

East metro birth outcomes

LOW BIRTH WEIGHT AND PREMATUREITY IN WASHINGTON AND DAKOTA COUNTIES (2000-2015)

This report responds to concerns in east metro communities around legacy perfluorochemicals (PFCs) contamination and adverse birth outcomes. MDH examined vital records data for two key indicators: low birth weight and prematurity. We looked at community-level trends to identify areas with unusually high rates of these indicators. Specifically we looked at whether these trends show differences related to social and economic factors that are important in identifying communities where people don't have what they need to be healthy.

Key findings

- There is a lot of variation but the small differences are not outside of what we would expect given what we know about the east metro and the rest of the state.
- Variation across areas and differences over time do not suggest any unusual increase in low birth weight or premature births in east metro communities.
- Health inequities across the diverse population are consistent with differences and trends we see across Minnesota. Addressing these inequities is a central piece of the department of health's work and priorities.

Adverse birth outcomes can have life-long health risks

Being born too soon (premature) or too small (low birth weight) can lead to serious life-long health risks. Premature and low birth weight babies are vulnerable to sickness and infection and have higher risks for infant mortality. Roughly 7% of babies in Minnesota are born premature before reaching "full-term" at 37 completed weeks of pregnancy (not counting multiple births, like twins). That's over 5,000 babies a year born premature in Minnesota. Roughly 2% of single full-term births in Minnesota are born with low weight.

Most recent statewide data show that teens and women over age 40 are more likely to have a low birth weight or premature birth. American Indian mothers and mother of color – including Hispanic, African American, Asian and Pacific Islander mothers – are also more likely than white mothers to have adverse birth outcomes.

Steps to take for a healthy pregnancy and healthy baby

Women who are pregnant or may become pregnant can reduce the likelihood of an adverse birth outcome with the following guidelines:

- Stop smoking and avoid exposure to secondhand smoke
- Do not use alcohol or illegal drugs
- Get preconception health care and early prenatal health care
- Follow nutritional and other advice carefully, including taking 400 micrograms of folic acid daily
- Maintain a healthy weight
- Avoid exposure to mercury (in fish), lead, and other chemical toxins at work and home

What's being done to improve birth outcomes?

The [MDH Center for Health Statistics](#) collects, analyzes, and reports state and county data on a variety of health outcomes, including births and deaths.

The [MDH Maternal and Child Health \(MCH\) Section](#) provides statewide leadership and public health information to promote, improve, and maintain the health of women, children, and families in Minnesota. MCH programs include activities to reduce infant mortality, promote healthy birth outcomes, and support positive parenting.

The Minnesota [Pregnancy Risk Assessment Monitoring System \(PRAMS\) collects](#) and provides data on maternal and child health indicators.

Annual data on birth outcomes are available on the [MN Public Health Data Access](#) portal.

The Centers for Disease Control and Prevention provides data and other information about [Pregnancy](#).

How to use this report

What this report can tell us

Charts and tables in this report show how overall rates of low birth weight and prematurity rates are changing over time across east metro communities. Full data tables are available at the end of the report. MDH does not have data on important factors for linking PFC exposure to birth outcomes, such as each mother's exposure levels and how long they lived in the area, as well as other important risk factors and exposures, like second hand smoke.

Detecting differences

MDH uses standard public health techniques to understand whether differences between communities are within the range of normal, expected small variations across the population.

- Prevalence rates take into account the total population in an area. Therefore, low birth weight or premature babies are a percentage of the total number of babies born in an area during a specific time.
- Confidence intervals help determine a range around a value, within which you might expect the value to vary under normal circumstances. We use confidence intervals representing 95% probability that variation within that range is not unusual and is likely due to random chance.
- Bar charts use thin error lines to show 95% confidence intervals. When these lines do not overlap, we understand that there is a 95% probability that the small difference is “significant”, and not due to random chance

Areas of interest

This report looks at the same eight communities (nine zip codes) within the region that had known or potential drinking water contamination, which have been used in previous MDH analyses – [Cancer Incidence in Dakota and Washington Counties](#). Water testing continues to monitor contaminant levels and more clearly define the borders of the PFC plume. Additional areas/zip codes could be added or removed from future studies as a result.

- The “study area” includes: Cottage Grove (55016), Hastings (55033), Lake Elmo (55042), Newport (55055), Oakdale (55128), Saint Paul Park (55071), South Saint Paul (55075), and Woodbury (55125, 55129).
- The “comparison area” covers Washington County’s 18 remaining ZIP codes: 55001, 55003, 55013, 55025, 55038, 55043, 55045, 55047, 55068, 55073, 55074, 55076, 55082, 55090, 55109, 55110, 55115, and 55119.
- Zip code areas are not real-world measures of neighborhoods or cities. However, there are generally enough people living in zip codes to derive reliable statistical estimates and they are recognizable by community members and partners.

Protecting privacy and calculating reliable values

MDH does not display birth outcome data or rates when there are fewer than 20 low birth weight or premature births. The reason is that rates calculated from fewer than 20 births are not reliable, so we cannot make conclusions from them. This is the same rule used by the National Center for Health Statistics and the US Centers for Disease Control and Prevention.

Time periods

This report looks at annual trends across Washington County, including study and comparison areas. When we look at separate zip codes, we combine five years of data to help protect privacy and ensure reliable values. Comparing the time periods 2001-2005, 2006-2010 and 2011-2015 is helpful in understanding longer-term trends without compromising the reliability of the data.

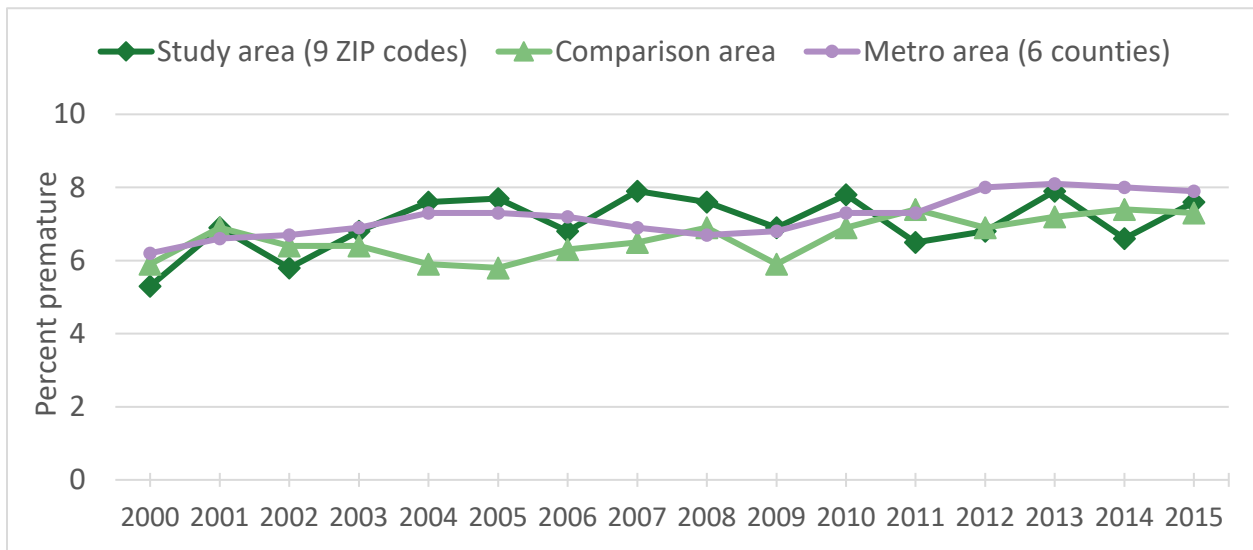
Trends in low birth weight and premature births

Patterns are similar across the metro region

Trends in premature and low birth weight births are statistically similar between the nine zip code “study area”, the rest of Washington County “comparison area”, and the other six counties in the Twin Cities metro region.

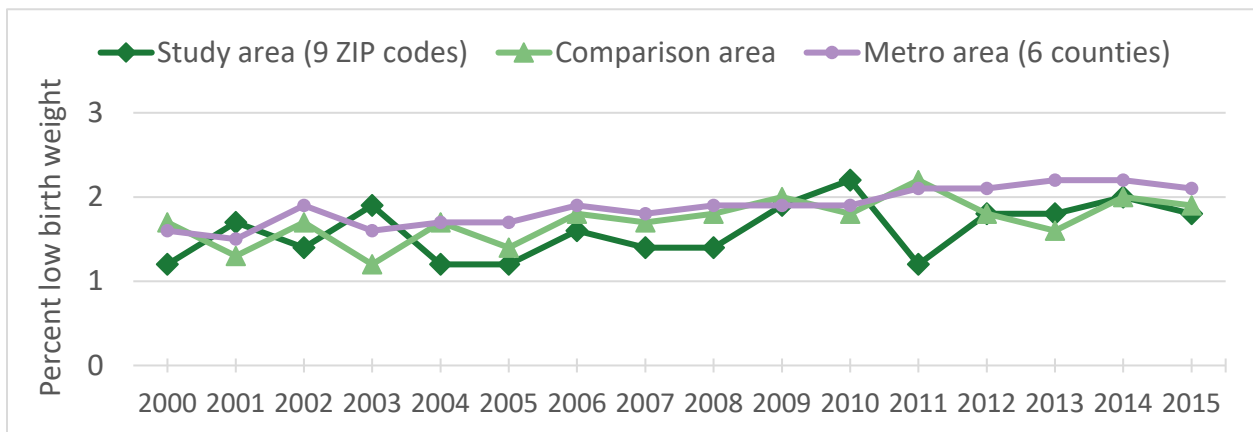
During 2000-2015, the annual rates of prematurity (Chart 1) and low birth weight (Chart 2) were not significantly different in the study area compared to the comparison area, meaning the study area was statistically similar to the rest of Washington County.

Chart 1: Annual rate of premature births, 2000-2015.



Note: All births are singleton. See Table 1.

Chart 2: Annual rate of low birth weight births, 2000-2015.

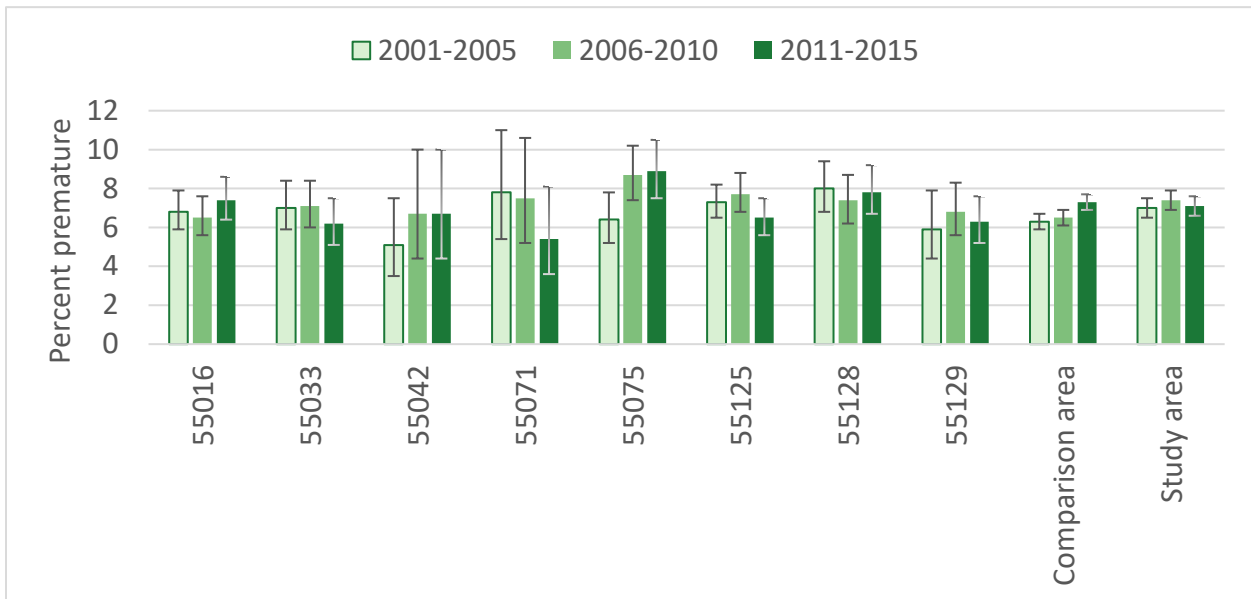


Note: All births are singleton, full term (37 weeks or more gestation). See Table 2.

Outcomes are within normal variations

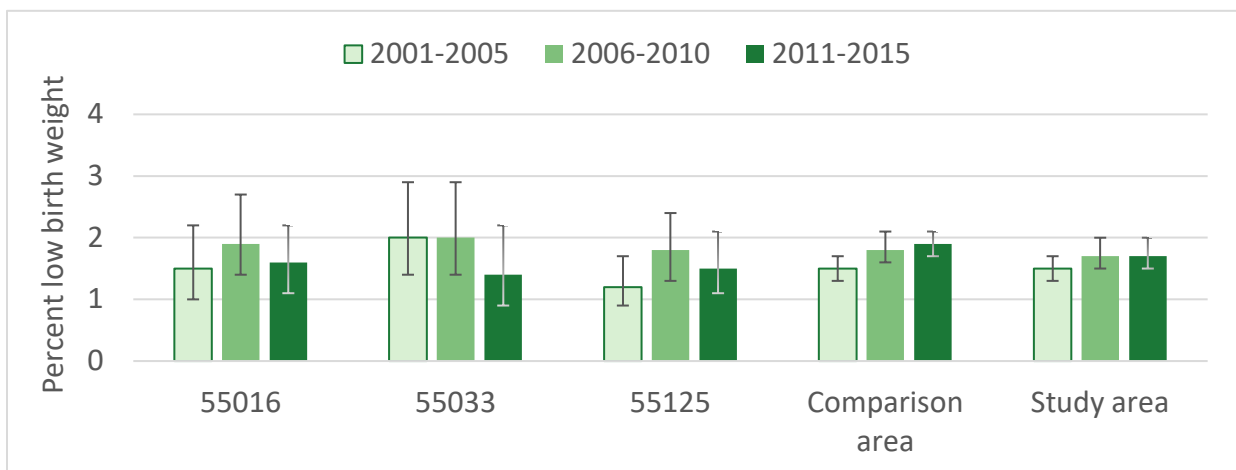
Variation is not unusual across the three time periods or across the areas. There are small differences in rates between the study and comparison areas, but they are so small that they are not statistically significant and are likely due to chance. For example, in Oakdale (55128), the rate of premature births was 8% in 2001 to 2005 (95% confidence interval 6.8 to 9.4) and 7.4% in 2006 to 2011 (6.2 to 8.7). Because the confidence intervals overlap, we are 95% confident that this small difference of 0.6% is due to chance and normal variation.

Chart 3: Premature birth rates in study and comparison areas, 2001-2015.



Note: Zip code 55055 is not shown because there were too few premature births (< 20) to estimate reliable values. All births are singleton. See Table 3.

Chart 4: Low birth weight rates in study and comparison areas, 2001-2015.



Note: Zip codes 55402, 55055, 55071, 55075, 55128, 55129 are not shown because there were too few low birth weight births (< 20) to estimate reliable values. All births are singleton, full term (37 weeks or more gestation). See Table 4.

Health differences and inequities

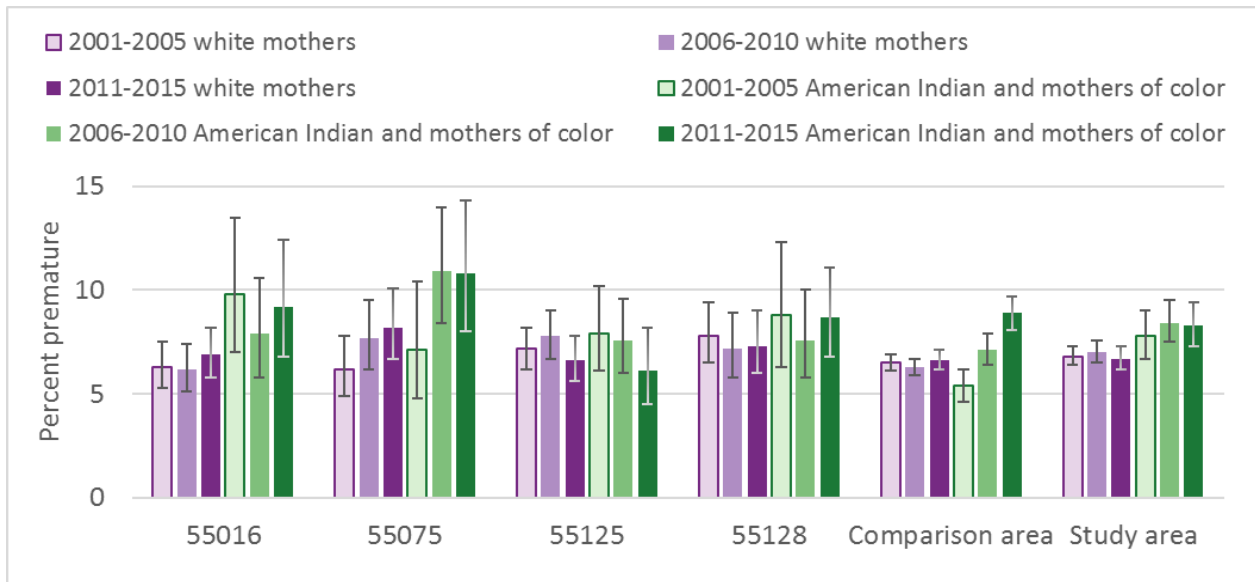
The Minnesota Department of Health’s vision is for health equity in Minnesota, where all communities are thriving and all people have what they need to be healthy. Structural barriers – things beyond a person’s control that can keep them from having what they need to be healthy – can create inequities in birth outcomes across Minnesota, including low birth weight and premature birth. Because structural barriers are difficult to measure, we look at social and economic factors to try to identify them and understand them.

In this report, we look at maternal race and ethnicity, education level and Medicaid status as indicators of structural barriers. Because every individual is different, these indicators are not perfect measures of structural barriers, but they are more accurate than aggregate measures, such as the percent of residents living in poverty in a particular zip code.

Health inequities are widespread and in some cases increasing

The group of American Indian mothers and mothers of color includes a diverse population, but for this report we had to pull together distinct groups to be able to calculate stable proportions (fewer than 20 births cannot support reliable estimates). The group called mothers of color includes births among African American/Black, Hispanic, Asian and Pacific Islander mothers, as well as those who identified “other” race.

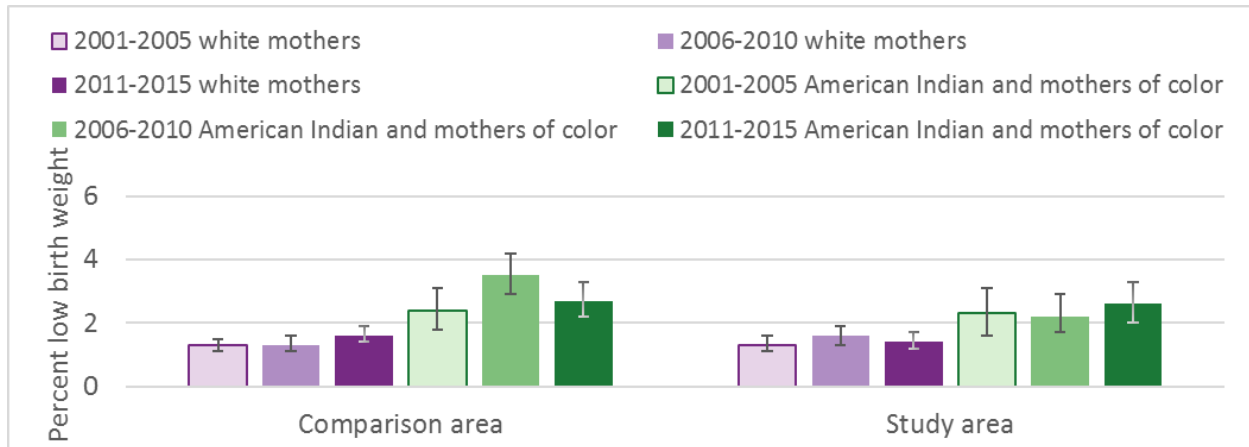
Chart 5: Premature birth rates by maternal race and ethnicity, 2001-2015.



Note: Zip codes 55033, 55042, 55055, 55071, 55129 are not shown because there were too few premature births (< 20) to estimate reliable values. All births are singleton. See Table 5a and Table 5b.

In some areas, premature births are more common among American Indian and mothers of color, compared to white mothers. The comparison area shows an increasing trend of premature births among American Indian and mothers of color, which is similar to some other areas of the metro region and state.

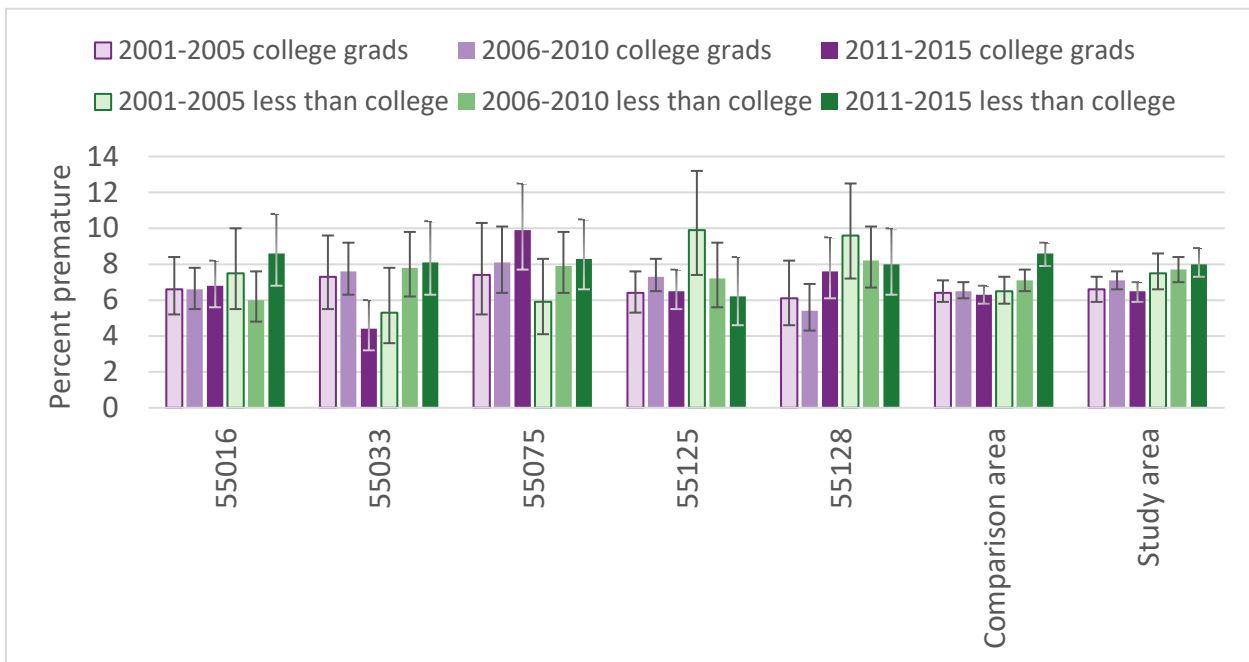
Chart 6: Low birth weight rates by maternal race and ethnicity, 2001-2015.



Note: Zip code-level rates are not shown because there were too few low birth weight births (< 20) to estimate reliable values. All births are singleton, full term (37 weeks or more gestation). See Table 6a and Table 6b.

Low weight births are more common among American Indian and mothers of color, compared to white mothers. The differences over time and between study and comparison areas are not unusual or outside the range of expected variation, in either maternal population.

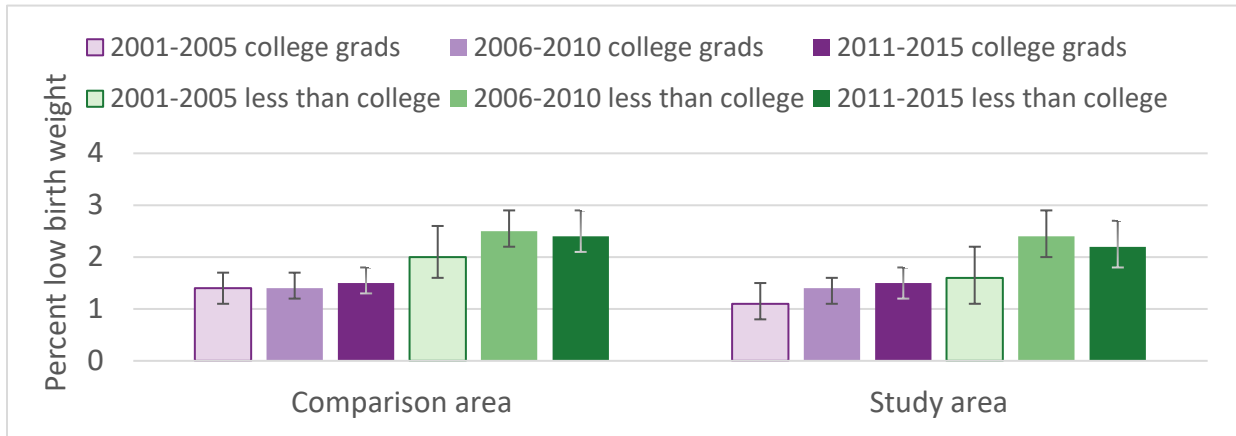
Chart 7. Premature birth rates by maternal education level, 2001-2015.



Note: Zip codes 55042, 55055, 55071, and 55129 are not shown because there were too few premature births (< 20) to estimate reliable values. All births are singleton. See Table 7a and Table 7b.

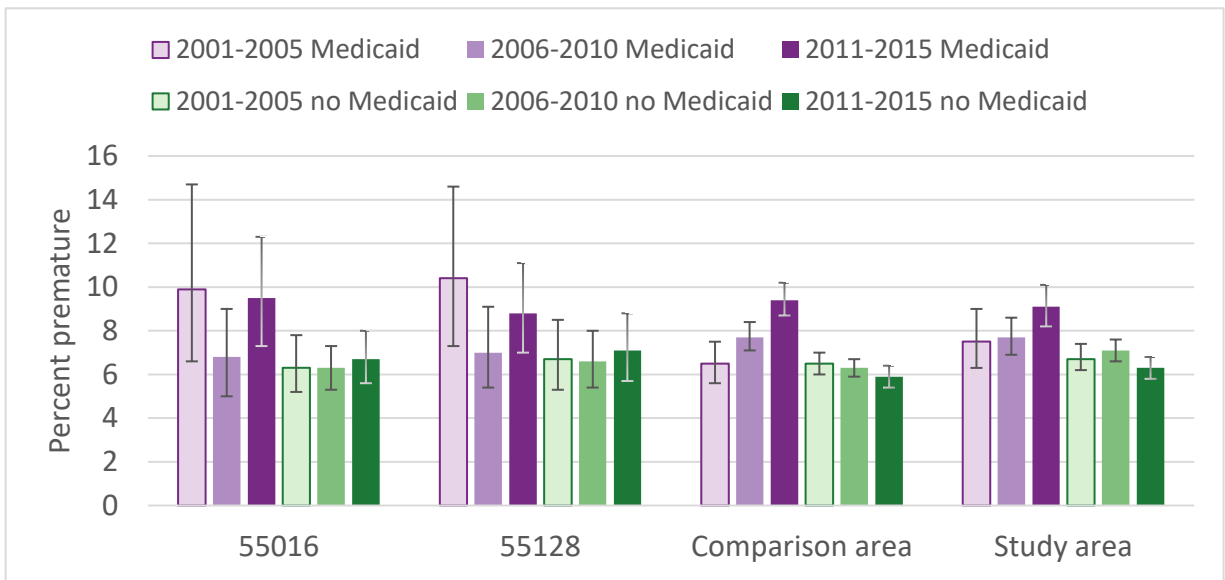
The range and size of variation in rates of low birth weight and premature births are not unusual across the study and comparison areas, and differences by maternal education are similar to health inequities across maternal race and ethnic groups.

Chart 8. Low birth weight rates by maternal education, 2001-2015.



Note: Zip code-level rates are not shown because there were too few low birth weight births (< 20) to estimate reliable values. All births are singleton, full term (37 weeks or more gestation). See Table 8a and Table 8b.

Chart 9: Premature birth rates by maternal Medicaid status, 2001-2015.



Note: Zip code-level rates are only shown for 55016 and 55128 because other zip codes had too few premature births in each category (< 20) to estimate reliable values. All births are singleton. See Table 9a and Table 9b.

The range and magnitude of variation in rates of premature births are not unusual across the study and comparison areas, and shows similar health inequity patterns.

Low birth weight rates are not shown by Medicaid status because there were too few premature births in each category (< 20) to estimate stable values. See Table 10a and Table 10b.

Data and analysis notes

What data and definitions does this report use?

- A low birth weight baby can be born too small, too soon, or both. The MN Tracking Program limits the definition of low birth weight babies to singleton infants (single births as opposed to twins, triplets, etc.) born at or above term (37 completed weeks of pregnancy). A low birth weight baby weighs less than 2,500 grams (5 pounds 8 ounces). This way, we can look at the proportion of only those babies born too small, and not because they were born too early or as part of a multiples birth. This is sometimes called intrauterine growth restriction.
- A premature birth, also called a preterm birth, is one that happens before 37 weeks of completed pregnancy. The MN Tracking Program limits the definition of premature babies to singleton infants (single births as opposed to twins, triplets, etc.).
- Birth outcomes were identified from birth certificates filed with the MDH Office of Vital Records, and data were obtained from MDH Center for Health Statistics. Prevalence values are not calculated for fewer than 20 low birth weight or premature births to ensure stable statistical interpretation and individual privacy.
- This report uses the date of last menstrual period to determine the number of completed weeks of pregnancy. MDH Center for Health Statistics will transition to only using the new obstetric estimate method (also called clinical estimate) beginning with 2016 births. Any numbers that use one method are not comparable to numbers that use the other method.
- These data include births to mothers of all ages. Because the mothers age is an important risk factor for low birth weight and prematurity, we also looked at trends and differences among babies born to women aged 20 to 39 and found similar conclusions.

How were data analyzed?

- In response to community concerns prompted by press coverage of the Attorney General filing, we examined our data for elevated premature birth and low birth weight in Oakdale, other areas in Washington and Dakota counties impacted by PFC contamination, as well as the rest of Washington County and the Metro region. See area definitions on page 3.
- We looked at individual birth data to understand annual trends and differences across communities. Low birth weight and premature births are relatively rare, so to protect privacy we looked at changes in prevalence within specific zip codes in three five-year periods: 2001-2005, 2006-2010 and 2011-2015.
- To examine health inequities, we conducted separate (stratified) analyses of known risk factors, such as maternal race and ethnicity, education level, and Medicaid status. These individual risk factors are more accurate than aggregate proxies. Stratified analyses are helpful to identify and understand potential vulnerable populations and public health prevention strategies. Differences across these groups may indicate structural barriers that can keep people from having the things that they need to stay healthy.
- Epidemiologists in the [MN Tracking program](#) worked with the MDH Center for Health Statistics and MDH birth outcomes experts to review and interpret analyses.

Supplemental data tables

All births are singleton, and low birth weight births are full term (37 weeks or more gestation). Values are not shown (*) for fewer than 20 low birth weight or premature births to ensure reliable statistical interpretation and individual privacy.

Table 1: Annual rate of premature births, 2000-2015.

Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI (study area)	Comparison area	95% CI (comparison area)	Metro area (6 counties)	95% CI (metro area)
2000	129	2425	5.3	(4.5 - 6.3)	5.9	(5.1 - 6.8)	6.2	(5.9 - 6.4)
2001	163	2362	6.9	(5.9 - 8.0)	6.9	(6.1 - 7.8)	6.6	(6.4 - 6.9)
2002	139	2378	5.8	(5.0 - 6.9)	6.4	(5.6 - 7.3)	6.7	(6.4 - 7.0)
2003	166	2425	6.8	(5.9 - 7.9)	6.4	(5.7 - 7.3)	6.9	(6.6 - 7.1)
2004	185	2423	7.6	(6.6 - 8.8)	5.9	(5.2 - 6.8)	7.3	(7.0 - 7.5)
2005	186	2415	7.7	(6.7 - 8.8)	5.8	(5.0 - 6.7)	7.3	(7.1 - 7.6)
2006	172	2536	6.8	(5.9 - 7.8)	6.3	(5.5 - 7.1)	7.2	(7.0 - 7.5)
2007	199	2532	7.9	(6.9 - 9.0)	6.5	(5.7 - 7.4)	6.9	(6.7 - 7.2)
2008	188	2469	7.6	(6.6 - 8.7)	6.9	(6.1 - 7.8)	6.7	(6.4 - 6.9)
2009	164	2383	6.9	(5.9 - 8.0)	5.9	(5.2 - 6.8)	6.8	(6.5 - 7.1)
2010	189	2432	7.8	(6.8 - 8.9)	6.9	(6.1 - 7.9)	7.3	(7.0 - 7.6)
2011	154	2384	6.5	(5.5 - 7.5)	7.4	(6.6 - 8.4)	7.3	(7.0 - 7.5)
2012	160	2336	6.8	(5.9 - 7.9)	6.9	(6.1 - 7.9)	8.0	(7.8 - 8.3)
2013	192	2421	7.9	(6.9 - 9.1)	7.2	(6.3 - 8.1)	8.1	(7.8 - 8.3)
2014	162	2449	6.6	(5.7 - 7.7)	7.4	(6.6 - 8.4)	8.0	(7.7 - 8.3)
2015	177	2337	7.6	(6.6 - 8.7)	7.3	(6.5 - 8.3)	7.9	(7.7 - 8.2)

Table 2: Annual rate of low birth weight births, 2000-2015.

Birth year	Number of LBW births	Number of singleton, term births	Percent low birth weight	95% CI (study area)	Comparison area	95% CI (comparison area)	Metro area (6 counties)	95% CI (metro area)
2000	23	1970	1.2	(0.8 - 1.7)	1.7	(1.3 - 2.4)	1.6	(1.4 - 1.7)
2001	33	1980	1.7	(1.2 - 2.3)	1.3	(0.9 - 1.8)	1.5	(1.4 - 1.7)
2002	28	1991	1.4	(1.0 - 2.0)	1.7	(1.3 - 2.3)	1.9	(1.7 - 2.0)
2003	37	1908	1.9	(1.4 - 2.7)	1.2	(0.9 - 1.7)	1.6	(1.5 - 1.8)
2004	23	1890	1.2	(0.8 - 1.8)	1.7	(1.3 - 2.3)	1.7	(1.6 - 1.9)
2005	23	1925	1.2	(0.8 - 1.8)	1.4	(1.0 - 2.0)	1.7	(1.6 - 1.9)
2006	32	1971	1.6	(1.2 - 2.3)	1.8	(1.3 - 2.4)	1.9	(1.8 - 2.1)
2007	29	2009	1.4	(1.0 - 2.1)	1.7	(1.3 - 2.2)	1.8	(1.6 - 2.0)
2008	30	2088	1.4	(1.0 - 2.0)	1.8	(1.4 - 2.4)	1.9	(1.8 - 2.1)
2009	40	2077	1.9	(1.4 - 2.6)	2.0	(1.6 - 2.6)	1.9	(1.7 - 2.0)
2010	46	2130	2.2	(1.6 - 2.9)	1.8	(1.4 - 2.4)	1.9	(1.8 - 2.1)
2011	26	2114	1.2	(0.8 - 1.8)	2.2	(1.7 - 2.8)	2.1	(1.9 - 2.2)
2012	37	2099	1.8	(1.3 - 2.4)	1.8	(1.4 - 2.4)	2.1	(2.0 - 2.3)
2013	38	2131	1.8	(1.3 - 2.4)	1.6	(1.2 - 2.1)	2.2	(2.0 - 2.3)
2014	42	2148	2.0	(1.4 - 2.6)	2.0	(1.5 - 2.6)	2.2	(2.0 - 2.3)
2015	37	2032	1.8	(1.3 - 2.5)	1.9	(1.5 - 2.5)	2.1	(2.0 - 2.3)

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Table 3: Premature birth rates in study and comparison areas, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	153	2241	6.8	(5.9 - 7.9)
55016	Cottage Grove	2006-2010	151	2313	6.5	(5.6 - 7.6)
55016	Cottage Grove	2011-2015	161	2179	7.4	(6.4 - 8.6)
55033	Hastings	2001-2005	111	1584	7	(5.9 - 8.4)
55033	Hastings	2006-2010	118	1663	7.1	(6.0 - 8.4)
55033	Hastings	2011-2015	93	1507	6.2	(5.1 - 7.5)
55042	Lake Elmo	2001-2005	24	470	5.1	(3.5 - 7.5)
55042	Lake Elmo	2006-2010	21	315	6.7	(4.4 - 10.0)
55042	Lake Elmo	2011-2015	21	314	6.7	(4.4 - 10.0)
55055	Newport	2001-2005	*	242	*	*
55055	Newport	2006-2010	23	243	9.5	(6.4 - 13.8)
55055	Newport	2011-2015	*	216	*	*
55071	St. Paul Park	2001-2005	28	361	7.8	(5.4 - 11.0)
55071	St. Paul Park	2006-2010	28	375	7.5	(5.2 - 10.6)
55071	St. Paul Park	2011-2015	22	405	5.4	(3.6 - 8.1)
55075	South St. Paul	2001-2005	89	1388	6.4	(5.2 - 7.8)
55075	South St. Paul	2006-2010	132	1522	8.7	(7.4 - 10.2)
55075	South St. Paul	2011-2015	125	1400	8.9	(7.5 - 10.5)
55125	Woodbury	2001-2005	242	3310	7.3	(6.5 - 8.2)
55125	Woodbury	2006-2010	218	2823	7.7	(6.8 - 8.8)
55125	Woodbury	2011-2015	166	2560	6.5	(5.6 - 7.5)
55128	Oakdale	2001-2005	135	1679	8	(6.8 - 9.4)
55128	Oakdale	2006-2010	127	1725	7.4	(6.2 - 8.7)
55128	Oakdale	2011-2015	142	1810	7.8	(6.7 - 9.2)
55129	Woodbury	2001-2005	43	728	5.9	(4.4 - 7.9)
55129	Woodbury	2006-2010	94	1373	6.8	(5.6 - 8.3)
55129	Woodbury	2011-2015	97	1536	6.3	(5.2 - 7.6)
	Comparison area	2001-2005	1001	15927	6.3	(5.9 - 6.7)
	Comparison area	2006-2010	1078	16595	6.5	(6.1 - 6.9)
	Comparison area	2011-2015	1171	16127	7.3	(6.9 - 7.7)
	Study area	2001-2005	839	12003	7	(6.5 - 7.5)
	Study area	2006-2010	912	12352	7.4	(6.9 - 7.9)
	Study area	2011-2015	845	11927	7.1	(6.6 - 7.6)

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Table 4: Low birth weight rates in study and comparison areas, 2001-2015.

ZIP code	Community	Birth year	Number of LBW births	Number of singleton, term births	Percent low birth weight	95% CI
55016	Cottage Grove	2001-2005	27	1810	1.5	(1.0 - 2.2)
55016	Cottage Grove	2006-2010	38	1951	1.9	(1.4 - 2.7)
55016	Cottage Grove	2011-2015	30	1905	1.6	(1.1 - 2.2)
55033	Hastings	2001-2005	28	1405	2	(1.4 - 2.9)
55033	Hastings	2006-2010	30	1486	2	(1.4 - 2.9)
55033	Hastings	2011-2015	20	1380	1.4	(0.9 - 2.2)
55042	Lake Elmo	2001-2005	*	372	*	*
55042	Lake Elmo	2006-2010	*	253	*	*
55042	Lake Elmo	2011-2015	*	276	*	*
55055	Newport	2001-2005	*	188	*	*
55055	Newport	2006-2010	*	191	*	*
55055	Newport	2011-2015	*	187	*	*
55071	St. Paul Park	2001-2005	*	280	*	*
55071	St. Paul Park	2006-2010	*	311	*	*
55071	St. Paul Park	2011-2015	*	356	*	*
55075	South St. Paul	2001-2005	24	999	2.4	(1.6 - 3.5)
55075	South St. Paul	2006-2010	*	1129	*	*
55075	South St. Paul	2011-2015	*	1205	*	*
55125	Woodbury	2001-2005	34	2724	1.2	(0.9 - 1.7)
55125	Woodbury	2006-2010	42	2356	1.8	(1.3 - 2.4)
55125	Woodbury	2011-2015	35	2309	1.5	(1.1 - 2.1)
55128	Oakdale	2001-2005	*	1321	*	*
55128	Oakdale	2006-2010	27	1407	1.9	(1.3 - 2.8)
55128	Oakdale	2011-2015	40	1538	2.6	(1.9 - 3.5)
55129	Woodbury	2001-2005	*	595	*	*
55129	Woodbury	2006-2010	*	1191	*	*
55129	Woodbury	2011-2015	24	1368	1.8	(1.2 - 2.6)
	Comparison area	2001-2005	188	12755	1.5	(1.3 - 1.7)
	Comparison area	2006-2010	245	13377	1.8	(1.6 - 2.1)
	Comparison area	2011-2015	263	13860	1.9	(1.7 - 2.1)
	Study area	2001-2005	144	9694	1.5	(1.3 - 1.7)
	Study area	2006-2010	177	10275	1.7	(1.5 - 2.0)
	Study area	2011-2015	180	10524	1.7	(1.5 - 2.0)

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Table 5a: Premature births among white mothers, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	121	1915	6.3	(5.3 - 7.5)
55016	Cottage Grove	2006-2010	112	1819	6.2	(5.1 - 7.4)
55016	Cottage Grove	2011-2015	122	1757	6.9	(5.8 - 8.2)
55033	Hastings	2001-2005	104	1487	7	(5.8 - 8.4)
55033	Hastings	2006-2010	112	1535	7.3	(6.1 - 8.7)
55033	Hastings	2011-2015	80	1414	5.7	(4.6 - 7.0)
55042	Lake Elmo	2001-2005	21	413	5.1	(3.3 - 7.6)
55042	Lake Elmo	2006-2010	*	262	*	*
55042	Lake Elmo	2011-2015	*	270	*	*
55055	Newport	2001-2005	*	192	*	*
55055	Newport	2006-2010	*	190	*	*
55055	Newport	2011-2015	*	164	*	*
55071	St. Paul Park	2001-2005	26	301	8.6	(6.0 - 12.4)
55071	St. Paul Park	2006-2010	22	291	7.6	(5.0 - 11.2)
55071	St. Paul Park	2011-2015	*	321	*	*
55075	South St. Paul	2001-2005	66	1063	6.2	(4.9 - 7.8)
55075	South St. Paul	2006-2010	81	1054	7.7	(6.2 - 9.5)
55075	South St. Paul	2011-2015	84	1019	8.2	(6.7 - 10.1)
55125	Woodbury	2001-2005	188	2629	7.2	(6.2 - 8.2)
55125	Woodbury	2006-2010	155	1997	7.8	(6.7 - 9.0)
55125	Woodbury	2011-2015	127	1921	6.6	(5.6 - 7.8)
55128	Oakdale	2001-2005	104	1328	7.8	(6.5 - 9.4)
55128	Oakdale	2006-2010	81	1123	7.2	(5.8 - 8.9)
55128	Oakdale	2011-2015	84	1145	7.3	(6.0 - 9.0)
55129	Woodbury	2001-2005	38	611	6.2	(4.6 - 8.4)
55129	Woodbury	2006-2010	61	1039	5.9	(4.6 - 7.5)
55129	Woodbury	2011-2015	73	1141	6.4	(5.1 - 8.0)
	Comparison area	2001-2005	838	12894	6.5	(6.1 - 6.9)
	Comparison area	2006-2010	777	12366	6.3	(5.9 - 6.7)
	Comparison area	2011-2015	771	11615	6.6	(6.2 - 7.1)
	Study area	2001-2005	679	9939	6.8	(6.4 - 7.3)
	Study area	2006-2010	656	9310	7	(6.5 - 7.6)
	Study area	2011-2015	615	9152	6.7	(6.2 - 7.3)

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Table 5b: Premature births among non-white mothers, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	32	326	9.8	(7.0 - 13.5)
55016	Cottage Grove	2006-2010	39	494	7.9	(5.8 - 10.6)
55016	Cottage Grove	2011-2015	39	422	9.2	(6.8 - 12.4)
55033	Hastings	2001-2005	*	97	*	*
55033	Hastings	2006-2010	*	128	*	*
55033	Hastings	2011-2015	*	93	*	*
55042	Lake Elmo	2001-2005	*	57	*	*
55042	Lake Elmo	2006-2010	*	53	*	*
55042	Lake Elmo	2011-2015	*	44	*	*
55055	Newport	2001-2005	*	50	*	*
55055	Newport	2006-2010	*	53	*	*
55055	Newport	2011-2015	*	52	*	*
55071	St. Paul Park	2001-2005	*	60	*	*
55071	St. Paul Park	2006-2010	*	84	*	*
55071	St. Paul Park	2011-2015	*	84	*	*
55075	South St. Paul	2001-2005	23	325	7.1	(4.8 - 10.4)
55075	South St. Paul	2006-2010	51	468	10.9	(8.4 - 14.0)
55075	South St. Paul	2011-2015	41	381	10.8	(8.0 - 14.3)
55125	Woodbury	2001-2005	54	681	7.9	(6.1 - 10.2)
55125	Woodbury	2006-2010	63	826	7.6	(6.0 - 9.6)
55125	Woodbury	2011-2015	39	639	6.1	(4.5 - 8.2)
55128	Oakdale	2001-2005	31	351	8.8	(6.3 - 12.3)
55128	Oakdale	2006-2010	46	602	7.6	(5.8 - 10.0)
55128	Oakdale	2011-2015	58	665	8.7	(6.8 - 11.1)
55129	Woodbury	2001-2005	*	117	*	*
55129	Woodbury	2006-2010	33	334	9.9	(7.1 - 13.6)
55129	Woodbury	2011-2015	24	395	6.1	(4.1 - 8.9)
	Comparison area	2001-2005	163	3033	5.4	(4.6 - 6.2)
	Comparison area	2006-2010	301	4229	7.1	(6.4 - 7.9)
	Comparison area	2011-2015	400	4512	8.9	(8.1 - 9.7)
	Study area	2001-2005	160	2064	7.8	(6.7 - 9.0)
	Study area	2006-2010	256	3042	8.4	(7.5 - 9.5)
	Study area	2011-2015	230	2775	8.3	(7.3 - 9.4)

Table 6a: Low birth weight births among white mothers, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	137	10593	1.3	(1.1 - 1.5)
Comparison area	2006-2010	136	10283	1.3	(1.1 - 1.6)
Comparison area	2011-2015	162	10120	1.6	(1.4 - 1.9)
Study area	2001-2005	110	8188	1.3	(1.1 - 1.6)
Study area	2006-2010	126	7948	1.6	(1.3 - 1.9)
Study area	2011-2015	118	8141	1.4	(1.2 - 1.7)

Table 6b: Low birth weight births among non-white mothers, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	51	2162	2.4	(1.8 - 3.1)
Comparison area	2006-2010	109	3094	3.5	(2.9 - 4.2)
Comparison area	2011-2015	101	3740	2.7	(2.2 - 3.3)
Study area	2001-2005	34	1506	2.3	(1.6 - 3.1)
Study area	2006-2010	51	2327	2.2	(1.7 - 2.9)
Study area	2011-2015	62	2383	2.6	(2.0 - 3.3)

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Table 7a. Premature births among mothers with college degrees, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	65	981	6.6	(5.2 - 8.4)
55016	Cottage Grove	2006-2010	121	1846	6.6	(5.5 - 7.8)
55016	Cottage Grove	2011-2015	94	1388	6.8	(5.6 - 8.2)
55033	Hastings	2001-2005	47	643	7.3	(5.5 - 9.6)
55033	Hastings	2006-2010	102	1339	7.6	(6.3 - 9.2)
55033	Hastings	2011-2015	36	816	4.4	(3.2 - 6.0)
55042	Lake Elmo	2001-2005	*	191	*	*
55042	Lake Elmo	2006-2010	*	298	*	*
55042	Lake Elmo	2011-2015	*	198	*	*
55055	Newport	2001-2005	*	64	*	*
55055	Newport	2006-2010	*	119	*	*
55055	Newport	2011-2015	*	84	*	*
55071	St. Paul Park	2001-2005	*	94	*	*
55071	St. Paul Park	2006-2010	*	229	*	*
55071	St. Paul Park	2011-2015	*	179	*	*
55075	South St. Paul	2001-2005	31	421	7.4	(5.2 - 10.3)
55075	South St. Paul	2006-2010	71	880	8.1	(6.4 - 10.1)
55075	South St. Paul	2011-2015	59	598	9.9	(7.7 - 12.5)
55125	Woodbury	2001-2005	117	1835	6.4	(5.3 - 7.6)
55125	Woodbury	2006-2010	219	2981	7.3	(6.5 - 8.3)
55125	Woodbury	2011-2015	123	1899	6.5	(5.5 - 7.7)
55128	Oakdale	2001-2005	42	687	6.1	(4.6 - 8.2)
55128	Oakdale	2006-2010	65	1194	5.4	(4.3 - 6.9)
55128	Oakdale	2011-2015	71	933	7.6	(6.1 - 9.5)
55129	Woodbury	2001-2005	26	437	5.9	(4.1 - 8.6)
55129	Woodbury	2006-2010	107	1405	7.6	(6.3 - 9.1)
55129	Woodbury	2011-2015	70	1279	5.5	(4.4 - 6.9)
	Comparison area	2001-2005	421	6546	6.4	(5.9 - 7.1)
	Comparison area	2006-2010	837	12840	6.5	(6.1 - 7.0)
	Comparison area	2011-2015	551	8813	6.3	(5.8 - 6.8)
	Study area	2001-2005	352	5353	6.6	(5.9 - 7.3)
	Study area	2006-2010	726	10291	7.1	(6.6 - 7.6)
	Study area	2011-2015	476	7374	6.5	(5.9 - 7.0)

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Table 7b. Premature births among mothers without college degrees, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	40	535	7.5	(5.5 - 10.0)
55016	Cottage Grove	2006-2010	65	1078	6	(4.8 - 7.6)
55016	Cottage Grove	2011-2015	67	779	8.6	(6.8 - 10.8)
55033	Hastings	2001-2005	23	434	5.3	(3.6 - 7.8)
55033	Hastings	2006-2010	64	821	7.8	(6.2 - 9.8)
55033	Hastings	2011-2015	56	688	8.1	(6.3 - 10.4)
55042	Lake Elmo	2001-2005	*	114	*	*
55042	Lake Elmo	2006-2010	*	180	*	*
55042	Lake Elmo	2011-2015	*	114	*	*
55055	Newport	2001-2005	*	90	*	*
55055	Newport	2006-2010	21	197	10.7	(7.1 - 15.7)
55055	Newport	2011-2015	*	128	*	*
55071	St. Paul Park	2001-2005	*	151	*	*
55071	St. Paul Park	2006-2010	22	242	9.1	(6.1 - 13.4)
55071	St. Paul Park	2011-2015	*	223	*	*
55075	South St. Paul	2001-2005	29	495	5.9	(4.1 - 8.3)
55075	South St. Paul	2006-2010	77	974	7.9	(6.4 - 9.8)
55075	South St. Paul	2011-2015	65	779	8.3	(6.6 - 10.5)
55125	Woodbury	2001-2005	41	413	9.9	(7.4 - 13.2)
55125	Woodbury	2006-2010	58	809	7.2	(5.6 - 9.2)
55125	Woodbury	2011-2015	40	641	6.2	(4.6 - 8.4)
55128	Oakdale	2001-2005	45	471	9.6	(7.2 - 12.5)
55128	Oakdale	2006-2010	80	970	8.2	(6.7 - 10.1)
55128	Oakdale	2011-2015	68	855	8	(6.3 - 10.0)
55129	Woodbury	2001-2005	*	67	*	*
55129	Woodbury	2006-2010	*	182	*	*
55129	Woodbury	2011-2015	27	251	10.8	(7.5 - 15.2)
55998	Comparison area	2001-2005	273	4179	6.5	(5.8 - 7.3)
	Comparison area	2006-2010	573	8088	7.1	(6.5 - 7.7)
	Comparison area	2011-2015	606	7076	8.6	(7.9 - 9.2)
	Study area	2001-2005	209	2770	7.5	(6.6 - 8.6)
	Study area	2006-2010	418	5453	7.7	(7.0 - 8.4)
	Study area	2011-2015	358	4458	8	(7.3 - 8.9)

Table 8a. Low birth weight births among mothers with college degrees, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	73	5373	1.4	(1.1 - 1.7)
Comparison area	2006-2010	156	10764	1.4	(1.2 - 1.7)
Comparison area	2011-2015	120	7821	1.5	(1.3 - 1.8)
Study area	2001-2005	49	4454	1.1	(0.8 - 1.5)
Study area	2006-2010	119	8780	1.4	(1.1 - 1.6)
Study area	2011-2015	96	6615	1.5	(1.2 - 1.8)

Table 8b. Low birth weight births among mothers without college degrees, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	65	3202	2	(1.6 - 2.6)
Comparison area	2006-2010	159	6331	2.5	(2.2 - 2.9)
Comparison area	2011-2015	142	5839	2.4	(2.1 - 2.9)
Study area	2001-2005	33	2127	1.6	(1.1 - 2.2)
Study area	2006-2010	107	4409	2.4	(2.0 - 2.9)
Study area	2011-2015	84	3835	2.2	(1.8 - 2.7)

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Table 9a: Premature births among mothers receiving Medicaid, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	21	212	9.9	(6.6 - 14.7)
55016	Cottage Grove	2006-2010	41	606	6.8	(5.0 - 9.0)
55016	Cottage Grove	2011-2015	52	546	9.5	(7.3 - 12.3)
55033	Hastings	2001-2005	*	218	*	*
55033	Hastings	2006-2010	54	570	9.5	(7.3 - 12.2)
55033	Hastings	2011-2015	34	462	7.4	(5.3 - 10.1)
55042	Lake Elmo	2001-2005	*	74	*	*
55042	Lake Elmo	2006-2010	*	132	*	*
55042	Lake Elmo	2011-2015	*	86	*	*
55055	Newport	2001-2005	*	47	*	*
55055	Newport	2006-2010	*	134	*	*
55055	Newport	2011-2015	*	106	*	*
55071	St. Paul Park	2001-2005	*	86	*	*
55071	St. Paul Park	2006-2010	*	177	*	*
55071	St. Paul Park	2011-2015	*	166	*	*
55075	South St. Paul	2001-2005	*	362	*	*
55075	South St. Paul	2006-2010	67	853	7.9	(6.2 - 9.9)
55075	South St. Paul	2011-2015	65	669	9.7	(7.7 - 12.2)
55125	Woodbury	2001-2005	*	208	*	*
55125	Woodbury	2006-2010	41	592	6.9	(5.1 - 9.3)
55125	Woodbury	2011-2015	41	506	8.1	(6.0 - 10.8)
55128	Oakdale	2001-2005	28	269	10.4	(7.3 - 14.6)
55128	Oakdale	2006-2010	53	752	7	(5.4 - 9.1)
55128	Oakdale	2011-2015	67	758	8.8	(7.0 - 11.1)
55129	Woodbury	2001-2005	*	26	*	*
55129	Woodbury	2006-2010	*	138	*	*
55129	Woodbury	2011-2015	22	166	13.3	(8.9 - 19.3)
	Comparison area	2001-2005	165	2531	6.5	(5.6 - 7.5)
	Comparison area	2006-2010	508	6591	7.7	(7.1 - 8.4)
	Comparison area	2011-2015	589	6237	9.4	(8.7 - 10.2)
	Study area	2001-2005	113	1502	7.5	(6.3 - 9.0)
	Study area	2006-2010	306	3954	7.7	(6.9 - 8.6)
	Study area	2011-2015	314	3465	9.1	(8.2 - 10.1)

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Table 9b: Premature births among mothers not receiving Medicaid, 2001-2015.

ZIP code	Community	Birth year	Number of preterm births	Number of singleton births	Percent preterm	95% CI
55016	Cottage Grove	2001-2005	85	1342	6.3	(5.2 - 7.8)
55016	Cottage Grove	2006-2010	149	2384	6.3	(5.3 - 7.3)
55016	Cottage Grove	2011-2015	109	1633	6.7	(5.6 - 8.0)
55033	Hastings	2001-2005	64	869	7.4	(5.8 - 9.3)
55033	Hastings	2006-2010	114	1608	7.1	(5.9 - 8.4)
55033	Hastings	2011-2015	59	1045	5.6	(4.4 - 7.2)
55042	Lake Elmo	2001-2005	*	237	*	*
55042	Lake Elmo	2006-2010	24	354	6.8	(4.6 - 9.9)
55042	Lake Elmo	2011-2015	*	228	*	*
55055	Newport	2001-2005	*	116	*	*
55055	Newport	2006-2010	*	190	*	*
55055	Newport	2011-2015	*	110	*	*
55071	St. Paul Park	2001-2005	*	169	*	*
55071	St. Paul Park	2006-2010	22	304	7.2	(4.8 - 10.7)
55071	St. Paul Park	2011-2015	*	239	*	*
55075	South St. Paul	2001-2005	42	607	6.9	(5.2 - 9.2)
55075	South St. Paul	2006-2010	86	1091	7.9	(6.4 - 9.6)
55075	South St. Paul	2011-2015	60	731	8.2	(6.4 - 10.4)
55125	Woodbury	2001-2005	143	2087	6.9	(5.8 - 8.0)
55125	Woodbury	2006-2010	240	3263	7.4	(6.5 - 8.3)
55125	Woodbury	2011-2015	125	2054	6.1	(5.1 - 7.2)
55128	Oakdale	2001-2005	62	925	6.7	(5.3 - 8.5)
55128	Oakdale	2006-2010	96	1461	6.6	(5.4 - 8.0)
55128	Oakdale	2011-2015	75	1052	7.1	(5.7 - 8.8)
55129	Woodbury	2001-2005	29	485	6	(4.2 - 8.5)
55129	Woodbury	2006-2010	110	1466	7.5	(6.3 - 9.0)
55129	Woodbury	2011-2015	75	1370	5.5	(4.4 - 6.8)
	Comparison area	2001-2005	549	8489	6.5	(6.0 - 7.0)
	Comparison area	2006-2010	935	14892	6.3	(5.9 - 6.7)
	Comparison area	2011-2015	582	9890	5.9	(5.4 - 6.4)
	Study area	2001-2005	461	6837	6.7	(6.2 - 7.4)
	Study area	2006-2010	859	12121	7.1	(6.6 - 7.6)
	Study area	2011-2015	531	8462	6.3	(5.8 - 6.8)

Table 10a: Low birth weight births among mothers receiving Medicaid, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	45	1803	2.5	(1.9 - 3.3)
Comparison area	2006-2010	144	5068	2.8	(2.4 - 3.3)
Comparison area	2011-2015	125	5082	2.5	(2.1 - 2.9)
Study area	2001-2005	*	1084	*	*
Study area	2006-2010	80	3121	2.6	(2.1 - 3.2)
Study area	2011-2015	64	2927	2.2	(1.7 - 2.8)

Table 10b: Low birth weight births among mothers not receiving Medicaid, 2001-2015.

Community	Birth year	Number of LBW births	Number singleton, term births	Percent low birth weight	95% CI
Comparison area	2001-2005	95	6938	1.4	(1.1 - 1.7)
Comparison area	2006-2010	175	12430	1.4	(1.2 - 1.6)
Comparison area	2011-2015	138	8778	1.6	(1.3 - 1.9)
Study area	2001-2005	73	5633	1.3	(1.0 - 1.6)
Study area	2006-2010	147	10307	1.4	(1.2 - 1.7)
Study area	2011-2015	116	7597	1.5	(1.3 - 1.8)

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