DEPARTMENT OF HEALTH

Central Sands Community Health Profile

MN Environmental Public Health Tracking and Biomonitoring Programs

January 2018

Contents

Acknowledgements

Thank you to the local public health officials in Becker County, Hubbard County, Morrison County, Todd County, Wadena County and Otter Tail County for your input on this report.

Introduction and Purpose

The Environmental Public Health Tracking (MN Tracking) and Biomonitoring Programs at the Minnesota Department of Health (MDH) gather and share public health surveillance data on environmental hazards, chemicals in people and related chronic diseases in Minnesota communities. Data and information are disseminated via an online data portal, called Minnesota Public Health Data Access, and used to inform data-driven public health actions and decision making. The program is advised by an external science advisory panel, the Environmental Health Tracking and Biomonitoring (EHTB) Advisory Panel.

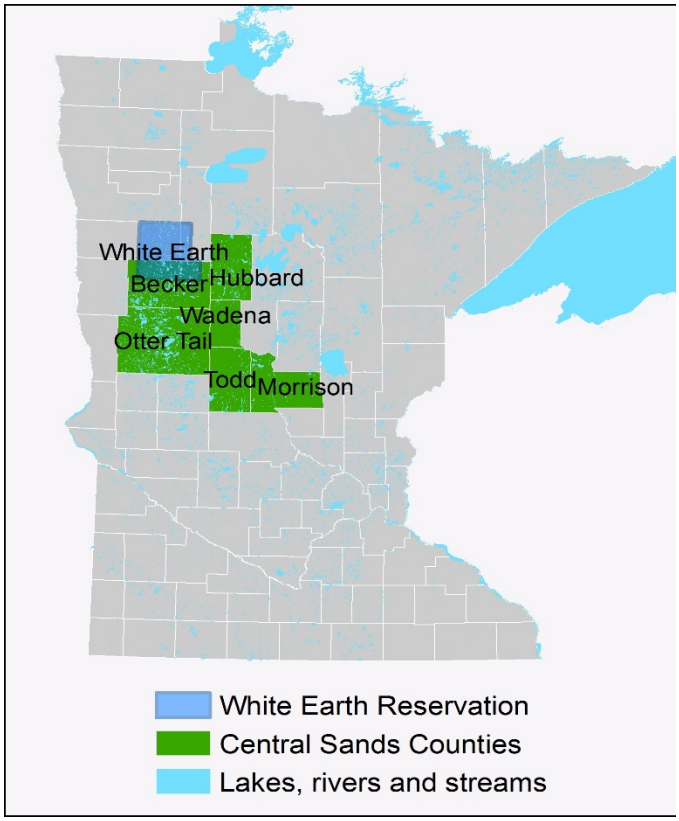
In February 2016, community members from counties in North Central Minnesota (the "Central Sands" region) contacted the EHTB Advisory Panel about their concerns regarding health problems in their area and the frequent use and aerial spraying of pesticides near where they live. Portions of the White Earth Reservation are included in these central counties. Program staff, with guidance from the EHTB Scientific Advisory Panel, have studied the issue, reviewed the available public health data and are responding to community concerns.

As part of this response, MDH staff visited the Central Sands area in summer 2016 and met with local public health agencies, staff from the White Earth Band and community organizations. Meetings with local public health agencies included county public health directors and/or their staff from six county public health agencies: Becker County, Hubbard County, Morrison County, Todd County, Wadena County and Otter Tail County. During the meetings, MDH staff learned broadly about community health and environmental concerns in the area.

In response to these community questions and concerns, MDH staff have developed this community health profile using existing data from the MN Tracking network. Staff compiled a list of health concerns reported by communities. Then staff reviewed existing surveillance data across MN Tracking environmental hazard and health indicators, publicly available on the Minnesota Public Health Data Access portal. In some cases, staff requested special data analyses to supplement information available on the portal.

This community health profile provides baseline health data for counties in the Central Sands region and compares the region to the state. It helps local public health and community members identify potential health disparities and prioritize public health action.

Description of the Central Sands Region



Becker County:

Becker County is located in the West Central region of Minnesota, and as of 2016, has an estimated population of 33,734. The age distribution of this population is 24.3% under 18-years, 6.4% of which are under the age of 5, 55.7% between the ages of 18 and 64, and 20.0% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 7.8% American Indian and Alaska Native, 0.5% Asian, 0.6% Black or African American, 1.2% Hispanic or Latino, 86.6% White, and 3.4% of the people are two or more races/ethnicities. In addition, from 2011 to 2015, 1.7% of the population were foreign born. The median household income between 2011 and 2015 was $52,038. In 2014, 6.4% of children under 19-years, 10.7% of adults aged 18 to 64, and 9.4% of people under the age of 65 did not have health insurance.

Hubbard County:

Hubbard County is located in the Northwest region of Minnesota, and as of 2016, has an estimated population of 20,718. The age distribution of this population is 21.3% under 18-years, 5.6% of which are under the age of 5, 54.1% between the ages of 18 and 64, and 24.6% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 2.7% American Indian and Alaska Native, 0.2% Asian, 0.2% Black or African American, 1.6% Hispanic or Latino, 93.6% White, and 1.8% of the people are two or more races/ethnicities. In addition, from 2011 to 2015, 1.3% of the population were foreign born. The median household income between 2011 and 2015 was $47,486. In 2014, 5.5% of children under 19-years, 10.0% of adults aged 18 to 64, and 8.8% of people under the age of 65 did not have health insurance.

Morrison County:

Morrison County is located in the Central region of Minnesota, and as of 2016, has an estimated population of 32,821. The age distribution of this population is 23.6% under 18-years, 5.9% of which are under the age of 5, 58.0% between the ages of 18 and 64, and 18.4% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 0.2% American Indian and Alaska Native, 0.3% Asian, 0.4% Black or African American, 1.2% Hispanic or Latino, 96.9% White, and 1.1% of the people are two or more

races/ethnicities. In addition, from 2011 to 2015, 1.0% of the population were foreign born. The median household income between 2011 and 2015 was $50,049. In 2014, 4.8% of children under 19-years, 8.6% of adults aged 18 to 64, and 7.6% of people under the age of 65 did not have health insurance.

Otter Tail County:

Otter Tail County is located in the West Central region of Minnesota, and as of 2016, has an estimated population of 58,085. The age distribution of this population is 21.7% under 18-years, 5.9% of which are under the age of 5, 55.1% between the ages of 18 and 64, and 23.2% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 0.5% American Indian and Alaska Native, 0.5% Asian, 0.8% Black or African American, 2.6% Hispanic or Latino, 94.7% White, and 1.2% of the people are two or more races/ethnicities. In addition, from 2011 to 2015, 2.6% of the population were foreign born. The median household income between 2011 and 2015 was $52,365. In 2014, 4.2% of children under 19-years, 8.6% of adults aged 18 to 64, and 7.4% of people under the age of 65 did not have health insurance.

Todd County:

Todd County is located in the Central region of Minnesota, and as of 2016, has an estimated population of 24,233. The age distribution of this population is 23.9% under 18-years, 6.6% of which are under the age of 5, 56.2% between the ages of 18 and 64, and 19.9% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 0.3% American Indian and Alaska Native, 0.4% Asian, 0.4% Black or African American, 5.2% Hispanic or Latino, 92.6% White, and 1.3% of the people are two or more races/ethnicities. In addition, from 2011 to 2015, 3.6% of the population were foreign born. The median household income between 2011 and 2015 was $46,414. In 2014, 7.2% of children under 19-years, 11.2% of adults aged 18 to 64, and 10.0% of people under the age of 65 did not have health insurance.

Wadena County:

Wadena County is located in the Central region of Minnesota, and as of 2016, has an estimated population of 13,761. The age distribution of this population is 24.4% under 18-years, 6.7% of which are under the age of 5, 53.6% between the ages of 18 and 64, and 22.0% that are 65-years and older. According to the 2010 Census, the racial/ethnic breakdown of the county is 0.5% American Indian and Alaska Native, 0.3% Asian, 0.8% Black or African American, 1.3% Hispanic or Latino, 95.8% White, and 1.5% of the people are two or more races/ethnicities. In addition, from 2011 to 2015, 1.4% of the population were foreign born. The median household income between 2011 and 2015 was $41,906. In 2014, 4.5% of children under 19-years, 8.5% of adults aged 18 to 64, and 7.2% of people under the age of 65 did not have health insurance.

Key Findings

Data and indicators examined for this project include existing county and regional level measures for pesticide poisonings, cancer incidence, asthma, COPD, child blood lead exposure, heart attacks, birth outcomes and obesity. Poverty was included as a key social determinant of health. Data are for single or aggregated years as described below. Although development delay was a health concern identified by the community, we lacked sufficient data to assess this outcome. Unless otherwise noted, the differences described are statistically significant.

Some health indicators were higher in Central Sands counties compared to the state.

- The Central Sands region as a whole had higher rates of pesticide poisoning emergency department (ED) visits compared to the state over a ten year period (2005-2014). About 30% of these pesticide poisoning ED visits occurred in young children.
- A number of Central Sands counties had higher poverty rates than the rest of the state. Becker, Todd and Wadena counties had higher overall poverty, and Becker, Hubbard, Todd and Wadena counties had higher childhood poverty (2010-2014).
- Some of the counties had higher percentages of children tested for elevated blood lead and childhood obesity. Wadena County had the highest percent of children tested for blood lead (95.8% for 2012 birth cohort), and the highest percent of children tested with elevated blood lead levels (1.9%, though this was not significantly different from the state). In Wadena, Todd and Becker counties, the percent of children in the Women, Infants and Children (WIC) program who were obese was higher than the state (2014, though this was not significantly different). Both of these outcomes are associated with poverty.
- Wadena, Becker and Morrison counties had higher COPD hospitalization rates than the state (2012-2014).

For cancer and heart attacks, depending on the county, rates were both higher and lower compared to the state.

- None of the Central Sands counties had significantly higher or lower all-cancer rates as compared to the state (2009-2013). Morrison County had lower melanoma rates. Wadena County had higher colorectal cancer and non-Hodgkin's lymphoma rates than the state.
- Childhood cancers in the region as a whole were not significantly elevated (2004-2013).
- Becker and Otter Tail counties had higher heart attack hospitalization rates than the state whereas Todd County had a lower rate (2011-2013).

Central Sands counties generally had lower rates of asthma compared to the state.

- All Central Sands counties had significantly lower asthma ED visit rates for children 0-17 years as compared to the state (2010-2014). For the population overall, Becker, Morrison, Otter Tail and Todd counties had lower asthma ED visit rates than the state, and Hubbard and Todd counties had lower asthma hospitalization rates (2011-2013). Wadena County was the one exception; its asthma hospitalization rate was significantly higher than the state.

Reproductive and birth outcomes assessed were similar to the state.

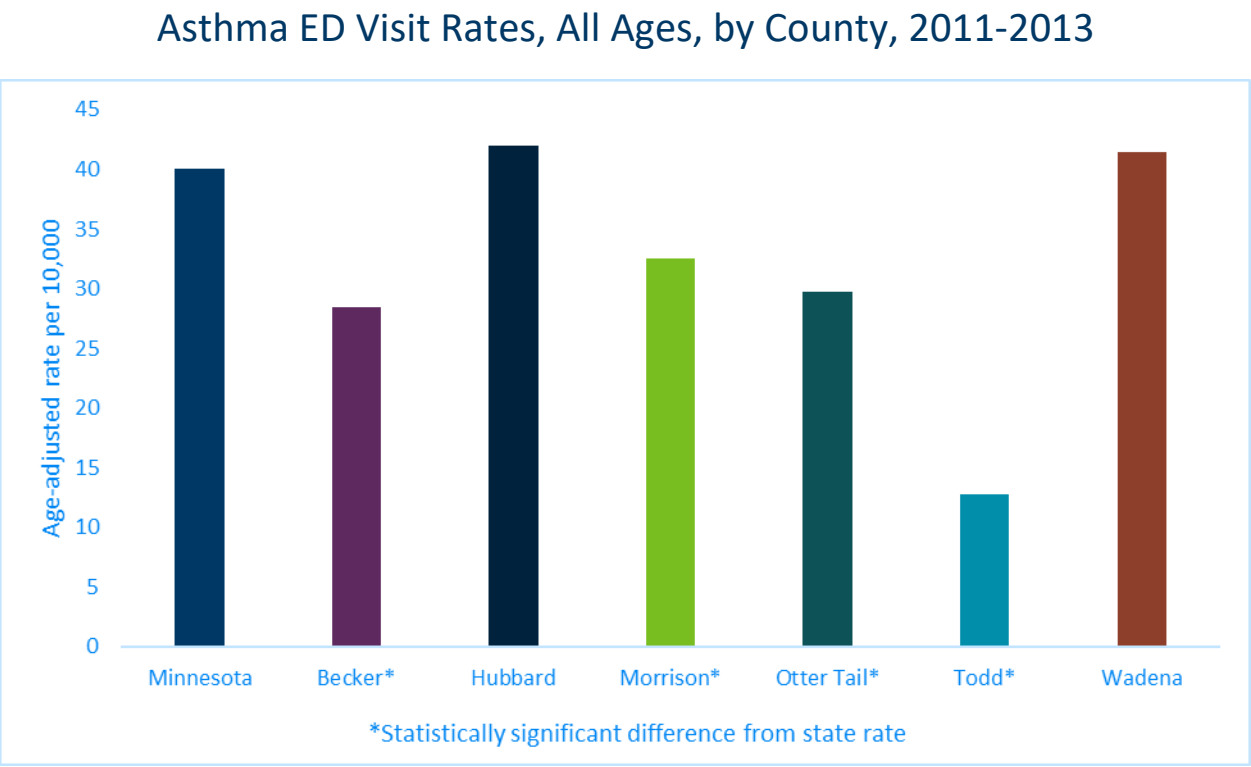
- The percents of low birth weight and premature births in Central Sands counties were similar to the state (2011-2015).
- Infant mortality in the region was slightly lower than the state but was not significantly different (2011-2015).

Asthma

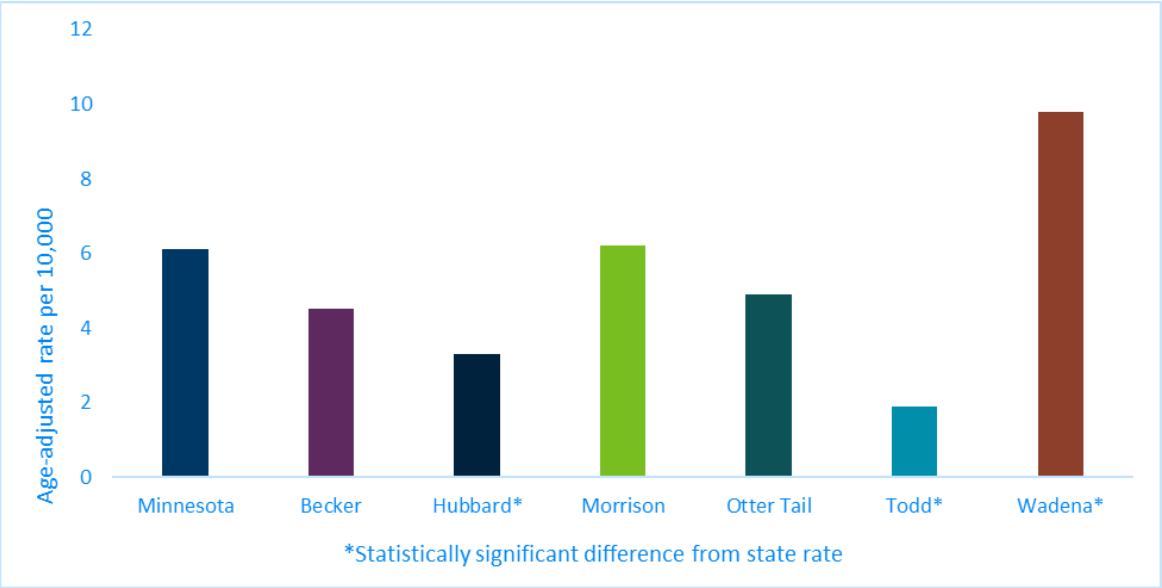
Asthma is a chronic disease that includes broncho-constriction and inflammation of the bronchial tubes. People with asthma have airways that narrow more easily than people who do not have the disease. Asthma is one of the most common chronic diseases in the United States and disproportionately impacts communities based on age, gender, race/ethnicity and low income status.

A variety of factors can trigger an asthma episode, including: viral infections, exposures to allergens (e.g., dust mites, dander protein particles shed by pets, mold, pollen), exercise, tobacco smoke, air pollution, strong emotions, chemical irritants, drugs (aspirin and beta blockers).

The following charts show information on asthma hospitalization and emergency department (ED) visits using Minnesota Hospital Discharge Data, which is obtained by MDH from the Minnesota Hospital Association.



Asthma Hospitalization Rates, All Ages, by County, 2011-2013



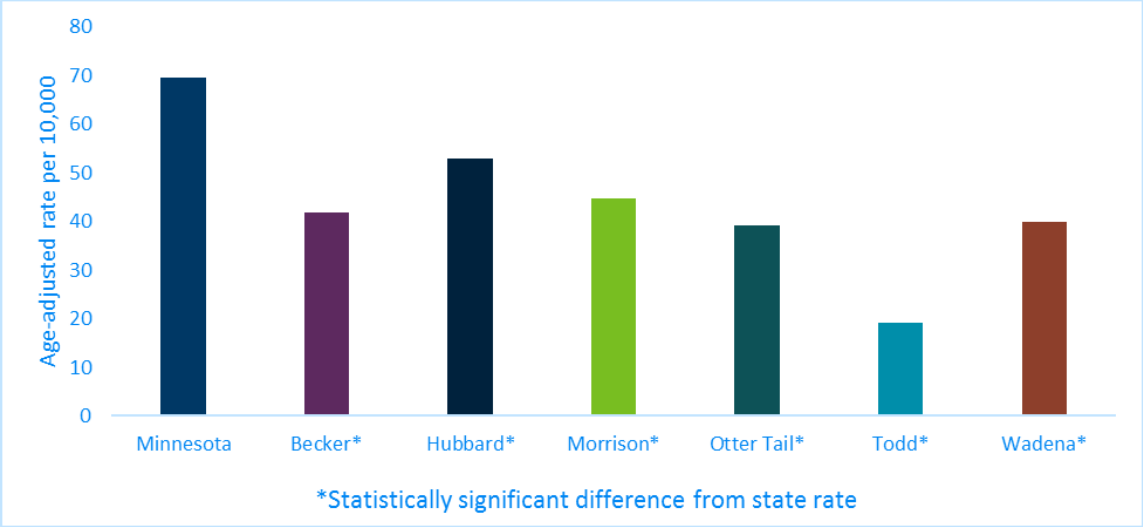
From 2011-2013, Becker, Morrison, Otter Tail and Todd County all had significantly lower asthma ED rates as compared to the state.

From 2011-2013, Hubbard and Todd County had significantly lower asthma hospitalization rates as compared to the state.

Wadena had a significantly higher asthma hospitalization rate as compared to the state. Wadena has higher rates of poverty, which tends to correlate with poor asthma outcomes and could be a contributing factor for asthma hospitalizations, but the real drivers are unknown.

Lower asthma ED and hospitalization rates observed could be due to a lower prevalence of asthma (fewer people at risk for these events), less access to hospitals and emergency rooms, and/or a lower prevalence of risk factors for asthma relative to the state population. High rates of asthma ED visits and hospitalizations in the urban metro area counties are known to occur.

Asthma ED Visit Rates for Children (0-17 years), by County, 2010-2014



Asthma Hospitalization Rates for Children (0-17 years), by County, 2010-2014

All of the Central Sands counties had significantly lower asthma ED rates as compared to the state among children 0-17 years for 2010-2014.

Hubbard and Todd County had significantly lower asthma hospitalization rates among children 0-17 years for 2010-2014 as compared to the state. The rate for Wadena County was suppressed due to having five or less asthma hospitalization cases.

About the Data

These data cannot tell us what leads to asthma hospitalizations and ED visits, the total burden of asthma in a population, or the number of people who are hospitalized or who visited the ED due to asthma. These data represent the number of visits or hospitalizations. Since personal identifiers are removed from the hospital discharge data before analysis, individuals who have multiple hospitalizations or ED visits cannot be identified.

Rates for counties in which residents are likely to visit hospitals that do not submit data to the Minnesota Hospital Association (e.g., Veteran's Administration or Indian Health Services hospitals) may also be artificially low. There is the potential for patient zipcodes to be assigned to the incorrect county causing some geography misclassification along county borders.

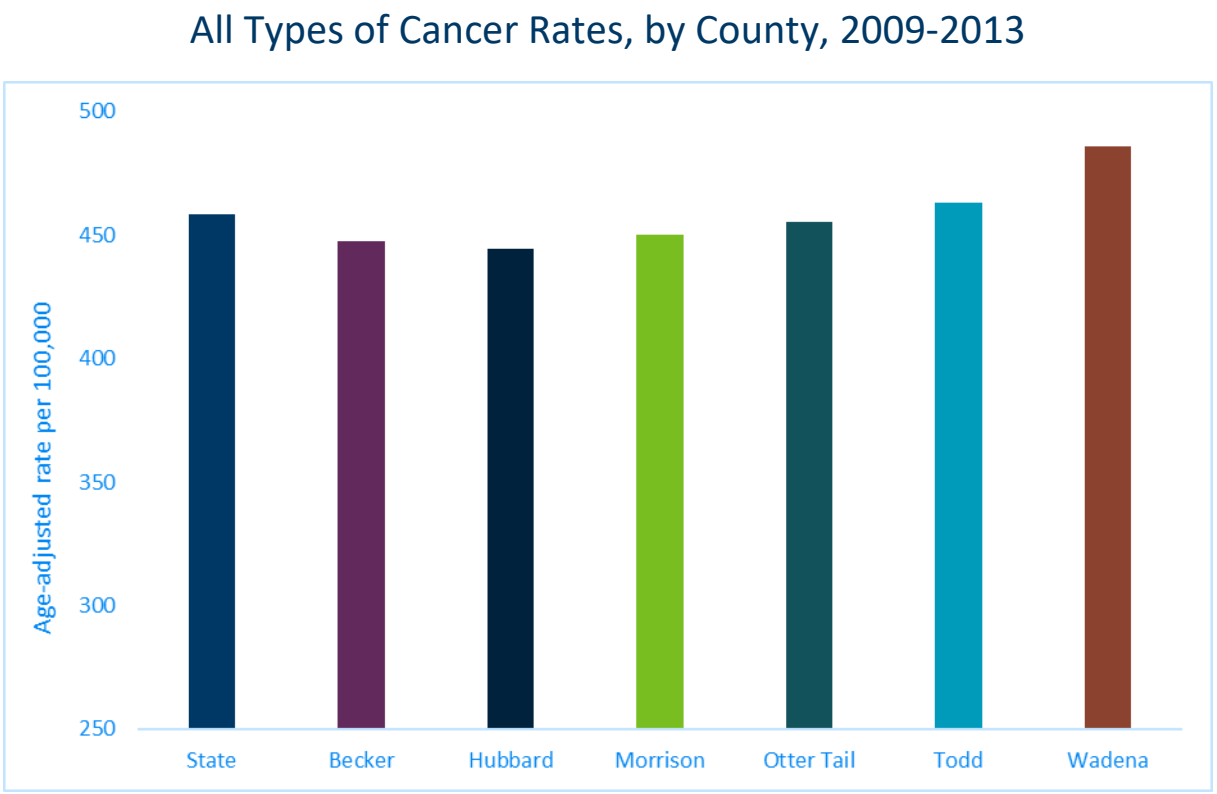
For more information: about the asthma data

Cancer

Cancer is a group of diseases that share the uncontrolled growth and spread of abnormal cells. Nearly half of all Minnesotans will be diagnosed with a potentially serious cancer during their lifetimes. Although the cancer mortality rate has decreased by nearly 15% in Minnesota over the past 20 years, one out of four Minnesotans die of cancer and cancer is the leading cause of death in the state.

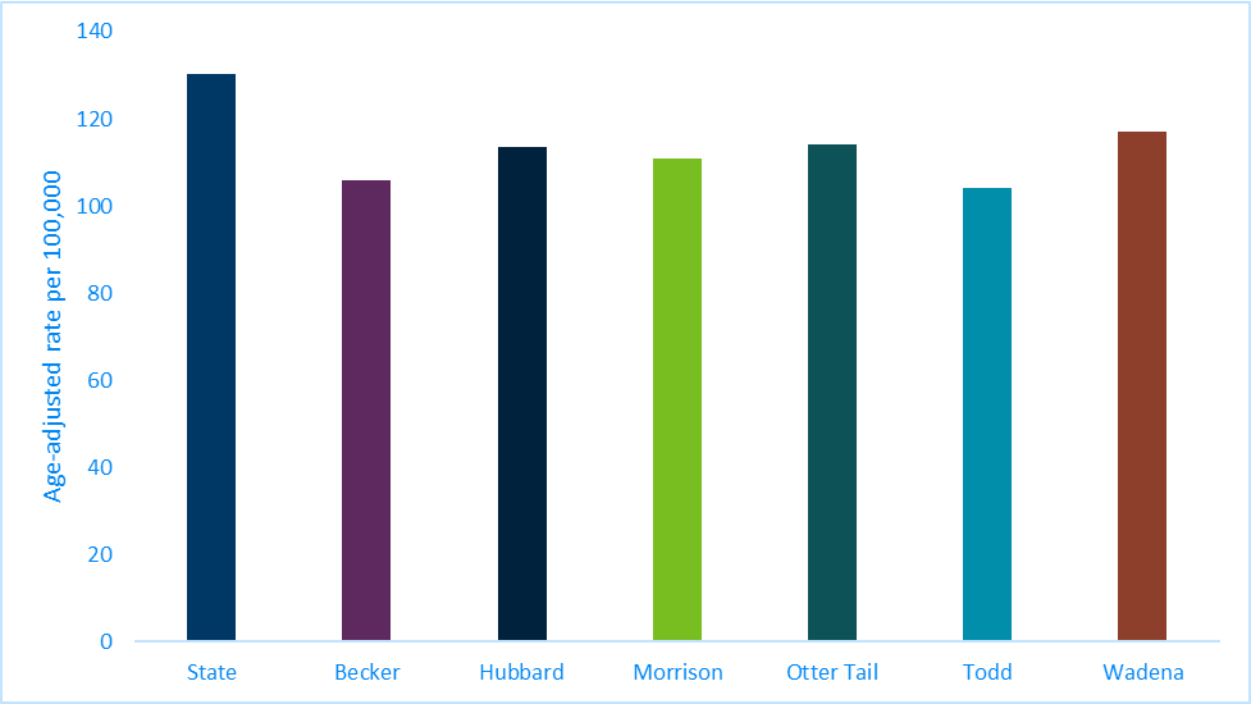
Cancer is a complex, multi-faceted disease that can have many factors. The primary determinants of risk for most cancers include smoking, obesity, diet, lack of exercise, UV radiation, alcohol, viruses, genetics, reproductive history, medications and occupation.

The following charts show cancer incidence rates using data collected by the Minnesota Cancer Reporting System, Minnesota's central cancer registry.



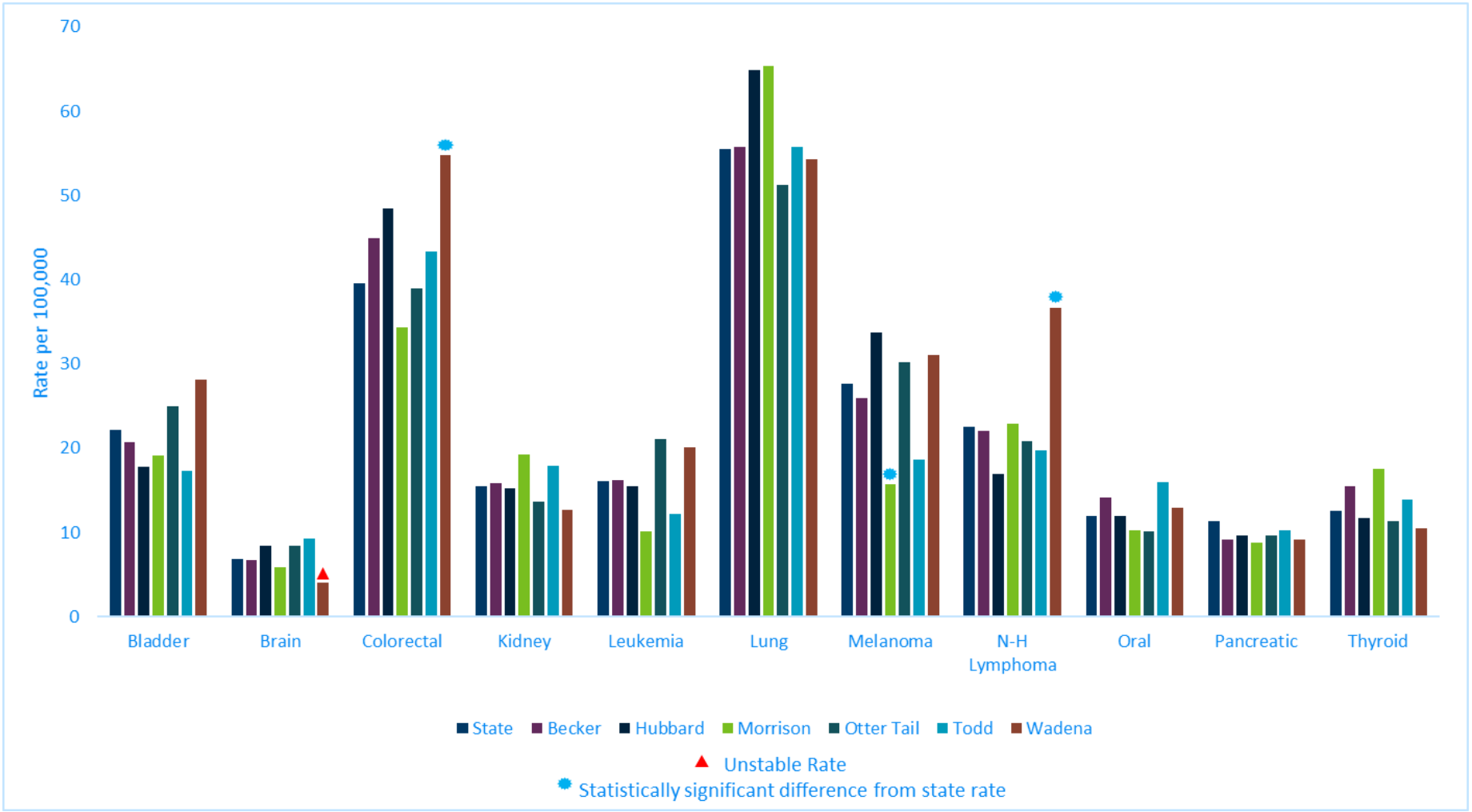
None of the counties were significantly different than the state all-cancer rate in 2009-2013. Wadena County had the highest all-cancer rate, however it was not significantly higher.

Breast Cancer Rates, by County, 2009-2013



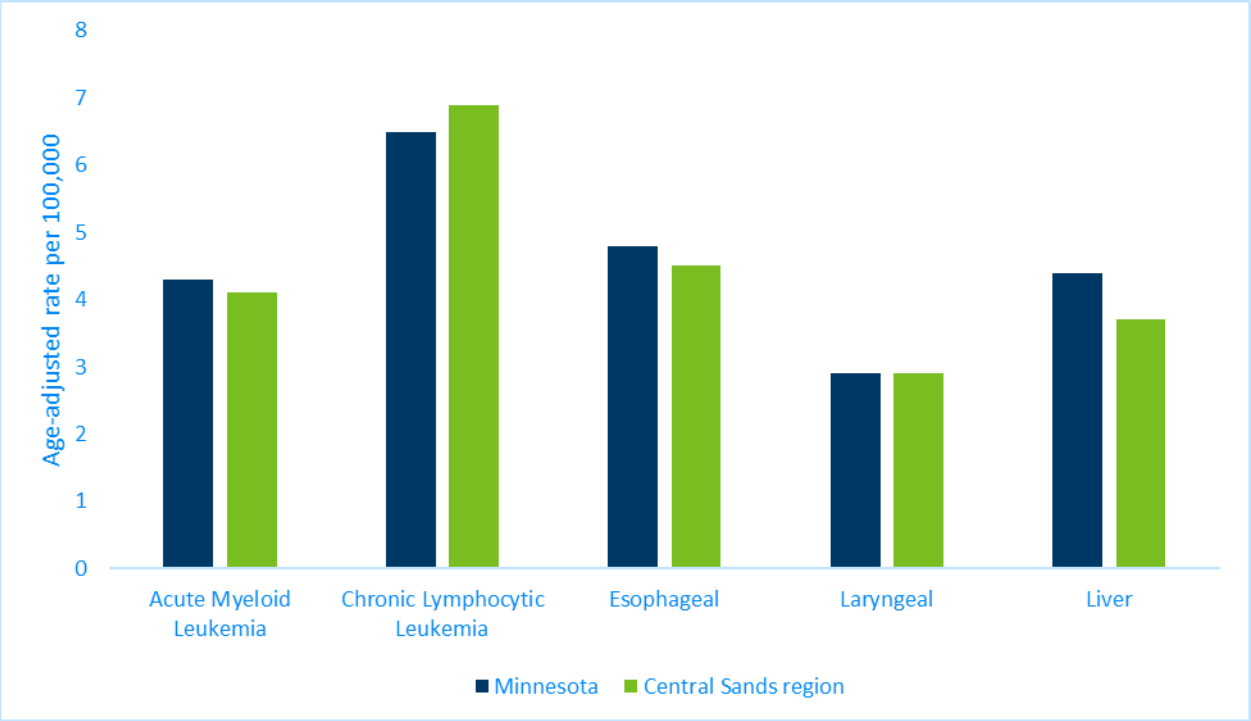
For 2009-2013, all of the counties had lower rates of breast cancer than the state, however they were not found to be significantly lower.

Cancer Rates, by County, 2009-2013



This chart (previous page) displays county and state rates for eleven common cancers for 2009-2013. Wadena County had significantly higher rates of colorectal and non-Hodgkin's lymphoma cancer as compared to the state. Morrison County had significantly lower melanoma cancer rates as compared to the state.

Select Cancers, by Central Sands Region, 2009-2013



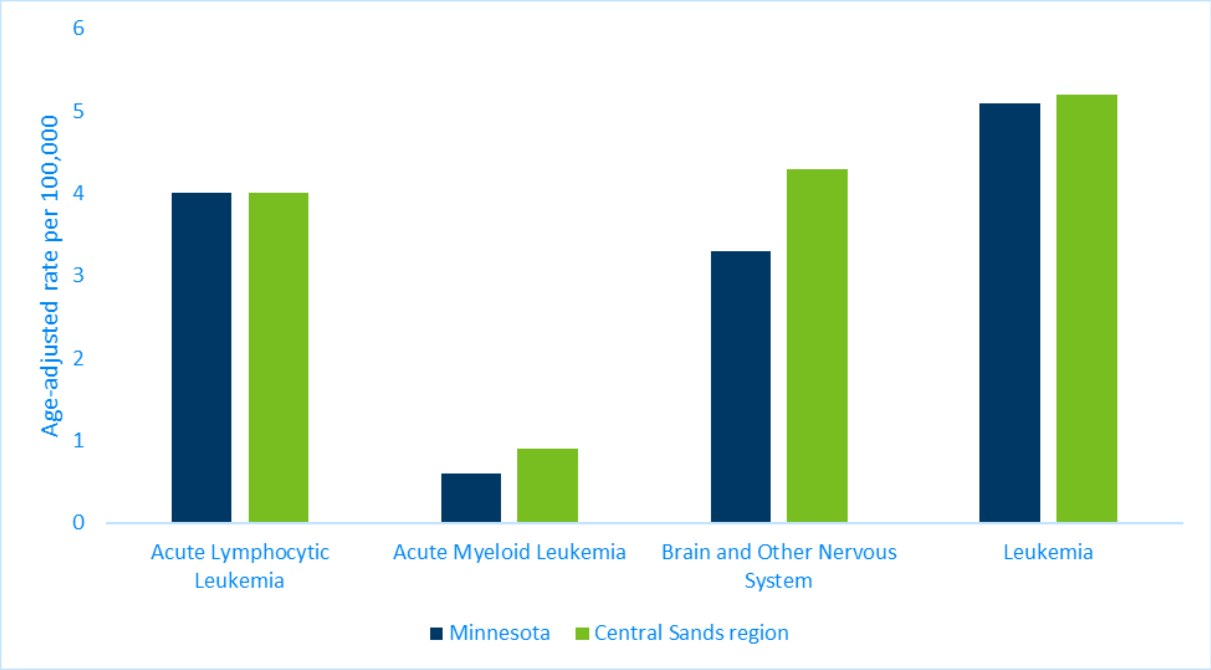
This chart shows results for cancers that are less common and had to be shown by region. None of the cancer rates shown for this region were significantly different than the state. Chronic lymphocytic leukemia was the only cancer that was higher for the Central Sands region than the state, but it was not significantly higher. There is a greater degree of variability and uncertainty when analyzing less common types of cancers because the small numbers of cases are less stable, even when they are aggregated over many years.

Childhood Cancer

Childhood cancer is defined here as the diagnosis of cancer in an individual **aged 14 years and younger**. Although major treatment advances have dramatically improved 5-year survival to about 80%, cancer is the leading cause of death due to illness in children under age 15. The most commonly diagnosed childhood cancers are leukemia, brain & other nervous system tumors, soft tissue cancer, lymphoma and kidney cancer.

Childhood cancers are fairly rare; to have enough numbers the data were aggregated by region and over ten years.

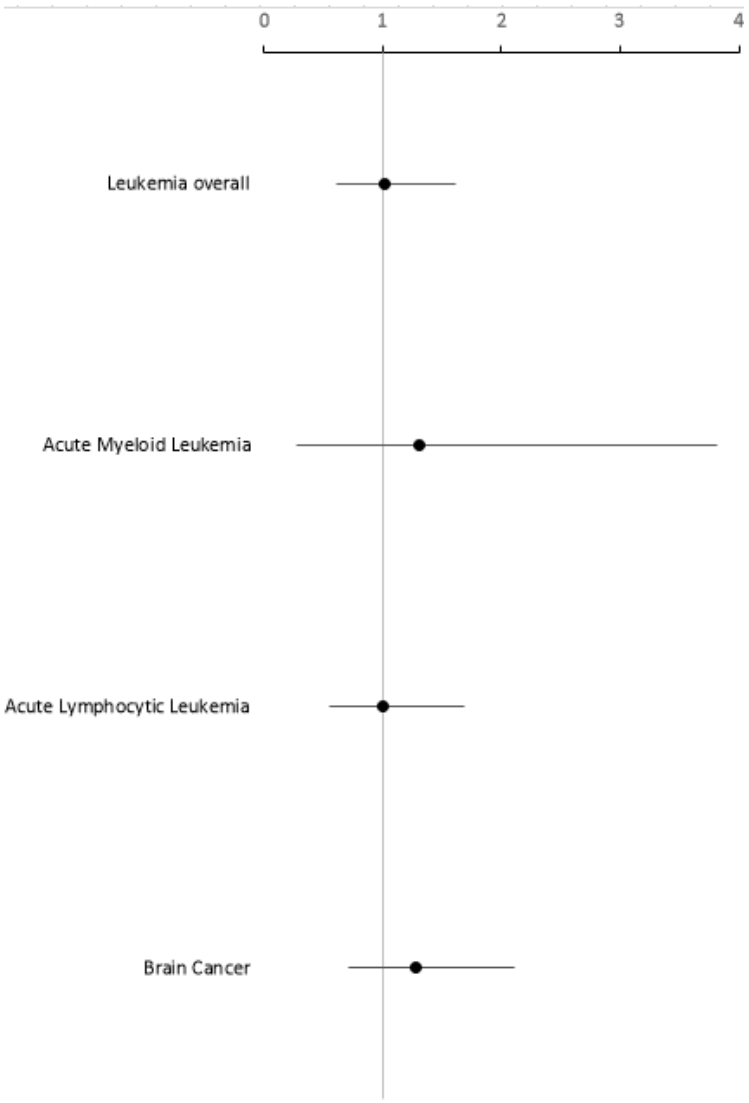
Childhood (0-14 years) Cancer Rates, by Central Sands Region, 2004-2013



Central Sands childhood cancer rates were not found to be significantly higher than the state.

Over the ten year span in the Central Sands region, there were only 14 acute lymphocytic leukemia cases, three acute myeloid leukemia cases, 15 brain cancer cases, and 18 total leukemia cases. Due to their smaller numbers and greater variability, the rates of specific types of cancer at a regional level are generally much less stable or informative and permit few conclusions.

Childhood (0-14 years) Cancer, Central Sands Compared to Minnesota SIRs, 2004-2013



This chart shows the same childhood cancer data in a different way than the previous charts. It shows standardized incidence ratios (SIRs) for each childhood cancer type shown above. An SIR is an estimate of the occurrence of cancer in a population relative to what might be expected if the population had the same cancer experience as the state. Specifically, an SIR is the ratio of the observed number of cancer cases to the expected number of cases. In the chart, the circle represents the SIR and the lines are the 95% confidence intervals. An SIR of one indicates that the number of cancer cases observed in the population evaluated is equal to the number of cancer cases expected in the comparison population (Minnesota). The childhood cancer SIRs were all very close to one, indicating they were not higher than expected.

About the Data

Childhood cancer is defined here as the diagnosis of cancer in an individual aged 14 years and younger. This is an accepted definition for childhood cancer, as post-puberty the cancer is biologically different.

A small number of cancer cases among Minnesota residents are missing "county of residence" and are therefore classified as "unknown" county. Because of this, it is possible that the sum of the number of new cancers for all Minnesota counties (combined) may not match the total number of new cancers at the state-level for a specific cancer type.

Rates based on 10 or fewer cases of cancer are unstable and caution should be exercised in interpreting these rates. For cancers with two or more unstable rates, a regional rate was calculated.

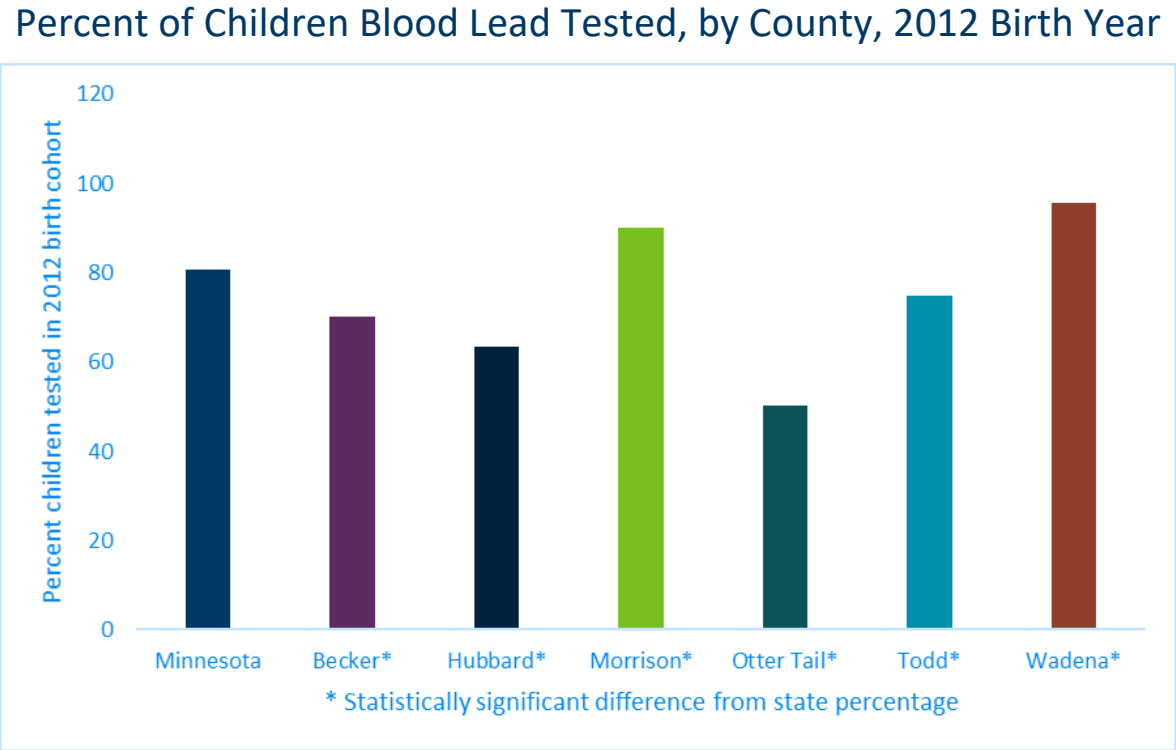
Counts are number of cancers, not number of people with cancer. A person can contribute more than one case of cancer for the purposes of these data.

For more information: about the cancer data

Childhood Lead Exposure

Elevated blood lead levels in young children are linked with adverse health effects, including learning problems, behavioral problems and even death if exposures are very high. The U.S. Environmental Protection Agency (EPA) estimates that more than 80% of all homes built in the U.S. before 1978 contain lead-based paint. According to the U.S. Centers for Disease Control and Prvention (CDC), young children living in poverty or who reside in older housing have a higher risk of lead exposure. Each year there are nearly 700 Minnesota children who have elevated blood lead levels.

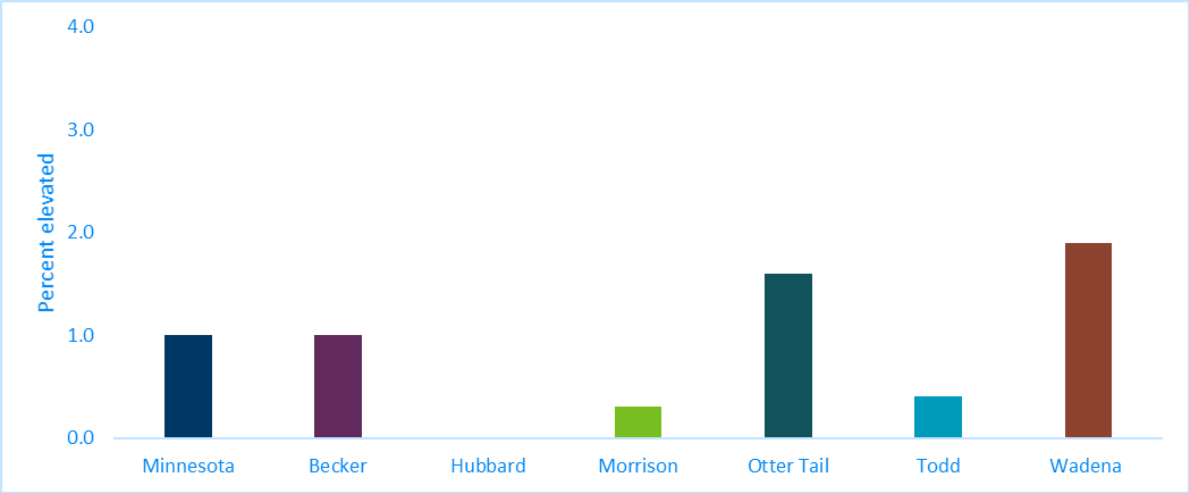
The following charts show information on childhood blood lead testing using data from the Blood Lead Information System, maintained by the Childhood Lead Poisoning Prevention Program at MDH. Blood lead testing is voluntary; not every child is tested for lead exposure. Children who have higher risk factors for lead exposure are targeted for blood lead testing.



This chart displays percent of children tested for lead in the 2012 birth cohort by county and state.

In Minnesota, 80.7% of children in the 2012 birth cohort were tested for blood lead. Wadena County had the highest percent (95.8%) of children in the 2012 birth cohort tested for blood lead, perhaps indicating that they had more children with risk factors for lead exposure. Blood lead testing in Morrison County was also significantly higher as compared to the state. Blood lead testing in the other Central Sands counties was significantly lower as compared to the state.

Percent with Elevated Blood Lead Levels 5+ mcg/dL, by County, 2012 Birth Year



This chart displays percent of children in the 2012 birth cohort with elevated (5+ mcg/dL) blood lead levels. Percent elevated describes the proportion of children with an elevated blood lead level (5+ mcg/dL) among children tested. Not all children are tested as testing is targeted to higher risk children, so the results are not representative of all children in the county.

In Minnesota, of the children tested, 1% had elevated blood lead levels. Wadena County had the highest percent of elevated blood lead levels (of the children tested), with 1.9%, though this difference was not significantly higher than the state. Hubbard County had no cases of elevated blood lead levels of children tested in the 2012 birth cohort.

About the Data

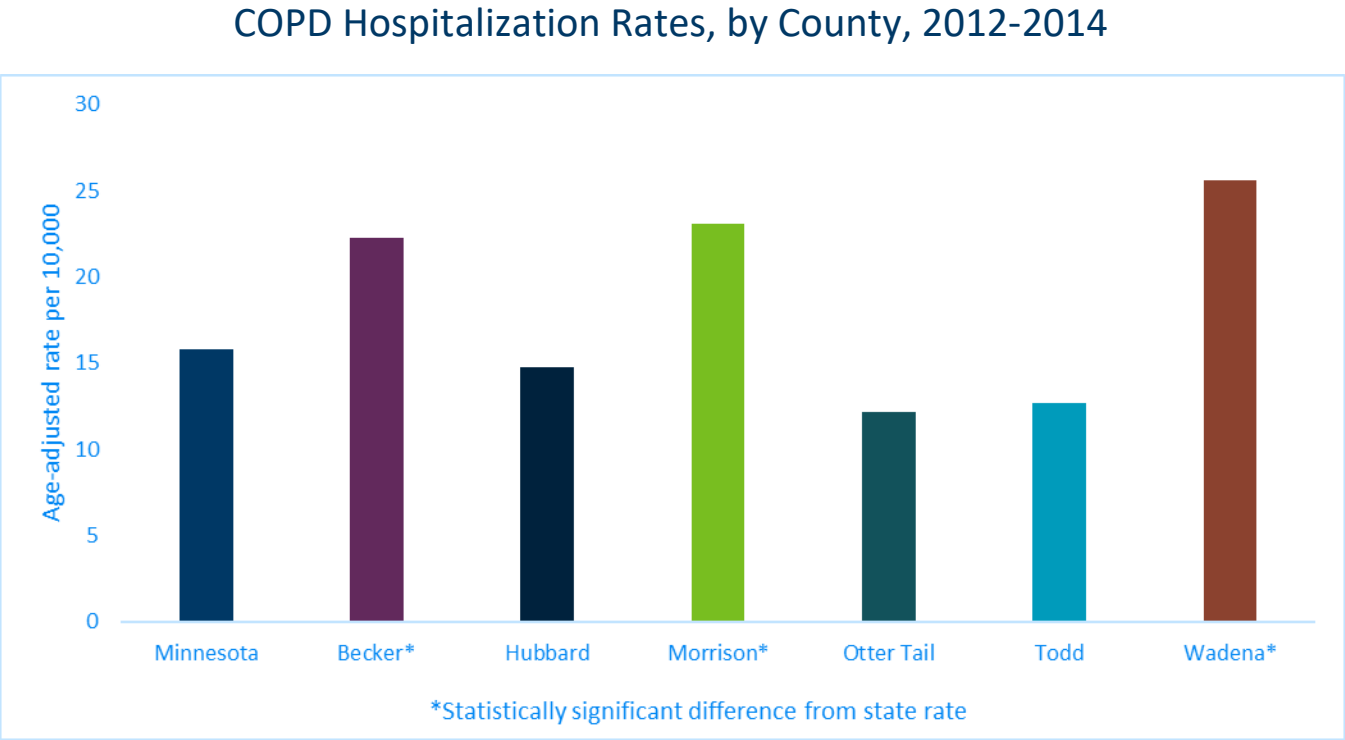
Blood lead testing is not universal or randomly sampled in Minnesota, so the data collected by the Blood Lead Information System are not representative of all Minnesota children. The MDH Childhood Blood Lead Screening Guidelines direct physicians to order blood lead tests for certain populations at higher risk for lead exposure: 1) children residing in specific geographic areas that have high rates of elevated blood lead levels; and 2) children matching specific demographic groups that tend to have higher rates of elevated blood lead levels.

For more information: about the childhood blood lead data

Chronic Obstructive Pulmonary Disease (COPD)

Chronic obstructive pulmonary disease (COPD) is a group of lung diseases that make it difficult to breathe, including emphysema and chronic bronchitis. COPD is the fifth-leading cause of death in Minnesota. It is a slowly progressive disease, meaning older people are more affected by COPD and their symptoms will worsen over time. Smoking is the leading cause of COPD. The rates of death for COPD differ by sex, age and race/ethnicity. In Minnesota, American Indians have much higher rates of deaths due to COPD.

The following chart shows information on COPD hospitalizations using data from Minnesota Hospital Discharge Data, which is maintained by the Minnesota Hospital Association.



Becker, Morrison and Wadena counties had significantly higher COPD hospitalization rates as compared to the state.

About the Data

Data represent the number of hospitalizations due to COPD and not the number of individual people hospitalized. Multiple hospital admissions by the same patient cannot be identified, and are not excluded. Since only those with the most severe symptoms of COPD are hospitalized, hospitalization data are not appropriate for estimating the total burden of COPD.

COPD hospitalization measures include discharges of Minnesota residents from hospitals in the border states of North Dakota, South Dakota and Iowa, beginning in year 2005. County-level analyses are only from 2005 onward because the addition of out-of-state hospitalizations greatly affects the rate for some counties.

Rates for counties in which residents are likely to visit hospitals that do not submit data to the Minnesota Hospital Association (e.g., Veteran's Administration or Indian Health Services hospitals) may also be artificially low. There is the potential for patient zipcodes to be assigned to the incorrect county causing some geography misclassification along county borders.

For more information: about the COPD data

Developmental Delay and Disabilities

In Minnesota, one in five families has at least one child with a special health care need. These include developmental disabilities such as attention-deficient/hyperactivity disorder, autism and other developmental disabilities – a diverse group of severe chronic conditions that are due to mental or physical impairments.

For more information: about developmental disabilities

Exploring Data

To address community concerns about perceived increases of developmental delay and disabilities in children in the region, staff explored different sources of state data for this health outcome.

Limited data on the prevalence of certain developmental disabilities are available for the state as a whole based on results from a telephone survey conducted by the CDC. However, results are not available by county or region, and are based on very small numbers of respondents.

The Minnesota Department of Education (MDE) collects and reports data on special education enrollment by school district. However, these data reflect services provided and not necessarily incidence of developmental delay and disabilities. The data on special education enrollment heavily depend on the school type, student enrollment numbers and funding available to provide services.

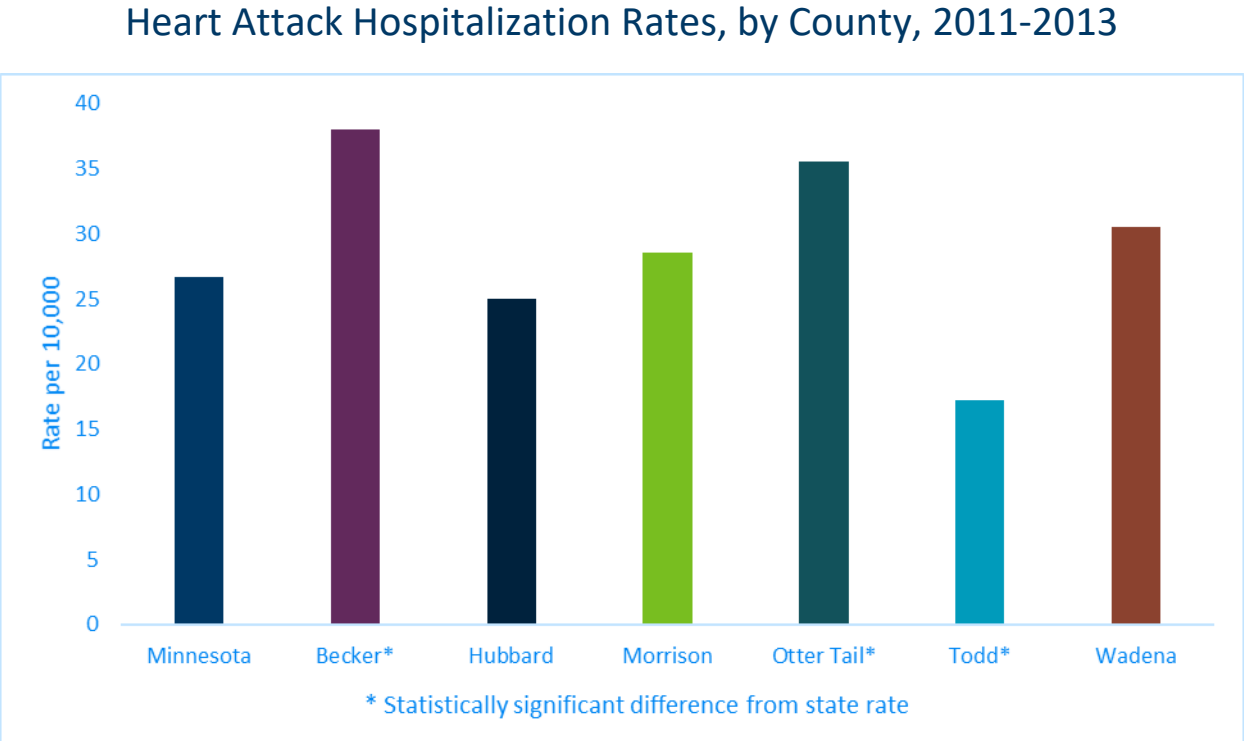
MDE also collects data on early childhood screening, both the percent of children screened and, of those screened, the percent who receive special education services. These data are also subject to numerous limitations and are not a true indicator of incidence of developmental delay and disabilities. The data reported may not include all children screened, including children screened by Head Start and local public health agencies. Screening may not be comparable by school district, and availability of special education services is heavily dependent on funding and resources available.

None of the data sources explored so far provide reliable information on the incidence of developmental delays and disabilities in the Central Sands region compared to other parts of the state. Staff are currently exploring whether delving deeper into the early childhood screening data may start to answer this important question. This approach would involve following a birth cohort through screening and receipt of services.

Heart Attacks

Heart attack, or acute myocardial infarction, occurs when the vessels supplying blood to the heart become blocked. The resulting blood and oxygen shortage causes damage and potential death of heart tissue. About 18% of all deaths in Minnesota in 2011 were due to heart disease, making it the second-leading cause of death in the state behind cancer. Gender, income and racial disparities can be found in rates of heart disease in Minnesota.

The following chart shows information on heart attacks using data from Minnesota Hospital Discharge Data, which is maintained by the Minnesota Hospital Association.



Todd County had a significantly lower heart attack hospitalization rate as compared to the state. Becker and Otter Tail counties had significantly higher rates as compared to the state.

About the Data

These data represent the number of hospitalizations due to heart attacks and not the number of individual people hospitalized. Multiple hospital or emergency department admissions by the same patient cannot be identified and are not excluded. Transfers from one hospital to another also are not excluded. Since the data only includes those who seek treatment at a hospital, these data are not appropriate for estimating the total burden of heart attacks in a population.

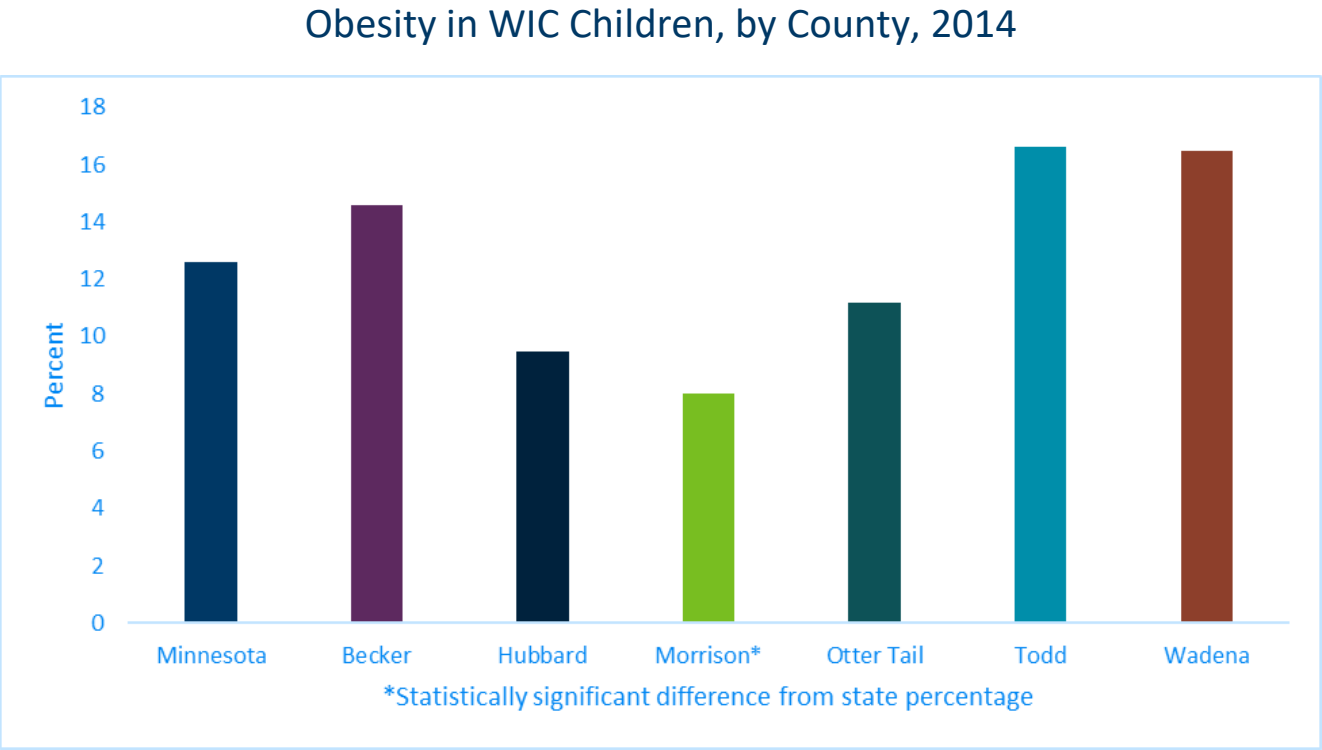
Heart attack hospitalization rates for counties in which residents are likely to visit hospitals that do not submit data to the Minnesota Hospital Association (e.g., Veteran's Administration or Indian Health Services hospitals) may also be artificially low. There is the potential for patient zipcodes to be assigned to the incorrect county causing some geography misclassification along county borders.

For more information: about the heart attack data

Obesity (Childhood)

Obesity occurs in an individual who has too much body fat that may be affecting their health. Obesity increases the risk of developing chronic health conditions such as heart disease, type 2 diabetes and several cancers. Older children and adolescents who are obese can face high blood pressure, bone and joint problems, and asthma. Data from the Women, Infants and Children (WIC) Program indicate there are disparities in childhood obesity among racial/ethnic groups, with American Indian children having the highest rates compared to others.

The following chart shows data on obesity in children two to five years old who participated in the WIC Program.



In Minnesota, 12.6% of WIC children were obese. Becker, Todd and Wadena County had higher percentages of obesity for WIC children than the state, though none of these differences were significant. The percentage of obese WIC children in Morrison County was significantly lower as compared to the state.

About the Data

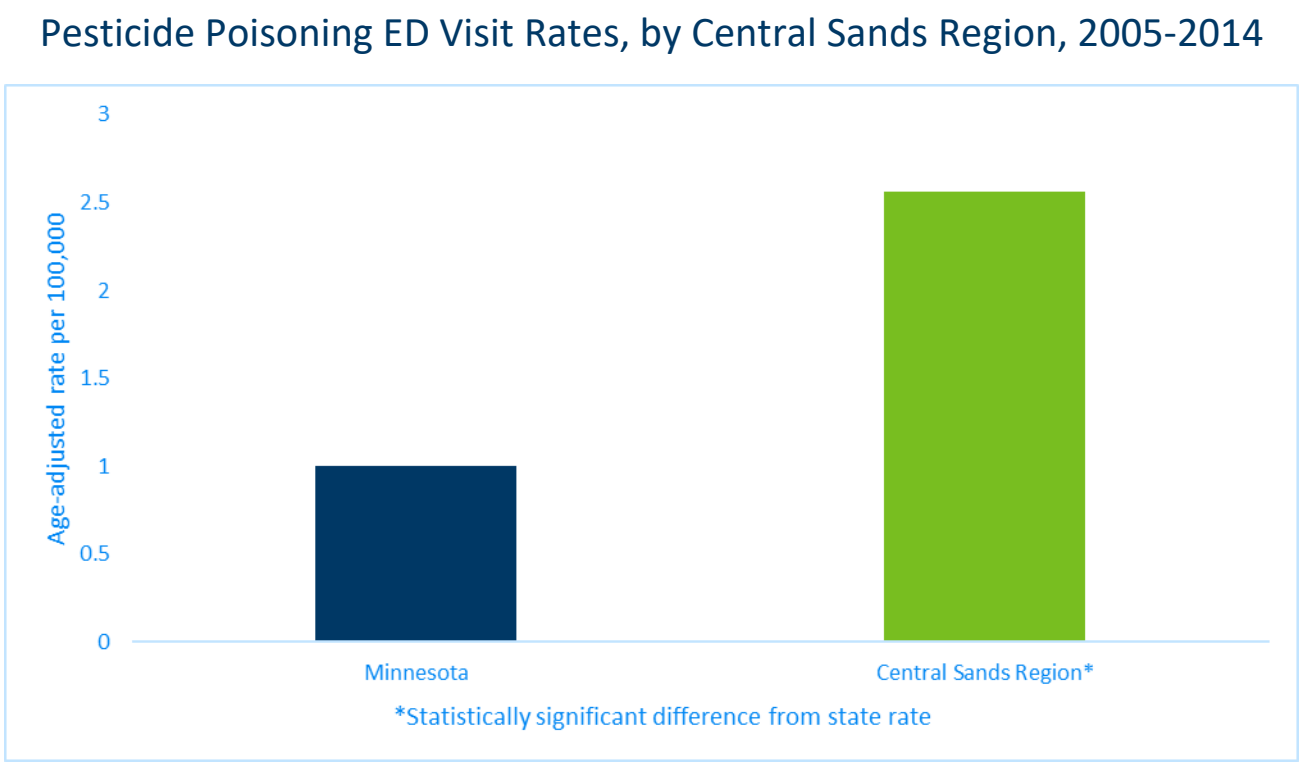
These data are for low-income children two to five years of age who participate in the WIC Program. The WIC Program is a nutrition and breastfeeding program that helps young families eat well, learn about nutrition and stay healthy. In 2013, WIC served approximately 66,900 Minnesota children, up to age five, every month. The program served over 41% of children zero to age 5 in Minnesota.

For more information: about the obesity data

Pesticide Poisoning

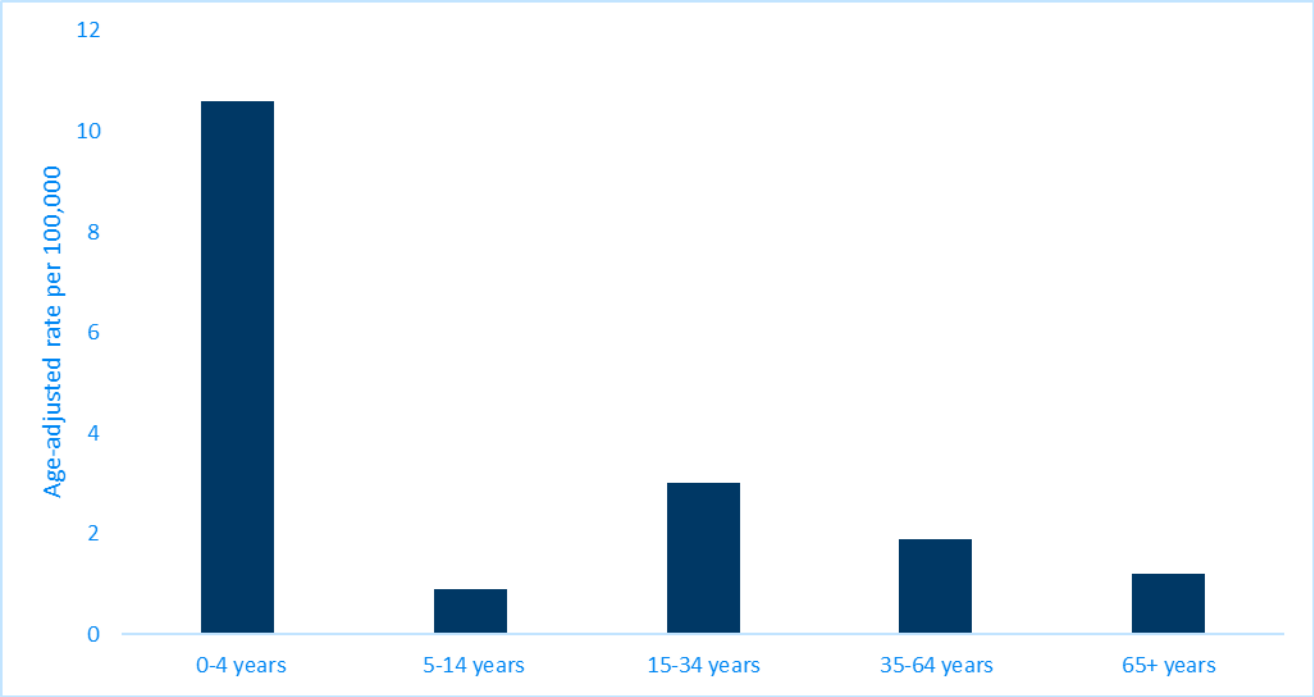
Pesticides are used to control insects, fungus and weeds in crops and home gardens, and pests in homes and other buildings. Most pesticide poisonings are acute and the symptoms can be mistaken for other illnesses, such as the flu. Depending on the pesticide exposure, it may result in chronic effects. Most pesticide poisonings occur in young children and the poison control center call data indicate the cases are mostly due to accidental ingestion of pesticides.

The following charts show data on pesticide poisoning emergency department (ED) visits using data from Minnesota Hospital Discharge Data, which is maintained by the Minnesota Hospital Association.



In ten years (2005-2014), there were 22 pesticide poisoning ED visits for the Central Sands region for a rate of 2.56 visits per 100,000 people. For the state, there were 528 pesticide poisoning ED visits over ten years for a rate of 1 visit per 100,000 people. The Central Sands pesticide poisoning ED visit rate was statistically higher than the state rate.

Pesticide Poisoning ED Visit Rates, by Age Group, for Central Sands Region, 2005-2014



Children age 4 and under had a much higher rate of ED visits for pesticide poisonings than other age groups, but the rate in this age group was not significantly higher than in the other age categories.

Of the 22 pesticide poisoning ED cases in the Central Sands region, six occurred in children four and under. The burden of pesticide poisonings occurring in young children is consistent with what is seen at the state level. These are often accidental pesticide ingestion cases. Young children are especially vulnerable to pesticide poisoning.

About the Data

The Minnesota Hospital Discharge Data used here provides limited information about the ED visit for pesticide poisonings. The relevant information includes: age, sex, date of visit and diagnoses. The information does not include details on how the pesticide poisoning occurred, where it occurred or the specific pesticide involved. Due to this lack of information, we cannot determine if the poisonings were due to pesticides used in the home or an exposure from agricultural pesticide use.

These pesticide poisoning data are restricted to unintentional pesticide poisonings and exclude disinfectants. The data do not exclude worker's compensation pesticide poisoning ED visits, however no cases were found.

Rates for counties whose residents are likely to visit hospitals that do not submit data to the Minnesota Hospital Association (e.g., Veteran's Administration or Indian Health Services hospitals) may also be artificially low. There is the potential for patient zipcodes to be assigned to the incorrect county causing some geography misclassification along county borders.

Multiple emergency department admissions by the same patient cannot be identified, and are not excluded. Since only people with the most severe or acute symptoms of pesticide poisoning are hospitalized or treated at the ED, these data are not appropriate for estimating the total burden of pesticide poisoning in a population.

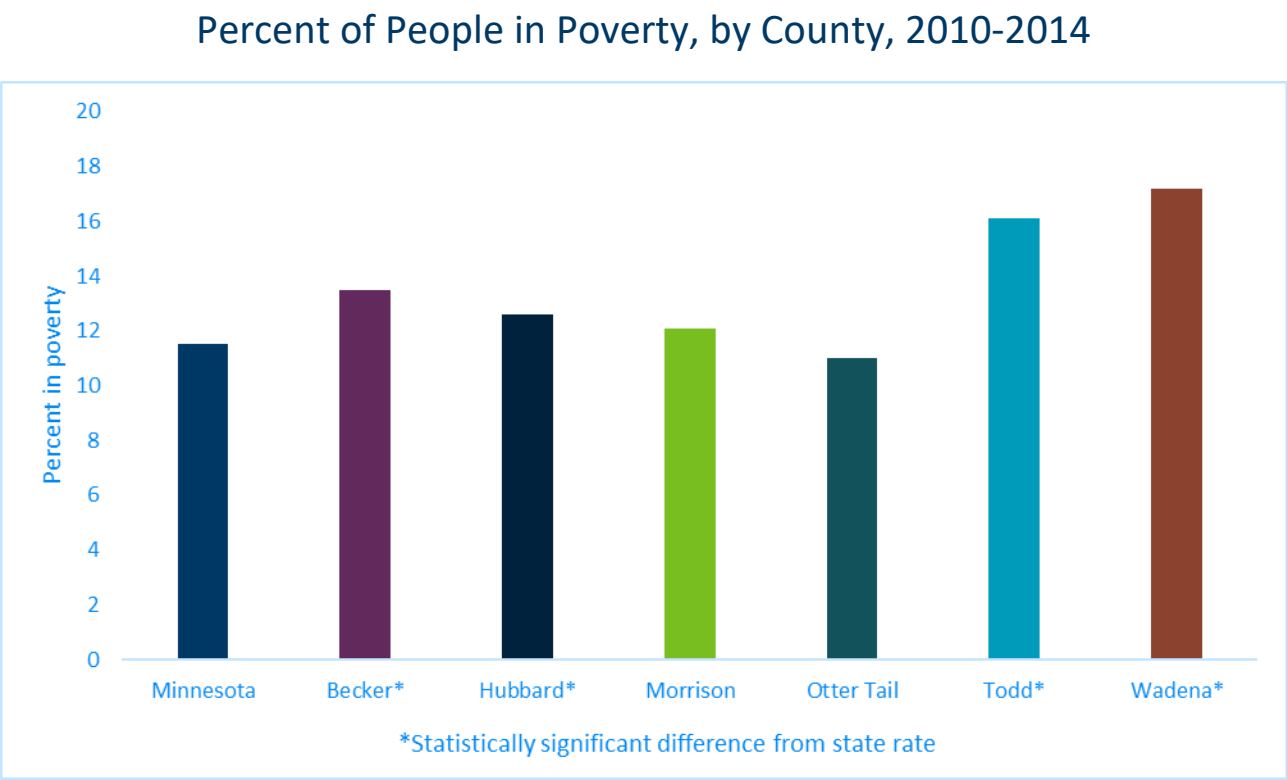
For more information: about the pesticide poisoning data

Poverty

Poverty includes a family's income, size and composition and has both immediate and long-term effects on health. Research shows that low socioeconomic status increases the chance that a person's health is threatened by environmental conditions. People living in poverty have greater risks of asthma attacks and hospitalizations, childhood lead poisoning and cardiovascular disease.

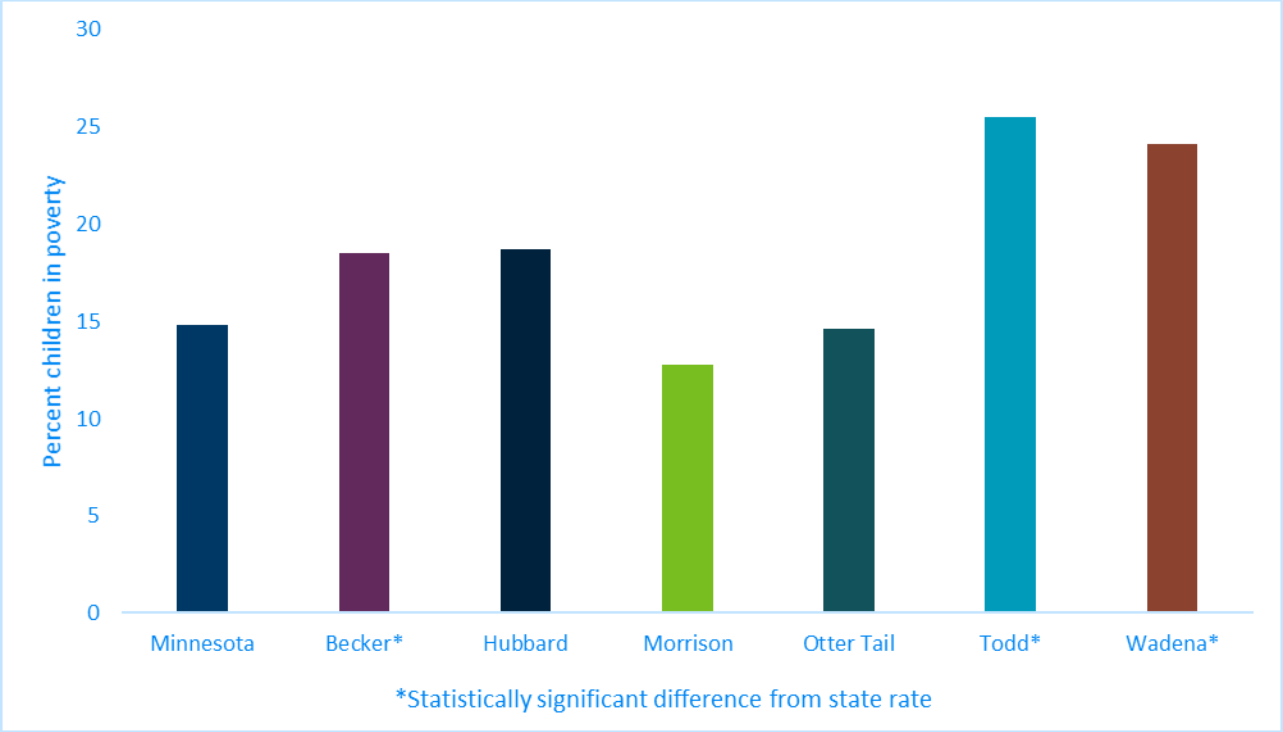
While Minnesota has a lower proportion of people living in poverty than the U.S. average, it affects more than one in nine Minnesotans. The prevalence of poverty is higher in several counties across the state, but especially in the Northeast and Northwest regions of the state. There are racial/ethnic disparities in poverty that greatly affect Black/African Americans and American Indian/Alaskan Natives.

The following charts use data on poverty from the U.S. Census Bureau's American Community Survey.



This chart displays percent of people in poverty by county and Minnesota from 2010-2014. Becker, Hubbard, Todd and Wadena counties had significantly higher percentage of people in poverty as compared to the state.

Children (under 18) in Poverty, by County, 2010-2014



Becker, Todd and Wadena counties had significantly higher percent of children in poverty as compared to the state. Todd County had the highest percent of children in poverty with 25.5% of children living in poverty.

About the Data

The U.S. Census Bureau defines "poverty" by comparing a family's annual household income to a set of federal poverty thresholds. The federal poverty thresholds are calculated using a family's household size and composition. If a household income is less than the poverty threshold, every person living in that household is considered to be in poverty. To learn more, go to the U.S. Census Bureau's poverty webpage.

The official poverty threshold for a two adult, two child family was $24,036 in 2015 for the U.S. These data are based on a 100% threshold. The Census Bureau adjusts the poverty thresholds each year according to the Consumer Price Index (CPI-U), which estimates prices paid for goods and services and is produced by the U.S. Department of Labor.

American Community Survey estimates are based on a sample of the population and not a full count of every person like the census. However, American Community Survey estimates are typically more current than the most recent decennial census (e.g., 2010 U.S. Census). Sometimes, American Community Survey estimates need to be aggregated across 5 years in order to have large enough groups of people to examine differences by factors like county or race/ethnicity.

For more information: about the poverty data

Reproductive and Birth Outcomes

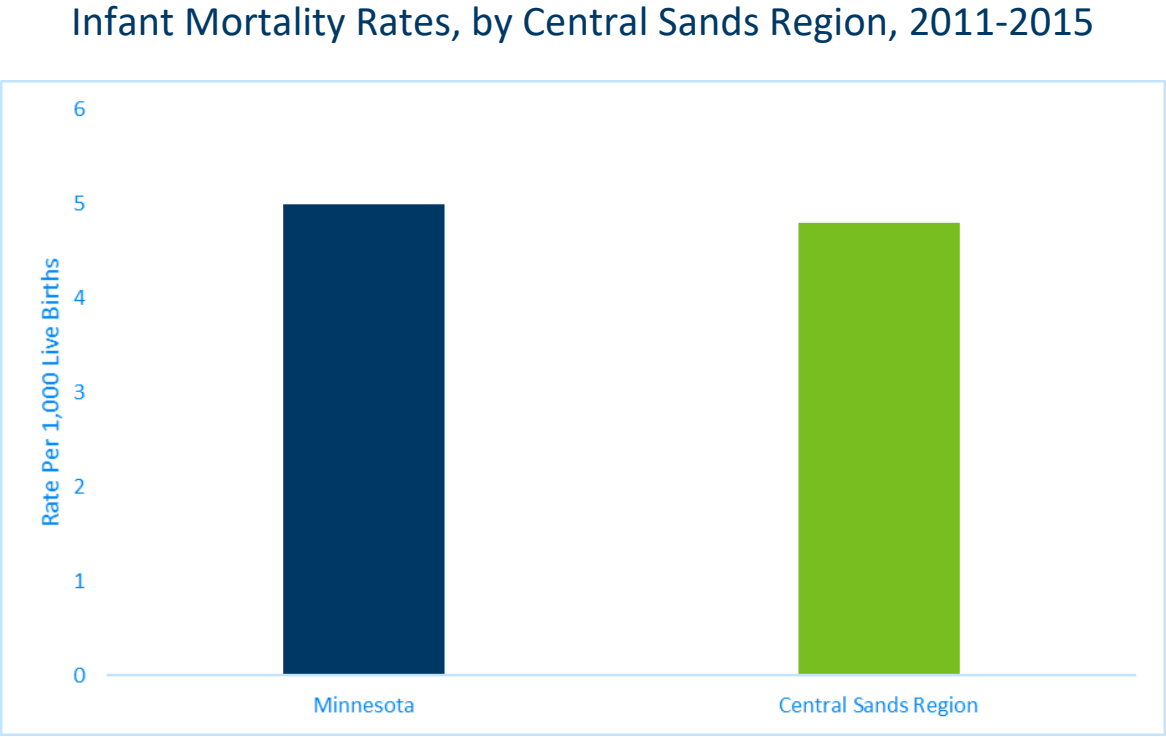
About 70,000 babies are born every year in Minnesota. Adverse reproductive and birth outcomes such as prematurity and low birth weight can cause difficulties for infant health and survival. Poor birth outcomes also place financial and emotional burdens on families and communities.

In Minnesota, there are racial and ethnic disparities in reproductive outcomes. American Indian and Non-Hispanic Black mothers are more likely than White mothers to have a premature birth. American Indian mothers also have higher rates of infant mortality than White mothers.

The following charts show data on infant mortality, low birth weight and premature birth using data from birth and death certificates and fetal death reports filed with the MDH Office of the Vital Records. This report was not able to consider birth defects as these data are not available at the county or regional level. MDH is working to expand birth defects surveillance state-wide.

Infant Mortality

In Minnesota about 350 babies die every year. The leading causes of infant death in the U.S. are birth defects, disorders related to premature birth and low birth weight, sudden infant death syndrome (SIDS), conditions due to pregnancy complications, and injury.

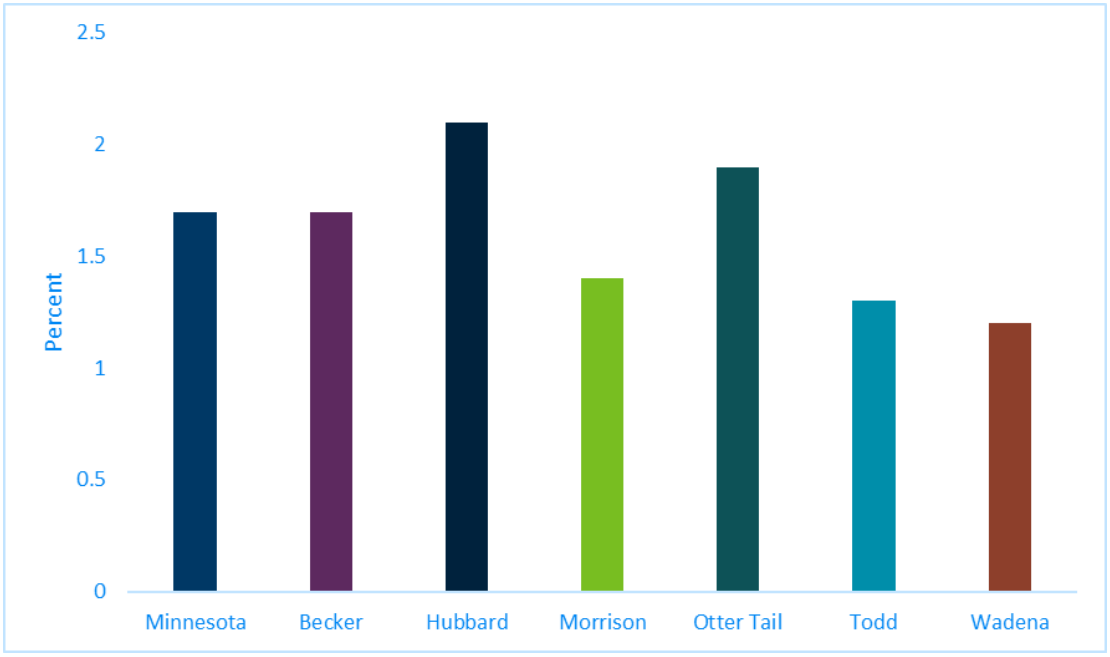


Infant mortality is fairly rare, so the data had to be aggregated by region. The Central Sands region had a lower rate of infant mortality compared to the state, though this was not a statistically significant difference.

Low Birth Weight

Low birth weight infants, born too small or too soon, may become sick during the first week of life, develop infections, or have longer-term health complications such as delayed motor and social development or learning disabilities. Infant mortality rates are much higher for low birth weight infants than for infants of normal weight.

Percent of Low Birth Weight, by County, 2011-2015



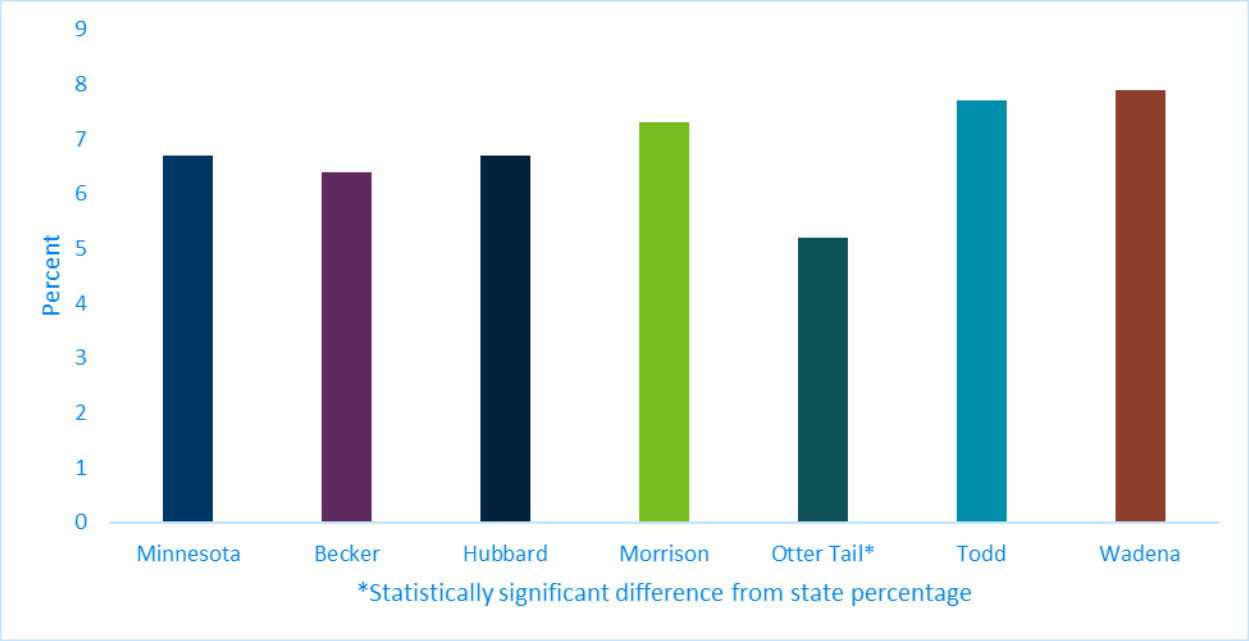
This chart displays percent of full-term, single births that had low birth weight by county and Minnesota from 2011-2015. In Minnesota, 1.8% of babies were born with low-birth weight. The percent of babies born with low birth weight in the Central Sands counties was fairly close to the state, with no statistically significant differences.

Premature Births

About 5,000 babies a year are born premature in Minnesota. A full-term pregnancy is 40 weeks; a premature baby is born before 37 completed weeks of pregnancy and a very premature baby is born before 32 weeks.

Premature birth is a leading cause of death in the first month of life and contributes to one in three infant deaths. Babies who survive an early birth face the risk of serious lifelong health problems such as intellectual disabilities, cerebral palsy, breathing and respiratory problems, vision and hearing loss, and feeding and digestive problems.

Percent of Premature Births, by County, 2011-2015



This chart displays percent of single, premature births by county and Minnesota from 2011-2015. In Minnesota, 7.4% of babies were born prematurely. Most Central Sands counties were similar to the state. Otter Tail County had a significantly lower premature birth percentage as compared to the state.

Overall, the Central Sands region had a lower rate of infant mortality as compared to the state. The percent of babies born with low birth weight or born prematurely were close to the state levels.

About the Data

Birth and death certificates and fetal death reports filed with the MDH Office of the Vital Records are the data sources for the reproductive and birth outcomes measures. These data are entered electronically into the Minnesota Registration and Certification (MR&C) system, an integrated, web-based application that electronically records and maintains records on vital events (birth, death and fetal death) for the State of Minnesota.

Measures are computed using data on births to Minnesota resident mothers, with residency determined by address at time of birth as listed on the birth certificate.

For more information: about the reproductive and birth outcome data

Discussion

This report provides baseline health data for six counties in the Central Sands region. It compares data on ten health indicators for these counties, either individually or grouped as a region, with state-wide data. Some health outcomes were higher in certain counties than the state and some were lower. We did not see a pattern of consistently elevated health outcomes for the region as a whole. That said, there were a few results worth noting and exploring further. All results were shared with local public health directors for their insights on the findings.

The Central Sands region had higher rates of pesticide poisoning emergency department (ED) visits as compared to the state over a ten year period. About 30% of these pesticide poisoning ED visits occurred in young children. The lack of exposure scenario details in the hospital records makes it difficult to know how the poisonings occurred. However, these results point to an important need for increased education about pesticide safety. In dicucussion with local public health directors about these data, several proposed incorporating pesticide storage and handling education into their home safety education and home visiting programs, particularly for families with children.

Some cancer rates in the Central Sands counties were significantly different than the state. Wadena County had higher colorectal cancer and non-Hodgkin's lymphoma rates. Morrison County had lower melanoma rates. Rates of individual cancer types tend to vary substantially over time within small geographic areas and it is not unusual to find that some cancers occurred more or less often than expected within a county over a period of years. We did not see a pattern of elevated non-Hodgkin's lymphoma or colorectal cancer in other Central Sands counties.

Variations in colorectal cancer may partly reflect differences in the proportion of the population screened for pre-cancerous polyps. For non-Hodgkin's lymphoma, some studies have suggested a link with exposure to certain herbicides and insecticides, but conclusions about which particular pesticides may contribute to risk are still unclear. While community cancer rates have a high degree of statistical uncertainty and must be interpreted cautiously, such data are also useful in addressing public concerns over cancer rates in a county or a community by providing a more complete and accurate profile of cancer occurrence.

A number of Central Sands counties had higher poverty rates than the rest of the state. Local public heath directors agreed that poverty is an important underlying factor for many of the health outcomes considered in this profile. People living in poverty have greater risks of asthma attacks and hospitalizations, childhood lead poisoning, and cardiovascular disease. Interestingly, most of these counties did not follow this trend for asthma and had lower asthma ED visit and hospitalization rates than the rest of the state. Wadena County had the highest percent of children tested for blood lead and the highest percent of children tested who had elevated levels. Living in poverty can also lead to higher environmental exposures related to poor housing conditions.

According to local public health directors, access to health care is challenging in rural areas, and could be a factor in explaining some of the differences seen in health outcomes included in this profile. Specific challenges include shortage of health care professionals, lack of access to Urgent Care clinics, transportation issues around reaching a health care facility and differences in Emergency Department utilization by immigrant communities.

In addition, local public health directors linked smoking rates to many of the outcomes observed, and wondered whether it would be possible to include smoking in this profile in the future. After reviewing available sources of smoking data, staff determined that we are unable to fully assess this due to lack of standardized county-level smoking data. However, this could change in the future as more data sources become available.

There are some important limitations to note about this report. Despite the fact that it was a key concern of community members, we were unable to include reliable data on developmental delays and disabilities for these counties because these data sources do not exist. None of the data sources explored by staff provide reliable information on the incidence of developmental delays and disabilities in the Central Sands region compared to other parts of the state. Staff are currently exploring whether data on early childhood screening may start to answer this important question.

Also, many of the health outcome results presented do not reflect the health of people from Tribal nations in the area as Indian Health Service (IHS) data are not included for any of the outcomes that involve hospitalizations. We are unable to present results by race/ethnicity as we do not have this data for most outcomes.

Lastly, this report provides useful baseline health data for the counties in the Central Sands region but cannot provide answers about causation. It is meant to be a starting place to identify whether there are any elevated health outcomes or consistent concerns that should be explored further.

Local public health directors had many ideas for ways that the information in this profile would be useful in their work. The results could be incorporated into future community health assessments; specific outcomes mentioned as being of interest included asthma, pesticide poisonings, cancer, low birth weight, pre-term birth and poverty. The results could also be useful in grant writing and program planning. The findings point to important risk factors and outcomes to look for in home visiting programs. And, local public health directors mentioned sharing the information with different groups including county commissioners, field staff members who are implementing programs, agency partners and local hospitals/health care providers.

Appendices

Appendix A: Becker County vs. State Comparison Tables

Becker vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Becker County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	28.5	(24.9 - 32.1)*
Hospitalizations	6.1	(6.0 - 6.3)	4.5	(3.3 - 6.0)
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	41.9	(35.6 - 48.2)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	6.2	(3.8 - 8.6)

*Statistically significant difference from the state

Becker vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Becker County	95% CI
All types combined	458.6	(456.1 - 461.1)	447.4	(418.8 - 477.6)
Breast (female only)	130.2	(128.3 - 132)	106.0	(86.3 - 129.1)
Bladder	22.2	(21.7 - 22.8)	20.7	(15.2 - 27.7)
Brain and other nervous system	6.8	(6.5 - 7.2)	6.7	(3.7 - 11.5)
Colorectal	39.6	(38.9 - 40.4)	44.9	(36.1 - 55.3)
Kidney	15.5	(15.1 - 16)	15.8	(10.7 - 22.6)
Leukemia	16.1	(15.6 - 16.6)	16.2	(10.8 - 23.5)
Lung and bronchus	55.5	(54.6 - 56.4)	55.7	(46.2 - 66.8)
Melanoma	27.7	(27.1 - 28.3)	26.0	(19.4 - 34.2)
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	22.1	(16.1 - 29.8)
Oral and pharyngeal	11.9	(11.5 - 12.3)	14.2	(9.5 - 20.7)
Pancreatic	11.3	(10.9 - 11.7)	9.2	(5.7 - 14.3)
Thyroid	12.6	(12.1 - 13.0)	15.5	(9.9 - 23)

Becker vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Becker County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	70.3%	(64.1% - 75.1%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	1.0%	(0.3% - 2.8%)

*Statistically significant difference from the state

Becker vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Becker County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	22.3	(19.2 - 25.4)*

*Statistically significant difference from the state

Becker vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Becker County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	38.0	(32.3 - 38.8)*

*Statistically significant difference from the state

Becker vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Becker County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	14.6%	(7.7% - 17.5%)

Becker vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Becker County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	13.5%	(12.1 - 14.9)*
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	18.5%	(15.4 - 21.6)*

*Statistically significant difference from the state

Becker vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Becker County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	1.7%	(1.2% - 2.4%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	6.4%	(5.4% - 7.6%)

Appendix B: Hubbard County vs. State Comparison Tables

Hubbard vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Hubbard County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	42.0	(36.2 - 47.7)
Hospitalizations	6.1	(6.0 - 6.3)	3.3	(2.1 - 5.1)*
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	52.9	(43.2 - 62.6)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	3.2 (UR)	(0.8 - 5.6)*

*Statistically significant difference from the state | UR Unstable rate that should be interpreted with caution

Hubbard vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Hubbard County	95% CI
All types combined	458.6	(456.1 - 461.1)	444.2	(410.2 - 480.6)
Breast (female only)	130.2	(128.3 - 132)	113.4	(90.4 - 141.4)
Bladder	22.2	(21.7 - 22.8)	17.8	(12.0 - 26.2)
Brain and other nervous system	6.8	(6.5 - 7.2)	8.4	(3.9 - 16.1)
Colorectal	39.6	(38.9 - 40.4)	48.4	(37.6 - 61.8)
Kidney	15.5	(15.1 - 16)	15.2	(9.7 - 23.4)
Leukemia	16.1	(15.6 - 16.6)	15.5	(9.7 - 24.0)
Lung and bronchus	55.5	(54.6 - 56.4)	64.9	(52.9 - 79.2)
Melanoma	27.7	(27.1 - 28.3)	33.7	(23.8 - 46.5)
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	16.9	(11.1 - 25.2)
Oral and pharyngeal	11.9	(11.5 - 12.3)	11.9	(6.8 - 19.7)
Pancreatic	11.3	(10.9 - 11.7)	9.7	(5.5 - 16.6)
Thyroid	12.6	(12.1 - 13.0)	11.7	(6.0 - 20.7)

Hubbard vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Hubbard County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	63.5%	(52.9% - 71.3%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	0.0%	(0.0% - 2.9%)

*Statistically significant difference from the state

Hubbard vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Hubbard County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	14.8	(11.9 - 17.7)

Hubbard vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Hubbard County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	25.0	(20.5 - 29.5)

Hubbard vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Hubbard County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	9.5%	(-0.7% - 13.4%)

Hubbard vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Hubbard County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	12.6%	(11.4 - 13.8)
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	18.7%	(15.6 - 21.8)*

*Statistically significant difference from the state

Hubbard vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Hubbard County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	2.1%	(1.4% - 3.2%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	6.7%	(5.3% - 8.3%)

Appendix C: Morrison County vs. State Comparison Tables

Morrison vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Morrison County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	32.5	(28.7 - 36.2)*
Hospitalizations	6.1	(6.0 - 6.3)	6.2	(4.7 - 7.9)
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	44.8	(38.3 - 51.4)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	7.6	(4.9 - 10.3)

*Statistically significant difference from the state

Morrison vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Morrison County	95% CI
All types combined	458.6	(456.1 - 461.1)	450.0	(420.9 - 480.6)
Breast (female only)	130.2	(128.3 - 132)	110.9	(91.1 - 134)
Bladder	22.2	(21.7 - 22.8)	19.1	(13.6 - 26.2)
Brain and other nervous system	6.8	(6.5 - 7.2)	5.9	(2.8 - 10.8)
Colorectal	39.6	(38.9 - 40.4)	34.3	(26.7 - 43.5)
Kidney	15.5	(15.1 - 16)	19.3	(13.6 - 26.7)
Leukemia	16.1	(15.6 - 16.6)	10.1	(6.3 - 15.6)
Lung and bronchus	55.5	(54.6 - 56.4)	65.4	(54.9 - 77.5)
Melanoma	27.7	(27.1 - 28.3)	15.7	(10.6 - 22.5)*
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	22.9	(16.8 - 30.7)
Oral and pharyngeal	11.9	(11.5 - 12.3)	10.2	(6.2 - 15.9)
Pancreatic	11.3	(10.9 - 11.7)	8.8	(5.1 - 14.2)
Thyroid	12.6	(12.1 - 13.0)	17.6	(11.4 - 26)

*Statistically significant difference from the state

Morrison vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Morrison County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	90.2%	(86.4% - 92.9%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	0.3%	(0.1% - 1.6%)

*Statistically significant difference from the state

Morrison vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Morrison County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	23.1	(19.9 - 26.3)*

*Statistically significant difference from the state

Morrison vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Morrison County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	28.6	(26.4 - 27.0)

Morrison vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Morrison County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	8.0%	(-0.4% - 10.9%)*

*Statistically significant difference from the state

Morrison vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Morrison County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	12.1%	(11.1 - 13.1)
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	12.8%	(10.8 - 14.8)

Morrison vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Morrison County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	1.4%	(1.0% - 2.1%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	7.3%	(6.2% - 8.6%)

Appendix D: Otter Tail County vs. State Comparison Tables

Otter Tail vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Otter Tail County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	29.7	(26.8 - 32.7)*
Hospitalizations	6.1	(6.0 - 6.3)	4.9	(3.8 - 6.2)
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	39.3	(34.4 - 44.2)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	7.5	(5.3 - 9.7)

*Statistically significant difference from the state

Otter Tail vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Otter Tail County	95% CI
All types combined	458.6	(456.1 - 461.1)	455.6	(434.5 - 477.6)
Breast (female only)	130.2	(128.3 - 132)	114.1	(98.8 - 131.2)
Bladder	22.2	(21.7 - 22.8)	25.0	(20.4 - 30.4)
Brain and other nervous system	6.8	(6.5 - 7.2)	8.4	(5.4 - 12.5)
Colorectal	39.6	(38.9 - 40.4)	39.0	(33.0 - 45.8)
Kidney	15.5	(15.1 - 16)	13.7	(10.4 - 17.9)
Leukemia	16.1	(15.6 - 16.6)	21.1	(16.7 - 26.5)
Lung and bronchus	55.5	(54.6 - 56.4)	51.2	(44.7 - 58.5)
Melanoma	27.7	(27.1 - 28.3)	30.2	(24.1 - 37.3)
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	20.8	(16.5 - 26)
Oral and pharyngeal	11.9	(11.5 - 12.3)	10.1	(7.2 - 14)
Pancreatic	11.3	(10.9 - 11.7)	9.6	(7.0 - 13.1)
Thyroid	12.6	(12.1 - 13.0)	11.3	(7.7 - 16)

Otter Tail vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Otter Tail County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	50.2%	(42.6% - 55.6%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	1.6%	(0.7% - 3.6%)

*Statistically significant difference from the state

Otter Tail vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Otter Tail County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	12.2	(10.6 - 15.6)

Otter Tail vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Otter Tail County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	35.6	(32.3 - 38.8)*

*Statistically significant difference from the state

Otter Tail vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Otter Tail County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	11.2%	(4.1% - 13.9%)

Otter Tail vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Otter Tail County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	11.0%	(10.1 - 11.9)
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	14.6%	(12.7 - 16.5)

Otter Tail vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Otter Tail County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	1.9%	(1.4% - 2.4%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	5.2%	(4.5% - 6.0%)*

*Statistically significant difference from the state

Appendix E: Todd County vs. State Comparison Tables

Todd vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Todd County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	12.8	(10.2 - 15.9)*
Hospitalizations	6.1	(6.0 - 6.3)	1.9 (UR)	(1.0 - 3.2)*
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	19.1	(14.1 - 24.0)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	2.0 (UR)	(0.4 - 3.6)*

*Statistically significant difference from the state | UR Unstable rate that should be interpreted with caution

Todd vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Todd County	95% CI
All types combined	458.6	(456.1 - 461.1)	463.3	(403.6 - 471.1)
Breast (female only)	130.2	(128.3 - 132)	104.2	(82.7 - 130)
Bladder	22.2	(21.7 - 22.8)	17.3	(11.6 - 25.1)
Brain and other nervous system	6.8	(6.5 - 7.2)	9.3	(4.4 - 17.1)
Colorectal	39.6	(38.9 - 40.4)	43.4	(33.8 - 55.2)
Kidney	15.5	(15.1 - 16)	17.9	(11.6 - 26.5)
Leukemia	16.1	(15.6 - 16.6)	12.2	(7.0 - 19.9)
Lung and bronchus	55.5	(54.6 - 56.4)	55.8	(44.7 - 69.0)
Melanoma	27.7	(27.1 - 28.3)	18.7	(12.0 - 27.7)
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	19.8	(13.5 - 28.4)
Oral and pharyngeal	11.9	(11.5 - 12.3)	16.0	(10.5 - 23.7)
Pancreatic	11.3	(10.9 - 11.7)	10.2	(5.5 - 17.4)
Thyroid	12.6	(12.1 - 13.0)	13.9	(7.7 - 22.7)

Todd vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Todd County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	74.8%	(68.2% - 79.8%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	0.4%	(0.1 - 2.2)

*Statistically significant difference from the state

Todd vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Todd County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	12.7	(10.2 - 15.6)

Todd vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Todd County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	17.2	(13.5 - 21.5)*

*Statistically significant difference from the state

Todd vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Todd County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	16.6%	(7.5% - 20.9%)

Todd vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Todd County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	16.1%	(14.4 - 17.8)*
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	25.5%	(21.5 - 29.5)*

*Statistically significant difference from the state

Todd vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Todd County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	1.3%(UR)	(0.8% - 2.1%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	7.7%	(6.5% - 9.1%)

UR Unstable rate that should be interpreted with caution

Appendix F: Wadena County vs. State Comparison Tables

Wadena vs State Asthma Rates per 10,000, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Wadena County	95% CI
Emergency Department Visits	40.1	(39.7 - 40.4)	41.4	(34.7 - 48.2)
Hospitalizations	6.1	(6.0 - 6.3)	9.8	(7.0 - 13.3)*
Child (0-17 years) Emergency Department Visits	69.6	(69.0 - 70.3)	39.9	(30.3 - 49.6)*
Child (0-17 years) Hospitalizations	8.5	(8.2 - 8.7)	NR	NR

*Statistically significant difference from the state | NR Data is not reported due to low number of counts

Wadena vs State Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Wadena County	95% CI
All types combined	458.6	(456.1 - 461.1)	485.9	(441.2 - 534.2)
Breast (female only)	130.2	(128.3 - 132)	117.1	(87.8 - 154.2)
Bladder	22.2	(21.7 - 22.8)	28.1	(19.1 - 40.8)
Brain and other nervous system	6.8	(6.5 - 7.2)	4.0 (UR)	(1.1 - 11.3)
Colorectal	39.6	(38.9 - 40.4)	54.8	(41.4 - 71.7)*
Kidney	15.5	(15.1 - 16)	12.7	(6.0 - 23.9)
Leukemia	16.1	(15.6 - 16.6)	20.1	(11.9 - 32.2)
Lung and bronchus	55.5	(54.6 - 56.4)	54.3	(40.9 - 71.2)
Melanoma	27.7	(27.1 - 28.3)	31.0	(19.4 - 47.0)
Non-Hodgkin lymphoma	22.5	(21.9 - 23.0)	36.7	(24.2 - 53.4)*
Oral and pharyngeal	11.9	(11.5 - 12.3)	12.9	(6.4 - 23.8)
Pancreatic	11.3	(10.9 - 11.7)	9.2 (UR)	(3.9 - 18.9)
Thyroid	12.6	(12.1 - 13.0)	10.5 (UR)	(3.8 - 22.4)

*Statistically significant difference from the state | UR Unstable rate that should be interpreted with caution

Wadena vs State Childhood Blood Lead Levels, 2012 Birth Year

	State of Minnesota	95% CI	Wadena County	95% CI
Percent of Children Blood Lead Tested	80.7%	(80.3% - 81.0%)	95.8%	(91.4% - 98.0%)*
Percent with Elevated Blood Lead Levels 5+ mcg/dL	1.0%	(0.9% - 1.0%)	1.9%	(0.6% - 5.4%)

*Statistically significant difference from the state

Wadena vs State COPD Rates per 10,000, Age-Adjusted, 2012-2014

	State of Minnesota	95% CI	Wadena County	95% CI
COPD Hospitalizations	15.8	(15.5 - 16.0)	25.6	(20.7 - 30.5)*

*Statistically significant difference from the state

Wadena vs State Heart Attack Rates per 10,000, Ages 35+, Age-Adjusted, 2011-2013

	State of Minnesota	95% CI	Wadena County	95% CI
Heart Attack Hospitalizations	26.7	(26.4 - 27.0)	30.5	(24.3 - 36.7)

Wadena vs State Obesity (Childhood), 2014

	State of Minnesota	95% CI	Wadena County	95% CI
Percent of Obesity in WIC Children	12.6%	(11.9% - 12.9%)	16.5%	(3.3% - 23.1%)

Wadena vs State Percent of People in Poverty, Age-Adjusted, 2010-2014

	State of Minnesota	95% CI	Wadena County	95% CI
Percent of People in Poverty	11.5%	(11.4 - 11.6)	17.2%	(14.8 - 19.6)*
Percent of Children (under 18) in Poverty	14.8%	(14.5 - 15.1)	24.1%	(18.8 - 29.4)*

*Statistically significant difference from the state

Wadena vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Wadena County	95% CI
Percent of Low Birth Weight	1.7%	(1.7% - 1.7%)	1.2 % (UR)	(0.6% - 2.2%)
Percent of Premature Births	6.7%	(6.6% - 6.8%)	7.9%	(6.2% - 9.9%)

UR Unstable rate that should be interpreted with caution

Appendix G: Central Sands Region vs. State Comparison

Central Sands vs State Select Cancer Rates per 100,000, Age-Adjusted, 2009-2013

	State of Minnesota	95% CI	Central Sands Region	95% CI
Acute myeloid leukemia	4.3	(4.1 - 4.6)	4.1	(3.0 - 5.5)
Chronic Lymphocytic Leukemia	6.5	(6.2 - 6.8)	6.9	(5.5 - 8.5)
Esophageal	4.8	(4.5 - 5.1)	4.5	(3.4 - 5.9)
Laryngeal	2.9	(2.7 - 3.1)	2.9	(2.1 - 4.0)
Liver	4.4	(4.2 - 4.6)	3.7	(2.7 - 5.0)

Central Sands vs State Childhood (0-14 years) Cancer Rates per 100,000, Age-Adjusted, 2004-2013

	State of Minnesota	95% CI	Central Sands Region	95% CI
Acute lymphocytic leukemia	4.0	(3.6 - 4.4)	4.0	(2.2 - 6.8)
Acute myeloid leukemia	0.6	(0.5 - 0.8)	0.9	(0.2 - 2.5)
Brain and other nervous system	3.3	(3.0 - 3.7)	4.3	(2.4 - 7.2)
Leukemia overall	5.1	(4.6 - 5.5)	5.2	(3.1 - 8.2)

Central Sands vs State Pesticide Poisoning Rates per 100,000, 2005-2014

	State of Minnesota	95% CI	Central Sands Region	95% CI
Emergency department visits	1.0	(0.9 - 1.1)	2.6	(1.6 - 3.9)*

*Statistically significant difference from the state

Central Sands vs State Reproductive and Birth Outcomes, 2011-2015

	State of Minnesota	95% CI	Central Sands Region	95% CI
Infant Mortality	5.0	(3.7 – 6.3)	4.8	(4.1 – 5.9)