A Description of the Use of Insured Health Care Services by Income Assistance Recipients in the Province of Manitoba

A Pilot Study

Recipients of Income Assistance for Mental Health Disability

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The Manitoba Centre for Health Policy and Evaluation (MCHPE) is a unit within the Department of Community Health Sciences, Faculty of Medicine, University of Manitoba. MCHPE is active in health services research, evaluation and policy analysis, concentrating on using the Manitoba Health data base to describe and explain patterns of care and profiles of health and illness.

Manitoba has one of the most complete, well-organized and useful health data bases in North America. The data base provides a comprehensive, longitudinal, population-based administrative record of health care use in the province.

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MCHPE undertakes several major research projects, such as this one, every year under contract to Manitoba Health. In addition, MCHPE researchers secure major funding through the competitive grants process. Widely published and internationally recognized, they collaborate with a number of highly respected scientists from Canada, the United States and Europe.

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EXECUTIVE SUMMARY

This report provides descriptive information on the use of insured health care services by residents of Manitoba receiving income assistance in FY94/95 for reasons of mental health disability. In the work described in this report, we document some expected patterns confirming the needs of this group of income assistance recipients. For example, individuals receiving income assistance for mental health disability have a very high treatment prevalence of major mental health disorder, are very likely to live in the poorest urban neighbourhoods in the province and have durations of income assistance support which can be very long. These individuals are also dramatically socially isolated; only a small minority of these adults live in a household with another adult and/or children present. These results also document the unexpected finding that approximately 20% of the case group did not receive insured health care from a fee-for-service physician or acute care hospital in a 24 month period surrounding FY94/95.

Details of the methods of the study are provided in the body of the report. In summary, this study linked anonymous records of income assistance beneficiaries qualifying on the grounds of mental health disability to 12-month histories of insured health care use provided by physicians or acute care hospitals. Information on the use of medications and on the use of community-based mental health services was not available to the study. Two groups of Manitoba residents were selected to compare profiles of health care use with that of the group of income assistance recipients: 1) a sample of age/sex-matched adults in treatment for mental health disorders during the study period and 2) a sample of age/sex matched adults drawn from the general population of the province. Key measures described in this study were the use of physician services and the use of acute care hospital services, both for the treatment of mental health disorders and for the treatment of non-mental health conditions.

The study has clearly documented that the approximately 4,000 persons receiving income assistance for mental health disability in Manitoba in FY94/95 were intensive users of publicly insured mental health services. In part, this higher use of insured health care services is accounted for by the high prevalence of major mental health disorder among

persons receiving income assistance for mental health disability. But it is very important to note that the use of insured mental health care services among persons receiving income assistance for mental health disability is consistently higher than that of a group of Manitoba residents with a similar profile of psychiatric morbidity. Persons receiving income assistance for mental health disability also use high levels of insured health care services for non-mental health reasons. This higher use of care relative to a group of Manitoba residents with similar mental health care needs suggests that initiatives focused on enhancing the role and social function of persons receiving income assistance for mental health disability may lead to a reduction in the reliance on services provided by the health care system.

A number of important differences between urban and rural residents in the prevalence of mental health disorder in treatment and in the use of mental health services are summarized in this study. First, the proportion of individuals receiving income assistance for mental health disability who are urban residents is higher than the proportion of all persons in the province in treatment for mental health disorders. Second, while the rate of hospital admission is higher for rural residents both for the treatment of mental health disorder and for the treatment of non-mental health disorder, urban residents used a greater number of hospital days per 1,000 people for the treatment of mental health disorder. This greater use of hospital days is due to a much longer length of stay for persons resident in urban areas.

This study had access to limited information on the social circumstances of persons in treatment for mental health disorders. Household structure was associated with frequency and duration of hospital admission for the treatment of mental health disorder. In the case of two comparison groups described in this study, hospital admission rates for the treatment of mental health disorder and the length of stay of these admissions were greater among individuals not resident in a family with other adults present, relative to individuals in households with another adult present. This pattern was most pronounced among the youngest members of the group receiving income assistance for mental health disability.

This study has highlighted the magnitude of resources that are currently committed to the needs of persons with significant disability due to mental health disorder. The study also

highlights the joint involvement of Manitoba Health and Manitoba Family Services in providing services to this community. There may be significant opportunities for coordinated programming in responding to the needs of persons receiving income assistance for reasons of mental health disability. Here we report two examples. First, persons receiving income assistance for mental health disability annually use approximately 20,000 days of acute care hospital psychiatric care which is in excess of that which would be expected if hospital utilization were similar to that of a comparison group of persons in treatment for mental health disorder who are not income assistance recipients. This magnitude of hospital care can be estimated to represent approximately $8,000,000 of resources. In a second example we would point to the disbursement of non-continuous health benefits to income assistance recipients. These benefits primarily cover pharmaceutical purchases. Non-continuous health benefits used by persons receiving income assistance for mental health disability totalled approximately $4,600,000 in the 12-month period April 1994 to March 1995. In the first example, hospital care is funded by Manitoba Health, and the use of these resources is largely determined by the hospital admission practices and protocols of psychiatric specialists. In the second example, non-continuous health benefits are funded by Family Services, and given that the majority of these disbursements are for the purchase of medications, are again largely determined by the prescribing practices of physicians. There is a clear need to consider program structures which may allow the management of these resources to be more effectively coordinated.

The greater intensity of use of insured health care services by persons receiving income assistance for mental health disability relative to a comparison group which was matched on the prevalence of psychiatric morbidity marks a very important opportunity for coordinated service delivery. Case management models may well serve the needs of this community of mental health service users. Current obstacles to coordinated case management in Manitoba, which are found in professional and institutional practices, should be addressed directly. The information reported in this study strongly suggest the potential for innovative community case management models to reduce the intensity of mental health service use by income assistance recipients with mental health disability in the medical service and acute care hospital sectors.

The elevated use of hospital care for the treatment of mental health disorder among socially isolated adults is an important and distinctive feature associated with persons receiving income assistance for mental health disability. Community-based services which aim to integrate individuals in meaningful social communities are emphasized in the ongoing reform of mental health service provision in the province of Manitoba. These community-based services are an important area of potential collaboration between Family Services and Manitoba Health.

Persons receiving income assistance for mental health disability also use high levels of insured health care services for non-mental health reasons. There is again strong evidence from the clinical literature that effective case management, which truly meets the psycho-social and therapeutic needs of this community, can also reduce the use of health care services for non-mental health conditions.

There are potentially very strong opportunities to integrate administrative records of income assistance benefits and the use of insured health care services to monitor the quality and the outcome of care provided to persons receiving income assistance for mental health disability. Information sources currently available which would support this monitoring function include the sources described in this report as well as information from sources not included in this pilot study (the Drug Prescription Information Network (DPIN) and the Mental Health Management Information System (MHMIS)). When combined, these sources of information would support analyses focused on describing the role of continuity of primary care and integrated case management in averting the need for hospital care and the contribution of medication to successful maintenance therapy.

However, it is important to acknowledge the ethical issues which surround the use of administrative records for policy and program research. The protection of the confidentiality of individual identities has been a fundamental principle in the conduct of this research program. In turn, however, the application of information derived from this study must be used to support the interests of the community of need described in this research. We recommend that prior to pursuing additional research with these data, that the methods and

results of this pilot study be presented to representatives of mental health care consumers for their assessment of the potential for benefit and for harm arising from this type of research.

On the basis of the findings of this study, MCHPE strongly recommends Manitoba Health and Manitoba Family Services consider jointly establishing an ongoing monitoring and evaluation information system. This information system would be used to measure the performance of the health care system and social assistance programs in meeting the needs of persons with serious mental health disorder who receive income assistance. The system would establish approaches to measuring performance relative to explicit goals in mental health care service delivery. For example, in a program model emphasizing community-based case management, one goal might be to reduce the use of inpatient psychiatric acute care hospital days among persons receiving income assistance for mental health disability to that observed among a group of Manitoba residents with similar psychiatric morbidity who are not receiving income assistance. Another goal of community-based case management might be to increase the continuity of care in ambulatory settings. A third goal might be to improve social function status among persons receiving income assistance for mental health disability. As demonstrated in this report, the performance of the health care system relative to some of these goals can be measured with existing sources of administrative data. The sources of data used in this study can be supplemented by other sources of administrative data, such as drug prescribing records and records of encounters with providers in community-based mental health centres. In addition, measures of client satisfaction and social role function could be obtained directly from a sample of income assistance clients. For example, a 20% sample of income assistance clients could be interviewed annually, using a health and functional status assessment instrument such as the SF-36.

If these sources of information were integrated and organized to report on relevant system performance indicators, all groups involved in the provision of services and the clients of those services would have a clear picture of the performance of mental health service delivery and a regular portrait of progress in the implementation of mental health reform. Before a formal initiative should be undertaken in this area, mental health consumer

representatives would need to be consulted to establish their comfort with the objectives and the methods of such an integrated information system.

An integrated monitoring and evaluation information system would be an innovative program element in Canadian mental health services. It would actually resurrect an older idea, that of a mental health case registry. It will be very important to maintain the distinction between an information system established to monitor and evaluate the performance of service delivery from an information system used to determine specific program and administrative interventions for individual patients. The evaluation system would not identify individual people, providers or institutions. Rather, it would be used to describe the performance of the system overall. The range of initiatives currently underway in the reform of mental health services would be substantially complemented by such an integrated monitoring and evaluation system.

1. INTRODUCTION

Adults with serious mental health disorder, such as major depressions, bipolar disorders, schizophrenia and some chronic and severe forms of anxiety disorder, are vulnerable to profound social disability (Barker et al. 1992; Goldman, Gattozzi, Taube 1981; Schinnar, Rothbard, Kanter et al. 1990; Bland 1984; Dohrenwend, Dohrenwend, Link et al. 1983; Regier, Boyd, Burke et al. 1988; Klerman 1989; George, Blazer, Hughes et al. 1989; Broadhead, Blazer, George et al. 1990; Johnson, Weissman, Klerman 1992; Burke, Burke, Regier et al. 1990; Goering, Lin, Campbell et al. 1996). These major mental health disorders typically onset in the early adult period and frequently impair an individual's ability to enter the labour force or to retain a meaningful occupational role. Major mental health disorder also frequently disrupts social role function. People with these disorders have difficulty forming nuclear families and other intimate social relationships which are important to maintaining social integration. They also are vulnerable to the disintegration of relationships within their kinship group.

It is because of the profound social and occupational disability that is frequently a consequence of major mental health disorder that provincial income assistance programs recognize a category of need that in Manitoba is defined as mental health disability under the income assistance program structure of Manitoba Family Services. This research undertaking by the Manitoba Centre for Health Policy and Evaluation is being conducted at the joint initiative of two human services departments of the Government of Manitoba: Family Services and Health. The broad goal of this initiative is to determine if enhanced information on the health care needs of persons receiving income assistance for reasons of mental health disability in the province can lead to improved service delivery and an increased emphasis on integrated service delivery.

There are three primary groups of income assistance recipients receiving benefits from Manitoba Family Services: persons with disability, households with dependent children and general assistance recipients. For each of these groups, the clientele served by Manitoba Family Services represents a different proportion of all persons in the province eligible for

income assistance. In the case of households with dependent children, for example, Manitoba Family Services is the exclusive source of income assistance to households with dependent children for all residents of the province who are not Status Indians living on reserve. A companion report, to be released in the summer of 1997, will describe the health care use of children in households receiving income assistance due to dependent children.

This study combines information on household income assistance status with information on the use of publicly-funded health care services. Income assistance case information includes a description of the case benefit eligibility, the duration of benefits and the amount of benefits in FY94/95 for all cases of income assistance. For each individual in these case records, comprehensive histories of health care utilization have been assembled, combining information on the use of hospital care and the use of physician services. In some of the analyses reported in this study, health care utilization histories for samples of persons not receiving income assistance have been compiled for comparison purposes.

2. METHODS

This report is based on a cross-sectional descriptive study of the use of insured health care services by persons receiving income assistance for reasons of mental health disability. A file of electronic records describing persons receiving income assistance for one or more months in the period April 1994 to March 1995 was provided by the Department of Family Services, Government of Manitoba. Using unique personal identifiers recorded on this file, individual identities were linked to the file of registrants with the Manitoba Health Services Insurance Plan (MHSIP). The MHSIP registry file is an accurate source of information for the complete population of Manitoba. Following this linkage phase, two series of comparison groups were sampled from the registry. Subsequently, histories of health care utilization were compiled for each individual receiving income assistance for mental health disability and for individuals in the two control groups.

2.1 Linkage Summary

The file provided by Family Services contained records for 70,379 persons, within 33,924 assistance cases. A total of 17,422 cases received income assistance due to dependent children (48,123 persons), 12,890 cases received income assistance due to disability (16,147 persons) and there were 2,702 cases of general assistance and 910 cases qualifying for other forms of assistance (6,109 persons in the two categories combined).

The methods and procedures of the proposed linkage of income assistance beneficiaries records with records of health care use were reviewed and approved by two research oversight bodies, the Faculty Committee on the Use of Human Subjects in Research of the Faculty of Medicine, University of Manitoba, and the Access and Confidentiality Committee of Manitoba Health. Following these approvals, the Family Services file of income assistance beneficiaries was provided to Manitoba Health. This file did not contain individual names or street addresses. Representatives of Manitoba Health altered the unique personal identifiers contained on the Family Service records and provided the file to the Manitoba Centre for Health Policy and Evaluation. All subsequent analyses of these records

were conducted within a secure computing environment which preserves the confidentiality of individual information.

With the exception of the general assistance client group, where only 89.8% of records were matched, there was generally strong evidence that the group of persons for whom records could not be linked were a random sample of all persons receiving income assistance (Appendix Table A). For example, a total of 95.5% of client records in households with dependent children were successfully linked. This compares well with the 97.4% of records among persons qualifying for disability benefits due to mental health conditions, 98.4% of records among persons qualifying for disability benefits due to mental retardation and 95.6% of records among persons qualifying for benefits due to physical disability. Overall, the linkage success between these two administrative file sources was very high, and there was no indication of important bias across the records for which a record linkage was not accomplished.

2.2 Case Definition: Persons Receiving Income Assistance for Mental Health Disability

There were 12,890 income assistance cases in FY94/95 eligible for benefits on the basis of disability, representing approximately 35% of income assistance cases in this period. Disability status is classified into four categories in Family Services income assistance records: mental health, mental retardation, physical disability and other disability.

A total of 4,183 cases of income assistance in FY94/95 qualified for reasons of mental health disability. Eligibility for mental health disability is determined by a medical review panel, which includes an assessment of the individual's occupational prospects. Individuals with mental health disorder who are resident in provincial Mental Health institutions are eligible for a limited range of income assistance needs.

Of these 4,183 cases receiving income assistance for mental health disability, 107 (2.6%) could not be linked to an identity in the Manitoba Health registry. In an additional 99 cases, the applicant was under the age of 20 or over the age of 64. These two groups of cases were

excluded from subsequent analyses described in this progress report. In addition, 8 individuals were represented in two cases during the observation period. The first case was retained in the analyses, resulting in a total of 3,969 individuals receiving income assistance for mental health disability.

2.3 Selection of Comparison Groups

Two comparison groups were selected from the population of Manitoba residents represented in the MHSIP health insurance registry as of June 1994. One comparison group was sampled to match each person receiving income assistance for mental health disability on sex, age (within one year) and urban or rural residence (Control Group A). A second comparison group was selected to match each person receiving income assistance for mental health disability on the basis of treatment history for mental health disorder, in addition to sex, age (within one year) and urban or rural residence (Control Group B). In both comparison groups, four controls were selected to match each case.

The first comparison group, control group A, is designed to serve as population reference. As a sample designed to be representative of the Manitoba population, control group A was expected to contain a proportion of individuals in treatment for mental health disorders. The second comparison group, Control group B, is designed to provide a sample of persons in treatment for mental health disorder who were not receiving income assistance for mental health disability in the study period. Table 1 reports the success of the effort to sample persons in treatment for mental health disorder to match the diagnostic profile of persons receiving income assistance for mental health disability. Information on psychiatric morbidity was obtained from diagnoses reported on hospital abstracts and physician reimbursement claims, classified in the ICD-9-CM system. A total of 2,231 income assistance recipients received treatment for a major mental health disorder in the study period (56.2% of all persons receiving income assistance for mental health disability). Among the 15,852 persons selected for Control Group B, 54.8% received treatment for a major mental health disorder. A total of 22.6% of persons receiving income assistance for mental health disability were in treatment for a minor or other mental health disorder in the study period, in comparison to 45.1% of persons in Control Group B.

2.4 Demographic Characteristics

For individuals in the case group and the two control groups, information on age and gender were obtained from the MHSIP insurance registry. In addition, information on family structure was derived from the MHSIP registry, using the data on the numbers of people sharing a family registration number. Two measures of family structure were developed: whether an individual shared a family registration number with another adult, and whether there were children sharing a family registration number with the case or control adult.

Postal code information available for each individual in the MHSIP registry was used to classify residence as urban or rural, using a census definition developed by Statistics Canada. For cases receiving income assistance during the observation period, the postal code reported on the Family Services case file was used for classification. Urban residents were additionally classified by the average household income of the neighbourhood of residence, as measured by the 1991 census. Five equal sized groups of urban residents are formed by this method, ranked from the 20% of the urban population residing in the poorest neighbourhoods to the 20% of the urban population residing in the wealthiest neighbourhoods. A small number of postal codes, which include postal codes which uniquely define institutions, cannot be classified by this method.

2.5 Measures of Health Care Utilization

For this pilot study, two source of information on the use of insured health care services are described: acute care hospital services and physician services.

Acute Care Hospital Services: Use of acute care hospital services in Manitoba hospitals over a 24 month period, from April 1993 to March 1995, was represented by three measures:

1. the rate of hospital admission per 1,000 persons
2. the average length of stay per hospital admission
3. total days of hospital care per 1,000 persons

In the two measures reporting use of hospital care per 1,000 persons, the denominator was formed from all persons in the relevant category. For example, as reported in Table 10, the 699 individuals aged 20-29 receiving income assistance for mental health disability had 425 hospital admissions recording a mental health diagnosis in the 24 month observation period, resulting in a rate of hospital admission of 608/1,000. These measures were computed separately for hospital separations recording a mental health diagnosis as the principal diagnosis on the separation abstract and for all other hospital separations.

Physician Services: Information on the use of physician services was obtained from electronic records of fee-for-service reimbursement claims submitted to the MHSIP in the 12 month period April 1994 to March 1995. For each person in the sample, two measures of physician service use were computed: total physician visits (excluding diagnostic laboratory and imaging services) and total physician visits recording a mental health diagnosis. These measures of physician utilization were classified by the site of service, either an ambulatory contact, a contact in a hospital emergency or outpatient department or an inpatient encounter. Additionally, physician providers were classified as psychiatrists or non-psychiatrists.

2.6 Analysis

For the purposes of this pilot study, we have emphasized the reporting of descriptive tables, incorporating estimates of standard errors where relevant. The following assumptions were used in the calculation of standard errors. In the case of physician services, the count of visits per person in the sample was assumed to follow a Poisson distribution. Hospital admissions were assumed to follow a binomial distribution. Hospital days per 1,000 population and average length of stay per hospital admission were treated as normally distributed Gaussian variables.

Additionally, a series of univariate and multivariate regression results are reported. In these analyses, we have reported odds ratios between cases and the two control groups for the risk of hospital admission and for the volume of physician visits. In these tables, we have reported 95% confidence intervals for the odds ratio point estimates.

No formal statistical testing is reported in this document. Readers can estimate the statistical significance of differences in utilization of health care services between cases and control groups through the use of the standard error estimates or the confidence interval estimates.

3. RESULTS

Table 2 reports the distribution of the Manitoba population between the ages of 20 and 64 in treatment for a mental health disorder in the 24 month period from April 1993 to March 1995. A total of 133,144 persons in this age group were treated by a physician in an ambulatory setting or admitted to an acute care hospital one or more times where a mental health diagnosis was reported on the electronic treatment record. This population of persons in treatment for mental health disorders is stratified in Table 2 into three categories of disorder: major mental health disorder, minor mental health disorder and other mental health disorder. The specific disorders comprising each category are reported in Appendix Table B. The classification of persons into these categories is hierarchical: an individual receiving treatment for a major disorder and also for a minor disorder in the observation period is classified to the major category.

Information derived from records of physician services and acute hospital care confirms that persons receiving income assistance for mental health disability have a very high prevalence of major mental health disorder. In the 24 month period of health care utilization observed in this study, 56.2% of the 3,969 persons receiving income assistance for mental health disability also received treatment one or more times for a major mental health disorder (Table 2).

Overall, persons receiving income assistance for mental health disability comprised 3.0% of all adults aged 20-64 in the province receiving mental health treatment. However, of the total of 13,066 Manitobans between the ages of 20 and 64 in treatment for major mental health disorders, 17.1% were also receiving income assistance for mental health disability, documenting the serious impact of these disorders on labour force participation.

In Table 2, a total of 838 persons receiving income assistance for mental health disability did not receive care from a fee-for-service physician or were not admitted to an acute care hospital for the treatment of a mental health condition in the 24 month observation period. As reported in Table 3, 13.8% of these individuals were resident in provincial mental health

institutions, compared to 2.9% of individuals receiving income assistance who were in treatment during the study period.

Table 4 reports the distribution of income assistance cases for mental health disability by neighbourhood income quintile. This classification is formed from ranking the population of the province by mean household income of census enumeration areas, and grouping these ranked geographic areas into five categories, each containing approximately 20% of the urban or rural population. In Table 4, mental health disability cases are compared to adults aged 20-64 in treatment for major mental health disorders who did not receive income assistance for mental health disability in the period April 1994 to March 1995.

Approximately 8% of the income assistance group could not be ranked on the neighbourhood income measure, compared to 2.8% of the comparison group. This difference is in part attributable to those members of the income assistance group who reside in institutional settings. The distribution of income assistance recipients across the five neighbourhood income levels in rural settings was approximately equivalent to that of rural residents in treatment for major mental health disorders. In urban areas, however, income assistance recipients were much more likely to live in the poorer neighbourhoods than were persons in treatment for major mental health disorders who were not receiving income assistance for mental health disability. Additional comparisons are reported in Tables 5 and 6.

Table 7 reports the mean age at initiation of benefits and the mean duration of benefits for persons receiving income assistance for mental health disability. The mean duration of benefits rises from 3.5 years for persons under the age of 30 to 11.0 years for persons aged 50-64. Readers should note the wide standard deviations of the mean duration and mean age at initiation measures. It is also important to recognize that in this study we are measuring the duration of benefits in the current case period, not the lifetime history of income assistance benefits. There were not important differences in mean duration of benefits or mean age at initiation when the sample of persons receiving income assistance for mental health disability was stratified by category of disorder defined by treatment encounters in the 24 month period April 1993 to March 1995.

Table 8 reports summary information on the level of average monthly benefits paid to income assistance recipients qualifying for reasons of mental health disability. In this table, we have grouped income assistance recipients into deciles, ranked by the amount of the average monthly payment. Each decile therefore contains 10% of the Family Services client group. The dollar values reported in Table 8 represent the maximum payment amount received by Family Services clients in each decile.

Mean monthly payments averaged in the range of $552 to $643 across the three categories of treatment status reported in Table 8. Approximately 20% of the group of clients for whom no record of treatment for mental health disorder could be identified in MHSIP files received average monthly benefits substantially below the mean for the three groups. Table 8 also reports a benefit component called non-continuous health benefits. The majority of this benefit category represents the purchase of medications from community-based pharmacies. The members of the case group not in treatment for mental health disorder in the MHSIP insured care sector incurred average monthly expenditures for non-continuous health benefits (such as medications) of $59, compared to average monthly expenditures of $109 for beneficiaries in treatment for major mental health disorders and $103 for beneficiaries in treatment for minor disorders.

In Table 9, aspects of the family structure of mental health disability clients are described and compared to the two comparison groups. By the measures available to this study, persons receiving income assistance for mental health disability appear profoundly socially isolated. Less than 8% of individuals receiving income assistance were found to share a family health registration number with another adult, which may be accepted as a proxy for residence in a household without a spouse or other adult present, compared to 59% of age and sex matched controls in control group A and 49% of age and sex matched controls in group B, selected on the basis of similar mental health care needs. Similarly, less than 5% of income assistance recipients were found to share a family registration number with children compared to 37% of control group A and 33% of control group B.

3.1 Use of Insured Health Care Services

In the following section, we describe the use of insured health care services by persons receiving income assistance for mental health disability. This description is focused on the use of acute hospital care in the 24 month period from April 1993 to March 1995 and the use of physician services in the 12 month period April 1994 to March 1995. Excluded from the analyses described in this pilot study are health care services provided by or funded by the Mental Health Division of Manitoba Health. These services are very relevant to the Family Services clientele receiving income assistance for mental health disability. The exclusion of this component of health services is due to two factors. First, the specific approvals required to enable research access to Mental Health Division records of service provision were not sought in this first phase of this pilot study. Second, the development of management information systems in the area of community mental health services, while making important progress in the observation period of this study, need to be carefully evaluated for the completeness of information provided on this population.

In the description of health care utilization, the group of adults receiving income assistance for mental health disability, termed ‘cases’ in the accompanying tables, are compared to the two control groups described earlier in this report. Control group A consists of 4 persons selected to match each individual receiving income assistance for mental health disability. Matching was limited to urban or rural residence, age and sex. Control group B consists of 4 persons selected to match each case on urban or rural residence, age, sex and mental health treatment status in the observation year.

3.2 Use of Hospital Services

In Table 10, the rate of hospital separation per 1,000 persons is compared between cases and the two control groups, stratified by four age groups. Additionally, the analysis in this table reports hospital separations with a primary diagnosis of mental health disorder and separations with a primary diagnosis other than mental health disorder. Overall, the hospital admission rate for persons receiving income assistance for mental health disorder exceeded that of both comparison groups. The crude all-cause hospital admission rate over the 24

month observation period was 704/1,000 persons for cases, compared to 164/1,000 in control group A and 477/1,000 in control group B.

In analyses stratified by the primary diagnosis on the separation abstract, the hospital admission rate for conditions other than mental health disorders in the case group and control group B were equivalent. The rates in these two groups were elevated relative to control group A (Table 10). The rate of hospital admission for treatment of mental health disorder declined in the case group over time, from 608/1,000 at ages 20-29 to 200/1,000 at ages 50-64. In contrast, in control group B, which was designed to match cases on mental health treatment status, the hospital admission rate for treatment of mental health disorder was essentially constant over the four age groups.

Table 11 describes rates of hospital days used by the case group compared to the two control groups. Consistent with the profile of hospital separations describes in Table 10, hospital days of care for the treatment of mental health disorders was dramatically greater in the case group (13,353 days per 1,000) compared to control group A (106.6/1,000 persons). The use of hospitals days in the case group was approximately 4.3 times greater in the case group compared to control group B, which was matched on the basis of mental health status.

These differences were less substantial in the case of hospital days for the treatment of non-mental health disorders. The case group used approximately 2.3 times the number of hospital days for non-mental health disorders as control group A (2,363 days per 1,000 persons compared to 1,027 days per 1,000 persons). The case group actually used fewer hospital days for the treatment of non-mental health disorders than control group B (2,363 days per 1,000 persons compared to 3,046 days per 1,000 persons).

Table 12 describes the mean length of stay per hospital admission for the three groups. Average length of stay in the case group was substantially longer than either control group for admissions with a mental health disorder recorded as the primary diagnosis. The average length of stay in admissions for the treatment of non-mental health conditions was longer for both the case group and control group B than for the reference group in control group A.

Tables 13-19 continue these comparisons, reporting differences in the use of hospital services between the case group and the two control groups on a series of characteristics. Table 13 stratifies hospital utilization by gender. Table 14 stratifies hospital use by household structure. It is noteworthy that in the case of admissions for the treatment of mental health conditions, the number of hospital admissions per 1,000 persons was greater among persons without another adult present in the household relative to persons residing in households with another adult present. This pattern was present for all three groups of subjects in the study. Average lengths of stay for admissions associated with the treatment of mental health disorder were also longer for members of all three groups who resided in households without another adult present. The combination of these two characteristics, higher rates of hospital admission and longer lengths of stay, result in substantially higher rates of hospital days per 1,000 persons among individuals residing in solitary households.

The use of acute care hospital services by urban residents is reported in Table 15 and Table 16, stratified by neighbourhood income. Each of the five income quintiles contains 20% of the urban population, ranked from the 20% of the population in the poorest neighbourhoods to the 20% of the population in the wealthiest neighbourhoods. The dominant pattern in the data reported in Table 15 is one of a declining rate of hospital admission with increasing neighbourhood income. This pattern is clearly visible in admissions for non-mental health diagnoses, where the rate of admission declines in the case group and the two control groups with rising neighbourhood income. The one departure from this pattern is the rate of hospital admission for mental health diagnoses in the case group, where no trend to a reduction in the rate of admission is observed in relation to increasing neighbourhood income.

In contrast, there are no important trends in the average length of stay over neighbourhood income rank for the case group or the two control groups (Table 16).

Table 17 compares rates of hospital admission between urban and rural residents. This table also reports the rates of hospital admissions for those individuals who could not be geographically classified by postal code. The admissions rates in the table document the higher use of hospital care typically seen in Manitoba for rural residents, with the exception

of hospital admissions for the treatment of mental health disorder in the case group. In this group, there was no difference between urban and rural residents in the rate of hospital admission. In this same group, however, there was substantially greater use of hospital days per 1,000 persons for the treatment of mental health disorder among urban residents (Table 18), determined largely by the much longer length of stay described in Table 19.

The descriptive results reported in the previous series of tables are summarized in Tables 20-22. Table 20 reports the odds of hospital admission for the treatment of mental health disorder relative to the four demographic measures used in this study: age, gender, household structure and neighbourhood income quintile. Odds ratios have been estimated from multivariate logistic regression, and were conducted stratified by case or control group. As a result of this stratification, odds ratios are referenced within each group and do not allow between group comparisons. The general patterns reported early are also seen in the multivariate analysis. For example, in the case group on income assistance recipients, the odds of hospital admission for the treatment of mental health disorder decline with increasing age, are lower for males than for females and do not differ by urban neighbourhood income. In contrast, in both control groups A and B, the odds of hospitalization for the treatment of mental health disorder declines with increasing neighbourhood income.

In Table 21, a similar analysis is reported for odds of hospitalization for the treatment of non-mental health disorders.

Table 22 reports analyses which compare the odds of hospitalization directly between the case group and the two control groups. In this table, the case vs. control odds are reported on an unadjusted basis, are then reported adjusted for each relevant independent variable, and finally are reported adjusted for all independent variables. The adjusted odds ratio for case hospitalization for the treatment of mental health disorder relative to control group A is 39.1 (95% confidence interval: 30.1 - 50.9) and relative to control group B is 1.8 (95% confidence interval: 1.6 - 2.0). The adjusted odds ratio for case hospitalization for the treatment of non-mental health disorder relative to control group A is 1.7 (95% confidence interval: 1.5 - 1.9) and relative to control group B is 0.9 (95% confidence interval: 0.8 - 1.0).

Among the information recorded on Family Services case records are the total amount of non-continuous health benefits provided to each income assistance recipient. Non-continuous health benefits include reimbursement for pharmaceuticals and medical devices. Analyses summarized in Table 23 examine the relationship between the magnitude of non-continuous health benefits and the use of hospital care. There are two principal hypotheses guiding this analysis. First, persons with serious mental health disorder in the regular care of a primary care physician may be more successful in maintaining a medication protocol which contributes to the successful management of their disorder, resulting in lower need for hospital care. Under this hypothesis, higher amounts of non-continuous health benefits would be predicted to associate with lower use of hospital care. The alternate hypothesis is less sanguine about the ability of psychotropic medication to maintain states of remission, and predicts instead that persons in periods of acute disease activity will both use greater amounts of hospital care and higher amounts of non-continuous health benefits. As is illustrated in Table 23, the latter hypothesis is most consistent with the relationship between the magnitude of non-continuous health benefits and the use of hospital care for the treatment of mental health disorder. When stratified into three groups of approximately equal size, the lowest use of acute care hospital services in the treatment of mental health disorder was associated with the lowest average monthly non-continuous health benefit. It is worth noting, however, that while persons receiving the lowest average non-continuous health benefit had a lower rate of hospital admission for the treatment of mental health disorder, the average length of stay in this group was substantially longer than that of persons receiving median or high levels of benefit.

Table 24 reports acute care hospital admissions, contrasting persons receiving income assistance for mental health disorder who were not in treatment for a mental health condition during the 24 month study period with those cases in treatment for a mental health condition one or more times in the study period. The utilization in this table is restricted to hospital admissions for non-mental health conditions. The table includes a comparison of utilization of hospital care among individuals in Control Group A for non-mental health conditions. It is clear in this comparison that the 20% of cases who did not receive treatment for a mental health disorder also used much less hospital care for non-mental health conditions than did

the group of cases in treatment for mental health conditions. In fact, the use of hospital care among the case group not in treatment for mental health disorder is less than that of Control Group A, which is a population reference. The largest differences between the group of cases not in treatment for mental health disorder and Control Group A appears to reside in the use of hospital care by women. This may reflect the lower rate of household formation and lower fertility of women receiving income assistance for reasons of mental health disability.

3.3 Use of Physician Services

In the series of tables reporting the use of physician services, we have conducted analyses organized in a structure similar to that of tables describing hospital use. In these analyses, persons receiving income assistance for mental health disability (cases) are compared to two groups. Control group A contains 4 persons who are age and sex matched to each case. Control group B contains 4 persons who are matched to each case on age, sex and mental health status. Tables report comparisons among these three groups, stratified by age, gender, household structure, urban/rural residence and the neighbourhood income of urban residents.

Physician services are reported as mean visits per person over the 12 month observation period and are described by three sites of service: ambulatory visits to physician offices, outpatient contacts in hospital and physician services received during inpatient hospital stays. Physician services are also reported for all encounters, and for the sub-set of encounters which report a mental health diagnosis.

Total use of physician services was substantially higher among cases than either of the two control groups. The mean number of physician encounters for the treatment of all conditions in the 12 month period was 19.7 visits for cases, compared with 6.8 visits for control group A and 15.7 visits for control group B (Table 25). As would be expected, the large majority of the difference between the control group A and the two other groups is associated with encounters for the treatment of mental health conditions. Among cases, a mean of 10.3 physician encounters recorded a mental health diagnosis and among control group B, a mean of 5.5 physician encounters recorded a mental health diagnosis, compared to only 0.5 mean

encounters in control group A. Even after accounting for mental health utilization, however, both cases and members of control group B recorded higher mean utilization than control group A for non-mental health reasons. Cases had a mean of 9.4 physician encounters for non-mental health reasons and control group B had a mean of 10.2 encounters, compared to 6.3 encounters for non-mental health reasons in control group A.

Table 26 reports case and control use of physician services for the treatment of mental health conditions, stratified by type of provider. Although cases received approximately twice as many visits for the treatment of mental health conditions relative to control group B (10.3 vs. 5.5), there was no important difference in the proportion of these visits provided by psychiatric specialist physicians (62.3% of case encounters vs. 57.6% of control group B encounters).

When compared across age groups, persons receiving income assistance for mental health disability displayed a profile of physician service use which was distinct from that of either control group (Table 27). While in both control groups, mean physician encounters for all causes increased with age, there was no distinct age trend among cases in the mean number of visits for all conditions. The use of physician services by cases was very high at all points in the age course. Table 28 reports gender comparisons. In these data, women consistently use more services, on average, than men. This pattern is present in the description of physician encounters for the treatment of mental health disorders, where women's mean utilization was 1.2 to 2.0 times greater than male utilization, and this pattern appeared to be consistent across the three sites of services (ambulatory, outpatient and inpatient).

There was no strong relationship between household structure, indicated by the presence or absence of another adult in the household, and the use of services in any of the three groups of persons described in this study (Table 29). Similarly, there were no important differences among urban residents in the three groups in the use of physician services when compared across neighbourhood income quintile (Table 30). Rural residents used substantially fewer physician services than urban residents and this pattern was especially notable among cases, where persons resident in urban settings receiving income assistance for mental health

disability had substantially more physician encounters than cases residing in rural areas (Table 31).

Tables 32-34 summarize the differences between case and control groups, using multivariate Poisson regression. In Table 32, odds ratios for ambulatory physician visits for all conditions are reported for the primary demographic characteristics used in this study, estimated from regressions stratified by case and control group. In both Control Groups A and B, the number of physician visits rises with age, while the profile was relatively flat over the age course in the case group. Persons receiving income assistance for mental health disability who did not live in a household with another adult present had fewer physician visits than did cases in households with another adult present. There were no differences in utilization on this characteristic in the two comparison groups.

Table 33 repeats the regression analysis for ambulatory physician visits for the treatment of mental health disorders. It is noteworthy that both in the case group receiving income assistance for mental health disability and in Control Group B, the volume of physician visits for the treatment of mental health disorders rises with increasing neighbourhood income.

In Table 34 we report odds ratios for physician visits, contrasting the case group with control group A, and separately, the case group with control group B. As can be seen in the comparison between the unadjusted ratios and the ratios estimated after adjustment for all other factors, differences between groups on age, gender, household structure and neighbourhood income contributed very little to the observed differences between cases and the two control groups. Cases received 2.21 times more physician services for all conditions than control group A and 1.06 times more visits than control group B. The volume of physician services received by cases for the treatment of mental health conditions was 12.97 times greater than that received by members of control group A and 1.42 times greater than control group B.

4. DISCUSSION

As is clearly documented in this study, the approximately 4,000 persons receiving income assistance for mental health disability in Manitoba in FY94/95 were intensive users of publicly insured mental health services. The following discussion reviews some of the important patterns observed in the use of insured health care services by these individuals. The discussion also emphasizes the substantial opportunity for increased coordination of the management and delivery of both health and social services to these individuals and concludes with a strong recommendation to develop an innovative information system to monitor and evaluate the process and outcome of integrated service delivery.

Income assistance recipients qualifying for mental health disability in Manitoba are intensive users of publicly insured mental health services. In part, this higher use of insured health care services is accounted for by the higher prevalence of major mental health disorder among persons receiving income assistance for mental health disability relative to the population of Manitoba adults in treatment for mental health disorder. But it is very important to note that the use of insured health care services among persons receiving income assistance for mental health disability is consistently higher than that of a group of Manitoba residents with a similar profile of psychiatric morbidity. These differences are even more substantial when it is recalled that approximately 20% of the case group did not receive any mental health care services in the insured care sector during the observation period.

This higher use of care relative to a group of Manitoba residents with similar mental health care needs suggests that initiatives focused on enhancing the role and social function of persons receiving income assistance for mental health disability may lead to a reduction in the reliance on services provided by the health care system.

Approximately 20% of persons receiving income assistance for mental health disability did not receive any insured health care services for the treatment of mental health disorder in the study period. This group of income assistance recipients also had a profile of use of health care services for the treatment of non-mental health conditions which was distinctively

similar to the profile observed in the population reference comparison group, control group A. For example, the 838 individuals receiving income assistance for mental health disability who did not receive any insured health care services for the treatment of mental health disorder had an annual average of 5.2 physician encounters for the treatment of non-mental health disorder, compared to 6.3 visits for persons in Control Group A. In contrast, persons receiving income assistance who were in treatment for mental health disorder had an average of 10.5 visits for the treatment of non-mental health disorder. Similar patterns were seen in the use of acute care hospital care for the treatment of non-mental health conditions.

On the basis of the work reported in this study, it is inappropriate to assume that the health care utilization profile of this group of income assistance cases indicates that these people are inappropriate recipients of income assistance for mental health disability. First, the study has no independent measure of social and occupational role disability of this group of income assistance recipients. It is disability, and not need for mental health care, which is the primary criteria for income assistance eligibility.

Second, it is amply clear from a number of recent large North American studies that a substantial number of persons with psychiatric disorder are not in care in the formal medical care system (McGuire, Fairbank 1988; Mustard, Derksen, Tataryn 1996; Steinwachs, Kasper, Skinner 1992). For example, a recent study reporting on the use of mental health care services by a large sample of Ontario residents reported that 75% of individuals experiencing a mental health disorder in the past year (as measured by the University of Michigan adaptation of the CIDI) did not report seeking therapeutic help in the formal or informal health care sectors (Lin, Goering, Offord et al. 1996). Explanations for this apparent mismatch between need for care and use of care are multi-factorial. Some individuals in this setting are receiving care from community mental health services which are not described in this study. Some individuals have, through experience, come to be dissatisfied with the mental health care provided in the formal medical care system.

Finally, as has been well-described in a number of recent studies, the natural history of most major mental health disorders is one of which can be typified by disease course of activity

and remission (Ormel, Von Korff, Van Den Brink et al. 1993; Maj, Veltro, Pirozzi et al. 1992; Shea, Elkin, Imber et al. 1992; Wells, Burnam, Rogers et al. 1992; Kupfer, Frank, Perel et al. 1992; Keller, Lavori, Mueller et al. 1992; Keller, Lavori, Rice et al. 1986; Coryell, Endicott, Keller 1990; Keller, Klerman, Lavori et al. 1984). Periods of inactive disease will be experienced by most individuals with a history of major mental health disorder. Previously, we have described the persistence of intensive use of mental health services in Manitoba among persons with serious mental health disorder, showing that approximately 31% of users of mental health services in a 24 month period will become non-users in a subsequent 24 month period (Mustard, Derksen, Tataryn 1996). In general, social and occupational role disability persists during periods of disease remission (Broadhead, Blazer, George et al. 1990; Johnson, Weissman, Klerman 1992; Keller, Klerman, Lavori et al. 1984).

A number of important differences between urban and rural residents in the prevalence of mental health disorder in treatment and in the use of mental health services are summarized in this study. First, the proportion of individuals receiving income assistance for mental health disability who are urban residents is higher than the proportion of all persons in treatment for mental health disorders who are urban residents. A total of 84.7% of provincial income assistance recipients are urban residents, compared to 77.2% of provincial residents in treatment for mental health disorder. Second, while the rate of hospital admission is higher for rural residents both for the treatment of mental health disorder and for the treatment of non-mental health disorder, urban residents used a greater number of hospital days per 1,000 people for the treatment of mental health disorder. This greater use of hospital days is due to a much longer length of stay for persons resident in urban areas.

Many population-based studies have reported similar findings, where urban residents are more likely to be in treatment for mental health disorder, and among those people in treatment, urban residents use mental health service more intensively (Lin, Goering, Offord et al. 1996; Tataryn, Mustard, Derksen 1994). There are three possible explanations for this pattern. The first explanation rests with urban/rural differences in the supply of psychiatric acute care hospital beds and mental health specialist providers, which are disproportionately

based in urban settings. The second explanation may rest with a pattern of patient migration to urban areas. Persons with serious mental illness may migrate from rural to urban settings where a wider range of health and social services may be available. We have previously described evidence that this pattern of migration does occur in Manitoba (Tataryn, Mustard, Derksen 1994). The third explanation may rest with the difference between urban and rural environments, where urban environments present greater challenges to persons with serious mental illness to maintain role and social function (Lin, Goering, Offord et al. 1996), resulting in greater need for mental health care services.

This study had access to limited information on the social circumstances of persons in treatment for mental health disorders. As noted in the presentation of study results, persons receiving income assistance for mental health disability are profoundly socially isolated. Less than 8% of individuals receiving income assistance are resident in a family with a spouse or other adult present, compared to 59% of age and sex matched controls in control group A and 49% of age and sex matched controls in group B, selected on the basis of similar mental health care needs. Similarly, less than 5% of income assistance recipients are members of families with children compared to 37% of control group A and 33% of control group B.

Household structure was associated with frequency and duration of hospital admission for the treatment of mental health disorder. In the case and two comparison groups described in this study, hospital admission rates for the treatment of mental health disorder and the length of stay of these admissions were greater among individuals not resident in a family with other adults present, relative to individuals in households with another adult present. This pattern was most pronounced among the youngest members of the group receiving income assistance for mental health disability. These patterns were not present in the use of hospital care for non-mental health conditions. In addition, there was no association between family structure and the use of ambulatory physician services for the treatment of mental health conditions.

It is important to note that in the 24 month period from April 1993 to March 1995, the average length of stay for a psychiatric disorder in an acute care hospital was 30.9 days for

urban residents receiving income assistance for mental health disability (Table 19). This duration of stay is essentially identical to the length of stay observed among urban residents in FY91/92 admitted for the treatment of a psychotic disorder in a previous report published by MCHPE (see Table E.1, 50). In FY93/94, a 25% reduction in the supply of acute care psychiatric beds was implemented, in parallel with an expansion of community-based services. Given that the average length of stay for the treatment of major mental health disorder in the period prior to the reduction in acute care psychiatric bed supply is similar to the average length of stay during the period of bed supply reduction for persons receiving income assistance for major mental health disorder, it appears that clinical response to a reduced supply of beds has not focused on adjustments to length of stay for this group of patients. Although not explicitly examined in this study, it may be assumed that without a substantial reduction in length of stay following the reduction in bed supply, fewer persons have been admitted to acute care hospital settings for the treatment of major mental health disorders.

It is important to note that one determinant of the 30 day average length of stay may well be related to the tariff structure for reimbursing the provision of inpatient psychiatric care. These tariff regulations permit psychiatric specialists to bill for daily therapeutic encounters with inpatients, up to a maximum of 30 days, after which time the billing frequency declines. This factor would seem to be relevant for partially understanding the 30 day average length of stay among urban residents receiving income assistance for mental health disability who were admitted to hospital for the treatment of a mental health disorder. There was no evidence that the mean length of stay for urban residents varied by age, sex or neighbourhood income quintile rank. The hospital length of stay for rural income assistance recipients was 17 days.

4.1 Study Limitations

As noted early, this study has not included information on therapeutic or supportive services provided by or funded by the Mental Health Division of Manitoba Health. These services are especially relevant to the Family Services clientele receiving income assistance for mental health disability. This pilot study excluded the description of these services for two reasons.

First, the specific approvals required to enable research access to Mental Health Division records of service provision were not sought in this first phase of this pilot study. Second, the development of management information systems in the area of community mental health services, while making important progress in the observation period of this study, need to be carefully evaluated for the completeness of information provided on this population before inclusion in a study of this type.

This study did not have access to information concerning medication use among the group of individuals receiving income assistance for mental health disability. We have reported the magnitude of average monthly benefits dispensed in the non-continuous health benefit category (which represents predominantly expenditures on medications) but the study did not have information on specific therapeutic agents, agent dose or duration of use.

Finally, the study was based on a cross-sectional research design. While information is available from both Family Services case files and records of health care utilization which would permit the description of longitudinal histories of income assistance and health care use, this perspective is not developed in this pilot study. It would be potentially important to describe the longitudinal histories of health care utilization among persons receiving income assistance for mental health disability and to understand more completely the patterns of duration, entry and exit from income assistance status in this group of individuals.

4.2 Policy Options

This study highlights the magnitude of resources that are currently committed to the needs of persons with significant disability due to mental health disorder. The study also highlights the joint involvement of Manitoba Health and Manitoba Family Services in providing services to this community. There may be significant opportunities for coordinated programming in responding to the needs of persons receiving income assistance for reasons of mental health disability. By way of example, we report two specific dimensions of service delivery. First, persons receiving income assistance for mental health disability use approximately 20,000 days of acute care hospital psychiatric care annually which is in excess of that which would be expected if hospital utilization were similar to that of Control Group

B. This magnitude of hospital care can be estimated to represent approximately $8,000,000 of resources. A second example: total non-continuous health benefits used in a one year period by persons receiving income assistance for mental health disability totalled approximately $4,600,000 in 12 month period April 1994 to March 1995. In the first example, hospital care is funded by Manitoba Health, and the use of these resources is largely determined by the hospital admission practices and protocols of psychiatric specialists. In the second example, non-continuous health benefits are funded by Family Services, and given that the majority of these disbursements are for the purchase of medications, are again largely determined by the prescribing practices of physicians. There is a clear need to consider program structures which may allow the management of these resources to be more effectively coordinated.

The greater intensity of use of insured health care services by persons receiving income assistance for mental health disability relative to a comparison group which was matched on the prevalence of psychiatric morbidity marks a very important opportunity for coordinated service delivery. Case management models may well serve the needs of this community of mental health service users (Fenton, Tessier, Contandriopoulos et al. 1982; Holder, Blose 1987; Merson, Tyrer, Onyett et al. 1992; Dean, Phillips, Gadd et al. 1993; Muijen, Marks, Connolly et al. 1992; Stein, Test 1980; Budman, Demby, Feldstein 1984; Jerrell, Hu 1989; Curtis, Millman, Struening et al. 1992; Dietzen, Bond 1993; Mai, Gosselin, Varan et al. 1993; Burns, Beadsmoore, Bhat et al. 1993; Burns, Raftery, Beadsmoore et al. 1993). Current obstacles to coordinated case management in Manitoba, which are found in professional and institutional practices, should be addressed directly. The information reported in this study strongly suggests the potential for innovative community case management models to reduce the intensity of mental health service use by income assistance recipients with mental health disability in the medical service and acute care hospital sectors.

The elevated use of hospital care for the treatment of mental health disorder among socially isolated adults is an important and distinctive feature associated with persons receiving income assistance for mental health disability. Community-based services which aim to integrate individuals in meaningful social communities are emphasized in the ongoing reform

of mental health service provision in the province of Manitoba. These community-based services are an important area of potential collaboration between Family Services and Manitoba Health.

Persons receiving income assistance for mental health disability also use high levels of insured health care services for non-mental health reasons. There is again strong evidence from the clinical literature that effective case management, which truly meets the psycho-social and therapeutic needs of this community, can also reduce the use of health care services for non-mental health conditions.

It would be inappropriate to assume that the 20% of persons receiving income assistance for mental health disability who did not receive insured medical services for mental health reasons during the study period are inappropriate recipients of income assistance for mental health disability. As outlined earlier in the discussion, there are a number of explanations for the finding that a relatively large proportion of persons receiving income assistance for mental health disability are not receiving treatment in the insured health care system.

There are potentially very strong opportunities to integrate administrative records of income assistance benefits and the use of insured health care services to monitor the quality and the outcome of care provided to persons receiving income assistance for mental health disability. Information sources currently available which would support this monitoring function include the sources described in this report as well as information from sources not included in this pilot study (the Drug Prescription Information Network (DPIN) and the Mental Health Management Information System (MHMIS)). When combined, these sources of information would support analyses focused on describing the role of continuity of primary care and integrated case management in averting the need for hospital care and the contribution of medication to successful maintenance therapy.

However, it is important to acknowledge the ethical issues which surround the use of administrative records for policy and program research. The protection of the confidentiality of individual identities has been a fundamental principle in the conduct of this research

program. In turn, however, the application of information derived from this study must be used to support the interests of the community of need described in this research. We recommend that prior to pursuing additional research with these data, that the methods and results of this pilot study be presented to representatives of mental health care consumers for their assessment of the potential for benefit and for harm arising from this type of research.

On the basis of the findings of this study, MCHPE strongly recommends Manitoba Health and Manitoba Family Services consider jointly establishing an ongoing monitoring and evaluation information system. This information system would be used to measure the performance of the health care system and social assistance programs in meeting the needs of persons with serious mental health disorder who receive income assistance. The system would establish approaches to measuring performance relative to explicit goals in mental health care service delivery. For example, in a program model emphasizing community-based case management, one goal might be to reduce the use of inpatient psychiatric acute care hospital days among persons receiving income assistance for mental health disability to that observed among a group of Manitoba residents with similar psychiatric morbidity who are not receiving income assistance. Another goal of community-based case management might be to increase the continuity of care in ambulatory settings. A third goal might be to improve social function status among persons receiving income assistance for mental health disability. As demonstrated in this report, the performance of the health care system relative to some of these goals can be measured with existing sources of administrative data. The sources of data used in this study can be supplemented by other sources of administrative data, such as drug prescribing records and records of encounters with providers community-based mental health centres. In addition, measures of client satisfaction and social role function could be obtained directly from a sample of income assistance clients. For example, a 20% sample of income assistance clients could be interviewed annually, using a health and functional status assessment instrument such as the SF-36.

If these sources of information were integrated and organized to report on relevant system performance indicators, all groups involved in the provision of services and the clients of those services would have a clear picture of the performance of mental health service

delivery and a regular portrait of progress in the implementation of mental health reform. Before a formal initiative should be undertaken in this area, mental health consumer representatives would need to be consulted to establish their comfort with the objectives and the methods of such an integrated information system.

An integrated monitoring and evaluation information system would be an innovative program element in Canadian mental health services. It would actually resurrect an older idea, that of a mental health case registry. It will be very important to maintain the distinction between an information system established to monitor and evaluate the performance of service delivery from an information system used to determine specific program and administrative interventions for individual patients. The evaluation system would not identify individual people, providers or institutions. Rather, it would be used to describe the performance of the system overall. The range of initiatives currently underway in the reform of mental health services would be substantially complemented by such an integrated monitoring and evaluation system.

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Table 1: Results of Matching Income Assistance Cases to Controls on Mental Health Treatment Status (Control Group B)

Treatment Status of Income Assistance Case	Cases	Control Group B Major Disorder in Treatment		Minor Disorder in Treatment		Total
	N	N		N		N
Not in Treatment (%)	838	1,533	(46.0)	1,820	(54.0)	3,335
Major Disorder (%) in Treatment	2,231	7,043	(78.9)	1,877	(21.0)	8,920
Minor/Other Disorder (%) in Treatment	900	118	(3.3)	3,479	(96.7)	3,597
Total (%)	3,969	8,694	(54.8)	7,158	(45.1)	15,852

In each row, the percentage value reports the percent of control group matches which were in treatment for a major or a minor mental health disorder.

Table 2: Manitoba Population in Treatment for Mental Health Disorder By Category of Disorder and Income Assistance Status Manitoba, April 1993 to March 1995

Treatment Status (2)		Income Assistance (1)		No Assistance		Total	
Major Disorder	N(%)	2,231	(17.1)	10,835	(82.9)	13,066	(100.0)
Minor Disorder	N(%)	827	(0.8)	102,697	(99.2)	103,524	(100.0)
Other Disorder	N(%)	73	(0.4)	15,643	(99.6)	15,716	(100.0)
Not in Treatment	N(%)	838	(100.0)	-	(0.0)	838	(100.0)
Total	N(%)	3,969	(3.0)	128,504	(97.0)	133,144	(100.0)

Treatment Status (2)	Income Assistance		No Assistance		Total	
	N	%	N	%	N	%
Major Disorder	2,231	(56.2)	10,835	(8.4)	13,066	(9.9)
Minor Disorder	827	(20.8)	102,697	(79.9)	103,524	(78.1)
Other Disorder	73	(1.6)	15,643	(11.7)	15,716	(11.3)
Not in Treatment	838	(21.4)	-	(0.0)	838	(0.6)
Total	3,969	(100.0)	128,504	(100.0)	133,144	(100.0)

(1) Income assistance for one or more months in the 12-month period April 1994 to March 1995.

(2) Treatment status classified based on use of insured physician services in the 12-month period April 1994 to March 1995 or acute hospital care in the 24-month period April 1993 to March 1995. Please see text for detail on diagnostic classification.

Table 3: Distribution of Type of Shelter By Treatment Status Income Assistance Recipents for Mental Health Disability

	Treatment Status (1)					
	Not in Treatment		In Treatment		Total	
Shelter Type	**N**	**%**	**N**	**%**	**N**	**%**
Board and Room	149	17.53	466	14.95	615	15.5
Community Residence	9	1.06	14	0.45	23	0.58
Home Owner	25	3.06	95	3.01	120	3.02
Hospital	0	0.00	47	1.51	47	1.18
Institution	117	13.76	91	2.92	208	5.24
No Cost	24	2.82	151	4.84	175	4.41
Personal care	17	2.82	30	0.74	47	1.18
Residential Care	72	8.59	248	7.92	320	8.06
Rent-Private	309	36.71	1,614	51.64	1,923	48.44
Rent-Subsidized	116	13.65	374	11.99	490	12.35
Trailer	0	0.00	x	x.xx	x	x.xx
Total	838	100.00	3,131	100.00	3,969	100.00

(1) Treatment status classified based on use of insured physician services or acute hospital care in the 24-month period April 1993 to March 1994. Please see text for detail on diagnostic classification.

(x) Cell values less than 5 are not reported for confidentiality reasons.

Table 4: Adults Aged 20-64 in Treatment For Major Mental Health Disorders Compared to Adults Aged 20-64 Receiving Income Assistance For Mental Health Disability By Neighbourhood Income Quintile Manitoba, April 1993 to March 1995

	Persons in Treatment for Major Mental Health Disorder Not Receiving Income Assistance		Income Assistance Recipient (1)	
	N	%	N	%
Not Ranked (2)	302	(2.8)	314	(7.9)
Rural Total	1,841	(17.0)	292	(7.4)
Urban Total	8,692	(80.2)	3,363	(84.7)
Total	10,835	(100.0)	3,969	(100.0)
Rural Income Quintile				
Q1 (lowest)	339	(18.4)	59	(20.2)
Q2	337	(18.3)	79	(27.1)
Q3	329	(17.9)	52	(17.8)
Q4	358	(19.4)	62	(21.2)
Q5	478	(26.0)	40	(13.7)
Rural Total	1,841	(100.0)	292	(100.0)
Urban Income Quintile				
Q1 (lowest)	2,061	(23.7)	1,776	(52.8)
Q2	1,837	(21.1)	669	(19.9)
Q3	1,714	(19.7)	493	(14.7)
Q4	1,624	(18.7)	267	(7.9)
Q5	1,456	(16.8)	158	(4.7)
Urban Total	8,692	(100.0)	3,363	(100.0)

(1) Income assistance for one or more months in the 12-month period April 1994 to March 1995.

(2) Individuals not ranked on neighbourhood income quintile were resident in institutions or the postal code could not be linked to census information

**Table 5: Adults Aged 20-64 in Treatment for Mental Health Disorders
By Disorder Category, Income Assistance Status and Neighbourhood Income Quintile
Manitoba, April 1993 to March 1995**

	Income Assistance Recipients (1) Treatment Status (3)						No Assistance Treatment Status (3)				
	Major Disorder	Minor Disorder	Other Disorder	No Treatment	Total	%	Major Disorder	Minor Disorder	Other Disorder	Total	%
Not Ranked (2)	146	10	16	145	317	7.9	301	985	218	1,504	1.2
Rural Income Quintile											
Q1 (lowest)	35	12	x	9	59	1.5	339	4,172	1,360	5,871	4.5
Q2	45	13	x	20	79	2.0	338	3,939	1,013	5,290	4.1
Q3	28	9	x	14	53	1.3	330	3,979	770	5,079	3.9
Q4	29	13	x	18	62	1.6	351	4,720	568	5,645	4.4
Q5	23	11	x	5	39	1.0	478	4,841	719	6,038	4.7
Rural Total	160	58	8	66	292	7.3	1,842	21,651	4,430	27,923	21.7
Urban Income Quintile											
Q1	1,020	394	28	332	1,774	44.7	2,061	17,162	2,856	22,079	17.1
Q2	367	166	9	126	668	16.9	1,836	15,706	2,251	19,793	15.3
Q3	283	107	6	98	494	12.4	1,713	16,133	2,107	19,953	15.5
Q4	157	66	x	42	267	6.7	1,626	16,200	1,965	19,791	15.3
Q5	98	26	x	29	157	4.0	1,456	14,860	1,816	18,132	14.1
Urban Total	1,925	759	49	627	3,360	84.7	8,692	80,061	10,995	99,748	77.2
Total	2,231	827	73	838	3,969	100.0	10,835	102,697	14,972	128,504	100.0

(1) Income assistance for one or months in the 12-month period April 1994 to March 1995
(2) Individuals not ranked on neighbourhood income quintile were resident in institutions or the postal code could not be linked to census information
(3) Treatment status classified based on use of insured physician services or acute hospital care in the 24-month period April 1993 to March 1994. Please see text for detail on diagnostic classification.
(x) Cell values less than 5 are not reported for confidentiality reasons.

Table 6: Income Assistance Recipents for Mental Health Disability By Age, Gender and Treatment Status Manitoba, April 1993 to March 1995

Age	Gender	Treatment Status (1)				Total
		No treatment in Observation Period		In Treatment in Observation Period		
		N	%	N	%	N
20-29		126	14.8	573	18.4	699
30-39		177	20.8	955	30.6	1,132
40-49		207	24.7	906	29.0	1,113
50-59		328	39.6	697	22.1	1,025
Total		838	100.0	3,131	100.0	3,969
20-29	Male	88	69.8	385	67.2	473
	Female	38	30.2	188	32.8	226
	Total	126	100.0	573	100.0	699
30-39	Male	121	68.4	583	61.0	704
	Female	56	31.6	372	39.0	428
	Total	177	100.0	955	100.0	1,132
40-49	Male	135	65.2	463	51.1	598
	Female	72	34.8	443	48.9	515
	Total	207	100.0	906	100.0	1,113
50-64	Male	186	57.3	319	45.3	505
	Female	142	42.7	378	54.7	520
	Total	328	100.0	697	100.0	1,025
Total	Male	530	63.4	1,750	55.8	2,280
	Female	308	36.6	1,381	44.2	1,689
	Total	838	100.0	3,931	100.0	3,969

Table 7: Age at Initiation of Benefits in Current Case and Duration of Benefits, By Age and Treatment Status
Income Assistance Recipents for Mental Health Disability (N=3,969)

Age Group		Treatment Status (1)									
		Major Disorder		Minor Disorder		Other Disorder		No Treatment		Total	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
20-29	Number of Cases	404		151		18		126		699	
	Age at Initiation of Benefits	23	(3.2)	22.8	(3.2)	21.8	(3.9)	20.7	(2.9)	22.5	(3.3)
	Duration of Benefits (Years)	3.2	(2.7)	3.1	(2.6)	4.1	(3.5)	4.6	(3.0)	3.5	(2.8)
30-39	Number of Cases	710		233		12		177		1,132	
	Age at Initiation of Benefits	29.7	(4.9)	30.5	(5.0)	25	(6.2)	27.1	(5.6)	29.4	(5.2)
	Duration of Benefits (Years)	5.5	(4.4)	4.8	(4.3)	9	(6.7)	8.1	(5.4)	5.8	(4.7)
40-49	Number of Cases	647		239		20		207		1,113	
	Age at Initiation of Benefits	36.6	(7.2)	39.3	(5.9)	37.7	(7.5)	34	(8.1)	36.7	(7.3)
	Duration of Benefits (Years)	8.2	(6.8)	5.7	(5.3)	8	(7.4)	11	(7.8)	8.2	(6.9)
50-64	Number of Cases	470		204		23		328		1,025	
	Age at Initiation of Benefits	45.8	(8.6)	47.2	(7.8)	48	(9.5)	45.7	(9.5)	46.1	(8.8)
	Duration of Benefits (Years)	10.7	(8.3)	9.2	(7.6)	8.8	(8.2)	12.7	(8.8)	11	(8.4)
Total	Number of Cases	2,231		827		73		838		3,969	
	Age at Initiation of Benefits	33.9	(10.0)	35.8	(10.4)	34.9	(13.0)	35.7	(12.2)	35.6	(10.7)
	Duration of Benefits (Years)	6.9	(6.5)	5.9	(5.8)	7.5	(7.0)	10.1	(7.8)	7.4	(6.8)

(1) Treatment status classified based on use of insured physician services or acute hospital care in the 24-month period April 1993 to March 1994. Please see text for detail on diagnostic classification.

Table 8: Distribution of Average Monthly Benefit and Average Monthly Non-Continuous Health Benefit, By Treatment Status Income Assistance Recipents for Mental Health Disability

	Treatment Status (1)		
Average Monthly Benefit	**No Treatment**	**Major Disorder**	**Minor Disorder**
Payment Decile (2)	**$**	**$**	**$**
1	83	239	359
2	268	416	466
3	458	499	569
4	524	587	632
5	608	639	665
6	663	670	678
7	686	692	701
8	733	735	750
9	897	886	905
10 (highest)	1,747	1,663	1,861
Mean Monthly Payment	552 (278)	593 (236)	643 (224)
Non-Continuous Health Benefits	**No Treatment**	**Major Disorder**	**Minor Disorder**
Payment Decile (2)	**$**	**$**	**$**
1	0	6	5
2	0	20	18
3	3	34	31
4	10	50	49
5	19	70	72
6	33	90	97
7	54	118	124
8	92	165	160
9	155	247	229
10 (highest)	2,114	1,281	1,404
Mean Monthly Payment	59 (130)	109 (134)	103 (117)

(1) Treatment status classified based on use of insured physician services or acute hospital care in the 24-month period April 1993 to March 1994. Please see text for detail on diagnostic classification.

(2) Payment decile ranks all cases within a treatment status category from smallest to largest payment. The reported dollar values represent the maximum payment within the 10% of cases in the decile.

Table 9: Characteristics of Family Structure of Income Assistance Recipents For Mental Health Disability Compared to Age and Sex Matched Controls (Control Group A) and Age, Sex and Mental Health Status Matched Controls (Control Group B)

		Income Assistance Cases		Control Group A (1)		Control Group B (1)	
Presence of Spouse or Other Adult in Household		**No Spouse/ Other Adult Present**	**Spouse/ Other Adult Present**	**No Spouse/ Other Adult Present**	**Spouse/ Other Adult Present**	**No Spouse/ Other Adult Present**	**Spouse/ Other Adult Present**
Age Group							
20-29	N (%)	665 (95.1)	34 (4.9)	2,176 (77.8)	620 (22.2)	2,268 (81.2)	524 (18.8)
30-39	N (%)	1,038 (95.1)	94 (8.3)	1,963 (43.4)	2,565 (56.7)	2,470 (54.5)	2,058 (45.5)
40-49	N (%)	1,005 (90.3)	108 (9.7)	1,283 (28.8)	3,169 (71.2)	1,866 (42.0)	2,575 (58.0)
50-64	N (%)	951 (92.8)	74 (7.2)	1,110 (27.1)	2,990 (72.9)	1,478 (36.1)	2,613 (63.9)
Total	N (%)	3,659 (92.2)	310 (7.8)	6,532 (41.1)	9,344 (58.9)	8,082 (51.0)	7,770 (49.0)

		Income Assistance Cases		Control Group A		Control Group B	
Presence of Children in Household		**No Children Present**	**Children Present**	**No Children Present**	**Children Present**	**No Children Present**	**Children Present**
Age Group							
20-29	N (%)	675 (96.6)	24 (3.4)	2,225 (79.6)	571 (20.4)	2,212 (79.2)	580 (20.8)
30-39	N (%)	1,065 (94.1)	67 (5.9)	1,956 (43.2)	2,572 (56.8)	2,261 (49.9)	2,267 (50.1)
40-49	N (%)	1,044 (93.8)	69 (6.2)	2,096 (47.1)	2,356 (52.9)	2,441 (54.7)	2,000 (45.3)
50-64	N (%)	1,006 (98.1)	19 (1.9)	3,682 (89.8)	418 (10.2)	3,680 (89.9)	411 (10.1)
Total	N (%)	3,790 (95.5)	179 (4.5)	9,959 (62.7)	5,917 (37.3)	10,594 (66.8)	5,258 (33.2)

(1) Four controls selected for each case, matched on age, sex and urban or rural residence. Controls in Group B are also matched on mental health treatment status. Please see text for additional details.

**Table 10: Hospital Separations per 1,000 Persons,
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Age Group, Manitoba FY93/94 - FY94/95**

		Age Group									
		20-29		30-39		40-49		50-64		Total	
Number of Subjects	Case	699		1,132		1,113		1,025		3,969	
	Control A	2,796		4,528		4,452		4,100		15,876	
	Control B	2,792		4,528		4,441		4,091		15,852	
Primary Diagnosis on Admission Abstract		**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**
Mental Health	Case	608.0	18.5	557.4	14.8	377.4	14.5	200.0	12.5	423.5	7.8
	Control A	3.9	1.2	9.1	1.4	8.1	1.3	10.5	1.6	8.3	0.7
	Control B	169.1	7.1	165.2	5.5	170.2	5.6	161.8	5.8	166.4	3.0
Non-Mental Health	Case	246.1	16.3	224.4	12.4	270.4	13.3	379.5	15.2	281.2	7.1
	Control A	163.1	7.0	138.5	5.1	123.3	4.9	204.9	6.3	155.7	2.9
	Control B	267.6	8.4	223.5	6.2	271.6	6.7	481.5	7.8	311.3	3.7
Total	Case	854.1	13.4	781.8	12.3	647.8	14.3	579.5	15.4	704.7	7.2
	Control A	167.0	7.1	147.5	5.3	131.4	5.1	215.4	6.4	164.0	2.9
	Control B	436.6	9.4	388.7	7.2	441.8	7.5	643.4	7.5	477.7	4.0

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.
Rate per 1,000 persons is computed as number of hospital separations in group divided by number of persons in group.

Table 11: Hospital Days per 1,000 Persons
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Age Group, Manitoba FY93/94 - FY94/95

		Age Group									
		20-29		30-39		40-49		50-64		Total	
Number of Subjects	Case	699		1,132		1,113		1,025		3,969	
	Control A	2,796		4,528		4,452		4,100		15,876	
	Control B	2,792		4,528		4,441		4,091		15,852	
Primary Diagnosis on Admission Abstract		**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**	**/1,000**	**SE**
Mental Health	Case	18,257.5	1,939.7	18,153.7	2,531.8	10,602.9	1,528.1	7,692.7	1,225.0	13,353.0	962.5
	Control A	39.0	19.8	114.0	54.4	107.1	39.9	144.1	59.2	106.6	24.7
	Control B	3,010.0	289.7	2,588.3	223.5	2,649.6	211.0	4,260.1	452.9	3,111.2	154.5
Non-Mental Health	Case	1,181.7	214.8	2,220.0	414.8	2,057.5	347.6	3,660.5	420.3	2,363.6	192.0
	Control A	606.6	75.1	520.5	47.2	1,234.3	438.2	1,648.3	206.3	1,027.1	135.3
	Control B	1,345.6	245.0	1,922.7	305.1	2,271.1	202.7	6,293.3	502.0	3,046.6	172.3
Total	Case	19,439.2	1,952.2	20,373.7	2,573.4	12,660.4	1,565.8	11,353.2	1,330.1	15,716.6	985.4
	Control A	645.6	77.9	634.5	71.9	1,341.4	441.8	1,792.4	214.6	1,133.7	138.0
	Control B	4,355.7	382.5	4,511.0	386.1	4,920.7	298.6	10,553.4	679.1	6,157.8	234.2

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.
Rate per 1,000 persons is computed as number of hospital separations in group divided by number of persons in group.

Table 12: Average Length of Stay per Hospital Admission
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Age Group, Manitoba FY93/94 - FY94/95

Primary Diagnosis on Admission Abstract		Age Group 20-29 Mean Days	SE	30-39 Mean Days	SE	40-49 Mean Days	SE	50-64 Mean Days	SE	Total Mean Days	SE
Mental Health	Case	30.0	2.2	32.6	4.0	28.1	2.7	38.5	4.9	31.5	1.8
	Control A	9.9	3.3	12.6	2.4	13.3	3.1	13.7	2.4	12.9	1.4
	Control B	17.8	1.1	15.7	0.8	15.6	0.8	26.3	2.3	18.7	0.7
Non-Mental Health	Case	4.8	0.5	9.9	1.5	7.6	0.9	9.6	0.7	8.4	0.5
	Control A	3.7	0.3	3.8	0.2	10.0	3.5	8.0	0.8	6.6	0.8
	Control B	5.0	0.8	8.6	1.1	8.4	0.4	13.1	0.8	9.8	0.4
Total	Case	22.8	1.7	26.1	2.9	19.5	1.7	19.6	1.8	22.3	1.1
	Control A	3.9	0.3	4.3	0.3	10.2	3.3	8.3	0.8	6.9	0.8
	Control B	10.0	0.7	11.6	0.7	11.1	0.4	16.4	0.8	12.9	0.4

Control A group contains 4 persons age and sex amtched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 13: Hospital Utilization, By Gender and Case/Control Status Manitoba FY93/94 - FY94/95

Separations per 1,000 Persons

Primary Diagnosis on Admission		Male /1,000	SE	Female /1,000	SE	Total /1,000	SE
Mental	Case	382.9	10.2	478.4	12.2	423.5	7.8
Health	Control A	6.0	0.8	11.2	1.3	8.3	0.7
	Control B	142.6	3.7	198.5	4.9	166.4	3.0
Non-Mental	Case	238.2	8.9	339.3	11.5	281.2	7.1
Health	Control A	111.3	3.3	215.7	5.0	155.7	2.9
	Control B	253.3	4.6	389.4	5.9	311.3	3.7
Total	Case	621.1	10.2	817.6	9.4	704.7	7.2
	Control A	117.3	3.4	226.9	5.1	164.0	2.9
	Control B	395.9	5.1	587.9	6.0	477.7	4.0

Hospital Days per 1,000 Persons

Primary Diagnosis on Admission		Male /1,000	SE	Female /1,000	SE	Total /1,000	SE
Mental	Case	12,154.8	1,029.9	14,970.4	1,783.8	13,353.0	962.5
Health	Control A	55.0	15.9	176.3	54.0	106.6	24.7
	Control B	2,466.0	165.5	3,979.9	285.5	3,111.2	154.5
Non-Mental	Case	2,411.8	266.0	2,298.4	273.2	2,363.6	192.0
Health	Control A	759.5	86.0	1,388.2	295.9	1,027.1	135.3
	Control B	2,737.9	216.7	3,462.3	279.9	3,046.6	172.3
Total	Case	14,566.7	1,072.5	17,268.8	1,807.0	15,716.6	985.4
	Control A	814.6	88.5	1,564.5	301.4	1,133.7	138.0
	Control B	5,203.9	278.3	7,442.1	401.3	6,157.8	234.2

Average Length of Stay per Admission

Primary Diagnosis on Admission		Male Mean Days	SE	Female Mean Days	SE	Total Mean Days	SE
Mental	Case	31.7	1.8	31.3	3.3	31.5	1.8
Health	Control A	9.1	2.0	15.7	1.9	12.9	1.4
	Control B	17.3	0.9	20.1	1.0	18.7	0.7
Non-Mental	Case	10.1	0.8	6.8	0.6	8.4	0.5
Health	Control A	6.8	0.7	6.4	1.3	6.6	0.8
	Control B	10.8	0.7	8.9	0.5	9.8	0.4
Total	Case	23.5	1.2	21.1	2.0	22.3	1.1
	Control A	6.9	0.6	6.9	1.3	6.9	0.8
	Control B	13.1	0.5	12.7	0.5	12.9	0.4

Table 14: Hospital Utilization
By Household Structure and Case/Control Status

Separations per 1,000 Persons

Primary Diagnosis on Admission		No Other Adult Present		Other Adult Present		Total	
		/1,000	SE	/1,000	SE	/1,000	SE
Mental Health	Case	432.9	8.2	312.9	26.3	423.5	7.8
	Control A	12.1	1.4	5.6	0.8	8.3	0.7
	Control B	190.1	4.4	141.8	4.0	166.4	3.0
Non-Mental Health	Case	279.6	7.4	300.0	26.0	281.2	7.1
	Control A	156.2	4.5	155.4	3.7	155.7	2.9
	Control B	289.4	5.0	334.1	5.4	311.3	3.7
Total	Case	712.5	7.5	612.9	27.7	704.7	7.2
	Control A	168.2	4.6	161.0	3.8	164.0	2.9
	Control B	479.5	5.6	475.9	5.7	477.7	4.0

Hospital Days per 1,000 Persons

Primary Diagnosis on Admission		No Other Adult Present		Other Adult Present		Total	
		/1,000	SE	/1,000	SE	/1,000	SE
Mental Health	Case	14,006.3	1,036.3	5,641.9	1,439.3	13,353.0	962.5
	Control A	170.5	52.5	62.0	20.5	106.6	24.7
	Control B	3,775.9	240.9	2,419.8	190.8	3,111.2	154.5
Non-Mental Health	Case	2,396.3	202.9	1,977.4	553.0	2,363.6	192.0
	Control A	1,030.3	119.2	1,024.8	214.2	1,027.1	135.3
	Control B	3,308.1	277.0	2,774.6	201.4	3,046.6	172.3
Total	Case	16,402.6	1,059.1	7,619.4	1,644.6	15,716.6	985.4
	Control A	1,200.9	133.0	1,086.8	215.2	1,133.7	138.0
	Control B	7,084.0	371.1	5,194.5	281.1	6,157.8	234.2

Average Length of Stay per Admission

Primary Diagnosis on Admission		No Other Adult Present		Other Adult Present		Total	
		Mean Days	SE	Mean Days	SE	Mean Days	SE
Mental Health	Case	32.4	1.9	18.0	2.9	31.5	1.8
	Control A	14.1	2.1	11.1	1.6	12.9	1.4
	Control B	19.9	0.9	17.1	1.1	18.7	0.7
Non-Mental Health	Case	8.6	0.5	6.6	1.2	8.4	0.5
	Control A	6.6	0.7	6.6	1.3	6.6	0.8
	Control B	11.4	0.8	8.3	0.4	9.8	0.4
Total	Case	23.0	1.2	12.4	1.6	22.3	1.1
	Control A	7.1	0.6	6.8	1.3	6.9	0.8
	Control B	14.8	0.6	10.9	0.5	12.9	0.4

**Table 15: Hospital Separations per 1,000 Persons,
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Urban Income Quintile, Manitoba FY93/94 - FY94/95**

		Urban Income Quintile											
Primary Diagnosis on Admission Abstract		**Q1 /1,000**	**SE**	**Q2 /1,000**	**SE**	**Q3 /1,000**	**SE**	**Q4 /1,000**	**SE**	**Q5 /1,000**	**SE**	**Total /1,000**	**SE**
Mental Health	Case	449.2	11.8	428.8	19.5	427.7	22.7	381.8	29.3	471.7	39.6	437.7	8.6
	Control A	15.1	2.4	6.6	1.6	6.1	1.5	2.8	1.0	2.8	1.0	6.5	0.7
	Control B	190.7	6.9	179.6	7.6	139.8	6.6	128.1	6.5	115.4	6.7	153.2	3.1
Non-Mental Health	Case	265.8	10.5	295.7	18.0	249.5	19.8	192.7	23.8	169.8	29.8	258.7	7.6
	Control A	191.0	7.7	145.3	7.2	122.0	6.4	137.5	6.4	115.6	5.9	141.5	3.0
	Control B	334.8	8.3	281.8	8.9	242.6	8.2	262.7	8.6	226.8	8.7	273.4	3.8
Total	Case	715.1	10.7	724.5	17.6	677.1	21.4	574.5	29.8	641.5	38.0	696.4	8.0
	Control A	206.1	8.0	151.9	7.3	128.1	6.5	140.3	6.5	118.4	6.0	147.9	3.1
	Control B	525.5	8.8	461.5	9.8	382.4	9.3	390.8	9.5	342.2	9.9	426.5	4.3

**Table 16: Average Length of Stay per Hospital Admission,
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Urban Income Quintile, Manitoba FY93/94 - FY94/95**

		Urban Income Quintile											
Primary Diagnosis on Admission Abstract		**Q1**		**Q2**		**Q3**		**Q4**		**Q5**		**Total**	
		Mean Days	**SE**	**Mean Days**	**SE**	**Mean Days**	**SE**	**Mean Days**	**SE**	**Mean Days**	**SE**	**Mean Days**	**SE**
Mental Health	Case	30.4	3.1	26.2	3.5	32.8	4.5	38.9	4.2	37.3	6.0	30.9	2.0
	Control A	16.5	2.5	6.3	1.4	16.9	5.9	4.6	1.5	15.0	6.5	13.5	1.7
	Control B	18.6	1.2	20.5	1.5	18.9	1.2	21.7	2.9	22.3	1.6	20.1	0.7
Non-Mental Health	Case	8.2	0.8	6.4	0.7	8.6	1.6	7.1	1.7	15.1	6.5	8.0	0.6
	Control A	7.0	0.6	5.9	0.7	6.3	0.7	10.3	4.8	4.6	0.4	6.9	1.0
	Control B	10.1	0.9	9.2	0.9	10.7	1.4	8.7	0.7	7.1	0.6	9.3	0.4
Total	Case	22.2	2.0	18.1	2.1	23.9	3.0	28.2	3.1	31.4	4.8	22.4	1.3
	Control A	7.7	0.6	6.0	0.7	6.8	0.7	10.2	4.7	4.8	0.4	7.2	1.0
	Control B	13.2	0.7	13.6	0.8	13.7	1.0	13.0	1.1	12.2	0.7	13.2	0.4

Table 17: Hospital Separations per 1,000 Population
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Urban/Rural Residence, Manitoba FY94/95

Primary Diagnosis on Admission Abstract		Unclassified /1,000	SE	Rural /1,000	SE	Urban /1,000	SE	Total /1,000	SE
Mental Health	Case	275.9	25.0	422.6	28.1	437.7	8.6	423.5	7.8
	Control A	130.1	27.8	10.8	2.1	6.5	0.7	8.3	0.7
	Control B	288.3	27.4	234.5	9.2	153.2	3.1	166.4	3.0
Non-Mental Health	Case	269.6	24.8	535.5	28.3	258.7	7.6	281.2	7.1
	Control A	164.4	30.7	237.8	8.9	141.5	3.0	155.7	2.9
	Control B	554.7	30.0	519.7	10.8	273.4	3.8	311.3	3.7
Total	Case	545.5	27.9	958.1	11.4	696.4	8.0	704.7	7.2
	Control A	294.5	37.7	248.6	9.0	147.9	3.1	164.0	2.9
	Control B	843.1	22.0	754.2	9.3	426.5	4.3	477.7	4.0

**Table 18: Hospital Days per 1,000 Population,
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Urban/Rural Residence, Manitoba FY94/95**

Primary Diagnosis on Admission Abstract		Unclassified /1,000	Unclassified SE	Rural /1,000	Rural SE	Urban /1,000	Urban SE	Total /1,000	Total SE
Mental Health	Case	17,551.7	3,584.8	7,129.0	1,702.5	13,529.6	1,079.3	13,353.0	962.5
	Control A	2,856.2	1,909.9	44.5	14.7	87.4	20.4	106.6	24.7
	Control B	10,310.2	2,987.1	2,420.6	342.0	3,073.8	162.6	3,111.2	154.5
Non-Mental Health	Case	3,667.7	897.3	4,151.6	855.0	2,073.1	195.7	2,363.6	192.0
	Control A	5,082.2	4,012.2	1,029.4	110.1	982.6	152.8	1,027.1	135.3
	Control B	17,167.9	4,216.8	4,338.3	566.0	2,554.6	159.8	3,046.6	172.3
Total	Case	21,219.4	3,703.1	11,280.6	2,047.0	15,602.7	1,099.7	15,716.6	985.4
	Control A	7,938.4	4,421.0	1,073.9	112.4	1,070.0	154.7	1,133.7	138.0
	Control B	27,478.1	5,273.3	6,758.9	669.9	5,628.4	229.6	6,157.8	234.2

Table 19: Average Length of Stay per Hospital Admission
Persons Receiving Income Assistance for Mental Health Disability Compared to Controls
By Urban/Rural Residence, Manitoba FY94/95

Primary Diagnosis on Admission Abstract		Unclassified		Rural		Urban		Total	
		Mean Days	SE	Mean Days	SE	Mean Days	SE	Mean Days	SE
Mental Health	Case	63.6	10.3	16.9	2.8	30.9	2.0	31.5	1.8
	Control A	21.9	4.6	4.1	0.7	13.5	1.7	12.9	1.4
	Control B	35.8	9.3	10.3	1.3	20.1	0.7	18.7	0.7
Non-Mental Health	Case	13.6	2.6	7.8	0.8	8.0	0.6	8.4	0.5
	Control A	30.9	24.1	4.3	0.2	6.9	1.0	6.6	0.8
	Control B	30.9	6.8	8.3	0.9	9.3	0.4	9.8	0.4
Total	Case	38.9	5.7	11.8	1.3	22.4	1.3	22.3	1.1
	Control A	27.0	13.5	4.3	0.2	7.2	1.0	6.9	0.8
	Control B	32.6	5.5	9.0	0.7	13.2	0.4	12.9	0.4

Table 20: Odds Ratio for Acute Care Hospital Admission For Treatment of Mental Health Disorders

Odds ratios estimated from multivariate logistic regression, stratified by Case or Control groups

	Case			Control A			Control B		
Crude Admission Rate /1,000 (SE) (1)	423.5	(7.8)		8.3	(0.7)		166.4	(3.0)	
Variable	**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**	
Age									
20-29	1.00			1.00			1.00		
30-39	0.84	0.68	1.04	1.60	0.68	3.74	1.01	0.87	1.18
40-49	0.57	0.45	0.71	2.42	1.05	5.58	1.04	0.89	1.22
50-64	0.32	0.25	0.42	3.41	1.52	7.65	1.04	0.88	1.22
Gender									
Female	1.00			1.00			1.00		
Male	0.82	0.70	0.97	0.79	0.50	1.25	0.76	0.69	0.85
Household Structure									
Other Adult in Household	1.00			1.00			1.00		
No Other Adult Present	1.78	1.25	2.54	1.82	1.12	2.94	1.33	1.19	1.49
Neighbourhood Income									
Urban Quintile 1	1.00			1.00			1.00		
Urban Quintile 2	1.00	0.80	1.25	0.56	0.28	1.12	0.96	0.82	1.14
Urban Quintile 3	1.04	0.81	1.33	0.57	0.29	1.14	0.83	0.70	0.99
Urban Quintile 4	0.75	0.53	1.05	0.34	0.15	0.76	0.73	0.61	0.88
Urban Quintile 5	1.00	0.67	1.48	0.12	0.04	0.42	0.71	0.59	0.86
Rural	0.81	0.58	1.12	0.71	0.36	1.40	1.36	1.15	1.60
Not Classified	0.72	0.51	1.01	2.36	0.70	7.98	1.63	1.17	2.27

(1) SE: Standard error

Table 21: Odds Ratios for Acute Care Hospital Admission For Treatment of Non-Mental Health Disorders

Odds ratios estimated from multivariate logistic regression, stratified by Case or Control groups

	Case			Control A			Control B		
Crude Admission Rate /1,000 (SE) (1)	281.2	(7.1)		155.7	(2.9)		311.3	(3.7)	
Variable	**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**	
Age									
20-29	1.00			1.00			1.00		
30-39	1.05	0.80	1.39	0.80	0.68	0.93	0.82	0.72	0.94
40-49	1.16	0.88	1.53	0.59	0.50	0.69	0.84	0.73	0.96
50-64	1.48	1.13	1.94	0.84	0.71	0.99	1.45	1.27	1.66
Gender									
Female	1.00			1.00			1.00		
Male	0.71	0.60	0.85	0.46	0.41	0.51	0.63	0.58	0.68
Household Structure									
Other Adult in Household	1.00			1.00			1.00		
Not Other Adult Present	0.90	0.66	1.23	0.87	0.78	0.98	0.91	0.83	0.99
Neighbourhood Income									
Urban Quintile 1	1.00			1.00			1.00		
Urban Quintile 2	1.04	0.82	1.33	0.83	0.69	0.99	0.86	0.74	0.99
Urban Quintile 3	0.94	0.71	1.25	0.76	0.63	0.91	0.73	0.63	0.84
Urban Quintile 4	0.87	0.60	1.25	0.85	0.71	1.01	0.76	0.66	0.88
Urban Quintile 5	0.80	0.48	1.31	0.72	0.60	0.86	0.65	0.56	0.76
Rural	1.61	1.20	2.16	1.16	0.97	1.38	1.35	1.18	1.55
Not Classified	1.02	0.74	1.42	1.10	0.66	1.81	1.92	1.46	2.54

(1) SE: Standard error

Table 22: Odds Ratios for Acute Care Hospital Admission Mental Health Disability Cases vs Control Groups A and B Treatment of Mental Health and Non-Mental Health Disorders

Odds ratios estimated from multivariate logistic regressions

Hospital Admissions for Treatment of Mental Health Disorders	Odds Ratio Relative to Control A			Odds Ratio Relative to Control B		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
Unadjusted Odds Ratio	50.03	39.46	63.42	2.08	1.89	2.28
Adjusted for Age	50.92	40.15	64.58	2.08	1.90	2.29
Adjusted for Gender	50.07	39.49	63.47	2.08	1.90	2.29
Adjusted for Household Structure	38.55	29.71	50.03	1.85	1.67	2.04
Adjusted for Urban/Rural Residence	50.75	39.99	64.41	2.11	1.92	2.32
Adjusted for Neighbourhood Income	47.41	37.05	60.67	1.96	1.78	2.16
Adjusted for All Measures	39.12	30.06	50.91	1.81	1.63	2.01

Hospital Admission for Treatment of Non-Mental Health Disorder	Odds Ratio Relative to Control A			Odds Ratio Relative to Control B		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
Unadjusted Odds Ratio	1.64	1.49	1.81	0.94	0.86	1.04
Adjusted for Age	1.65	1.49	1.82	0.94	0.86	1.04
Adjusted for Gender	1.65	1.50	1.83	0.94	0.86	1.04
Adjusted for Household Structure	1.70	1.52	1.90	1.00	0.91	1.11
Adjusted for Urban/Rural Residence	1.68	1.52	1.86	0.94	0.86	1.04
Adjusted for Neighbourhood Income	1.58	1.42	1.76	0.88	0.80	0.98
Adjusted for All Measures	1.66	1.48	1.87	0.91	0.82	1.01

Table 23: Acute Care Hospital Use
Persons Receiving Income Assistance for Mental Health Disability
Classified by Amount of Average Monthly Non-Continuous Health Benefit
Manitoba FY93/94, FY94/95

Admissions for Treatment of Mental Health Disorder	Level of Non-Continuous Health Benefit					
	Lowest		Median		Highest	
N	937		1,250		939	
Hospital Admissions /1,000 (SE)	413.0	(33.0)	527.2	(33.0)	665.6	(54.3)
Hospital Days per Person (SE)	17.3	(2.2)	15.0	(1.3)	18.8	(2.9)
Average Length of Stay (Days)(SE)	42.0	(4.0)	28.5	(1.6)	28.3	(3.9)

Admissions for Treatment of Non-Mental Health Disorder	Level of Non-Continuous Health Benefit					
	Lowest		Median		Highest	
N	937		1,250		939	
Hospital Admissions /1,000 (SE)	218.8	(21.4)	236.8	(18.4)	561.2	(52.4)
Hospital Days per Person (SE)	2.3	(0.4)	2.0	(0.3)	4.4	(5.2)
Average Length of Stay (Days) (SE)	10.5	(1.6)	8.5	(0.9)	7.9	(0.6)

Level of Non-Continuous Health Benefit:
Lowest: 1st-3rd decile, Median: 4th-7th decile, Highest 8th-10th decile

Table excludes persons receiving income assistance for mental health disability not in treatment for mental health disorder in the observation period (N=843).

Table 24: Hospital Admissions for Non-Mental Health Disorder
Per 1,000 Persons Receiving Income Assistance for Mental Health Disability
Classified by Mental Health Treatment Status
Manitoba FY93/94 - FY94-95

	Cases Not in Treatment for Mental Health Disorder			Cases in Treatment for Mental Health Disorder			Control Group A	
	N	Admissions /1,000	SE	N	Admissions /1,000	SE	Admissions /1,000	SE
Age								
20-29	126	174.6	33.8	573	261.8	18.4	163.1	7.0
30-39	177	101.7	22.7	955	247.1	14.0	138.5	5.1
40-49	207	87.0	19.6	906	312.4	15.4	123.3	4.9
50-64	328	85.4	15.4	697	517.9	18.9	204.9	6.3
Gender								
Female	308	120.1	18.5	1,381	388.1	13.1	215.7	5.0
Male	530	92.5	12.6	1,750	282.3	10.8	111.3	3.3
Family Structure								
Other Adult in Family	64	125.0	41.3	774	739.8	28.0	155.4	3.7
No Other Adult Present	774	100.8	10.8	2,885	875.9	6.1	156.2	4.5
Neighbourhood Income								
Urban Quintile 1	322	96.3	16.4	1,461	303.2	12.0	191.0	7.7
Urban Quintile 2	122	98.4	27.0	524	341.6	20.7	145.3	7.2
Urban Quintile 3	82	73.2	28.8	395	286.1	22.7	122.0	6.4
Urban Quintile 4	42	142.9	54.0	233	201.7	26.3	137.5	6.4
Urban Quintile 5	34	29.4	29.0	125	208.0	36.3	115.6	5.9
Rural	83	204.8	44.3	227	656.4	31.5	237.8	8.9
Not Classified	153	85.0	22.5	166	439.8	38.5	164.4	30.7

(1) SE: Standard error

Table 25: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Site of Service, FY94/95

		Site of Physician Service							
		Ambulatory		Outpatient		Inpatient		Total	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
All Visits	Case	12.6	0.23	3.4	0.15	3.7	0.19	19.7	0.37
	Control A	5.9	0.06	0.5	0.02	0.4	0.02	6.8	0.07
	Control B	12.0	0.09	2.0	0.06	1.8	0.05	15.7	0.14
Mental Health Visits	Case	5.1	0.15	2.2	0.14	3.0	0.17	10.3	0.29
	Control A	0.4	0.02	0.0	0.01	0.0	0.01	0.5	0.02
	Control B	3.6	0.06	0.9	0.04	1.0	0.04	5.5	0.09

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 26: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Type of Provider, Manitoba FY94/95

	Type of Provider					
Visits with	**Psychiatrist**		**Non-Psychiatrist**		**Total**	
Mental Health Diagnoses	**Mean**	**SE**	**Mean**	**SE**	**Mean**	**SE**
Case	6.4	0.26	3.9	0.13	10.3	0.29
Control A	0.2	0.02	0.3	0.01	0.5	0.02
Control B	3.2	0.08	2.3	0.03	5.5	0.09

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 27: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Age and Site of Service, Manitoba FY94/95

All Visits		Site of Physician Service							
		Ambulatory		Outpatient		Inpatient		Total	
Age Group		Mean	SE	Mean	SE	Mean	SE	Mean	SE
20-29	Case	11.2	0.50	4.8	0.45	4.7	0.50	20.7	0.95
	Control A	4.4	0.11	0.4	0.03	0.2	0.02	5.0	0.12
	Control B	9.5	0.20	1.7	0.12	1.2	0.10	12.4	0.29
30-39	Case	13.4	0.48	3.8	0.31	4.3	0.41	21.5	0.76
	Control A	5.3	0.10	0.4	0.03	0.3	0.03	5.9	0.12
	Control B	11.5	0.18	1.8	0.09	1.4	0.09	14.7	0.24
40-49	Case	13.8	0.45	3.2	0.25	3.3	0.31	20.3	0.66
	Control A	6.1	0.11	0.5	0.04	0.4	0.03	7.0	0.14
	Control B	12.8	0.19	2.0	0.11	1.7	0.10	16.6	0.26
50-64	Case	11.2	0.41	2.3	0.25	3.0	0.29	16.4	0.61
	Control A	7.4	0.13	0.7	0.06	0.6	0.04	8.7	0.16
	Control B	13.3	0.18	2.3	0.14	2.5	0.12	18.2	0.29

Mental Health Visits		Site of Physician Service							
		Ambulatory		Outpatient		Inpatient		Total	
Age Group		Mean	SE	Mean	SE	Mean	SE	Mean	SE
20-29	Case	4.9	0.34	3.5	0.41	4.2	0.49	12.6	0.81
	Control A	0.2	0.02	0.0	0.00	0.0	0.01	0.3	0.03
	Control B	2.8	0.12	0.8	0.07	0.9	0.09	4.5	0.19
30-39	Case	6.4	0.35	2.7	0.29	3.7	0.38	12.8	0.63
	Control A	0.4	0.04	0.0	0.01	0.0	0.02	0.4	0.04
	Control B	3.6	0.11	1.0	0.07	1.0	0.08	5.6	0.17
40-49	Case	5.8	0.29	2.0	0.22	2.5	0.29	10.4	0.50
	Control A	0.5	0.04	0.1	0.02	0.1	0.02	0.6	0.05
	Control B	4.2	0.11	1.0	0.08	1.0	0.08	6.2	0.18
50-64	Case	3.1	0.21	1.0	0.20	1.7	0.25	5.9	0.42
	Control A	0.4	0.04	0.0	0.01	0.0	0.01	0.5	0.04
	Control B	3.4	0.10	0.8	0.06	1.1	0.08	5.3	0.16

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 28: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Gender and Site of Service, Manitoba FY94/95

		Site of Physician Service							
		Ambulatory		Outpatient		Inpatient		Total	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
All Visits									
Male	Case	10.7	0.29	3.2	0.19	3.3	0.23	17.2	0.45
	Control A	4.7	0.07	0.4	0.03	0.3	0.02	5.5	0.09
	Control B	10.1	0.11	1.8	0.08	1.5	0.06	13.4	0.17
Female	Case	15.1	0.38	3.7	0.24	4.3	0.31	23.1	0.61
	Control A	7.5	0.10	0.6	0.04	0.4	0.03	8.5	0.12
	Control B	14.5	0.16	2.2	0.08	2.1	0.09	18.8	0.22
Mental Health Visits									
Male	Case	4.9	0.20	2.2	0.18	2.6	0.21	9.7	0.37
Male	Control A	0.3	0.02	0.0	0.01	0.0	0.01	0.3	0.03
Male	Control B	3.1	0.07	0.8	0.04	0.8	0.05	4.6	0.10
Female	Case	5.4	0.24	2.3	0.21	3.5	0.29	11.2	0.47
Female	Control A	0.5	0.03	0.0	0.01	0.1	0.01	0.6	0.04
Female	Control B	4.3	0.10	1.1	0.06	1.3	0.07	6.7	0.15

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 29: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Family Structure and Site of Service
Manitoba FY94/95

		Site of Physician Service							
		Ambulatory		Outpatient		Inpatient		Total	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
All Visits									
No Other Adult Present	Case	12.3	0.24	3.4	0.16	3.9	0.20	19.7	0.39
	Control A	5.6	0.09	0.5	0.04	0.4	0.03	6.5	0.12
	Control B	11.6	0.14	2.2	0.09	1.9	0.08	15.7	0.20
Other Adult Present	Case	15.1	0.82	2.9	0.40	2.2	0.39	20.2	1.08
	Control A	6.2	0.07	0.5	0.03	0.3	0.02	7.0	0.09
	Control B	12.4	0.13	1.8	0.08	1.6	0.07	15.8	0.19
Mental Health Visits									
No Other Adult Present	Case	5.1	0.16	2.3	0.15	3.1	0.19	10.5	0.31
	Control A	0.4	0.03	0.1	0.01	0.1	0.01	0.5	0.04
	Control B	3.8	0.08	1.1	0.06	1.2	0.06	6.0	0.13
Other Adult Present	Case	5.2	0.51	1.5	0.33	1.5	0.36	8.3	0.76
	Control A	0.4	0.02	0.0	0.00	0.0	0.01	0.4	0.03
	Control B	3.4	0.07	0.7	0.04	0.8	0.06	4.9	0.12

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 30: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls by Neighbourhood Income Quintile and Site of Service
Manitoba FY94/95

	Neighbourhood Income Quintile (Urban Residents Only)											
	Q1		Q2		Q3		Q4		Q5		Total	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
All Diagnoses												
Ambulatory Visits												
Case	13.5	0.34	14.5	0.66	12.9	0.70	12.3	0.86	13.0	1.28	13.5	0.26
Control A	6.2	0.16	5.8	0.16	6.0	0.14	6.0	0.13	6.0	0.13	6.0	0.06
Control B	12.5	0.22	12.2	0.24	12.1	0.23	11.4	0.21	12.8	0.27	12.2	0.10
All Visits												
Case	21.1	0.55	21.5	0.99	20.1	1.08	18.9	1.35	21.0	1.92	20.9	0.41
Control A	7.4	0.21	6.7	0.19	6.7	0.16	6.7	0.15	6.6	0.15	6.8	0.08
Control B	17.2	0.36	15.8	0.32	15.5	0.31	14.6	0.31	16.0	0.36	15.9	0.15
Mental Health Diagnoses												
Ambulatory Visits												
Case	5.3	0.22	5.9	0.42	5.6	0.52	5.7	0.62	6.0	0.84	5.5	0.17
Control A	0.4	0.04	0.4	0.05	0.4	0.06	0.4	0.04	0.4	0.05	0.4	0.02
Control B	3.4	0.11	3.6	0.13	3.7	0.14	3.3	0.13	4.6	0.19	3.7	0.06
All Visits												
Case	11.0	0.44	10.9	0.76	11.1	0.91	11.1	1.11	12.7	1.54	11.0	0.33
Control A	0.6	0.07	0.4	0.05	0.5	0.06	0.4	0.05	0.5	0.05	0.5	0.03
Control B	5.6	0.21	5.7	0.22	5.6	0.21	5.2	0.21	6.4	0.26	5.7	0.10

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 31: Physician Visits per Person
Persons Receiving Income Assistance for Mental Health Disability
Compared to Controls By Urban/Rural Residence, Manitoba FY94/95

		Urban/Rural Residence							
		Not Ranked		Rural		Urban		Total	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
All Diagnoses									
Ambulatory Visits	Case	5.0	0.54	10.6	0.67	13.5	0.26	12.6	0.23
	Control A	6.2	0.54	5.4	0.14	6.0	0.06	5.9	0.06
	Control B	9.8	0.70	11.0	0.22	12.2	0.10	12.0	0.09
All Visits	Case	11.3	0.98	15.9	1.11	20.9	0.41	19.7	0.37
	Control A	7.9	0.90	6.4	0.18	6.8	0.08	6.8	0.07
	Control B	17.0	1.02	14.5	0.33	15.9	0.15	15.7	0.14
Mental Health Diagnoses									
Ambulatory Visits	Case	1.6	0.31	4.5	0.49	5.5	0.17	5.1	0.15
	Control A	0.4	0.11	0.2	0.04	0.4	0.02	0.4	0.02
	Control B	3.2	0.45	3.1	0.12	3.7	0.06	3.6	0.06
All Visits	Case	5.5	0.79	7.3	0.86	11.0	0.33	10.3	0.29
	Control A	1.1	0.52	0.3	0.05	0.5	0.03	0.5	0.02
	Control B	7.0	0.76	4.1	0.16	5.7	0.10	5.5	0.09

Control A group contains 4 persons age and sex matched to each case. Control B group contains four persons matched to each case on age, sex and mental health status. See text for additional details.

Table 32: Odds Ratios for Physician Visits
Mental Health Disability Cases vs Control Groups A and B
Ambulatory Visits for All Conditions

Odds ratios estimated from multivariate poisson regression

	Case			Control A			Control B		
Mean Visits per Person (SE) (1)	12.6	(0.23)		5.9	(0.06)		12.0	(0.09)	
Variable	**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**	
Age									
20-29	1.00			1.00			1.00		
30-39	1.16	1.13	1.19	1.18	1.16	1.21	1.20	1.18	1.22
40-49	1.16	1.13	1.19	1.33	1.30	1.36	1.30	1.28	1.32
50-64	0.98	0.95	1.01	1.58	1.54	1.61	1.34	1.32	1.36
Gender									
Female	1.00			1.00			1.00		
Male	0.71	0.70	0.73	0.65	0.65	0.66	0.71	0.71	0.72
Family Structure									
Other Adult in Houshold	1.00			1.00			1.00		
No Other Adult Present	0.83	0.81	0.86	1.00	0.98	1.01	1.00	0.99	1.01
Neighbourhood Income									
Urban Quintile 1	1.00			1.00			1.00		
Urban Quintile 2	1.04	1.01	1.06	0.93	0.91	0.95	0.96	0.95	0.97
Urban Quintile 3	0.95	0.92	0.97	0.94	0.92	0.96	0.95	0.93	0.96
Urban Quintile 4	0.90	0.87	0.93	0.94	0.92	0.96	0.88	0.87	0.90
Urban Quintile 5	1.01	0.97	1.06	0.93	0.91	0.95	0.99	0.97	1.00
Rural	0.80	0.78	0.83	0.82	0.80	0.84	0.85	0.84	0.87
Not Classified	0.39	0.37	0.41	0.96	0.90	1.03	0.77	0.74	0.80

(1) SE: Standard error

Table 33: Odds Ratios for Physician Visits
Mental Health Disability Cases vs Control Groups A and B
Ambulatory Visits for Treatment of Mental Health Disorders

Odds ratios estimated from multivariate poisson regression

	Case			Control A			Control B		
Mean Visits per Person (SE) (1)	5.1	(0.15)		0.4	(0.02)		3.6	(0.06)	
Variable	**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**		**Odds Ratio**	**95% Confidence Interval**	
Age									
20-29	1.00			1.00			1.00		
30-39	1.32	1.27	1.38	1.84	1.67	2.02	1.31	1.27	1.34
40-49	1.18	1.13	1.23	2.65	2.42	2.91	1.50	1.46	1.54
50-59	0.68	0.64	0.71	1.95	1.77	2.15	1.24	1.20	1.27
Gender									
Female	1.00			1.00			1.00		
Male	0.89	0.86	0.91	0.55	0.53	0.58	0.73	0.72	0.74
Family Structure									
Other Adult in Family	1.00			1.00			1.00		
No Other Adult Present	1.04	0.99	1.09	1.51	1.43	1.59	1.23	1.21	1.25
Neighbourhood Income									
Urban Quintile 1	1.00			1.00			1.00		
Urban Quintile 2	1.09	1.05	1.13	0.85	0.78	0.93	1.08	1.05	1.11
Urban Quintile 3	1.04	0.99	1.08	1.05	0.96	1.14	1.11	1.08	1.14
Urban Quintile 4	1.06	1.00	1.12	0.95	0.88	1.04	1.02	0.99	1.05
Urban Quintile 5	1.11	1.04	1.19	1.03	0.95	1.12	1.41	1.37	1.45
Rural	0.89	0.84	0.94	0.58	0.52	0.64	0.96	0.93	0.99
Not Classified	0.33	0.31	0.37	0.91	0.70	1.18	0.95	0.88	1.02

(1) SE: Standard error

Table 34: Odds Ratios for Physician Visits Mental Health Disability Cases vs Control Groups A and B Ambulatory Visits for All Conditions and Ambulatory Visits for Treatment of Mental Health Disorders

Odds ratios estimated from multivariate poisson regression

Visits for All Conditions	Odds Ratio Relative to Control A			Odds Ratio Relative to Control B		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
Unadjusted Odds Ratio	2.12	2.10	2.15	1.05	1.04	1.06
Adjusted for Age	2.12	2.10	2.15	1.05	1.04	1.06
Adjusted for Gender	2.12	2.10	2.15	1.05	1.04	1.06
Adjusted for Family Structure	2.25	2.22	2.28	1.08	1.07	1.09
Adjusted for Urban/Rural Residence	2.18	2.16	2.21	1.07	1.06	1.08
Adjusted for Neighbourhood Income	2.16	2.13	2.18	1.06	1.05	1.07
Adjusted for All Measures	2.21	2.18	2.24	1.06	1.05	1.07

Visits for Treatment of Mental Health Disorders	Odds Ratio Relative to Control A			Odds Ratio Relative to Control B		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
Unadjusted Odds Ratio	13.21	12.84	13.59	1.43	1.41	1.45
Adjusted for Age	13.21	12.84	13.59	1.43	1.41	1.45
Adjusted for Gender	13.21	12.84	13.59	1.43	1.41	1.45
Adjusted for Family Structure	12.51	12.09	12.94	1.37	1.35	1.40
Adjusted for Urban/Rural Residence	13.64	13.26	14.04	1.46	1.44	1.48
Adjusted for Neighbourhood Income	14.02	13.60	14.46	1.51	1.49	1.54
Adjusted for All Measures	12.97	12.52	13.43	1.42	1.40	1.45

Table 35: Use of Physician Services for Non-Mental Health Disorder Persons Receiving Income Assistance for Mental Health Disability, Classified by Mental Health Treatment Status Manitoba FY94/95

	Cases Not in Treatment for Mental Health Disorder			Cases in Treatment for Mental Health Disorder		
	N	Average Visits	SE	N	Average Visits	SE
	838	5.2	0.3	3,131	10.5	0.2
Age						
20-29	126	5.5	0.8	573	8.7	0.5
30-39	177	4.2	0.5	955	9.5	0.4
40-49	207	4.4	0.5	906	11.2	0.4
50-64	328	6.2	0.4	697	12.5	0.6
Gender						
Female	308	6.8	0.5	1,381	13.0	0.4
Male	530	4.3	0.3	1,750	8.5	0.3
Family Structure						
Other Adult in Family	64	6.9	0.9	774	13.2	0.8
No Other Adult Present	774	5.1	0.3	2,885	10.3	0.2
Neighbourhood Income						
Urban Quintile 1	322	6.0	0.4	1,461	11.1	0.3
Urban Quintile 2	122	5.1	0.6	524	11.9	0.7
Urban Quintile 3	82	4.5	0.7	395	9.9	0.6
Urban Quintile 4	42	7.7	1.4	233	7.8	0.6
Urban Quintile 5	34	3.9	0.6	125	9.5	1.2
Rural	83	5.4	0.7	227	9.8	0.8
Not Classified	153	3.6	0.6	166	7.8	0.7

(1) SE: Standard error

Appendix Table A: Client Numbers, By Age and Income Assistance Group and Proportion of Clients Linked to Manitoba Health registry records FY94/95

Percent cells report the proportion of all records in an age and assistance group which were successfully linked to Manitoba Health registry records

Income Assistance Group		Age Group 00-04	05-09	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+	Total
Households	N	10,662	9,360	6,858	4,679	3,923	3,739	3,646	2,657	1,470	721	267	104	31	6		48,123
with children	%	95.3	95.6	96.2	96.1	95.2	94.6	95.3	96.3	96.1	95.8	96.6	97.1	93.6	83.3		95.6
General Assistance	N	653	581	394	594	768	636	527	403	305	220	172	146	94	97	519	6,109
and Other	%	93.3	91.4	95.2	88.2	87.2	89	86.3	88.1	89.8	87.3	87.2	90.4	91.5	80.4	96	89.8
Mental Health	N				51	265	396	571	594	599	573	410	348	297	73	6	4,183
Disability	%				96.1	97.4	98.2	97.4	97.8	97.2	98.1	98.3	97.4	96.6	87.7	66.7	97.4
Mental Retardation	N				165	507	521	628	607	483	400	285	220	189	34	5	4,044
Disability	%				95.8	97.6	99.2	99.4	99	98.8	99.3	99	97.7	96.8	82.4	100	98.5
Physical Disability	N				34	163	205	241	313	310	444	516	746	779	168	15	3,934
	%				100	95.1	95.1	93.4	95.9	93.9	96.6	96.1	96.9	96.7	91.1	73.3	95.6
Other Disability	N	24	18	16	16	35	49	54	69	77	96	108	165	211	59	36	1,033
	%	91.7	88.9	100	93.8	91.4	95.9	92.6	94.2	97.4	94.8	94.4	98.8	96.2	88.1	91.7	95.1
Household Member	N	293	449	557	478	40	87	136	141	183	164	163	148	96	17	1	2,953
of Disability Case	%	97.6	97.1	97.3	96.2	95	95.4	97.1	92.9	97.8	92.7	97.6	97.3	94.8	82.4	100	96.4
Total	N	11,632	10,408	7,825	6,017	5,701	5,633	5,803	4,784	3,427	2,618	1,921	1,877	1,697	454	582	70,379
	%	95.3	95.4	96.2	95.3	94.4	94.7	95.1	96	96	96	96.3	96.8	96.2	86.8	95	95.4

Appendix Table B: Classification of Mental Health Disorders

ICD-9-CM	Disorder
	Major Disorder Category
295	Schizophrenic Disorders
296	Affective Psychoses
297	Paranoid States
298	Other Nonorganic Psychoses
299	Psychoses with Origin Specific to Childhood
	Minor Disorder Category
300	Neurotic Disorders
301	Personality Disorders
306	Physiological Malfunction due to Mental Factors
307	Special Symptoms or Syndromes
308	Acute Reactions to Stress
309	Adjustment Reaction
311	Depressive Disorder not elsewhere classified
	Other Mental Health Disorders
290	Senile and Presenile Organic Psychoses
291	Alcoholic Psychoses
292	Drug Psychoses
293	Transient Organic Psychotic Conditions
294	Other Organic Psychoses
302	Sexual Deviations and Disorders
303	Alcohol Dependence Syndrome
304	Drug Dependence
305	Nondependent Use of Drugs
310	Disorders Due to Organic Brain Damage
317-319	Mental Retardation

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