

# Northern Saskatchewan Health Indicators

## Health Status: Cancer and Traffic Collisions

# 2019

Population Health Unit

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## KEY MESSAGES

### *Cancer*

- Invasive cancer is defined as “The uncontrolled growth of cells resulting in the formation of a malignant tumour that invades underlying tissue” [1]. The most common types of invasive cancer diagnosed in northern Saskatchewan females between 2010 and 2014 were breast (62), lung (40), colorectal (37), Non-Hodgkin's lymphoma (10) and kidney (8). In males, during the same time period, the most common types were prostate (58) lung (42), colorectal (41), kidney (17) and Non-Hodgkin's lymphoma (9).
- Cancer incidence refers to the number of new cases of cancer that are diagnosed in a population in a specific period of time. Compared to the province, northern Saskatchewan had significantly higher female lung and colorectal age-standardized cancer incidence rates and a significantly lower uterine rate between 2010 and 2014. Age standardized rates for breast and Non-Hodgkin's lymphoma were similar between the two areas.
- Compared to the province, northern Saskatchewan had higher male lung and kidney age standardized cancer incidence rates, between 2010 and 2014, although neither was significantly greater. Similarly, age standardized rates for prostate, colorectal, leukemia and Non-Hodgkin's lymphoma were lower in northern males, although none were significantly lower.
- Between 1990-2016 there were 23 cases of invasive cancer in those aged 0 to 14 years of age in northern Saskatchewan, resulting in a crude rate of 7.3 cases per 100,000 population. This was approximately half of the rate in the province as a whole, whose rate was 14.2 cases per 100,000. After adjustments were made for age, rates in northern Saskatchewan and Saskatchewan were 7.1 and 14.3 cases per 100,000 population, respectively. Overall, this indicates a lower rate of invasive pediatric cancer in northern Saskatchewan compared to the province as a whole.
- Cancer prevalence refers to the number of people in a population at a given time that are still alive after being diagnosed with cancer. The crude 5 and 10 year invasive cancer prevalence rates in northern Saskatchewan in 2014 were 7 and 11.2 per 1,000 population. Both of these rates were approximately half of the corresponding provincial 5 and 10 year crude prevalence rates of 14.3 and 23.4 per 1,000 population.
- Between 2010 and 2014 the leading causes of cancer mortality in northern Saskatchewan females were lung (22), breast (14), and colorectal (11), followed by primary unknown, leukemia, and pancreas (all tied with < 5). The leading causes of cancer mortality in northern Saskatchewan males were lung (29), colorectal (12), prostate (11), primary unknown (9) and kidney (8).
- It has been estimated that in Saskatchewan in 2015, about 40% of cancer cases could be prevented through healthy living and policies. Of the 2,000 preventable cancer cases in 2015, close to half of them could be addressed by reducing tobacco use (920) and second hand smoke exposure (45). Other risk

factors that could potentially prevent large numbers of cancer cases in Saskatchewan include improving physical activity habits such as, decreasing physical inactivity (330), and sedentary behaviors (90), as well as attaining a healthy weight (190) and improving dietary habits such as low fruit (200) and vegetable intake (100), reducing alcohol (80), red meat (55) and processed meat consumption (40).

- When applying this work to the north, there are several important considerations to keep in mind. The impact of any one risk factor on cancer incidence is greatly influenced by the number of people that are exposed to that risk factor. For example, the number of cancer cases that are estimated to be caused by using tobacco would be very different in a population in which everyone in the population used tobacco, compared to a population in which no one used tobacco. In Saskatchewan, it was estimated that close to half (920) of the 2,000 preventable cancer cases could be addressed by reducing tobacco use. This is in the context of a smoking rate of 19.8% in Saskatchewan, according to the 2015-16 Canadian Community Health Survey. Using the same survey, the off-reserve northern smoking rate was estimated to be almost doubled at 37.2%. In addition, according to the First Nations Food Nutrition and Environment Study [2], the smoking rate in some northern Saskatchewan First Nations communities has been estimated to be 79%. Therefore, it is reasonable to expect that the impact of tobacco use on cancer in northern Saskatchewan may be even greater than the province, due to a substantially higher smoking rate.

### ***Traffic Collisions***

- Saskatchewan Government Insurance (SGI) collects information on traffic collisions allowing us to assess the extent of injuries and deaths from these events. Between 1998 and 2014 the injury rate from traffic collisions in northern Saskatchewan declined from 55 to 44 injuries per 10,000 population. During the same time period the injury rate in the province as a whole decreased from 73 to 61 injuries per 10,000 population. However, the percent of injuries from traffic collisions that involved a drinking driver was over double in the north, compared the province as whole, ranging from 26 to 28% compared to 10-12%.
- The death rate from traffic collisions was consistent in both the province and northern Saskatchewan between 1998-2014. The northern rates remained approximately 50% higher than the province with rates of 21 deaths per 100,000 population, compared to 14 deaths per 100,000. The percent of deaths from traffic collisions involving a drinking driver was also much higher in the north, ranging from 53 to 66%, compared to 40% in the province as a whole.

### ***Further information on chronic disease, cancer and traffic collisions***

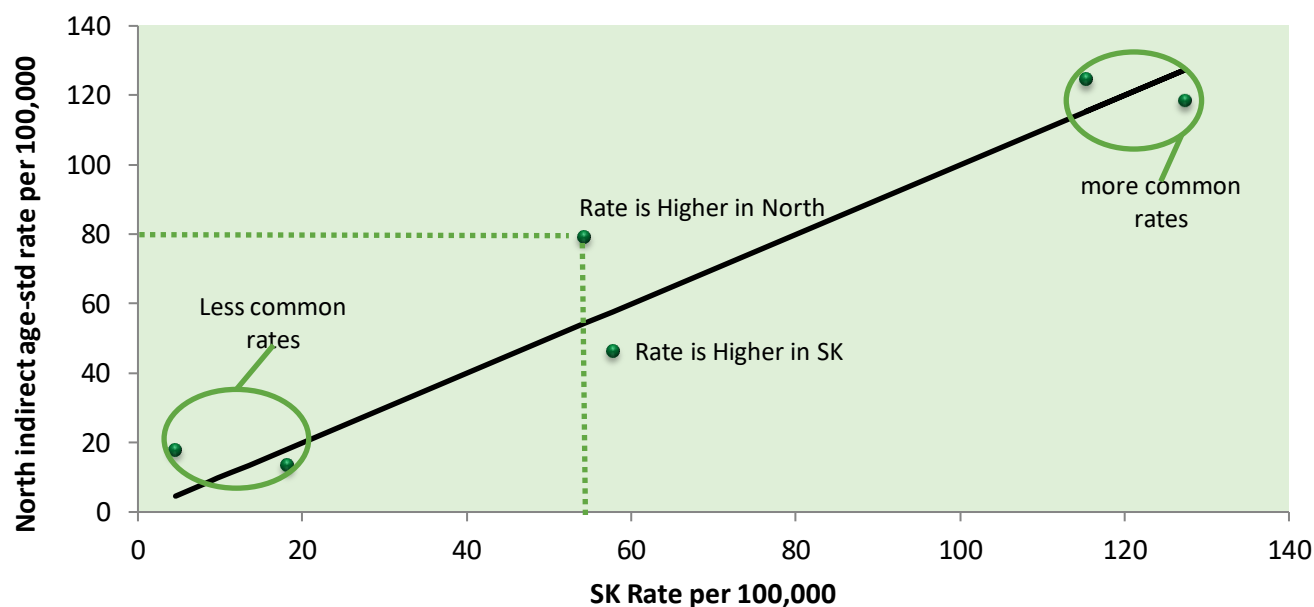
- For further information on hospitalizations and deaths related to chronic disease, cancer and traffic collisions please see the hospitalization and mortality reports on the Population Health Unit website: [https://populationhealthunit.ca/health\\_monitoring\\_and\\_research/health\\_monitoring.html](https://populationhealthunit.ca/health_monitoring_and_research/health_monitoring.html). In addition, for further information on cancer incidence, prevalence and mortality across Saskatchewan, please see the Saskatchewan Cancer Agency's report "Saskatchewan Cancer Control Report: Profiling Cancer in Regional Health Authorities" [1].

# CANCER AND TRAFFIC COLLISIONS

## Cancer

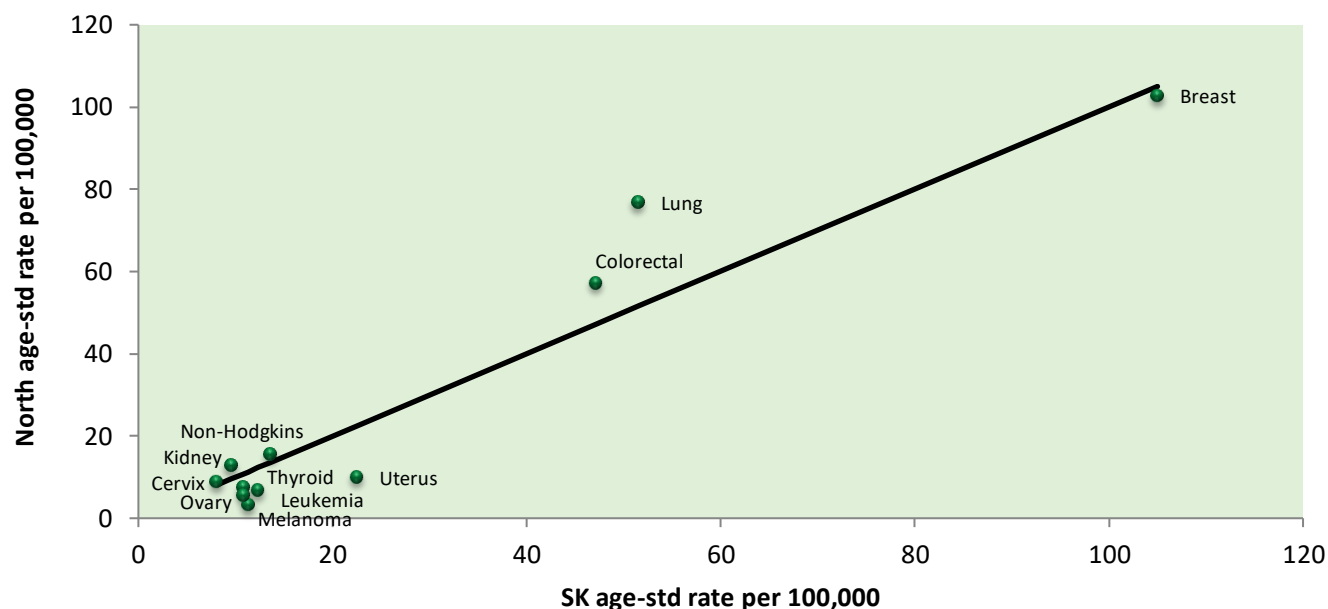
The graph below illustrates cancer incidence data to aid in interpreting the graphs on the upcoming pages. The Saskatchewan rate is on the bottom of the chart (x-axis) while the northern rate is on the left hand side of the chart (y-axis). The black line that runs through the middle of the chart shows the point where the north and Saskatchewan rates would be the same. Therefore, when a green dot is below the line, the rate is higher in Saskatchewan, while a green dot above the line means the rate is higher in the north. For example, the green dot identified as “Rate is Higher in North” is above the black line. By following the dashed green line to the left we can see the north rate would be ~ 80 cases per 100,000 population compared to the Saskatchewan rate of ~ 55 cases per 100,000 population (by following the dashed green line to the bottom). This chart also lets us see what are the most common rates compared to the least common rates. The most common rates in both locations will be located at the far right hand corner of the chart, while the least common rates will be located in the bottom left hand corner.

**Figure 1: Example figure for age-standardized invasive cancer incidence interpretation**



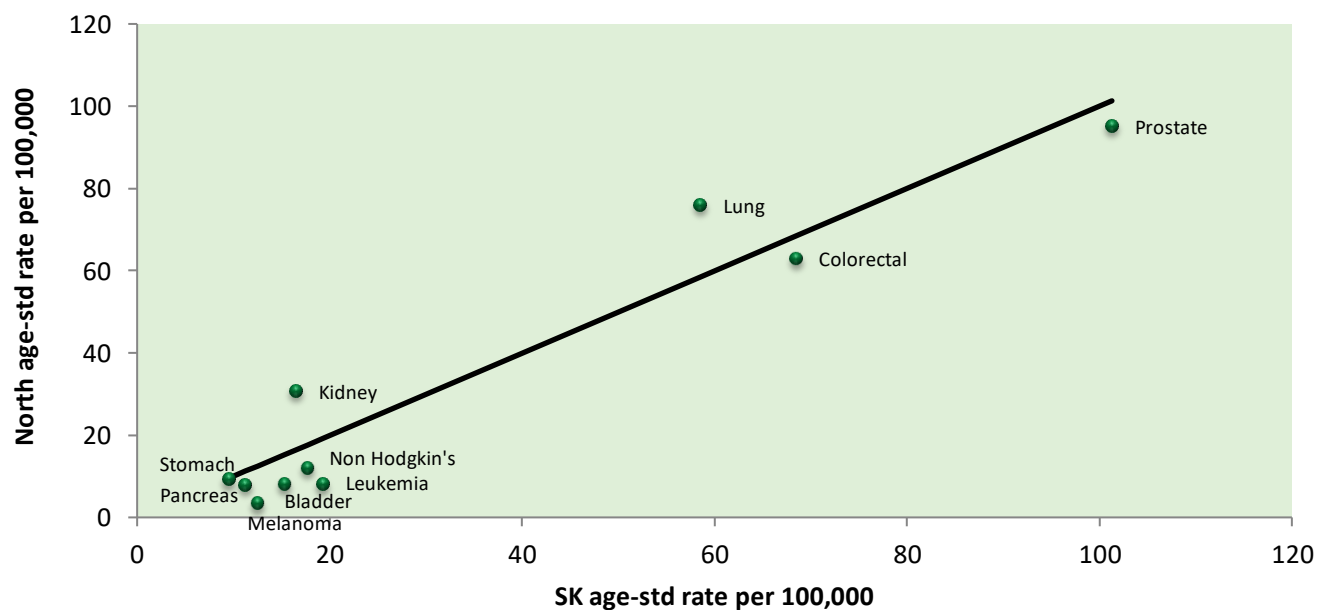
Prepared by PHU Nov, 2010

**Figure 2: Age-standardized female cancer incidence rates, northern Saskatchewan and Saskatchewan, 2010-2014**



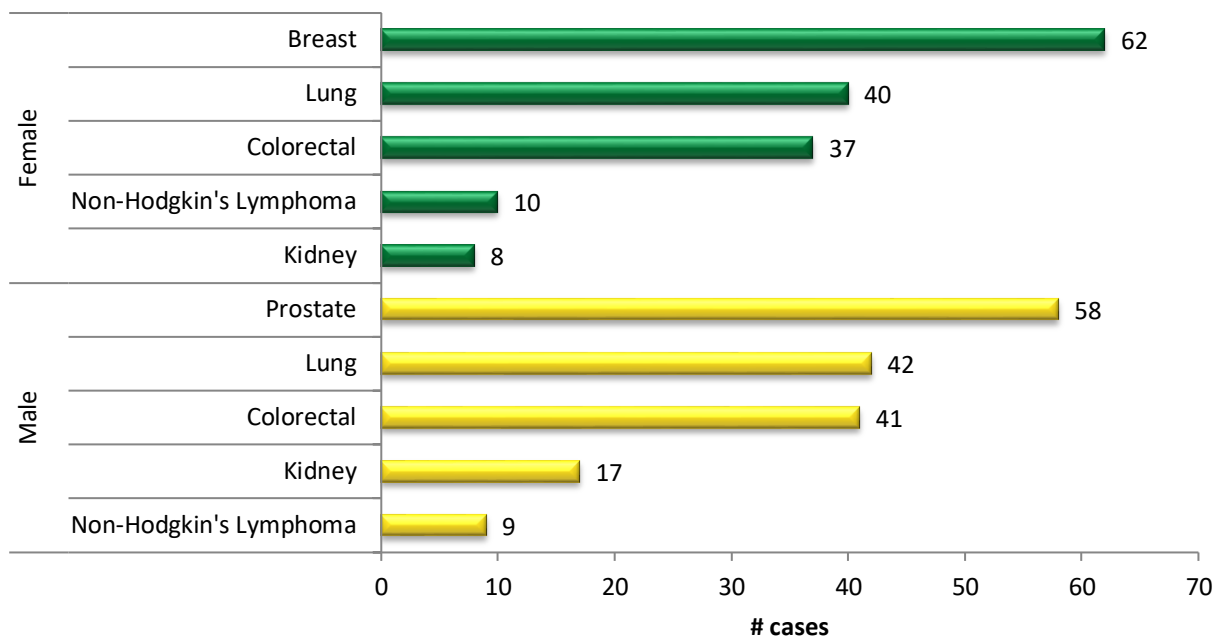
Source: SCA (Saskatchewan Cancer Control Report) 2017, Prepared by PHU Apr 2019

**Figure 3: Age-standardized male cancer incidence rates, northern Saskatchewan and Saskatchewan, 2010-2014**



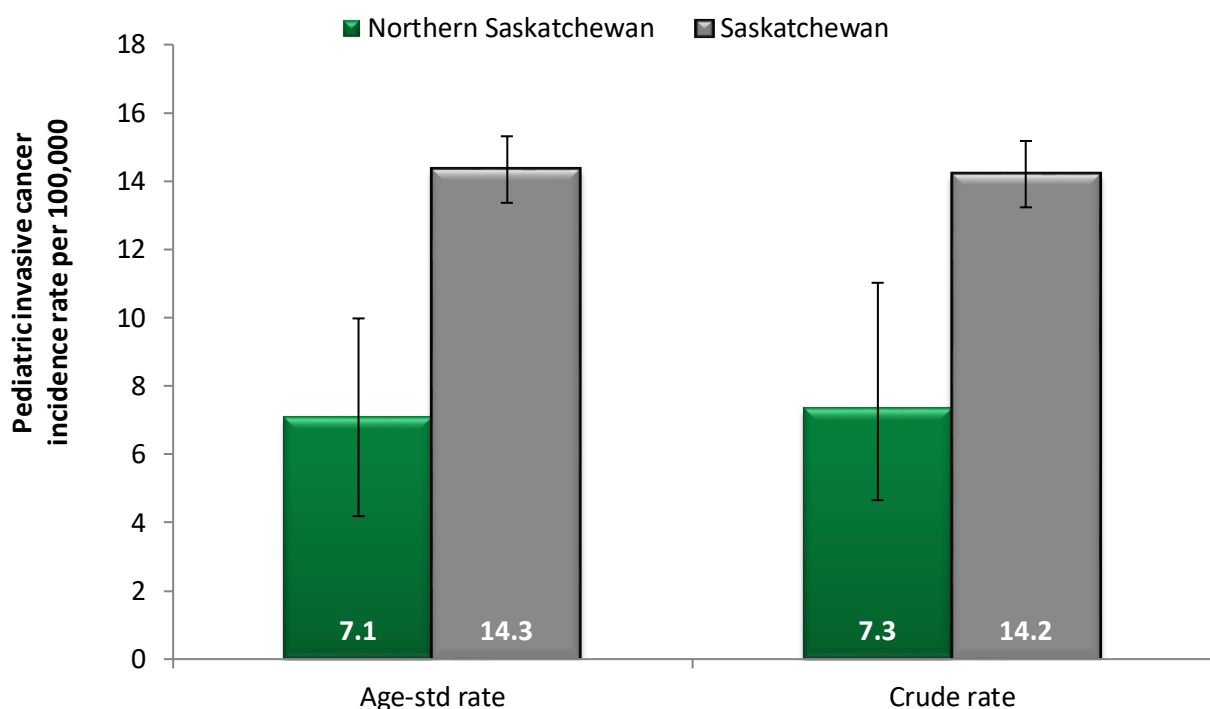
Source: SCA (Saskatchewan Cancer Control Report) 2017, Prepared by PHU Apr 2019

**Figure 4: Top five invasive cancer sites by sex, northern Saskatchewan, 2010-2014**



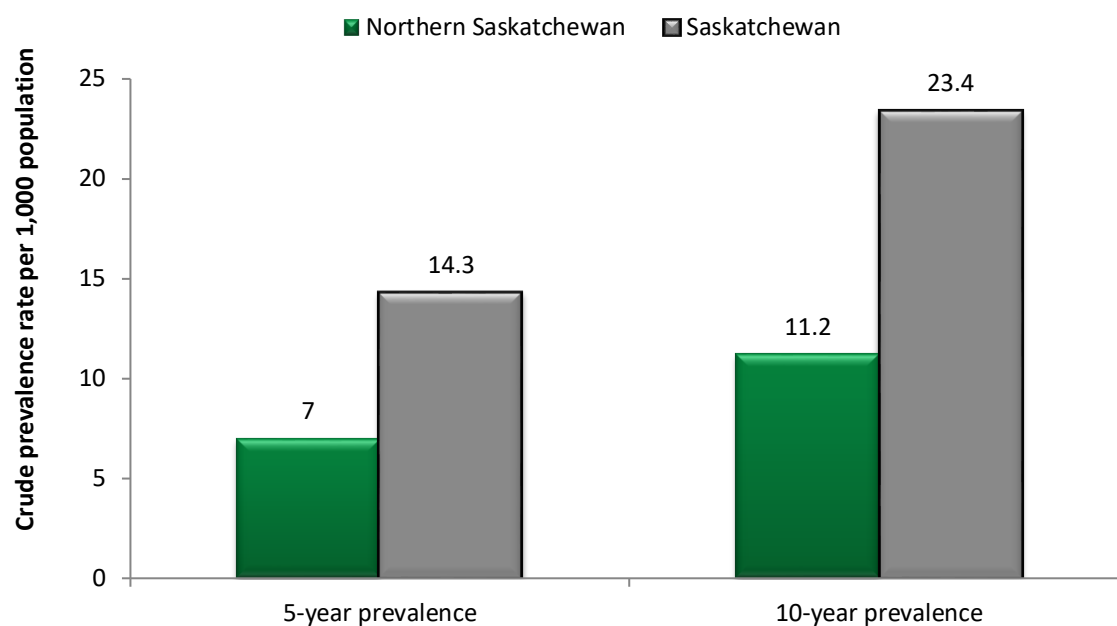
Source: SCA (Saskatchewan Cancer Control Report) 2017, Prepared by PHU Apr 2019

**Figure 5: Pediatric invasive cancer incidence rate, northern Saskatchewan and Saskatchewan 1990-2016**



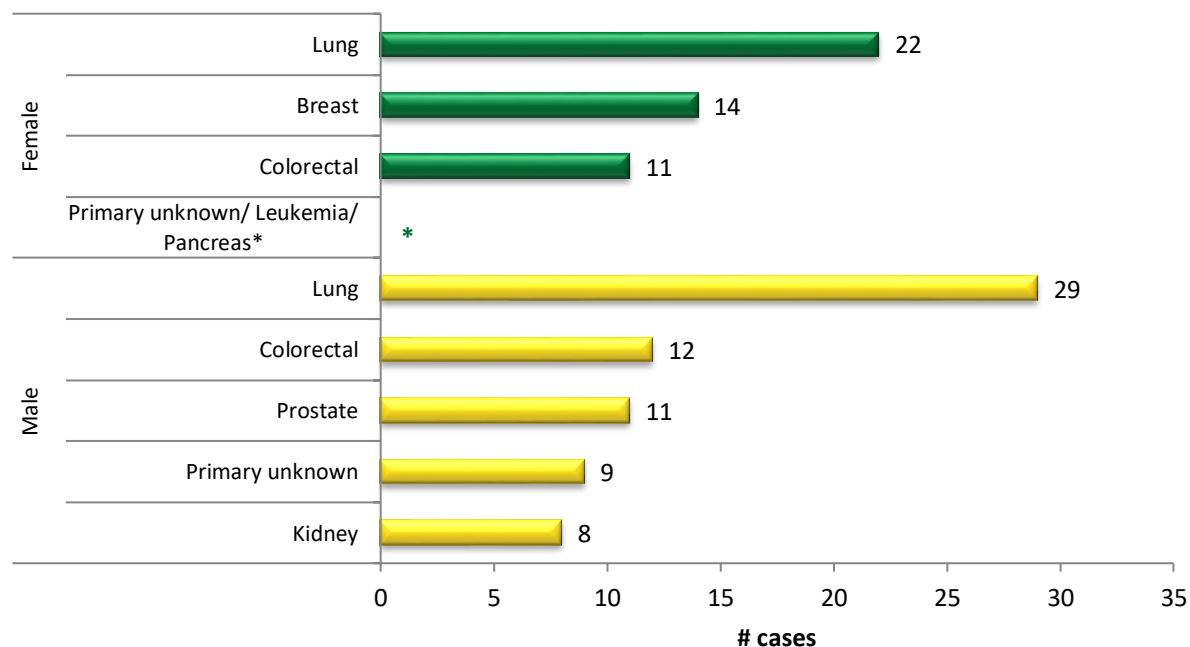
Source: Saskatchewan Cancer Agency, March 2019

**Figure 6: Five and ten year prevalence rates of invasive cancer, northern Saskatchewan and Saskatchewan, 2014**



Source: SCA (Saskatchewan Cancer Control Report) 2017, Prepared by PHU Apr 2019

**Figure 7: Top three to five invasive cancer causes of death by sex, northern Saskatchewan, 2010-2014**

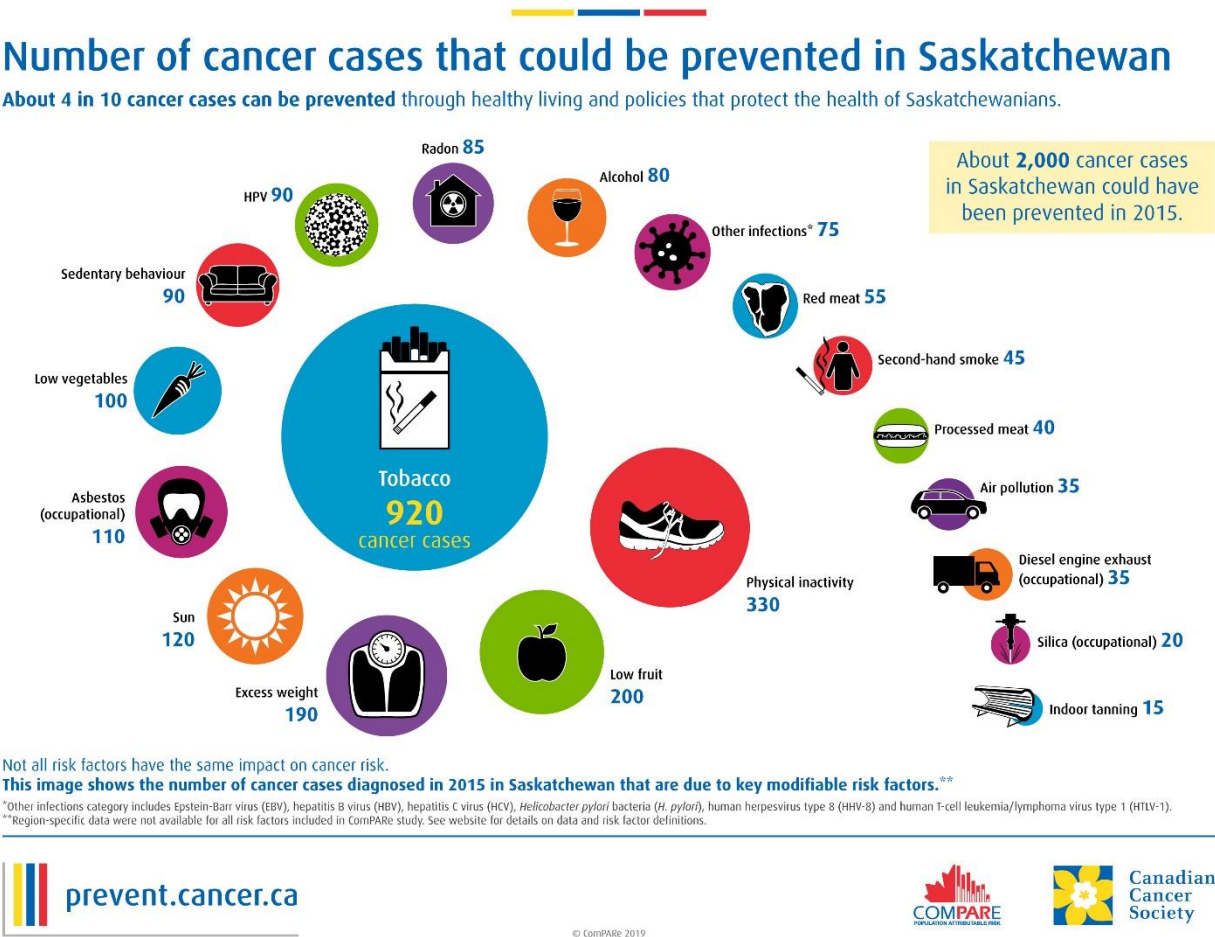


Source: SCA (Saskatchewan Cancer Control Report) 2017, Prepared by PHU Apr 2019\* all tied with < 5 cases



In 2014, a group of researchers began work on estimating the current and future burden of cancer due to modifiable lifestyle, environmental and infectious agent risk factors [3]. The study is called ComPARE (Canadian Population Attributable Risk of Cancer), and its results can help identify key areas of action for programs, policies and planning. Figure 11, is a diagram taken from their work and highlights the number of incidence cancer cases in Saskatchewan in 2015 that could be have been prevented through addressing modifiable risk factors.

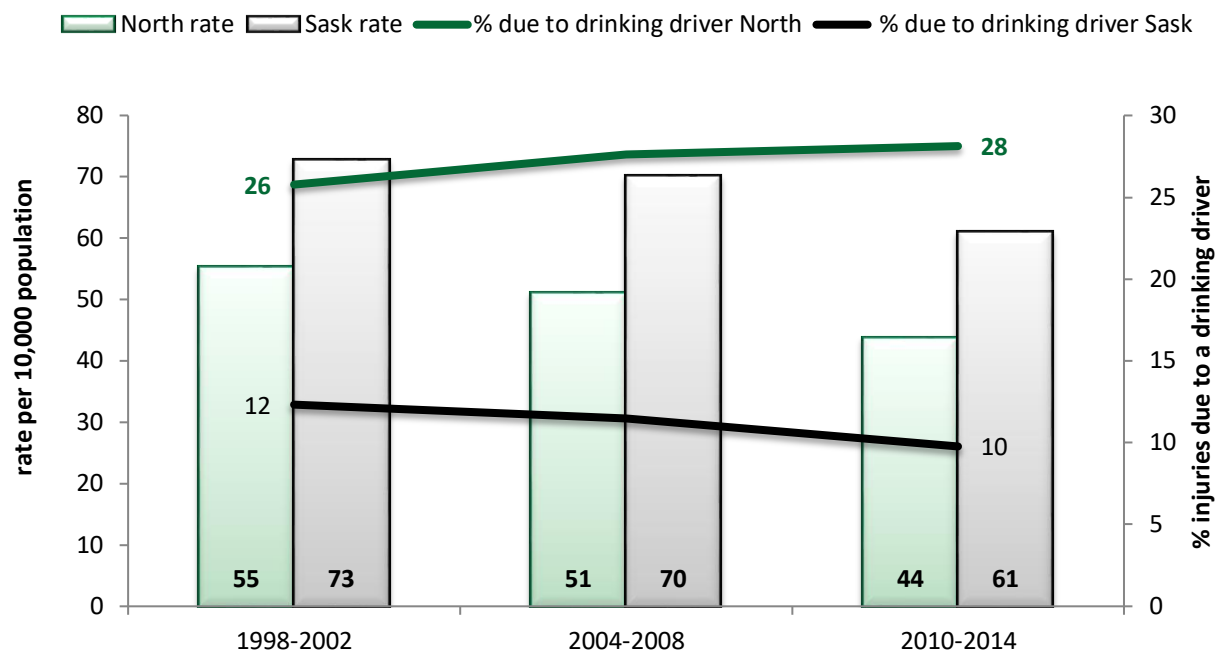
Figure 8: Cancer Prevention in Saskatchewan, 2015



Canadian Population Attributable Risk of Cancer (ComPARE) study. (2019). Number of cancer cases that could be prevented in Saskatchewan. Available at: [prevent.cancer.ca/resources/infographics](http://prevent.cancer.ca/resources/infographics) (accessed [September 30, 2019]).

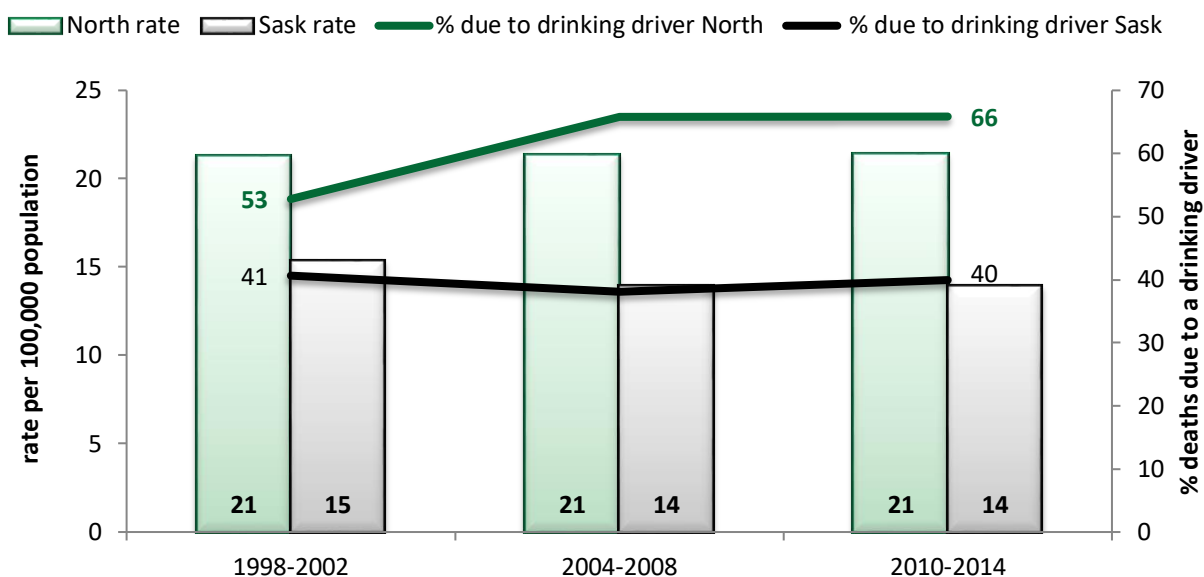
## Traffic Collisions

Figure 9: Traffic injury rate, northern Saskatchewan and Saskatchewan, 1998-2002 to 2010-2014



SGL Traffic Accident Information System 2016, Prepared by PHU Sept 2016

Figure 10: Traffic death rate, northern Saskatchewan and Saskatchewan, 1998-2002 to 2010-2014



SGL Traffic Accident Information System 2016, Prepared by PHU Sept 2016

# APPENDIX A – DATA NOTES

## Data Sources

### **Saskatchewan Cancer Agency's report "Saskatchewan Cancer Control Report: Profiling Cancer in Regional Health Authorities" [1].**

– This report was the fifth Saskatchewan Cancer Control Report and had a focus on profiling cancer across the regional health authority boundaries in Saskatchewan.

<http://www.saskcancer.ca/SCCR%202017%20Low%20Res>. Outside of the pediatric cancer data, all of the cancer incidence, prevalence and mortality data used in this section of the health status report came from this Saskatchewan Cancer Agency report.

**Pediatric invasive cancer incidence data** – The Saskatchewan Cancer Agency provided aggregate counts of invasive cancer for children less than 15 years of age, for both northern Saskatchewan and Saskatchewan as a whole, for the time period 1990-2016. They also provided Covered population estimates for the same geographies and time period. We then calculated crude and age standardized incidence rates that were used in this health status report.

**Traffic Accident Information System (TAIS)** – The TAIS compiles information on traffic collisions occurring on Saskatchewan public roads. Collisions involving bodily injury or death, a hit and run, an out-of-province vehicle, an unregistered vehicle, an impaired operator and collisions where vehicles have to be towed are reported through police agencies. A Motor Vehicle Accident (MVA) form is completed in accordance with Section 253 of The Traffic Safety Act and forwarded to Saskatchewan Government Insurance (SGI). Information on all other types of collisions is collected through SGI's claims reporting process. Both data sources are combined to create TAIS. The collision database and its publications are administered by SGI. SGI provided us with aggregate counts of traffic collisions for northern Saskatchewan and Saskatchewan as a whole.

**Saskatchewan Covered Population 2015** – Covered Population is based on eligibility for health insurance benefits in Saskatchewan. All residents of Saskatchewan are included except: (a) members of the Canadian Forces and inmates of federal prisons and (b) people not yet meeting the residency requirement. The covered population estimates are derived from the person health registry system which collects information on multiple addresses, when available, in an attempt to distinguish between correspondence (i.e. mailing address) and residence addresses. In northern Saskatchewan, many communities share postal codes, and thus it is difficult to determine exactly which community the person lives in. For example, La Ronge, Air Ronge, and several Lac La Ronge communities share two postal codes. First Nations are assigned residence based on band affiliation. In southern Saskatchewan, some reassignment of residence codes occurs based on additional residence information; however this does not occur in northern Saskatchewan due to the difficulty in distinguishing between residence on reserves and northern towns and villages. As a result, individuals may be assigned to a band but not an actual community. For example, many individuals are assigned to the Peter Ballantyne Cree Nation as opposed to the communities of Pelican Narrows, Sandy Bay, Deschambault Lake, Southend, or Sturgeon Landing. As a result of these limitations, the covered population is thought to be a good estimation of the populations for community areas, health centre service areas, and health authorities but not individual

northern communities. For further details on the covered population methodology, please refer to the 2015 covered population website (<https://www.ehealthsask.ca/health-data/covered-population>).

**Canadian Community Health Survey (CCHS)** – The CCHS is a national cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. The CCHS covers the population 12 years of age and over living in the ten provinces and the three territories. Excluded from the survey's coverage are: persons living on reserves and other Aboriginal settlements in the provinces; full-time members of the Canadian Forces; the institutionalized population and persons living in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James. Altogether, these exclusions represent less than 3% of the Canadian population aged 12 and over. In Northern Saskatchewan, Mamawetan Churchill River Health Region, Keewatin Yatthé Health Region and the Athabasca Health Authority are grouped together to provide one north-wide off-reserve estimate. Data from 2007 onwards from the CCHS can be obtained from either a yearly file or from a combined two-year file. Due to the small sample sizes in northern regions, only the two-year 2015-16 file is presented (CANSIM Table 105-0509).

### Data Notes

**Presentation of Data (e.g. numbers of death, crude rates, age-standardized rates)** – For a full description of crude rates, age-adjusted rates, and raw numbers, please refer to “A Guide to the Reports – Understanding the Presentation of Data” report on the Population Health Unit website:

([http://www.populationhealthunit.ca/mrws/filedriver/Health\\_Indicator\\_reports/A\\_Guide\\_to\\_the\\_Reports\\_Understanding\\_the\\_Presentation\\_of\\_Data.pdf](http://www.populationhealthunit.ca/mrws/filedriver/Health_Indicator_reports/A_Guide_to_the_Reports_Understanding_the_Presentation_of_Data.pdf))

Age-adjusted rates in this report were calculated using the 2011 Canadian population as the standard. Confidence intervals for crude rates were calculated using the Gamma distribution[4] while confidence intervals for age-adjusted rates were calculated using the Poisson approximation method[5].

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## REFERENCES

1. Philips Z, N.G., Sarker S, Trecker M, Zhu T, Alvi R, & Tonita J. *Profiling Cancer in Regional Health Authorities*. 2017.
2. Laurie Chan, O.R., Malek Batal, Tonio Sadik, Harold Schwartz, Amy Ing, Karen Fediuk and Constantine Tikhonov, *First Nations Food, Nutrition and Environment Study (FNFNES): Results from Saskatchewan (2015)*. . 2018, University of Ottawa: Ottawa.
3. Brenner, D.R., et al., *Estimating the current and future cancer burden in Canada: methodological framework of the Canadian population attributable risk of cancer (ComPARE) study*. BMJ Open, 2018. **8**(7): p. e022378.
4. Fay, M.P. and E.J. Feuer, *Confidence Intervals for Directly Standardized Rates: a Method Based on the Gamma Distribution*. Statistics in Medicine, 1997. **16**: p. 791-801.
5. Bains, N. *Standardization of rates*. 2009; Available from: Available from:

[http://core.apheo.ca/resources/indicators/Standardizationreport NamBains FINALMarch16.pdf](http://core.apheo.ca/resources/indicators/Standardizationreport%20NamBains%20FINALMarch16.pdf).