MANITOBA HEALTH

PROVINCIAL

HEALTH INDICATORS

Prepared by Manitoba Health
Health Indicator Working Group
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HEALTH INDICATORS

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INTRODUCTION

The Health Status Indicator Working Group represented by Regional Health Authority representatives and Manitoba Health staff worked collaboratively in the preparation of this document. These indicators were developed for Manitoba Health and the Regional Health Authorities to assure standardized data reporting and to allow tracking of important health issues. The members of this working group developed a set of indicators based on designated criteria. The criteria (Appendix A) were developed based on extensive research involving numerous documents from National and International sources. Indicator initiatives under development were also reviewed to ensure that the indicators selected for Manitoba would either link to or supplement future work in this area. A feedback process to Regional Health Authorities, Manitoba Health staff, and other external stakeholders was initiated in January of 1999. All feedback was reviewed and incorporated where possible keeping in mind the original criteria for the indicators.

The indicators were developed in order to assist the Regional Health Authorities in describing the health status of their population in the annual report submitted to Manitoba Health. The health indicator information can also be used in the RHAs Community Health Assessments and will assist the RHAs in tracking the health status of their populations over time. Manitoba Health will also use the health indicators within the document the "Report on the Health of Manitobans". Provincial and National comparisons will be made and the health status of the Province will be tracked over time.

The development of health indicators and measuring of health status is an ongoing process. As Regional Health Authorities and Manitoba Health work with the current list of indicators and available data sources, it is recognized that other indicators will be developed. In addition, the future availability or development of other data sources will allow the indicators to be enhanced to address gaps in particular areas. The working group will continue to meet to address these issues.

Limitations are discussed under each indicator. In general, a major limitation is the availability of data at the regional level. Consideration was given to this limitation during the selection process for the indicators. Where data is not available for a particular indicator at the regional level, yet the indicator was included, the importance of the indicator was felt to be such that a data source should be recommended for development.

The Community Health Assessment Unit of Manitoba Health will centrally coordinate the access to most of the data and information with assistance from the Office of the Chief Medical Officer of Health. Some indicators may require collection at the local level by each RHA.

The indicators have been divided up into two major categories: Health Status and Determinants of Health. Within each, subcategories were used to sort the indicators and ensure a broad range of health issues was addressed.

The framework utilized is based on the Report on the Health of Canadians (Federal, Provincial, and Territorial Advisory Committee on Population Health, 1996). This framework conceptualizes the broad range of issues that affect health. Indicators relating to Health Status have been subdivided into the following areas; Length of Life, Deaths, Diseases and Conditions, Ability to Function, and Well Being. Determinants of Health subcategories are Healthy Child Development, Personal Health Practices/Coping Skills, Physical Environment, Employment/Working Conditions, Education, and Income/Socioeconomic Status. By categorizing the indicators in this way, planning processes for RHAs and Manitoba Health will be enhanced.

HEALTH STATUS INDICATORS

"Health status indicators are phenomena we can measure, which serve as an indication of the state of health of individuals and thus the health of the overall population." (Report on the Health of Canadians, 1996, p. 1) These indicators can be subdivided into 5 main categories:

- Length of Life
- Deaths
- Diseases and Conditions
- Ability to Function and
- Well being.

Indicators have been developed for each of these areas. Within the area of diseases and conditions, indicators have been chosen for a variety of reasons. The disease may be particularly pertinent to the Manitoba population, or it may relate to screening or prevention initiatives currently underway in Manitoba. Other diseases (e.g. incidence of lung cancer) that one would expect in this area which have not been included, will appear in the subcategory of Deaths due to the close correlation between morbidity and mortality for some diseases. The health indicator working group recognizes that limitations exist for each indicator. For example, limitations accessing region specific information for indicators relying on the National Population Health Survey may occur due to small cell size numbers for particular questions.

LENGTH OF LIFE

1. Premature Mortality

a. Potential Years of Life Lost (Total and Major Categories)

Indicator: Total and proportionate potential years of life lost by major causes of death and by age group.

Category: Health status.

Definition: Years of life lost before age 75 by major causes (ICD 9 major headings) and by age groups (5-year intervals).

Calculation: Each death at age $x < 75$ contributes $75 - x$ years.
Numerator = sum of each death contribution by category.
Denominator = population at mid year.

Source: Vital statistics and Manitoba Health death database.

Uses: Unlike other crude or specific mortality data which count all deaths as an equal unit regardless of age at death, PYLL measurements only consider deaths before age 75 and weights them by age. This allows one to observe and compare death occurrence and causes by their impact on "premature death".

Limitations: The setting of a life "potential" is arbitrary and may give the impression that younger life years are considered more valuable or worthwhile than the years beyond age 75, especially since average life expectancy now exceeds 75. Furthermore, different standards exist - e.g. LCDC age 75, Statistics Canada age 70, and International (OECD) age 64. For meaningful comparisons, the "crude" PYLLs should be expressed as a rate, and, ideally by age categories (or age-standardized) to account for variations in population age distributions.

National Value: Total = 1,060,361
1989 data (potential = 64) = 4,974 per 100,000

Provincial Value: Total = 41,046

RHA Value: Available.

Trends: Increasing for cancer and suicides, but decreasing for accidents, heart disease for Canada, 1972-1992.

b. Potential Years of Life Lost (Proportionate, Specific Cause)

Indicator: Proportionate potential years of life lost by specific causes of death and by age group for the top 25 causes.

Category: Health status.

Definition: Years of life lost before age 75 by specific causes (ICD 9 3-digit specificity) and by age groups (5-year intervals).

Calculation: Each death age x where $x < 75$ contributes $75 - x$ years. Numerator = sum of the number of PYLLs for each specific cause of death. Denominator = total number of PYLLs for the entire population or specific age and sex group.

Source: Vital statistics and Manitoba Health death database.

Uses: Unlike other crude or specific mortality data which count all deaths as an equal unit regardless of age at death, PYLL measurements only consider deaths before age 75 and weights them by age. This allows one to observe and compare death occurrence and causes by their impact on "premature death".

Limitations: The setting of a life "potential" is arbitrary and may give the impression that younger life years are considered more valuable or worthwhile than the years beyond age 75, especially since average life expectancy now exceeds 75. Furthermore, different standards exist - e.g. LCDC age 75, Statistics Canada age 7, International (OECD) age 64. Whereas proportionate PYLL gives a picture of the relative comparisons between specific causes of death within a population, it does not reflect absolute rates for any specific cause, which can be used for comparisons between populations.

National Value: Not reported.

Provincial Value: Available.

RHA Value: Available.

Trends: Not reported.

c. Premature Mortality Rate

Indicator: Premature Mortality Rate

Category: Health Status Indicator

Definition: Annual number of deaths occurring before the age of 75 years of age per 100,000 population for individuals under age 75, adjusted to a reference (or standard) population of individuals under 75 years of age. The standard population will be the June 1, 1990 Manitoba population under 75 years of age.

Calculation: Direct standardization

$$\frac{\sum (\text{Age specific death rate for age groups under 75 years} \times \text{size of standard population for that age group})}{\text{Size of standard population under 75 years of age}} \times 100{,}000$$

Sources: Numerator: Vital Statistics and the Manitoba Health data base
Denominator: Manitoba Health Registration file

Uses: The standard mortality rate (SMR) based on deaths occurring among individuals aged 0 to 74 years provides the foundation for the premature mortality rate (PMR), which is an indicator of the rate of early death (i.e. death before average life expectancy) in a population. This indicator has been suggested as the best single indicator of health status capturing the relative need for health care (Carstairs and Morris 1991; Eyles et al. 1993); high rates of premature death are associated with a higher need for health care resources. The PMR has been used for allocating health care funds across different parts of Scotland. Even the U.S. General Accounting Office has identified the premature mortality rate as the "single best proxy for reflecting differences in the health status of states' populations" (U.S. General Accounting Office 1996; Kindig 1997). This measure has also been shown to be strongly associated with other measures of health status that can only be derived from more expensive data collection techniques: self assessed health, number of symptoms, rates of self-reported acute illness (Mays et al, 1992). This measure is the indicator used by the Manitoba Centre for Health Policy and Evaluation to provide regions with context about regional health status as a necessary precursor to understanding their differential rates of use of health care resources (Black et al, forthcoming).

Limitations: Interpretation may be somewhat difficult.
National Value: Canadian rates are not available for this measure.
Provincial Value: Available.
Regional Value: Available.
Trends: The provincial premature mortality rate is declining. However, the differential across regions is increasing. For healthier regions, this measure has improved (i.e. PMR has declined) between 1986 and 1996; for regions with less healthy populations, this measure indicates worsening health status (i.e. PMR has increased) over this period (Mustard et al., forthcoming).

DEATHS

2. SMR - Manitoba Population

Indicator: Standardized Mortality Rates for Manitoba

Category: Health Status Indicator

Definition: Annual number of deaths per 100,000 population, which would be observed in the population if it had the same age composition as a reference or ("standard") population. The standard population will be the June 1st, 1990 Manitoba population.

Calculation: Direct Standardization

$$\frac{\sum \text{(Age specific death rate x Size of standard population for that age group)}}{\text{Size of standard population}} \times 100{,}000$$

Sources: Numerator: Vital Statistics and the Manitoba Health death data base
Denominator: Manitoba Health Registration file

Uses: Allows the tracking of long term success in reducing mortality in Manitoba and in the RHAs while controlling for changes in the population structure. National and International comparisons are possible. Allows comparisons between RHAs and the Province.

Limitations: Does not tell you anything about the causes of death.
Understanding may be difficult.

National Value: Canadian rates are among the lowest in the world. (505/100,000 population - 1992 rates based on the 1971 population)

Provincial Value: Available

Regional Value: Available

Trends: The Standardized death rate is declining. (1921-1982)

3. Causes of Death by Gender for the Top 25 Diseases

Indicator: Causes of Death by Gender for the Top 25 Diseases at both the provincial and the RHA level - standardized and crude rates by cause

Category: Health Status Indicator

Definition: **Crude mortality** rates by cause of death: annual number of deaths per 100,000 population by specific cause by sex for the 25 most prevalent ICD-9 code groupings for cause of death.

Standardized mortality rates by cause of death: annual number of deaths by specific cause for the 25 most prevalent ICD-9 code groupings for cause of death which would be observed in the population if it had the same age composition as the June 1, 1990 Manitoba population. See Indicator #2. These rates will be reported by sex.

Calculation: **Crude Mortality Rates:**

$$\frac{\text{Number of deaths by specific cause}}{\text{At risk population}} \times 100{,}000$$

Standardized Mortality Rates: See Indicator #2

Sources: Numerator: Cause of death is obtained from death certificates filled out by physicians and forwarded to Vital Statistics where they are given ICD-9 codes.
Denominator: Manitoba Health Registration File

Uses: Identifies those problems that have the most visible and complete impact on individuals. Cause of death has been used as an indicator of health status for a long period of time. National and International comparisons are possible.

Limitations: Multiple factors may contribute to the death and only one is recognized per person.
Physicians may not fill out Death Certificate accurately.
Errors may occur in coding the information.
Time trends may be inaccurate due to changes in diagnostic capabilities. These capabilities also vary from country to country.

National Value: In 1993, there were 712.66 deaths per 100,000 Canadians and the most important causes of death were: heart attack, other ischemic heart disease, lung cancer, breast cancer and stroke.

Provincial Value: Available

Regional Value: Available

4. Infant Mortality Rates

Indicator: Infant Mortality Rate

Category: Health status

Definition: Ratio of deaths among infants under 1 year old to the number of live births, for a given period of time.

Calculation: $\frac{\text{Number of deaths for each of the age groups during a given period}}{\text{Total live births during the period of time}} \times 1000$

Categories: Early neonatal (0 days - 7 days)
Late neonatal (8 days - 28 days)
Post neonatal (29 days - 12 months)
Total of Above Categories (0 days – 12 months)

Source: Death database, Manitoba Health, Decision Support Services
Live birth (newborn) database, Manitoba Health, Decision Support Services

Uses: Infant mortality is an indicator of the level of mortality, health status and level of health care of a country, as well as the effectiveness of its preventive care and the attention paid to the health of the mother and her child.
Early and late neonatal mortality rates are generally considered to be more descriptive of medical care measures. Early neonatal mortality rate is influenced by the delivery of very low and low birth weight infants. While post neonatal mortality rates reflect socioeconomic conditions.
Deaths among infants under 1 year formerly occurred mainly among infants over 1 month old, but since the 1960s they have been concentrated among infants less than 1 month old who present very low weight at birth.

Limitations: Differences in infant mortality from country to country may depend on differences in the definition of live births and still births.
In international comparisons, it is recommended that only births of 1000 grams or over be used or, if birth weight is unknown, births after 28 or more weeks of pregnancy be used.
Some experts feel that more than 10,000 births are needed in the denominator to obtain an accurate estimate of infant mortality.

National Value: 6.4 per 1000 live births (1991)

Provincial Value: Available

RHA Value: Available

DISEASES AND CONDITIONS

5. Birth weight Rates

Indicator: Annual rate of very low birth weight infants
Annual rate of low birth weight infants
Annual rate of high birth weight infants

Category: Health Status Indicator

Definition: The average full term infant weighs 3400 grams at birth. Anomalies from the average are defined as follows:
Rate of **very low birth weight infants** is the ratio of infants born weighing less than <1500 grams to the number of live births for a given period of time.
Rate of **low birth weight infants** is the ratio infants born weighing less than 2500 grams to the number of live births for a given period of time.
Rate of **high birth weight infants** is the ratio of infants born weighing more than 4000 grams to the number of live births for a given period of time.

Calculation: $\frac{\text{Number of births in each weight group}}{\text{Total number of live births in time period}} \times 1000$

Sources: Live birth (newborn) database, Manitoba Health, Decision Support Services.

Uses: Low birth weight has been identified as a principal risk factor associated with infant mortality. Factors associated with low birth weight include smoking, poor diet during pregnancy, low weight prior to pregnancy, poverty and pregnancy at very early or late ages. In Manitoba, increasing numbers of high birth weight babies have been seen in mothers with gestational diabetes.

Limitations: In international comparisons, it is recommended that only births of 1000 grams or more be used in calculations. This may affect international comparisons of very low birth weight infants.

National Value: 5.7% (57 per 1000) of infants born in 1993 weighed less than 2500 grams.

Provincial Value: 5.4% (54 per 1000) of infants born in Manitoba in 1993 weighed less than 2500 grams.

Regional Value: Available

Trends: On a national level, rate of low birth weight infants has declined fairly steadily since 1970.

6. Incidence of Selected Notifiable Diseases

a. Tuberculosis Incidence

Indicator: Tuberculosis incidence rate

Category: Health status

Definition: Number of cases of tuberculosis per population per year. A "case" of active tuberculosis is reportable and consistently defined by Statistics Canada, Health Canada, Manitoba TB Registry and Manitoba Health as an episode of new or reactivated active tuberculosis, confirmed through X-ray or bacteriological test or both, and including pulmonary or extrapulmonary manifestations, or both.

Calculation: (Number of cases reported in calendar year / total mid-year population) x 100,000

Categories: Sex, age group, sex by age group

Source: Manitoba Health, MB TB Registry, Health Canada

Uses: Reflects socioeconomic status and general health status, as well as effectiveness of primary and secondary prevention programs. Especially important for the Aboriginal population in Manitoba.

Limitations: Outbreaks and case-finding efforts in response to outbreaks may cause year-to year fluctuations in incidence, but variation is not great. Unknown degree of under-diagnosis; minimal under-reporting. Cases represent episodes and not individuals; one individual may have more than one case, if clinically assessed as a reactivation and not relapse.

National value: Approx. 7 per 100,000/yr (total population)

Provincial value: Approx. 9 per 100,000/yr (total population)

RHA value: Available; varies markedly by RHA.

Trends: Downward trend over recent decades has plateaued since mid-90's.

b. Chlamydia Infection Incidence

Indicator: Chlamydia incidence rate

Category: Health status

Definition: Number of cases of the notifiable sexually transmitted disease (STD) *Chlamydia trachomatis* per population per year. A "case" of chlamydia STD is consistently defined by Health Canada and Manitoba Health as an episode of genital, rectal or oropharyngeal infection, laboratory confirmed to be due to *C. trachomatis.*

Calculation: (Number of cases reported in a calendar year / total mid-year population) x 100,000

Categories: sex, age group, and sex by age group

Source: Manitoba Health, CDC Unit; Health Canada for national and provincial comparisons.

Uses: Correlates with risk of STD sequelae such as infertility and ectopic pregnancy. Associated with risk of heterosexual HIV transmission. Reflects effectiveness of primary and secondary prevention efforts.

Limitations: Under-reported, especially in men, leading to misleading gender rate ratio. May be variations in degree of screening/reporting in different settings, potentially leading to bias in incidence rate variations e.g. between RHA's.

National value: 127 per 100,000/yr (1995)

Provincial value: 239 per 100,000/yr (1997)

RHA value: Available. Variable.

Trends: Downward provincial trend since introduction of control program in 1980's. However, now beginning to plateau.

c. Human Immunodeficiency Virus (HIV) Infection Incidence

Indicator: HIV incidence rate

Category: Health status

Definition: Number of new laboratory-confirmed infections with HIV per 100,000 population per year. HIV is not currently reportable by legislation in Manitoba; reporting is mandated in some provinces and not others. In Manitoba, surveillance depends on coded specimens submitted to Cadham Provincial Lab, the only lab that performs HIV testing. A "case" of new HIV infection is defined as a positive test with a unique code that has not previously been associated with a positive test in Manitoba.

Calculation: (Number of cases of new infection / total mid-year population) x 100,000.

Categories: Sex, age group, age group by sex, risk group, risk group by sex

Source: Manitoba Health, CDC Unit; Health Canada for national and provincial comparisons.

Uses: Evaluate effectiveness of primary and secondary prevention efforts. Estimation of future burden of illness and mortality due to AIDS.

Limitations: Under-reported (Health Canada estimates 30-40% not reported). Under-reporting varies by age, region and risk category, introducing bias into these category-specific rates. No ethnicity data for HIV in Manitoba.

National value: 10.3 per 100,000 per year (1996-97)

Provincial value: 5.2 per 100,000 per year (1996 –97)

RHA value: Available.

Trends: Reported total incidence stable in Manitoba since mid-1980's, but increasing proportion in women and injection drug users, with decreasing proportion in men who have sex with men.

d. Shigellosis Incidence

Indicator: Shigellosis incidence rate

Category: Health status

Definition: Number of new laboratory-confirmed infections with shigella species per population per year. Shigellosis is a notifiable disease in Manitoba.

Calculation: (Number of cases of infection / total mid-year population) x 100,000.

Categories: Sex, age group, and sex by age group

Source: Manitoba Health, CDC Unit.

Uses: Reflects general living conditions and fundamental public health prerequisites (clean water, sanitation), as well as secondary prevention.

Limitations: Cases that are not laboratory-confirmed are not included, therefore underestimates total incidence, especially during years with outbreaks.

National value: 2.5 per 100,000 per year (1996)

Provincial value: 9.0 per 100,000 per year (1997)

RHA value: Available. Varies markedly by RHA.

Trends: Gradual decline in total incidence in Manitoba since 1970's, with spikes in incidence every few years corresponding to outbreaks in remote communities.

7. Incidence of Selected Cancers

a. Melanoma Incidence

Indicator: Melanoma incidence rate

Category: Health status

Definition: Number of new cases of melanoma (ICD-9 172) per 100,000 population per year. A "case" of melanoma is defined as one primary tumour; if more than one primary is diagnosed, an individual may be reported more than once. Cases of cancer are reportable to the Manitoba Cancer Registry.

Calculation: Crude incidence rate:(number of new cases of melanoma / mid-year population) x 100,000

Age-standardized incidence rate: calculated using the direct method for age standardization, with the 1996 Manitoba population used as the standard population.

Categories: Sex

Source: Manitoba Cancer Registry, maintained by Manitoba Cancer Treatment and Research Foundation and the Epidemiology Unit, Manitoba Health.

Uses: Follow trends and estimate burden of illness due to an important yet preventable contributor to cancer mortality. Reflects effectiveness (or lack thereof) of primary prevention (i.e. reduction of ultraviolet exposure).

Limitations: Duplicate counting if more than one primary at same site. Under-counting of those cancers diagnosed only at postmortem, or not autopsied. No ethnicity data from this data source.

National value: Age-standardized rate (1998): males 11; females 9 (per 100,000)

Provincial value: Age-standardized rate (1990-96): males 9.9 females 9.4 (per 100,000)

RHA value: Available. Moderate variation by RHA, highest in southern rural RHA's.

Trends: Stable in Manitoba over last decade.

b. Breast Cancer Incidence

Indicator: Breast cancer incidence rate

Category: Health status

Definition: Number of new cases of breast cancer (ICD-9 174 Female, 175 Male) per 100,000 population per year. A "case" of breast cancer is defined as one primary tumour; if more than one primary is diagnosed, and individual may be reported more than once. Cases of cancer are reportable to the Manitoba Cancer Registry.

Calculation: Crude incidence rate: (number of new cases of breast cancer/mid-year population) x 100,000
Age-standardized incidence rate: calculated using the direct method for age standardization, with the 1996 Manitoba population used as the standard population.

Categories: Sex

Source: Manitoba Cancer Registry, maintained by Manitoba Cancer Treatment and Research Foundation and the Epidemiology Unit, Manitoba Health.

Uses: Follow trends and estimate burden of illness due to a major cause of mortality in women. May reflect effectiveness of primary prevention.

Limitations: Duplicate counting if more than one primary at same site. Under-counting of those cancers diagnosed only at postmortem, or not autopsied. Incidence influenced by changes in screening/casefinding practices and programs. No ethnicity data from this data source.

National value: Estimated age-standardized rate (1998): females 108 per 100,000

Provincial value: Age-standardized rate (1990-96): males 0.9 females 115.7 (per 100,000 per year)

RHA value: Available. Moderate-large variation by RHA.

Trends: Increasing in Manitoba over last decade. RHA trends: variable.

c. Cervical Cancer Incidence

Indicator: Cervical cancer incidence rate

Category: Health status

Definition: Number of new cases of cervical cancer (ICD-9 180) per 100,000 female population per year. Does not include carcinoma-in-situ (CIS). Cases of cancer are reportable to the Manitoba Cancer Registry.

Calculation: Crude incidence rate=(number of new cases of cervical cancer/mid-year population) x 100,000
Age-standardized incidence rate: calculated using the direct method for age standardization, with the 1996 Manitoba population used as the standard population.

Source: Manitoba Cancer Registry, maintained by Manitoba Cancer Treatment and Research Foundation and the Epidemiology Unit, Manitoba Health.

Uses: Reflects effectiveness of primary (e.g. delayed onset of sexual activity, reduced number of sexual partners) and secondary (Pap smear screening programs) prevention, as well as access to health care.

Limitations: Does not include carcinoma-in-situ (CIS). No ethnicity data from this data source.
Small numbers reduce reliability of RHA trends.

National value: Estimated age-standardized rate (1998): females 8 (per 100,000 per year)

Provincial value: Standardized rate (1990-96): females 10.2 (per 100,000 per year)

RHA value: Available. Marked variation by RHA.

Trends: Stable in Manitoba over last decade.

d. Prostate Cancer Incidence

Indicator: Prostate cancer incidence rate

Category: Health status

Definition: Number of new cases of prostate cancer (ICD-9 185) per 100,000 male population per year. Cases of cancer are reportable to the Manitoba Cancer Registry.

Calculation: Crude incidence rate = (number of new cases of prostate cancer / mid-year population) x 100,000.
Age-standardized incidence rate: calculated using the direct method for age standardization, with the 1996 Manitoba population used as the standard population.

Source: Manitoba Cancer Registry, maintained by Manitoba Cancer Treatment and Research Foundation and the Epidemiology Unit, Manitoba Health.

Uses: Monitor trends in incidence, and help evaluate impact of secondary prevention (screening and case finding), as well as access to health care.

Limitations: Apparent incidence influenced by screening practices and access to health care. Duplicate counting if more than one primary at same site. Under-counting of those cancers diagnosed only at postmortem, or not autopsied. No ethnicity data from this data source.

National value: Estimated age-standardized rate (1998): males 112 (per 100,000 per year)

Provincial value: Standardized rate (1990-96): males 167.5 (per 100,000 per year)

RHA value: Available. Slight variation by RHA.

Trends: Variable in Manitoba over last decade, with peak incidence in 1993. Small numbers reduce reliability of RHA trends.

8. Incidence and Prevalence of Diabetes Mellitus

Indicator: Diabetes mellitus (DM) incidence and prevalence rates

Category: Health status

Definition: **Incident case of DM:** A Manitoba resident who has at least two physician claims or one hospitalization claim with a diagnosis of DM (ICD-9 250) submitted to MB Health during a two year period, with no previous claims for DM.
Prevalent case of DM (in a particular year): All new incident cases defined for that year, plus all live persons previously detected as incident cases in previous years.

Calculation: Crude incidence rate = (number of incident cases in a particular year / mid-year population) x 1000
Crude prevalence rate = (number of prevalent cases in a particular year / mid-year population) x 1000.
Age-standardized incidence and prevalence rates: calculated using the direct method for age standardization, with the 1990 Manitoba population used as the standard population.

Categories: Sex, age group, Treaty Status

Source: Manitoba Diabetes Database (MDD), maintained by the Diabetes Unit and Epidemiology Unit, Manitoba Health.

Uses: Monitor trends in incidence and prevalence, to help evaluate impacts of primary and secondary prevention, and to predict needs for health services.

Limitations: Provides estimates of *diagnosed* DM rates only. It has been estimated elsewhere that up to 50% persons with DM have not been diagnosed.
It is estimated that approximately 35% of Treaty Status individuals are not identified as such in the MDD. Therefore, rates provided for the Treaty Status sub-category are corrected for this under-reporting.

National value: Crude prevalence (NPHS 1996): 35 per 1000 (> age 12)
Crude incidence (NPHS 1996): 2.6 per 1000 per year (> age 12)

Provincial value: Crude prevalence (1991): 65.0 per 1000 (> age 24)
Age-standardized prevalence (1991): 69.7 per 1000 (> age 24)
Estimated crude prevalence (1998): 75 per 1000 (> age 24)

RHA value: Available. Large variations by RHA.

Trends: Steady and rapidly increasing prevalence provincially. Incidence may have peaked in mid-1980's, now stabilized.

9. Mental Health

a. Psychological Well Being. Sense of Coherence Scale

Indicator: Psychological well-being: Sense of coherence scale.

Category: Health status and determinant (coping skills).

Definition: Sense of coherence is a positive measure of health, reflecting a view of the world that a) events are comprehensible, b) challenges are manageable, and c) life is meaningful. Minimum score is 4, maximum is 78.

Calculation: Each of 13 questions on the National Population Health Survey is scored on a scale of 0 to 6. Total scores on the scale are adjusted for one to two missing responses out of the total 13.

Source: National Population Health Survey – 13 questions. (Described in the Technical Appendix of The Report on the Health of Canadians, 1996).

Uses: This is one of the few positive indicators of health, reflecting the ability to cope successfully with stressors and maintain good health.

Limitations: It is survey-based data, requiring the administration of a survey or using data from the National Population Health Survey. It is a relatively new indicator and is not familiar to most users.

National Value: The mean for the Canadian population over the age of 18 is 58.8.

Provincial Value: Available.

RHA Value: Availability may be limited by cell sizes.

Trends: The national value reported above for the Report on the Health of Canadians is the first time this measure has been used in a national survey in Canada; no trend data is yet available.

b. Depression

Indicator: Depression

Category: Health status

Definition: Prevalence of depression, based on 27 questions in the personal interview of the National Population Health Survey.

Calculation: Depression scores are based on responses to 27 questions and a scoring algorithm that establishes the probability of suffering a major depressive episode. Individuals classified as depressed have at least a 90% probability of such an episode.

Source: National Population Health Survey – 27 questions. (Described in the Technical Appendix of The Report on the Health of Canadians, 1996)

Uses: Depression is a common disabling condition that accounts for an important proportion of psychiatric hospitalization and, arguably, the majority of suicides. It is common and treatable.

Limitations: It is survey-based data, requiring the administration of a survey or using data from the National Population Health Survey.

National Value: Overall, 6% of Canadians over the age of 12 would qualify as depressed and about 3% have a tendency toward depression.

Provincial Value: 8% (1994-95)

RHA Value: Availability may be limited by cell sizes.

Trends: Not established.

c. Suicide

Indicator: Suicide.

Category: Health status.

Definition: Incidence rate of suicides.

Calculation: Number of suicides per 100,000.

Source: Vital Statistics and Manitoba Health Death Database

Uses: Suicide is an important preventable cause of death and of potential years of life lost, particularly among youth. It is a reflection and the "tip of the iceberg" of mental anguish and depression.

Limitations: Statistics on suicide depend upon the accuracy of the cause indicated on death certificates, and are probably underestimated. Many motor vehicle crashes or other "accidents", including alcohol and drug overdoses may be, at least in part, the result of suicidal intention. It is an end-point and does not measure the underlying circumstances or proximate determinants.

National Value: 13 per 100,000

Provincial Value: 12 per 100,000 (1992)

RHA Value: Regional level data may not be available on a yearly basis due to small numbers. Small numbers can mean unstable rates and in this case an average annual rate is the most appropriate statistic.

Trends: The national suicide rate increased by about 33% from 1970 to 1978 and then decreased back to baseline by 1995.

d. Psychiatric Hospitalizations

Indicator: Psychiatric hospitalizations.

Category: Health status.

Definition: Hospital discharges due to the major psychiatric causes including affective psychoses, schizophrenic psychoses, alcohol/drug dependence/psychoses, adjustment reaction, depressive disorder (NEC), senile/presenile conditions.

Calculation: Rates = discharges in one year/100,000 population.

Source: Hospital Abstract System, Decision Support Service, Manitoba Health
Health Canada for National and International comparisons

Uses: Mental illness is a major cause of hospitalization and days of hospital care. Hospitalization rates are an indicator of the quantity of clinically severe mental illness requiring hospital care.

Limitations: Hospitalization is the result of many factors including diagnosis, access to hospital care, bed availability, and threshold for hospital admission. It may also be affected by the availability of other services such as crisis centres and home care and of social support networks. Hence, hospitalization rates must be used with caution to draw conclusions about morbidity alone.

National Value: 617/100,000 (1990-91)

Provincial Value: 553/100,000 (1990-91)

RHA Value: Available

Trends: No trend data available.

ABILITY TO FUNCTION

10. Function

Indicator: Function

Category: Health Status Indicator

Definition: Long term activity limitation is defined as any limitation or disability in normal activities, at home, school or work. Perfect health is defined as the percent with perfect health, a score of 100% based on eight attributes; vision, hearing, speech, mobility, dexterity, cognition, emotion and pain/discomfort. Function is an indicator derived from NPHS survey responses to the following questions:

- Long term activity limitation.
- Disability days (past 2 weeks).
- Perfect health (Functional status).

Calculation: Proportion of respondents in each category of the three scales.

Categories: (1) Gender
(2) Age group
(3) Subgroups such as ethnicity, educational level, annual household income.

Sources: National Population Health Survey

Uses: Function is a useful indicator to assess the numbers of residents who may have ongoing health needs.

Limitations: Representativeness of NPHS (e.g. does not include peoples living on reserve).
The numbers may be too small to report at a regional level due to the categorical breakdowns of questions.
There is no guarantee that the same NPHS questions will be asked every year so this indicator may not be calculated if the survey is relied on.

National Value: Long term activity limitation - 20%
Disability days (past 2 weeks) - 0.84
Perfect health - 25%

Provincial Value: Long term activity limitation - 21%
Disability days (past 2 weeks) - 1.00
Perfect health - 26%

Regional Value: May not be useable or available depending on cell size in each response category.

11. Well Being

Indicator: Well Being

Category: Health Status Indicator

Definition: Well being is defined as: proportion of respondents with self reported health of "excellent"; job satisfaction of " very satisfied" and a score of at least 73 on the Sense of Coherence Scale. Well being is an indicator derived from NPHS survey responses to the following questions:

- Self rated health.
- Psychological well being as determined by score on the Sense of Coherence Scale.
- Job Satisfaction.

Calculation: Proportion of respondents in each category of the three scales.

Categories: (1) Gender
(2) Age group
(3) Subgroups such as ethnicity, educational level, annual household income.

Sources: National Population Health Survey

Uses: Well being is a useful indicator for evaluating efforts in the prevention of disabling chronic diseases. It will also be useful to test relationship between well being and factors such as income, age group etc.

Limitations: Representativeness of NPHS (e.g. does not include peoples living on reserve).
The numbers may be too small to report at a regional level due to the categorical breakdowns of questions.
The sense of coherence scale is a relatively unknown measure and there is no guarantee that it will be measured in every NPHS.

National Value: Self rated health of "excellent" - 26%
High psychological well being - 9%
Job satisfaction of "very satisfied" - 50%

Provincial Value: Self rated health of "excellent" - 24%
High psychological well being - 10%
Job satisfaction of "very satisfied" - 51%

Regional Value: Availability may be limited by cell sizes.

DETERMINANT OF HEALTH INDICATORS

Determinants of health consist of factors that influence health at a very broad level and they are not always easy to define or measure (Report on the Health of Canadians, 1996). Six of the nine Determinants of Health have indicators within this document. These six areas are:

- Employment/Working Conditions
- Education
- Income/Socioeconomic Status
- Healthy Child Development
- Personal Health Practices/Coping Skills and
- Physical Environment

Social support network and biology and genetic endowment are not represented within this document. The final determinant of health, health services, will be covered within a separate initiative on System Indicators currently in the developmental stage at Manitoba Health. The indicators selected have Manitoba, National and International relevance. It should be noted that numerous indicators could have been chosen. However, the selection of these particular indicators by the working group was felt to best represent the area within the determinant of health. The health indicator working group recognizes that limitations exist for each indicator. For example, limitations accessing region specific information for indicators relying on the National Population Health Survey may occur due to small cell size numbers for particular questions.

HEALTHY CHILD DEVELOPMENT

12. Childhood Immunization Rates

a. Proportion of two-year-olds fully immunized

Indicator: Proportion of two-year-olds fully immunized

Category: Determinant of health

Definition: Proportion of two-year-olds fully immunized by their second birthday to the total population of two-year-olds. Fully immunized at age two are children who have completed the primary series for immunization:

- diphtheria/pertussis/tetanus (DPT): four doses
- polio (IPV): four doses (*OPV: 3 doses)
- haemophilus influenza b (Hib): four doses
- measles/mumps/rubella (MMR): one dose

Calculation:

$$\frac{\text{Fully immunized by second birthday}}{\text{Total population of two-year-olds}} \times 100$$

Categories: (1) vaccine components: DPT, OPV/IPV, Hib, MMR
(2) sex: male, female, total
(3) health care jurisdiction: federal/provincial

Source: Manitoba Immunization Surveillance System (MIMS)

Uses: This indicator provides service coverage rates for the pre-school immunization program. The indicator provides a proxy outcome measure for the immunization program since immunizations are highly effective. Manitoba Health has adopted targets for childhood immunization rates. Monitoring this indicator would enable the province to monitor progress in achieving these targets.

Limitations: There are key issues to consider when interpreting data from the MIMS database. These include:

- the data in MIMS are dependent on accurate physician billing of physician provided immunizations
- MIMS is based upon the Manitoba Population Registry and any errors in this registry are reflected in the MIMS data (e.g. place of residence, Treaty status)

National value: Estimates through survey data are available through Health Canada

Provincial value: Available

RHA value: Available

b. Proportion of seven-year-olds fully immunized

Indicator: Proportion of seven-year-olds fully immunized

Category: Determinant of health

Definition: Proportion of seven year olds fully immunized by their seventh birthday to the total population of seven-year-olds. Fully immunized at age seven are children who have completed the appropriate immunizations as follows:

- diphtheria/pertussis/tetanus (DPT): five + doses
- polio (IPV/OPV): four + doses
- haemophilus influenza b (Hib): four doses
- measles/mumps/rubella (MMR): two doses (1 dose if born 1984 or earlier)

Calculation:

$$\frac{\text{Fully immunized by seventh birthday}}{\text{Total population of seven-year-olds}} \times 100$$

Categories: (1) vaccine components: DPT, OPV/IPV, Hib, MMR
(2) gender: male, female, total
(3) health care jurisdiction: federal/provincial

Source: Manitoba Immunization Surveillance System (MIMS)

Limitations: There are key issues to consider when interpreting data from the MIMS database. These include:

- the data in MIMS are dependent on accurate physician billing of physician provided immunizations
- MIMS is based upon the Manitoba Population Registry and any errors in this registry are reflected in the MIMS data (e.g. place of residence, Treaty status)
- The indicator does not provide information about the immunization schedule that was used.

Uses: This indicator provides service coverage rates for the pre-school and school entry immunization program. The indicator provides a proxy outcome measure for the immunization program since immunizations are highly effective. Manitoba Health has adopted targets for childhood immunization rates. Monitoring this indicator would enable the province to monitor progress in achieving these targets.

National value: Estimates through survey data are available through Health Canada

Provincial value: Available

RHA value: Available

13. Proportion of Infants Breastfed (Initiation and Duration Rates)

Indicator: Proportion of infants breastfed and fully breastfed at selected ages (key intervals: initiation, hospital discharge, one month, three months, four months, six months, and if possible, nine months, 1 year).

Category: Determinant of health, and measure of provision of preventive services (prenatal instruction, maternity care, and postnatal care).

Definition: Proportion of infants breastfeeding at a given age: proportion of infants who are breastfeeding at a given age to the total population of infants of that age.

Proportion of infants fully breastfeeding at a given age: proportion of infants who are fully breastfeeding at a given age to the total population of infants of that age.

Calculation: Proportion breastfeeding (or fully breastfeeding) at a given age "a": number of infants of age "a" who are breastfed (or fully breastfed) x 100 total number of infants in the sample.

Categories: 1. Categories of breastfeeding: "any" breastfeeding, "fully" breastfed", partially breastfed, not breastfed, at given ages: at birth, hospital discharge, one month, three months, four months, six months, nine months, 1 year.
2. Demographics: maternal age, maternal income, maternal education, marital status, immigrant status, smoking status, and immigrant status.
3. National, provincial (or Prairies region), regional RHA.

Sources: National Population Health Survey (NPHS) and National Longitudinal Survey on Children and Youth (NLSCY), both included in the Canadian Perinatal Surveillance System database, RHA surveys, Manitoba Health Postpartum Referral Form.

Uses: Breastfeeding is associated with a decrease in otitis media, respiratory and gastrointestinal infections, with possible associations to increased cognitive development, reduction in diabetes, and fewer hospitalizations. Current recommendations by the Canadian Pediatric Association are: full breastfeeding for the first four to six months of life, with continued breastfeeding and complementary food for up to two years of age and beyond. Recommendations by the American Academy of Pediatrics and WHO/UNICEF are full breastfeeding for the first six months of life. Health Canada and the Breastfeeding Committee for Canada promote the WHO/UNICEF Baby Friendly Hospital Initiative, which outlines appropriate breastfeeding policy and practice for maternity facilities. Monitoring breastfeeding rates and full breastfeeding, rates will give regions the opportunity to monitor the effectiveness of their preventive health programs, including prenatal and postnatal community health, and maternity services.

Limitations: NPHS and NLSCY do not currently include information on "full" breastfeeding rates, only "any breastfeeding". The survey outcomes did not include four months (so the CPA recommendations cannot be monitored as accurately). They rely on maternal recall, but rates at various ages seem consistent. Neither study included First Nations communities.

The Postpartum Referral Form indicates method of feeding at hospital discharge, and is valid for classification of "any" versus "no" breastfeeding. Reporting for "fully" versus "partially" breastfed may not be valid. Some RHA community health assessments have incorporated information about breastfeeding, but others have not.

National Value: 73% breastfeeding initiation rate for Canada, with 23% to 30% breastfeeding at six months. 40% of those initiating breastfeeding have weaned prior to 3 months.

Provincial Value: The Prairies have initiation rates of 86% NPHS, 83% NLSCY, 92% Breastfeeding Promotion Steering Committee. Breastfeeding Promotion Steering Committee found an initiation rate of 82% at two weeks.

Regional Value: May be available; not reported currently.

Trends: Breastfeeding rates rose substantially up to the late 1980's, but national rates have reached a plateau in the last decade. The Canadian trend of increased initiation rates going from East to West, with Eastern Canada at about 50%, and BC at about 87%. Studies indicate only 20-30% breastfeeding at six months, with very small percentages "fully" breastfeeding for the first four to six months. Pressures such as returning to work and concerns about insufficient milk contributing to the cessation of breast-feeding.

1. According to international breastfeeding definitions (Labbok and Krasovec, 1990), "fully" breastfed refers to infants who are exclusively breastfed (breastmilk is the sole infant food intake), and "almost exclusively" breastfed (one or two swallows of another liquid not more than once a day - for example, vitamin drops). Once any food is introduced to a greater extent than that, the infant is classified as "partially breastfed", using "high" (more than 80% of intake is breastmilk), medium and low" categories.

14. Teenage Pregnancy Rate

Indicator: Teenage Pregnancy Rate

Category: Determinant of Health

Definition: ratio of the number of pregnancies in teenagers aged 15-19 in a given period, to the total female population ages 15-19 at mid-period.

Calculation: $\frac{\text{Number of live births, stillbirths and abortions in teenagers 15-19}}{\text{Total females aged 15-19 at mid year}} \times 1000$

Source: Numerator from live birth, stillbirth, and abortion databases Manitoba Health,
Decision Support Services
Denominator from Manitoba Health, Decision Support Services population file

Uses: The teenage pregnancy rate indicates the number of teenagers and their children who may experience difficult living conditions. It also provides indirect information on accidental or unplanned pregnancies and the use of contraceptive methods among teenagers. The consequences of pregnancy vary depending on whether the choice is made to continue or interrupt the pregnancy. Continuing the pregnancy exposes both mother and child to a certain number of risks, whether physical complications (i.e. prematurity, low birth weight, psychosomatic problems), psychological stress (i.e. delay in speaking, understimulation, behavioural problems, stress) or social stress (i.e. poor education, isolation, poverty). If the pregnancy is interrupted, the consequences may be emotional reactions and possible medical complications.
The number of teenage pregnancies and the issue of these pregnancies may be influenced by various factors. These factors include but are not limited to marital status, age, employment situation, socioeconomic status, religious and cultural beliefs, sexual behaviour and practices, knowledge of contraceptive methods and their use, availability and accessibility of family planning and related health care services.

Limitations: Miscarriages (spontaneous abortions) requiring no medical intervention and abortions performed outside of Manitoba hospitals cannot be included in this calculation. In other provinces, elective abortions performed in clinic settings are excluded from the figures. The number and rate of elective abortions may indicate the availability and accessibility of abortions. Pregnancies in teenagers under 15 are excluded from this calculation.

National Value: 44.1 per 1000 (1989 health reports)
Provincial Value: 64.6 per 1000 1996/97
RHA Value: available

15. Children in "Out-of-Home" Care

Indicator: Proportion of children in out of home care

Category: Determinant of health

Definition: Proportion of children under 18 in out of home care (formal out of home placement of children in alternative settings including foster care, correctional facilities, group home care, residential facility, crisis stabilization unit) for a given period to the total number of children under 18 at mid period.

Calculation: $\frac{\text{Number of children under 18 in out of home care for a given period}}{\text{Total population under 18 at mid period}} \times 100$

Categories: (1) type of care: foster care, correctional facility, group home care, residential facility, crisis stabilization unit
(2) total duration: one month or less, one month to less than one year, one year or more
(3) frequency: once, twice, three times, >3 times

Source: Child and Youth Secretariat
Family Services Department
Aboriginal child care agencies (e.g. Awasis)

Uses: The proportion of children under 18 under the care of a child agency is an indicator of the capacity of families to care for their own children.

Limitations: Issues of interpretation of indicator exist
"Front end" efforts may have to be made to set up a system to obtain data for this indicator
Issues regarding quality and accessibility of the data
Indicator may reflect agencies' service provision capacities versus need for services.

National value: Available but limited

Provincial value: Available

RHA value: Not available in a central data source. Availability may require access to multiple data sources.

PERSONAL HEALTH PRACTICES/ COPING SKILLS

16. Smoking Rates

a. Proportion of Regular Smokers

Indicator: Proportion of regular smokers

Category: Determinant of health

Definition: Proportion of the population 15 or over smoking cigarettes regularly to the total population 15 or over in private households. (Regular smokers are people who report smoking at least one cigarette a day every day.)

Calculation: $\frac{\text{Regular smokers 15 or over} \times 100}{\text{Total population 15 or over in private households}}$

Categories: (1) gender: male, female, total;
(2) age: 15-24, 25-44, 45-64, 65 or over, total(15 +);
(3) # cigarettes/day: 1-14, 15-24, 25 or over, total

Source: National Population Health Survey

Uses: The proportion of regular smokers is an indicator of both the frequency and the minimum daily volume of cigarette consumption, which is one of the determinants of overall *avoidable* morbidity and mortality.

Limitations: Although this indicator represents a higher risk minority of the total number of current smokers, it does not separate out the *highest* risk heavy smokers (25 or more cigarettes per day), who comprise approximately 16% of regular smokers. The prevalence of regular smokers may be underrepresented due to social desirability. The province's ability to systematically collect the data for this indicator is currently limited by several factors. Limiting factors include the following: representativeness of Manitobans in the National Population Health Survey (e.g. no First Nations), outstanding questions regarding provincial commitment to re-survey and frequency of same, inconsistencies in RHA Community Health Assessment surveys (e.g. questions asked, distribution).

National value: 26% (1991)
Provincial value: Available
RHA value: Availability may be limited by cell sizes.

Trends: After 24 years of decline, smoking rates in the overall population began to level off in the 1990's. Smoking rates among young people have increased, however. The 15-19 year old age group was the only group with an increasing prevalence of smoking between 1991-1994. This is also the only age group in which women smokers outnumber men.

b. Proportion of pregnant women who are regular smokers

Indicator: Proportion of pregnant women who are regular smokers

Category: Determinant of health

Definition: Proportion of pregnant women who smoke cigarettes regularly to the total number of pregnant women, over defined period of time. (Regular smokers are people who report smoking at least one cigarette a day every day.)

Calculation: $\frac{\text{Pregnant women who are regular smokers (in a time period)}}{\text{Total number of pregnant women (in a time period)}} \times 100$

Categories: (1) age: 15-19, 20-24, 25-29, 30-34, 35-44, total (15 +);
(2) # cigarettes/day: 1-14, 15-24, 25 or over, total

Source: Manitoba Health Study of Smoking and Pregnancy (for 1995 data)
National Population Health Survey (for "Smoked During Last Pregnancy")
Perinatal Surveillance System (not yet developed; future development likely)

Uses: Smoking in pregnancy is associated with *avoidable* adverse health outcomes in the fetus and newborn.

Limitations: The prevalence of regular smokers in pregnancy may be underrepresented due to social desirability.
Issues of the quality of data collected by primary care providers exist.
The province's ability to systematically collect and analyze data for this indicator is currently limited. A one time study was conducted by Manitoba Health, however, which indicates the feasibility of using this approach.
It is not known if the indicator exists at the national level for comparative purposes.

National value: Available

Provincial value: Available

RHA value: Availability may be limited by cell sizes.

17. Obesity Rates

Indicator: Proportion of obese persons

Category: Determinant of health

Definition: Proportion of the population 15 or over with a body mass index equal to or greater than 30.0 to the total population 15 or over in private households. (The body mass index, BMI, is derived from Quetelet's Index, which is based on the ratio between a person's weight and the square of his or her height. This index is used to calculate overweight and underweight: plumpness at 27 or over and obesity at 30 or over.)

Calculation: $\frac{\text{Obese population 15 or over} \times 100}{\text{Total population 15 or over in private households}}$

Categories: (1) sex: male, female, both
(2) age: 15-24, 25-44, 45-64, 65 or over, total (15 +)

Source: National Population Health Survey

Uses: The proportion of obese persons is an indicator of the prevalence of problems of excess weight corresponding to the highest level of BMI and thus presenting potential health risks. High BMI is associated with increased prevalence of high blood pressure, diabetes, high cholesterol levels and certain cancers.

Limitations: The prevalence of obesity may be underrepresented due to social desirability (i.e. survey respondents tend to underestimate their weight and overestimate their height).
The province's ability to systematically collect the data for this indicator is currently limited by several factors. Limiting factors include issues such as the representativeness of Manitobans in the National Population Health Survey (e.g. no First Nations), outstanding questions regarding provincial commitment to re-survey and frequency of same.
The interpretation of this indicator for different groups of people is problematic (e.g. cultural/ethnic origin, age, sex, muscle versus fat weight).

National value: 23% (1991, BMI>27)

Provincial value: Available

RHA value: Availability may be limited by cell sizes.

18. Physical Activity Level

Indicator: Proportion of the population with inactive leisure time

Category: Determinant of health

Definition: Proportion of population aged 12 or older whose average energy expenditure (EE, as calculated below) on leisure time physical activities is less than 1.5 kcal/kg/day.

Calculation: This is a derived variable calculated in the NPHS as follows:

Total annual leisure time EE estimated for each individual by multiplying by 4 the number of times they engaged in each category of leisure time activity over the last 3 months, by the average duration spent at each activity in hours, and by the energy requirement of the each activity (expressed in kcal expended per kg of body weight per hour of activity). To calculate average daily EE, the total annual estimate is divided by 365.

The level of leisure time physical activity is defined in the NPHS based on the average daily EE: "active" is 3 or more kcal/kg/day (KKD), "moderate" is 1.5 to 2.9 KKD, and "inactive" is less than 1.5 KKD.

$$\text{Proportion "inactive"} = \frac{\text{Population 12 or older "inactive"} \times 100}{\text{Total population 12 or older}}$$

Categories: Gender, age group

Source: National Population Health Survey

Uses: Inactive leisure time, or sedentary lifestyle, has been associated with increased rates mortality, as well increased risk of several chronic diseases including ischemic heart disease, hypertension, obesity, colorectal cancer, breast cancer, osteoarthritis and depression. Monitoring the prevalence of this indicator will detect population trends and the impact of interventions. Will allow comparisons to other regions and provinces participating in NPHS.

Limitations: Based on self-reported activity. NPHS does not currently include First Nations.

National value: Approximately 60% of Canadian population > age 12 are considered "inactive" (1996/97 NPHS).

Provincial value: Available.

Regional value: Availability may be limited by cell sizes.

19. Proportion of Heavy Drinkers

Indicator: Proportion of Heavy Drinkers (or Proportion of Population Consuming 14 or more Alcoholic Drinks per Week)

Category: Determinant of Health

Definition: Proportion of the population 15 years of age or over consuming 14 or more alcoholic drinks per week to the total population 15 or over at mid year

Calculation: $\frac{\text{Population 15 or over consuming 14 or more alcoholic drinks per week}}{\text{Total population 15 or over (mid year)}} \times 100$

Source: National Population Health Survey

Uses: This indicator measures the prevalence of a high level of alcohol consumption potentially linked to personal, family and health problems.

Limitations: 14 or more drinks per week involve several levels of consumption. Therefore all drinkers in this category do not present consumption equally harmful to their health and social life. The negative impacts on health may be affected by differences in gender and weight. Some of these drinkers are more at risk than other drinkers. In the case of beer, for example, a minority of drinkers consumes over three-quarters of the total volume sold. Critical levels associated with "heavy" consumption vary from one study to another.

The term "heavy drinkers" applies to the population 15 or over as a whole, which may mask the fact that certain specific sub-groups may be at risk with weekly consumption well under 14 drinks; this is the case for young people, pregnant women, workers in the workplace and drivers of motor vehicles.

There are other indicators of over consumption. For example, getting drunk occasionally by taking five or more drinks at one sitting (binge drinking) is an alternate indicator of heavy drinking that is positively correlated with this indicator. This behaviour is more common among young men (15-24) of whom two-thirds report getting drunk at least once a year.

Heavy drinkers are more difficult to reach in surveys, the proportion might be underestimated and the overall drinking profile skewed.
Considering the method of collecting information and the possible social disapproval perceived by respondents, reports on alcohol consumption are probably self-censured and under-reported due to the desire to present an image more in line with what is culturally expected.

The "at risk" nature of high alcohol consumption is more or less well established depending on the type of problem involved. In the case of cirrhosis of the liver, specific levels will give a fairly certain prediction of occurrence. However, for general health problems such as excess mortality, excess hospital morbidity, disability, injury, diseases of the circulatory system, cancers and a wide range of psychosocial and economic problems, we would tend to speak instead of a high probability of occurrence.

National Value: 6% (1991)

Provincial Value: available

RHA Value: Availability may be limited by cell sizes.

PHYSICAL ENVIRONMENT

20. Water and Sewage Systems

a. Proportion of housing units served by sewage system

Indicator: Proportion of housing units served by sewage system

Category: Determinant of health

Definition: Proportion of housing units, for a given period of time, served by sewage system to the total # of housing units at mid period.

Calculation: $\frac{\text{Housing units served by sewage system for a given period}}{\text{Total \# housing units at mid period}} \times 100$

Categories: (1) Total: total # served by sewage treatment system.
(2) System type: piped, septic field, individual septic field, septic truck, other

Source: Environment Canada's Municipal Use Data (MUD) database
Department of Northern Affairs
Indian and Northern Affairs Canada
Manitoba Environment (EHOs)

Uses: This indicator provides a measurement of the status of a sewage system. It assists in determining the sanitary conditions of communities and thus potential health hazards.
Because many communities do not have adequate sewage systems, it is not proposed at this time that the *sewage treatment level* be used as an indicator (i.e. proportion of housing units served by different levels of sewage treatment: primary, secondary, tertiary). Sewage treatment levels assist in determining the situation regarding reduction in the negative effects of sewage on the aquatic environment and in the protection of recreational waters and thus of human health. Sewage that has not received secondary treatment may contain pathogenic bacteria, which may result in the closing of beaches used for swimming.

Limitations: "Front end" efforts will have to be made to set up a system to obtain the data for this indicator. Important that treatment type definitions used are consistent.

National value: Not reported.

Provincial value: Not reported.

RHA value: Not reported.

b. Proportion of housing units served by potable water system

Indicator: Proportion of housing units served by potable water system

Category: Determinant of health

Definition: Proportion of housing units, for a given period of time, served by potable water system to the total # of housing units at mid period.

Calculation: $\frac{\text{Housing units served by potable water system for a given period}}{\text{Total \# housing units at mid period}} \times 100$

Categories: (1) total: total # served by potable water system
(2) delivery system: piped, community well, individual well, truck, other

Source: Manitoba Association of Municipalities
Department of Northern Affairs
Indian and Northern Affairs Canada
Manitoba Environment (EHOs)

Uses: This indicator provides a measurement of the status of a water delivery system. It assists in determining the situation regarding accessibility of potable water that is a major determinant of adverse health effects such as communicable disease outbreaks.

Limitations: "Front end" efforts will have to be made to set up a system to obtain the data for this indicator.

National value: Not reported.

Provincial value: Not reported.

RHA value: Not reported.

EMPLOYMENT/WORKING CONDITIONS

21. Unemployment Rate

Indicator: Proportion of population aged 15+ actively looking for work.

Category: Determinant of Health.

Definition: The unemployment rate refers to the unemployed labour force expressed as a percentage of the total labour force in the week prior to the census day. Being "unemployed" is defined as persons aged 15+, excluding institutionalized residents, who during the week prior to the census day were without work and were available for work.

Calculation: $\frac{\text{Population 15+ actively looking for work}}{\text{Number of Canadians 15+ participating in labour force.}}$

Source: Statistics Canada census (every five years)
Statistics Canada Labour Force Survey (monthly)

Uses: Unemployment rates indicate who is working and may have access to employee health benefits. Unemployed people have been shown to suffer from a disproportionate share of health problems including depression, other forms of morbidity and reduced life expectancy.

Limitations: Unemployment rates can be misleading as they reflect only those people who are actively looking for jobs. In times of severe recession, people may give up looking for work and thus are not reflected in the unemployment rate. When the economy improves, unemployment rates may appear to increase as people return to the labour force and send the rate up. Economic impacts on health may be underrepresented since those too discouraged to look for work are not included.

National Value: 10.6% (January, 1995)

Provincial Value: 8.5% (January, 1995)

RHA Value: Available.

Trends: Unemployment is highest among 15-24 year olds. Unemployment rates are higher for men in every age group than for women. Unemployment rates decrease with each higher level of education.

EDUCATION

22. Education Level

Indicator: Proportion of the population with less than nine years of schooling

Category: Determinant of health

Definition: Proportion of persons 15 or older who left school before ninth grade to the total non-institutional population 15 or older.

Calculation: $\frac{\text{Population 15 or over with less than nine years of schooling}}{\text{Total non-institutional population 15 or over}} \times 100$

Categories: (1) age: 15-24, 25-44, 45-64, 65 or over, total (15 +)
(2) gender: male, female, total

Source: Statistics Canada Census
National Population Health Survey

Uses: This indicator measures the proportion of the population who are extremely disadvantaged in terms of education.
Education (and income and occupation) is one of the main variables used as a socioeconomic indicator in studies analyzing the links between social status and health.
People with little schooling or who have no certificate or degree are more likely to get low paying jobs and to have periods of unemployment or living on welfare. The probability of being functionally illiterate is also higher in this group.

Limitations: Knowledge and skills acquired outside of the traditional education system (media, libraries, internet, recreational activities, etc.) are not taken into account by this measurement.
Changes to legislation and the education system mean that the age structure of the population studied may influence the value of this indicator.

National value: 13.9 % (1991)

Provincial value: Available

RHA value: Available

INCOME/SOCIOECONOMIC STATUS

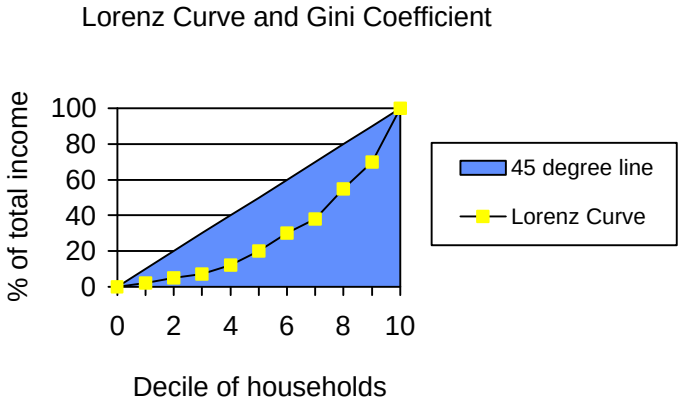
23. Income Inequality

Indicator: Gini coefficient of income inequality

Category: Determinant of health

Definition: The Gini coefficient is one of the most commonly used measures of income inequality. The Gini coefficient is derived from the Lorenz curve, which is a graphical device for displaying the cumulative share of total income accruing to successive income intervals. The curve shows the shares of income earned by successive deciles of households, arrayed in order from the bottom 10% upwards. If incomes were equally distributed, the Lorenz curve would follow the 45° diagonal. As the degree of inequality increases, so does the curvature of the Lorenze curve, and thus the area between the curve and the 45° line becomes larger.

Calculation: The Gini is calculated as the ratio of the area between the Lorenze curve and the 45 degree line, to the whole area below the 45 degree line (shaded area).



Source: Statistics Canada (Census)

Uses: The Gini coefficient is one of the most commonly used indicators of income inequality and thus is an indicator that can be used for comparative purposes.

Ecological studies have demonstrated that once a country has achieved some threshold level of income (approx. $5000 US per capita in 1990), mortality and life expectancy are strongly related to income inequality (not absolute level of income as in poor countries of the world).

Limitations: The calculation of the Gini may not include social welfare income.
Adjustments may not be made for household size.
The availability of the data for the Gini coefficient calculation from Statistics Canada needs to be determined.
The Gini measures income and not wealth (as with all measures of income inequality); wealth is much more inequally distributed than income.

National value: Available.

Provincial value: Available.

RHA value: Not reported.

APPENDIX A

CRITERIA FOR INDICATOR SELECTION

In total, indicators should:

- be a small number of measures,
- provide a broad, overall measure of community health (be comprehensive),
- include both global measures of community health (i.e. Overall mortality and quality of life) and specific measures of community health (i.e., specific problems with public health importance),
- reflect efforts to reduce health risks and improve health status and health systems,
- contain indicators that are measurable at the regional level and consistent at the RHA, Provincial and National level (and where available at the International level),
- be relevant to Manitoba (recognizing high risk populations and inequities), and
- be useful to decision-makers and program planners.

Individual indicators should:

- be readily and uniformly understandable and acceptable,
- be measurable using available or obtainable data,
- be outcome oriented, and
- be of public concern.