Definition/Description:

Diabetes is a serious health problem. It is a common chronic disease that can be managed, but not cured once well established. Diabetes can be diagnosed by a simple blood test that detects more than normal amount of glucose (sugar) in the blood. Either a lack of insulin or an ineffective use of insulin will cause blood glucose to rise. Insulin is a hormone produced in the pancreas which is required to change the sugar from food into energy.

Diabetes is a public health concern because it has a high disease burden in the population and prevention efforts may help to decrease the burden of illness. Since United States statistics demonstrate that for every known person with diabetes there is someone with undiagnosed diabetes, these statistics most likely underestimate the prevalence of the disease. Assuming that the same situation is true in Canada, up to 10% of Canadian adults may currently have diabetes[1].

Complications of Diabetes

While the cause of the different types of diabetes varies, the complications of diabetes are the same. It is the complications of diabetes or 'end organ damage' that accounts for the substantial morbidity and mortality of diabetes.

Examples of complications include chronic high blood sugar levels that affect the eyes, kidneys, nerves and blood vessels. Diabetes is also a major cause of heart disease. In adults, it is also a leading cause of blindness, kidney failure and loss of limbs due to amputations. In 1995, evidence indicated that the cost of diabetes and its complications (in adults, 15 years and older) to the health care system was over $193 million per year or 18% of the 1995/96 provincial health care budget[2].

Classification of Diabetes

Accurate classification of type of diabetes at the time of diagnosis is helpful to ensure appropriate medical treatment. The two types of diabetes are listed here, unfortunately the data sources do not accurately differentiate the types of diabetes.

Facts About Type 1 Diabetes

- Previously called 'juvenile-onset' or insulin-dependent diabetes mellitus (IDDM).
- Type 1 diabetes is diagnosed mainly in children and young adults. It accounts for about 10% of all diabetes.
- Type 1 diabetes is an auto-immune disease characterized by a relative or absolute lack of insulin.
- Treatment always requires insulin replacement therapy.
- No environmental factors have been conclusively determined in the aetiology of type 1 diabetes.

Facts About Type 2 Diabetes

- Previously called 'adult-onset' or non-insulin dependent diabetes mellitus (NIDDM).
- Type 2 diabetes can occur when there is resistance to insulin or a defect in insulin production or a combination of the two.
- Approximately 85-90 % of all people with diabetes are older adults who have type 2 diabetes.
- Treatment can vary from lifestyle management to the inclusion of five classes of anti-diabetes medication to the use of insulin.
- Risk for type 2 diabetes increases with family history, age, body weight and sedentary lifestyle.

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[1] Meltzer S, Leiter L, Daneman D, et al., 1998 Clinical practice guidelines for the management of diabetes in Canadaa. CMAJ1998;159(Suppl8):S1-29
[2] Diabetes: A Manitoba Strategy. Manitoba Health, 1998.

Other Types of Diabetes
Gestational diabetes is diagnosed during pregnancy and resolves after the pregnancy. Both mother and baby are at risk of developing diabetes in the future.

Secondary diabetes occurs as a result of other diseases or treatments for other diseases.

Six forms of MODY, or Maturity Onset Diabetes in Youth, have been identified. Diagnosis of these rare forms of genetically determined diabetes is currently in the research stage. The different forms of MODY can take the characteristics of type 1 or type 2 diabetes.

Diabetes in Aboriginal People
While Aboriginal people are vastly over-represented in the numbers of case reports of diabetes, this document does not provide information on prevalence of diabetes based on ethnicity. The epidemic of type 2 diabetes is still on the rise among Aboriginal people, with a trend toward earlier age at onset, and genetic-environmental interactions are the likely cause[3]. The prevalence of diabetes is almost five-fold higher in First Nation women and three-fold higher in First Nation men than in the general population in Manitoba[2]. Type 2 diabetes in First Nations Cree children has been recognized since 1983 in Manitoba. The incidence and prevalence have increased twenty-fold over the past 20 years[4].

Method
In order to quantify the occurrence of diabetes in the Winnipeg Health Region population we will consider two measures of disease occurrence. The first is the incidence of diabetes, which measures the number of people who develop diabetes during a specified time period. The second is prevalence, which measures the number of people who have diabetes at a specified time period.

Incidence is defined as the number of new cases in a fixed period of time divided by the number of people at risk. The time period in our case was chosen to be one year, in which case, we speak of the annual incidence. Incidence will be reported as cases per 1000 per year. Prevalence is defined as the number of people with diabetes divided by the population at risk. Prevalence reported is point prevalence, where the point in time chosen was June 1 for the given year.

For incidence the numerator is a count of "new" rather than "existing" cases. Incidence, therefore, can be viewed as becoming, whereas prevalence can be viewed as having something. Often when one is planning such things as screening programs for early detection, disease incidence is of immediate interest. However, if one is concerned with the provision of services for people with the disease, then the prevalence of the disease will be of interest.

The case definition for a clinically diagnosed case of diabetes is having at least two separate physician claims for diabetes within two years of each other or at least one hospital separation record with a diagnosis of diabetes (ICD-9-CM 250). Date of diagnosis was assigned, defined by the first physician claim, or by the first hospitalization record with a diagnosis of diabetes, whichever came first. The data do not distinguish between Type I and Type II diabetes, nor do they include persons with gestational diabetes.

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[3] Young TK, Reading J, Elias B, O'Neil J. Type 2 diabetes mellitus in Canada's First Nations: Status of an epidemic in progress. CMAJ 2000; 163(5):561-6
[4] Dean H. Guest, Editorial, Diabetes Quarterly, Summer 2002.

Source:

Diabetes incidence and prevalence data used in this report were obtained from the Diabetes and Chronic Diseases Unit, Manitoba Health. Source of hospitalization data is the Hospital Abstract Database, Decision Support Services, Manitoba Health. All numerical values, tables and figures were generated by the Population Health and Health System Analysis Unit, Winnipeg Regional Health Authority.
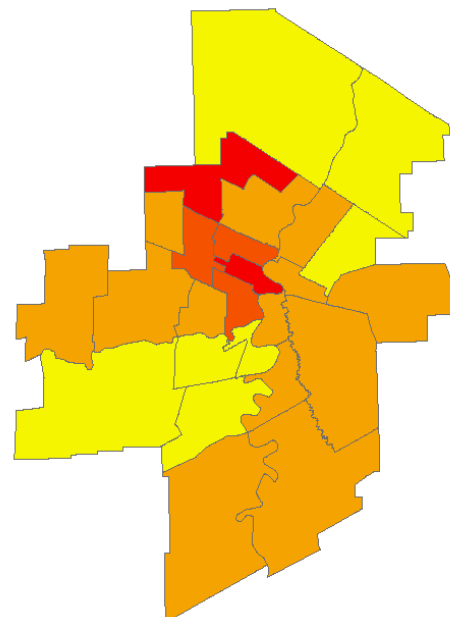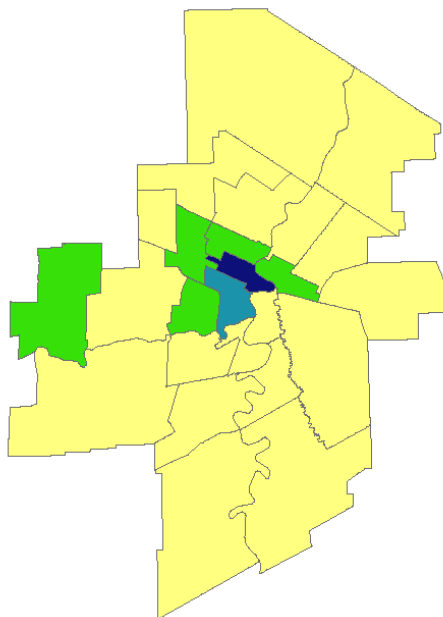
Findings:

Prevalence of Diabetes in the Winnipeg Health Region by Age Group and Year; Both Genders
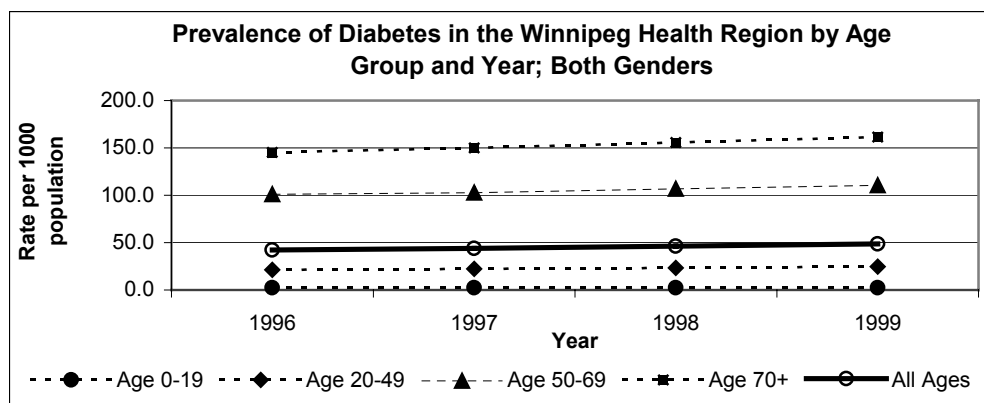
Prevalence of Diabetes in the Winnipeg Health Region by Age Group, Year, and Sex, 1996-1999

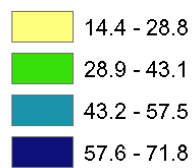| Sex	Age	Diabetes Cases				Prevalence of Diabetes per 1000				Average Rate of Change in the Prevalence of Diabetes between 1996 and 1999 (cases per 1000 population at risk per year)
		1996	1997	1998	1999	1996	1997	1998	1999	
Both Sexes	0-19	411	419	418	422	2.4	2.5	2.5	2.5	0.0
	20-49	6524	6696	6986	7305	21.4	22.2	23.4	24.6	1.1
	50-69	11218	11687	12430	13214	101.1	102.8	106.6	110.6	3.2
	70	9233	9644	10166	10639	145.3	149.9	155.6	161.6	5.4
	All Ages	27386	28446	30000	31580	42.1	43.9	46.3	48.6	2.2
Females	0-19	215	227	216	209	2.6	2.7	2.6	2.6	0.0
	20-49	3483	3584	3799	3989	22.7	23.7	25.4	26.8	1.4
	50-69	5293	5533	5845	6200	91.7	93.9	96.9	100.4	2.9
	70	5293	5507	5816	6076	132.7	136.7	142.3	147.7	5.0
	All Ages	14284	14851	15676	16474	42.7	44.6	47.2	49.5	2.2
Males	0-19	196	192	202	213	2.2	2.2	2.4	2.5	0.1
	20-49	3041	3112	3187	3316	20.1	20.7	21.4	22.4	0.8
	50-69	5925	6154	6585	7014	111.2	112.3	117.1	121.4	3.4
	70	3940	4137	4350	4563	166.5	172.1	177.8	184.7	6.0
	All Ages	13102	13595	14324	15106	41.5	43.1	45.4	47.8	2.1

Prevalence of Diabetes in the Winnipeg Health Region, 1999
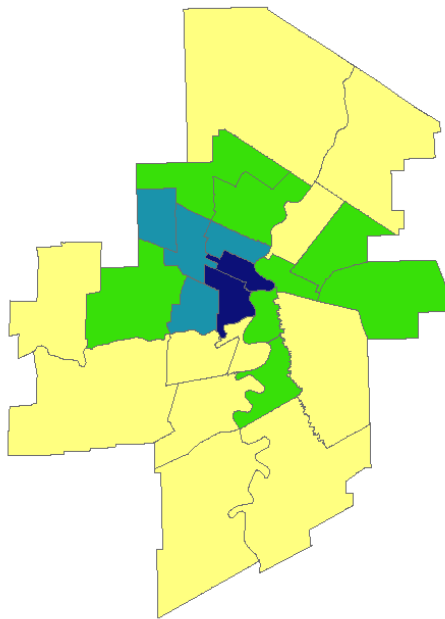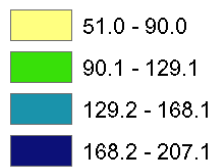## Ages 20-49

Females

Males

Prevalence per 1000

- 14.4 - 28.8
- 28.9 - 43.1
- 43.2 - 57.5
- 57.6 - 71.8

Prevalence per 1000

- 12.4 - 18.9
- 19.0 - 25.4
- 25.5 - 31.8
- 31.9 - 38.3
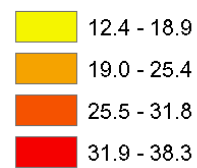
Prevalence of Diabetes in the Winnipeg Health Region, 1999
Ages 50-69

Females

Males

Prevalence per 1000

- 51.0 - 90.0
- 90.1 - 129.1
- 129.2 - 168.1
- 168.2 - 207.1

Prevalence per 1000

- 96.0 - 112.8
- 112.9 - 129.7
- 129.8 - 146.5
- 146.6 - 163.3
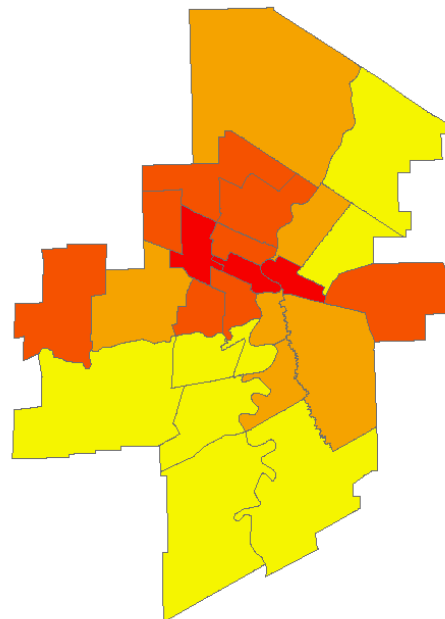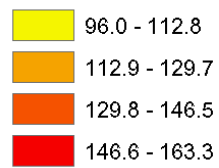
Prevalence of Diabetes in the Winnipeg Health Region, 1999
Ages 70+

Females

Males

Prevalence per 1000

☐	80.6 - 110.0
☐	110.1 - 139.3
☐	139.4 - 168.7
☐	168.8 - 198.0

Prevalence per 1000

☐	150.9 - 163.9
☐	164.0 - 176.8
☐	176.9 - 189.8
☐	189.9 - 202.7
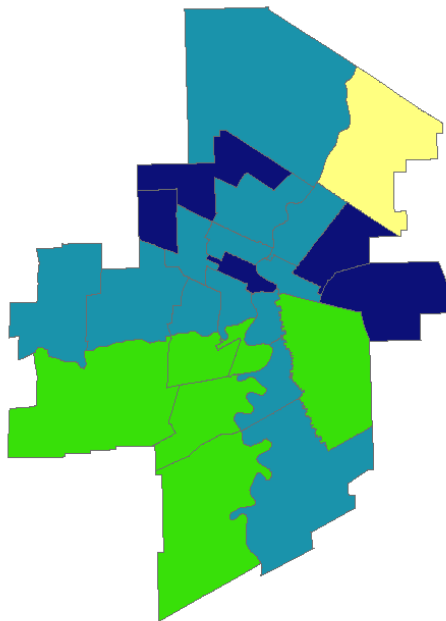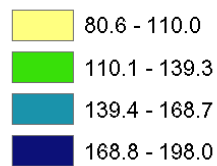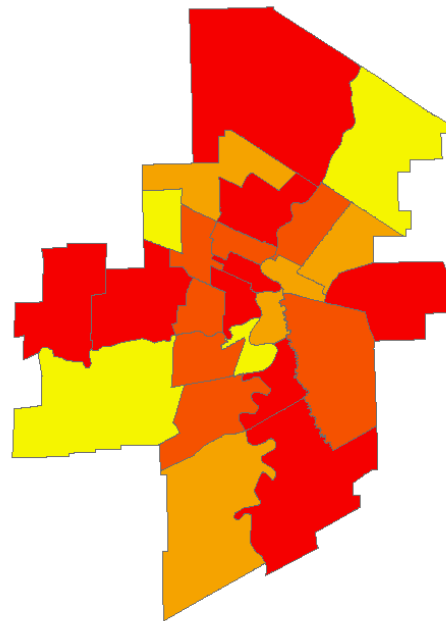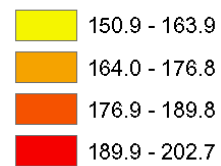
Highlights:

- Based on 1999 data, there are 31580 people in the Winnipeg Health Region known to have diabetes which represents approximately 5 % of the general population. Over the four-year period from 1996 to 1999, the prevalence of diabetes has been increasing at an average rate of 2.2 cases per 1000 population per year for both genders and all ages.
- In CIHI's Health Indicator Report 2004, based on self-reported diabetes in the population 12 years and over, it was estimated that 3.4% (CI 2.5% -4.4%) of the population 12 and over in the WHR reported having diabetes, while the Canadian comparison was 4.1% (CI4.0% - 4.3%).
- The prevalence of diabetes by gender and selected age groups in the 25 neighbourhood clusters within the WHR for the year 1999 demonstrate the variation within NCs for both males and females.