

Northern Saskatchewan Health Indicators

Health Status: Mortality

2023

Population Health Unit

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Refer to A Guide to the Reports: Understanding the Presentation of Data for an explanation of the variety of ways data is presented.

Suggested reference: Quinn B, Irvine J. Northern Saskatchewan Health Indicators, Health Status: Mortality. Athabasca Health Authority and Saskatchewan Health Authority, Population Health Unit, La Ronge, 2023.

All maps in this report were created by Tracy Creighton, GIS Analyst with the Saskatchewan Health Authority. Copies of this document and related reports can be downloaded from the Population Health Unit website www.pophealthnorthsask.ca

KEY MESSAGES

There are two main sources of data for this report, including a dataset from eHealth Saskatchewan that provides information on general mortality and a dataset from Statistics Canada that provides information on premature mortality. The general mortality section contains information on people in the northern health networks and the Athabasca Health Authority (AHA) including those both off and on-reserve. The dataset from Statistics Canada is still using former RHA (fRHA) boundaries and thus has a northern Saskatchewan geography made up of the AHA combined with the former health regions of Mamawetan Churchill River, and Keewatin Yatthé. For a full description of geographical differences between the fRHA's and northern network boundaries please see the Community Characteristics Report "Geographical and Political Profile". In brief, the two are very similar geographies although the fRHA boundaries also included the communities of Dore Lake, Green Lake, Montreal Lake, and Timber Bay.

General mortality

Crude all-cause mortality in the northern health networks for males and females combined, ranging from 415-535 deaths per 100,000 population, is about half of what the provincial rate is at 815 per 100,000. This is not surprising as compared to the north, the province has a much older population and mortality is more common in the older age groups. However, after adjustments for age have been made, compared to the province, North East 1, North West 1 and the Athabasca Health Authority had statistically higher rates of mortality from all causes, while North East 2 had rates similar to the province.

In Saskatchewan, circulatory and cancer together make up just over 50% of deaths, followed by respiratory, injuries and mental and behavioral disorders, each contributing just under 10%. The remaining deaths in the "Other" category, make up to 25%. The major difference in northern Saskatchewan is the greater proportion of Injury mortality. In northern Saskatchewan, cancer and circulatory make up just over 40% of deaths, while injuries contribute 20%, twice that of the province, with respiratory contributing 8% and mental and behavioral 3%. The "other" category contributes 28% of total deaths.

The leading crude mortality rates in Saskatchewan are circulatory (229.6), cancer (206.6), respiratory (72.7), injuries (64.5) and mental and behavioral disorders (58.0). Compared to northern Saskatchewan health networks, the crude provincial rates are substantially higher. The rates for circulatory (2.4-3.3), cancer (1.5-3.1), respiratory (1.4-4.1), and mental and behavioral disorders (3.8-6.2) are between 1.4 and 6.2 times greater for the province. On the other hand, the northern health networks crude injury mortality rate is between 1.3 and 1.7 times greater than the province. However, after adjustments for age have been made, compared to the province, North East 1 and North West 1 have statistically higher rates of death for all-cause mortality, cancer, injury, and respiratory and other mortality. North East 2 had statistically higher rates of injury and other mortality, while having lower rates of cancer, circulatory, mental and behavioral disorders, and respiratory mortality. AHA had statistically higher rates for all-cause and injury mortality, with all other causes having similar rates to the province. When North West 1 and North East 2 were divided up into their corresponding small area geographies (SAG), some differences in mortality rates were noticed. In North West 1, the Ile a la Crosse SAG had lower rates of respiratory and mental and behavioral disorder mortality than the La Loche SAG.

In North East 1, the Creighton SAG had lower rates of mortality for all causes that were examined, compared to the Pelican Narrows SAG.

The Creighton SAG appears to have very low mortality rates, having indirect ratios that are either suppressed due to low counts or statistically less than the province for all causes we examined except injuries, which was similar to the province. This is despite the fact it has very similar rates of most chronic diseases (see Health Status: Chronic disease report) and similar socioeconomic conditions as the province (see SDOH: living and working conditions report). This may be explained by missing vital statistics information for the Creighton SAG. The Saskatchewan Vital Statics database only contains information on deaths that occurred in Saskatchewan. It may be possible that residents of the Creighton SAG either died in Manitoba (e.g. Hospital, LTC, etc. as Creighton's closest hospital and LTC are in Manitoba) and are not included in the database or live in the Creighton SAG but have a Manitoba address and are being captured as out of province residents, as opposed to Creighton SAG residents.

Premature mortality

Premature mortality refers to deaths that occur in those individuals aged 74 years and younger. The Canadian Institute of Health Information has developed an indicator that classifies these premature deaths further into avoidable mortality, which refers to “untimely deaths that should not occur in the presence of timely and effective health care or other public health practices, programs and policy interventions”[1]. Avoidable mortality is further divided into preventable and treatable deaths. Preventable deaths are linked to modifiable factors, such as smoking, physical activity, healthy eating or alcohol consumption, as well as public health interventions such as vaccination or safety legislation [2]. Conversely, treatable deaths are thought be reasonably averted or significantly delayed by adequate screening, early detection and appropriate treatment (e.g. breast cancer) [3]. For a complete list of conditions that are used in the classification of avoidable, preventable, and treatable mortality, please see Appendix C.

Between 2018 and 2020, there were approximately 520 deaths that occurred prematurely in northern Saskatchewan. Of these, 70% (360) were deemed potentially avoidable, with 255 potentially avoidable through preventative measures and 105 avoidable through screening, early detection and appropriate treatment. Compared to the province, age-standardized (age-std) rates of both premature and avoidable mortality are substantially higher in northern Saskatchewan, ranging from 1.7 to 1.9 times the provincial rate between 2015-2017 and 2018-2020. During the same time period, age-std rates of avoidable mortality from both preventable and treatable causes were also substantially higher than the province ranging from 1.6-2.0 times the provincial rate.

HEALTH STATUS

General Mortality

Figure 1: All-cause mortality by northern health network, 10-year average crude rate, 2011-2020

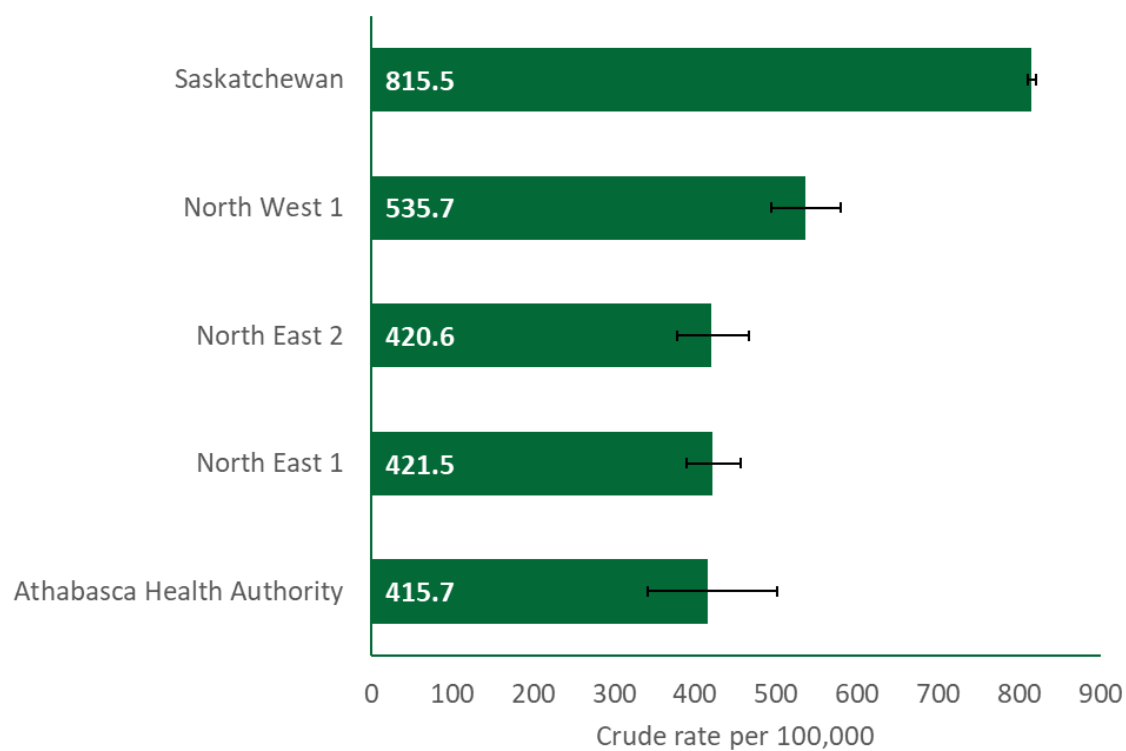


Figure 2: Indirect standardized mortality ratio, 10-year average, all-cause mortality by health networks, 2011-2020

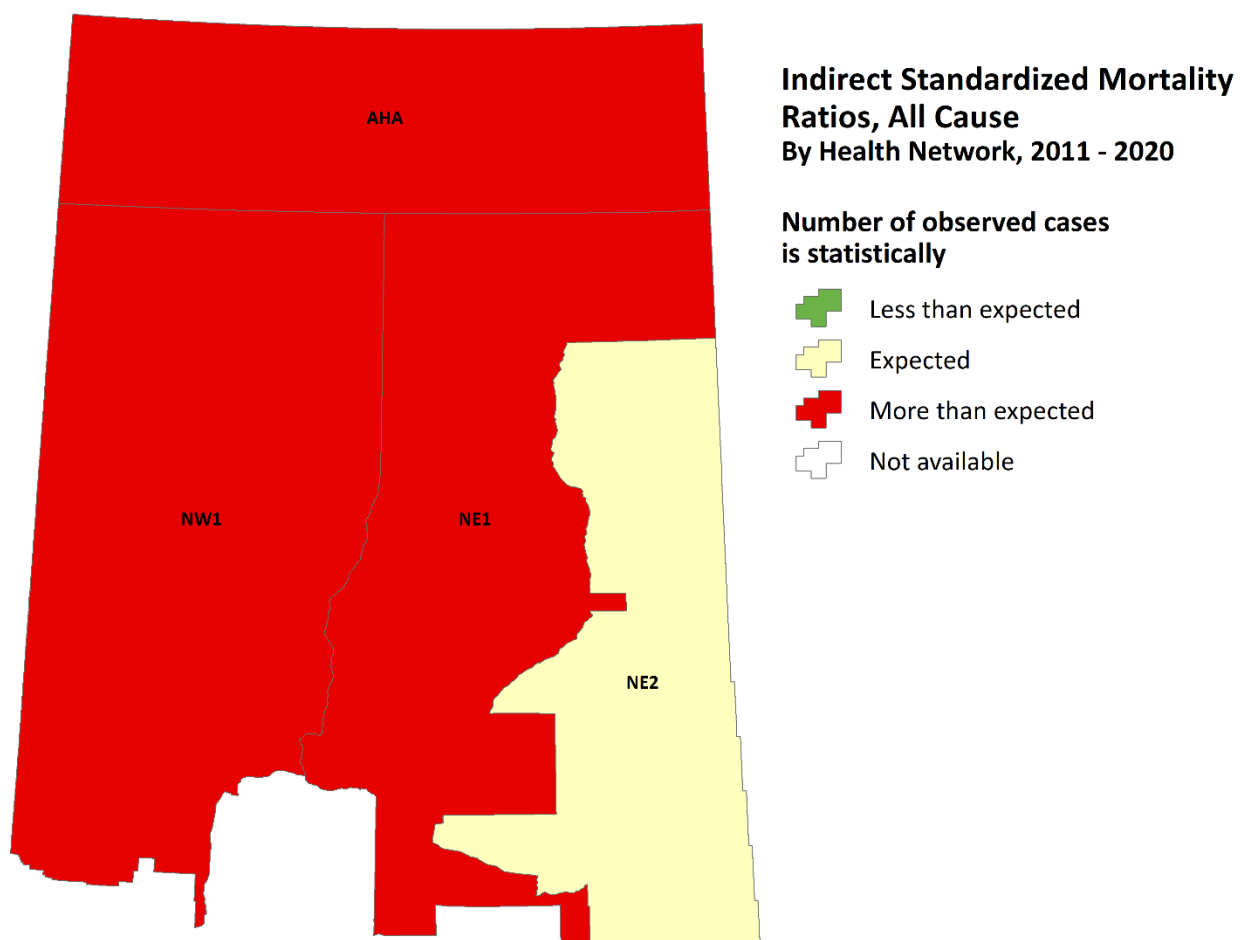


Figure 3: Indirect standardized mortality ratio, 10-year average, all-cause mortality by SAG, 2011-2020

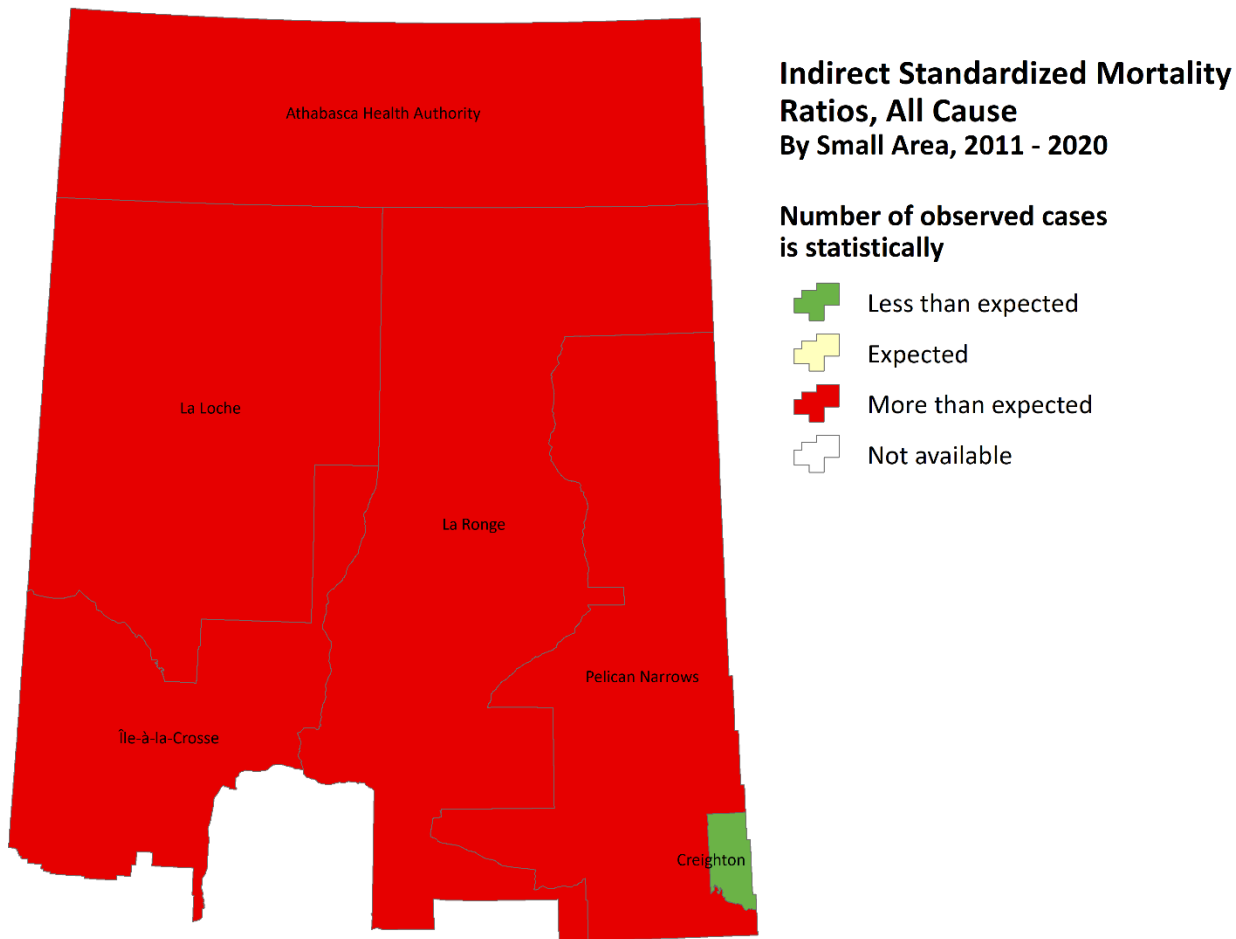


Figure 4 Proportion of total mortality by leading cause, Northern Saskatchewan and Saskatchewan, 2011-2020

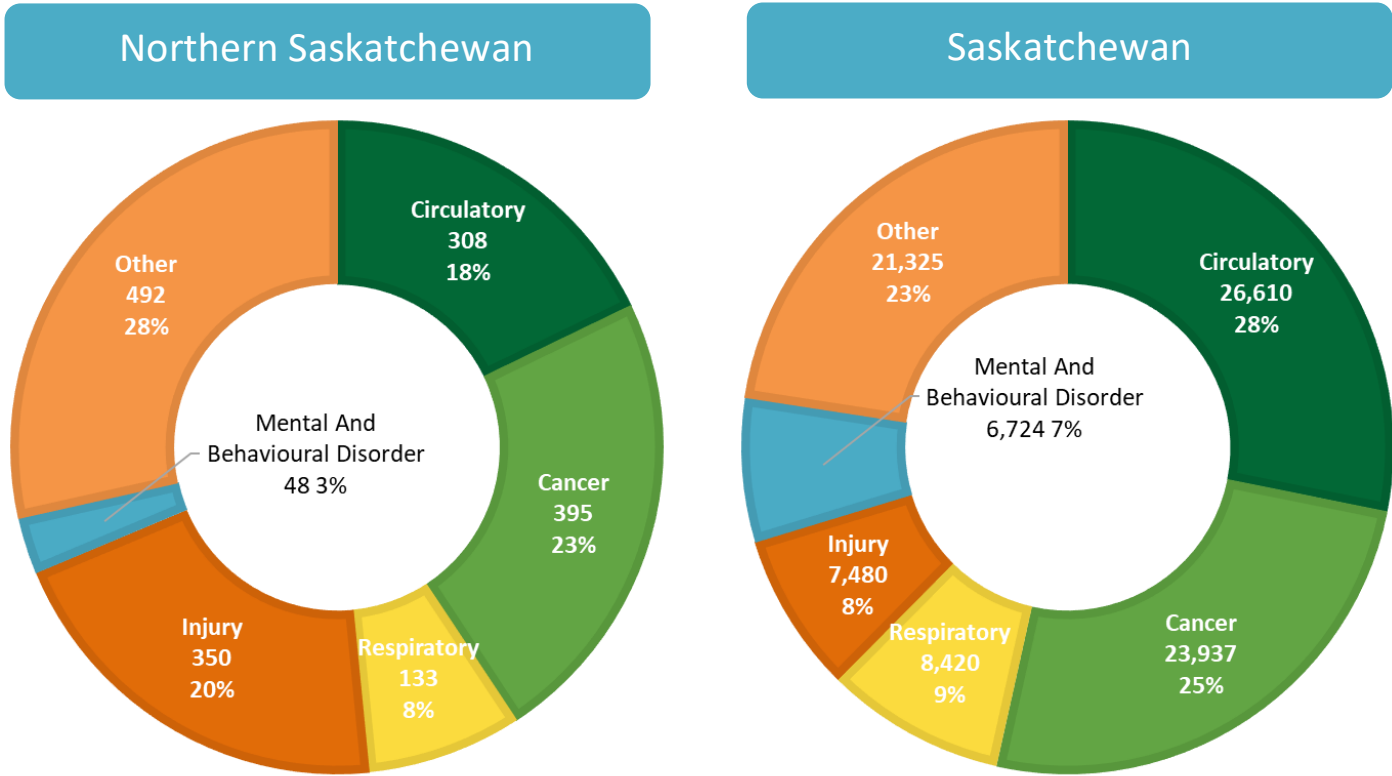


Figure 5: Mortality by leading cause, northern Saskatchewan health networks 10-year average crude rates, 2011-2020

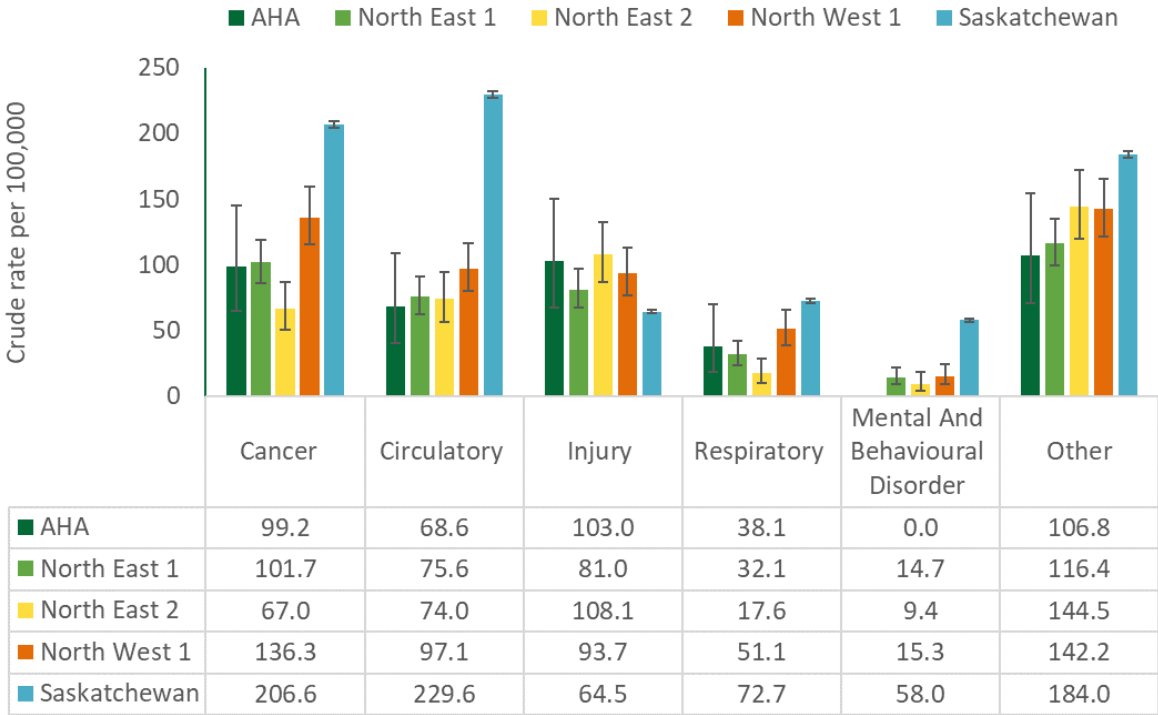


Figure 6: Indirect standardized cancer mortality ratio, 10-year average, by health networks, 2011-2020

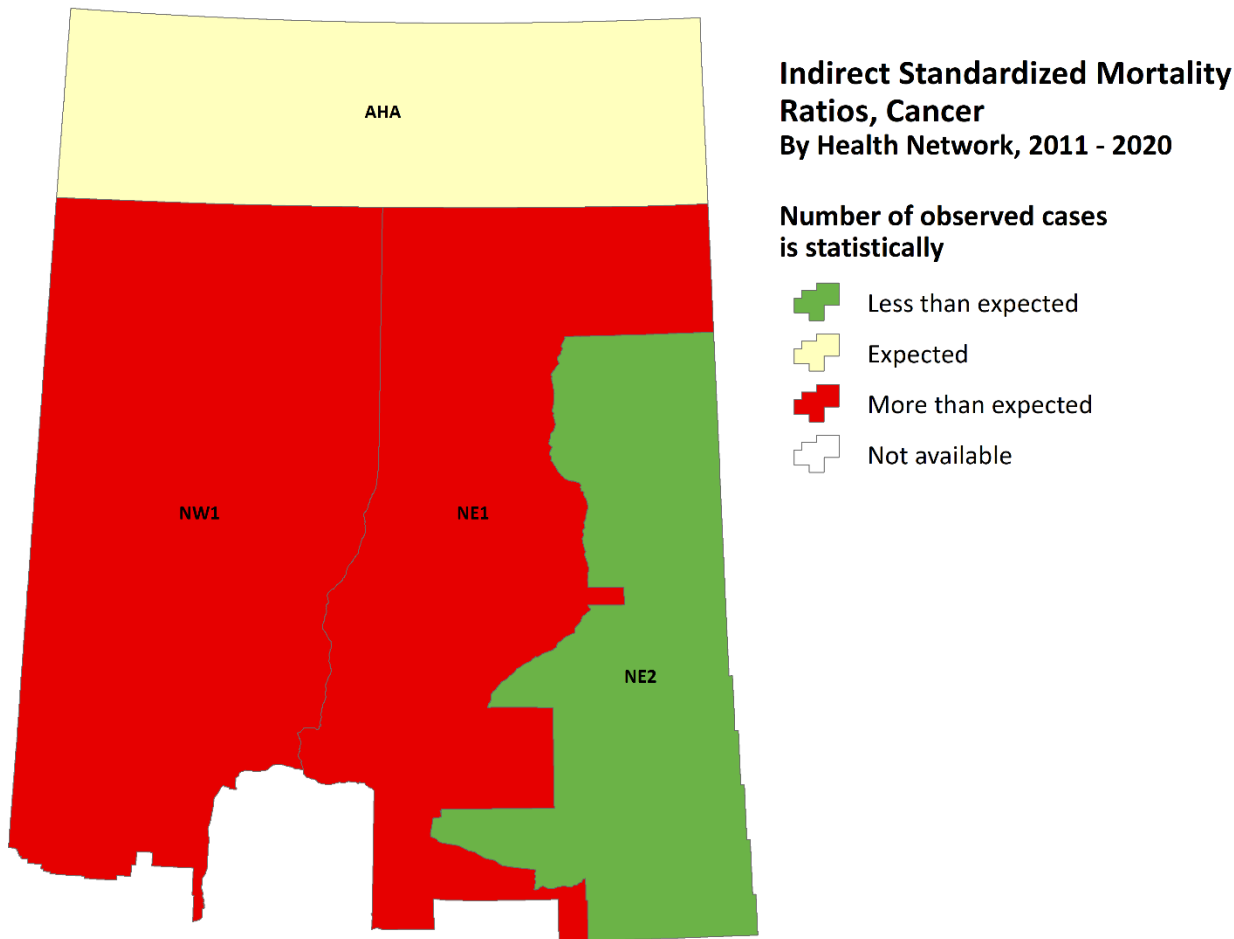


Figure 7: Indirect standardized cancer mortality ratio, 10-year average, by SAG, 2011-2020

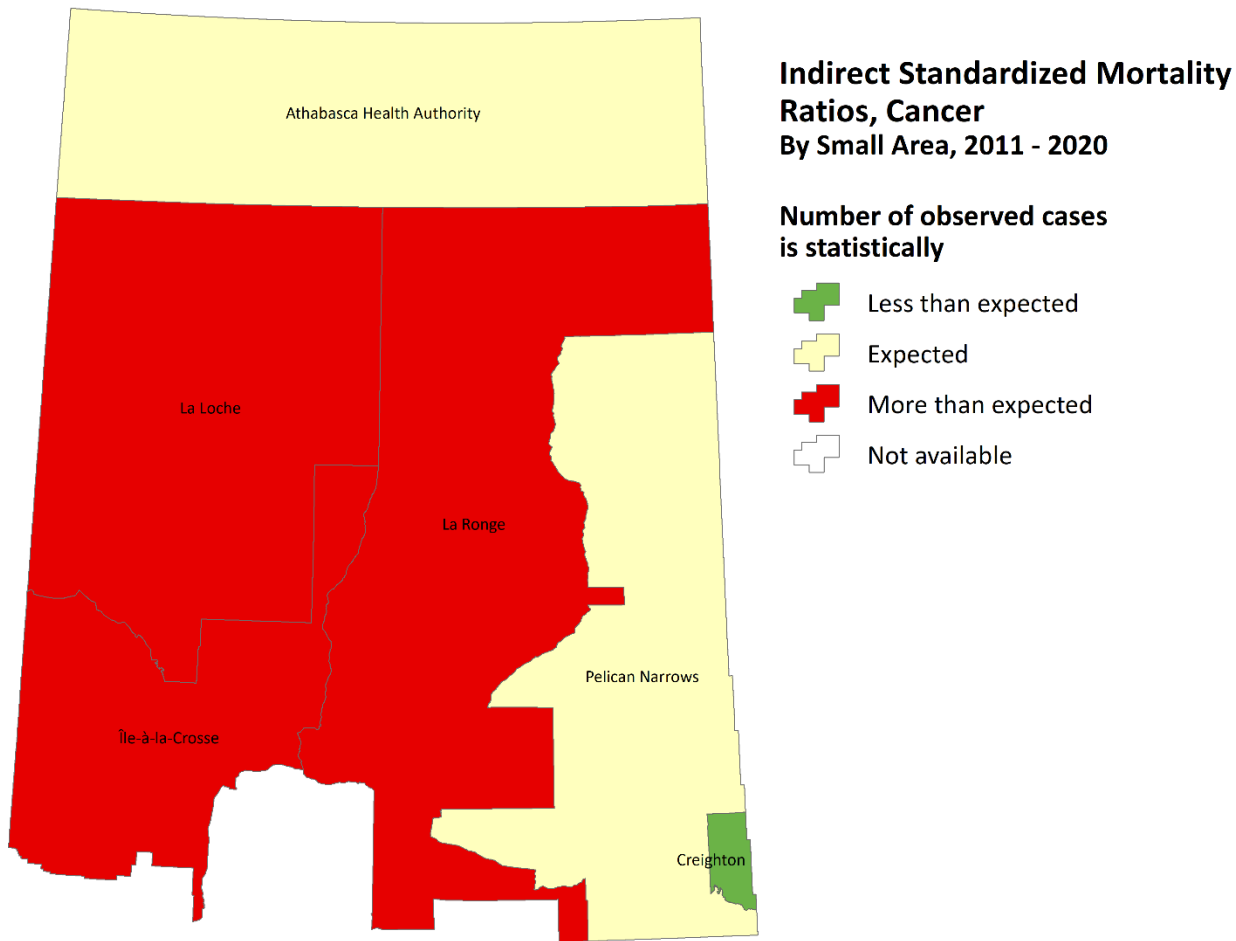


Figure 8: Indirect standardized circulatory mortality ratio, 10-year average, by health networks, 2011-2020

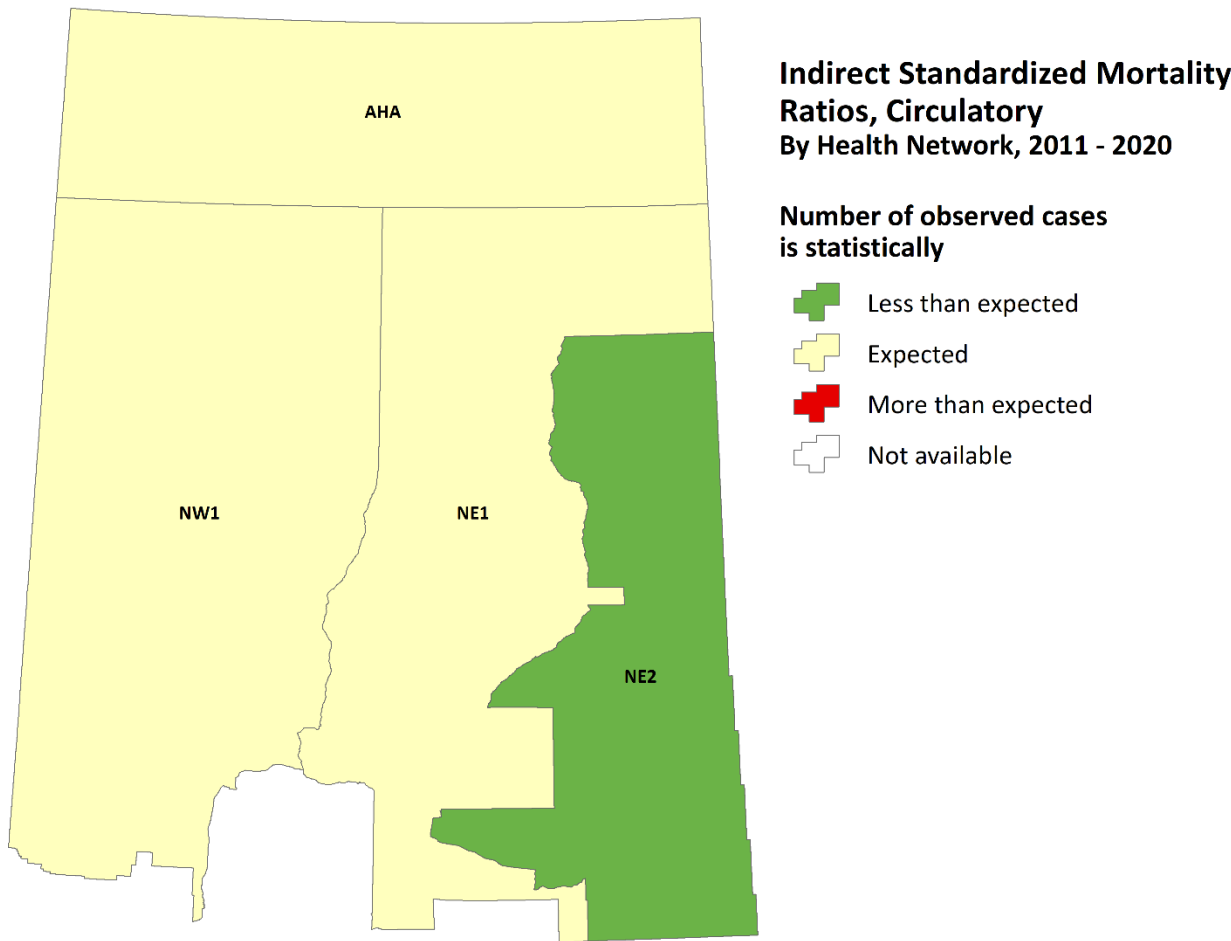


Figure 9: Indirect standardized circulatory mortality ratio, 10-year average, by SAG, 2011-2020

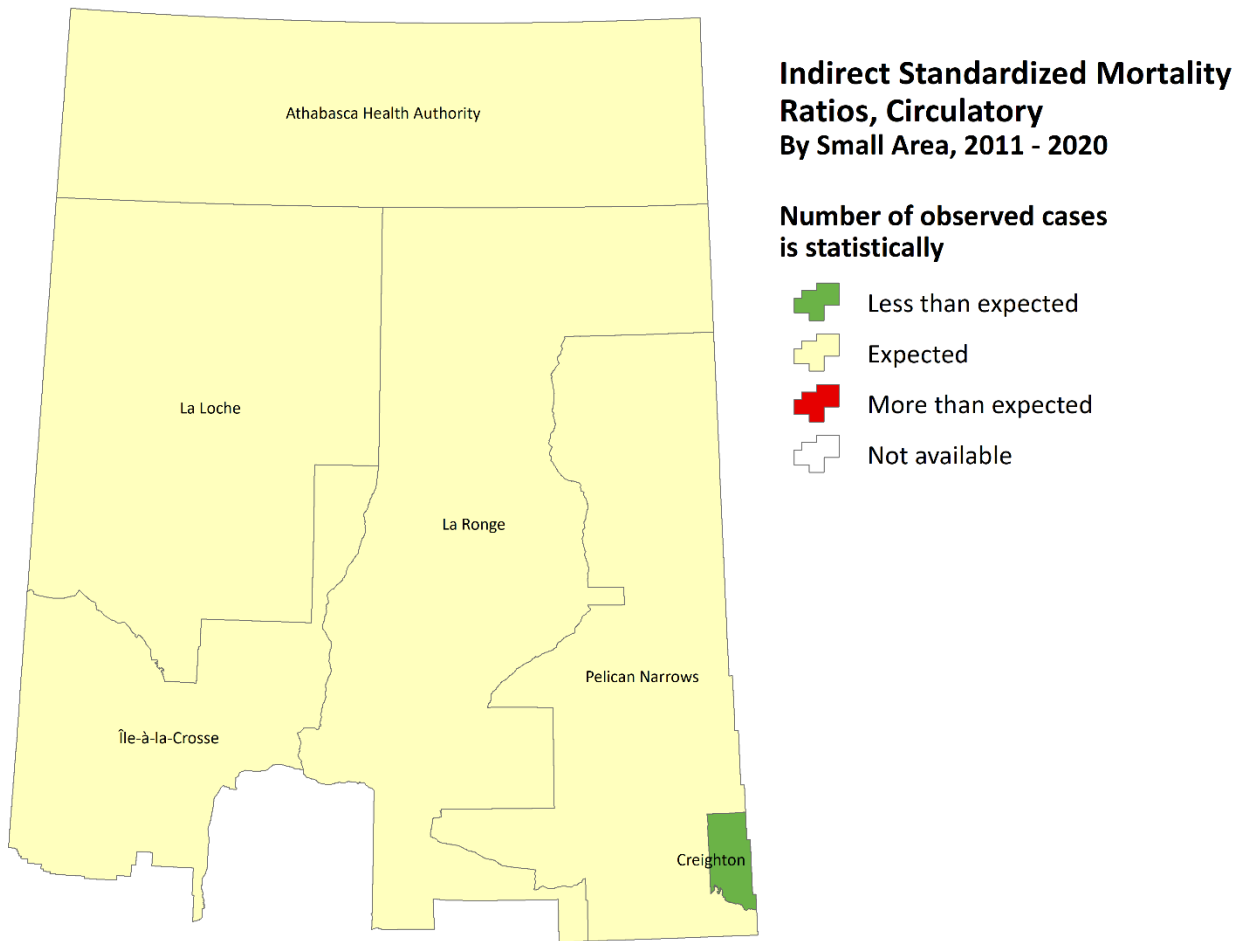


Figure 10: Indirect standardized injury mortality ratio, 10-year average, by health networks, 2011-2020

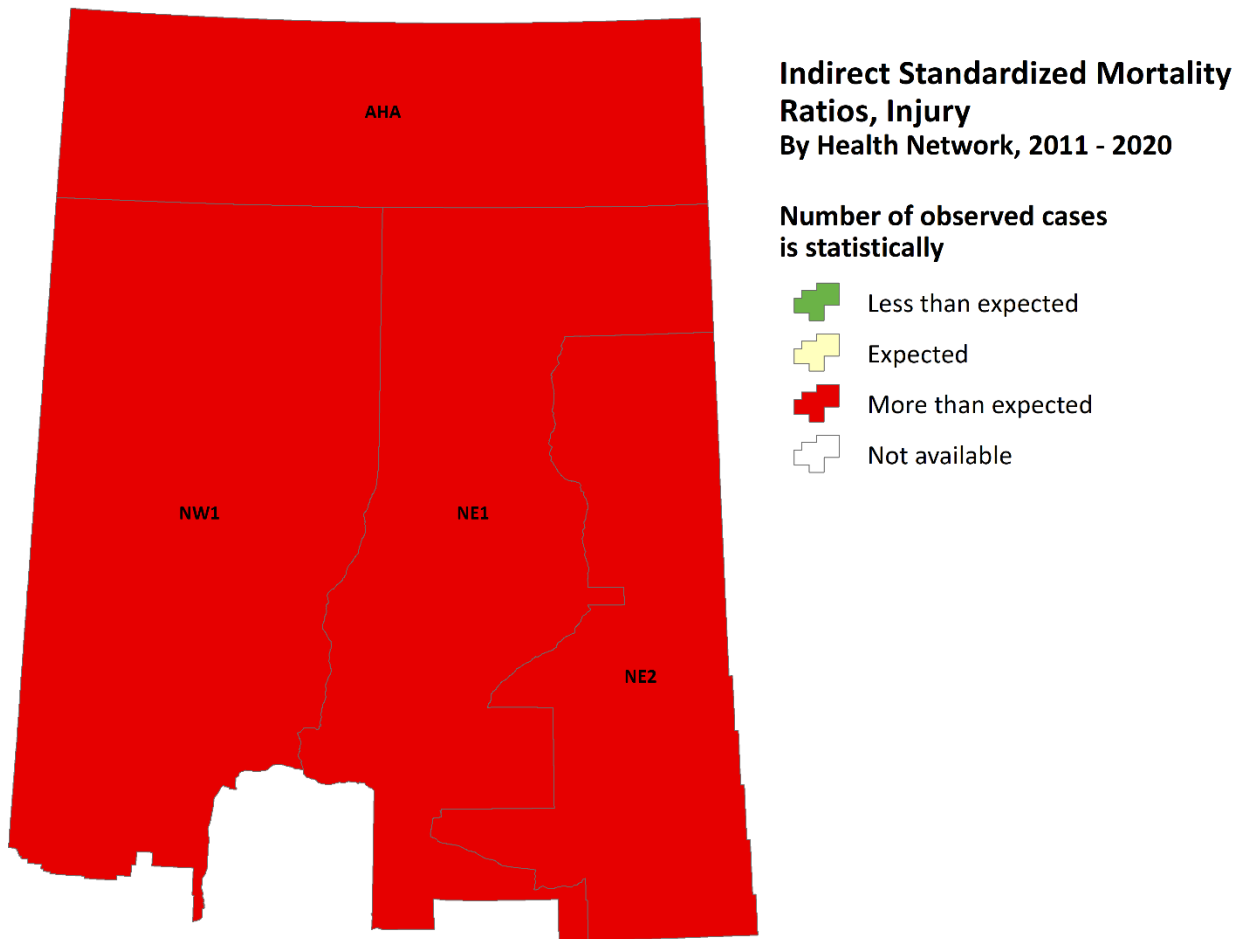


Figure 11: Indirect standardized injury mortality ratio, 10-year average, by SAG, 2011-2020

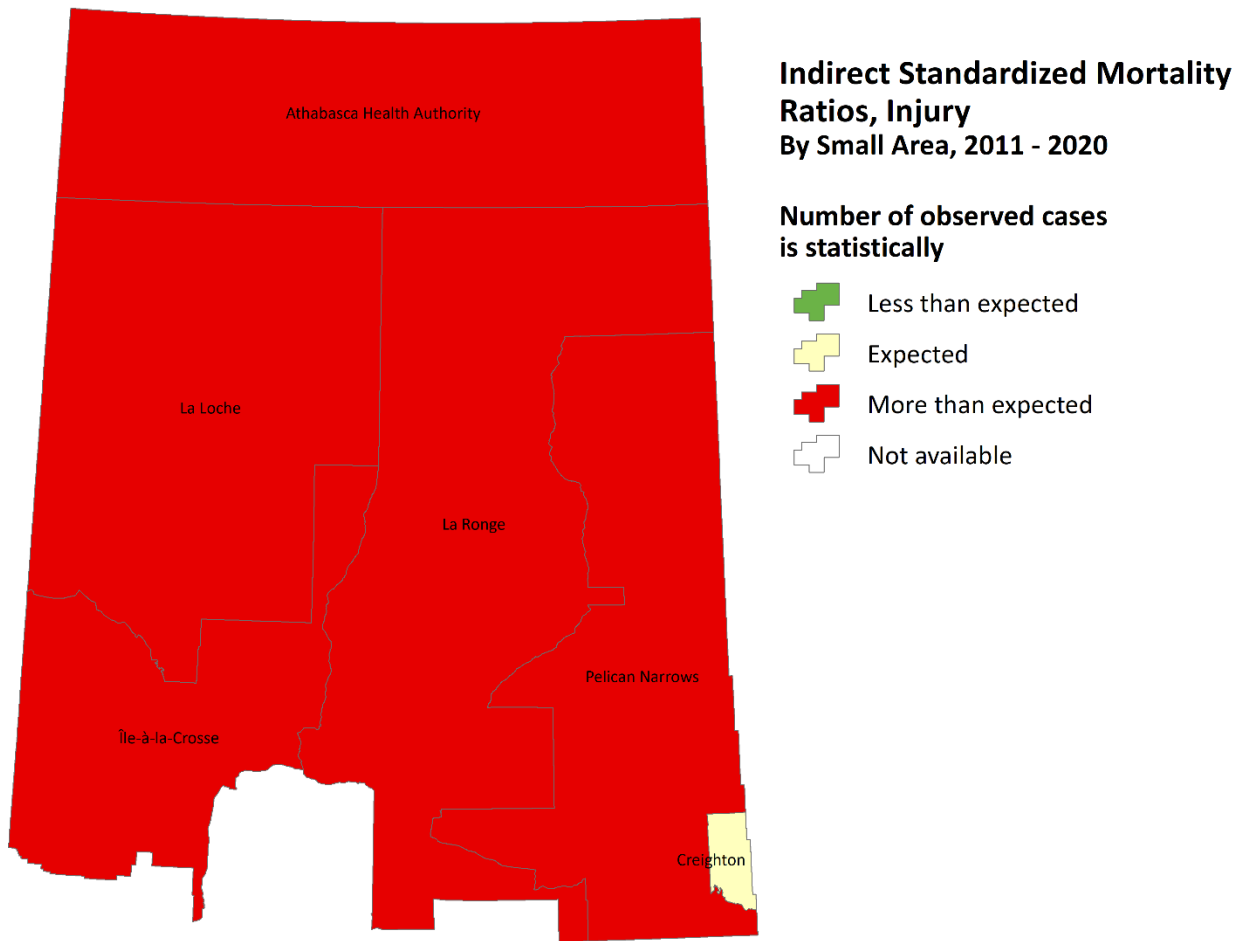


Figure 12: Indirect standardized respiratory mortality ratio, 10-year average, by health networks, 2011-2020

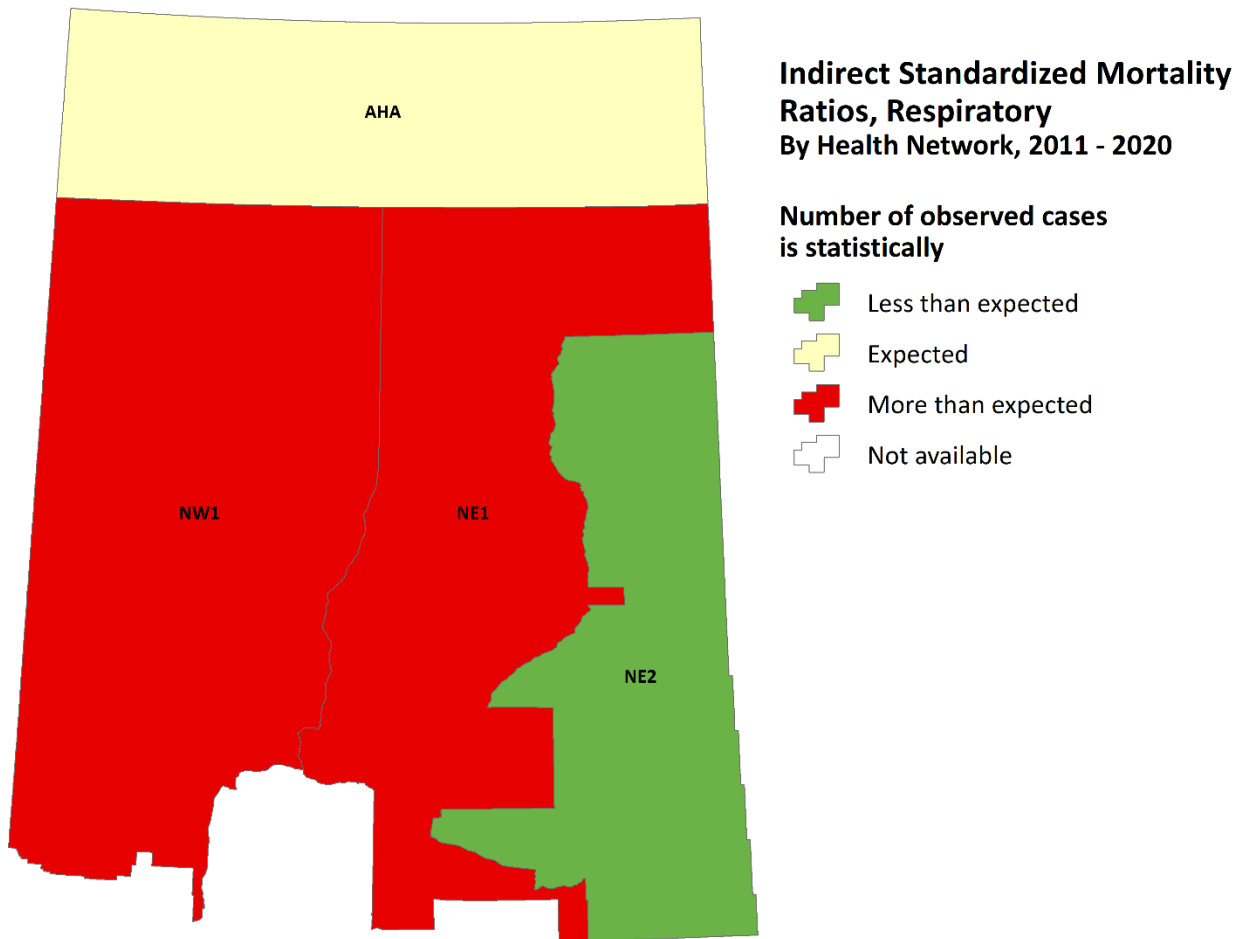


Figure 13: Indirect standardized respiratory mortality ratio, 10-year average, by SAG, 2011-2020

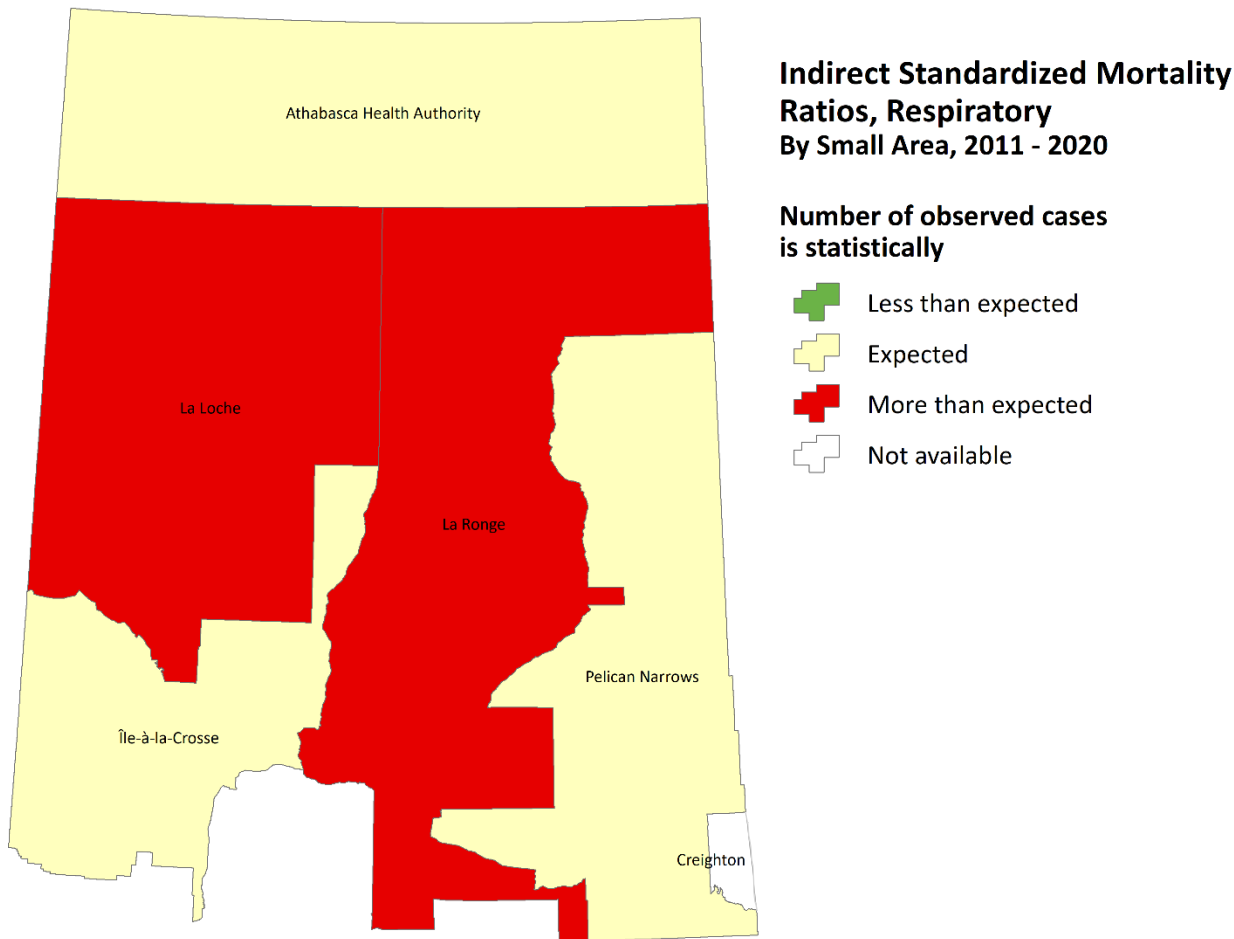


Figure 14: Indirect standardized mental and behavioral disorder mortality ratio, 10-year average, by health networks, 2011-2020

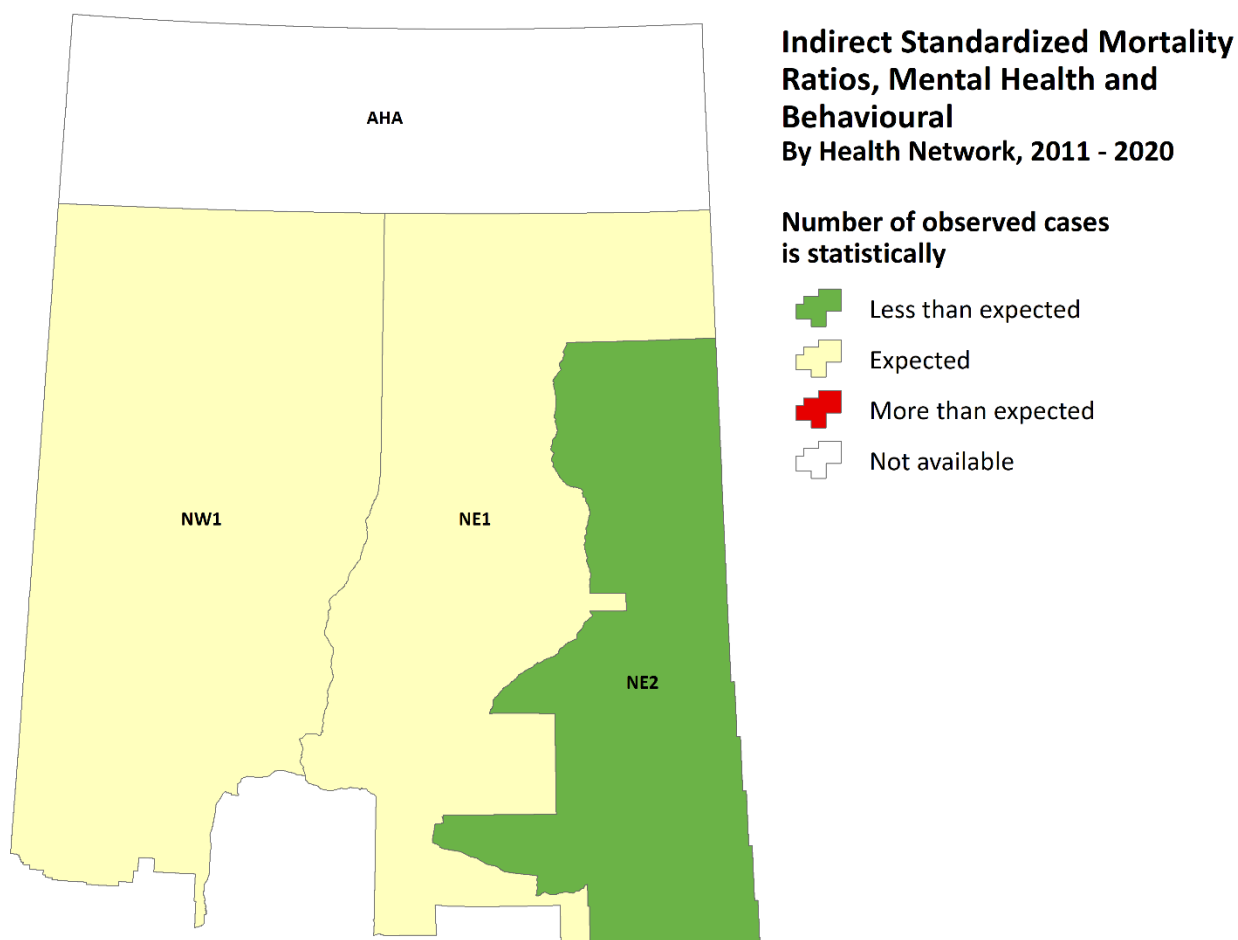


Figure 15: Indirect standardized mental and behavioral disorder mortality ratio, 10-year average, by SAG, 2011-2020

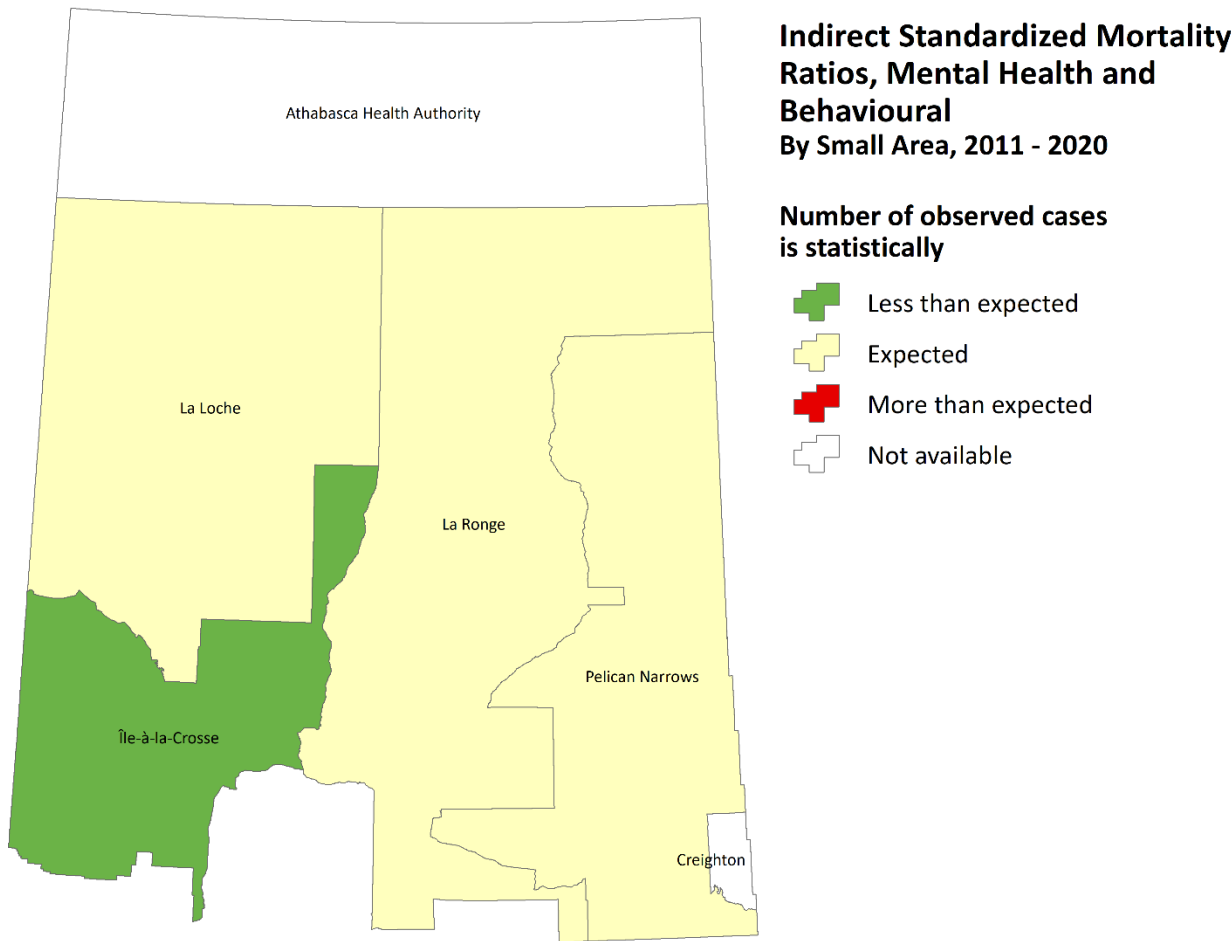


Figure 16: Indirect standardized other mortality ratio, 10-year average, by health networks, 2011-2020

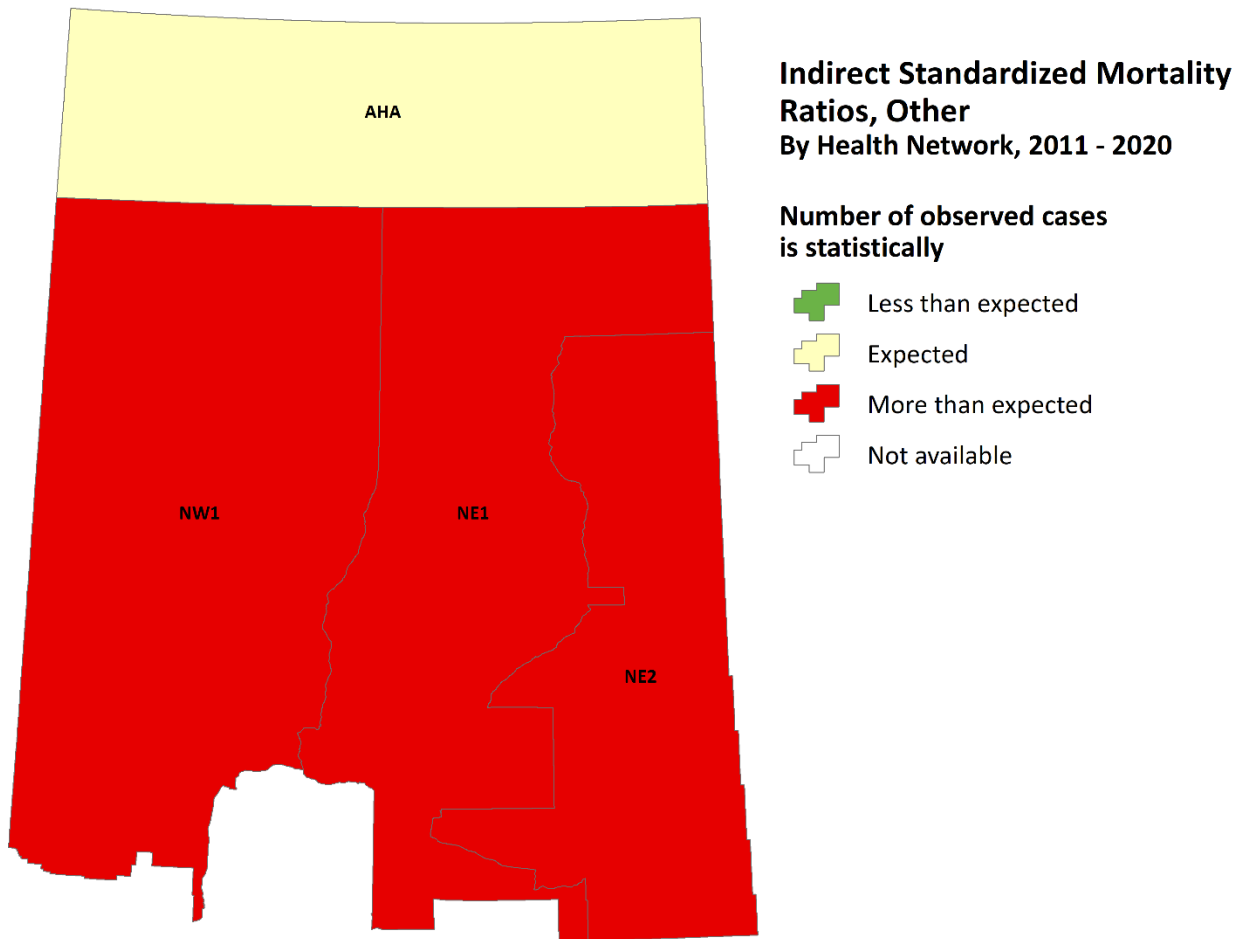
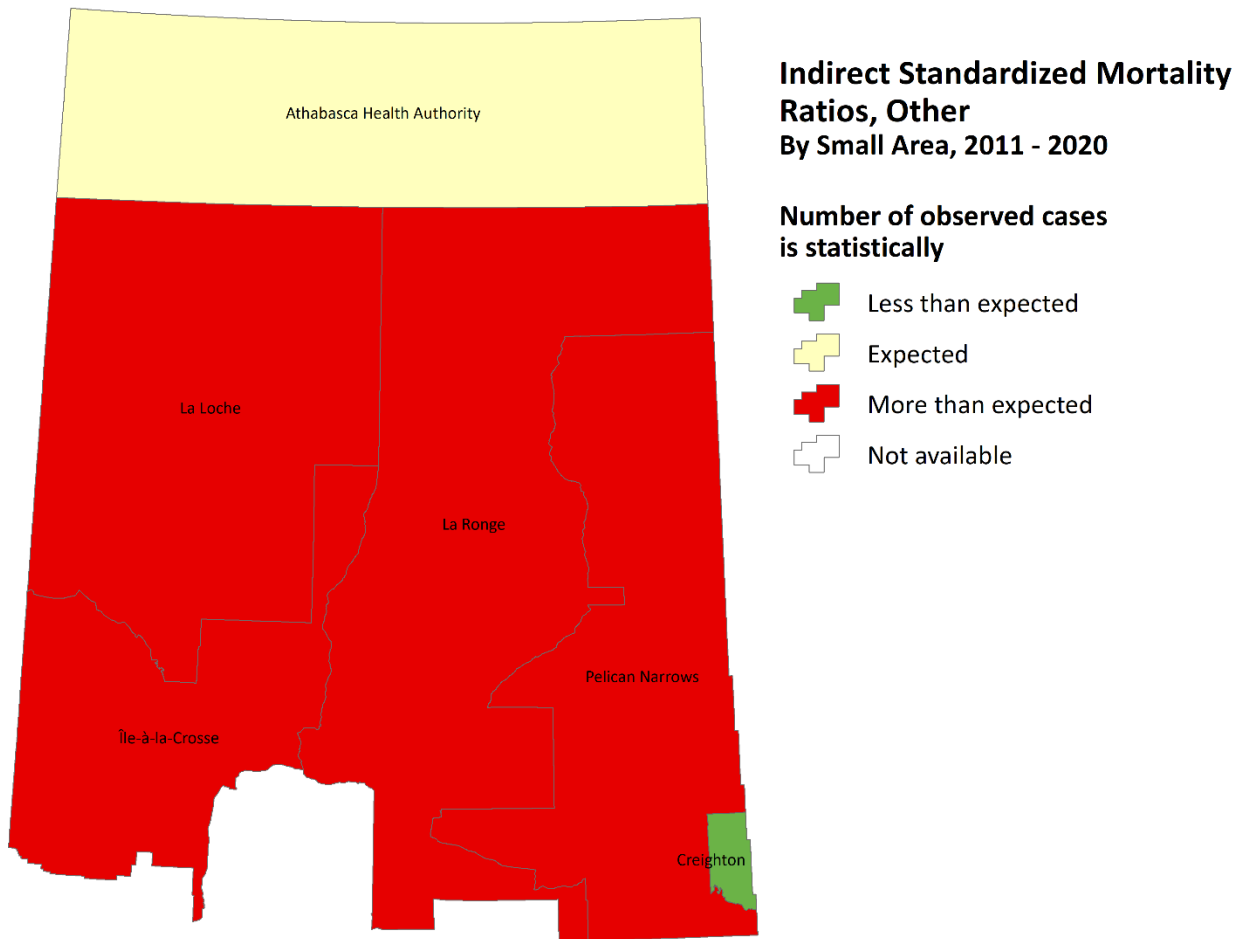
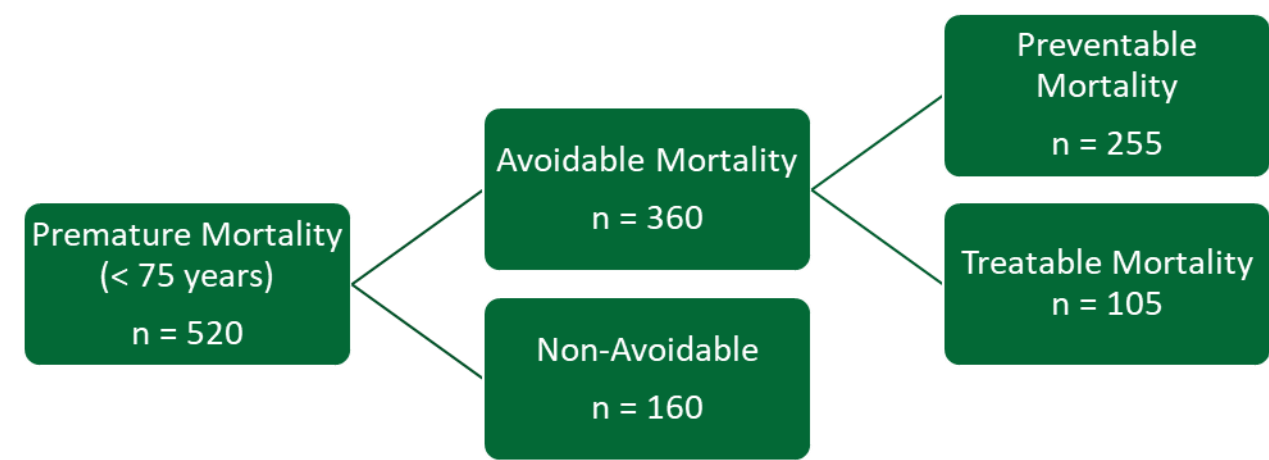


Figure 17: Indirect standardized other mortality ratio, 10-year average, by SAG, 2011-2020



Premature mortality

Figure 18: Premature mortality indicators by proportion of premature mortality, 3 year totals, northern Saskatchewan, 2018-2020



Note* due to rounding, components may not add up exactly to the total. Non-avoidable was calculated by subtracting avoidable from premature.

Figure 19: Age-std premature mortality, 3 year average, northern Saskatchewan and Saskatchewan, 2015-2017 to 2018-2020

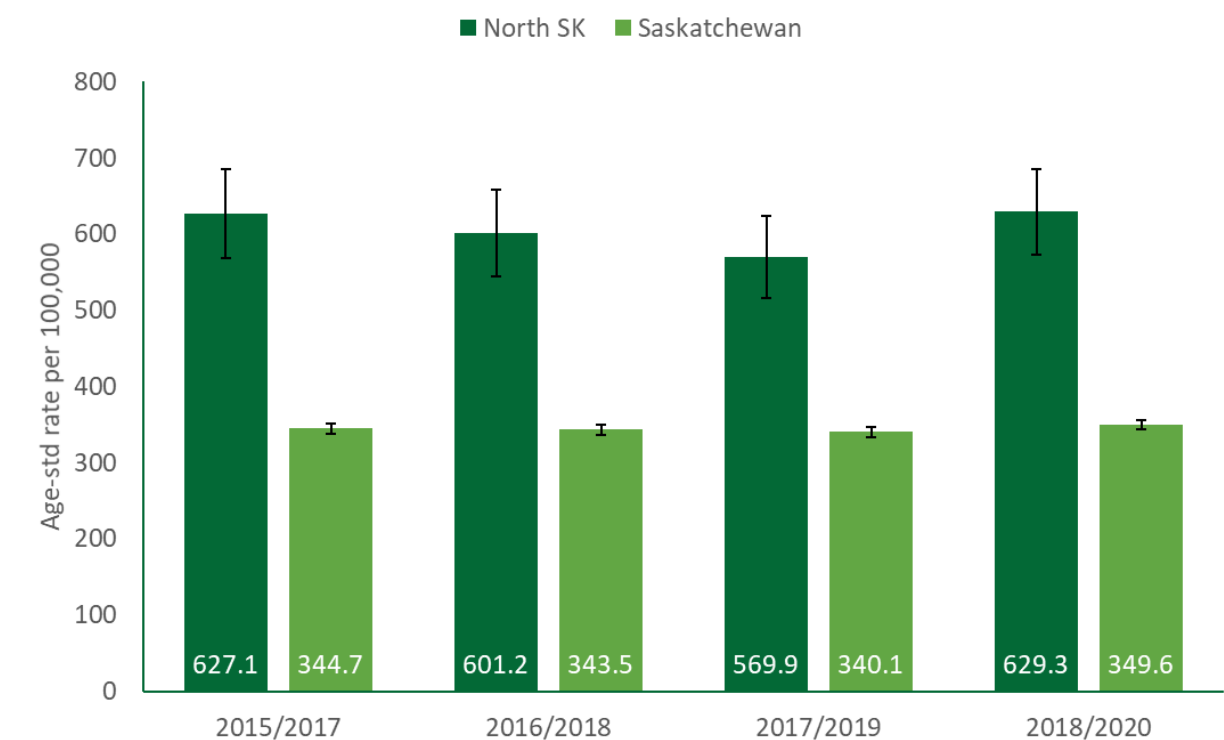


Figure 20: Age-std potentially avoidable mortality, 3 year average, northern Saskatchewan and Saskatchewan, 2015-2017 to 2018-2020

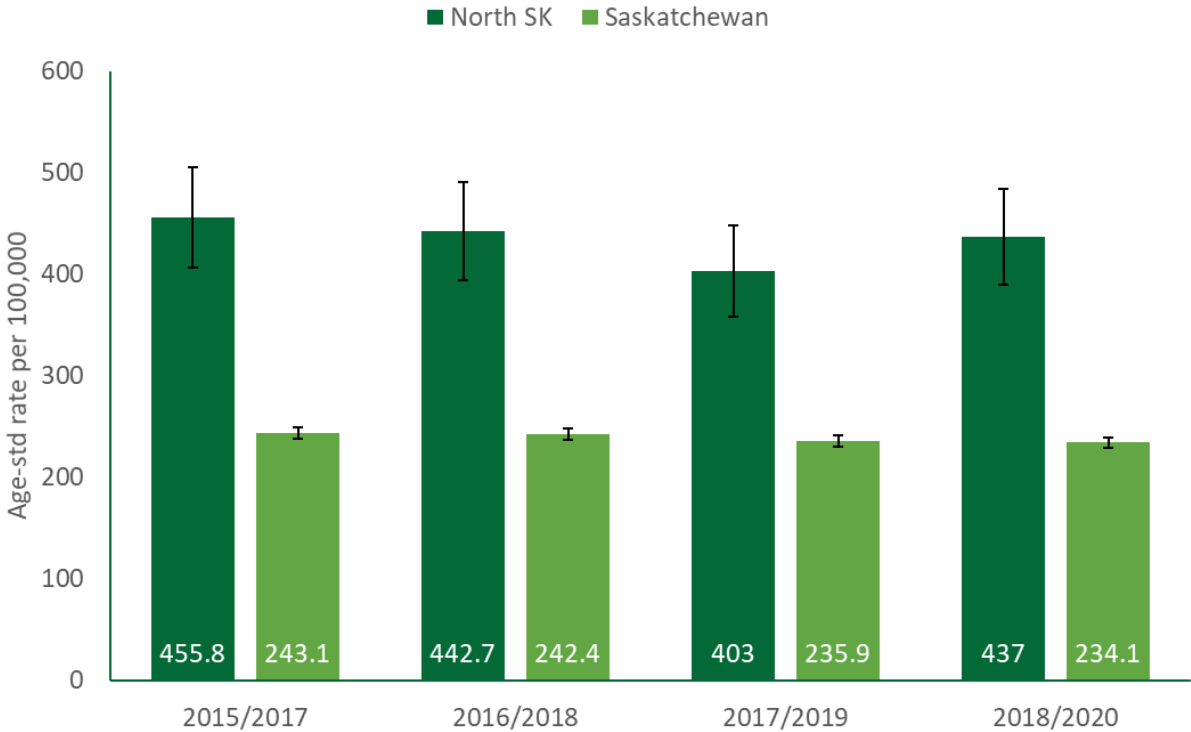


Figure 21: Age-std preventable mortality, 3 year average, northern Saskatchewan and Saskatchewan, 2015-2017 to 2018-2020

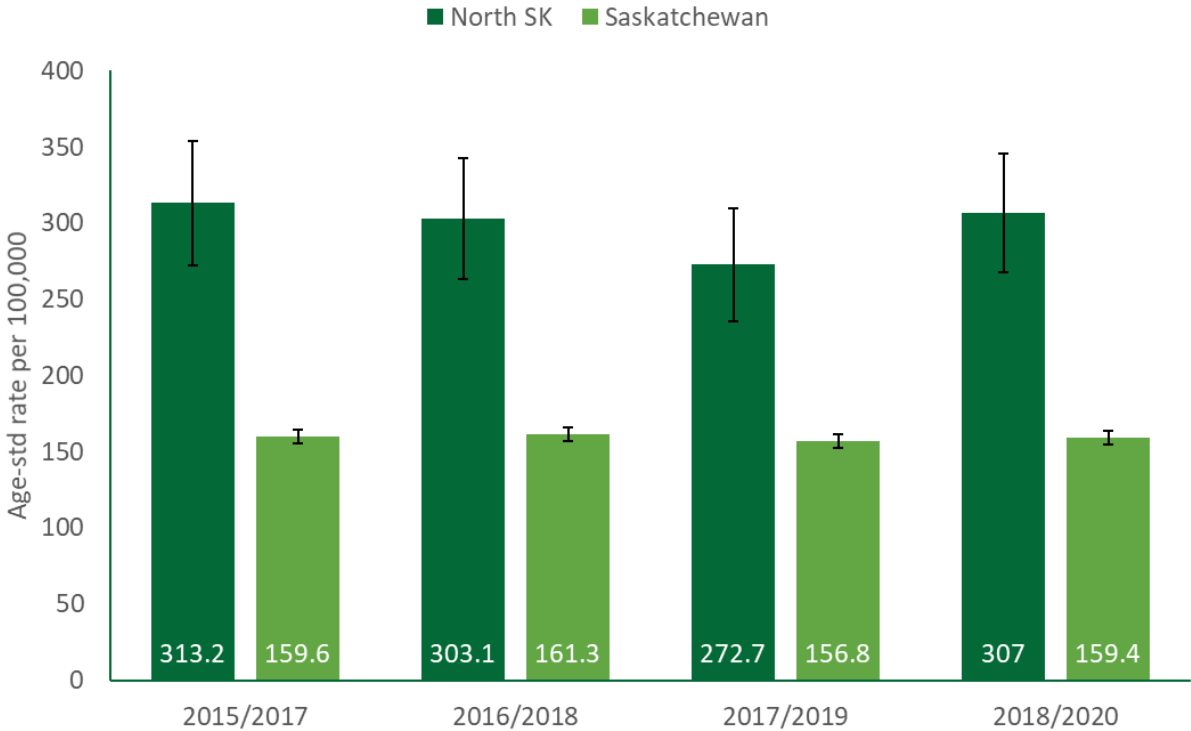
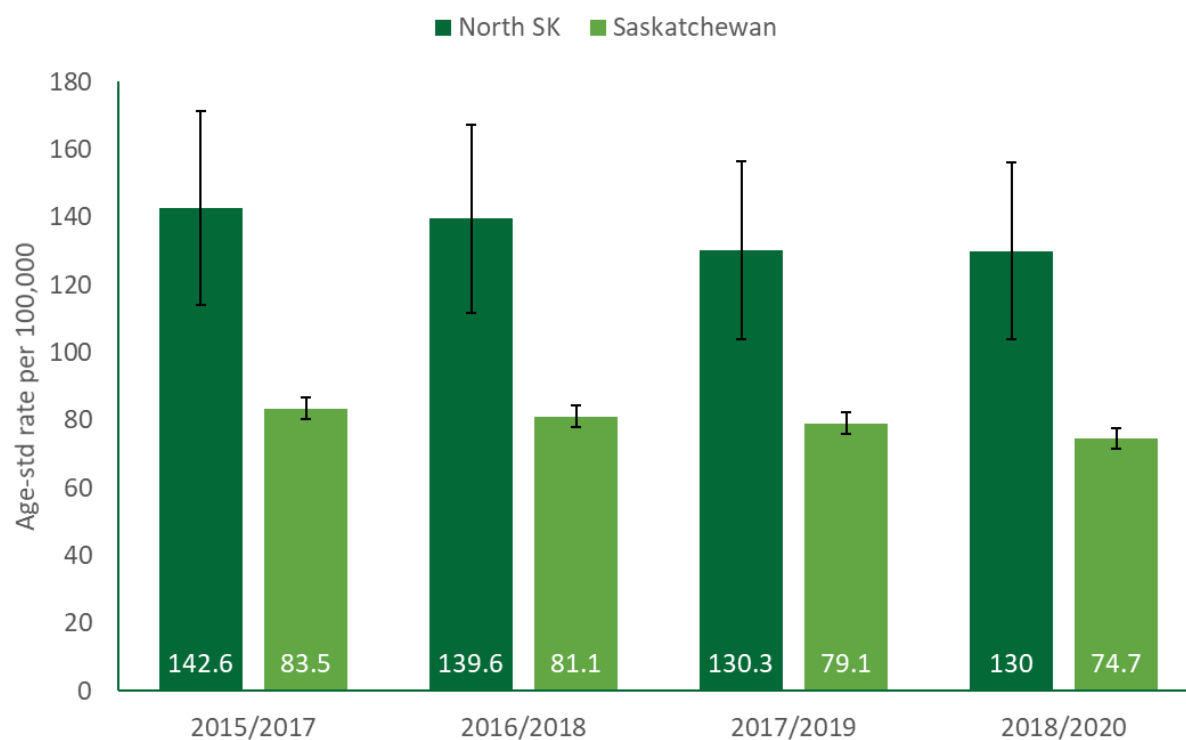


Figure 22: Age-std treatable mortality, 3 year average, northern Saskatchewan and Saskatchewan, 2015-2017 to 2018-2020



APPENDIX A – DATA NOTES

Data Sources

Vital statistics data request with eHealth 2011-2020. The data refers to the number of deaths that occurred over a 10-yr time period, from 2011-2020 as identified in the Saskatchewan Vital Statistics database. Cause of death was based on ICD10 codes and their corresponding chapter (see appendix C). Geographic assignment was based on the rescode of the person as listed in the vital statistics database. Unfortunately we were unable to obtain any other geographical information and as such could not assign SAG or Networks to individuals living in Saskatoon or Regina. Numerators included death counts from vital statistics database. Counts less than 6 were suppressed. Denominators were population estimates from the Covered Population 2022 AESB file (years included 2011-2020) excluding OOP residents. 95% Confidence intervals for crude rates were calculated using the gamma distribution in Microsoft Excel. Standardized Incident Ratios (SIRs) were calculated for each network using the proc stdrate procedure and indirect method in SAS. The reference population was the Saskatchewan total (excluding OOP residents) with 5-yr age groups 00-04, 05-09....80+.

Statistics Canada. Table 13-10-0753-01 Statistics Canada, Canadian Vital Statistics, Death Database and Demography Division. Premature and potentially avoidable mortality, three-year period, Canada, provinces, territories, health regions (2018 boundaries) and peer groups. This file provided all the data on premature, avoidable, preventable and treatable mortality. In this file, northern Saskatchewan is based on the fRHA boundaries of Athabasca Health Authority combined with Mamawetan Churchill River Regional Health Authority and Keewatin Yatthe Regional Health Authority. For a full description of geographical differences between the fRHA's and northern network boundaries please see the Community Characteristics Report "Geographical and Political Profile". In brief, the two are very similar geographies although the fRHA boundaries also included the communities of Dore Lake, Green Lake, Montreal Lake, and Timber Bay.

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%20Indicator%20reports/A%20Guide%20to%20the%20Reports%20Understanding%20the%20Presentation%20of%20Data.pdf)).

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APPENDIX C – LIST OF ICD CODES BY CHAPTER

Category	ICD10 chapter name	ICD10 codes
Total mortality	All chapters	all ICD10 codes
Circulatory	Diseases of the Circulatory System	I00-I99
Cancer	Neoplasms	C00-D48
Respiratory	Diseases of the Respiratory System	J00-J99
Injuries	External Causes of Morbidity and Mortality (Injuries)	V01-Y98
Mental and Behavioral Disorders	Mental and Behavioral Disorders	F00-F99

*The "Other" category was calculated by subtracting known chapters (circulatory, cancer, respiratory, injuries, and mental and behavioral) from total mortality. The remaining deaths were defined as "other". In cases where suppression occurred, the value for "other" would also include the count that was suppressed from that specific chapter and thus would be a slight over count.

*Note: Mental and Behavioral Disorders do not include all deaths from alcohol, narcotics, hallucinogens or other poisonings nor does it include deaths by suicide. Deaths by suicide and acute alcohol and drug poisoning are captured under "Injuries". Other deaths from chronic drug and alcohol use (e.g. alcohol dependency syndrome, alcohol cardiomyopathy) are captured under the specific category (e.g. mental and behavioral disorders, circulatory) depending on the organs involved and specific situation surrounding the death.

APPENDIX D – LIST OF AVOIDABLE MORTALITY BY PREVENTABLE AND TREATABLE CATEGORIES

Category	Subcategory	ICD 10 Codes	Preventable	Treatable
Infections	Enteritis and other Diarrhoeal Disease	A00-A09	x	...
	Tuberculosis	A16-A19, B90, J65	...	x
	Vaccine-preventable Diseases	A35-A37, A39, A40.3, A41.3, A49.2, A80, B01, B05, B06, J09-J11, J13, J14, G00.0, G00.1	x	...
	Selected Invasive Bacterial Infections	A38, A48.1, A49.1	...	x
	Sepsis	A40 (except A40.3), A41 (except A41.3)	...	x
	Malaria	B50-B54	...	x
	Meningitis	G00.2,3,8,9	...	x
	Cellulitis	A46, L03	...	x
	Pneumonia	J12, J15, J16, J18	...	x
	Sexually Transmitted Infections, except HIV/AIDS	A50-A60, A63, A64	x	...
	Viral Hepatitis	B15-B19	x	...
	HIV/AIDS	B20-B24	x	...
Neoplasms	Lip, Oral Cavity and Pharynx Cancer	C00-C14	x	...
	Esophageal Cancer	C15	x	...
	Stomach Cancer	C16	x	...
	Colorectal Cancer	C18-C21	...	x
	Liver Cancer	C22	x	...
	Lung Cancer	C33, C34	x	...
	Melanoma Skin Cancer	C43	x	...

Category	Subcategory	ICD 10 Codes	Preventable	Treatable
	Non-melanoma Skin Cancer	C44	x	...
	Malignant Neoplasm of Breast	C50	...	x (female only)
	Cervical Cancer	C53	...	x
	Uterus Cancer	C54, C55	...	x
	Testicular Cancer	C62	...	x
	Bladder Cancer	C67	...	x
	Thyroid Cancer	C73	...	x
	Hodgkin's Disease	C81	...	x
	Leukemia	C91.0, C91.1, C92.1	...	x (age <45)
	Benign Neoplasms	D10-D36	...	x
Diseases of the Circulatory System	Rheumatic Heart Disease	I01, I02, I05-I09	x	...
	Hypertensive Diseases	I10, I11-I13, I15	...	x
	Cerebrovascular Diseases	I60-I62, I63-I64, I67, I69	x (50%)	x (50%)
	Ischaemic Heart Disease	I20-I25	x (50%)	x (50%)
	Other Atherosclerosis	I70, I73.9	x (50%)	x (50%)
	Aortic Aneurysm	I71	x	...
	Venous Thromboembolism	I26, I80, I82.9	x	...
Diseases of the Respiratory System	Chronic Obstructive Pulmonary Disorders	J40-J44	x	...
	Asthma and Bronchiectasis	J45, J47	...	x
	Acute Lower Respiratory Infections	J20, J22	...	x
	Upper Respiratory Infections	J00-J06, J30-J39	...	x
	Lung Diseases due to External Agents	C45, J60-J64, J66-J70, J82, J92	x	...
	Adult Respiratory Distress Syndrome	J80	...	x
	Pulmonary Oedema	J81	...	x
	Abscess of Lung and Mediastinum; Pyothorax	J85, J86	...	x
	Other Pleural Disorders	J90, J93, J94	...	x
	Other Respiratory Disorders	J98	...	x
	Peptic Ulcer Disease	K25-K28	...	x

Category	Subcategory	ICD 10 Codes	Preventable	Treatable
Diseases of the Digestive System	Diseases of Appendix; Hernia; Disorders of Gallbladder, Biliary Tract, and Pancreas	K35-K38, K40-K46, K80-K83 K85.0,1,3,8,9 K86.1,2,3,8,9	...	x
	Chronic Liver Disease (excluding Alcohol-related Disease)	K73, K74.0,1,2,6	x	...
Diseases of the Genito-urinary System	Nephritis and Nephrosis	N00-N07	...	x
	Renal Failure	N17-N19	...	x
	Obstructive Uropathy, Urolithiasis & Prostatic Hyperplasia	N13, N20, N21, N23, N35, N40	...	x
	Inflammatory Diseases of Genito-urinary System	N34.1, N70-N73, N75.0, N75.1, N76.4, N76.6	...	x
	Disorders resulting from Impaired Renal Tubular Function	N25	...	x
Infant and Maternal Causes	Complications of Perinatal Period A	A33	x	...
	Complications of Perinatal Period B	H31.1, P00-P96	...	x
	Congenital Malformations, Deformations and Chromosomal Anomalies	Q00-Q99	...	x
	Pregnancy, Childbirth and the Puerperium	O00-O99	...	x
Unintentional Injuries	Transport Accidents	V01-V99	x	...
	Falls	W00-W19	x	...
	Other External Causes of Accidental Injury	W20-W64, W75-W99 X10-X39, X50-X59	x	...
	Drowning	W65-W74	x	...
	Fires and Flames	X00-X09	x	...
	Accidental Poisonings	X40-X49	x	...
Injuries of Undetermined Intent	Injuries of Undetermined Intent	Y10-Y34	x	...
Intentional Injuries	Suicide and Self-inflicted Injuries	X60-X84, Y87.0	x	...
	Assault	X85-X99 Y00-Y09, Y87.1	x	...
Alcohol and Drug Use Disorders	Alcohol-related Diseases, excluding External Causes	F10, G31.2, G62.1, I42.6, K29.2, K70, K85.2, K86.0	x	...

Category	Subcategory	ICD 10 Codes	Preventable	Treatable
	Drug Use Disorders	F11-F16, F18, F19	x	...
Nutritional, Endocrine and Metabolic Disorders	Nutritional Deficiency Anaemia	D50-D53	x	...
	Thyroid Disorders	E00-E07	...	x
	Diabetes Mellitus	E10-E14	x (50%)	x (50%)
	Adrenal Disorders	E24, E25, E27	...	x
	Congenital Metabolic Disorders	E74.0, E74.2	...	x
Neurological Disorders	Epilepsy	G40, G41	...	x
Disorders of Musculo-skeletal System	Osteomyelitis	M86	...	x
Adverse Effects of Medical and Surgical Care	Drugs, medicaments and biological substances causing adverse effects in therapeutic use	Y40-Y59	x	...
	Misadventures to patients during surgical and medical care	Y60-Y66, Y69	x	...
	Medical devices associated with adverse incidents in diagnostic & therapeutic use	Y70-Y82	x	...
	Surgical and other medical procedures as the cause of abnormal reaction	Y83, Y84	x	...

APPENDIX E – REFERENCES

1. Canadian Institutes of Health Information. *Avoidable Deaths [indicator]*. April 18, 2023]; Available from: <https://www.cihi.ca/en/indicators/avoidable-deaths>.
2. Canadian Institutes of Health Information. *Avoidable Deaths from Preventable Causes [indicator]*. April 18, 2023]; Available from: <https://www.cihi.ca/en/indicators/avoidable-deaths-from-preventable-causes>.
3. Canadian Institutes of Health Information. *Avoidable Deaths from Treatable Causes [indicator]*. April 18, 2023]; Available from: <https://www.cihi.ca/en/indicators/avoidable-deaths-from-treatable-causes>.