

Prevalence of Asthma, COPD, Diabetes, and Hypertension in Saskatchewan, 2010/11



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Summary:

This snapshot report highlights the age and sex profile and regional variations for four chronic diseases (asthma, COPD, diabetes and high blood pressure) in Saskatchewan.

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Purpose

The purpose of this report is to present prevalence information for four chronic diseases in Saskatchewan in the 2010/11 fiscal year: asthma, chronic obstructive pulmonary disease (COPD), diabetes, and hypertension.

Each disease is characterized by sex and age-specific prevalence at the provincial level, and also provides age-standardized prevalence estimates for comparison of disease burden in each regional health authority.

Prevalence Trends and Co-morbidity

Prevalence provides an estimate of the importance and burden of disease at a given time and is influenced by both incidence and duration of a disease. Estimated prevalence trends are generally increasing because there are more new cases identified than there are cases lost to death or follow-up. For the ten years between 2001/02 and 2010/11, the net prevalence trends for the four conditions in Saskatchewan were as follows:

- Asthma had a net increase of 3969 cases per year to more than 113,000 cases in

2010/11.

- COPD had a net increase of 1901 cases per year to more than 54,000 cases in 2010/11.

- Diabetes had a net increase of 2920 cases per year to more than 75,000 cases in 2010/11.

- Hypertension had a net increase of 7007 cases per year to about 213,000 cases in 2010/11.

Table 1: Co-prevalence among select chronic conditions.

	Asthma	COPD	Diabetes	Hypertension	Crude Population Prevalence
Number with Condition	113169	54251	75159	212729	
Proportion with Asthma	100%	27.5%	11.1%	9.9%	10.3%
Proportion with COPD	33.1%	100%	18.0%	16.3%	9.4%
Proportion with Diabetes	7.4%	23.7%	100%	24.9%	6.8%
Proportion with Hypertension	30.1%	62.5%	71.3%	100%	26.2%

Individuals may have more than one chronic disease, and co-morbidity among chronic diseases has important implications for primary care and disease management. Table 1 shows co-prevalence of the four selected chronic diseases, which can be compared to the overall proportion of each condition in the population.

- COPD has elevated co-prevalence among all other three chronic diseases, compared to the overall COPD prevalence in the population.
- There is elevated co-prevalence between the two respiratory conditions: Asthma and COPD.

- Diabetes co-prevalence is elevated among COPD and Hypertension cases.
- Hypertension co-prevalence is elevated among COPD and particularly among diabetes cases.

Elevated co-prevalence of chronic conditions may be the result of shared risk factors such as smoking and obesity, or of physiological characteristics that make diseases risk factors for each other.

Asthma

Asthma is a chronic inflammatory disease of the airways that is characterized by wheezing, coughing, chest tightness, and shortness of breath. It is thought to be caused by a combination of genetic and environmental factors such as exposure to allergens, tobacco smoke, and viral respiratory infections.

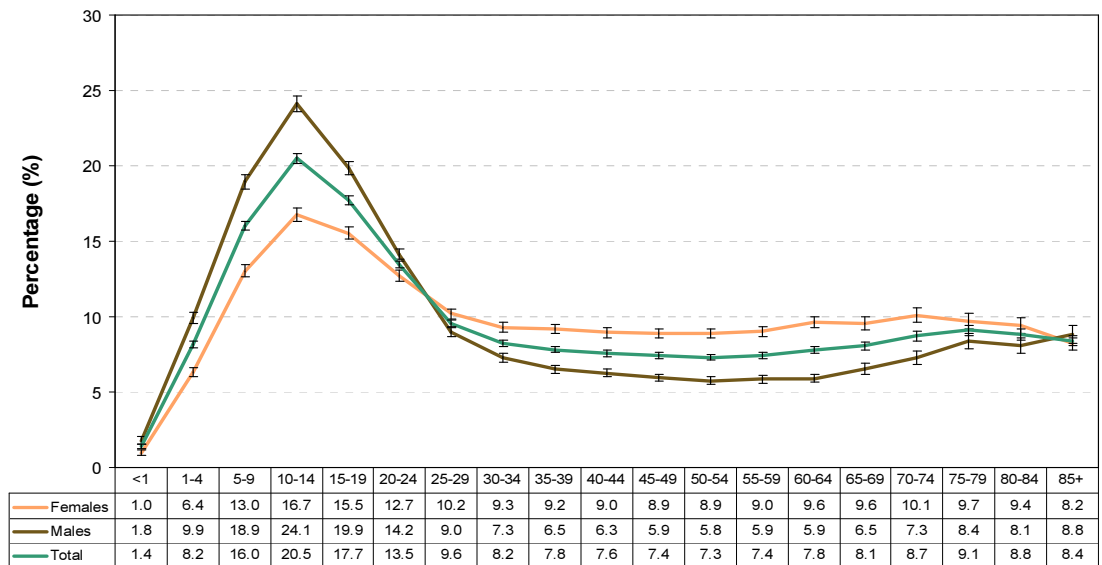
Management of asthma includes identification and avoidance of triggers that cause asthma attacks, as well as use of quick-relief medications to treat acute symptoms and long-term control medications to prevent further exacerbation.

For surveillance purposes, the asthma case definition requires that an individual must have EITHER:

- One or more inpatient hospital separations with a diagnosis of ICD-9 code 493 or ICD-10-CA codes J45, J46 in any field of the hospital separation records; OR
- Two or more physician claims with a diagnosis of ICD-9 493 within two years.

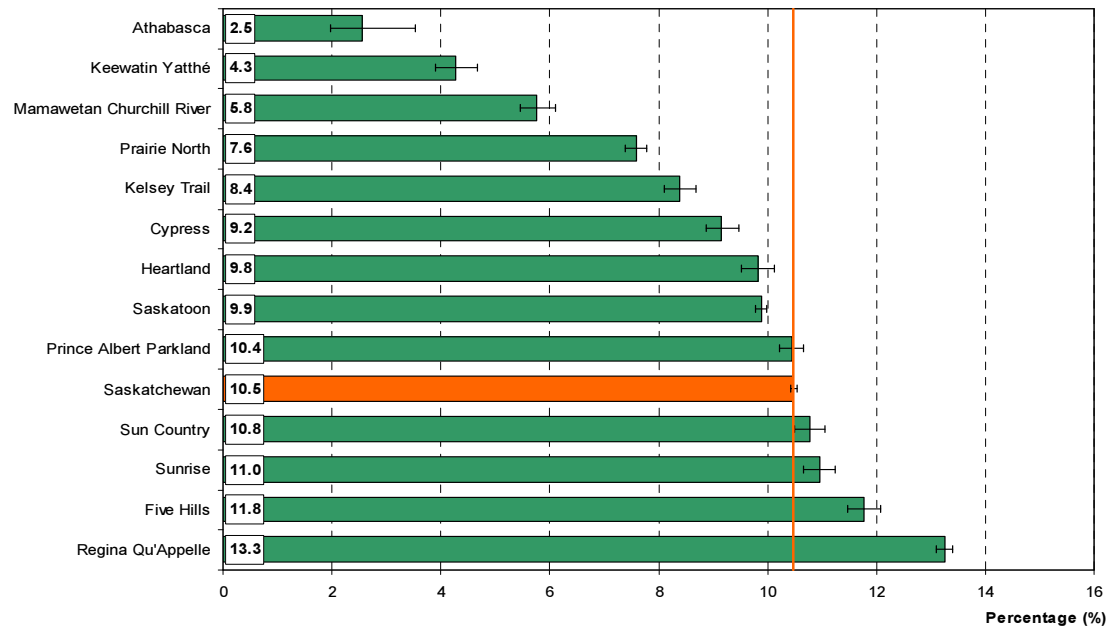
The asthma case definition applies to all ages.

Figure 1: Asthma (all ages) - Age-specific Prevalence, Saskatchewan, 2010/11



- Asthma is most prevalent in childhood with about half of the cases (48%) being younger than 25 years of age, and a significantly higher prevalence among males.
- Age-specific asthma prevalence among Saskatchewan residents older than 25 years of age is relatively stable around 9.3% for females and 8.2% for males.
- The highest asthma prevalence is in the 10 to 14 years age group, with about 20% of children having met the case definition.

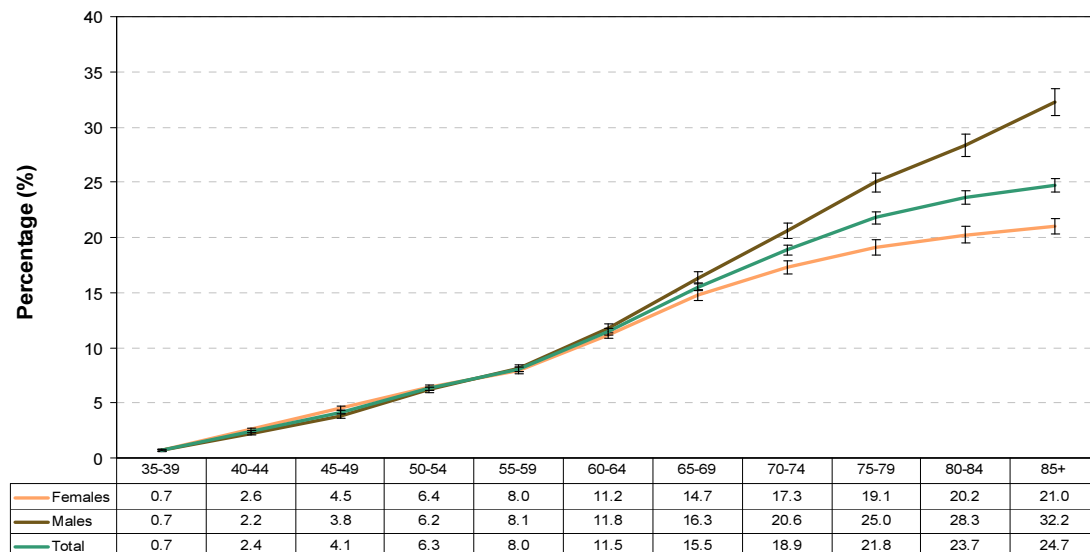
Figure 2: Asthma (all ages) - Age-standardized Prevalence by SK Health Region, 2010/11



- Asthma prevalence is significantly lower than Saskatchewan in the Athabasca, Keewatin Yatthé, Mamawetan Churchill River, Prairie North, Kelsey Trail, Cypress, Heartland, and Saskatoon health regions.
- Asthma prevalence is significantly higher than Saskatchewan in the Sunrise, Five Hills, and Regina Qu'Appelle health regions.

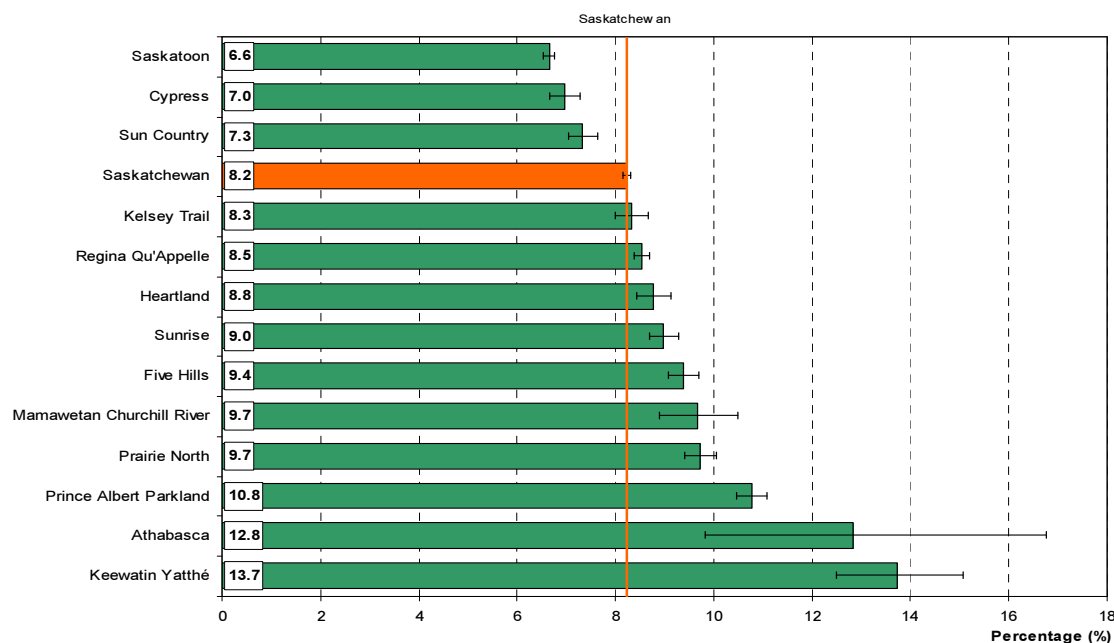
Chronic Obstructive Pulmonary Disease (COPD)

Figure 3: COPD (ages 35 years and older) - Age-specific Prevalence, Saskatchewan, 2010/11



- Age-specific COPD prevalence increases gradually until about age 59 with a slightly higher female prevalence in the 45-49 years age group.
- By age 85 years, about one-quarter of Saskatchewan residents have met the COPD case definition.
- COPD prevalence increases with a steeper gradient among older males, where male prevalence is significantly higher than female among Saskatchewan residents aged 65 years and older.

Figure 4: COPD (ages 35 years and older) - Age-standardized Prevalence by SK Health Region, 2010/11



- COPD prevalence is significantly lower than Saskatchewan in the Saskatoon, Cypress, and Sun Country health regions.
- COPD prevalence is significantly higher than Saskatchewan in the Regina Qu'Appelle, Heartland, Sunrise, Five Hills, Mamawetan Churchill River, Prairie North, Prince Albert Parkland, Athabasca, and Keewatin Yatthé health regions.

Chronic bronchitis and emphysema, together with similar respiratory illnesses, are collectively known as chronic obstructive pulmonary disease (COPD). COPD is characterized by progressive and chronic airflow limitation that is not fully reversible and is most commonly diagnosed in individuals 35 years of age and older. COPD is largely preventable as the majority of cases are caused by smoking.

Important management strategies are smoking cessation, vaccinations for respiratory organisms, rehabilitation, and drug therapy (often using inhalers).

For surveillance purposes, the COPD case definition requires that an individual must have EITHER:

- One or more inpatient hospital separations with a diagnostic code ICD-9 491, 492, 496 or ICD-10-CA J41-J44 in any field of the hospital separation records; OR
- One or more physician claims with a diagnostic code ICD-9 491, 492, 496

The COPD case definition applies to individuals 35 years of age and older.

Diabetes

Diabetes is characterized by the body's inability to sufficiently produce and/or use insulin – a hormone produced by the pancreas that assists with the conversion of glucose (sugar) into energy.

Diabetes increases the risk of heart disease and stroke, blindness, kidney disease, peripheral nerve problems, and amputation. These risks may be reduced by controlling blood sugar with a healthy diet, exercise, weight loss and medications.

For surveillance purposes, the diabetes case definition requires that an individual must have EITHER:

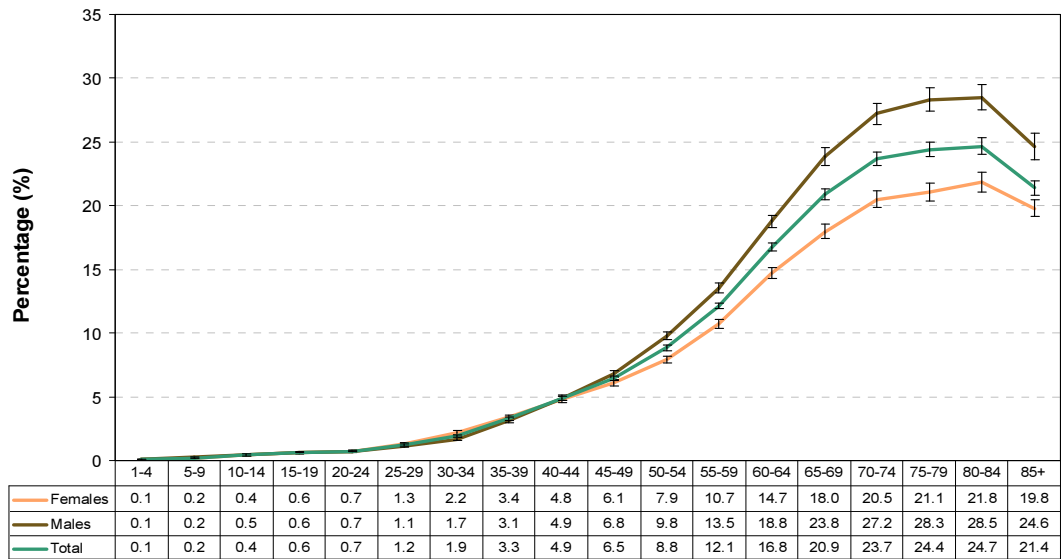
- One or more inpatient hospital separations with an ICD-9 code 250 or an equivalent ICD-10-CA code E10 to E14, selected in any field of the hospital separation records; OR
- Two or more physician claims with a diagnostic code ICD-9 250 within two years.

These diagnostic codes include both type 1 and type 2 diabetes.

The case definition does not include temporary gestational diabetes. Therefore, the case criteria exclude females aged 10 to 54 diagnosed with diabetes 120 days preceding or 180 days after any pregnancy-related hospital visit (as identified by a set of obstetric diagnostic codes).

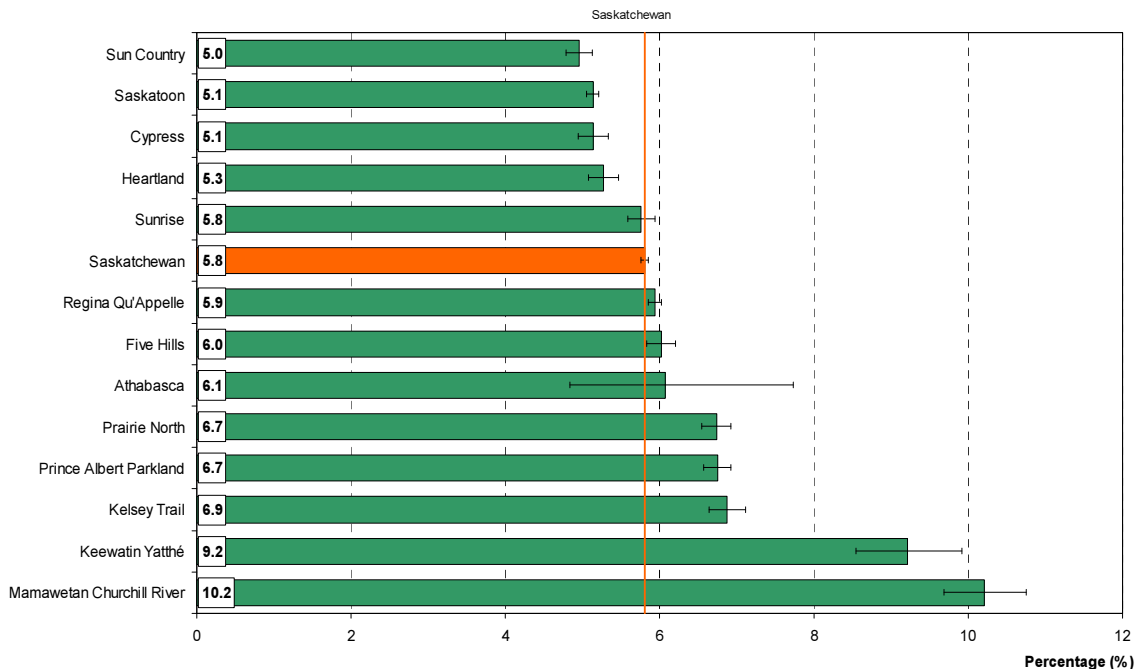
The diabetes case definition applies to individuals one year of age and older.

Figure 5: Diabetes (age 1 year and older) - Age-specific Prevalence, Saskatchewan, 2010/11



- Age-specific diabetes prevalence increases gradually until about age 44 years with a slightly higher female prevalence in the 30-34 years age group.
- At ages 45 years and older, diabetes prevalence in men is starting to be significantly higher than in women.
- Diabetes prevalence in 2010/11 was highest for Saskatchewan residents aged 75 to 84 years, at almost 20% for women and 25% for men.
- Past age 84 years, a decrease in prevalence occurs possibly due to reduced life expectancy of people with diabetes.

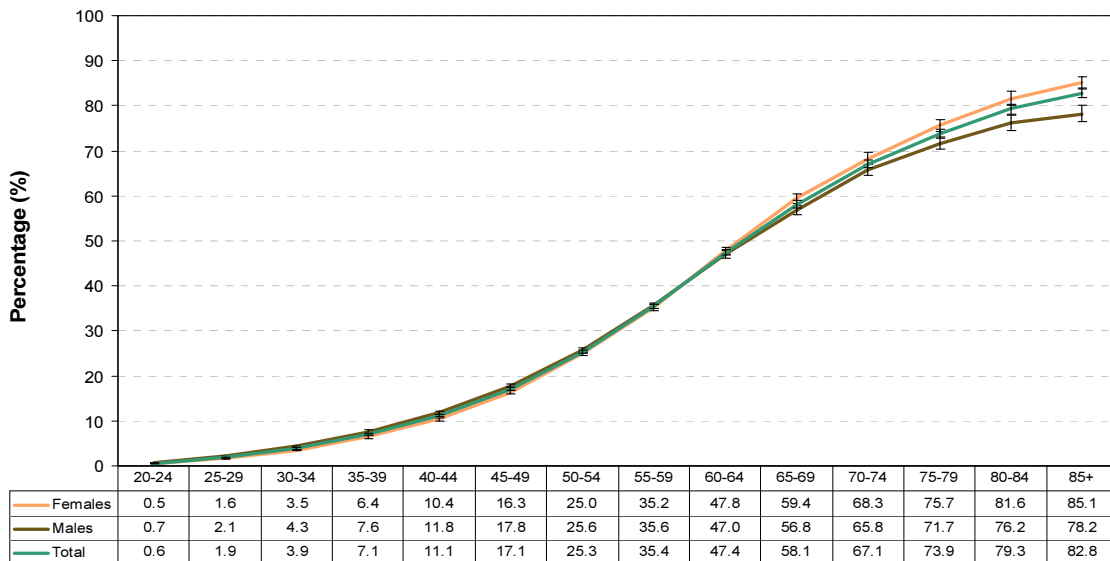
Figure 6: Diabetes (age 1 year and older) - Age-standardized Prevalence by SK Health Region, 2010/11



- Diabetes prevalence is significantly lower than Saskatchewan in the Sun Country, Saskatoon, Cypress, and Heartland health regions.
- Diabetes prevalence is significantly higher than Saskatchewan in the Prairie North, Prince Albert Parkland, Kelsey Trail, Keewatin Yatthé, and Mamawetan Churchill River health regions.

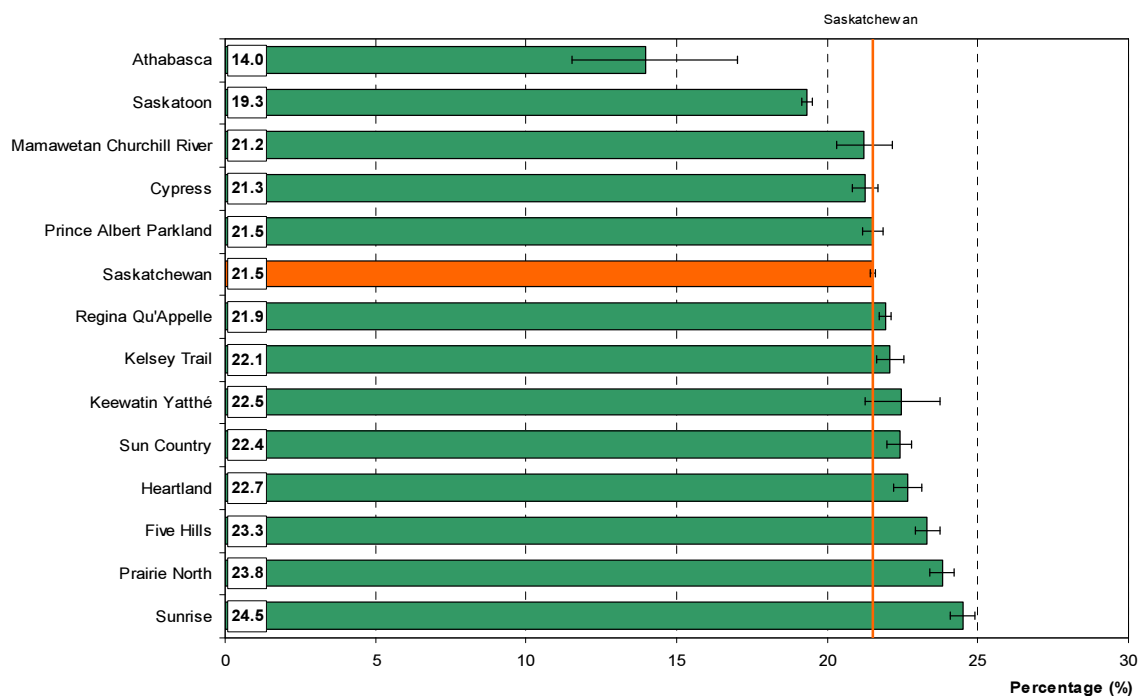
Hypertension

Figure 7: Hypertension (ages 20 years and older) - Age-specific Prevalence, Saskatchewan, 2010/11



- Hypertension prevalence increases with age and more than half of the population older than 65 years of age met the hypertension case definition.
- More than 80% of Saskatchewan residents aged 85 years and older has met the hypertension case definition.
- Male age-specific hypertension prevalence is significantly higher than female prevalence between the ages of 20 and 49, whereas female prevalence is higher than male among Saskatchewan residents aged 75 years and older.

Figure 8: Hypertension (ages 20 years and older) - Age-standardized Prevalence by SK Health Region, 2010/11



- Hypertension prevalence is significantly lower than Saskatchewan in the Athabasca and Saskatoon health regions.
- Hypertension prevalence is significantly higher than Saskatchewan in the Regina Qu'Appelle, Kelsey Trail, Sun Country, Heartland, Five Hills, Prairie North, and Sunrise health regions.

Hypertension occurs when systemic arterial blood pressure is consistently high for long periods of time.

If left untreated, hypertension can increase the risk of stroke, coronary heart disease, dementia, heart and kidney failure.

People with hypertension may reduce their risk of complications by controlling blood pressure with a healthy diet, exercise, weight loss, smoking cessation, reducing alcohol intake, and anti-hypertensive medications.

For surveillance purposes, the hypertension case definition requires that an individual must have EITHER:

- One or more inpatient hospital separations with a diagnosis of ICD-9 codes 401,402, 403, 404, 405 or ICD-10-CA codes I10, I11, I12, I13, I15, selected in any field of the hospital separation records; OR
- Two or more physician claims with a diagnostic code ICD-9 401-405 within two years.

These diagnostic codes include both essential and secondary hypertension.

The case definition does not include temporary pregnancy-induced hypertension. Therefore, the case criteria exclude females aged 10 to 54 diagnosed with hypertension 120 days preceding or 180 days after any pregnancy-related hospital visit (as identified by a set of obstetric diagnostic codes).

The hypertension case definition applies to individuals 20 year of age and older.

Summary / Conclusion

- Three of the four chronic diseases (COPD, diabetes, and hypertension) are characterized by increased prevalence at older ages with a substantial proportion of Saskatchewan residents affected and considerable co-prevalence among the three. Consequently, there will be an increasing burden and complexity of chronic disease in an aging society.
- Differences between males and females are not consistent for the four diseases: male prevalence is higher for COPD, diabetes, and childhood/adolescent asthma, while female prevalence is higher for adult asthma and hypertension among the elderly.
- There are few consistent regional differences among the four diseases: Saskatoon Health Region had significantly lower prevalence of all four conditions compared to the Province, and Cypress had lower prevalence of three conditions. On the other hand, Regina Qu'Appelle, Sunrise, Prairie North, and Five Hills Health Regions had significantly higher prevalence of three conditions than Saskatchewan. However, differences in prevalence are generally difficult to interpret because prevalence may be influenced by physician billing practices, disease risk factors and health determinants, screening mechanisms in place, and approaches to care/disease management that affect survival and duration of the disease.

Technical Notes

Method:

Chronic disease estimates are based on the case definitions and infrastructure of the Canadian Chronic Disease Surveillance System (CCDSS), with support of the Public Health Agency of Canada. This method is based on linkage of administrative data sources including:

- Person Health Registry System: includes all residents eligible for Saskatchewan Health benefits and provides the annual population base, demographic, and coverage information.
- Hospital services: includes data on inpatient separations and day surgeries for patients treated in hospitals. Out-of-province hospital separations for Saskatchewan health beneficiaries are also captured.
- Medical services: includes physician and nurse practitioner service claims.

Ascertainment of chronic disease cases in the CCDSS starts with the 1995/96 fiscal year.

Calculations:

- Age standardization allows comparisons to be made among regions that have populations with different age distributions or comparisons over time by accounting for an aging population. To adjust for differences in population age distributions across regions and the resulting effect on rates, the rates are age-adjusted using the 1991 Canadian population as a reference. Adjustment is done via the direct method, using five-year age groups to age 85 years and older.

- To facilitate comparisons, 95% confidence intervals (CIs) of all age-standardized and age-specific rates were calculated when the rate is greater than zero. The CI includes the true value for the estimated rate 19 times out of 20. A prevalence difference was considered statistically significant if there was no overlap of confidence intervals.

Limitations:

- Administrative data do not capture undiagnosed chronic diseases.
- Persons with physician diagnosed chronic conditions may be excluded if they receive their care in a setting where services are not billed on a fee-for-service basis. Services delivered by physicians in salaried or contractual arrangements may or may not be captured if service information is not submitted consistently through "shadow billing".
- Case ascertainment is sensitive to changing diagnostic criteria and to changes in billing practices. These changes may cause significant short-term fluctuations in incidence estimates.
- Any system which tracks lifelong diseases over many years on an individual basis will tend to accumulate false positives. This is because a case, once identified, is carried forward from year to year. Even if false positives are extremely rare, they will still inevitably comprise an increasing proportion of reported cases over time.