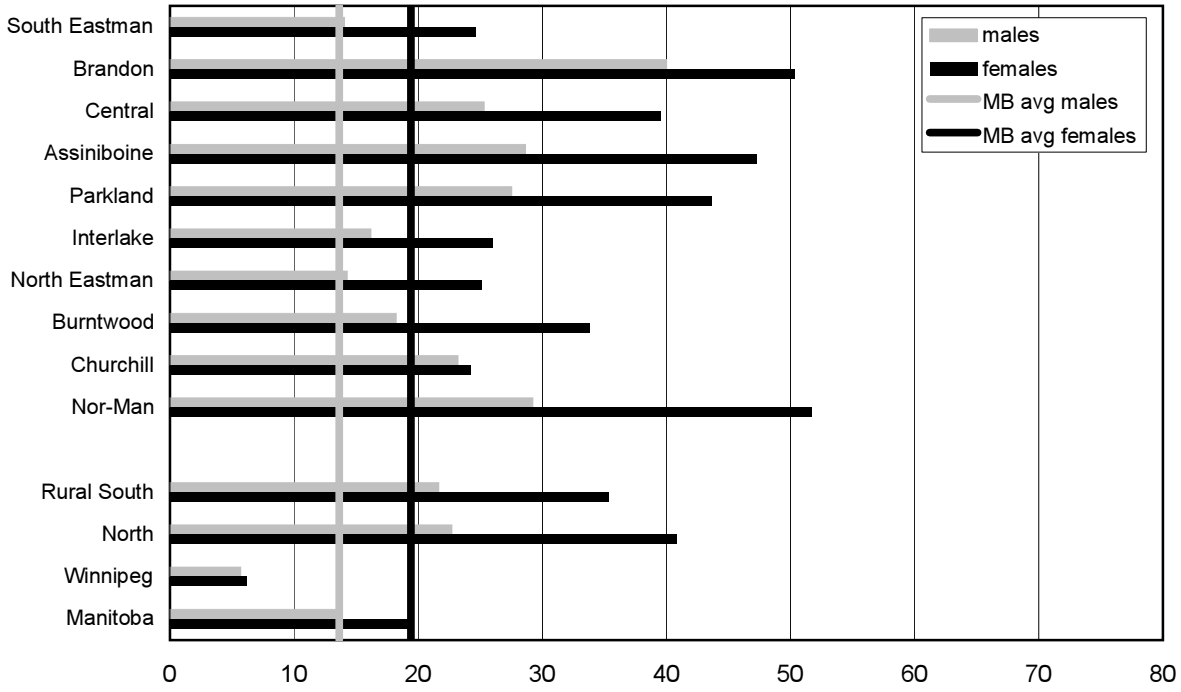
Figure 3.6.1: Inpatient Cases in MHMIS by RHA, 1997/98-2001/02



's' indicates data suppressed due to small numbers
**because of concerns about missing data, statistical testing was not performed

Figure 3.6.2: Community Cases in MHMIS by RHA 1997/98-2001/02

Age-adjusted rate of cases per 1000 residents (community includes outpatient cases)

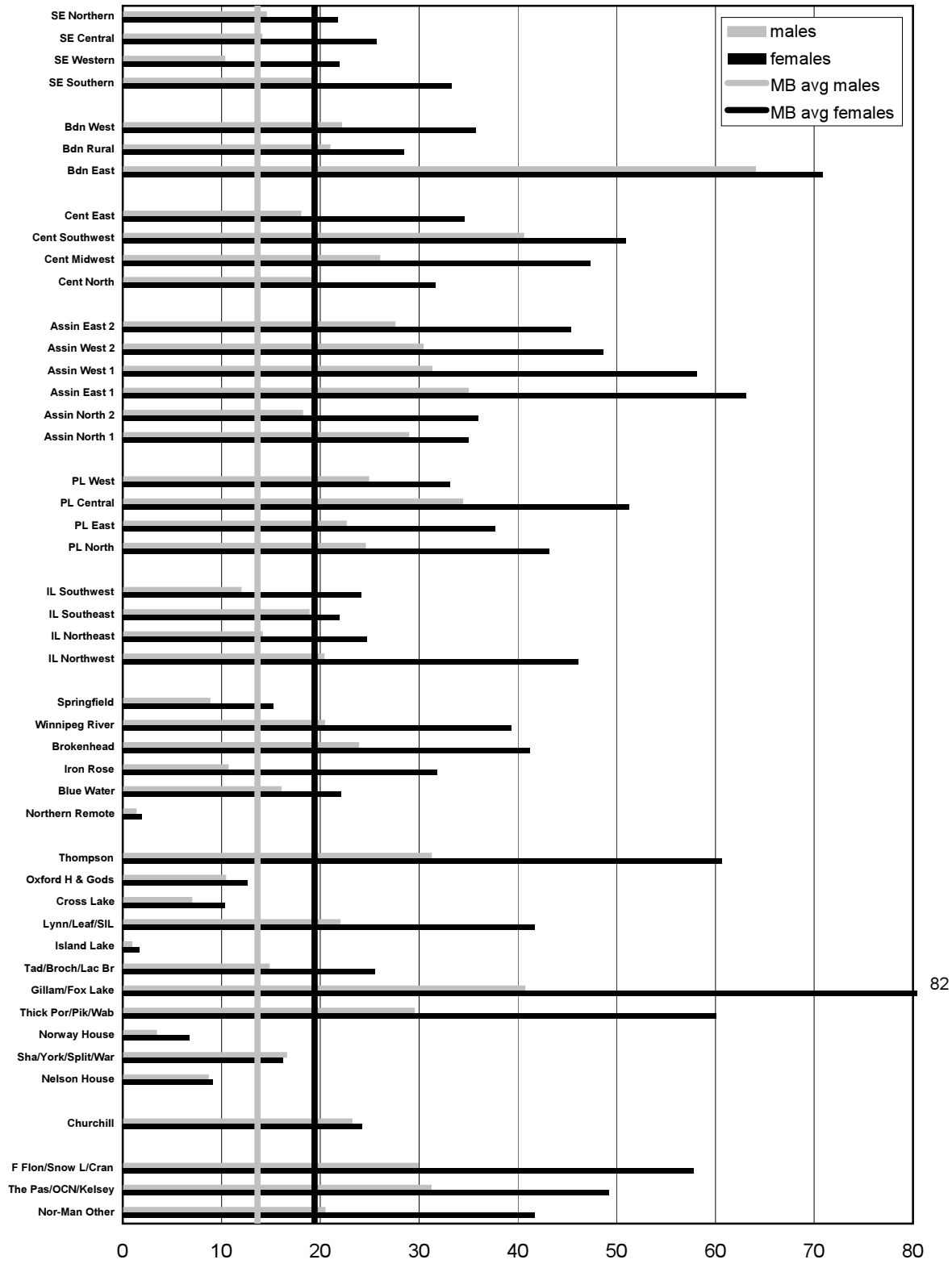


's' indicates data suppressed due to small numbers

**because of concerns about missing data, statistical testing was not performed

Figure 3.6.3: Community Cases in MHMIS by District, 1997/98-2001/02

Age-adjusted rate of cases per 1000 residents (community includes outpatient cases)



Key findings:

NOTE: *All information is solely based on the data input by RHA, which could vary according to the way in which information is inputted within each region. Therefore, these are simply descriptions of the information existing within MHMIS, for purposes of regions being able to discuss the validity of the database.*

- The majority of MHMIS cases are community cases (which includes outpatient cases) at13.6 per thousand males and 19.4 per thousand females per year, compared with the relatively low inpatient case rate of 1.7 per thousand males and 1.5 per thousand females per year.
- While inpatient case rate is similar, the community case rate is about 1.5 times higher among females compared to males.
- The Rural South and North have similar overall rates of inpatient cases and community cases. RHAs with particularly high inpatient case rate are Interlake and Churchill, and those with high community cases are Brandon (especially for males), Central, Assiniboine, Parkland and Nor-Man. However, this may be an artifact of the way in which MHMIS data are inputted in regions.

3.7 Median Length of MHMIS Case

Definition: This is the median length of a "case" within MHMIS, in number of days, given for each RHA by both inpatient and community cases. We used the median rather than the mean number of MHMIS case days to examine average length of case, because the mean length of case is skewed by individuals under care for long periods of time, particularly among inpatient cases.

Figure 3.7.1 Median Length of MHMIS Inpatient Case by RHA, 1997/98-2001/02

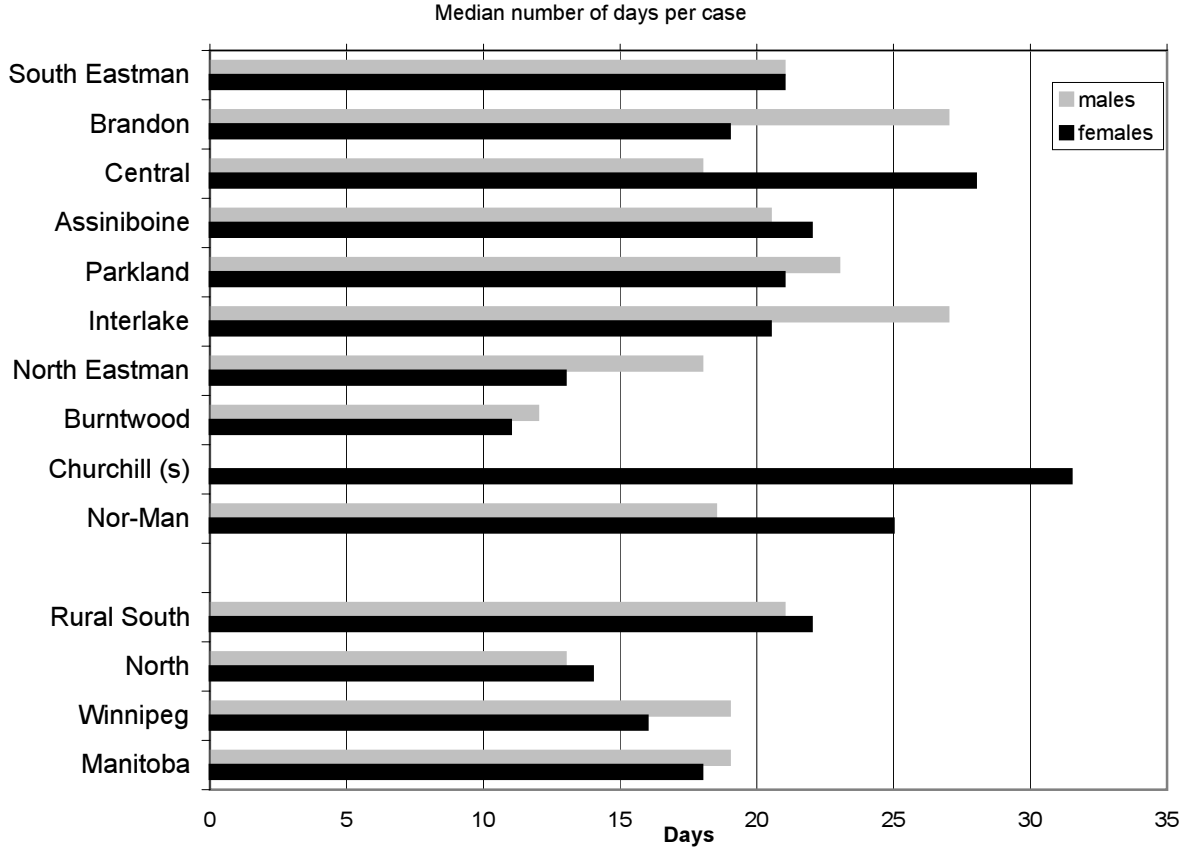
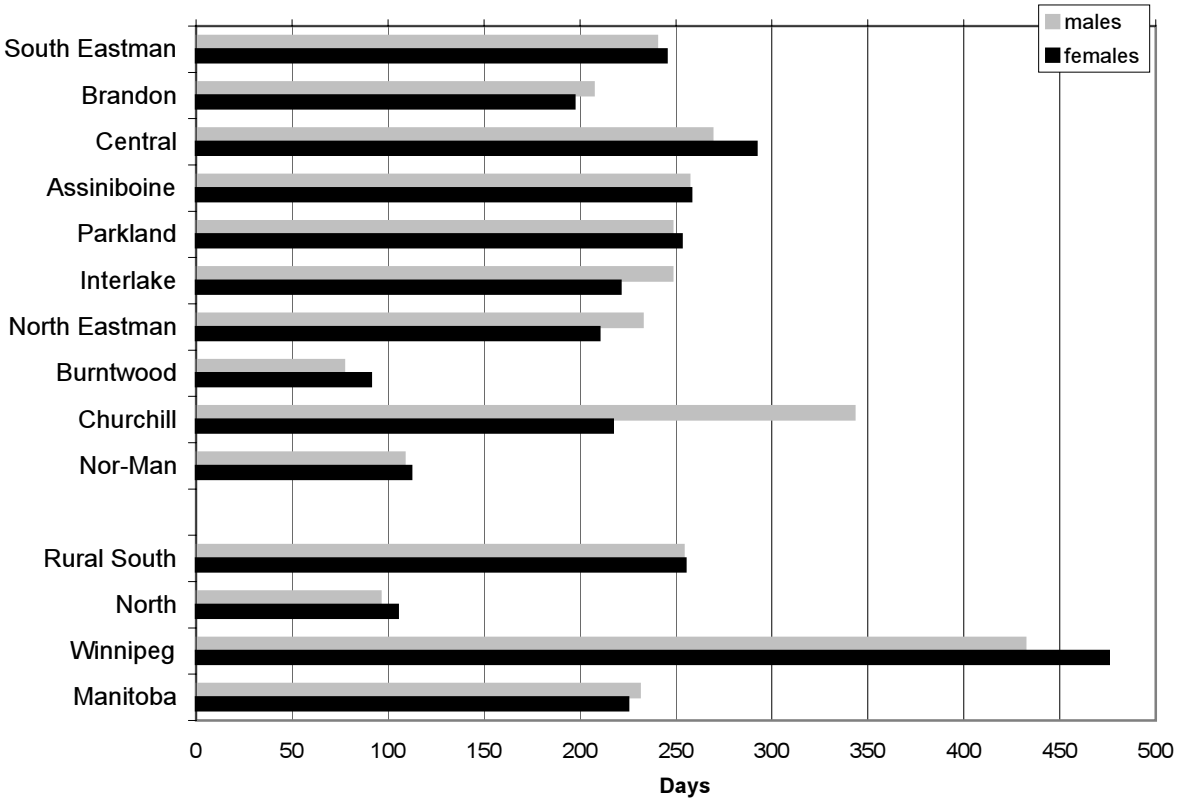


Figure 3.7.2 Median Length of MHMIS Community Case by RHA, 1997/98-2001/02

Median number of days per case



Key findings:

NOTE: *All information is solely based on the data input by RHA, which could vary according to the way in which information is inputted within each region. Therefore, these are simply descriptions of the information existing within MHMIS, for purposes of regions being able to discuss the validity of the database.*

- The median length of inpatient case in Manitoba is 19 days for males and 18 days for females (see Figure 3.6.1). Median length appears shorter in the North (13 days for males, 14 days for females) but longer in the Rural South (21 days for males, 22 days for females).
- The median length of community case in Manitoba is 231 days for males and 225 days for females (see Figure 3.6.2). There is very little difference among males and females in median length of a community case, both at the provincial and RHA levels. As with inpatient cases, the North has a lower median (96 days for males, 105 days for females) compared to the Rural South (254 days for males, 255 days for females).

3.8 Proportion of the Population in MHMIS Prior to, During, and After a Mental Illness Hospitalization

Definition: For these analyses, we examined all Manitobans who were hospitalized for a mental illness during the central year (1999/2000). These hospitalizations were defined as those that had a mental illness in the most responsible diagnosis field (ICD-9-CM 290-319). MHMIS records from all five years (1997/98-2001/02) were examined so prior and after time periods could be used. Because of the underrecording known to exist in Winnipeg MHMIS systems, only the Rural South, North and Brandon data are shown as pie chart figures.

Figure 3.8.1: MHMIS Status of Manitobans Hospitalized for Mental Illness Conditions: Rural South (n = 2126), 1999/2000

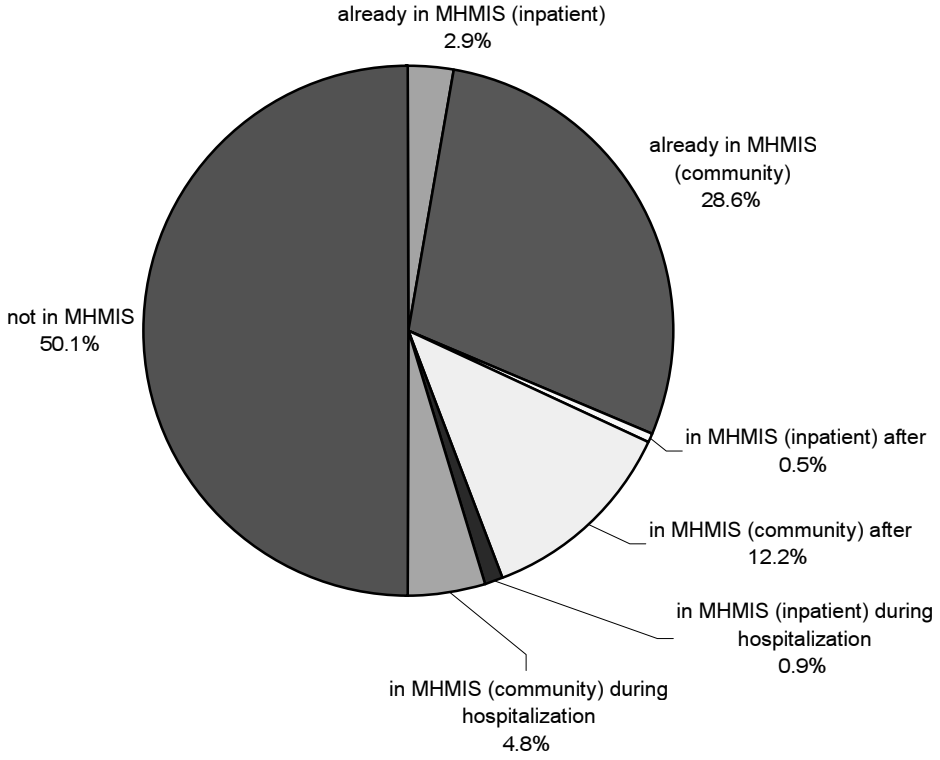


Figure 3.8.2: MHMIS Status of Manitobans Hospitalized for Mental Illness Conditions: North (n = 441), 1999/2000

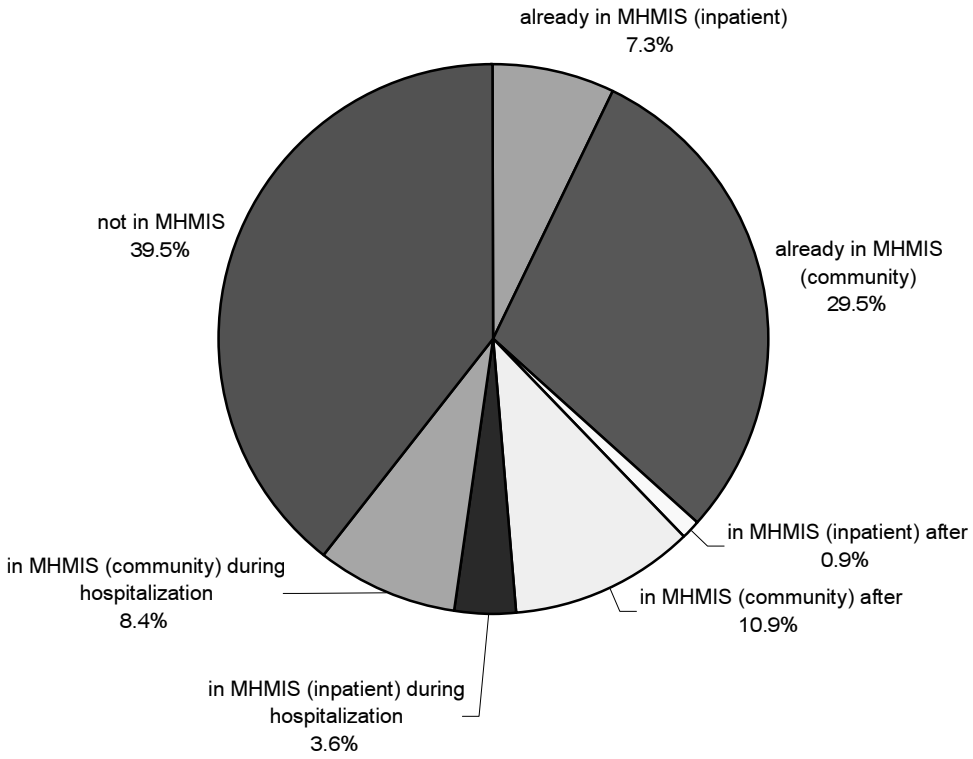


Figure 3.8.3: MHMIS Status of Manitobans Hospitalized for Mental Illness Conditions: Brandon (n = 318), 1999/2000

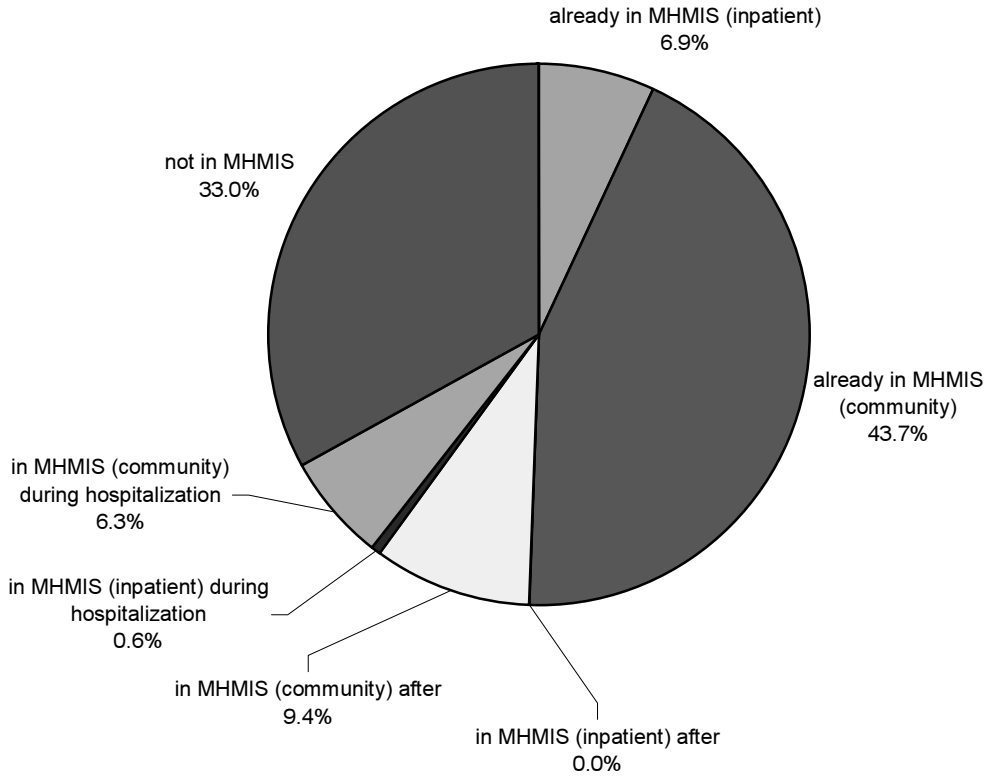


Table 3.8.1: MHMIS status of Manitobans hospitalized for psychiatric conditions in 1999/2000

	Hospitalized for psychiatric condition in 1999/2000 (% of total)	Timing of MHMIS contact for clients of MHMIS (%)	Median (mean) days to MHMIS case after discharge from hospital
PROVINCIAL (may be highly influenced by Winnipeg numbers, so caution must be taken)*			
No Contact with MHMIS	3,306 (57%)		
In MHMIS	2,504 (43%)		
• Entered MHMIS Prior to hospital admission		1,617 (65%)	
• Entered MHMIS during hospital stay		343 (14%)	
• Entered MHMIS after discharge		544 (22%)	120 (253)
Total (n)	5,810	2,504	
RURAL SOUTH			
No Contact with MHMIS	1,065 (50%)		
In MHMIS	1,061 (50%)		
• Entered MHMIS Prior to hospital admission		669 (63%)	
• Entered MHMIS during hospital stay		121 (11%)	
• Entered MHMIS after discharge		271 (26%)	87 (234)
Total (n)	2,126	1,061	
NORTH			
No Contact with MHMIS	174 (39%)		
In MHMIS	267 (61%)		
• Entered MHMIS Prior to hospital admission		162 (61%)	
• Entered MHMIS during hospital stay		53 (20%)	
• Entered MHMIS after discharge		52 (19%)	27 (191)
Total (n)	441	267	
BRANDON			
No Contact with MHMIS	105 (33%)		
In MHMIS	213 (67%)		
• Entered MHMIS Prior to hospital admission		161 (76%)	
• Entered MHMIS during hospital stay		22 (10%)	
• Entered MHMIS after discharge		30 (14%)	139 (244)
Total (n)	318	213	
WINNIPEG*			
No Contact with MHMIS	1,962 (67%)		
In MHMIS	963 (33%)		
• Entered MHMIS Prior to hospital admission		625 (65%)	
• Entered MHMIS during hospital stay		147(15%)	
• Entered MHMIS after discharge		191 (20%)	168 (299)
Total (n)	2,925	963	

* Winnipeg in particular appears to have a very low reporting rate into MHMIS; only the Adult Community Mental Health Program of the WRHA uses MHMIS. Therefore these numbers may not accurately reflect contact with the mental health system.

Key findings:

NOTE: *All information is solely based on the data input by RHA, which could vary according to the way in which information is inputted within each region. Therefore, these are simply descriptions of the information existing within MHMIS, for purposes of regions being able to discuss the validity of the database.*

- In 1999/2000 there were 5,810 admissions to hospital with a mental illness diagnosis. In the Rural South (*n*=2,126), half (50%) of those people admitted for mental illness reasons were clients of MHMIS previous to the admission. In contrast, two-thirds (67%) of the Brandon people hospitalized for mental illness reasons were clients of MHMIS prior to admission, and 61% of those in the North. Between 80 and 90% of the MHMIS clients prior to the admission were community clients (includes community and outpatient), compared with inpatient clients.
- For those discharged from a hospital stay for a mental illness diagnosis, but only entering MHMIS post-hospital discharge, the median time to enter MHMIS as a client varies substantially, from 27 days in the North, 87 days in Rural South, and 139 days in Brandon.

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CHAPTER 4: USE OF PHYSICIAN SERVICES

4.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

This chapter contains information on several indicators of physician service use:

- Physician Visits for All Causes (Section 4.2)
- Physician Visits For Mental illness (Section 4.3)
- Visit Rates to Psychiatrists, For Mental illness (Section 4.4)

Definitions and data used for physician visit claims

MCHP's definition of 'ambulatory visits' captures virtually all contacts with physicians, except visits to hospitalized patients. It includes office visits, home visits, personal care home (nursing home) visits, and visits to outpatient departments and some emergency rooms (where data are available—see the Glossary for details). Most physicians in the province are paid through the fee-for-service claims system. In order to receive payment for their services, they bill the Health department, and record the reason (diagnosis) for the visit. However, there are some physicians, especially in northern and remote areas, who are paid a salary. Most of these salaried physicians submit "shadow bill" claims the government, that is, they fill out an evaluation claim so that the diagnosis code is still recorded for the visit. However, we realize that 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 nurse practitioner services for basic illness care. Nurses in these situations do not record their services through the fee-for-service billing system, so these visits are not included in the report. Thus our rate of general practitioner use may be undercounted for some northern and remote areas. This is not a problem with specialist visits, since almost all specialists who see patients outside of hospitals are paid through fee-for-service billing claims.

The reported rate of general practitioner use may be underestimated for some rural and remote areas due to incomplete "shadow billing" claims.

An important exception to this relates to salaried psychiatrists working in the province. For example, many psychiatrists working in Provincial Mental Health Centres provide care to outpatients, but individual service claims are not created for these visits, so they cannot be included in our measure of visit rates. As a result, the visit rates reported here are underestimates of actual visit rates, particularly among residents living near mental health centres.

The visit rates to psychiatrists are underestimated due to salaried psychiatrists providing outpatient care in Provincial Mental Health Centres that are not billed as individual service claims.

As with most of the indicators in this report, visits to physicians were allocated to the area of residence of the patient, not the location where the visit took place.

Defining the comparison groups

Most comparisons in this chapter are made between those persons in the "cumulative mental disorders" group and those in the "no disorders" group. These cohorts have been established for the Manitoba population aged 10 or older, living in Manitoba at least one year for the five-year period 1997/98-2001/02. The *cumulative mental disorders* group has one or more of the following diagnoses: depression, anxiety state, personality disorder, substance abuse, or schizophrenia. The *no disorders* group has no mental illness diagnoses in the five-year period. Occasionally, a third group is referred to in this chapter. The *other disorders* group has at least one mental illness diagnosis in the five years, but are not in the "cumulative disorders" group. For further explanation of these terms, please refer to Chapters 1 and 2 of this report.

Example: Burntwood and Nor-Man RHAs

Burntwood and Nor-Man RHAs both have generally high need populations, as judged by their high premature mortality rates. In Nor-Man, all-cause visit rates for both males and females are similar to the provincial averages, while in Burntwood, the visit rates are lower (except for females with no disorders, whose rate is at the provincial average). In both regions, Federal Nursing Stations also provide care to local residents, and since these data are not included in the physician visit data, residents of both RHAs likely receive slightly more 'primary care visits' than just physician visits.[1]

But an examination of visit rates for mental illness reveals a striking difference between these RHAs: both males and females from Nor-Man saw physicians for mental illness at almost double the rate of Burntwood residents. There is no reason to believe that the 'need' for mental health services differs markedly between these RHAs (the prevalence of Cumulative Disorders is similar), so similar visit rates were expected. A number of factors may affect how this finding is interpreted. First, it is possible that Burntwood residents simply do not visit physicians for mental illness as often as Nor-Man residents. However, several alternative explanations are also possible. The residents of these two RHAs may be using different providers for their mental health care. That is, Burntwood residents may be seeking as much care for mental health problems, but they may be using other care providers (nurses, social workers, etc). Physician recording practices may also affect this: it could be that physicians in Burntwood are more likely to record a physical health problem for their visits, even if mental health concerns were also addressed during the visit. Whatever the explanation, the lower rate of physician visits for mental illness among Burntwood residents remains a cause for concern, and may justify further investigation.

[1] It is likely that this difference is larger in Burntwood than in Nor-Man, because Burntwood has a larger proportion of its residents living in remote communities served by nursing stations.

Finally, visit rates to Psychiatrists are very low for residents of both Burntwood and Nor-Man RHAs. This is almost certainly the result of very restricted access, due to the low supply of Psychiatrists to serve northern residents close to home.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Is there a way to find out how much care is provided by Nursing Station staff or physicians who do not shadow bill? Can this differentiate services for physical versus mental health care?*
- *Why do some RHA residents have lower physician visit rates for mental illness? Is this a feature of the underlying prevalence of mental illness, a feature that coding for mental illness is not done as often in certain areas, or a feature that people with mental illness are not seeking the services of physicians?*
- *What steps can be taken to ensure appropriate access to psychiatrists for those that need it?*
- *How can we ensure that psychiatrists working in various mental health programs are coding into the administrative claims so that their work is captured in the service use picture of the province?*

Overall key findings from this chapter:

- Males and females in the "cumulative disorders" group visit physicians more than twice as often as those with no mental illness, across all RHAs and districts of Manitoba.
- Visits for mental illness do not make up the entire difference in rates: people in the "cumulative disorders" group visit physicians almost twice as often for every kind of *physical* illness as well (e.g. Respiratory, Circulatory, etc). This reflects a higher level of physical morbidity among those in the cumulative disorders group.
- For the entire population of Manitoba, about one in ten physician visits (9.5%) was coded as being 'for' mental illness (8.7% for males, 10% for females). Among those in the "cumulative disorders" group, about one in five of their visits (20%) was 'for' mental illness (21.6% for males versus 19.3% for females).
- Among both those in the "cumulative" and "no" disorder groups, females made more visits than males, and older residents made more visits than younger residents.
- Those persons with schizophrenia and personality disorders have about three to four times as many physician visits 'for' mental illness reasons compared with the overall "cumulative mental disorders" group (Females:: schizophrenia 5.0 visits per person per year, personality disorder 6.6, cumulative disorders group 1.6 visits per person per year. Males: schizophrenia 4.0, personality disorder 4.9, cumulative disorders 1.5 visits per person per year).

- The 'total burden' of mental illness on the medical care system is high:
  - Males in the "cumulative disorders" group account for about 35% of all visits for males, even though they comprise only 19% of the male population.
  - Females in the "cumulative disorders" group account for about 47% of all visits for females, even though they comprise only 29% of the female population.
- There are contradictory findings in the relationship of visit rates and neighbourhood income quintiles. There is no relationship between neighbourhood income and all-cause physician visit rates, except for males and females in the "cumulative disorders" group living in an Urban area. In Urban neighbourhood income groupings of those in the "cumulative disorders" group, visit rates to physicians 'for' mental illness are not related to neighbourhood income; in Rural areas, the higher the neighbourhood income the *higher* the physician visit rate 'for' mental illness. Among both Urban and Rural residents (males and females) in the "cumulative disorders" group, psychiatrist visit rates were significantly related to neighbourhood income, with residents of higher income neighbourhoods making *more* visits to psychiatrists than residents of lower income neighbourhoods.
- For those in the "cumulative disorders" group, the use of *psychiatrists* is much lower if they live in the Rural South (males: 0.19, females: 0.20 visits per person per year) or the North (males: 0.05, females: 0.04) compared to Winnipeg (males: 0.79, females: 0.75) and Brandon (males: 0.44, females: 0.43 visits per person per year). Although not as large a gap, the use of *all physicians* 'for' mental illness visits is somewhat lower for those in the "cumulative disorders" group if they live in the Rural South (males: 1.0, females: 1.3) or the North (males: 0.8, females: 0.9) compared to Winnipeg (males and females 1.9) or Brandon (males: 1.3, females: 1.5 visits per person per year).

Canadian Comparisons:

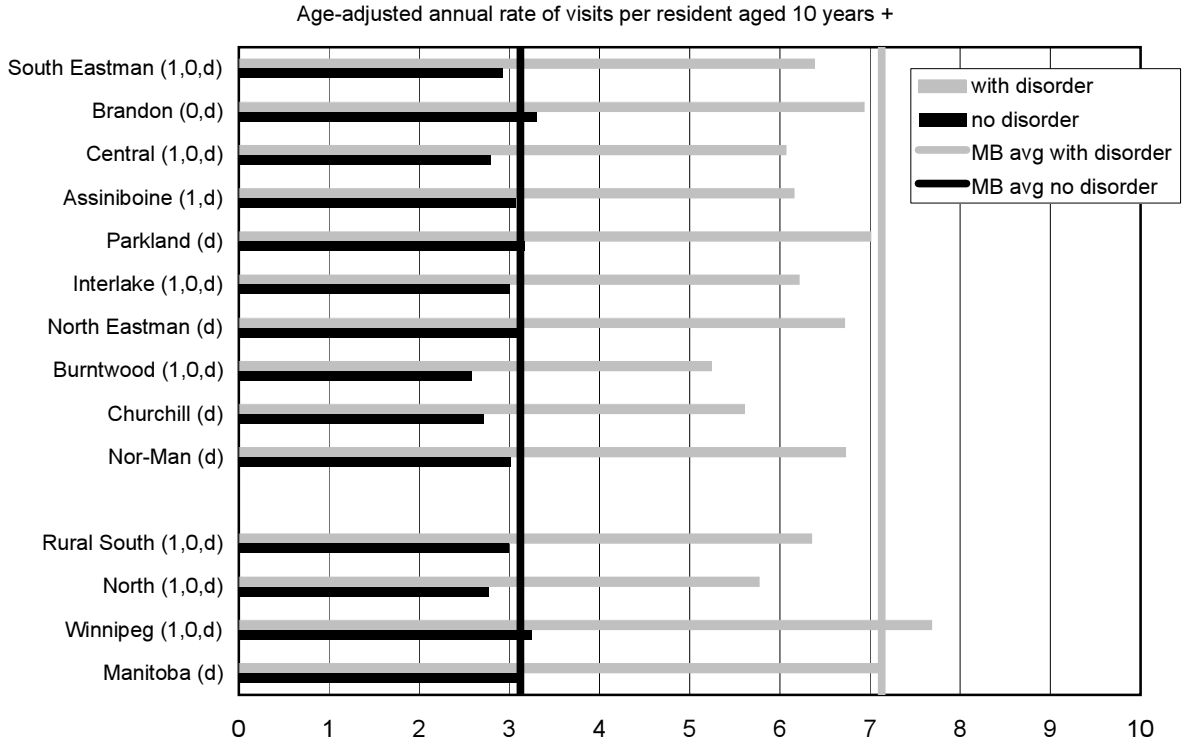
- A number of other studies have reported on health care use among people with mental illness, but they use different indicators than reported here. Lin et al. (1996) reported that Ontario females and urban dwellers used more services, consistent with our findings. Other studies also show that people with mental illness are two to three times more likely to seek health services (both 'general medical' and 'mental health specialty') than those without disorders (Kessler et al., 1997). *Our report shows that those in the cumulative mental disorders group visit physicians and are hospitalized at more than double the rate of those with no mental illness.*

4.2 Physician Visits for All Causes

4.2.1 All-cause physician visit rates

Definition: This is the average annual number of ambulatory visits to all physicians (including GP/FPs and specialists) for all causes (physical and mental health concerns), per resident. The rates are age-adjusted to reflect the population of Manitoba. The following figures show visit rates for the "cumulative" versus "no" disorders groups by RHA, district, age group, and income quintile (with males and females separated in all graphs). All-cause physician visit rates for persons with each of the specific disorders are shown in Table 4.2.1.

Figure 4.2.1: All-Cause Physician Visit Rates for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 4.2.2: All-Cause Physician Visit Rates for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of visits per resident aged 10 years +

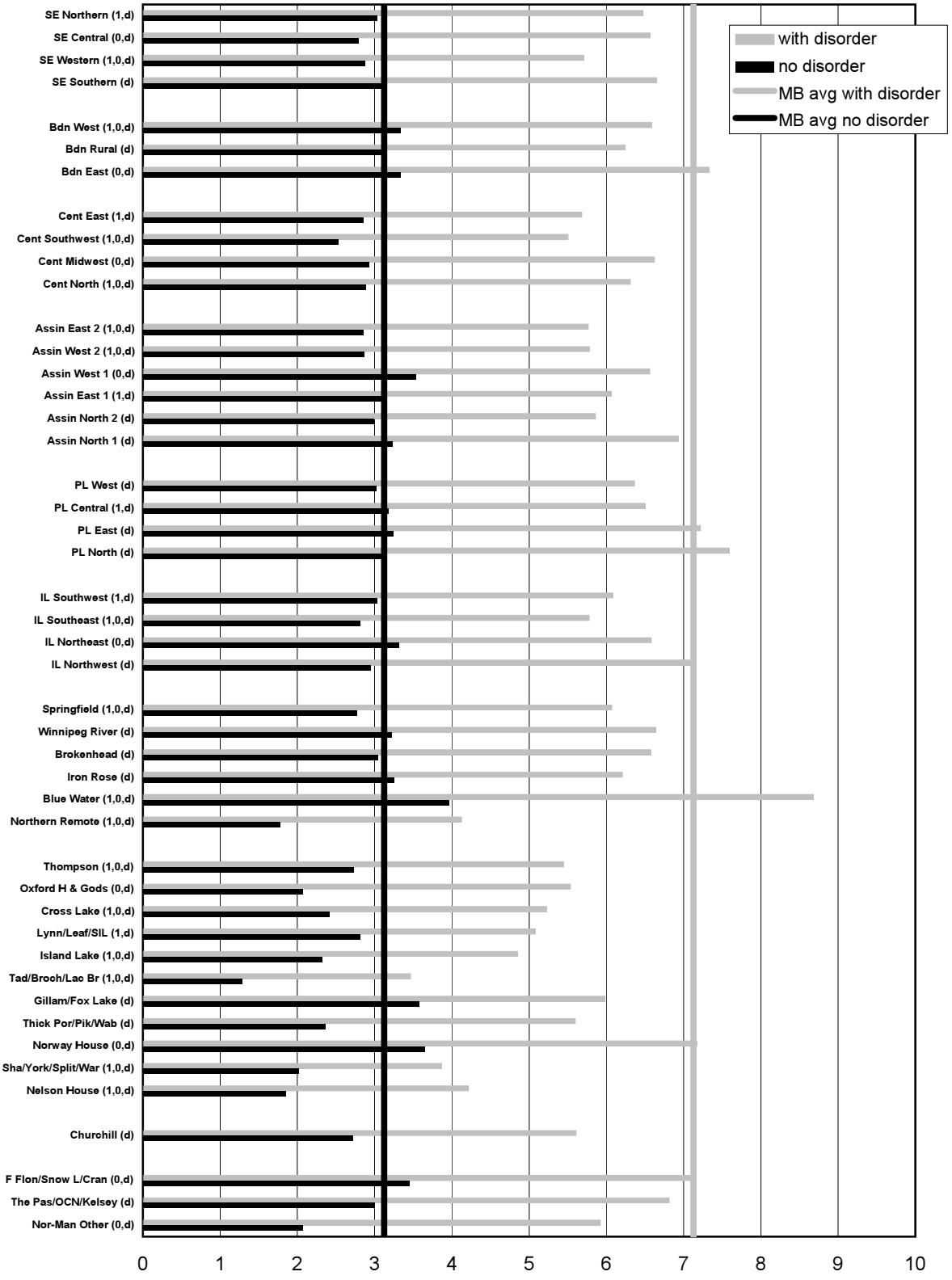


Figure 4.2.3: All-Cause Physician Visit Rates for Males With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

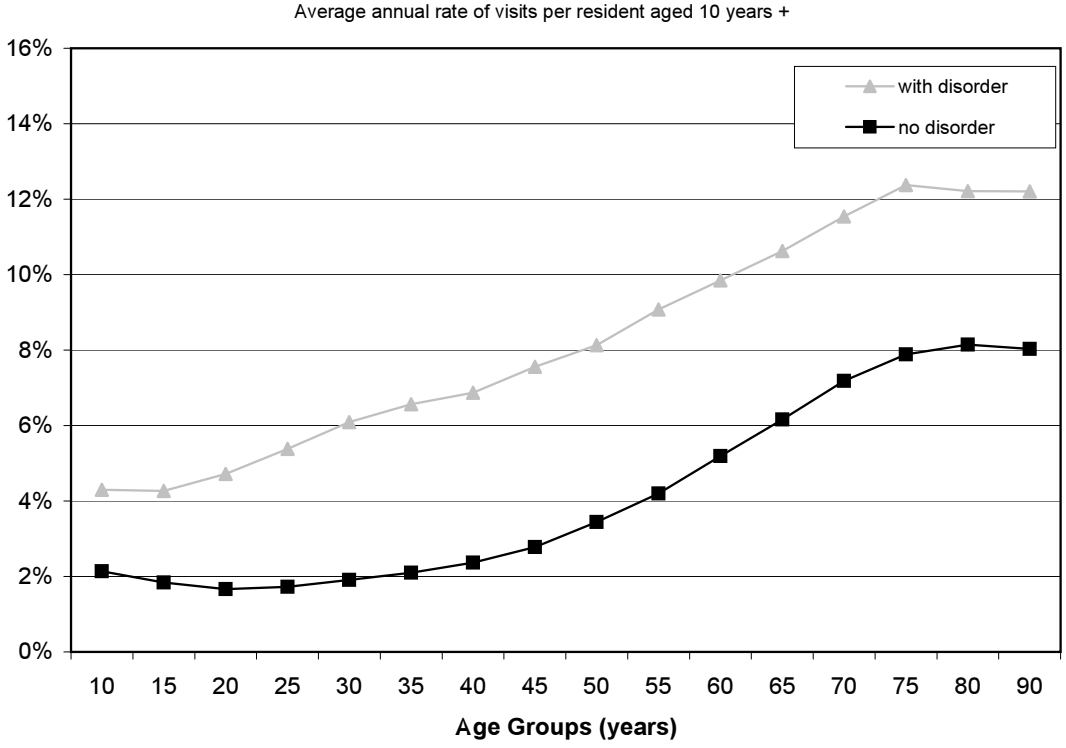


Figure 4.2.4: All-Cause Physician Visit Rates for Males With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

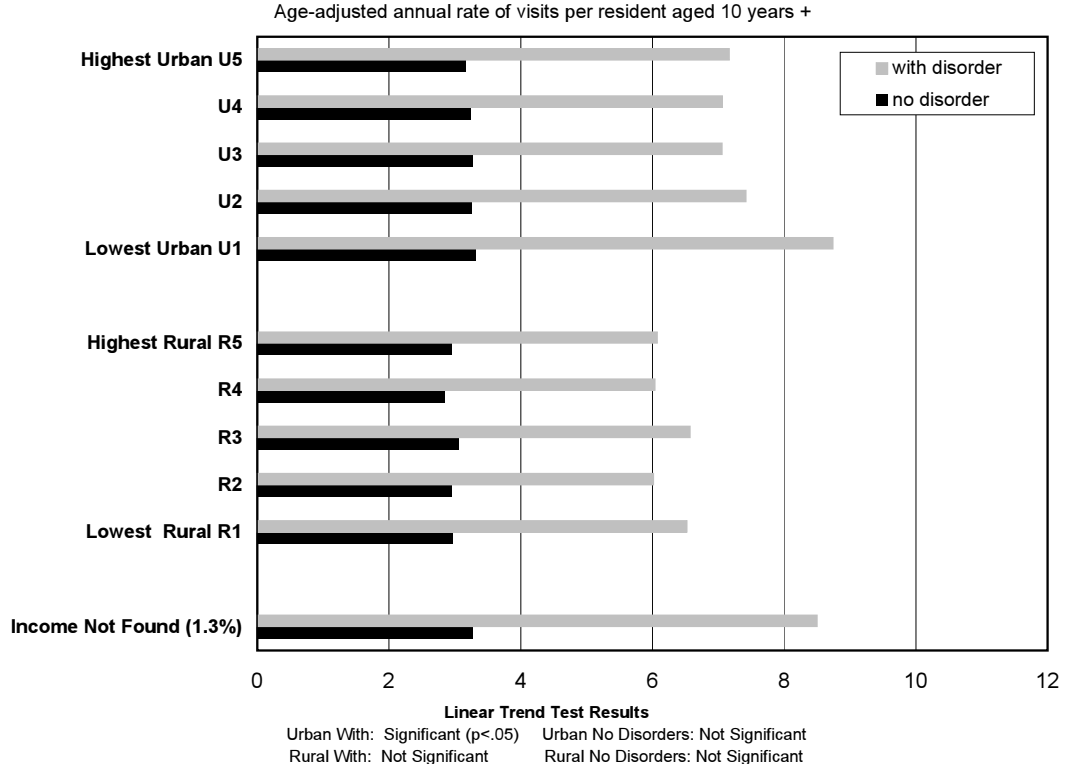
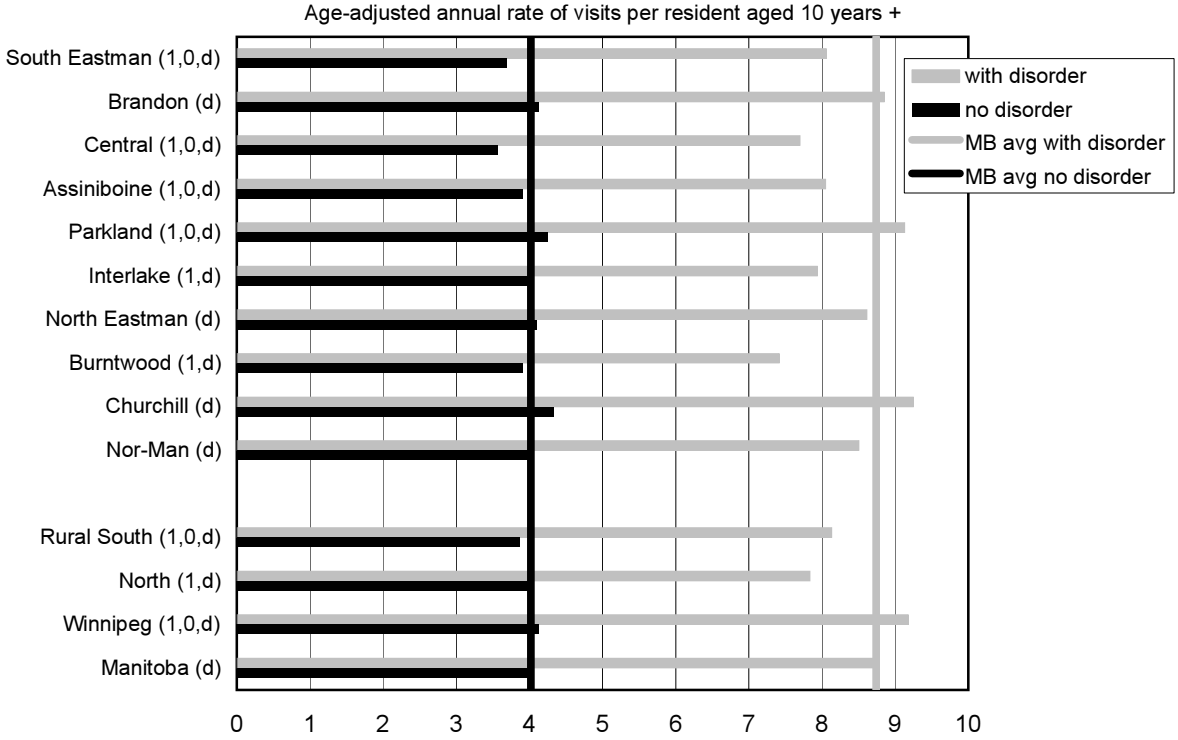


Figure 4.2.5: All-Cause Physician Visit Rates for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 4.2.6: All-Cause Physician Visit Rates for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of visits per resident aged 10 years +

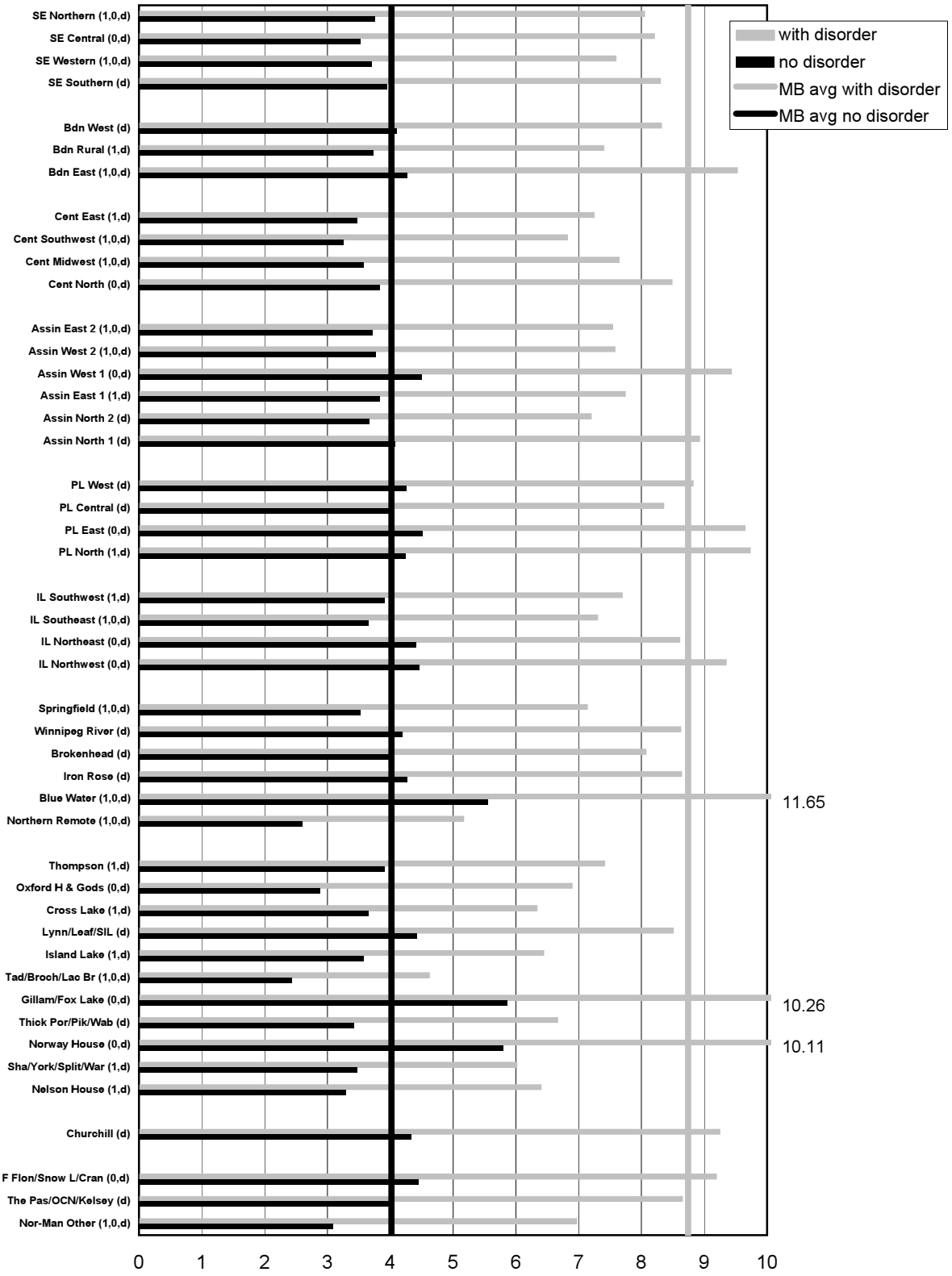


Figure 4.2.7: All-Cause Physician Visit Rates for Females With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

Average annual rate of visits per resident aged 10 years +

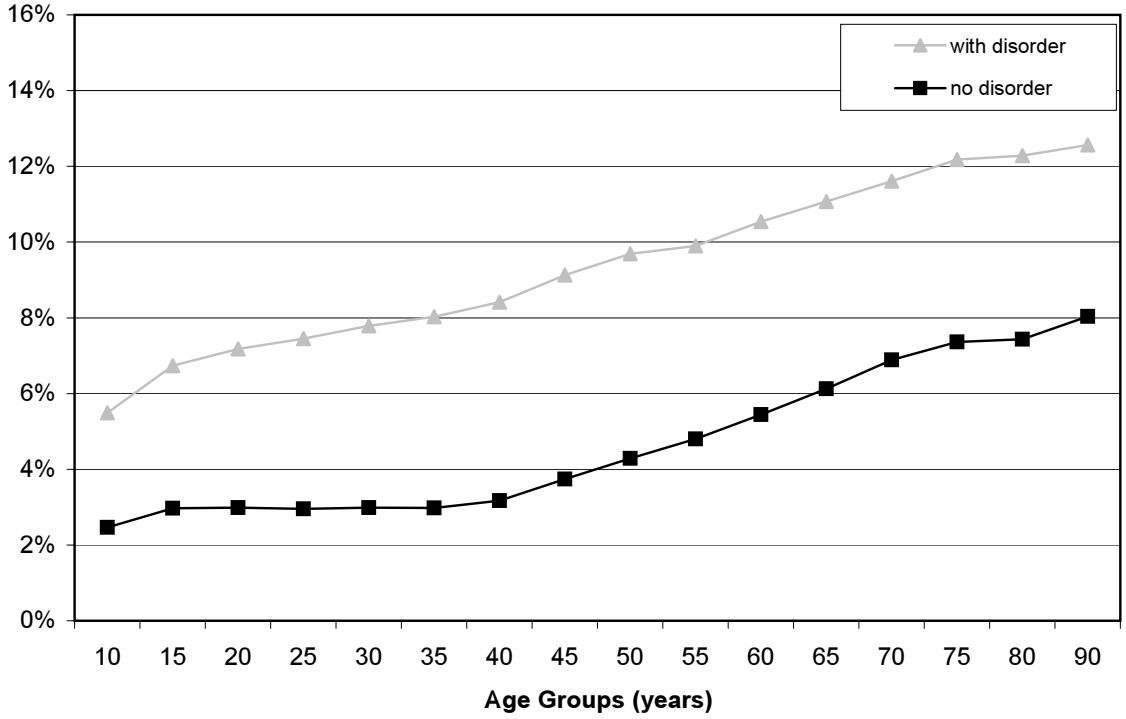
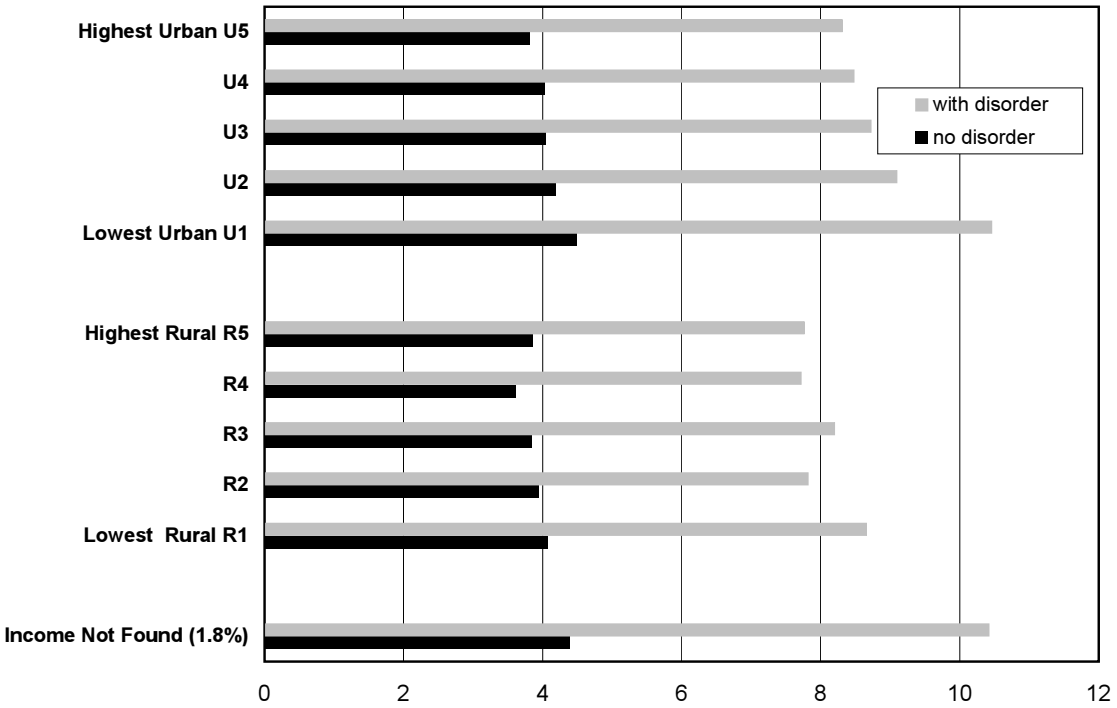


Figure 4.2.8: All-Cause Physician Visit Rates for Females With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual rate of visits per resident aged 10 years +



Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Not Significant
Rural With: Not Significant Rural No Disorders: Not Significant

Table 4.2.1: All-cause physician visits by specific disorder groups and RHA, 1997/98-2001/02
Age-adjusted annual rate of visits to all physicians, per resident aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	7.1	8.6	5.6	6.9	9.0	4.5	6.4	2.9
Brandon	7.6	9.9	6.4	8.3	11.5	4.9	6.9	3.3
Central	6.6	8.7	5.8	6.4	9.3	4.4	6.1	2.8
Assiniboine	6.7	8.4	5.8	7.2	8.4	4.8	6.2	3.1
Parkland	7.7	9.8	6.8	7.6	9.6	4.9	7.0	3.2
Interlake	6.9	8.6	5.7	6.3	8.2	4.6	6.2	3.0
North Eastman	7.6	9.4	6.2	6.7	9.2	4.8	6.7	3.1
Burntwood	6.8	7.9	4.9	5.7	9.3	3.9	5.2	2.6
Churchill	5.7	4.5	5.1	5.0	2.1	4.9	5.6	2.7
Nor-Man	7.8	9.1	6.0	8.8	10.1	4.7	6.7	3.0
Rural South	7.0	8.9	5.9	6.8	8.9	4.6	6.4	3.0
North	7.2	8.5	5.2	7.1	9.3	4.4	5.8	2.8
Winnipeg	8.5	10.3	7.4	9.8	12.3	5.0	7.7	3.2
Manitoba	8.0	9.8	6.6	8.9	11.4	4.9	7.1	3.1

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	8.4	10.0	8.4	11.0	13.9	5.0	8.1	3.7
Brandon	9.3	11.9	8.9	11.8	16.0	5.9	8.8	4.1
Central	7.9	10.0	8.6	7.8	12.5	5.3	7.7	3.6
Assiniboine	8.4	10.4	8.1	9.9	13.9	5.7	8.1	3.9
Parkland	9.6	11.5	9.9	9.9	14.5	6.0	9.1	4.2
Interlake	8.3	10.4	7.7	8.9	12.0	5.6	7.9	4.0
North Eastman	9.1	11.1	8.7	11.7	14.6	5.8	8.6	4.1
Burntwood	8.6	10.2	7.1	7.3	10.8	6.0	7.4	3.9
Churchill	11.1	12.3	8.8	11.4	6.3	7.0	9.2	4.3
Nor-Man	9.1	10.3	7.8	10.3	12.9	6.2	8.5	4.0
Rural South	8.5	10.5	8.4	9.4	13.2	5.5	8.1	3.9
North	8.8	10.2	7.2	9.1	11.5	6.1	7.8	4.0
Winnipeg	9.6	11.5	9.4	12.8	16.6	6.0	9.2	4.1
Manitoba	9.2	11.1	8.7	11.9	15.7	5.8	8.7	4.0

Key findings:

- Males and females in the "cumulative mental disorders" group visit physicians more than twice as often as those with no mental illness, across all RHAs and districts of Manitoba. (7.1 versus 3.1 visits per year for males, and 8.7 versus 4.0 for females).
- Among all groups, their was a steady rise in visit rates with age (from 10 to 90 years):
  - From two visits per year to eight for males with no mental illness
  - From four visits per year to 12 for males in the "cumulative disorders" group
  - From three visits per year to eight for females with no mental illness
  - From six visits per year to 12 for females in the "cumulative disorders" group
- Neighbourhood income was not strongly related to all-cause physician use for most groups, except urban residents in the "cumulative disorders" group, among whom visit rates were higher for those from lower neighbourhood income areas

Canadian comparisons:

- Rhodes et al. reported on several studies that have consistently shown that mental illness and physical health problems are associated—that is, people with mental illness often have more physical health problems. *In our report, this was clearly evident in Manitobans, and is illustrated in Figure 4.2.9.* However, they also noted that females' higher rate of 'general medical' visits were linked to their increased use of mental health services. They suggested that because females see GP/FPs more often, they are more likely to discuss mental health issues with them, which in turn increases their probability of being referred for specialist mental health care.
- Tweed et al. (1998) documented higher physician visit rates among people with psychiatric disorders. *Their results are similar to this report which found that people with psychiatric disorders had double the visit rates of people with no disorders. They also reported that females used more services than males, again similar to our results. They showed that visits for mental health reasons accounted for only a minority of visits, which we also found (see Figure 4.2.9).* Finally, they found that people with higher levels of education had lower visit rates. *Our analysis of visit rates by neighbourhood income quintile (which is correlated with education) did not show statistically significant trends, though there was a hint of lower visit rates among those with higher neighbourhood incomes (especially among Urban dwellers), which is comparable to the Ontario results.*
- Parikh et al. (1996), focusing on mood disorders, found that urban residents used more outpatient (physician and other) services than rural residents, but rural residents used more inpatient (hospital) services. *Our analyses show similar results, and this is true of both 'all-cause' service use, as well as use for mental illness.*

4.2.2 Proportion of all physician visits attributed to persons in the "cumulative mental disorders" group

Definition: This analysis adds up all the visits made by people in the "cumulative disorders" group (regardless of cause) and expresses it as a percentage of the total number of visits made by all residents. This indicates how large an impact mental illness has on total physician visits.

Table 4.2.2: Percentage of all-cause physician visits attributed to cohort members by RHA, 1997/98-2001/02

RHA	Males		Females		Males + Females	
	% of total visits for all males attributed to **Cumulative**	% of total visits for all males attributed to **Cumulative + Other**	% of total visits for all females attributed to **Cumulative**	% of total visits for all females attributed to **Cumulative + Other**	% of total visits for all residents attributed to **Cumulative**	% of total visits for all residents attributed to **Cumulative + Other**
South Eastman	31.1%	45.5%	45.1%	59.6%	39.1%	53.6%
Brandon	33.6%	49.1%	48.2%	62.5%	42.5%	57.3%
Central	28.9%	41.7%	41.9%	55.0%	36.5%	49.5%
Assiniboine	27.0%	39.8%	40.9%	54.1%	35.1%	48.1%
Parkland	28.7%	43.6%	43.1%	59.0%	37.2%	52.7%
Interlake	30.3%	42.6%	43.1%	56.0%	37.7%	50.4%
North Eastman	30.3%	42.7%	44.3%	57.3%	38.3%	51.1%
Burntwood	41.0%	50.2%	50.0%	59.8%	46.4%	56.0%
Churchill	35.0%	48.6%	43.8%	54.7%	40.2%	52.2%
Nor-Man	35.8%	50.0%	50.1%	66.3%	44.2%	59.7%
Rural South	29.2%	42.4%	42.8%	56.4%	37.1%	50.5%
North	38.6%	50.1%	49.9%	62.5%	45.4%	57.5%
Winnipeg	37.6%	53.0%	48.1%	63.4%	43.9%	59.2%
Manitoba	34.9%	49.4%	46.6%	61.3%	41.8%	56.4%

Key findings:

- Males in the "cumulative disorders" group account for about 35% of all visits for males, even though they comprise only 19% of the male population.
- Females in the "cumulative disorders" group account for about 47% of all visits for females, even though they comprise only 29% of the female population.
- Males with any indication of mental illness (cumulative + other) account for 50% of physician visits, despite comprising only 30% of the male population.
- Females with any indication of mental illness (cumulative + other) account for 56% of physician visits, despite comprising only 43% of the female population.

4.2.3 Physician visit rates by cause

Definition: This analysis illustrates the proportion of all-cause physician visits which were 'for' various causes (showing the top 10). The graph compares results for the "cumulative disorders" and "no disorders" groups, for males and females separately. Table 4.2.3 shows the percentages of visits which were 'for' mental illness by RHA. The table also gives 'All Male', 'All Female', and 'All Residents' totals.

Figure 4.2.9: All-Cause Physician Visit Rates by Sex and Cause Cumulative Disorders vs. No Disorders, 1997/98-2001/02

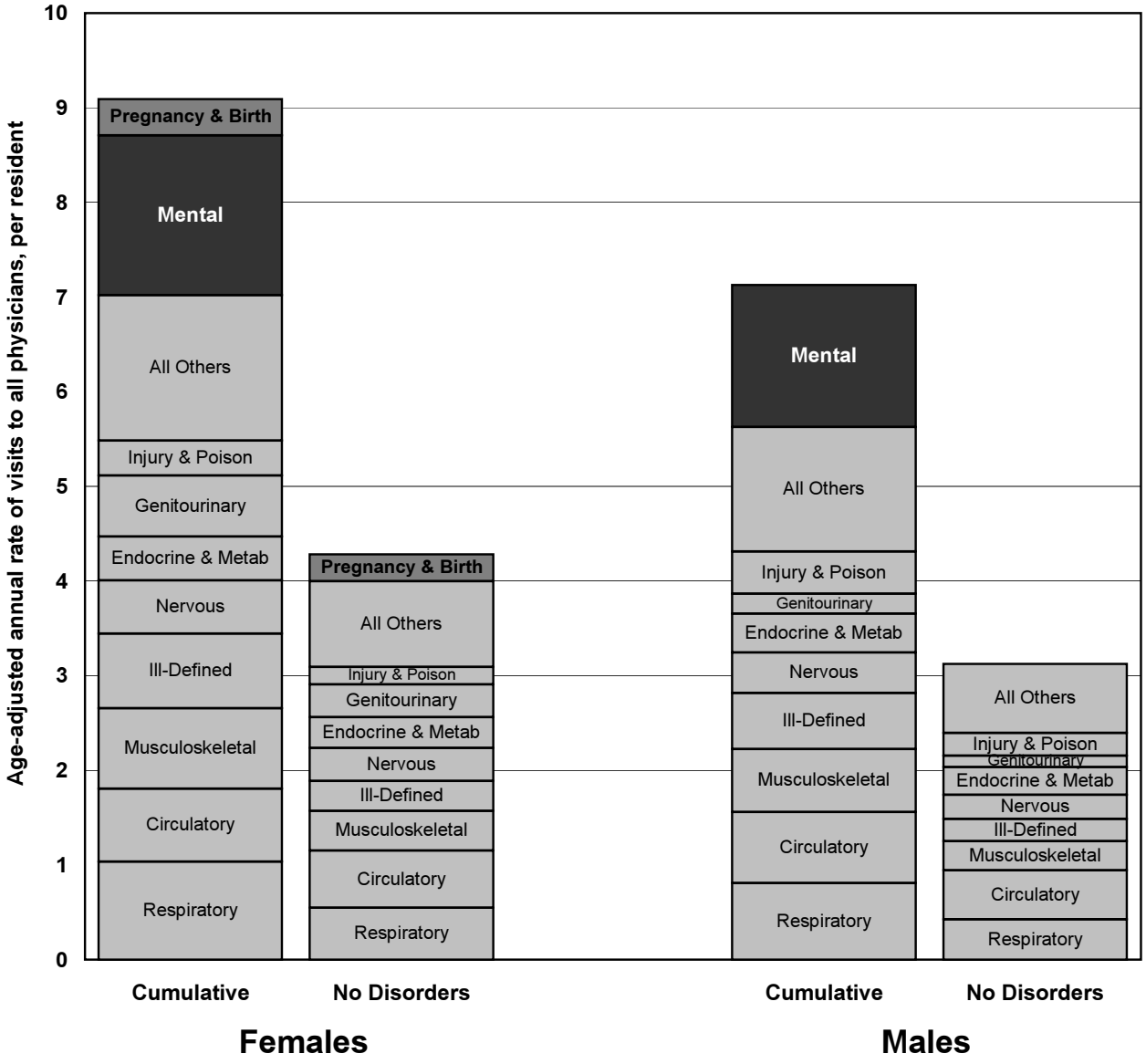


Table 4.2.3: Percentage of all-cause physician visits 'for' mental illness by cohort groups and RHA, 1997/98-2001/02

RHA	Males			Females			Males + Females		
	Cumulative	Other	All males	Cumulative	Other	All females	Cumulative	Other	All residents
South Eastman	17.3%	7.1%	6.4%	17.0%	6.6%	8.6%	17.1%	6.8%	7.7%
Brandon	19.0%	8.7%	7.7%	17.1%	9.0%	9.5%	17.7%	8.9%	8.8%
Central	16.5%	7.6%	5.7%	15.1%	6.7%	7.2%	15.6%	7.1%	6.6%
Assiniboine	13.8%	8.2%	4.8%	14.6%	8.1%	7.1%	14.3%	8.1%	6.1%
Parkland	14.1%	6.6%	5.0%	13.5%	5.4%	6.7%	13.7%	5.9%	6.0%
Interlake	17.7%	7.5%	6.3%	17.5%	5.8%	8.3%	17.6%	6.5%	7.4%
North Eastman	16.5%	7.1%	5.9%	15.6%	5.6%	7.6%	15.9%	6.3%	6.9%
Burntwood	13.6%	9.3%	6.4%	9.5%	5.0%	5.3%	11.0%	6.6%	5.7%
Churchill	11.5%	5.9%	4.8%	12.3%	3.7%	5.8%	12.0%	4.7%	5.4%
Nor-Man	16.9%	6.7%	7.0%	14.7%	5.4%	8.2%	15.4%	5.9%	7.7%
Rural South	16.0%	7.4%	5.7%	15.6%	6.5%	7.5%	15.7%	6.9%	6.8%
North	14.9%	7.8%	6.6%	11.8%	5.2%	6.5%	12.9%	6.2%	6.6%
Winnipeg	24.5%	7.8%	10.4%	21.7%	7.0%	11.5%	22.7%	7.3%	11.1%
Manitoba	21.6%	7.8%	8.7%	19.3%	6.9%	10.0%	20.1%	7.2%	9.5%

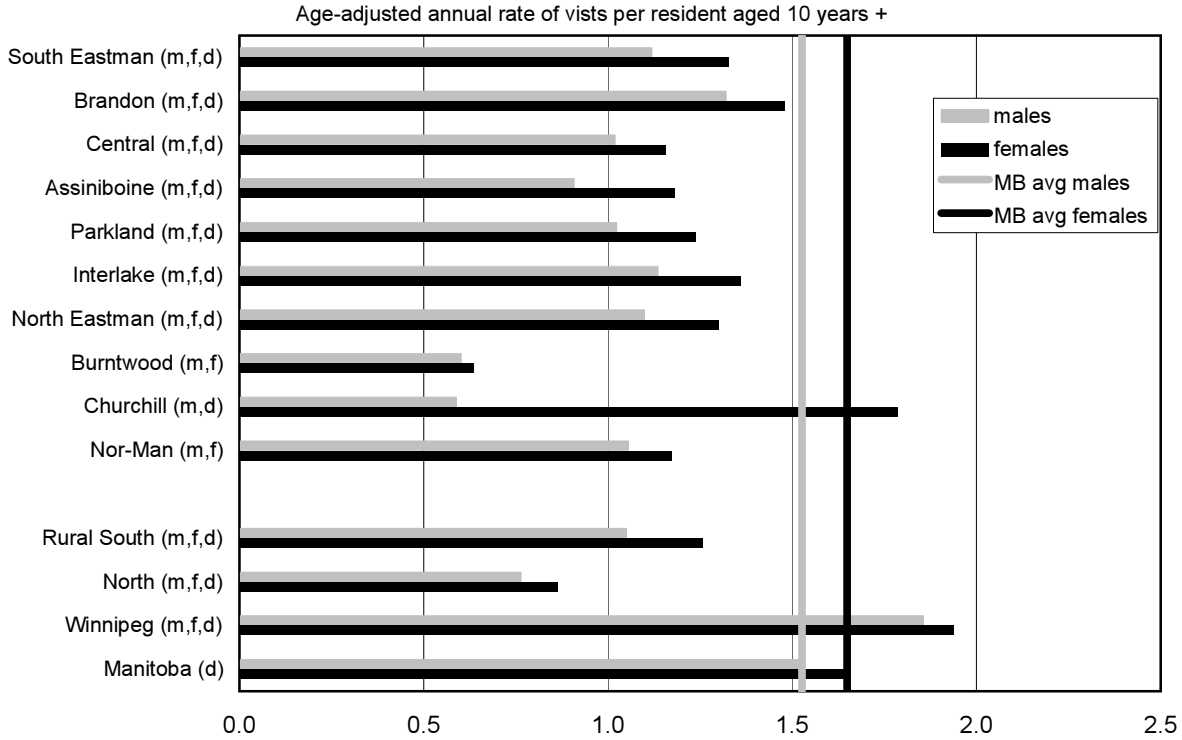
Key findings:

- The higher visit rate among those in the cumulative disorders group is not accounted for solely by their visits 'for' mental illness. Visit rates for virtually every 'physical' illness (e.g. Respiratory, Circulatory, etc.) are near double those of people with no mental illness, reflecting their higher level of physical morbidity.
- About one in ten physician visits (9.5%) was coded as being 'for' mental illness (8.7% for males, 10% for females).
- Among those with mental illness, about one in five of their visits (20%) was 'for' mental illness (21.6% for males, 19.3% for females).
- The percentage of all physician visits which were 'for' mental illness varies considerably by RHA, with most rural RHAs being considerably lower than Winnipeg.

4.3 Physician Visits "For" Mental Illness

Definition: This is the average annual number of ambulatory visits to all physicians (GP/FPs and specialists) for which a Mental Illness (ICD-9-CM codes 290-319) was coded as the cause of the visit. In physician claims, only one diagnosis code is recorded for each visit. So while more than one issue may be discussed during the visit, the physician must record a single code as 'the cause' for the visit. This analysis includes only those with some indication of a mental health disorder because, by definition, those without any service use for mental illness (the "no disorders" group) had no physician visits or hospitalization for mental illness. The rates are age-adjusted to reflect the population of Manitoba. The figures show visit rates for the "cumulative disorders" and "no disorders" groups by RHA, district, age group, and income quintile (with males and females separated in all graphs). Table 4.3.1 shows visit rates by the specific disorder groups for each RHA.

Figure 4.3.1: Visit Rates to All Physicians for Mental Illness Disorders for those With Cumulative Disorders by RHA, 1997/98-2001/02



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

Figure 4.3.2: Visit Rates to All Physicians for Mental Illness Disorders for those With Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of visits per resident aged 10 years +

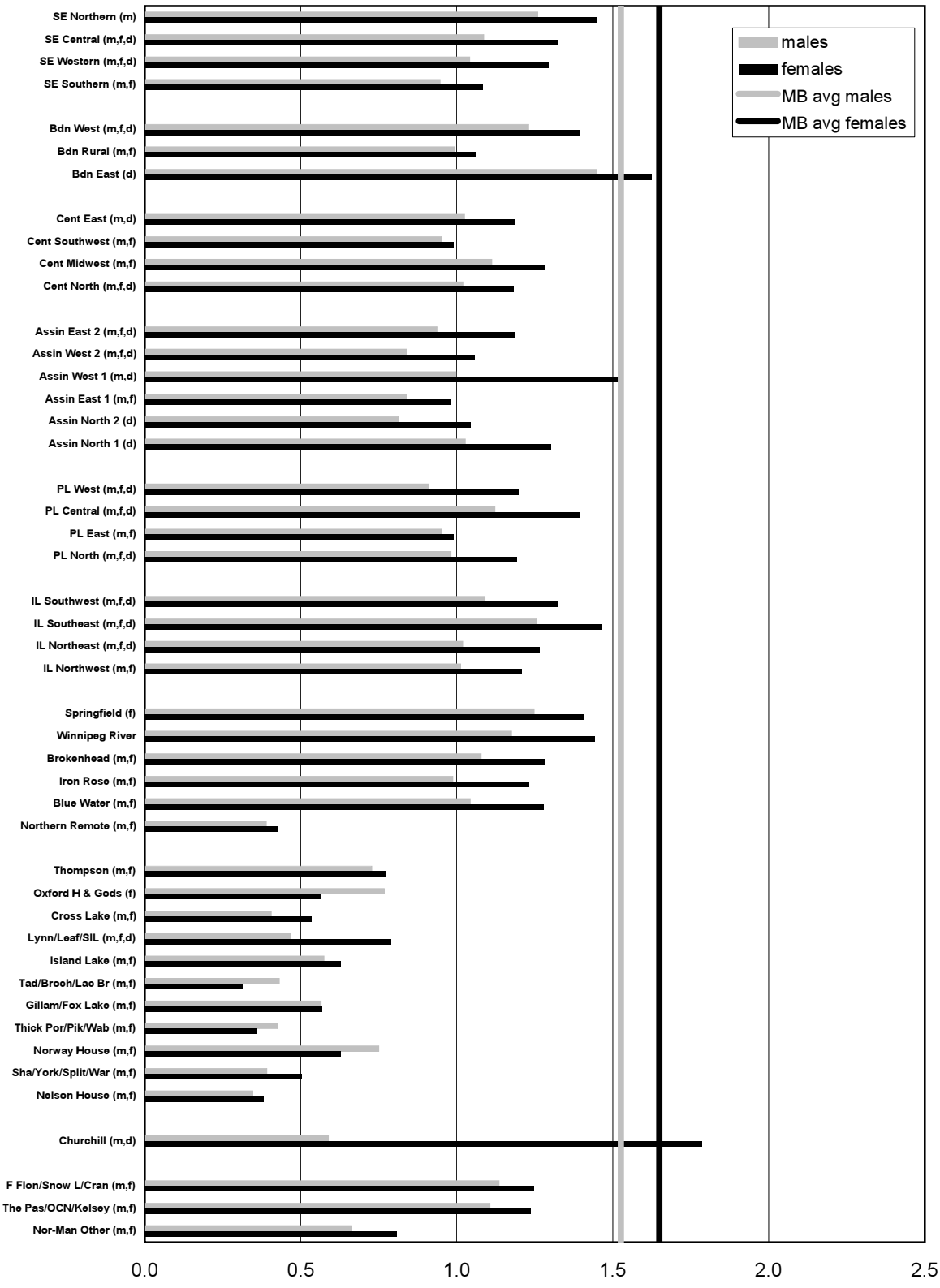


Figure 4.3.3: Visit Rates to All Physicians for Mental Illness Disorders for those with Cumulative Disorders by Age and Sex, 1997/98-2001/02

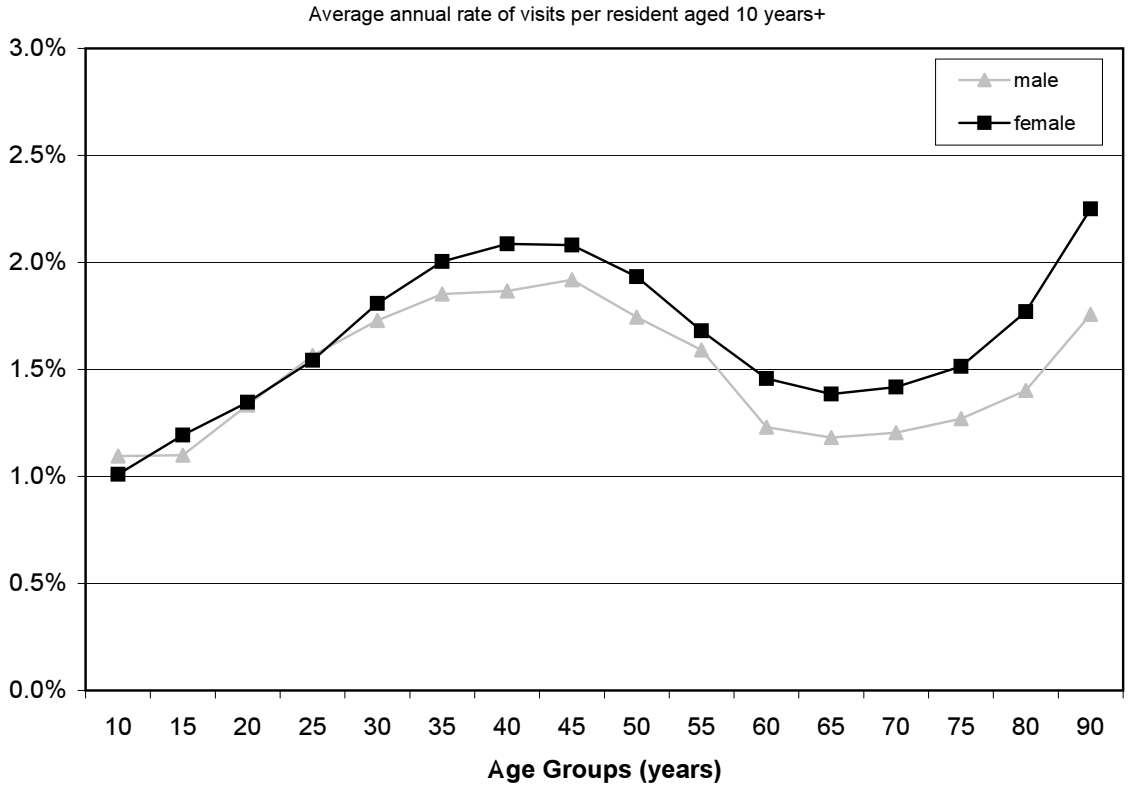


Figure 4.3.4: Visit Rates to All Physicians for Mental Illness Disorders for those With Cumulative Disorders by Income Quintile, 1997/98-2001/02

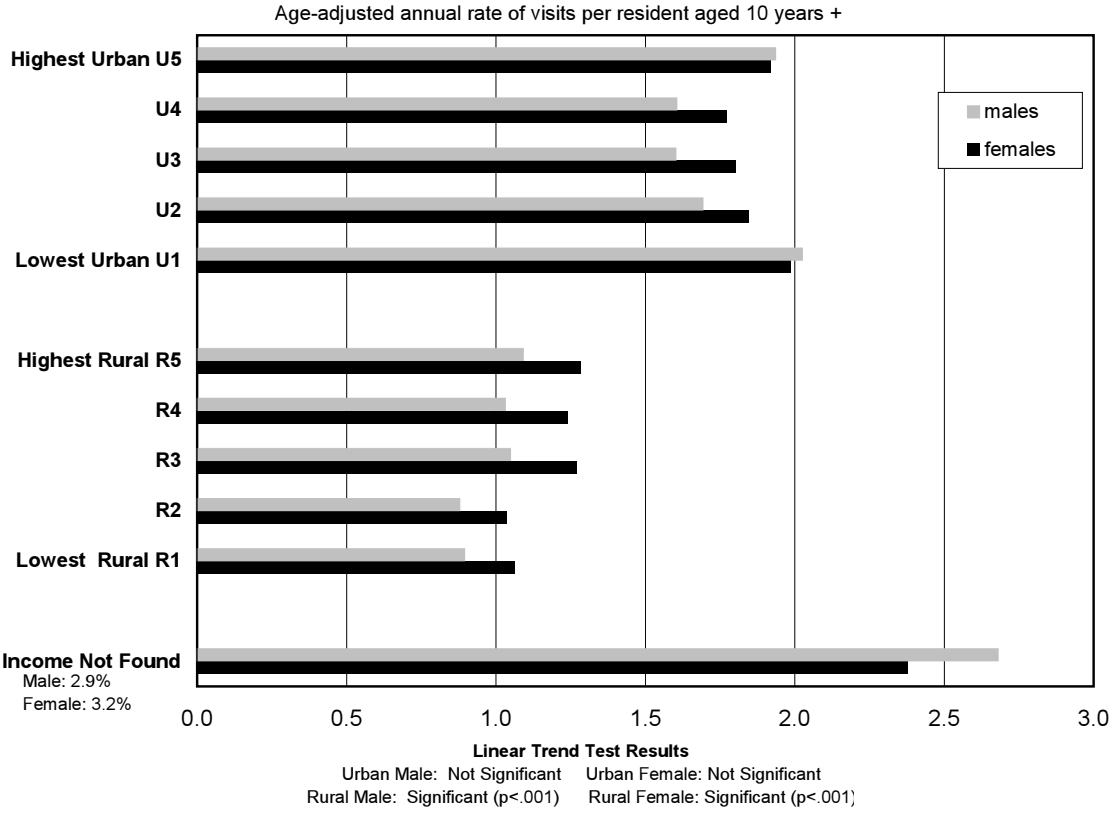


Table 4.3.1: Physician visits 'for' mental illness by specific disorder groups and RHA, 1997/98-2001/02
Age-adjusted annual rate of visits to all physicians for mental illness, per resident aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None *
South Eastman	1.4	1.9	0.9	2.9	3.2	0.3	1.1	0
Brandon	1.6	2.5	1.1	3.0	4.1	0.4	1.3	0
Central	1.2	2.1	0.9	2.3	3.1	0.3	1.0	0
Assiniboine	1.1	1.8	0.8	2.3	2.8	0.4	0.9	0
Parkland	1.2	1.9	1.0	2.9	3.1	0.3	1.0	0
Interlake	1.4	2.2	0.9	2.5	3.0	0.3	1.1	0
North Eastman	1.4	2.3	0.9	2.3	3.4	0.4	1.1	0
Burntwood	1.0	1.6	0.5	2.5	3.0	0.4	0.6	0
Churchill	0.7	1.2	0.3	2.9	0.8	0.3	0.6	0
Nor-Man	1.4	2.1	0.9	3.9	4.3	0.3	1.1	0
Rural South	1.3	2.0	0.9	2.6	3.1	0.4	1.0	0
North	1.2	1.9	0.6	3.2	3.4	0.3	0.8	0
Winnipeg	2.2	3.3	1.6	4.7	5.6	0.4	1.9	0
Manitoba	1.9	2.9	1.3	4.0	4.9	0.4	1.5	0

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	1.5	2.0	1.2	4.0	4.6	0.3	1.3	0
Brandon	1.6	2.6	1.4	4.0	4.8	0.5	1.5	0
Central	1.2	2.0	1.4	2.4	4.0	0.4	1.2	0
Assiniboine	1.3	2.1	1.2	3.8	5.1	0.4	1.2	0
Parkland	1.4	2.0	1.3	3.3	5.0	0.3	1.2	0
Interlake	1.5	2.4	1.2	3.3	4.8	0.3	1.4	0
North Eastman	1.4	2.2	1.2	3.7	4.6	0.3	1.3	0
Burntwood	0.9	1.6	0.5	2.1	2.7	0.3	0.6	0
Churchill	2.8	3.4	1.6	5.7	2.2	0.2	1.8	0
Nor-Man	1.3	1.8	1.1	4.2	3.5	0.3	1.2	0
Rural South	1.4	2.1	1.3	3.3	4.7	0.4	1.3	0
North	1.1	1.7	0.6	3.4	2.9	0.3	0.9	0
Winnipeg	2.1	3.1	1.9	5.6	7.4	0.4	1.9	0
Manitoba	1.8	2.7	1.5	5.0	6.6	0.4	1.6	0

Key findings:

- In the "cumulative disorders" group, females made more visits for mental illness than males (1.7 versus 1.5 visits per year), but the difference between sexes is smaller for mental-health-related visits (8%) than all-cause visits (23%).
- Winnipeg residents in the cumulative disorders group had a higher visit rate than residents of any other RHA, reflecting both the higher physician supply, and the fact that those with severe problems may have moved closer to providers and facilities which provide care.
- In the cumulative disorders group, physician visit rates were highest among the 30-55 year age group, as well as those 80 and older, but lower among young adults.
- Among Rural residents (both males and females), visit rates of those in the "cumulative disorders" group were significantly related to neighbour-

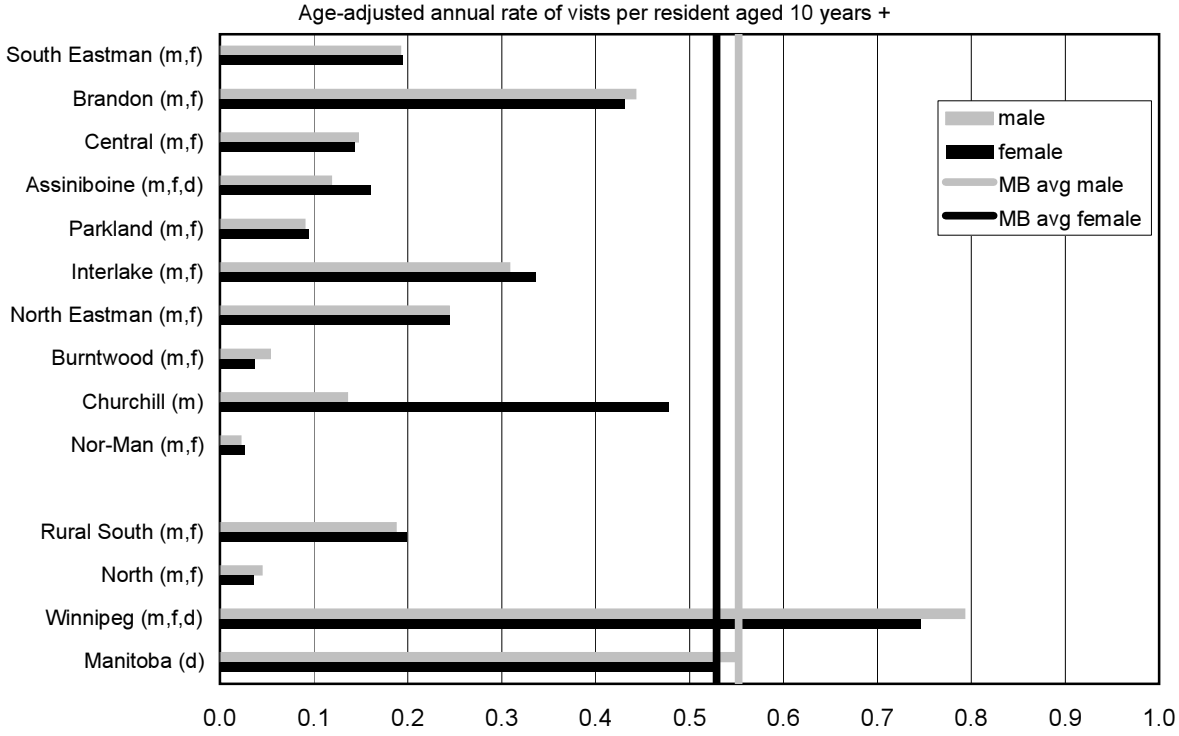
hood income, with residents of lower income areas making *fewer* visits than residents of higher income areas. Among Urban residents (Winnipeg and Brandon), there was no relationship between neighbourhood income and visit rates.

- Those persons with schizophrenia and personality disorders have about three to four times as many physician visits 'for' mental illness reasons compared with the overall "cumulative mental disorders" group (Females: schizophrenia 5.0 visits per person per year, personality disorder 6.6, cumulative disorders group 1.6 visits per person per year. Males: schizophrenia 4.0, personality disorder 4.9, cumulative disorders 1.5 visits per person per year).

4.4 Visits to Psychiatrists "For" Mental illness

Definition: This is the average annual number of ambulatory visits to Psychiatrists only, for which a Mental Health Disorder (ICD-9-CM codes 290-319) was coded as the cause of the visit. In physician claims, only one diagnosis code is recorded; so while more than one issue may be discussed during a single physician visit, the physician must record a single code as 'the cause' for the visit. This analysis includes only those with some indication of a mental health disorder because, by definition, those without any service use for mental health (the "no disorders" group) had no physician visits or hospitalization for mental illness. The rates are age-adjusted to reflect the population of Manitoba. The following figures show visit rates for the "cumulative" and "no" disorders groups by RHA, district, age group, and income quintile (with males and females separated in all graphs). Table 4.4.1 shows visit rates to psychiatrists by the specific disorder groups, for each RHA.

Figure 4.4.1: Visit Rates to Psychiatrists for Mental Illness Disorders for those with Cumulative Disorders by RHA, 1997/98-2001/02



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

Figure 4.4.2: Visit Rates to Psychiatrists for Mental Illness Disorders for those with Cumulative Disorders by District, 1997/98-2001/02

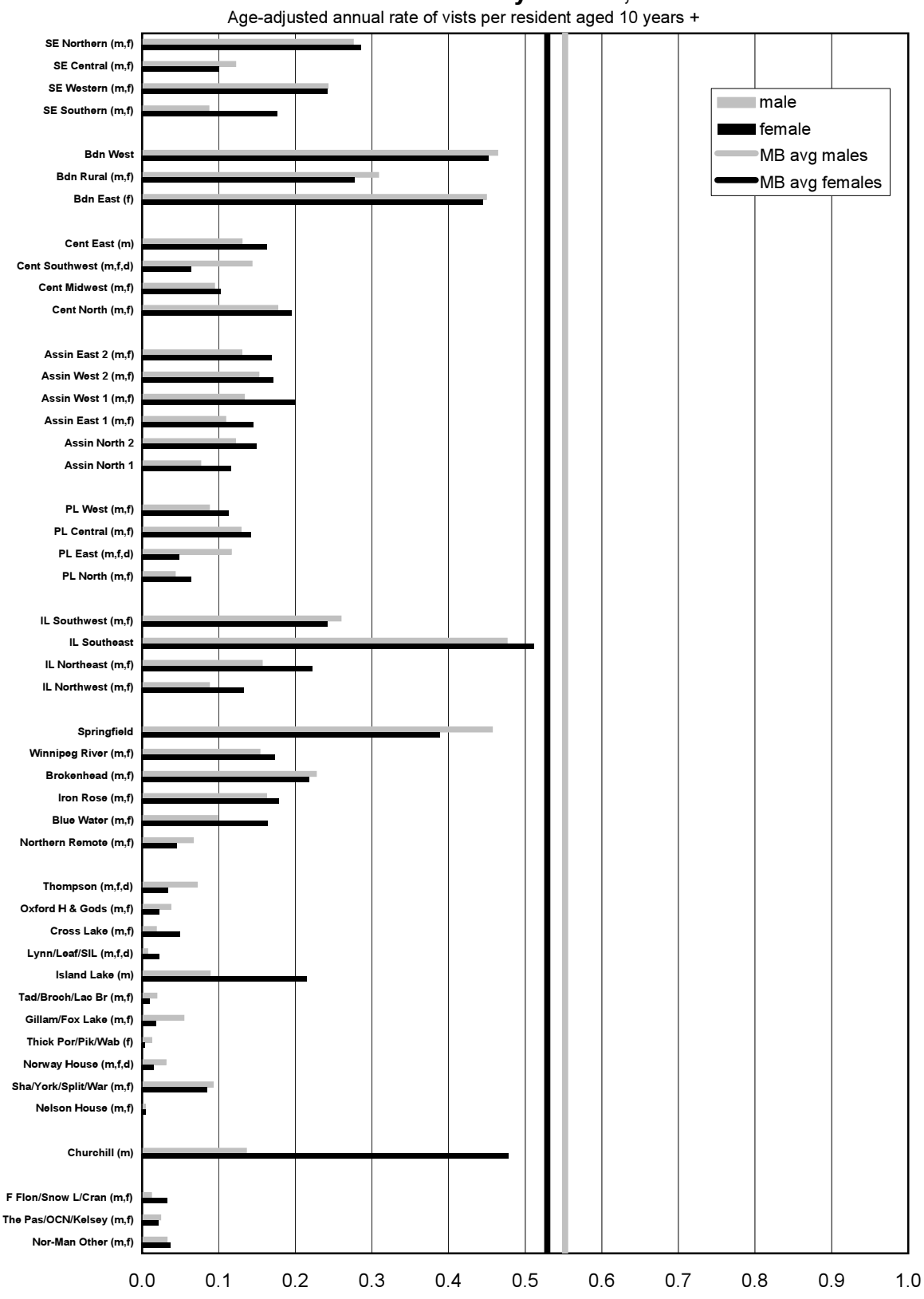


Figure 4.4.3: Visit Rates to Psychiatrists for Mental Illness Disorders for those with Cumulative Disorders by Age and Sex, 1997/98-2001/02

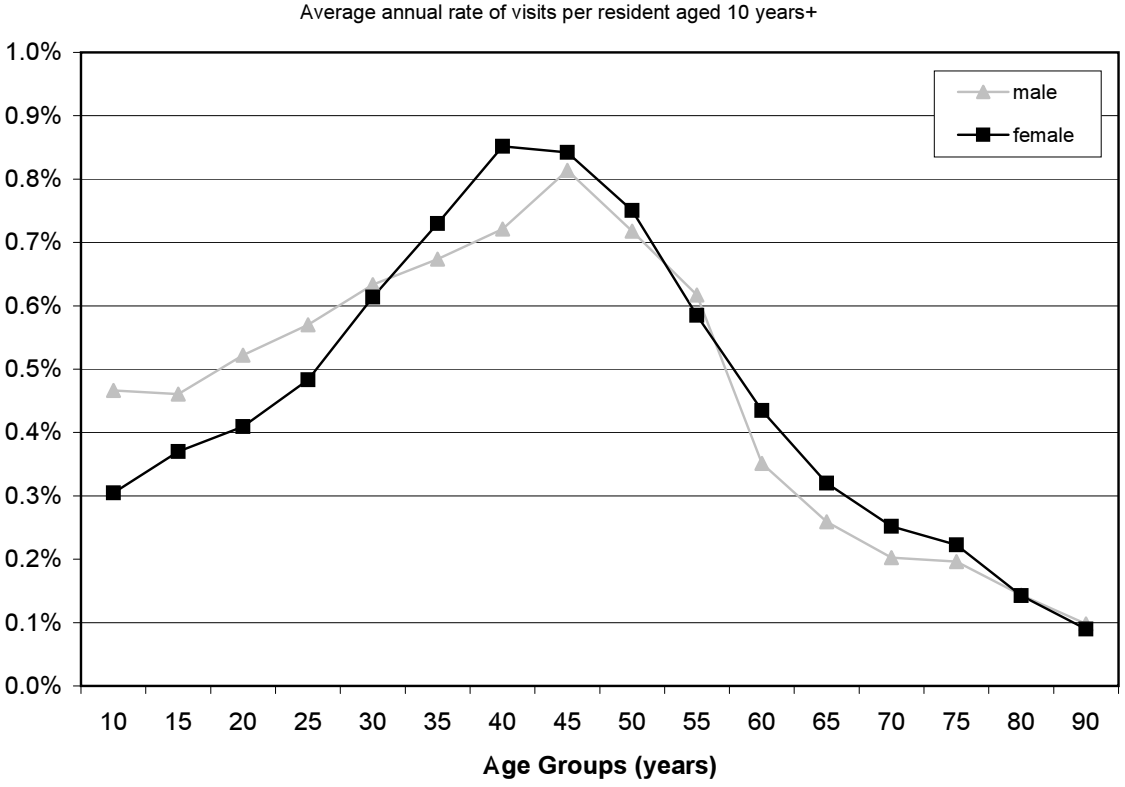


Figure 4.4.4: Visit Rates to Psychiatrists for Mental Illness Disorders for those with Cumulative Disorders by Income Quintile, 1997/98-2001/02

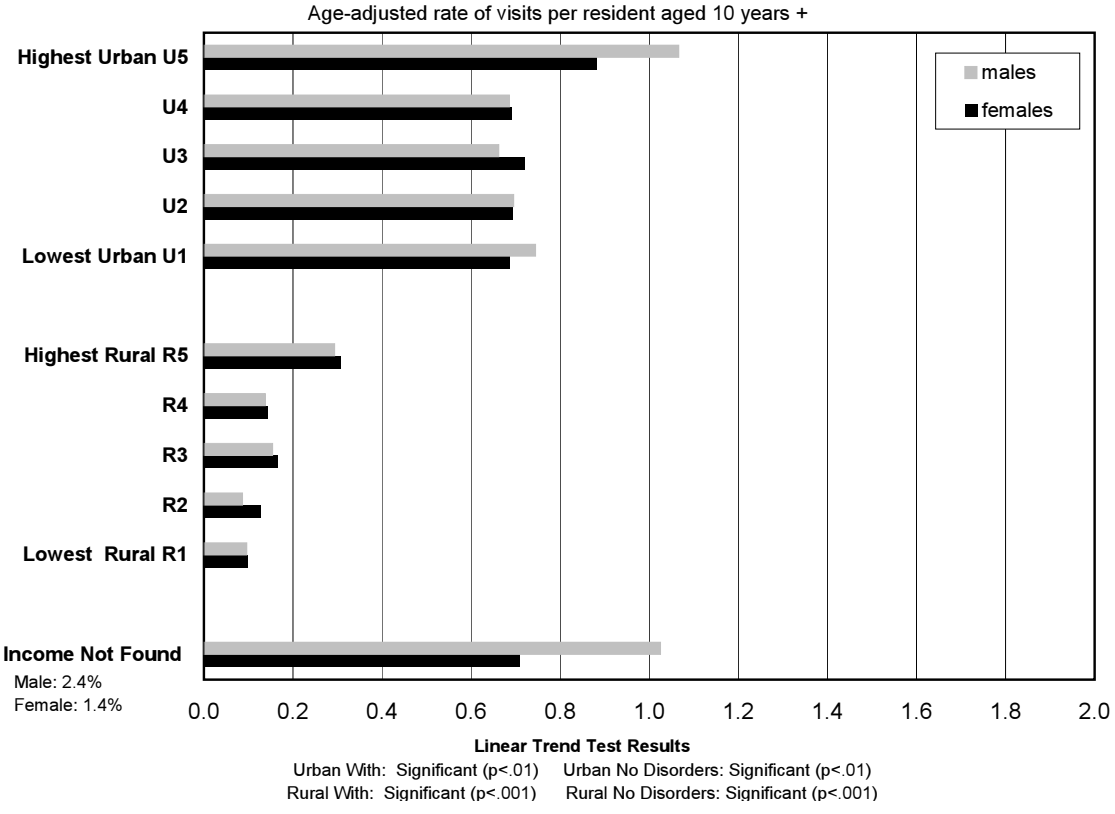


Table 4.4.1: Visits to psychiatrists 'for' mental illness by specific disorder group and RHA, 1997/98-2001/02

Age-adjusted annual rate of visits to psychiatrists for mental illness, per resident aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	0.26	0.30	0.10	1.01	0.76	0.01	0.19	0.00
Brandon	0.59	0.89	0.31	1.21	1.55	0.01	0.44	0.00
Central	0.19	0.29	0.07	0.70	0.77	0.01	0.15	0.00
Assiniboine	0.16	0.25	0.06	0.41	0.70	0.01	0.12	0.00
Parkland	0.12	0.13	0.05	0.33	0.39	0.01	0.09	0.00
Interlake	0.41	0.64	0.14	0.80	1.43	0.01	0.31	0.00
North Eastman	0.33	0.45	0.15	1.03	2.13	0.01	0.24	0.00
Burntwood	0.10	0.15	0.03	0.30	1.28	0.01	0.05	0.00
Churchill	0.18	0.30	0.03	1.37	0.07	0.01	0.14	0.00
Nor-Man	0.03	0.03	0.02	0.25	0.25	0.00	0.02	0.00
Rural South	0.25	0.35	0.10	0.66	0.94	0.01	0.19	0.00
North	0.07	0.10	0.03	0.31	0.69	0.01	0.05	0.00
Winnipeg	0.99	1.44	0.49	2.71	3.38	0.04	0.79	0.00
Manitoba	0.72	1.06	0.31	2.09	2.70	0.03	0.55	0.00

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	0.23	0.27	0.17	0.96	1.38	0.00	0.19	0.00
Brandon	0.50	0.83	0.33	1.30	1.92	0.01	0.43	0.00
Central	0.16	0.23	0.16	0.70	1.13	0.01	0.14	0.00
Assiniboine	0.19	0.35	0.12	1.39	1.31	0.00	0.16	0.00
Parkland	0.11	0.15	0.08	0.43	0.88	0.01	0.09	0.00
Interlake	0.39	0.60	0.24	1.05	2.28	0.00	0.34	0.00
North Eastman	0.29	0.40	0.08	1.08	2.54	0.00	0.24	0.00
Burntwood	0.06	0.10	0.02	0.25	0.49	0.00	0.04	0.00
Churchill	0.71	0.78	0.45	2.16	0.95	0.00	0.48	0.00
Nor-Man	0.04	0.04	0.02	0.24	0.20	0.00	0.03	0.00
Rural South	0.23	0.33	0.15	0.88	1.55	0.01	0.20	0.00
North	0.06	0.07	0.03	0.35	0.39	0.00	0.04	0.00
Winnipeg	0.86	1.24	0.62	3.41	4.70	0.02	0.75	0.00
Manitoba	0.62	0.91	0.39	2.67	3.79	0.01	0.53	0.00

Key findings:

- The sex differences for visits to psychiatrists showed mixed results. For the "cumulative disorders" group:
  - Males made 4% more visits to psychiatrists than females provincially—the opposite of findings for other visit rates.
  - However, among RHAs, the sex difference was significant only among residents of Winnipeg (males higher) and Assiniboine RHA (females higher). For all other RHAs, the rates for males and females were not different from each other.
- Winnipeg residents in the "cumulative disorders" group had a much higher psychiatrist visit rate than residents of any other RHA, possibly reflecting both the higher psychiatrist supply, and the fact that those with severe problems may have moved closer to providers and facilities which provide care.
- Psychiatrist visit rates appear particularly low among those in the "cumulative disorders" group in Burntwood and Nor-Man RHAs, possibly reflecting limited access.
- Visit rates to psychiatrists were highest among those people aged 35-50 years, and lower among young adults and seniors.
- Among both Urban and Rural residents (males and females) in the "cumulative disorders" group, visit rates were significantly related to neighbourhood income, with residents of higher income areas making *more* visits to psychiatrists than residents of lower income areas.

Canadian comparisons:

- Kessler et al. reported that 8% of 15-54 year-old Ontarians had obtained outpatient psychiatric treatment in the previous 12 months. Their definition of outpatient services included a variety of providers (physicians, mental health workers, etc). They reported that visit rates among users averaged 14-17 visits depending on level of comorbidity. About half the visits were to a 'general medical' sector, and half to a 'mental health specialist' sector. *In our report, visit rates 'for' mental illness were much lower (about 1.7 for females and 1.5 for males), but the administrative data include only visits to physicians (not mental health workers, social workers, etc.).*
- Lin et al. (1996) noted that young adults were less reluctant to seek mental health services, so they sought services more often. *In our data, it appears as if the most frequent users of psychiatrists were the 35-55 year olds, with lower rates for both young adults, and extremely low rates for people aged 60 or more. The most frequent users of all physicians for mental illness reason were still the 35-55 year olds, but also the people aged 80 or more.*

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CHAPTER 5: USE OF HOSPITAL AND MENTAL HEALTH CENTRE SERVICES

5.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

This chapter provides information on the use of acute care hospital and mental health centre services, including hospitalizations, days of stay in hospital, and causes of hospitalizations. Data for acute care hospitals include use of 'general' acute beds as well as beds specifically dedicated for psychiatric patients. The rates shown in graphs and tables have been age-adjusted to allow comparisons across regions. Crude rates and actual observed numbers for each of the indicators are available in Appendix 2 (and on-line at MCHP's website). For Churchill, hospital data include both hospital patients and patients considered to be personal care home (PCH) residents, because the data files do not code a separate PCH in Churchill.

This chapter contains information on several indicators of hospital and mental health centre service use:

Part 1) Hospital Use for All Causes (Acute Care facilities only)
- Section 5.2: All-Cause Hospital Separation Rates
- Section 5.3: Days used in Short Stays (0-29 days, all-causes)
- Section 5.4: Days used in Long Stays (30+ days, all causes

Part 2) Hospital Use for Mental Illness (Acute Care and Mental Health Centres)
- Section 5.5: Separations for Mental Illness Disorders
- 5.5.1: Separations from acute hospitals for Mental Illness Disorders
- 5.5.2: Separations from mental health centres for Mental Illness Disorders
- Section 5.6: Days used in Short Stays (0-29 days) for Mental Illness Disorders)
- 5.6.1 Days used in short-stays in acute hospitals
- 5.6.2 Days used in short-stays in mental health centres
- Section 5.7: Days used in Long Stays (30+ days) for Mental Illness Disorders
- 5.7.1 Days used in long-stays in acute hospitals
- 5.7.2 Days used in long-stays in mental health centres

Within each of these sections, separate results are provided for males and females, by RHA, district, age group, and by neighbourhood income quintile. The graphs show results for the "cumulative disorders" and "no disorders" groups; a table lists values for individual disorder groups (e.g. depression, anxiety disorders, and so on). For further explanation of the "cumula-

tive disorders" group, refer to Chapters 1 and 2. Section 5.2 also provides an analysis of hospital separations by cause and sex.

Use of 'dedicated' psychiatric beds in acute hospitals cannot be separated in the data files.

In Winnipeg, use of psychiatric wards at St. Boniface Hospital (McEwen) and Health Sciences Centre (PsycHealth) is coded with the acute care hospital, as they are not separate mental health centres. This also applies to rural acute facilities which have dedicated psychiatric beds. Therefore, rates shown for acute hospital use and mental health centre use must be considered together to provide the complete picture of service use for mental illness.

Mental health centre (MHC) indicators *were not subjected to statistical testing due to concerns about the accuracy and completeness of data* in the Mental Health Management Information System (refer to Chapter 3). The Brandon Mental Health Centre was closed just after the start of the study period used in this report, but use of that facility is included in these analyses. People with more serious mental illnesses may be more prone to move closer to MHCs for purposes of ongoing treatment. This could be one explanation for rates of service use being higher among residents of areas containing MHCs, since people could be present or former residents of the facility, or could be receiving ongoing outpatient services from these facilities.

Example: Central and Assiniboine RHAs

The populations of Central and Assiniboine RHAs are among the healthiest in the province, but there are some notable differences in their use of hospitals. The *RHA Indicators Atlas* report (Martens et al., 2003) showed that Assiniboine had a somewhat higher supply of hospital beds, and a correspondingly higher hospitalization rate. The same basic result is shown in Figures 5.2.1 through 5.4.3: males and especially females from Assiniboine have higher than average all-cause hospital separation rates and short-stay days. Interestingly, the rates of long-stay days are similar for Central and Assiniboine RHAs.

The more interesting comparison is between these RHAs' rates of hospitalization 'for' mental illness. Looking at both hospital separations and short-stay days used for mental illness, the rates for Assiniboine residents are much higher than those for residents of Central. Long stay days rates for males are similar, though women from Central used fewer long-stay days than women from Assiniboine. An obvious place to look for an explanation for this difference is in the use of Mental Health Centres (MHCs). *One needs to be cautious here, given the validity issues of the MHMIS data reporting system upon which the use of MHCs are based (see Chapter 3 for a full explanation of this)*. However, Figure 5.5.2.a reveals that Central residents have much higher separation (i.e. discharge) rates and short-stay days in MHCs—and this is most likely in the Eden MHC, located in Central RHA. Brandon MHC closed in 1998, and

was not available to residents of the western RHAs for inpatient care. However, a closer look reveals that this explains only about one-third of the difference: Compared to Assiniboine residents, Central residents had about 20 fewer separations per 1,000 in acute hospitals, yet only seven more separations per 1,000 in MHCs. So Assiniboine residents may still be hospitalized for mental illness more often than residents of Central.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Why are the hospitalization rates for mental illness higher or lower in one RHA compared to other RHAs? Could this simply reflect a difference in physician coding practices (more likely to record a mental illness as the most responsible diagnosis)?*
- *What is the difference in the mental health care received between acute care hospitals and mental health centres, and is the lack of mental health centre inpatient services a problem in some areas of the province (or are community services adequate for those people who would be hospitalized in different RHAs of the province?)*
- *Is the higher use of mental health care services in some RHAs simply a migration effect—that is, people who require frequent contact with mental health services choose to live closer to such facilities?*
- *Is the higher use of acute care hospitals for mental illness reasons possibly driven by the fact that people choose to stay closer to home/family rather than live in a place with a mental health centre?*
- *Comparing different health services, such as acute care hospitals, mental health centres, home care and personal care homes, are there "replacement effects" in different RHAs where one RHA may preferentially use the type of health care service most readily available? Is the use of long-stay acute care hospital days appropriate, or are home care/PCH options preferable for mental health clients?*

Overall Key Findings: Hospital Services

- Males and females in the "cumulative disorders" group were hospitalized more often than those in the "no disorders" group. For females, the rate was double (301 versus 152 separations per thousand per year). For males, the rate 2.5 times higher (248 versus 102 separations per thousand per year).
- Those with mental illness were also 'physically sicker': hospitalization rates for every physical illness for the "cumulative disorders" group were near double those of the "no disorders" group.
- Among the "cumulative disorders" group, hospitalization 'for' mental illness accounted for only 13% of male and 8% of female hospitalizations.
- Those in the "cumulative disorders" group used short-stay days in acute care facilities at more than double the rate of those in the "no disorders" group. For long-stay days, the rate difference was even higher: four-fold

for females, and almost seven-fold for males.

- For all-cause hospital use, females in the "cumulative disorders" group had higher separation rates, similar rates of short-stay days, and lower rates of long-stay days than males.
- For hospitalizations 'for' mental illness, males in the "cumulative disorders" group had higher rates of separations, short-stay days and long-stay days than females.
- The 'total burden' on the acute hospital system attributable to mental illness is high:
  - Males in the "cumulative disorders" group used 36.7% of all separations, despite comprising only 19% of the male population. They also used 41.3% of all short-stay hospital days, and 52.3% of all long-stay days.
  - Females in the "cumulative disorders" group used 44.1% of all separations, despite comprising only 29% of the female population. They also used 47.1% of all short-stay hospital days, and 51.7% of all long-stay days.
  - These rates were even higher among residents of Burntwood RHA, where 57% of hospital separations, 58% of short-stay days, and 60% of long-stay days were attributed to mental illness.
- The percentage of all hospital separations which were 'for' mental illness varied considerably by RHA. Of those in the "cumulative disorders" group, 9.5% of their hospital separations were 'for' mental illness, but this is much higher in Brandon (12.5%), Assiniboine (11.1%), Parkland (10.0%) and Churchill (15.1%), with the first three likely reflecting high use of acute care facilities among former residents of the Brandon Mental Health Centre. (This includes use of dedicated psychiatric beds in acute hospitals.)
- From the population-based perspective, use of the provincial mental health centres adds relatively few hospital separations and short-stay days, but almost doubles the rates of use of long-stay days. However, these findings must be viewed with caution due to the data limitations of the MHMIS system.
- Compared to the overall "cumulative disorders" rate, those persons with schizophrenia or personality disorders have a much higher all-cause and mental-illness-related use of acute care hospitals, and a much higher use of mental health centres.

Canadian comparisons:

- Parikh et al. (1996), focusing on mood disorders, found that urban residents used more outpatient (physician and other) services than rural residents, but rural residents used more inpatient (hospital) services. *Our analyses show exactly the same results, and this is true of both 'all-cause' service use, as well as use for mental illness.*

Part 1) Hospital Use for All Causes (Acute care facilities only)

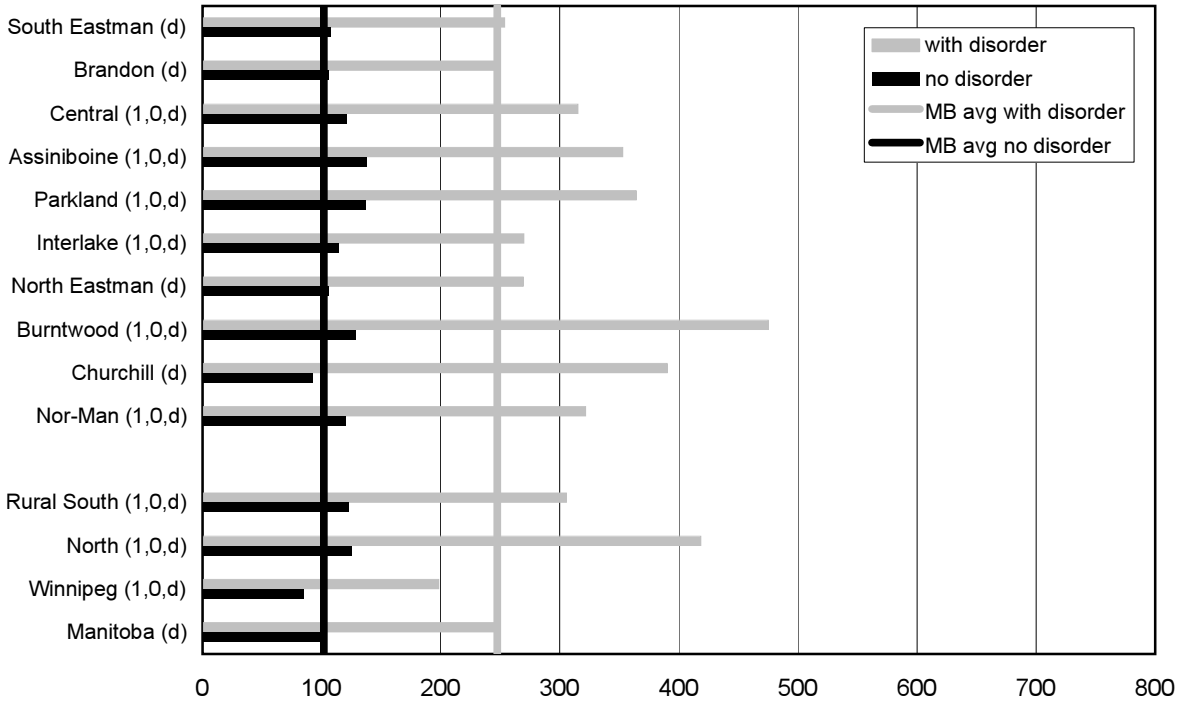
5.2 All-Cause Acute Care Hospital Separation Rates

Definition: This is the number of hospitalizations in acute care hospitals, for any cause, per thousand residents of the area. This does not include the use of Mental Health Centres, which is shown in Sections 5.5-5.7. This rate does include both inpatient and outpatient hospitalizations, regardless of the location of the hospital. Multiple admissions for a single person are counted as multiple events. These rates are age-adjusted to reflect the population of Manitoba. The first eight figures in this section show all-cause separations by sex, RHA, district, age and neighbourhood income quintile groups. Figure 5.2.9 shows hospitalization rates by sex and cause, illustrating the proportion of all-cause hospitalizations which were 'for' various causes (showing the top 10).

Table 5.2.1 shows the all-cause hospital separation rates by people in each of the specific mental disorder groups, and by RHA. Table 5.2.2 shows what proportion of all hospital separations were attributed to members of the "cumulative disorders" and "cumulative + other disorders" cohorts, by RHA, reflecting use of acute care facilities for all causes. Table 5.2.3 shows the proportion of hospitalizations which were 'for' mental illness, by RHA.

Figure 5.2.1: All-Cause Hospital Separations for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.2.2: All-Cause Hospital Separations for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +

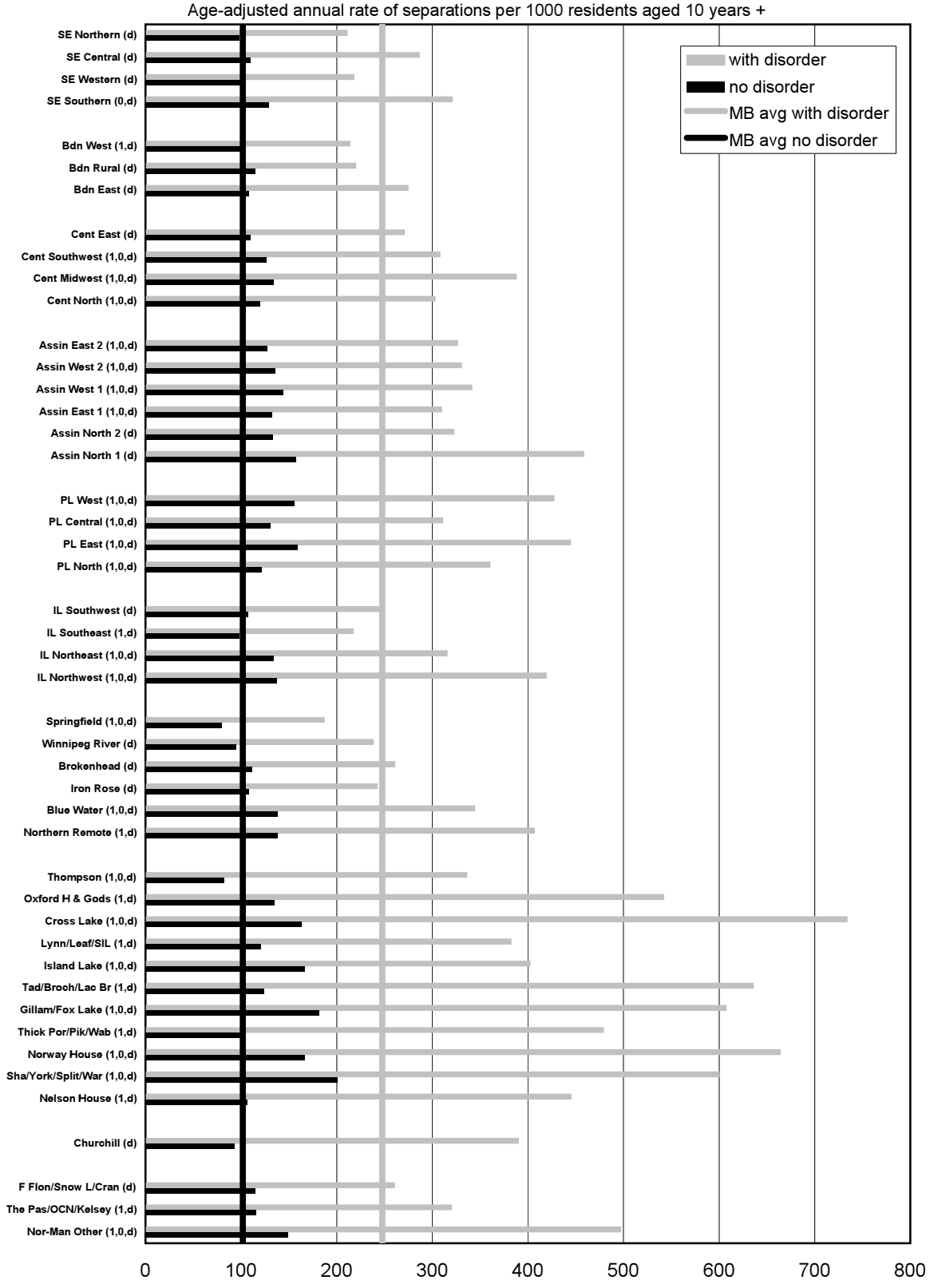


Figure 5.2.3: All-Cause Hospital Separations for Males With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

Annual average rate of separations per 1000 residents aged 10 years +

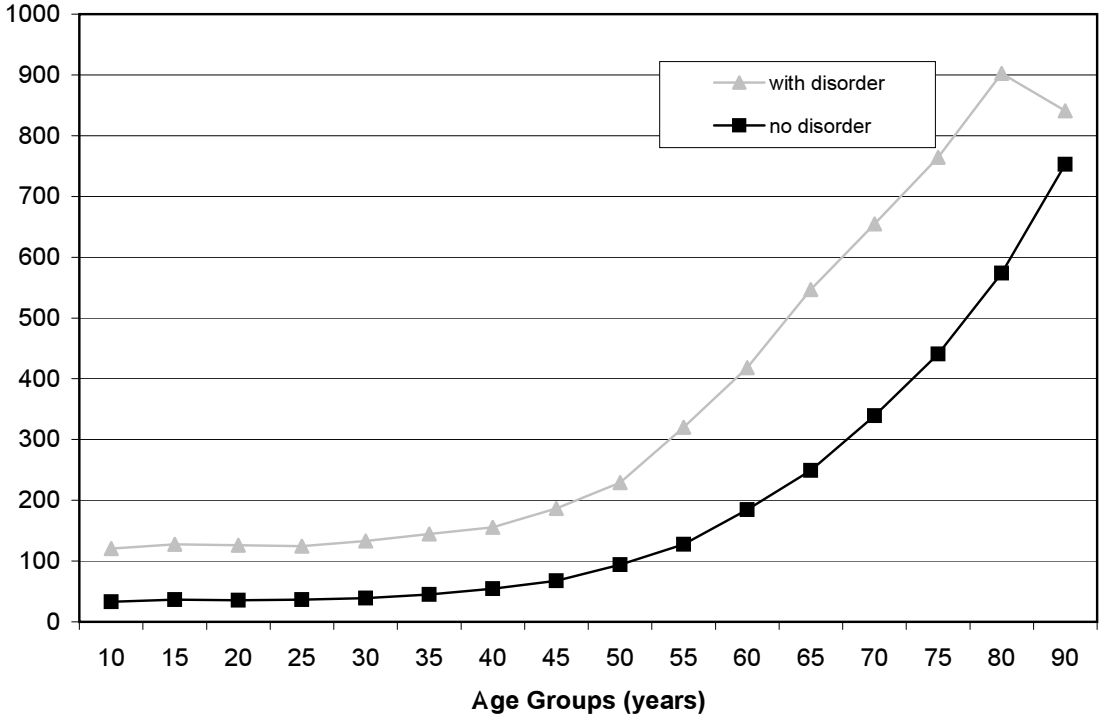
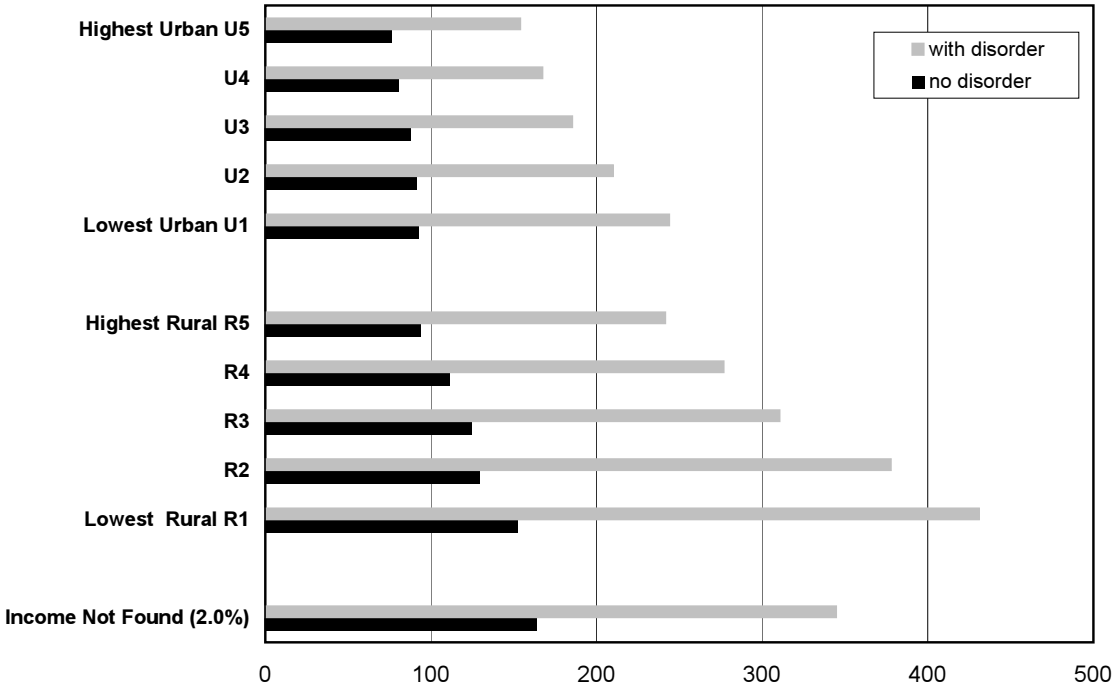


Figure 5.2.4: All-Cause Hospital Separations for Males With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +

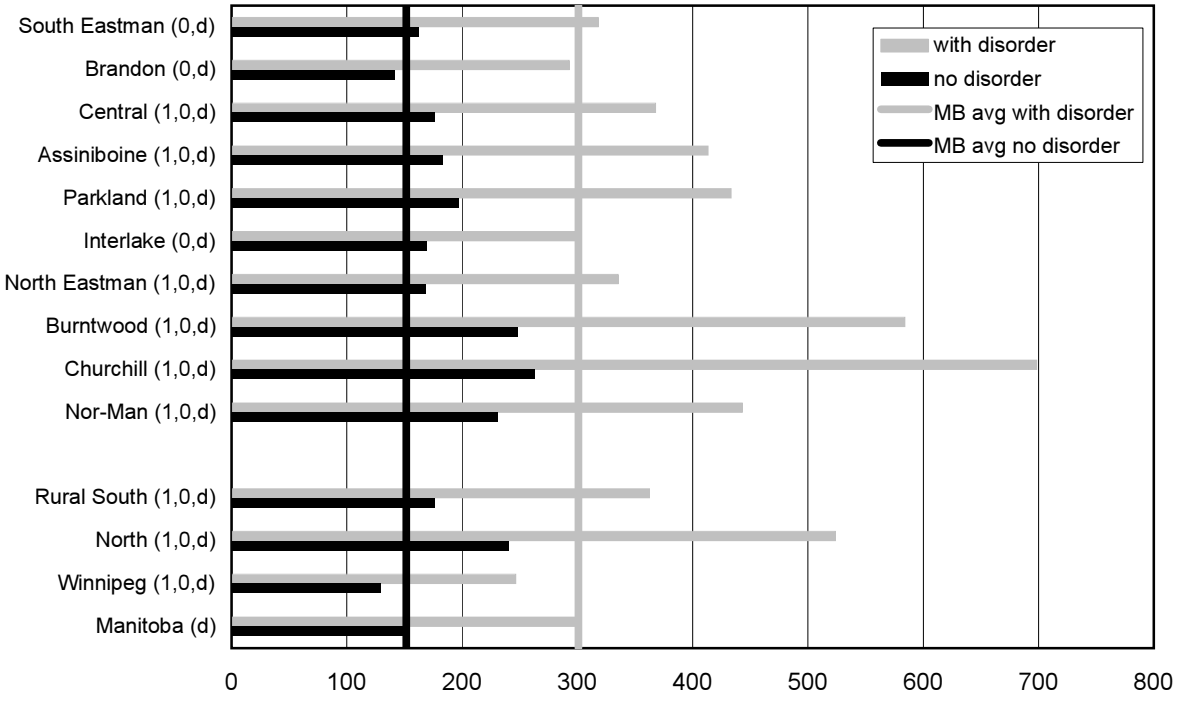


Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Significant (p<.01)
Rural With: Significant (p<.001) Rural No Disorders: Significant (p<.001)

Figure 5.2.5: All-Cause Hospital Separations for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.2.6: All-Cause Hospital Separations for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +

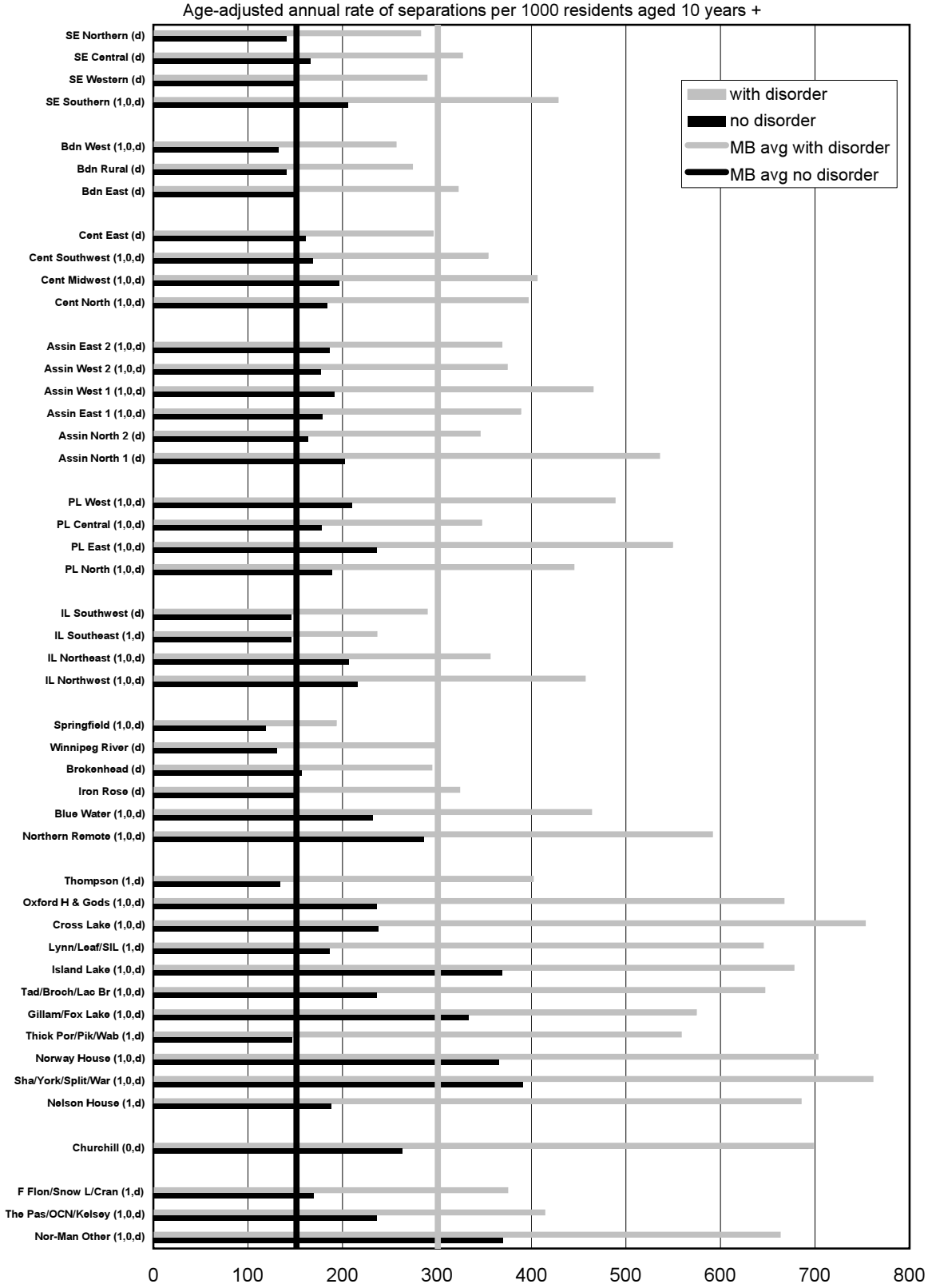


Figure 5.2.7: All-Cause Hospital Separations for Females With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

Annual average rate of separations per 1000 residents aged 10 years +

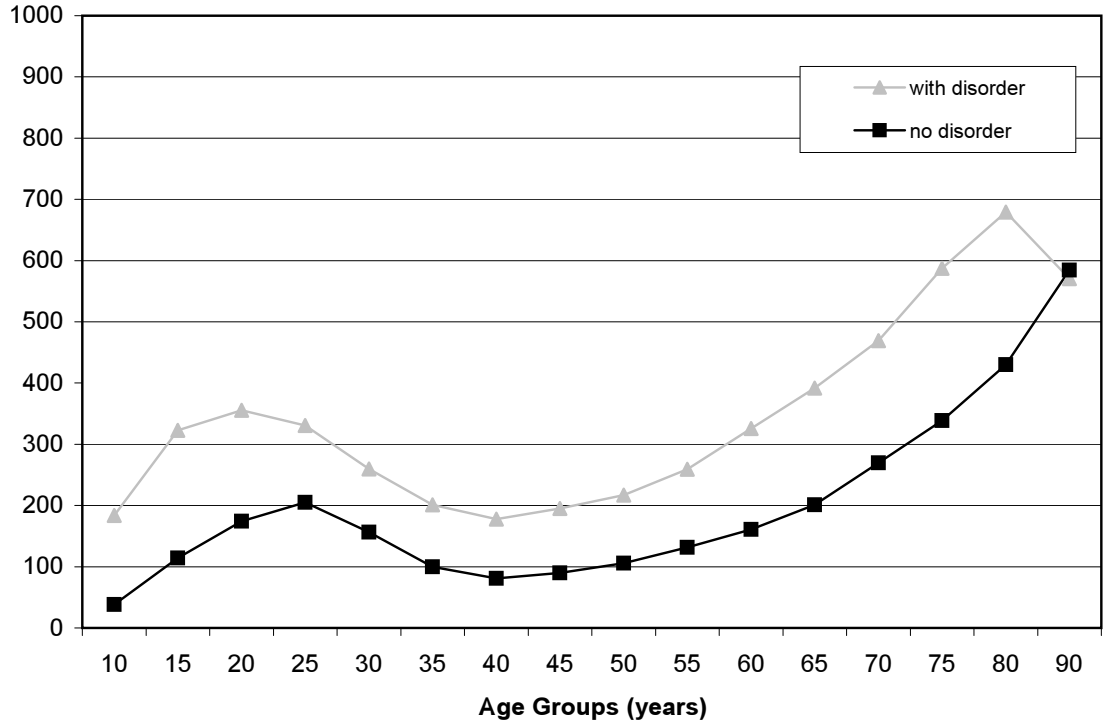
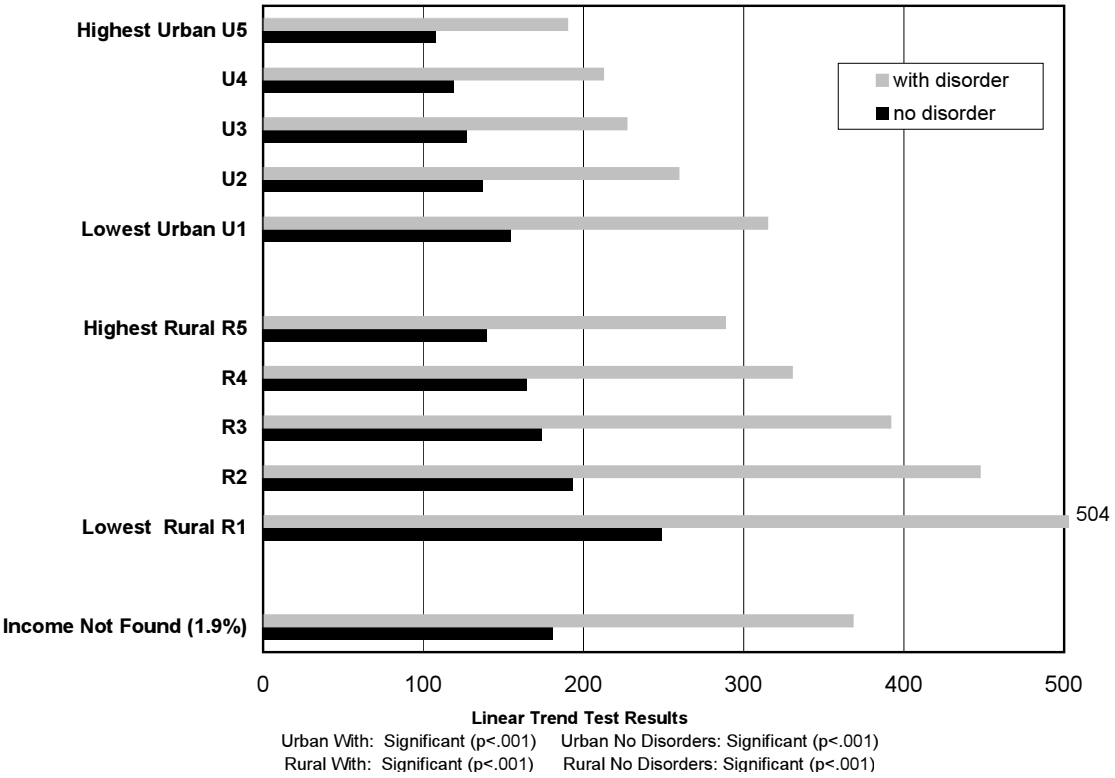


Figure 5.2.8: All-Cause Hospital Separations for Females With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +



Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Significant (p<.001)
Rural With: Significant (p<.001) Rural No Disorders: Significant (p<.001)

Figure 5.2.9: All-Cause Hospital Separation Rates by Sex and Cause (ICD-9-CM)
Cumulative Disorders vs. No Disorders, 1997/98-2001/02

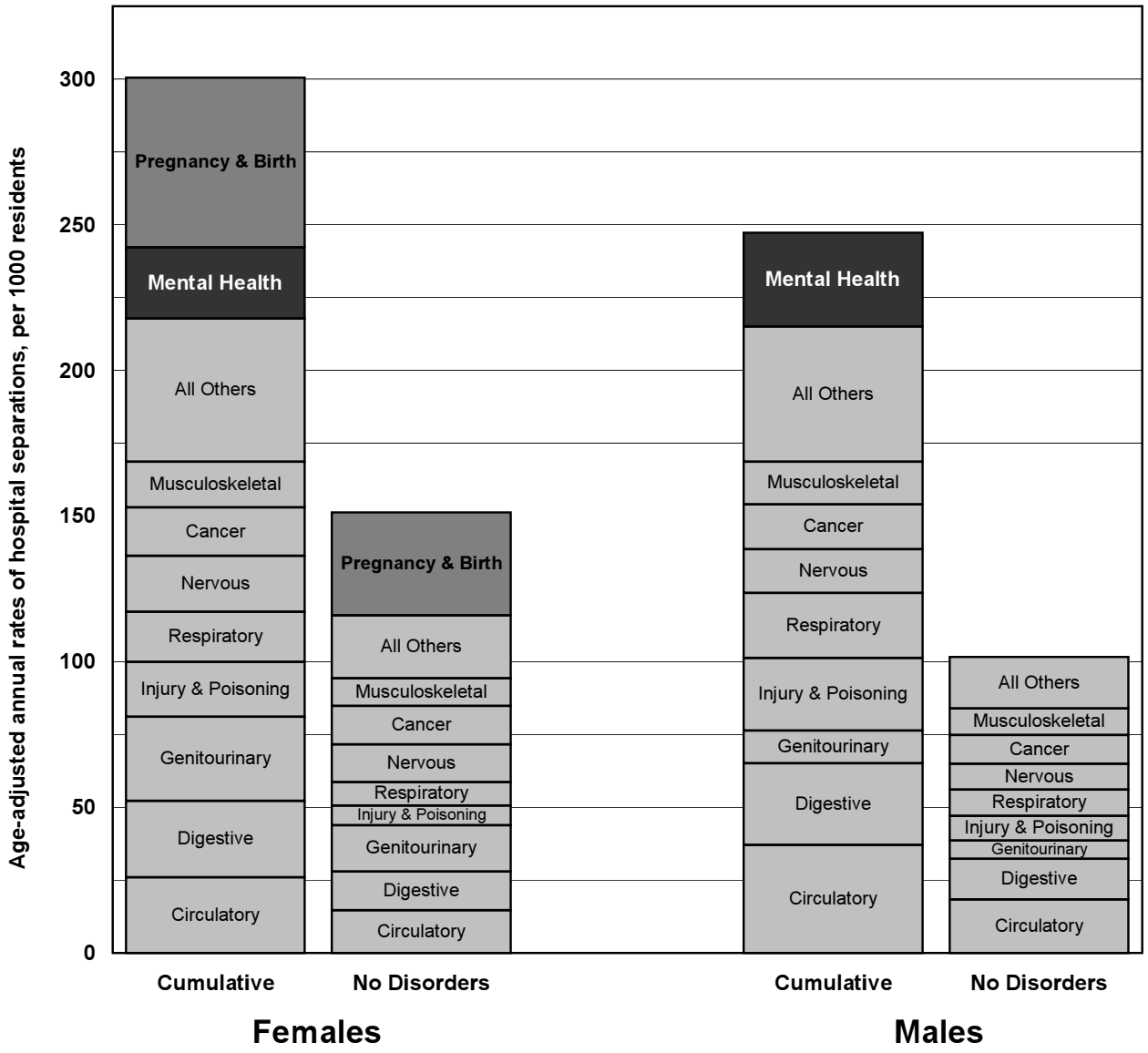


Table 5.2.1: All-Cause hospital separation rates by specific disorder groups and RHA, 1997/98-2001/02
Age adjusted annual rate of separations per 1000 residents aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	273	308	273	335	500	173	254	108
Brandon	268	293	293	360	584	152	245	106
Central	320	386	372	328	491	209	315	121
Assiniboine	374	426	436	404	708	227	353	138
Parkland	376	434	462	443	760	233	364	137
Interlake	264	277	349	285	428	177	270	114
North Eastman	271	270	349	300	362	175	269	106
Burntwood	452	517	554	392	838	205	475	128
Churchill	498	223	398	304	211	248	390	92
Nor-Man	327	273	420	608	747	188	322	120
Rural South	314	353	376	347	563	202	306	122
North	399	381	516	463	779	196	418	125
Winnipeg	207	187	271	330	383	123	198	85
Manitoba	253	250	332	345	453	151	248	102

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	327	388	406	507	583	210	318	163
Brandon	303	352	380	510	690	195	293	141
Central	371	470	486	362	787	265	368	176
Assiniboine	428	522	559	674	1278	268	413	183
Parkland	448	538	617	576	1048	286	433	197
Interlake	304	360	389	449	509	227	301	169
North Eastman	340	377	439	413	647	246	335	168
Burntwood	569	624	707	733	1204	357	584	248
Churchill	860	787	714	477	450	521	698	263
Nor-Man	452	446	571	571	804	299	443	231
Rural South	370	451	480	483	819	254	363	177
North	514	513	673	637	1035	318	524	240
Winnipeg	254	259	356	415	512	179	246	130
Manitoba	303	333	437	451	603	207	301	152

Table 5.2.2: Percentage of all-cause hospital separations attributed to cohort members by RHA, 1997/98-2001/02

RHA	Males		Females		Males + Females	
	% of total seps for all males attributed to **Cumulative**	% of total seps for all males attributed to **Cumulative + Other**	% of total seps for all females attributed to **Cumulative**	% of total seps for all females attributed to **Cumulative + Other**	% of total seps for all residents attributed to **Cumulative**	% of total seps for all residents attributed to **Cumulative + Other**
South Eastman	33.6%	49.3%	42.4%	57.5%	38.9%	54.3%
Brandon	35.4%	51.3%	46.5%	61.5%	42.2%	57.6%
Central	33.0%	47.4%	40.7%	54.7%	37.7%	51.8%
Assiniboine	32.4%	46.1%	43.3%	56.9%	38.6%	52.3%
Parkland	32.1%	48.9%	43.4%	60.1%	38.6%	55.4%
Interlake	33.5%	46.2%	39.8%	53.4%	37.1%	50.3%
North Eastman	33.2%	46.7%	41.6%	55.8%	38.2%	52.1%
Burntwood	56.2%	62.8%	57.9%	64.8%	57.3%	64.1%
Churchill	52.5%	67.2%	41.5%	54.5%	45.3%	58.8%
Nor-Man	39.4%	53.1%	47.6%	63.1%	44.9%	59.8%
Rural South	32.9%	47.2%	41.8%	56.2%	38.1%	52.5%
North	50.5%	59.6%	54.0%	64.0%	52.8%	62.5%
Winnipeg	38.3%	53.7%	44.1%	60.4%	41.9%	57.9%
Manitoba	36.7%	51.3%	44.1%	59.1%	41.3%	56.1%

Table 5.2.3: Percentage of all-cause hospital separations 'for' mental illness by cohort groups and RHA, 1997/98-2001/02

RHA	Males			Females			Males + Females		
	Cumulative	**Other**	**All males**	**Cumulative**	**Other**	**All females**	**Cumulative**	**Other**	**All residents**
South Eastman	9.4%	2.1%	3.5%	6.5%	0.9%	2.9%	7.5%	1.4%	3.1%
Brandon	18.7%	2.2%	6.9%	9.5%	1.7%	4.7%	12.5%	1.9%	5.6%
Central	10.2%	3.0%	3.8%	6.4%	2.1%	2.9%	7.7%	2.5%	3.2%
Assiniboine	12.4%	3.2%	4.4%	10.4%	2.7%	4.9%	11.1%	2.9%	4.7%
Parkland	12.6%	3.3%	4.6%	8.7%	2.3%	4.2%	10.0%	2.7%	4.3%
Interlake	9.2%	2.2%	3.4%	6.1%	1.4%	2.6%	7.3%	1.7%	2.9%
North Eastman	8.9%	2.6%	3.3%	6.7%	1.7%	3.0%	7.5%	2.0%	3.1%
Burntwood	12.3%	2.0%	7.1%	5.8%	0.8%	3.4%	8.0%	1.2%	4.7%
Churchill	18.8%	0.0%	9.9%	12.6%	1.3%	5.4%	15.1%	0.8%	6.9%
Nor-Man	14.8%	1.3%	6.0%	6.5%	0.9%	3.2%	8.9%	1.0%	4.1%
Rural South	10.6%	2.8%	3.9%	7.7%	2.0%	3.5%	8.7%	2.3%	3.7%
North	13.1%	1.6%	6.7%	6.1%	0.8%	3.4%	8.4%	1.1%	4.5%
Winnipeg	13.7%	1.9%	5.5%	8.0%	1.5%	3.8%	9.9%	1.6%	4.4%
Manitoba	12.7%	2.3%	5.0%	7.8%	1.6%	3.7%	9.4%	1.9%	4.2%

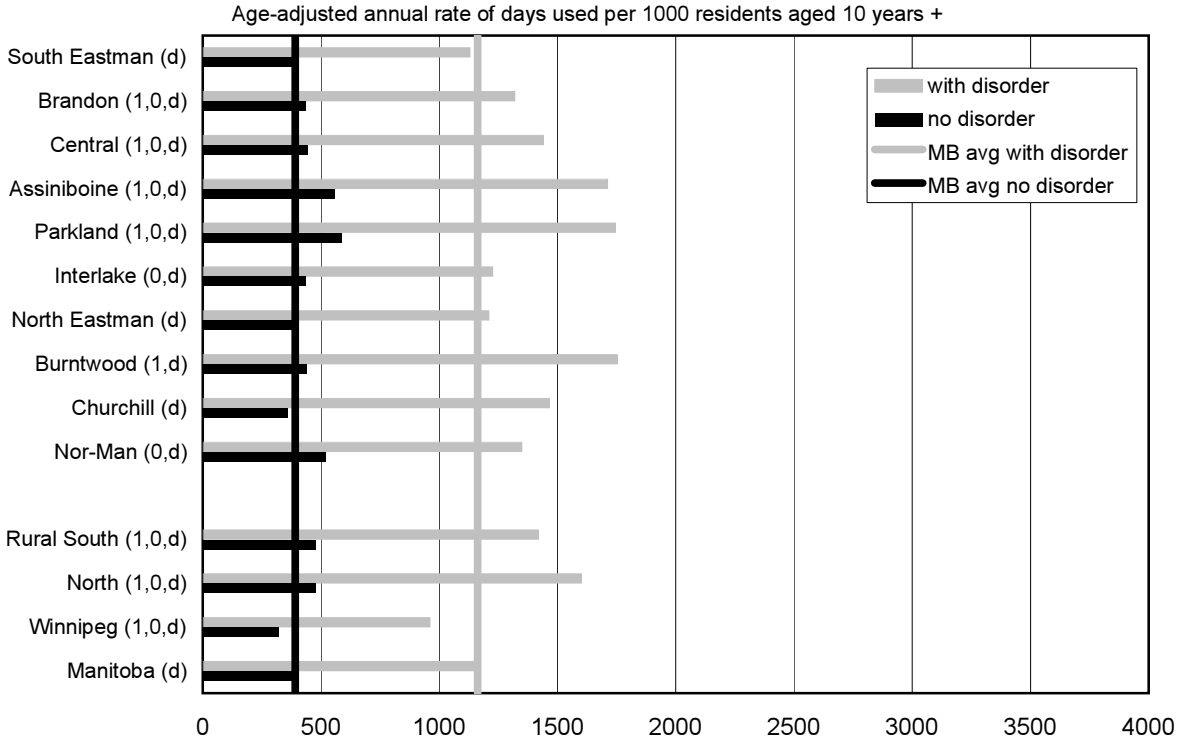
Key findings:

- Residents in the "cumulative disorders" group were hospitalized much more frequently than those in the "no disorders" group. This held for residents of all RHAs and districts in Manitoba. For females, the rate was double (301 versus 152 separations per thousand per year). For males, the rate was two and a half times higher (248 versus 102 separations per thousand per year).
- On average, women were hospitalized more often than men, for both those with "cumulative disorders" (301 versus 248 separations per thousand per year) and those with "no disorders" (152 versus 102 separations per thousand per year), but this was mostly attributable to pregnancy and birth. Among the "cumulative disorders" group, women were actually hospitalized less often than men if pregnancy and births are excluded (242 versus 248 separations per thousand per year).
- Among males, hospitalization rates rose dramatically with age, for both those in the "cumulative" and "no" disorders groups. Among females, hospitalization rates were low for young women, high during the early reproductive years (ages 20-34), lower for middle-aged women, and highest for older adults. Trends were parallel for those with and without mental illness, though the actual rates were much higher for those with disorders.
- Residents of lower neighbourhood income areas are hospitalized more frequently, in keeping with their overall poorer health status. This trend occurs in both sexes, in Rural and Urban income quintiles, and for those in the "cumulative" and "no" disorders groupings.
- Residents with a "cumulative mental illness" were also 'physically sicker': the higher hospitalization rates for those with mental illness were not just caused by their mental health concerns. Their hospitalization rates were near double those of people without mental illness for almost every 'cause' of illness (e.g. Respiratory, Circulatory, etc). In fact, hospitalizations 'for mental disorders' accounted for only 8% of all hospitalizations for females and 13% for males in the "cumulative disorders" group, reflecting the high burden of physical illness among those with a cumulative mental disorder.

5.3 All-Cause Acute Care Hospital Days Used in Short Stays (0-29 days)

Definition: This is the number of short-stay days used per thousand residents per year for short-stays, for any diagnosis and regardless of hospital location. Short stays are defined as stays less than 30 days. These rates are age-adjusted to reflect the population of Manitoba. The figures show the rates by RHA and district for males and females. Table 5.3.1 shows the all-cause short-stay days rates for each of the specific disorder groups, by RHA. Table 5.3.2 shows what proportion of short-stay days for all causes were attributed to members of the "cumulative disorders" and "cumulative + other disorders" cohorts, by RHA. Table 5.3.3 shows the proportion of short-stay days which were 'for' mental illness, by RHA.

Figure 5.3.1: All-Cause Short (<30) Stay Hospital Days for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.3.2: All-Cause Short (<30) Stay Hospital Days for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of days used per 1000 residents aged 10 years +

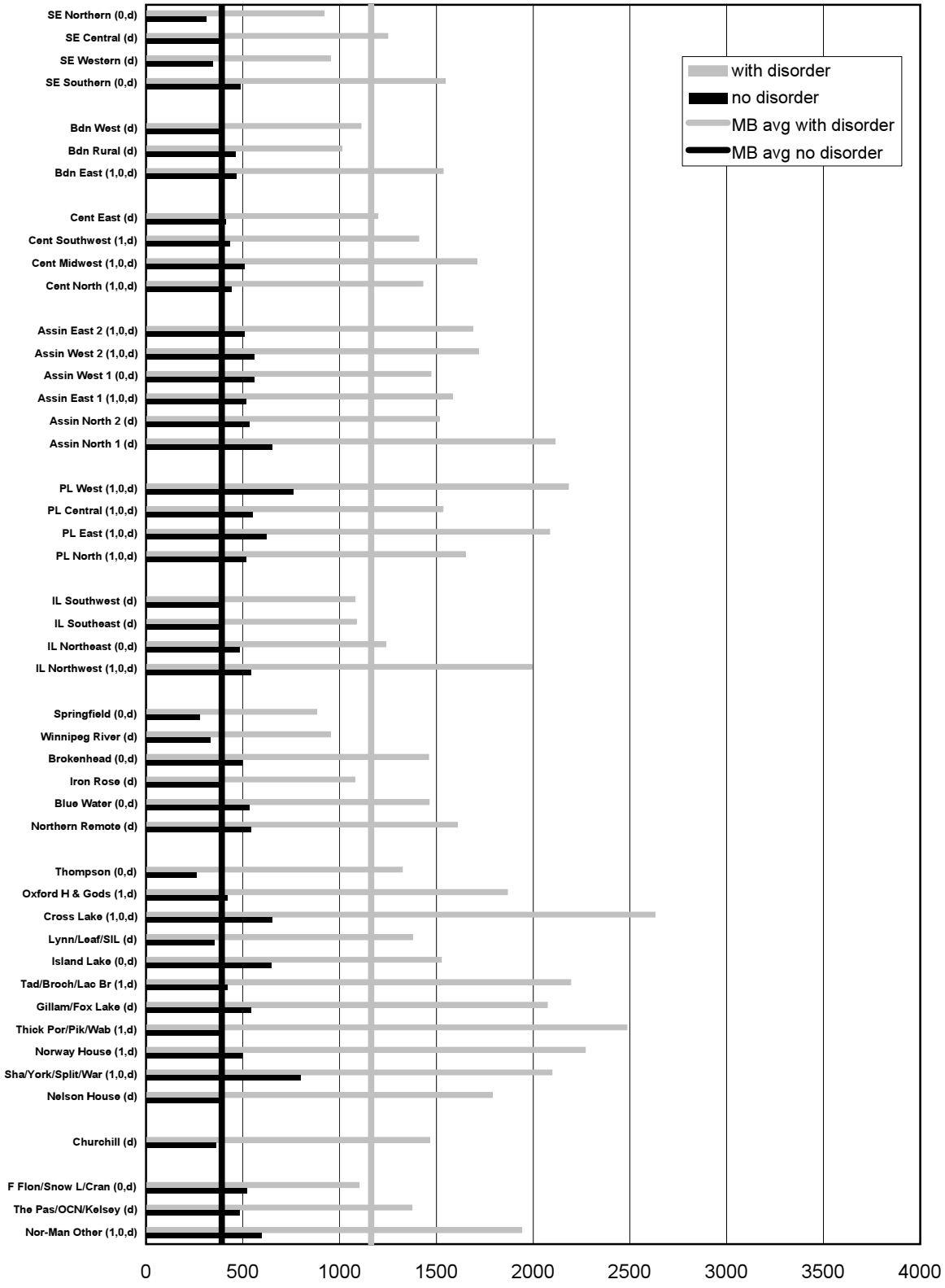
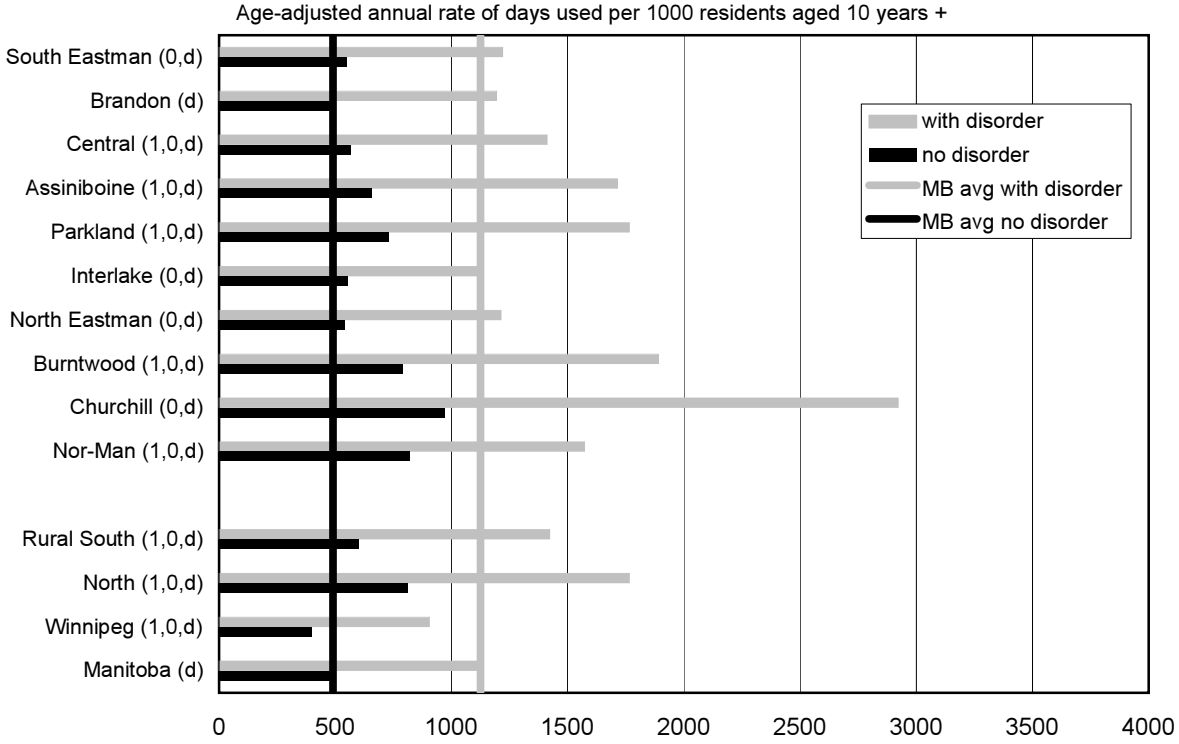


Figure 5.3.3: All-Cause Short (<30) Stay Hospital Days for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.3.4: All-Cause Short (<30) Stay Hospital Days for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

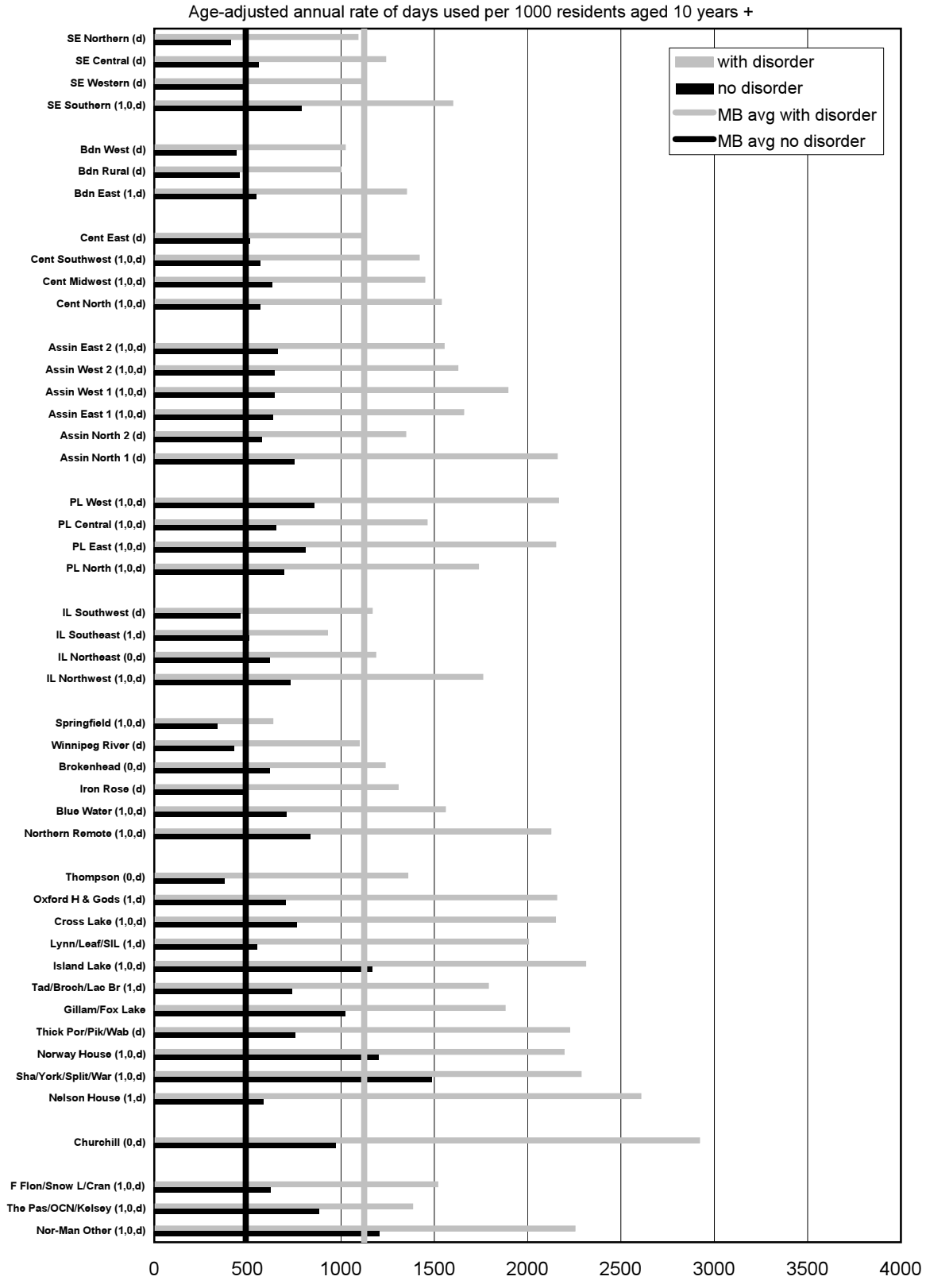


Table 5.3.1: All-cause short (<30) stay hospital days by specific disorder groups and RHA, 1997/98-2001/02

Age-adjusted annual rate of days used in short stays per 1,000 residents aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	1,220	1,364	1,211	1,789	2,753	725	1,130	376
Brandon	1,470	1,551	1,601	2,457	3,682	685	1,320	435
Central	1,498	1,682	1,654	1,667	2,748	915	1,440	443
Assiniboine	1,832	1,904	2,140	2,653	4,484	1,011	1,712	557
Parkland	1,809	2,078	2,327	2,753	4,507	1,039	1,744	588
Interlake	1,218	1,189	1,596	1,483	2,195	750	1,226	436
North Eastman	1,225	1,189	1,630	1,719	2,312	730	1,209	406
Burntwood	1,663	1,952	2,035	1,813	3,335	748	1,753	440
Churchill	1,796	629	1,494	1,304	493	1,037	1,466	360
Nor-Man	1,274	940	1,900	2,875	2,811	815	1,350	519
Rural South	1,478	1,575	1,761	1,990	3,310	882	1,420	475
North	1,499	1,377	1,995	2,116	2,962	793	1,601	478
Winnipeg	1,002	871	1,464	2,208	2,359	488	960	317
Manitoba	1,207	1,141	1,618	2,200	2,720	633	1,163	391

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	1,277	1,505	1,617	2,973	2,987	718	1,220	548
Brandon	1,264	1,447	1,618	2,982	3,934	692	1,193	486
Central	1,430	1,787	1,946	1,758	3,617	986	1,411	565
Assiniboine	1,795	2,125	2,327	3,823	6,712	1,093	1,714	655
Parkland	1,847	2,172	2,685	3,022	5,766	1,079	1,766	727
Interlake	1,140	1,353	1,541	2,179	2,359	815	1,134	551
North Eastman	1,261	1,370	1,549	2,129	2,771	889	1,213	540
Burntwood	1,864	2,076	2,414	2,876	4,072	1,292	1,890	790
Churchill	3,974	3,616	2,970	4,994	1,949	2,276	2,922	970
Nor-Man	1,644	1,409	2,196	2,376	3,555	974	1,573	816
Rural South	1,464	1,762	1,942	2,537	4,149	950	1,423	598
North	1,779	1,677	2,364	2,675	3,836	1,102	1,766	811
Winnipeg	942	950	1,535	2,479	2,818	586	904	398
Manitoba	1,155	1,255	1,756	2,573	3,203	718	1,124	490

Table 5.3.2: Percentage of all-cause short stay hospital days attributed to cohort members by RHA, 1997/98-2001/02

RHA	Males		Females		Males + Females	
	% of total short days for all males attributed to **Cumulative**	% of total short days for all males attributed to **Cumulative + Other**	% of total short days for all females attributed to **Cumulative**	% of total short days for all females attributed to **Cumulative + Other**	% of total short days for all residents attributed to **Cumulative**	% of total short days for all residents attributed to **Cumulative + Other**
South Eastman	39.5%	56.9%	46.6%	60.8%	43.5%	59.1%
Brandon	42.7%	58.8%	50.6%	65.2%	47.1%	62.4%
Central	38.4%	54.7%	45.1%	60.0%	42.2%	57.7%
Assiniboine	36.3%	51.1%	45.8%	60.9%	41.6%	56.5%
Parkland	34.1%	51.7%	44.4%	61.1%	39.7%	56.8%
Interlake	37.4%	50.7%	42.9%	57.0%	40.3%	54.0%
North Eastman	36.0%	50.3%	43.7%	58.8%	40.2%	54.9%
Burntwood	58.8%	65.2%	57.2%	64.8%	57.8%	64.9%
Churchill	55.7%	70.5%	37.4%	54.3%	44.4%	60.5%
Nor-Man	39.5%	53.6%	48.2%	62.6%	44.8%	59.1%
Rural South	36.9%	52.4%	44.8%	59.9%	41.3%	56.5%
North	51.2%	60.8%	53.5%	63.8%	52.6%	62.6%
Winnipeg	44.1%	59.3%	47.8%	63.8%	46.2%	61.9%
Manitoba	41.3%	56.4%	47.1%	62.3%	44.6%	59.7%

Table 5.3.3: Percentage of all-cause short stay hospital days 'for' mental illness by cohort groups and RHA, 1997/98-2001/02

RHA	Males			Females			Males + Females		
	Cumulative	**Other**	**All males**	**Cumulative**	**Other**	**All females**	**Cumulative**	**Other**	**All residents**
South Eastman	11.9%	3.8%	5.4%	11.0%	2.6%	5.5%	11.4%	3.2%	5.4%
Brandon	22.7%	3.5%	10.3%	17.5%	1.4%	9.1%	19.6%	2.3%	9.6%
Central	10.5%	5.6%	4.9%	9.7%	4.2%	5.0%	10.0%	4.8%	5.0%
Assiniboine	15.3%	4.7%	6.3%	14.9%	4.2%	7.5%	15.1%	4.4%	6.9%
Parkland	14.8%	3.2%	5.6%	13.0%	2.3%	6.2%	13.7%	2.7%	5.9%
Interlake	11.2%	2.8%	4.5%	9.8%	2.5%	4.6%	10.4%	2.6%	4.5%
North Eastman	11.8%	4.4%	4.9%	10.4%	3.1%	5.0%	11.0%	3.7%	5.0%
Burntwood	13.6%	1.4%	8.1%	8.7%	0.9%	5.1%	10.6%	1.1%	6.2%
Churchill	18.8%	0.0%	10.5%	22.4%	0.0%	8.4%	20.7%	0.0%	9.2%
Nor-Man	15.3%	1.4%	6.2%	8.8%	0.9%	4.3%	11.0%	1.1%	5.1%
Rural South	12.7%	4.2%	5.3%	11.8%	3.3%	5.8%	12.2%	3.7%	5.6%
North	14.2%	1.3%	7.4%	8.9%	0.9%	4.9%	10.9%	1.0%	5.8%
Winnipeg	20.4%	2.1%	9.3%	16.6%	1.9%	8.2%	18.1%	1.9%	8.7%
Manitoba	17.1%	3.1%	7.5%	14.2%	2.4%	7.0%	15.3%	2.7%	7.3%

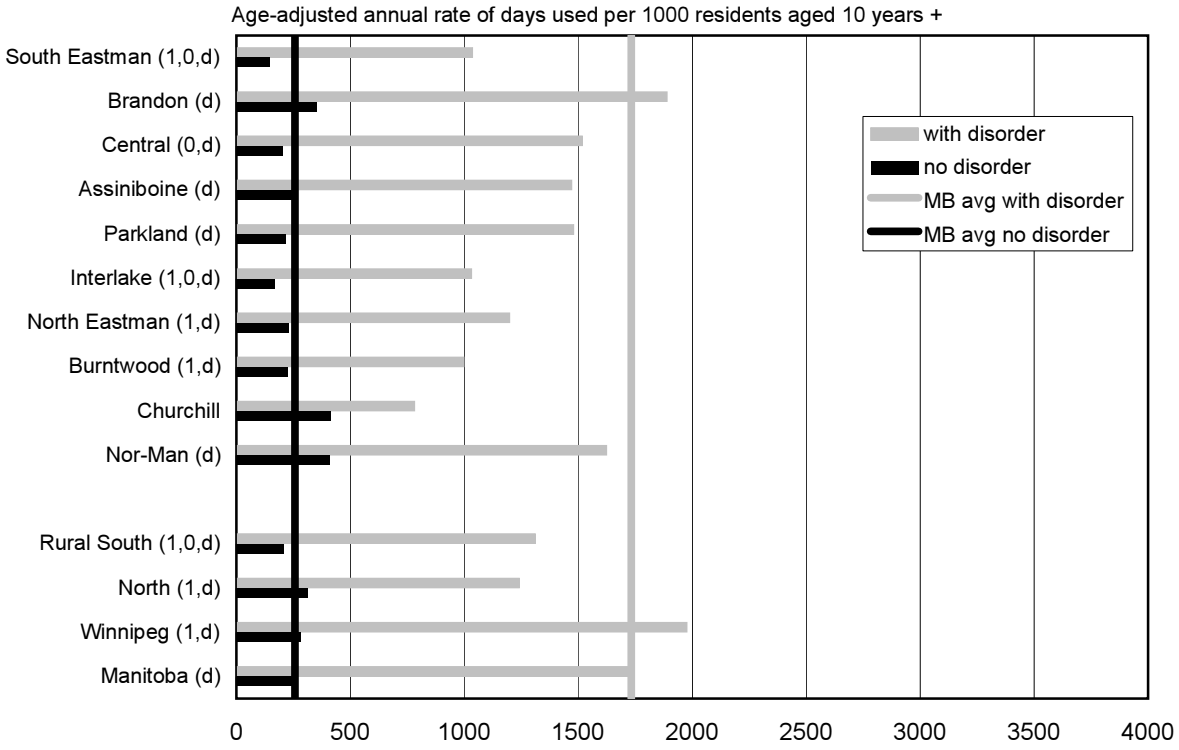
Key findings:

- People in the "cumulative disorders" group used significantly more short-stay days in hospital for all causes than those with no disorders. The difference was more than two-fold for both males and females, and for all RHAs and districts.
- Males in the "cumulative disorders" group used 41.3% of all-cause short-stay days for males, despite comprising only 19% of the male population. Females used 47.1% of all-cause short-stay hospital days, despite comprising only 29% of the female population.
- As with hospital separations (Section 5.2), Brandon residents had a higher than average proportion of short days being used by those in the "cumulative disorders" group (47.1%). However, the percentage for Burntwood is even higher, at 57.8% of all-cause short-stay days being attributed to the "cumulative disorders" group.
- The percentage of short-stay days with the most responsible diagnosis being 'mental illness' vary considerably by RHA, though again Brandon and Churchill residents show a particularly high proportion of short-stay days being 'for' mental illness (Brandon: 9.6%, Churchill 9.2% of the short-stay days of every person in the RHA). This is likely reflecting high use of acute care facilities among former residents of the Brandon Mental Health Centre, as well as for more remote clients such as in Churchill.
- The rates of all-cause short-stay days used were similar among males and females with "cumulative disorders".

5.4 All-Cause Acute Care Hospital Days Used in Long Stays (30+ days)

Definition: This is the number of hospital days used in long-stays, per thousand residents, regardless of hospital location and cause of hospitalization. Long stays are defined as stays of 30 days or longer within a given fiscal year. These rates are age- adjusted to reflect the population of Manitoba. For Churchill, these data include long-stay days used by those considered to be personal care home (PCH) patients, because the data files do not recognize a separate PCH in Churchill. Figures are shown by RHA and district for males and females. Table 5.4.1 shows the all-cause short-stay days rates for each of the specific disorder groups, by RHA. Table 5.4.2 shows what proportion of all cause long-stay days were attributed to members of the "cumulative disorders" and "cumulative + other disorders" cohorts, by RHA. Table 5.4.3 shows the proportion of long-stay days which were 'for' mental illness, by RHA.

Figure 5.4.1: All-Cause Long (30+) Stay Hospital Days for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.4.2: All-Cause Long (30+) Stay Hospital Days for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of days used per 1000 residents aged 10 years +

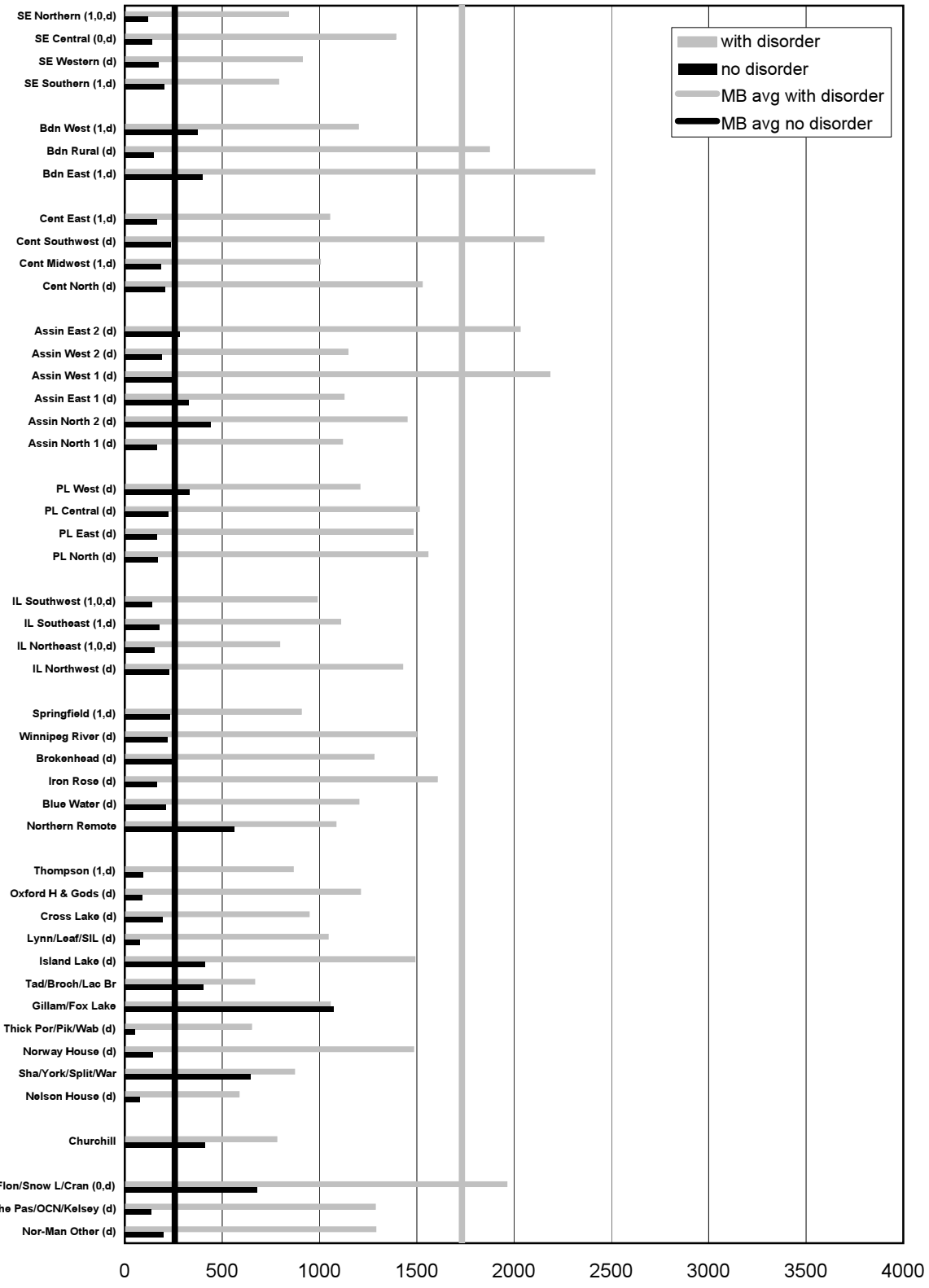
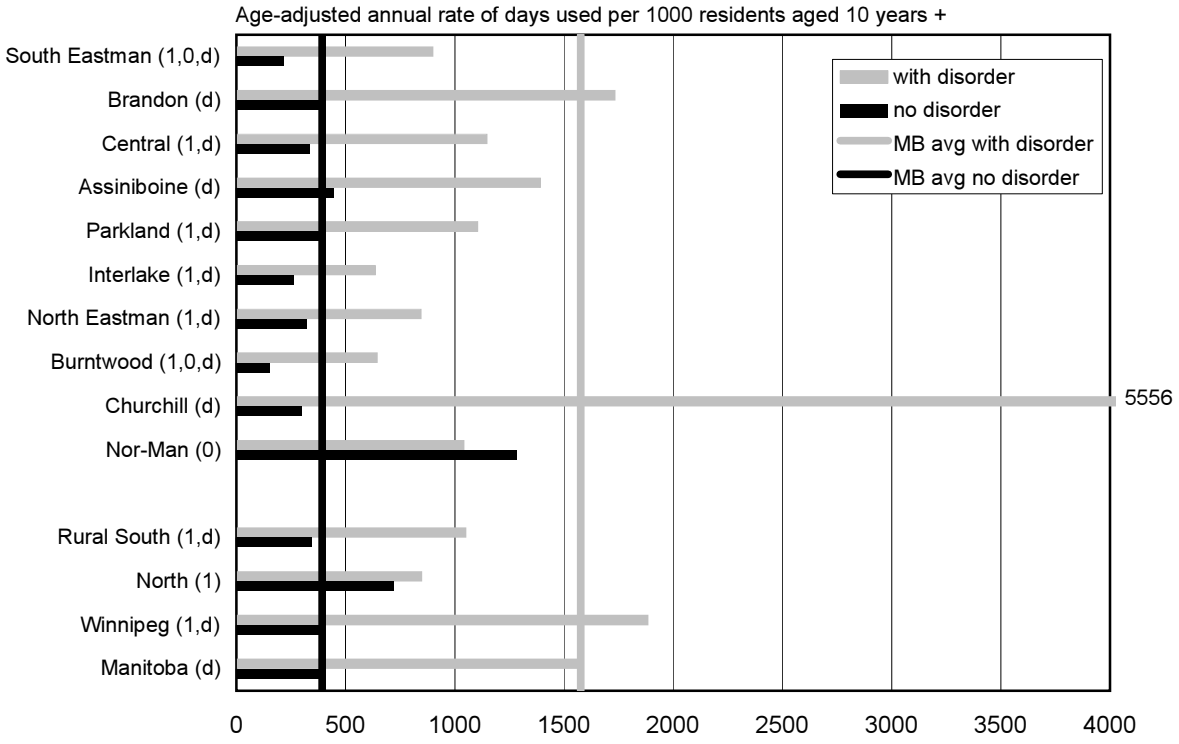


Figure 5.4.3: All-Cause Long (30+) Stay Hospital Days for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 5.4.4: All-Cause Long (30+) Stay Hospital Days for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

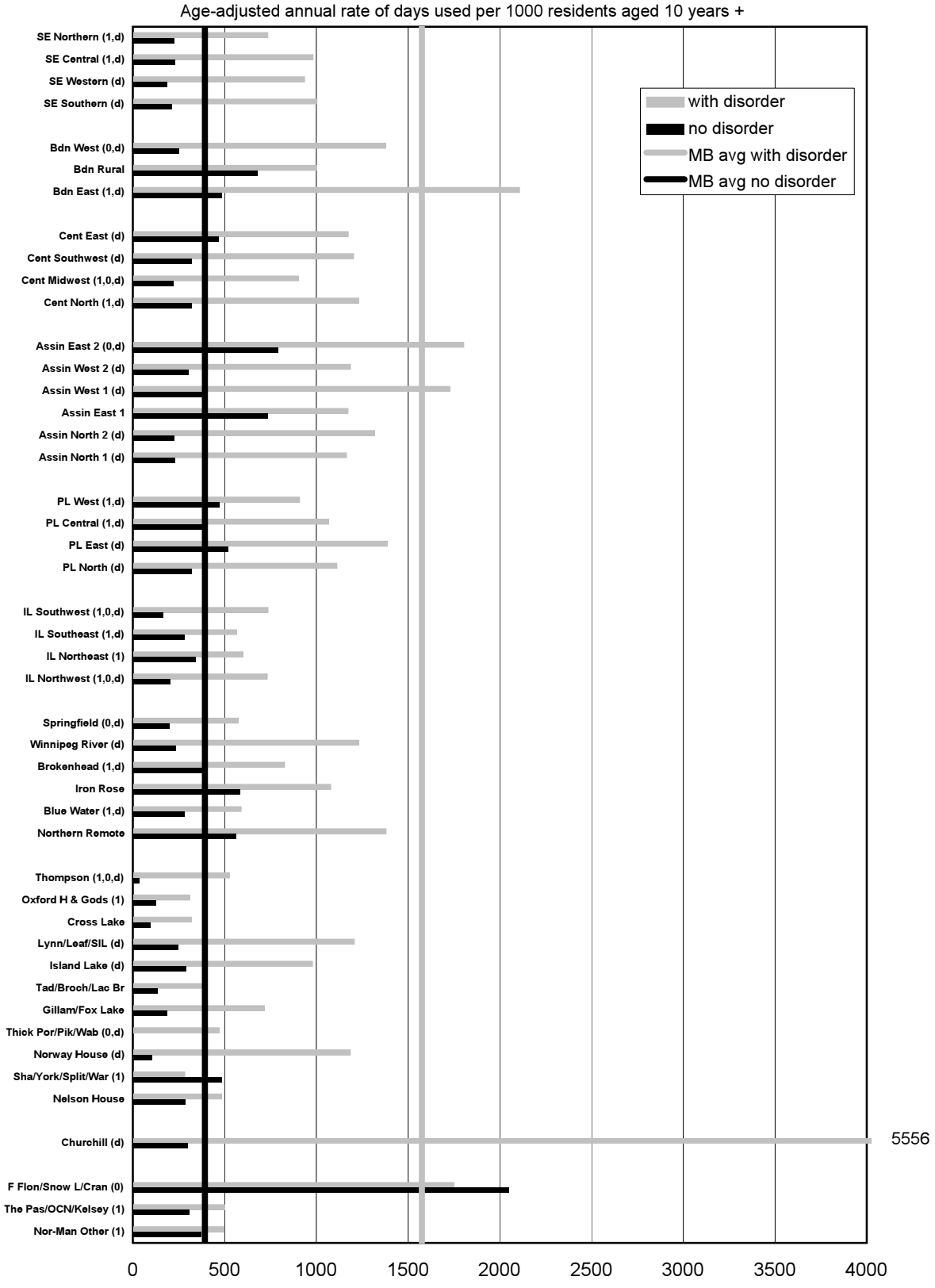


Table 5.4.1: All-cause long (30+) stay hospital days by specific disorder groups and RHA, 1997/98-2001/02

Age-adjusted annual rate of days in long stays per 1,000 residents aged 10+

Males	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	1,109	608	871	6,815	2,398	777	1,037	146
Brandon	2,062	1,440	2,225	4,123	9,125	1,184	1,889	353
Central	1,670	963	1,456	2,529	4,431	1,114	1,518	201
Assiniboine	1,536	920	1,280	3,168	7,012	1,207	1,471	268
Parkland	1,579	837	1,621	5,170	5,304	988	1,480	215
Interlake	1,106	764	926	2,983	2,542	751	1,031	168
North Eastman	1,238	730	1,415	3,476	3,119	1,023	1,199	229
Burntwood	1,448	833	1,161	3,159	877	1,287	998	223
Churchill	1,811	891	310	4,155	2,076	0	782	413
Nor-Man	1,810	819	1,997	7,044	7,192	869	1,624	407
Rural South	1,405	832	1,262	3,975	4,668	1,003	1,311	209
North	1,645	853	1,381	4,444	3,595	1,002	1,241	314
Winnipeg	2,079	1,138	2,598	7,704	6,690	1,200	1,976	282
Manitoba	1,853	1,064	2,057	6,514	6,337	1,127	1,732	257

Females	Depression	Anxiety	Substance Abuse	Schizophrenia	Personality Disorder	Other	Cumulative	None
South Eastman	984	893	1,621	3,973	3,281	591	900	218
Brandon	1,897	1,284	1,674	4,558	6,651	1,769	1,734	387
Central	1,224	1,024	1,327	2,192	3,189	1,298	1,148	336
Assiniboine	1,396	999	1,385	6,980	4,379	1,662	1,392	446
Parkland	1,172	824	1,211	2,556	4,138	1,095	1,105	402
Interlake	630	882	954	3,964	3,018	600	636	264
North Eastman	840	670	1,243	3,291	2,925	1,272	846	321
Burntwood	826	671	604	2,756	3,575	469	645	155
Churchill	5,195	5,007	5,692	5,007	5,007	31,769	5,556	297
Nor-Man	1,012	1,040	917	3,241	3,861	1,082	1,041	1,283
Rural South	1,085	939	1,228	3,765	3,713	1,146	1,051	344
North	937	945	697	3,332	3,745	1,412	848	720
Winnipeg	1,997	1,501	2,668	8,550	7,789	1,551	1,884	409
Manitoba	1,669	1,296	2,019	6,966	6,643	1,430	1,576	393

Table 5.4.2: Percentage of all-cause long (30+) stay hospital days attributed to cohort members by RHA, 1997/98-2001/02

RHA	Males		Females		Males + Females	
	% of total long days for all males attributed to **Cumulative**	% of total long days for all males attributed to **Cumulative + Other**	% of total long days for all females attributed to **Cumulative**	% of total long days for all females attributed to **Cumulative + Other**	% of total long days for all residents attributed to **Cumulative**	% of total long days for all residents attributed to **Cumulative + Other**
South Eastman	48.8%	76.4%	56.7%	75.2%	52.9%	75.7%
Brandon	50.1%	73.5%	51.7%	80.3%	51.0%	77.4%
Central	50.0%	75.5%	46.3%	71.6%	47.9%	73.4%
Assiniboine	44.1%	69.2%	42.8%	70.1%	43.3%	69.7%
Parkland	44.4%	72.3%	40.3%	67.0%	42.1%	69.3%
Interlake	48.9%	70.3%	42.8%	62.0%	45.9%	66.3%
North Eastman	40.7%	66.2%	39.0%	68.0%	39.8%	67.1%
Burntwood	58.8%	74.6%	61.0%	71.3%	59.6%	73.4%
Churchill	55.3%	55.3%	9.4%	95.3%	14.7%	90.6%
Nor-Man	48.9%	64.6%	29.1%	44.4%	37.3%	52.7%
Rural South	46.5%	71.8%	44.1%	69.3%	45.2%	70.4%
North	53.5%	69.1%	35.1%	55.4%	43.8%	61.9%
Winnipeg	54.8%	78.3%	55.1%	79.3%	55.0%	78.9%
Manitoba	52.3%	76.0%	51.7%	76.3%	51.9%	76.1%

Table 5.4.3: Percentage of all-cause long (30+) stay hospital days 'for' mental illness by cohort group and RHA, 1997/98-2001/02

RHA	Males			Females			Males + Females		
	Cumulative	**Other**	**All Males**	**Cumulative**	**Other**	**All Females**	**Cumulative**	**Other**	**All residents**
South Eastman	24.7%	5.1%	13.5%	22.1%	6.8%	13.8%	23.2%	5.8%	13.6%
Brandon	33.6%	14.5%	20.2%	32.8%	24.7%	24.0%	33.1%	20.9%	22.4%
Central	20.3%	15.6%	14.2%	16.3%	11.7%	10.5%	18.2%	13.4%	12.1%
Assiniboine	16.0%	11.4%	9.9%	21.6%	19.8%	14.6%	19.3%	16.6%	12.7%
Parkland	25.6%	22.2%	17.5%	25.1%	21.1%	15.7%	25.3%	21.6%	16.5%
Interlake	12.4%	14.8%	9.2%	18.9%	15.5%	11.0%	15.3%	15.1%	10.1%
North Eastman	25.1%	13.0%	13.5%	21.0%	13.8%	12.2%	23.0%	13.4%	12.8%
Burntwood	24.8%	27.7%	19.0%	20.7%	0.0%	12.6%	23.3%	20.1%	16.6%
Churchill	52.6%	0.0%	29.1%	77.6%	67.3%	65.1%	66.7%	67.3%	60.9%
Nor-Man	15.4%	7.3%	8.7%	27.7%	24.3%	11.8%	21.0%	17.1%	10.5%
Rural South	19.5%	14.1%	0.0%	20.4%	16.2%	13.1%	20.0%	15.3%	7.2%
North	20.7%	16.9%	13.7%	25.9%	37.2%	16.6%	22.9%	29.0%	15.3%
Winnipeg	31.3%	12.3%	20.1%	27.6%	11.6%	18.0%	29.1%	11.9%	18.8%
Manitoba	28.2%	13.0%	17.8%	26.3%	14.1%	17.1%	27.1%	13.7%	17.4%

Key findings:

- Females in the "cumulative disorders" group used four times as many all cause long-stay hospital days than those with no disorders (1,576 versus 393 per thousand per year). Among males, the difference was almost seven-fold (1,732 versus 257 days per thousand per year).
- For those with "cumulative disorders", males used more days in all cause long-stays than females (1,732 versus 1,576 days per thousand per year). However, for those in the "no disorders" group, males used fewer days in long-stays than females (257 versus 393 days per thousand per year).
- Males in the "cumulative disorders" group used 52.3% of all cause long-stay days for males, despite comprising only 19% of the male population. Females in the "cumulative disorders" group used 51.7% of all long-stay days, despite comprising only 29% of the female population.
- All-cause long-stay day rates for Churchill residents are the highest in the province, at 90.6% of total long-stay days being attributed to use by the "cumulative + other disorders" group. This may in part be driven by the fact that the Churchill PCH beds are included in the acute hospital bed files.
- Brandon (22.4%) and Churchill (60.9%) residents show a particularly high proportion of long-stay days 'for' mental illness. This is likely reflecting high use of acute care facilities among former residents of the Brandon Mental Health Centre, and the possible use of acute care facilities by people in the remote RHA of Churchill.
- Those persons having a diagnosis of schizophrenia and personality disorders are particularly high users of long-stay days for all causes—over four times the rate compared with those in the "cumulative disorders" group, and extremely higher rates compared to the "no disorders" group (25 times higher for males, 17 times higher for females).

Part 2) Use of Acute Care Hospitals and Mental Health Centres "For" Mental Illness

Sections 5.5-5.7 report rates of use of acute care hospitals and provincial mental health centres for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. In hospital records, up to 16 diagnoses can be recorded; the 'most responsible' diagnosis is the condition which was determined to be responsible for 'most' of the hospital episode.

These analyses include only those 'with' mental illness, as those in the 'no disorder' group have, by definition, no use of health care services for mental illness. The results therefore show rates for males and females 'with' a disorder—either in the "cumulative disorders" group or the "other disorders" group, depending upon the figure or table (see Chapters 1 and 2 for definitions of these groups). For each indicator, rates for acute care hospitals as well as rates for mental health centres are given.

The Eden and Selkirk Mental Health Centres provide a range of services specifically for people with mental illness. The Brandon Mental Health Centre closed just after the start of the period used for this study, but its use is included in these analyses.

There are three sections in this part of the chapter:

- Acute care hospital/mental health centre separation rates 'for' mental illness (Section 5.5)
- Rates of Acute Care Hospital/Mental Health Centre Days Used in Short Stays 'for' mental illness (Section 5.6)
- Rates of Acute Care Hospital/Mental Health Centre Days Used in Long Stays 'for' mental illness (Section 5.7)

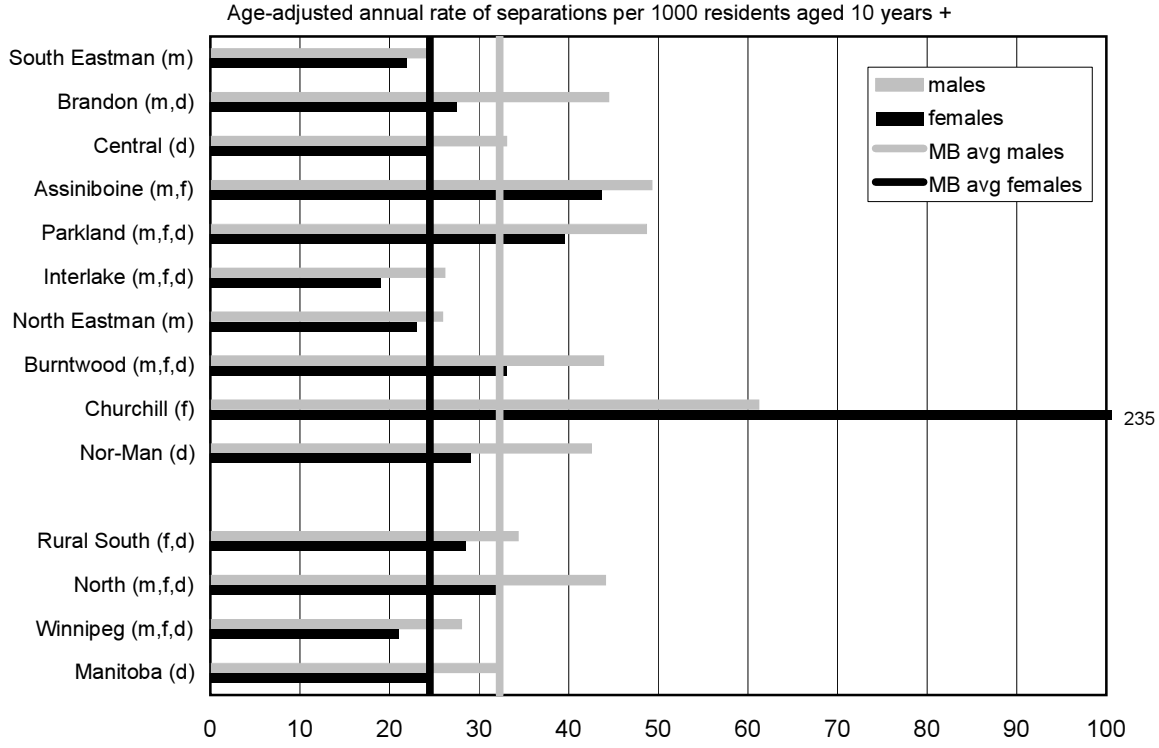
5.5 Separations "For" Mental Illness Disorders

5.5.1 Separations from acute care hospitals with a diagnosis "for" mental illness

Definition: This is the number of hospitalizations in acute care hospitals per thousand residents per year, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. These rates may underestimate total hospital use for mental illness. Many more hospitalizations likely included care for mental illness but those disorders may not have been (or may not have been recorded as) the 'most responsible' diagnosis for the hospitalization. The rates are age-adjusted to reflect the population of Manitoba. Only the rates of those in the "cumulative disorders" group are shown in the figures. The figures show separation rates by RHA, district, age and neighbourhood income quintile for males and females. Table 5.5.1 shows rates of separations from acute care hospitals for mental illness, by each of the specific mental disorder groups.

NOTE: These rates include use of psychiatric services at St. Boniface General Hospital (McEwen), Health Sciences Centre (PsycHealth), and in several rural hospitals, since these are within the acute care facilities in Winnipeg and thus cannot be separated out in our data files.

Figure 5.5.1a: Hospital Separations for Mental Illness Disorders for those With Cumulative Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 5.5.1b: Hospital Separations for Mental Illness Disorders for those With Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +

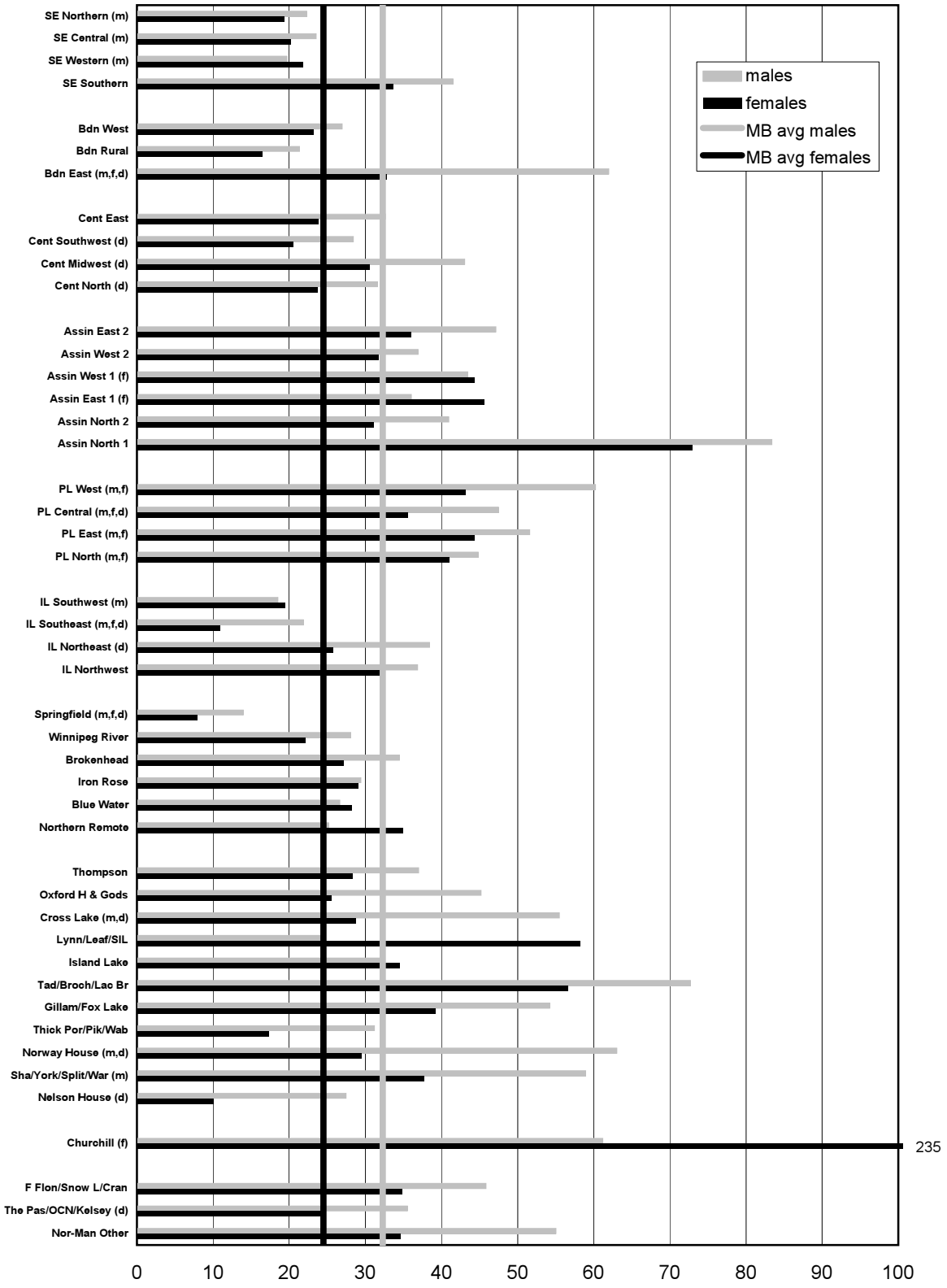


Figure 5.5.1c: Hospital Separations for Mental Illness Disorders for those With Cumulative Disorders by Age and Sex, 1997/98-2001/02

Average annual rate of separations per 1000 residents aged 10 years +

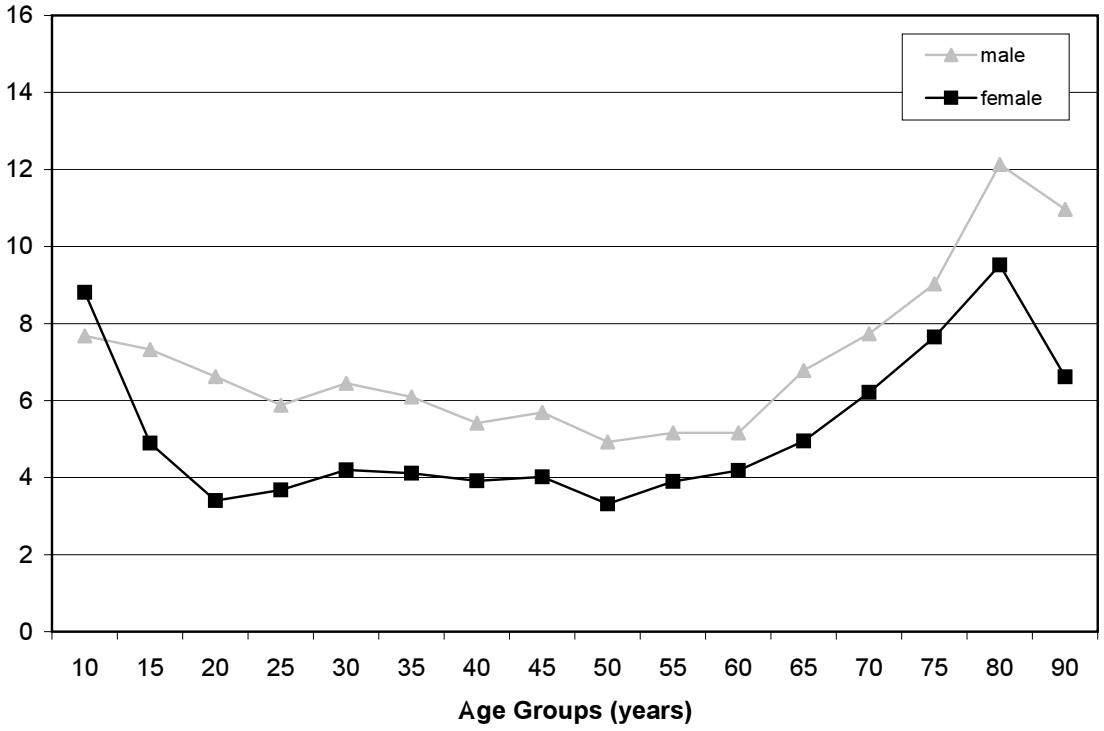
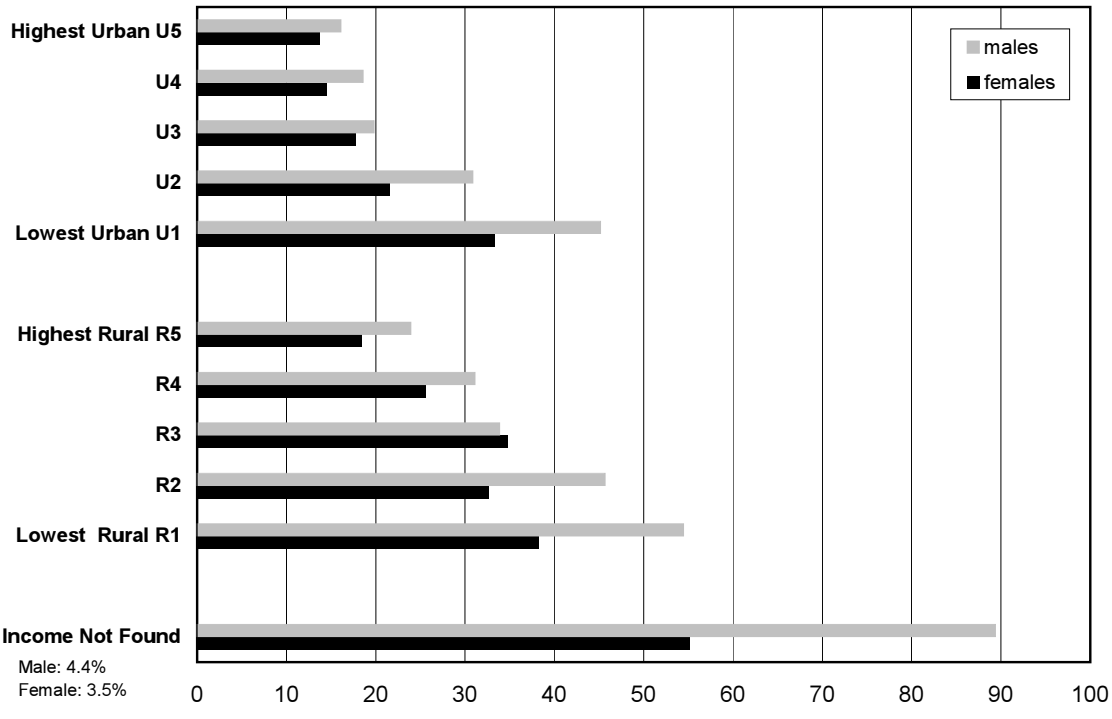


Figure 5.5.1d: Hospital Separations for Mental Illness Disorders for those With Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +



Linear Trend Test Results

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

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

Key findings:

- Males have higher rates of hospitalization 'for' mental illness than females (32 versus 25 separations per thousand per year). This trend is opposite that for 'all-cause' hospitalizations, in which females had higher rates than males (301 versus 248 separations per thousand per year—see Section 5.2)
- For both sexes, the rates of hospitalization 'for' mental illness are much lower than the 'all-cause' hospitalization rates, confirming that mental illness is responsible for only a portion of all hospitalizations.
- For both sexes, the rates were remarkably similar across many age groups, with the elderly having the highest rates.
- Service use was also strongly related to neighbourhood income: those living in lower income areas had a higher rate of hospitalizations for mental illness compared with those living in higher income areas. This was true for males and females, among both urban and rural residents.
- For those having a diagnosis of schizophrenia and personality disorders, the rate of hospital separations 'for' mental illness disorders was particularly high when compared to the overall "cumulative disorders" group (schizophrenia: females 219, males 181, personality disorder: females 227, males 188, "cumulative": females 24.5, males 32.3 separations per thousand per year).

5.5.2 Separations from mental health centres with a diagnosis 'for' mental illness

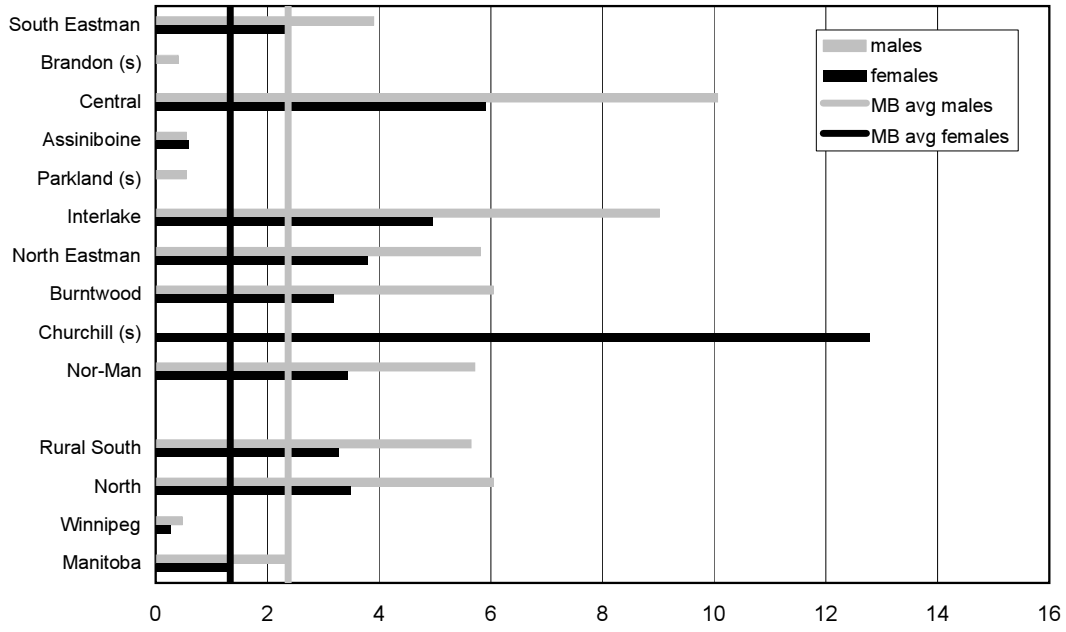
Definition: This is the number of hospitalizations in Mental Health Centres per thousand residents per year, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. Only the rates of those in the "cumulative disorders" group are shown, by RHA and district for males and females. The rates are age-adjusted to reflect the population of Manitoba. Table 5.5.1 also shows rates by specific disorder groups.

Because of uncertainties in the way in which much of the information in the Mental Health Management Information System (MHMIS) is collected in different institutions, these findings must be viewed with caution. Since differences may be due to the extent that data were collected, not necessarily the population's actual use of the facilities, no statistical testing is done for the Mental Health Centre data in this chapter (see Chapter 3 for a further discussion of MHMIS).

NOTE: These rates DO NOT include use of psychiatric services at St. Boniface General Hospital (McEwen), Health Sciences Centre (PsycHealth), and in several rural hospitals, since these are within the acute care facilities and thus cannot be separated out in our data files as mental health centres.

Figure 5.5.2a: Separations from Mental Health Centres for those With Cumulative Disorders by RHA, 1997/98-2001/02

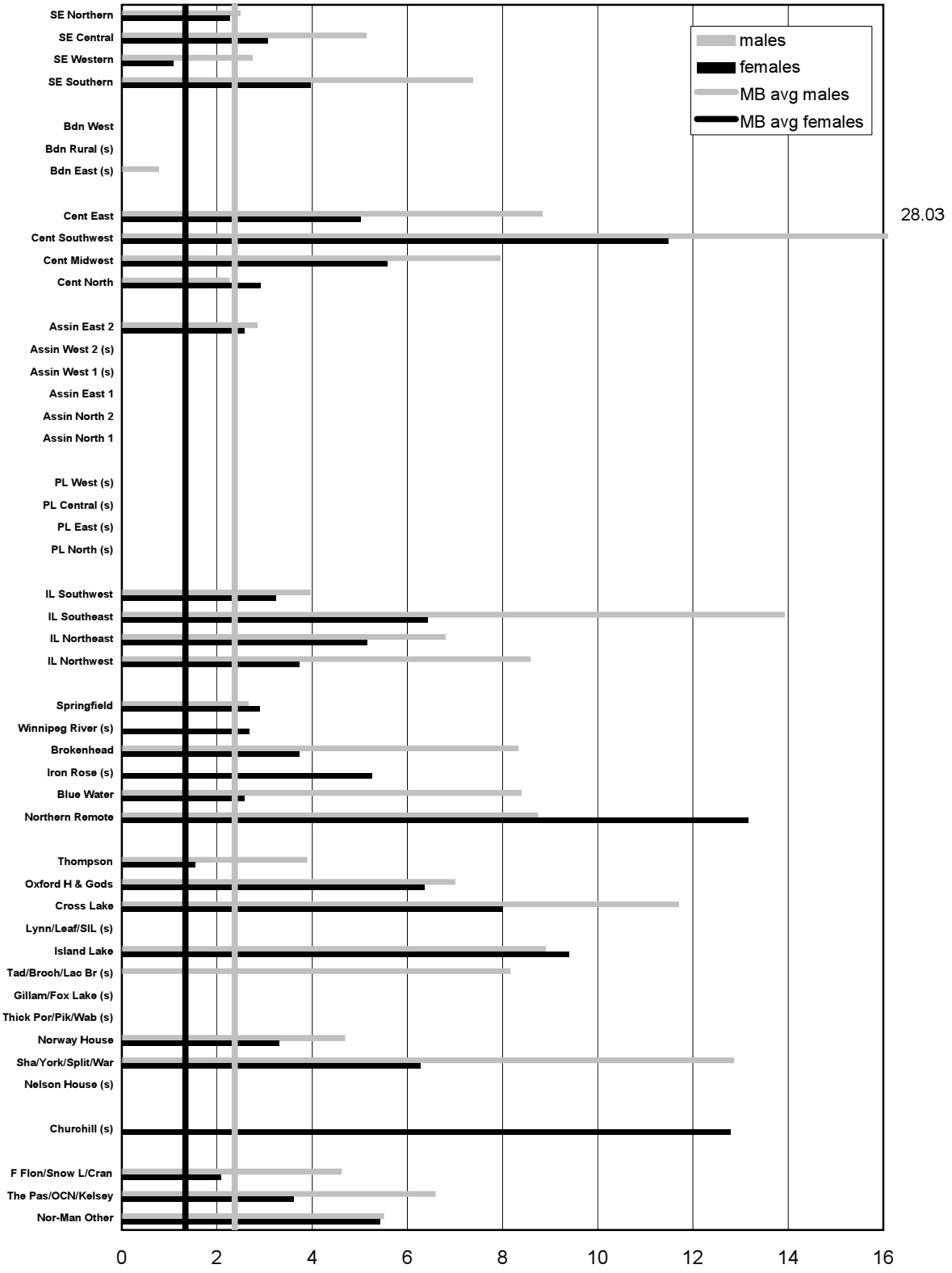
Age-adjusted annual rate of separations per 1000 residents aged 10 years +



's' indicates data suppressed due to small numbers
**because of concerns about missing data, statistical testing was not performed

Figure 5.5.2b: Separations from Mental Health Centres for those With Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of separations per 1000 residents aged 10 years +



Key findings:

- Males were hospitalized in mental health centres much more frequently than females (2.4 versus 1.3 separations per thousand per year).
- Mental health centre separation rates were far lower than rates of hospitalization for mental illness in acute care facilities (2.4 versus 32 separations per thousand per year for males, 1.3 separations per thousand per year for females) (refer to Section 5.5.1).
- Mental health centre separation rates vary significantly by RHA: the highest rates (other than Churchill) are found in Central and Interlake RHAs, the locations of the two mental health centres. This likely reflects that people who need ongoing care at these facilities often move to residences closer to the facility.
- Unlike many other analyses, the rates for Winnipeg residents are very low. This is due to the fact that psychiatric service units in St. Boniface Hospital and Health Sciences Centre are not considered Mental Health Centres—they are part of the acute care hospital system, so they are included in Section 5.5.1. This may also affect rates for residents of other RHAs, many of whom rely on services at St. Boniface and Health Sciences Centre.

Table 5.5.1: Acute care hospital and mental illness centre separation rates 'for' mental illness by specific disorder groups and RHA, 1997/98-2001/02

Age-adjusted annual rate of separations per 1,000 residents aged 10+

Males	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	28.74	4.35	43.52	3.28	40.16	4.59	115.75	55.05	206.29	33.43	3.49		24.38	3.90
Brandon	53.34		73.51		80.10		180.82	3.08	280.80		2.97		44.48	0.40
Central	32.20	8.76	60.02	8.93	59.79	9.37	118.51	117.40	170.64	39.15	5.60	0.50	33.09	10.06
Assiniboine	55.58	0.86	102.59		88.16		166.80		286.98		6.00	0.00	49.30	0.55
Parkland	54.54		80.89		87.55		202.87		364.54		7.00	0.00	48.67	0.55
Interlake	25.91	9.38	47.26	10.15	49.92	11.34	98.75	106.29	115.16	66.98	3.66	1.02	26.18	9.02
North Eastman	28.66	6.53	49.64	8.05	41.13	7.83	108.20	51.04	87.93	15.29	4.17	0.00	25.94	5.81
Burntwood	71.32	12.38	120.34	9.28	54.38	5.54	186.86	73.64	228.07	66.13	5.45		43.88	6.04
Churchill	84.07		86.10		66.26		219.89		70.36		0.00	0.00	61.20	
Nor-Man	56.22	7.15	74.58	7.43	70.57	8.35	401.95	75.88	361.02	95.41	2.46		42.54	5.71
Rural South	36.68	5.63	63.30	5.72	61.36	6.16	132.89	68.11	213.85	30.96	5.12	0.31	34.35	5.65
North	66.68	10.33	97.17	8.56	58.95	6.37	249.29	73.16	274.12	75.21	3.45		44.11	6.04
Winnipeg	31.72	0.45	36.27	0.51	53.14	0.59	188.25	4.85	165.18	2.89	2.27	0.04	28.05	0.47
Manitoba	36.51	2.42	49.42	2.25	58.17	3.01	180.56	20.86	187.85	10.74	3.28	0.14	32.30	2.37

Females	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	24.28	2.62	40.69	2.84	47.10	3.13	174.25	45.52	212.83	15.58	2.31		21.87	2.40
Brandon	31.15		50.00		51.68		241.99		271.87	0.00	3.05		27.51	
Central	25.64	6.31	48.93	8.77	59.02	11.18	110.54	90.09	232.90	70.92	5.51		24.30	5.91
Assiniboine	49.35	0.70	94.17	0.50	96.47		349.42		578.24	9.98	6.02	0.00	43.65	0.58
Parkland	43.41		70.57	0.00	86.21		233.33		437.60	0.00	5.64	0.00	39.51	
Interlake	19.75	4.63	36.66	4.77	50.14	7.23	174.11	90.96	157.21	67.83	3.18		18.96	4.96
North Eastman	26.04	4.41	40.92	5.77	44.25	7.18	184.87	70.35	153.46	72.45	4.29		23.04	3.78
Burntwood	50.01	4.88	76.64	5.03	46.83	3.87	291.95	72.66	438.38	40.60	4.18	0.00	33.09	3.18
Churchill	325.07		243.60	0.00	243.88		236.62		223.21	0.00		0.00	234.50	12.78
Nor-Man	32.11	3.77	39.00	3.43	61.94	4.96	290.48	68.55	230.66	73.74	2.94		28.99	3.43
Rural South	31.10	3.45	56.43	4.01	64.09	5.32	190.81	54.90	294.87	41.10	4.74	0.13	28.52	3.28
North	43.50	4.47	57.88	4.11	52.37	4.27	280.38	72.13	340.98	52.73	3.42		32.57	3.50
Winnipeg	23.50	0.26	32.64	0.20	49.67	0.40	215.42	4.62	197.58	2.61	2.76	0.00	20.96	0.27
Manitoba	27.47	1.40	42.40	1.48	53.56	2.24	219.10	17.60	226.69	11.84	3.42	0.04	24.49	1.33

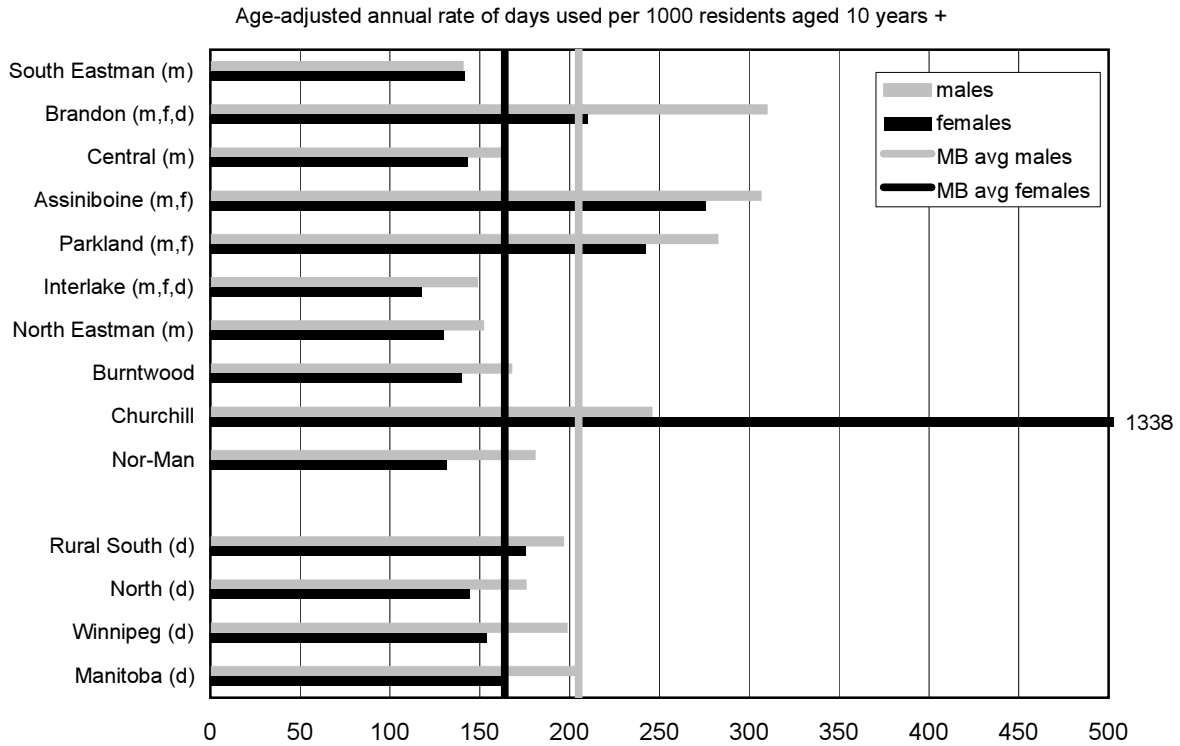
Note: blank cell = suppressed

5.6 Days Used in Short Stays for Mental Illness Disorders

5.6.1 Days used in short-stays in acute care hospitals "for" mental illness

Definition: This is the number of days used in short-stay hospitalizations (1-29 days) in acute hospitals per thousand residents per year, averaged over the five-year period 1997/98 to 2001/02, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. The rates are age-adjusted to reflect the population of Manitoba. Only the rates of those in the "cumulative disorders" group are shown, by RHA and district for males and females. Table 5.6.1 shows rates of short-stay days used in acute hospitals 'for' mental illness, by specific disorder group.

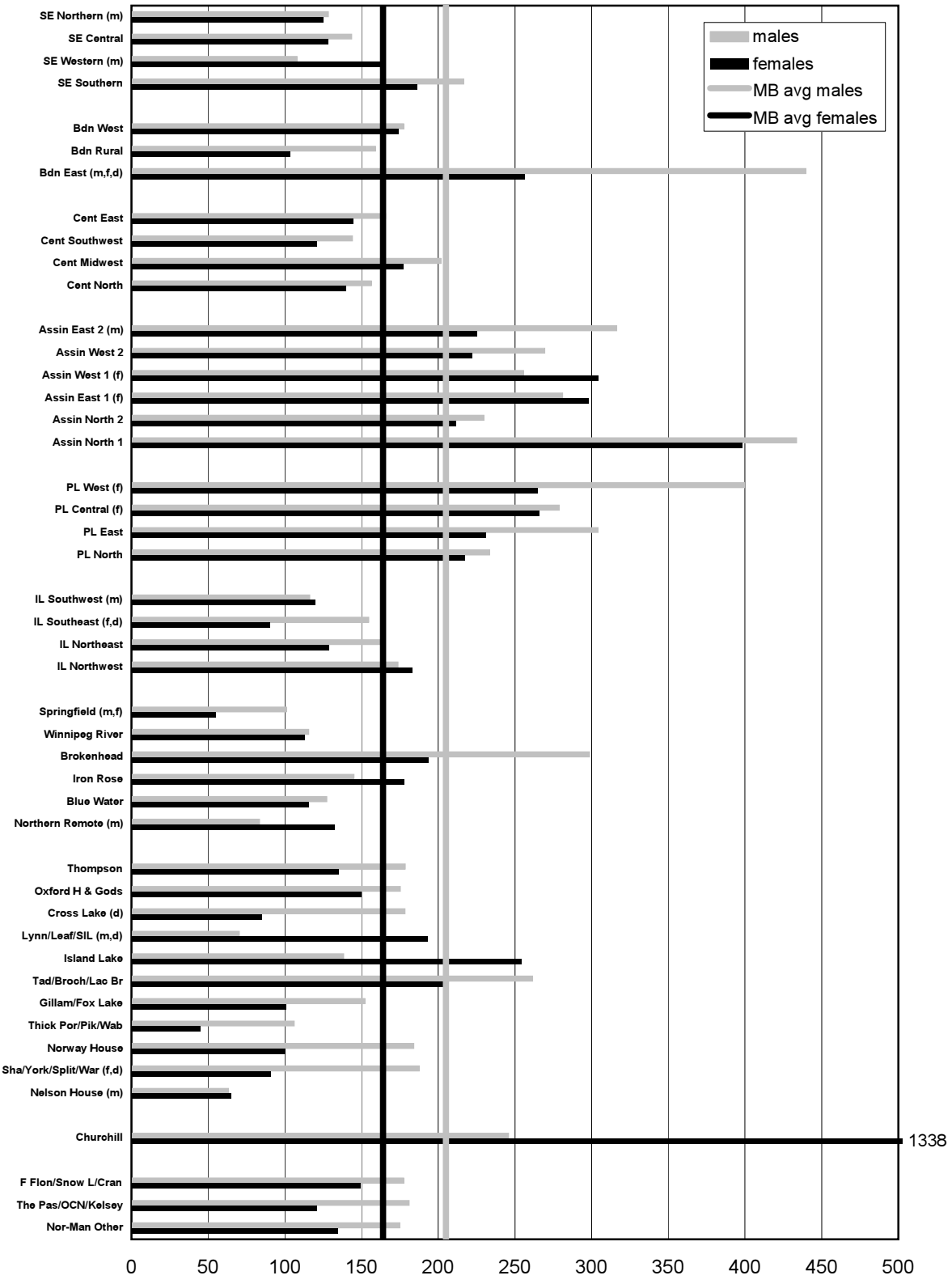
Figure 5.6.1a: Short (<30) Stay Hospital Days for Mental Illness Disorders for those With Cumulative Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 5.6.1b: Short (<30) Stay Hospital Days for Mental Illness Disorders for those With Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of days used per 1000 residents aged 10 years +



Key findings:

- In the "cumulative disorders" group, males had a higher rate of use of short-stay days in acute care hospitals 'for' mental illness than females (205 versus 164 days per thousand per year). These rates were much lower than the comparative short-stay days used for all causes by those in the cumulative disorders group (males: 1,163, females: 1,124 days per thousand per year—see Section 5.3).
- Brandon, Assiniboine and Parkland RHAs have significantly higher rates of short-stay days 'for' mental illness disorders in acute care hospitals compared to other RHAs, when considering those persons in the "cumulative disorders" group. Churchill also appears high, but this is not statistically significant (probably due to the low numbers upon which the rates are based).
- Those persons diagnosed with schizophrenia and personality disorders use short-stay days in acute care hospitals 'for' mental illness at much higher rates than the overall "cumulative disorders" group (schizophrenia 1,609, personality disorders 1,668, cumulative 164 days per thousand per year).

5.6.2 Days used in short-stays in mental health centres "for" mental illness

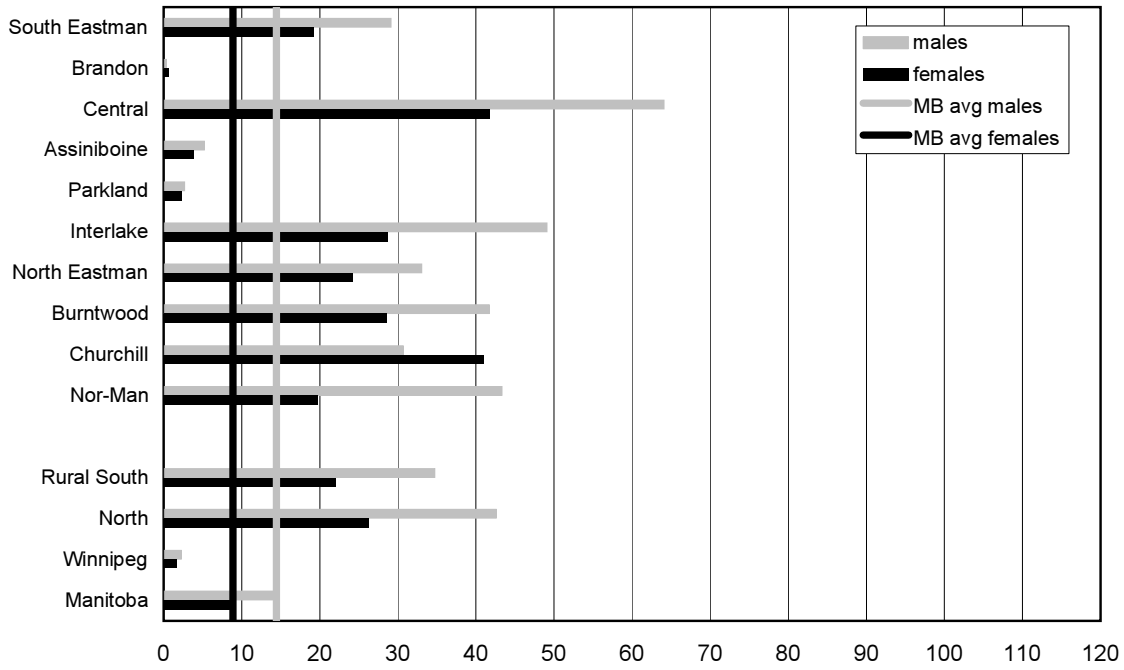
Definition: This is the number of days used in short-stay hospitalizations (1-29 days) in Mental Health Centres per thousand residents per year, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. Only the rates of those in the "cumulative disorders" group are shown, by RHA and district for males and females. The rates are age-adjusted to reflect the population of Manitoba. Table 5.6.1 in the previous sub-section shows rates by specific disorder groups.

Because of uncertainties in the way in which much of the information in the Mental Health Management Information System (MHMIS) is collected in different institutions, these findings must be viewed with caution. Since differences may be due to the extent that data were collected, not necessarily the population's actual use of the facilities, no statistical testing is done for the Mental Health Centre data in this chapter (see Chapter 3 for a further discussion of MHMIS).

NOTE: These rates DO NOT include use of psychiatric services at St. Boniface General Hospital (McEwen), Health Sciences Centre (PsycHealth), and in several rural hospitals, since these are within the acute care facilities and thus cannot be separated out in our data files as mental health centres.

Figure 5.6.2a: Short (<30) Stay Days in Mental Health Centres for those with Cumulative Disorders by RHA, 1997/98-2001/02

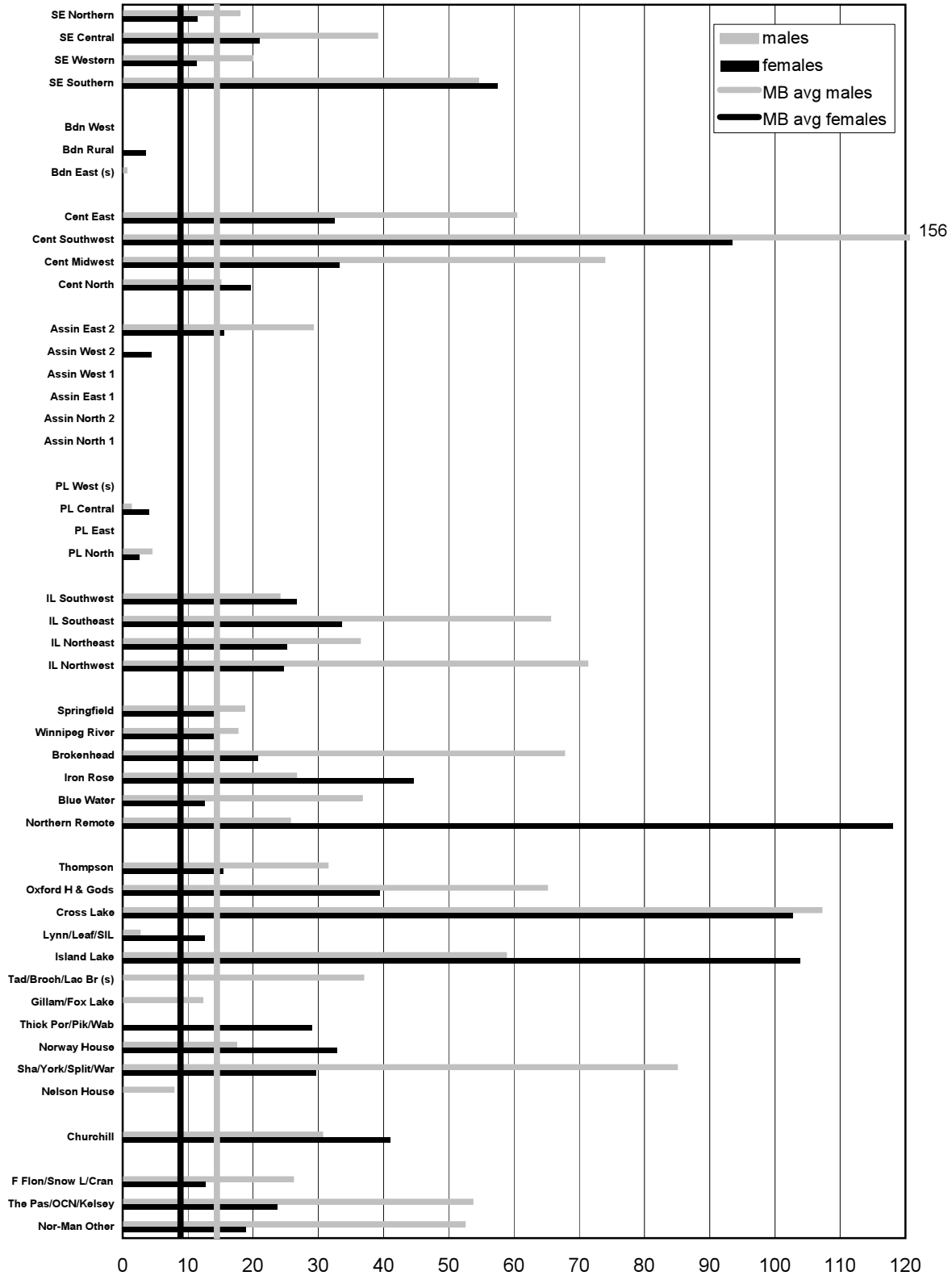
Age-adjusted annual rate of days used per 1000 residents aged 10 years +



's' indicates data suppressed due to small numbers
**because of concerns about missing data, statistical testing was not performed

Figure 5.6.2b: Short (<30) Stay Days in Mental Health Centres for those with Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of days used per 1000 residents aged 10 years +



Key findings:

- In the "cumulative disorders" group, males appeared to use more days in short-stays in Mental Health Centres than females (14 versus nine days per thousand per year), though the differences were not tested statistically because of concerns about data completeness and accuracy.
- For the "cumulative disorders" group, rates of short-stays in mental health centres were much lower than short-stay days used in acute hospitals 'for' mental illness (14 versus 205 for males, nine versus 164 days per thousand per year for females—see Section 5.6.1).
- The rates of short-stay days in mental health centres 'for' mental illness were highest among residents of the RHAs in which the Mental Health Centres are located (Central and Interlake), but are also high among residents of northern RHAs.

Table 5.6.1: Acute care hospital and mental illness centre short (<30) stay hospital days 'for' mental illness by specific disorder groups by RHA, 1997/98-2001/02

Age-adjusted annual rate of days used per 1,000 residents aged 10+

Males	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	168.28	37.43	261.40	36.56	211.37	37.26	773.10	319.28	1,431.18	226.22	27.63	0.00	140.69	29.12
Brandon	382.83	0.49	495.97	1.40	539.77	0.00	1,352.51	3.08	2,047.47	0.00	22.86	0.00	309.90	0.35
Central	172.41	60.91	278.84	56.84	270.71	56.10	728.36	700.94	1,098.68	287.02	47.91	2.48	163.06	64.10
Assiniboine	368.84	8.10	605.35	4.18	472.45	3.37	1,443.77	71.53	2,277.22	0.00	43.04	0.00	306.58	5.21
Parkland	331.77	4.07	470.74	2.23	491.90	1.59	1,530.14	29.94	2,303.83	14.70	32.95	0.00	282.57	2.68
Interlake	166.91	53.06	255.84	50.30	249.12	68.41	590.50	656.79	757.92	340.30	19.63	1.82	148.81	49.10
North Eastman	172.59	36.40	321.76	36.17	240.58	38.75	856.57	415.56	864.53	46.13	30.55	0.00	152.20	33.08
Burntwood	293.90	94.22	522.14	65.25	205.66	37.09	964.35	587.65	959.54	582.66	12.98	3.16	167.78	41.69
Churchill	397.76	115.50	301.55		231.08	31.59	1,073.27		105.54	0.00	0.00	0.00	245.79	30.69
Nor-Man	243.71	50.45	309.00	41.33	281.40	70.49	2,143.59	771.44	1,443.62	563.83	11.64	1.24	180.83	43.33
Rural South	225.31	37.33	357.18	34.32	319.55	38.15	961.74	409.45	1,502.88	175.11	35.08	0.90	196.68	34.73
North	282.79	76.62	423.16	56.95	226.83	46.35	1,313.89	617.17	1,113.52	514.87	11.84	2.21	175.86	42.60
Winnipeg	230.18	2.66	258.10	3.59	359.38	2.78	1,469.59	20.87	1,283.28	10.87	10.14	0.19	198.64	2.25
Manitoba	243.36	16.18	310.95	14.46	341.17	18.91	1,355.49	122.69	1,390.19	58.92	19.06	0.51	205.09	14.43

Females	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	161.34	23.03	258.10	30.14	265.62	28.42	1,370.88	342.18	1,507.62	132.78	20.64	0.00	141.31	19.14
Brandon	240.12	0.68	339.30	1.46	359.61	0.00	1,825.91		1,892.47	0.00	8.94	0.00	210.10	0.57
Central	156.76	45.71	257.97	55.31	334.32	96.42	683.11	738.13	1,423.10	468.24	40.58		143.44	41.72
Assiniboine	314.54	4.57	530.89	5.22	534.51	4.07	2,532.81	0.00	3,767.86	53.89	41.37	0.00	275.87	3.80
Parkland	268.51	1.62	379.55	0.00	487.55	3.75	1,638.68	55.43	2,966.27	0.00	22.21	0.00	242.35	2.33
Interlake	126.92	31.49	207.70	32.15	270.03	48.16	1,046.94	419.95	1,141.67	411.82	19.93	0.00	117.42	28.71
North Eastman	148.63	27.08	209.71	30.23	205.73	49.31	1,124.27	396.08	1,206.43	350.21	27.89	2.30	129.86	24.21
Burntwood	217.30	41.37	345.26	54.74	190.66	33.30	1,456.06	740.54	1,673.97	388.32	18.62	0.00	140.01	28.50
Churchill	1,657.31		1,334.97	0.00	1,377.35	0.00	1,565.54	671.26	1,607.44	0.00	0.00	0.00	1,337.57	40.91
Nor-Man	160.91	21.66	152.19	21.94	247.25	25.56	1,372.15	291.25	1,048.96	565.76	8.85	2.77	131.65	19.75
Rural South	195.50	24.72	315.62	27.09	355.17	42.42	1,293.96	358.47	2,000.10	259.41	30.71	0.30	175.64	22.09
North	204.72	33.16	256.60	35.63	212.16	31.06	1,444.52	518.56	1,389.43	474.91	11.57	1.85	144.36	26.19
Winnipeg	175.25	1.68	247.02	1.01	341.65	2.58	1,649.09	30.44	1,541.85	12.74	11.39	0.00	153.81	1.59
Manitoba	188.34	9.89	276.49	10.10	324.23	17.03	1,609.25	113.57	1,668.13	73.92	17.35	0.12	163.96	8.87

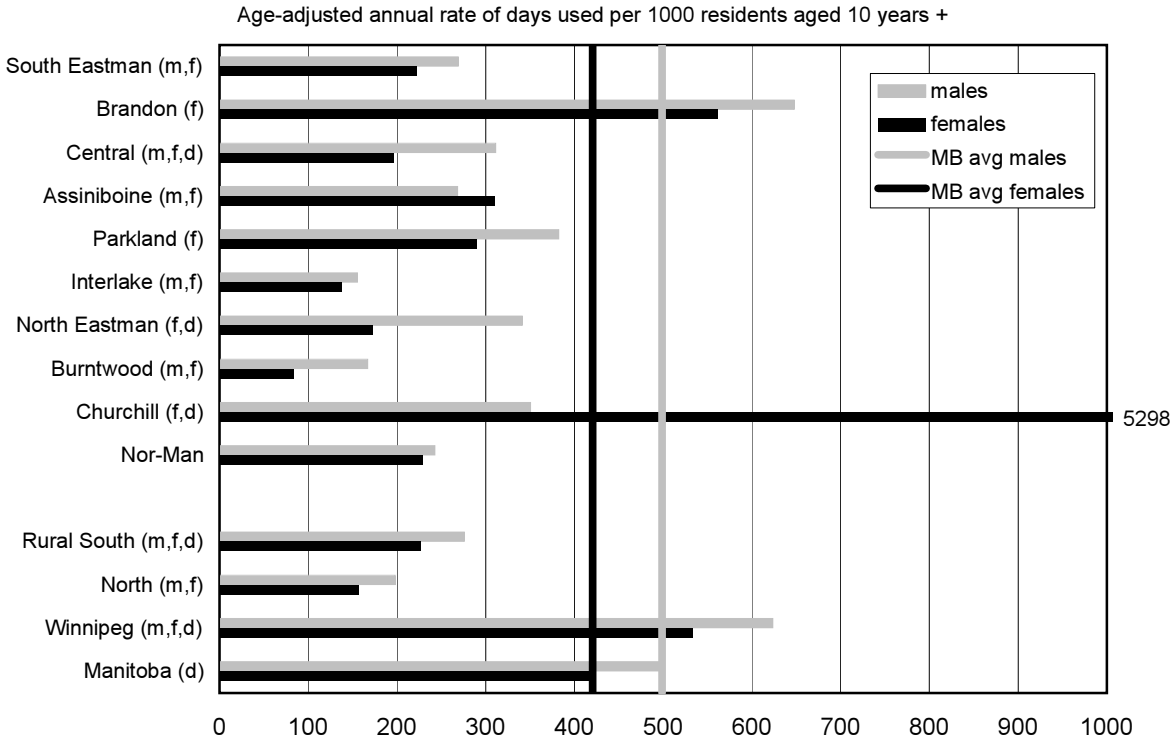
Note: blank cell = suppressed

5.7 Days Used in Long Stays 'For' Mental Illness Disorders

5.7.1 Days used in long-stays in acute care hospitals 'for' mental illness

Definition: This is the number of days used in long-stay hospitalizations (30+ days) in acute hospitals per thousand residents per year, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. The rates are age-adjusted to reflect the population of Manitoba. Only the rates of those in the "cumulative disorders" group are shown, by RHA and district for males and females. Table 5.7.1 shows rates of long-stay days used in acute hospitals 'for' mental illness, by specific disorder group.

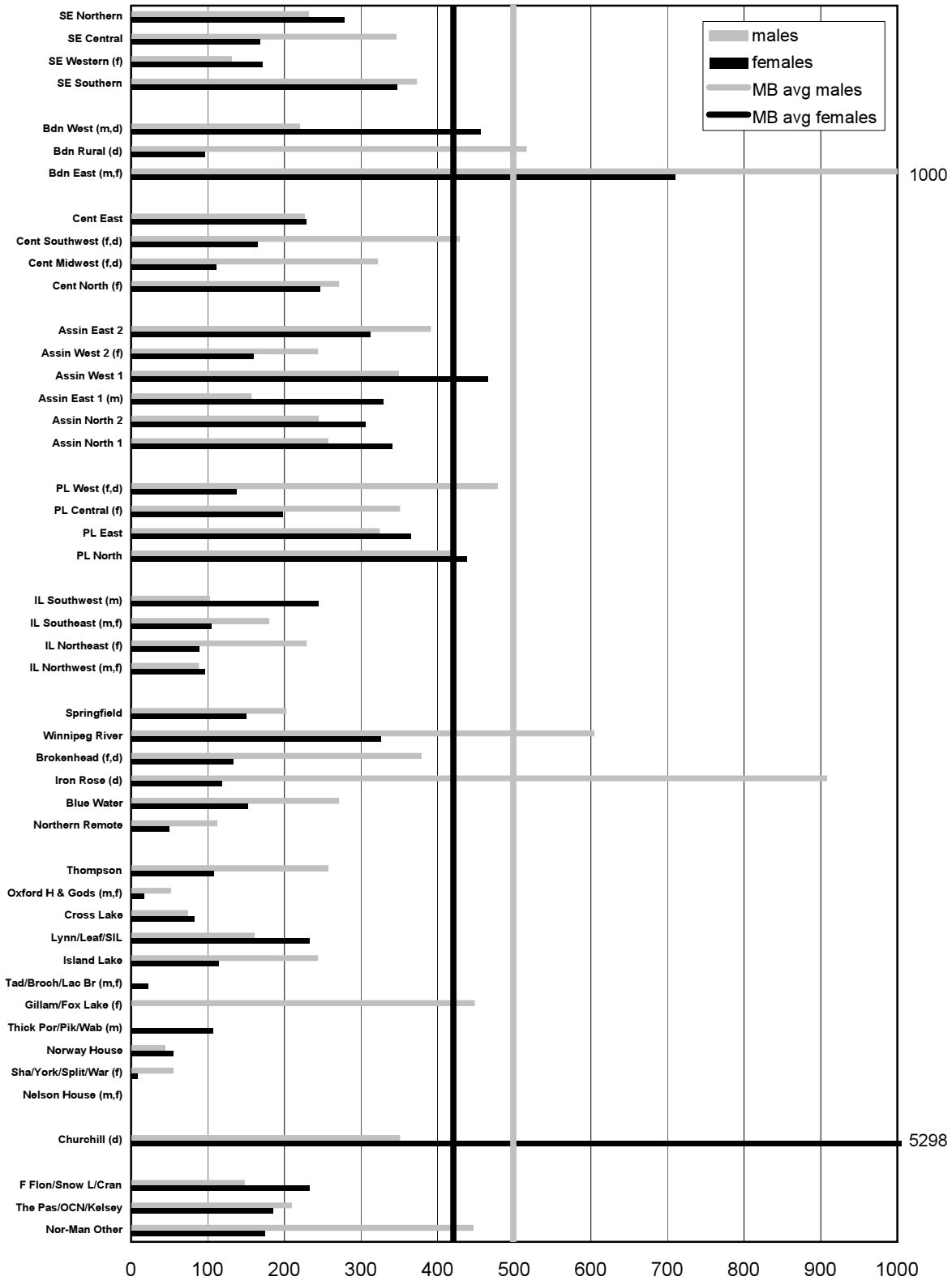
Figure 5.7.1a: Long (30+) Stay Hospital Days for Mental Illness Disorders for those With Cumulative Disorders by RHA, 1997/98-2001/02



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 5.7.1b: Long (30+) Stay Hospital Days for Mental Illness Disorders for those With Cumulative Disorders, 1997/98-2001/02, by District

Age-adjusted annual rate of days used per 1000 residents aged 10 years +



Key findings:

- On average, males in the "cumulative disorders" group used more long-stay days in acute hospitals 'for' mental illness than females (499 versus 421 days per thousand per year), though this varied by RHA.
- The rate of long-stay days in acute care hospitals 'for' mental illness was much lower than rate of all-cause long-stay days (males: 499 versus 1,625, females: 421 versus 1,576 days per thousand per year).
- Rates of long-stay days in acute care hospitals 'for' mental illness were particularly high for those in the "cumulative disorders" group residing in Brandon and Winnipeg RHAs (and possibly in Churchill, especially for females), reflecting the fact that mental health care in these urban or remote centres is often provided within the acute care system.
- For those persons diagnosed with schizophrenia or personality disorders, the rate of long-stay days in acute care hospitals 'for' mental illness is extremely high when compared to the overall rate for those in the "cumulative disorders" group (males: schizophrenia 4,664, personality disorder 3,102, cumulative disorders 499 days per thousand per year; females: schizophrenia 5,047, personality disorder 3,687, cumulative disorders 421 days per thousand per year).

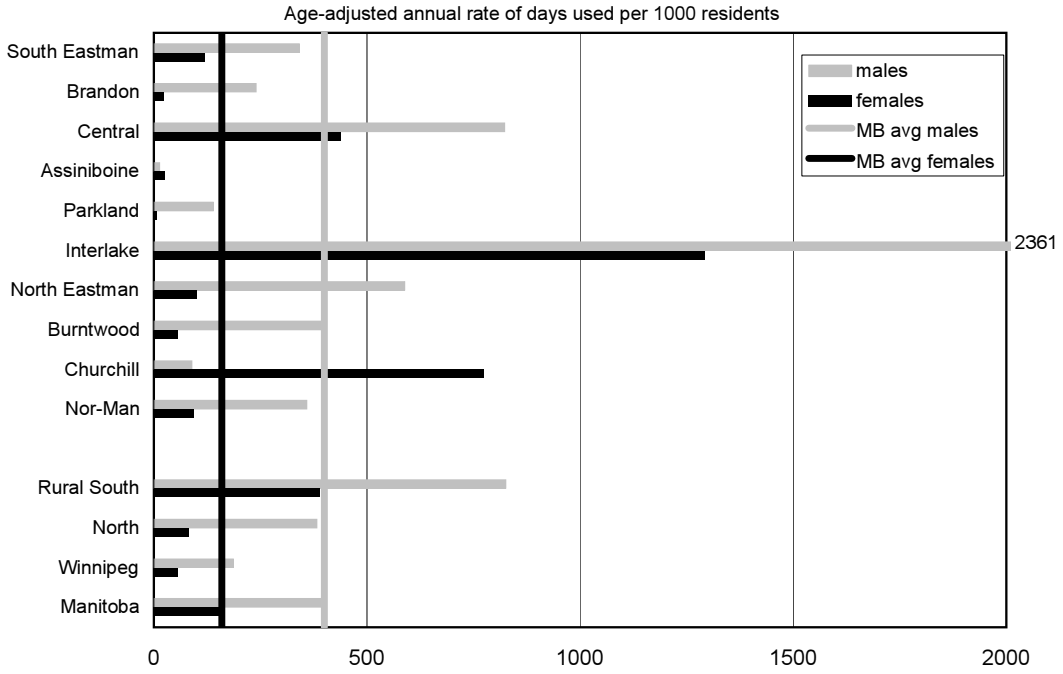
5.7.2 Days used in long-stays in mental health centres 'for' mental illness

Definition: This is the number of days used in long-stay hospitalizations (30+ days) in Mental Health Centres per thousand residents per year, for which a Mental Illness Disorder (ICD-9-CM codes 290-319) was coded as the 'most responsible' cause of the hospitalization. Only the rates of those in the "cumulative disorders" group are shown, by RHA and district for males and females. The rates are age-adjusted to reflect the population of Manitoba. Table 5.7.1 in the previous sub-section also shows rates by specific disorder groups.

Because of uncertainties in the way in which much of the information in the Mental Health Management Information System (MHMIS) is collected in different institutions, these findings must be viewed with caution. Since differences may be due to the extent that data were collected, not necessarily the population's actual use of the facilities, no statistical testing is done for the Mental Health Centre data in this chapter (see Chapter 3 for a further discussion of MHMIS).

NOTE: These rates DO NOT include use of psychiatric services at St. Boniface General Hospital (McEwen), Health Sciences Centre (PsycHealth), and in several rural hospitals, since these are within the acute care facilities and thus cannot be separated out in our data files as mental health centres.

Figure 5.7.2a: Long (30+) Stay Days in Mental Health Centres for those With Cumulative Disorders by RHA, 1997/98-2001/02



's' indicates data suppressed due to small numbers
**because of concerns about missing data, statistical testing was not performed

Figure 5.7.2b: Long (30+) Stay Days in Mental Health Centres for those With Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of days used per 1000 residents

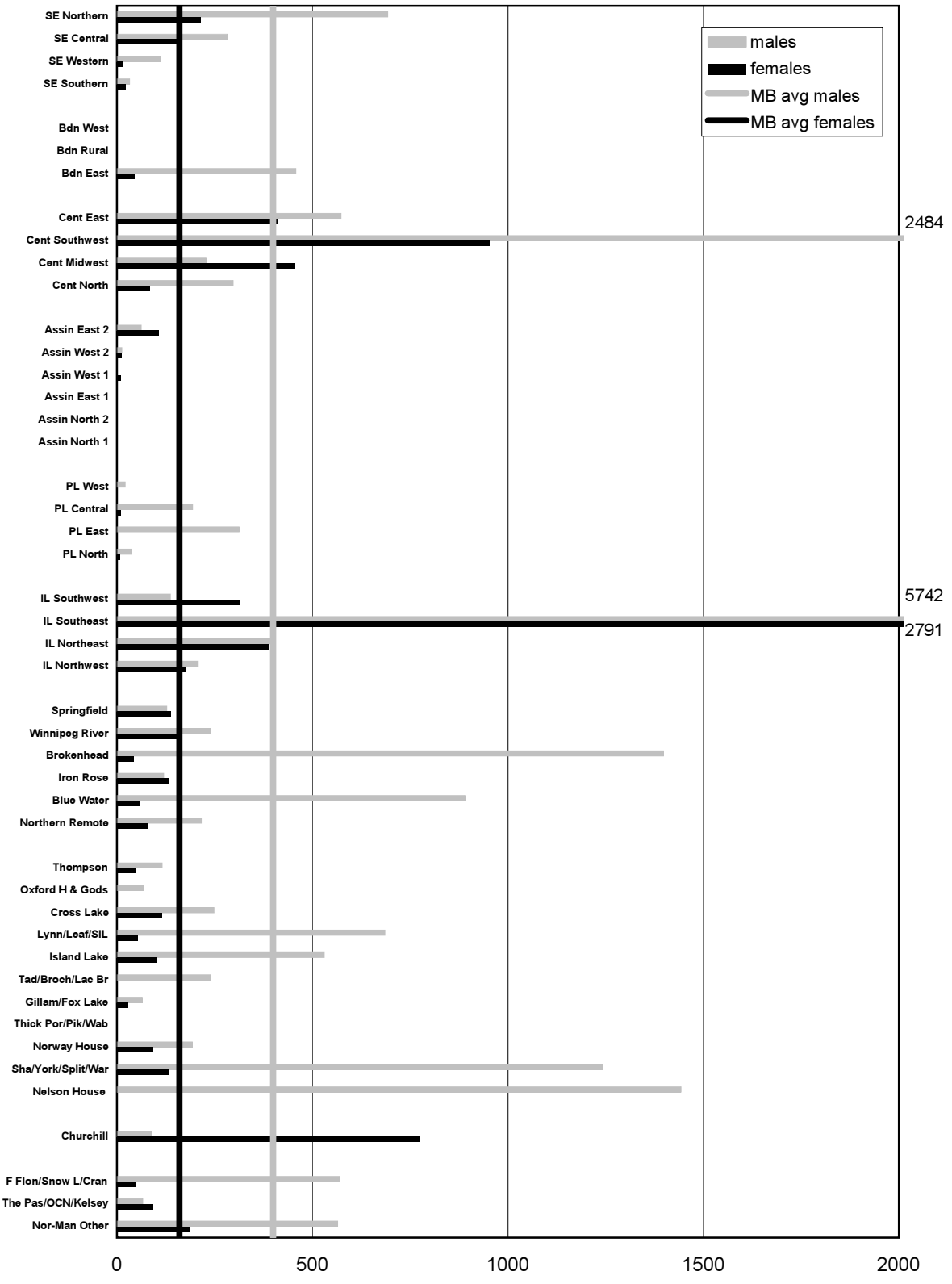


Table 5.7.1: Acute care hospital and mental illness centre long (30+) stay hospital days for mental illness by specific disorder groups and RHA, 1997/98-2001/02

Age-adjusted annual rate of days used per 1,000 residents aged 10+

Males	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	261.82	122.03	171.15	14.17	262.43	120.84	4,164.78	6,944.93	750.67	1,671.87	39.35	10.37	269.13	341.27
Brandon	706.46	95.24	769.41	87.45	1,046.45	142.33	3,043.95	2,058.35	4,722.20	773.48	165.69	33.68	647.66	240.20
Central	338.59	483.10	318.90	950.07	283.08	899.02	1,428.18	13,006.11	1,268.17	1,972.03	173.19	114.30	311.20	823.07
Assiniboine	263.15	21.88	322.74	12.14	277.95	0.00	2,215.76	276.16	2,823.96	123.22	134.13	0.00	268.14	13.57
Parkland	371.10	27.48	475.28	20.67	633.98	268.36	2,935.03	264.07	4,120.64	1,877.71	212.22	0.00	382.34	139.38
Interlake	190.82	758.40	268.02	618.13	104.55	1,097.56	1,642.36	40,082.78	687.63	11,691.25	117.84	887.43	155.56	2,360.89
North Eastman	358.85	438.99	340.53	336.54	281.70	1,077.32	2,531.70	7,415.72	472.32	118.04	136.17	0.00	341.28	588.42
Burntwood	271.45	258.79	341.50	135.30	235.66	275.83	2,179.78	9,172.46	50.57	1,482.05	370.78	0.00	166.84	394.30
Churchill	887.20	0.00	890.79	0.00	157.20	0.00	4,155.01		2,075.54	0.00	0.00	0.00	350.56	89.26
Nor-Man	292.78	412.85	332.29	218.90	352.70	146.44	5,636.85	6,755.58	3,856.26	7,627.92	60.65	0.00	242.55	358.73
Rural South	287.16	346.12	319.62	396.30	288.42	614.68	2,387.44	14,347.64	2,007.19	3,717.70	141.98	186.18	275.93	825.38
North	302.76	348.69	366.10	157.65	260.28	237.04	3,238.28	8,406.95	1,529.34	4,886.14	172.10	0.00	198.12	382.48
Winnipeg	653.63	61.11	499.87	30.19	834.04	185.88	5,558.29	2,488.44	3,312.51	311.65	147.87	27.43	623.61	186.40
Manitoba	534.54	160.12	470.54	128.90	613.84	319.77	4,664.00	5,507.29	3,102.43	1,184.40	146.50	79.65	498.84	399.74

Females	Depression		Anxiety		Substance Abuse		Schizophrenia		Personality Disorder		Other		Cumulative	
	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC	Acute	MHC
South Eastman	259.36	62.95	288.77	32.01	644.17	21.38	3,344.52	3,082.02	2,710.05	235.26	40.79	29.40	222.32	118.09
Brandon	603.75	0.00	653.48	0.00	671.74	213.52	3,435.86	276.81	4,051.69	0.00	459.00	108.01	561.26	22.90
Central	215.21	403.93	224.35	385.75	334.44	404.59	583.69	9,584.91	1,633.19	4,152.71	150.37	38.58	196.14	438.78
Assiniboine	329.28	28.50	345.81	16.20	462.10	0.00	4,188.03	105.10	2,211.86	373.20	328.15	0.00	309.96	23.71
Parkland	303.49	3.46	276.95	0.00	344.91	0.00	1,903.38	192.74	2,552.84	0.00	227.02	0.00	290.32	5.58
Interlake	143.21	344.67	316.11	67.15	328.73	264.04	2,618.96	26,756.57	922.84	7,982.86	93.20	271.77	137.61	1,292.40
North Eastman	185.42	119.42	199.65	204.59	338.41	124.66	1,552.09	2,523.57	1,453.19	1,968.89	175.54	0.00	172.29	98.62
Burntwood	152.19	104.62	167.20	86.93	94.73	74.35	1,967.43	2,075.75	2,045.49	751.73	0.00	0.00	83.96	54.90
Churchill	5,006.85	127.06	5,006.85	0.00	5,331.52	456.73	5,006.85	6,922.35	5,006.85	0.00	21,374.98	0.00	5,297.86	772.78
Nor-Man	187.11	91.30	288.98	53.44	327.50	102.59	2,436.05	2,487.64	1,138.38	884.12	259.41	0.00	229.18	93.51
Rural South	244.58	189.80	288.33	129.58	364.73	163.37	2,227.78	8,581.79	1,861.72	2,704.82	184.92	59.71	226.60	388.64
North	175.13	100.77	285.53	67.12	172.31	94.19	2,530.74	2,563.14	1,831.52	833.58	531.93	0.00	156.77	81.95
Winnipeg	576.82	33.04	589.16	7.97	795.44	18.72	6,362.14	1,229.26	4,351.12	401.13	181.59	0.00	533.45	56.23
Manitoba	457.55	84.28	489.32	48.12	577.32	75.08	5,046.54	2,929.71	3,686.59	922.04	202.57	23.78	420.64	159.76

Note: blank cell = suppressed

Key findings:

- For the "cumulative disorders" group, males appeared to use many more days in Mental Health Centres for long-stay days 'for' mental illness than females (400 versus 160 days per thousand per year), though the differences were not tested statistically because of concerns about data completeness and accuracy.
- In the cumulative disorders group, the rate of long-stay days 'for' mental illness in mental health centres was somewhat lower than the corresponding rate in acute hospitals for males (400 versus 499 days per thousand per year), but much lower for females (160 versus 421 days per thousand per year).
- This analysis clearly illustrates the role of the Selkirk Mental Health Centre (located in the Southeast district of Interlake RHA) as the designated facility for long-term and residential care of persons with mental illness, with rates in this district being extremely high (males: 5,742, females: 2,791 days per thousand per year). Similarly, Eden Mental Health Centre may be contributing to the very high rate in the Southwest district of Central RHA (males: 2,484, females: 953 days per thousand per year). This explains part of the extreme variation in rates by RHA and District.

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CHAPTER 6: HOME CARE

6.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

This chapter contains information on the use of Home Care services in Manitoba for the fiscal years 1997/98 to 2001/02. Many of the rate comparisons involve Manitoba residents aged 10 or more in the "cumulative mental disorders" group and the "no disorders" group (see Chapters 1 and 2 for further explanation of these terms).

The indicators of home care in this chapter include:

- Open Home Care Cases:
  - Prevalence of cases registered (open) on average per year
  - Prevalence for those with depression
  - Prevalence for those with dementia (age 55+ years)
- New Home Care Cases:
  - Average incidence of cases opened after 1 April each year
- Closed Home Care Cases:
  - Average number of cases ending per year
- Length of Home Care Cases:
  - Average number of days a case is open per year

We have included Manitoba residents aged 10 years and over in the analysis. Since individuals can receive more than one 'episode' of home care support over a five-year period, each opened and closed episode is counted as a separate case. Home care services to people living in First Nations communities under federal health care jurisdictions could not be included in the analyses.

What is home care?

Home care is health-care services provided to Manitobans in their own homes. It is used in such circumstances as when individuals have inadequate help after they return home from hospital, or when they are waiting for placement in long-term care facilities. In this chapter, most of the data on home care cases come from the Manitoba Support Services Payroll (MSSP) file for the five fiscal years from 1997/98 to 2001/02.[1]

From 1997/98 to 2001/02, home care services were provided by: home care attendants (45%), Registered Nurses (25%), home-support services (22%), licensed practical nurses (4%), and physiotherapists or occupational therapists (4%) (Manitoba Health Annual Statistics, 2001-2002). In the fiscal

[1] Home care data are not recorded under certain circumstances (Roos et al., 2001). One occurs when a home care worker provides services to people living in a senior citizens housing complex. The worker records services under one data entry as block care. These services can not be attributed to an individual. Block care accounted for about 12% of the MSSP service hours delivered in Manitoba in 1998/99, and 22% in 2000/01. A second circumstance occurs when outside agencies (e.g., private care and the VON) deliver home care but do not report to the MSSP system. Home care data are available for at least 80% of home care clients. More information about home care is in the MCHP document, A Look at Home Care in Manitoba (Roos et al., 2001).

year 1998/99, home care served 31,298 people in Manitoba or about 2.7% of the population. Most home care clients (79%) were aged 65 years or older, and 63% were female (Roos et al., 2001).

What comparisons are used in this chapter?

Twenty-four percent of the Manitoba population aged 10 and older has been diagnosed with one or more of five mental illness or addiction disorders (anxiety, depression, personality disorder, schizophrenia, or substance abuse). This group we refer to as the cumulative mental illness disorder group. Thirteen percent of the population has been diagnosed with other mental illnesses, such as Alzheimer's disease or other dementias. The remaining 63% of the population is without a diagnosed mental illness disorder. The key analyses in the current study compare home care use in those with any cumulative mental illness to those without a mental illness. Unless specified, those with other mental disorders are not included in the comparisons.

Example: North Eastman RHA

North Eastman is an area with average overall health status (see Chapter 1 discussion of premature mortality rate), with the exception of the Northern Remote district. Therefore, we would expect the RHA to show similar patterns of home care service use to the provincial patterns.

The rate of open home care cases in North Eastman is 2.5 times higher for residents with a mental illness disorder compared to those without a disorder (Figures 6.2.1 and 6.2.5). The rate of male cases is similar to the Manitoba average, but there are fewer than average female cases, including females with depression (Figure 6.6.1). All residents in North Eastman with dementia have a rate of open cases similar to the Manitoba average.

The incidence of new home care cases in North Eastman for those with mental illnesses is 2.4 times higher than for those without an illness (Figures 6.3.1 and 6.3.3). Compared to Manitoba averages, rates of new cases are lower for all residents, both with and without mental illnesses. Closed home care rates in North Eastman for those with a mental illness are 2.2 times higher than for those without an illness (Figures 6.4.1 and 6.4.3). Compared to the Manitoba average, closing rates are lower for all residents of North Eastman, both with and without mental illnesses. The average length of cases (Figures 6.5.1 and 6.5.3) for all residents in North Eastman is similar to the Manitoba averages (i.e., males and females with and without any mental illness).

In North Eastman, females have 1.4 times the rate of open cases as males, but the larger difference lies between those with and those without a mental illness disorders. The rate of home care cases is 2.4 times higher among residents with a cumulative mental illness compared to those without an illness. The difference in the rate for those with dementia is even higher (5.9 times higher for males and 5.1 times higher for females) than for those with no cumulative mental illness (Table 6.7.1), a situation similar across Manitoba.

In North Eastman, the rate and duration of open home care cases is similar to the Manitoba average, but rates of new- and closed-care cases are lower. Given that North Eastman has generally average health status, the lower than average rates of new cases may indicate that there are more restrictions to accessing home care services or less demand for services there. Perhaps personal care homes are used more often than home care in North Eastman. With a higher incidence of new home care cases compared to closed cases over the five years, it appears likely that the prevalence of open cases will rise in North Eastman.

Some of the questions that health policy planners may wish to explore include:

- *How are the rates of home care cases in your RHA influenced by residents with mental illness disorders, and how does this influence compare to other regions?*
- *If home care use in your region is high, is it due to high rates of new admissions to home care, long-stays, or few closings? If use is low, is your use of personal care homes higher than average, or also lower than average?*
- *How do mental illnesses influence the use of home care in your RHA?*
- *Based on your knowledge of the rates of mental illness in your RHA, what predictions on the use of home care (new, open, closed, and length of care) could you make for the future?*

Overall key findings from this chapter:

Comparing residents in the "cumulative mental disorders" group to those in the "no mental disorders" group:

- The average annual rate of new-, open-, and closed- home care cases was two and a half times higher for those with a diagnosed mental health disorder.
- The same pattern was present at every age for both males and females, although on average, female home care cases (mean length 198.0 days) were open 9.5% longer than male cases (mean length 180.9 days).
- For each income quintile category ranked from highest to lowest neighbourhood income, there was a 30% higher prevalence in open cases for those in the "cumulative mental disorders" group.

- Although residents with cumulative mental illness disorders use more home care, once a Manitoba resident is receiving home care, the average length of a case (189.7 days) is about the same for all residents (187.6 days for those with and 191.8 days for those with no mental illness).
- Although they account for 24% of the population, people in the "cumulative disorders" group count for 52% of the open cases, 51% of the new cases, and 53% of the closed home care cases.
- Prevalence of home care is higher at older ages. There is a 10-fold difference in the number of cases between age 50 and age 80 years.
- Only people living in urban areas had significant differences in open case rates by income quintile. Males and females living in urban areas had 20% to 30% more open home care cases if they came from the lowest compared to the highest income area, whether or not they have a mental illness. In rural areas, there was no significant gradient by neighbourhood income for females either with or without a mental health disorder.
- The prevalence of open cases for those age 55+ with dementia is on average 4.5 times higher (3.7 times for females and 5.2 times for males) than for those without a cumulative mental illness (57.2 per thousand per year for males and 91.5 per thousand per year for females).
- The prevalence of open cases in those age 55+ with dementia is 37% higher than among those with one of the five cumulative mental illnesses (whose prevalence is still 3.3 times higher than for those with no cumulative mental illness).

Canadian comparisons:

- Current available data for Canada are limited to self-reported home care utilization rates for selected provinces. Data from the Canadian Community Health Survey (CCHS) are available for several provinces (Statistics Canada, 2003). On average, it was estimated that 2.7% of the population of several provinces used home care in the fiscal year 2000/01 (2.2% males and 3.4% females).[2] There are no data found specifically comparing case rates for those with and without mental illnesses. The rate in Manitoba for all ages was 2.7% in 1998/99 (Roos et al., 2001). In the current study, 72,078 Manitoba residents over the age of 10 years received home care over the five-year period (7% of our population cohort of Manitobans aged 10 and up, n= 1,029,232).

[2] Averages are based on data from Prince Edward Island, Nova Scotia, New Brunswick, and Quebec (Statistics Canada, 82-577-XIE, 2003).

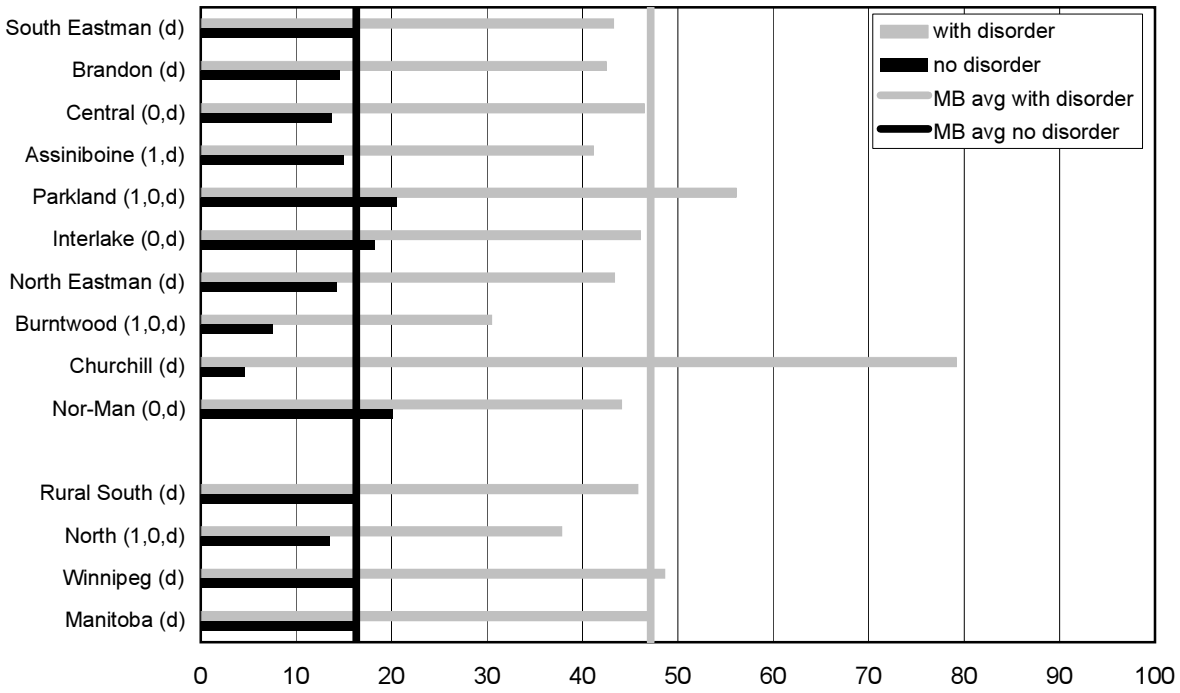
6.2 Open Home Care Cases (Prevalence)

Definition: This is the average number of open home care cases per thousand residents per year over the five-year period. A case may remain open when home care is provided intermittently or when the individual is hospitalized for a period. Also, a resident may have more than one episode of home care in the five-year period, and these are both counted as separate cases. Thus, the rate of open cases does not equal the number or frequency of home care services received. The number of cases is age-adjusted to reflect the population of Manitoba on December 31st, 2001, so that comparisons can be made across RHAs and districts. See the Glossary for more details.

The figures show the annualized number of open home care cases over the five-year period for males and females aged 10 and older for those in the "cumulative disorders" group and those in the "no disorders" group. Prevalence of home care cases is shown by RHA, by district, by age distribution, and by income quintile (urban and rural) for males and females. Unadjusted crude rates are shown in the figures for each age separately by sex. Neighbourhood income quintiles are based on the average annual income of those in the enumeration area where each individual lives. See the Glossary for full definitions of terms.

Figure 6.2.1: Open Home Care Cases for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.2.2: Open Home Care Cases for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +

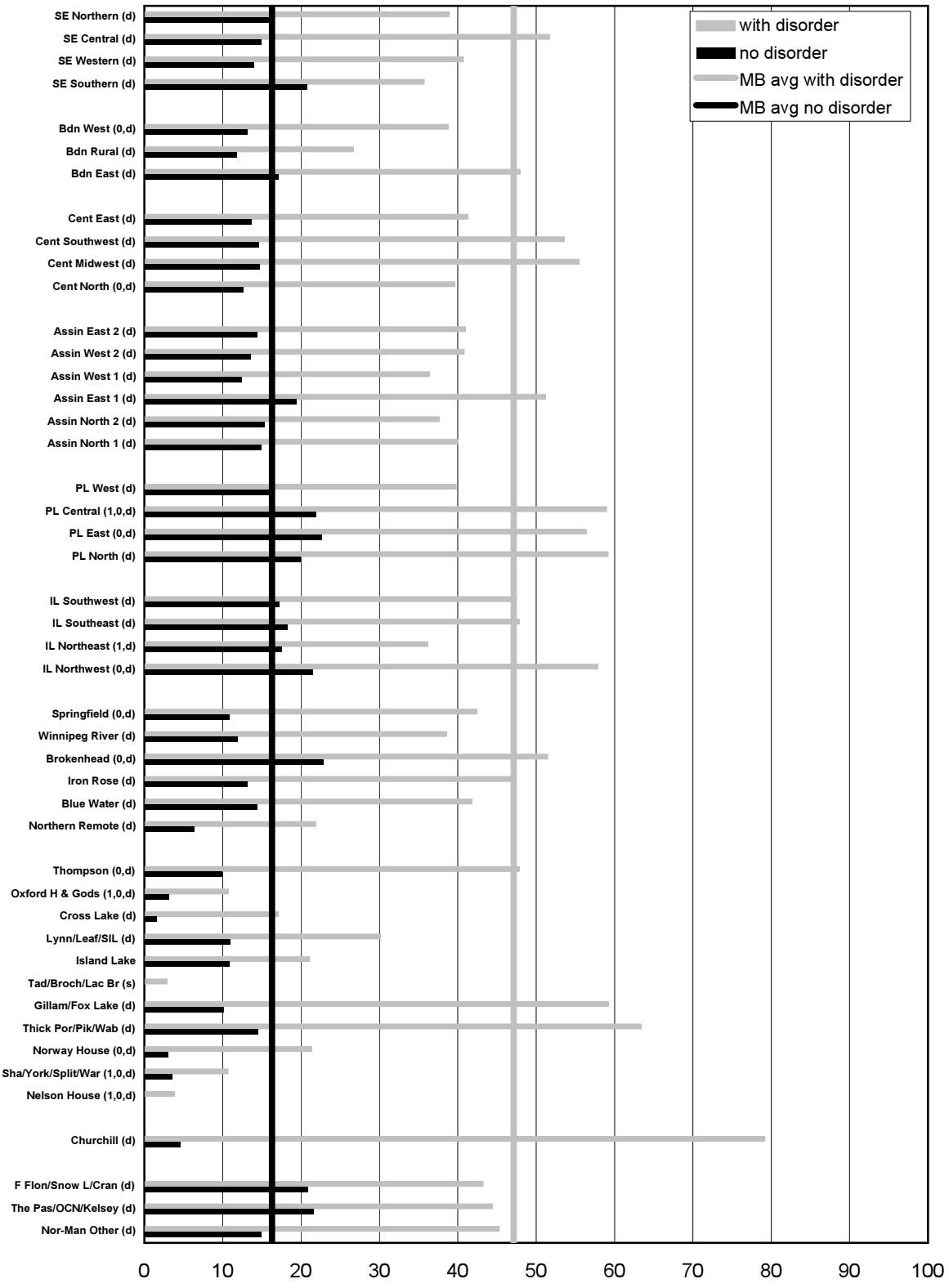


Figure 6.2.3: Open Home Care Cases for Males With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

Average annual rate per 1000 residents aged 10 years +

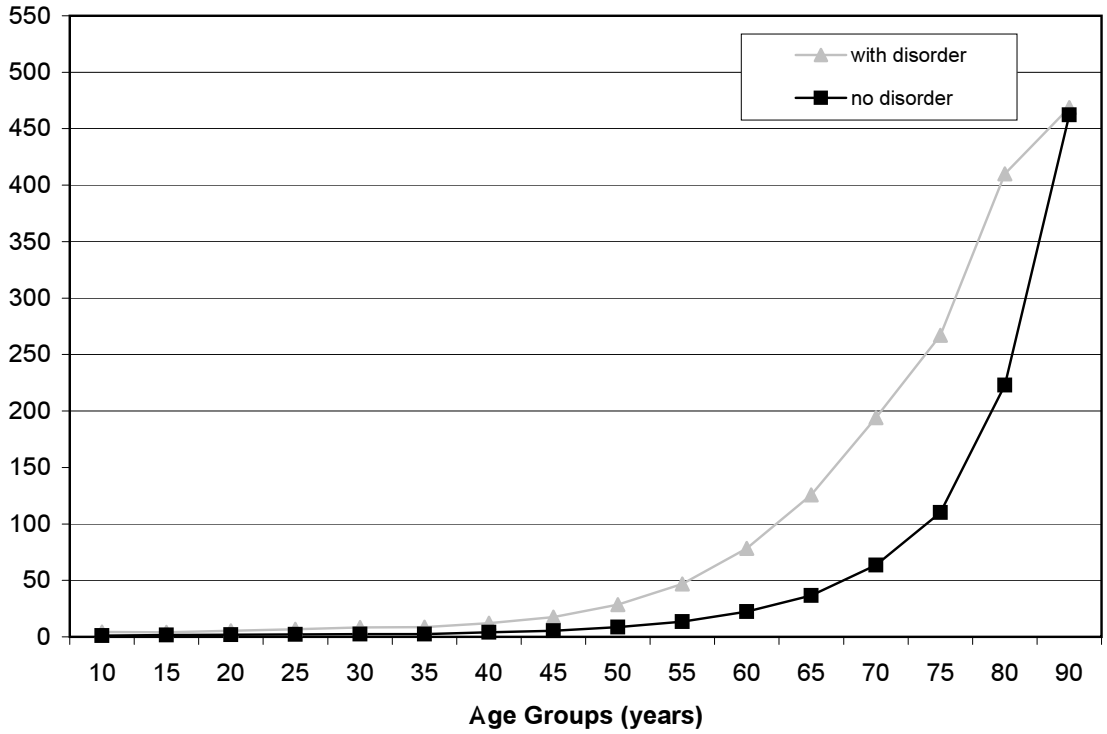
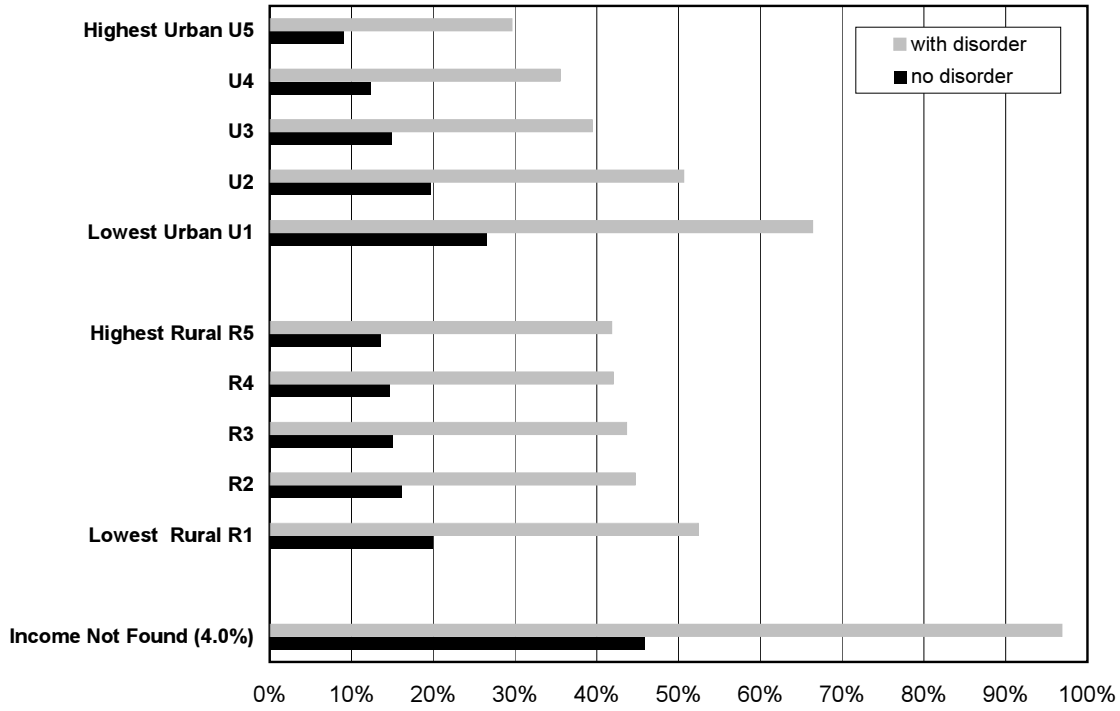


Figure 6.2.4: Open Home Care Cases for Males With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual percentage of open home care cases over period (prevalence)



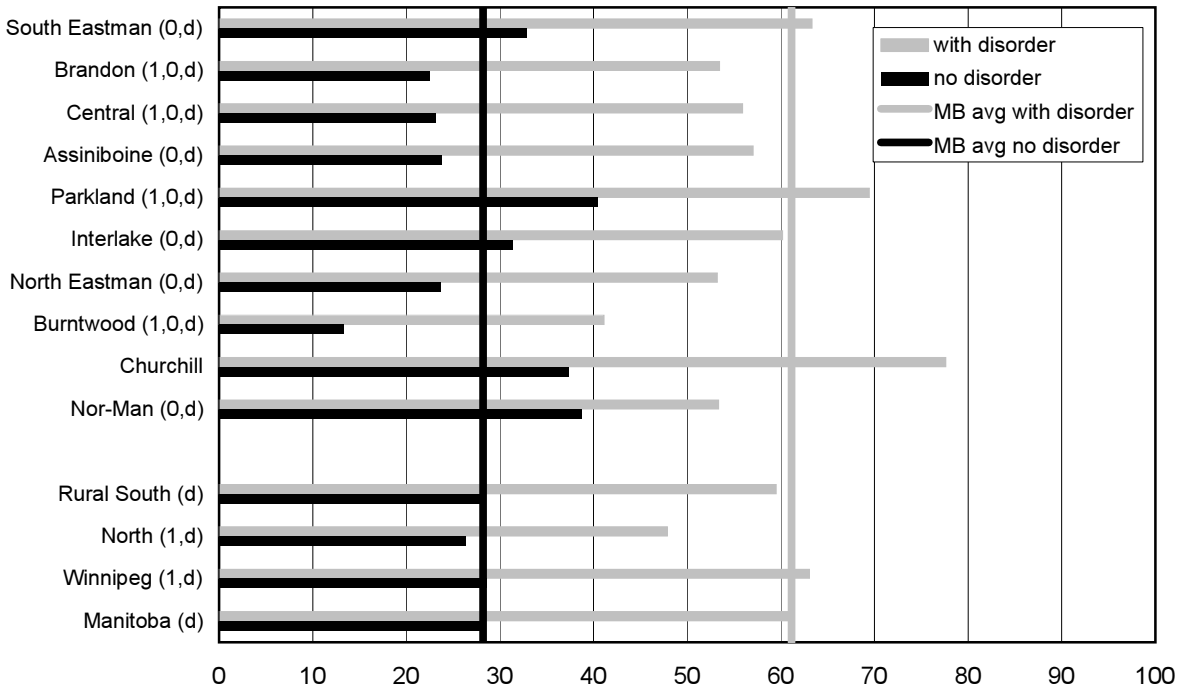
Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Significant (p<.001)

Rural With: Not Significant Rural No Disorders: Not Significant

Figure 6.2.5: Open Home Care Cases for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.2.6: Open Home Care Cases for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +

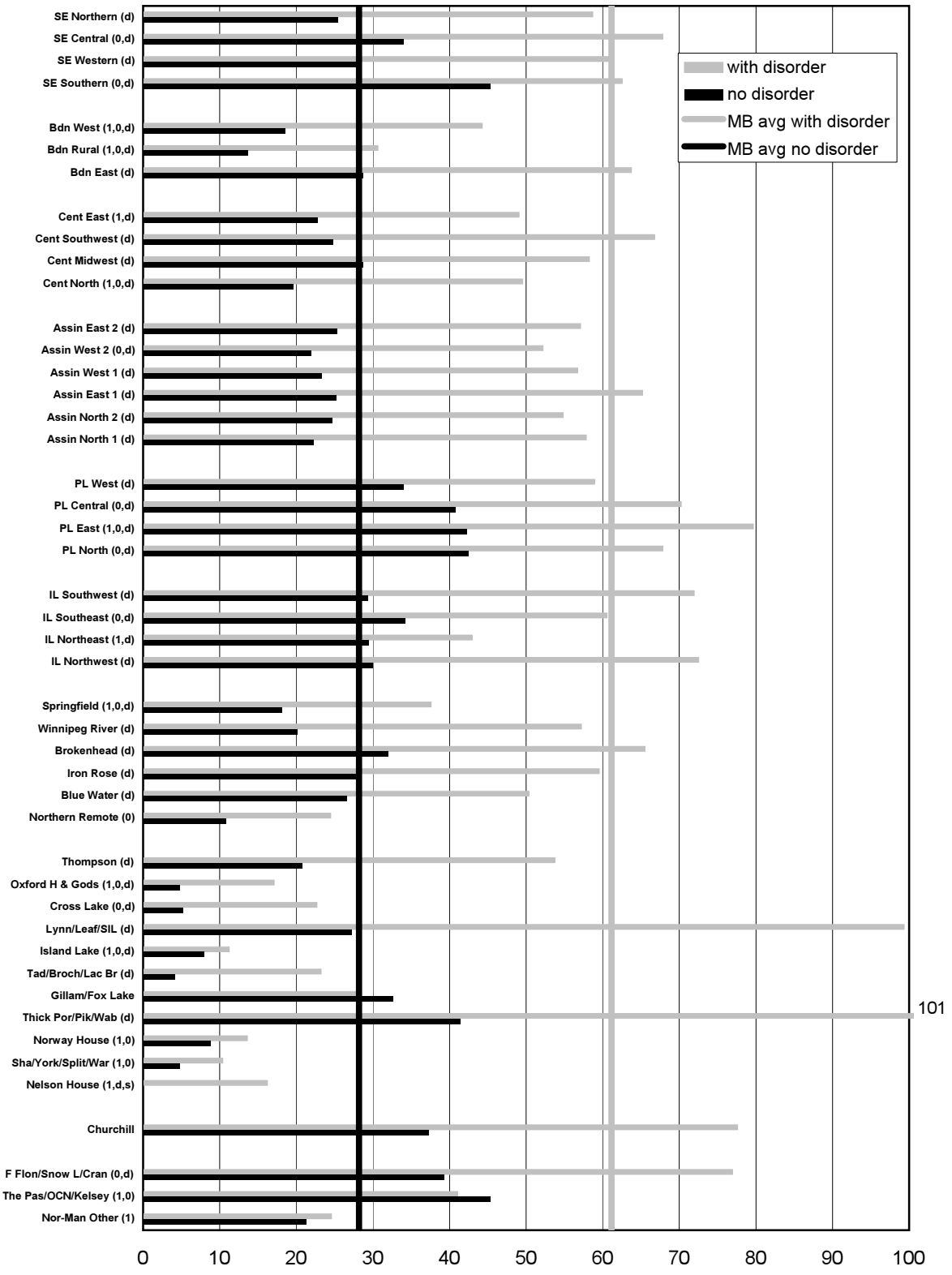


Figure 6.2.7: Open Home Care Cases for Females With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

Average annual rate per 1000 residents aged 10 years +

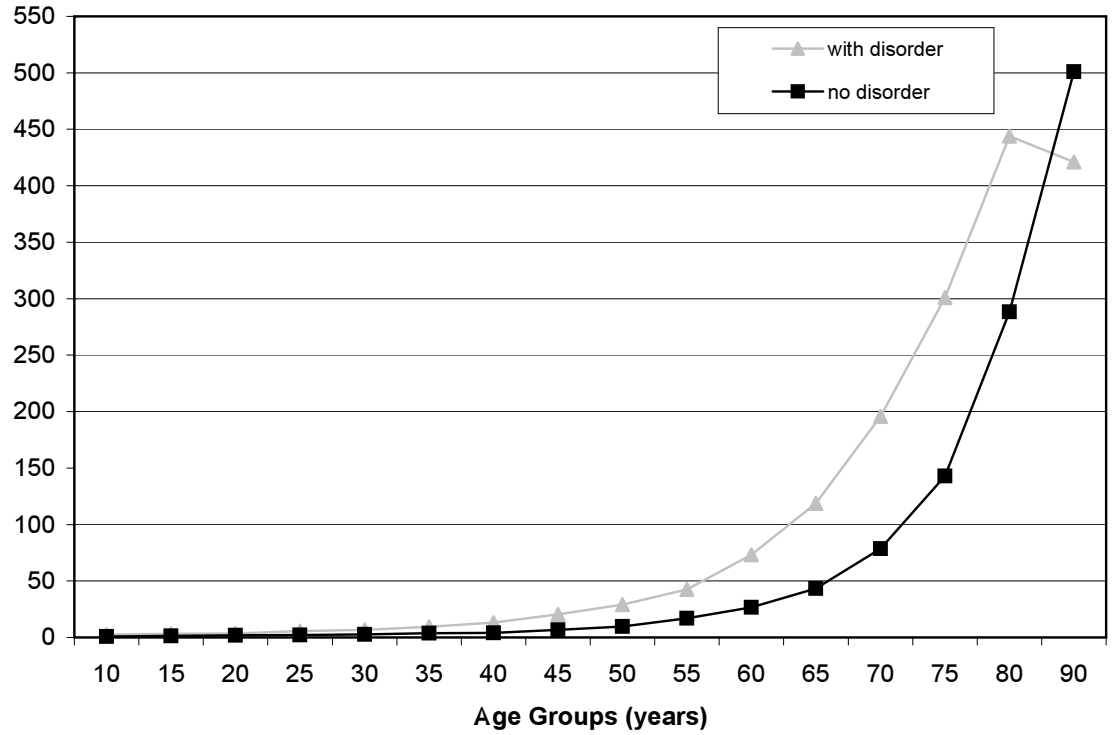
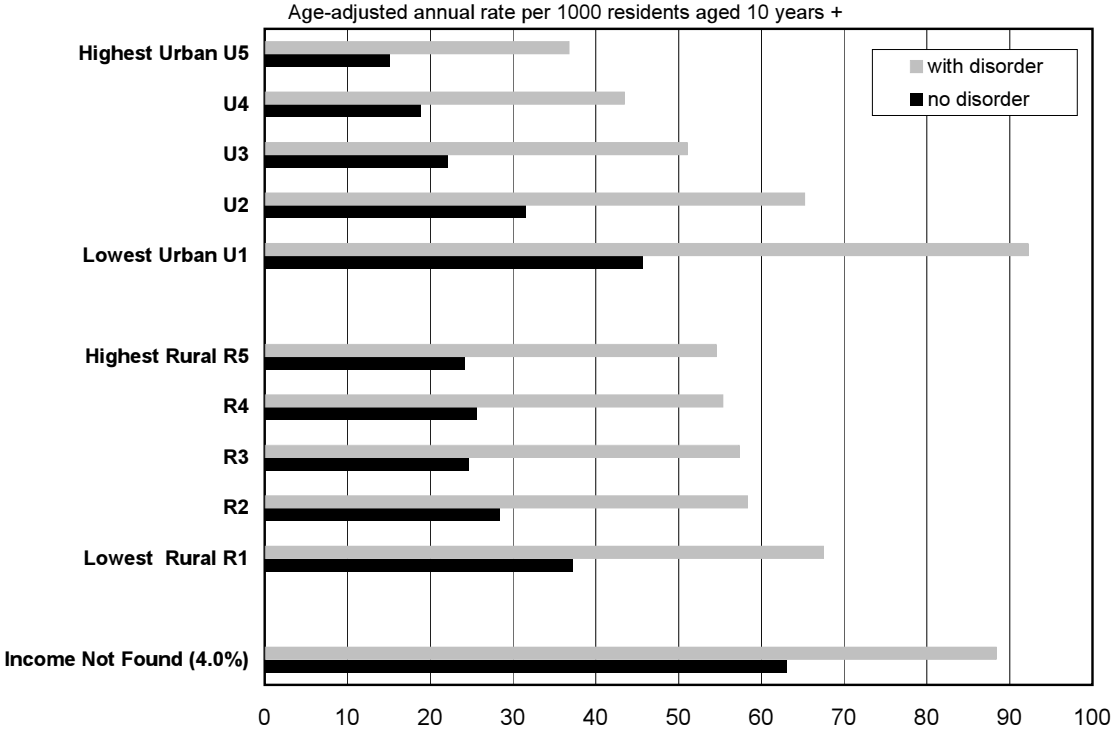


Figure 6.2.8: Open Home Care Cases for Females With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Significant (p<.001)
Rural With: Not Significant Rural No Disorders: Not Significant

Key Findings:

- In Manitoba there were on average 24,658 open home care cases (age adjusted) in each of the five years. The number of female cases (n=15,693.4/year) was almost double the number of male cases (n=8,964.6/year).
- Although they account for 24% of the Manitoba population, 52% of open cases (n=12,881/year) are among people with a cumulative mental illness disorder.
- The number of open cases (males and females combined) is nearly 2.5 times higher for those in the "cumulative disorders" group (54.3 open cases per thousand per year) compared to those with no mental illness (22.4 open cases per thousand per year).
- In males, the average annual number of open home care cases is 2.9 times as high (47 versus 16 open cases per thousand per year), and in females it was twice as high (61 versus 28 open cases per thousand per year), for those in the "cumulative" compared to the "no" disorders groups. This pattern is consistent across most RHA and districts.
- Older adults have a much higher prevalence of home care than younger adults for those both in the "cumulative" and "no" disorders groups. As expected, with increasing age, there are more open home care cases for both males and females. There is about a 10-fold higher prevalence of open cases at age 80 compared to age 50 for all Manitoba residents, both with a mental illness and without a mental illness.
- For people living in Urban areas, there is a significant gradient by income quintile for open home care case rates both for the "cumulative" and the "no" disorders groups—the lower the neighbourhood income, the higher the rate. At every neighbourhood income level in both Urban and Rural groups, people in the "cumulative mental disorders" group had a higher rate of open home care cases than people without a mental illness.
- For each decrease in neighbourhood income in the five income quintile groupings, males living in urban areas have a 22% higher rate of open cases, whether or not they have a mental illness. Females have a 20.5% higher rate for each decrease if they have no mental illness, and 30% higher rate if they are in the cumulative disorders group.
- In rural areas, there is no significant gradient by neighbourhood income for males or females either with or without a mental health disorder.
- Male in the "income not found" group (residents of long-term care facilities, personal care homes and psychiatric facilities, prisons, and wards of the public trustee and Child and Family Services) have at least double the rate of open home care cases compared to the provincial male average (cumulative disorders group: 97 versus 47, "no" disorders group: 46 versus 16 open home care cases per thousand per year). Females also show elevated rates (cumulative disorders group: 88 versus 61, "no" disorders group: 63 versus 28 open cases per thousand per year).

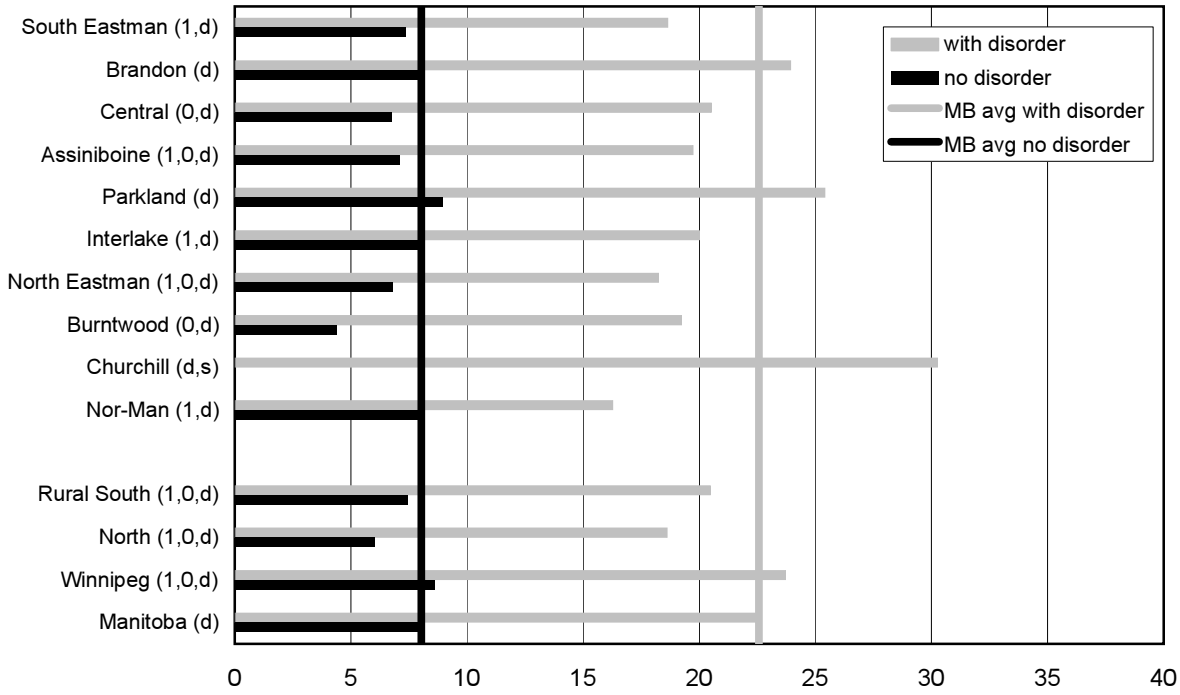
6.3 New Home Care Cases (Incidence)

Definition: This is the number of home care cases which opened between April 1st and March 31st of each year (1997/98-2001/02). People who were on home care at the beginning of each year are not included in this measure.

The figures show an average annual rate per 1,000 residents over the five-year period by RHA and district for males and females. The rate is age-adjusted to reflect the population of Manitoba on December 31st, 2001.

Figure 6.3.1: New Home Care Cases for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.3.2: New Home Care Cases for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +

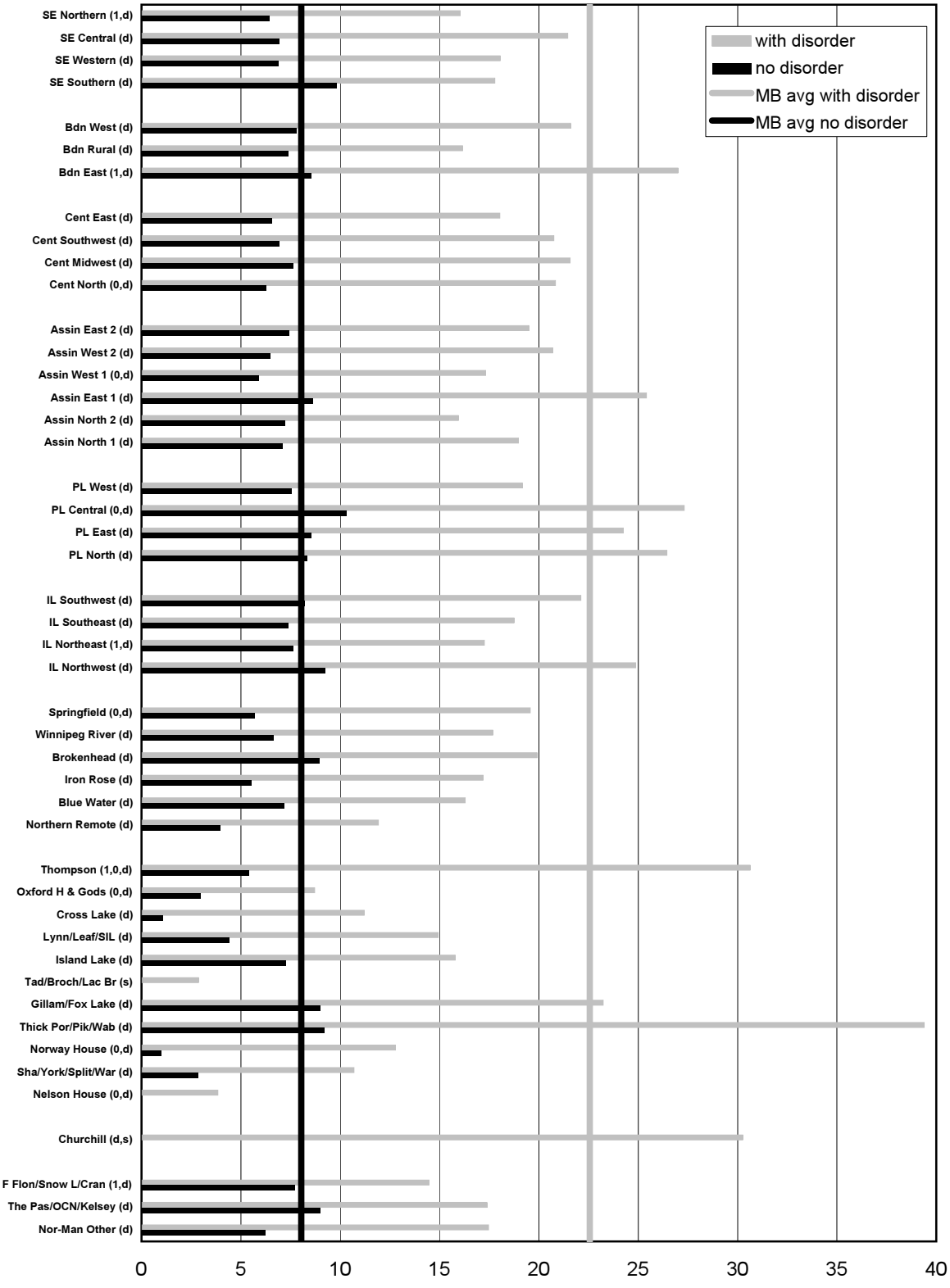
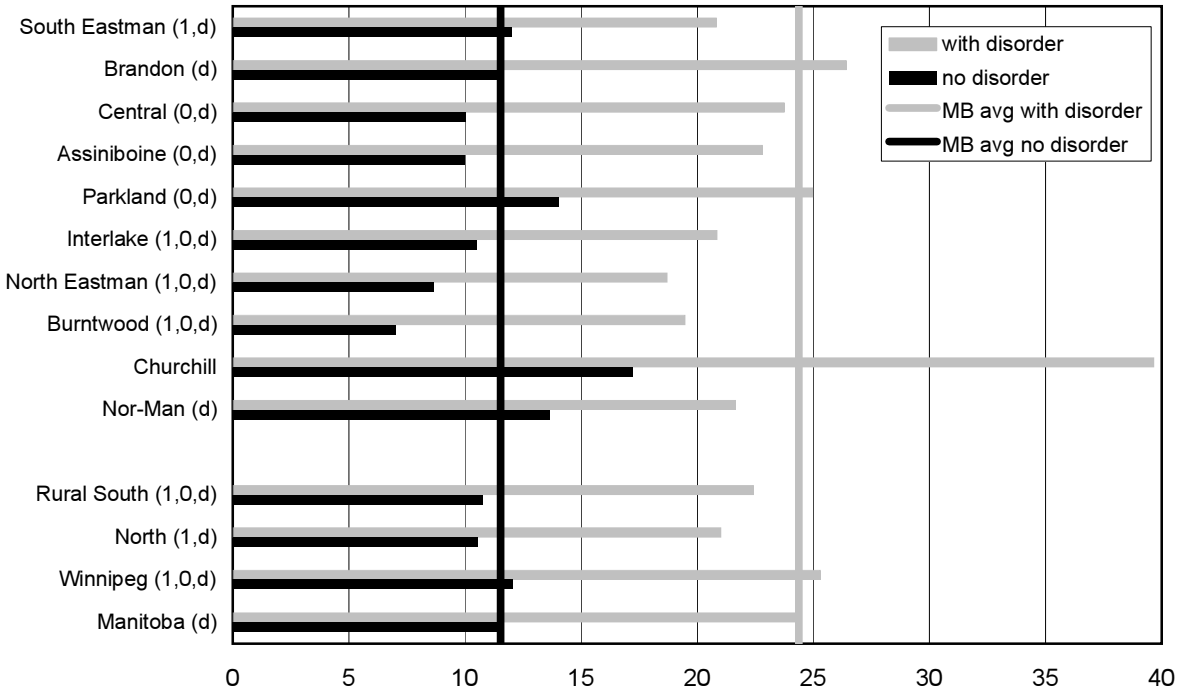


Figure 6.3.3: New Home Care Cases for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02

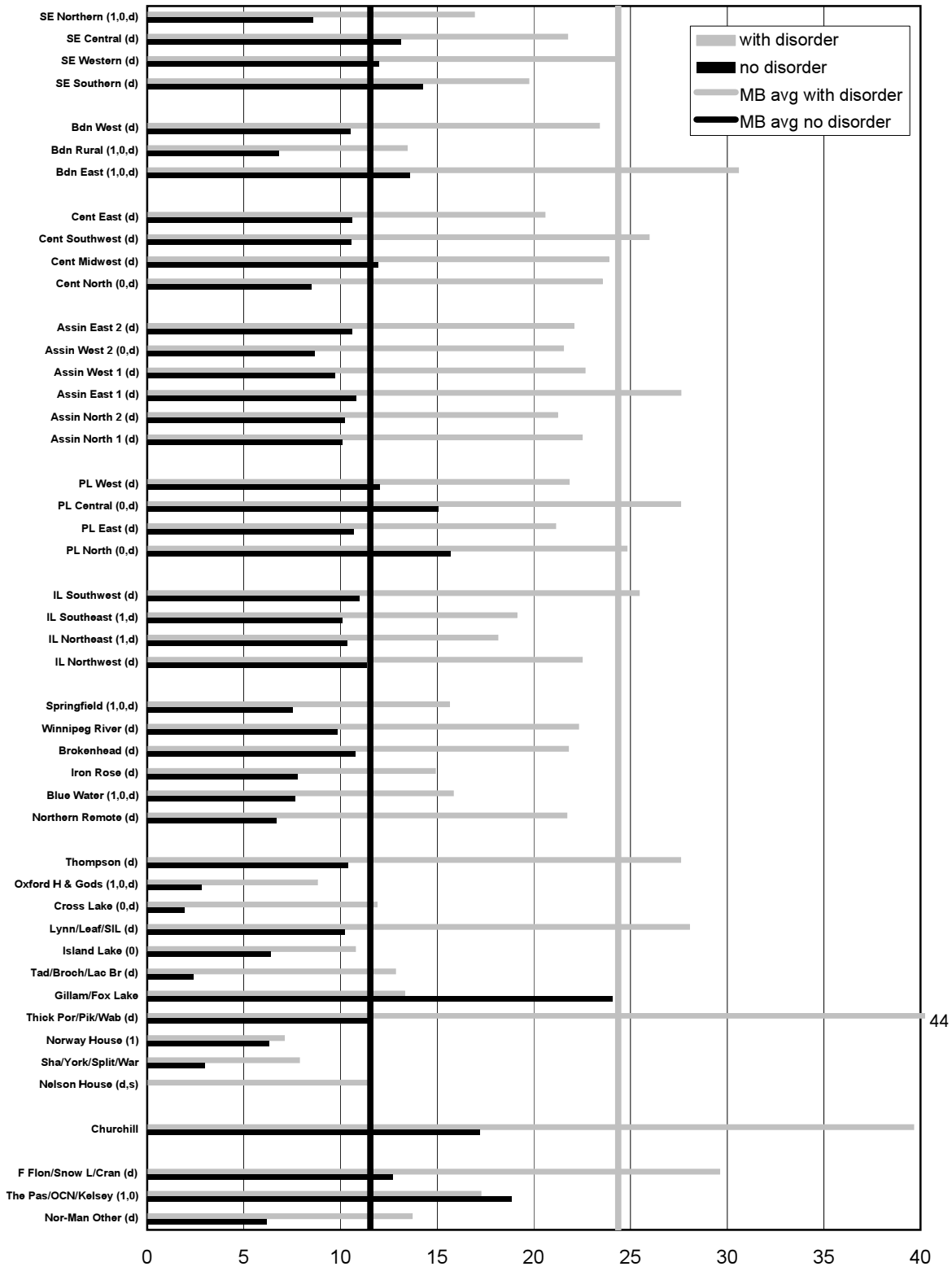
Age-adjusted annual rate per 1000 residents aged 10 years +



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.3.4: New Home Care Cases for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



Key Findings:

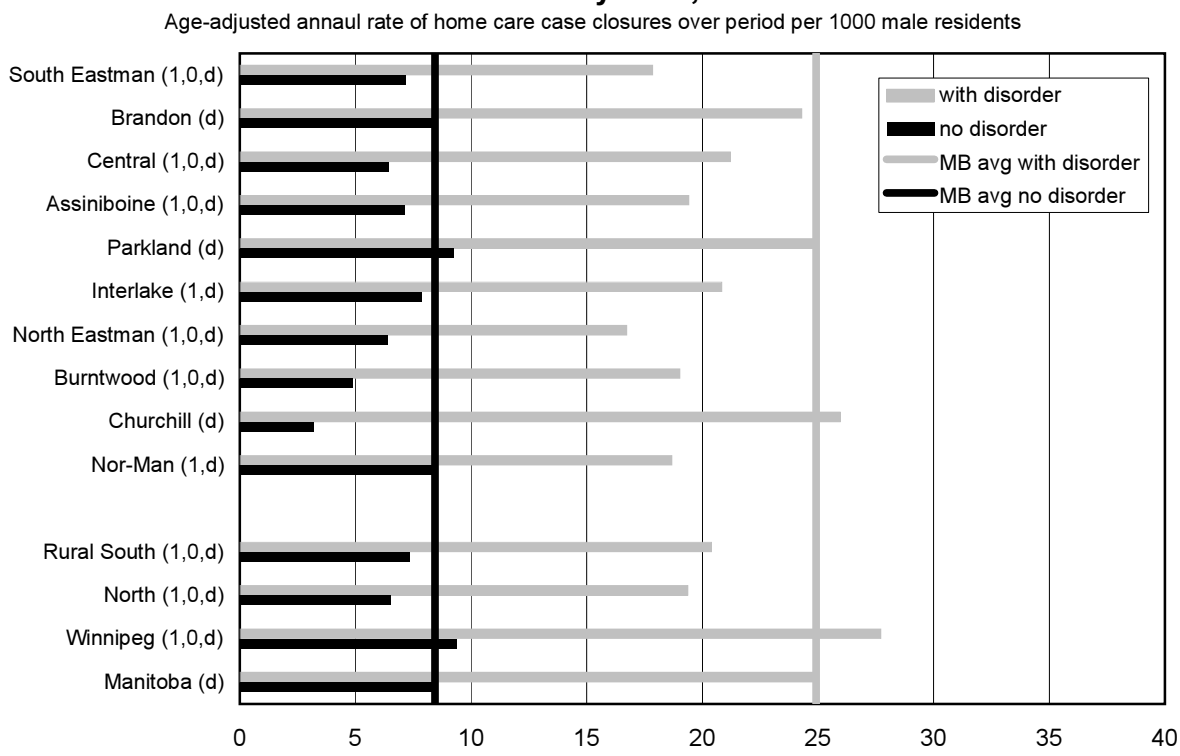
- Combining males and females together, 10,739 new home care cases (4,372 males and 6,367 females) opened annually on average in each of the five years.
- Although they make up about 24% of the Manitoba population, 51% of the new cases (n=5,516.2/year) are among residents in the cumulative mental illness group (males 49% and females 56% of new cases, annually).
- In all RHAs, residents in the cumulative mental illness group have significantly more new home care cases than those without a mental illness.
- The average annual rate of new cases for those in the cumulative disorders group (23.5 new cases per thousand per year) is 2.4 times higher than for those with no mental illness (9.8 new cases per thousand per year).
- In the North and the Rural South, males in the cumulative and "no" disorder groups, and females in the cumulative disorders group, have lower annual new home care case rates than the provincial average. Irregardless of mental illness category, all males and females in Winnipeg have higher than average rates of new cases.

6.4 Closed Home Care Cases

Definition: Closed cases are defined as the number of cases which concluded home care registration. Closings are due to admission to a personal care home, cancellation of coverage, or death.

The figures show an age-adjusted average annual rate per 1,000 residents over the five-year period by RHA and district for males and females. The age adjustment reflects the population of Manitoba on December 31st, 2001.

Figure 6.4.1: Home Care Case Closing Rates for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.4.2: Home Care Case Closing Rates for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of home care case closures over period per 1000 male residents

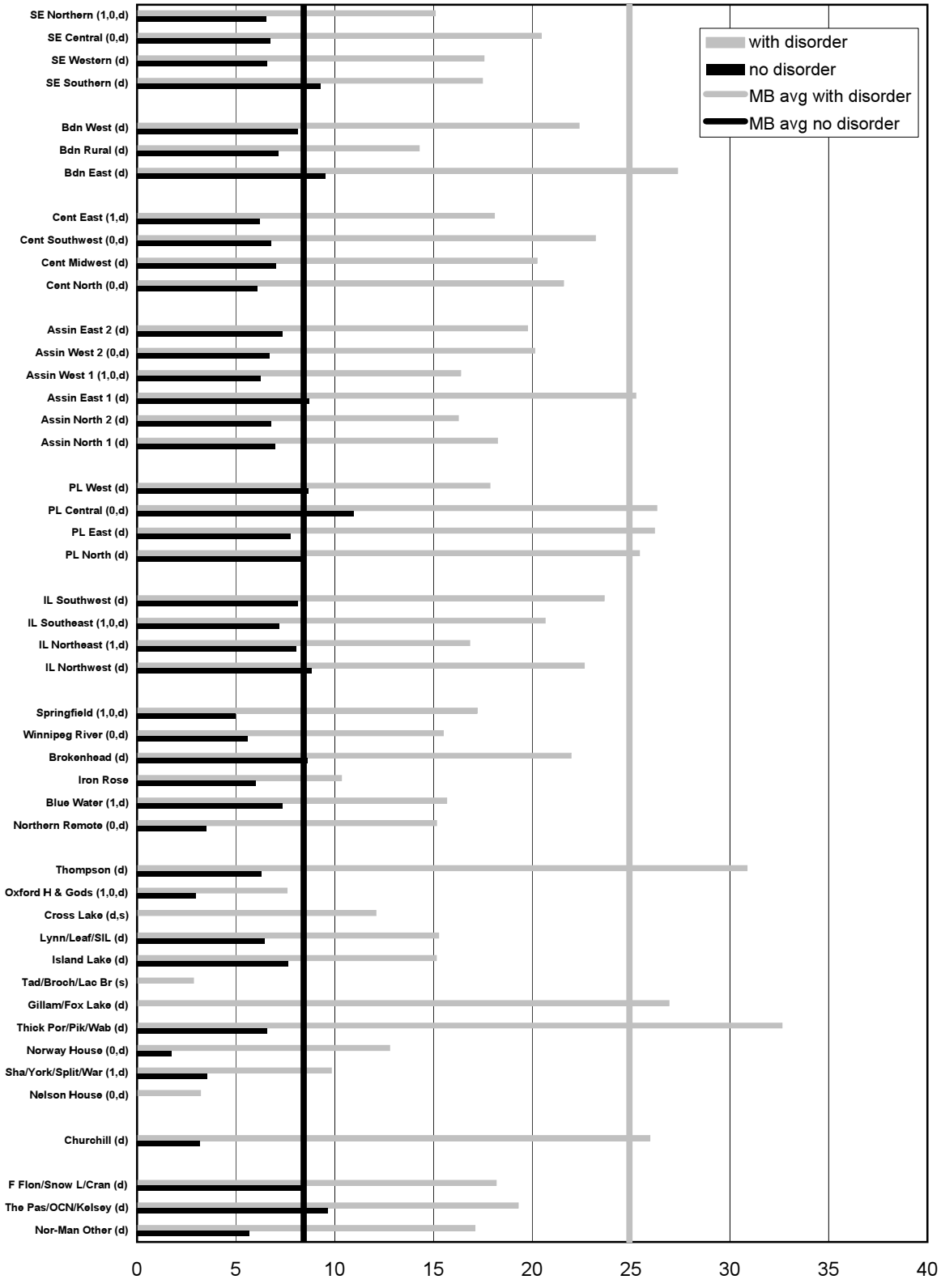
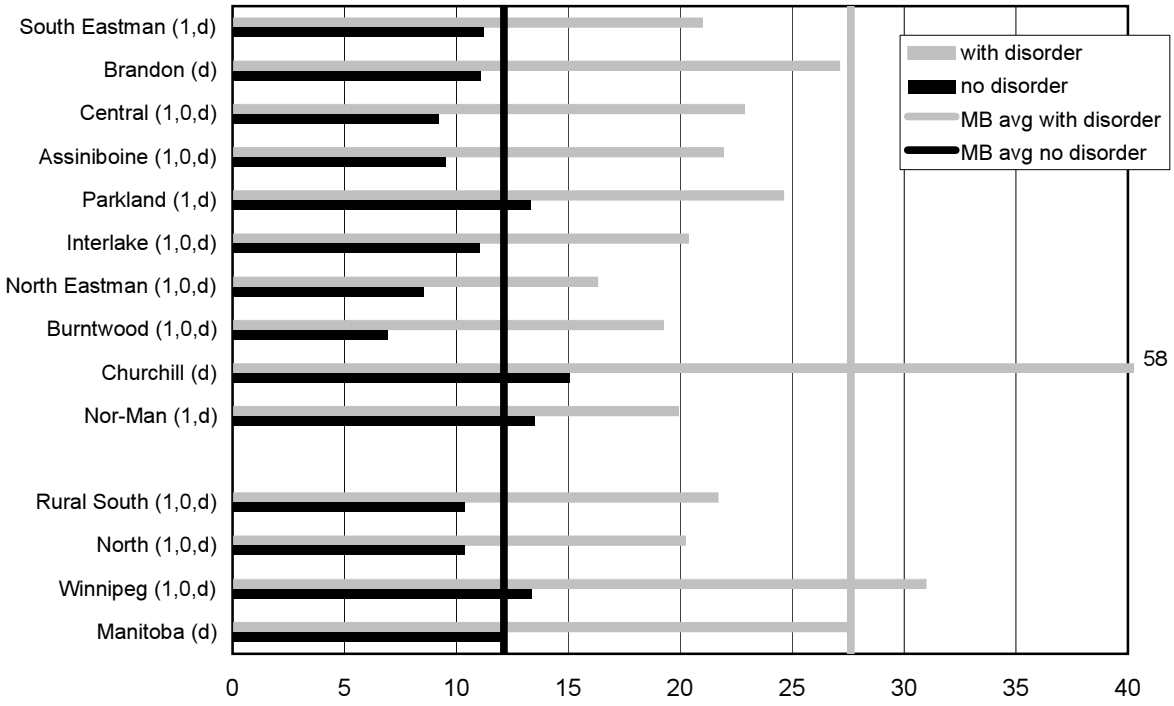


Figure 6.4.3: Home Care Case Closing Rates for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02

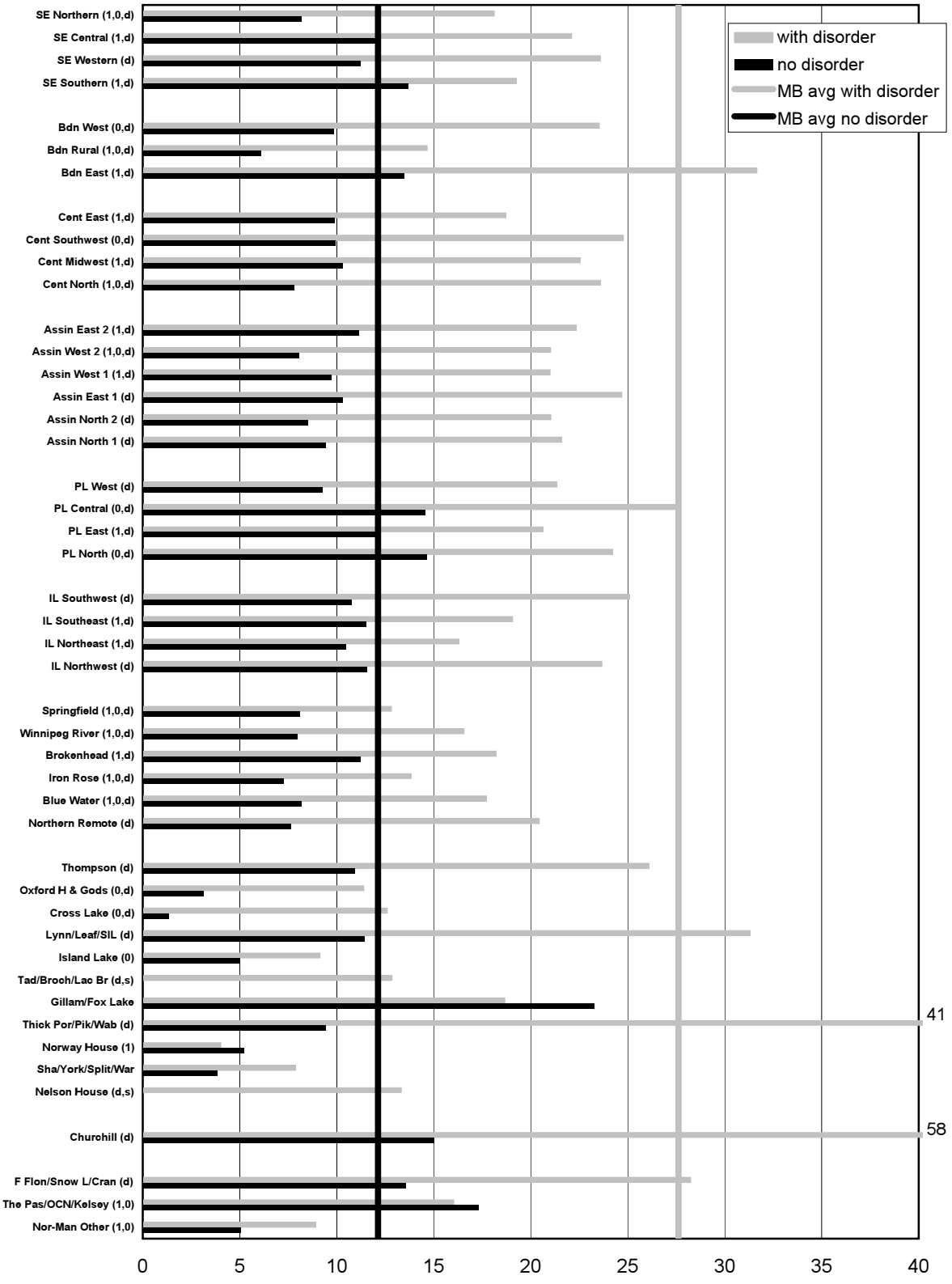
Age-adjusted annual rate of home care case closures over period per 1000 male residents



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.4.4: Home Care Case Closing Rates for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual rate of home care case closures over period per 1000 male residents



Key Findings:

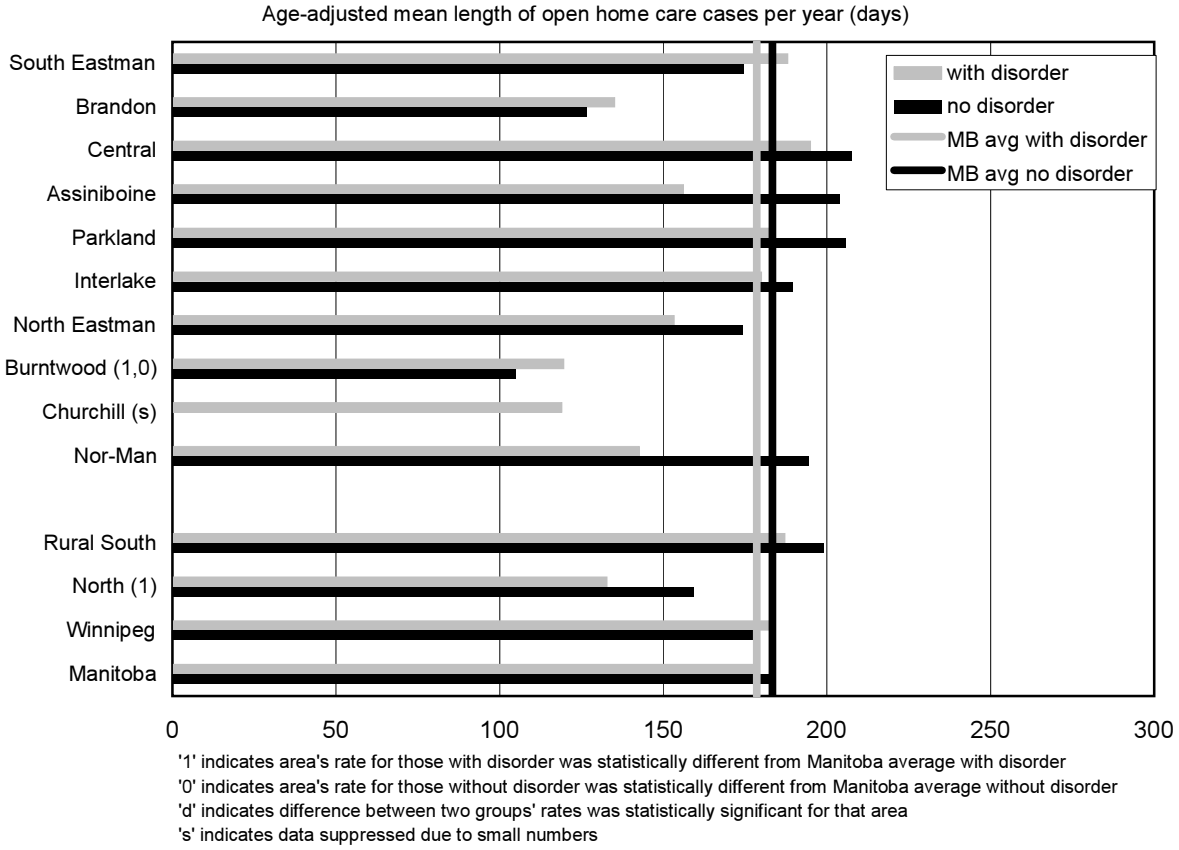
- In Manitoba there were on average 11,653 home care cases closed in each of the five years (n=6,958.4 female cases and n=4,695 male cases per year).
- 53% of the cases closed (n=6,173.2/year) are among those with a cumulative mental illness.
- The incidence rate of closed cases is 2.6 times higher for those in the cumulative mental illness group (26.3 closed cases per thousand per year) than for those with no mental illness (10.3 closed cases per thousand per year).
- For males and females in most of the rural RHAs (North and South), closing rates are significantly lower than the Manitoba average. In Winnipeg, closing rates are significantly higher than the Manitoba average for all residents, whether or not they have a mental illness disorder.

6.5 Average Length of Home Care Cases

Definition: The length is the average number of days cases are registered in the Home Care Program. The duration is calculated using the opening registration and end dates of each resident's home care case.[3] The measure includes only residents who are or have been home care recipients, so it is not based on the whole population of each RHA and region.

The figures show an age-adjusted average number of days registered in home care annually over the five-year period. The age adjustment reflects the population of Manitoba on December 31st, 2001.

Figure 6.5.1: Average Length of Home Care Cases for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



[3] Note that individuals are not necessarily receiving services during the entire length of time they remain registered. They can, for example, be hospitalized during the time their cases remain registered and open. These days are included in the average length of care measure. Care also can be given over several discontinuous periods. As well, if a client is opened to more than one type of service at the same time, days are not double counted.

Figure 6.5.2: Average Length of Home Care Cases for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted mean length of open home care cases per year (days)

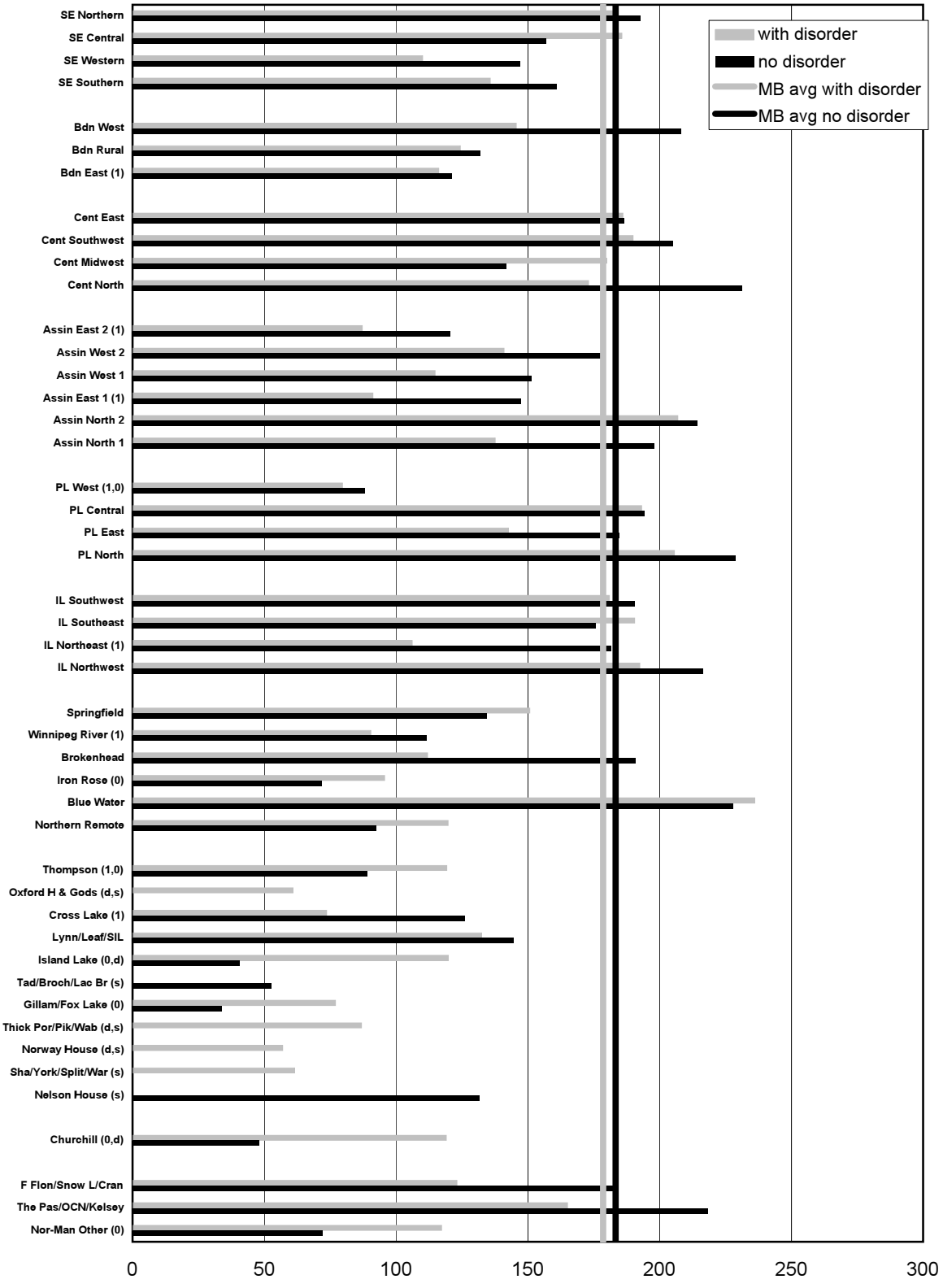
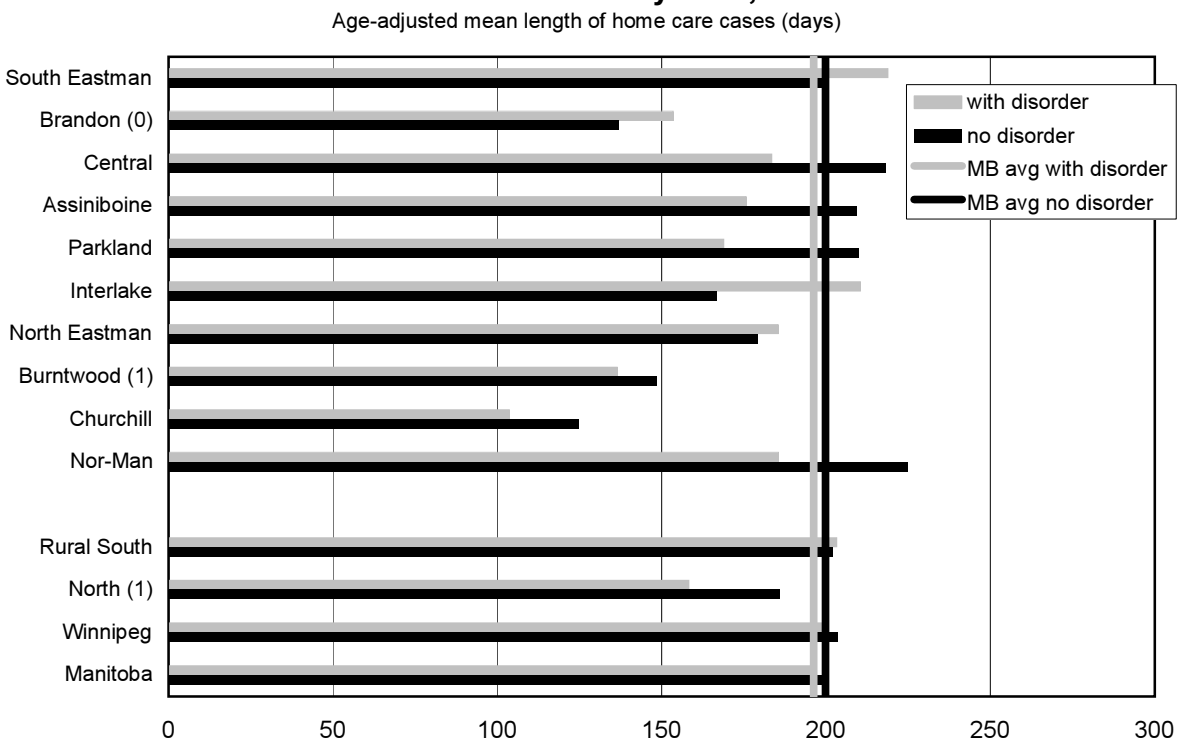
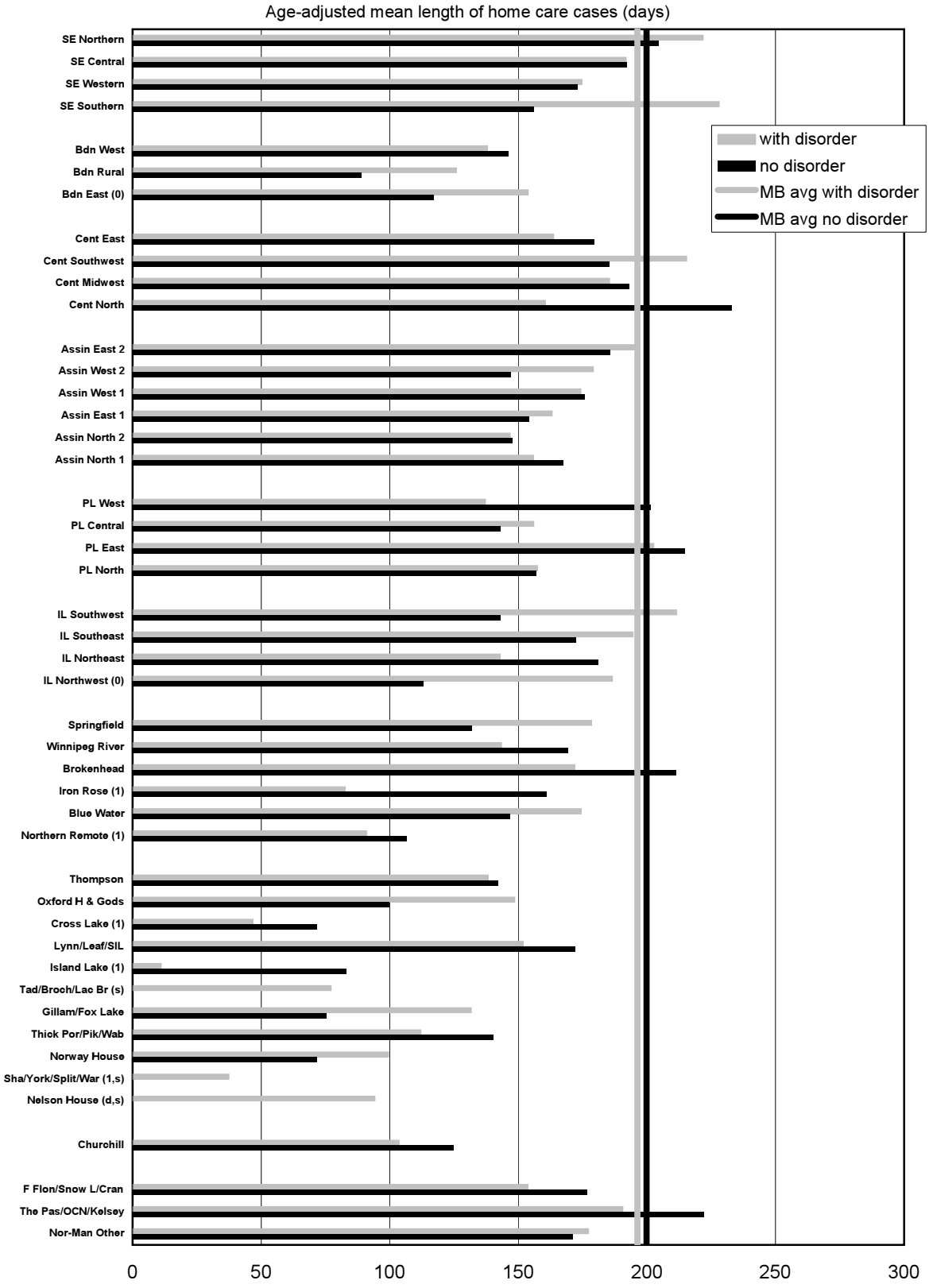


Figure 6.5.3: Average Length of Home Care Cases for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 6.5.4: Average Length of Home Care Cases for Females With and Without Cumulative Disorders by District, 1997/98-2001/02



Key Findings:

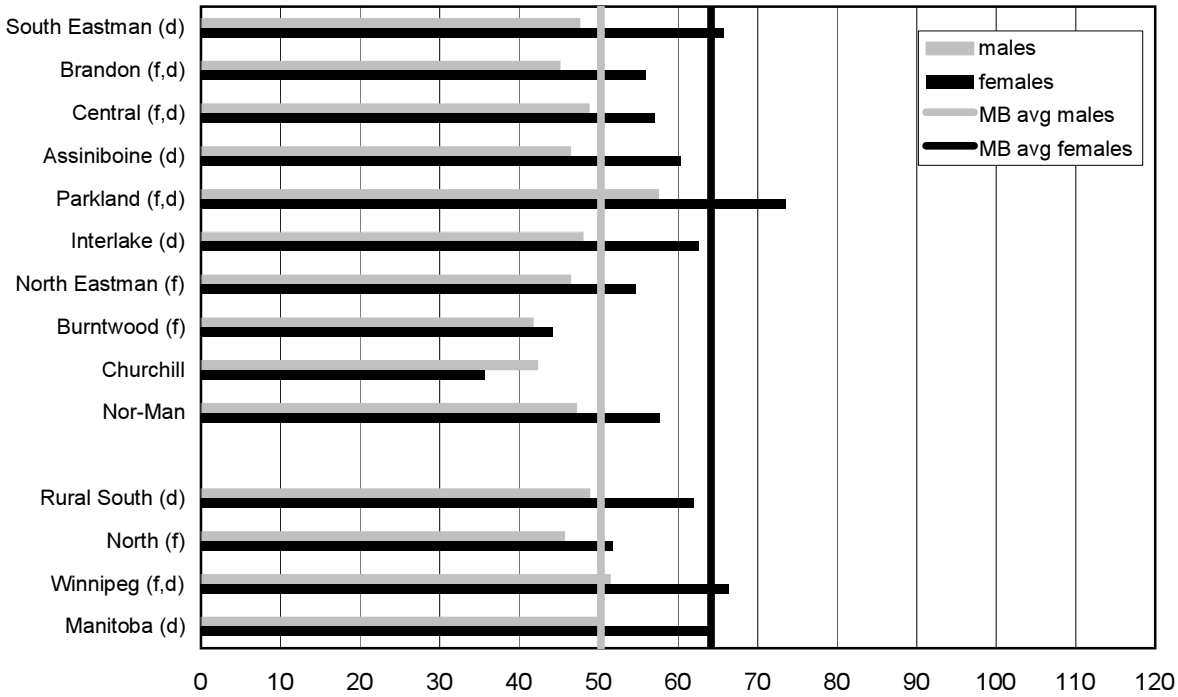
- Although residents in the "cumulative disorders" group use more home care, once a Manitoba resident is receiving home care, the average length of a case (189.7 days) is about the same for people in the "cumulative" and "no" disorders groups (cumulative: 187.6 days per year, no disorders: 191.8 days per year). The average is about 22 days less than it was in 1998/99 (212 days per year) (see Table 4.1 in Roos et al., 2001).
- For males in the "cumulative disorders" group receiving home care, the average duration (178.5 days per year) is about the same as for males with no mental illness (183.3 days per year).
- For females with a mental illness receiving home care, the average duration (196.2 days) is about the same as for females without a mental illness (199.8 days).
- The average duration of all female cases (n=198.0 days per year) is 17 days longer than all male cases (n=180.9 days per year).
- In Burntwood, the lengths of cases for males and females in the "cumulative disorders" group and using home care were significantly shorter than the Manitoba averages, but there were no significant differences in any other RHA.
- Males with no mental illness have significantly fewer than average days in Burntwood only. There are no differences for females with no mental illness in any RHA.
- In all RHAs, average case lengths do not differ between males with and without a mental illness. For females in the "cumulative disorders" group, case lengths in the Rural South and Winnipeg are longer than for those with no mental illness.

6.6 Open Home Care Cases for Those with Depression

Definition: The analysis examined the average number of open home care cases for Manitoba residents who had a diagnosis of depression over the five-year period. Depression was defined as any ICD-9 code identifying depression in either hospital abstracts or physician claims. See the Glossary for the specific ICD codes used. Figures 6.6.1 and 6.6.2 show the occurrences of open home care cases for those with diagnosed depression by sex for each RHA and district.

Figure 6.6.1: Open Home Care Cases for those With Depression by RHA, 1997/98-2001/02

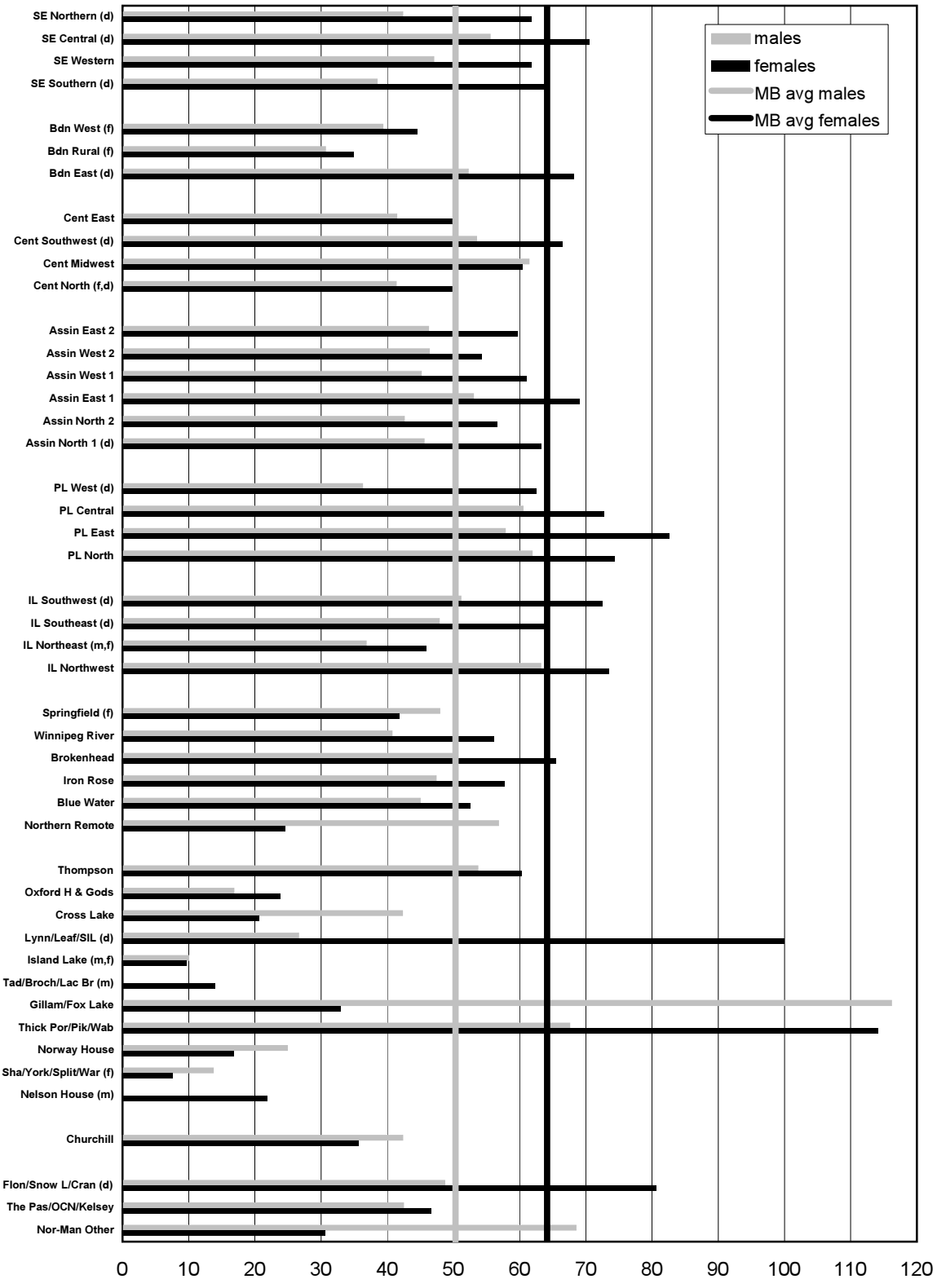
Age-adjusted annual rate per 1000 residents aged 10 years +



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

Figure 6.6.2: Open Home Care Cases for those With Depression by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 10 years +



Key Findings:

- On average for each of the five years, the prevalence of open cases was 50.3 open cases per thousand per year for males and 64.2 open cases per thousand per year for females with a treated depression.
- Compared to the Manitoba averages, males with depression have a lower prevalence of open home care cases in Brandon and higher in Parkland. For females with depression, there is a lower prevalence in Central, North Eastman, and Burntwood, and higher in Winnipeg.
- In comparing males and females with depression by region, the Rural South (except North Eastman) and Winnipeg have a higher prevalence of open home care cases for females compared to males. The North does not show sex differences in the prevalence of open home care cases for those with depression.

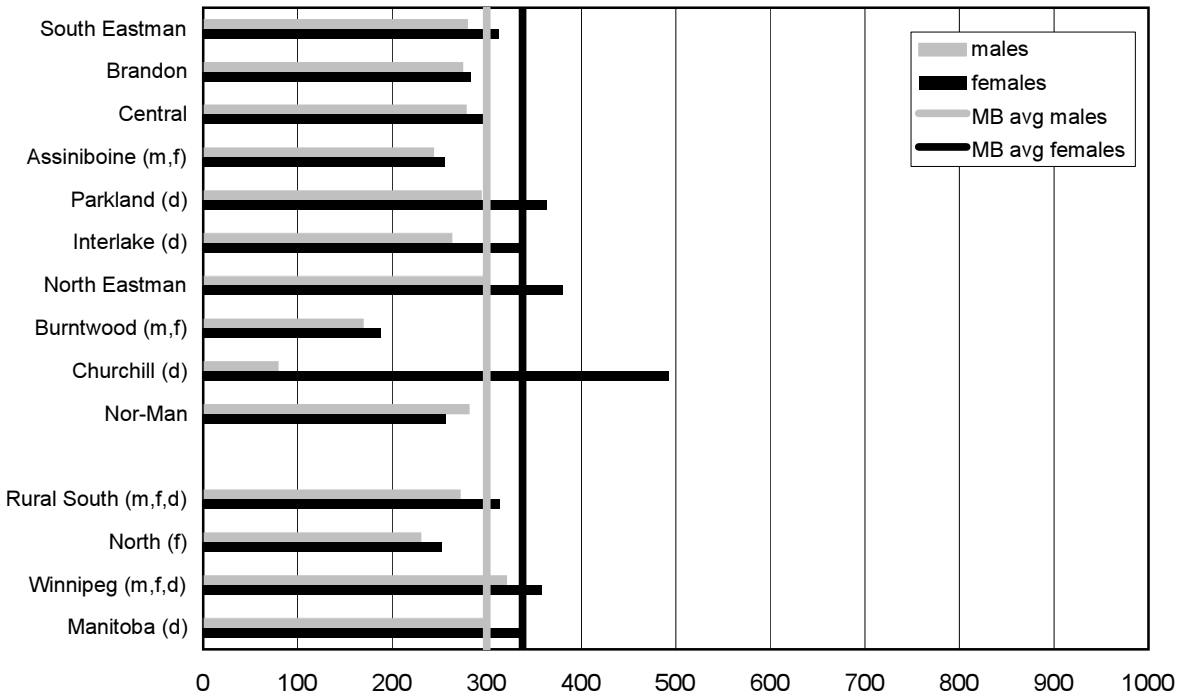
6.7 Open Home Care Cases for Those with Dementia

Definition: We examined the average number of open home care cases for Manitoba residents who had a diagnosis of dementia over the five-year period. Dementia is defined as the presence of any of ICD-9-CM codes identifying an organic psychosis, cerebral degeneration, or senility in either hospital abstracts or physician claims. The analysis was restricted to the Manitoba population age 55 or older who had dementia diagnosed. See the Glossary for the specific ICD codes used. Figures 6.7.1 and 6.7.2 show the occurrences of open home care cases for those with diagnosed dementia by sex for each RHA and District.

Table 6.7.1 compares prevalence of open home care cases by RHA for those aged 55 years of age and older, separately for males and females. For comparison, the prevalence of three groups is shown: open cases in those with at least one of the five cumulative mental illnesses, with no identified mental illness, and with dementia. There is some overlap between the cumulative and dementia groups among adults having a comorbidity between dementia and a cumulative mental illness (some individuals may be in both the cumulative and dementia groups). Therefore, the key findings are cases for those with a cumulative mental illness compared to those with no cumulative mental illness and for those with dementia compared to those with no cumulative mental illness.

Figure 6.7.1: Open Home Care Cases for those With Dementia by RHA, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 55 years +



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

Figure 6.7.2: Open Home Care Cases for those With Dementia by District, 1997/98-2001/02

Age-adjusted annual rate per 1000 residents aged 55 years +

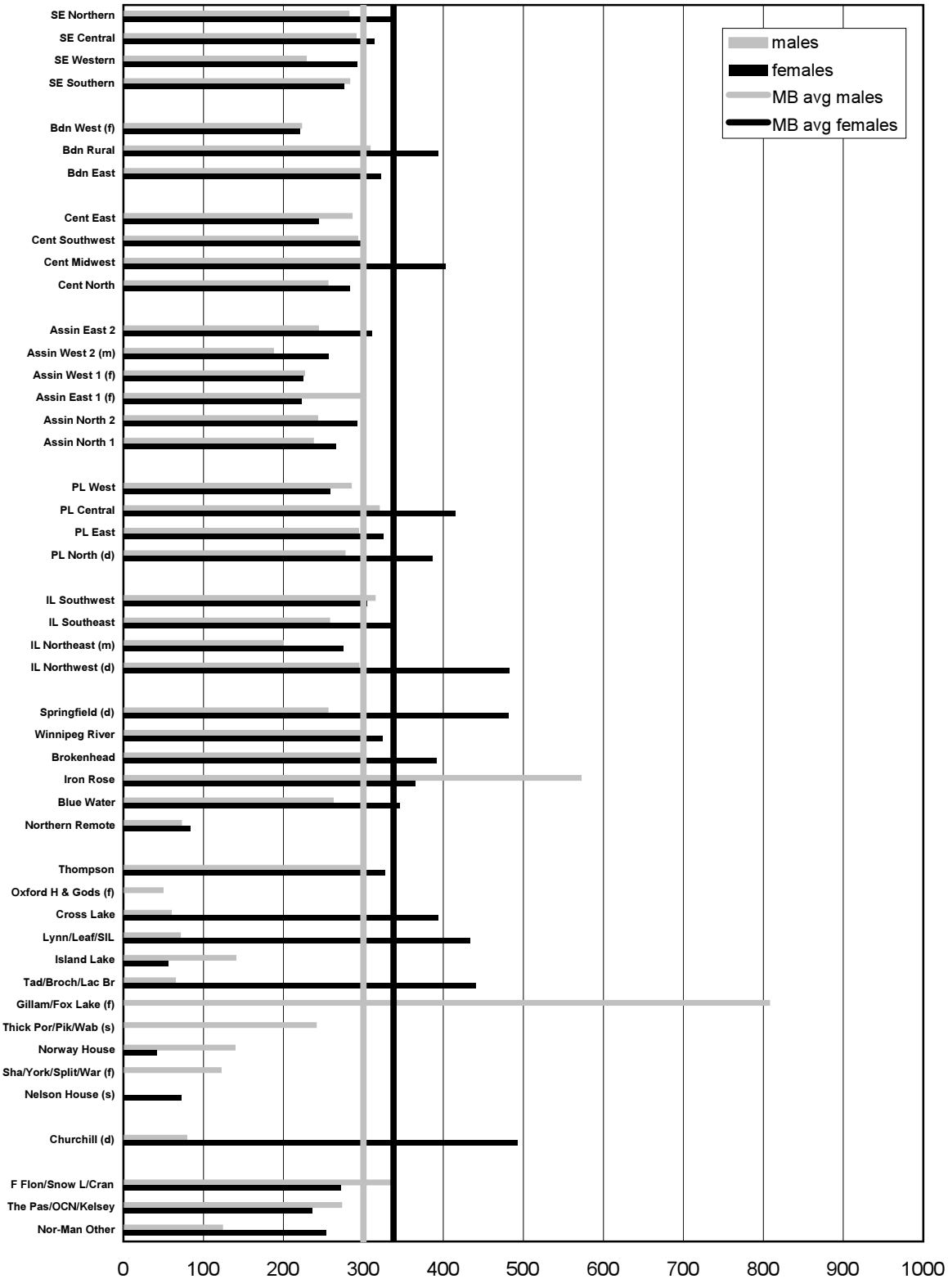


Table 6.7.1: Open home care cases for males and females age 55+ (age-adjusted rates per 1,000)

RHA	Males age 55+			Females age 55+		
	Cumulative	No Disorder	Dementia	Cumulative	No Disorder	Dementia
South Eastman	150.6	56.8	279.8	191.5	106.4	312.5
Brandon	150.0	50.6	274.6	160.9	72.4	282.7
Central	167.6	47.7	278.4	178.6	75.1	298.3
Assiniboine	150.1	54.9	243.6	185.2	77.3	255.7
Parkland	193.5	74.0	294.1	217.7	134.9	363.3
Interlake	151.2	65.2	263.2	185.7	102.8	333.5
North Eastman	155.5	50.5	296.4	173.0	74.4	380.5
Burntwood	88.0	22.8	169.2	115.2	35.9	187.7
Churchill	297.0	17.2	79.1	227.7	88.4	492.6
Nor-Man	159.9	72.2	281.3	158.3	123.6	255.8
Rural South	160.3	57.8	271.9	187.7	92.3	313.2
North	123.7	46.5	230.0	139.1	80.5	252.0
Winnipeg	166.2	58.0	321.0	196.8	91.5	357.5
Manitoba	162.0	57.2	300.0	190.8	90.7	337.8

Key Findings:

- On average for each of the five years for residents aged 55+years, the prevalence of home care (that is, open home care cases) was 300.0 per thousand per year for males and 337.8 per thousand per year for females with dementia.
- The prevalence of open cases for those age 55+ with dementia is on average 4.5 times higher (3.7 times for females and 5.2 times for males) than for those with no mental disorders (males: 57.2, females: 90.7 per thousand per year).
- The prevalence of open cases for those age 55+ with dementia is on average 1.8 times higher (1.8 times for females and 1.9 times for males) than for those in the "cumulative mental disorders" group (males: dementia 300.0, cumulative 162.0 open cases per thousand per year; females: dementia 337.8, cumulative 190.8 open cases per thousand per year).

6.8 Conclusion

In Canada, the home care sector is currently preoccupied with issues such as the development of standards for home care, measures of quality of care, training and human resource management, and the development of electronic information systems (Statistics Canada, 2003). Contributing to the discussion on standards, quality of care, and training, should be embedded in the fact that the majority of home care clients have mental illness diagnoses.

Knowing that income is often related to underlying comorbidity and severity of illness, one would expect to see people in the lower income neighbourhoods using home care at greater rates than those in the higher income neighbourhoods. This is, indeed, the case in urban areas—both for those in the "cumulative disorders" group and the "no disorders" group—demonstrating a needs-based system. It is more unclear in the rural areas, where the gradients are not as apparent. The rural areas may need to explore the issue of needs-based home care use further.

People in higher income areas may also be more able to purchase private services. There is little information about the extent to which residents purchase home care services privately (Statistics Canada, 2003). Thus, it could be that the rate of home care use may be underestimating the informal and private hiring practices (presumably more frequent in the higher income neighbourhoods).

The lack of data and differences among jurisdictions in collecting data make comparability across the country difficult, and hampers the development of an evidence base to support decision-making related to home care provisions (Statistics Canada, 2003). In Manitoba, more information is needed about who is receiving home care, specifically with the issues of block care (see Section 6.1). Our findings on the high use of home care by residents in the "cumulative disorders" group begin to shed light on the needs of the population for home care and the forces influencing its use.

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Roos NP, Stranc L, Peterson S, Mitchell L, Bogdanovic B, Shapiro E. *A Look at Home Care in Manitoba*. Winnipeg MB: Manitoba Centre for Health Policy, August 2001.

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CHAPTER 7: PERSONAL CARE HOMES

7.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

Most of the comparisons are between those people in the "cumulative" mental disorders group and those with "no" mental illness. There are some specific mental illness categories discussed, such as dementia and depression.

This chapter describes the use of Personal Care Homes (PCHs) by Manitoba residents aged 75 years or older for the five fiscal years from 1997/98 to 2001/02. We compare the use of personal care homes within each RHA to the Manitoba averages for residents "with a cumulative mental illness" to those with no mental illness (see Chapter 2 for a discussion of these terms). The analysis does not include information about residents of federal nursing homes.[1] Most of the comparisons are between those people in the "cumulative" mental disorders group and those with "no" mental illness. There are some specific mental illness categories discussed, such as dementia and depression.

The indicators of personal care homes used in this chapter:

- Prevalence of PCH Residents (Section 7.2)
- Incidence of PCH Admissions (Section 7.3)
- Waiting times for PCH Admissions (Section 7.4)
- Level of Care on PCH Admission (Section 7.5)
- Median Length of Stay by Level of Care (Section 7.6)
- Proportion of Manitoba residents admitted to a PCH in 2002/03 with and without a mental illness diagnosis (Section 7.7)
- Proportion of Manitoba residents with a mental illness diagnosis residing in a PCH (Section 7.8)

What are personal care homes?

Personal care homes are residential facilities for persons with chronic illness or disability, particularly older people who have mobility and eating problems. They are also known as long-term care institutions or nursing homes. In 1997/98 there were 9,105 licensed PCH beds in Manitoba (Manitoba Health, 2004).

What comparisons are used in this chapter?

Key comparisons are between the elderly population diagnosed with any of five cumulative mental illness disorders (anxiety, depression, personality disorder, schizophrenia, or substance abuse) and those without any of the mental illnesses. As well, we compare PCH use between each RHA and the Manitoba averages.

[1] In 2000, there were also 184 federal nursing home beds in six RHAs. Five RHAs have federal beds on Reserves outside Winnipeg (Assiniboine, North Eastman, Interlake, Burntwood, and Nor-Man). These beds increase the total capacity of the RHAs in which they are located by as little as 4% (in Interlake) to as much as 131% (in Burntwood) (MCHP website: Concept Dictionary (Types of Personal Care Homes -> PCH Supply and utilization -> Personal Care Home Data) (http://www.umanitoba.ca/centres/mchp/concept/concept.frame.shtml). Thus our PCH data from the North are less reliable than our data elsewhere in the province.

Example: Interlake RHA

Interlake had 522 licensed PCH beds in 10 residences with an occupancy rate of 98.2% in 1997/98 (Manitoba Health Annual Statistics, 1997-98). It is an area of moderate health-care needs generally. Therefore, we would expect the RHA to show use of personal care home (PCH) services similar to the Manitoba averages. The *prevalence of PCH residents* 75+ years in Interlake is 3.1 times higher in those with at least one of the cumulative mental disorders compared to those without a mental disorder (Figures 7.1 and 7.2), a situation which is similar across most RHAs in Manitoba. The prevalence of PCH residents in Interlake is similar to the Manitoba averages for males and females with a cumulative mental illness disorder. However, females without a mental disorder have a 1.7 times higher than average prevalence of PCH residency (128.6 per thousand versus the Manitoba average of 77.6 per thousand for females over the 5 years as seen in Figures 7.2.1 and 7.2.2).

As occurs in the rest of Manitoba, the *incidence of PCH admissions* in Interlake is significantly higher for those with a cumulative mental disorder compared to those with no mental disorder. Males 75+ years with a disorder have a rate 6.5 times higher (60.7 per thousand) than males with no disorder (9.4 per thousand), and females 75+ years with a disorder have a rate 3.9 times higher (56.9 per thousand) than females with no disorder (14.7 per thousand), as shown in Figures 7.3.1 and 7.3.2. Compared to Manitoba averages, rates of admissions in Interlake are higher for those with no cumulative mental disorder (males at 9.4 per thousand versus the Manitoba average of 6.0 per thousand, and females at 14.7 per thousand versus the Manitoba average of 7.4 per thousand). Admission rates are similar the Manitoba average for those with a cumulative mental disorder (60.7 per thousand for males with a disorder versus the Manitoba average of 56.6 per thousand, and 56.9 per thousand for females with a disorder versus the Manitoba average rate of 58.0 per thousand).

Median waiting times in Interlake for those with a cumulative mental illness disorder are similar to those without a disorder (males: cumulative 7.7 weeks, no disorder 5.6 weeks; females: cumulative 9.3 weeks, no disorder 11.6 weeks), as seen in Figures 7.4.1 and 7.4.2. Waiting times in Interlake are similar to the Manitoba averages. (males with 9.0 weeks, males without 9.7 weeks, females with 10.7 weeks, and females without 10.9 weeks).

The *level of care on admission* for the 75+ year cohort in Interlake is shown in Figures 7.4.1 and 7.4.2. There were 143 male and 257

female admissions over the five-year period (1997/98-2001/02) in Interlake. There were more admissions in the cumulative mental disorder group (69% of males and 67% of females). More males were admitted needing a higher level of care than females (at level 4, males with a cumulative disorder 16.2% and males without a disorder 6.8%, females with a cumulative disorder 5.2% and females without a disorder 3.6%). When levels 3 and 4 are combined, there are in Interlake relatively more admissions than Manitoba averages among females with a disorder (57.2% versus Manitoba 44.6%) and fewer among females with no disorder (36.9% versus Manitoba 43.4%). In males, there are relatively more admitted with a disorder (57.6% versus Manitoba 52.9%) and with no disorder (56.8% versus Manitoba 46.9%).

The *median length of stay* (see Tables 7.6.1 and 7.6.2) in Interlake is slightly longer for those without a cumulative mental disorder (2.14 years for males and 3.68 years for females) than for those with a disorder (2.10 years for males and 2.54 years for females), likely indicating a longer life span for those without any cumulative mental illness.

As in the rest of Manitoba, Interlake RHA has a larger number of PCH residents in the cumulative mental disorder group (see Table 7.9.1 for Manitoba percentages) than in the no mental disorder group. While waiting times do not differ between those with and without a mental disorder, when they are admitted to a PCH, *those with a mental disorder are more likely to need higher levels of care* (level 4 for males and levels 3 and 4 for females) compared to those without a mental disorder. Compared to the Manitoba averages, Interlake PCH residents tend to need a somewhat higher level of care (Figures 7.5.1 and 7.5.2), particularly for females with any cumulative mental disorder.

Some of the questions that health policy planners may wish to explore include:

- *Are the rates of PCH use in your RHA influenced by residents with mental illness disorders, and how does this influence compare to other regions?*
- *Is the use of PCHs higher than average or lower than average in your area?*
- *How do mental illness disorders influence the use of PCHs in your RHA?*
- *If PCH use in your region is high, is it due to a high admission rate or long-stay?*
- *Based on your knowledge of the rates of mental illness disorders in your RHA, what predictions on the use of PCHs could you make for the future?*

Overall key findings from this chapter:

- Knowing that 83% of PCH residents, and 75% of those admitted to PCH, had some mental illness diagnoses within five years, it is important to ensure that our PCH system is able to address the high burden of mental illnesses, not only the physical illnesses of clients. A further study should examine the qualifications of PCH staff in addressing mental illness issues.

Prevalence

- Those people in the "cumulative disorders" group are five times more likely to be a PCH resident compared to those without a mental disorder (34.7% of the population versus 6.9%)—this holds true for males (30.5% versus 5.3%) and females (37.3% versus 7.8%).
- In the "no disorders" group, both males and females are more likely to be a PCH resident if they reside in the Rural South, but less likely in Winnipeg
- In the "cumulative disorders" group, females are less likely in North and Rural South, and more likely in Winnipeg to be a resident of a PCH.
- Out of 20,207 Manitoba residents 75+ years with dementia, 54.2% of males and 66.9% of females were residing in a PCH for a period of time in 1997/98-2001/02.
- Out of 16,778 Manitoba residents 75+ years with depression, 31.0% of males and 37.7% of females resided in a PCH for a period of time in 1997/98-2001/02.

Incidence

- At least eight times the proportion of people aged 75+ in the cumulative disorders group were admitted to PCHs compared to those without a mental disorder (57.5 per thousand per year versus 6.9 per thousand per year)—both for males (56.6 versus 6.0) and females (58.0 versus 7.4).
- In the "cumulative disorders" group, no regions had admission rates different from the Manitoba average, except for the lower female rate in the North.
- In the "no disorders" group, both males and females were more likely to be admitted to a PCH in the Rural South and less likely in Winnipeg.

Wait times, level of care and length of stay in a PCH

- There was a similar waiting time (around 10 weeks) for people aged 75+ with a cumulative mental illness and for those with no mental illness disorder.
- Waits for all individuals with a cumulative mental disorder across all RHAs do not differ significantly from the provincial median.
- Around 90% of residents admitted to a PCH over the 5 years were assessed at level 2 or 3, in both the cumulative disorders and no disorders groups.
- Combining all levels of care on admission, those with a cumulative mental disorder stay a median of 2.7 years. Those with no mental disorder stay 3.1 years.

- Females stay longer on average (3.0 years for those with and 3.4 years for those without a mental illness) than males (2.1 years for those with and 2.4 years for those without a mental illness), reflecting a longer average life span for females.

PCH Admittants with a mental illness

- 39% of all people admitted to PCH in 2002/03 had one or more of the five cumulative mental illness disorders, 46% had dementia, and 75% had at least one mental illness diagnosis (that is, "any" disorder) within the previous five years.

PCH Residents with mental illnesses

- 43% of PCH residents had one or more of the five cumulative mental illness disorders, 67% had dementia, 35% had depression, and 83% had at least one mental illness diagnosis (that is, "any" disorder) within the previous five years.

Canadian (and other) comparisons:

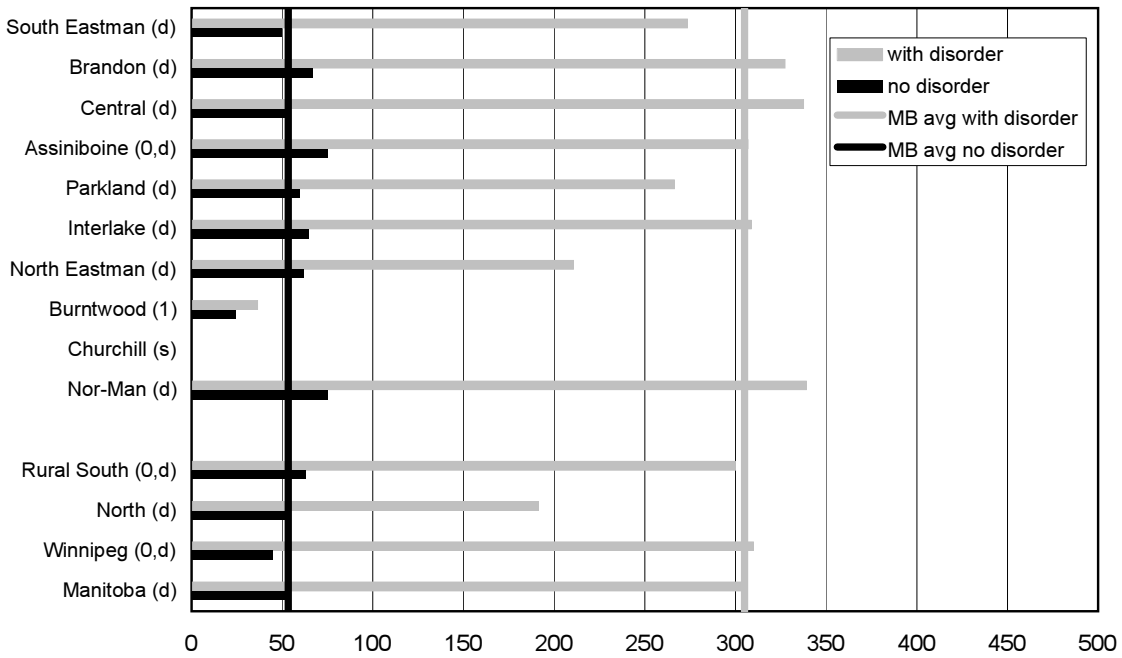
- Rovner et al. (1990) found that in their sample of 454 American nursing home residents, senile dementias occurred in 34.9%. In another survey of American nursing homes, researchers found a prevalence of 51% of residents with dementia and 4% with schizophrenia (Burns et al., 1993). *Our data show the proportion of PCH residents with a dementia is 46%.* Rovner et al. (1990) found that dementia and other psychiatric disorders were present in about 80% of new admissions to nursing homes, and that about 20% had no psychiatric disorder. *In our data, 74.6% of new PCH residents in 2002/03 had been diagnosed with at least one of the five cumulative or 'other' mental illnesses (including dementia) in the five years before their admission. Just over 25% had no diagnosed mental illness over the same time period.*

7.2 Prevalence of Personal Care Home (PCH) Residents

Definition: A PCH Resident is a person who lived for any portion of fiscal years 1997/98 to 2001/02 in a PCH in Manitoba. This is expressed as a rate, with the numerator being the number persons aged 75+ years who lived in a PCH in the five-year period. The denominator is the entire cohort age 75+ years in Manitoba. *We are interpreting this graph, despite the fact that it is in a rate per thousand, as similar to a percentage of the population, i.e., prevalence.* This is due to the fact that most of the people living in a PCH would stay in the PCH and not necessarily move "in and out of" the PCH system during that time. The figures show only people aged 75+, so they include most, but not all PCH residents. The analysis does not include residents of federal nursing homes.

Figure 7.2.1: PCH Residents: Males 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02

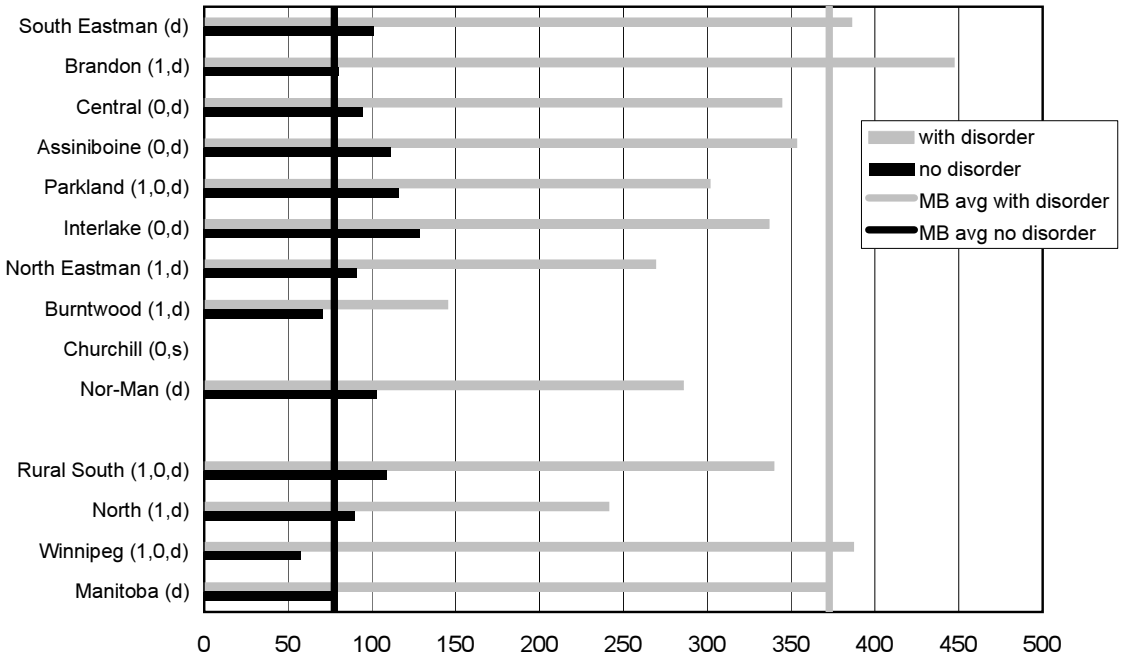
Crude annual rate per 1000 male residents aged 75+



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 7.2.2: PCH Residents: Females 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Crude annual rate per 1000 female residents aged 75+



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Key findings:

- There were 10,292 Manitoba residents aged 75+ years living in a PCH during any part of the five-year period (3,040 males and 7,252 females).
- Those people in the "cumulative disorders" group are five times more likely to be a PCH resident compared to those without a mental disorder (34.7% of the population versus 6.9%)—this holds true for males (30.5% versus 5.3%) and females (37.3% versus 7.8%).
- Females have a greater likelihood of being a resident in a PCH compared to males, both in the cumulative mental disorder group (37.3% females versus 30.5% males) and in the "no disorders" group (7.76% females versus 5.34% males).
- In the "no disorders" group, both males and females are more likely to be a PCH resident if they reside in the Rural South, but less likely in Winnipeg
- In the "cumulative disorders" group, males are just as likely in the North, Rural South and Winnipeg to be a resident of a PCH. But females are less likely in North and Rural South, and more likely in Winnipeg to be a resident of a PCH.

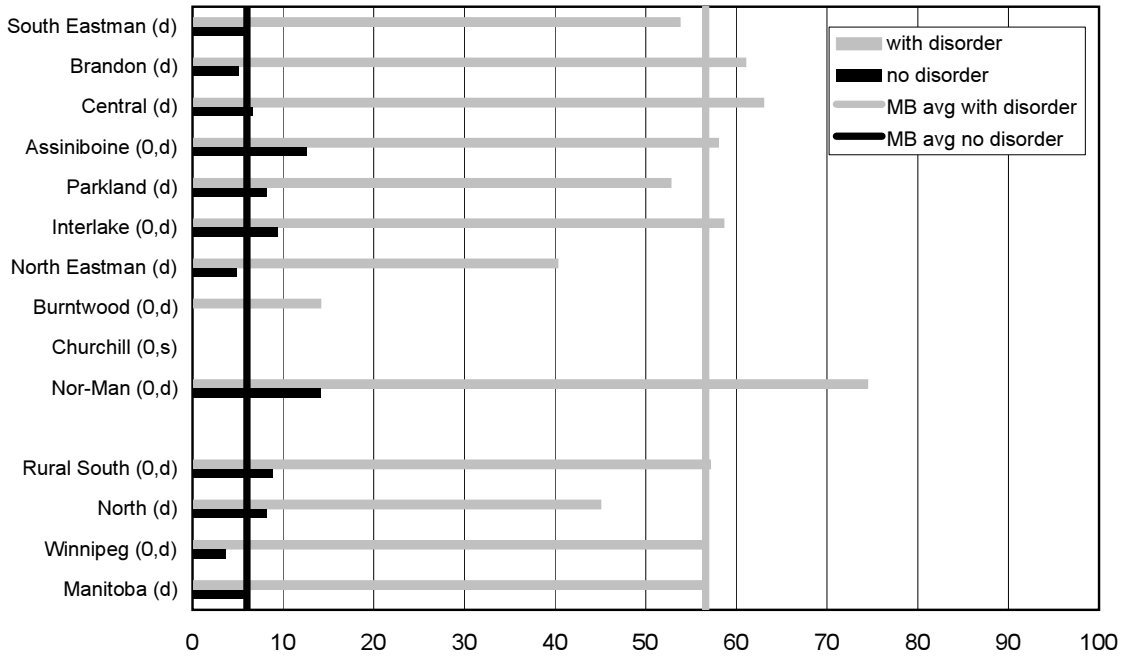
7.3 Incidence of Personal Care Home (PCH) Admissions

Definition: Admission rates represent how many people entered a PCH in Manitoba for any part of fiscal years 1997/98 to 2001/02, according to the RHA where they lived prior to being admitted. Admission is relatively infrequent, so five years of data were combined to provide reliable rates.

This is expressed as a rate, with the numerator being the number of admissions to a PCH over the five years, and the denominator is the cohort of Manitoba residents aged 75+ years. The figures show only people aged 75+ years, so they include most, but not all PCH admissions. The analysis does not include admissions of residents to federal nursing homes.

Figure 7.3.1: PCH Admissions for Males 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02

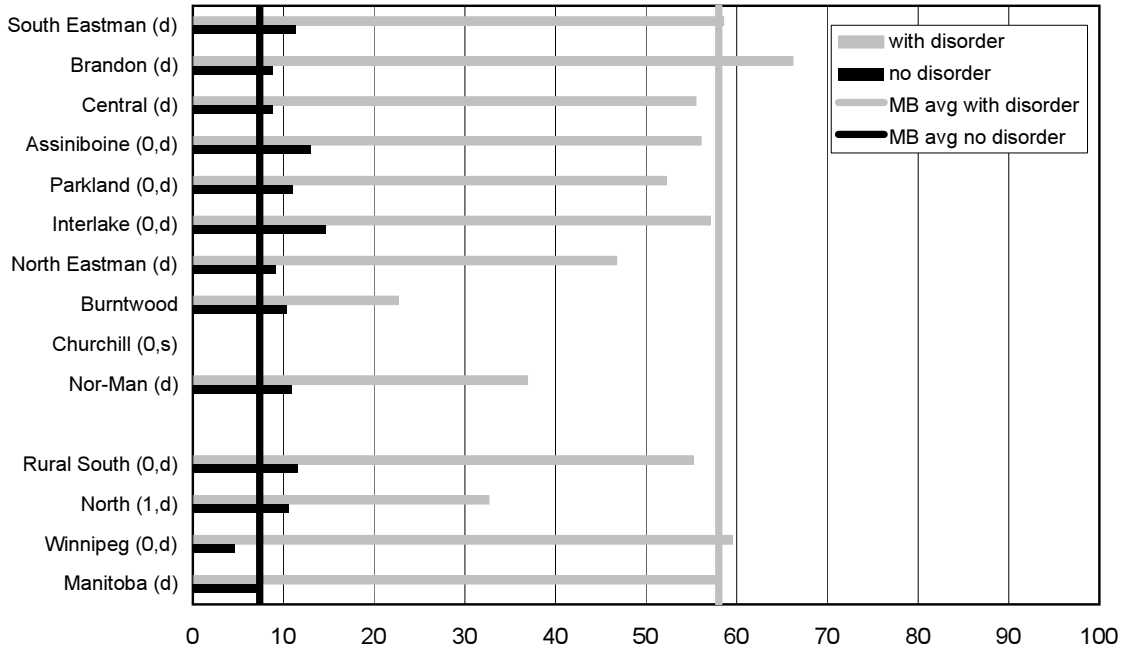
Crude annual rate per 1000 males aged 75+



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 7.3.2: PCH Admissions for Females 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Crude annual rate per 1000 females aged 75+



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Key findings:

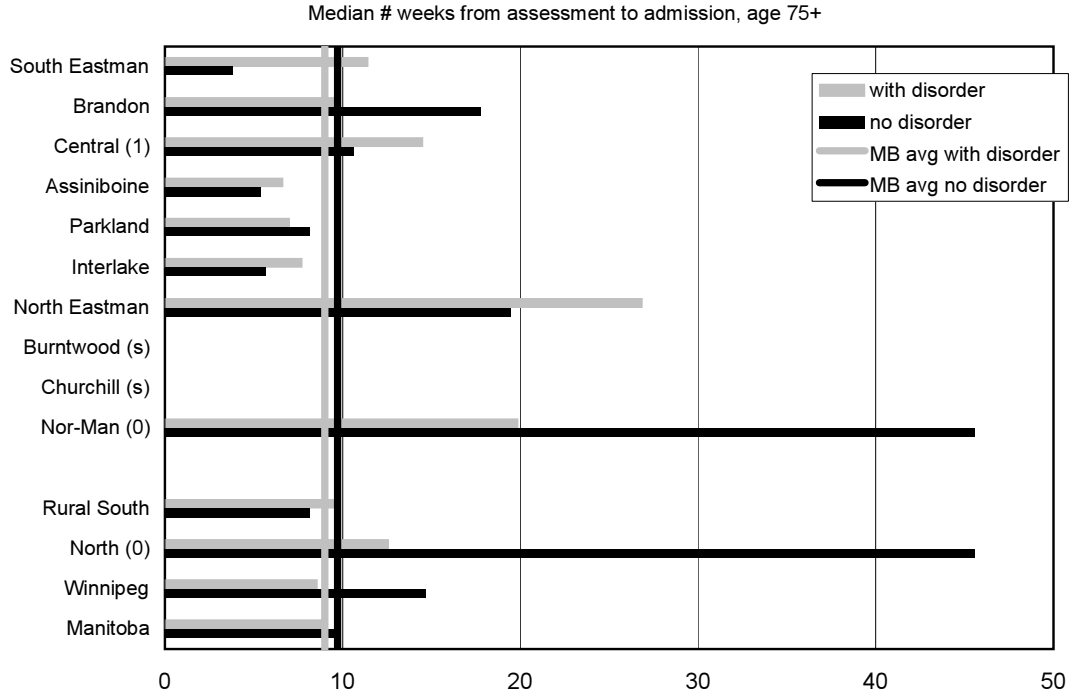
- At least eight times the proportion of people aged 75+ in the cumulative disorders group were admitted to PCHs compared to those without a mental disorder (57.5 per thousand versus 6.9 per thousand)—both for males (56.6 versus 6.0 per thousand) and females (58.0 versus 7.4 per thousand).
- Females were slightly more likely to be admitted to a PCH compared with males, both in the cumulative disorders group (58.0 versus 56.6 per thousand) and in the "no mental disorders" group (7.4 versus 6.0 per thousand).
- Among those with a cumulative mental illness disorder, no regions had admission rates different from the Manitoba average, except for the female rate in the North, which was lower than average.
- Among those with no mental illness, both males and females were more likely to be admitted to a PCH in the Rural South and less likely in Winnipeg.

7.4 Waiting Times for Admission into a Personal Care Home (PCH)

Definition: Waiting time is the number of weeks residents 75+ years had to wait for admission to a provincial PCH between the time they were assessed ("panelled") and the time they were admitted.

The measure is the median number of weeks they waited over the five-year period from 1997/98 to 2000/02.[2] The RHA is based on the residence prior to admission to a PCH.[3] Waiting time data from federal nursing homes are missing from the analysis.[4]

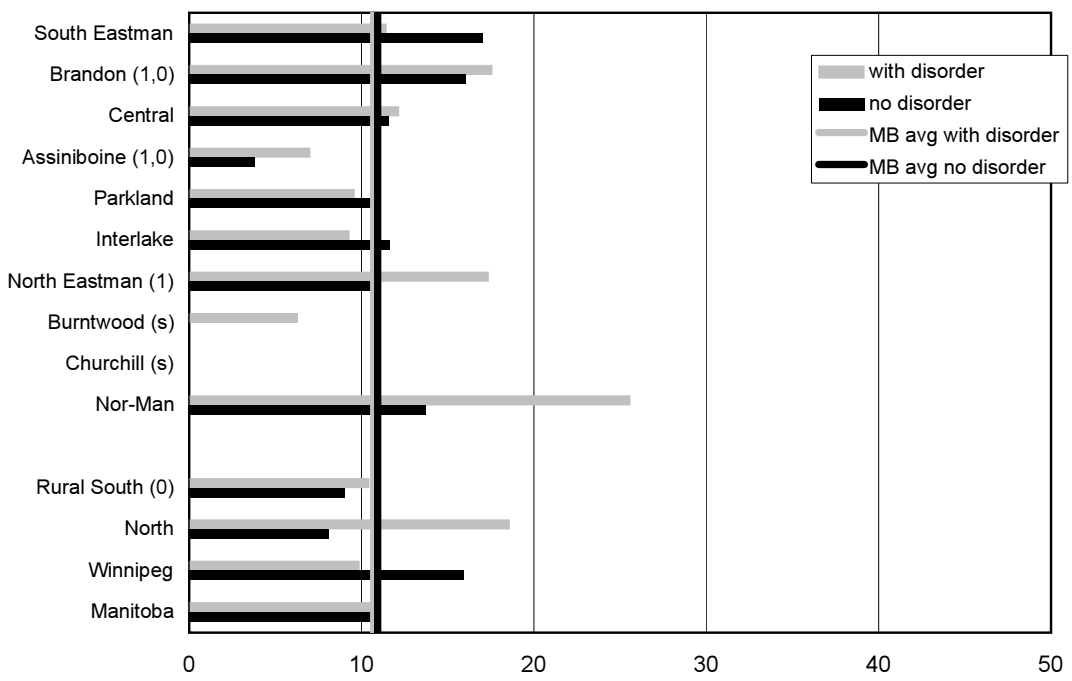
Figure 7.4.1: Median Waiting Times for PCH Admission for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

[2] The median waiting time for PCH admission is the amount of time it took for one-half of all residents to be admitted. Half the residents waited less and half waited more.
[3] Median waiting times have been dropping since 1985 to 1987 when they were 25 weeks. In 1997/98 they were 11 weeks, and in 1998/99 and 1999/2000 they were nine weeks (Frohlich et al., 2002, p. 7).
[4] There are more federal PCHs in the North where data are missing. Therefore, waiting time data from these areas may be less reliable than from areas where there are few federal nursing home beds. Some data from Burntwood and Churchill is suppressed due to small numbers.

Figure 7.4.2: Median Waiting Times for PCH Admission for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Key findings:

- There was a similar waiting time (around 10 weeks) for people aged 75+ with a cumulative mental illness and for those with no mental illness disorder.
- Females waited slightly longer than males, both in the cumulative disorders group (10.7 versus 9 weeks) and the "no disorders" group (10.9 versus 9.7 weeks).
- For males with no mental illness, waits in the North (especially Nor-Man) are much longer than the median. For females with no mental illness, waits in the Rural South (especially Assiniboine) are shorter than the median, but they are longer than the median in Brandon
- Waits for all individuals with a cumulative mental disorder across all RHAs do not differ significantly from the provincial median.

7.5 Level of Care at Admission to a Personal Care Home (PCH)

Definition: The measure is a percentage distribution of levels of care[5] assigned to residents 75+ years upon first admission to a PCH, unadjusted by age or sex.

The bar graphs show the percent of admissions (75+ years) in each RHA by level of care assessed on admission by the presence or absence of a cumulative mental disorder. Only provincial PCH beds were included (not federal beds), due to lack of information on federal beds in the provincial database.

Figure 7.5.1: Level of care at admission to PCH for Males 75+, by RHA
Figure 7.5.2: Level of care at admission to PCH for Females 75+, by RHA

[5] All nursing home (PCH) residents are assessed at one of four levels of care, depending on the number of nursing hours they require per day. Level 1 is the lightest at 0.5 hours per day, level 2 at 2 hours, with levels 3 and 4 at least 3.5 hours per day. Level 4 is the heaviest nursing assessment.

Figure 7.5.1: Level of Care on Admission to PCH for Males 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02

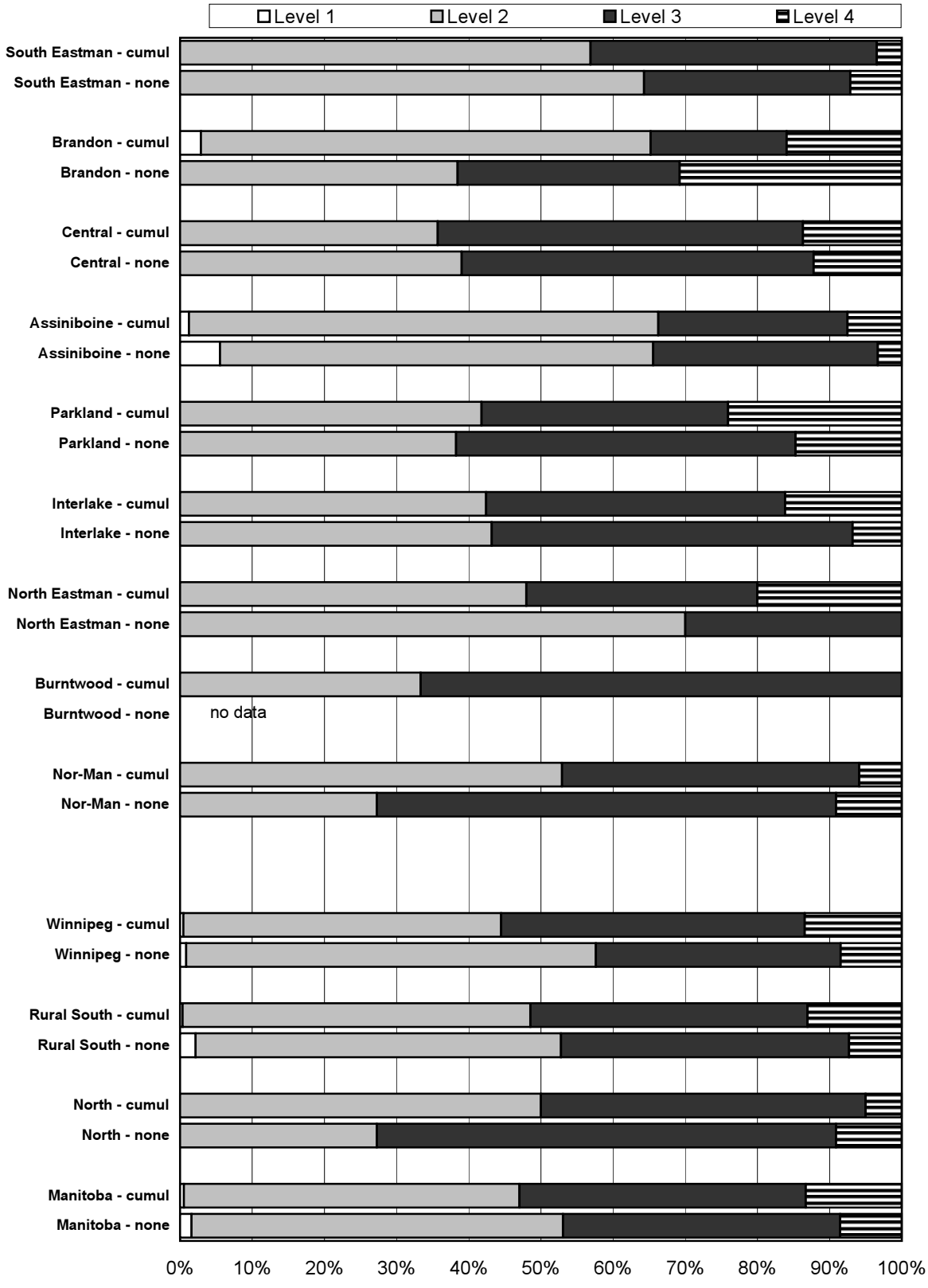
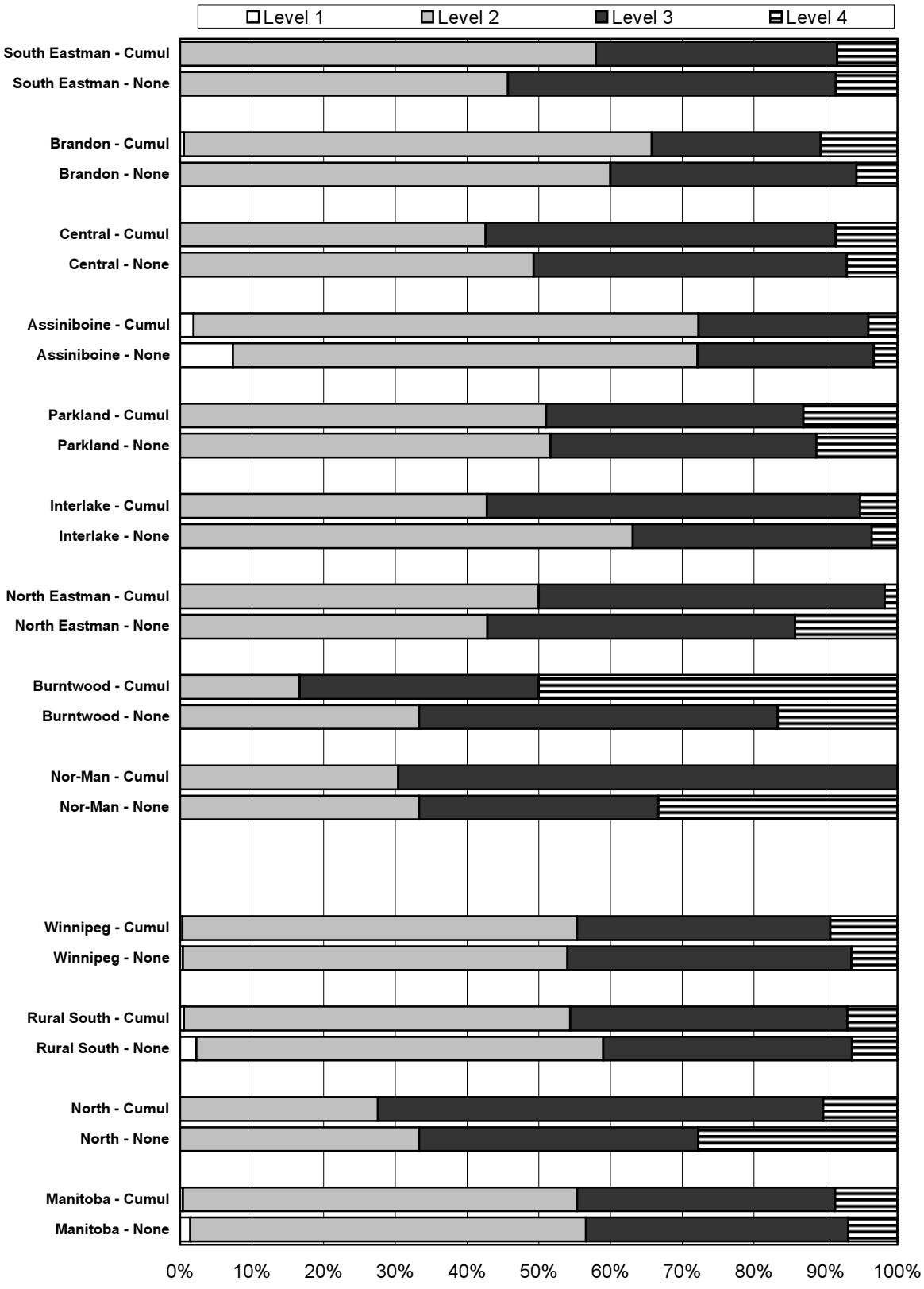


Figure 7.5.2: Level of Care on Admission to PCH for Females 75+ With and Without Cumulative Disorders by RHA, 1997/98-2001/02



Key findings:

- Around 90% of residents admitted to a PCH over the 5 years were assessed ("panelled") at level 2 or 3 before admission. This is very similar for males and females in the cumulative mental disorders group (87% males, 91% females) and in the "no disorders" group (92% males, 93% females).

7.6 Median Length of Stay

Definition: The length of stay is the median number of years of residence in a PCH for residents 75+ years of age over the five-year period.

The tables show the median number of years for those with and without a mental illness at each level of care assessed at admission by RHA for males and females separately. In most cases, the end of the length of stay was due to the death of the resident. Only provincial PCH beds were included (not federal beds), due to lack of information on federal bed use in the provincial database.

Table 7.6.1: Median length of stay (years) by level of care at admission to PCH for males with and without cumulative disorders

	All	1	2	3	4
South Eastman w	2.37	26.36	2.29	2.69	1.82
South Eastman w/o	2.31	4.29	2.35	1.62	1.67
Brandon w	2.41	6.35	3.14	2.22	0.78
Brandon w/o	4.13	10.12	4.35	4.27	2.12
Central w	2.02	24.41	2.25	1.94	1.30
Central w/o	2.41	21.16	2.53	2.04	2.91
Assiniboine w	2.08	5.93	2.13	1.72	1.78
Assiniboine w/o	1.66	2.68	1.85	1.48	1.33
Parkland w	1.89		1.94	1.97	1.49
Parkland w/o	2.29		2.95	1.56	0.64
Interlake w	2.10	19.42	2.36	2.15	1.04
Interlake w/o	2.14	4.88	1.88	2.06	2.38
North Eastman w	1.31		1.32	1.36	1.14
North Eastman w/o	2.31		2.49	2.34	2.29
Burntwood w	1.29		4.95	0.67	
Burntwood w/o	3.68		3.68	2.98	6.57
Nor-Man w	2.14	4.22	2.33	2.06	0.86
Nor-Man w/o	1.14	7.02	1.76	0.50	2.27
Rural South w	2.02	8.19	2.11	1.97	1.38
Rural South w/o	2.06	4.23	2.19	1.75	2.18
North w	2.06	4.22	2.47	1.88	0.86
North w/o	1.76	7.02	2.49	0.82	4.00
Winnipeg w	2.18	7.58	2.52	1.91	1.35
Winnipeg w/o	2.87	7.58	3.12	2.56	2.46
Manitoba w	2.13	7.56	2.37	1.94	1.30
Manitoba w/o	2.42	5.14	2.62	2.06	2.27

(empty cells: data suppressed due to small numbers)
"w" reflects data for those with disorders; "w/o" reflects data for those without disorder

Table 7.6.2: Median length of stay (years) by level of care at admission to PCH for females with and without cumulative disorders

	All	1	2	3	4
South Eastman w	3.30	17.73	3.55	2.61	0.93
South Eastman w/o	3.35	6.77	4.51	2.10	3.84
Brandon w	3.27	15.84	3.41	2.57	2.15
Brandon w/o	2.88	15.45	2.98	2.21	1.37
Central w	2.67	23.89	3.29	2.15	2.06
Central w/o	3.57	11.95	4.02	2.65	2.45
Assiniboine w	2.91	6.66	2.78	2.54	3.07
Assiniboine w/o	3.24	4.08	3.30	3.27	1.82
Parkland w	2.88		3.20	2.55	2.08
Parkland w/o	3.55	10.15	4.08	3.24	1.65
Interlake w	2.54	18.57	2.97	2.36	1.26
Interlake w/o	3.68	17.62	4.08	2.61	0.46
North Eastman w	2.48	9.88	3.40	2.23	0.07
North Eastman w/o	2.22		3.01	1.81	1.54
Burntwood w	2.12		6.58	1.20	0.39
Burntwood w/o	1.67		4.23	1.35	1.26
Nor-Man w	3.25	8.96	3.58	2.51	8.59
Nor-Man w/o	3.48	8.84	2.70	5.09	1.78
Rural South w	2.77	8.26	3.08	2.37	1.96
Rural South w/o	3.40	7.31	3.77	2.74	1.79
North w	3.08	8.96	4.59	2.17	1.03
North w/o	2.95	8.84	3.48	2.95	1.74
Winnipeg w	3.02	10.41	3.26	2.69	2.38
Winnipeg w/o	3.62	11.77	4.12	2.89	3.87
Manitoba w	2.97	10.32	3.22	2.57	2.15
Manitoba w/o	3.44	11.44	3.85	2.72	2.51

(empty cells: data suppressed due to small numbers)
"w" reflects data for those with disorders; "w/o" reflects data for those without disorder

Key findings:

- Combining all levels of care on admission, those with a cumulative mental disorder stay a median of 2.7 years. Those with no mental disorder stay 3.1 years.
- Females stay longer on average (3.0 years for those with and 3.4 years for those without a mental illness) than males (2.1 years for those with and 2.4 years for those without a mental illness), reflecting a longer average life span for females.
- Residents who require least care tend to have the longest stay, and those who require most care have the shortest stay, whether or not they have a mental illness. For example, Level 1 care stayed 9.9 years for those with a cumulative mental illness, and 7.9 years for those without a mental disorder. In contrast, Level 4 stayed 1.9 years and 2.3 years respectively.

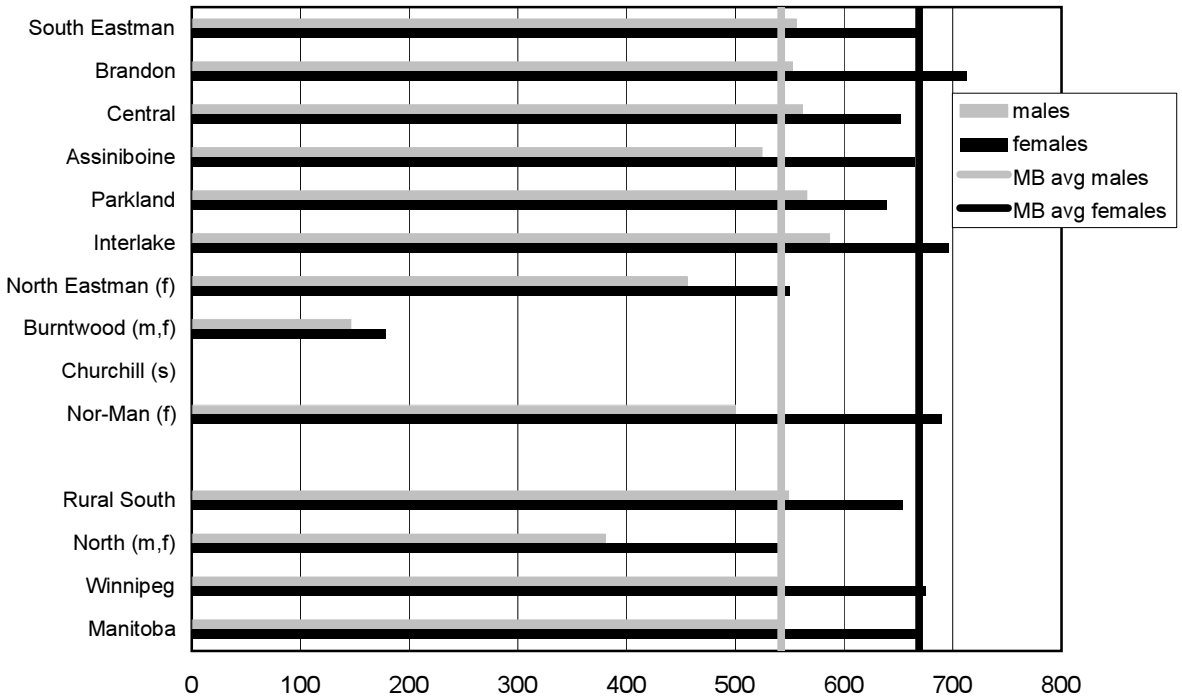
7.7 Prevalence of Population Aged 75+ with Dementia Who are PCH Residents

Definition: This is the rate of the population aged 75+ with dementia who resided in a PCH for any portion of the years 1997/98 to 2001/02. Dementia is defined as the presence of any of ICD codes designating organic or other psychotic conditions, cerebral degeneration, or senility in hospital abstracts or physician claims. See the Glossary for details on the specific ICD-9 codes used to define dementia.

The numerator is the number of people aged 75+ years with dementia who lived in a PCH in the five-year period. The denominator is the entire cohort age 75+ years treated for dementia. *We are interpreting this graph, despite the fact that it is in a rate per thousand, as similar to a percentage of the population, i.e., prevalence.* This is due to the fact that most of the people living in a PCH would stay in the PCH and not necessarily move "in and out of" the PCH system during that time. The figure shows the prevalence for males and females, aged 75+ with dementia. Data from Churchill has been suppressed due to low numbers. The analysis does not include residents of federal nursing homes in Manitoba.

Figure 7.7.1: PCH Residents 75+ With Dementia by RHA, 1997/98-2001/02

Crude annual rate per 1000 RHA residents aged 75+



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Key findings:

- Out of 20,207 Manitoba residents 75+ years with dementia, 12,648 were living in a PCH (3,733 males and 8,915 females) at any time during the five-year period.
- 54.2% of males and 66.9% of females aged 75+ with dementia were residing in a PCH for a period of time in the five years 1997/98-2001/02.
- In most areas of Manitoba, the prevalence of the population aged 75+ with dementia who are living in PCHs does not differ by gender or by region. The Burntwood prevalence may be highly underestimated by the lack of federal PCH data. However, in North Eastman, the prevalence of females aged 75+ with dementia who resided in a PCH is lower than average.

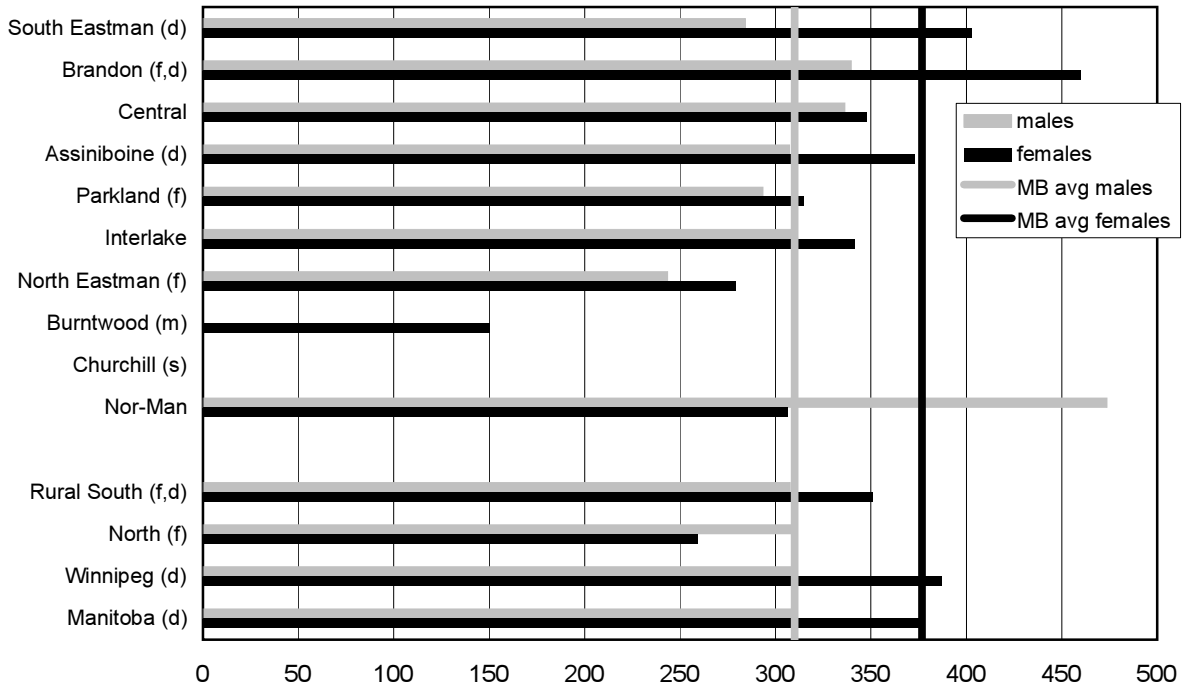
7.8 Prevalence of Population Aged 75+ with Depression Who are PCH Residents

Definition: This is the rate of the population aged 75+ with depression who resided in a PCH for any portion of the years 1997/98 to 2001/02 in a PCH in Manitoba. Depression is defined as the presence of any of ICD codes designating affective psychoses, neurotic depression, adjustment reaction, or depressive disorder in hospital abstracts or physician claims. See the Glossary for details on the specific ICD-9 codes used to define depression.

The numerator is the number of people aged 75+ years with depression who lived in a PCH in the five-year period. The denominator is the entire cohort age 75+ years treated for depression. *We are interpreting this graph, despite the fact that it is in a rate per thousand, as similar to a percentage of the population, i.e., prevalence.* This is due to the fact that most of the people living in a PCH would stay in the PCH and not necessarily move "in and out of" the PCH system during that time. The figure shows the treatment prevalence for males and females, aged 75+ with depression. Data from Churchill has been suppressed due to low numbers. The analysis does not include residents of federal nursing homes in Manitoba.

Figure 7.8.1: PCH Residents 75+ With Depression by RHA, 1997/98-2001/02

Crude annual rate per 1000 residents aged 75+



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Key findings:

- Out of 16,778 Manitoba residents 75+ years with depression, there were 5,985 living in a PCH (1,570 males and 4,415 females) at some time during the five-year period.
- 31% of males and 37.7% of females aged 75+ with depression resided in a PCH in the five-year period 1997/98-2001/02.
- The prevalence of female residents (75+) with depression living in a PCH is generally lower than the Manitoba average in the Rural South and the North. The exception is in Brandon, where females with depression have a higher prevalence than the average.

7.9 Presence of Mental Illness Disorder Diagnoses on Admission to a PCH

Definition: This is the proportion of Manitoba residents over 10 years of age admitted to a PCH in the fiscal year 2002/03 with one of the five cumulative mental illnesses (depression, anxiety, substance abuse or addiction, schizophrenia, or personality disorder) or other mental illnesses (dementias).

The calculation of the presence or absence of a mental illness is based on administrative data from the previous five years (1997/98-2001/02). See the Glossary for the specific ICD-9 codes used to identify the mental illnesses.

Table 7.9.1: Proportion of residents admitted to a PCH in 2002/03, with and without a mental illness from 1997/98 to 2001/02 (aged 10 years and older).

Mental Illness Disorder	Percentage of people admitted to PCH, in each mental illness category listed (%)
Any of 5 Cumulative Mental Illnesses	38.7
Any Mental Illness (Cumulative + Other)	74.6
No Mental Illness	25.4
The Five Cumulative Mental Disorders:	
Depression	33.8
Anxiety	11.4
Substance Abuse	7.1
Schizophrenia	5.2
Personality Disorders	2.0
Other Mental Illness Disorders:	
Dementias	46.0

Key findings:

- 38.7% of the 2,252 people admitted to PCH in 2002/03 had one or more of the five cumulative mental illness disorders, 46.0% had dementia, and 74.6% had at least one mental illness diagnosis (that is, "any" disorder) within the previous five years.

7.10 Proportion of Manitobans Residing in a PCH, in the Cumulative Mental Disorder Group

Definition: We identified the proportion of Manitobans over 10 years of age with a mental illness[6] residing in a PCH at any time over the five years (1997/98-2001/02). The percentage of residents in Table 7.10.1 does not add to 100% because residents may have more than one mental illness and may be identified in more than one illness category.

Table 7.10.1: Proportion of Manitoba residents with (and without) a mental illness living in a PCH in 2002/03.

Mental Illness Disorder	Percentage of Manitoba Residents residing in a PCH in each mental illness category listed (%)
Any of the 5 Cumulative Mental Illness Disorders	43.2
Any Mental Illness (Cumulative + Other)	82.6
No Mental Illness	17.4
The Five Cumulative Mental Illnesses:	
Depression	34.6
Anxiety	7.0
Substance Abuse	5.7
Schizophrenia	7.3
Personality Disorders	3.9
Other Mental Illness Disorder:	
Dementia	67.3

[6] Mental illness disorders include one of the five cumulative disorders (depression, anxiety, substance abuse or addiction, schizophrenia, or personality disorder) or dementia. See the Glossary for the specific ICD-9-CM codes used to identify the mental health disorders from the administrative data.

Key findings:

- 43.2% of PCH residents had one or more of the five cumulative mental illness disorders, 67.3% had dementia, 34.6% had depression, and 82.6% had at least one mental illness diagnosis (that is, "any" disorder) within the previous five years.
- Most mental illnesses are comorbid (are present with another mental illness) in this cohort. However, 6.5% of residents have depression alone, 33.7% have dementia alone, and 16.6% have both depression and dementia.

7.11 Conclusion:

There are many seniors who are healthy and able to live independently in the community. However, there are many who require the more intensive nursing care that a PCH can provide. With the increasing growth of an older population (Menec et al., 2002) to an anticipated 17.8% of the Manitoba population over age 65 by 2020, it will be necessary to identify and plan for their health-service needs. For example, the use of PCHs by those with dementia is notably high—46% of those admitted, and 67% of PCH residents. Moreover, those over age 85 are particularly vulnerable to developing dementia (Menec et al., 2002). Dementia patients require about 36% more nursing care than others without the disease (O'Brien and Caro, 2001), so the pressures due an increasingly vulnerable population together with high costs of care will make this a health-care issue of importance.

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CHAPTER 8: PHARMACEUTICAL USE FOR MENTAL ILLNESS DISORDERS

8.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

This chapter contains information on the rates of use of pharmaceuticals for various categories of mental illness disorders, by sex, region of the province (RHAs and districts), and for some selected categories, by age and neighbourhood income grouping. The pharmaceutical indicators are:

- Proportion of the Population with at Least One Prescription (Section 8.2)
- Number of Different Drugs per User (Section 8.3)
- Number of Defined Daily Doses for all drugs and mental-illness-specific drugs (Section 8.4)
- Proportion of Adolescents on SSRIs (Section 8.5)

Sources of information and the study population

The Drug Program Information Network (DPIN) is an administrative record of pharmaceutical use for all Manitoba residents who have prescriptions filled by pharmacists. Anonymized DPIN files are available in the Population Health Research Data Repository housed at MCHP. Pharmaceuticals given to *hospitalized* patients are not recorded in the DPIN files, but DPIN does contain files of *community* pharmaceutical use. As well, there may be some communities (notably some northern remote communities) where nursing stations give prescription drugs to patients without a pharmaceutical claim. Previous MCHP research indicates that DPIN files for northern areas of the province may only capture around 80% of the actual use (Kozyrskyj and Mustard, 1998).

Three basic indicators of pharmaceutical use are given in this chapter:

- Proportion of the population with at least one prescription, which is an indicator of the overall use of any pharmaceutical listed in the provincial formulary.
- For those people having at least one prescription, the number of different drugs used.
- Number of defined daily doses (DDDs) for solid drug forms. If a person were given the standard DDD of a drug for an entire year, that person would receive 365 DDDs during that year (assuming one DDD per day for the entire year).

The five years of analysis for this report are fiscal years 1997/98-2001/02. For many of the analyses, comparisons are made between the *cumulative disorders* group and the *no disorders* group. The cumulative disorders group refer to those persons who have at least one of the following diagnoses using

administrative data claims: depression, anxiety disorder, substance abuse, schizophrenia, and personality disorder. Each of these diagnoses is explained in detail in Chapter 2, including the ICD-9-CM codes (and in some selected cases, pharmaceutical prescriptions) for classifying mental illness disorders using the administrative claims data. Another group, called the *other disorders* group, includes those persons with any mental illness diagnosis in the five years of the study, except those already included in the "cumulative disorders" group. The third group is comprised of those who have *no mental illness disorders* administrative database claims within the five years. Many of the graphs in this particular chapter compare the first (cumulative disorders) to the third (no disorders) group.

Dr. Colleen Metge assisted us in determining the pharmaceuticals normally prescribed for mental illness conditions. Although these may have changed over time, Table 8.1 shows the normal prescribing practices during the 1997/98-2001/02 time period. As the reader can see, several drugs are prescribed for more than one mental illness condition. For purposes of part of this chapter (Section 8.4), we determined the DDDs for all drugs used by those with the cumulative mental illness conditions (see Chapter 2), compared to those with no mental illness conditions. As well, we determined the most frequently used pharmaceuticals from the list of drugs used for the mental illness conditions, and compared rates of use of these selected pharmaceuticals in males and females having this condition. Not all of the indicated pharmaceuticals in Table 8.1.1 were used in this selected analysis—for each mental illness category, we selected a specific group of drugs used in these comparisons, and these are described in detail in the relevant sections.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *Is the use of medication for mental illnesses different amongst the RHAs or districts within the RHAs?*
- *Is there potential for over or underprescribing of pharmaceuticals?*

Table 8.1.1: Pharmacological treatments for mental health disorders

Pharmacological Agents	Schizophrenia	Depression	Generalized Anxiety Disorder(s)	Personality Disorders
Atypical Antipsychotics (e.g., clozapine, olanzapine)	X			X
Conventional Antipsychotics (e.g., haloperidol, thioridazine)	X		X	X
Depot Injections (e.g., flupentixol decanoate)	X			
Benzodiazepines	X			X
-*hypnotics* (e.g., flurazepam)			X	
-*anxiolytics* (e.g., diazepam, lorzepam)			X	
Antidepressants & Mood Stablilizers	X	X	X	
-*tricyclic antidepressants* (e.g., amitriptyline)		X	X	
-*SSRIs* (e.g, fluoxetine, paroxetine)		X	X	X
-*MAO-Inhibitors* (e.g., phenelzine)		X		X
-tranylcypromine				
-*Other antidepressants* (e.g., nefazodone)		X	X	
-*Mood stabilizers* (e.g., lithium carbonate)				X
Other Interventions (Side effect treatment) (e.g., carbamazepine)	X			X
Beta-blockers (e.g., metoprolol)	X		X	
Antimuscarinic Drugs (anticholinergics) (e.g., benzatropine)	X			
Nonbenzodiazepine GABA Agonists (e.g., valproic acid)	X			X
Calcium Channel Blockers (e.g., nifedipine, verapamil)	X		X	
Cholinergics -choline	X			
Miscellaneous (e.g., clonidine, tryptophan)	X		X	

Overall key findings from this chapter:

- *About 1.3 to 1.4 times as many people in the cumulative mental disorders group had at least one prescription per year, compared to those in the "no mental disorders" group (females: 87.6% versus 68.2%, males: 76.1% versus 53.9%).*
- *About 1.5 times the number of different drugs are used for those in the cumulative disorders group compared with those in the no mental illness disorders group, for both females and males (females: 5.2 versus 3.4 drugs per user per year, males: 4.2 versus 2.9 drugs per user per year).* The lower the neighbourhood income group, the higher the number of different medications used.
- Females living in regions of poorer health status are dispensed higher average numbers of different drugs—for both the cumulative disorders group and the no disorders group. However, this pattern is not as apparent for males, especially in the cumulative disorders group. One persistent anomaly is the RHA of Parkland, where the number of different drugs used is higher than one would expect given the underlying regional health status.
- *Those in the cumulative disorders group are being dispensed about 1.6 times the DDDs (all drugs included) compared with those having no mental disorder, for both males (388 versus 235) and females (440 versus 273 DDDs per year).*
- For both males and females diagnosed with depression, anxiety disorder, schizophrenia or personality disorder, mental-illness-specific drugs represent about three-quarters of their total DDDs dispensed in a year.
- Female adolescents are twice as likely to be prescribed selective serotonin reuptake inhibitors (SSRIs), a drug used in cases of depression, compared with male adolescents (1.70% females versus 0.76% of males provincially). Winnipeg RHA has a significantly higher percentage of adolescents prescribed SSRIs (1.86% females, 0.86% males), whereas the Rural South (1.58% females, 0.64% males) and the North (1.11% females, 0.65% males) have lower percentages of adolescents prescribed SSRIs.
- About 17% of the total SSRIs dispensed to adolescents is fluoxetine, despite the fact that this drug is the only SSRI currently recommended for adolescent depression. This may partly be an artifact of the data representing 1997/98-2001/02 before it became a concern. However, this needs further monitoring to determine appropriate prescribing practices for adolescents.

Canadian comparisons:

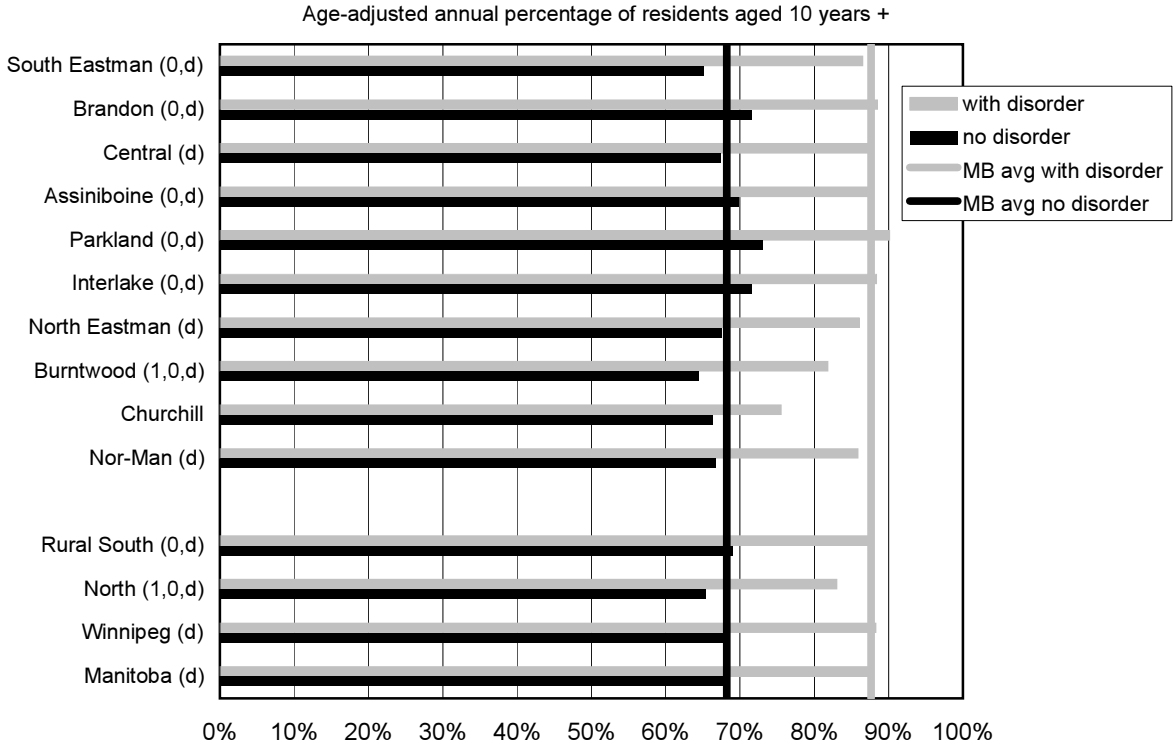
- Frise et al. (2002) examined the mental health service use of Ontario women aged 25 to 74 years. The proportion of women using pharmaceuticals over their lifetime was 1.4 times higher for those with a mental illness disorder compared to those having no mental disorder (70.1% versus 49.6%). *In our study, about 1.3 to 1.4 times as many people in the cumulative mental disorders group had at least one prescription per year, compared to those in the "no mental disorders" group (females: 87.6% versus 68.2%, males: 76.1% versus 53.9%). Moreover, about 1.5 times the number of different drugs are used for those in the cumulative disorders group compared with those in the no mental illness disorders group, for both females and males (females: 5.2 versus 3.4 drugs per user per year, males: 4.2 versus 2.9 drugs per user per year). Similarly, those in the cumulative disorders group are being dispensed about 1.6 times the DDDs compared with those having no mental disorder, for both males (388 versus 235) and females (440 versus 273 DDDs per year).*
- According to the Canadian Medical Association (editorial CMAJ, 2004), Health Canada issued a public warning that the paediatric use of seven antidepressants—paroxetine, bupropion (Wellbutrin), citalopram (Celexa), fluvoxamine (Luvox), mirtazapine (Remeron), sertraline (Zoloft) and venlafaxine (Effexor)—should proceed only after consultation with the treating physician to ensure that the benefits outweigh the potential risks. This stems from worldwide concern that paroxetine should not be prescribed to patients under the age of 18, due to possible elevations in suicidal behaviour (between 1.5 and 3.2 times the risk). The article also states that approximately 3 million Canadian children are taking antidepressants. A systematic review (Whittington et al., 2004) indicated that although published data suggest a favourable risk-benefit profile for some SSRIs, the addition of unpublished data indicates risk could outweigh benefits—except in the case of fluoxetine, i.e., Prozac—in treating depression in young adults. *In our report in the five-year period 1997/98 through 2001/02 for Manitoban residents, 502 males and 1,075 females ages 12 through 19 were given at least one prescription of SSRIs, which corresponds with 0.76% of the males and 1.70% of the females. In our report, approximately 17% of the SSRIs prescribed to male and female adolescents were fluoxetine, indicating that 83% of the SSRIs could be contraindicated by current recommendations. This is one area that needs future monitoring, given the fact that the recommendations may have only become known to prescribing physicians in the time period beyond this report.*
- In a 1999 report from MCHP (Metge et al., 1999), population-based measures of pharmaceutical use were analyzed. 66.4% of the population was dispensed at least one prescription per year. *In our report for those with no mental disorders, 68% of females and 54% of males were dispensed at least one prescription per year, but for those in the cumulative disorders*

group, the percentages were much higher at 88% of females and 76% of males. In 1999, residents of Manitoba who had at least one prescription per year (i.e., "users") were dispensed 3.2 different drugs per person per year. *In our report for those with no mental disorders, the number of different drugs dispensed per "user" was 3.4 for females and 2.9 for males. But for those in the cumulative disorders group, the number was much higher at 5.2 different drugs for females and 4.2 for males.* The number of DDDs per day was 0.4 per person for the entire population. *In our report, the DDDs per day (dividing the DDDs reported per year by 365) for those having no mental disorder was 0.75 for females and 0.64 for males, and for those in the cumulative disorder group the DDDs were higher at 1.20 for females and 1.06 for males.*

8.2 Proportion of the Population with at Least One Prescription per Year

Definition: This is an age-adjusted percentage of the population aged 10 or greater who received at least one prescription of any kind per year (mental illness-related as well as any other medication) during the five-year period from 1997/98 to 2001/02. There are two comparison groups for this analysis. Those in the "cumulative disorders" group (having one or more of the following diagnoses within the five-year period: depression, anxiety disorder, substance abuse, schizophrenia, and personality disorder), are compared with those in the "no disorders" group (the group of persons having no mental illness diagnoses during the five years). See Chapter 2 for a complete explanation of the terms. The numerator is the number of people in a five-year period with at least one prescription, with the denominator being the cohort. This indicator is given separately for males and females, and shown by RHA, by district, by age distribution, and by income quintile grouping. Note that prescription use shown in these graphs for northern RHAs (Burntwood, Churchill and Nor-Man) may underestimate the actual use, due to incomplete recording into the DPIN of pharmaceutical dispensing in nursing stations.

Figure 8.2.1: Proportion of Females with at Least One Prescription With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 8.2.2: Proportion of Females with at Least One Prescription With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual percentage of residents aged 10 years +

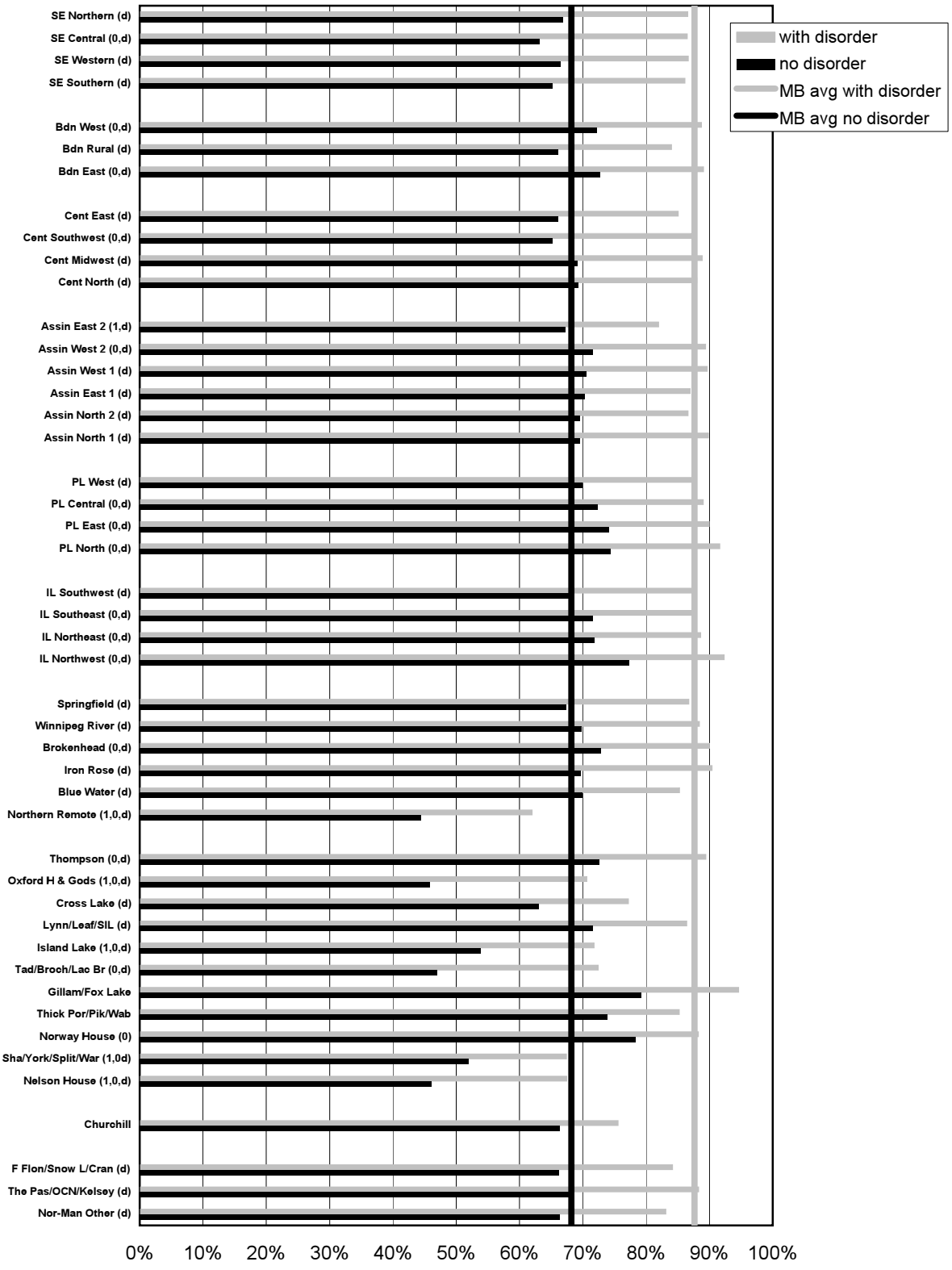
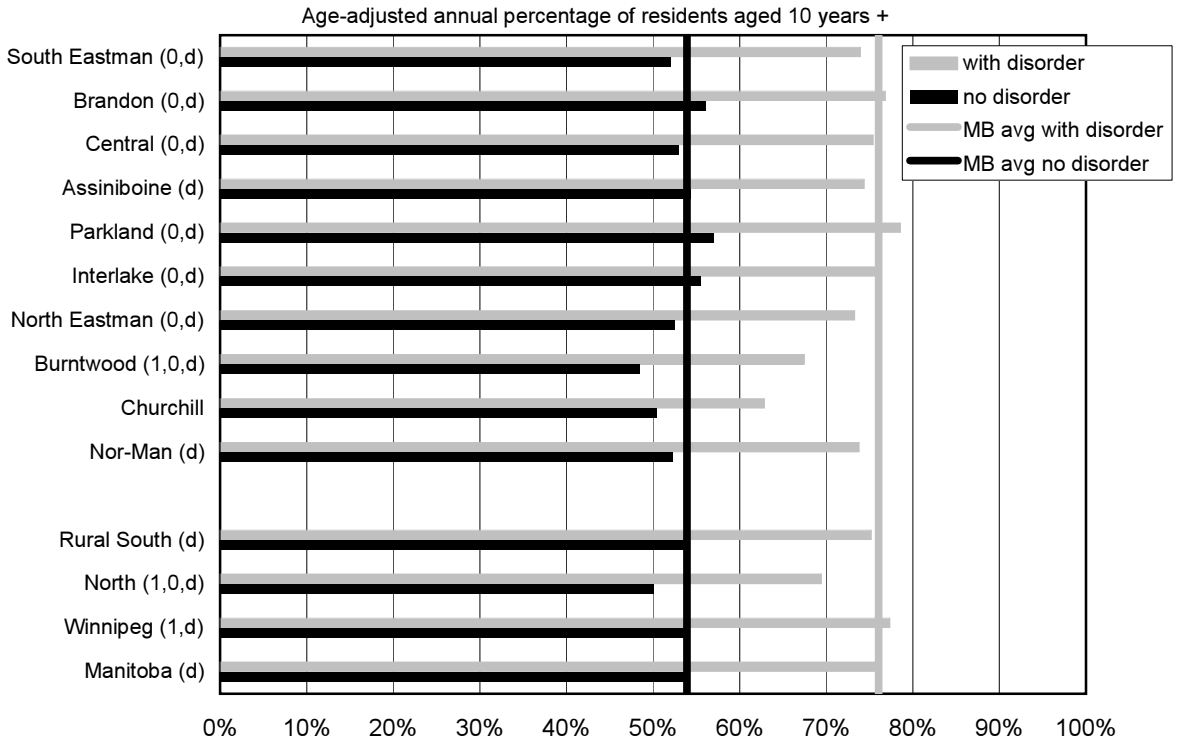


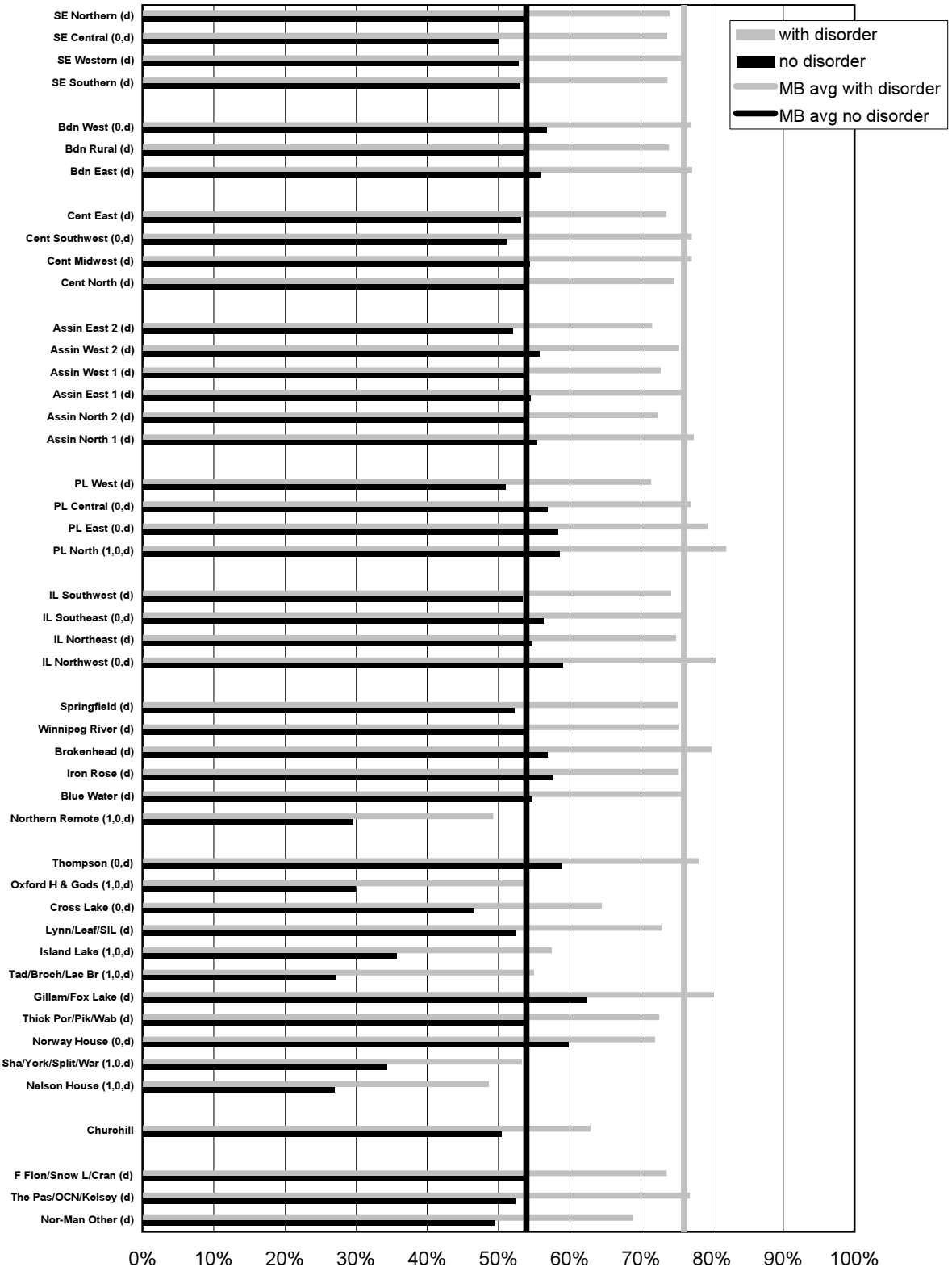
Figure 8.2.3: Proportion of Males with at Least One Prescription With and Without Cumulative Disorders by RHA, 1997/98-2001/02



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 8.2.4: Proportion of Males with at Least One Prescription With and Without Cumulative Disorders by District, 1997/98-2001/02

Age-adjusted annual percentage of residents aged 10 years +



Key findings:

- The proportion of the population with at least one prescription is remarkably similar across RHAs and districts, for both males and females, but shows consistent differences between those with cumulative disorders compared to those with no disorders. For those having no mental illness disorder, 68.2% of females and 53.9% of males had at least one prescription per year. For those in the cumulative disorders group, 87.6% of females and 76.1% of males had at least one prescription.

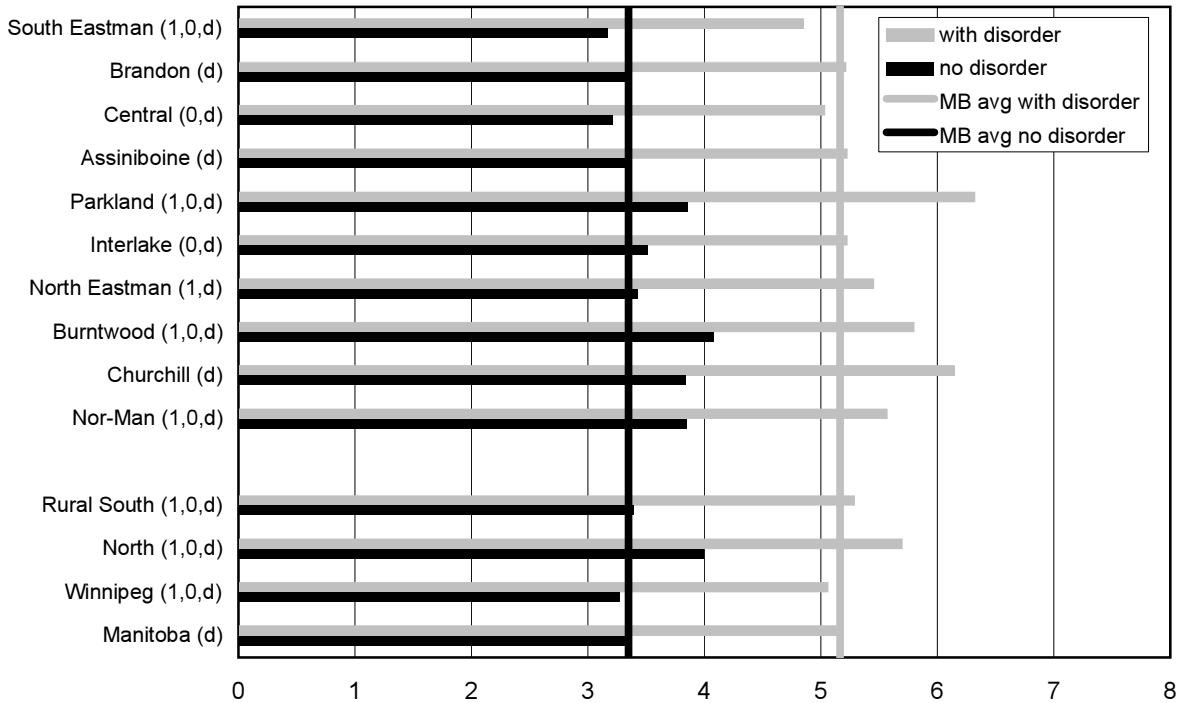
8.3 Number of Different Drugs per User per Year

Definition: This is an age-adjusted average number of all different drugs *per year* dispensed to those residents aged 10 or greater who received at least one prescription during the five-year period 1997/98-2001/02. If a person obtains multiple prescriptions of the same type of drug, then this is only considered to be one drug. There are two comparison groups for this analysis. Those in the "cumulative disorders" group are compared with those in the "no disorders" group. See Chapter 2 for a complete explanation of the terms.

The numerator is the number of different drugs dispensed in a five-year period for those residents with at least one prescription, with the denominator being the cohort of those residents with at least one prescription. This indicator is given separately for males and females, and shown by RHA, by district, by age distribution, and by income quintile grouping. Except in the age distribution graph, the average number of drugs is age-adjusted to reflect the overall Manitoba age distribution. The income quintile proportions are given by "urban" (Winnipeg, Brandon) and by "rural" (all other Manitoban RHAs), whereby approximately one-fifth of the population is grouped into each neighbourhood income strata from lowest to highest neighbourhood income levels. Note that prescription use shown in these graphs for northern RHAs (Burntwood, Churchill, Nor-Man) may underestimate the actual use, due to incomplete recording into the DPIN of pharmaceutical dispensing in nursing stations.

Figure 8.3.1: Number of Different Drugs per User for Females With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 8.3.2: Number of Different Drugs per User for Females With and Without Cumulative Disorders by District, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions

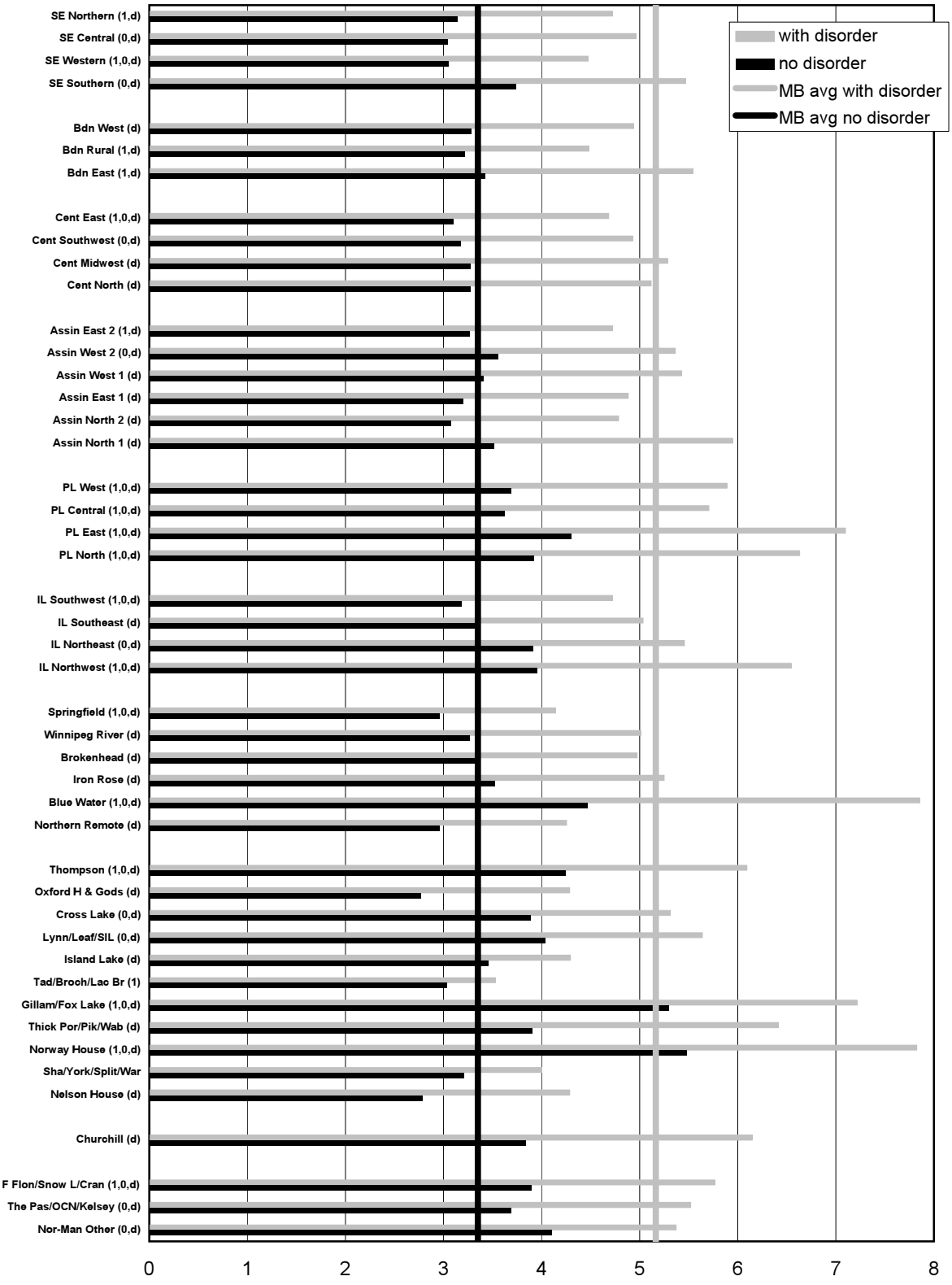


Figure 8.3.3: Number of Different Drugs Per User for Females With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

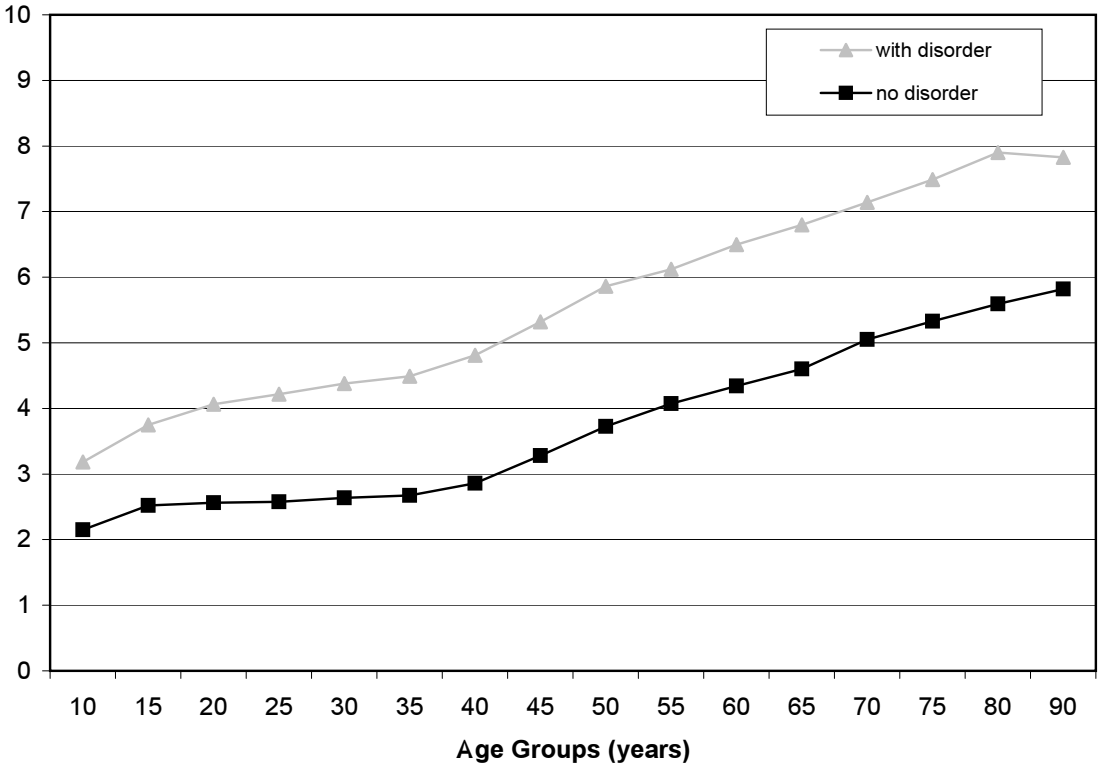


Figure 8.3.4: Number of Different Drugs per User for Females With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions

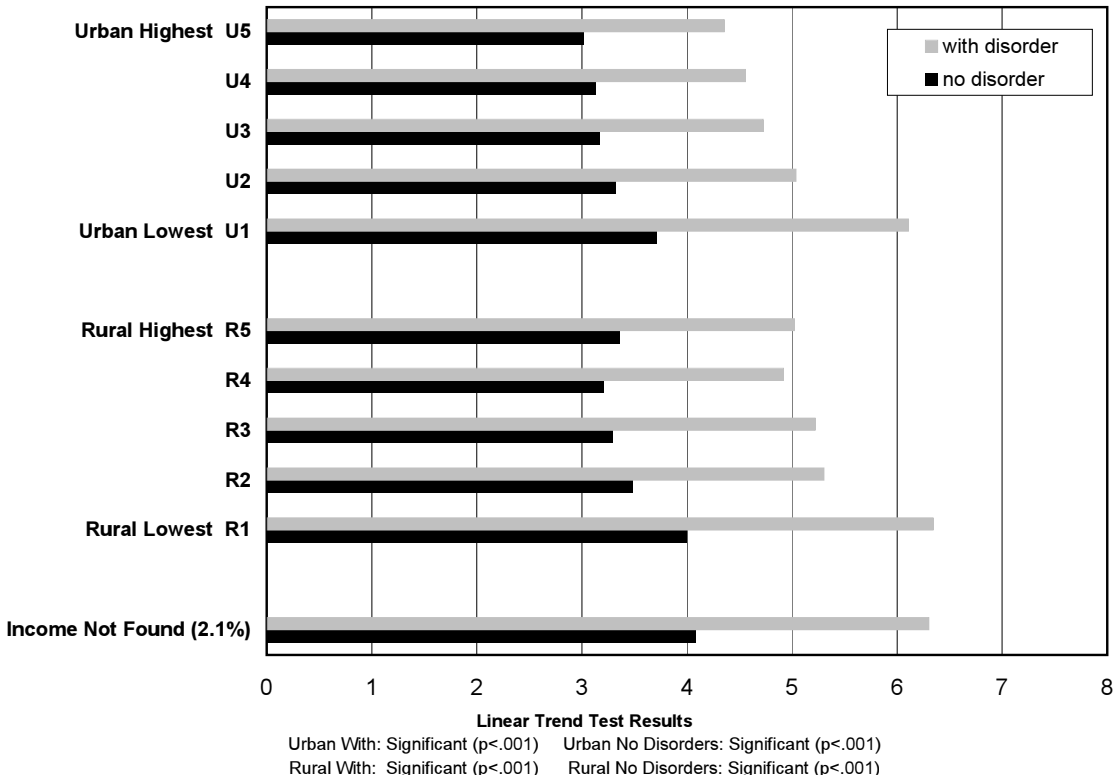
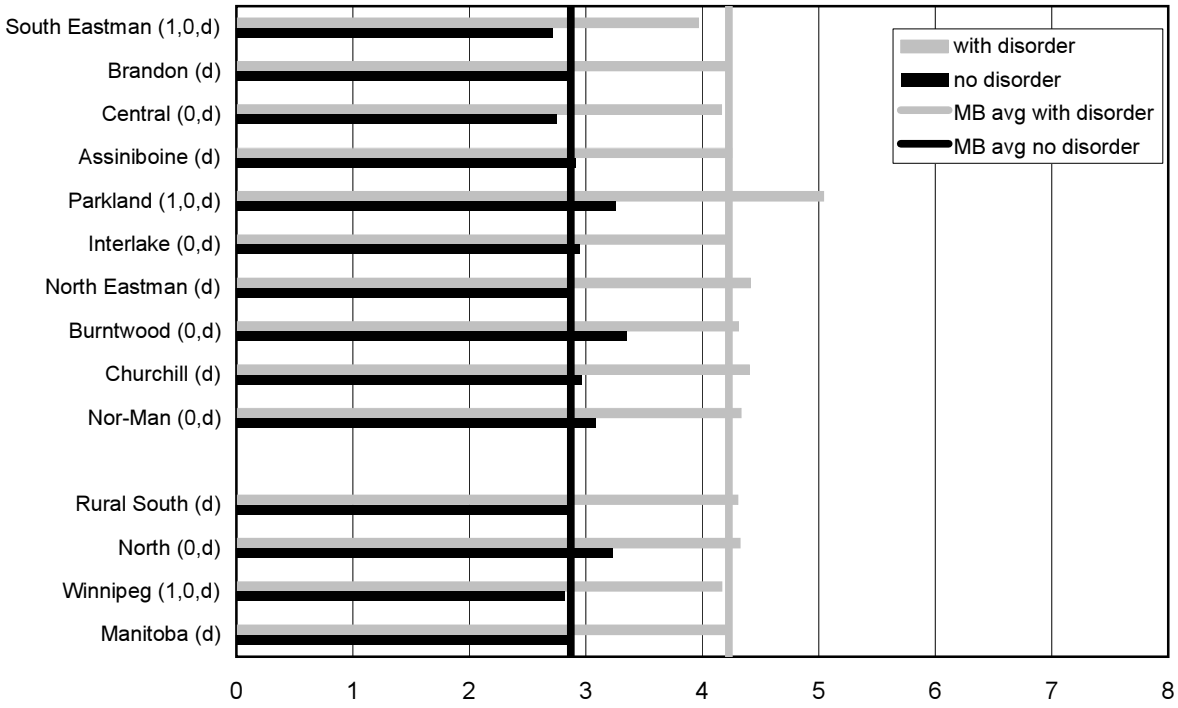


Figure 8.3.5: Number of Different Drugs per User for Males With and Without Cumulative Disorders by RHA, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions



'1' indicates area's rate for those with disorder was statistically different from Manitoba average with disorder
'0' indicates area's rate for those without disorder was statistically different from Manitoba average without disorder
'd' indicates difference between two groups' rates was statistically significant for that area
's' indicates data suppressed due to small numbers

Figure 8.3.6: Number of Different Drugs per User for Males With and Without Cumulative Disorders by District, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions

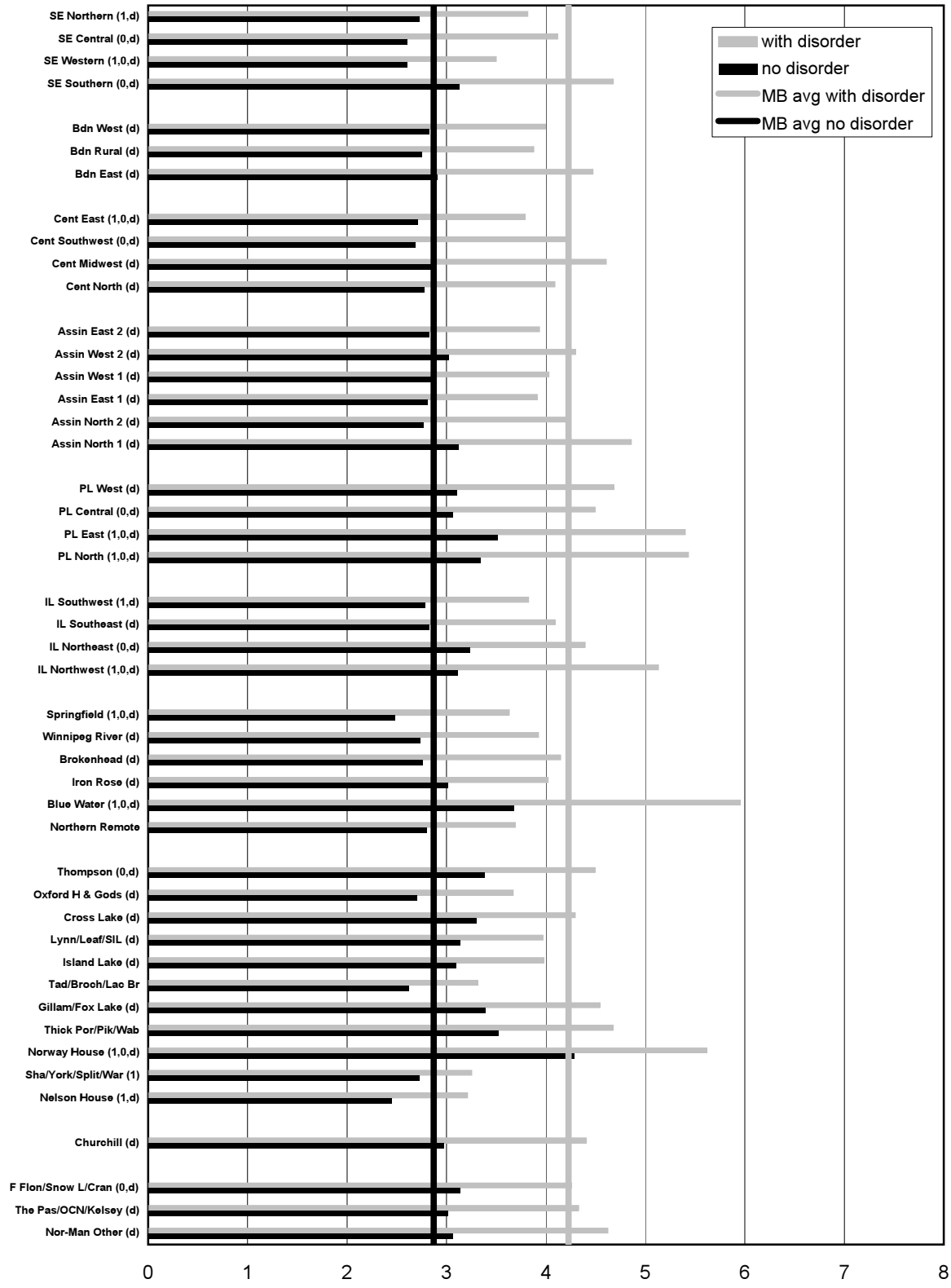


Figure 8.3.7: Number of Different Drugs Per User for Males With and Without Cumulative Disorders by Age and Sex, 1997/98-2001/02

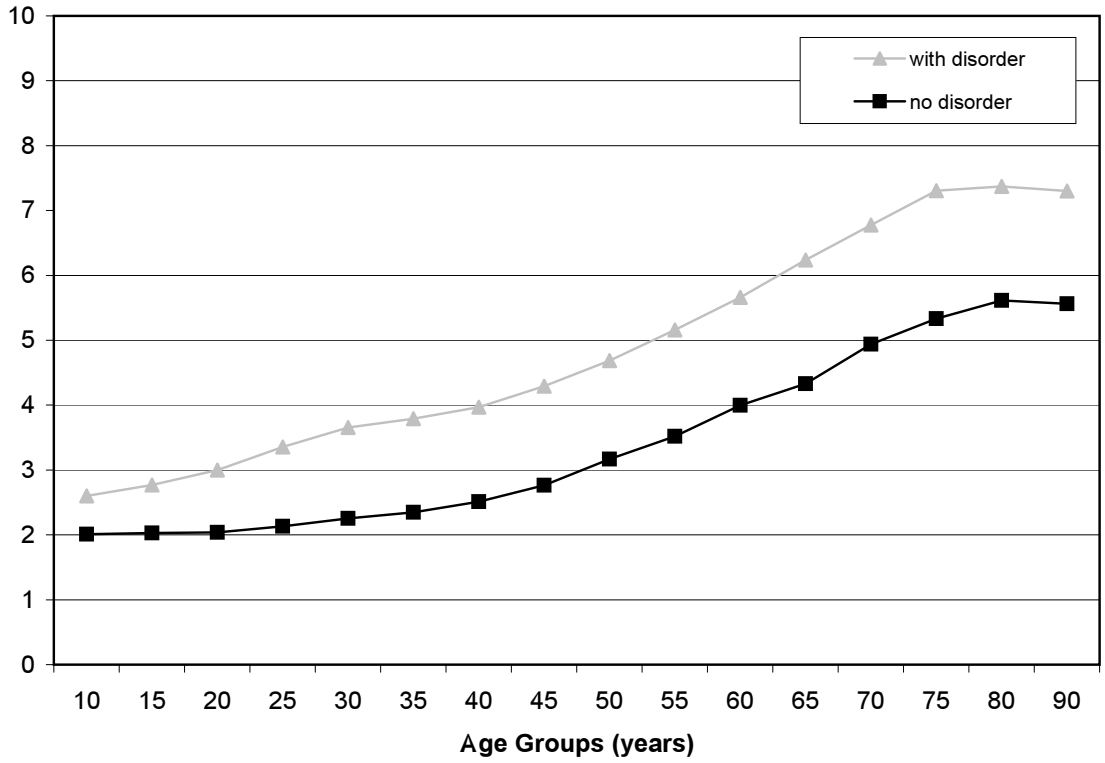
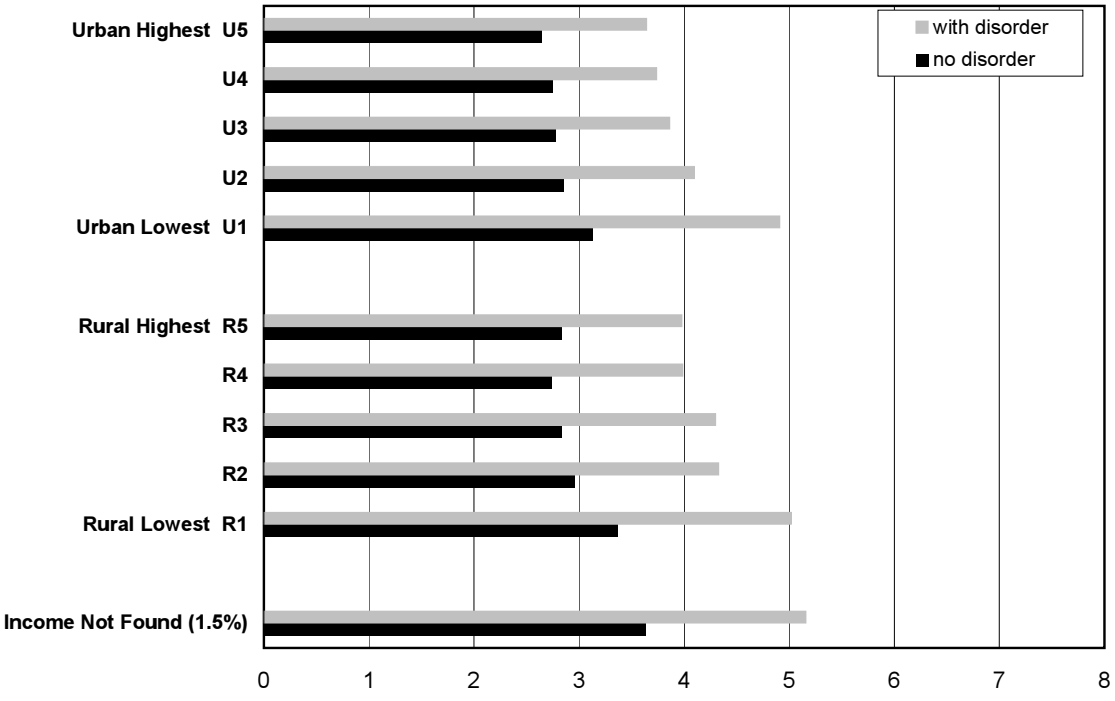


Figure 8.3.8: Number of Different Drugs per User for Males With and Without Cumulative Disorders by Income Quintile, 1997/98-2001/02

Average number of different drugs dispensed, per resident (age 10+) with 1+ prescriptions



Linear Trend Test Results

Urban With: Significant (p<.001) Urban No Disorders: Significant (p<.001)

Rural With: Significant (p<.001) Rural No Disorders: Significant (p<.001)

Key findings:

- About 1.5 times the number of different drugs are used by those in the cumulative disorders group compared with those in the no mental illness disorders group, for both females and males (females: 5.2 versus 3.4 drugs per user per year, males: 4.2 versus 2.9 drugs per user per year).
- There is a consistent effect throughout the age groupings for both males and females, such that those in the cumulative disorders group of users are prescribed a greater number of different drugs compared to users in the "no mental illness" disorders group (approximately two more drugs for females and 1.5 for males in all age groups).
- The lower the neighbourhood income group, the higher the number of different drugs used. In all neighbourhood income groupings, those in the cumulative disorders group use about 1.5 times the number of different drugs compared to those with no mental illness disorders.
- Knowing that the underlying health status (as measured by PMR of the RHAs—see Chapter 1) indicates the need for health care services, it is not surprising that the number of different drugs per user shows an expected pattern—higher average number of different drugs is associated with poorer regional health status for females in both the cumulative disorders group and the no disorders group. However, this pattern is not as apparent for males, especially in the cumulative disorders group. One persistent anomaly is the RHA of Parkland, where the number of different drugs used for both those with cumulative disorders and no mental illness disorders, and for males and females, is higher than one would expect given the underlying regional health status.

8.4 Number of Defined Daily Doses for All Drugs and for Specified Drugs

Definition: This is an age-adjusted average number of DDDs *per year* for the years 1997/98-2001/02, dispensed to those residents aged 10 or greater who are in certain mental illness diagnosis groupings—depression, anxiety disorder, schizophrenia, and personality disorder—as well as in the cumulative mental disorders group and the no disorders group (see Chapter 2 for a description of these). If a person were taking the assumed average maintenance dose per day for a drug, then there would be 365 DDDs per year. The numerator is the number of DDDs given to a specific mental illness group (such as depression), with the denominator being the number of residents in this specific cohort. The table compares males and females, and is shown by RHA and by district. Note that prescription use for northern RHAs (Burntwood, Churchill, Nor-Man) may underestimate the actual use, due to incomplete recording into the DPIN of pharmaceutical dispensing in nursing stations.

The Defined Daily Dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults. This is limited to solid form drugs only, and is a technical unit of measurement assigned by the WHO Collaborating Centre for Drug Statistics Methodology in Norway. There are many limitations to using DDDs. First, it does not necessarily reflect the actual amount or dose used, since prescribing patterns may be different than the original DDD assigned to the drug. For example, a drug which is now given in a higher dosage due to changing prescribing patterns, such as two times the previous dosage, could mathematically appear as if the person were receiving twice the DDD (since DDD is based on the guideline given originally by WHO). Another limitation is that some drugs have not been assigned DDDs, although for mental illness drugs, this is considered to be a very small number of drugs.

For each of the mental illness disorder groups, as well as for the cumulative disorders and the "no disorders" mental illness groups, DDDs were calculated *for use of all drugs*. As well, for each of the following categories, selected medications most frequently prescribed for the specific condition have been chosen. The following medications were used in the analysis of specific mental-illness-related DDDs:

Depression: N06A: Antidepressants including N06AB Selective serotonin reuptake inhibitors (SSRIs) like paroxetine (Paxil) and fluoxetine (Prozac).

Anxiety: N05B: Anxiolytics including N05BA Benzodiazepine derivatives like diazepam (Valium), lorazepam (Ativan), chlordiazepam, and oxazepam.

Schizophrenia: N05A: Psycholeptics (antipsychotics) including N05AH Diazepines (e.g., clozapine, loxapine) and N05AX: Other antipsychotics, such as risperidone.

Personality disorder: N06A: Antidepressants including N06AB Selective serotonin reuptake inhibitors (SSRIs) like paroxetine (Paxil) and fluoxetine (Prozac).

Table 8.4.1: Defined Daily Doses of all drugs per year by sex, RHA and mental illness grouping,* 1997/98-2001/02

Age-adjusted annual rate of DDDs per resident (age 10+) with 1+ prescriptions

RHA	Defined Daily Doses per year - All drugs											
	Depression		Anxiety Disorder		Schizophrenia		Personality		Cumulative		No Disorders	
	males	females	males	females	males	females	males	females	males	females	males	females
South Eastman	399	487	440	481	498	763	470	680	367	462	225	273
Brandon	444	469	470	528	714	701	664	804	404	453	245	276
Central	447	471	479	502	729	618	549	626	412	448	226	288
Assiniboine	464	500	455	572	547	761	460	806	407	476	243	291
Parkland	484	524	536	573	694	686	575	832	442	509	262	296
Interlake	411	453	393	496	639	716	470	667	374	439	230	274
North Eastman	409	468	442	501	462	789	432	752	362	442	211	271
Burntwood	359	462	376	505	408	537	361	810	277	394	247	297
Churchill	307	400	100	430	184	938	115	217	334	402	222	299
Nor-Man	326	451	300	408	461	580	431	560	291	422	235	323
Rural South	437	481	456	522	639	711	506	726	396	460	233	283
North	345	457	330	443	447	572	407	698	285	408	244	310
Winnipeg	429	460	410	463	611	703	567	723	391	432	235	263
Manitoba	430	466	421	482	617	700	556	729	388	440	235	273

* Graphs by RHA and by district are available, showing statistically significant differences, at www.umanitoba.ca/centres/mchp/ and go to Data Extras.

Table 8.4.2: Defined Daily Doses of mental disorder-specific prescriptions per year, 1997/98-2001/02**

Age-adjusted annual rate of DDDs per resident (age 10+) with 1+ prescriptions

RHA	Defined Daily Doses – Mental Disorder-Specific Prescriptions							
	Depression		Anxiety Disorder		Schizophrenia		Personality Disorder	
	males	females	males	females	males	females	males	females
South Eastman	276	300	319	263	330	619	415	647
Brandon	287	290	337	304	583	723	338	526
Central	302	346	368	307	560	491	398	436
Assiniboine	371	289	245	263	416	493	457	458
Parkland	262	297	511	468	434	322	406	506
Interlake	293	316	365	351	444	592	442	420
North Eastman	291	321	307	358	218	537	385	547
Burntwood	215	322	163	200	228	372	320	483
Churchill	89	303	27	58	106	756	97	135
Nor-Man	225	249	256	283	286	323	317	356
Rural South	301	315	359	335	437	528	428	462
North	218	286	217	253	261	354	335	445
Winnipeg	312	338	418	383	474	551	443	545
Manitoba	305	327	395	359	464	542	431	523

* Refer to the definitions in this section for the specific drug categories used for each of the mental illness conditions. Graphs by RHA and by district are available, showing statistically significant differences, at www.umanitoba.ca/centres/mchp/ and go to Data Extras.

Key findings:

- The DDDs for all drug use indicate that those in the cumulative mental illness group are dispensed about 1.6 times the DDDs compared with those in the "no mental disorders" group, both for males (388 versus 235 DDDs per year) and for females (440 versus 273 DDDs per year).
- For all drug use, females are dispensed more DDDs than males in every mental illness disorder category: depression (466 versus 430 DDD per year), anxiety disorder (482 versus 421), schizophrenia (700 versus 617 per year), personality disorder (729 versus 556). This is also evident in the cumulative disorders (440 versus 388) and the "no mental disorders" group (273 versus 235 DDD per year). This may be due to differing prescribing patterns, or to compliance issues with visits to health care providers and with filling prescriptions.
- Knowing that 365 DDDs would translate into a person receiving a daily assumed average maintenance dose, the average DDDs for all drugs (especially for schizophrenia and for personality disorder) indicate that multiple drugs are being prescribed, or medications are given at much higher dosages than the DDD standards. This needs further study.
- The DDDs for specific mental illness disorders range from 305 to 542 DDDs per year, indicating that people with mental illness are receiving around the expected range of 365 DDDs per year and up to 1.5 times that. The higher range may be indicative of prescribing patterns which differ from the original WHO DDD standards, or some persons being on multiple medications within the mental illness drug category.
- For males and females in the mental illness categories of depression, anxiety disorder, schizophrenia and personality disorder, mental-illness specific drugs represent about three-quarters of their total DDDs dispensed in a year. For example, males with schizophrenia have a DDD of 617 per year for all drugs, of which 464 (75%) is for schizophrenia-related drugs.

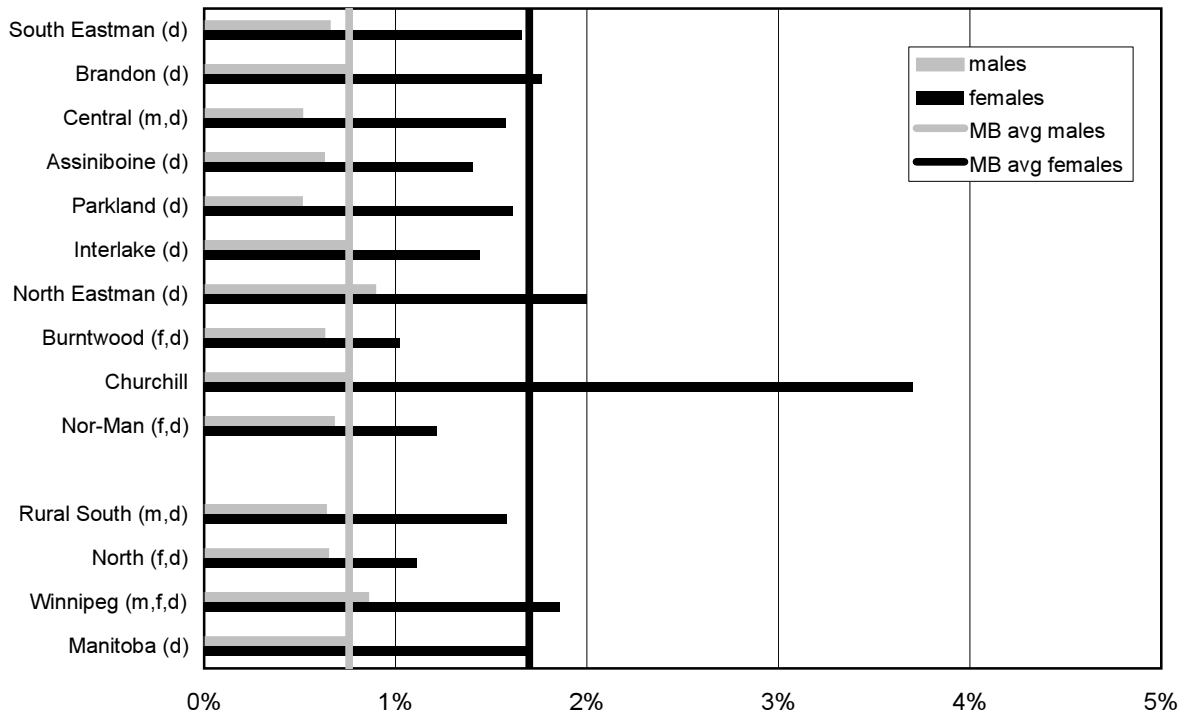
8.5 Proportion of Adolescents on SSRIs

Definition: The percentage of adolescents on SSRIs (selective serotonin reuptake inhibitors) is an age-adjusted percentage of the population aged 12-19 years having at least one SSRI prescription in the five-year period 1997/98-2001/02. This is shown by males and females, for RHAs and districts.

There has been recent concern about the use of SSRIs for treating adolescent depression, and the association with suicidal behaviour in adolescents (Wilens et al., 2003; Whittington et al., 2004; Editorial CMAJ, 2004). According to the Canadian Medical Association (Editorial CMAJ, 2004), Health Canada issued a public warning that the paediatric use of seven antidepressants—paroxetine, bupropion (Wellbutrin), citalopram (Celexa), fluvoxamine (Luvox), mirtazapine (Remeron), sertraline (Zoloft) and venlafaxine (Effexor)—should proceed only after consultation with the treating physician to ensure that the benefits outweigh the potential risks. This stems from worldwide concern that paroxetine should not be prescribed to patients under the age of 18, due to possible elevations in suicidal behaviour (between 1.5 and 3.2 times the risk). The article also states that approximately three million Canadian children are taking antidepressants. A systematic review (Whittington et al., 2004) indicated that although published data suggest a favourable risk-benefit profile for some SSRIs, the addition of unpublished data indicates risk could outweigh benefits—except in the case of fluoxetine, i.e., Prozac—in treating depression in young adults.

Figure 8.5.1: Teenagers on SSRI's by RHA, 1997/98-2001/02

Age-adjusted annual percentage of 12-19 year olds with at least one SSRI prescription



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder 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

Figure 8.5.2: Teenagers on SSRI's by District, 1997/98-2001/02

Age-adjusted annual percentage of 12-19 year olds with at least one SSRI prescription

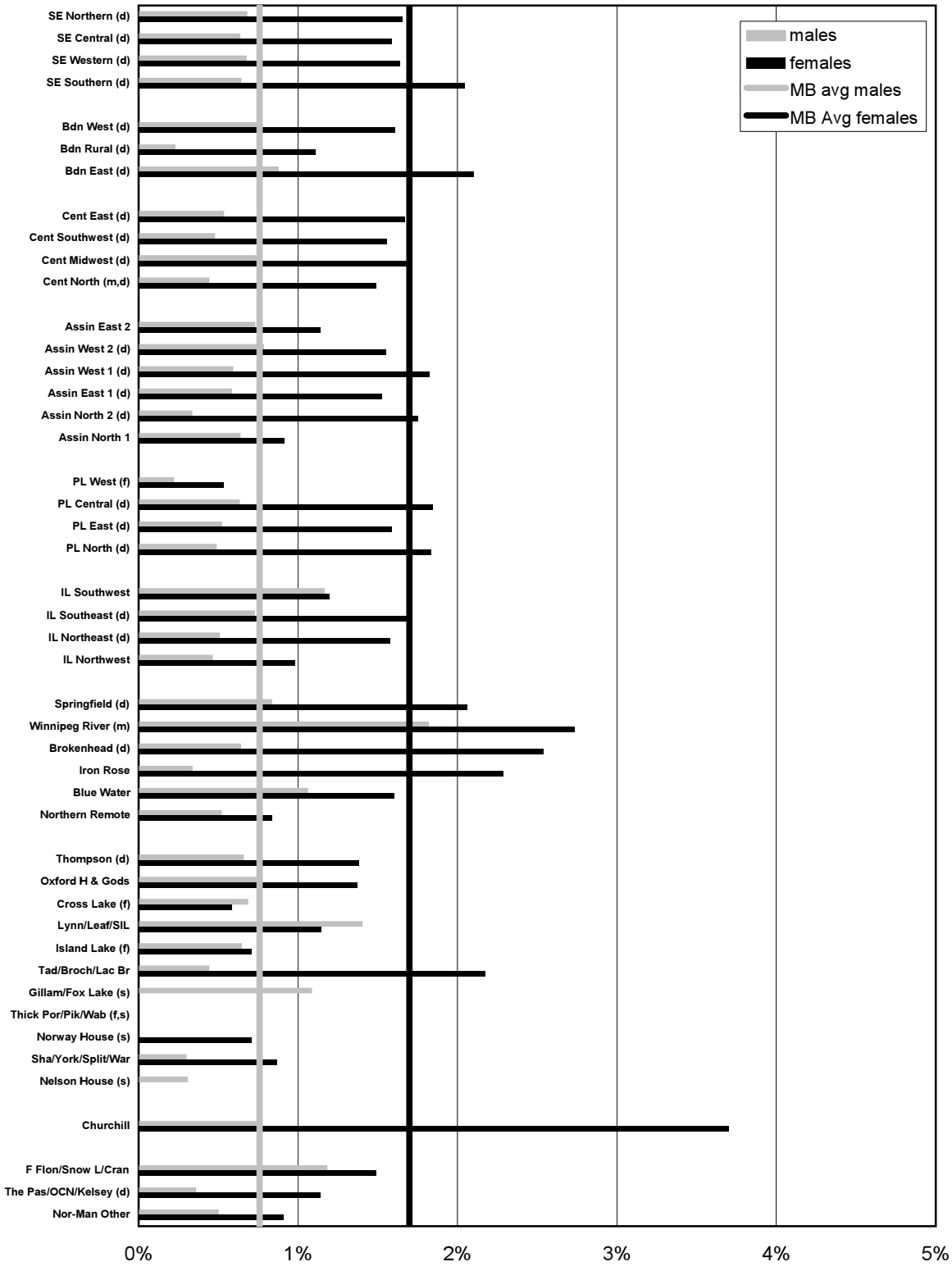


Table 8.5.1: The percentage of fluoxetine as a total of the SSRIs prescribed to adolescents aged 12 through 19 years

RHA	Fluoxetine as a percentage of total SSRIs	
	Males	Females
South Eastman	16.90%	20.70%
Brandon	22.10%	25.10%
Central	14.50%	11.90%
Assiniboine	19.90%	15.60%
Parkland	9.00%	13.60%
Interlake	14.50%	13.80%
North Eastman	20.60%	14.60%
Burntwood	17.10%	18.90%
Churchill	suppressed	0.00%
Nor-Man	12.30%	13.50%
Rural South	16.20%	14.70%
North	15.20%	16.30%
Winnipeg	17.50%	17.60%
Manitoba	17.10%	16.90%

Key findings:

- Female adolescents are twice as likely to be prescribed SSRIs compared with male adolescents (1.70% females versus 0.76% of males).
- Winnipeg RHA has a significantly higher percentage of adolescents prescribed SSRIs (1.86% females, 0.86% males), whereas the Rural South (1.58% females, 0.64% males) and the North (1.11% females, 0.65% males) have lower percentages of adolescents prescribed SSRIs. Although not statistically significant, there are a few RHAs which show elevated rates, warranting possible further study—including Churchill (which may be due to small numbers and highly fluctuating percentages from year to year), as well as North Eastman.
- About 17% of the total SSRIs dispensed to adolescents is fluoxetine (i.e. Prozac). This varies only slightly by RHA, with the highest percentages in Brandon RHA (22% for males, 25% for females). This may partly be an artifact of the data representing 1997/98-2001/02 before it became a concern. However, this needs further monitoring to determine appropriate prescribing practices for adolescents.

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CHAPTER 9: SUICIDE AND SUICIDE ATTEMPTS

9.1 What's in This Chapter? Overall Description, Examples, and Possible Questions

Although suicide takes the lives of a relatively small proportion of Canadians (3,699 or 2% of deaths in 1998; Health Canada, 2002), it is still the second leading cause of death (after unintentional injuries) for young Canadians (10- to 34- years) and fourth leading cause for middle-aged Canadians (35- to 54- years) (Health Canada, 2003). Suicides and suicide attempts represent crises in mental health (Sanchez, 2001) and result in distraught family and friends. They also take their toll on the wider community, engendering a sense of sadness, inadequacy, and impotence in the communities involved. This chapter is intended to give health planners and policy-makers current information needed to address this tragic and potentially preventable cause of death.

This chapter provides an overall description of suicide-related behaviours and population-based risk factors in Manitoba from 1997 to 2001. The key indicators are:

- Suicide: the act of intentionally killing oneself
  - Rates by region, age, sex, and census income
  - Most common methods
  - Comparison of Manitoba rates with Canadian rates
  - Potential Years of Life Lost (PYLL) due to suicide
- Suicide Attempts: acts intended to kill oneself, but not resulting in death
  - Rates by region, age, and sex
  - Most common methods
- Suicide Attempters: individuals who attempt suicide
  - Percentage of the population by region, age, sex, and census income
  - Proportion of Manitobans considering or attempting suicide: interview data from the Canadian Community Health Survey (CCHS)
- Combined Group: both suicide completers and attempters
  - Percentage of the population by region, age, sex, and census income
  - Identification of key risk factors related to suicide completion or attempts

Comparisons used in this chapter

Events (suicide completions and suicide attempts) are reported as a rate per 10,000 residents per year. People (suicide attempters and those in the combined group) are reported as an average yearly proportion of the population affected from 1997 to 2001. To allow comparisons across regions, (differing in the age or sex of their populations), we standardized the suicide indicators by age and sex.

Rates are obtained by dividing the observed number per year (of suicides, for example) by the total number of eligible residents in the group, then multiplying by 10,000. This yields an average annual rate, that is, the number per 10,000 residents. Eligible residents lived in an RHA in December 1999 for at least one year from 1997 to 2001.

In interpreting the data, it is important to note that even though the rates may be high in some RHAs, the actual number of individuals who commit suicide may be low. For example, when we compare the rural South with the North, we see that the North has a much higher *per capita* yearly rate of suicide (North 1.7 per10,000 and rural South 1.4 per10,000). However, the rural South has a larger population, and over five years the actual number of suicides in the rural South (n=234) is higher than in the North (n=57).

We also report sex- and age-group differences for the suicide and suicide attempt indicators. For these analyses, we present sex- and age-specific crude rates (not standardized) across Manitoba.

Strengths and limitations of our data

Strengths: We have five years of suicide-related administrative data from Manitoba (1997 to 2001). The data include several potential risk factors, such as sex, age, and region of residence, health status [an index of morbidity, the Adjusted Clinical Group (ACG)[1]], the presence of a mental illness diagnosis (including substance abuse) in the previous year [based on the Aggregated Diagnostic Group (ADG)[2]], and an estimate of average household income (i.e., neighbourhood income) by census enumeration area.

Limitations: Suicide attempts may be dealt with by family and friends, and if they are not seen by a physician or hospitalized, they are not included in our data. In this report, suicide attempts are defined as those that have been reported to health care providers. Secondly, some suicidal behaviours are not counted. For example, if a suicide occurred during the data-collection period, these individuals were counted as suicides and also *included in the combined group*, but any previous attempts they made during that time period were not counted. Thirdly, administrative data only contain basic demographic information, but do not contain information about personal characteristics which might protect against or add to the likelihood of individuals committing suicide (social environment, education). Finally, the administrative data come from Manitoba Health and Vital Statistics, and we rely on its being accurate and complete.

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[1] The ACG system groups individuals based on their age, gender, and all known medical diagnoses (assigned over a period of time, typically one year). The ACG value is a morbidity measure of the individual's expected or actual consumption of health services. See the Glossary for more details on ACGs.

[2] ADGs 23, 24, and 25 (psychosocial diagnoses) from the last year of health insurance coverage were combined to get a measure of the presence or absence of a mental illness. See the Glossary for more details.

Recommendation for further database studies on suicide

The problem of suicide is complex (Health Canada, 1994; Peruzzi and Bongar, 1999), but effective strategies or intervention programs aimed at preventing suicide can help lower suicide rates. One recently published community-based program in the United States, designed to reduce risk factors and increase protective factors, resulted in a sustained drop in the suicide rate (a 33% relative risk reduction) over six years (Knox et al., 2003). Programs like this one offer hope that effective prevention strategies can be developed and used with success.

We used codings from the Vital Statistics for the cause of death. However, these have been shown to underestimate the number of provincial suicides as reported by the Medical Examiner's Office, due to the fact that post-mortem death reports are not utilized to update the Vital Statistics data. Therefore, we recommend exploring the possibility of linking post-mortem causes of death with Vital Statistics files to ensure cause-of-death updating based on post-mortem investigations. This may help to resolve the problem of underestimates of suicides in the Manitoba Health/Vital Statistics files compared to the Medical Examiner's Office of Manitoba.

Some of the questions that health policy planners and decision-makers may wish to explore include:

- *How do the rates of suicide/attempted suicide in the region compare to other regions and districts or to the province, and how will these differences affect local needs for health-care services?*
- *What do sex differences in the suicide outcomes tell us about the best way to address issues of treatment and prevention of suicide?*
- *Are there differences between the number of reported suicides/attempted suicides and the number actually present in the community, and is there any way to get a more accurate measure of these? How does knowing about the prevalence of suicidal thoughts help planners address the health needs of the community?*
- *What are the risk factors contributing to suicide outcomes, and can changing health-care approaches modify any of these factors to help reduce suicides and suicide attempts?*

Overall key findings from this chapter:

Suicide

- From 1997 to 2001, 677 residents (135.4 per year) committed suicide in Manitoba.
- The age- and sex-adjusted suicide rate is 1.3 per 10,000 Manitobans per year, with male rates three times as high as females rates (male:s 2.01 per 10,000 per year and females 0.63 per 10,000 per year).
- The most common suicide method for males is by hanging (37.4% of suicides).

- The most common method for females is by poisoning (50.9% of suicides).
- Potential Years of Life Lost (PYLL) is 44.3 *years lost* per 10,000 residents in Manitoba. North Eastman and Burntwood have higher PYLLs, indicating that suicide accounts for a greater loss of young people there than elsewhere.
- When all the risk factors available are considered together in a regression analysis, the key factors predicting suicide are: *being male, being diagnosed with a mental illness in the previous year, being young, and having poorer health.*
- Region of residence and neighbourhood income are not statistically significant predictors of suicide when other risk factors (mental illness diagnosis and other health problems) are considered at the same time.

Suicide Attempts and Attempters

- From 1997 and 2001, there were 4,160 suicide attempts (832 per year) (not resulting in a death) in Manitoba carried out by 3,630 individuals (726 per year).
- The suicide-attempt rate is 8.0 per year per 10,000 Manitoba residents.
- Females attempt suicide twice as often as males (10.4 versus 5.7 per 10,000 per year).
- Burntwood, Nor-Man, North Eastman, and Brandon have higher attempt rates than the Manitoba average.
- South Eastman, Central, and Interlake have lower than average attempt rates.
- Each year on average, 89.3% (*n*=649) were first-time attempters, 8.9% were second-time attempters (*n*=65), and 1% were third-time attempters (*n*=8).
- The most common means of attempting suicide was by poisoning (usually a drug overdose) for both males (71.7%) and females (87.0%).
- CCHS interviews indicate that there are about four times more suicide attempts in the province than are reported to medical authorities.
- When all the risk factors available are considered together in a regression analysis, the key factors predicting attempted suicide are: *being diagnosed with a mental illness in the previous year, poor health, being young, female, and living in a low neighbourhood income area.*

Combined Group: Includes both Completed Suicide and Attempted Suicide

- Individuals who either completed or attempted suicide (the combined group) make up 0.08% of the Manitoban population (n=862 people) on average per year.
- Across age groups, females are more likely than same-age males either to complete or attempt suicide. The only exception is that older males (65+ years) are more likely either to complete or attempt than older females (65+ years).

- When all the risk factors available are considered together in a regression analysis, the key factors predicting either suicide or attempted suicide are: *living in Northern Manitoba or the Rural South (compared to living in Winnipeg or Brandon), being female, being young, being diagnosed with a mental illness in the previous year, and living in a low neighbourhood income area.*

9.2 Suicide Rate

Definition: This is the number of deaths due to suicide from 1997 through 2001, annualized to give a number of deaths per year, divided by the population of the region. Because the Vital Statistics files are used for cause of death, the data are by calendar year rather than fiscal year. Suicide is the act of intentionally killing oneself through self-inflicted injury (e.g., cutting) or poisoning. It includes selected accidental poisonings, usually from a drug overdose.[3] It does not include unintentional or accidental deaths, such as those due to motor vehicle accidents, falls, drowning, or burns. The suicide rate is shown by RHA and District, by age group for males and females, and by income quintile. Neighbourhood income is based on the average household income of the individual's enumeration area. Urban and Rural areas are divided up into five different income levels called quintiles. See the Glossary for a full definition of income quintiles. As well, the Potential Years of Life Lost (PYLL) due to suicide is given by RHA and District. Tables give the methods by which suicide was completed.

Our definition is more inclusive than that used by Statistics Canada. They have used ICD-9 codes E950 to E959 (e.g., Health Canada, 2002; Langlois and Morrison, 2002; Statistics Canada, 1999) only. Suicide is shown in the figures as a rate per 10,000 residents per year, except in comparisons with Canadian rates, where the rate is per 100,000 per year. Eligible residents were Manitobans aged 10 or more in 1997. The Glossary has the ICD-9 and ICD-10 codes we used to define suicide.

Important Note: Values shown may underestimate the actual suicide rates in some areas of the North. According to data from the Medical Examiner's Office (MEO), our data may underestimate suicides by as much as 16%, on average. Data from Nor-Man and Burntwood may be underestimated by more. However, exact comparisons can not be made. The MEO records place of death, not residence, and people may not commit suicide where they live. Age groups are based on different age calculations, no income data are available, and data are not linked to the MCHP Repository for other information (e.g., who has attempted and then completed suicide). Therefore, there may be quality issues regarding the completeness of the suicide data. Regional patterns appear to be similar to the findings of the Medical Examiner's Office suicide reports (i.e., suicide is highest in the North), but absolute numbers may differ.[4]

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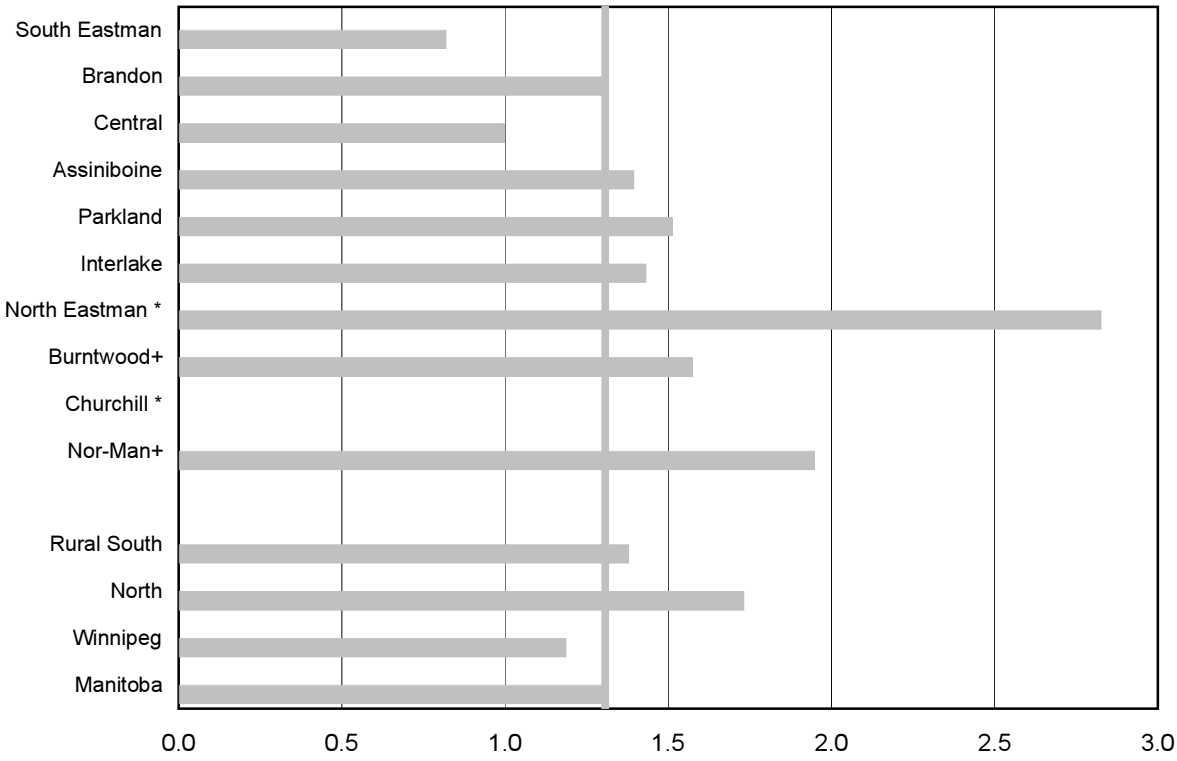
[3] Accidental poisoning can result from analgesics, sedatives, or tranquilizers, carbon monoxide poisoning, gasoline vapours, or solvents. Using this inclusive definition means that a few of the poisonings we define as suicides may have been unintentional (e.g., carbon monoxide poisoning from a faulty furnace). However, even given these broad categories, we still underestimate the actual numbers of suicide compared to the Medical Examiner's Office.

[4] Based on crude numbers from the Medical Examiner's Office, there may be an underestimate in the number of suicides, particularly in the North. However, this is difficult to verify without linked files to determine location of residence of the person completing suicide, rather than location of death. See the recommendation given in Section 9.1 concerning a linkage of Vital Statistics with Medical Examiner's Office post-mortem causes of death.

Figure 9.2.1: Suicide Rate by RHA, 1997-2001

Age- and sex-adjusted annual rate per 10,000 residents aged 10 years +



* indicates area's rate was statistically different from Manitoba average

's' indicates data suppressed due to small numbers

+ indicates that this suicide data from Vital Statistics may be underestimated. See Footnote 3

Figure 9.2.2: Suicide Rate by Age and Sex, Manitoba, 1997-2001

Crude annual rate per 10,000 residents

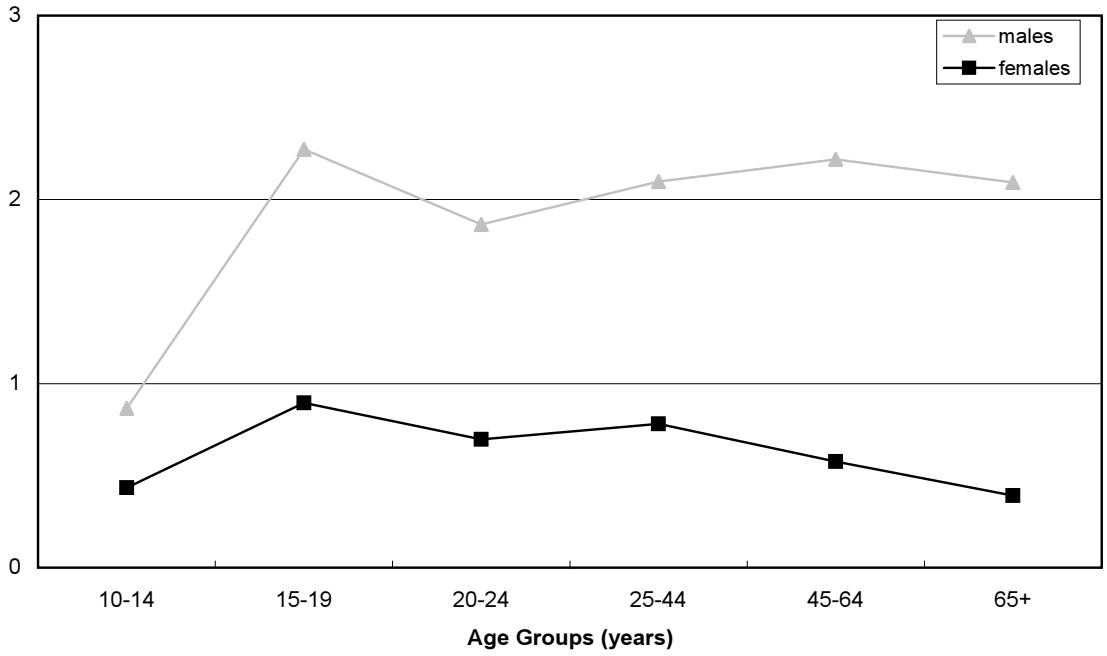
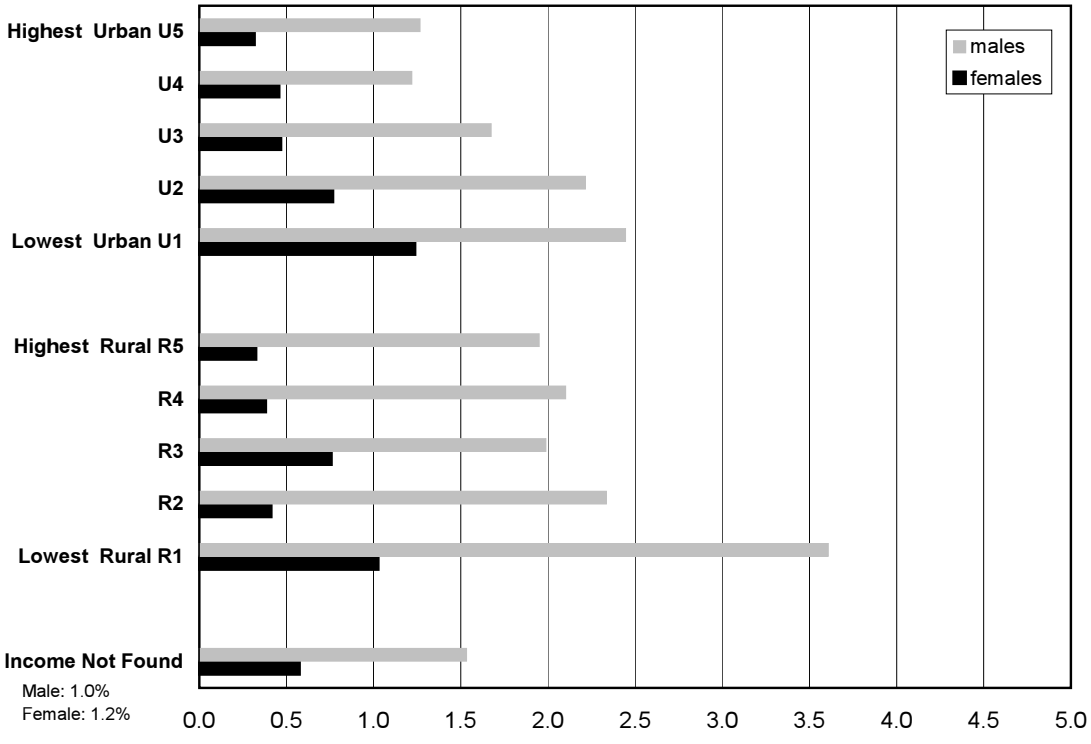


Figure 9.2.3: Suicide Rate by Income Quintile, 1997-2001

Age-adjusted annual rate per 10,000 residents (aged 10 years +)



Linear Trend Test Results

Urban Males: Significant (p<.001) Rural Males: Significant (p<.05)

Urban Females: Significant (p<.001) Rural Females: Significant (p<.05)

Key findings:

- Over the five-year period 1997-2001, 677 residents died as a result of suicide in Manitoba. The suicide rate is 1.3 per 10,000 residents per year (95% CI 1.2-1.5), with North Eastman statistically higher at 2.83 per 10,000 per year. Some RHAs appear to have rates lower (e.g., Central) or higher (e.g., Parkland) than the Manitoba average, but due to the large variability in the data, these RHAs are not significantly different from the average. Values shown may underestimate the actual suicide rates in some areas of the North. According to suicide counts from the Medical Examiner's Office, our data may underestimate suicides by as much as 16%, on average (see explanation in Section 9.1).
- Annually, males committed suicide more than three times as often (2.0 per 10,000) as females (0.6 per 10,000). The count is about 102 males and 33 females per year. Males are more likely to commit suicide than females in all age groups, except in 10- to 14-year olds, where there are no consistent sex differences. Among males only, the suicide incidence for 10- to 14- year olds is lower than all other age groups, but there are no differences among other age groups. Among females only, suicide incidence for 15- to 19-year olds and 25- to 44-year olds are higher than for 65+ years, but there are no differences among other age groups.
- In both urban and rural Manitoba, suicide rates for both males and females show a significant gradient with average household income. For all males, suicide rates for those from the lowest income quintile areas are about twice as high as males living in the highest income areas. For all females, suicide rates for those from the lowest income areas are about four times higher than females living in the highest income areas. However, this finding may need to be viewed with caution, since Section 9.10 shows that "income" may be a surrogate for greater morbidity (including mental illness).

Canadian comparisons:

- Table 9.2.1 compares suicides from Canada and Manitoba. Canadian data are based on 1997 data (Statistics Canada, 2003). Manitoba data are based on the period from 1997 to 2001. Statistics Canada uses ICD-9 E-codes 950-959 to define suicide. We define suicide more broadly by including several additional ICD codes (see the Glossary), especially certain accidental poisonings. Historically, the Canadian rate has ranged between 11 and 15 suicides per 100,000 from 1970 to 1996 (Statistics Canada, 1999). *The Manitoba rate of 1.3 per year per 10,000 is similar to the 1997 Canadian average (1.2 per 10,000). Suicide rates are similar to the national averages in all age groups. Males committed suicide about 3.1 times as often as females, lower than the overall Canadian average (3.8 times the female rate).*

Table 9.2.1 Suicide rates: Manitoba and Canada by sex and age group*

Males and Females			
	Manitoba		Canada
Age Group	Rate [a]	CI	Rate [a]
10 - 14	0.7	.3 - 1.0	--
15 - 19	1.6	1.1 - 2.1	1.3
20 - 24	1.3	.8 - 1.8	1.5
25 - 44	1.5	1.2 - 1.7	1.6
45 - 64	1.4	1.1 - 1.7	1.7
65 +	1.1	.8 - 1.4	1.2
All Age Groups	1.3	1.2 - 1.5	1.2
Males only			
Age Group	**Rate**	**CI**	**Rate**
10 - 14	0.9	.4 - 1.4	--
15 - 19	2.3	1.4 - 3.1	2.0
20 - 24	1.9	1.1 - 2.6	2.5
25 - 44	2.1	1.7 - 2.5	2.5
45 - 64	2.2	1.7 - 2.7	2.6
65 +	2.1	1.5 - 2.7	2.3
All Age Groups	2.0	1.8 - 2.3	2.0
Females only			
Age Group	**Rate**	**CI**	**Rate**
10 - 14	0.4	.1 - .8	--
15 - 19	0.9	.4 - 1.4	0.6
20 - 24	0.7	.2 - 1.2	0.4
25 - 44	0.8	.5 - 1.0	0.7
45 - 64	0.6	.3 - .8	0.8
65 +	0.4	.2 - .6	0.5
All Age Groups	0.6	.5 - .8	0.5

* Note. Age groups are in years. Rates are crude rates per year per 10,000 residents. The Confidence Interval (CI) is around the 95th percentile.

[a] Canadian statistics are from 1997 (Statistics Canada, 2003). Dashes indicate data are not reported for that age.

9.3 Methods of Completing Suicide

Definition: Methods of completing suicide are grouped into five categories: poison, cutting, gunshot, hanging, or other means. The two most common methods are described by sex and region as a percentage of all suicides. Poison usually involves drug overdoses. Table 9.3.1 shows the percent of suicides attributable to each method by each region and sex. Table 9.3.2 lists the types of poisons used to commit suicide over the 5-year period, grouped into four categories for males and females.

Table 9.3.1: Top suicide methods by region and sex, percent of deaths attributable to each method

Region*	#1 Method	Suicides (%)	#2 Method	Suicides (%)
		Males		
North	hanging	71.9	gunshot	18.8
Rural South	gunshot	45.8	hanging	26.8
Urban	hanging	39.0	poison	33.9
Manitoba	hanging	37.4	poison	27.9
		Females		
North	hanging	69.2	--	--
Rural South	poison	47.7	hanging	38.6
Urban	poison	55.1	hanging	31.2
Manitoba	poison	50.9	hanging	36.4

*Note: The North includes RHAs of Burntwood, Churchill, and Nor-Man. The Rural South includes South Eastman, Central, Assiniboine, Parkland, Interlake, and North Eastman. Urban refers to Brandon and Winnipeg. Dashes indicate rates are too low to report.

Table 9.3.2: Percent of poisoning suicides attributable to each type of poison by sex

Type of Poison	Males (%)	Females (%)
Analgesics, narcotics, antipyretics	15.5	16.3
Sedatives, hypnotics, tranquilizers	13.4	26.7
Unspecified drugs	12.7	32.6
Gases	58.5	24.4

Key findings:

- The vast majority of suicide deaths in the North were by hanging for both males (71.9%) and females (69.2%). In the Rural South, guns were used most often by males (45.8%), but poison was used most often by females (47.7%). In the Urban areas (Winnipeg and Brandon), males used hanging (39%) more often than poison (33.9%), but females used poison more often (55.1%) than hanging (31.2%).

- There were 142 males and 86 females who committed suicide by poison from 1997 to 2001. Males used gases most often, and females used unspecified drugs most often.
- Combining males and females together, we counted the total number of poisonings from all attempts and all suicides occurring between 1997 and 2001. Then, we calculated the proportion of all poisonings that resulted in death by each type of poison. We found that analgesics, sedatives, and unspecified drugs were used about equally often. Together, they were used in about 95% of all the poisonings and were responsible for 3% to 4% of suicides. Gases were used in 5% of all poisonings, and accounted for 45% of deaths by poison.

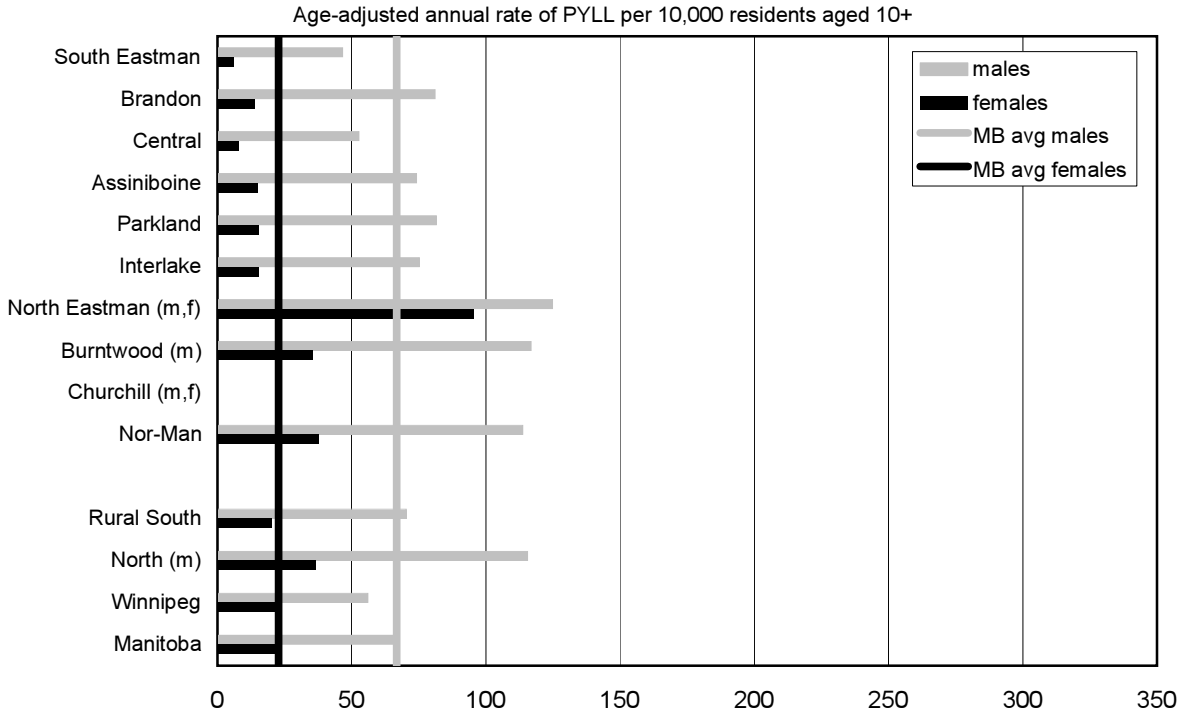
Canadian Comparisons: Suicide Methods

- ***Males:*** In Canada, hanging was used by 25% of males in 1980 to 1982, 31% in 1990 to 1992 (Health Canada, 1994), and 40% in 1998 (Langlois and Morrison, 2002). Guns (and explosives) were used in Canada in 41% of male suicides in 1980 to 1982, 36% in 1990 to 1992 (Health Canada, 1994), and 26.2% in 1998. Poisoning was third most common, used by 22.1% of males in Canada in 1998 (Langlois and Morrison, 2002). *In Manitoba, the most common method by males was hanging, used in 37.4% of suicides. The second most common method was poisoning (or drug overdose), used by 27.9% of males. Firearms were third, used by 26.8% of males.*
- ***Females:*** In Canada, poisoning has been the most common method for females to commit suicide: by 41% in 1980 to 1982, 37% in 1990 to 1992 (Health Canada, 1994), and 41.3% in 1998 (Langlois and Morrison, 2002). Hanging was the second most common method used by females: by 19% in 1980 to 1982, 22% in 1990 to 1992 (Health Canada, 1994), and 33.9% in 1998 (Langlois and Morrison, 2002). *In Manitoba, the most common method of female suicide was poisoning, used in 50.9% of suicides. Hanging was the second most frequent suicide method, used by 36.4% females.*
- According to Health Canada (1994), males use more immediately fatal methods to commit suicide (hanging or gunshot) and often commit suicide impulsively, after a breakdown in a personal relationship, an academic failure, or conflict with authority. The impulsive behaviour combined with an instantly lethal method makes males more likely than females to die. *Our results are consistent with reports that males tend to use more lethal methods. Over the five years, nearly 64% of males but only 37% of females used either hanging or guns to commit suicide. Our data do not include information on the immediate emotional trigger for committing suicide.*

9.4 Potential Years of Life Lost (PYLL) due to Suicide

Definition: PYLL is an indicator of premature mortality (i.e., death before age 75), calculated by subtracting the actual age of death from 75. This is given as an annual rate of 'years lost' per 10,000 residents, ages 10- to 74-years. The PYLL is larger if there is a high death rate among young people and smaller if most of the deaths occur later in life.

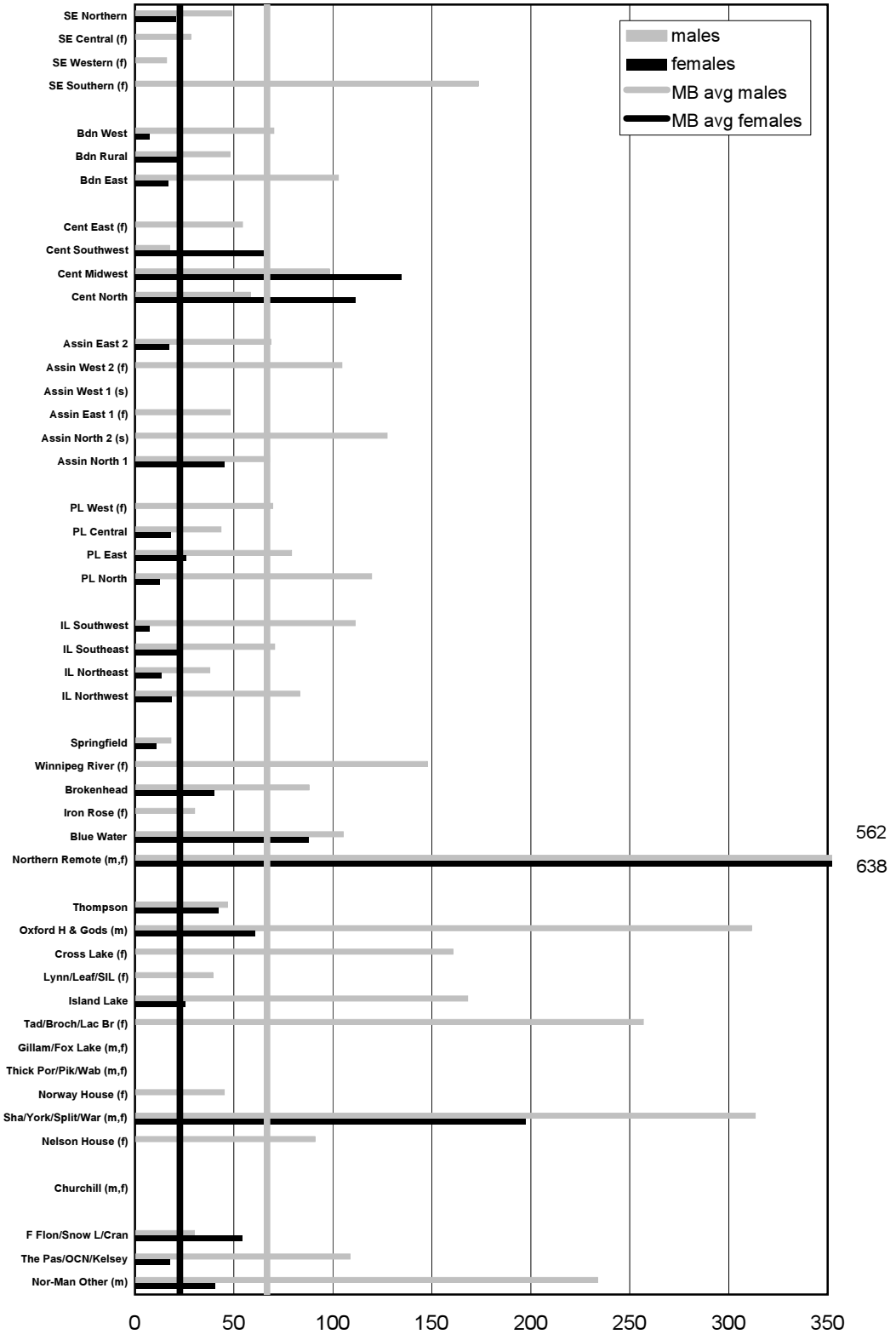
Figure 9.4.1: Potential Years of Life Lost (PYLL) for Suicide by RHA, 1997-2001



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder was statistically different from Manitoba average for females
's' indicates data suppressed due to small numbers

Figure 9.4.2: Potential Years of Life Lost (PYLL) for Suicide by District, 1997-2001

Age-adjusted annual rate of PYLL per 10,000 residents aged 10+



Key finding:

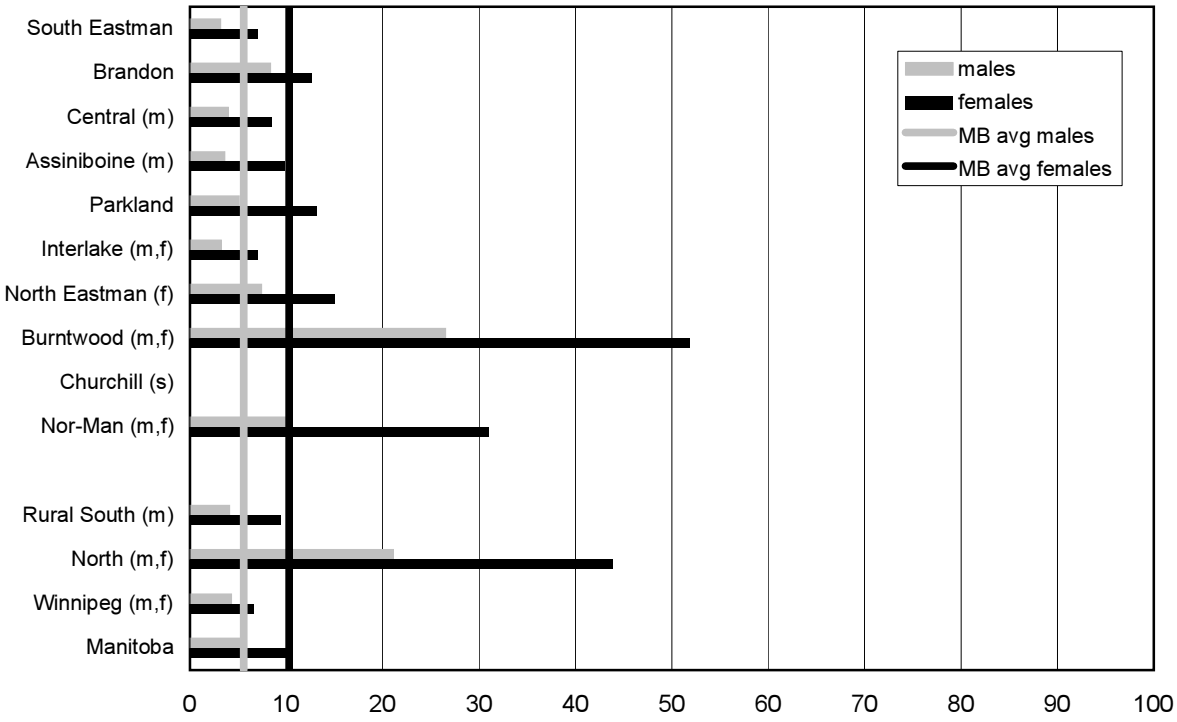
- The annual Manitoba PYLL rate is 44.3 *years lost* per 10,000 residents, combining both sexes. The RHAs of North Eastman (for males and females) and Burntwood (for males) had higher rates than the Manitoba average, indicating that suicide there annually accounted for a greater loss of young people than elsewhere in Manitoba. Except for Churchill (no suicides), no other RHA had a PYLL rate significantly higher than the average Manitoba rate. For perspective, we note that the PYLL rate in Manitoba for *all* causes of premature mortality (1996-2000) was 52.8 per thousand (528 per 10,000) (Martens et al., 2003), so suicide annually accounts for 8% (44.3/528) of the *lost years* in Manitoba.

9.5 Rate of Suicide Attempts

Definition: Suicide attempts are defined as any hospital or physician claim coding a suicide attempt.[5] We include ICD codes referring to intentional self-inflicted injuries and poisonings and unintentional ones, if there was a psychiatric diagnosis within 30 days of the incident.[6] It includes every reported suicide attempt, whether or not the attempt was carried out by the same individual, but it does not include attempts that resulted in a completed suicide. Suicide attempts do not refer to individuals since one person can attempt more than once.[7] Suicide attempts are shown by RHA and district as a rate per 10,000 residents per year (age- and sex- adjusted), as well as by age and sex groups.

Figure 9.5.1: Rate of Suicide Attempts by RHA, 1997-2001

Age-adjusted annual rate per 10,000 residents aged 10 years + (per year)



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder was statistically different from Manitoba average for females
's' indicates data suppressed due to small numbers

[5] Attempted suicide is sometimes called self-inflicted injury. However, we use the terms suicide and attempted suicide, as do other organizations (e.g., Health Canada, 2002).

[6] Our broader definition would include, for example, heroin overdoses or self-mutilation by cutting, even if they were not intended as a suicide.

[7] This also included codings from the MHMIS files (see Chapter 3), which includes Mental Health Centre files such as Eden, Selkirk, and Brandon (before it closed in 1998).

Figure 9.5.2: Rate of Suicide Attempts by District, 1997-2001

Age-adjusted annual rate of residents per 10,000 aged 10 years +

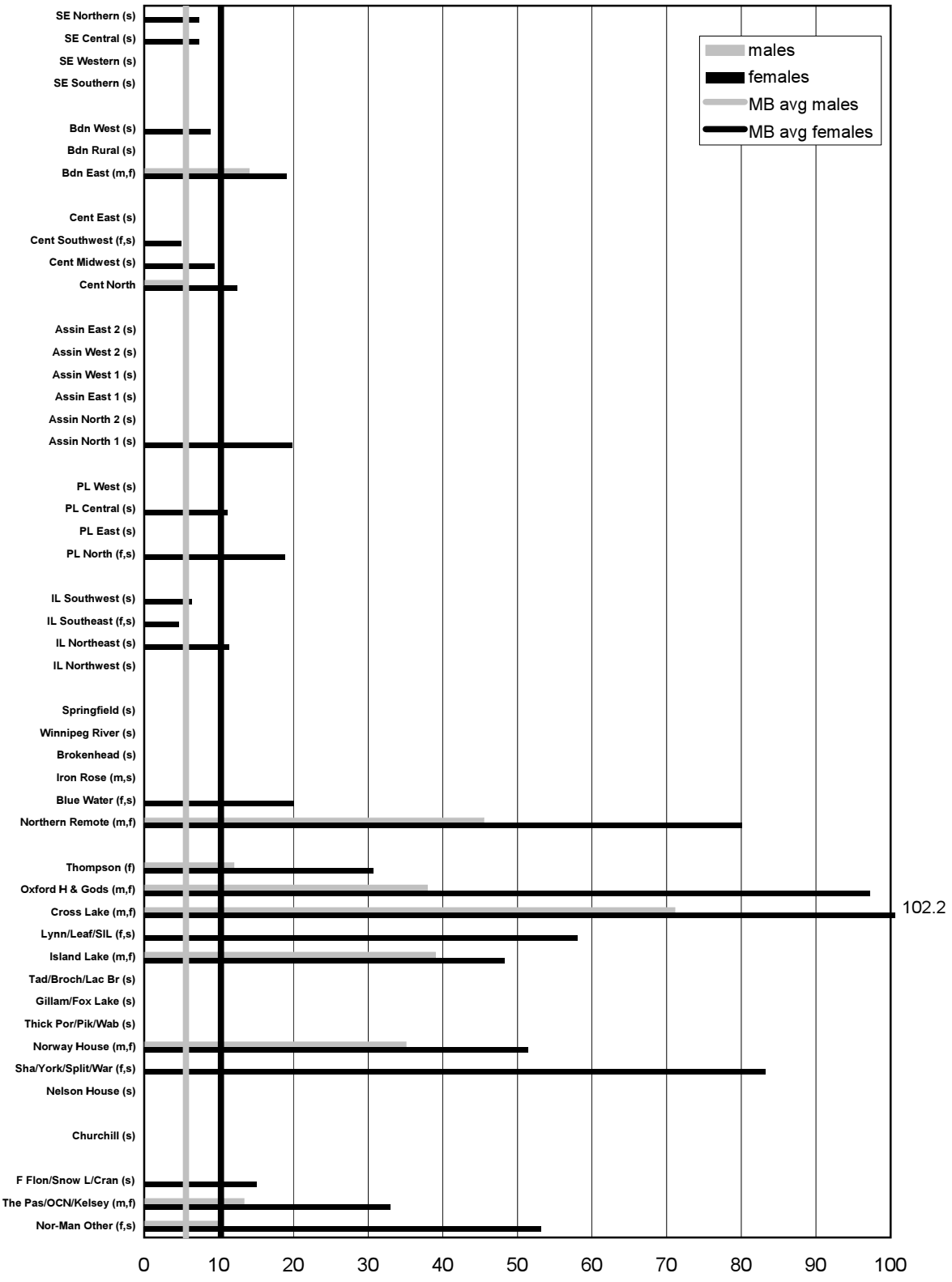
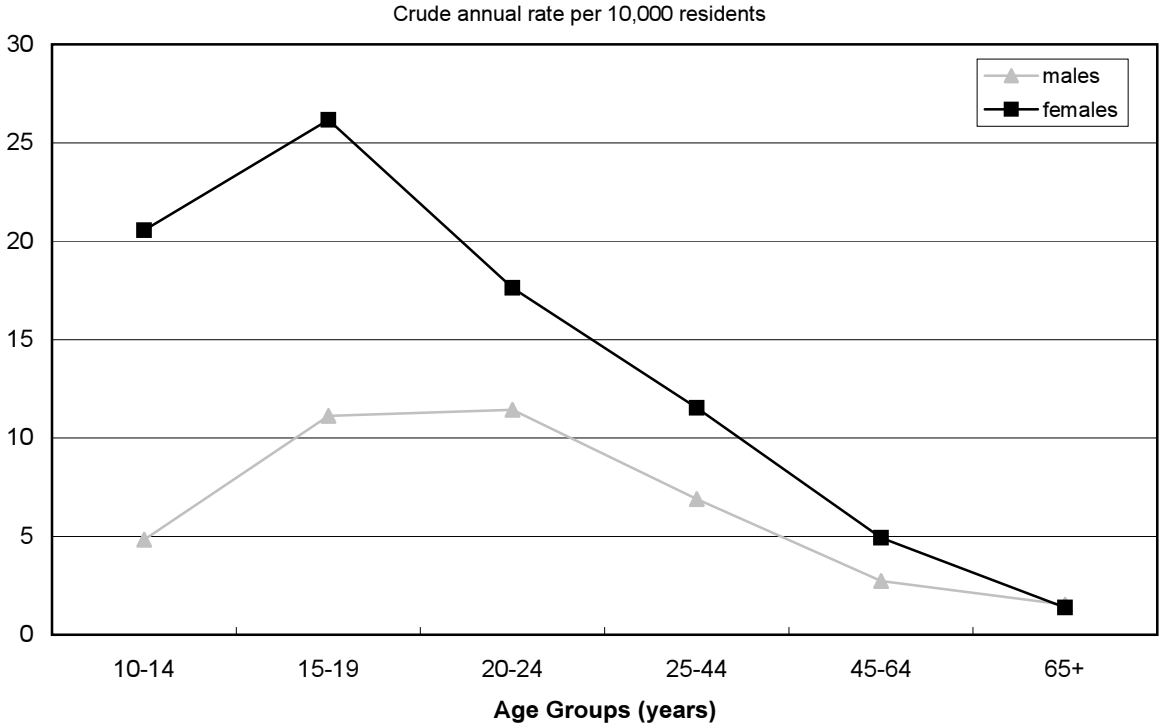


Figure 9.5.3: Suicide Attempt Rates by Age and Sex, 1997-2001



Key findings:

- On average, there were 832 suicide attempts (not resulting in a death) per year in Manitoba (1997-2001), a rate of 8.0 per 10,000 per year (95% CI 7.6-8.4). The North had the highest rates for both males (25.6) and females (58.2). The Rural South and Winnipeg had lower than average rates.
- Females (10.4 per 10,000 or *n*=544 per year) attempt suicide almost twice the rate of males (5.7 per 10,000 or *n*=288 per year). Secondly, younger people attempt suicide more frequently than older people. Rates are highest among young people 15- to 19-years old and 20- to 24-years old, and lowest among the 65+ years group. Only in the 65+ year group are there no sex differences.

9.6 Methods of Attempting Suicide

Definition: The two most frequent means of attempting suicide are reported by sex and region as a percentage of total attempts (1997 to 2001). Suicide-attempt methods are by our definition, non-fatal events. Two tables are shown: the percentage of attempts by region and sex attributable to the two most commonly-used methods for that region; and the types of drugs used to attempt suicide shown by category and sex.

Table 9.6.1 shows the percent of male and female suicide attempts by region attributable to the two most commonly used methods. In the North, for example, 70.5% of attempts by males are by poison, 11% by hanging, and 18.5% by other methods.

Table 9.6.1: Top suicide-attempt methods by region and sex, percent attributable to each method

Region*	#1 Method	Attempts	#2 Method	Attempts
Males				
North	poison	70.5	hanging	11.0
Rural South	poison	72.3	cutting	14.3
Urban	poison	72.0	cutting	17.8
Manitoba	poison	71.7	cutting	14.9
Females				
North	poison	86.4	cutting	6.3
Rural South	poison	92.1	cutting	4.7
Urban	poison	84.0	cutting	9.6
Manitoba	poison	87.0	cutting	7.3

*Note. The North includes Burntwood, Churchill, and Nor-Man. Rural South includes South Eastman, Central, Assiniboine, Parkland, Interlake, and North Eastman. Urban refers to residents of Brandon and Winnipeg.

Table 9.6.2: Percent of suicide attempts by poison attributable to each type of poison by sex

Type of Poison	Males (%)	Females (%)
Analgesics, narcotics, antipyretics	31.8	39.6
Sedatives, hypnotics, tranquilizers	32.8	30.5
Unspecified drugs	29.5	28.3
Gases	6.0	1.6

Key findings:

- The two most frequent methods of attempting suicide in Manitoba are by poison and cutting. Together these two methods account for 86.6% of male attempts and 94.3% of female attempts. Poison most often is a drug overdose. Poison was used as the most common attempt method across the different age groups. Young females (10- to 14- years) for example, used poison in their attempts about 90% of the time.
- When males and females are combined, suicide attempts by poisoning are about equally split among those due to analgesics (37%), sedatives (31%), and unspecified drugs (29%). Gases, such as carbon monoxide, account for about 3% of poisoning attempts. Females are most likely to use analgesics, followed by sedatives. Males use sedatives most often, with analgesics and unspecified drugs closely behind.

Canadian comparisons of suicide attempt methods

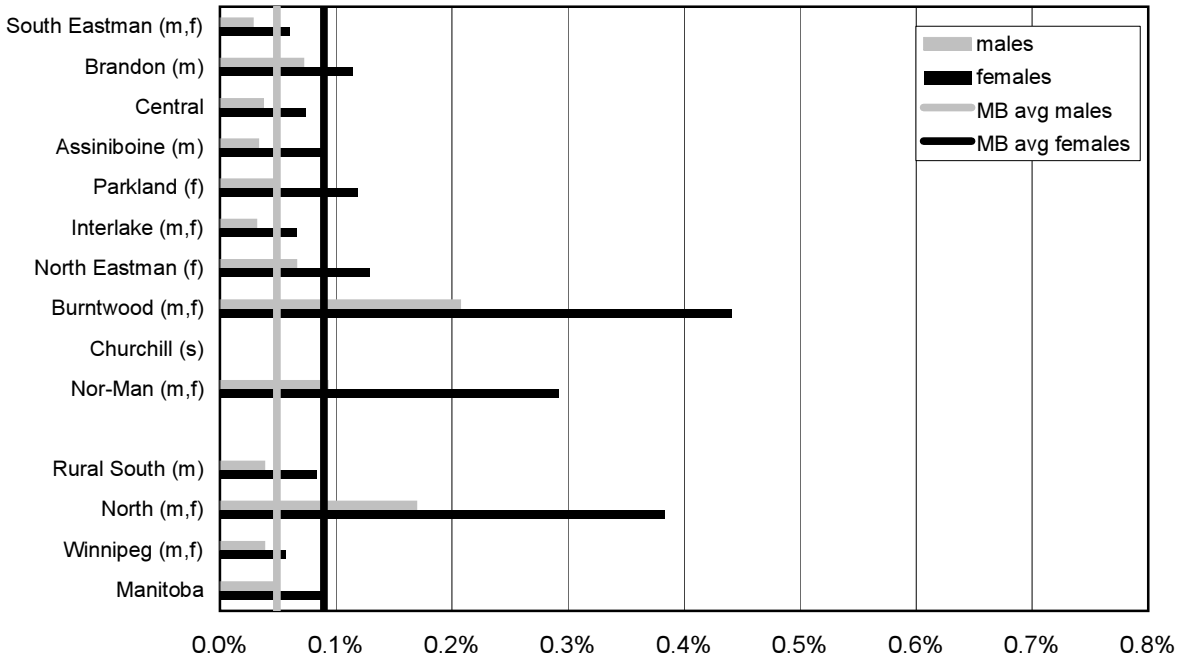
- In Canada for the fiscal year 1998/99, poison (drug overdose) accounted for 83% of hospitalizations due to suicide-attempts (males 76% and females 88%) (Langlois and Morrison, 2002). *In Manitoba, poison was used in 79.4% of identified suicide attempts (males 71.7% and females 87%)*. Cutting or stabbing was used in 10% of suicide-attempt hospitalizations (males 13% and females 8%). *In Manitoba, cutting was used in 11% of identified suicide attempts (males 14.9% and females 7.3%)*.

9.7 Prevalence of Suicide Attempters

Definition: Suicide attempters are individuals who attempted suicide at least once during the study period, but did not die as a result. The prevalence of suicide attempters is given as the average yearly prevalence over the five-year period from 1997-2001. Suicide attempters received a hospital or physician claim coding a suicide attempt, or they had a self-inflicted injury or accidental poisoning associated with a psychiatric diagnosis within 30 days after the incident.[8] The Glossary has the specific ICD codes used to define suicide attempts. Attempters are described as a percentage of the population who has attempted suicide.[9] This is shown for RHA, districts, by age and sex, and by income quintile. Neighbourhood income is based on the average household income of the enumeration area in which the individual lived. Urban and rural areas of Manitoba are divided up into five income levels called quintiles. See the Glossary for the definition of quintiles.

Figure 9.7.1: Prevalence of Suicide Attempters by RHA, 1997-2001

Age-adjusted annual percentage of residents (aged 10 years +)



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder was statistically different from Manitoba average for females
's' indicates data suppressed due to small numbers

[8] This latter part of the definition added about 40 individuals defined as attempters.
[9] People who attempted and completed suicide are defined as suicides, not as attempters.

Figure 9.7.2: Prevalence of Suicide Attempters by District, 1997-2001

Age-adjusted annual percentage of residents (aged 10 years +)

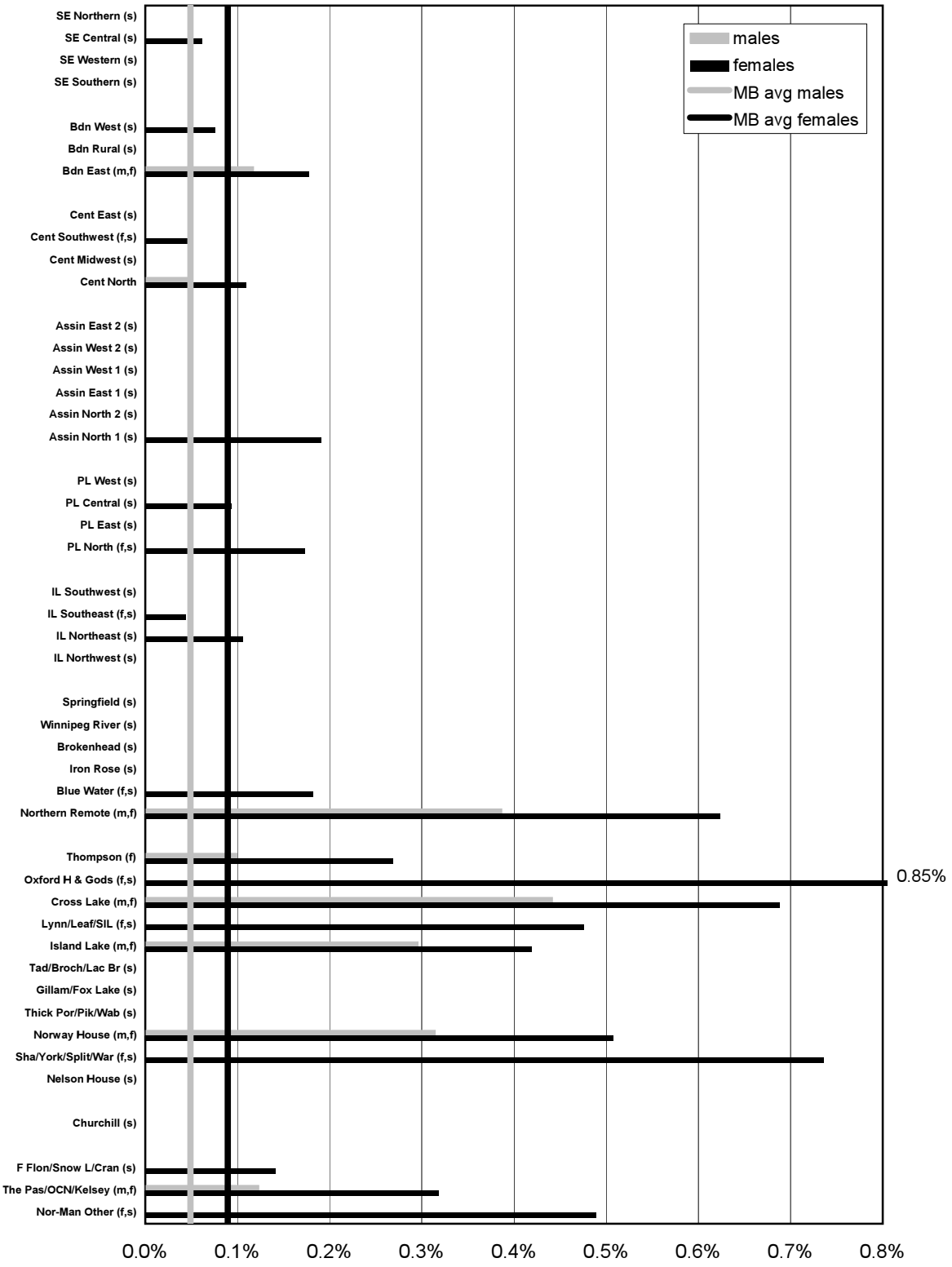


Figure 9.7.3: Prevalence of Suicide Attempters by Age and Sex, 1997-2001

Crude annual percent of residents

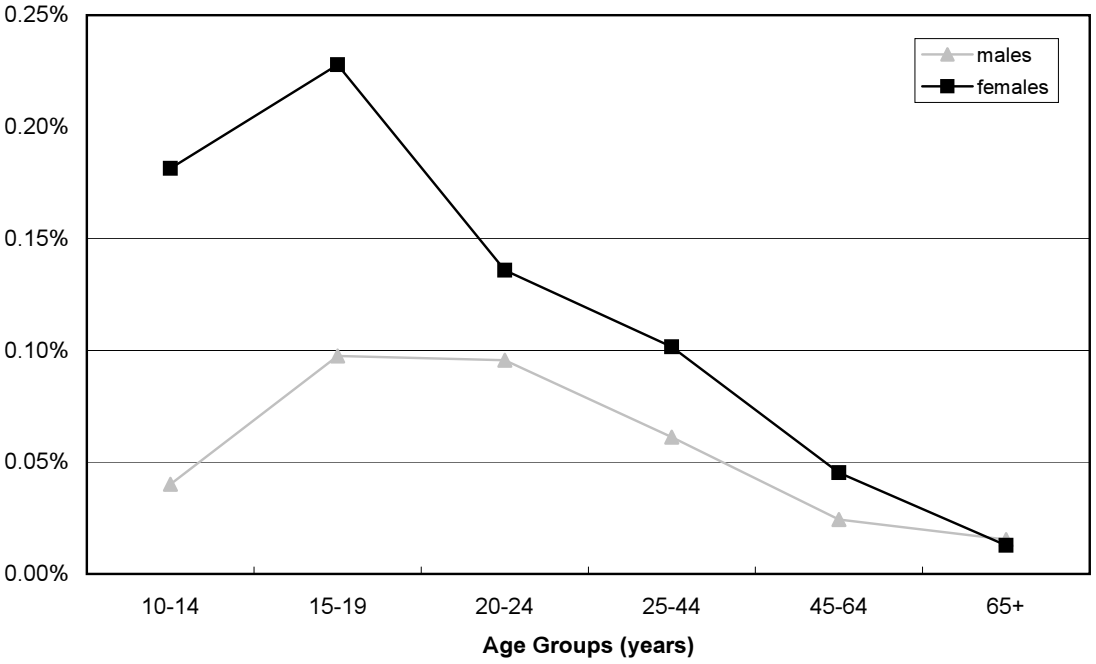
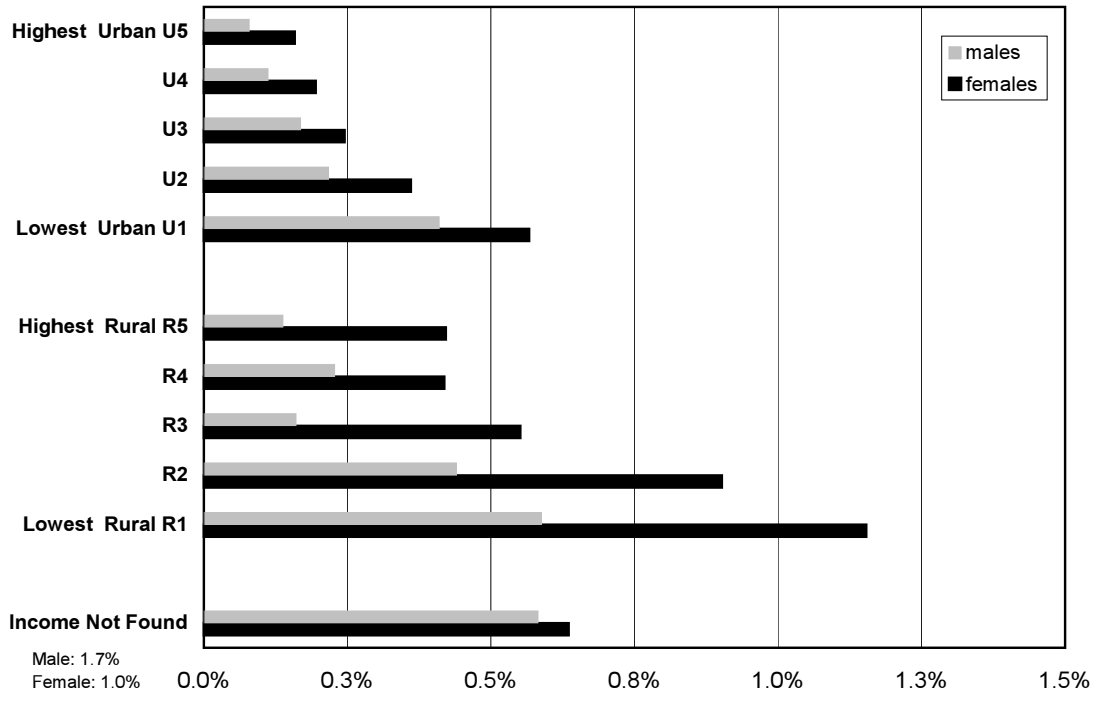


Figure 9.7.4: Prevalence of Suicide Attempters by Income Quintile, 1997-2001

Age-adjusted annual percent of residents (aged 10 years +)



Linear Trend Test Results

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

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

Key findings:

- Most people attempted suicide only once (89.3%). However, in each year on average, 8.9% were second-time attempters, and 1% third-time attempters.
- Compared to the Manitoba average (0.09%), females in Burntwood (0.44%), Nor-Man (0.29%), North Eastman (0.13%), and Parkland (0.12%) have higher percentages of females who have attempted suicide. Interlake (0.07%) and South Eastman (0.06%) have lower than average percentages of females who attempt suicide. Males in Burntwood (0.21% of males per year), Nor-Man (0.09%), and Brandon (0.07%) have higher than average percentages of males who attempt compared to the provincial average of 0.05%; South Eastman (0.03%) and Interlake (0.03%) have lower than average percentages of males who attempt suicide.
- There were about twice as many female attempters (473 or 0.09%) as male attempters (253 or 0.05%) each year. The percentage of attempters in the population is higher in the younger age groups (ages 10 to 44 years) than in those over age 44 for both males and females.
- In Manitoba, the prevalence of suicide attempters show a gradient with neighbourhood income for both males and females. In both urban and rural areas, the percentage of suicide attempts by people from the lowest income quintiles is at least three times that of people from the highest neighbourhood income areas. The pattern is the same for males and females.

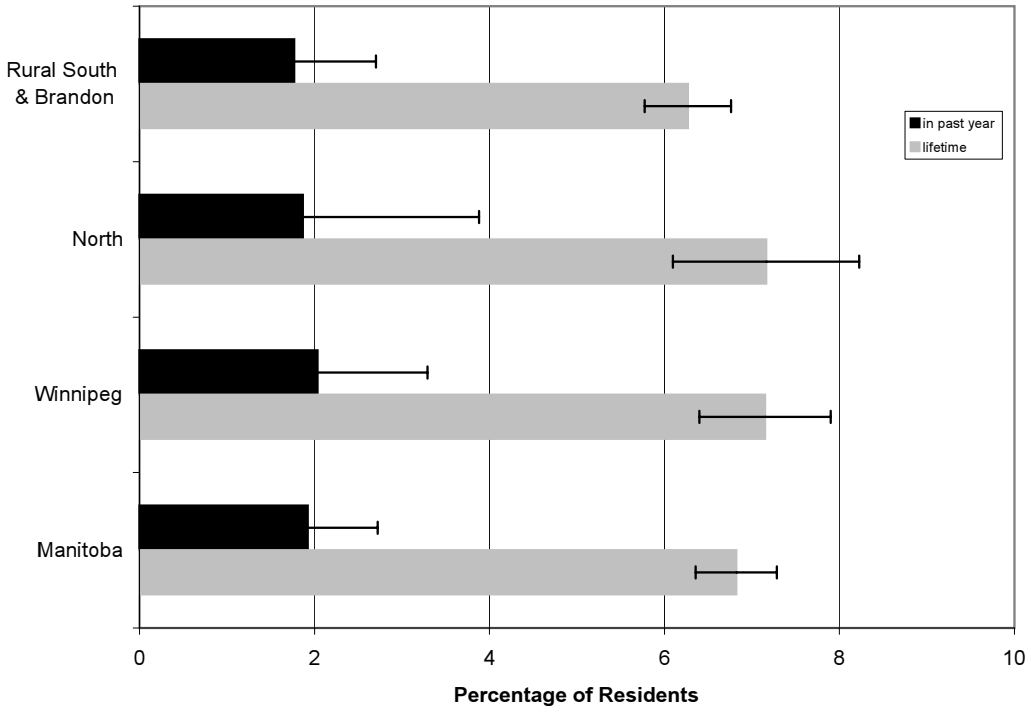
9.8 Prevalence of Self-Reported Suicidal Thoughts and Behaviours (CCHS Cycle 1.1)

Definition: This is the proportion of the population who self-reported suicidal thoughts and/or behaviours in the CCHS survey. Manitobans were asked about their suicidal thoughts and behaviours in the 2000/01 Canadian Community Health Survey (CCHS) Cycle 1.1.[10] With the CCHS data we can compare 'official' suicide attempt data (the administrative data from the MCHP Repository and Vital Statistics) with self-reported suicide attempt rates from the survey.

We examined two CCHS interview questions: (1) Have you ever seriously considered committing suicide or taking your own life?, and (2) Have you ever attempted to commit suicide or tried taking your own life? For those answering "yes" to the second question, they were asked: Did this happen in the past 12 months?

The reliability of the data on self-reported suicidal thoughts was too low to report results by RHA, but can be reported by larger regions. The large variability in the data means that results should be interpreted with caution. Due to small sample sizes by RHA, data are only reported by larger aggregate areas of North, Rural South and Winnipeg (Brandon's data are considered to small to report). The data is standardized to the population of Manitoba in 2001, in order to account for different age and sex populations in the different regions of Manitoba.

Figure 9.8.1: CCHS Cycle 1.1 Results for Serious Suicidal Thoughts (2001)



[10] In 2000-2001, a random sampling of 8,120 Manitoban residents, aged 12-98 years was interviewed on a variety of subjects. The sample was stratified by age, sex, and region of residence to represent the makeup of the Manitoba population.

Key findings:

- The proportion of Manitobans who had ever considered suicide in their lives was 6.8% (95% CI 6.0-7.6).
- The percentage of people who reported that they had considered suicide in the past year was 1.92% (95% CI 1.5-2.4).
- Less than 1% of Manitobans said they had ever attempted suicide [0.6% (95% CI 0.4-0.9)].
- The percentage of the people who reported that they had attempted suicide in the past year was 0.3% (95% CI 0.1-0.5). This estimate must be viewed with caution, due to small sample sizes resulting in unreliable results.

Comparisons between CCHS Data and our Administrative Data estimates: The CCHS estimates on *attempted suicide in the past year* show about four times as many suicide attempters in Manitoba than are captured through administrative data (CCHS data: about 3,100 or 0.30% of the population versus Administrative data: 726 per year or 0.07% of the population).

According to CCHS, there is no difference in the proportion of male versus female suicide attempters. The proportion of males reporting that they had *ever attempted suicide* was similar to the females [0.7% of males (95% CI 0.5-0.9) and 0.6% of females (95% CI 0.4-0.7)]. In contrast, the administrative data show nearly twice as many females (0.09%) attempting suicide as males (0.05%) (see Section 9.7). For this item, the administrative and CCHS data are based on different time periods (annual average over five years versus *ever attempted suicide*). However, putting the results of the two CCHS questions together, we can see that there may be many more residents who attempt suicide than are reported in the administrative data, especially males.

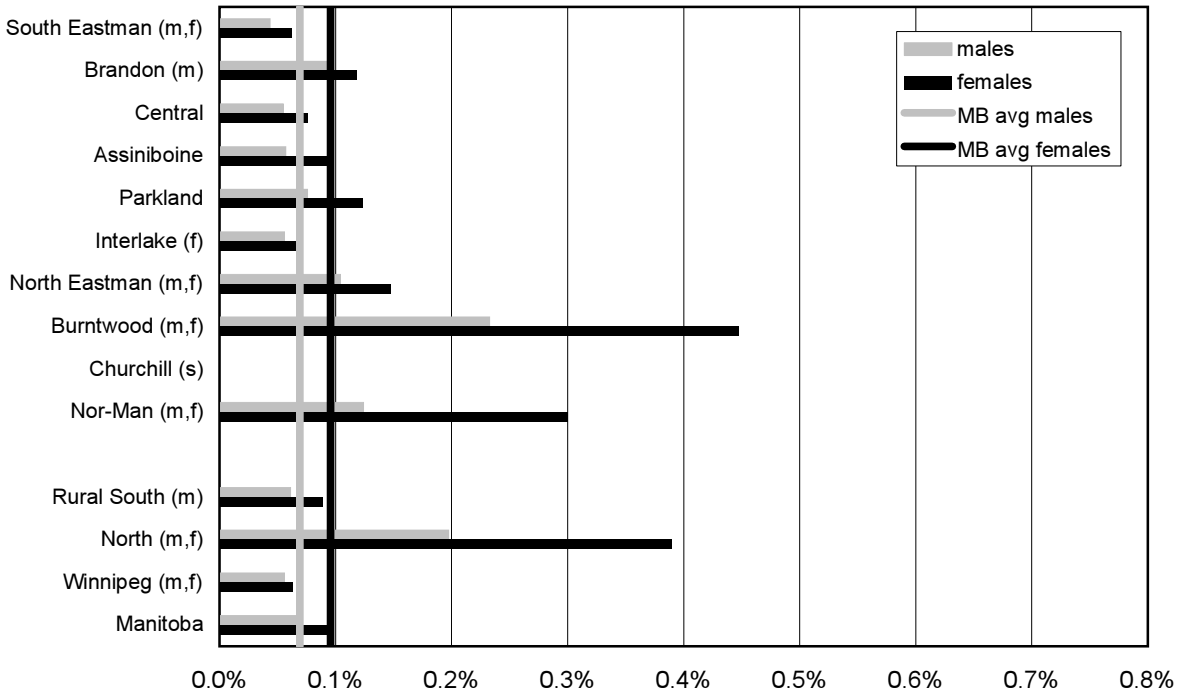
These data demonstrate the limitations of the administrative data to show a complete picture of suicide and suicide attempts in Manitoba. We have extensive data once events are counted in the medical system. However, there may be many suicide attempts which are not reported because the people involved do not seek medical care (see Health Canada, 2002, p. 96), or they are not reported by the physician or hospital as an attempt. The CCHS reports may not change immediate hospital and medical care requirements. However, they do indicate an *iceberg effect*, in the depth of the mental health problems in the community. It is apparent that there is a vulnerable, but possibly unrecognized, population of suicidal individuals in Manitoba.

9.9 Prevalence of Individuals who Completed or Attempted Suicide (Combined Group)

Definition: Individuals who either *attempted* or *completed* suicide from 1997 to 2001 were combined into one group. They were identified by any of the relevant ICD-9 codes or ICD-10 codes in Vital Statistics records, physician billing claims, or hospital discharge abstracts. The combined group measure is an average percentage of the population per year who either attempted or completed suicide over the five-year period. This is shown by RHA, district, age, sex and neighbourhood income quintile. Neighbourhood income is based on the average household income of the individual's census enumeration area. Urban and rural areas are divided into five income levels called quintiles. The Glossary has a full definition.

Figure 9.9.1: Prevalence of Individuals who Completed or Attempted Suicide by RHA, 1997-2001

Age-adjusted annual percentage of residents (aged 10 years +)



'm' indicates area's rate for males with the disorder was statistically different from Manitoba average for males
'f' indicates area's rate for females with disorder was statistically different from Manitoba average for females
's' indicates data suppressed due to small numbers

Figure 9.9.2: Prevalence of Individuals who Completed or Attempted Suicide by District, 1997-2001

Age-adjusted annual percentage of residents (aged 10 years +)

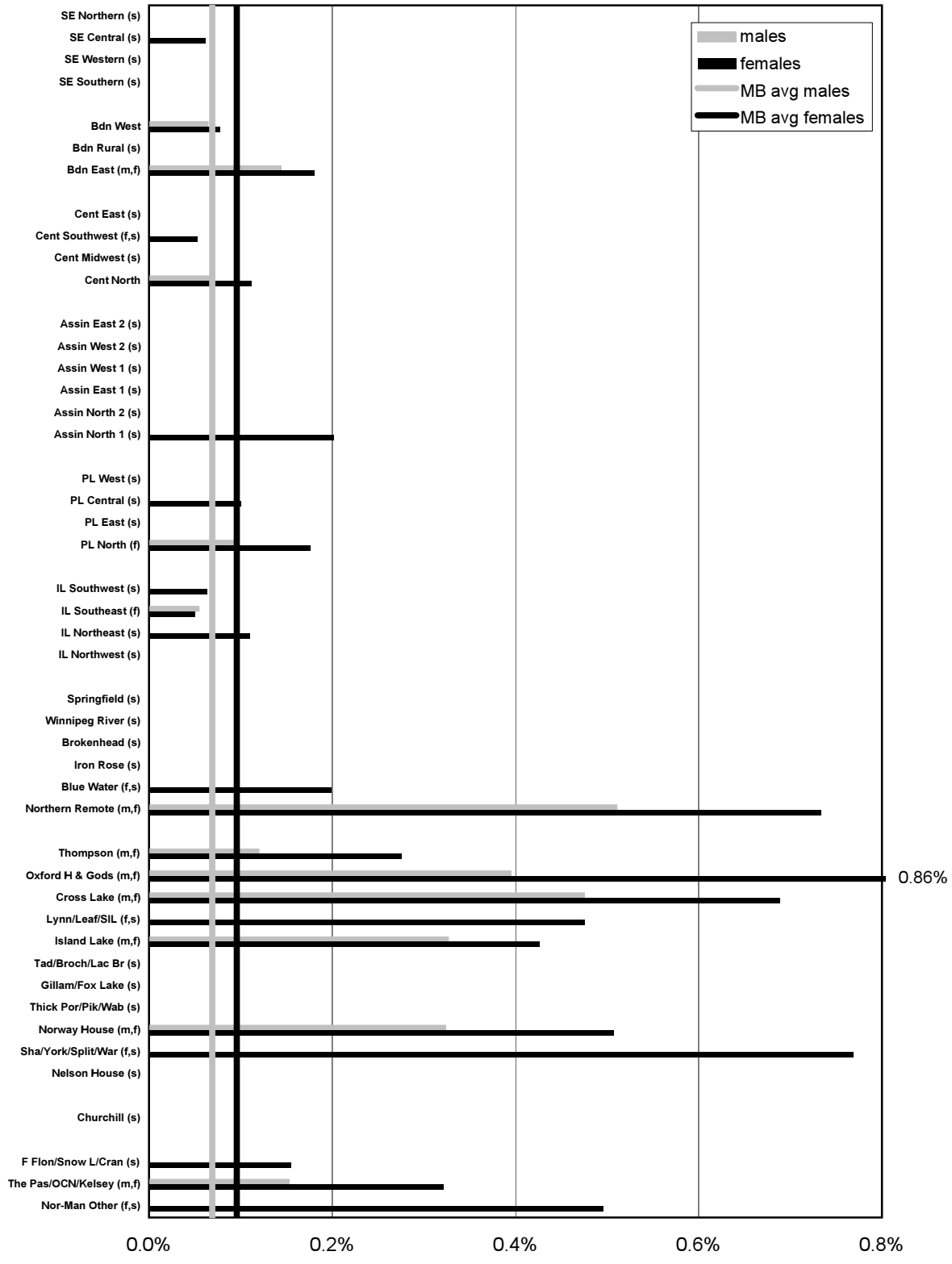


Figure 9.9.3: Prevalence of Individuals who Completed or Attempted Suicide by Age and Sex, 1997-2001

Crude annual percent of residents

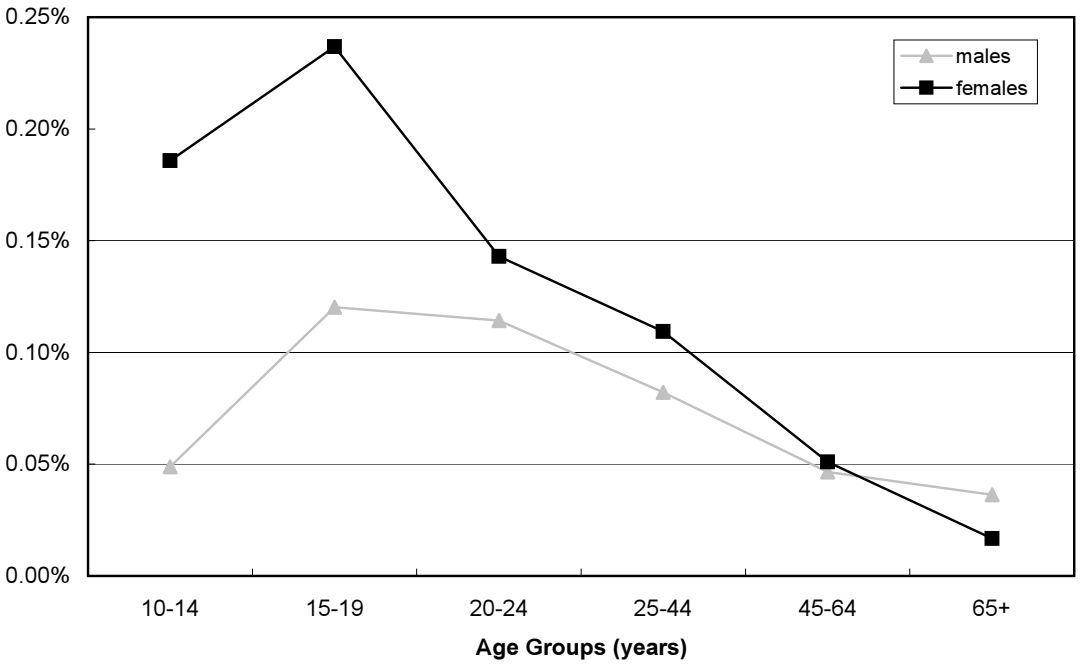
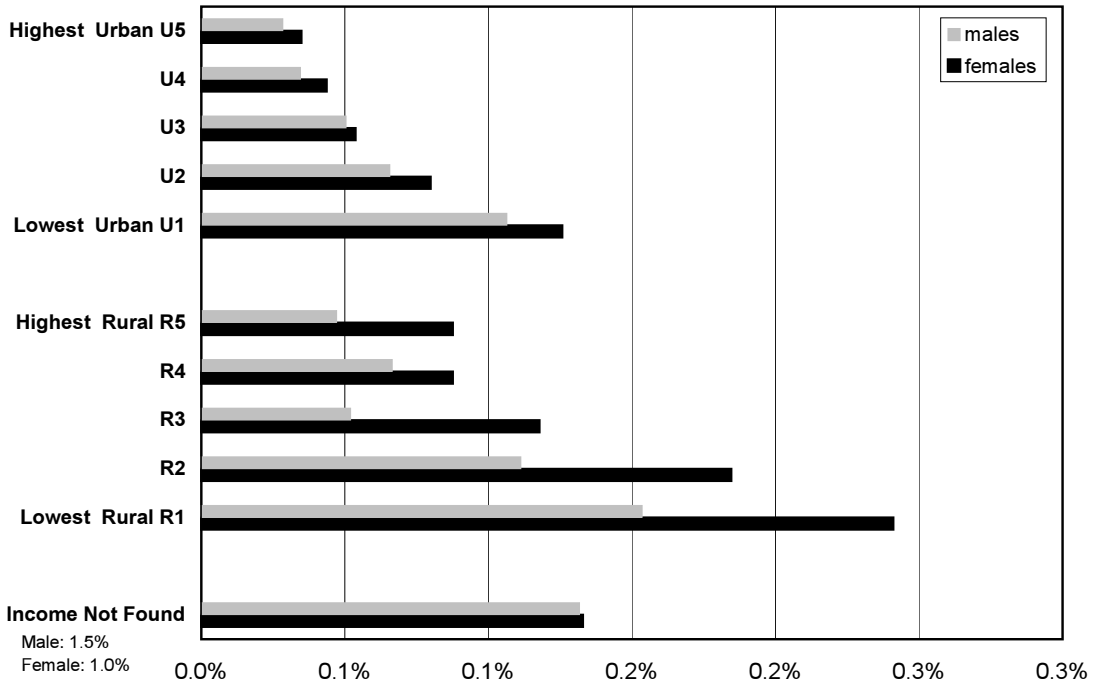


Figure 9.9.4: Prevalence of Individuals who Completed or Attempted Suicide by Income Quintile, 1997-2001

Age-adjusted annual percent of residents (aged 10 years +)



Linear Trend Test Results

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

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

Key findings:

- The combined group (combining both those individuals who completed and those who attempted suicide) made up 0.08% (95% CI 0.08-0.09) of the Manitoba population (862 residents) per year (1997-2001). The average annual percentage of people in the *combined* group was higher than the Manitoba average in Burntwood, Nor-Man, and North Eastman for both males and females, and in Brandon for males. It was lower than average in South Eastman for males and females, and in Interlake for females. In Parkland, Assiniboine, Central, and Churchill the proportion was not different from the Manitoba averages.
- On average each year, 0.10% of all females (*n*=506) and 0.07% (*n*=355) of all males either completed or attempted suicide (age adjusted), and each year there were about 43% more females than males. By age group, younger individuals (male or female) were more likely to be in the combined group than older individuals. Sex differences were greatest in the younger age groups. Females at almost every age were more likely to be in the combined group compared to males. Only males 65+ years were more likely to commit or attempt suicide than same age females (males 26 per year and females 16 per year).
- In both urban and rural areas, the proportion of individuals (both males and females) in the combined group from the lowest neighbourhood income areas was two or three times higher than those from the highest neighbourhood income areas.

9.10 Risk Factors for Completing Suicide or Attempting Suicide (Combined Group)

Definition: Risk factors are characteristics of people or place that can increase the likelihood of an individual committing suicide. On a case by case basis, it is difficult to know who will attempt suicide (Brown et al., 2000; Peruzzi and Bongar, 1999). However, some factors are linked to an increased risk of attempting or committing suicide. These risk factors include: *background characteristics* of the individual, such as having a mental illness (especially depression and schizophrenia), being a substance abuser, or being the victim of various kinds of abuse; *personal characteristics*, such as age, gender, personality traits, emotional instability, problem-solving deficits, or poor coping skills; *social factors*, such as a breakdown of social support systems, and *clinical factors*, such as the relapse of an illness or non-compliance in taking medication (Sanchez, 2001).

In our administrative data, we do not have measures of all of these risks, but we do have several database factors which can be analyzed. Using regression analyses, we identified key risk factors for each suicide outcome (suicide completion, suicide attempts, and both combined). Our initial set of risk factors or predictors included:

- Region of residence
- Sex
- Age group
- An estimate of neighbourhood income based on the individual's census enumeration area's average household income (used as a continuous rather than a categorical variable).
- Presence or absence of a mental illness diagnosis in the year prior to the suicide or attempted suicide (as measured by the Ambulatory Diagnosis Groups (ADG) 23, 24, and 25, in the Adjusted Clinical Group (ACG) system. The ADG definition closely resembles the 'any' mental illness category used elsewhere in this document - see Glossary for further details).
- A health-status morbidity index (ACG), based on the number and severity of illnesses an individual has[11]

Regression analysis is a statistical technique that allows us to examine all risk factors simultaneously to see which are the most important predictors of a yes/no outcome (such as completing suicide/attempting suicide or not). It is a way of determining overlapping risk factors. For example, people from low-income areas may also have poorer health status, so which factor has the most power to explain the outcome - the income, or the poorer health status? Each predictor remaining in the final models adds significantly to the risk or odds of a suicide outcome occurring, even after taking into account

[11] The assessment of mental health status and morbidity (ACGs) was based on the 12-month time period before a first suicide attempt or suicide. For non-suicidal individuals, mental health status and morbidity (ACGs) were based on the last year of coverage, usually 2000/01.

the influence of all the other predictors. For each regression model, individuals in the group of interest (combined, suicide attempts, suicide) were compared to 'others' in the population, who had neither completed nor attempted suicide over the five years.

How to read these figures

For each of the three regions (North, Rural South, Urban), there are two sets of figures graphed - those with and those without a mental health diagnosis. In each figure, the predicted probability is on the vertical axis, and neighbourhood income is on the horizontal axis. Each neighbourhood income number represents a $10,000.00 per year unit. For example, an average neighbourhood income of 4 means $40,000.00 per year. The four regression lines in each figure represent males (younger and older) and females (younger and older). The risk is very low that anyone of any age will complete or attempt suicide if they did *not* have a mental illness diagnosis within the previous year. It is much higher if a mental illness diagnosis was present within the previous year.

Appendix 5 contains information on the logistic regression models for each suicide outcome. Only statistically significant effects (p <.05) are reported, and only the combined (suicide completers and suicide attempters) outcome is graphed.

Figure 9.10.1a: Probability of Completing or Attempting Suicide in the North With No Mental Illness Diagnosis

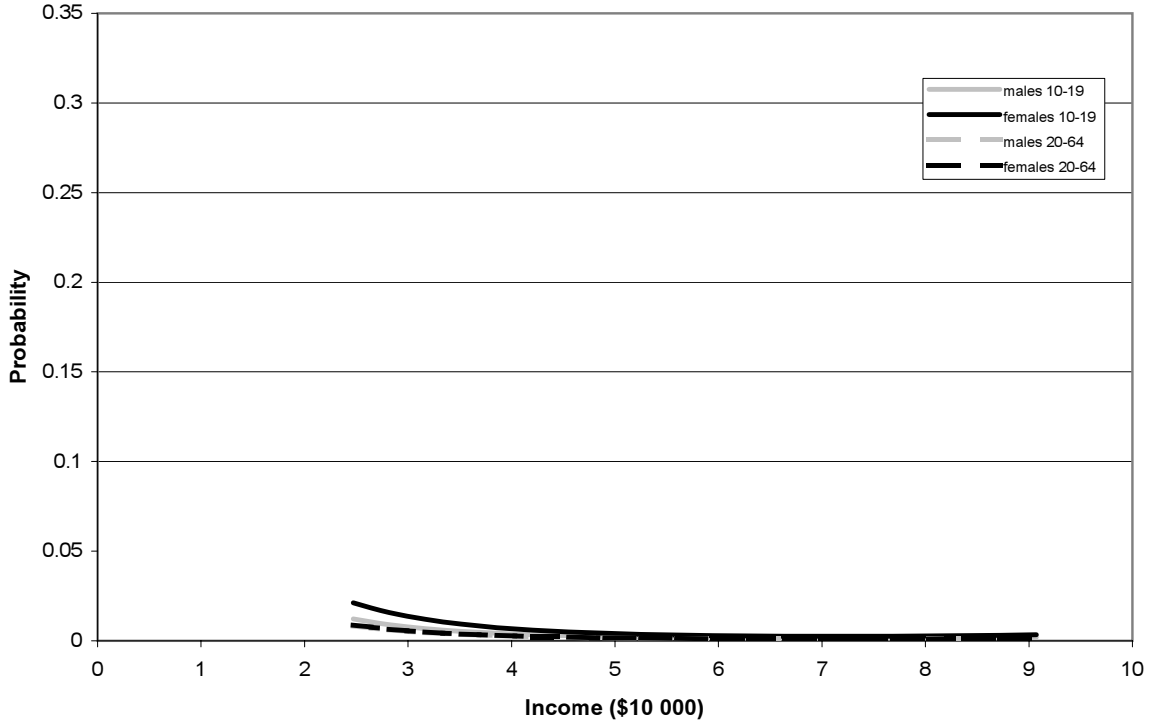


Figure 9.10.1b: Probability of Completing or Attempting Suicide in the North With a Mental Illness Diagnosis

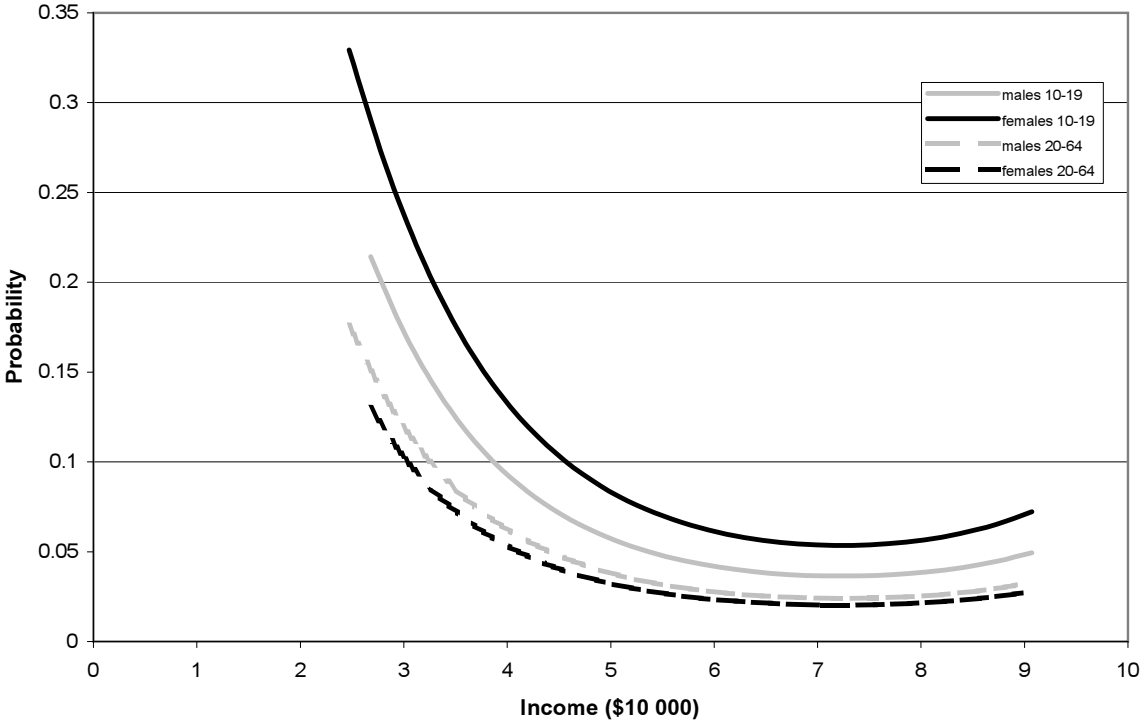


Figure 9.10.2a: Probability of Completing or Attempting Suicide in the Rural South Area With No Mental Illness Diagnosis

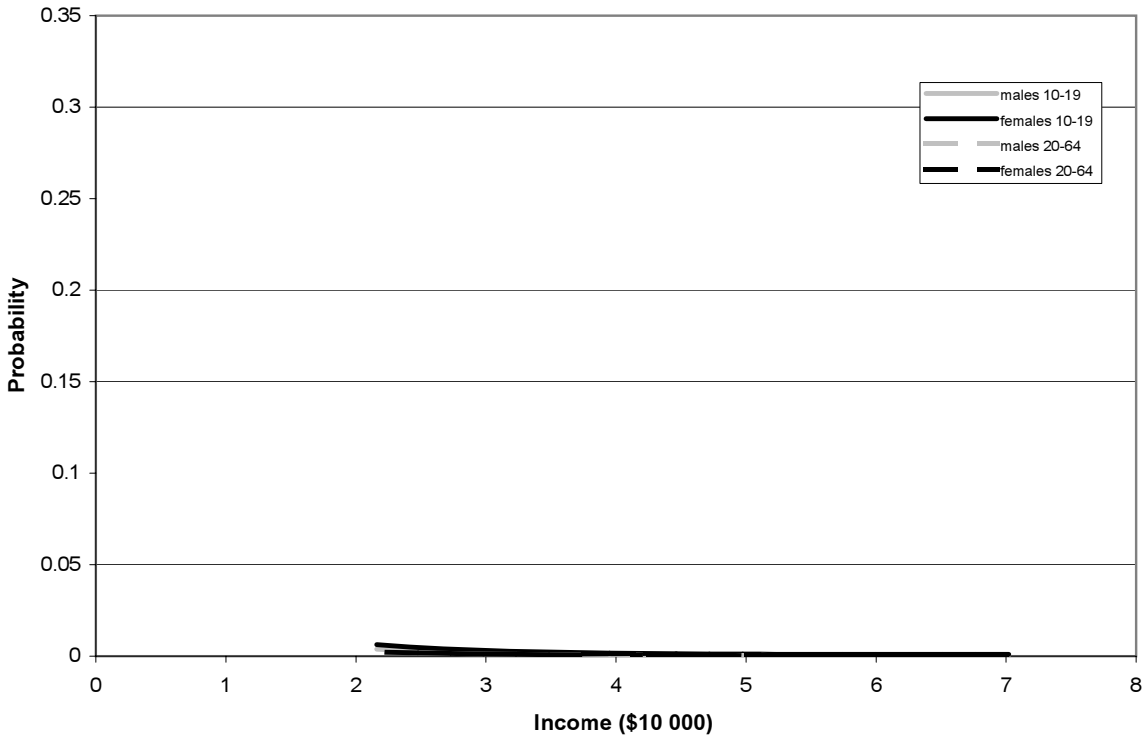


Figure 9.10.2b: Probability of Completing or Attempting Suicide in the Rural South Area With a Mental Illness Diagnosis

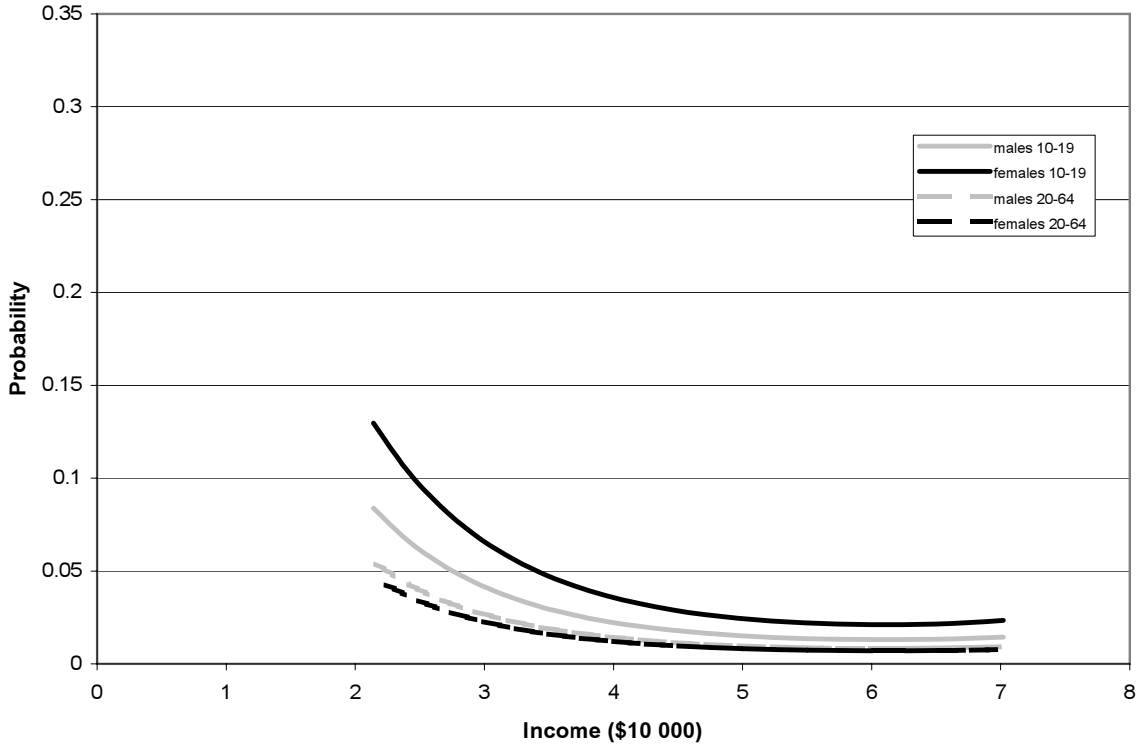


Figure 9.10.3a: Probability of Completing or Attempting Suicide in Urban Areas With No Mental Illness Diagnosis

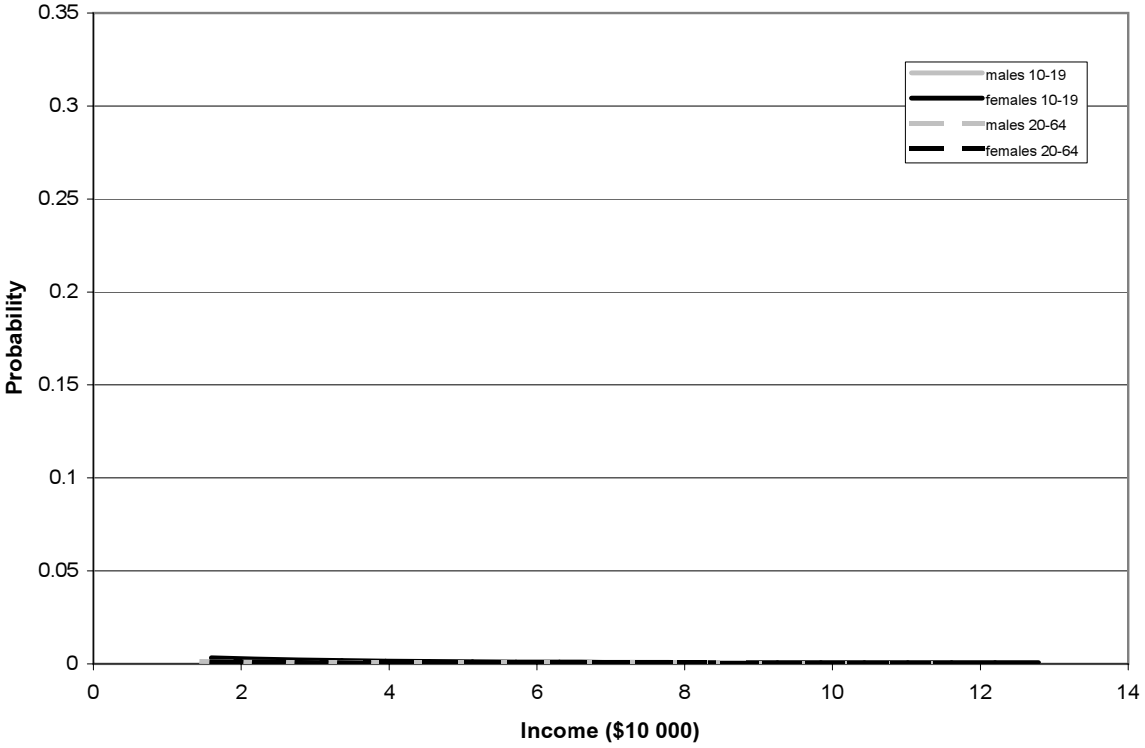
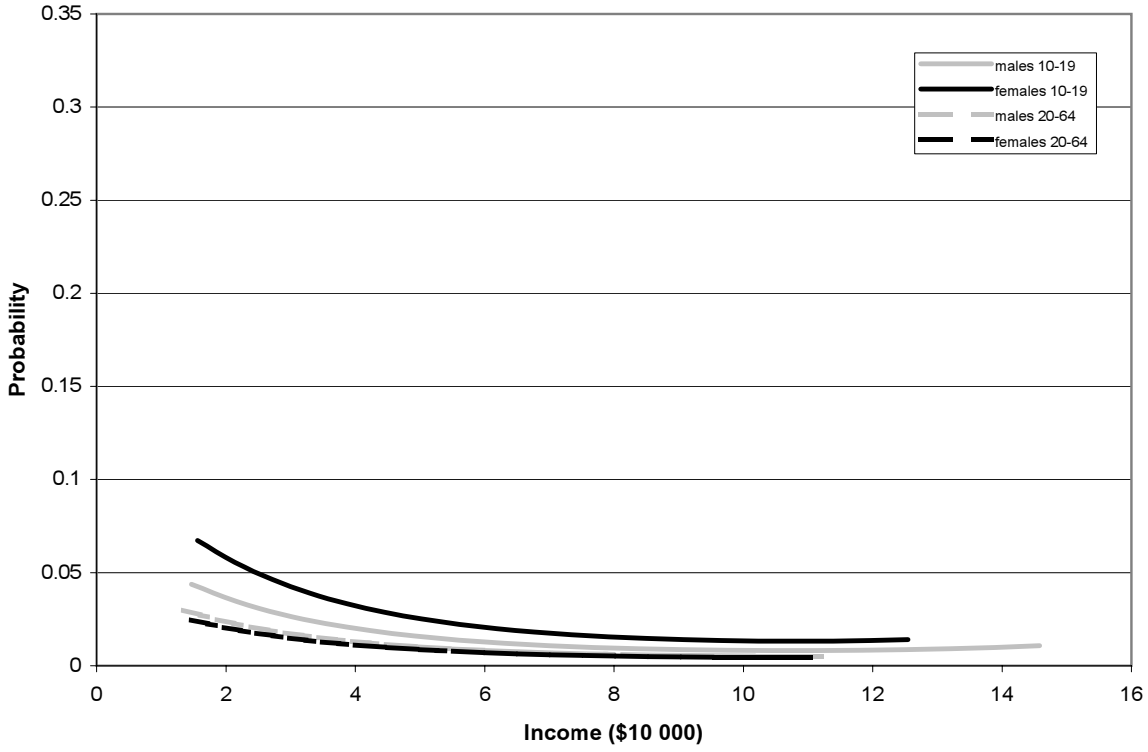


Figure 9.10.3b: Probability of Completing or Attempting Suicide in Urban Areas With a Mental Illness Diagnosis



Key findings:

- The combined group of people who had either attempted suicide or completed suicide was compared to 'other' non-suicidal people. Figures 9.10.1 to 9.10.3 show the risk factors of being in this group. *The key factors predicting either completion or a suicide attempt (i.e., the "combined group") are: living in the North or the rural South (compared to living in an urban area), being female, being young, having a mental illness diagnosis in the previous year, and living in a low neighbourhood income area.*
- Figure 9.10.1 shows that young females (10- to 19- years) from low neighbourhood income areas in the North are predicted to have greater than 30% probability of completing or attempting suicide if they were diagnosed with a mental illness in the previous year. Figure 9.10.2 shows that younger females (10- to 19- years) from low-income areas in the rural South are predicted to have a 13% probability of completing or attempting suicide if they were diagnosed with a mental illness in the previous year. Figure 9.10.4 shows that younger females (10- to 19-years) from low neighbourhood income areas in the urban South (Winnipeg and Brandon) are predicted to have a 7% probability of completing or attempting suicide if they were diagnosed with a mental illness in the previous year.
- Further analyses were also done separating out the comparisons, however these are NOT shown in the figures due to small sample sizes. Those who had completed suicide were compared to people who neither completed suicide nor attempted suicide in the five-year period. *The key factors predicting completed suicide were: diagnosis of a mental illness in the previous year, being male, being young, and having health problems.* Region of residence and neighbourhood income were not significant predictors of suicide, when the other risk factors are taken into account. Similarly, suicide attempters were compared to people who had neither attempted nor completed suicide. *The key factors predicting that an individual would attempt suicide were: living in the North, diagnosis of a mental illness in the previous year, having other health problems, being young, being female, and living in a low neighbourhood income area.*
- On their own, region of residence and neighbourhood income are risk factors in all three suicide outcomes. However, when all of the variables are together in the regression model, both region and neighbourhood income drop out as significant risk factors predicting suicide. Both factors remain risks for predicting suicide attempts and the combined group who either completed or attempted suicide. Risk factors such as age and sex are important factors. These cannot be modified, but they can give us important information about who is likely to attempt or complete suicide. A diagnosis of a mental illness in the previous year and overall health problems are also risk factors. These factors are potentially modifiable and might, therefore, be the ones that could be targeted in suicide-prevention programs.

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GLOSSARY

ADD/ADHD (Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder)
ADD/ADHD was defined as either the presence of ICD-9-CM code 314 (hyperkinetic syndrome) in physician claims, hospital abstracts, or MHMIS data, OR a prescription for a psychostimulant (Cylert, Desoxyn, Dexedrine, Dupram, Ritalin, PMS-Methylphenidate, Vivarin) over last year of the study. Those individuals that had a diagnosis of 312 (conduct disorder) with a prescription for a psychostimulant were considered ADHD with a comorbid condition. Those individuals with a diagnosis code of 347 (catalepsy and narcolepsy) with a prescription for a psychostimulant but no 314 diagnosis were removed. Only individuals aged 4-18 years at the end of 2001/02 were included. ADD/ADHD was measured as a percent of the population for individuals 4-18 years of age.

Adjusted Clinical Group (ACG)
The ACG system groups individuals based on their age, gender, and all known medical diagnoses (assigned over a period of time, typically one year). The ACG value is a morbidity measure of the individual's expected or actual consumption of health services. In the current analysis, ACG was used as a measure of physical health in the regression analyses identifying risk factors for suicide and attempted suicide (Chapter 9). The measure was based on the last year of health insurance coverage prior to an attempted or completed suicide, or it was based on the last calendar year of coverage (Jan 1, 2001 to Dec 31, 2001) for those who did not attempt or commit suicide. All individuals had to have at least nine months of coverage prior to death or loss to follow-up. The ACGs were also used to combine people into larger Aggregated Diagnostic Groups (ADGs) to determine mental illness status, as described under ADG. The ACG is fully described in the following reference documents:
- The Johns Hopkins University Bloomberg School of Public Health, Health Services Research & Development Center. The Johns Hopkins ACG® Case-Mix System Version 6.0 Release Notes. (Editor in Chief: Jonathan P. Weiner). The Johns Hopkins University. April, 2003.
- The Johns Hopkins University Bloomberg School of Public Health, Health Services Research & Development Center. The Johns Hopkins ACG® Case-Mix System Documentation & Application Manual Version 5.0. (Senior Editor: Jonathan P. Weiner). The Johns Hopkins University. October, 2001.

Aggregated Diagnostic Group (ADG)
The ADG (formerly Ambulatory Diagnostic Groups) are part of the Adjusted Clinical Group (ACG) case-mix system. The ACG method groups ICD medical diagnosis codes into 32 different ADGs based on five clinical

and expected utilization criteria:1) duration of the condition (acute, recurrent, or chronic), 2) severity of the condition (e.g., minor and stable versus major and unstable), 3) diagnostic certainty (symptoms focusing on diagnostic evaluation versus documented disease focusing on treatment services), 4) etiology of the condition (infectious, injury, or other), and 5) specialty care involvement (medical, surgical, obstetric, haematology, etc.). In the current study for purposes of the regression model of factors in suicide and suicide attempts, ADGs 23, 24, and 25 were calculated from the ACG codes which were based on psychosocial diagnoses from the last year of health insurance coverage prior to an attempted or completed suicide, or on the last calendar year of coverage (Jan 1, 2001 to Dec 31, 2001) for those who did not attempt or commit suicide. The presence or absence of one or more of the three ADGs was used as a single dichotomous measure of mental illness in the regression analyses identifying risk factors for suicide and attempted suicide. The advantage of using the ADG clusters is that a psychosocial illness was identified in the year prior to the occurrence of a suicide attempt or completion so that it can be considered a predictive variable. The use of the three ADGs as a measure of mental illness provides a broad definition representing almost any psychosocial illness. ADG 23 is a group of psychosocial diagnoses which are time-limited, but not severe (e.g., sleep disorders, reactions to stress, nervousness). ADG 24 is a group of persistent or recurrent, but stable psychosocial diagnoses (e.g., anxiety state, hypochondriasis, tics, depressive disorder, and paranoid personality disorder). ADG 25 is a group of persistent or recurrent, but unstable diagnoses (e.g., senile dementia, drug psychoses, schizophrenia, major depressive disorder, and alcohol dependence). Specific information can be obtained in the documentation on ACGs and ADGs (The Johns Hopkins University Bloomberg School of Public Health, 2003 and 2001. See the full reference above under ACG)

Adjusted Rates
See Rates and Standardization of Rates.

Age Calculations
In this report, age was calculated as the age on December 31, 1999.

Alcohol Dependence
The measure of alcohol dependence is based on work by Kessler and Mroczek. The probability that individuals had an alcohol dependence was based on their response to a set of questions from the CCHS 1.1 survey designed to measure alcohol dependence based on Criterion A and Criterion B of the DSM-III-R diagnosis for psychoactive substance use disorder. For the purposes of the report, individuals were classified as alcohol dependent if their probability was 0.85 or higher.

Anxiety States
Anxiety States were defined as the presence of one or more ICD-9-CM codes 300.0 (anxiety states), 300.2 (phobic disorders), or 300.3 (obsessive-compulsive disorders) in hospital abstracts or MHMIS, OR for a physician coding of 300 at least three times in the five-year span. Inclusion is all people aged 10 years or more. This is stated as a percentage of the population 10+ years of age who have this condition according to the definitions. The numerator is the number of people in our five-year cohort who fit this definition, with the denominator being the entire cohort.

Any Disorders
In this report, "Any Disorders" was defined as the presence of one or more ICD-9-CM code for any psychiatric condition, in either hospital abstracts or physician claims.

Calendar Year
A calendar year runs from January 1 to December 31.

Canadian Community Health Survey (CCHS Cycle 1.1)
The Canadian Community Health Survey (CCHS) is a survey conducted by Statistics Canada in order to provide cross-sectional estimates of the health determinants, health status and health system utilization of Canadians. The CCHS asked a sample of Canadians aged 12 years and up about a range of health issues, and contains a section on mental health and well-being. Therefore, these are self-reported indicators. The mental health section includes information on general psychological well-being, various specific mental illnesses such as depression and anxiety disorders, and mental health services such as medication use, social support, and health services use. Data collection began in September of 2000, and took place over a period of two years. The first year of data collection consisted of a health region-level survey conducted with 130,000 Canadians, while the second year consisted of a provincial- level survey conducted with 30,000 Canadians. Excluded from the CCHS were those living in Reserves, Military Bases, and some remote areas. This report used the Share File for Cycle 1.1 of the CCHS. There were 8120 respondents in Manitoba included in this data set. All rates and confidence intervals derived from the CCHS and included in this report were calculated using a modified version of the bootstrapping program provided by Statistics Canada.

Cohort
For a description of the entire population used in this study, see "Denominator"

Cumulative Treatment Prevalence (Cumulative Mental Illnesses)
Cumulative treatment prevalence was defined as the proportion of the cohort population who received treatment for any of the following five mental illnesses: depression, anxiety states, substance abuse, personality disorders, and schizophrenia. Please see the individual disorders for definitions.

Data Suppression
Data was suppressed when the cell count was less than five. 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 a given fiscal year. Analysis in this report was separated into short-stay days and long-stay days. Surgical outpatients were excluded.

Defined Daily Dose (DDD)
The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults. This is a technical unit of measurement and does not necessarily reflect the actual amount or dose used; it is also limited to solid form drugs only. DDDs are assigned per ATC 4th level by the WHO Collaborating Centre for Drug Statistics Methodology in Norway. There are many limitations to using DDDs. First, it does not necessarily reflect the actual amount or dose used, since prescribing patterns may be different than the original DDD assigned to the drug. For example, a drug which is now given in a higher dosage due to changing prescribing patterns, such as two times the previous dosage, could mathematically appear as if the person were receiving twice the DDD (since DDD is based on the guideline given originally by WHO). For some types of drugs, DDDs have not been assigned either because it is difficult to find appropriate DDDs (e.g., dermatologicals or drugs combined in the same dosage form) or because no requests for DDD have been made to the WHO Centre. In this report, a negligible number of injectable drugs used to treat mental disorders could not be assigned a DDD.

Dementia
For this report, dementia was defined as the presence of any of ICD-9-CM codes 290-292 (organic psychotic conditions), 294 (other organic psychotic conditions), 331 (cerebral degenerations), or 797 (senility) in either hospital abstracts or physician claims. Analysis was restricted to the Manitoba population aged 55 years or older.

Denominator
All residents of Manitoba who were aged 10 years and over in 1997 with at least one year of coverage were included in the denominator. The time period included was April 1, 1997 to March 31, 2002 (January 1, 1997 to

December 31, 2001 for suicide). For the prevalence measures, each individual is counted once. For the utilization measures, the denominator is the years at risk for each individual. If an individual left the province or died before the end of the study time period, they were only counted for the years that they were covered. The region of residence was assigned as of December 31, 1999. For those who were not residing in Manitoba as of that date, the region of residence closest to that time period was used.

Depression

Depression was defined as the presence of any hospital or physician claims coding depression using the following definitions:

From the hospital files:

"Any of ICD-9-CM codes 296.2-296.8 (affective psychoses), 300.4 (neurotic depression), 309 (adjustment reaction), or 311 (depressive disorder)

"ICD-9-CM code 300 (neurotic disorders) plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine)

From the physician files:

"Any of ICD-9-CM codes 296, 309, or 311

"ICD-9-CM code 300 plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine)

The presence of an electroconvulsive therapy (ECT) procedure code (94.27) was tested in the definition, but as it did not add any new cases to the numerator, it was removed. This is stated as a percentage of the population aged 10+ years who have this condition according to the definitions. The numerator is the number of people in our five-year cohort who fit the definition, and the denominator is the entire cohort.

FAS

FAS (Fetal Alcohol Syndrome) was defined as the presence of ICD-9-CM code 760.71 (fetal alcohol syndrome) in hospital abstracts or MHMIS files. These administrative data sources seem to significantly undercount the number of cases when compared to information from the Clinic for Alcohol and Drug Affected Children at Health Sciences Centre. Therefore, analyses were not conducted using these data.

Fiscal Year

The fiscal year starts on April 1 and ends the following March 31. For example, the 1999/2000 fiscal year would be April 1, 1999 to March 31, 2000, inclusive.

Home Care Use

See Resource Use.

Hospital Data
Includes psychiatric wards of acute care hospitals, but excludes the long-term psychiatric facilities: Eden Mental Health Centre, Selkirk Mental Health Centre, and Brandon Mental Health Centre.

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.

Hospital Use
See Resource Use.

Income Quintiles
An income quintile divides the population up 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 file. 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 income.

Income Not Found
A group of individuals who cannot be assigned a neighbourhood income from census data, and are therefore excluded from all income quintile analyses. Individuals included in the "Income Not Found" group include residents of long-term care facilities, personal care homes and psychiatric facilities, federal and long-term prisoners, wards of the Public Trustee and Child and Family Services, and residents of various areas reporting no income in the census.

Linear Trend Test
Linear trend tests were conducted on analyses by income quintiles to determine the existence of a trend by income quintile. A regression line was fitted to the crude rate with income quintile and age as the independent variables. The value of the resulting coefficient for the income quintile variable denotes the magnitude of the trend (i.e., the larger the coefficient, the more dramatic the trend), while the sign of the coefficient gives the direction of

the trend (i.e., increasing if positive and decreasing if negative). The rural and urban income quintiles were run separately for both males and females.

Log Transformation
Log transformation is used on rare events to approximate a normal curve.

Logistic Regression
The logistic regression model has become, in many fields, the standard method of data analysis concerned with describing the relationship between a response variable and one or more explanatory variables where the response variable follows a binomial distribution. Logistic regression is used to model the probability of occurrence of a binary or dichotomous outcome. Binary-valued covariates are usually given arbitrary numerical coding such as zero for one possible outcome and one for the other possible outcome. In this report, logistic regression was used to examine the relationship between suicide and several suicide risk factors. See the entry for "Suicide Risk Factors" for more detail.

Long Stay Days
The total number of days of hospital care used by all residents of a given region of stays 30 days or longer within a given fiscal year.

Mental Health Management Information System
The Mental Health Information Management System (MHMIS) is a database containing comprehensive case management information for Manitoba residents who receive services from the Mental Health division of Manitoba Health. There are three levels of MHMIS data:
Client data - a client is an individual in a region. Individuals may have more than one client file, if they have received mental health services in more than one region.
Case data - cases document the mental health services provided to a client, as well as the changes in legal or clinical status. A client may have several cases within a given region or facility, but theoretically, only one case should be open at any given time.
Encounter data - an encounter is any contact with a mental health care provider.

Mood Balance
The Mood Balance scale, also called the Bradburn Affect Balance Scale, was developed by Norman Bradburn. It is designed to indicate the psychological reactions (positive and negative) of people in the general population to events in their daily lives. This scale is considered an indicator of happiness or of general well-being, by measuring an individual's ability to cope with the stresses of everyday living. This scale is not considered a measure of psychiatric or psychological disorders. Data were derived from the CCHS 1.1

survey, and the rates shown indicate the age- and sex-adjusted proportion of the population with a 'Positive mood balance' (those with Negative mood balance are much rarer, and the numbers are too low to report).

North
"North" is an aggregate geography which includes all of the northern RHAs, that is, Nor-Man, Burntwood, and Churchill.

Other Disorders
In this report, "Other Disorders" was defined as the presence of one or more ICD-9-CM code for any psychiatric condition, in either hospital abstracts or physician claims, except those who fit the descriptions used in this report for any of the following five disorders: depression, anxiety states, substance abuse, personality disorder, and schizophrenia.

Personal Care Home Use
See Resource Use.

Personality Disorders
Personality Disorders was defined as the presence of ICD-9-CM code 301 (personality disorders) in hospital abstracts or physician claims. This will be a percentage of the population aged 10+ years who have the conditions according to the definitions. The numerator is the number of people in our five-year cohort who fit the definition, and the denominator is the entire cohort.

Pharmaceutical Use
See Resource Use.

Physician Use
See Resource Use.

Population for the study
See Denominator.

Potential Years of Life Lost (PYLL)
PYLL is an indicator of premature mortality (death before age 75), which gives greater weight to causes of death 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 such early deaths—cancer, accidents and cardiovascular disease—in order to improve health status. PYLL has been found to vary with characteristics such as sex, socio-economic status, and place of residence. It is calculated by subtracting the actual age of death from 75, and then presented as

"years lost per thousand people". For example, a person dying at age 25 instead of age 75 has lost 50 (75-25) years of life. For this report, Vital Statistics records for 1997 to 2001 were used, with the cumulative population (restricted to people who were aged 10 years or more in 1997 and who had been living in Manitoba for at least one year in 1999) as the denominator. Age was calculated as of date of death. PYLL was calculated as (75-age at death). Deaths before 10 years of age were excluded, as were those individuals older than 75 years of age. Demographic information was assigned as of date of death.

Prevalence

The measure of a condition in a population at a given point in time is referred to as point prevalence. A second type of prevalence is called period prevalence. Over a period of time, such as five years, this measures the number of individuals with a particular condition in the population during that time period. Period prevalence is the most common measure of prevalence used in MCHP studies. Prevalence data provide an indication of the extent of a condition and may have implications for the provision of services needed in a community. Both measures of prevalence are proportions—as such, they do not describe changes over time and should not be described as rates.

Public Trustee Wards

The Office of the Public Trustee has the responsibility to look after the financial and other affairs of residents unable to do so themselves. These are individuals of any age who cannot look after their own affairs. Because this office has total responsibility for such persons, their address of record in the Manitoba Health Registry is that of the office. When looking at regional utilization it should be noted that these individuals may represent a sizable portion of Winnipeg core area, and possibly Brandon.

Rates and Standardization of Rates

Unless otherwise noted, rates were standardized for age (and sex where relevant) to the 2001 Manitoba population using the direct method of standardization. This procedure mathematically removes the effects of different population structures that may influence overall rates of use of health care. These rates may also be referred to as adjusted rates. For most of the analyses in this report, the age groups used for standardization were: 10-14, 15-24, 25-39, 40-54, and 55+ years. When numerators were less than five cases, rates were suppressed due to instability.

Resource Use

In this report, resource use is defined as the history of service use of a cohort of people over a five-year period, often comparing those with "cumulative disorders" (i.e. one or more of five psychiatric diagnoses: depression, anxiety states, substance abuse, personality disorder, or schizophrenia) to a cohort of

Manitobans with no psychiatric diagnosis. The resource use rates are annualized, that is, given as an average rate per year. Exceptions to these comparisons are noted below. Analysis was performed by males, females, and by both sexes. Physician use, hospital use, home care use, pharmaceutical use, and personal care home use are all examined. Definitions for each category of resource use are detailed below.

Physician use - Three variables were used: psychiatrist visit rate, psychiatric diagnosis rate, and overall physician visit rate. Psychiatric diagnoses were defined as the presence of any of ICD-9-CM codes 290-319 (mental disorders) in physician claims. Psychiatrist visit rates are defined as any visit to a physician with a specialty code of 03. Visits to psychiatrists among those who had no mental disorders were rare, and 95% of those were assigned a V-code of 61 (other family conditions). This would typically include marital problems, parent-child problems, health in the family problems, unwanted pregnancy, and other similar family-related problems.

Hospital use - We examined separations, long-stay days, and short-stay days. Both "all-cause use" and "for mental illness" were examined. For the latter, a mental disorder was the most responsible diagnosis for the hospitalization. We also examined hospitalization patterns in Eden and Selkirk Mental Health Centres, the province's two mental health institutions, from closed cases in MHMIS.

Home Care use - We examined new home care cases, open home care cases, closed cases, and average length of home care case. New cases were defined as those which had a start date in the Home Care Program after each April 1st (i.e., after the fiscal year start). Open cases were defined as those who received at least one Home Care visit during the year. Closed cases were defined as those which conclude Home Care registration due to admission to a Personal Care Home, cancellation of coverage, or death. Average length of case was defined as the average number of days cases are registered in the Home Care program over the five-year period. We compared the rates among those with depression, dementia, and those in the cumulative disorder group to that of our cohort with no mental illnesses. The data was reported as an annual rate per 1,000 residents averaged over the five years of study.

Pharmaceutical use - We compared those in the cumulative disorder group to those with no disorder as to the percentage of the population with at least one prescription and the number of different drugs per user. In addition, we examined selective serotonin reuptake inhibitor (SSRI) use among teens aged 12-19 years. An analysis was also done as to the average DDD's used (defined daily doses), the assumed average maintenance dose per day for a drug when used for its major indication in everyday practice.

Personal Care Home use - We examined a cohort of individuals who were admitted to a Personal Care Home from April 1, 2001 to March 31, 2002 and determined the prevalence of cumulative disorders as well as dementia among this group. In addition, we examined admissions, median wait time to admission, level of care on admission, and median length of stay, comparing those in the cumulative disorder group to those with no disorders.

Rural South
"Rural South" is an aggregate geography which includes all of the RHAs in the south and the mid-province of Manitoba except the two urban centres of Winnipeg and Brandon. Those RHAs include: South Eastman, Central, Assiniboine, Interlake, North Eastman, and Parkland.

Schizophrenia
Schizophrenia was defined as the presence of ICD-9-CM code 295 (schizophrenic disorders) in either hospital abstracts or physician claims. This is stated as a percentage of the population aged 10+ years who have this condition according to the definitions. The numerator is the number of people in our five-year cohort with a 295 diagnosis over the last 10 years, and the denominator is the entire cohort.

Short Stay Days
The total number of days of hospital care used by all residents of a given region for stays less than 30 days within a given fiscal year. Surgical outpatients were excluded.

Statistical Testing
Statistical testing was performed to determine whether regional rates were significantly different from the Manitoba average. For RHA-level analyses, 99% confidence intervals were used; for district-level analyses, 99.5% confidence intervals were used. Logistic regression was used to determine odds ratios for various risk factors on suicide and attempted suicide.

Substance Abuse
Substance abuse was defined as the presence of any of ICD-9-CM codes 291 (alcoholic psychoses), 292 (drug psychoses), 303 (alcohol dependence), 304 (drug dependence), or 305 (nondependent abuse of drugs) in physician claims or hospital abstracts. This is stated as a percentage of the population aged 10+ years who have this condition according to the definitions. The numerator is the number of people in our five-year cohort who fit the definition, and the denominator is the entire cohort.

Suicidal Individuals
Suicidal individuals are individuals aged 10 years or more who attempted or completed suicide within a five-year period, and were identified by the pres-

ence of any of ICD-9-CM or ICD-10 in Vital Statistics records, physician billing claims, or hospital discharge abstracts. See "Suicide" and "Suicide Attempts" for the diagnostic criteria for each grouping. This is stated as a percentage of the population aged 10 years or more who have this condition according to the definitions. The numerator is the number of people in our five-year cohort who fit the definitions, and the denominator is the entire cohort.

Suicide Attempters
Suicide attempters are individuals aged 10 years or more who attempted suicide at least once in a five-year period, and were identified by the presence of any of ICD-9-CM or ICD-10 in Vital Statistics records, physician billing claims, or hospital discharge abstracts. See "Suicide Attempts" for the diagnostic criteria. Suicide attempters do not include people who completed suicide. This will be a percentage of the population aged 10 years and above. The numerator is the number of people in our five-year cohort who fit the definition, and the denominator is the entire cohort.

Suicide
Suicide is the act of intentionally killing oneself. The numerator is the number of people aged 10 years or older in a five-year period (1997 to 2001) who committed suicide, and the denominator is the cumulative five-year Manitoba population aged 10 years or older. For the purposes of this report, suicide was defined as the presence of any cause of death in Vital Statistics data with a code of:

"Suicide and self-inflicted injury codes include E850-E854, E858, E862, E868 (accidental poisoning), E950-E952 (self-inflicted poisoning), E953 (self-inflicted injury by hanging), E954 (drowning), E955 (self-inflicted injury by firearms), E956 (self-inflicted injury by cutting), E957 (self-inflicted injury by jumping from high places), E958 (other/unspecified self-inflicted injury), E959 (late effects of self-inflicted injury); or

"ICD10 codes X40- X42, X46, X47 (accidental poisoning by analgesics, antipyretics, anti-rheumatics, sedative-hypnotic, narcotics), X46 (solvents and vapours), X47 (other gasses and vapours), X60-X69 (intentional self poisoning), X70 (suicide hanging), X72-X74 (suicide by gunshot), X78 (suicide by cutting), X71, X75-X77, X79-X84 (other suicide) in Vital Statistics records.

Suicide Attempts
For purposes of these analyses, suicide attempts do NOT include those events that were a suicide completion. A person can have more than one suicide attempt during the five-year period. All analyses are restricted to those aged 10 years or more, and over a five-year time period. The numerator is

the number of attempts among people aged 10 years or older in a five-year period (1997 to 2001), and the denominator is the cumulative five-year Manitoba population aged 10 years or older. Suicide attempts were defined as the presence of any of hospital or physician claims coding a suicide attempt using the following definitions:

From the hospital files:
1. Suicide and self-inflicted injury codes E950-E959.
2. Accidental poisoning codes E850-E854, E859, E862, E868 (described below) only if there is a psychiatric tariff code either during the hospital stay or within 30 days post- discharge.

-E850 accidental poisoning by analgesics, antipyretics, antirheumatics
-E851 accidental poisoning by barbiturates
-E852 accidental poisoning by other sedatives and hypnotics
-E853 accidental poisoning by tranquilizers
-E854 accidental poisoning by other psychotropic agents
-E858 a accidental poisoning by unspecified drug
-E862 accidental poisoning by petroleum products and vapours
-E868 accidental poisoning by other utility gas and carbon monoxide

Psychiatric tariff codes are as follows:
From the psychiatric schedule:

-8444 Psychotherapy - group of two to four patients
-8446 Psychotherapy - group of five or more patients
-8472 Child and Youth Management Conference
-8475 Psychiatry - Patient Care Family Conference
-8476 Psychiatric Social Interview
-8503 Complete history and psychiatric examination - adult
-8504 Complete history and psychiatric examination - child
-8553 Consultation - adult
-8554 Consultation - child
-8581 Psychotherapy - Individual
-8584 Psychiatric care - individual
-8588 Electroshock therapy
-8596 Consultation - Unassigned patient - child

From the general schedule:

-8580 Psychotherapy - Individual
-8587 Electroshock therapy
-8589 Psychotherapy - Group

3. Persons with poisoning codes (defined below) plus a psychiatric tariff code during the hospital stay or within 30 days of post-discharge

From the physician files:

4. Persons who have attempted suicide, identified through the use of several "poisoning" codes in conjunction with a psychiatric tariff codes within 30 days after the poisoning episode.

-965 poisoning by analgesics,
-967 poisoning by sedatives and hypnotics,
-969 poisoning by psychotropic agents,
-977.9 Poisoning by unspecified drug or medicinal substance or
-986 toxic effects of carbon monoxide
-Refer to Hospital Files for psychiatric tariff codes.

Suicide Risk Factors

Variables that were significant risk factors for predicting future suicide were determined through logistic regression analysis. Postal codes with no income information were excluded from the regression. This includes postal codes for Personal Care Homes, prisons, psychiatric facilities, long-term care facilities, and public trustee offices. Variables examined were region (North, Rural South, and Urban), sex, age, psychiatric diagnosis, average household income, and burden of disease, with probability of suicide as the outcome variable. Of the variables examined, sex, psychiatric diagnosis, income, and region were significant predictors of suicide.

Urban

"Urban" is an aggregate geography which includes the two urban centres in Manitoba: Winnipeg and Brandon.

Work Stress

The Work Stress scale is a derived measure based on respondents' answers to 12 questions. The scale was developed by Karasek and Theorell in Healthy work-stress, productivity and the reconstruction of working life (1990), and includes six sub-scales of work-related stress. It reflects a respondent's perceptions of work, including job security, social support, monotony, physical effort required, and extent of participation in decision-making. Scale scores range from zero to 48, with high scores indicating high work stress. For our definition of work stress, we use a cut-off score of 25, which represents the 90th percentile (i.e., 90% of respondents had scores lower than 25). The rates shown are the age- and sex-adjusted proportion of area residents who scored higher than 25 on the work stress scale. Data for this indicator were derived from the CCHS 1.1 survey, and included only those aged 15-75 years who had worked at a job or business anytime in the previous 12 months.

APPENDIX 1: TABLES OF CRUDE RATES AND OBSERVED NUMBERS OF EVENTS

Appendix Table 1.1: Prevalence of Mental Illness Diseases

RHA	Cumulative Disorders				Other Disorders				Any Disorder			
	Males		Females		Males		Females		Males		Females	
	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %
South Eastman	3,877	16.6%	6,096	27.1%	2,563	11.0%	3,230	14.4%	6,421	27.5%	9,310	41.4%
Brandon	3,987	19.4%	6,994	30.8%	2,509	12.2%	3,107	13.7%	6,471	31.4%	10,084	44.5%
Central	6,389	15.4%	10,462	25.1%	3,838	9.2%	4,860	11.7%	10,206	24.6%	15,301	36.7%
Assiniboine	5,019	15.4%	8,491	25.9%	2,997	9.2%	3,831	11.7%	7,995	24.5%	12,294	37.4%
Parkland	3,215	15.9%	5,391	27.0%	2,267	11.2%	3,072	15.4%	5,458	27.0%	8,439	42.3%
Interlake	5,778	17.2%	9,109	27.9%	3,220	9.6%	3,955	12.1%	8,972	26.7%	13,047	40.0%
North Eastman	2,959	16.9%	4,566	27.7%	1,649	9.4%	2,013	12.2%	4,593	26.3%	6,571	39.9%
Burntwood	4,259	24.0%	5,681	34.8%	1,280	7.2%	1,325	8.1%	5,517	31.1%	6,991	42.8%
Churchill	90	18.9%	123	28.5%	45	9.5%	37	8.6%	135	28.4%	160	37.0%
Nor-Man	2,115	19.3%	3,409	32.7%	1,231	11.2%	1,559	14.9%	3,335	30.4%	4,956	47.5%
Rural South	27,237	16.1%	44,115	26.6%	16,534	9.8%	20,961	12.6%	43,645	25.9%	64,962	39.1%
North	6,464	22.2%	9,213	33.9%	2,556	8.8%	2,921	10.7%	8,987	30.8%	12,107	44.5%
Winnipeg	57,579	20.0%	91,566	29.9%	36,646	12.7%	46,053	15.1%	93,841	32.5%	137,336	44.9%
Manitoba	95,267	18.8%	151,888	29.1%	58,245	11.5%	73,042	14.0%	152,944	30.2%	224,489	43.0%

Appendix Table 1.1 (Continued): Prevalence of Mental Illness Diseases

RHA	Depression				Anxiety States				Substance Abuse			
	Males		Females		Males		Females		Males		Females	
	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %
South Eastman	2,679	11.5%	5,066	22.5%	885	3.8%	1,822	8.1%	1,179	5.1%	933	4.2%
Brandon	2,768	13.4%	5,783	25.5%	910	4.4%	1,926	8.5%	1,322	6.4%	1,363	6.0%
Central	4,443	10.7%	8,855	21.2%	1,424	3.4%	2,939	7.0%	2,021	4.9%	1,535	3.7%
Assiniboine	3,415	10.5%	6,978	21.2%	1,012	3.1%	2,458	7.5%	1,636	5.0%	1,426	4.3%
Parkland	2,159	10.7%	4,387	22.0%	734	3.6%	1,831	9.2%	1,078	5.3%	873	4.4%
Interlake	3,923	11.7%	7,693	23.6%	1,121	3.3%	2,310	7.1%	1,941	5.8%	1,543	4.7%
North Eastman	1,921	11.0%	3,769	22.9%	644	3.7%	1,305	7.9%	1,101	6.3%	845	5.1%
Burntwood	1,600	9.0%	2,931	18.0%	618	3.5%	871	5.3%	3,069	17.3%	3,687	22.6%
Churchill	28	5.9%	68	15.7%	13	2.7%	17	3.9%	62	13.0%	72	16.7%
Nor-Man	1,108	10.1%	2,365	22.7%	650	5.9%	1,307	12.5%	1,001	9.1%	900	8.6%
Rural South	18,540	11.0%	36,748	22.1%	5,820	3.4%	12,665	7.6%	8,956	5.3%	7,155	4.3%
North	2,736	9.4%	5,364	19.7%	1,281	4.4%	2,195	8.1%	4,132	14.2%	4,659	17.1%
Winnipeg	39,660	13.7%	75,010	24.5%	15,272	5.3%	28,409	9.3%	17,894	6.2%	14,625	4.8%
Manitoba	63,704	12.6%	122,905	23.5%	23,283	4.6%	45,195	8.7%	32,304	6.4%	27,802	5.3%

Appendix Table 1.1 (Continued): Prevalence of Mental Illness Diseases

RHA	Schizophrenia				Personality Disorder				Dementia			
	Males		Females		Males		Females		Males		Females	
	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %
South Eastman	165	0.7%	177	0.8%	83	0.4%	113	0.5%	358	7.2%	448	8.5%
Brandon	352	1.7%	315	1.4%	241	1.2%	281	1.2%	433	8.7%	693	11.0%
Central	307	0.7%	293	0.7%	185	0.5%	247	0.6%	934	9.3%	1,293	10.9%
Assiniboine	188	0.6%	235	0.7%	173	0.5%	222	0.7%	901	8.6%	1,348	11.1%
Parkland	235	1.2%	242	1.2%	157	0.8%	156	0.8%	637	9.9%	805	11.4%
Interlake	306	0.9%	295	0.9%	186	0.6%	255	0.8%	658	7.3%	762	8.1%
North Eastman	104	0.6%	89	0.5%	73	0.4%	94	0.6%	293	6.6%	361	8.5%
Burntwood	174	1.0%	100	0.6%	83	0.5%	116	0.7%	117	6.1%	98	5.9%
Churchill	6	1.3%	6	1.4%	s	s	s	s	s	s	7	11.1%
Nor-Man	88	0.8%	97	0.9%	49	0.5%	49	0.5%	141	7.4%	155	7.9%
Rural South	1,305	0.8%	1,331	0.8%	857	0.5%	1,087	0.7%	3,781	8.3%	5,017	10.1%
North	268	0.9%	203	0.8%	135	0.5%	169	0.6%	261	6.7%	260	7.0%
Winnipeg	4,182	1.5%	4,250	1.4%	2,941	1.0%	3,619	1.2%	6,154	9.4%	10,987	12.8%
Manitoba	6,107	1.2%	6,099	1.2%	4,174	0.8%	5,156	1.0%	10,629	8.9%	16,957	11.6%

Note: s = suppressed

Appendix Table 1.1 (Continued): Prevalence of Mental Illness Diseases

RHA	ADD/ADHD				No Disorders			
	Males		Females		Males		Females	
	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %	Observed Number	Crude Rate %
South Eastman	194	2.7%	47	0.7%	16,928	72.5%	13,171	58.6%
Brandon	422	7.8%	111	2.1%	14,138	68.6%	12,596	55.5%
Central	430	3.4%	105	0.9%	31,352	75.4%	26,389	63.3%
Assiniboine	424	5.4%	139	1.9%	24,612	75.5%	20,556	62.6%
Parkland	167	3.3%	52	1.1%	14,729	73.0%	11,518	57.7%
Interlake	396	4.5%	111	1.4%	24,670	73.3%	19,599	60.0%
North Eastman	166	3.4%	40	0.9%	12,889	73.7%	9,898	60.1%
Burntwood	202	2.6%	53	0.7%	12,207	68.9%	9,337	57.2%
Churchill	0	0.0%	0	0.0%	341	71.6%	272	63.0%
Nor-Man	84	2.4%	25	0.7%	7,649	69.6%	5,481	52.5%
Rural South	1,777	3.8%	494	1.1%	125,180	74.1%	101,131	60.9%
North	290	2.5%	79	0.7%	20,197	69.2%	15,090	55.5%
Winnipeg	3,506	5.2%	967	1.5%	194,734	67.5%	168,733	55.1%
Manitoba	5,995	4.6%	1,651	1.3%	354,249	69.8%	297,550	57.0%

Appendix Table 1.2: All-cause physician visits

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	24,399	6,496.0	47,679	7,987.0	11,334	4,579.7	15,251	4,848.9	18,925	7,269.3	41,410	8,336.1
Brandon	26,663	7,039.0	59,542	8,802.0	12,242	5,165.6	17,749	6,047.3	20,739	7,834.1	51,838	9,235.3
Central	38,642	6,324.0	79,200	7,805.0	17,147	4,722.1	24,863	5,372.2	29,611	6,966.6	69,233	8,048.1
Assiniboine	32,590	6,865.0	68,889	8,395.0	15,479	5,574.9	22,179	6,167.6	24,567	7,598.4	59,352	8,784.9
Parkland	22,723	7,445.0	48,675	9,312.0	11,767	5,549.0	18,038	6,178.0	16,843	8,158.4	41,770	9,796.9
Interlake	36,488	6,584.0	71,330	8,008.0	14,802	4,829.0	21,456	5,616.1	27,706	7,300.6	63,168	8,376.1
North Eastman	19,608	6,857.0	38,521	8,595.0	8,007	5,070.6	11,307	5,789.3	14,693	7,881.3	33,677	9,087.4
Burntwood	18,730	4,529.0	34,473	6,156.0	4,196	3,376.3	6,770	5,231.3	8,902	5,712.6	22,254	7,690.6
Churchill	507	5,734.0	916	7,672.0	198	4,532.3	227	6,546.3	173	6,321.0	601	9,001.2
Nor-Man	13,223	6,516.0	26,919	8,085.0	5,260	4,443.4	8,732	5,744.0	8,087	7,570.5	20,153	8,730.6
Rural South	174,449	6,692.0	354,295	8,251.0	78,536	5,019.1	113,094	5,637.0	132,345	7,430.6	308,609	8,611.5
North	32,460	5,191.0	62,307	6,886.0	9,653	3,908.1	15,729	5,520.9	17,162	6,466.7	43,007	8,162.9
Winnipeg	434,237	7,860.0	825,255	9,277.0	177,077	5,055.2	262,022	5,964.8	334,674	8,747.7	713,767	9,768.7
Manitoba	667,810	7,310.0	1,301,398	8,811.0	277,508	4,998.7	408,594	5,855.9	504,920	8,227.4	1,117,222	9,326.9

Appendix Table 1.2(Continued): All-cause physician visits

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	7,859	9,086.0	18,093	10,053.6	6,189	5,381.4	7,421	8,087.5	1,087	7,335.6	1,842	11,395.9
Brandon	9,171	10,326.0	22,769	12,026.0	7,712	6,072.5	11,238	8,469.0	2,796	8,938.8	3,244	11,873.1
Central	12,817	9,277.7	29,485	10,251.4	11,138	5,696.1	12,668	8,428.5	1,912	6,765.7	2,146	8,174.6
Assiniboine	9,225	9,488.6	26,398	10,977.6	9,201	5,897.3	10,803	7,820.8	1,295	7,587.7	2,169	10,177.3
Parkland	7,392	10,444.8	21,212	11,836.8	6,806	6,670.7	8,266	9,645.2	1,690	7,931.8	2,189	9,825.6
Interlake	10,036	9,164.4	24,181	10,615.0	10,921	5,894.6	11,579	7,636.6	1,868	6,922.9	2,310	8,638.5
North Eastman	6,152	9,767.9	14,620	11,333.1	6,439	6,073.6	6,925	8,356.5	625	6,564.3	892	11,266.3
Burntwood	4,321	7,153.3	8,131	9,467.8	12,781	4,294.0	20,231	5,564.1	848	5,119.1	666	6,919.2
Churchill	89	6,846.2	190	11,779.4	339	5,598.0	525	7,454.6	42	7,707.7	71	11,766.7
Nor-Man	5,916	9,311.0	12,994	10,078.9	5,461	5,711.5	6,620	7,515.9	724	8,620.8	955	10,928.6
Rural South	53,481	9,463.5	133,989	10,770.3	50,695	5,895.5	57,664	8,232.9	8,478	7,186.6	11,548	9,570.4
North	10,326	8,244.7	21,315	9,849.1	18,581	4,653.2	27,376	5,967.9	1,614	6,326.9	1,692	8,919.9
Winnipeg	160,938	10,732.5	327,852	11,710.9	128,612	7,536.3	132,238	9,328.5	39,870	10,340.7	51,376	13,291.0
Manitoba	233,916	10,265.2	505,926	11,370.8	205,600	6,647.7	228,516	8,434.2	52,758	9,415.6	67,860	12,260.1

Appendix Table 1.2(Continued): All-cause physician visits

RHA	Personality Disorders				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	679	8,514.8	1,711	15,446.6	42,798	2,657.5	42,719	3,410.7
Brandon	2,480	11,119.6	4,296	16,227.0	40,400	3,118.1	46,325	4,011.8
Central	1,654	9,578.9	2,943	12,237.5	77,978	2,628.3	85,127	3,408.2
Assiniboine	1,320	8,576.4	2,924	13,823.3	72,848	3,172.9	77,217	4,014.4
Parkland	1,394	9,440.3	2,192	14,207.6	44,568	3,275.8	46,288	4,348.9
Interlake	1,445	8,089.8	3,023	12,137.0	69,126	2,965.6	72,763	3,923.8
North Eastman	586	8,292.0	1,238	13,425.4	37,039	3,040.0	37,191	3,953.4
Burntwood	507	6,344.9	950	8,346.7	22,779	1,987.0	27,673	3,123.3
Churchill	12	4,848.4	56	14,050.0	744	2,392.3	946	3,793.7
Nor-Man	422	9,141.4	582	12,190.6	18,481	2,621.6	18,131	3,588.8
Rural South	7,078	8,811.4	14,031	13,257.3	344,357	2,922.5	361,305	3,790.0
North	941	7,319.5	1,589	9,593.0	42,004	2,231.3	46,750	3,301.2
Winnipeg	34,607	12,263.5	59,117	16,947.6	542,682	3,021.4	627,053	4,021.3
Manitoba	45,105	11,342.3	79,032	15,879.8	969,443	2,944.6	1,081,434	3,904.5

Appendix Table 1.3: Physician visits for mental illness

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	4,215	1,122.2	8,101	1,357.1	4,025	325.3	805	319.8	3,560	1,367.4	7,406	1,490.8
Brandon	5,075	1,339.6	10,170	1,503.5	5,304	447.6	1,061	544.7	4,348	1,642.6	9,334	1,662.9
Central	6,388	1,045.4	11,975	1,180.1	6,484	357.1	1,297	359.8	5,230	1,230.4	10,960	1,274.1
Assiniboine	4,488	945.5	10,073	1,227.5	6,353	457.6	1,271	499.8	3,688	1,140.7	9,115	1,349.1
Parkland	3,208	1,051.0	6,549	1,252.7	3,886	366.5	777	336.5	2,599	1,259.0	5,828	1,366.8
Interlake	6,451	1,163.9	12,487	1,401.9	5,586	364.5	1,117	323.9	5,412	1,426.0	11,677	1,548.3
North Eastman	3,245	1,134.8	6,014	1,342.0	2,859	362.1	572	326.2	2,664	1,428.8	5,523	1,490.3
Burntwood	2,548	616.2	3,290	587.5	1,947	313.3	389	262.2	1,598	1,025.7	2,757	952.8
Churchill	58	658.2	112	940.2	58	266.1	12	242.2	23	856.0	91	1,368.9
Nor-Man	2,234	1,100.7	3,947	1,185.4	1,750	295.7	350	308.4	1,574	1,473.7	3,108	1,346.5
Rural South	27,995	1,073.9	55,199	1,285.5	29,193	373.1	5,839	365.1	23,152	1,299.9	50,508	1,409.4
North	4,840	774.0	7,348	812.1	3,755	304.0	751	286.6	3,196	1,204.3	5,957	1,130.6
Winnipeg	106,467	1,927.2	178,880	2,010.9	69,418	396.4	13,884	417.5	88,689	2,318.2	163,399	2,236.3
Manitoba	144,376	1,580.4	251,598	1,703.4	107,670	387.9	21,534	402.5	119,385	1,945.3	229,197	1,913.4

Appendix Table 1.3(Continued): Physician visits for mental illness

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	1,692	1,956.5	3,800	2,111.6	1,054	916.6	1,150	1,253.4	443	2,987.1	617	3,819.7
Brandon	2,343	2,637.8	5,100	2,693.6	1,487	1,171.2	1,777	1,339.4	929	2,971.7	1,087	3,978.2
Central	2,920	2,113.4	5,793	2,014.2	1,789	914.9	2,113	1,405.7	708	2,504.9	650	2,475.5
Assiniboine	1,791	1,842.0	5,296	2,202.2	1,258	806.5	1,586	1,148.3	400	2,343.0	755	3,541.6
Parkland	1,396	1,972.4	3,602	2,010.0	998	977.9	1,116	1,302.0	631	2,960.2	765	3,433.5
Interlake	2,536	2,315.7	5,687	2,496.7	1,699	917.1	1,998	1,317.5	730	2,704.7	801	2,996.4
North Eastman	1,462	2,322.1	2,987	2,315.4	1,008	950.7	992	1,196.7	231	2,428.2	263	3,320.0
Burntwood	991	1,640.3	1,425	1,658.9	1,589	533.7	1,724	474.1	422	2,546.3	200	2,072.4
Churchill	22	1,676.9	46	2,854.9	24	393.0	55	780.7	25	4,493.1	36	6,000.0
Nor-Man	1,390	2,187.4	2,440	1,892.2	928	970.3	1,003	1,138.8	335	3,990.0	399	4,559.5
Rural South	11,797	2,087.5	27,165	2,183.6	7,807	907.8	8,955	1,278.5	3,142	2,663.8	3,851	3,191.6
North	2,402	1,918.3	3,910	1,806.8	2,540	636.1	2,782	606.4	782	3,063.1	634	3,342.6
Winnipeg	51,654	3,444.6	90,666	3,238.6	30,556	1,790.5	29,613	2,089.0	19,618	5,088.3	21,807	5,641.6
Manitoba	68,196	2,992.7	126,842	2,850.8	42,390	1,370.6	43,127	1,591.7	24,472	4,367.5	27,379	4,946.6

Appendix Table 1.3(Continued): Physician visits for mental illness

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	262	3,280.5	578	5,215.1	0	0	0	0
Brandon	914	4,098.7	1,319	4,981.4	0	0	0	0
Central	536	3,106.1	933	3,879.0	0	0	0	0
Assiniboine	411	2,668.2	1,066	5,038.0	0	0	0	0
Parkland	449	3,038.4	730	4,728.9	0	0	0	0
Interlake	571	3,197.9	1,265	5,077.6	0	0	0	0
North Eastman	224	3,165.1	423	4,587.2	0	0	0	0
Burntwood	168	2,106.6	228	2,001.0	0	0	0	0
Churchill	5	1,939.3	21	5,150.0	0	0	0	0
Nor-Man	189	4,098.0	163	3,413.0	0	0	0	0
Rural South	2,452	3,052.7	4,993	4,718.1	0	0	0	0
North	362	2,817.9	411	2,484.3	0	0	0	0
Winnipeg	16,797	5,952.4	27,483	7,878.8	0	0	0	0
Manitoba	20,526	5,161.4	34,207	6,873.1	0	0	0	0

Appendix Table 1.4: Psychiatrist visits

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	681	181.3	1,159	194.1	15	5.9	11	3.6	635	244.1	1,136	228.6
Brandon	1,687	445.2	3,023	447.0	32	13.3	23	7.8	1,576	595.4	2,944	524.6
Central	913	149.4	1,483	146.1	49	13.5	37	8.0	832	195.8	1,433	166.6
Assiniboine	558	117.5	1,307	159.2	17	6.0	12	3.4	515	159.2	1,300	192.4
Parkland	265	86.8	473	90.5	14	6.7	16	5.6	235	113.9	460	107.9
Interlake	1,694	305.6	3,136	352.1	40	13.2	15	4.0	1,559	410.8	3,073	407.5
North Eastman	748	261.4	1,189	265.3	22	13.7	4	1.8	667	358.0	1,163	313.8
Burntwood	242	58.5	222	39.7	9	7.2	4	3.4	166	106.5	204	70.5
Churchill	15	167.4	20	165.9	s	s	0	0.0	6	226.8	18	263.6
Nor-Man	45	22.3	90	27.0	6	5.1	3	2.1	34	32.2	89	38.5
Rural South	4,858	186.4	8,746	203.7	156	10.0	96	4.8	4,444	249.5	8,565	239.0
North	302	48.3	332	36.7	15	6.2	8	2.7	207	77.8	310	58.9
Winnipeg	45,162	817.5	70,139	788.5	1,336	38.1	732	16.7	39,337	1,028.2	66,410	908.9
Manitoba	52,008	569.3	82,241	556.8	1,540	27.7	858	12.3	45,564	742.4	78,230	653.1

Note: s = suppressed

Appendix Table 1.4(Continued): Psychiatrist visits

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	246	284.9	481	267.2	117	101.6	140	153.0	150	1,009.2	124	765.9
Brandon	816	919.2	1,653	873.2	401	315.5	417	314.4	296	947.1	327	1,197.0
Central	404	292.3	660	229.3	143	73.2	248	165.1	207	732.6	166	632.4
Assiniboine	235	242.1	802	333.5	96	61.7	179	129.7	58	340.9	182	854.9
Parkland	86	121.2	278	155.2	55	53.5	74	86.3	67	316.3	96	430.9
Interlake	687	627.2	1,411	619.5	283	152.5	396	260.9	216	800.5	266	996.3
North Eastman	295	467.8	558	432.4	170	160.0	71	85.9	87	915.8	78	987.9
Burntwood	86	142.7	95	110.2	115	38.6	108	29.6	69	415.1	31	323.9
Churchill	6	446.2	10	645.4	2	33.0	11	161.8	12	2,191.8	13	2,200.0
Nor-Man	17	27.4	63	48.9	19	19.7	23	26.6	20	238.2	21	242.5
Rural South	1,953	345.6	4,190	336.8	863	100.4	1,109	158.3	785	665.8	913	756.3
North	109	87.4	168	77.6	136	34.0	142	31.0	101	395.0	66	345.7
Winnipeg	21,838	1,456.3	36,617	1,308.0	9,036	529.5	9,589	676.5	11,573	3,001.7	12,704	3,286.6
Manitoba	24,717	1,084.7	42,628	958.1	10,435	337.4	11,258	415.5	12,756	2,276.5	14,009	2,531.1

Appendix Table 1.4(Continued): Psychiatrist visits

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	66	825.1	177	1,596.3	0	0	0	0
Brandon	361	1,620.3	535	2,022.3	0	0	0	0
Central	124	719.5	263	1,095.1	0	0	0	0
Assiniboine	89	575.7	238	1,125.2	0	0	0	0
Parkland	54	366.9	134	865.9	0	0	0	0
Interlake	275	1,538.5	600	2,410.7	0	0	0	0
North Eastman	124	1,752.4	244	2,646.0	0	0	0	0
Burntwood	56	705.5	46	404.1	0	0	0	0
Churchill	s	s	9	2,150.0	0	0	0	0
Nor-Man	13	281.9	11	222.0	0	0	0	0
Rural South	731	910.6	1,656	1,564.9	0	0	0	0
North	70	543.0	65	393.7	0	0	0	0
Winnipeg	10,381	3,678.9	17,763	5,092.3	0	0	0	0
Manitoba	11,544	2,902.9	20,020	4,022.6	0	0	0	0

Note: s = suppressed

Appendix Table 1.5: All-cause hospitalization: Separation rates

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	976	259.7	1,864	312.3	451	182.1	658	209.3	740	284.2	1,596	321.3
Brandon	952	251.2	1,970	291.2	406	171.5	609	207.4	735	277.6	1,682	299.7
Central	2,077	339.9	3,811	375.5	884	243.4	1,292	279.2	1,523	358.3	3,261	379.1
Assiniboine	2,032	428.1	3,651	444.9	856	308.1	1,146	318.6	1,503	464.8	3,121	462.0
Parkland	1,253	410.6	2,327	445.2	654	308.2	905	309.9	882	427.1	1,965	460.9
Interlake	1,638	295.6	2,664	299.0	610	198.9	892	233.5	1,097	289.0	2,287	303.2
North Eastman	766	268.0	1,443	321.9	315	199.2	487	249.6	516	276.8	1,208	326.1
Burntwood	1,574	380.6	3,061	546.6	181	145.8	363	280.3	573	367.4	1,486	513.5
Churchill	36	407.1	51	427.4	9	211.0	16	455.6	16	578.0	28	422.4
Nor-Man	579	285.5	1,400	420.4	197	166.4	447	293.8	317	296.4	974	422.0
Rural South	8,743	335.4	15,759	367.0	3,768	240.8	5,380	268.2	6,260	351.5	13,438	375.0
North	2,189	350.1	4,511	498.6	387	156.8	825	289.6	905	341.0	2,488	472.2
Winnipeg	10,929	197.8	21,796	245.0	4,482	127.9	8,154	185.6	7,906	206.6	18,369	251.4
Manitoba	22,812	249.7	44,035	298.1	9,043	162.9	14,968	214.5	15,806	257.6	35,978	300.4

Appendix Table 1.5(Continued): All-cause hospitalization: Separation rates

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	292	337.8	697	387.3	282	245.4	329	358.7	53	360.2	84	519.7
Brandon	275	309.2	671	354.5	334	263.2	487	366.8	125	398.4	121	441.5
Central	604	437.1	1,401	487.0	671	343.4	676	449.9	91	321.3	102	389.3
Assiniboine	510	524.8	1,391	578.6	705	452.1	726	525.9	78	454.5	137	641.9
Parkland	354	500.2	986	550.2	444	435.0	476	555.7	101	472.1	115	514.4
Interlake	334	305.4	821	360.6	669	361.3	546	360.3	85	315.0	107	400.9
North Eastman	176	279.1	476	368.7	331	312.0	337	406.9	27	287.8	31	396.7
Burntwood	261	431.8	480	558.5	1,335	448.6	2,350	646.4	71	428.4	71	737.2
Churchill	5	400.0	11	682.7	26	426.0	36	511.0	3	474.9	4	633.3
Nor-Man	155	244.0	568	440.6	343	359.1	456	518.2	44	524.1	46	523.9
Rural South	2,270	401.8	5,772	464.0	3,103	360.9	3,092	441.4	435	368.6	576	477.5
North	421	336.2	1,059	489.2	1,704	426.8	2,843	619.7	118	460.9	121	635.6
Winnipeg	2,784	185.6	7,220	257.9	4,301	252.0	4,692	331.0	1,198	310.6	1,501	388.2
Manitoba	5,750	252.3	14,722	330.9	9,442	305.3	11,113	410.2	1,875	334.6	2,318	418.8

Appendix Table 1.5(Continued): All-cause hospitalization: Separation rates

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	39	486.6	79	716.9	1,456	90.4	1,843	147.1
Brandon	125	558.6	189	713.1	1,238	95.6	1,574	136.3
Central	92	532.9	185	768.3	3,234	109.0	4,196	168.0
Assiniboine	117	757.7	261	1,232.1	3,360	146.3	3,619	188.2
Parkland	111	752.8	160	1,034.5	1,983	145.7	2,161	203.1
Interlake	68	382.9	126	505.9	2,598	111.5	3,052	164.6
North Eastman	22	308.6	59	642.0	1,247	102.3	1,516	161.1
Burntwood	53	663.0	120	1,055.9	1,034	90.2	1,846	208.4
Churchill	1	484.8	4	1,050.0	21	66.9	57	227.8
Nor-Man	35	750.2	40	845.9	676	95.8	1,065	210.8
Rural South	449	558.7	870	821.7	13,877	117.8	16,387	171.9
North	89	690.9	165	995.2	1,731	91.9	2,968	209.6
Winnipeg	1,022	362.0	1,781	510.5	13,429	74.8	19,822	127.1
Manitoba	1,684	423.4	3,004	603.6	30,275	92.0	40,752	147.1

Appendix Table 1.6: All-cause hospitalization: Short stay days

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	4,348	1,157.6	6,819	1,142.2	1,918	774.8	2,075	659.8	3,322	1,276.1	5,950	1,197.9
Brandon	5,110	1,349.0	7,665	1,133.2	1,934	815.9	2,216	755.1	4,045	1,527.9	6,724	1,197.9
Central	9,642	1,578.0	14,682	1,447.0	4,092	1,127.0	4,868	1,051.8	7,305	1,718.7	12,618	1,466.8
Assiniboine	10,270	2,163.5	15,825	1,928.4	4,169	1,501.4	5,200	1,446.1	7,680	2,375.3	13,701	2,027.9
Parkland	6,187	2,027.3	9,618	1,840.0	3,191	1,504.8	3,626	1,241.8	4,375	2,119.3	8,245	1,933.9
Interlake	7,498	1,352.9	9,844	1,105.2	2,680	874.5	3,213	841.0	5,095	1,342.6	8,410	1,115.2
North Eastman	3,435	1,201.1	5,019	1,120.0	1,369	866.7	1,729	885.5	2,338	1,253.9	4,322	1,166.1
Burntwood	5,230	1,264.7	8,347	1,490.8	577	464.6	1,098	848.2	1,912	1,227.1	4,254	1,470.3
Churchill	135	1,531.3	148	1,241.9	36	825.7	67	1,932.2	56	2,063.1	90	1,350.9
Nor-Man	2,281	1,123.8	4,360	1,309.4	816	689.4	1,307	859.7	1,171	1,096.2	3,144	1,362.1
Rural South	41,381	1,587.4	61,807	1,439.4	17,419	1,113.2	20,711	1,032.3	30,115	1,690.8	53,246	1,485.8
North	7,646	1,222.8	12,855	1,420.8	1,429	578.7	2,472	867.5	3,140	1,183.0	7,489	1,421.4
Winnipeg	52,376	948.1	78,447	881.9	18,081	516.2	26,320	599.2	37,817	988.5	66,959	916.4
Manitoba	106,513	1,166.0	160,774	1,088.5	38,863	700.0	51,719	741.2	75,117	1,224.0	134,418	1,122.2

Appendix Table 1.6(Continued): All-cause hospitalization: Short stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	1,299	1,502.2	2,619	1,455.1	1,180	1,025.6	1,171	1,276.1	302	2,035.9	507	3,134.2
Brandon	1,460	1,643.8	2,704	1,428.3	1,759	1,385.3	1,807	1,361.9	879	2,811.2	744	2,723.4
Central	2,691	1,948.2	5,554	1,930.9	2,875	1,470.3	2,415	1,606.5	466	1,649.9	559	2,130.3
Assiniboine	2,373	2,440.6	6,116	2,543.4	3,451	2,212.1	2,784	2,015.2	498	2,915.8	822	3,858.8
Parkland	1,755	2,480.0	4,046	2,257.9	2,187	2,143.1	1,827	2,131.4	622	2,920.8	680	3,051.1
Interlake	1,454	1,327.8	3,055	1,341.3	3,046	1,644.1	2,005	1,322.2	452	1,676.6	548	2,049.5
North Eastman	758	1,204.2	1,713	1,327.9	1,493	1,408.6	1,056	1,274.7	178	1,865.3	179	2,258.8
Burntwood	866	1,433.7	1,398	1,627.9	4,428	1,487.7	6,424	1,766.7	314	1,895.8	271	2,811.7
Churchill	15	1,123.1	46	2,830.0	97	1,608.4	114	1,620.9	10	1,899.5	30	5,066.7
Nor-Man	517	813.7	1,619	1,255.9	1,412	1,476.2	1,412	1,602.7	205	2,441.7	198	2,262.6
Rural South	10,331	1,828.1	23,103	1,857.1	14,232	1,655.1	11,257	1,607.2	2,518	2,134.7	3,295	2,730.6
North	1,398	1,116.0	3,063	1,415.2	5,937	1,486.8	7,950	1,733.0	530	2,075.5	499	2,630.0
Winnipeg	12,564	837.9	25,665	916.8	22,590	1,323.7	18,646	1,315.3	8,001	2,075.1	9,174	2,373.3
Manitoba	25,753	1,130.2	54,535	1,225.7	44,519	1,439.4	39,660	1,463.8	11,928	2,128.7	13,712	2,477.3

Appendix Table 1.6(Continued): All-cause hospitalization: Short stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	211	2,651.0	399	3,602.5	4,741	294.4	5,743	458.5
Brandon	789	3,535.6	1,027	3,880.0	4,933	380.8	5,264	455.9
Central	517	2,996.0	845	3,514.0	11,394	384.0	13,020	521.3
Assiniboine	748	4,863.3	1,419	6,709.8	13,832	602.4	13,501	701.9
Parkland	668	4,523.8	863	5,593.6	8,745	642.8	8,433	792.3
Interlake	349	1,956.1	569	2,283.8	9,890	424.3	9,870	532.2
North Eastman	138	1,953.4	231	2,505.1	4,749	389.8	4,732	503.0
Burntwood	197	2,469.4	385	3,383.7	3,094	269.9	5,141	580.3
Churchill	3	1,131.3	20	5,000.0	72	230.3	181	726.8
Nor-Man	131	2,849.1	160	3,341.8	2,683	380.6	3,385	670.0
Rural South	2,633	3,277.5	4,326	4,087.7	53,350	452.8	55,298	580.1
North	332	2,579.9	565	3,410.6	5,848	310.7	8,708	614.9
Winnipeg	6,288	2,228.3	9,645	2,765.1	48,324	269.0	59,382	380.8
Manitoba	10,041	2,524.9	15,563	3,127.1	112,456	341.6	128,652	464.5

Appendix Table 1.7: All-cause hospitalization: Long stay days

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	3,708	987.1	4,738	793.7	2,099	848.1	1,544	490.9	2,789	1,071.3	4,319	869.5
Brandon	7,355	1,941.4	10,607	1,568.0	3,422	1,444.0	5,870	1,999.8	5,710	2,157.0	9,587	1,707.9
Central	10,322	1,689.2	11,956	1,178.3	5,272	1,451.9	6,554	1,416.1	8,275	1,946.8	10,788	1,254.1
Assiniboine	9,612	2,025.0	13,978	1,703.3	5,467	1,968.9	8,884	2,470.5	7,130	2,205.2	11,665	1,726.6
Parkland	5,250	1,720.1	6,162	1,178.8	3,299	1,555.9	4,081	1,397.7	3,845	1,862.6	5,347	1,254.2
Interlake	6,276	1,132.3	5,276	592.3	2,754	898.5	2,373	621.1	4,612	1,215.2	4,421	586.2
North Eastman	3,196	1,117.8	3,258	727.0	2,001	1,267.2	2,422	1,240.0	2,260	1,212.2	2,703	729.4
Burntwood	2,812	679.9	1,706	304.7	758	610.1	289	223.6	1,389	891.3	1,348	465.9
Churchill	73	830.1	95	794.4	0	0.0	866	24,979.7	59	2,143.6	77	1,150.2
Nor-Man	2,647	1,304.3	2,235	671.2	850	717.8	1,176	773.7	1,687	1,579.1	1,521	658.8
Rural South	38,364	1,471.7	45,368	1,056.6	20,892	1,335.2	25,858	1,288.8	28,910	1,623.2	39,244	1,095.1
North	5,532	884.7	4,036	446.0	1,608	650.9	2,332	818.5	3,134	1,181.1	2,946	559.1
Winnipeg	105,995	1,918.7	156,956	1,764.4	45,349	1,294.6	68,940	1,569.4	76,781	2,006.9	136,253	1,864.8
Manitoba	157,246	1,721.3	216,966	1,468.9	71,271	1,283.8	102,999	1,476.2	114,535	1,866.3	188,030	1,569.7

Appendix Table 1.7(Continued): All-cause hospitalization: Long stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	579	669.6	1,530	850.0	817	710.4	852	928.5	740	4,994.7	527	3,257.9
Brandon	1,243	1,399.5	2,416	1,275.9	2,170	1,708.6	1,303	981.6	1,430	4,572.3	1,418	5,192.0
Central	1,606	1,162.4	3,282	1,141.1	2,428	1,241.5	1,456	968.7	802	2,837.5	761	2,898.3
Assiniboine	1,310	1,347.2	3,270	1,360.0	2,068	1,325.4	1,356	981.8	691	4,048.7	1,840	8,632.6
Parkland	711	1,004.9	1,641	916.0	1,491	1,461.7	607	708.7	1,166	5,470.9	763	3,422.7
Interlake	835	762.7	1,803	791.5	1,766	953.2	1,047	690.6	698	2,587.6	651	2,434.7
North Eastman	420	666.9	786	609.0	1,131	1,066.4	636	767.4	314	3,302.1	313	3,954.2
Burntwood	325	538.1	364	424.1	2,403	807.3	971	267.2	558	3,369.3	296	3,069.2
Churchill	21	1,584.6	62	3,835.4	20	336.9	95	1,345.6	39	7,050.1	62	10,300.0
Nor-Man	352	554.3	826	641.0	1,315	1,375.4	533	604.9	418	4,978.6	232	2,653.8
Rural South	5,461	966.4	12,312	989.7	9,701	1,128.1	5,955	850.2	4,412	3,739.9	4,854	4,022.7
North	698	557.2	1,252	578.7	3,739	936.2	1,599	348.6	1,015	3,977.8	589	3,106.5
Winnipeg	15,386	1,026.0	38,146	1,362.6	37,471	2,195.7	26,862	1,894.9	26,562	6,889.2	30,323	7,844.7
Manitoba	22,788	1,000.0	54,126	1,216.5	53,080	1,716.2	35,718	1,318.3	33,419	5,964.3	37,185	6,718.2

Appendix Table 1.7(Continued): All-cause hospitalization: Long stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	163	2,039.0	357	3,221.5	1,797	111.6	2,076	165.7
Brandon	1,705	7,642.3	1,725	6,514.2	3,895	300.6	4,041	350.0
Central	944	5,470.7	738	3,066.6	5,047	170.1	7,330	293.5
Assiniboine	1,371	8,909.1	1,107	5,232.8	6,711	292.3	9,767	507.8
Parkland	802	5,429.7	602	3,899.3	3,281	241.2	5,039	473.4
Interlake	375	2,098.3	751	3,016.2	3,811	163.5	4,685	252.6
North Eastman	147	2,078.0	185	2,008.4	2,654	217.8	2,672	284.0
Burntwood	35	432.8	254	2,234.7	1,216	106.1	803	90.6
Churchill	12	4,767.5	62	15,450.0	59	191.1	48	191.7
Nor-Man	361	7,818.8	143	2,990.1	1,920	272.3	4,276	846.3
Rural South	3,802	4,732.9	3,739	3,533.1	23,302	197.8	31,568	331.1
North	407	3,166.5	459	2,771.7	3,195	169.7	5,126	362.0
Winnipeg	15,156	5,371.0	23,066	6,612.7	41,903	233.3	58,863	377.5
Manitoba	21,070	5,298.2	28,989	5,824.7	72,294	219.6	99,598	359.6

Appendix Table 1.8: Hospitalization for mental illness: Separation rates

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	90	24.0	120	20.1	9	3.8	6	1.9	74	28.4	111	22.4
Brandon	168	44.3	181	26.8	9	3.7	10	3.5	142	53.6	171	30.5
Central	206	33.7	241	23.7	26	7.2	27	5.9	139	32.8	216	25.1
Assiniboine	250	52.6	376	45.8	27	9.7	31	8.7	186	57.5	352	52.1
Parkland	156	51.2	205	39.1	22	10.2	21	7.1	117	56.6	183	43.0
Interlake	149	26.9	159	17.9	14	4.4	13	3.3	99	26.0	143	18.9
North Eastman	69	24.1	96	21.4	8	5.2	8	4.2	49	26.3	89	24.1
Burntwood	193	46.6	177	31.6	4	2.9	3	2.2	124	79.6	147	50.9
Churchill	6	70.1	6	53.6	0	0.0	s	s	3	109.7	5	74.9
Nor-Man	84	41.2	89	26.7	3	2.2	4	2.5	61	57.1	70	30.2
Rural South	920	35.3	1,196	27.9	106	6.8	106	5.3	664	37.3	1,094	30.5
North	282	45.2	272	30.1	6	2.5	7	2.4	188	70.8	222	42.2
Winnipeg	1,521	27.5	1,765	19.8	84	2.4	120	2.7	1,187	31.0	1,617	22.1
Manitoba	2,891	31.6	3,415	23.1	205	3.7	243	3.5	2,181	35.5	3,104	25.9

Note: s = suppressed

Appendix Table 1.8(Continued): Hospitalization for mental illness: Separation rates

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	36	42.1	67	37.5	43	37.7	36	39.0	15	103.9	22	137.3
Brandon	65	73.6	99	52.1	100	78.7	66	50.0	55	176.5	47	170.6
Central	77	56.0	139	48.5	113	58.0	79	52.8	30	107.6	26	99.0
Assiniboine	103	106.1	239	99.4	141	90.1	126	90.9	26	153.5	50	232.7
Parkland	61	86.8	122	68.2	89	87.2	69	80.0	45	211.2	44	195.7
Interlake	48	44.2	80	35.1	95	51.2	65	43.1	21	79.3	26	98.0
North Eastman	25	40.3	50	39.1	40	37.4	32	38.4	12	128.1	11	144.0
Burntwood	74	122.2	69	80.6	175	58.7	145	39.8	42	254.6	29	297.0
Churchill	2	153.8	3	198.6	4	72.7	6	82.3	2	328.8	3	433.3
Nor-Man	38	60.1	45	34.7	65	68.0	49	55.2	28	331.1	20	231.1
Rural South	352	62.3	698	56.1	521	60.6	407	58.1	151	127.7	179	148.4
North	114	91.0	117	54.2	244	61.2	199	43.4	72	281.4	51	270.9
Winnipeg	498	33.2	826	29.5	888	52.1	664	46.8	675	175.1	678	175.3
Manitoba	1,030	45.2	1,740	39.1	1,753	56.7	1,336	49.3	953	170.0	955	172.5

Appendix Table 1.8(Continued): Hospitalization for mental illness: Separation rates

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	17	213.2	28	251.0	0	0	0	0
Brandon	62	279.8	75	284.8	0	0	0	0
Central	28	164.5	53	221.2	0	0	0	0
Assiniboine	47	302.8	112	531.4	0	0	0	0
Parkland	53	358.8	63	410.9	0	0	0	0
Interlake	20	113.1	40	159.8	0	0	0	0
North Eastman	7	104.7	13	136.6	0	0	0	0
Burntwood	22	270.2	40	349.6	0	0	0	0
Churchill	s	s	2	600.0	0	0	0	0
Nor-Man	20	425.0	11	238.7	0	0	0	0
Rural South	173	214.9	309	292.2	0	0	0	0
North	42	323.7	54	323.7	0	0	0	0
Winnipeg	495	175.5	704	201.8	0	0	0	0
Manitoba	772	194.1	1,142	229.5	0	0	0	0

Note: s = suppressed

Appendix Table 1.9: Hospitalization for mental illness: Short stay days

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	517	137.7	752	126.0	74	29.7	53	17.0	432	165.9	718	144.5
Brandon	1,162	306.6	1,341	198.3	67	28.3	30	10.3	1,004	379.2	1,277	227.6
Central	1,009	165.1	1,430	140.9	228	62.8	202	43.7	746	175.4	1,326	154.1
Assiniboine	1,574	331.6	2,362	287.8	194	70.0	220	61.3	1,260	389.7	2,233	330.6
Parkland	917	300.5	1,253	239.6	102	48.0	82	28.2	720	349.0	1,136	266.5
Interlake	838	151.2	965	108.3	74	24.1	79	20.7	637	167.9	886	117.5
North Eastman	405	141.7	524	117.0	60	38.1	53	27.2	288	154.7	498	134.4
Burntwood	714	172.6	730	130.4	8	6.4	10	7.9	512	328.8	643	222.1
Churchill	25	287.3	33	278.2	0	0.0	0	0.0	14	504.8	29	434.3
Nor-Man	349	171.9	382	114.6	11	9.5	11	7.5	261	244.3	329	142.5
Rural South	5,261	201.8	7,286	169.7	732	46.8	691	34.4	4,084	229.3	6,797	189.7
North	1,088	174.0	1,145	126.5	19	7.8	22	7.6	787	296.6	1,001	189.9
Winnipeg	10,710	193.9	13,028	146.5	376	10.7	488	11.1	8,569	224.0	12,130	166.0
Manitoba	18,220	199.4	22,799	154.4	1,194	21.5	1,231	17.6	14,444	235.4	21,206	177.0

Appendix Table 1.9(Continued): Hospitalization for mental illness: Short stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	215	248.6	400	222.2	220	191.3	199	216.6	104	700.2	167	1,033.2
Brandon	441	496.1	647	341.7	665	523.7	442	332.9	435	1,392.2	375	1,374.1
Central	343	248.6	759	264.0	493	251.9	425	283.0	191	675.9	178	678.1
Assiniboine	616	634.0	1,407	584.9	743	476.5	672	486.8	220	1,287.5	369	1,731.4
Parkland	362	510.9	666	371.8	493	483.6	368	428.9	329	1,542.1	316	1,416.5
Interlake	274	250.4	436	191.6	469	253.3	363	239.4	142	524.8	174	650.0
North Eastman	160	253.7	261	202.2	236	222.8	137	164.8	109	1,140.6	86	1,091.5
Burntwood	303	502.3	304	353.5	634	213.1	575	158.2	209	1,259.9	148	1,532.5
Churchill	7	538.5	18	1,141.9	16	257.6	30	420.1	8	1,497.7	17	2,900.0
Nor-Man	157	247.7	174	135.1	253	265.0	183	208.2	149	1,772.3	103	1,175.9
Rural South	1,970	348.7	3,929	315.8	2,655	308.7	2,164	308.9	1,093	926.9	1,290	1,069.0
North	468	373.5	496	229.3	903	226.2	788	171.8	366	1,433.6	268	1,411.5
Winnipeg	3,454	230.4	6,233	222.6	5,901	345.8	4,596	324.2	5,271	1,367.1	5,415	1,401.0
Manitoba	6,333	277.9	11,305	254.1	10,124	327.3	7,990	294.9	7,166	1,278.8	7,348	1,327.6

Appendix Table 1.9(Continued): Hospitalization for mental illness: Short stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	113	1,412.0	191	1,722.7	0	0	0	0
Brandon	463	2,074.9	522	1,971.0	0	0	0	0
Central	177	1,023.0	326	1,355.4	0	0	0	0
Assiniboine	367	2,384.9	742	3,506.2	0	0	0	0
Parkland	344	2,326.2	430	2,785.8	0	0	0	0
Interlake	138	770.4	289	1,161.2	0	0	0	0
North Eastman	68	968.2	90	973.8	0	0	0	0
Burntwood	101	1,266.0	182	1,600.5	0	0	0	0
Churchill	s	s	17	4,250.0	0	0	0	0
Nor-Man	80	1,734.6	54	1,130.7	0	0	0	0
Rural South	1,206	1,501.2	2,067	1,953.2	0	0	0	0
North	182	1,414.4	253	1,529.0	0	0	0	0
Winnipeg	3,856	1,366.3	5,580	1,599.6	0	0	0	0
Manitoba	5,706	1,434.8	8,422	1,692.2	0	0	0	0

Note: s = suppressed

Appendix Table 1.10: Hospitalization for mental illness: Long stay days

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	916	243.8	1,047	175.5	108	43.6	105	33.3	601	230.8	1,019	205.1
Brandon	2,470	652.1	3,475	513.8	495	208.9	1,451	494.4	1,895	715.7	3,095	551.4
Central	2,098	343.4	1,955	192.7	823	226.5	764	165.1	1,636	385.0	1,804	209.8
Assiniboine	1,537	323.7	3,017	367.7	625	225.1	1,759	489.0	1,024	316.8	2,688	397.9
Parkland	1,342	439.8	1,546	295.7	732	345.2	859	294.3	901	436.3	1,307	306.6
Interlake	778	140.3	995	111.7	406	132.6	367	96.2	642	169.2	882	117.0
North Eastman	803	280.7	684	152.7	259	164.3	334	171.2	586	314.2	618	166.7
Burntwood	699	168.9	353	63.1	210	169.3	0	0.0	379	243.5	341	117.8
Churchill	39	436.6	74	616.7	0	0.0	583	16,807.0	32	1,185.2	62	925.6
Nor-Man	408	201.3	618	185.6	62	52.4	285	187.7	281	262.9	336	145.5
Rural South	7,474	286.7	9,244	215.3	2,953	188.7	4,188	208.8	5,390	302.6	8,318	232.1
North	1,146	183.2	1,045	115.5	272	110.3	868	304.7	693	261.0	739	140.2
Winnipeg	33,192	600.8	43,260	486.3	5,565	158.9	8,004	182.2	23,751	620.8	38,086	521.2
Manitoba	44,281	484.7	57,024	386.1	9,286	167.3	14,512	208.0	31,728	517.0	50,237	419.4

Appendix Table 1.10(Continued): Hospitalization for mental illness: Long stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	120	138.5	401	222.7	272	236.7	308	335.9	484	3,266.4	377	2,332.4
Brandon	636	716.5	1,251	660.8	1,080	850.6	501	377.9	968	3,094.5	923	3,377.1
Central	499	361.4	604	209.9	490	250.5	398	264.5	459	1,624.4	206	783.3
Assiniboine	396	407.7	1,071	445.2	419	268.7	464	335.6	432	2,530.4	564	2,648.2
Parkland	364	514.0	545	304.2	637	624.7	182	212.4	674	3,164.8	534	2,398.5
Interlake	218	198.9	523	229.6	196	105.7	238	157.1	264	977.7	272	1,018.0
North Eastman	141	224.5	224	173.9	211	199.2	221	266.9	243	2,552.2	124	1,561.5
Burntwood	168	278.5	174	203.1	689	231.4	278	76.5	489	2,953.0	240	2,489.8
Churchill	21	1,584.6	62	3,835.4	12	194.9	74	1,044.7	39	7,050.1	62	10,300.0
Nor-Man	89	139.8	255	197.8	285	298.5	298	338.1	337	4,018.6	148	1,688.4
Rural South	1,738	307.6	3,368	270.7	2,226	258.8	1,811	258.5	2,556	2,167.1	2,077	1,721.5
North	278	221.7	491	227.0	986	246.9	650	141.6	865	3,391.5	449	2,367.5
Winnipeg	6,799	453.4	14,297	510.7	12,574	736.8	8,395	592.2	19,431	5,039.7	19,552	5,058.0
Manitoba	9,452	414.8	19,407	436.2	16,866	545.3	11,357	419.2	23,821	4,251.3	23,001	4,155.5

Appendix Table 1.10(Continued): Hospitalization for mental illness: Long stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	52	649.6	304	2,741.2	0	0	0	0
Brandon	903	4,047.6	1,052	3,972.1	0	0	0	0
Central	265	1,536.2	373	1,550.0	0	0	0	0
Assiniboine	533	3,461.0	543	2,568.2	0	0	0	0
Parkland	612	4,143.3	365	2,364.5	0	0	0	0
Interlake	132	736.8	244	981.3	0	0	0	0
North Eastman	37	520.9	90	971.7	0	0	0	0
Burntwood	8	100.1	201	1,765.6	0	0	0	0
Churchill	12	4,767.5	62	15,450.0	0	0	0	0
Nor-Man	230	4,982.7	53	1,118.1	0	0	0	0
Rural South	1,630	2,029.3	1,918	1,812.6	0	0	0	0
North	250	1,941.9	316	1,909.4	0	0	0	0
Winnipeg	8,718	3,089.3	13,532	3,879.4	0	0	0	0
Manitoba	11,500	2,891.9	16,818	3,379.3	0	0	0	0

Appendix Table 1.11: Mental health centre use: Separation rates

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	15	4.0	15	2.5	s	s	s	s	11	4.2	14	2.8
Brandon	2	0.4	1	0.1	s	s	s	s	s	s	s	s
Central	66	10.8	63	6.2	2	0.6	s	s	40	9.3	57	6.6
Assiniboine	2	0.5	5	0.6	0	0.0	0	0.0	2	0.7	5	0.8
Parkland	2	0.6	s	s	0	0.0	0	0.0	1	0.6	s	s
Interlake	51	9.2	47	5.3	4	1.2	s	s	36	9.5	38	5.0
North Eastman	17	5.9	17	3.9	0	0.0	s	s	12	6.3	17	4.5
Burntwood	29	7.1	19	3.5	s	s	0	0.0	21	13.5	16	5.4
Churchill	s	s	1	11.7	0	0.0	0	0.0	s	s	s	s
Nor-Man	13	6.3	12	3.5	s	s	s	s	9	8.1	9	4.0
Rural South	153	5.9	149	3.5	6	0.4	3	0.1	102	5.7	131	3.6
North	43	6.8	32	3.6	1	0.2	s	s	30	11.4	25	4.8
Winnipeg	29	0.5	25	0.3	1	0.0	0	0.0	19	0.5	20	0.3
Manitoba	226	2.5	207	1.4	8	0.2	3	0.0	152	2.5	177	1.5

Note: s = suppressed

Appendix Table 1.11(Continued): Mental health centre use: Separation rates

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	3	3.5	6	3.1	6	4.9	3	3.7	8	55.3	7	43.3
Brandon	s	s	s	s	s	s	s	s	1	4.5	s	s
Central	13	9.1	26	9.0	20	10.0	17	11.4	38	135.9	25	93.7
Assiniboine	s	s	1	0.6	s	s	s	s	s	s	s	s
Parkland	s	s	0	0.0	s	s	s	s	s	s	1	3.6
Interlake	12	11.0	12	5.4	22	11.9	12	8.2	29	106.7	25	93.5
North Eastman	5	7.6	8	5.9	9	8.5	6	7.7	6	65.1	6	70.7
Burntwood	6	10.6	6	6.5	22	7.5	15	4.2	14	82.1	7	72.7
Churchill	s	s	0	0.0	0	6.6	s	s	s	s	s	s
Nor-Man	5	8.2	5	4.0	9	9.6	4	4.8	7	85.8	6	70.9
Rural South	33	5.9	53	4.2	57	6.7	40	5.7	84	70.9	63	52.5
North	12	9.4	11	5.0	32	8.0	20	4.3	21	83.1	14	74.8
Winnipeg	9	0.6	6	0.2	12	0.7	6	0.4	22	5.6	17	4.3
Manitoba	54	2.4	70	1.6	101	3.3	66	2.4	128	22.8	95	17.1

Note: s = suppressed

Appendix Table 1.11(Continued): Mental health centre use: Separation rates

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	3	35.1	3	25.3	0	0	0	0
Brandon	s	s	0	0.0	0	0	0	0
Central	7	41.7	16	66.5	0	0	0	0
Assiniboine	s	s	2	8.5	0	0	0	0
Parkland	s	s	0	0.0	0	0	0	0
Interlake	13	73.9	17	69.1	0	0	0	0
North Eastman	2	22.6	5	56.4	0	0	0	0
Burntwood	4	52.5	5	42.2	0	0	0	0
Churchill	0	0.0	0	0.0	0	0	0	0
Nor-Man	4	91.1	3	71.2	0	0	0	0
Rural South	26	32.4	43	40.6	0	0	0	0
North	8	65.4	8	49.5	0	0	0	0
Winnipeg	9	3.3	10	2.9	0	0	0	0
Manitoba	44	11.1	61	12.3	0	0	0	0

Appendix Table 1.12: Mental health centre use: Short stay days

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	113	30.2	122	20.4	0	0.0	0	0.0	97	37.4	122	24.6
Brandon	1	0.4	5	0.7	0	0.0	0	0.0	1	0.5	5	0.8
Central	418	68.5	448	44.1	8	2.3	s	s	270	63.6	416	48.4
Assiniboine	21	4.5	34	4.2	0	0.0	0	0.0	21	6.6	34	5.1
Parkland	8	2.6	13	2.4	0	0.0	0	0.0	8	3.9	7	1.7
Interlake	274	49.5	277	31.1	6	2.1	0	0.0	212	55.9	258	34.3
North Eastman	101	35.2	117	26.0	0	0.0	4	2.2	70	37.5	108	29.1
Burntwood	202	48.8	168	30.0	5	4.2	0	0.0	162	104.2	141	48.8
Churchill	3	36.2	6	50.3	0	0.0	0	0.0	3	117.1	s	s
Nor-Man	106	52.2	58	17.4	2	1.4	3	2.0	67	62.3	48	21.0
Rural South	936	35.9	1,010	23.5	15	0.9	5	0.2	679	38.1	946	26.4
North	311	49.8	232	25.6	7	2.8	3	1.1	232	87.5	190	36.1
Winnipeg	134	2.4	148	1.7	7	0.2	0	0.0	107	2.8	130	1.8
Manitoba	1,382	15.1	1,395	9.4	28	0.5	8	0.1	1,019	16.6	1,271	10.6

Appendix Table 1.12(Continued): Mental health centre use: Short stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	34	39.8	57	31.8	49	42.4	29	31.2	48	322.5	52	322.9
Brandon	1	1.6	4	1.9	0	0.0	0	0.0	1	4.5	s	s
Central	80	57.8	162	56.2	124	63.2	163	108.7	226	800.5	165	627.1
Assiniboine	4	4.1	14	5.9	6	3.7	6	4.1	8	45.7	0	0.0
Parkland	2	2.3	0	0.0	2	1.6	4	4.7	7	33.8	9	39.5
Interlake	61	55.9	83	36.3	135	72.9	81	53.6	161	597.4	115	430.1
North Eastman	24	37.5	41	31.9	51	48.3	48	57.7	45	474.7	31	396.7
Burntwood	56	92.4	61	71.3	152	51.1	127	34.8	101	610.6	67	693.6
Churchill	s	s	0	0.0	2	36.3	0	0.0	s	s	5	900.0
Nor-Man	32	50.4	31	23.7	84	88.1	21	23.8	72	857.6	28	320.3
Rural South	205	36.2	357	28.7	366	42.6	331	47.2	495	419.9	372	308.3
North	89	70.9	92	42.4	238	59.7	148	32.2	174	682.7	100	528.1
Winnipeg	57	3.8	31	1.1	57	3.3	37	2.6	95	24.6	109	28.2
Manitoba	352	15.5	483	10.9	661	21.4	516	19.0	766	136.7	582	105.2

Note: s = suppressed

Appendix Table 1.12(Continued): Mental health centre use: Short stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	21	260.8	24	214.9	0	0	0	0
Brandon	0	0.0	0	0.0	0	0	0	0
Central	54	314.0	107	446.5	0	0	0	0
Assiniboine	0	0.0	9	41.6	0	0	0	0
Parkland	2	10.8	0	0.0	0	0	0	0
Interlake	63	354.9	105	420.8	0	0	0	0
North Eastman	6	84.9	27	290.6	0	0	0	0
Burntwood	31	390.3	46	407.6	0	0	0	0
Churchill	0	0.0	0	0.0	0	0	0	0
Nor-Man	26	572.4	23	481.6	0	0	0	0
Rural South	146	181.8	272	256.6	0	0	0	0
North	58	448.1	69	419.1	0	0	0	0
Winnipeg	37	13.3	48	13.6	0	0	0	0
Manitoba	241	60.6	389	78.1	0	0	0	0

Appendix Table 1.13: Mental health centre use: Long stay days

	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	1,349	359.2	722	120.9	28	11.5	75	24.0	334	128.4	327	65.8
Brandon	950	250.8	138	20.4	101	42.5	365	124.4	272	102.7	0	0.0
Central	5,463	894.1	4,576	451.0	547	150.6	196	42.3	2,270	534.0	3,585	416.8
Assiniboine	51	10.8	211	25.7	0	0.0	0	0.0	51	15.8	211	31.3
Parkland	537	176.0	31	5.9	0	0.0	0	0.0	66	32.1	16	3.7
Interlake	14,845	2,678.5	11,417	1,281.7	3,264	1,065.0	1,079	282.5	3,240	853.9	2,560	339.4
North Eastman	1,727	603.8	399	89.1	0	0.0	0	0.0	825	442.5	399	107.8
Burntwood	1,815	438.8	397	70.9	0	0.0	0	0.0	396	254.0	365	126.0
Churchill	10	113.1	70	584.9	0	0.0	0	0.0	0	0.0	11	161.8
Nor-Man	608	299.8	334	100.2	0	0.0	0	0.0	343	321.1	226	97.8
Rural South	23,973	919.6	17,356	404.2	3,840	245.4	1,350	67.3	6,787	381.1	7,098	198.1
North	2,433	389.1	800	88.4	0	0.0	0	0.0	739	278.4	601	114.1
Winnipeg	11,261	203.8	5,418	60.9	959	27.4	0	0.0	2,595	67.8	2,664	36.5
Manitoba	38,617	422.7	23,712	160.5	4,899	88.3	1,715	24.6	10,392	169.3	10,363	86.5

Appendix Table 1.13(Continued): Mental health centre use: Long stay days

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	14	16.4	64	35.5	121	104.9	30	32.9	1,252	8,448.7	536	3,317.3
Brandon	88	98.6	0	0.0	121	95.4	138	103.8	937	2,996.0	138	504.4
Central	1,404	1,016.6	1,203	418.4	1,908	975.6	550	365.7	4,236	14,990.9	3,082	11,739.6
Assiniboine	12	11.9	44	18.5	0	0.0	0	0.0	28	166.4	19	87.3
Parkland	15	21.2	0	0.0	238	232.9	0	0.0	66	310.7	31	137.3
Interlake	789	720.3	167	73.5	2,103	1,134.9	528	348.3	12,944	47,971.7	9,887	36,976.8
North Eastman	190	302.0	249	192.7	972	916.4	81	97.7	640	6,726.0	229	2,890.5
Burntwood	51	85.1	108	125.5	1,016	341.3	293	80.5	1,684	10,163.5	259	2,691.3
Churchill	0	0.0	0	0.0	0	0.0	17	235.6	10	1,826.5	53	8,866.7
Nor-Man	118	186.4	88	68.6	152	158.5	100	113.5	574	6,831.9	217	2,484.5
Rural South	2,424	429.0	1,728	138.9	5,340	621.0	1,189	169.8	19,168	16,248.3	13,783	11,422.8
North	170	135.6	196	90.7	1,167	292.3	409	89.2	2,268	8,888.3	530	2,791.3
Winnipeg	543	36.2	266	9.5	3,663	214.7	292	20.6	10,508	2,725.3	5,113	1,322.6
Manitoba	3,224	141.5	2,190	49.2	10,292	332.8	2,028	74.8	32,880	5,868.1	19,563	3,534.4

Appendix Table 1.13(Continued): Mental health centre use: Long stay days

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	124	1,557.5	44	400.9	0	0	0	0
Brandon	134	601.7	0	0.0	0	0	0	0
Central	415	2,402.8	917	3,814.2	0	0	0	0
Assiniboine	11	72.8	68	323.4	0	0	0	0
Parkland	300	2,028.3	0	0.0	0	0	0	0
Interlake	1,930	10,806.2	1,487	5,971.4	0	0	0	0
North Eastman	8	116.1	94	1,019.4	0	0	0	0
Burntwood	85	1,065.8	89	785.3	0	0	0	0
Churchill	0	0.0	0	0.0	0	0	0	0
Nor-Man	259	5,620.2	38	799.9	0	0	0	0
Rural South	2,788	3,471.2	2,611	2,467.4	0	0	0	0
North	344	2,679.5	128	770.5	0	0	0	0
Winnipeg	580	205.5	1,530	438.6	0	0	0	0
Manitoba	3,847	967.3	4,269	857.8	0	0	0	0

Appendix Table 1.14: Home care use: Prevalence (open cases)

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	168	44.8	335	56.2	110	44.2	127	40.0	133	50.9	291	58.5
Brandon	168	44.2	328	48.5	106	44.5	164	55.4	128	48.3	284	50.7
Central	320	52.4	590	58.1	220	59.9	289	61.5	246	57.9	509	59.2
Assiniboine	275	58.0	580	70.7	191	67.4	302	82.0	219	67.7	511	75.7
Parkland	209	68.6	394	75.3	177	82.4	270	91.4	148	71.9	343	80.4
Interlake	293	52.9	515	57.8	156	50.3	211	54.7	211	55.5	455	60.4
North Eastman	122	42.8	202	45.1	76	47.8	120	60.9	89	48.0	174	46.9
Burntwood	78	18.8	102	18.2	9	6.9	22	16.8	36	23.0	66	22.7
Churchill	7	74.6	5	40.2	s	s	2	57.7	1	43.9	2	27.0
Nor-Man	65	32.2	116	34.8	37	30.9	59	38.4	38	35.2	90	39.0
Rural South	1,389	53.3	2,615	60.9	931	58.7	1,319	64.9	1,046	58.8	2,283	63.7
North	150	23.9	223	24.6	46	18.6	83	28.8	75	28.1	157	29.9
Winnipeg	2,641	47.8	5,367	60.3	1,455	41.3	2,602	58.9	1,937	50.6	4,644	63.6
Manitoba	4,347	47.6	8,534	57.8	2,538	45.4	4,168	59.2	3,186	51.9	7,369	61.5

Note: s = suppressed

Appendix Table 1.14(Continued): Home care use: Prevalence (open cases)

RHA	Dementia				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	114	393.6	153	397.2	200	12.4	316	25.2
Brandon	118	342.9	193	339.8	163	12.6	235	20.4
Central	268	363.9	396	370.5	348	11.7	507	20.3
Assiniboine	230	332.2	392	352.5	377	16.4	523	27.2
Parkland	199	408.2	283	434.1	310	22.8	506	47.5
Interlake	171	329.4	253	404.6	413	17.7	556	30.0
North Eastman	93	386.7	140	456.3	166	13.6	197	20.9
Burntwood	16	173.3	15	186.5	47	4.1	61	6.9
Churchill	s	s	3	456.7	s	s	6	23.3
Nor-Man	37	324.8	43	335.9	98	13.9	133	26.4
Rural South	1,074	362.5	1,617	389.6	1,814	15.4	2,605	27.3
North	54	254.9	61	283.8	145	7.7	201	14.2
Winnipeg	1,873	391.2	3,658	407.3	2,495	13.9	4,118	26.4
Manitoba	3,119	375.5	5,529	397.4	4,617	14.0	7,160	25.8

Appendix Table 1.15: Home care use: Incidence (new cases)

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	73	19.3	112	18.8	39	15.8	43	13.6	56	21.4	97	19.6
Brandon	94	24.9	163	24.1	54	22.7	76	25.5	70	26.6	139	24.7
Central	141	23.1	250	24.7	89	24.4	111	23.5	105	24.6	218	25.3
Assiniboine	131	27.7	230	28.1	90	32.0	108	29.3	101	31.4	198	29.4
Parkland	94	30.7	141	27.0	68	31.6	86	29.2	65	31.4	118	27.8
Interlake	126	22.8	180	20.2	62	20.1	70	18.1	88	23.3	157	20.9
North Eastman	52	18.1	73	16.2	30	19.0	38	19.2	37	19.7	63	16.9
Burntwood	52	12.5	57	10.2	4	3.5	11	8.6	23	14.9	33	11.5
Churchill	3	29.4	3	23.5	s	s	s	s	s	s	1	21.0
Nor-Man	25	12.5	49	14.8	15	12.3	21	13.8	13	12.0	38	16.6
Rural South	617	23.7	987	23.0	380	24.0	455	22.4	452	25.4	852	23.8
North	80	12.8	109	12.0	20	8.0	33	11.4	37	13.8	73	13.9
Winnipeg	1,295	23.4	2,171	24.4	636	18.1	963	21.8	927	24.2	1,870	25.6
Manitoba	2,086	22.8	3,430	23.2	1,090	19.5	1,527	21.7	1,485	24.2	2,934	24.5

Note: s = suppressed

Appendix Table 1.15(Continued): Home care use: Incidence (new cases)

RHA	Dementia				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	37	126.4	41	107.2	92	5.7	117	9.3
Brandon	57	165.1	79	140.1	91	7.0	121	10.4
Central	105	142.6	145	135.2	170	5.7	220	8.8
Assiniboine	101	146.0	139	124.7	180	7.8	219	11.4
Parkland	69	141.4	78	119.5	135	9.9	174	16.4
Interlake	64	123.8	71	114.0	178	7.7	187	10.1
North Eastman	34	140.3	39	126.2	79	6.5	73	7.7
Burntwood	6	65.5	6	80.7	30	2.6	34	3.9
Churchill	s	s	1	210.8	s	s	3	10.4
Nor-Man	11	101.2	12	92.9	39	5.6	48	9.4
Rural South	409	138.1	512	123.5	835	7.1	989	10.4
North	18	84.6	20	91.5	69	3.7	84	6.0
Winnipeg	755	157.7	1,225	136.4	1,291	7.2	1,743	11.2
Manitoba	1,239	149.2	1,837	132.0	2,286	6.9	2,937	10.6

Appendix Table 1.16: Home care use: Closing cases

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	70	18.5	113	18.9	45	16.2	46	14.4	55	21.0	98	19.8
Brandon	96	25.2	167	24.7	59	22.8	86	29.0	72	27.3	143	25.4
Central	146	23.9	241	23.8	103	24.9	126	26.9	110	26.0	208	24.2
Assiniboine	129	27.2	222	27.0	92	28.6	124	33.7	101	31.1	193	28.6
Parkland	92	30.1	139	26.6	76	29.5	97	32.8	65	31.6	117	27.3
Interlake	131	23.6	176	19.7	73	21.0	82	21.2	92	24.3	154	20.4
North Eastman	47	16.6	63	14.1	31	17.2	41	20.8	35	18.6	54	14.6
Burntwood	51	12.3	56	10.1	5	4.0	10	7.7	23	15.0	34	11.7
Churchill	2	24.9	3	28.5	s	s	s	s	s	s	1	18.0
Nor-Man	29	14.3	46	13.7	15	11.8	18	12.0	16	15.4	35	15.2
Rural South	615	23.6	954	22.2	420	23.4	516	25.4	458	25.7	824	23.0
North	82	13.1	105	11.6	21	8.1	29	10.1	41	15.3	70	13.3
Winnipeg	1,507	27.3	2,646	29.7	827	21.5	1,323	29.9	1,089	28.5	2,288	31.3
Manitoba	2,300	25.2	3,873	26.2	1,327	21.5	1,953	27.8	1,659	27.0	3,325	27.8

Note: s = suppressed

Appendix Table 1.16(Continued): Home care use: Closing cases

RHA	Dementia				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	44	153.3	52	134.8	89	5.6	109	8.7
Brandon	64	186.0	102	179.6	96	7.4	116	10.1
Central	127	173.0	173	161.8	163	5.5	202	8.1
Assiniboine	111	160.8	165	148.6	180	7.8	209	10.9
Parkland	84	173.1	102	156.9	140	10.3	165	15.5
Interlake	81	155.5	94	150.7	178	7.6	197	10.6
North Eastman	35	145.3	45	146.4	74	6.1	72	7.6
Burntwood	7	78.2	6	73.1	32	2.8	33	3.7
Churchill	s	s	2	316.2	s	s	2	9.6
Nor-Man	15	129.6	14	109.9	41	5.9	47	9.3
Rural South	483	162.9	632	152.2	824	7.0	954	10.0
North	22	106.5	22	101.8	74	3.9	83	5.8
Winnipeg	1,085	226.5	1,912	212.9	1,401	7.8	1,932	12.4
Manitoba	1,654	199.1	2,667	191.7	2,395	7.3	3,085	11.1

Appendix Table 1.17: Home care use: Average length of case

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	35,133	218.5	82,012	256.1	25,512	241.1	30,145	244.7	28,348	224.6	71,126	256.0
Brandon	26,941	173.6	60,424	198.4	17,908	181.6	31,323	202.3	21,311	181.2	53,374	202.8
Central	65,550	219.4	127,037	230.0	46,224	221.2	63,266	235.9	51,205	224.0	109,599	230.3
Assiniboine	53,455	206.2	129,965	234.8	35,549	197.5	68,516	236.1	43,335	210.2	116,014	238.2
Parkland	43,702	223.2	93,489	249.3	38,194	226.0	66,695	260.9	30,868	223.7	83,143	254.6
Interlake	60,920	219.1	124,346	253.7	33,160	225.0	51,608	253.2	44,868	225.0	110,177	253.7
North Eastman	26,122	225.6	49,520	256.8	17,435	237.5	29,381	254.6	19,097	227.3	42,336	255.0
Burntwood	10,730	150.3	16,882	178.8	1,430	174.4	4,144	203.1	5,106	159.6	12,052	199.5
Churchill	1,695	264.8	616	146.6	29	36.8	550	274.8	193	160.7	220	137.8
Nor-Man	13,496	226.4	25,877	235.7	8,017	222.7	14,499	252.6	7,942	232.2	19,958	233.7
Rural South	284,883	217.7	606,369	244.1	196,073	221.8	309,612	246.5	217,722	221.6	532,395	245.6
North	25,921	188.7	43,375	208.1	9,477	210.6	19,192	240.5	13,240	196.4	32,230	218.7
Winnipeg	489,432	225.8	1,156,789	264.4	281,472	239.0	565,834	271.0	368,287	234.4	1,005,970	267.0
Manitoba	827,177	219.5	1,866,958	253.3	504,930	229.0	925,961	258.7	620,561	226.6	1,623,968	255.9

Appendix Table 1.17(Continued): Home care use: Average length of case

RHA	Dementia				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	26,436	243.9	39,451	270.2	39,556	202.6	73,248	236.7
Brandon	20,735	190.2	38,537	217.2	25,565	166.7	42,639	192.4
Central	56,959	225.8	89,278	244.7	66,089	198.6	108,150	224.1
Assiniboine	45,439	209.8	88,710	236.8	72,026	198.1	113,984	226.0
Parkland	44,906	239.4	72,758	270.7	63,793	219.8	122,433	252.1
Interlake	36,676	227.0	64,669	266.8	84,467	212.0	131,676	245.1
North Eastman	21,753	246.1	35,922	267.3	32,682	203.8	46,032	243.8
Burntwood	3,735	263.0	3,135	217.7	5,893	140.3	10,052	174.5
Churchill	133	221.7	476	198.3	157	196.8	1,239	238.2
Nor-Man	8,258	237.3	11,460	275.5	21,900	233.5	31,574	244.0
Rural South	232,169	228.8	390,788	255.3	358,613	206.0	595,524	237.4
North	12,126	244.5	15,071	258.1	27,950	204.6	42,864	223.0
Winnipeg	373,694	258.3	810,794	286.5	448,359	204.9	887,037	248.8
Manitoba	638,725	243.8	1,255,190	273.1	860,487	204.0	1,568,064	241.7

Appendix Table 1.18: Personal care home use: Residents

RHA	Cumulative				Other				No Disorders			
	Males		Females		Males		Females		Males		Females	
	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000
South Eastman	70	273.4	173	386.2	99	361.3	138	428.6	33	49.6	85	101.0
Brandon	91	327.3	284	447.2	127	361.8	291	507.0	50	66.8	89	80.1
Central	217	337.5	421	344.5	258	402.5	496	524.9	95	54.1	211	94.4
Assiniboine	208	306.8	454	353.3	268	390.7	546	529.6	155	75.2	281	111.4
Parkland	94	266.3	191	301.7	192	388.7	317	496.9	75	59.8	179	115.9
Interlake	125	308.6	222	336.9	179	411.5	282	484.5	87	64.5	204	128.6
North Eastman	32	210.5	70	269.2	64	359.6	98	403.3	37	61.5	56	90.6
Burntwood	2	36.4	9	145.2	7	194.4	6	113.2	4	24.1	12	70.6
Churchill	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nor-Man	20	339.0	40	285.7	28	318.2	55	443.5	17	75.2	31	102.6
Rural South	746	300.0	1,531	339.7	1,060	391.4	1,877	499.1	482	62.7	1,016	108.7
North	22	191.3	49	241.4	35	280.0	61	338.9	21	52.9	43	89.6
Winnipeg	1,204	309.9	3,386	387.3	1,326	345.5	3,386	469.8	424	44.8	854	57.5
Manitoba	2,063	305.0	5,250	372.7	2,548	362.9	5,615	479.0	977	53.4	2,002	77.6

* This is the total number of residents over the entire five-year period. It cannot be expressed as an annual average because most people stay more than one year in a PCH.

Appendix Table 1.18(Continued): Personal care home use: Residents

RHA	Dementia				Depression			
	Males		Females		Males		Females	
	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000	Observed 5-Year Total*	Crude Rate per 1,000
South Eastman	129	556.0	210	670.9	11	284.3	30	402.7
Brandon	153	552.3	375	712.9	14	339.6	49	459.7
Central	356	561.5	663	651.3	36	336.4	73	347.7
Assiniboine	332	524.5	710	664.2	33	307.3	81	372.8
Parkland	237	565.6	384	638.9	15	293.4	33	314.7
Interlake	234	586.5	389	695.9	19	309.0	40	341.4
North Eastman	77	455.6	144	549.6	6	243.5	13	278.8
Burntwood	6	146.3	8	177.8	0	0.0	1	150.0
Churchill	0	0.0	0	0.0	0		0	
Nor-Man	40	500.0	80	689.7	4	473.7	6	306.1
Rural South	1,365	549.1	2,500	654.1	120	307.7	269	350.7
North	46	380.2	88	539.9	4	310.3	7	259.0
Winnipeg	2,169	542.3	5,952	675.3	176	309.6	558	386.9
Manitoba	3,733	542.3	8,915	669.0	314	310.1	883	376.8

Appendix Table 1.19: Personal care home use: Admissions

RHA	Cumulative				Other				No Disorder			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	58	53.8	14	6.2	14	65.0	13	49.0	3	6.2	7	11.3
Brandon	69	61.0	13	5.1	14	50.7	30	67.5	3	5.1	7	8.8
Central	168	63.0	41	6.7	35	73.2	53	72.4	8	6.7	14	8.7
Assiniboine	160	58.0	90	12.6	33	65.9	62	76.4	18	12.6	24	12.9
Parkland	79	52.8	34	8.2	26	70.8	34	67.8	7	8.2	12	11.0
Interlake	99	58.6	44	9.4	23	71.3	31	68.0	9	9.4	17	14.7
North Eastman	25	40.3	10	4.8	10	69.9	15	74.4	2	4.8	4	9.1
Burntwood	3	14.1	0	0.0	1	50.3	s	s	0	0.0	1	10.4
Churchill	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nor-Man	17	74.5	11	14.1	3	45.3	5	44.0	2	14.1	2	10.8
Rural South	589	57.1	233	8.8	141	69.6	208	70.1	47	8.8	79	11.5
North	20	45.0	11	8.1	4	46.4	5	35.4	2	8.1	4	10.5
Winnipeg	863	56.3	118	3.7	174	60.0	357	62.4	24	3.7	50	4.6
Manitoba	1,541	56.6	375	6.0	333	63.0	600	64.7	75	6.0	140	7.4

Note: s = suppressed

Appendix Table 1.20: Pharmaceutical use: Proportion of population with at least one prescription

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	14,018	74.6	25,820	86.5	7,943	64.2	11,595	73.7	10,307	79.2	21,806	87.8
Brandon	14,624	77.2	29,923	88.5	8,305	70.1	11,889	81.0	10,676	80.7	25,257	90.0
Central	23,453	76.8	44,784	88.3	12,387	68.2	17,875	77.2	17,220	81.0	38,456	89.4
Assiniboine	18,329	77.2	36,230	88.3	9,747	70.2	14,467	80.5	13,177	81.5	30,418	90.0
Parkland	12,230	80.1	23,743	90.8	7,691	72.5	11,928	81.7	8,629	83.6	19,711	92.5
Interlake	21,490	77.5	39,519	88.7	10,756	70.2	15,491	81.1	15,478	81.6	33,984	90.1
North Eastman	10,630	74.3	19,317	86.2	5,312	67.3	7,653	78.4	7,567	81.2	16,315	88.0
Burntwood	13,317	64.4	21,958	78.4	3,701	59.6	4,860	75.1	5,612	72.0	12,262	84.8
Churchill	295	66.7	437	73.2	121	55.5	127	73.2	92	67.3	266	79.7
Nor-Man	7,446	73.4	14,218	85.4	3,797	64.2	5,910	77.8	4,257	79.7	10,182	88.2
Rural South	100,150	76.8	189,413	88.2	53,836	68.8	79,009	78.8	72,378	81.3	160,690	89.7
North	21,058	67.4	36,613	80.9	7,619	61.7	10,897	76.5	9,961	75.1	22,710	86.2
Winnipeg	215,374	78.0	394,634	88.7	117,772	67.2	174,175	79.3	156,275	81.7	329,549	90.2
Manitoba	351,206	76.9	650,583	88.1	187,532	67.6	275,970	79.1	249,290	81.2	538,206	89.9

Appendix Table 1.20(Continued): Pharmaceutical use: Proportion of population with at least one prescription

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	3,536	81.8	8,081	89.8	3,747	65.2	3,773	82.2	621	83.8	755	93.4
Brandon	3,811	85.8	8,689	91.8	4,520	71.2	5,627	84.8	1,328	84.9	1,205	88.2
Central	5,846	84.6	13,265	92.2	6,741	68.9	6,441	85.7	1,182	83.7	1,154	87.9
Assiniboine	4,123	84.8	10,836	90.1	5,444	69.8	5,849	84.7	694	81.3	963	90.4
Parkland	3,133	88.5	8,412	93.9	3,763	73.8	3,708	86.5	887	83.3	969	87.0
Interlake	4,629	84.5	10,542	92.6	6,663	71.9	6,486	85.5	1,012	75.0	1,143	85.5
North Eastman	2,635	83.7	5,861	90.9	3,378	63.7	3,251	78.5	348	73.1	370	93.5
Burntwood	2,365	78.3	3,796	88.4	9,216	61.9	13,697	75.3	571	68.9	382	79.3
Churchill	47	72.3	66	81.9	200	66.1	248	70.4	23	84.0	25	83.3
Nor-Man	2,676	84.2	5,816	90.2	3,178	66.5	3,520	79.9	309	73.6	362	82.8
Rural South	23,902	84.6	56,997	91.6	29,736	69.2	29,508	84.3	4,744	80.4	5,354	88.7
North	5,088	81.3	9,678	89.4	12,594	63.1	17,465	76.1	903	70.8	769	81.1
Winnipeg	62,790	83.7	127,610	91.2	62,379	73.1	61,265	86.4	16,344	84.8	17,931	92.8
Manitoba	95,591	83.9	202,974	91.2	109,229	70.6	113,865	84.1	23,319	83.2	25,259	91.3

Appendix Table 1.20(Continued): Pharmaceutical use: Proportion of population with at least one prescription

RHA	Personality Disorder				Dementia				No Disorder			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	326	81.8	515	93.0	1,378	95.1	1,867	97.2	39,573	49.1	39,022	62.3
Brandon	947	84.9	1,242	93.8	1,562	90.8	2,706	95.5	35,218	54.4	40,743	70.6
Central	701	81.2	1,117	92.9	3,224	87.6	4,475	83.7	75,695	51.0	81,866	65.6
Assiniboine	620	80.6	959	90.7	3,057	88.2	4,863	87.5	63,274	55.1	67,607	70.3
Parkland	610	82.6	718	93.1	2,060	84.7	2,611	80.0	39,344	57.8	39,136	73.5
Interlake	695	77.8	1,140	91.5	2,448	94.4	3,023	96.5	64,345	55.2	65,717	70.9
North Eastman	254	71.9	410	88.9	1,104	92.2	1,444	94.4	31,637	51.9	31,040	66.0
Burntwood	258	64.5	454	79.8	379	80.1	354	89.2	24,401	42.6	25,900	58.5
Churchill	7	56.6	16	80.0	7	46.7	16	56.2	738	47.5	778	62.4
Nor-Man	178	77.2	207	86.7	416	73.8	423	65.5	17,184	48.8	16,026	63.4
Rural South	3,206	79.8	4,859	91.8	13,271	89.6	18,283	88.1	313,868	53.3	324,388	68.1
North	443	68.9	677	81.8	802	76.3	793	74.0	42,323	45.0	42,704	60.3
Winnipeg	11,653	82.6	16,183	92.8	22,170	92.6	43,210	96.2	470,446	52.4	522,771	67.1
Manitoba	16,249	81.7	22,961	92.3	37,805	91.0	64,992	93.4	861,855	52.4	930,606	67.2

Appendix Table 1.21: Pharmaceutical use: Number of different drugs per user

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	61,699	4.3	129,682	4.9	28,225	3.5	40,217	3.4	47,962	4.5	113,704	5.1
Brandon	68,297	4.5	163,697	5.2	30,986	3.6	49,353	4.0	53,477	4.8	143,112	5.4
Central	111,458	4.6	242,956	5.2	45,947	3.6	71,127	3.8	87,345	4.9	214,798	5.4
Assiniboine	94,260	4.9	211,913	5.6	41,069	4.0	65,270	4.3	72,187	5.2	184,348	5.8
Parkland	71,122	5.5	164,266	6.5	35,449	4.4	58,431	4.7	52,705	5.8	142,513	6.8
Interlake	103,868	4.6	220,328	5.3	42,081	3.8	67,726	4.2	78,579	4.9	195,096	5.5
North Eastman	51,637	4.7	111,143	5.5	20,861	3.8	32,441	4.1	40,013	5.1	98,246	5.8
Burntwood	58,916	4.1	125,123	5.2	13,664	3.5	23,560	4.4	27,883	4.6	81,228	6.0
Churchill	1,502	4.9	2,498	5.4	499	4.0	700	5.2	528	5.5	1,670	6.0
Nor-Man	34,558	4.4	82,246	5.3	13,868	3.5	26,488	4.2	21,376	4.7	63,507	5.7
Rural South	494,044	4.7	1,080,288	5.5	213,632	3.8	335,212	4.1	378,791	5.0	948,705	5.7
North	94,976	4.2	209,867	5.3	28,031	3.5	50,748	4.3	49,787	4.7	146,405	5.9
Winnipeg	987,981	4.4	2,132,069	5.2	407,423	3.4	672,928	3.7	761,046	4.7	1,859,390	5.4
Manitoba	1,645,298	4.5	3,585,921	5.3	680,072	3.5	1,108,241	3.9	1,243,101	4.8	3,097,612	5.5

Appendix Table 1.21(Continued): Pharmaceutical use: Number of different drugs per user

RHA	Anxiety States				Substance Abuse				Schizophrenia			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	18,080	5.0	44,979	5.4	14,425	3.8	18,077	4.6	3,309	5.0	5,758	7.0
Brandon	20,904	5.2	57,518	6.2	19,225	4.1	29,755	5.0	8,454	5.9	9,790	7.4
Central	33,580	5.4	84,152	6.0	30,045	4.3	35,735	5.3	6,392	4.9	7,674	6.1
Assiniboine	24,340	5.6	74,816	6.5	26,184	4.6	32,465	5.3	3,986	5.3	7,126	6.9
Parkland	21,355	6.4	67,817	7.5	20,482	5.1	26,652	6.7	5,457	5.7	7,704	7.3
Interlake	25,110	5.2	68,214	6.2	31,682	4.5	35,718	5.2	5,816	5.2	8,228	6.6
North Eastman	14,997	5.4	40,664	6.6	16,617	4.7	19,490	5.7	1,654	4.4	3,010	7.5
Burntwood	12,672	5.0	28,640	6.8	40,226	4.1	73,026	4.9	2,432	3.9	2,431	5.7
Churchill	220	4.4	452	6.6	1,039	4.9	1,386	5.3	96	4.0	215	8.0
Nor-Man	13,487	4.7	37,150	5.9	14,357	4.2	19,144	5.0	1,698	5.0	2,502	6.3
Rural South	137,462	5.5	380,642	6.3	139,435	4.5	168,137	5.4	26,614	5.2	39,500	6.8
North	26,379	4.8	66,242	6.2	55,622	4.1	93,556	4.9	4,226	4.3	5,148	6.0
Winnipeg	311,211	4.7	755,376	5.6	302,131	4.6	357,792	5.5	92,584	5.1	134,545	6.8
Manitoba	495,956	4.9	1,259,778	5.9	516,413	4.5	649,240	5.4	131,878	5.1	188,983	6.8

Appendix Table 1.21(Continued): Pharmaceutical use: Number of different drugs per user

RHA	Personality Disorder				Dementia				No Disorder			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	1,567	4.6	3,847	7.1	10,351	7.1	15,062	7.5	61,699	4.3	124,654	3.1
Brandon	6,049	6.0	11,340	8.4	11,808	6.9	21,551	7.3	68,297	4.5	141,251	3.4
Central	4,369	5.9	8,285	6.9	22,856	6.6	32,663	6.8	111,458	4.6	271,615	3.2
Assiniboine	3,562	5.3	7,939	7.8	21,923	6.6	36,932	7.0	94,260	4.9	247,896	3.6
Parkland	3,922	6.0	6,475	8.4	16,333	7.2	21,315	7.5	71,122	5.5	165,198	4.1
Interlake	3,750	5.1	7,911	6.6	18,310	6.9	23,766	7.3	103,868	4.6	243,156	3.6
North Eastman	1,152	4.3	2,906	6.8	8,456	7.3	11,989	7.8	51,637	4.7	110,013	3.5
Burntwood	1,265	4.6	3,106	6.2	2,817	6.4	3,230	8.0	58,916	4.1	103,164	3.7
Churchill	37	5.3	142	8.9	36	4.5	228	12.0	1,502	4.9	2,944	3.6
Nor-Man	920	4.7	1,729	7.7	3,206	6.8	3,323	7.0	34,558	4.4	62,660	3.7
Rural South	18,322	5.4	37,363	7.2	98,229	6.8	141,727	7.2	494,044	4.7	1,162,532	3.5
North	2,222	4.7	4,977	6.7	6,059	6.6	6,781	7.5	94,976	4.2	168,768	3.7
Winnipeg	67,031	5.4	126,088	7.2	160,084	6.6	330,866	7.0	987,981	4.4	1,787,218	3.3
Manitoba	93,624	5.4	179,768	7.3	276,180	6.7	500,925	7.1	1,645,298	4.5	3,259,769	3.4

Appendix Table 1.22: Pharmaceutical use: Defined daily doses

RHA	Cumulative				Other				Depression			
	Males		Females		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	6,110,719	425.4	12,407,512	466.4	2,581,053	317.6	3,069,000	258.7	4,886,275	462.6	11,064,836	492.6
Brandon	6,893,987	452.5	14,089,323	449.5	3,183,456	370.3	3,830,284	309.5	5,580,032	501.0	12,405,132	468.8
Central	11,823,636	483.0	22,486,226	481.1	4,552,166	354.2	5,677,804	306.1	9,580,641	532.8	20,292,153	505.9
Assiniboine	10,259,008	534.4	21,011,652	553.3	4,170,208	409.5	5,813,875	385.2	8,368,518	606.3	18,639,960	584.5
Parkland	6,841,969	528.5	13,777,117	546.6	3,236,823	400.5	4,461,940	356.2	5,259,860	577.2	11,824,821	564.7
Interlake	9,992,923	445.8	19,193,062	465.4	3,391,440	303.8	4,882,800	303.0	7,865,650	488.2	17,028,275	480.2
North Eastman	4,507,595	408.9	9,130,524	454.3	1,717,463	312.2	2,759,109	350.2	3,670,346	467.0	8,237,953	485.1
Burntwood	3,404,709	238.5	6,664,811	277.1	797,640	202.9	1,353,396	255.1	1,785,554	295.1	4,862,602	359.4
Churchill	126,713	410.1	135,673	295.6	50,611	408.2	22,612	168.7	40,252	419.3	87,763	313.4
Nor-Man	2,291,459	288.9	5,583,122	363.1	835,216	208.4	1,696,982	270.1	1,436,287	315.8	4,428,025	400.8
Rural South	49,535,850	474.4	98,006,092	495.3	19,649,152	351.5	26,664,528	325.1	39,631,294	525.4	87,088,000	518.8
North	5,822,880	258.6	12,383,606	310.4	1,683,467	208.8	3,072,990	262.2	3,262,094	305.0	9,378,391	377.3
Winnipeg	97,458,806	432.8	187,798,928	455.4	33,982,117	279.9	50,654,403	280.6	77,246,263	472.8	167,483,527	486.0
Manitoba	159,711,524	434.7	312,277,948	458.2	58,498,191	301.6	84,222,205	293.8	125,719,685	482.3	276,355,052	490.2

Appendix Table 1.22(Continued): Pharmaceutical use: Defined daily doses

RHA	Anxiety States				Schizophrenia			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	1,870,828	515.8	4,141,327	496.3	391,919	588.5	762,584	922.1
Brandon	2,126,311	533.3	4,961,679	538.1	1,153,489	802.1	1,130,431	850.6
Central	3,478,525	562.0	7,856,121	561.1	1,091,079	841.9	954,113	756.6
Assiniboine	2,647,367	608.9	7,996,624	698.6	461,759	617.3	989,397	954.1
Parkland	2,060,683	618.5	5,565,535	616.1	739,781	766.6	927,555	877.5
Interlake	2,184,982	450.0	5,888,563	531.9	824,107	739.1	1,009,374	812.0
North Eastman	1,346,133	489.1	3,233,335	524.6	171,061	454.9	344,740	864.0
Burntwood	774,304	302.7	1,731,302	410.8	230,275	370.2	200,285	466.9
Churchill	8,528	170.6	24,601	361.8	7,282	303.4	24,741	916.3
Nor-Man	881,120	308.3	2,326,276	367.9	171,825	500.9	256,521	641.3
Rural South	13,588,518	541.3	34,681,504	577.4	3,679,706	712.3	4,987,762	856.4
North	1,663,951	304.4	4,082,180	384.9	409,382	413.9	481,547	562.6
Winnipeg	29,107,907	443.2	64,951,437	485.4	11,978,791	662.8	15,971,921	812.2
Manitoba	46,486,688	463.7	108,676,799	508.5	17,221,369	671.0	22,571,661	815.6

Appendix Table 1.22(Continued): Pharmaceutical use: Defined daily doses

RHA	Personality Disorder				No Disorder			
	Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000	Observed Annual Average	Crude Rate per 1,000
South Eastman	151,519	445.6	378,781	695.0	9,452,721	235.8	10,550,351	266.1
Brandon	646,098	639.1	1,048,293	778.8	10,192,034	283.0	11,950,035	286.7
Central	449,088	602.0	719,755	602.3	19,750,197	255.7	24,730,765	295.5
Assiniboine	311,178	467.2	895,499	875.4	20,416,129	314.0	23,882,871	343.9
Parkland	380,826	585.0	610,037	787.1	13,758,200	338.0	13,996,022	345.0
Interlake	325,886	447.0	754,016	624.7	18,170,583	275.2	19,822,042	292.8
North Eastman	98,501	366.2	276,776	643.7	7,993,227	247.5	8,908,371	280.4
Burntwood	66,402	240.6	235,255	470.5	5,361,929	207.7	6,103,008	219.3
Churchill	2,138	305.4	8,895	556.0	135,369	178.4	195,480	241.3
Nor-Man	78,930	406.9	113,213	500.9	4,248,440	237.3	4,890,973	288.2
Rural South	1,716,996	504.9	3,634,863	702.4	89,541,057	278.6	101,890,424	306.2
North	147,470	309.2	357,363	481.6	9,745,738	219.1	11,189,462	245.3
Winnipeg	6,829,620	548.2	12,389,229	709.9	123,367,370	256.5	148,820,643	277.9
Manitoba	9,340,183	538.4	17,429,748	705.2	232,846,199	263.7	273,850,565	286.6

Appendix Table 1.23: Suicides & Suicide Attempts

RHA	Suicides		Attempts				Suicide-related PYLLs			
	Males & Females Combined		Males		Females		Males		Females	
	Observed Annual Average	Crude Rate per 10,000	Observed Annual Average	Crude Rate per 10,000	Observed Annual Average	Crude Rate per 10,000	Observed Annual Average	Crude Rate per 10,000	Observed Annual Average	Crude Rate per 10,000
South Eastman	3.8	0.83	7.6	3.25	17.4	7.74	114	48.82	14.2	6.32
Brandon	5.6	1.29	17.4	8.44	29.6	13.05	170.4	82.68	32.2	14.20
Central	8.2	0.99	17.0	4.09	35.6	8.54	214	51.49	33.4	8.01
Assiniboine	9.2	1.41	11.0	3.37	29.0	8.83	219.8	67.41	43	13.09
Parkland	6.0	1.49	9.6	4.76	24.4	12.23	146.8	72.72	27.6	13.83
Interlake	9.8	1.48	10.6	3.15	22.6	6.92	247	73.42	51.6	15.81
North Eastman	9.8	2.89	12.8	7.32	25.4	15.42	215.8	123.44	165	100.19
Burntwood	7.0	2.06	60.8	34.30	119.6	73.25	273.2	154.14	89.4	54.75
Churchill	0.0	0.00	s	s	s	s	0	0.00	0	0.00
Nor-Man	4.4	2.05	12.4	11.29	38.4	36.79	141	128.37	47.2	45.22
Rural South	46.8	1.40	68.6	4.06	154.4	9.30	1157.4	68.56	334.8	20.16
North	11.4	2.02	74.6	25.56	158.2	58.17	414.2	141.93	136.6	50.23
Winnipeg	71.6	1.20	127.8	4.43	201.4	6.58	1667	57.77	699.4	22.85
Manitoba	135.4	1.32	288.4	5.69	543.6	10.41	3409	67.21	1203	23.04

APPENDIX 2: MANITOBA REGIONAL HEALTH AUTHORITIES—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. For each RHA, the districts are listed along with the assigned municipal areas and, where necessary, postal codes.

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, and this report reflects the districts subsequent to the amalgamation.

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

North
Lakeview RM
Westbourne RM
Gladstone Town
Alonsa RM
Sandy Bay First Nation
Cartier RM
Headingley RM
St. Francois Xavier RM
Macgregor Village
North Norfolk RM
Portage RM
Portage City
Dakota Tipi First Nation
Dakota Plains First Nation
Long Plain First Nation

Midwest
Carman Town
Dufferin RM
Grey RM
Roland RM
St. Claude Village
Thompson RM
Lorne RM
Notre Dame de Lourdes Village
Somerset Village
Swan Lake First Nation

Southwest
Stanley RM
Morden Town
Winkler City
Crystal City Village
Louise RM

Manitou Village
Pembina RM
Pilot Mound Village

East
Altona Town
Gretna Village
Plum Coulee Village
Rhineland RM
Emerson Town
MacDonald RM
Montcalm RM
Morris RM
Morris Town
Roseau River

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
Snow Lake Town
Flin Flon City
Cranberry Portage

The Pas, OCN, Kelsey
The Pas Town
Kelsey RM (Consol LGD)
Opaskwayak Cree Nation

Sherridon, Cormorant, Rand Rapids, Moose Lake, Easterville, Pukatawagan
(Nor-Man Other)
Unorganized Territories
Grand Rapids LGD
Grand Rapids First nation
Mosakahiken Cree Nation
Chemahawin First Nation
Mathias Colomb Cree Nation

North Eastman RHA

Bluewater
Powerview Village
Victoria Beach RM

Alexander LGD
Pine Falls Town
Sagkeeng (Fort Alexander) First Nation
Little Black River First Nation
Bloodvein First Nation
Hollow Water First Nation

Brokenhead
Brokenhead
Beausejour Town
Garson Village

Iron Rose
Reynolds RM
Whitemouth RM

Springfield
Springfield RM

Northern Remote
Princes Harbour
Loon Straits
Whiteshell
Rennie
Seven Sisters Falls
Hadashville
Pauingassi
Seddon's Corner
Bissett
Belair
Black River
Traverse Bay
Pointe du Bois
Wanipagow
Manigotagan
Little Grand Rapids First Nation
Poplar River First Nation
Berens River First Nation
Unorganized Territories

Winnipeg River
Lac Du Bonnet RM,
Lac Du Bonnet Village
Pinawa LGD

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

South East
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
Winnipeg is further divided based on postal code into 12 Community Areas and 23 Neighbourhood clusters. There are separate formats for each of these. Winnipeg groupings are not part of this document.

APPENDIX 3: VALIDATION OF DEPRESSION DEFINITION (DR. EILISH CLEARY, WITH THE ASSISTANCE OF CHARLES BURCHILL, JENNIFER MAGOON AND DR. PATRICIA MARTENS)

It is not easy to accurately measure the true prevalence of depression, largely due to the considerable variation in clinical presentations, but also because of inconsistencies between screening and diagnostic tools as well as in coding methods. In order to validate the prevalence data in Manitoba, we compared the survey data available from the 1996/97 National Population Health Survey (NPHS) with the provincial administrative database data.

Coding of Disease

Administrative Data: Disease coding in the administrative data is generated at a three-digit level for physician visits. For hospital visits there are additional sub-classifications, which allow a more precise reflection of diagnoses. As a result of the broad categories created by coding at a three-digit level, and also because of the discordance between the ICD-9-CM system used in Manitoba for claims and the DSM-IV system actually used by most providers in case management, it was necessary to develop a working definition of depression for retrieving information from the database. The administrative definition used for the analysis therefore includes the following people: 1) Those who have a single diagnosis of ICD-9-CM codes of 296, 309, 311, 300.4 (in hospital), 2) Those with a diagnosis of 300 and with a code for anti-depressant use within 12-month period. Individuals on paroxetine and citalopram were excluded as these are frequently prescribed for anxiety. Those with only an antidepressant drug code but no recorded diagnostic code were likewise excluded. Data were examined for 1 and 5 year periods. The one-year period was the fiscal year 1996/7. Two five year periods were examined—a five year period centered around the 1996/97 NPHS survey time frame, plus a five-year period following the survey. Those under age 12 were excluded.

Survey data: Using the data from the 1996/97 NPHS it is possible to classify respondents as to their risk of major depression in the preceding 12 months. The instrument used to determine risk was the Composite International Diagnostic Interview Short Form, an abbreviated questionnaire derived from the Composite International Diagnostic Interview (CIDI) which was developed by Kessler and Mroczek. A subset of questions cover a cluster of symptoms for a depressive disorder as listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM111-R). Subjects are scored on a scale according to their responses. The scale was a probability estimate; that is, if the score was 0.9 then that subject was considered to have a 90% probability of having a major depressive episode (MDE) in the preceding 12 months. Based on the scores three groups were identified: no risk: 0; possible risk:

0.01 to 0.89 and probable risk: 0.90 or higher. While we used the Derived Depression Score to define the depressed population from the NPHS, we also looked at some other measures in the mental health section of the NPHS that could have captured individuals with depressive symptoms. We included the six item Distress Scale which rates symptoms that could be related to both anxiety and depression. High distress was defined as a score of five or greater. The Chronic Stress Scale is a 15- item scale which assesses a variety of potential stresses including social, personal and financial aspects. The score is reported as being high (4-15) or low (0-3). In addition, we also looked at those respondents who had visited a health professional for reasons of mental health in the previous 12 months. The 1996 NPHS included persons age 12 and up.

Analysis

To determine the congruence between the administrative data and survey data, Kappa Coefficients were calculated. This calculation uses a term called the proportion of expected agreement that verifies if agreement exceeds chance levels. It does not assume either data source to be a more correct measure. We also calculated the positive predictive value, sensitivity and specificity and concordance using the administrative data as the gold standard.

Results

Appendix Table 3.1 shows the prevalence of depression as defined by our administrative definition in both the general population and in the NPHS subset. These have all been age-adjusted to create fair comparisons between the overall Manitoba population and the NPHS sub-sample. The one-year prevalence of depression in the general population age 12 in 1996/97 was 5.74% (95% CI 5.69-7.85, n=57,357 out of a base population 998,462). In a five-year period (1997/98-2001/02) the prevalence of depression was 16.47% (95% CI 16.40-16.51, n=171,679 out of a base population of 1,042,320). The base population increased for the five-year period due to yearly fluctuation of the Manitoba population. When we looked at the NPHS sample population itself, but using the administrative claims data definition, we found that 5.84% (95% CI 5.38-6.30, n=581/9,944) had a diagnosis of depression over a one-year period (1996/97). This subset had a five-year prevalence of depression of 16.90% (95% CI 16.19-17.66, n=1,684/9,944) for the years 1997/98-2001/02. Therefore, the NPHS sample itself was not statistically different than the overall population of Manitoba. Using the survey-derived definition of "depressed", the NPHS prevalence is given in Appendix Table 3.1. The prevalence of depression from the survey tool is 4.80% (95% CI 4.00-5.65), which is not statistically different from the administratively-derived prevalence of 5.84% (5.38-6.30) for the same population (i.e., the NPHS subset 1 year value).

Appendix Table 3.1: Prevalence of depression as determined by administrative claims in the Manitoba population and in the 1996/97 NPHS subset, plus NPHS survey estimates

Source	No. Of Claims	Population	Per cent	Upper and lower (95%) CI
Manitoba population 1 year	57,357	998,462	5.74	5.69-5.785
Manitoba population 5 year	171,679	1,042,320	16.47	16.4-16.51
NPHS subset 1 year	581	9,944	5.84	5.38-6.30
NPHS subset 5 years	1,684	9,944	16.90	16.19-17.66
Depressed by Survey	409	9,944	4.80	3.998-5.65

Appendix Table 3.2 shows the results of the cross-tabulation of the linked survey and administrative data using the administrative definition and the depressive scale in the NPHS. Of the 409 (4.11%) respondents who were defined as "depressed" by the survey definition, and the 581 (5.84%) respondents who showed up in our administrative database as depressed, only 150 people showed up in both. This means that 431(4.33%) depressed individuals according to our administrative definition were not identified as being depressed in the survey. 259 (259%) people who were diagnosed by the survey as being depressed had not been diagnosed and treated for it in our health care system.

Appendix Table 3.2: Cross-tabulation of NPHS data and administrative data

	Not depressed administrative	Depressed administrative	Total
Probably not depressed (NPHS)	9,104 (91.55%)	431 (4.33%)	9,535 (95.89%)
Probably depressed (NPHS)	259 (2.6%)	150 (1.51%)	409 (4.11%)
Total	9,363 (94.16%)	581 (5.84%)	9,944 (100%)

Appendix Table 3.3 shows the distribution by age according to definition of depression. Using the administrative definition 44% of the depressed population are less than 50 years old contrasting to 79% when the survey definition is used. 25% of the people with a diagnosis of depression were over 70 years as opposed to 7 % of those depressed in the survey.

Appendix Table 3.3: Percentage distribution by age according to category of depression

Age group (years)	Not depressed	Diagnosed depressed	Depressed in survey	Depressed by diagnosis and survey
0-19	9.91	2.79	10.51	2.61
20-29	14.34	9.64	22.03	15.79
30-39	19.29	16.50	26.78	27.19
40-49	15.78	15.48	20.34	33.33
50-59	14.06	16.75	10.17	13.16
60-69	11.59	13.45	4.75	3.51
70-79	10.84	14.21	4.41	4.39
80-89	4.57	9.39	1.02	0
>90	0.62	1.78	0	0

Appendix Table 3.4 shows the agreement between the administrative definition of 1 year prevalence of depression (n=581, 5.84% in administrative claims data) and NPHS mental health scales for depression, high distress scores, chronic distress scores and persons who talked to a health professional in the Manitoba subset of the 1996/7 NPHS sample population. Although not reported here, the various definitions using administrative claims data referred to earlier (i.e., differing five-year periods of time) had lower Kappa scores than are reported here, and were therefore considered less valid than those reported.

Appendix Table 3.4: Agreement between the administrative definition of I year prevalence of depression (n=581, 5.84%) and NPHS mental health scales for depression, high distress scores and chronic distress scores in the Manitoba subset of the 1996/97 NPHS sample population

NPHS scales	No.'s	Kappa	95% CI Kappa	Concordance %	Sensitivity	Specificity	Positive predictive value	Negative predictive value
High Probability of being depressed	409	0.26	0.23-0.30	93.06	0.37	0.95	25.82	97.23
High distress score	1,279	0.17	0.14-0.19	85.78	0.17	0.96	0.96	38.38
Chronic distress	447	0.06	0.03-0.09	90.81	0.12	0.94	9.81	95.83
Talked to a health professional in past 12 months about mental health	628	0.4	0.36-0.43	93.13	0.42	0.96	45.27	96.1

The results show a low level of agreement (Kappa = 0.26) between the two definitions of depression. There is low sensitivity and low positive predictive value (36%, 26% respectively) in using the survey definition to diagnose depression as compared to our administrative database. The definition is more specific and has a better negative predictive value (95%, 97% respectively) so if the survey identified a person as not being depressed, there was a high probability that the individual would not show up as depressed in our health system. As with the Depression scale we found low levels of agreement between a high distress score and a high level of chronic distress and the administrative definition for depression. There was also low sensitivity and poor positive predictive value for using these scales to identify depression. Of all of the measures looked at in the NPHS, the question "have you consulted a health professional for reasons of mental health in the past 12 months" had the best level of agreement with the administrative definition for depression with a Kappa score of 0.39. The sensitivity and positive predictive value of this question as a measure of depression was low however.

Discussion

The majority of large population-based prevalence estimates of depression have been based on survey data. There is an increasing trend to link data from surveys and administrative databases in order to take advantage of their respective strengths. In Manitoba to date there has been no information from such linkage in order to validate depression prevalence. From our results we can see that the prevalence obtained from both the survey data and the administrative data are very similar to each other.

Despite the similarities in overall prevalence rates, there are significant differences between the two sets of results. In looking at the age profiles we can see that using the administrative definition 42.69% of depressed NPHS population is 50 years old or over as opposed to 20.53% of the same population using the depression scale in the survey. The other striking difference between the two sets of results is the fact that out of the 409 respondents depressed by the survey definition, and the 581 respondents who showed up in our administrative database as depressed, only 150 people showed up in both. This means that 431 depressed individuals according to our administrative definition were not identified as being depressed in the survey. Also 259 people who were diagnosed by the survey as being depressed had not been diagnosed and treated for it in our health care system. There is therefore low sensitivity and low positive predictive value (36%, 26% respectively) in using the survey definition to diagnose depression as compared to our administrative database. The definition is more specific and has a better negative predictive value (95%, 97% respectively) so if the survey identified a person as not being depressed, there was a high probability that the individual would not show up as depressed in our health system.

It is not easy to fully explain the reason for these findings. Certainly there are some methodological difficulties in deriving an administrative definition, many of which are out lined in Chapter 2 of the report. Likewise there are problems inherent to any survey. When we consider that the administrative definition represents those people who have been seen and diagnosed by a physician with depression, and that the methodological difficulties would in general lead to an underestimation rather than an overestimation, our results could indicate that while the health care system is failing to pick up and adequately diagnose young people who self-report depression on the survey, that the survey is also failing to pick up some depressed people, particularly in the older age group. The implications are then that depression is even more common than has been reported by most of the major surveys, and that the health care system faces a large unmet need.

It is also clear that many people do not answer surveys accurately. This is made clear by the finding that out of the 581 respondents who were

depressed according to our administrative definition, and therefore had been diagnosed by a doctor as being depressed, only 263 of them answered that they had consulted a health professional in the previous 12 months for reasons of mental health. 318 people denied that they had. There may be many reasons for this, including embarrassment and forgetfulness, or as has been postulated that because they have been treated that they are no longer feeling depressed. This latter point is not thought to be a major factor, however, as the survey question referred to depressive symptoms in the previous 12 months and thus the time span allowed for symptoms was the same as that for the administrative definition.

While the time frames used for the results presented here were not exactly overlapping, the fiscal year being used for the administrative definition, we subsequently did go back and compare the exact time frame periods and obtained similar results. In addition the prevalence results for both the 1-year and the 5-year time periods were remarkably stable. The results presented for the five year period are those centered around the survey, however similar results were obtained when we looked at the 5 years following the survey. This, and the fact that at the population level, the prevalence results were so similar using either definition seems to imply that either definition is probably valid although both would tend to underestimate depression prevalence. However, it is also evident that although a population prevalence estimate is relatively similar no matter what the source—survey data or administrative claims data—researchers must be cautious when attributing the diagnosis to an individual person. In other words, studies which propose to study the individual effects of depression may be problematic when the Kappa scores are so low. It is clear, however that there are many unanswered questions in this complex area and further probing is necessary to further our understanding so that we can then plan appropriate care and provide the necessary supports for this common, debilitating and sometimes fatal condition.

APPENDIX 4: MHMIS EXTRA INFORMATION FOR THE YEARS 1997/98-2001/02

Mental Health Information Database (MHID) in use by WRHA vs. Mental Health Management Information System (MHMIS)

This was based on information given to Dr. Carolyn De Coster from the WRHA contact person: Susan Chipperfield

Winnipeg RHA has been using the Mental Health Information Database (MHID) since December 2002, as a replacement for the Mental Health Management Information System (MHMIS).

Some of the problems that Winnipeg RHA was experiencing with MHMIS were as follows:

- Changes were not recognized, e.g., address changes, until the individual changed their registration with Manitoba Health. This was particularly troublesome if several changes were entered at once, since no changes would be accepted if the person's registration was not up-to-date.
- An MHMIS file may be 'opened' but the patient might not have actually been seen by anybody, i.e., the patient could still be waiting for a first visit.
- The RHA cannot generate its own reports—any reports had to be requested through Manitoba Health. On the other hand, they have to compile reports for Manitoba Health, so they receive certain data from Manitoba Health. Then they use Manitoba Health's reports to create activity reports for Manitoba Health.

There were several advantages of MHID, from the perspective of the Winnipeg RHA. The MHID contains all of the MHMIS required data fields. It uses DSM4 diagnostic information, but there are cross-walks for ICD-9-CM. In addition, MHID tracks waiting times, prioritized for different programs. Patients are classified as Urgent, Primary or Basic. Urgent patients are not waitlisted and must be seen within five business days. Primary patients are to be seen in 12 business days, and Basic within 26 business days. The waitlist information is sent to each community area office weekly. See the following table for more information on specific data fields in MHID and MHMIS.

The chief advantages of the MHID system appear to be its ease of use and the ability to interact with the system. MHID is based on ACCESS software. The data are easier to enter, the system is updated immediately (instead of having to wait for the patient to change their address with Manitoba Health if they move), and the RHA can generate their own

reports. MHID also permits multiple providers to be entered into the system simultaneously.

The WRHA has indicated that it is willing to share their software with other RHAs at no cost, if Manitoba Health decided to adopt the system.

The main concern with any Mental Health database is comparability across the province. It is essential that all RHAs use comparable systems, as well as comparable fields and definitions. Manitoba Health would need to obtain copies of basic data fields at the person-level to generate comparable reports for all RHAs and facilities in the province. Finally, any system chosen needs to be "linkable" to other health systems at the person-level (that is, the system needs to use the personal health identification number, or PHIN), and this person-level information must be sent to Manitoba Health. A system-wide approach to understanding mental health services, health outcomes, and use of other health care services is critical for the province, and needs to be maintained within Manitoba Health's administrative claims system.

Appendix Table 4.1: Education of MHMIS clients

Education level attained	Count	Per cent
Grade 0	33	0.24
1	35	0.25
2	48	0.34
3	112	0.80
4	225	1.60
5	286	2.04
6	541	3.85
7	752	5.36
8	1,317	9.38
9	1,457	10.38
10	1,904	13.56
11	1,607	11.45
12	5,676	40.43
13	40	0.28
missing	24,537	

Appendix Table 4.2: Marital status of clients

Marital Status	Count	Per cent
Never married	15,117	39.2
Married	10,618	27.5
Common-law	1,537	4.0
Separated	2,199	5.7
Divorced	2,180	5.7
Widowed	3,119	8.1
Other	107	0.3
Unknown	3,693	9.6

Appendix Table 4.3: MHMIS referral 'from'

Referral Type	Count	Per cent
0 Private	11,643	31.52
1 Education	952	2.58
2 legal system	604	1.64
3. Employment system	139	0.38
4. Income Security System	219	0.59
5. Agencies	1,653	4.48
6. Health Facility	8,026	21.73
7. Health provider	11,250	30.46
8 Legally resp. party	315	0.85
9. Other health and family pgms	2,135	5.78

Appendix Table 4.4: Distribution of diagnosis codes by case

ICD-9-CM Diagnosis code	Count	Per cent
295 Schizophrenic disorders	17,623	36.87
300 Neurotic disorders	14,662	30.67
799 Other ill-defined and unknown causes	5,567	11.65
290 Senile and presenile organic psychotic	3,015	6.31
V61 Other family circumstances	2,459	5.14
V62 Other psychosocial circumstances	2,339	4.89
V71 Observation and evaluation for	2,000	4.18
317 Mild mental retardation	43	0.09
797 Senility without mention of psychosis	30	0.06
780 General symptoms	17	0.04
V65 Other persons seeking consultation	16	0.03
V15 Other personal history presenting	8	0.02
333 Other extrapyramidal disease and	*suppressed*	*suppressed*
347 Cataplexy and narcolepsy	*suppressed*	*suppressed*
625 Pain and other symptoms associated	*suppressed*	*suppressed*
995 Certain adverse effects not elsewhere	*suppressed*	*suppressed*
V21 Constitutional states in development	*suppressed*	*suppressed*
V40 Mental and behavioral problems	*suppressed*	*suppressed*
V68 Encounters for administrative purposes	*suppressed*	*suppressed*

Appendix Table 4.5: Program codes and number of programs present in cases

Program Name	Count	Per cent
06. Community Mental Health Workers	24,761	46.07
04. Child/Adolescent prog	6,782	12.62
99. No program specified	4,726	8.79
13. Psychogeriatrics	4,602	8.56
02. Admission/Assessment	2,226	4.14
08. Community Psych. Follow up	2,068	3.85
41. Community Mental health Employment Rel. Prog/Serv	1,539	2.86
17. Intensive Psychiatric	957	1.78
18. Community Psychological Serv.	792	1.47
01. Crises Intervention	748	1.39
07. Community Nursing	711	1.32
26. General Psychiatry (end Sept 2003)	589	1.10
25. Mood Disorders (end Sept 2003)	507	0.94
16. Rehab/life skills	486	0.90
19. Comm. social Work Ser.	365	0.68
28. Intake Unit/Team	256	0.48
35. Community Support	224	0.42
10. Forensic Adults	201	0.37
12. Geriatric Program	200	0.37
27. Schizophrenia (end Sept 2003)	199	0.37
05. Community Mental Health Day program	112	0.21
03. Behaviour Therapy Prog.	110	0.20
30. Intensive Case Management Program	100	0.19
29. Occupational Therapy	61	0.11
31. Employment Development Services	60	0.11
36. Community/Residential Support	48	0.09
39. Mental health Promotion Clinic	50	0.09
40. Proctor Program	50	0.09
14. Independent Group Living	42	0.08
15. Supervised Alternative Care	41	0.08
38. Ventures	40	0.07
23. Eating Disorders Program	34	0.06
09. Day Program	27	0.05
37. Residential Services (Brandon RHA only)	17	0.03
44. Income Security	6	0.01
11. Forensic Child	*suppressed*	*suppressed*
21. General Treatment (end Sept 2003)	*suppressed*	*suppressed*
22. Continuing Care changed to Home Care Program	*suppressed*	*suppressed*
24. Academic Clinical Unit (end Sept 2003)	*suppressed*	*suppressed*
34. Self-Help Program	*suppressed*	*suppressed*
43. Addictions Program	*suppressed*	*suppressed*

Appendix Table 4.6: Primary therapist

Primary Therapist	Count	Per cent
Registered Psychiatric Nurse	17,923	46.47
Social Worker	8,714	22.59
Community Mental Health Worker	5,668	14.69
Psychiatrist (Salaried no MHSC #)	2,238	5.80
Psychologist	1,942	5.03
Registered Nurse	1,457	3.78
Occupational Therapist	263	0.68
Other non-physicians	210	0.54
Activity Instructor	92	0.24
Physicians (Salaried no MHSC #)	55	0.14
Pastoral Care	7	0.02

Appendix Table 4.7: Therapy groupings

Therapy Code	Count	Per cent
200 Treatment	55,174	46.19
100 Assessment	48,704	40.77
400 Care and Support	5,914	4.95
300 Rehabilitation	4,463	3.74
999 No therapy specified	2,819	2.36
600 Management	1,332	1.12
901 No therapy provided	693	0.58
500 Discharge	354	0.30

Appendix Table 4.8: MHMIS age distribution of clients by region/facility

Region/Facility	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-89	90+
HSC	205	315	158	173	209	193	163	137	92	69	39	37	40	22	9	
Selkirk		124	140	132	168	177	131	128	120	79	91	100	98	88	80	
Brandon	120	108	49	57	72	71	69	55	46	29	30	53	50	79	87	11
Eden	86	206	205	250	269	329	319	257	222	188	122	168	163	210	268	41
Winnipeg	30	267	316	386	461	544	486	499	347	285	223	260	218	163	181	23
Brandon	558	469	372	364	382	375	324	263	202	131	118	201	217	303	400	54
North Eastman	179	140	58	79	117	135	131	102	74	56	43	44	60	57	98	12
South Eastman	211	163	117	142	171	177	156	124	101	96	56	63	71	81	111	11
Interlake	486	274	158	200	268	288	233	184	136	117	96	69	86	98	100	21
Central	362	234	164	230	232	281	211	151	119	89	67	86	89	113	209	22
Assiniboine	640	347	270	287	330	376	364	265	258	214	146	207	225	305	470	90
Parkland	428	326	169	185	250	248	214	174	172	111	90	125	141	196	342	45
Norman	336	344	221	247	233	249	162	137	62	53	51	36	39	46	67	6
Burntwood	370	322	246	302	284	236	203	105	103	43	34	15	13	6	6	
Churchill																
Total	4,011	3,639	2,643	3,034	3,446	3,679	3,166	2,581	2,054	1,560	1,206	1,464	1,510	1,767	2,428	336

Appendix Table 4.9: Comparison of the WRHA's MHID with the MHMIS system*

Variable	MHMIS	MHID	Variable	MHMIS	MHID
PHIN #	R	R	Financial affairs	O	NA
MHSC #	R	R	Other Agency	O	NA
Surname	R	R	Optional Info	O	NA
Second surname	O	O	Case Manager	R	R
Given name	R	R	Primary therapist	O	O
Sex	R	R	Secondary therapist	O	NA
Date of birth	R	R	Diagnosis made by MD	R	R
Phone	O	O	DSM Axis Code	R	R
Address	R	O	ICD codes	automatic with DSM	
City	?	O	Therapies	R	NA
Province	R	R	Program codes	R	NA
Post code	O	O	Close Date	R	R
Temporary address	O	O	Close Time	O	O
Marital status	R	R	Close Type[2]	R	R
Non-resident	R	R	Sub-office	O	O
Next of Kin	O	NA	Autopsy	R	NA
Responsible person	O	NA	Referral to:	R	NA
SIN	O	NA	Forwarding address	O	NA
Birth Place	O	NA	Client Transfers	O	R
DVA #	O	NA	Intake terminated	NA	R
Treaty/Inuit #	O	O			
Social allowance #	O	NA	Reason for applying	NA	R
Religion	O	NA	Date eligibility decided	NA	R
Allergies	O	NA	Urgency rating	NA	R
Education	O	O	Program assigned[1]	NA	R
Employment	O	NA	Community Area	NA	R
Open date	R	R	Place on wait list?	NA	R
Time	O	NA	Date on list	NA	R
Type	R	R	Date off list	NA	R
Sub-Office	R	R	Reason off list	NA	R
Legal Status[2]	R	R	Case Type	NA	R
New Open/re-open	R	R	Date application received by program	NA	R
Supervision	O	NA	Date worker assessed	NA	R
Referral From	O	R	Hazard assessment	NA	R
Attending MD	O	NA	Addictions	NA	R
Family MD	O	NA	Multiple Providers	NA	R
Living arrangements	O	NA			

*R = Required; O = optional; NA = not Applicable

[1] It is unclear if this is different from the Program Codes required in MHMIS
[2] Although both systems require this, their classification systems are somewhat different.

APPENDIX 5: LOGISTIC REGRESSION INFORMATION ON SUICIDE AND SUICIDE ATTEMPTS

In Chapter 9, logistic regression analyses were used to determine risk factors for suicide and suicide attempts. This appendix includes information on the results of the logistic regression.

The first logistic regression was designed to answer two research questions:

- *Which demographic characteristics distinguish Suicide Completers from people without a diagnosed mental illness?*
- *Which demographic characteristics distinguish Suicide Attempters from people without a diagnosed mental illness?*

Therefore, the regression (a polytomous model) simultaneously estimated the odds of completing a suicide (compared to people without a mental illness) and the odds of attempting a suicide (compared to people without a mental illness).

The second logistic regression model was designed to answer one research question:

- *Which demographic characteristics distinguish Suicide Completers from Suicide Attempters?*

Therefore, the regression estimated the odds of being either a Suicide Attempter or a Suicide Completer (compared to people who did not have a mental illness).

The following variables were entered in to the logistic regression as explanatory variables:

Manitoba Regions: North and Rural South versus Urban areas (Winnipeg and Brandon), with Urban being the reference group

Sex: Males versus Females, with females being the reference group

Age Groups: The six age groups (10-14, 15-19, 20-24, 25-44, 45-64, and 65+ years) were combined into five age groups for the polytomous regression analysis (10-14, 15-24, 25-39, 40-54, and 55+) with 55+ as the reference group. For the figures and the combined group (attempters and suicide completers versus others) we combined age groups into three (10-19, 20-64, and 64+) with 64+ as the reference group.

Mental Illness Diagnosis in the previous year: No mental illness diagnosis in the previous year versus Ambulatory Diagnosis Groups (ADG) 23 to 25 (in the ADG system from The Johns Hopkins), with "no mental illness" being the reference group. (The ADG was assigned for the 12-month time period before a first suicide attempt or suicide. For non-suicidal individuals, the ADG were based on the last year of coverage, usually 2000/01). See the Glossary for a description of illnesses in the ADG categories.

A*verage Household Income (Neighbourhood Income):* Average Household Income based on each census enumeration area, attributed to each individual residing within that enumeration area. The amount is limited to the observed low and high values for the areas in each region. Income is measured as a continuous variable as tens of thousands of dollars.

Overall measure of health status, or morbidity: The Adjusted Clinical Group (ACG) Morbidity Index is based upon the twelve month time period before a first suicide attempt or suicide. For non-suicidal individuals, ACG is based on the last year of coverage, usually 2000/01. The ACG value is a continuous variable, divided by 1,000 for the analysis to produce a scale of approximately one to five.

At times, there may be "interactions" that are significant. This means that although there may be an effect of a main explanatory variable, like "age", there may be differences in this relationship depending upon the presence or absence of another explanatory variable, like "sex".

Sex by Age Group Interaction: Males versus females by age group (10-19 years and 20-64 years) were compared to the oldest age group. The 65+ year old female group is the reference group.

Neighbourhood Income by Region interaction: The Average Income in Rural areas versus Average Income in Urban areas are compared. The Urban areas (Winnipeg and Brandon) are the reference group

Neighbourhood Income squared by Region interaction: Average Household Income in Urban areas versus Rural areas is tested. The Urban area (Winnipeg and Brandon) is the reference group. The Income variable is squared to model a curvilinear relation (higher suicide and suicide attempts in the lowest and highest income brackets).

Appendix Table 5.1: Odds ratios for logistic regression - Suicide attempters and suicide completers versus others without a mental illness 1997-2001

Variable	ClassVal0	ClassVal1	ChiSq	ProbChiSq	odds	lower	upper
Intercept			4,119.19	<.0001	0.000	0.000	0.000
region	North		133.74	<.0001	63.130	31.270	127.450
region	Rural		77.79	<.0001	14.897	8.173	27.150
sex	1		40.01	<.0001	2.038	1.635	2.542
age group	10-14		876.51	<.0001	22.550	18.347	27.716
age group	15-24		763.99	<.0001	14.398	11.917	17.396
age group	25-39		439.56	<.0001	7.481	6.198	9.029
age group	40-54		217.11	<.0001	4.466	3.660	5.449
mental health diagnosis	Yes		2,341.24	<.0001	7.955	7.314	8.652
avg hh income			139.90	<.0001	0.676	0.634	0.722
avg hh income_sq			47.31	<.0001	1.019	1.013	1.024
avg hh income*region	North		38.54	<.0001	0.389	0.288	0.524
avg hh income*region	Rural		46.90	<.0001	0.356	0.265	0.479
avg hh income sq*region	North		26.28	<.0001	1.077	1.047	1.109
avg hh income sq*region	Rural		29.85	<.0001	1.103	1.065	1.142
acg morbidity index			1,019.93	<.0001	1.646	1.596	1.697
sex*age group	1	10-14	92.73	<.0001	0.212	0.155	0.291
sex*age group	1	15-24	13.65	0.0002	0.621	0.482	0.799
sex*age group	1	25-39	12.70	0.0004	0.636	0.496	0.816
sex*age group	1	40-54	12.89	0.0003	0.614	0.470	0.801

Appendix Table 5.2: Odds ratios for polytomous logistic regression - suicides and suicide attempters versus others, 1997-2001

Suicide Completion vs. Others without a mental illness 1997-2001							
Parameter	**ClassValue**	**funcno**	**ChiSq**	**ProbChiSq**	**odds ratio**	**lower**	**upper**
Intercept		1	270.29	<.0001	0.001	0.001	0.003
region	North	1	0.02	0.884	1.116	0.257	4.853
region	Rural	1	0.15	0.698	1.210	0.461	3.178
sex 1=males 0=females	1	1	133.02	<.0001	1.901	1.705	2.121
age group	10-14	1	2.79	0.095	0.756	0.544	1.050
age group	15-24	1	9.25	0.002	1.349	1.112	1.635
age group	25-39	1	9.87	0.002	1.295	1.102	1.522
age group	40-54	1	1.07	0.300	1.099	0.919	1.315
psych diagnosis	0	1	267.94	<.0001	2.170	1.977	2.380
avg household income		1	0.02	0.875	0.971	0.676	1.395
avg hhincome_squared		1	1.30	0.255	0.977	0.938	1.017
acg health index		1	9.22	0.002	1.088	1.030	1.149
sex*agegroup	10-14	1	1.89	0.169	0.796	0.574	1.102
sex*agegroup	15-24	1	0.03	0.865	0.984	0.813	1.191
sex*agegroup	25-39	1	0.57	0.449	0.940	0.800	1.104
sex*agegroup	40-54	1	0.67	0.413	1.077	0.901	1.288
avg hh income*region	North	1	0.17	0.677	1.151	0.595	2.228
avg hh income*region	Rural	1	0.09	0.760	0.931	0.587	1.475
avg hh income_sq*region	North	1	0.30	0.585	0.980	0.912	1.053
avg hh income_sq*region	Rural	1	0.00	0.994	1.000	0.946	1.057

Attempters vs. Others							
Parameter	**ClassValue**	**funcno**	**ChiSq**	**ProbChiSq**	**odds ratio**	**lower**	**upper**
Intercept		2	2183.2	<.0001	0.002	0.002	0.003
region	North	2	66.94	<.0001	3.979	2.858	5.540
region	Rural	2	0.03	0.864	1.027	0.761	1.385
sex 1=males 0=females	1	2	10.51	0.001	0.928	0.886	0.971
agegroup	10-14	2	387.88	<.0001	2.922	2.626	3.251
agegroup	15-24	2	952.04	<.0001	2.993	2.791	3.208
agegroup	25-39	2	93.22	<.0001	1.392	1.301	1.488
agegroup	40-54	2	71.4	<.0001	0.703	0.648	0.763
psych diagnosis	0	2	1961.9	<.0001	3.005	2.862	3.155
avg hh income		2	96.5	<.0001	0.608	0.550	0.671
avg hh income_sq		2	7.62	0.006	1.018	1.005	1.030
acg health index		2	1157.1	<.0001	1.967	1.892	2.046
sex*agegroup	10-14	2	56.01	<.0001	0.671	0.604	0.745
sex*agegroup	15-24	2	18.09	<.0001	1.160	1.083	1.242
sex*agegroup	25-39	2	11.16	0.001	1.120	1.048	1.198
sex*agegroup	40-54	2	0.08	0.774	1.012	0.933	1.097
avehhinc*region	North	2	1.12	0.289	0.921	0.791	1.072
avehhinc*region	Rural	2	2.17	0.141	0.889	0.760	1.040
avehhinc_sq*region	North	2	0.27	0.606	1.005	0.987	1.022
avehhinc_sq*region	Rural	2	0.01	0.930	1.001	0.980	1.022

APPENDIX 6: VALIDITY ISSUES SURROUNDING MENTAL ILLNESS DIAGNOSES

Selecting the diagnostic categories of mental illness—construct validity

The Need To Know Team, as well as the Working Group for this deliverable (see Acknowledgements for a list of all members), discussed the categories of mental illness diagnoses to be used in this report. One MCHP Mental Health report in 1994[1] used the mental illness categories of "psychotic", "non-psychotic" and "other". However, the Team and the Working Group felt that more detailed categories would be more reflective of the way in which the mental health population is viewed today. The terms used in the previous MCHP report reflected the institutional era, where persons were often categorized psychotic/non-psychotic as an indicator of those who were institutionalized versus not institutionalized. Current mental health professionals regard mental illnesses as having continuums of severity, which can change over time. So the service systems must be flexible. The more specific terms of "depression", "personality disorder", "anxiety states", "substance abuse" and "schizophrenia" were considered more useful in reflecting the types of mental illness disorders currently discussed by planners and providers.

It was also considered important to try to make this report comparable, if at all possible, to similar Canadian reports. Administrative claims definitions of various mental illness conditions were available in the literature, and Appendix Table 6.1 shows the comparison of codings. Although some reports (notably, the Health Canada, 2002 report) were limited to hospital records only, we are able to include non-hospital claims in Manitoba to derive more population-based treatment prevalence estimates. The limitation of physician claims, with the more general three-digit coding without additional decimals, did not allow some specific diagnostic categories to be isolated from more generic groupings. For example, "bipolar" could not be distinguished from the category of "depression", nor could pharmaceutical usage patterns assist in the diagnostic task due to the fact that many of the drugs could be used for either condition.

[1] Tataryn D, Mustard C, Derksen S. *The Utilization of Medical Services for Mental Health Disorders. Manitoba: 1991-1992.* Winnipeg, MB: Manitoba Centre for Health Policy and Evaluation, July 1994.

Appendix Table 6.1: Comparison of diagnostic codes used to determine mental illness diagnostic categories

Groups	ICD-9-CM disorders	Three-digit codes	Tataryn et al., 1994	Health Canada, 2002*	Present Report (Martens et al., 2004)**	Yuen et al., 1996***
Organic psychoses	Dementia	290	other			ORG
	Alcoholic psychoses	291	other		SA	SA
	Drug Psychoses	292	other		SA	SA
	Delirium	293	other			ORG
	Other organic psychoses	294	other			ORG
Non-organic psychoses	Schizophrenia	295	psychotic	SCHIZ	SCHIZ	SCHIZ+OTH
	Affective psychoses	296	psychotic		DEP	DEP/BIPO
	depression	.2, .3	psychotic	DEP	DEP	
	bipolar disorder	.4 to .8	psychotic	.0, .4-.7 BIPO	DEP	
	Paranoid states	297	psychotic			SCHIZ+OTH
	Other psychoses	298	psychotic			SCHIZ+OTH
	Childhood psychoses	299	psychotic			
Nonpsychotic	Anxiety states	300	nonpsychotic	.0, .2, .3 ANX .4 DEP	DEP if associated with pharmaceuticals (see definition); .0, .2 and .3 ANXIETY (hospital claims), or at least 3 physician claims of 300 .4 DEP	AR
	Personality disorders	301	nonpsychotic	PD	PD	PD
	Sexual deviation	302	other			AR
	Alcohol Dependence	303	other		SA	SA
	Drug dependence	304	other		SA	SA
	Substance abuse (non-dependent)	305	other other		SA	
	Physiologic malfunction from mental factors	306	nonpsychotic			PSY-PHY
	Special syndromes NOC	307	nonpsychotic	.1, .5: EAT		PSY-PHY
	Acute reaction to stress	308	nonpsychotic			AR
	Adjustment reaction	309	nonpsychotic	.8 ANX	DEP	AR
	Nonpsychosis from organic brain damage	310	other			ORG
	Depressive NOC	311	nonpsychotic	DEP	DEP	AR
	Conduct disturbance NOC	312	na			
	Emotional disturbance in child and adolescence	313	na			
	Hyperkinetic syndrome	314	na		ADD/ADHD	
	Development delays	315	na			
	Psychic factors w diseases classified elsewhere	316	na			PSY-PHY
retardation	Mild	317	other			ORG
	Moderate to profound	318	other			ORG
	Unspecified	319	other			ORG
suicide and attempts	violence to self	E950 to E959	na	SU	SU (plus other codings – see description)	

307 includes anorexia nervosa (3071) and other eating disorders (3075). Overeating is 7836.
* HC report used most responsible diagnosis for hospital abstracts only.
** The category of "cumulative mental disorders" group included those persons who were categorized as one or more of the following: depression, anxiety
*** Also used codes for Counselling: V60 to V71.
ANX: anxiety; BIPO: bipolar; DEP: depression; EAT: eating disorder; PD: Personality disorder
SA: substance abuse; SCHIZ: schizophrenia; SU: suicide
AR: adjustment reactions; ORG: organic disorders; PSY-PHY: psychophysiologic+A17

The following definitions were used for this report:

Schizophrenia:

This diagnosis is relatively easy to identify since one code (295) applies and likely these people will have either a hospital or a physician claim due to the severity of the condition.

Definition: The treatment prevalence of schizophrenia is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of ICD-9-CM code 295 (schizophrenic disorders) in either hospital abstracts or physician claims.

According to Health Canada, the prevalence is around 1%.[2] Other studies have reported lifetime adult prevalence to be between 0.2% and 1%, similar to our five-year treatment prevalence of 1.2% (see Chapter 2).

Depression and bipolar disorder

This definition created difficulties due to the fact that bipolar disorder was only identifiable using decimals beyond the three-digit coding available in physician claims. Therefore, "bipolar" was excluded as a separate category, and our "depression" cohort could presumably include those with bipolar disorder. Because many of the pharmaceutical drugs used to treat mental illness are prescribed for various conditions, we consulted with pharmaceutical experts to determine the appropriate drug choices to use in identifying depression for the five-year period of the study population (1997/98-2001/02).

From the hospital or MHMIS files:

- Any of ICD-9-CM codes 296.2-296.8 (affective psychoses), 300.4 (neurotic depression), 309 (adjustment reaction), or 311 (depressive disorder).
- ICD-9-CM code 300 (neurotic disorders) plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine).

From the physician files:

- Any of ICD-9-CM codes 296, 309, or 311.
- ICD-9-CM code 300 plus a prescription for an antidepressant or mood stabilizer (excluding the anti-anxiety drugs paroxetine, citalopram and venflaxamine.

A validation study (West et al., 2000) used Saskatchewan Health physician claims data compared with medical records as the gold standard, using three ICD-9-CM physician codes for depression: 296, 309, 311 (patients were also taking an antidepressant). The administrative claims data achieved 77% accuracy compared to medical records. Unfortunately, the validity of this

[2] Health Canada. *A Report on Mental Illnesses in Canada*. Ottawa: 2002. NOTE: this report used hospital data only, and used most responsible diagnosis only.

study may be challenged by the fact that people were first identified through a pharmaceutical database.

We also conducted our own validation study for depression, using survey data linked to administrative claims data. Refer to Appendix 3 for more information on this validation study, which used the National Population Health Survey from 1996.

Our study determined the treatment prevalence for depression of around 7% for a one-year period, and 18% for a five-year period. Various other studies have estimated lower one-year prevalence of around four to 5%, but these studies often refer to "major" depressive episodes (see Chapter 2). Our estimates also include bipolar disorders, often estimated at around 1% (Tataryn et al., 1004).

Substance abuse

Definition: The treatment prevalence of substance abuse is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02: the presence of any of ICD-9-CM codes 291 (alcoholic psychoses), 292 (drug psychoses), 303 (alcohol dependence), 304 (drug dependence), or 305 (nondependent abuse of drugs) in physician claims or hospital abstracts.

We found an overall five-year treatment prevalence of 6% for substance abuse, similar to an Ontario one-year prevalence of 5% (see Chapter 2).

Anxiety States

Definition: The treatment prevalence of "anxiety states" is an age-adjusted percentage of the population aged 10 or greater that satisfies the following criteria in the five-year period from 1997/98 to 2001/02:

From the hospital or MHMIS files:

- The presence of one or more ICD-9-CM codes 300.0 (anxiety states), 300.2 (phobic disorders), or 300.3 (obsessive-compulsive disorders)

From the physician files:

- A physician coding of 300 at least 3 times in the five-year span.

Our estimate of anxiety disorders is around 7%, similar to many of the worldwide findings such as the WHO study estimate of around 8% (see Chapter 2 for more details).

Personality Disorders

Definition: the treatment prevalence of personality disorder is an age-adjusted percentage of the population aged 10 or greater that satisfies the follow-

ing criteria in the five-year period from 1997/98 to 2001/02: the presence of ICD-9-CM code 301 (personality disorders) in hospital abstracts or physician claims.

The estimated prevalence in U.S. data suggest 6% to 9% prevalence of personality disorder (see Chapter 2), which is much higher than our five-year treatment prevalence of around 1%. Therefore, we are most likely underestimating this category of mental illness through our use of administrative database claims. This may be difficult to identify, since clients are unlikely to be hospitalized, but may be seen by community mental health workers or physicians. As well, there is a high degree of comorbidity associated with personality disorders (see Chapter 2) which may lead to undercoding, especially in physician claims which are limited to one diagnosis per visit.

ADD/ADHD

Definition: The treatment prevalence of Attention Deficit Disorder (ADD) and Attention Deficit Hyperactive Disorder (ADHD) is a crude percentage of the population aged four through 18 years old (age determined in 2001/02) who had at least one ICD-9-CM code of 314 (hyperkinetic syndrome) in either physician claims or hospital abstracts, or a prescription for a psychostimulant (Cylert, Desoxyn Dexedrine, Dupram, Ritalin, PMS-Methylphenidate, Vivarin) during the one-year period. Children with a diagnosis of conduct disorder (312) or 347 (Catalepsy and Narcalepsy) are removed from this cohort.

This has been researched by Dr. Marni Brownell of MCHP, and is discussed further in Chapter 2.

Suicide and Suicide Attempts

Definition: Suicide and self-inflicted injury codes include E850-E854, E858, E862, E868 (accidental poisoning), E950-E952 (self-inflicted poisoning), E953 (self-inflicted injury by hanging), E954 (drowning), E955 (self-inflicted injury by firearms), E956 (self-inflicted injury by cutting), E957 (self-inflicted injury by jumping from high places), E958 (other/unspecified self-inflicted injury), E959 (late effects of self-inflicted injury); or ICD10 codes X40- X42, X46, X47 (accidental poisoning by analgesics, antipyretics, anti-rheumatics, sedative-hypnotic, narcotics), X46 (solvents and vapours), X47 (other gasses and vapours), X60-X69 (intentional self poisoning), X70 (suicide hanging), X72-X74 (suicide by gunshot), X78 (suicide by cutting), X71, X75-X77, X79-X84 (other suicide) in Vital Statistics records.

Our present report broadens the codings used to define suicide and suicide attempts in other reports. Despite these broadened categories, we are still

underestimating the number and rate of suicides when comparing our estimates to those of the Medical Examiner's Office (see Chapter 9 for a further discussion). However, the broadened categories appear to give population estimates in Manitoba that are more valid than those using only the E950-E952 definitions found in most other Canadian reports.

Predictive validity, strengths and limitations: do our categories of mental illness detect health care use differences, and patterns of mental illness as expected?

As observed throughout this report, the various mental illness diagnoses categories—both the overarching categories of "cumulative", "other", "any" and "no" mental illness diagnoses, as well as the more specific categories such as "depression", "schizophrenia" and so on—are consistently associated with substantial differences in the rates of use of hospitals, mental health centres, physicians and specialists. Moreover, those diagnoses that one would expect to be associated with high service use do, indeed, show the expected patterns (particularly, schizophrenia and personality disorders), strengthening the validity of these measures. Refer to Chapters 4 and 5 for specific information on physician and hospital/mental health centre use patterns.

Our results for income and its relationship with mental illness demonstrate predictive validity, especially in urban areas. The strongest income gradients in the treatment prevalence of most mental illness conditions are in the urban neighbourhood income quintiles, showing the greatest burden of mental illness in the lowest income neighbourhoods. The rural and remote areas do not show such a strong gradient, which may partly be due to the fact that there is more dispersion of people with mental illnesses despite varying neighbourhood income areas, or may partly be due to a migration effect whereby people with serious mental illnesses may migrate to urban settings for treatment (thus leaving a relatively equal distribution). However, this may be due to a limitation of our data in rural areas, where there are fewer psychiatrists and mental health services available, and presumably a greater degree of salaried physicians who may not necessarily submit claims into the administrative billing system, thus resulting in an underdiagnosis of mental illness problems. The gradient of health care service use with income reflects previous findings of MCHP, whereby physician visit rates show less of a pattern, but hospital rates and home care rates do, indeed, reflect a needs-based pattern whereby those in the lowest income quintile group have highest rates of use (presumably reflecting the greatest need for health care due to underlying severity of conditions).

Administrative claims data from northern and remote areas of the province may be undercounted due to the relatively high proportion of salaried physicians, and the fact that only 80% of visits are "shadow billed" to Manitoba Health by salaried physicians. Moreover, nurse practitioners may provide

care but do not bill into the claims data. Despite these limitations, rates/prevalence estimates for the North do show validity. The treatment prevalence of "cumulative mental disorders" is highest in the North, consistent with the idea that the area of poorest overall health status would presumably be the area with the highest burden of mental illness diagnoses. The treatment prevalence is mainly driven by diagnoses of "substance abuse" in this report (see Chapter 2), which is consistent with the findings of the earlier 1994 MCHP report (Tataryn et al., 1994). Concurrent validity is also demonstrated using CCHS Cycle 1.1 survey self-reported data on alcohol dependency. CCHS data show significantly higher rates in the North, supporting the validity of our administrative database findings (see Chapter 2, Section 2.7). However, the CCHS self-reported indicators of "probably depressed" from the CCHS Cycle 1.1 indicate potentially high rates for the North (although not statistically significant); whereas the administrative claims data indicate significantly lower treatment prevalence for depression (see Chapter 2, Section 2.5). This may indicate that depression diagnoses may be missing in the claims data for the North (possibly due to missing nurse practitioner diagnoses). On the other hand, there may be a "replacement effect" in diagnoses for the North, since comorbid conditions can only receive one diagnosis per physician visit. Therefore, "substance abuse" may be comorbid with conditions such as depression, but only receive one coding in physician visit claims files. Therefore, people may score high on a self-reported "probable depression" in CCHS, but the feelings of depression could be due to other conditions such as poor physical health, socioeconomic conditions, or a mental illness such as substance abuse.

As discussed both in this Appendix in extensively in Chapter 2, treatment prevalence estimates for mental illness disorders are relatively close to published results from other studies, many of which are clinical studies (with the exception of personality disorder, which we probably underestimate in this report). The degree of mental illness comorbidity in our research is also reflective of previously published data (see Chapter 2), where it is reported that 54% of people with a mental illness will exhibit a comorbid mental illness condition some time in their lifetime. In our report, half of those treated for depression have at least one other diagnosis, as well as half those treated for substance abuse. Of those in the group treated for anxiety states, and for schizophrenia, about three-quarters had at least one other diagnosis. Of those treated for personality disorder, almost all had at least one other diagnosis. The fact that our "other mental illness diagnoses" group has the least amount of comorbidity (only one-third had at least one other diagnosis) indicates the hierarchical nature of our groupings, with "cumulative" disorders showing a greater degree of comorbidity (as well as health care service use) compared to those in the "other" disorders group.

Does the profile of MHMIS clientele demonstrate the validity of our mental illness categories?

The Mental Health Management Information System (MHMIS) is discussed in Chapter 3, including issues of data collection in the various regions of the province. MHMIS clients are those people receiving mental health services, either community-based, institutional, or out-patient. The treatment prevalence of various mental illness disorders amongst clients of MHMIS helps demonstrate the construct validity of the definitions for mental illness used in this report. The population treatment prevalence for "cumulative mental disorders" is 24% in the entire population, compared with 84% for MHMIS clients—thus indicating an MHMIS clientele with a high burden of mental illness. The majority of mental illness conditions are approximately three to four times more prevalent among the MHMIS population than the overall Manitoba population. The more severe conditions, such as personality disorders (10% versus 0.9%) and schizophrenia (17% versus 1.2%), are over ten times more prevalent—an expected finding given the fact that those with more severe conditions would more likely be referred to mental health services (both community-based and institutional-based services).

One would expect that the more serious a mental illness, the more likely a person would be referred to mental health services, and the more likely this person would then be identified as a client within MHMIS. Looking at our administrative database defined cohort of people with "depression" diagnoses, we divided this group into those with no comorbidity and those with at least one other comorbidity within the "cumulative disorders" group. Of all those with only a depression diagnosis (n=45,890 non-Winnipeg, n=71,222 Winnipeg), 14.6% were clients of MHMIS in the non-Winnipeg areas, and 0.94% in Winnipeg. Of all those with at least one other comorbidity diagnosis (n=26,050 non-Winnipeg, n=43,449 Winnipeg), 20.5% were clients of MHMIS in the non-Winnipeg areas, and 3.5% in Winnipeg. Therefore, the greater degree of comorbidity, the greater likelihood that the person will be a client of MHMIS, giving a sense of face validity of our measures.

In the various income quintile graphs in this report, the "income not found" group includes people who are residents of long-term care facilities, personal care (nursing) homes and psychiatric facilities; residents of federal and long-term prisons; wards of the Public Trustee and Child and Family Services; or residents of areas reporting no average household income in the census. Therefore, one would expect that this group should more likely be clientele of mental health services, both community-based and institutional-based, if our measure has a sense of predictive validity. In our report, 8% of males and 4.3% of females in the "income not found" group are clients of MHMIS—six times greater for males and three times greater for females compared to the overall provincial prevalence.

How much information does MHMIS "add" to the diagnostic numbers?
According to the 1994 MCHP report on mental illness treatment prevalence (Tataryn et al., 1994), use of the MHMIS data captured 2.7% more cases of "any mental disorder" (from 61.2 to 62.9 per thousand), 11.0% of "psychotic disorders" (from 8.9 to 10.2 per thousand), 1.4% of non-psychotic disorders (from 47.5 to 48.2 per thousand), and 6.0% of "other disorders" (from 10.9 to 11.5 per thousand) over and beyond what the administrative data would capture. In order to determine the degree to which MHMIS currently contributes to capturing claims data not normally available through the Repository, comparisons by diagnostic group are given in Appendix Tables 6.2 and 6.3. Because MHMIS may not capture as many client records in Winnipeg compared to non-Winnipeg RHAs, two different sets of analyses were completed as part of this analysis (see Chapter 3 for a description of the differences in data collection between Winnipeg and non-Winnipeg RHAs).

In Appendix Table 6.2, the numbers and percentages of the total are given for those records appearing only in MHMIS, only in the Repository's administrative database claims (physician, pharmaceutical and hospital claims), and those records appearing in both are given for each of the major diagnostic categories used in this report. The column "MHMIS only" identifies clients whose Repository claims would NOT have identified them with a mental illness diagnosis if MHMIS were not used. For non-Winnipeg RHAs, the percentage of the total records captured solely through MHMIS data varied from 1.31% ("other" mental illness diagnoses group) to 6.41% (schizophrenia). For Winnipeg RHA, the percentages are considerably lower, from 0.09% ("other") to 1.83% (schizophrenia), which is not surprising given the fact that MHMIS is not used as extensively in Winnipeg. Therefore, the degree to which MHMIS "adds" to the numbers of people identified with a mental illness diagnosis is relatively small. One exception, however, is the diagnosis of Attention Deficit Disorder (ADD/ADHD), where the use of MHMIS files added 14.1% more cases than the Repository alone for non-Winnipeg RHAs. The MHMIS system added very little (0.2%) to the numbers diagnosed with ADD/ADHD within Winnipeg RHA.

Appendix Table 6.2: Number and percentage of client records present in MHMIS, administrative claims data in the Population Health Research Data Repository, or both

Mental illness diagnostic group	Data source for identification of mental illness diagnoses			Total
	MHMIS **only** N (% of total)	Repository **only** N (% of total)	**Both** MHMIS and Repository N (% of total)	
Non-Winnipeg				
Cumulative	3,261 (3.3%)	84,355 (86.1%)	10,375 (10.6%)	97,991
Anxiety States	1,276 (5.2%)	22,198 (89.5%)	1,323 (5.3%)	24,797
Depression	1,534 (2.1%)	58,076 (80.7%)	12,330 (17.1%)	71,940
Personality Disorders	142 (5.1%)	2,576 (93.0%)	52 (1.88%)	2,770
Schizophrenia	242 (6.4%)	2,287 (60.6%)	1,245 (33.0%)	3,774
Substance Abuse	885 (3.2%)	25,580 (92.8%)	1,088 (4.0%)	27,553
"other"	635 (1.3%)	46,792 (96.3%)	1,154 (2.4%)	48,581
ADD/ADHD	446 (14.1%)	2,085 (65.7%)	642 (20.2%)	3,173
Winnipeg only				
Cumulative	383 (0.3%)	145,869 (97.8%)	2,886 (1.9%)	149,138
Anxiety States	155 (0.4%)	43,194 (98.9%)	333 (0.8%)	43,682
Depression	121 (0.1%)	111,528 (97.3%)	3,022 (2.6%)	114,671
Personality Disorders	12 (0.2%)	6,515 (99.3%)	34 (0.5%)	6,561
Schizophrenia	154 (1.8%)	6,246 (74.1%)	2,034 (24.1%)	8,434
Substance Abuse	122 (0.4%)	32,131 (98.9%)	235 (0.7%)	32,488
"other"	76 (0.1%)	82,457 (99.7%)	147 (0.2%)	82,680
ADD/ADHD	10 (0.2%)	4,433 (99.1%)	30 (0.7%)	4,473

As an alternate way of looking at MHMIS data, we explore the degree to which MHMIS information would be captured using only the existing Population Health Research Data Repository. This is shown in Appendix Table 3.3. Presumably, because Winnipeg does not make extensive use of MHMIS (see Chapter 3), a lower percentage of records were added by using the MHMIS files than in non-Winnipeg RHAs.

Appendix Table 6.3: The percentage of MHMIS client records "captured" using the Population Health Research Data Repository as the only data source*

Mental Illness Diagnostic Category	Non-Winnipeg RHAs: % of MHMIS records captured using Repository only	Winnipeg RHAs: % of MHMIS records captured using Repository only
Cumulative	76.10%	88.30%
Anxiety States	50.90%	68.20%
Depression	88.90%	96.20%
Personality Disorders	26.80%	73.90%
Schizophrenia	83.70%	93.00%
Substance Abuse	55.10%	65.80%
"other"	64.50%	65.90%
ADD/ADHD	59.00%	75.00%

* referring to Appendix Table 3.2, the percentage calculation would be as follows: [(Both MHMIS and Repository)/(MHMIS + Both MHMIS and Repository)] x100

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