CITY GOAL

results minneapolis

Infant Mortality Rate

December 2, 2015

Minneapolis
City of Lakes

What is this?

City Goal Results Minneapolis roundtables are focused on answering the question “are we there yet?” by reporting progress on our community indicators. These reports are analytical in nature and focused on making connections with cross-sector data. Creating these reports requires input from multiple departments and, in many cases, external participants. The goal of this initiative is to reflect the realities being experienced in our communities. The objectives of the report and roundtable are to 1) have a new and different understanding of the indicator and 2) think differently about solutions.

Why infant mortality rates?

“The death of a baby before his or her first birthday is called infant mortality. The *infant mortality rate* is an estimate of the number of infant deaths for every 1,000 live births. This rate is often used as an indicator to measure the health and well-being of a nation, because factors affecting the health of entire populations can also impact the mortality rate of infants. ” – Centers for Disease Control

The health and well-being of children and families across the globe are measured by infant mortality rates. Wide acceptance and relative ease of calculating the annual rate have resulted in infant mortality rate being commonly used for comparisons across regions, populations and time periods.

Indicator: Infant Mortality Rate

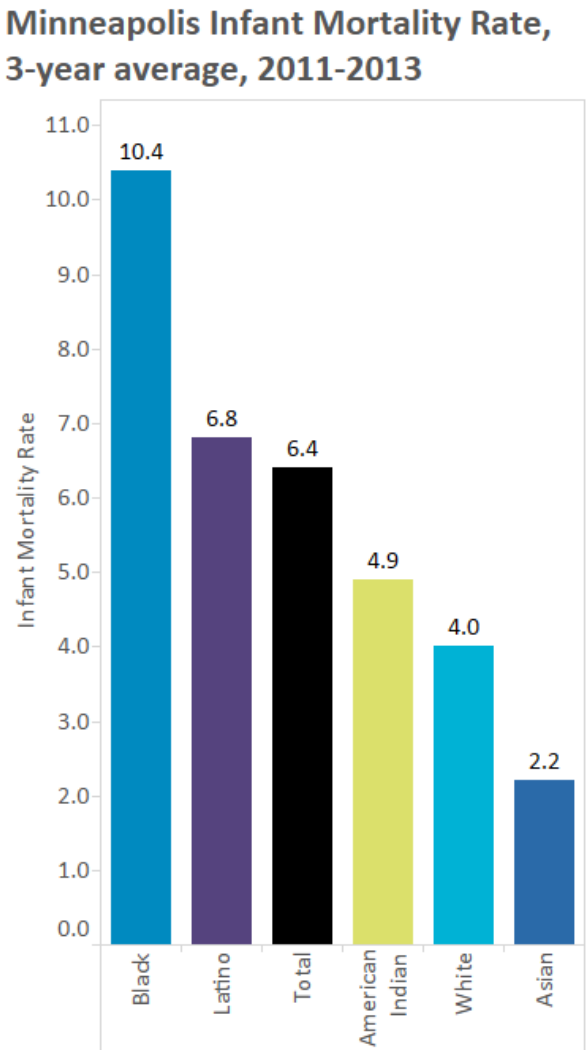
The most current Minneapolis Infant Mortality Rate (IMR) is **6.4** (2011-2013 3-year average).[1]

How does this compare?

- The United States infant mortality rate was **6.0** in 2012.[2]
- The Minnesota infant mortality rate was **4.9** in 2012.[2]

Definition of Infant Mortality Rate (IMR):

$$\frac{\text{Number of babies who die in a particular year}}{\text{Number of babies born in that same year}}$$



1: Minneapolis Health Department
2: 2012 Minnesota Infant Mortality Data Book, MN Department of Health, January 2014
http://www.health.state.mn.us/divs/chs/infantmortality/2012infantmortdatabook.pdf

Understanding the issue

A life course perspective framework was used to identify and understand infant mortality rate intervention opportunities. This framework evaluates the risk for infant mortality based on distinct periods in a mother's life. These periods include a woman's life before conception, the time during pregnancy, the baby's first 28 days after birth, and the time when a baby is older than 28 days yet younger than one year.

By analyzing the framework and infant mortality rate history, the following becomes evident.

Infant mortality rates have decreased in the last 20 years.

- Minneapolis has made great strides in decreasing infant mortality rates.
- This is important context to consider when looking at fluctuations within the last 5 years.

Much of this decrease is due to interventions in pregnancy, neonatal care and infant care.

- Primary interventions resulting in preventable infant deaths include:
    - Increasing access to and improving quality of prenatal care.
    - Better medical interventions immediately after a baby's birth.
    - Major initiatives on safe sleep environments and parental education.
- Until practices are embedded culturally, interventions such as those listed above need to continue.

Some risk factors related to infant mortality, like premature birth, are influenced by conditions that affect a woman's well-being before pregnancy.

- The focus has been on and continues to shift toward interventions that impact infant mortality before a woman is even pregnant.
- Improving social conditions to reduce lifelong stress is a major factor impacting infant mortality rates.

The City plays an important role in all periods of risk.

- The City of Minneapolis can play an important role in stabilizing the factors that influence a child's chance of survival, from preconception through infancy.

Questions

1. Chronic stress and trauma are contributors to infant mortality in Minneapolis - how does lack of stability contribute to these factors?

2. What touchpoints does the City have to influence stability?

3. Stability could mean limiting disruption for families and it also could mean creating opportunity for upward mobility. How could we consider these different impacts when making policy decisions?

infant mortality

FRAMEWORK FOR ANALYSIS

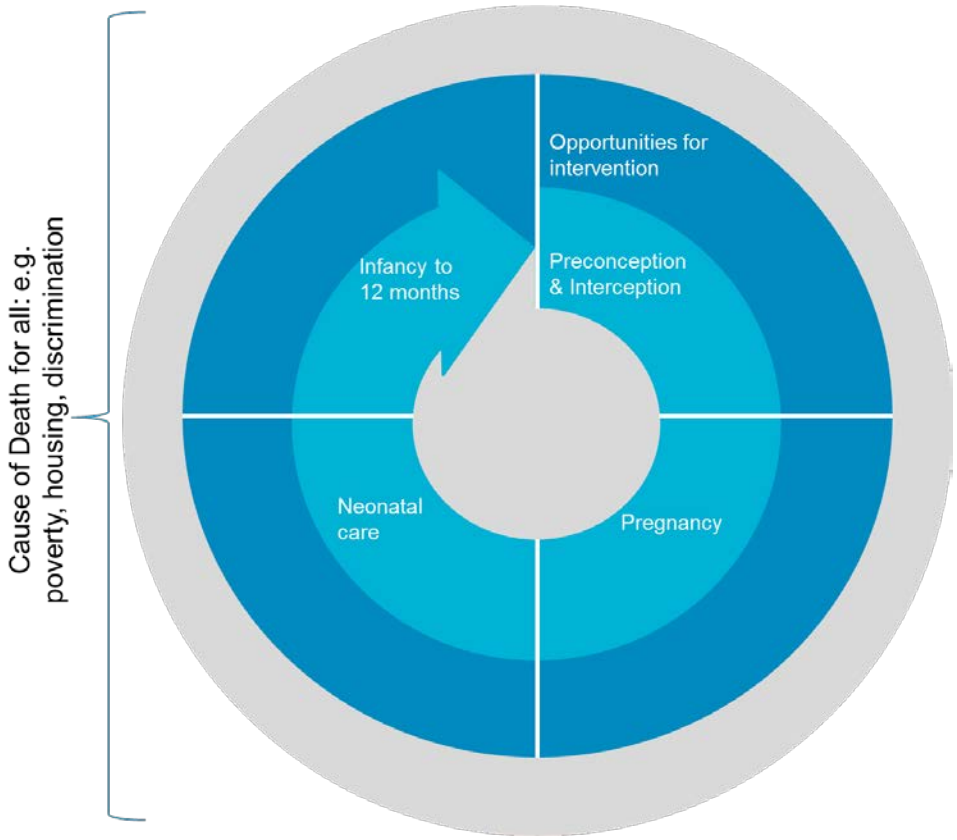
This report uses an analysis framework developed for communities to understand factors underlying infant mortality.
The framework enables us to develop strategies that target the period(s) of risk with the biggest opportunities for impact in Minneapolis.

A life-course perspective was used for the analysis of infant mortality rates. This accounts for the impact mental, physical and social health has on a mother's risk for infant mortality.

What framework was used?

The framework below comes from the Perinatal Periods of Risk (PPOR), which helps a community analyze its local infant mortality data.[1]

Since causes of fetal and infant death tend to be similar, the PPOR divides the deaths into four periods of risk. This allows the researcher to identify 1) which period has the highest infant mortality rates for a specific population and 2) whether there are excess deaths when compared to the population with the lowest infant mortality rate. Based on this information, communities can develop strategies that target the highest needs.[2]



Sources of infant mortality can be divided into four Perinatal Periods of Risk:

1) Pre-conception and interconception (the period of time between consecutive births)
2) Pregnancy
3) The first 28 days after birth
4) 29 days to 12 months

1: What Is PPOR: CityMach.org. Retrieved from: http://www.citymatch.org/perinatal-periods-risk-ppor-home/what-ppor

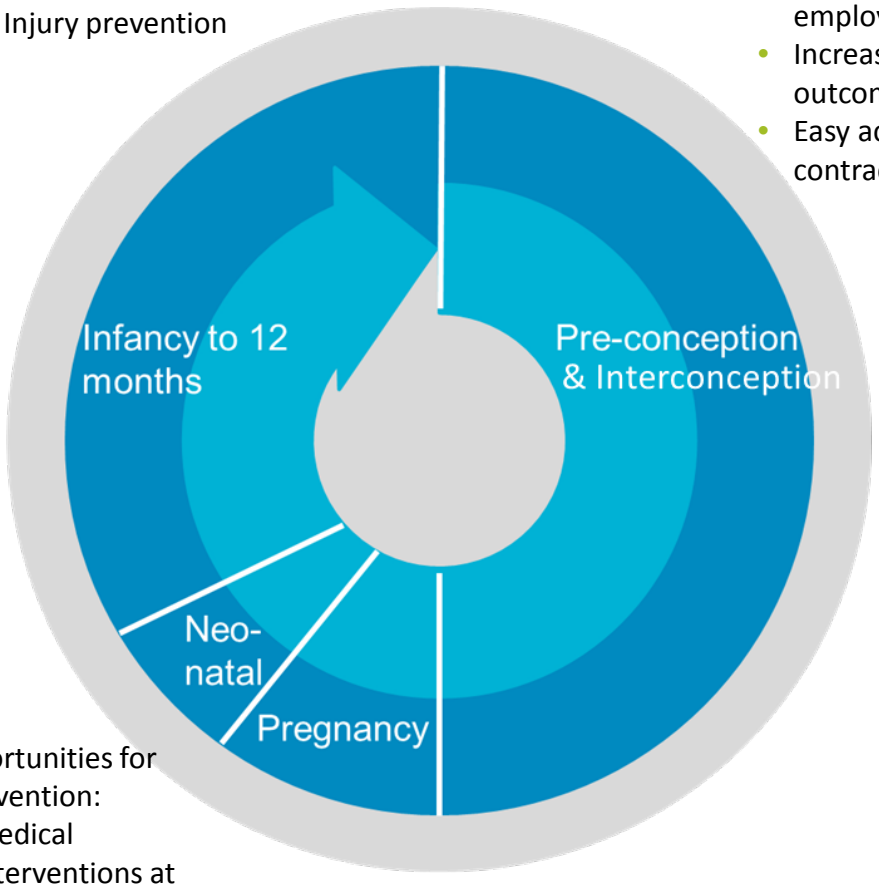
2: Sidebottom, A. and Borg, S. Perinatal Periods of Risk Model: An Examination of Infant Mortality Disparities in the Twin Cities 1990-1998. Minneapolis Department of Health and Family Support and Ramsey County Department of Public Health (2003)

By adapting the framework diagram to better reflect the amount of time a woman spends in each period of risk over her lifetime, it becomes clear that the preconception and infancy periods both have the longest opportunity for intervention.

Opportunities for Intervention:
- Safe sleep interventions
- Parental education
- Injury prevention

Opportunities for Intervention:
- Reduced stress
- Stable housing and employment
- Increased educational outcomes
- Easy access to affordable contraception

Cause of Death for all: e.g. poverty, housing, discrimination



Opportunities for Intervention:
- Medical interventions at hospitals

Opportunities for Intervention:
- Prenatal care
- Access to healthcare and transportation

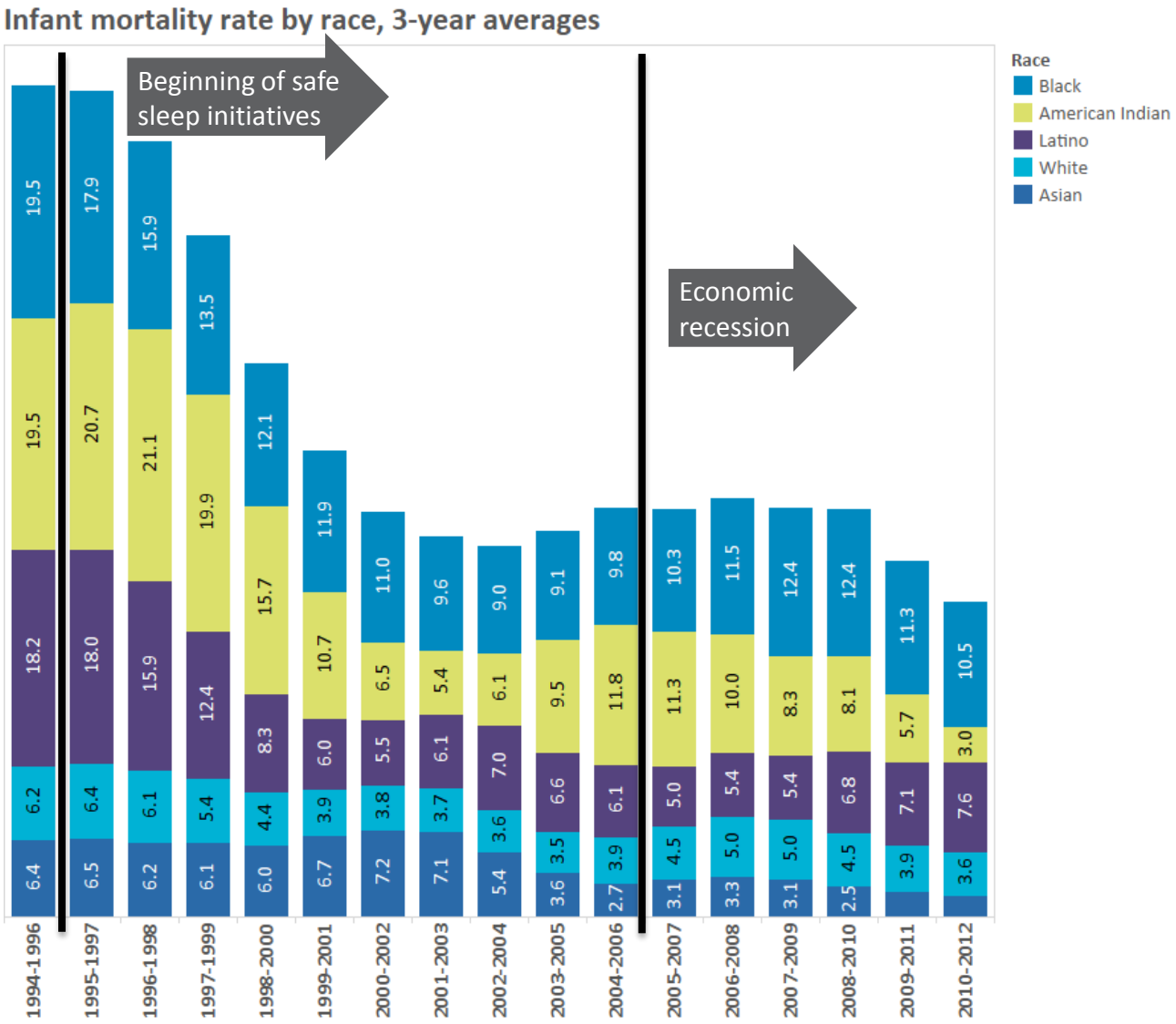
infant mortality

INFANT MORTALITY RATES HAVE DECREASED IN THE LAST 20 YEARS

Past efforts to reduce infant morality, like safe sleep initiatives, have had positive effects.

Past efforts to reduce infant mortality have had a positive, and substantial, impact on infant mortality rates.

- Infant mortality rates have decreased since the 1990s, particularly for Native American and Black babies.
- This decline is important to understand when interpreting relatively small fluctuations in recent years.



Data Source: Minneapolis Health Department

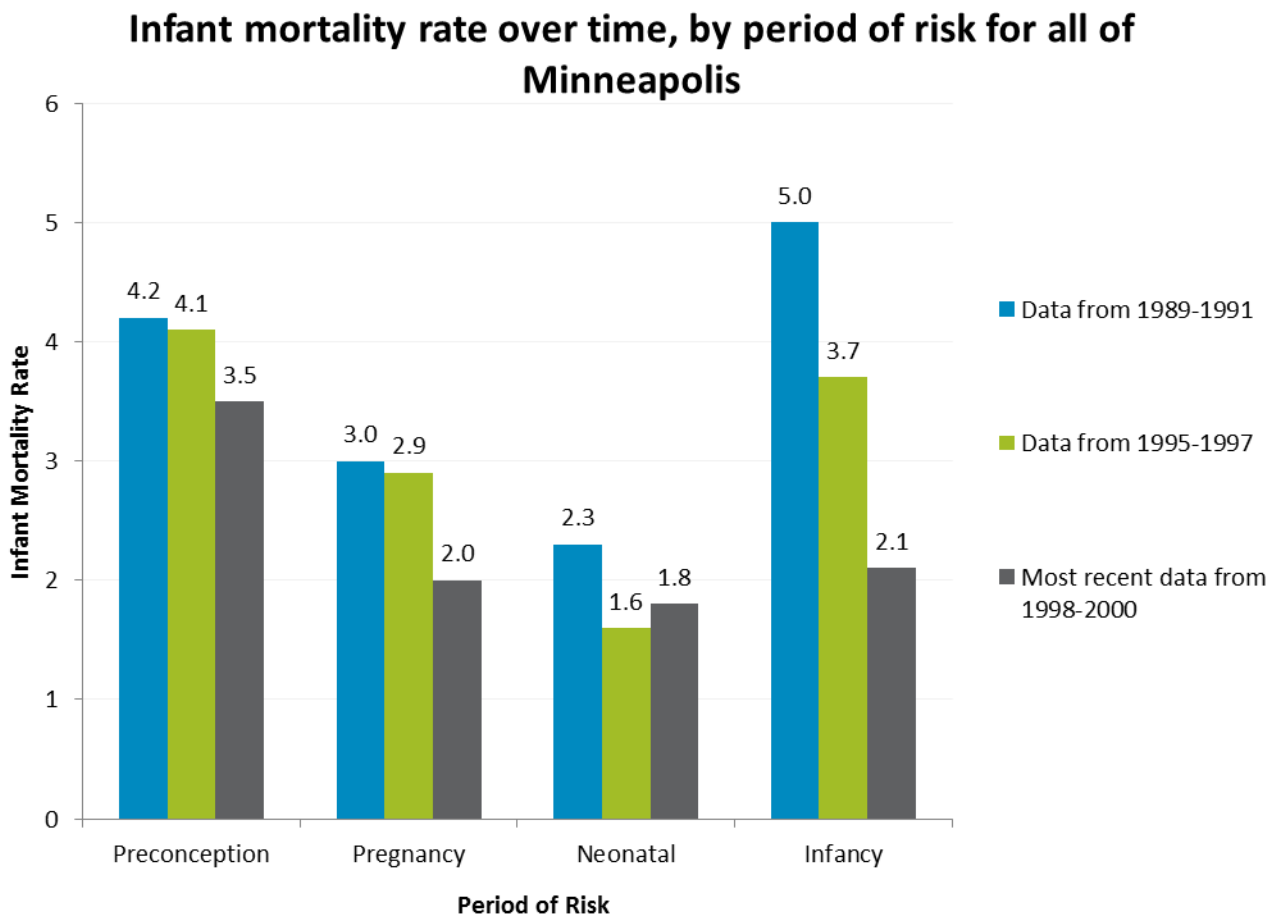
infant mortality

MUCH OF THE DECREASE IN INFANT MORTALITY IS DUE TO INTERVENTIONS IN PREGNANCY, NEONATAL CARE AND INFANT CARE

Further decreases in infant mortality will require both improved preconception health among women at risk for adverse birth outcomes and ongoing awareness of the importance of safe sleep practices and environments.

The biggest decreases in infant mortality rates have come from interventions during infancy.

- These interventions primarily consist of safe sleep initiatives.
- Infant mortality rate decreases also occur when mothers interact with medical systems during pregnancy and directly after birth.



Source: National PPOR data tables

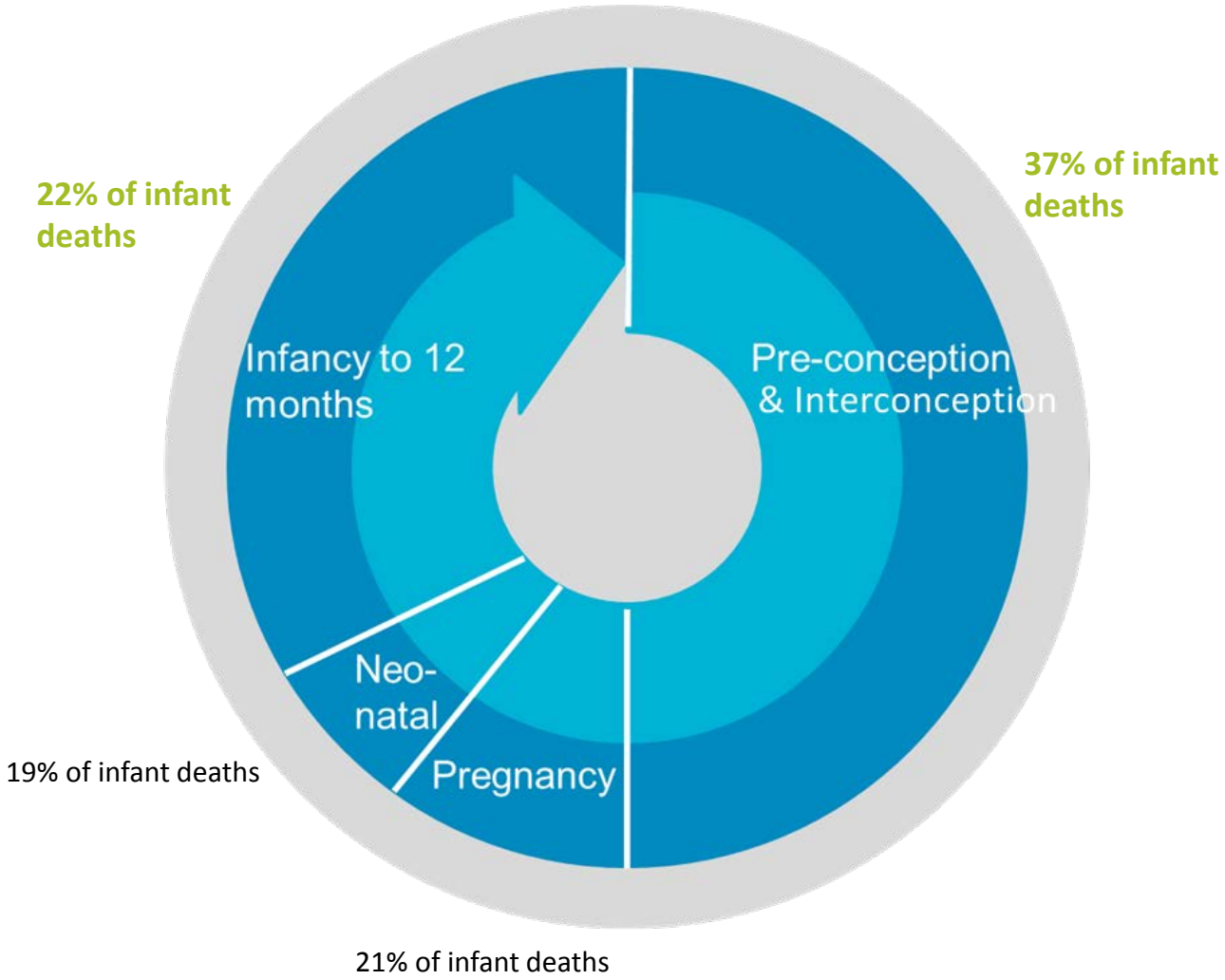
infant mortality

THE RISK FOR INFANT MORTALITY IS INFLUENCED LONG BEFORE A WOMAN IS PREGNANT

The focus has been on and continues to shift toward interventions that impact infant mortality before a woman is even pregnant. Improving social conditions to reduce stress is a major factor impacting infant mortality that results from events before conception.

The two periods with the highest number of infant deaths are those which are influenced the most by social and behavioral risk factors.

- The highest number of infant deaths can be attributed to the pre-conception period of risk.
- While many gains have been made to reduce preventable deaths with health interventions during pregnancy and after birth, infant mortality is a generational issue. These interventions need to continue until they become embedded into a culture and passed down through families rather than through the healthcare system.
- The periods with the lowest infant mortality rates seem to be when the mother and newborn have the most interaction with the medical system.[1]



1: http://www.minneapolismn.gov/www/groups/public/@health/documents/webcontent/convert_278968.pdf

Improving pre-conception health is especially important for some women of color.

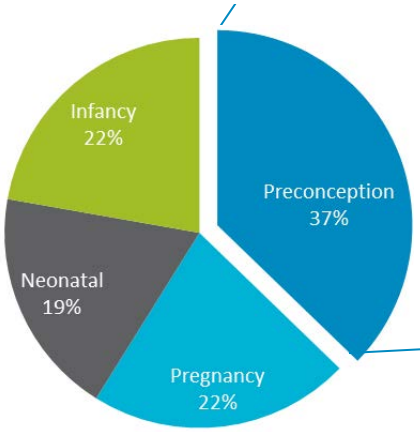
For example, African American mothers have worse outcomes than White mothers.

- Infant mortality among White American women with a college degree or higher is about 4 deaths per thousand births. But among African American women with the same level of education, infant mortality is about 10 per thousand births – almost three times higher. [1]

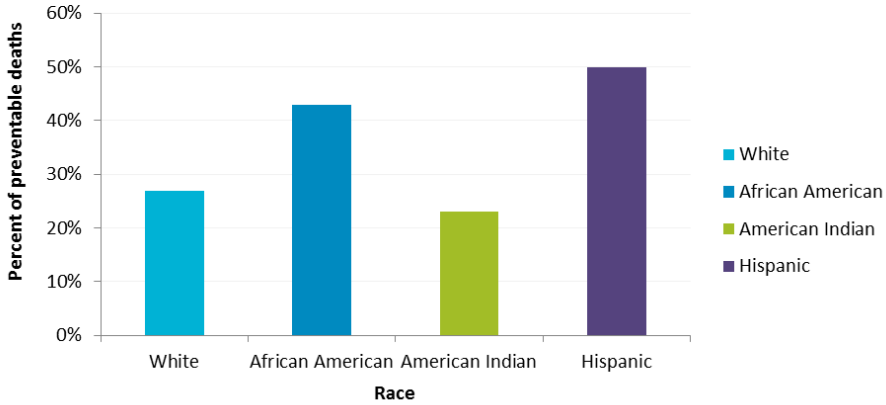
Birth outcomes are the product of not simply the 40 weeks of pregnancy but the entire life course of a woman.

- Disparity in birth outcomes is the result of not only differential stress exposures during pregnancy but the differential stress experiences across a woman's life.[1]

Percent of infant deaths attributable to period of risk



Percent of preventable deaths from pre-conception by race (1990-1998) in Minneapolis and St. Paul



Data Source: Sidebottom, A. and Borg, S. Perinatal Periods of Risk Model: An Examination of Infant Mortality Disparities in the Twin Cities 1990-1998. Minneapolis Department of Health and Family Support and Ramsey County Department of Public Health (2003)

1: Unnatural Causes: When the Bough Breaks. California Newsreel (2008)

infant mortality

THE CITY PLAYS AN IMPORTANT ROLE IN ALL PERIODS OF RISK

The City of Minneapolis can play an important role in stabilizing the factors that influence a child's chance of survival, from preconception through infancy.

The factors influencing preconception also influence all periods of risk.

- The City plays a role in many of these aspects, such as: housing and employment stability, racial discrimination, poverty, violence in the home and community safety.

Continuing and reinforcing factors that have already reduced infant mortality.

- There may be ways that City departments can think about their work differently in order to reinforce existing interventions and promote stability for women, children and families.

Greater focus

- In the last PPOR analysis conducted in the late 1990s, preconception was the greatest area of opportunity to reduce preventable deaths in Minneapolis. A new analysis currently underway will help us understand whether this has changed and then prioritize the period of risk in which the City should focus.

The stress of not having control over life circumstances is an important factor in discussions about stability and advancement. More work should be done to understand the stress from employment instability and how it affects families.

What we know

- Long bouts of unemployment have been shown to cause greater instability in family systems. Attachment to the labor force is an important factor in understanding economic outcomes.
- Employment and economic stability and security is a critical through-line across the contributors to the periods of risk influencing infant mortality rates.
- Research suggests that chronic scarcity and wage stability as well as uncertainty and lack of agency in work-schedule can lead to thought patterns which perpetuate anxiety and depression.[1]
- Stress limits a mother's ability to address short and long-term needs and influence her health before and during pregnancy, affecting a baby's chance of survival.[2]

What we don't know

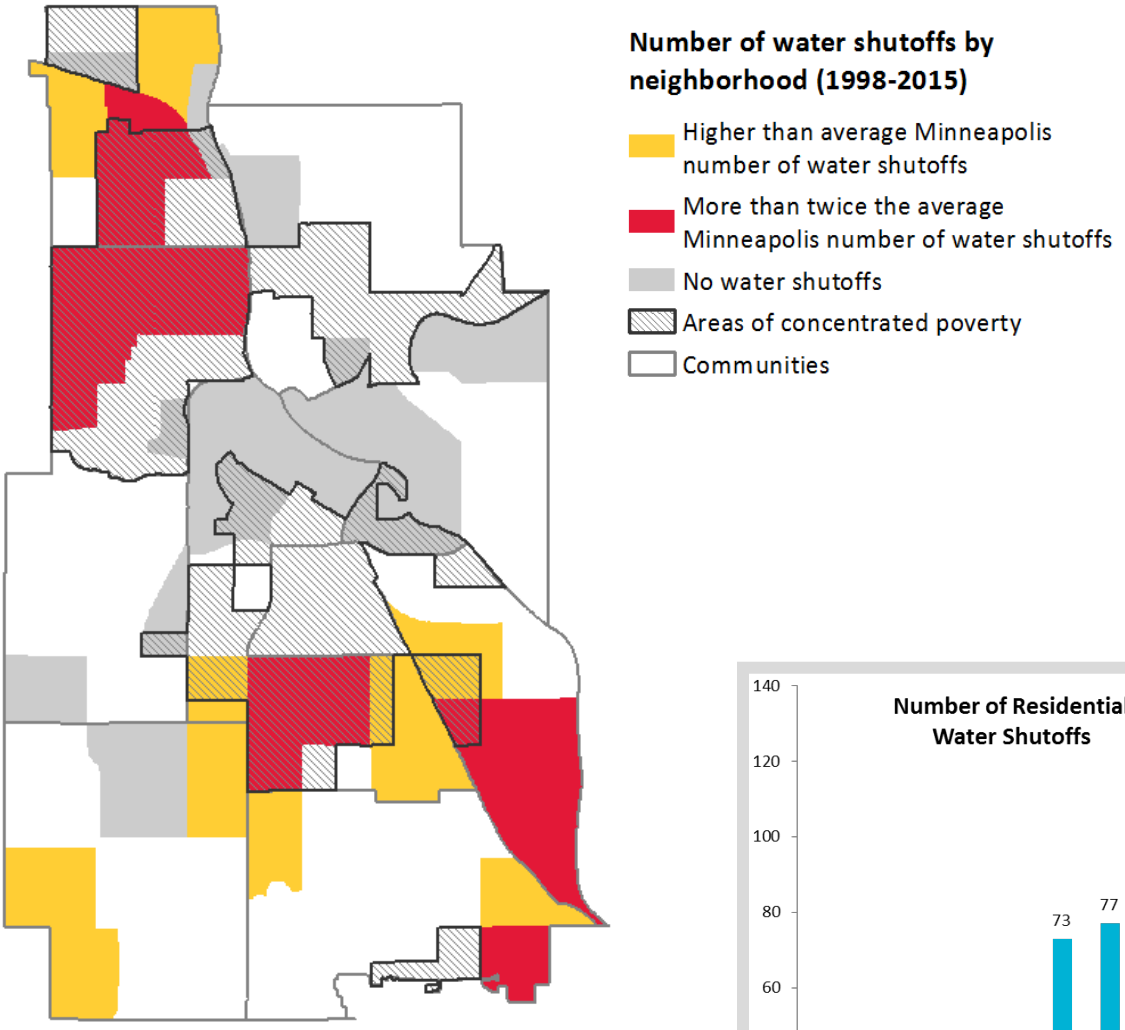
- Why improved economic outcomes are not always correlated with better outcomes for infants and children, as is the case for African American women who, despite college degrees, are more likely to have a baby die than White women without a degree.
- A clear definition of employment stability – a person can be employed stably in a low paying job, or someone may change jobs because of upward mobility. Both of these may be reflected as instability but have distinctly different effects on infants and children.
- A nuanced understanding of economic and employment stability – knowing when instability is good and when it is disruptive.

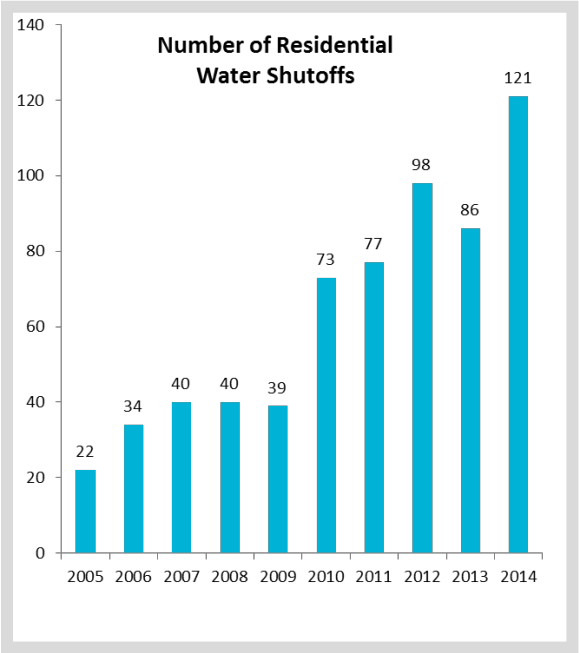
1. Thompson, Ross. "Stress and Child Development". *The Future of Children* 24 (2014).
2. Akee,Randal, Simeonova, Emilia, Costello, Jane and Copeland, William. How does household income affect child personality traits and behaviors (Working Paper 21562). National Bureau of Economic Research (2015)

Nearly half of residential water shutoffs, a possible predictor of family housing displacement, were in North Minneapolis. Water shutoffs have been steadily increasing in number.

- Since water in multi-unit buildings is typically paid by the owner, residential water shutoffs are mostly an issue for single-family homes.
- The average number of residential water shutoffs by neighborhood from 1998-2015 is 5.

Residential water shutoffs by neighborhood (1998-2015)



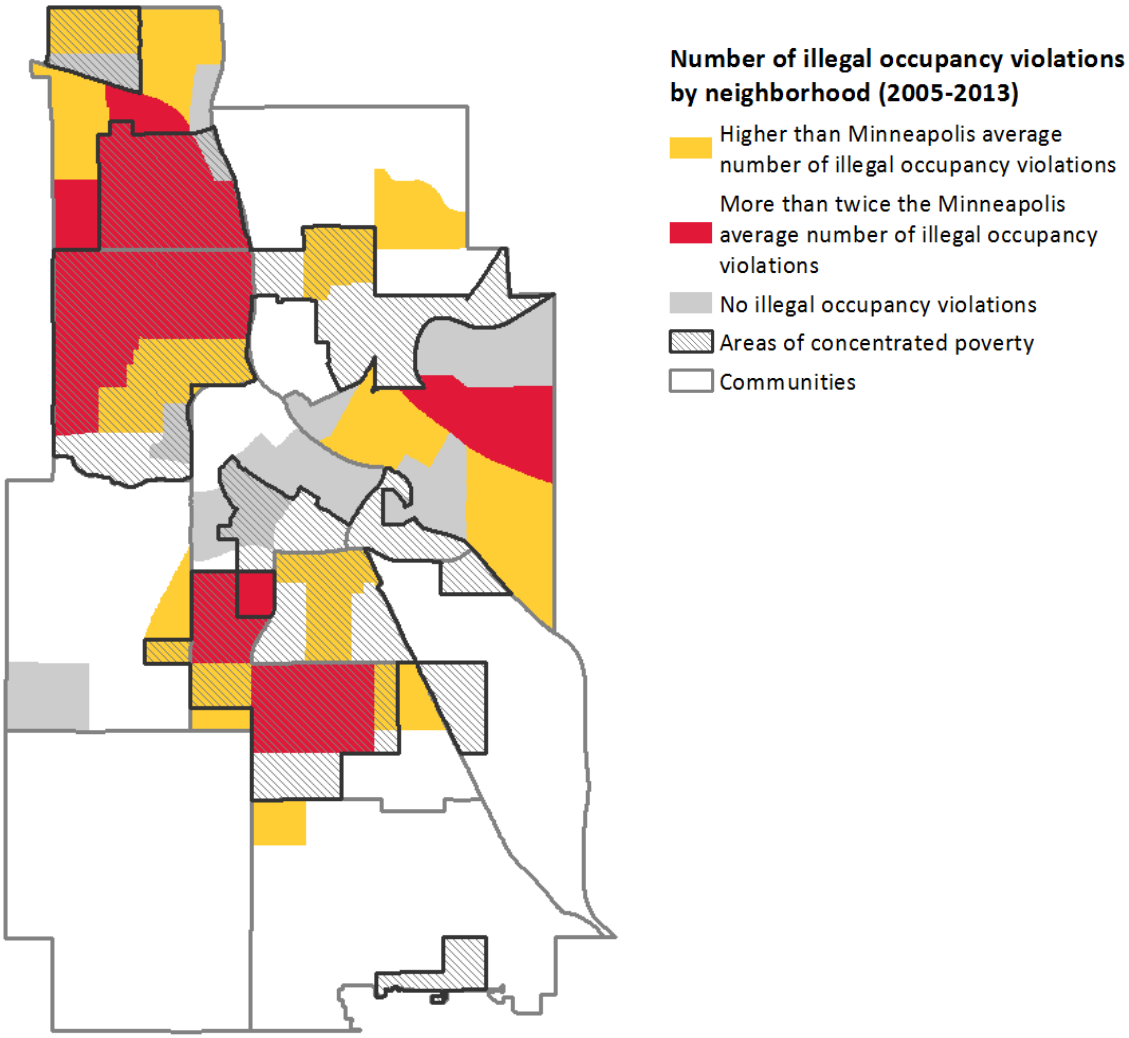


Source: City of Minneapolis, Utility Billing

Illegal occupancy is a symptom of housing instability, both for the individual or family and for neighbors.

- The definition for illegal occupancy of between one and three housing units is tied to the zoning of the building. For most of the properties included in this map, it is legal to have one family and two unrelated people living together in a single unit.
- Properties are flagged through both proactive inspections and complaints.
- The average number of illegal occupancy violations by neighborhood from 2005-2013 was 20.

Illegal occupancy violations by neighborhood (2005-2013)

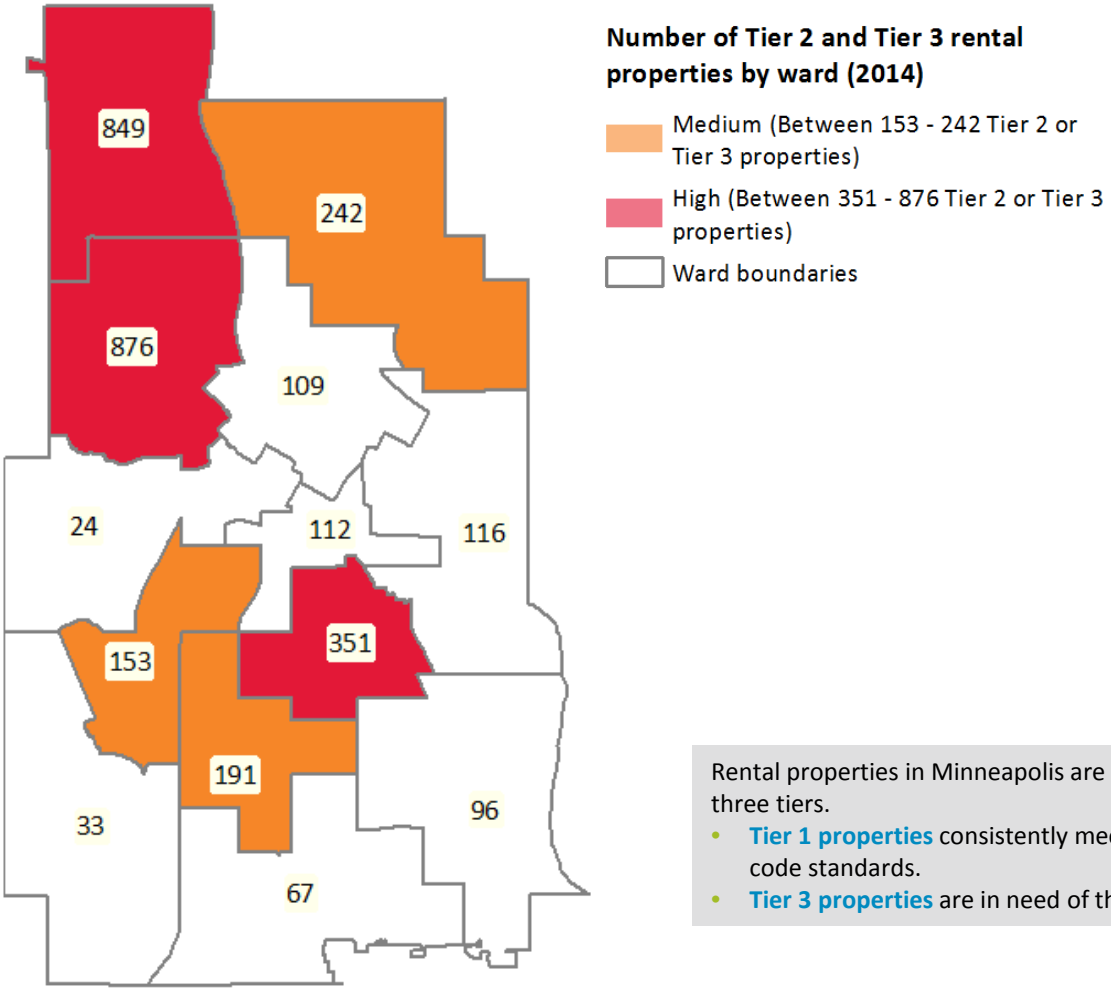


Source: City of Minneapolis, Regulatory Services

Low quality housing can pose safety hazards and is a potential source of stress for families. Stress has important effects on child health and wellbeing.

- Lower-quality rental housing stock is concentrated in North Minneapolis.
- Wards with the most Tier 2 and Tier 3 rental properties tend to have schools with lower reading proficiency rates.
- More than half (54%) of Tier 2 and Tier 3 properties are located in Wards 4 and 5.

Tier 2 and Tier 3 rental properties by ward (2014)



Rental properties in Minneapolis are divided into three tiers.

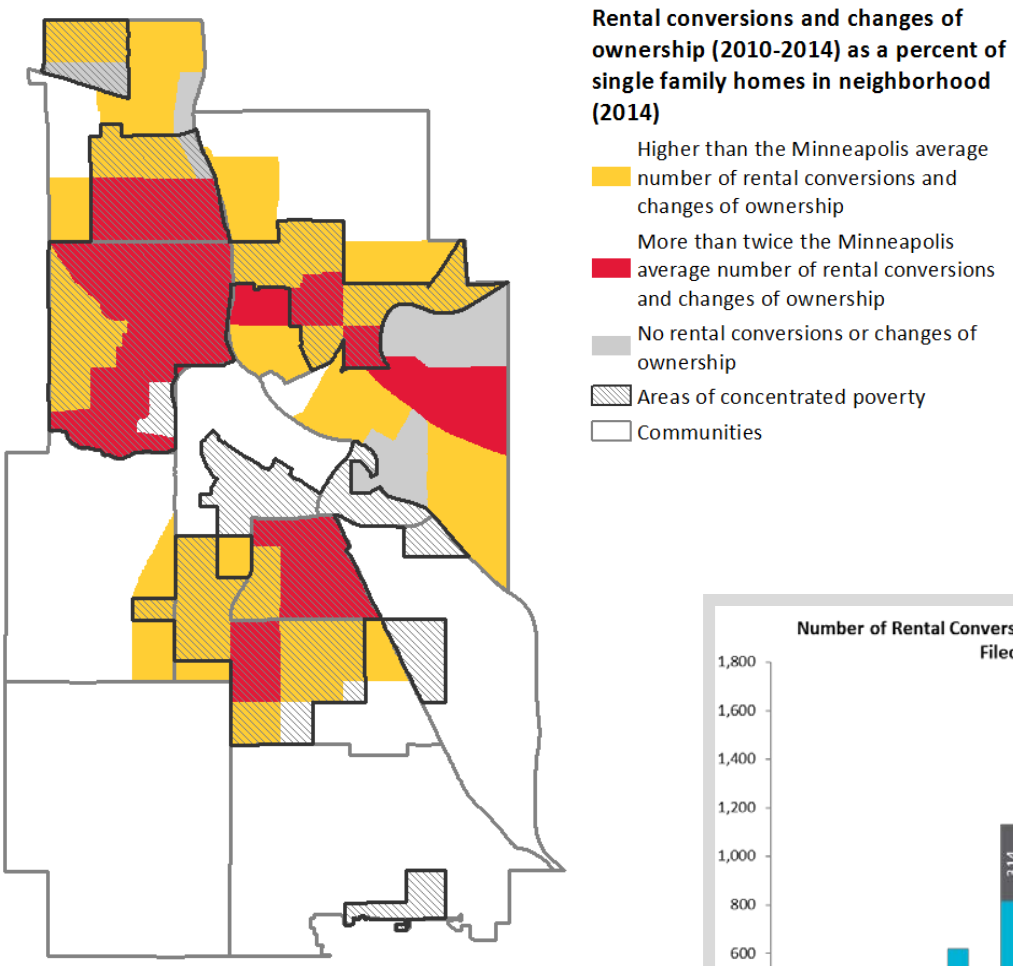
- **Tier 1 properties** consistently meet building code standards.
- **Tier 3 properties** are in need of the most work.

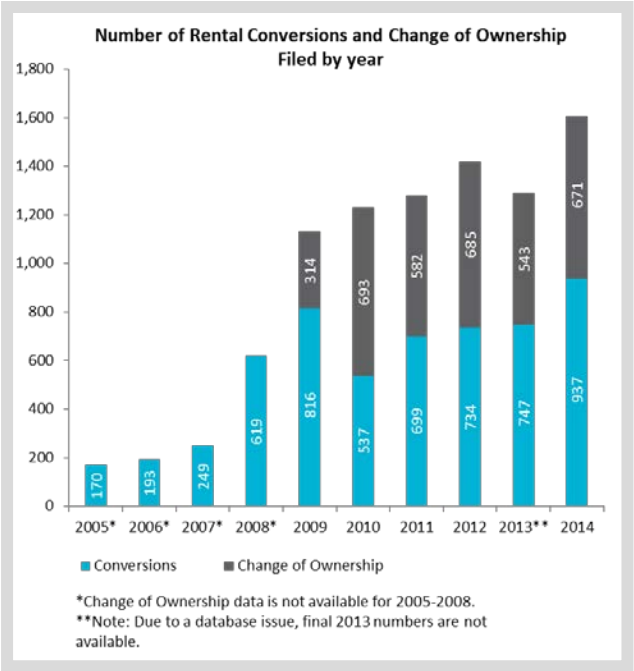
Data sources: Minneapolis Regulatory Services Department, City of Minneapolis

The increase in rental conversions since the recession might signal a move toward short-term housing solutions. This could impact the mobility and transience of families.

- Rental conversions illustrate a move from home ownership toward rental properties.
- Properties that change ownership can indicate housing instability since a tenant's lease does not have to be transferred to the new owner.
- The average percent of homes subject to rental conversions or changes of ownership by neighborhood was 10%.

Rental conversions and changes of ownership (2010-2014) as a percent of single family homes in neighborhood (2014)

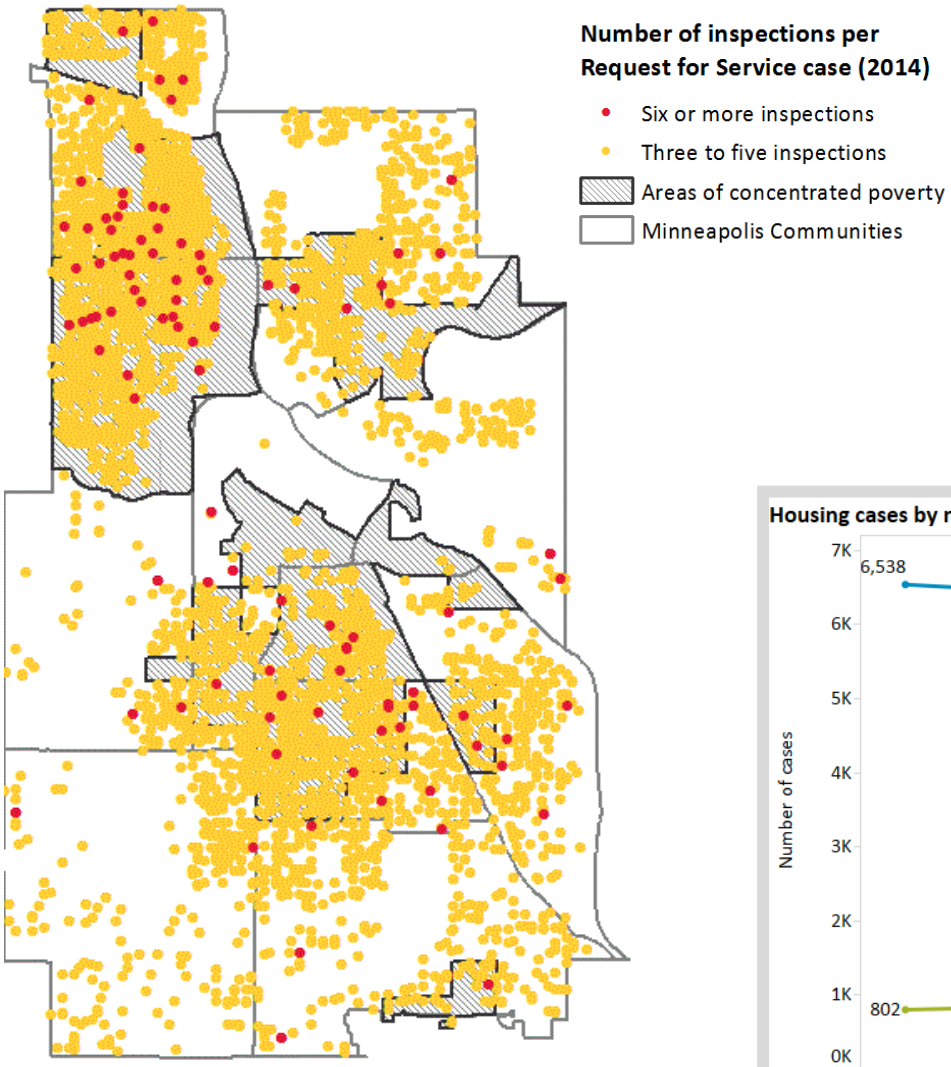


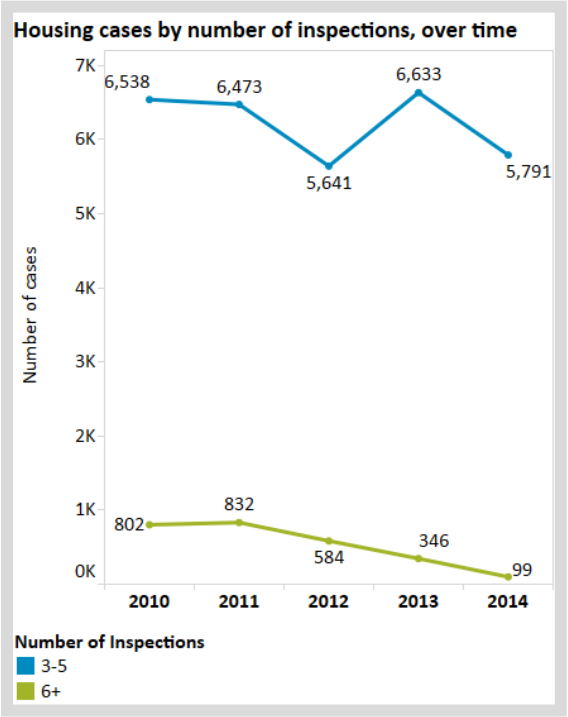


The number of inspections required to resolve a housing violation highlights the amount of time a tenant and surrounding community has been affected by subpar housing conditions.

- Cases requiring 3-5 inspections has remained somewhat steady, but the number of cases with 6 or more inspections have been in decline.
- The majority of housing violations occur either in rental properties or are exterior violations in homesteaded properties.
- A typical violation requires two inspections, one to verify the violation is occurring and the second to verify that it has been rectified. Once a violation reaches five inspections, it is typically upgraded to an administrative citation.

Number of inspections per Request for Service case (2014)



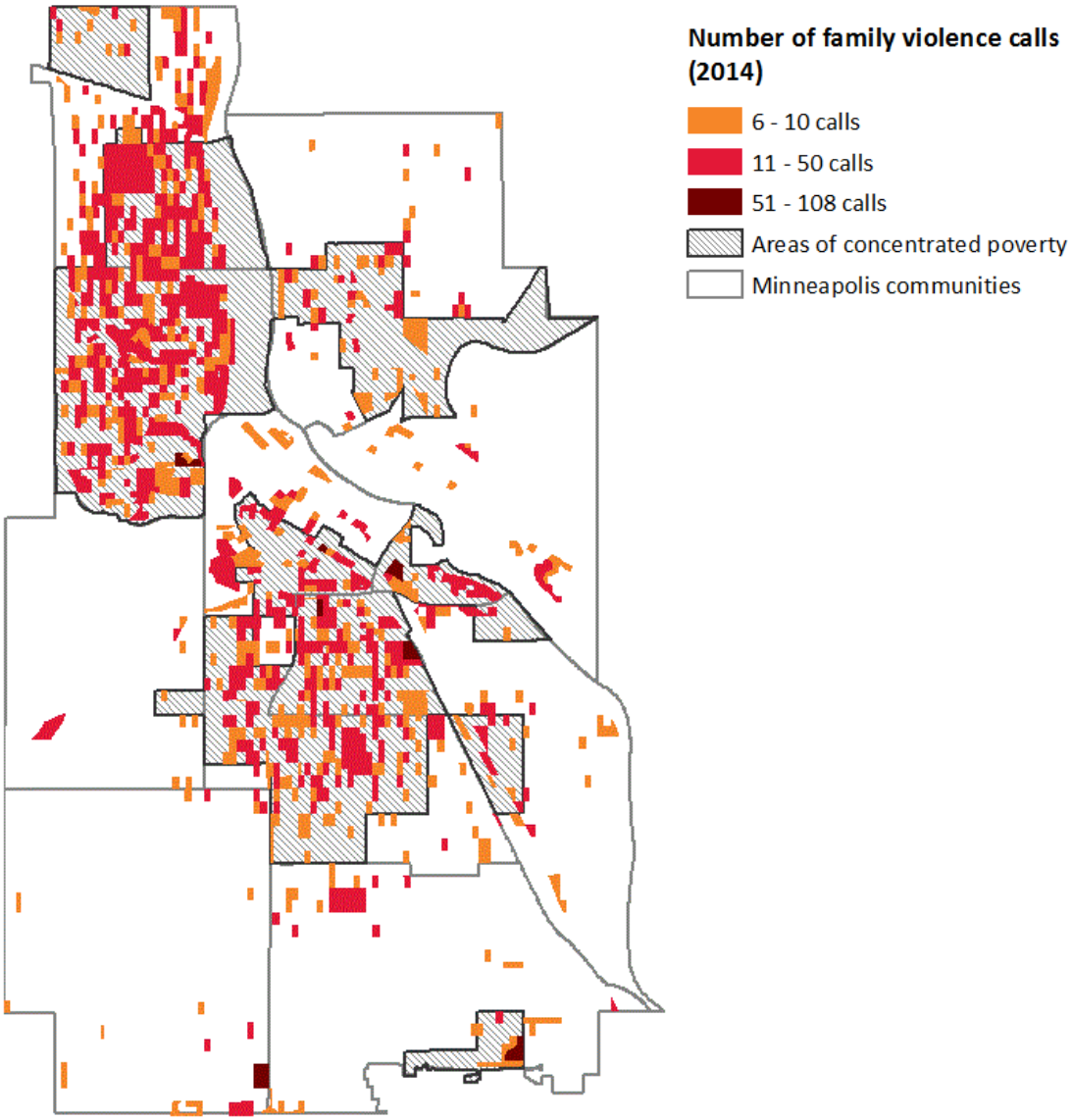


Data sources: Minneapolis Regulatory Services Department, Metropolitan Council, City of Minneapolis

Family violence calls, a measure of community stability, represent a disproportionately large number of calls in the same areas where schools have low proficiency rates.

- Family violence calls represent only 4 of 160 possible call codes but are 25% of police calls received.
- These codes are 1) domestic 2) domestic abuse - report only 3) domestic abuse - in progress) and 4) domestic with weapons.

Number of family violence calls to Minneapolis Police Department (2014)



Data sources: Minneapolis Police Department, Metropolitan Council, City of Minneapolis

infant mortality

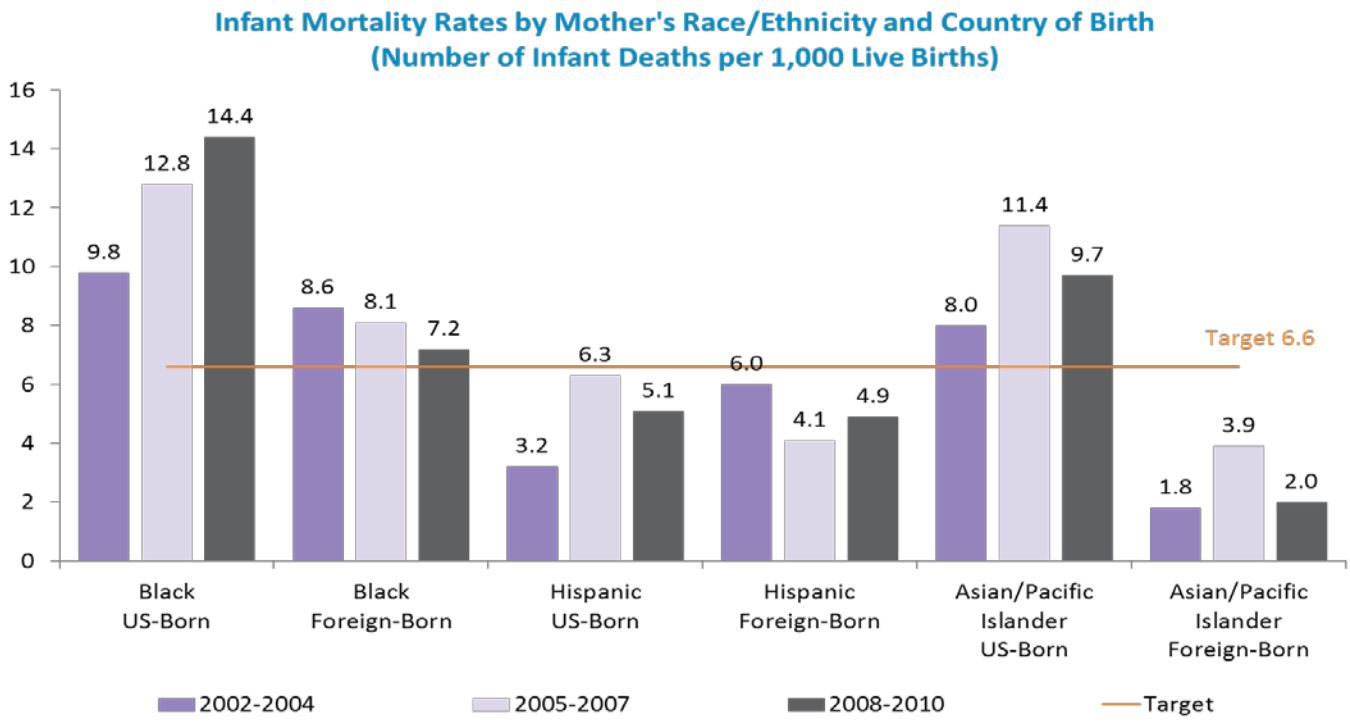
APPENDIX

Pre-term births and low birth-weight

The Minneapolis Health Department was foundational in discovering and bringing attention to calculation errors regarding pre-term births and low birth-weight babies happening nationally. They have raised this with the Centers for Disease Control which is working on correcting the issue.

As a result, the Minneapolis Health Department will need to wait until the issue is resolved and past data issues are corrected before providing updated data. There are concerns that past data may have been over or understated and, for that reason, they are not included in this report.

Babies born to foreign-born black and Asian/Pacific Islander mothers have a lower infant mortality rate than babies born to US-born mothers of the same race.



Note: Hispanic is a mutually exclusive category that includes whites, blacks, and Asians that identify as Hispanic.
Source: Minnesota Department of Health