

Data Sources & Limitations

Over 20 data sources were used to generate information for the Data Book in the Community Health Assessment Report 2004. Information was compiled from valid and reliable sources.

Indicator Data Sources

| Information Source Abbreviation | Source Name |
|---------------------------------|---|
| AFM | Addictions Foundation of Manitoba |
| CCENDU | Canadian Community Epidemiology Network on Drug Abuse |
| CCHS | Canadian Community Health Survey |
| CCM | Cancer Care Manitoba |
| CENSUS | Canadian Census |
| CIHI | Canadian Institute for Health Information |
| CW | City of Winnipeg |
| HC | Health Canada |
| KLINIC | Klinik Community Health Centre |
| MBS | Manitoba Bureau of Statistics |
| MC | Manitoba Conservation |
| MCHP | Manitoba Center for Health Policy |
| MEY | Manitoba Education & Youth |
| MH | Manitoba Health |
| MLSCY | Manitoba Longitudinal Study of Children and Youth |
| MNA | Manitoba Northern Affairs |
| NAS | Native Affairs Secretariate |
| NLSCY | National Longitudinal Study of Children and Youth |
| SC | Statistics Canada |
| TC | Transport Canada |
| WPS | Winnipeg Police Service |
| WRHA | Winnipeg Regional Health Authority |
| VS | Vital Statistics, Consumer and Corporate Affairs, |

Vital Statistics Agency, Consumer and Corporate Affairs, Manitoba Finance

Manitoba Vital Statistics is the source of information on mortality data, which includes, the number of deaths, leading causes of death and the potential years of life lost. The International Classification of Diseases: Cause of death categories were based on ICD-9 methodology.

Limitations of the data relate to the recording and reporting of mortality information. Examples include inaccuracies in completing death certificates (recording). Often multiple factors may contribute to a death, but only the most responsible factor is recognized (reporting).

Data on residents of Winnipeg were extracted from the Vital Statistics data using the February 2002 Postal Code Conversion file produced in a collaborative effort by the Community Data Network. Differences between the rates reported in this document and other documents (external to the WRHA) might be due, in part, to the assignment of residents through another Postal Code file or another method of allocating residents.

Canadian Community Health Survey (CCHS), Statistics Canada

Data based on the Canadian Community Health Survey (CCHS) Cycle 1.1 (2000-2001) was obtained, where possible, directly from Statistics Canada and includes, where available, estimates for Canada, Manitoba and the Winnipeg Health Region (WHR). Data obtained from Statistics Canada uses the CCHS Master File, which contains all respondents to the survey.

The CCHS collects information from individuals aged 12 and older who are living in private dwellings. People living on Indian reserves or Crown lands, residents of institutions, full-time members of the Canadian Armed Forces, and residents of certain remote regions are excluded. The CCHS encompasses approximately 98% of the Canadian population aged 12 and older.

For indicators of the Winnipeg Health Region not available directly from Statistics Canada, estimates for the Winnipeg Health Region were generated using the CCHS Shared File obtained from Statistics Canada. The shared file is a subset of the Master File and contains respondents who agreed to share their survey responses with the Health Ministries. The shared file represents approximately 95% of respondents of the Master File. For indicators of the WHR generated using the shared file, Canada and Manitoba values are provided using estimates directly from Statistics Canada if available, if not available, the estimates for Canada and Manitoba are generated using the Public Use Microdata file from Statistics Canada. The Public Use Microdata file (PUMF) from Statistics Canada is an aggregated file created from the Master File. Protection of respondents confidentiality is assured through suppression of individual values, variable grouping, and variable capping. For example, the PUMF does not contain single years of age but rather age groups.

The CCHS (Cycle 1.1) combined response rate for the Winnipeg Health Region was 87%. The combined response rate is a function of the house-hold-level response rate and person-level response rate.

All CCHS (Cycle 1.1) estimates published in this report follow the data release guidelines established by Statistics Canada. CCHS estimates that have high sampling variability are specially noted with an asterisk(*) and should be interpreted with caution.

In June 2004, several indicators from Statistics Canada, Canadian Community Health Survey, 2003 (Cycle 2) became available and were obtained directly from the Statistics Canada website.

2001 Census Data, Community Data Network, Custom Tabulation, 2001 Canadian Census Data, Statistics Canada

The census enumerates the entire Canadian population, which consists of Canadian citizens (by birth and by naturalization), landed immigrants, and non-permanent residents together with family members who live with them. Non-permanent residents are persons living in Canada who have a Minister's permit, a student or employment authorization, or who are claiming refugee status, and family members living with them. The census also counts Canadian citizens and landed immigrants who are temporarily outside the country on Census Day. This includes federal and provincial government employees working outside Canada, Canadian embassy staff posted to other countries, members of the Canadian Armed Forces stationed abroad, and all Canadian crew members of merchant vessels.

Data on age, sex, marital status, common-law status, mother tongue, and relationship to person 1 (from questionnaire) were collected from all Canadians. However, **the majority of the information gathered in the census came from a 20% sampling of the population.** Weighting, which was applied to the respondent data after editing and imputation, was used to adjust the census sample to represent the whole population.

Confidentiality

Statistics Canada uses several procedures to ensure that the statistical data cannot be associated with a particular individual. Some of these procedures are:

Random rounding

Rounding is a mathematical operation that can increase a number, decrease a number or leave it unchanged; only certain predetermined values are permitted. For example, one could decide in advance to round figures to the nearest multiple of 10, the next highest multiple of 10, or the next lowest multiple of 10. So, if we round 10, 13 and 17 to the next lowest multiple of 10, the result would be 10 in all three cases. The random rounding method is based on established probabilities. **It involves rounding every figure in a table (including the totals) randomly up or down to the nearest multiple of 5, or in some cases, 10.** For instance, random rounding of 12 to a multiple of 5 would yield either 10 or 15; applying the same operation to 10 would produce 10. This technique provides strong protection against direct, residual or negative disclosure, without adding significant error to the census data.

Area suppression

Area suppression involves removing all characteristic data for geographic areas with populations below a specified size. A table is always associated with a geographic area, viewed from either the "place of residence" standpoint or the "place of work" standpoint. Also, for place of residence, the threshold depends on the number of people who live in the area, and for place of work, it depends on the number of people who work in the area. When a table involves both place of residence and place of work, the threshold depends on both the number of residents and the number of people employed in the area.

There are different thresholds for different cases:

250 people if the table contains income data, and if the table also contains place-of residence data, at least 40 private households;

100 people if it is a six-character postal code area, that is, a local delivery unit (LDU);

40 people in all other cases.

Dissemination rules for statistics

Tables are sometimes accompanied by statistics such as averages, totals and standard deviations. There are various ways of ensuring that these statistics do not reveal sensitive information; for instance, they may be suppressed or made less precise. Some statistics, such as totals, ratios and percentages, are based on the rounded values in the tables to which they apply. A statistic will be suppressed if there are too few data to compute it; that is, if the number of data items needed to calculate the statistic is smaller than the rounding base (5 or 10), the statistic will be suppressed. In cases where data items expressed in dollars all have the same value, the statistic will be suppressed.

Errors in Census Data

The accuracy of a statistical estimate is a measure of how much the estimate differs from the correct or “true” figure. Departures from true figures are known as errors. The significance of error to the data user depends very much on the nature of the error, the intended use of the data and the level of detail involved. Some errors occur more or less at random and tend to cancel out when individual responses are aggregated for a sufficiently large group. For example, some people may overestimate their income, while others may underestimate it. If there is no systematic tendency for people to err in either direction, then overestimates by some individuals will more or less offset underestimates by others in the group. The larger the group, the closer the average reported income is likely to be to the true value. On the other hand, if many people forget a source of income, the result will be a general tendency to understate total income. In this case, the average reported income will be lower than the true average. Such systematic errors are far more serious a problem for most users than random errors since the bias they cause in the data persists no matter how large the group, and is very difficult to measure.

Sources of Error

Coverage errors

Census representatives may misjudge the location of the enumeration area boundaries and miss certain dwellings. A household may be missed because it is inside what looks like a single dwelling or located on a road not marked on the enumeration area map. The census representative may fail to drop off a questionnaire at an occupied dwelling because it appears to be vacant. Householders may misunderstand the Step B guidelines and not list all the usual residents of the dwelling; for example, a family member temporarily away from home at school or in a hospital could be left out. A family maintaining two residences could be missed at both because of confusion about where its members should be counted. Such situations could also lead to double-counting or “over-coverage”, although this is less prevalent than “under-coverage”, which occurs when individuals or households are missed.

Non-response errors

Sometimes it proves impossible to obtain a complete questionnaire from a household, even though the dwelling was identified as occupied and a questionnaire was dropped off. The household members may be away over the entire census period or may refuse to complete the form. In most cases, the questionnaire is returned but information is missing for some questions or individuals. Census representatives edit the questionnaires and follow up on missing information. Some non-response is inevitable and, although certain adjustments for missing data can be made during processing, some loss of accuracy is inevitable.

Response errors

A response may not be entirely accurate. The respondent may have misinterpreted the question or may not know the answer, especially if it is given for an absent household member. Occasionally, a response error may be caused by the Census Representative when following up for a missing response or when recording items such as the structural characteristics of a dwelling.

Processing errors

Mistakes can occur in coding, especially when written information is ambiguous, incomplete or difficult to read. Following coding, all the data undergo a series of computer checks to identify missing or inconsistent responses. Responses are created or “imputed” for missing or unacceptable information, using answers from respondents who share similar characteristics such as age and sex. When results are tabulated for sufficiently large geographic areas or subgroups of the population, imputation errors will more or less cancel out.

Sampling errors

Some census questions are asked of all Canadian residents, but most of the cultural and economic information is obtained from a sample of one in five households. The information collected from these households is “weighted” to produce estimates for the whole population. The results of the weighted sample differ somewhat from the results that would have been obtained from the total population. The difference is known as sampling error.

Sampling Errors

Estimates obtained by weighting-up responses collected on a sample basis are subject to error. This is due to the fact that the distribution of characteristics within the sample will not usually be identical to the distribution of characteristics within the population from which the sample has been selected.

The potential error introduced by sampling will vary according to the relative scarcity of the characteristics in the population. For large cell values, the potential error due to sampling, as a proportion of the cell value, will be relatively small. For small cell values, this potential error, as a proportion of the cell value, will be relatively large.

The potential error due to sampling is usually expressed in terms of the so-called standard error. This is the square root of the average, taken over all possible samples of the same size and design, of the squared deviation of the sample estimate from the value for the total population.

The following table provides approximate measures of the standard error due to sampling. These measures are intended as a general guide only.

Approximate Standard Error Due to Sampling for 2001 Census Sample Data

| Cell Value | Approximate Standard Error |
|------------|----------------------------|
| 50 or less | 15 |
| 100 | 20 |
| 200 | 30 |
| 500 | 45 |
| 1000 | 65 |
| 2000 | 90 |
| 5000 | 140 |
| 10000 | 200 |
| 20000 | 280 |
| 50000 | 450 |
| 100000 | 630 |
| 500000 | 1400 |

Users wishing to determine the approximate error due to sampling for any given cell of data, based upon the 20% sample, should choose the standard error value corresponding to the cell value that is closest to the value of the given cell in the census tabulation. When using the obtained standard error value, the user, in general, can be reasonably certain that, for the enumerated population, the true value (discounting all forms of error other than sampling) lies within plus or minus three times the standard error (e.g. for a cell value of 1,000, the range would be $1,000 \pm [3 \times 65]$ or $1,000 \pm 195$).

The standard errors given in the table above will not apply to population, household, dwelling or family counts for the geographic area under consideration. The effect of sampling for these cells can be determined by a comparison with a corresponding 100% data product.

The effect of the particular sample design and weighting procedure used in the 2001 Census will vary from one characteristic to another and from one geographic area to another. The standard error values in the table may, therefore, understate or overstate the error due to sampling.

Manitoba Health

Information Systems, Manitoba Health

Fertility, Newborn, Live births, and Birth weight indicators are derived from the Manitoba Health Hospital Abstract database. Mammography screening, cervical screening and asthma data were obtained from Manitoba Health Medical Claims. Population files for Winnipeg Health Region residents are based on the Manitoba Health Registration System. Manitoba Health Annual Statistical report also reports hospital and physician activity and is based on the systems noted above.

Potential Limitations:

Geographic allocation: Geographic allocation relies on the resident to provide accurate information on where they live. If a resident has a change of address, the onus is on the resident to provide updated information on the change to Manitoba Health. Also, there is no advance validation of postal codes through Canada Post, it is done as discrepancies are encountered.

Geographic differences may exist between the hospital abstract and medical claims systems. Medical claims tend to be processed faster than hospital abstracts (2 weeks versus 3 months), therefore, if a resident has both a medical claim and a hospitalization, the medical claim may have information from before the address change, while the same patient may have a different address three months later.

New residents may also have a hospital stay before they register with Manitoba Health, therefore, it may take up to three months for that person to appear in the hospital abstract system.

Response errors: A response may not be entirely accurate. The respondent may have misinterpreted the form, question or may not know the answer.

Processing errors: Mistakes can occur in the coding and input of data, especially when written information is ambiguous, incomplete or difficult to read.

Communicable Diseases

Data on residents of Winnipeg were extracted by the Communicable Disease Control Unit, Manitoba Health, using the February 2002 Postal Code Conversion file produced in a collaborative effort by the Community Data Network. Differences between the rates reported in this document and other documents (external to the WRHA) might be due, in part, to the assignment of residents through another Postal Code file or another method of allocating residents.

Diabetes

The Diabetes and Chronic Diseases Unit, Manitoba Health provided diabetes data.

Manitoba Centre for Health Policy (MCHP)

Data was obtained from the Manitoba Centre for Health Policy under contract to the WRHA. Crude and age- and sex-standardized rates for population health indicators were produced for the region, the 12 community areas and 25 neighbourhood clusters within the Winnipeg Health Region. This was done using the same methodology as for *The Manitoba RHA Indicator Atlas: Population-based Comparisons of Health and Health Care Use*, (Martens, P.J. et al. June, 2003). Only selected indicators were chosen for inclusion in this report.

The methods and limitations of the data provided below were excerpted from Appendix 1: Methods: *The Manitoba RHA Indicator Atlas: Population-based Comparisons of Health and Health Care Use*, June, 2003. Please note that this refers to methodology for Manitoba and RHA rates however, appropriate methods were

used for calculation of rates for geographies within the WHR. Further detail on specific analyses can be found in the *Manitoba RHA Indicator Atlas* and from the MCHP website <http://www.umanitoba.ca/centres/mchp/reports.htm>.

Data Preparation

Several sources of data were used for the analyses: hospital discharge abstracts, physician claims, registry data, and vital statistics. Two exclusions were typically made for all analyses: Public Trustee postal codes for both Winnipeg and Brandon were excluded. The Office of the Public Trustee is responsible for individuals unable to care for themselves. Their location of residence information contains the location of the Public Trustee's office, so we cannot determine their actual area of residence. Since all analyses are based on where people lived, these residents cannot be properly assigned to any district. There is a high turnover among individuals registered with the Office of the Public Trustee.

Non-Manitoba residents were defined using a combination of postal code and municipal code identification, and subsequently excluded from analyses.

Three additional exclusions were typically made for hospital discharge abstracts data:

- Duplicate records were removed from analyses using hospital discharge abstracts.
- Dates outside the fiscal year (or set of fiscal years) of study were removed. For multi-year analyses comparing utilization by year, dates outside the fiscal year were removed for each year to ensure comparability. When years were combined for analyses, only the dates outside of the multi-year period were removed.
- Newborns and brain deaths are excluded for overall utilization analyses. As newborns typically have identical records to their mothers, they are eliminated to avoid double-counting. With brain deaths, death occurs prior to admission. Since these individuals are taken directly to the morgue, their records are eliminated because they bypass the usual kinds of resource utilization.

Assignment of Residence Information

Virtually all analyses in this report allocate health service use to the area where the patient who received the service lived, regardless of where the service was provided. For example, if a resident of Interlake RHA travels to Winnipeg for a physician visit, that visit contributes to the visit rate for Interlake residents.

With claims-based analyses, more than one record per person is possible. The residence information on the first-occurring record for a given year was generally used. For individual-based analyses (selecting one record per person; e.g., Diabetes and Hypertension), the most frequently-occurring residence information from the combined time period was used. If there was a tie, the first-occurring record was used.

Denominator

The Manitoba population as of December 31 was used for any given year. Standard exclusions to prepare the population denominators consisted of non-Manitoban residents and public trustee postal codes. Eligibility criteria applied to the numerator were also generally applied to the denominator. For adjusted rate analyses, unless otherwise stated, the standard population was always the 1996 Manitoba population.

Study Years

For this study, various time periods are used – one-year rates for physician visits and multi-year rates for less common events (two-year, three-year, five-year). Two time periods are compared. For two-year rates, fiscal years 1994/95-1995/96 are usually used for the first time period, and 1999/2000-2000/01 are usually used for the second time period. For the five-year rates, fiscal years 1991/92-1995/96 are usually used for the first time period, while 1996/97-2000/01 are usually used for the second time period. In some instances, calendar years are used, as designated by notation such as 1991-1995 or 1996-2000. See specific categories of analysis for more details on study years.

Age Groups for Standardization

For most of the analyses in this report, the age groups used for standardization were: 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, 85-89, and 90+ years. Where different age groups for standardization were used, a note is made in the specific sections, below.

Overall Physician Utilization Analyses

Physician analyses used 1995/96 and 2000/01 claims data, with the Manitoba population from December 31, 1995 and 2000 as the denominator (except for location of physician visits, see below). Age was calculated as of December 31. Data were restricted to ambulatory visits for in-province services by Manitoba physicians. All data were adjusted for age and sex. Visits to physicians practicing outside of Manitoba were excluded after analysis revealed that such visits accounted for less than 1% of all visits provided to Manitoba residents.

1. Ambulatory visits - Both GP/FP and specialist visits were selected.
2. Ambulatory consultations - Both GP/FP and specialist consultations were selected.
3. Ambulatory visits by age and gender - Ambulatory visits to GPs/FPs and specialists were selected. The age group used for standardization was 0-4, 5-9, 10-14, 15-25, 25-34, 35-44, 45-54, 55-64, 65-74, 75-79, 80-84, 85-89, 90+.
4. Physician access - Physician access was defined as the proportion of people with at least one ambulatory physician visit in a year. Ambulatory visits to GPs/FPs and specialists were selected. The age group used for standardization was the same as for ambulatory visits by age and gender.
5. Location of ambulatory visits: GPs/FPs vs Specialists (same vs different RHA) - The denominator was total ambulatory visits, and proportions (not rates) were calculated. Physician location was assigned to one of four categories:
 - within the individual's district of residence
 - outside the district of residence, but within RHA of residence
 - outside RHA of residence: non-Winnipeg
 - in Winnipeg

With location of visits to GPs, the denominator was the total number of visits to GPs. The data included only services to Manitobans within Manitoba, which may lead to undercounting of physician visits in some districts where a significant number of residents receive care out-of-province. When assigning physician numbers to a region, some physician numbers associated with hospital ERs could not be assigned. In these cases, physician location was calculated using hospital number. In/out of RHA comparisons were made between residence RHA on the first record of the time period and physician RHA as per any given record.

Overall Hospital Utilization Analyses

Hospital analyses used 1994/95, 1995/96, 1999/00, and 2000/01 data, with the corresponding Manitoba population as the denominator (except injury hospitalizations – see below). Federal hospitals, nursing stations, and out-of-province hospitals were included; personal care homes and long-term care facilities were excluded. Age was calculated as of December 31. Region was assigned as of the last-occurring hospitalization for each given year. All data were adjusted for age and sex.

1. Separations - These consist of inpatient hospital stays and surgical outpatient (day surgery) records. Stays less than 30 days were considered short stays; stays 30 days or more were considered long stays.
2. Days - Stays less than 30 days were considered short stays; stays 30 days or more were considered long stays. For records where days were greater than 365 days, the original length of stay (LOS) variable was truncated to 365 days (i.e., within the 98/99 year of data being used, there could be discharges where the stay was longer than one year, e.g., spanning 97/98 and 98/99). Other stays spanning the two fiscal years but less than a year would thus be counted as the full number of days.

3. Location of hospitalization - The comparisons of hospital in/out of resident RHA were done using the RHA of the first-occurring PHIN. Rates of hospitalization by location were grouped into the following four categories:

in RHA, other RHA, in Winnipeg, out-of-province.

Hospital catchments (where each RHA's hospitals' patients came from) were also calculated, using the same four categories.

4. Injury hospitalizations - Five years of hospital discharge abstracts were used (1991/92-1995/96 and 1996/97-2000/01); the denominator was taken from five years of population files (corresponding to the years of the numerator data). Transfers were excluded. Transfers were defined as any hospitalization which falls completely within another hospitalization (these are cases where a patient is transferred to another hospital to receive a special test like the MRI and then is sent back to the original hospital) or when the admission date of the second hospitalization is equal to the discharge date of the first hospitalization. Age was calculated as of December 31 for each given year. Region was assigned as of the last-occurring hospitalization for each given year.

CIHI Health Information Portal Pilot - HIPP

HIPP is a customizable and interactive tool to access and apply CIHI methodologies and data stores via a secure Internet connection. The portal was piloted in 3 Canadian sites including the WHR in the fall and winter of 2003-2004. The first stage included hospitalization data from the Discharge Abstract Database (DAD) at CIHI for all participating jurisdictions in Canada. It was a major step to pan-Canadian sharing of hospital utilization information.

Because this was a prototype system, many of the data checks and balances typically inherent in a distributed data store may not been completed. As well, the issues related to reporting to Discharge Abstract Database are also present, such as differences in reporting and interpretation of participating facilities and regions.

Therefore information based on the Portal Pilot should be considered preliminary.

National Health Expenditure Trends – CIHI

The data contained in the National Health Expenditure Database (NHEx) are estimates. The data are collected from diverse sources and include varying classes of financial information. They are collected and classified according to methods established by a Review Committee.

Most private sector expenditures are estimated from survey data.

To access additional information on data limitations, collection, non-response and classification contact the National Health Expenditure section by email nhex@cihi.ca.

WINNIPEG REGIONAL HEALTH AUTHORITY

WRHA Bed Map

All RHAs are required to submit to Manitoba Health, a listing of all beds in operation on a yearly basis. This information must be submitted by March 31st of each year. The information is tabled in the legislature.

All in-patient beds at the nine sites are included. The PCH program completes its own bed inventory and also submits it to the WRHA by March 31st.

The data is used internally by a variety of programs and departments. It is used to track changes in bed volumes by program and hospital. Programs and sites use it for budget purposes and service re-configuration. It is also an important component of resource planning for support areas.

Prior to regionalization, each hospital had to submit this information. It was with the creation of the regional health authorities in December 1997 that bed data was compiled by program and site. Therefore, bed count data should be used with caution during the transition years of 1998 and 1999.

Key Informants

Interviews with field experts (called key informants) were conducted to obtain both qualitative and quantitative information on indicators where appropriate and when information was not available from routinely collected sources.