

ILLINOIS INFANT MORTALITY DATA REPORT

**Illinois Department of Public Health
Office of Women's Health and Family Services**

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EXECUTIVE SUMMARY

This report presents Illinois data on infant mortality, including trends and at-risk populations. The purpose of this report is to inform prevention efforts and guide the development of strategies for infant mortality reduction.

Major Findings

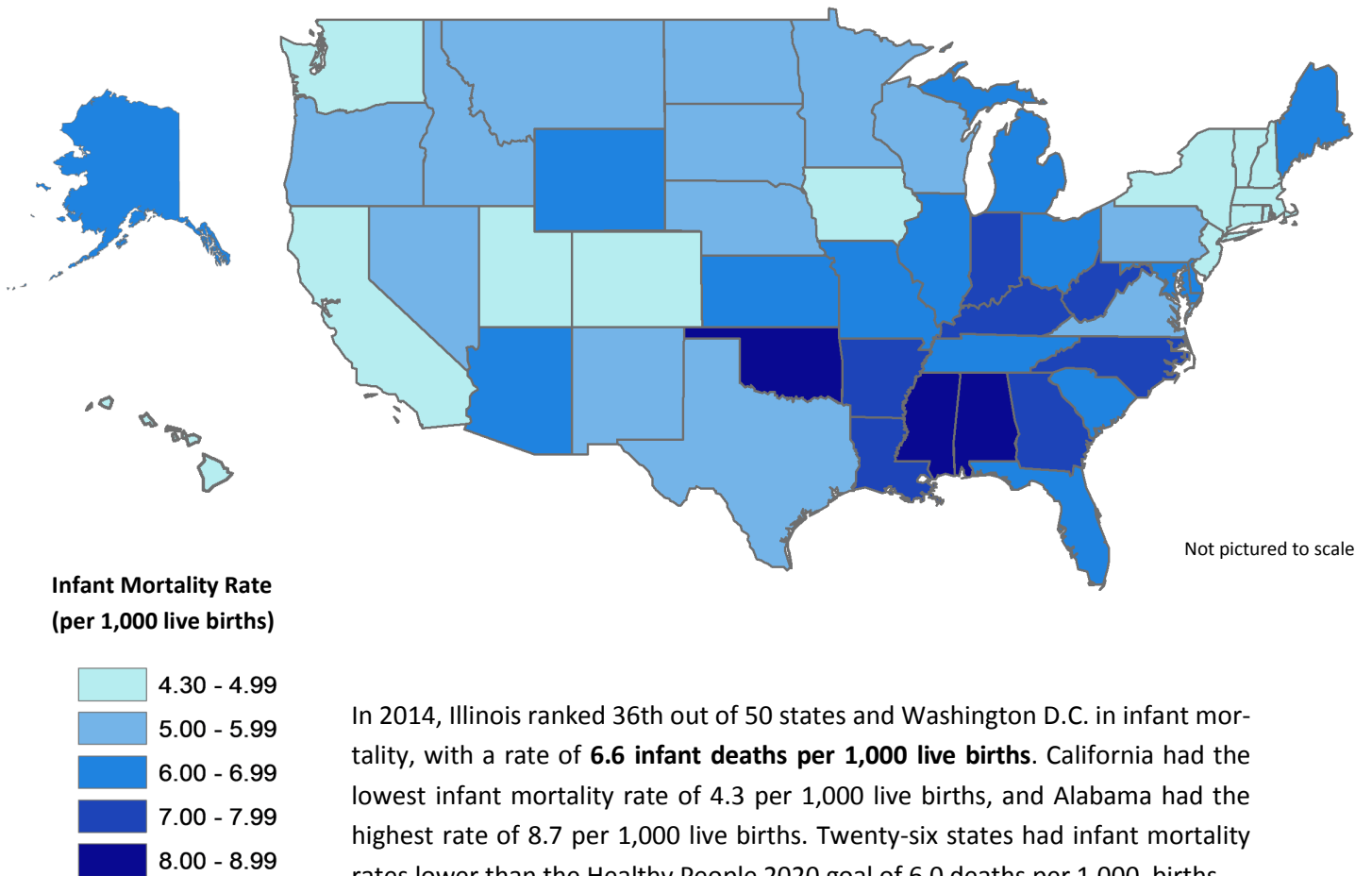
- In 2014, Illinois ranked 36th out of 50 states and Washington D.C. in infant mortality.
- The infant mortality rate in Illinois has decreased over time to meet the *Healthy People 2020* objective of 6.0 deaths per 1,000 live births.
- However, major racial/ethnic disparities persist. The infant mortality rate for infants born to Non-Hispanic black women is consistently at least two to three times as high as the infant mortality rate of infants born to Non-Hispanic white women.
- Infants at higher risk for infant mortality include those born to: Non-Hispanic black women, younger mothers, unmarried women, women with a high school education or less, U.S.-born women (vs. foreign-born), women covered by Medicaid, women with three or more previous births, residents of the city of Chicago, women with pregnancy-related hypertension (high blood pressure) or eclampsia, or women who did not receive any prenatal care.
- The leading causes of infant deaths are prematurity, congenital anomalies (birth defects), and Sudden Unexplained Infant Deaths (SUID), which includes deaths related to accidental suffocation and Sudden Infant Death Syndrome (SIDS).
- Based on a special kind of analysis called “Perinatal Periods of Risk,” the fetο-infant mortality rate for infants of non-Hispanic black women was nearly three times higher than that for infants born to the low-risk “reference” group (non-Hispanic white women at least 20 years of age and who had more than a high school education).
- The “excess” fetο-infant mortality rate refers to the difference between the rates in the target (non-Hispanic black women) and reference populations. During 2014-2015, there was an excess of 7.98 deaths per 1,000 births in the target population compared to the reference population. This translates to 418 excess fetal and infant deaths among non-Hispanic black infants.
- Because most of the excess fetο-infant deaths among non-Hispanic black infants occurred in the “Maternal Health/ Prematurity” and the “Infant Health” periods of risk, interventions could target preconception health, prenatal behaviors, perinatal care, social determinants, sleep position, postpartum behaviors, and injury prevention.
- More than half of the excess fetο-infant mortality in the target population were related to prematurity, due to increased prematurity rates overall and lower survival rates for premature babies.

BACKGROUND

According to the Centers for Disease Control and Prevention (CDC), over 23,000 infants died in the United States in 2014. This national infant mortality rate is higher than that of any other developed country, and reduction of infant mortality has been a longstanding goal in the United States. *Healthy People 2020* is a federal plan that provides national objectives for improving the health of Americans. One of the *Healthy People 2020* objectives is an infant mortality rate of no more than 6.0 infant deaths per 1,000 live births by the year 2020.

As Illinois considers statewide strategies to reduce infant mortality, the data surrounding infant mortality rates, trends, and risk markers, including disparities between different populations of interest will inform prevention efforts. Stakeholders in Illinois can use this report to develop and target strategies for infant mortality reduction.

Infant Mortality Rates, United States 2014



METHODS

DATA SOURCE

Data for this report came from birth, death, and fetal death certificates (IDPH Division of Vital Records). Analyses were limited to births and deaths of Illinois residents. The 2010-14 American Community Survey (ACS) provided the socioeconomic data by county.

DEFINITIONS

Fetal Death: Death of a fetus (≥ 20 weeks gestation) prior to delivery

Infant Death: Death of an infant before first birthday

Neonatal Death: Death during days 0-27 of life

Post-Neonatal Death: Death during days 28-364 of life

Term: Gestational age ≥ 37 weeks

Preterm: Gestational age < 37 weeks

Very Preterm: Gestational age < 32 weeks

RACE/ETHNICITY

The race/ethnicity groups used are: **Non-Hispanic White**, **Non-Hispanic Black**, **Hispanic**, and **Asian/Pacific Islander**. All other groups were excluded due to small numbers.

GEOGRAPHY

Illinois was divided into five regions: **Chicago**, **suburban Cook County**, **collar counties** (Lake, McHenry, Kane, DuPage, and Will Counties), **other urban counties** (Winnebago, DeKalb, Kendall, Kankakee, Rock Island, Peoria, Tazewell, McLean, Champaign, Macon, Sangamon, Madison, and St. Clair Counties), and **rural counties** (all others).

CAUSES OF DEATH

International Classification of Disease (ICD) codes for underlying cause of death were classified into 30 categories of infant death, as defined by CDC. The top three causes that will be discussed in this report are: 1) disorders related to length of gestation and fetal malnutrition, 2) congenital malformations, deformations, and chromosomal abnormalities, and 3) symptoms, signs, findings not elsewhere classified. In this report, these categories are simplified to: 1) **disorders related to prematurity**, 2) **congenital and chromosomal abnormalities**, and 3) **SIDS and other unknown causes**.

ANALYSIS

Two different calculation methods were used to describe infant mortality:

Cross-sectional analyses compare the number of infant deaths in a year to the number of babies born in that year. These analyses do not require a linkage between infants' birth and death certificates. This method was used for the time trend analyses.

Trend analysis: Joinpoint regression was used to assess trends over time and to estimate the average annual percent change in infant mortality.

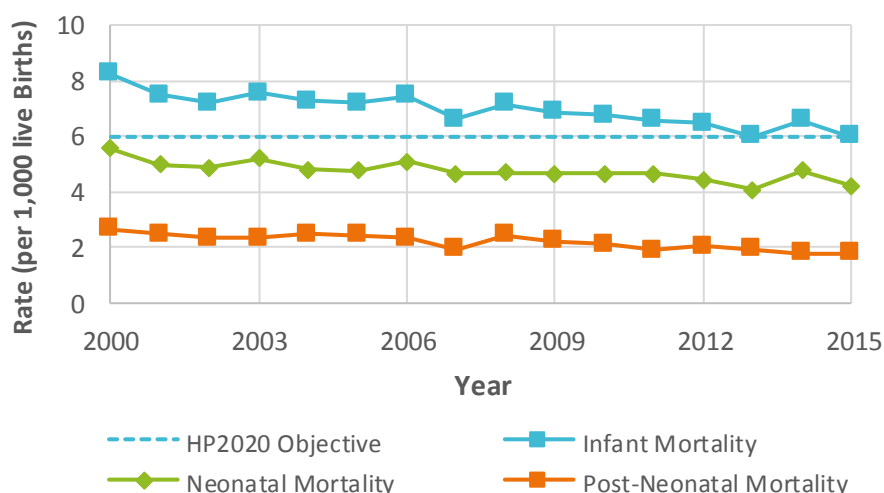
Cohort analyses require matched infant birth and death records and provide more information about the difference between babies who died and those who did not die. This method was used to do in-depth analyses of the risk markers associated with infant mortality. Matched infant records were not available prior to 2014.

RESULTS: CROSS-SECTIONAL ANALYSIS

In cross-sectional analyses, the Infant mortality rate (IMR) was defined as:

$$\frac{\text{\# of infant deaths in year A}}{\text{total \# of live births in year A}} \times 1,000$$

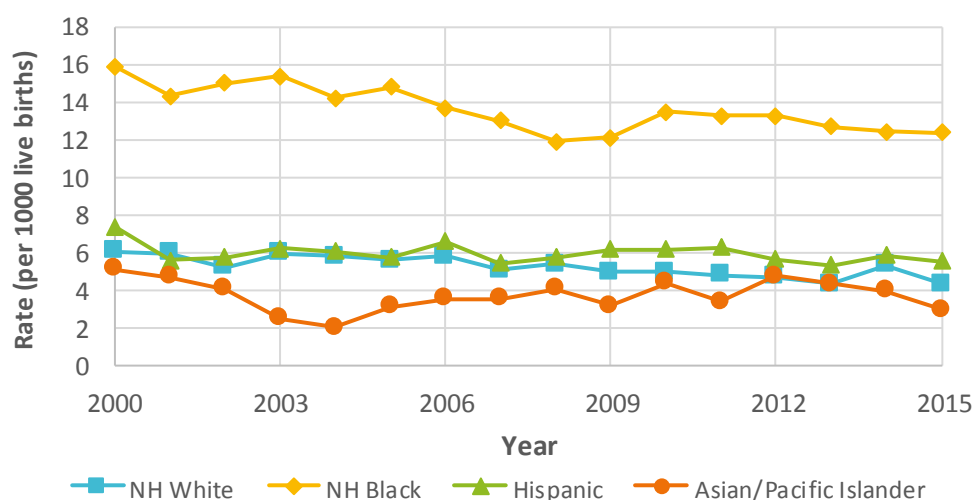
Infant Mortality Rate, Illinois 2000-2015



The Illinois infant mortality rate decreased from 8.3 per 1,000 in 2000 to 6.0 per 1,000 in 2015 — a total average decrease of 28% and an average annual decrease of 1.6%. The neonatal mortality rate was 4.3 per 1,000 in 2015, with an average annual decrease of 1.3% since 2000. The post-neonatal mortality rate was 1.8 per 1,000 in 2015, with an average annual decrease of 2.3% since 2000.

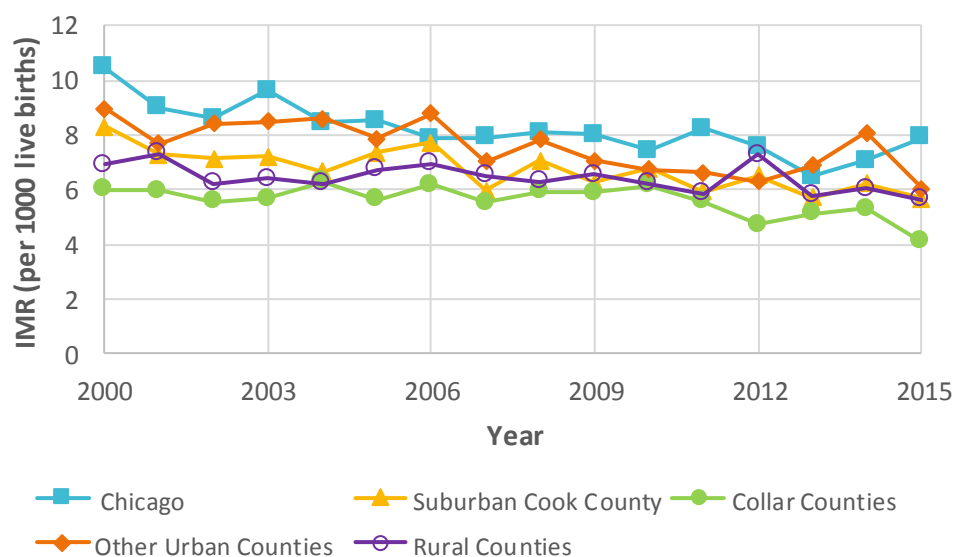
There are substantial differences in the infant mortality rates for Illinois babies of different racial/ethnic groups. The IMR for non-Hispanic Black infants is consistently more than double that of the other three racial/ethnic groups. On average, between 2000 and 2015, the infant mortality rate decreased about 1.9% per year for Non-Hispanic White infants, 1.6% per year for Non-Hispanic Black infants, and 0.8% per year for Hispanic infants, with no significant change over time for Asian infants. The significantly higher IM rate in Non-Hispanic Black infants highlights the need for targeted interventions.

Infant Mortality Rate by Race/Ethnicity, Illinois 2000-2015



RESULTS: CROSS-SECTIONAL ANALYSIS

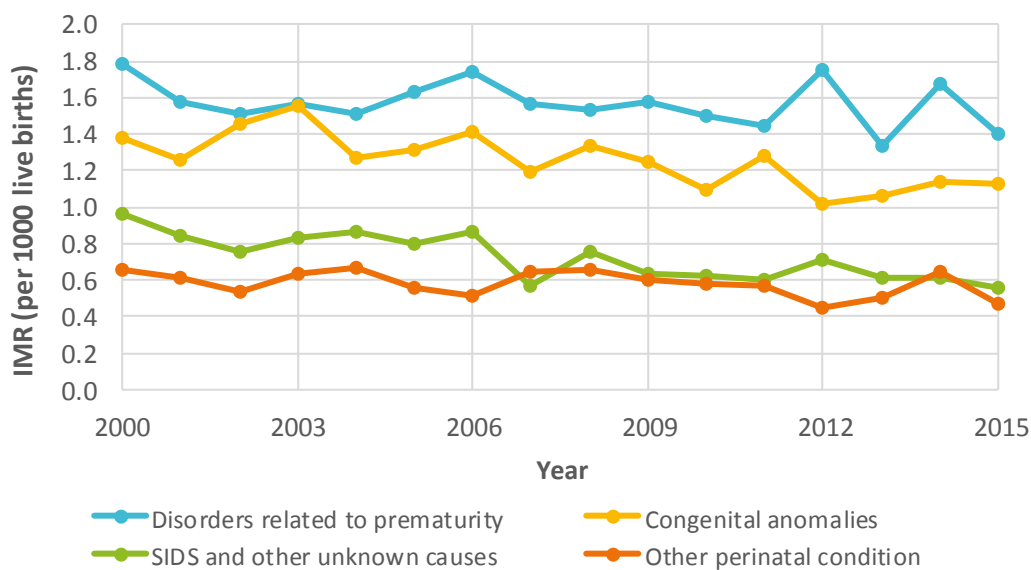
Infant Mortality by Area of Residence, Illinois 2000-2015



On average, the infant mortality rates between 2000 and 2015 decreased 2.0% per year for Chicago residents, 1.9% per year for suburban Cook Co. residents, 1.3% per year for collar county residents, 1.9% per year for other urban county residents, and 0.9% per year for rural county residents.

The top three causes of infant mortality in Illinois between 2000 and 2015 were disorders related to prematurity, congenital and chromosomal abnormalities, and SIDS and other unknown causes. Together, these three causes accounted for about half of infant deaths. On average, the rate of deaths due to a congenital or chromosomal abnormality decreased 2% per year during 2000-2015. The rate of SIDS and other unknown deaths decreased an average 3% per year between 2000 and 2015. There was no significant change over time for the rate of deaths due to disorders related to prematurity. The rate of deaths due to all other causes decreased an average 1.7% per year between 2000 and 2015.

Top 4 Causes of Infant Mortality, Illinois 2000-2015



RESULTS: CROSS-SECTIONAL ANALYSIS

In these analyses:

SUID Death

- Sudden Infant Death Syndrome (SIDS)
- Accidental suffocation and strangulation in bed
- Unknown cause

Prematurity-related Death

Examples:

- Respiratory distress of newborn
- Premature rupture of membranes
- Other causes attributable to prematurity¹

There are two specific causes of death that are of interest because they make up a large proportion of the overall infant deaths:

Sudden Unexpected Infant Deaths (SUID) and Prematurity-Related Deaths.

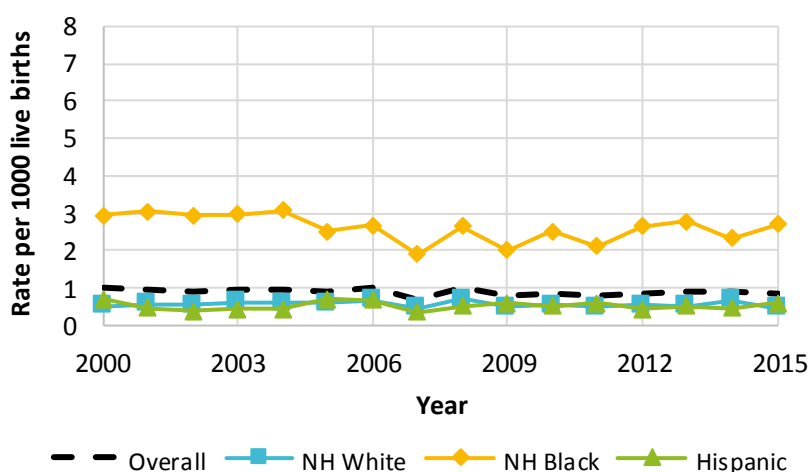
The rate of SUID is significantly higher in Non-Hispanic Black infants than in Non-Hispanic White or Hispanic infants. There was a significant decrease in SUID for non-Hispanic Black infants at an average of 1.5% per year during 2000-2015, but no significant change over time for Non-Hispanic White or Hispanic infants.

The rate of prematurity-related infant death is also significantly higher in Non-Hispanic Black infants than in Non-Hispanic White or Hispanic infants. On average, the rate of prematurity-related death for Non-Hispanic White infants decreased 2.2% per year, and the rate for Non-Hispanic Black infants decreased 1.1% per year between 2000 and 2015. There was no statistically significant change for Hispanic infants over time.

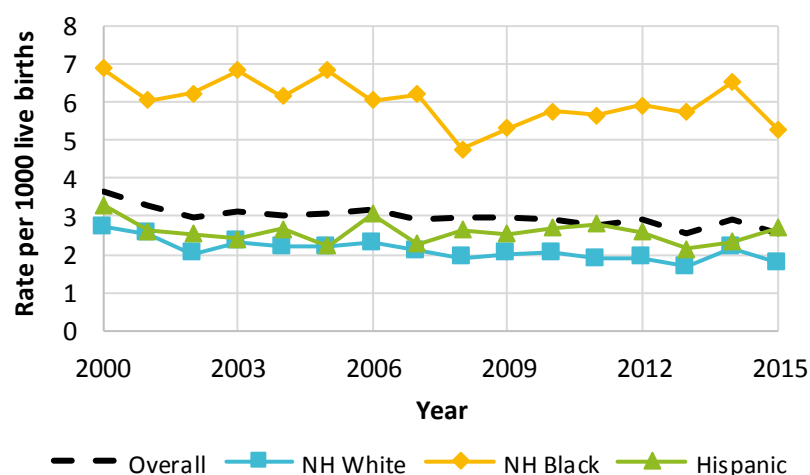
Note:

Asian/Pacific Islander data are not presented because the numbers were too small to provide reliable estimates.

Sudden Unexpected Infant Death (SUID) rate by Race/Ethnicity, Illinois 2000-2015



Prematurity-Related Infant Mortality Rate by Race/Ethnicity, Illinois 2000-2015



¹The Contribution of Preterm Birth to Infant Mortality Rates in the United States. William M. Callaghan, Marian F. MacDorman, Sonja A. Rasmussen, Cheng Qin, Eve M. Lackritz. Pediatrics Oct 2006; 118 (4) 1566-1573; DOI: 10.1542/peds.2006-0860

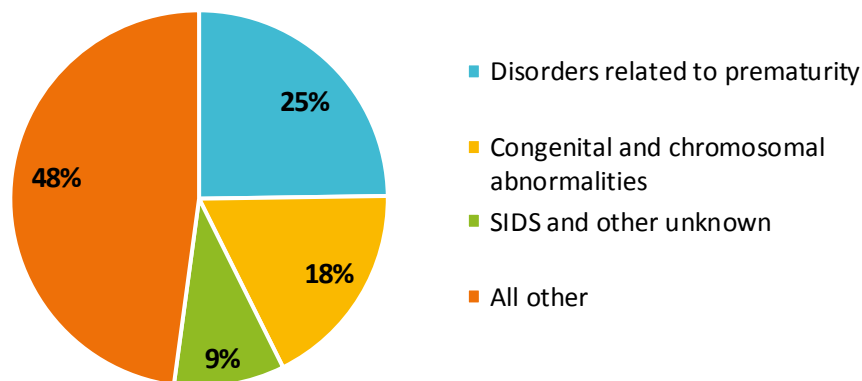
RESULTS: COHORT ANALYSIS

The following data are from a cohort of birth certificates for infants born in Illinois in 2014 or 2015. These births were linked to their corresponding death certificates, where infant mortality is defined as:

$$\frac{\text{\# of infants born in year A who died within 1 year}}{\text{total \# of live births in year A}} \times 1,000$$

By having the matched birth record for each of the death records, we can analyze more detailed maternal and infant characteristics associated with infant mortality.

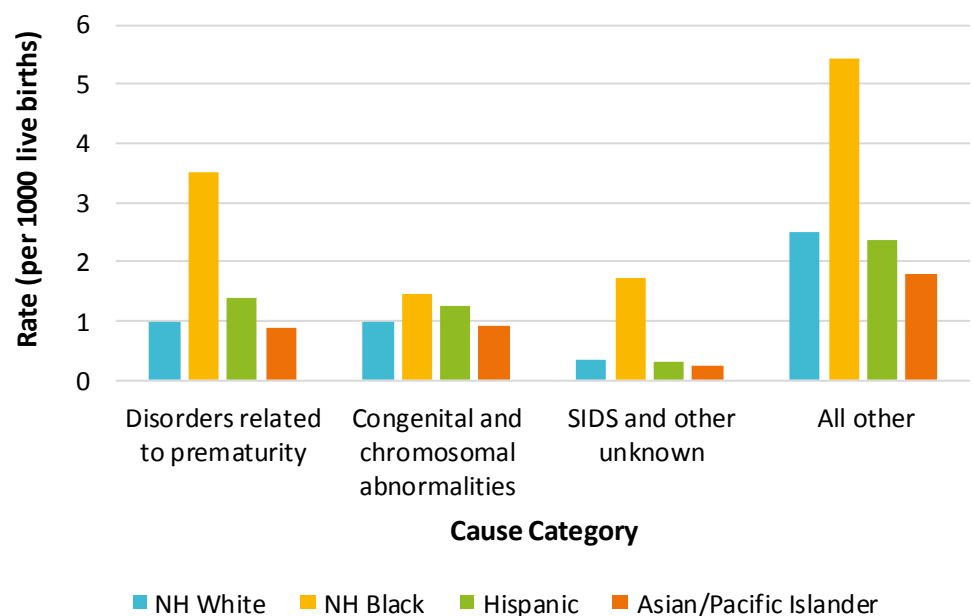
Leading Causes of Infant Deaths, Illinois 2014-2015



The top three causes of infant deaths in Illinois account for a little more than 50% of all infant deaths. These are disorders related to prematurity, congenital and chromosomal abnormalities, and SIDS and other unknown causes. All other causes account for about 48% of all infant deaths.

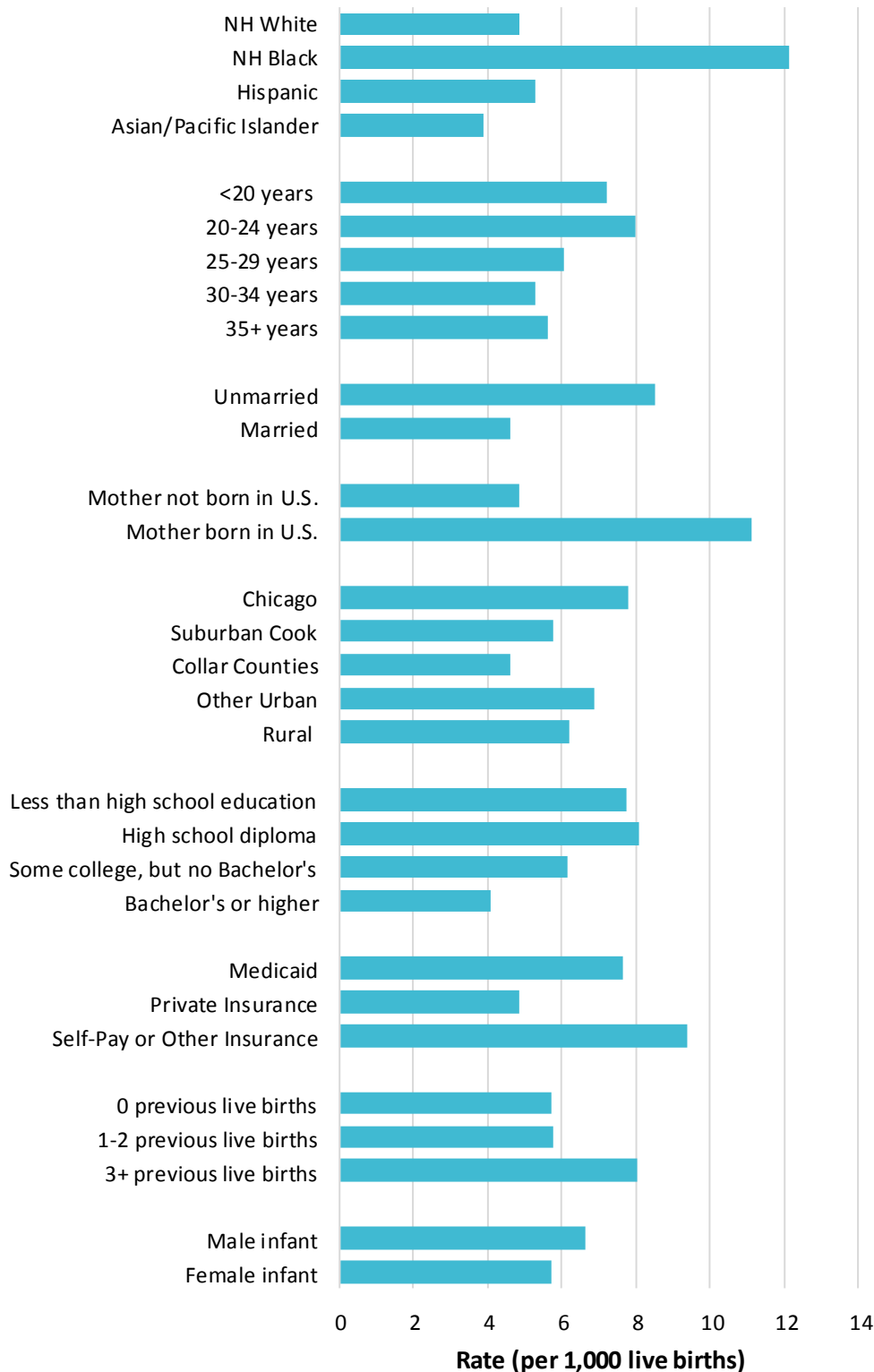
Within each of the three leading causes of infant death in Illinois, infants of Non-Hispanic Black mothers have the highest infant mortality compared to other racial/ethnic groups. The widest disparities are seen with “disorders related to prematurity” and “SIDS and other unknown causes”; infants of Non-Hispanic Black mothers are more than three times as likely to die from these causes as infants of Non-Hispanic white mothers.

Infant Mortality Rates for Leading Causes of Death, by Race/Ethnicity, Illinois 2014-2015



RESULTS: COHORT ANALYSIS

Illinois Infant Mortality Rate by Maternal and Infant Demographics, 2014-2015



RACE/ETHNICITY: Infants born to Non-Hispanic Black women have the highest rate of infant mortality.

AGE: Infants born to younger women generally have higher infant mortality rates than those born to older women.

MARITAL STATUS: Infants born to unmarried women have a higher mortality rate than those born to married women.

PLACE OF MOTHER'S BIRTH: Infants of women who were born in the U.S. have an infant mortality rate twice as high as infants of foreign-born women.

GEOGRAPHIC REGION: Residents of Chicago have a higher infant mortality rate than other areas of the state

EDUCATION: The rate of infant mortality generally decreases as the mother's education increases.

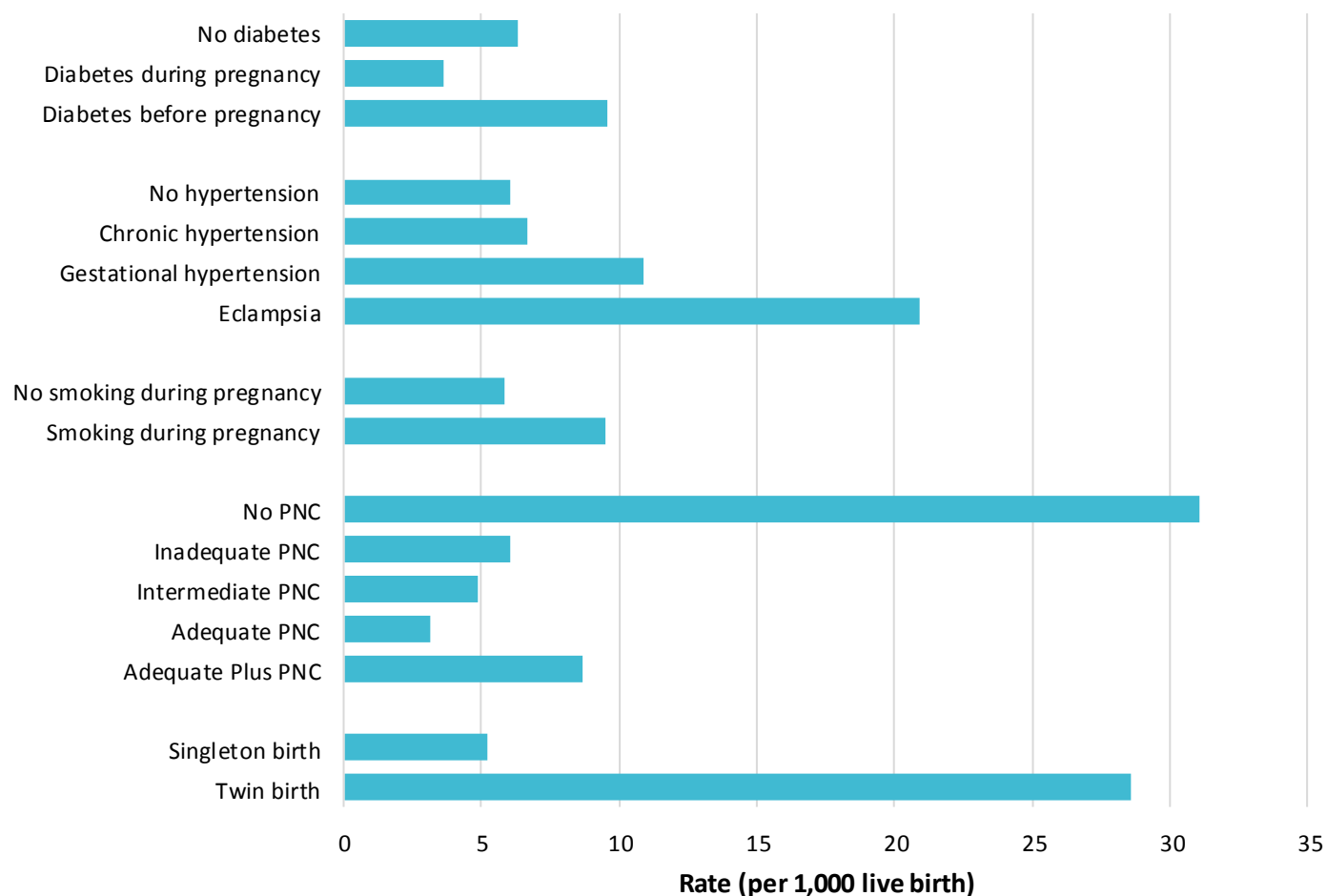
PAYER FOR DELIVERY: Infants of privately-insured women have a lower infant mortality rate than infants of women covered by Medicaid or other types of insurance.

PARITY: Infants of women with three or more previous live births have higher infant mortality rates than infants of women with fewer previous live births.

INFANT GENDER: Male infants have a higher infant mortality rate than female infants.

RESULTS: COHORT ANALYSIS

**Illinois Infant Mortality Rate by
Maternal and Infant Medical and Healthcare Factors, 2014-2015**



DIABETES: Infants born to women who had diabetes before pregnancy have a higher mortality rate than infants born to women who had diabetes during pregnancy or no diabetes.

HYPERTENSION: Infants born to women with eclampsia and gestational hypertension have higher infant mortality rates than infants of women with chronic hypertension or no hypertension at all.

SMOKING: Infants born to women who smoke during pregnancy have a higher mortality rate than infants born to women who do not smoke during pregnancy.

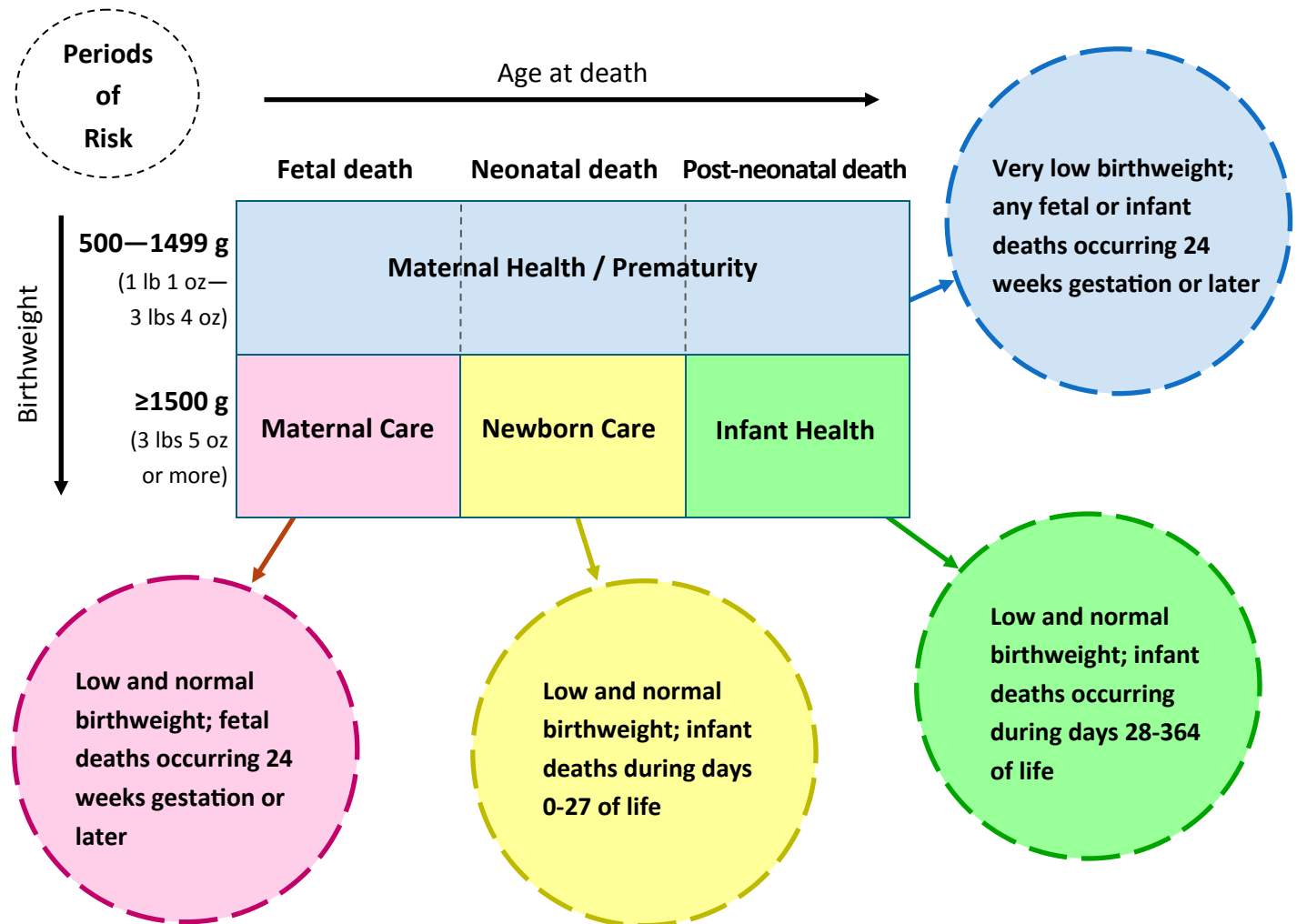
PRENATAL CARE (PNC)*: Infants of women with no prenatal care have higher rates of infant mortality than women with any prenatal care. Infants of women with “adequate plus” prenatal care have the second highest mortality rate — this group of women likely had higher-risk pregnancies that prompted them to receive more prenatal care than is typical.

PLURALITY: Twin births have an infant mortality rate more than four times that of singleton births.

**Prenatal care was measured on the Adequacy of Prenatal Care Utilization Index (“Kotelchuck” index), which classifies prenatal care utilization into adequacy categories based on the time of prenatal care initiation*

RESULTS: PERINATAL PERIODS OF RISK

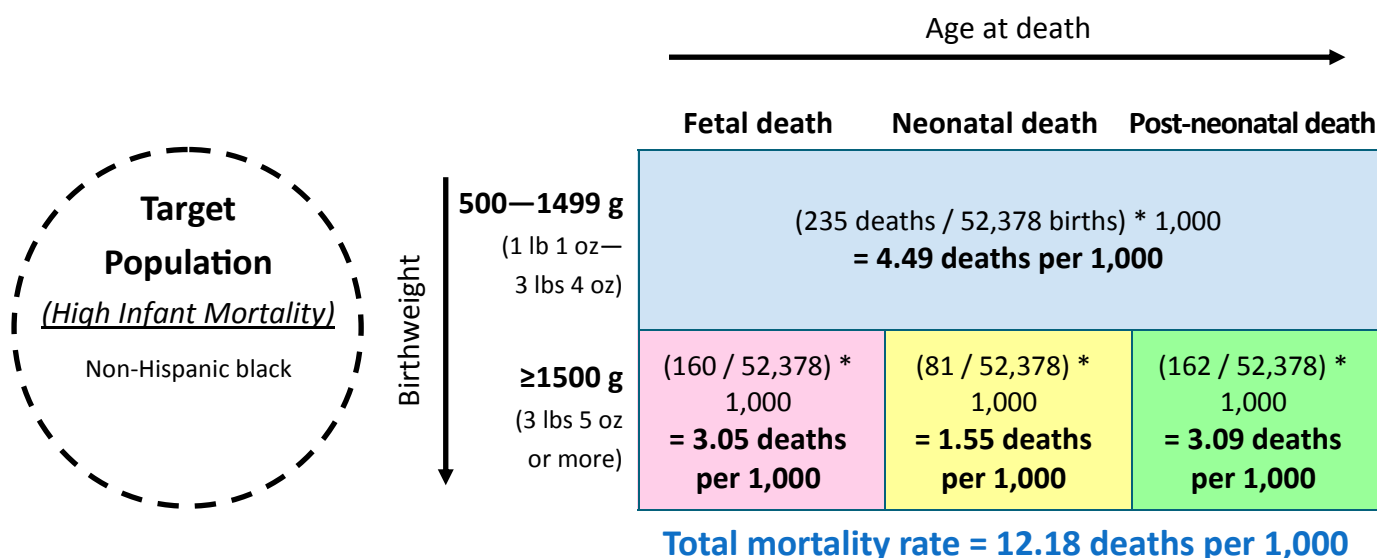
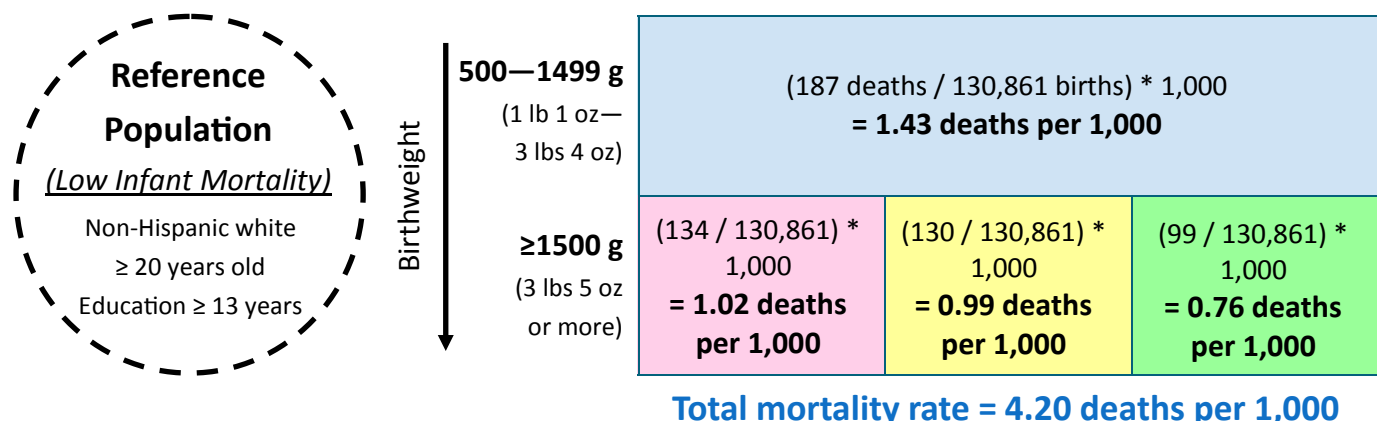
A Perinatal Periods of Risk (PPOR) approach identifies opportunities to reduce fetal and infant death. PPOR is an analytical framework developed by CityMatCH that was developed to investigate the disparity in fetal and infant death between a reference population and a target population. The “reference” population is typically the subgroup of women with the best birth outcomes, and the “target” population is typically the subgroup of women with the worst birth outcomes.



Period of Risk	Maternal Health / Prematurity	Maternal Care	Newborn Care	Infant Health
Targets for Action	Preconception health Prenatal behaviors Perinatal care Social determinants	Prenatal care High risk referral Obstetric care Social determinants	Perinatal management Neonatal care Pediatric surgery	Sleep position Postpartum behaviors Injury prevention

RESULTS: PERINATAL PERIODS OF RISK

PPOR Analyses were limited to Illinois resident women, with an infant/fetus at least 24 weeks gestation and at least 500 grams at delivery



The “excess” feto-infant mortality rate refers to the difference between the rates in the target and reference populations.

Period of Risk	Maternal Health / Prematurity	Maternal Care	Newborn Care	Infant Health
“Excess” Rate in Target Population	3.06 per 1,000	2.03 per 1,000	0.56 per 1,000	2.34 per 1,000
“Excess” # Deaths in Target Population	160	106	29	123

During 2014-2015, there was an excess of 7.98 deaths per 1,000 births in the target population compared to the reference population. This translates to 418 excess fetal and infant deaths that could have been prevented if the feto-infant mortality rate for the target population was the same as the rate for the reference population.

RESULTS: PERINATAL PERIODS OF RISK

Period of Risk	Maternal Health / Prematurity	Maternal Care	Newborn Care	Infant Health
Excess Deaths in Target Population	160 ↓	106 ↓	29 ↓	123 ↓
Targets for Action	Preconception health Prenatal behaviors Perinatal care Social determinants	Prenatal Care High risk referral Obstetric care Social determinants	Perinatal management Neonatal care Pediatric surgery	Sleep position Postpartum behaviors Injury prevention

Of the 418 total number of excess deaths in the target population, about two-thirds occurred in the maternal health/prematurity and infant health periods of risk. Therefore, targets of action in Illinois could include preconception health, prenatal behaviors, perinatal care, and social determinants (to address the maternal health/prematurity period), or sleep position, postpartum behaviors, and injury prevention (to address the infant health period).

Examples of these factors are:

Preconception health: maintenance of a healthy weight and diet before pregnancy

Prenatal behaviors: alcohol, smoking, or drug use before delivery

Perinatal care: receipt of care at appropriate facility

Social determinants: income, education, neighborhood safety

Sleep position: infants sleeping alone, on their backs, and in cribs

Postpartum behaviors: breastfeeding, smoking in house with infant

Injury prevention: cribs for safe sleep, car seats

Note: This is not an all-inclusive list.

KITAGAWA ANALYSIS

Two possible explanations for the large number of excess deaths in the maternal health/prematurity period of risk may be: a **higher number of preterm live births and fetal deaths (different gestational age distributions)**, or **lower survival rates regardless of gestational age distribution (higher birthweight-specific mortality rate)** in the target population. The Kitagawa approach allows us to determine the contribution of each explanation to the overall excess. The causes, risk factors, and interventions for preterm births are generally different than those for gestational age-specific mortality rate.

Explanation

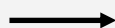
More Preterm Births
(gestational age distribution)



General Pathway for Intervention

Behavioral, social, health, and economic disparities of the mothers

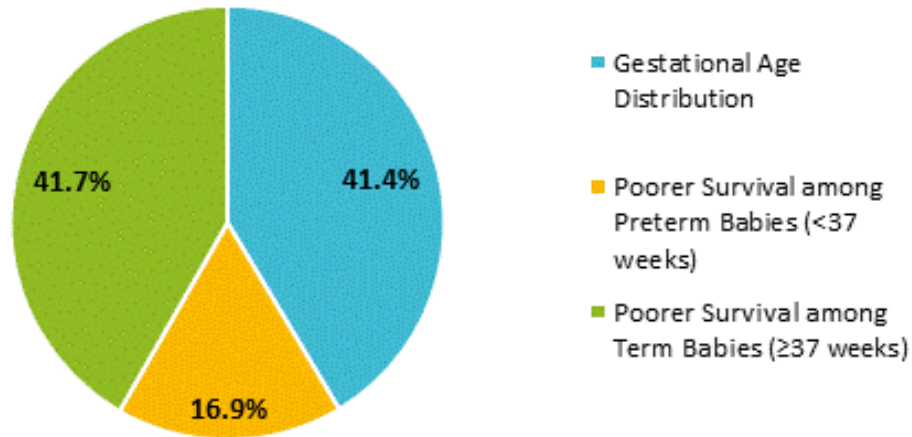
Lower Survival Rates
(higher gestational age-specific mortality rate)



Perinatal care provided to the mother and infant

RESULTS: PERINATAL PERIODS OF RISK

Explanations for the Excess Feto-Infant Mortality Rate in Target Population, 2014-2015



In Illinois between 2014-2015, 41.4% of the excess feto-infant mortality in the target population was attributable to the gestational age distribution, or the fact that more preterm births occur in the target population. The remaining 58.6% of the excess feto-infant mortality rate was attributable to lower gestational-age specific survival rates in the target population, with 16.9% of the excess due to lower survival rates for preterm babies and 41.7% of the excess due to lower survival rates for term babies .

➡ **About 60% of the excess feto-infant mortality in the target population was related to prematurity through the combination of increased prematurity and lower survival rates for premature babies.**

To address prematurity, we examined risk factors and risk markers that may be associated with having a preterm baby.

- ⇒ Was the woman on **MEDICAID** during her pregnancy?
- ⇒ Did the woman have fewer than 13 years of **EDUCATION** during her pregnancy?
- ⇒ Did the woman have **THREE OR MORE LIVE BIRTHS PRIOR** to this pregnancy?
- ⇒ Did the woman enter **PRENATAL CARE DURING HER 1ST TRIMESTER**?
- ⇒ Did the woman **SMOKE** during her pregnancy?
- ⇒ Did the woman have **HYPERTENSION** before or during her pregnancy?

County-level data from the American Community Survey (ACS) provided an assessment of community economic factors that may be associated with having a preterm baby:

- ⇒ Did the woman live in a **HIGH POVERTY** county during pregnancy?
- ⇒ Did the woman live in a county with a **HIGH UNEMPLOYMENT RATE** during pregnancy?

RESULTS: RISK FACTORS FOR PRETERM BIRTH

If prematurity accounts for most of the difference in infant mortality, what social and medical factors influence prematurity?

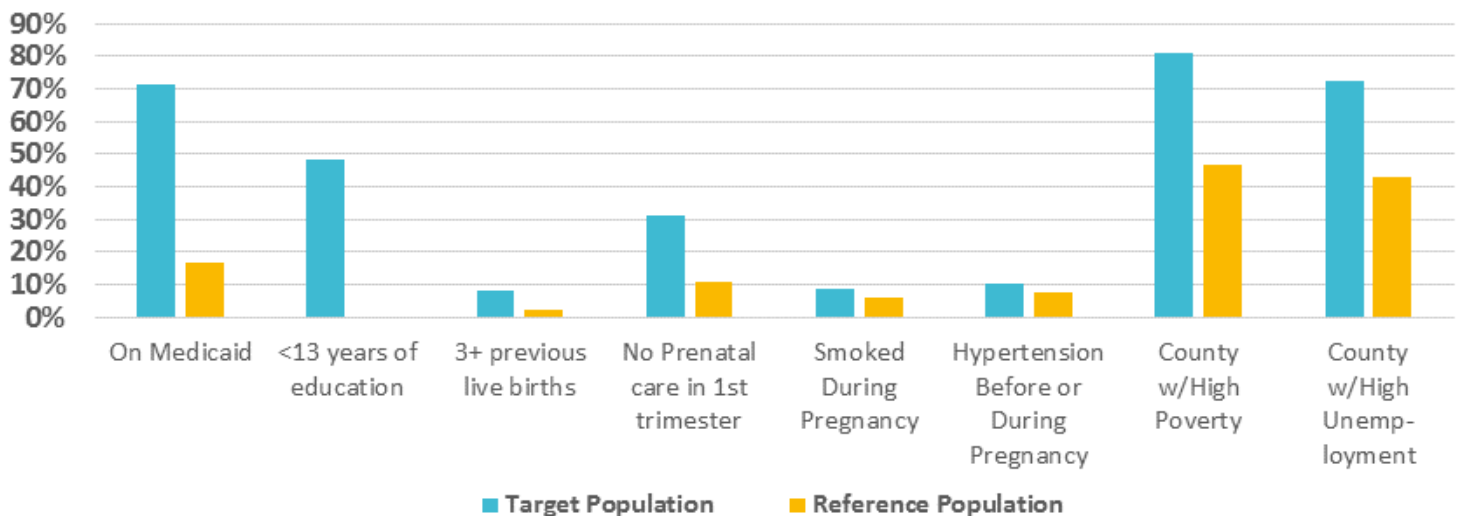
Social and Medical Factors	% Increase in Risk of Preterm Birth
On Medicaid (vs. Private Insurance)	11.7%
No education beyond high school	9.2%
Had 3 or more previous live births	44.1%
Did not enter prenatal care during 1st trimester	4.7%
Smoked during pregnancy	29.1%
Had hypertension before or during pregnancy	204.0%
High poverty in county of residence*	7.0%
High unemployment in county of residence*	6.1%

Each of the factors to the left were found to significantly increase the likelihood of preterm birth for Illinois women during 2014-2015.

For example, a woman covered by Medicaid was 11.7% more likely to have a preterm birth than a woman on private insurance.

We examined how these factors differed in the target (non-Hispanic black) and reference (low-risk non-Hispanic white) populations.

Percentage of Target and Reference Populations Affected by Various Characteristics Associated with Preterm Birth



Each of the factors associated with preterm birth was significantly more common among non-Hispanic black women than the low-risk non-Hispanic white women. The factors that were the most different between the two populations were: Medicaid coverage, lower education levels, and living in areas with high poverty and high unemployment.

* Using data from the American Community Survey (ACS), Illinois counties were divided into four equal sizes groups (quartiles) based on their poverty level and unemployment rate in the civilian population above 16 years old.

Note: A map and list of the counties included in each category for poverty and unemployment can be found in the appendix.

SUMMARY

OVERALL INFANT MORTALITY

The infant mortality rate in Illinois has decreased over time to meet the Healthy People 2020 goal. However, major racial/ethnic disparities persist. The infant mortality rate for infants born to Non-Hispanic black women is consistently at least two to three times as high as the infant mortality rate of infants born to Non-Hispanic white women.

CAUSES OF DEATH

The leading cause of infant death is any disorder related to prematurity, so if we can reduce the incidence of premature births, we can help to reduce infant mortality. Another leading cause of infant death is Sudden Unexplained Infant Deaths (SUID), which includes Sudden Infant Death Syndrome (SIDS) and other sleep-related deaths. Targeted interventions to address infant sleep patterns should also be a focus.

PERINATAL PERIODS OF RISK (PPOR) ANALYSIS

The fetο-infant mortality rate for infants of non-Hispanic black women (the target population) was nearly three times higher than that for infants born to non-Hispanic white women at least 20 years of age and who had at least 13 years of education (the reference population). If the fetο-infant mortality rate in the target population had been the same as that of the reference population, 418 deaths would have been prevented in 2014-2015. Most of the excess fetο-infant deaths in the target population occurred in the “Maternal Health/ Prematurity” and the “Infant Health” periods of risk. These periods of risk suggest preconception health, prenatal behaviors, perinatal care, social determinants, sleep position, postpartum behaviors, and injury prevention as potential target for action.

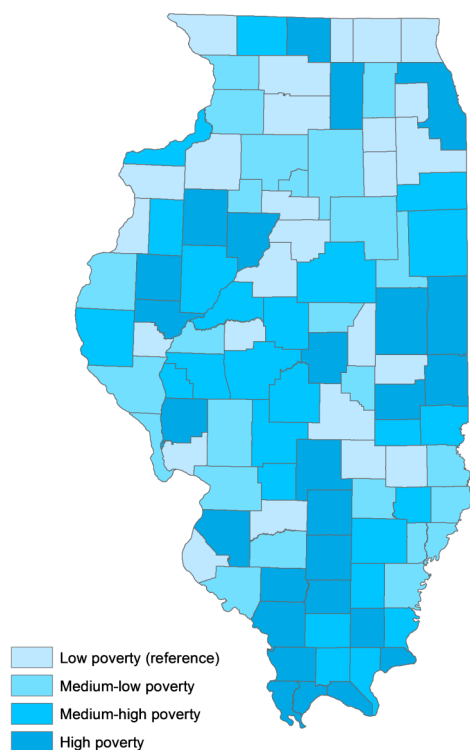
More than half of the excess fetο-infant mortality in the target population was related to prematurity through the combination of increased prematurity and lower survival rates for premature babies. Being on Medicaid, having fewer than 13 years of education, having three or more previous live births, not entering prenatal care during the 1st trimester, smoking during pregnancy, and having hypertension before or during pregnancy were all associated increased risk of prematurity. In addition, women who lived in counties with higher poverty and unemployment rates had higher risks of prematurity than those living in counties of low poverty and unemployment. All of these social and medical factors that were associated with prematurity were significantly more common among non-Hispanic black women than among low-risk non-Hispanic white women.

LOOKING FORWARD

Beyond the factors studied in this report, it would be useful to analyze factors associated with preterm birth further, such as those reported in the Pregnancy Risk Assessment Monitoring System (PRAMS) survey. Given that the PPOR analysis also showed a large excess mortality in the infant health period of risk, further analyses of infant sleep behaviors could inform efforts to reduce these deaths.

APPENDIX

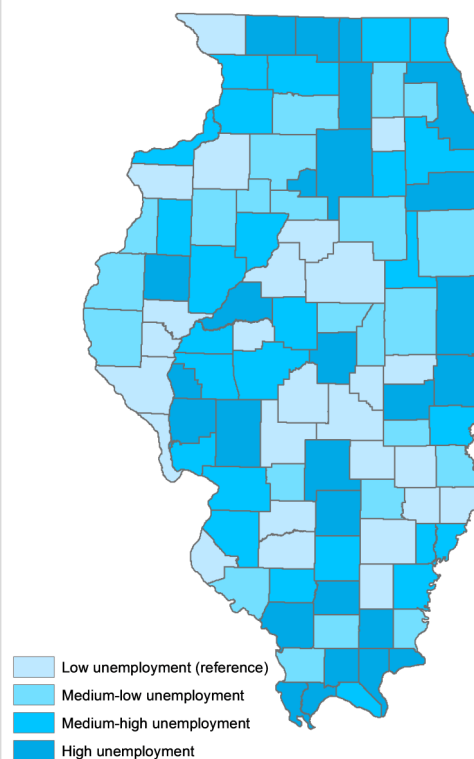
POVERTY Counties were divided into four quartiles based on ACS 2015 poverty estimates. The lowest poverty quartile was used as the reference group.



LOW POVERTY	MEDIUM-LOW POVERTY	MEDIUM-HIGH POVERTY	HIGH POVERTY
Boone	Bureau	Adams	Alexander
Brown	Calhoun	Bond	Champaign
Clinton	Carroll	Christian	Coles
Douglas	Cass	Clark	Cook
DuPage	Clay	Cumberland	DeKalb
Effingham	Crawford	Fulton	Edgar
Grundy	De Witt	Gallatin	Fayette
Henderson	Edwards	Hamilton	Franklin
Henry	Ford	Iroquois	Greene
Jasper	Hancock	Johnson	Hardin
Jersey	Kane	Kankakee	Jackson
Jo Daviess	LaSalle	Logan	Jefferson
Kendall	Lawrence	Mason	Knox
Lake	Livingston	McLean	Macon
Lee	Macoupin	Montgomery	Marion
Menard	Madison	Morgan	Massac
Marshall	Moultrie	Pope	McDonough
McHenry	Pike	Richland	Peoria
Mercer	Putnam	Rock Island	Perry
Monroe	Randolph	Sangamon	Pulaski
Ogle	Stark	Scott	Saline
Piatt	Wabash	Stephenson	Schuyler
Shelby	Washington	Warren	St. Clair
Tazewell	White	Wayne	Union
Will	Whiteside	Williamson	Vermillion
Woodford			Winnebago

UNEMPLOYMENT Counties were divided into four quartiles based on ACS 2015 estimates of unemployment rate. The lowest unemployment quartile was used as the reference group.

LOW UNEMPLOYMENT	MED-LOW UNEMPLOYMENT	MED-HIGH UNEMPLOYMENT	HIGH UNEMPLOYMENT
Brown	Adams	Carroll	Alexander
Calhoun	Bond	Cass	Boone
Christian	Bureau	Clark	Coles
Clinton	Champaign	Edwards	Cook
Douglas	Clay	Ford	DeKalb
Effingham	Crawford	Fulton	Edgar
Hamilton	Cumberland	Grundy	Fayette
Henry	De Witt	Jefferson	Franklin
Jasper	DuPage	Jersey	Greene
Jo Daviess	Gallatin	Lake	Hardin
Kendall	Hancock	Logan	Jackson
Lawrence	Henderson	Madison	Johnson
Mercer	Iroquois	Massac	Kankakee
McLean	Kane	McHenry	LaSalle
Menard	Knox	Morgan	Macon
Monroe	Lee	Ogle	Macoupin
Montgomery	Livingston	Peoria	Marion
Moultrie	Marshall	Perry	Mason
Pike	Piatt	Rock Island	McDonough
Richland	Randolph	Sangamon	Pope
Schuyler	Stark	St. Clair	Pulaski
Shelby	Union	Wabash	Putnam
Tazewell	Williamson	Warren	Saline
Washington		White	Scott
Wayne		Whiteside	Stephenson
Woodford		Will	Vermillion
			Winnebago



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AUTHOR

Jennifer Le, MPH candidate (Tulane University)
Graduate Student Epidemiology Program (GSEP) Intern
Illinois Department of Public Health
Office of Women's Health and Family Services

INTERNSHIP MENTOR

Amanda Bennett, PhD
CDC Assignee in Maternal and Child Health Epidemiology
Illinois Department of Public Health
Office of Women's Health and Family Services

DATA SOURCES

Illinois Vital Statistics: birth and death certificates (2000-2015)
American Community Survey (ACS) 5-Year Estimates (2015)

RESOURCES

CityMatCH Tools and Resources. <http://www.citymatch.org/perinatal-periods-risk-ppor-home/training-materials/tools-and-resources>

Gibson, C., MPH, Blackwell, S., MPH, & Rohan, A., PhD. (2015). *A Perinatal Periods of Risk (PPOR) Analysis for the Lifecourse Initiative for Healthy Families (LIHF)*. Wisconsin Department of Health Services.

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