

August 2016

# Northern Saskatchewan Health Indicators

## A Guide to the Reports: Understanding the Presentation of Data



## Introduction

The purpose of the series of Northern Saskatchewan Health Indicators reports is to provide an overview of the population of northern Saskatchewan, including important community characteristics, the determinants of health (the things that influence our health), and some indicators about the health status and well-being of the people of northern Saskatchewan.

This guide should be referred to in conjunction with the individual reports as it presents information on how the data is presented and explains the reasons for the apparent differences in the way it is presented.

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Suggested reference: Irvine J, Quinn B. Northern Saskatchewan Health Indicators, Community Characteristics: Geographic and Political Profile. Athabasca Health Authority, Keewatin Yatthé Health Region and Mamawetan Churchill River Health Region. Population Health Unit, La Ronge, 2016.

Copies of this document and related reports can be downloaded from the Population Health Unit website [www.pophealthnorthsask.ca](http://www.pophealthnorthsask.ca)

## Comparisons

Throughout these reports, we often make comparisons with other northern Canadian regions that have somewhat comparable geography, population and socioeconomic conditions. Statistics Canada has created ten health region peer groups, using twenty-four social and economic determinants of health including:

- basic demographics (i.e., population change, Aboriginal status, and demographic structure);
- living conditions (i.e., socioeconomic characteristics, housing, and income inequality);
- working conditions (i.e., labour market conditions).

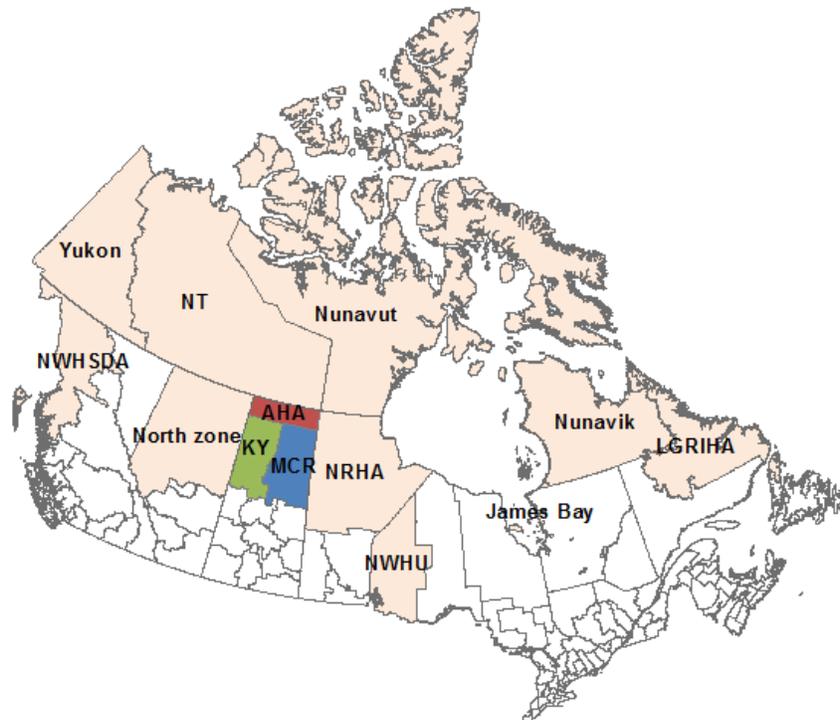
The Statistics Canada peer group, including northern Saskatchewan, consists of:

- James Bay Cree Region, QC
- Nunavik Region, QC
- Northern Regional Health Authority, MB (NRHA)
- Mamawetan Churchill River/Keewatin Yatthé/Athabasca, SK (MCR/KY/AHA)
- Nunavut

We have also used Canada, Saskatchewan, as well as several other northern regions for comparison that belong to other peer groups but share some similar geography and characteristics, including:

- Yukon
- Northwest Territories (NT)
- North Zone, AB
- Northwestern Health Unit, ON (NWHU)
- Northwest Health Service Delivery Area, BC (NWHSDA)
- Labrador-Grenfell Regional Integrated Health Authority, NL (LGRIFA)

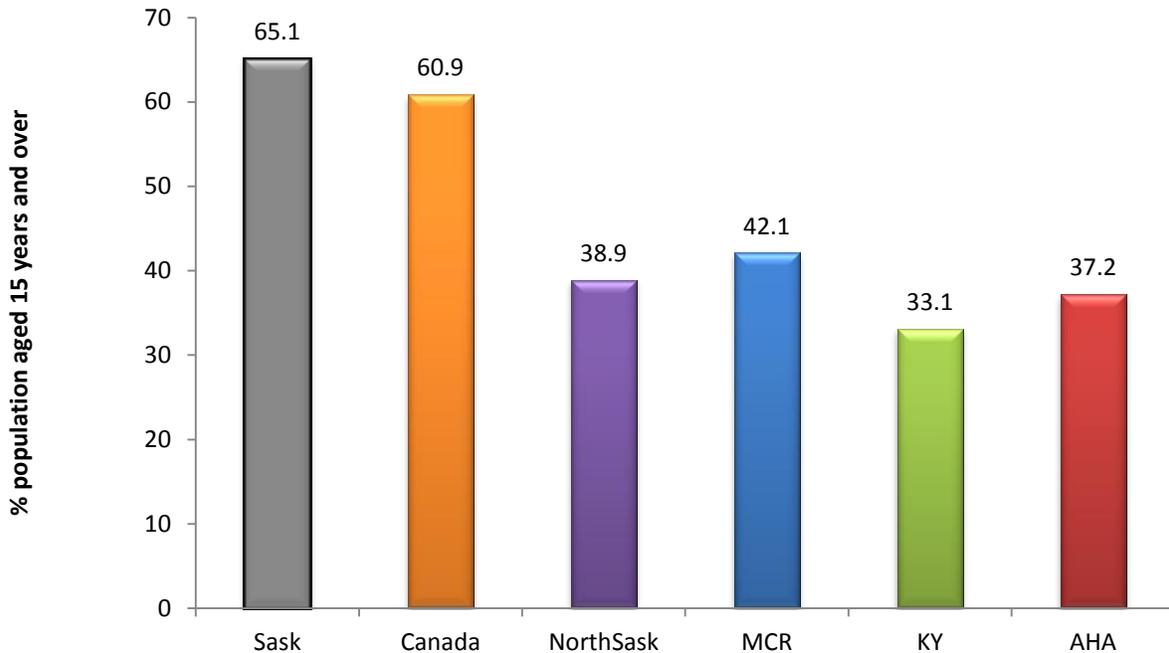
**Figure 1: Map of Canada identifying northern regions**



Where charts are employed, the following colour scheme is used:

Saskatchewan - grey; Canada - orange; Northern Saskatchewan - purple; Mamawetan Churchill River - blue; Keewatin Yatthé - green; Athabasca - red.

**Figure 2: Example of chart illustrating colour scheme**



Source: Statistics Canada 2011 NHS Health profile Catalogue no. 82-228-XWE, Prepared by PHU, May 2014

## Numbers, Rates and Ratios

Information is presented in a variety of ways, including raw numbers, crude or unadjusted rates, age-adjusted or age-standardized rates, as well as standardized incident or standardized mortality ratios.

When we present raw numbers, we are able to show exactly what is happening in a particular region during a certain time period. For example, there were 75 cases of male lung cancer in northern Saskatchewan between 1998 and 2007.

It is difficult to compare two populations of very different population sizes, however, when using raw numbers, as one group will have a huge number compared to the other. This discrepancy may imply that a particular condition is not an important issue in the smaller community. For example, between 1998 and 2007, there were 3,572 cases of male lung cancer in Saskatchewan compared to only 75 in northern Saskatchewan. To avoid this problem, we will often express the number of cases per 100,000 population. For example, between 1998 and 2007, there were 42 cases of male lung cancer per 100,000 population in northern Saskatchewan compared to 70 cases per 100,000 in Saskatchewan as a whole. This is known as an “unadjusted” or “crude” rate and is a good indicator of actual frequency of the condition of interest within the two regions.

When comparing different populations such as northern Saskatchewan and the total Saskatchewan population, we are comparing two populations with very different age structures. The Saskatchewan population, with its greater proportion of elders, would be expected to have a higher crude rate of male lung cancer, as lung cancer is more common in older age groups. In order to make a fair comparison between two or more populations that have different age structures, an epidemiologic tool is used to adjust the rates. These new rates are referred to as “age-adjusted” or “age-standardized” rates, which really indicate the “risk” of developing lung cancer, as it illustrates the rates that would occur if the compared groups had the same age-group characteristics. For example, when we take age into account using age-standardized rates, we find that there were 98 cases of lung cancer per 100,000 northern males compared to Saskatchewan’s 54 cases per 100,000 males.

Sometimes there are too few cases of a particular disease to accurately calculate an age-standardized rate. In this case, we can account for differing age structures by calculating a standardized incidence ratio (SIR) (or standardized mortality ratio for deaths) instead. This essentially provides the same information as the age-standardization described above, but uses different methods and is interpreted slightly differently. Using age-standardization described above, we end up with two rates and can see if one is higher than the other. With the SIR, we end up with a ratio and need to compare it against 1. For example, the SIR compares the actual number of male lung cancer cases in northern Saskatchewan to the number of cases that would be expected if northern Saskatchewan had the same age-specific rates as Saskatchewan. A ratio of 1 would indicate that the number of cases of male lung cancer that occurred in the north was the same as what would be expected, while a ratio of less than 1 would indicate that there were fewer cases than expected, and a ratio of greater than 1 would indicate that there were more cases than expected. Using the same example, the northern SIR for male lung cancer was 1.42 indicating there are more cases of male lung cancer in northern Saskatchewan than would be expected compared to Saskatchewan males. In the reports, it will always be clearly marked as to how the data is presented.

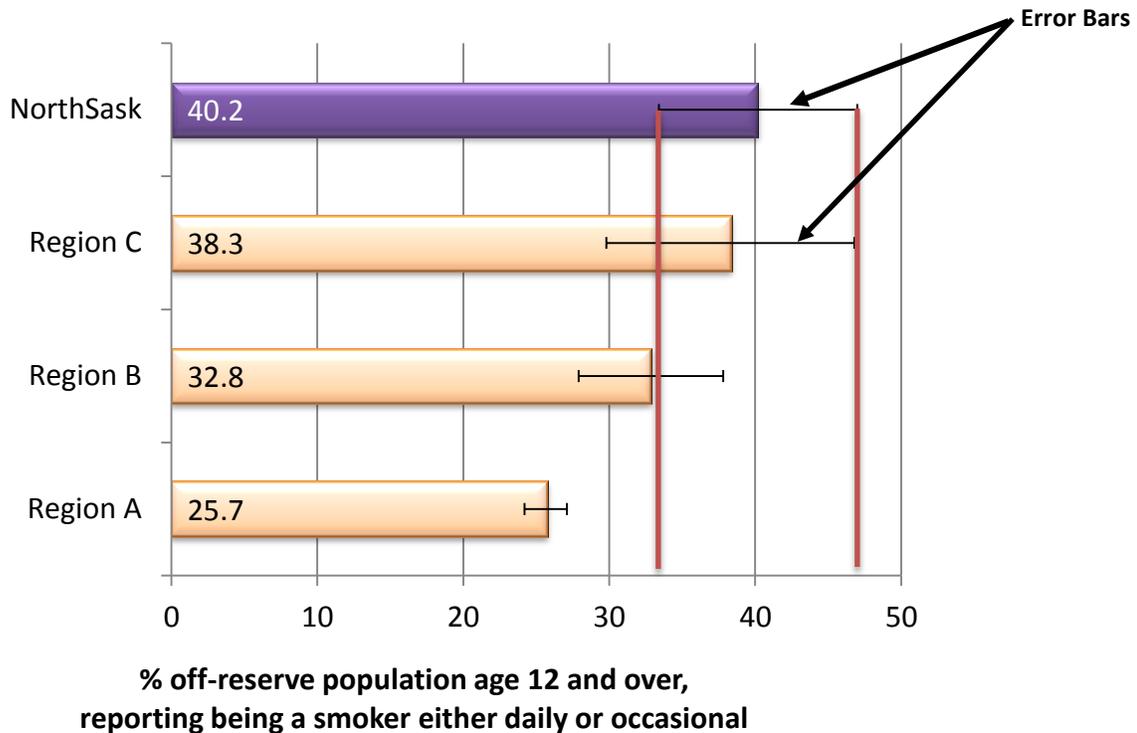
## Confidence Intervals

Regardless of the type of rate we are using, there is a degree of uncertainty with all estimates. One way that we show this level of uncertainty is by displaying 95% confidence intervals (CI). The 95% confidence interval displays the range of values within which the true value would fall 95% of the time (e.g. 19 times out of 20). Generally, rates for smaller populations or for rare diseases tend to have greater uncertainty and thus wider confidence intervals than larger populations or common diseases. If we look at the figure on the next page, we can see that the rate of daily or occasional smoking in northern Saskatchewan off-reserve population aged 12 and over in 2007-2008 was 40.2%. However, we accept that there is uncertainty with this estimate and the “true” rate is either slightly above or below this estimate. As indicated by the error bars on the chart, the confidence interval for this estimate indicates that 95% of the time the “true” rate would fall somewhere between 33.4 and 47%.

As confidence intervals and statistical tests have similar foundations, confidence intervals can be valuable tools when comparing statistical differences between two groups. In general, a statistical difference refers to a “true” difference or one that is unlikely to occur by chance alone.

There are three possible interpretations when comparing statistical differences between two groups using 95% confidence intervals, which are described using the figure below.

**Figure 3: Example of confidence intervals in charts**



Interpretation 1: 95% Confidence Intervals (CIs) do not overlap – For example, the daily or occasional smoking rate in northern Saskatchewan was 40.2 (95% CI: 33.4 – 47) while Region A’s rate was 25.7 (95% CI: 24.2 – 27.1). The CIs of the two rates do not overlap, suggesting a statistically significant difference between the two rates.

Interpretation 2: 95% CI of one rate contains the point estimate of the other rate – For example, the daily or occasional smoking rates of northern Saskatchewan and Region C were 40.2 (95% CI: 33.4 – 47) and 38.3 (95% CI: 29.8 – 46.8), respectively. The CI of the rate for northern Saskatchewan includes the point estimate (38.3) for Region C, suggesting no statistically significant difference between the two rates.

Interpretation 3: 95% CIs overlap but the 95% CI of one rate does not include the point estimate of the other – For example, the daily or occasional smoking rates of northern Saskatchewan and Region B were 40.2 (95% CI: 33.4 – 47) and 32.8 (95% CI: 27.9 – 37.8), respectively. The confidence intervals of the two rates overlap but the 95% CI of the northern Saskatchewan rate does not contain the point estimate of the Region B rate, indicating a formal statistical test is needed to test for statistical significant differences.

## Significance and Importance

The phrase “significant difference” is only used when referring to a statistically significant difference. If the difference is not statistically significant, other language such as “substantial” is used. However, it should be noted that just because a difference is not statistically significant, does not mean it is not clinically important.

For example, northern rates often have a large degree of uncertainty due to having a small population, and thus statistical significance cannot always be found. However, if we see a large discrepancy between the northern rate and provincial rate consistently over time, we are confident that the difference seen is “true” and should be examined. On the other hand, a statistical difference does not necessarily mean a clinically important difference. For example, if numbers are large enough, one could find a statistically significant difference between two smoking rates of 25% and 25.1%; however this may not be a clinically relevant difference.

## Residents

Throughout the reports, information for Northern Saskatchewan is presented in several ways. In most cases, information includes all residents in northern Saskatchewan, while in some cases, it refers only to those individuals living off-reserve (including non-Aboriginal, Métis and First Nations individuals). We have indicated in the title of the figure or the text when the information is limited to those living off-reserve.

## Time Periods

Data for time periods is presented in several ways in the reports.

Data for non-calendar years is presented with a forward slash (e.g. 2004/5 indicating one full year beginning in 2004 and ending in 2005). Non-calendar years used in these reports include school years, immunization seasons, and fiscal years).

Single calendar years are written out using a four digit format (e.g. 2004).

Multiple year time periods are written out with a hyphen (e.g. 2004-2005, indicating the two-year time period from 2004 to 2005); and time periods including two multiple year periods are written out fully (e.g. 2004-2005 to 2006-2007, indicating the two-year time period of 2004 to 2005 to the two year time period of 2006 to 2007).

## Appendix A - Glossary of Acronyms

<b>AB</b>	Alberta
<b>AHA</b>	Athabasca Health Authority
<b>BC</b>	British Columbia
<b>CI</b>	Confidence Interval
<b>KY</b>	Keewatin Yatthé (Health Region)
<b>LGRIHA</b>	Labrador-Grenfell Regional Integrated Health Authority (NL)
<b>MB</b>	Manitoba
<b>MCR</b>	Mamawetan Churchill River (Health Region)
<b>NL</b>	Newfoundland & Labrador
<b>NRHA</b>	Northern Regional Health Authority (MB)
<b>NT</b>	Northwest Territories
<b>NWHSDA</b>	Northwest Health Service Delivery Area (BC)
<b>NWHU</b>	Northwestern Health Unit (ON)
<b>ON</b>	Ontario
<b>PHU</b>	Population Health Unit
<b>QC</b>	Quebec
<b>SIR</b>	Standardized Incidence Ratio
<b>SK</b>	Saskatchewan