Commissioner's Office
PO Box 64882
St. Paul, MN 55164-0882
651-201-3760
www.health.state.mn.us

Infant Mortality Reduction Plan for Minnesota (Part One)

A Partnership between the Minnesota Department of Health and the Residents of Minnesota

March 2015

Infant Mortality Reduction Plan for Minnesota:

A partnership between the Minnesota Department of Health and the residents of Minnesota

March 2015

For more information, contact:
Maternal and Child Health Section
Minnesota Department of Health
P.O. Box 64882
St. Paul, MN, 55164-0882
Phone: 651-201-3760
Fax: 651-201-3590

Protecting, maintaining and improving the health of all Minnesotans

March 16, 2015

Dear Colleagues:

To me, there is no better measure of how Minnesota is doing as a state than its infant mortality rate. This measure represents a fundamental desire shared by all Minnesotans to create a state where all babies are born healthy and have an equal opportunity to celebrate their first birthday.

The infant mortality rate reflects how well a society organizes and allocates resources to benefit the health of its population. Based on this measure, Minnesota does well compared to other states. During the 2008-2010 period, for instance, Minnesota's infant mortality rate was 5.0 infant deaths per 1,000 live births, and the state had the 8th best infant mortality rate overall among all 50 states in the country. But Minnesota's overall rate hides stark inequalities between Whites, American Indians and Populations of Color. More specifically, infants born to African American and American Indian women are twice more likely to die before their first birthday than babies born to White women. This heart-breaking statistic suggests that not all communities in our state have equal access to resources and opportunities that optimize health and allow families, mothers, and infants to thrive and develop to their fullest potential.

To reduce disparities in infant mortality rates and to ensure that infants survive to age one and beyond, the Minnesota Department of Health partnered with a diverse group of stakeholders from the public, private, and non-profit sectors around the state to develop an infant mortality reduction plan. The plan includes an analysis of what is causing infant deaths in Minnesota and seven broad recommendations to prevent these deaths. The recommendations prioritized by stakeholders build on existing efforts to improve maternal and infant health outcomes in the state. Strategies range from reducing sleep-related infant deaths and preterm births to improving health equity and addressing the social determinants of health that most significantly impact disparities in birth outcomes.

It is with tremendous optimism that I release the first part of Minnesota's infant mortality reduction plan. This plan would not have been possible without the knowledge, commitment, time, and passion that stakeholders brought to this process during the past year. As we move forward with implementing the plan statewide, we hope that you will join us in making infant mortality reduction a priority in our state.

Sincerely,

Edward P. Ehlinger, MD, MSPH
Commissioner
P. O. Box 64975
St. Paul, MN 55164-0975

Acknowledgements

The Minnesota Department of Health (MDH) respectfully acknowledges the contributions of the American Indian community for their tireless efforts, dedication, time, and commitment to reducing infant mortality in Minnesota's American Indian population. In particular, MDH would like to thank the American Indian Infant Mortality Review Case Review teams whose intensive case reviews of American Indian infant deaths during 2005-2007 and 2010-2012 resulted in the formation of Community Action Teams created to develop and implement culturally-appropriate interventions to improve birth outcomes in American Indian communities across the state. The recommendations generated by the Case Review Teams, particularly those published in the 2008 report, *American Indian Infant Mortality Review Project: Minnesota, 2005-2007*, were used by stakeholders from around the state to help prioritize topics and develop the seven broad recommendations found in the first part of the state's infant mortality reduction plan.

MDH also wishes to acknowledge the invaluable contributions of the African American community in developing and supporting efforts over the years to improve birth outcomes among infants born to African American women in Minnesota. More specifically, MDH wishes to acknowledge the Stairstep Foundation, whose 2010 report, *Addressing Infant Mortality Among African Americans: An Urgent Matter*, served as a catalyst for the creation of Community Voices and Solutions (CVAS), a partnership between MDH and representatives from the African American community to reduce infant mortality in the state's African American population.

MDH would also like to thank our partners from across multiple sectors around the state who contributed their time and expertise in developing the recommendations to improve birth outcomes and reduce infant mortality in Minnesota. We are especially thankful for our partners who helped to review this document and provided comments and feedback.

Table of Contents

EXECUTIVE SUMMARY

Background

Health, as defined by the World Health Organization, is a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity.[1] Health is created through the interaction of individual, social, economic, and environmental factors, and in the systems, policies, and processes encountered in everyday life. These include job opportunities, wages, transportation options, the quality of housing and neighborhoods, the food supply, access to health care, the quality of public schools and opportunities for higher education, racism and discrimination, civic engagement, and the availability of networks of social support. When groups face serious social, economic, and environmental disadvantages, such as structural racism and a widespread lack of economic and educational opportunities, health inequities are the result.

Minnesota is known for a number of great achievements: excellent public schools, colleges and universities, great hospitals and clinics, high insurance coverage rates, excellent public health infrastructure, and high overall health rankings. However, the growing economic inequities and the persistence of health disparities in Minnesota are a matter of life and death for many. Communities across the state are being devastated by high rates of infant mortality and more. Multiple efforts have been made to try to close the significant gaps in health outcomes across populations, but disparities remain, suggesting that more work needs to be done to improve the health of all Minnesotans.

Minnesota has consistently had one of the lowest infant mortality rates in the nation, and as recently as 2003 to 2005, the state had the lowest rate among all 50 states in the country. However, the state's consistently favorable rate has masked significant and persistent racial and ethnic disparities. Infants born to African American and American Indian women have more than twice the risk of dying in their first year of life than infants born to White women.

This document, hereafter referred to as the Plan, serves as a "call-to-action" to address the persistent racial and ethnic disparities in infant mortality and poor birth outcomes in Minnesota. To develop the plan, the Minnesota Department of Health (MDH) engaged a diverse group of stakeholders representing a wide range of Minnesota communities and professionals to identify the sources of long-standing disparities in infant mortality, particularly among American Indians and African Americans, and gather their perspectives on what changes could be made in systems, policies, and practices to improve birth outcomes.

Key Findings

- From 2008-2010, Minnesota's infant mortality rate overall (5.0 infant deaths per 1,000 live births) was lower than the nation's rate (6.4 infant deaths per 1,000 live births). While the state has already met the Healthy People 2020 target of 6.0 infant deaths per 1,000 live births, the nation as a whole has not yet done so.

- Minnesota's overall rate masks significant disparities in rates between American Indians, African Americans, and Whites. From 2006-2010, African Americans (9.8 infant deaths per 1,000 live births) and American Indians (9.1 infant deaths per live 1,000 births) had the highest infant mortality rates in the state. These rates more than doubled the rate for Whites (4.4 infant deaths per 1,000 live births).

- Infants born to African-American women are two times as likely to die during the neonatal period (first month) than infants born to White women and women in the state as a whole. Babies born to American Indian women are three times as likely to die in the post-neonatal period compared to the babies of White women and women in the state overall. Even when the babies of African American and American Indian women are born full-term or normal weight at birth, their risk of death before reaching age one is two to three times that of Whites (2006 - 2010).

- Congenital anomalies are the leading cause of infant deaths in Minnesota overall, and the leading cause of infant deaths among Asians, Hispanics, and Whites. Prematurity is the leading cause of infant deaths among African Americans, while Sudden Unexpected Infant Deaths (SUID), which includes Sudden Infant Deaths Syndrome (SIDS) and sleep-related deaths, are the leading causes of deaths among American Indian infants (2006-2010).

- Infants born to African American and American Indian teen mothers, U.S.-born Black, Asian, and Hispanic women, and women with less than a high school education (in the state as a whole), are at greater risk of dying before their first birthday compared to foreign-born Black, Asian, and Hispanic women, and women with 16 or more years of education.

- The infant mortality rate for infants born to well-educated (i.e., 16 or more years of education) African American women is significantly higher than the infant mortality rate of infants born to White women with less than a high school education.

- Compared to women of other racial/ethnic groups, infants born to African American and American Indian women are at greater risk of dying before their first birthday even if their mothers did not smoke during pregnancy or initiated prenatal care early.

It is obvious from these findings that infant mortality is a complex, multi-factorial problem that requires a multidisciplinary, multi-sectorial approach to reduce the rate overall, and particularly to reduce the racial and ethnic disparities in the rate at which babies die. Reducing the infant mortality rate and improving birth outcomes for all families in Minnesota will take a broad multi-faceted approach and include many partners.

Recommendations

The priority recommendations developed by the stakeholders to reduce infant mortality in Minnesota are as follows:

1) **Improve** health equity and address the social determinants of health that most significantly impact disparities in birth outcomes.

2) **Reduce** the rate of Sudden Unexpected Infant Deaths (SUID), which includes SIDS and sleep-related infant deaths in Minnesota.

3) **Assure** a comprehensive statewide system that monitors infant mortality.

4) **Provide** comprehensive, culturally appropriate, coordinated health care to all women during the preconception, pregnancy and post-partum period.

5) **Reduce** the rate of preterm births in Minnesota.

6) **Improve** the rate of pregnancies that are planned, including reducing the rate of teen pregnancies.

7) **Establish** an ongoing task force of stakeholders to oversee implementation of recommendations and action steps.

Vision, Goals, and Objective

MDH and stakeholders' collective vision, goals, and objectives are as follows:

Vision: All babies are born healthy, to healthy parents in healthy communities, and are given equal opportunities to survive to age one and beyond.

Goals: 1) To reduce Minnesota's overall infant mortality rate, and) to reduce racial and ethnic disparities in infant death rates.

Objective: To reduce the state's overall infant mortality rate by 10 percent from 4.6 infant deaths for every 1,000 babies born alive in 2010 to 4.1 by 2020.

MINNESOTA'S INFANT MORTALITY REDUCTION PLAN

Introduction

Health, as defined by the World Health Organization, is a state of complete physical, social, and mental well-being and not merely the absence of disease or infirmity.[1] Health is created through the interaction of individual, social, economic, and environmental factors and in the systems, policies, and processes encountered in everyday life. These include job opportunities, wages, transportation options, the quality of housing and neighborhoods, the food supply, access to health care, the quality of public schools and opportunities for higher education, racism and discrimination, civic engagement, and the availability of social support networks. When groups face serious social, economic, and environmental disadvantages, such as structural racism and a widespread lack of economic and educational opportunities, health inequities are the result. The growing economic inequities and the persistence of health disparities in Minnesota are a matter of life and death for many. Communities across the state are being devastated by high rates of infant mortality, diabetes, suicide and more. Multiple efforts have been made to try to close the significant gaps in health outcomes across populations, but disparities remain, suggesting that more work needs to be done to improve the health of all Minnesotans.

- Even where health outcomes have improved overall, as in infant mortality rates, the disparities in these outcomes remain unchanged: American Indian and African American babies are still dying at twice the rate of white babies.
- Inequities in social and economic factors are the key contributors to health disparities and ultimately are what need to change if health equity is to be advanced.
- Structural racism — the normalization of historical, cultural, institutional dynamics that routinely advantage white people while producing cumulative and chronic adverse outcomes for people of color and American Indians — is rarely talked about. Revealing where structural racism is operating and where its effects are being felt is essential for determining where policies and programs can make the greatest improvements.
- Improving the health of those experiencing the greatest inequities will result in improved health for all.

Despite having one of the lowest infant mortality rates in the country, infant mortality remains a topic of great public health concern in Minnesota. Infant mortality, defined as the death of an infant before age one, is an important indicator of the health and well-being of a nation. It is a cause for concern in Minnesota because of the approximately 70,000 infants born alive in the state each year, about 380 do not survive to their first birthday.[2] In addition, the state's low overall infant mortality rate and ranking over the years have masked significant racial and ethnic disparities in infant mortality. Specifically, babies born to women of color – particularly African American and American Indian women – have historically been, and still are, more likely to die in their first year of life than babies born to White women. If the state's infant mortality problem is not addressed, it will have profound, long-term negative consequences on families, communities, and the state as a whole for years to come. Thus,

developing and implementing effective, evidenced-based policies and programs that foster optimal maternal and child health conditions is critical in ensuring that:

- The state fulfills its *Healthy Minnesota 2020* goal that all babies born in Minnesota experience a healthy start in life.[3]

- All babies develop to their fullest potential, and survive to become successful adults who contribute to the vitality of their communities.[4]

- The state's vision that "All people in Minnesota enjoy healthy lives and healthy communities"[3] becomes a reality.

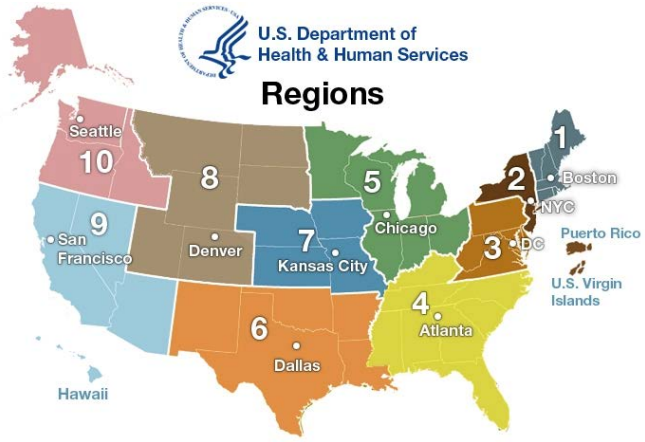
- All Minnesotan's are given an "Equal opportunity for health."[3]

- The state realizes its overall objective of reducing the state's overall infant mortality rate by 10 percent from 4.6 infant deaths for every 1,000 babies born alive in 2010 to 4.1 by 2020.

A Call to Action

This document (hereafter called the Plan) serves as a "call-to-action" to address the infant mortality problem in Minnesota, particularly the persistent racial and ethnic disparities in poor birth outcomes. It outlines a strategic plan with several broad recommendations to further reduce infant mortality in the state. Reducing infant mortality and eliminating health disparities is a national priority called forth in *Healthy People 2020*, the nation's public health agenda.[5] It includes an explicit objective to reduce the national infant mortality rate by the year 2020 to 6.0 infant deaths per 1,000 live births. It also identifies eliminating racial and ethnic health disparities in infant mortality as a national public health goal and priority.

Figure 1: US Department of Health & Human Services 10 Designated Public Health & Human Services Regions



Source: http://www.hhs.gov/about/regionmap.html. Accessed on 8 August 2014.

The U.S.'s infant mortality rate has declined by more than 90 percent since the turn of the twentieth century.[6] Even so, in 2010, the U.S. ranked 27th in infant mortality among selected industrialized societies,[7] and racial/ethnic, socioeconomic, and geographic disparities in rates persist across the country.[8] To accelerate infant mortality declines and to address disparities in rates, the U.S. Department of Health Resources and Services Administration (HRSA), the Association of Maternal and Child Health Programs (AMCHP) and other partner agencies and organizations recently launched a public-private Collaborative Innovation and Improvement Network (CoIIN) in regions IV, V, and VI.[9] The CoIIN affords opportunities for participants to engage in interstate learning with one another, share best practices and lessons learned, draw on the knowledge of topical experts, and tracks progress of common objectives. Additionally, the CoIIN employs quality improvement (QI) principles and methods to ensure that actions are taken to produce measurable improvements and outcomes. In 2013, Minnesota joined the five other states in Region V– Illinois, Indiana, Michigan, Ohio, and Wisconsin – to launch a regional CoIIN to focus on four priority areas chosen by the states to address some of the most pronounced racial and ethnic infant mortality differentials in the country.

HRSA and partner organizations rolled out a national CoIIN across all ten regions in February 2015, and all participating states will be given an opportunity to focus on at least three of the six strategy areas prioritized by the ten regions. The six national CoIIN priority areas are: (1) Safe Sleep; (2) Smoking Cessation (3) Preconception Health/Interconception Health; (4) Prevention of Preterm and Early Births; (5) Perinatal Regionalization; and (6) Social Determinants of Health. With the exception of the Perinatal Regionalization learning collaborative, MDH plans to participate in the remaining five networks.

As with the federal government and its national partners, Minnesota has long recognized the importance of eliminating racial and ethnic disparities in infant mortality as a major public health priority, and has implemented numerous programmatic and policy efforts over the years to improve birth outcomes and reduce infant mortality. For example, *Minnesota Milestones*, a thirty-year plan first introduced in 1991, identifies infant mortality as an important barometer of population health and monitors its performance among 70 progress indictors.[10] More recently, the Eliminating Health Disparities Initiative (EHDI), a joint long-term policy initiative of the Minnesota Legislature and MDH, enacted in 2001, established a goal of a 50 percent reduction in the infant mortality rate between communities of color and American Indians as compared to Whites by 2010.[2] Although $5.5 million dollars in community grants have been awarded by the EHDI since 2001 to reduce infant mortality, primarily to organizations serving the African American and American Indian populations, and progress has been made, we have yet to achieve the infant mortality reduction goal (Table 1).[11] This suggests that additional efforts combined with a new approach are needed to further accelerate infant mortality declines in these populations.

Table 1: Minnesota Infant Mortality Rates and Disparities, 1995 - 1999 and 2006 - 2010

Rates and Disparities	African American	American Indian	Asian	Hispanic*	White
Baseline prior to EHDI (1995-1999)	13.2	13.5	7.1	7.0	5.5
Current (2006-2010)	9.8	9.1	4.9	4.8	4.4
Rate Ratio (1995-1999)	2.4	2.1	1.3	1.3	NA
Rate Ratio (2006-2010)	2.2	2.0	1.1	1.1	NA
Percentage Infant Mortality Reduction	26.0	33.0	31.0	31.0	20.0
Baseline Disparity with Whites	7.7	8.0	1.6	1.5	NA
Current Disparity with Whites	5.4	4.7	0.5	0.4	NA
Percentage Disparity Reduction with Whites	**30.0**	**41.3**	**69.0**	**73.3**	**NA**
EHDI Disparity Goal Met**	No	No	Yes	Yes	NA

Source: Minnesota Department of Health, Vital Statistics
*Can be of any race
** Progress towards achieving the EHDI disparity goal of 50% is determined against the baseline period of 1995-1999
(*See Appendix D for formulas*)

Why is this plan needed?

Minnesota's Infant Mortality Reduction Plan is being developed by the Minnesota Department of Health (MDH) in partnership with a broad array of stakeholders. The plan lays out a collective vision to improve infant survival through the first year of life and reduce disparities in infant mortality rates. The plan intends to identify where MDH and its partners need to go, how to get there, and how to evaluate if our efforts have been successful. More specifically, this plan aims to:

- Reduce racial and ethnic disparities in infant mortality, namely the African American and American Indian rates in Minnesota.
- Enhance collaboration and partnerships between MDH and stakeholders across Minnesota.
- Establish priority areas with accompanying infant mortality reduction strategies and action plans, and engage stakeholders in its implementation.
- Monitor progress of benchmarks to determine what else needs to be done "to move the needle."
- Further the state's vision for improving infant health outcomes by collaborating and learning from regional and national CoIIN infant mortality reduction activities.

How is the work being framed?

This plan is framed through the lenses of the life course perspective and the health equity framework.[9] The life course perspective has gained considerable popularity among maternal and child health researchers and practitioners in recent years, in part because it helps to explain the persistent racial and ethnic disparities in poor birth and other health outcomes between Whites and communities of Color. According to the life course perspective, individual health outcomes are shaped by the complex

interaction of multiple risk and protective factors, including biological, psychological, social, and environmental influences across the lifespan.[12] Additionally, one stage of the life course sets the stage for the next, and health can be transferred from generation to generation, even at the genetic level. Thus, maternal experiences prior to, and during pregnancy, can affect birth outcomes, the health of children in infancy, as well as later on in life. Because one stage of the life course sets the stage for the next, early interventions before and during pregnancy are critical to boost protective factors, or to mitigate risks factors (e.g., smoking, drinking, and many other risk factors) that can result in poor birth outcomes, including infant deaths.

As with the life course perspective, the health equity framework also focuses on the conditions that create health, with greater emphasis given to the role that social and economic conditions play in shaping health outcomes. It is supported by research which demonstrates that while 10 percent of the factors that influence health outcomes are due to clinical care, 90 percent are due to non-clinical factors. Of this 90 percent, 40 percent are due to social and economic conditions.[13] More specifically, the health equity framework suggests that the conditions (e.g., education, safe communities, food, shelter, and adverse experiences) that create health are "socially determined" through decisions that are made across multiple sectors of society (e.g., governmental and corporate sectors). These decisions are often rooted in structural racism and other discriminatory practices. In the long-run, such decisions can create favorable conditions and opportunities that foster optimal health in one or a few groups, while creating conditions that result in poor health outcomes for others. "When these socially-determined differences lead to disparities in health outcomes, they are health inequities." [14] Health equity is possible if everyone, regardless of race/ethnicity, gender, socioeconomic status, sexual orientation, religious background or creed, is provided with the needed levels of supports and opportunities to achieve their fullest health potential.[14]

How is the plan organized?

This plan is being developed and released in two phases. This particular document is Part One of the plan. It provides an overview of the scope of the infant mortality problem, highlights our collective vision, goals, and benchmarks for reducing infant mortality, and presents a set of broad recommendations and next steps for action. Part Two of the plan will spell out evidence-based strategies with specific action steps the state and communities can take to reduce infant mortality, and associated disparities, across the state. The remainder of this document is organized as follows:

- **Section 1, *Where are We Now?*** Using the most current data available, this section provides an overview of the scope of the infant mortality problem in Minnesota. It puts into context the significant racial/ethnic and other infant mortality differentials that exist in the state by providing baseline information on selected infant and maternal socio-demographic and behavioral characteristics associated with poor birth outcomes and infant deaths.

- **Section 2, *Where Do We Need to Go*?** Outlines our collective vision and goals to obtain additional infant mortality reductions by 2020.

- **Section 3*, How Will We Get There?*** This section describes the process used during three stakeholders' meetings held between July and November 2013 to develop and prioritize recommendations and potential strategies to reduce infant mortality in Minnesota. It also presents the set of seven broad recommendations and a rationale for why the recommendation is important.

Who should use this plan?

This plan is intended for stakeholders in the private, public, academic, or non-profit sectors throughout the state. It may also be used by any individual, group, or organization that seeks to improve overall population health by taking a "health in all policies" approach. Thus, the plan may be used by planners, healthcare workers, non-profit organizations, tribal health departments, policy makers, academic researchers, advocates, local public health departments, faith-based organizations, as well as communities to inform policy and programs that aim to improve outcomes for babies and families across the state.

How often will the plan be updated?

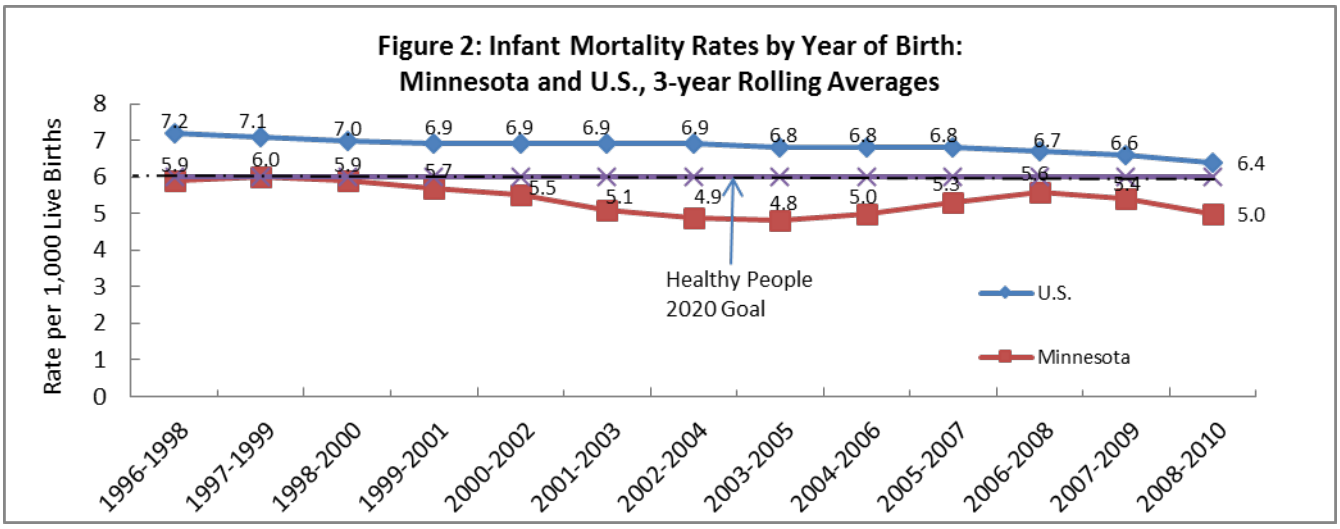
Although progress towards benchmarks will be monitored regularly by MDH and stakeholders, this document will be updated periodically to capture the most current data, evidence-based strategies, and best practices in the scientific literature at such time.

Section 1: Where Are We Now?

To gauge the current burden of infant deaths for a particular group, geographic area, or a specified time period, the infant mortality rate is calculated and then compared across groups. The infant mortality rate is defined as the number of infant deaths during the first year of life per 1,000 live births.[15] This rate often serves as an important proxy measure for the health status of a population, often signaling the extent to which a community, state or country has conditions that foster optimal health such as: access to quality medical care, the availability of a well-developed public health infrastructure, and favorable social, economic, environmental and political conditions.[16] The infant mortality rate observed in both Minnesota and the nation today is the result of vast improvements in public health (e.g., nutrition and sanitation), medicine (e.g., antibiotics), and social-conditions that began at the turn of the twentieth century and continued into the twenty-first century.[6]

National Racial and Ethnic Infant Mortality Disparities and Rankings

Figure 2: Infant Mortality Trends



Source: National Center for Health Statistics

Figure 2 shows that Minnesota's infant mortality rate has historically been lower than the U.S. rate overall. Additionally, the U.S. rate has, on average, been much slower to decline than Minnesota's rate. Between 2006 and 2010 (three-year averages), the last year for which data from the National Center for Health Statistics are available, the U.S. infant mortality rate was 6.4 infant deaths per 1,000 live births compared to Minnesota's 5.0 infant deaths per 1,000 live births.[17] During 1996 to 2010 (three-year average rates), Minnesota's rate dropped by 15.3 percent from 5.9 infant deaths per 1,000 live births to 5.0, while the U.S. rate dropped by 11.1 percent, from 7.2 infant deaths per 1,000 live births to 6.4. Minnesota's rate of 5.0 infant deaths per 1,000 live births indicates that while the state has already met the Healthy People 2020 target of 6.0 infant deaths per 1,000 live births, the nation as a whole has not yet done so.

Table 2: National Racial and Ethnic Infant Mortality Disparities and Ranking. Infant Mortality Rates (per 1,000 births) and Disparities by Race/Ethnicity: Minnesota and the United States, 2008-2010

	Total	Non-Hispanic Black	Non-Hispanic American Indian or Alaska Native[1]	Asian or Pacific Islander	Hispanic	Non-Hispanic White
Minnesota	5.0	9.6	8.6	4.8	5.1	4.3
United States	6.4	12.2	8.4	4.4	5.4	5.3
States Reporting	50	38	15	29	42	50
Minnesota Ranking*	8	5	7	15	11	9

Source: National Center for Health Statistics.
*Ranking is from best to worst, i.e., Minnesota has the 8th best (lowest) infant mortality rate in the United States.
Note: States were excluded from the report if there were fewer than 20 infant deaths
[1] Includes Aleuts and Eskimos

Not only is Minnesota's infant mortality rate (5.0 infant deaths per 1,000 live births) lower than the nation's rate overall (6.4 infant deaths per 1,000 live births), but it is also one of the lowest (i.e., 8th best) among all 50 states in the country (Table 2). Minnesota has the lowest infant mortality rate among all states in Region V: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin (Table 3). With the exception of Ohio and Michigan, which have the lowest infant mortality rate among Asians or Pacific Islanders, and Wisconsin which has the lowest infant mortality rate among Non-Hispanic American Indian or Alaska Natives, the rate for all other racial/ethnic groups is lower in Minnesota than in the other Region V states (Table 3).

Regional Racial and Ethnic Infant Mortality Disparities and Rankings

Table 3: Infant Mortality Rates (per 1,000 births) by Race/Ethnicity and Rank Among States in Region V, 2008-2010

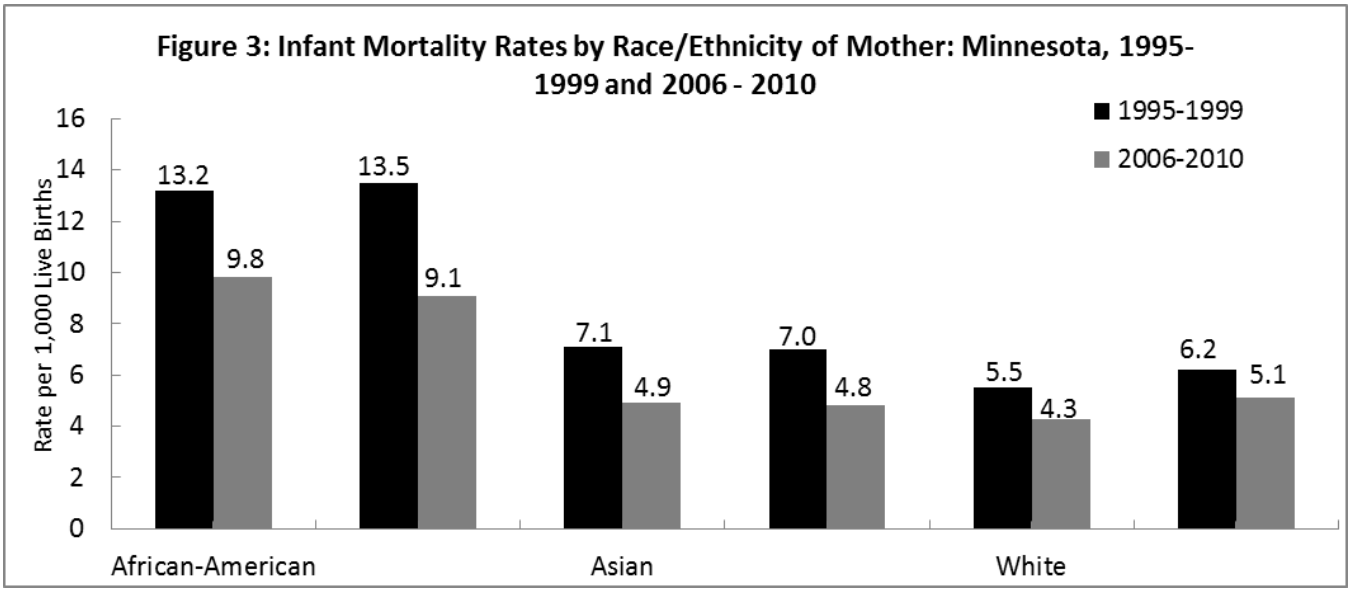
	Total	Non-Hispanic Black	Non-Hispanic American Indian or Alaska Native[1]	Asian or Pacific Islander	Hispanic	Non-Hispanic White	Region V Rank
Illinois	7.0	13.6	--	5.5	5.8	5.5	3
Indiana	7.4	14.1	--	6.1	6.8	6.5	4
Michigan	7.4	14.3	12.3	4.5	6.9	5.9	4
Minnesota	5.0	9.6	8.6	4.8	4.6	4.6	1
Ohio	7.7	14.5	--	4.5	7.3	6.3	5
Wisconsin	6.3	13.9	8.0	6.4	6.2	5.4	2

Source: National Center for Health Statistics
*Ranking is from best to worst, i.e., Minnesota has the lowest (best) infant mortality rate in region V
--Data are not available.
[1] Includes Aleuts and Eskimos

Maternal Race and Ethnicity

Despite Minnesota's favorable infant mortality rate and ranking, the state's overall infant mortality rate disguises substantial variation in rates by race/ethnicity. This suggests that the burden of infant mortality is not shared equally across all groups. During the periods from 1995 to 1999, and 2006 to 2010, African-Americans and American Indians had the highest infant mortality rates in the state (Figure 2). The rates did decline for all groups between the two periods, and while American Indians, Hispanics, and Asians experienced the largest declines (32.6, 31.4, and 31.0 percent, respectively) relative to the other groups (Figure 3), the infant mortality rates for African Americans and American Indians still doubled the rate for Whites. The infant mortality rates for Asians (7.1 and 4.9) and Hispanics (7.0 and 4.8) were virtually identical.

Figure 3: Infant Mortality Rates by Race/Ethnicity of Mother, Minnesota, 1995-1999



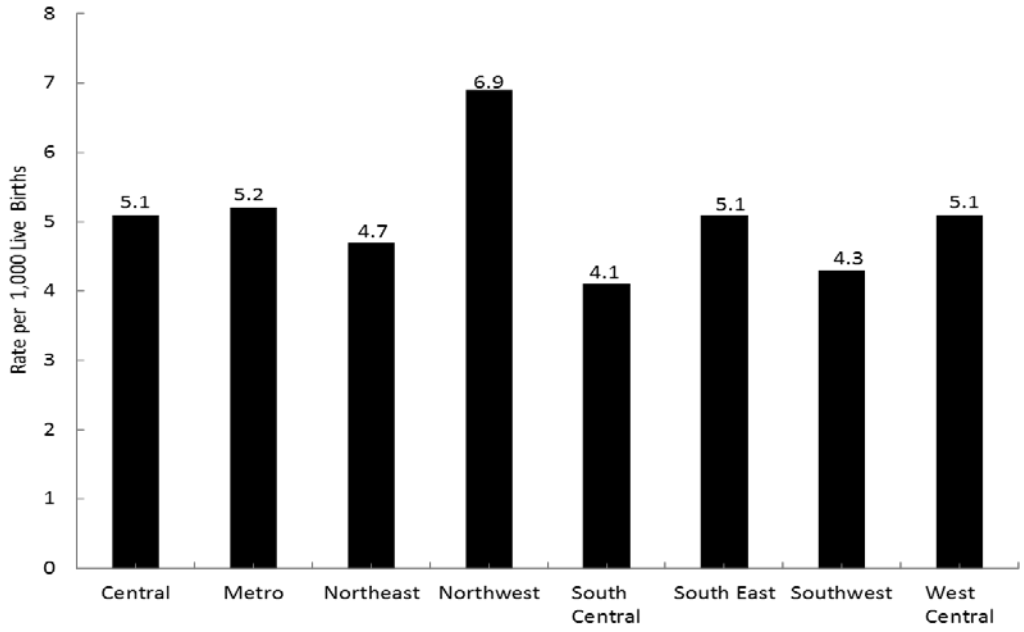
*Can be of any race
Source: Minnesota Department of Health, Center for Health Statistics

Geographic Location

Minnesota has 50 locally governed Community Health Boards that oversee local health departments (LHDs). These Community Health Boards are organized into eight geographic regions, and they work in partnership with the MDH to fulfill the state's public health responsibilities in ensuring that Minnesotans are healthy.[18] Figure 4 presents the infant mortality rates for the eight regions. The eight regions depicted in Figure 3 represent the mother's place of residence at the time she gave birth.

Infant mortality rates vary across geographic regions, with rates ranging from as low of 4.1 infant deaths per 1,000 live births in the South Central part of the state to a high of 6.9 infant deaths per 1,000 live births in the Northwest. The infant mortality rate in the Metro area – which comprises the seven metro counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington – was 5.2 infant deaths per 1,000 live births, which was about the same as the rates for the Central, South East, and West Central regions of the state.

Figure 4: Infant Mortality Rates by Geography, Minnesota, 2006-2010



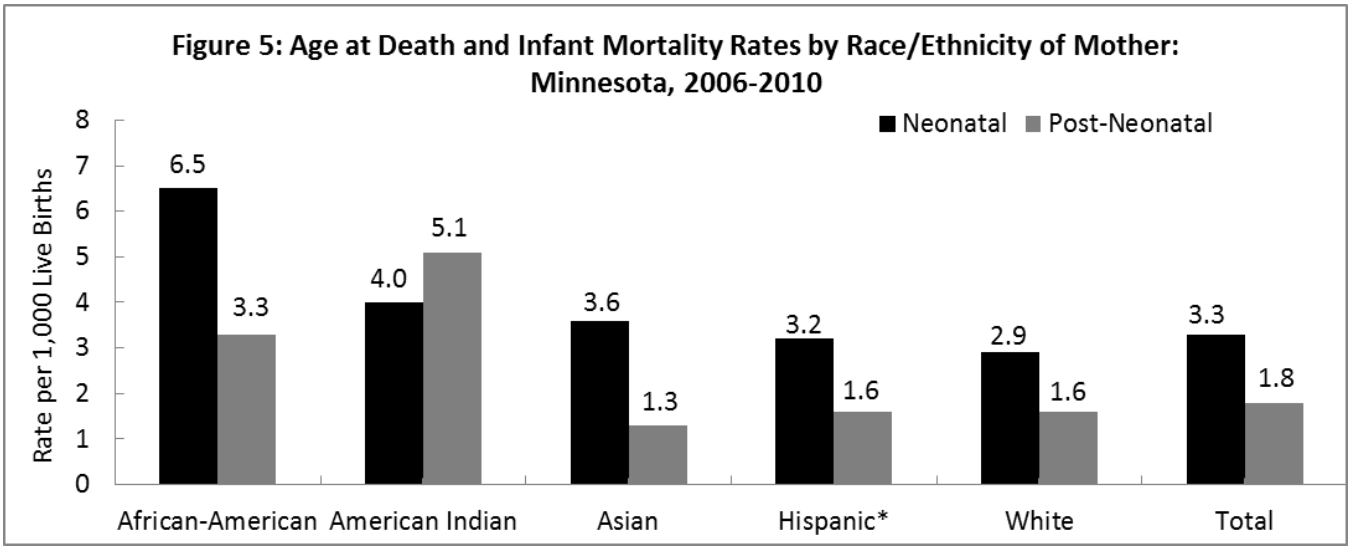
Source: Minnesota Department of Health, Center for Health Statistics.

Selected Characteristics

Age at Death

The death of an infant before his/her first birthday occurs in either the neonatal or the post-neonatal period. Neonatal deaths occur during first 27 days of life (i.e., the first month) and post-neonatal deaths occur between 28 days and the first birthday. The age at which an infant dies is important because it offers important clues into the likely cause(s) of death. Deaths occurring in the neonatal period are usually due to either problems associated with the mother's health during pregnancy or health problems experienced by the infant as it develops in utero (e.g., biological or birth defects). In contrast, deaths occurring in the post-neonatal period are typically the result of social-environmental factors such as unsafe infant sleep practices or exposure to tobacco smoke.

Figure 5: Age at Death and Infant Mortality Rates by Race/Ethnicity of Mother: Minnesota, 2006-2010



*Can be of any race
Source: Minnesota Department of Health, Center for Health Statistics

Between 2006 and 2010, infants born to African American women were more likely to die in the neonatal period than infants born to women in other racial or ethnic groups (Figure 5). In fact, the neonatal infant mortality rate for African Americans was 2.2 times the White neonatal mortality rate (Figure 5), and was approximately two times Minnesota's overall rate. Infants born to American Indian women had the highest post-neonatal mortality rate, and the rate was 3.2 times the White rate, and 2.8 times the state's overall rate.

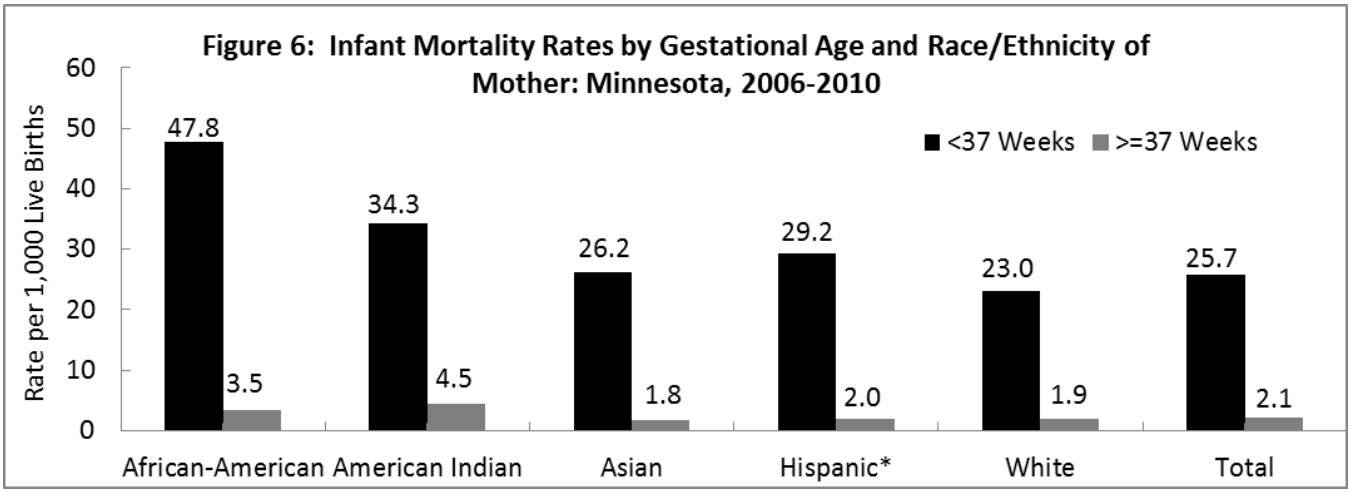
Gestational Period and Preterm Births

Gestational age at birth is an important determinant of an infant's later health status and likelihood of surviving beyond infancy.[19] Compared to infants born full term (≥37 weeks gestation), infants born preterm (<37 weeks gestation) are at increased risk of dying in infancy or suffering from a variety of health complications and developmental disabilities, including acute respiratory illnesses, motor and cognitive impairments, and behavioral and social-emotional problems.[19] In addition, the risk of morbidity and mortality typically increases as gestational age at birth decreases. In 2012, the MDH accepted a joint challenge from the March of Dimes and the Association of Territorial State Health Officials (ASTHO) to reduce premature births by 8 percent by 2014. As a result, the percentage of premature babies born in Minnesota is expected to drop from 9.9 percent in 2011 to 9.1 percent by 2014.[20]

For the 2006 to 2010 period, the infant mortality rate for infants born preterm differed by race/ethnicity (Figure 6). The rate was highest for African Americans (47.8 infant deaths per 1,000 births) and American Indians (34.3 infant deaths per 1,000 live births births), followed by Hispanics (29.2 infant deaths per 1,000 live births). Whites and Asians had the lowest rates, 23.0 infant deaths per 1,000 live births and 26.2 infant deaths per 1,000 live births, respectively. Figure 6 shows that even when

African American and American Indian babies are born full-term, their risk of death in infancy are 1.8 and 2.4 times the rate for Whites, and 1.7 and 2.1 times the state's rate.

Figure 6: Infant Mortality Rates by Gestational Age and Race/Ethnicity of Mother, Minnesota, 2006-2010

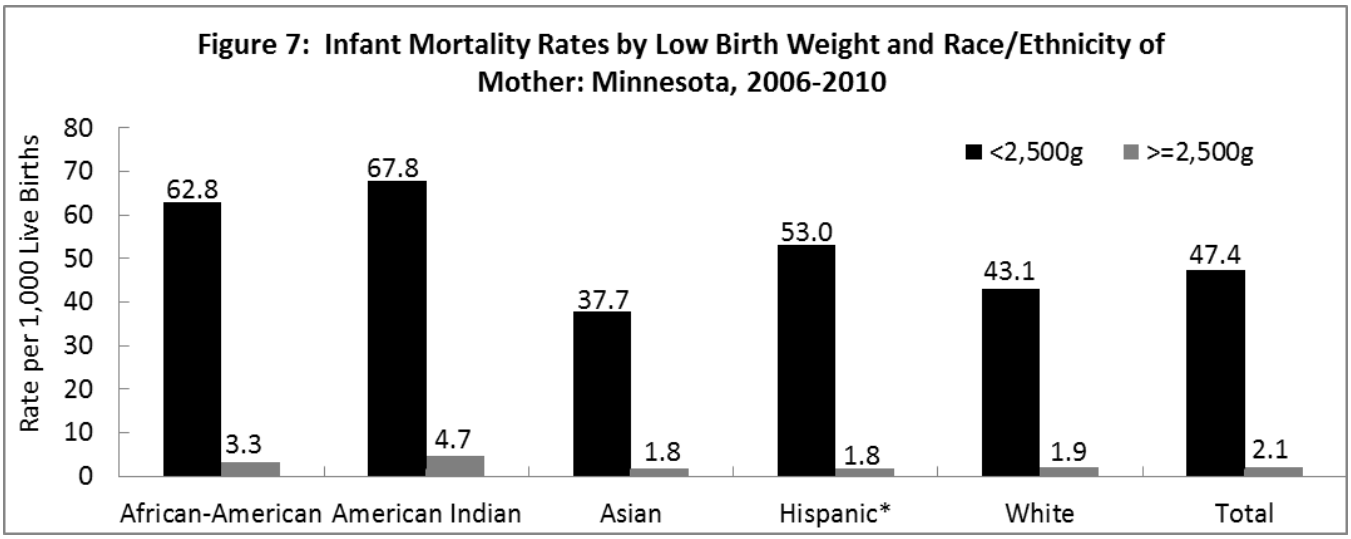


*Can be of any race
Source: Minnesota Department of Health, Center for Health Statistics

Low Birth Weight

As with gestational age at birth, low birth weight is also an important determinant of an infant's health status and survival. Low birth weight is defined as weight of 2,500g (5.5 pounds) or less at birth. Low birth weight babies are either preterm or growth retarded at birth.[21] Low birth weight babies are at increased risk of experiencing life-long morbidity and disabilities if they survive beyond the first birthday. Some examples of long-term problems associated with low birth weight include neurodevelopmental and psychomotor problems, deafness, blindness, and learning disabilities.[21]

Figure 7: Infant Mortality Rates by Low Birth weight and Race / Ethnicity of Mother, Minnesota, 2006-2010



*Can be of any race
Source: Minnesota Department of Health, Center for Health Statistics

Between 2006 and 2010, the infant mortality rate for low birth weight babies varied by race/ethnicity. The rates ranged from 67.8 infant deaths per 1,000 live births for the infants of American Indian mothers to 37.7 for the infants born to Asian mothers. Both the African American and American Indian rates were approximately two times greater than the Asian rate, the group with the lowest low birthweight rate across all groups. Like gestational age (Figure 6), Figure 7 shows that even when the babies of African American and American Indian women are normal weight at birth, their rate of death in infancy are 1.7 and 2.5 times the White rate, and 1.6 and 2.2 times Minnesota's overall rate.

Leading Causes of Infant Deaths

Congenital anomalies, which include conditions usually present at birth such as birth defects of the brain and spinal cord as well as neural tube defects, were the leading causes of infant deaths in Minnesota from 2006 to 2010, accounting for slightly more than one-fourth (25.5 percent) of all infant deaths (Figure 8). Prematurity (19.2 percent) was the second leading cause, SUID (includes SIDS and sleep-related infant deaths) (13.8 percent), obstetric conditions (11.0 percent), and injuries (2.2 percent) were the third, fourth, and fifth leading causes, respectively. Together, these top five causes of death accounted for 72 percent of all infant deaths between 2006 and 2010.

Sudden Unexpected Infant Deaths (SUID)

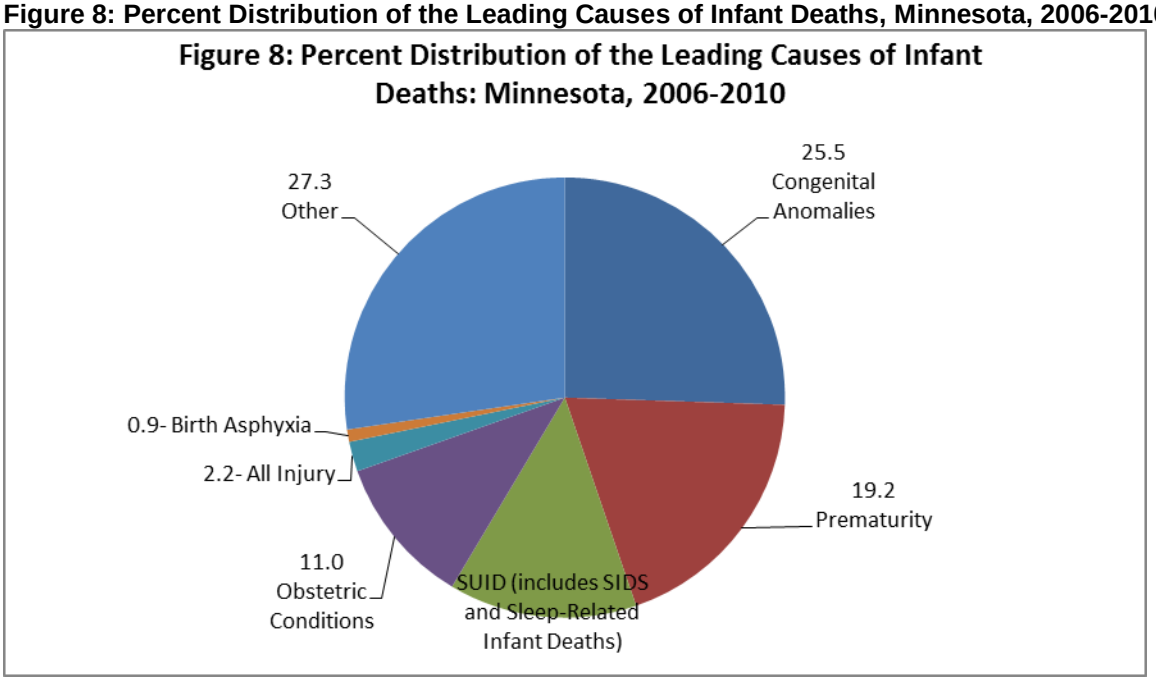
Sudden Unexpected infant Deaths (SUID) is a term used to describe and classify deaths that occur suddenly and unexpectedly to infants less than one year old.[1] Because the causes of SUID are not immediately recognizable, a thorough investigation is required, including an autopsy to determine the cause and manner of death.

According to the Centers for Disease Control and Prevention (CDC), the three most commonly reported types of SUID are: accidental suffocation and strangulation in bed (ASSB), unknown cause, and Sudden Infant Death Syndrome (SIDS).[1] Although SIDS is the most widely recognized type of SUID by the public, it is not a type of sudden unexpected death that is easily determined. Deaths are classified as SIDS only after: (1) a thorough investigation has been conducted; (2) an autopsy has been completed; (3) the death scene has been examined; and (4) the child's clinical history has been reviewed.

In this document, the phrase "SUID (includes SIDS and sleep-related infant deaths)," is being used to capture the fact that SIDS and sleep-related deaths comprise the vast majority of deaths in the SUID category as classified and reported by the Minnesota Center for Health Statisics based on *International Classification of Diseases Codes* (ICD-10 codes) (see APPENDIX B). Sleep-related infant deaths are primarily due to accidental suffocation and strangulation in bed, a result of unsafe infant sleep environments. Sleep-related infant deaths are preventable.

[1]Source: Sudden Unexpected Infant Death and Sudden Infant Death Syndrome: http://www.cdc.gov/sids/aboutsuidandsids.htm. Accessed on 2 September 2014

Figure 8: Percent Distribution of the Leading Causes of Infant Deaths, Minnesota, 2006-2010



Source: Minnesota Department of Health, Center for Health Statistics

The leading causes of infant deaths differed by race/ethnicity (Table 4). Congenital anomalies were the leading causes of death among Asians (24.4 percent), Hispanics (33.6 percent), and Whites (26.7 percent), while it is the second leading cause of deaths for African Americans (19.1 percent) and American Indians (20.6 percent). Prematurity is the leading cause of death for African Americans (25.3 percent), the second leading cause of death among Asian (23.5 percent) Hispanics (21.9 percent), Whites (17.4 percent), and the third most common cause of death among American Indians (11.8 percent). SIDS and sleep-related deaths accounted for the largest proportion of infant deaths among American Indians (23.5 percent), but are the third leading cause of infant deaths for African Americans (13.9 percent), Hispanics (14.6 percent), Whites (13.9 percent), and statewide.

Table 4: Top Five Leading Causes of Infant Mortality by Race/Ethnicity of Mother, Minnesota, 2006-2010

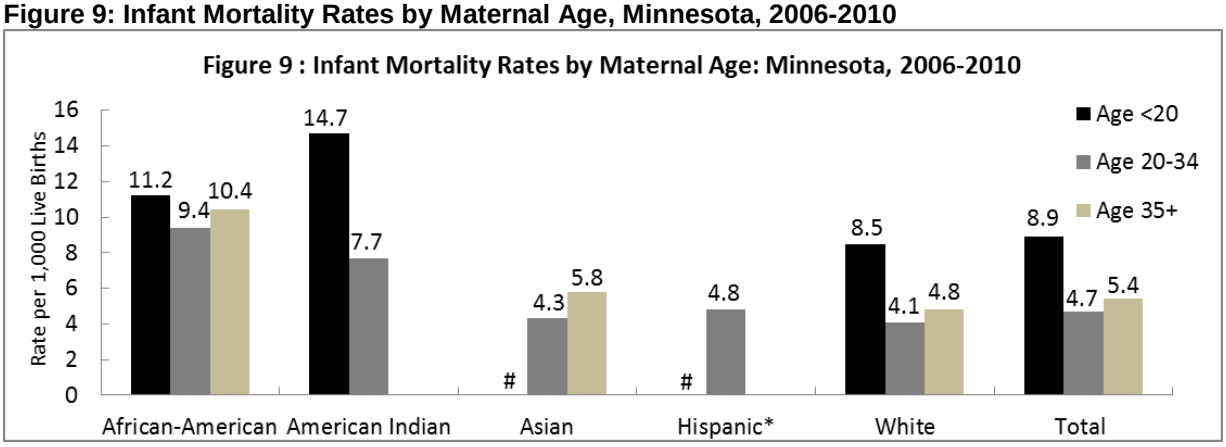
Race/Ethnicity	First	Second	Third	Fourth	Fifth
African American	Prematurity (25.3%)	Congenital Anomalies (19.1%)	SUID (includes SIDS and Sleep-Related Infant Deaths) (13.9%)	Obstetric Conditions (13.6%)	Birth Asphyxia (1.9%)
American Indian	SUID (includes SIDS and Sleep-Related Infant Deaths) (23.5%)	Congenital Anomalies (20.6%)	Prematurity (11.8%)	Obstetric Conditions (10.3%)	Birth Asphyxia & Injury (1.5%)
Asian	Congenital Anomalies (24.4%)	Prematurity (23.5%)	Obstetric Conditions (15.1%)	SUID (include SIDS and Sleep-Related Infant Deaths) (6.1%)	Birth Asphyxia (2.5%)
Hispanic*	Congenital Anomalies (33.6%)	Prematurity (21.9%)	SUID (includes SIDS and Sleep-Related Infant Deaths) (14.6%)	Obstetric Conditions (5.8%)	Injury (1.5%)
White	Congenital Anomalies (26.7%)	Prematurity (17.4%)	SUID (includes SIDS and Sleep-Related Infant Deaths) (13.9%)	Obstetric Conditions (10.4%)	Injury (2.8%)
Total	Congenital Anomalies (25.5%)	Prematurity (19.2%)	SUID (includes SIDS and Sleep-Related Infant Deaths) (13.8%)	Obstetric Conditions (11.0%)	Injury (2.2%)

*[1] Excludes deaths classified as "other."
*Can be of any race
Source: Minnesota Center for Health Statistics

Selected Maternal Socio-Demographic Characteristics

Maternal Age

Figure 9: Infant Mortality Rates by Maternal Age, Minnesota, 2006-2010

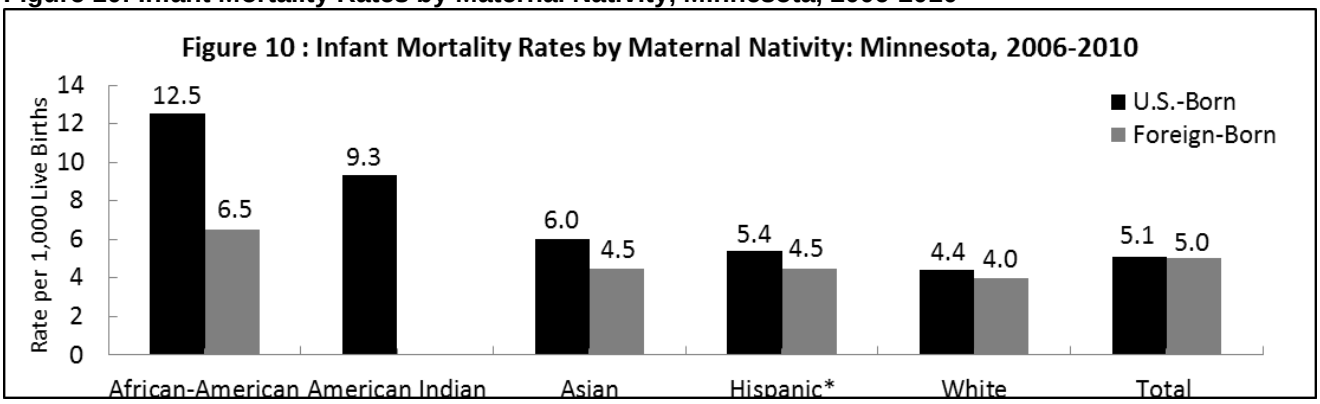


*Can be of any race
# Indicates unstable rates; fewer than 20 cases
Source: Minnesota Department of Health, Center for Health Statistics

Maternal age is an important predictor of infant mortality. In general, the infants of teens and older mothers are at increased risk of dying in infancy as compared to babies born to women in other age groups.[2] Between 2006 and 2010, the infant mortality rate for infants born to teen mothers in the state overall was approximately two times the rate for infants born to older mothers (i.e., 20-34 years old and 35 and older) (Figure 9). Notably, American Indian teens had the highest infant mortality rate across all age and racial and ethnic groups for whom data are presented. Not only was this rate approximately two times the rate for infants born to American Indian mothers 20 to 34 years old, but it was also approximately two times the infant mortality rate of White teen mothers. Interestingly, among mothers 35 years of age and older, infants born to African American mothers had a two-fold greater risk of dying before their first birthday compared to infants born to their Asian and White counterparts, and women in the state overall in the same age group.

Maternal Nativity

Figure 10: Infant Mortality Rates by Maternal Nativity, Minnesota, 2006-2010

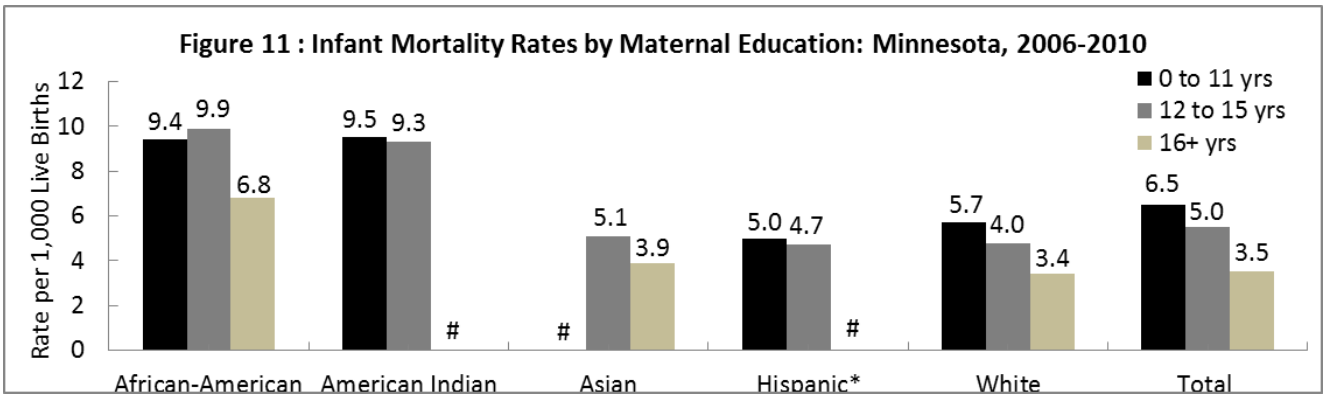


*Can be of any race
#Indicates unstable rates; fewer than 20 cases
Source: Minnesota Department of Health, Center for Health Statistics

Although the infant mortality rate in Minnesota as a whole is about the same for infants born to foreign-and U.S.-born women, Figure 9 shows that there is variation in rates by race/ethnicity and nativity. For instance, between 2006 and 2010, the infant mortality rate for the infants of U.S.-born Black mothers was approximately 2.0 times the foreign-born Black rate (Figure 10). In addition, the U.S.-born Asian rate was 1.3 times the foreign-born Asian rate, and the U.S.-born Hispanic rate was 1.2 times the foreign-born Hispanic rate.

Education

Figure 11: Infant Mortality Rates by Maternal Education, Minnesota, 2006-2010

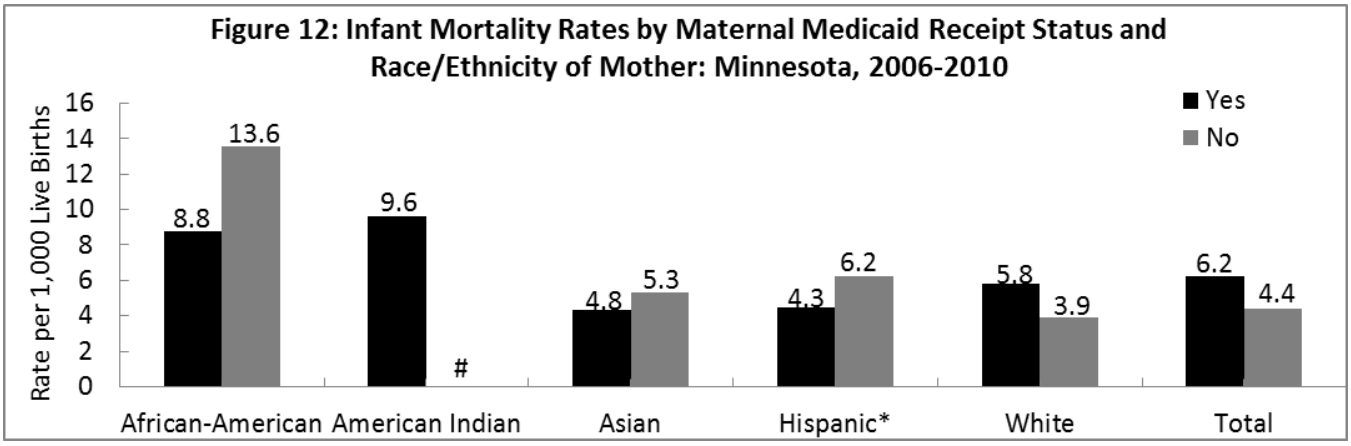


*Can be of any race
# Indicates unstable rates; fewer than 20 cases
Source: Minnesota Department of Health, Center for Health Statistics

Education is an important indicator of socioeconomic status in the U.S. Education helps to shape individuals' future income potential and occupational opportunities, which in turn determines the extent to which they have access to resources beneficial to health.[22] Consequently, better educated individuals are generally healthier than those with less education. In Minnesota overall, the rate for infants born to women with less than a high school education was approximately two times the rate for infants of better educated women with 16 or more years of education (Figure 11). However, it is worth noting that the infant mortality rate for better educated African American women (i.e., 16 or more years of education) is twice the rate of infants born to White women with similar levels of education, and is 1.2 times the rate for infants born to White women with fewer than 12 years of education.

Medicaid Receipt

Figure 12: Infant Mortality Rates by Maternal Medicaid Receipt Status and Race / Ethnicity of Mother: Minnesota, 2006-2010



*Can be of any race
# Indicates unstable rates; fewer than 20 cases
Source: Minnesota Center for Health Statistics

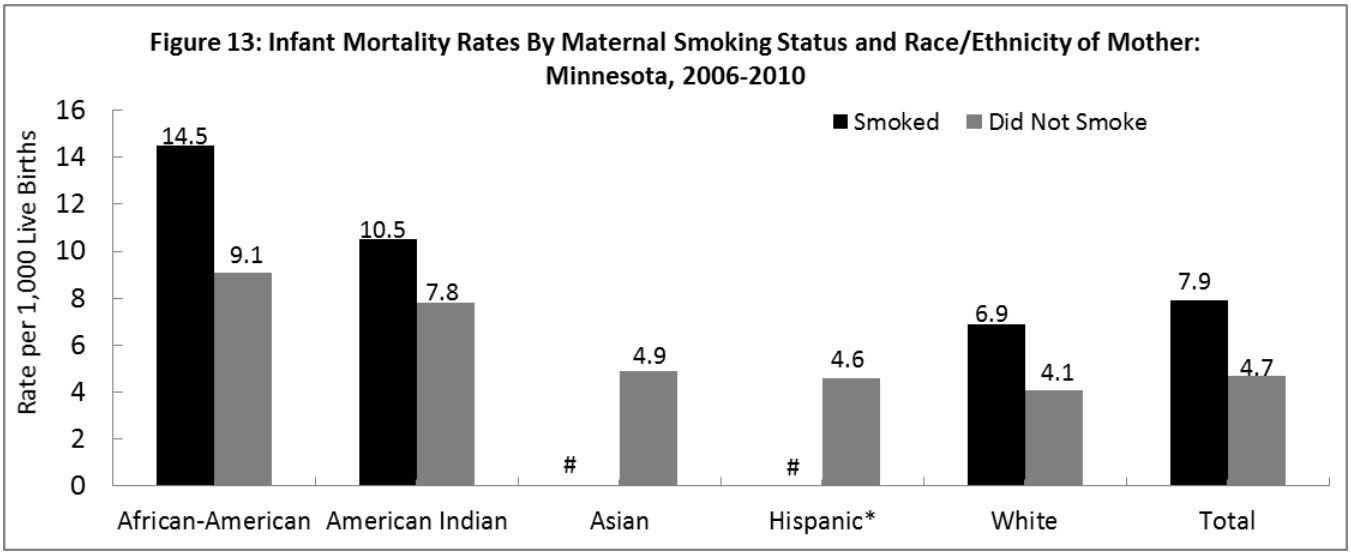
Medicaid or Medical Assistance (MA), as it is called in Minnesota, is the state's largest publicly funded health care program. MA provides health care funding for low-income individuals, including pregnant women and children. In Minnesota, the infant mortality rate for African American and American Indian women on MA was 1.5 and 1.7 times the rate for Whites, and 1.4 and 1.5 times the rate for mothers on MA in the state overall (Figure 12). Also, during the 2006 to 2010 period, the infant mortality rate for African American women, the group with the highest infant mortality rate for women not on MA, was 3.5 times the rate for Whites not on MA, and 3.1 times Minnesota's overall rate for women who did not receive MA benefits.

Selected Behaviors

Maternal Smoking

The relationship between smoking and poor birth outcomes has long been established. Infants whose mothers smoked during pregnancy have an increased risk of morbidity (e.g., low birth weight) and mortality. Exposure to second-hand smoke also elevates an infant's risk for sudden infant deaths syndrome (SIDS) regardless of how healthy he or she was at birth.[23]

Figure 13: Infant Mortality Rates by Maternal Smoking Status and Race/Ethnicity of Mother, Minnesota, 2006-2010



*Can be of any race
# Indicates unstable rates; fewer than 20 cases
Source: Minnesota Department of Health, Center for Health Statistics

From 2006 to 2010, the infant mortality rate for women who smoked during pregnancy varied by race/ethnicity, from a high of 14.5 infant deaths per 1,000 live births among African American women to 6.9 among Whites (Figure 13). In fact, the infant mortality rate for African Americans who smoked during pregnancy was twice the rate for Whites who smoked when they were pregnant. Interestingly, the infant mortality rates were two times greater for African American and American Indian women who did not smoke during pregnancy compared to White women and women in the state as a whole who did.

Alcohol Consumption

Figure 14: Percent of Women Who Consumed Alcohol During the Last 3 Months of Pregnancy by Race / Ethnicity, 2009-2010

[1]Consumed any amount of alcohol during pregnancy among those who drank any alcoholic beverages in the previous two years

*Can be of any race
Note: Rates are not statistically different from the Total/Minnesota overall rate
Source: Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS), Minnesota Department of Health, Division of Community and Family Health, Maternal and Child Health. These data was made possible by grant number IU01DP003117-01 from the Centers for Disease Control and Prevention

In addition to maternal smoking, alcohol consumption during pregnancy can adversely affect the health of the mother and the baby. Alcohol consumption during pregnancy has been linked to preterm births, low birth weight, miscarriages, and fetal alcohol spectrum disorders (FASD), the most serious of which is fetal alcohol syndrome (FAS).[24] According to data from the 2009 to 2010 Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS), the percentage of women who reported consuming alcohol during the last three months of pregnancy (among those who drank any alcoholic beverages in the previous two years) ranged from 5.6 percent among Non-Hispanic Blacks to 7.8 percent among Hispanics (Figure 14).

Prenatal Care

Table 5: Infant Mortality Rates by Prenatal Care Initiation and Adequacy of Prenatal Care, Minnesota, 2006-2010

Maternal Race	Prenatal Care Initiation First Trimester	Prenatal Care Initiation Third Trimester	Adequacy of Prenatal Care** Intensive/Adequate	Adequacy of Prenatal Care** Inadequate/None
African-American	9.8	12.8	8.4	12.9
American Indian	9.6	#	#	#
Asian	4.5	#	4.1	#
Hispanic*	4.9	#	4.2	#
Whites	4.1	8.9	3.4	10.7
Total	4.4	8.2	3.9	9.8

*Can be of any race
**GINDEX, an index that defines adequate care as starting in the first trimester and having at least nine prenatal care visits
# Indicates unstable rates; fewer than 20 cases
Source: Minnesota Department of Health, Center for Health Statistics.

Although the relationship between prenatal care and poor birth outcomes is not thoroughly understood, evidence suggests that women who initiate prenatal care early and use it consistently throughout pregnancy have a decreased risk of experiencing an adverse birth outcome, including infant mortality.[23] Table 5 provides infant mortality rates by race/ethnicity for the timing and adequacy of prenatal care. From 2006 to 2010, the infant mortality rate among infants born to African American and American Indian women who initiated prenatal care early was, for the most part, more than two times the rate for infants born to women in the other racial/ethnic groups. Also, the infant mortality rate of infants born to African American women who received adequate prenatal care when they were pregnant was twice the Asian and Hispanic rates, and was more than two times the rate for Whites and women in the state as a whole who also received adequate prenatal care during pregnancy.

Section 2: Where Do We Need To Go?

Vision, Goals, and Objectives

It is clear from the data presented in Section One that as a state we have made tremendous strides in reducing infant mortality in Minnesota. However, the persistent disparities in outcomes for babies, particularly for American Indians and African Americans as compared to Whites, compels us to think differently about how to ensure that all babies are given an equal chance to survive well beyond their first birthday. To ensure that more babies survive to experience their first birthday, it is imperative that Minnesota has an action plan in place that articulates our collective vision, with clear goals, objectives, and action steps on "where we need to go" to achieve optimal birth outcomes.

Vision

In 2012, the Commissioner of Health convened a group called the Healthy Minnesota Partnership to develop a statewide health assessment and health improvement framework that articulates a vision for a healthier Minnesota by 2020. The *Healthy Minnesota 2020* vision developed by the partnership explicitly states that: "All people in Minnesota enjoy healthy lives and healthy communities."[3]

In addition, to this larger vision, the partnership also developed three specific goals along with indicators to monitor the health of the state's population. One of these goals aims to ensure "A Healthy Start for All," while another specifies an "Equal opportunity for health" for all Minnesotans. Drawing on the Partnership's overall vision and the goals, MDH and stakeholders envision a state by 2020 in which:

All babies are born healthy, to healthy parents in healthy communities, and are given equal opportunities to survive to age one and beyond.

Goals

By 2020, MDH and stakeholders aim to achieve the following infant mortality reduction goals:

1) Reduce the state's overall infant mortality rate.

2) Reduce racial and ethnic disparities in infant death rates.

Objective

Historically, Minnesota has never achieved an infant mortality rate below 4.0 infant deaths per 1,000 live births in any given year. In fact, a review of historical infant mortality data for single years dating back to 1940 shows that the state's infant mortality rate ranged from a low of 4.6 infant deaths per 1,000 live births in 2010 to a high of 33.3 in 1940. Our immediate objective as a state is to achieve an overall infant mortality rate that is 4.1 infant deaths per 1,000 live births or below by 2020. To meet this target, the state will need to experience a 10 percent reduction in rate between the 2010 and 2020. Embedded within this goal is an explicit imperative to also reduce racial and ethnic disparities in infant mortality in Minnesota.

In 2010, two states in the U.S., Alaska and New Hampshire, achieved infant mortality rates below 4.0 infant deaths per 1,000 live births (3.57/1,000 live births and 3.88/1,000 live births, respectively).[17] In long run, perhaps 20 years or so from now, MDH and its stakeholders hope to achieve an infant mortality rate that is comparable to other industrialized nations whose rates are well below 4.0 infant deaths per 1, 000 live births (Table 6).

Table 6: Infant Mortality Rates for Selected OECD Countries, 2010

Country	IMR
Iceland	2.2
Japan	2.3
Finland	2.3
Sweden	2.5
Portugal	2.5
Czech Republic	2.7
Norway	2.8
Spain	3.2
Korea	3.2
Italy	3.4
Germany	3.4
Denmark	3.4
Belgium	3.5
France	3.6
Israel	3.7
Switzerland	3.8
Netherlands	3.8
Ireland	3.8
Greece	3.8
Austria	3.9
Australia	4.1
United Kingdom	4.2
Poland	5.0
New Zealand	5.1
Hungary	5.3
Slovak Republic	5.7
United States	6.1

Source: Organization for Economic Development (OECD) Health Data (2010). http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_STAT. Accessed November 10, 2012. In Report of The Secretary's Advisory Committee on Infant Mortality: Recommendations for HHS Action and Framework for a National Strategy. January 2013.

Section 3: How Will We Get There?

Stakeholders Meetings

Developing *Minnesota's Infant Mortality Reduction Plan* requires input from many stakeholders to ensure its success. Between July and November 2013, the Minnesota Department of Health, in partnership with the Maternal and Child Health Advisory Task Force, hosted three stakeholders' meetings to prioritize and coordinate recommendations to develop the state's infant mortality reduction plan. During the meetings stakeholders:

1) prioritized existing recommendations to reduce infant mortality

2) identified additional infant mortality reduction strategies

3) identified topic-specific workgroups needed to develop action steps to improve birth outcomes across the state

As a result of the meetings, two new work groups were created:

- **SIDS/SUID/Safe Sleep Working Group**: develop action steps to further reduce the incidence of sudden unexpected infant deaths (including SIDS), as well as implement evidence-based strategies to improve infant safe sleep practices,

- **Infant Mortality Review Protocol Development Working Group**: develop a robust infant mortality review protocol and process.

Prioritizing Topics and Recommendations

During the second stakeholders' meeting held on October 11, 2013, stakeholders were given an opportunity to prioritize 23 infant mortality topics/issues either compiled from recommendations published in several reports on infant mortality in Minnesota between 2006 and 2013 (20 topics) or added to the list during the meeting (3 topics). The purpose of the prioritization process was to afford stakeholders an opportunity to select topics/issues they deem crucial for improving birth outcomes and reducing disparities in infant mortality rates in Minnesota. Table 8 below shows the prioritized topics, their rank, and associated score. A detailed description of the prioritization process, including how the priority topics were selected and the recommendations developed can be found on the Maternal and Child Health Advisory Task Force's website here: http://www.health.state.mn.us/divs/fh/mchatf/. From the list, seven broad recommendations were developed— all of which were identified as having the potential to most immediately and permanently reduce infant mortality and disparities in rates across the state.

Table 8: Infant Mortality-Related Topics Prioritized by Stakeholders in Minnesota

Rank	Topic	Score
1	Social Determinants of Health	121
2	Community and Family Services and Supports	79
3	SUID (includes SIDS and sleep-related infant deaths)	65
4	Infant Mortality Reviews and Monitoring	55
5	Prenatal Care	48
6	Women's Health/Preconception and Interconception Care	47
7	Prematurity	46
8	Teen Pregnancy Prevention	44
9	Culturally Competent Care	26
10	Alcohol and Drug Use and Abuse	22
10	Doula Support	22
12	Fatherhood Support/Involvement	16
13	Medical Care Access/Systems	13
14	Tobacco Cessation	11
15	Pregnancy and Parenting Supportive Workplaces	8
15	Infant Safety	8
17	Birth Defects	5
18	Perinatal Regionalization	3
18	Breastfeeding	3
18	Other Topics/Strategies	3

Recommendations and Next Steps

The recommendations and next steps outlined and described in this plan serve as an initial framework for developing more specific strategies with accompanying action steps. When the stakeholders met to identify potential priorities, it became clear that many of the priority topics and strategies to address these topics do not fall cleanly within one area. The following is a summary of information included in this section of the report:

- The **recommendations** set forth in this plan are intentionally broad to allow for ongoing discussion and refinement. It is expected that groups will take these recommendations and develop goals and objectives that can be used to implement and monitor efforts in Minnesota to reduce infant mortality and improve birth outcomes.

- The **rationale** describes the reason for including the recommendation and why the recommendation is important for reducing infant mortality.

- The **past and current activities** section describes activities or groups currently underway in Minnesota to either address the recommendation or that have a connection to the recommendation. Every effort will be made to assure these activities are coordinated with any new or expanding infant mortality reduction activities. In addition, many of the current

activities are not designed to address one specific recommendation and may address issues in several recommendations.

- The **next steps** section describes the actions that will be taken in the first phase of the plan. These next steps will lead to a set of more specific action steps that can be taken by the MDH and partners to reduce infant mortality.

Table 9 below provides a summary of the primary next steps to implement the recommendations developed by the stakeholders for Phase 1 of the Infant Mortality Reduction Plan. Each of these recommendations and next steps is more fully explained in this section of the report.

Table 9: Recommendations Developed During Stakeholders' Meetings to Reduce Infant Mortality in Minnesota

RECOMMENDATIONS	PRIMARY NEXT STEPS
RECOMMENDATION 1: Improve health equity and address the social determinants of health that most significantly impact disparities in birth outcomes.	• Monitor MDH Advancing Health Equity activities
RECOMMENDATION 2: Reduce the rate of Sudden Unexpected Infant Deaths (SUID), which includes SIDS and sleep-related infant deaths, in Minnesota.	• Convene SIDS/SUID/Safe Sleep Work Group
RECOMMENDATION 3: Assure a comprehensive statewide system that monitors infant mortality.	• Convene a short-term Infant Mortality Review discussion group
RECOMMENDATION 4: Provide comprehensive, culturally appropriate, coordinated health care to all women during the preconception, pregnancy and post-partum periods.	• Monitor Preconception Health Work Group activities
RECOMMENDATION 5: Reduce the rate of preterm births in Minnesota.	• Monitor Prematurity Task Force activities • Monitor DHS Low Birth weight Initiative activities
RECOMMENDATION 6: Improve the rate of pregnancies that are planned, including reducing the rate of teen pregnancies.	• Monitor Adolescent Health Work Group activities
RECOMMENDATION 7: Establish an ongoing task force of stakeholders to oversee implementation of recommendations and action steps.	• Convene Infant Mortality Reduction Steering Committee

The complete list of recommendations and strategies discussed in previous work groups and the three stakeholder meetings can be found in **Attachment 1 (Appendix C)**.

Work Groups Structure

The diagram below (Figure 15) shows how the work for the first phase of the infant mortality reduction plan is being structured. In particular, it shows how existing work groups and committees are working on aspects of the seven recommendations. The Infant Mortality Reduction Steering Committee is tasked with monitoring progress of this work, and to identify gaps and potential strategies for implementation. Also captured in the diagram is Minnesota's involvement in Region V's CoIIN, as well as the residents of Minnesota, who the collective efforts are intended to impact.

Figure 15: Minnesota's Infant Mortality Reduction Plan Working Groups Structure

Notes:
*MDH convenes
[1]Includes national infant mortality reduction priorities and recommendations such as the CoIIN and the Title V MCH Block Grant

Recommendation 1:

Improve health equity and address the social determinants of health that most significantly impact disparities in birth outcomes.

Rationale

Disparities in infant mortality rates are significant in Minnesota and are often reflective of the social determinants of health— the circumstances in which people are born, grow up, live, work, and age, as well as the systems that have been put in place to deal with illness.[25] Disparities are the differences in burden of disease and other health status indicators between different population groups (e.g., race, age, gender). These disparities are often driven by how people and organizations function and make decisions that influence the structures within society— for example, decisions about where to construct a road or bridge, where to open a bank, how much interest to charge on loans, or how much funding to provide for public transit.

Past or present conditions and decisions made about the structures and systems of society— e.g., finance, housing, transportation, education— can create (intended or not) structural inequities. For example, when a freeway is built that bypasses a poor community but provides on-off ramps for wealthier communities, it sets up a structural inequity: businesses making decisions about where to locate often choose to build (and provide jobs) near freeway exits, which then continues to benefit the wealthier community and bypass the poorer community.

Exploring the potential adverse effects of racism on health may enable the development of appropriate interventions to benefit the health and well-being of individuals and communities. Additionally, the social determinants of health should be considered in their broader contexts to better understand and improve health outcomes across multiple generations. For equity in health outcomes to be possible, systems need to be in place to ensure that every person is provided with sufficient supports and have access to economic, educational, and political opportunities, as well as opportunities to make decisions that will optimize not only their health, but the health of their families and communities as well.

Achieving health equity requires valuing everyone with focused and ongoing efforts to address avoidable systematic inequalities, historical and contemporary injustices, and reducing health and health care disparities. For example, services must be provided in communities by providers who reflect the racial, ethnic, and cultural makeup of the community. Families should also have access to services and information provided in a manner that is compatible with their cultural practices, health beliefs, and language.

Past and Current Activities

Advancing Health Equity: During the fall of 2013, the MDH initiated an effort to more clearly understand health inequities in Minnesota. In 2013 the Minnesota Legislature passed Session Laws

2013, Chapter 108, Article 12, Section 102. This bill initiated the Advancing Health Equity initiative and tasked MDH with completing a report on health equity. To develop the report, MDH actively engaged in organizations and communities across the states in conversations about policies, processes, and systems that contribute to health inequities. Based on these conversations, the MDH has developed recommendations for change to promote health equity in Minnesota.

The process of engaging communities and organizations was captured in an MDH report that articulates a health equity vision and framework based on a shard understanding among community stakeholders and MDH about what creates health. The report, submitted to the Legislature in January, 2014, began a process to build support for, and act on, the health equity vision, framework and recommendations.

Center for Health Equity: The Minnesota Department of Health created a new Center for Health Equity to facilitate these efforts and sharpen the agency's focus on alleviating health disparities in Minnesota. The Center's mission is to lead a state-wide effort to bring a health equity lens to MDH's work and to the state to achieve health in all policies. The Center for Health Equity will support the work of MDH to more effectively impact improved health outcomes for various populations experiencing disparities.

Eliminating Health Disparities Initiative: In 2001, the Minnesota Legislature created the Eliminating Health Disparities Initiative (EHDI), a ten-year statewide initiative to address and eliminate racial and ethnic health disparities in Minnesota through Community and Tribal Grants. The mission of the EHDI, administered by MDH's Office of Minority and Multicultural Health, is to support culturally appropriate public health programs implemented by racial and ethnic communities. For fiscal year 2013 there are a total of 40 Community and Tribal grantees working in communities across the state to eliminate health disparities in eight health areas. Grantees have been able to select more than one health area and may serve more than one population.

Currently, four EHDI programs are working to reduce infant mortality, and 22 are working to reduce teen pregnancy in their communities. Grantees have implemented several different types of interventions including Doula programs which provide labor support to women before, during and after delivery, home visiting, one-to-one and group education classes, and media campaigns. Most commonly discussed topics have been safe sleeping habits, prenatal care and healthy behaviors. Grants are currently scheduled to end after state fiscal year 2015.

Community Voices and Solutions (CVAS) Advisory Committee: CVAS Advisory Committee is a partnership between the MDH and representatives from Minnesota's African American community. The CVAS Advisory Committee formed after receiving a grant in 2010 to consider the causes and recommend solutions to the infant mortality crisis in Minnesota's African American community. The goal of the committee is to reduce African American infant mortality through the availability of comprehensive services and resources. By bringing together individuals and organizations experienced in maternal and child health, CVAS is building on the knowledge and experience of participants necessary to improve the overall quality of life of African American mothers and children.

Next Steps

Given the complexity of infant mortality and its interconnection to multiple public health issues, the Infant Mortality Reduction Initiative will leverage the health equity activities taking place within the MDH to heighten the impact of infant mortality reduction strategies. Infant mortality staff will remain involved in discussion and work with other MDH staff to ensure that infant mortality activities are fully integrated and considered as these initiatives move forward.

As mentioned in the "Introduction," addressing the social determinants of health is also a priority for the Region V CoIIN. Minnesota and other states in the region participating in the CoIIN are currently in the process of developing state-specific objectives to address infant mortality in their respective states. In Minnesota, much of the work to address the intersection of social determinants of health and health outcomes are being addressed through the health equity framework or "health in all policies" lenses.

Recommendation 2:

Reduce the rate of Sudden Unexpected Infant Deaths (SUID), which includes SIDS and sleep-related infant deaths, in Minnesota.

Rationale

Sudden Unexpected Infant Deaths (SUID), which include SIDS and sleep-related deaths, are the leading causes of deaths among American Indian infants, the third leading cause of death in the African American population, and the third leading cause of infant deaths in the state overall (Table 4, Section 1). The vast majority of these deaths are due to accidental suffocation and strangulation in bed, or unsafe infant sleep environments, and they are preventable.

Past and Current Activities

Minnesota's Child Mortality Review Program: The purpose of the Minnesota Child Mortality Review program is prevention of future deaths or serious injury of children by making recommendations to improve the systems that protect children from maltreatment, as well as quality assurance in child death reporting. This program was established in 1989 by legislation (MN Statute §256.01 subdivision 12). The program is federally funded by the Child Abuse Prevention and Treatment Act and staffed by the Minnesota Department of Human Services, Child Safety and Permanency Division, which has authority to conduct child death reviews under state statute. The Minnesota Child Mortality Review Panel is comprised of 28 members and makes recommendations to improve the state and local systems that protect children. Additionally, there are 89 local Child Mortality Review Teams including two American Indian tribal teams. The Minnesota Child Mortality Review Program reviews deaths and near fatal injuries resulting from maltreatment or suspected maltreatment; manner of death classified on the death certificate as homicide, suicide, accident or undetermined and whether the child was a member of a family that received social services within one

year prior to the death; deaths and near-fatal injuries that occurred in a facility licensed by the Department of Human Services; and natural deaths classified as SIDS or Sudden Unexpected Infant Death. The team reviews cases of all of the above in which the age is less than 18 years old, including infant deaths.

Sudden Unexpected Infant Death Project: MDH received funding from the federal Centers for Disease Control (CDC) to implement a Sudden Unexpected Infant Death (SUID) Project. The goal of the project is to continue to implement the components of a state-based SUID Case Registry including timely and complete review, data entry, quality control procedures, reporting of all SUID cases in the state, and to build local capacity to conduct excellent death scene investigations and to organize community (local) SUID reviews. The purpose of the SUID Case Registry is to monitor SUID trends, including race, ethnicity and other socio-demographic characteristics. Project objectives include: (1) to identify and review all SUID cases in Minnesota during the project period (and, by so doing to establish system support to continue this review after the grant funding has expired); (2) to collect and report standardized information from multiple data sources; (3) to create actionable recommendations to improve death scene investigation and strengthen autopsy procedures in Minnesota; and (4) to develop and disseminate SUID prevention messages and findings.

SUIDIRF Guidelines: MDH, the Minnesota Bureau of Criminal Apprehension and the Minnesota Coroners and Medical Examiners Association have partnered on implementing the Sudden Unexplained Infant Death Investigation Reporting Form (SUIDIRF) statewide, effective for use on September 1, 2014. The SUIDIRF is a death scene investigation tool developed by the Centers for Disease Control and Prevention (CDC) to standardize death scene investigations of sudden unexpected infant deaths (SUID) in states and local jurisdictions. The forms were designed to better ascertain the cause and manner of infant deaths so that communities can develop the appropriate interventions to prevent future deaths.

Minnesota Sudden Infant Death Center: The Minnesota Sudden Infant Death (SID) Center at Children’s Hospitals and Clinics of Minnesota is a statewide program that provides information, counseling, and support to anyone experiencing a sudden and unexpected infant death from any cause. In addition, the Center, in keeping with its original mission, continues to be Minnesota's resource for information on SIDS and SUID risk reduction. The Minnesota SID Center conducts training and educational programs for health care providers, child care workers, and other professionals and community groups. The Center tracks infant mortality trends in Minnesota and participates in local, state, and national initiatives to reduce the risk of sudden unexpected infant deaths. The Minnesota SID Center is a partnership between Children's Hospitals and Clinics of Minnesota and the MDH.

Other Related Activities in Minnesota:

Organization	Activity
MN Sudden Infant Death Center Infant Mortality Reduction Initiative Child Mortality Review Panel-DHS MN Coroners & Medical Examiners Association Family Home Visiting	*Back To Sleep Campaign* Other Sudden Infant Death Syndrome risk reduction *Safe and Asleep in a Crib of Their Own* *Safe Sleep Top 10*
Midwest Children's Resource Center Child Mortality Review Panel-DHS MN Hospital Association Prevent Child Abuse—Minnesota Infant Mortality Reduction Initiative Family Home Visiting	Public and professional education interventions to prevent Shaken Baby Syndrome (SBS) also known as Inflicted Abusive Head Trauma

Next Steps

The MDH Maternal and Child Health Section has convened an interdisciplinary SIDS/SUIDS/Safe Sleep Work Group. The purpose of the work group is to develop and implement evidenced-based strategies and action steps to address unsafe infant sleep practices in Minnesota. The strategies to be implemented are those identified in phase two of Minnesota's Infant Mortality Reduction Plan, as well as those developed through the Child Death Review's SUID sub-committee case review process, and those the group may generate.

Recommendation 3:

Assure a comprehensive statewide system that monitors infant mortality.

Rationale

It is important that Minnesota maintains a comprehensive and ongoing system of reviewing and monitoring infant deaths to determine the factors and circumstances surrounding those deaths. Implementation of this recommendation would require the reinstatement of an infant mortality statute in Minnesota, and associated funding. This would provide the necessary legal authority and resources to review deaths to learn more about their cause and develop policy and program responses to reduce future deaths. As noted previously, Minnesota has significant disparities in infant mortality among populations of color and American Indians. Infant mortality reviews allow for a standardized process of review and ensures the gathering of consistent information to accurately identify issues associated with the death.

Past and Current Activities

American Indian and African American Infant Mortality Reviews: MDH and urban and tribal agencies and programs across the state conducted a review of 24 American Indian infant deaths occurring between 2005 and 2006 in Minnesota. The review was conducted using the National Fetal and Infant Mortality Review (NFIMR) model and resulted in a list of recommendations to address infant mortality in the American Indian population in Minnesota. Recommendations were prioritized and Community Action Teams (CATs) were formed to implement the recommendations.

In 2011 and 2012, the state conducted infant mortality reviews in both the American Indian and African American (U.S.-born Blacks) communities for deaths that occurred between 2009 and 2010. The project was community-driven with support from MDH.

Both the American Indian and the African American reviews contained approximately 29 cases. Reviews included all available resources, including birth and death records for all cases, and autopsy records for cases where autopsies were conducted. For cases where the mother was contacted and reached, and in which she consented to participate in the review process, medical records were abstracted and a maternal interview conducted. Significant barriers to contacting families were identified, resulting in only two cases being fully reviewed in each community.

One of the priority recommendations that resulted from 2011-2012 American Indian infant mortality reviews was to improve the review process by strengthening the protocol used to conduct reviews in the American Indian community. As a result, MDH and community partners are reviewing the most recent reviews to identify strengths and barriers associated with the process. These findings will be used to improve planning and conducting future reviews in the state.

Community Action Teams: As a result of the American Indian Infant Mortality review, the American Indian community formed Community Action Team (or CAT Teams) to implement the priority recommendations developed during the review process. Teams ensure culturally-appropriate reviews and implement recommendations developed during the review process. The CAT teams are designed to translate the findings and recommendations produced by case review teams into action plans to improve birth outcomes and reduce infant mortality in communities.

Newborn Screening: The leading cause of infant deaths in the state is congenital anomalies. A number of these anomalies can be identified through newborn screening. Since 1965, the MDH has screened Minnesota newborns very soon after birth to determine if they have or are at risk for rare disorders. Without treatment, these disorders can lead to illness, physical disability, mental retardation, or death. Medications or changes in diet help prevent most health problems caused by disorders that are identified through newborn screening.

Minnesota is a national leader in newborn screening, and the MDH together with hospitals, laboratories, and medical professionals across the state screen for hearing loss and more than 50

disorders that may affect an infant's metabolism, endocrine system, blood, breathing, hearing, or digestion.

Next Steps

The MDH will convene a small group of stakeholders to more clearly define the goals, objectives, and roles and responsibilities associated with a comprehensive, statewide infant mortality review system. The work of this group could include:

- Recommending a system to formalize the connection to national FIMR while determining how best to implement the national guidelines in Minnesota, including specific strategies for disparate racial/ethnic community reviews.
- Identification of the infrastructure needed to implement a comprehensive infant mortality review.
- Developing guidelines for defining the need for regular and systematic review of populations experiencing higher rates of infant mortality.
- Providing input related to an infant mortality review statute to allow access to the necessary data and information to conduct comprehensive reviews of infant deaths by reviewing medical records, autopsy reports and maternal and family interviews.

Recommendation 4:

Provide comprehensive, culturally appropriate, coordinated health care to all women during the preconception, pregnancy and post-partum periods.

Rationale

The health and healthy behaviors of women before and between pregnancies are critical to healthy birth outcomes. In addition to intentionally planning a pregnancy, women are encouraged to address chronic health conditions, take vitamins including folic acid, and reduce risky behaviors before conception. Increasing these practices within Minnesota would lead to improved birth outcomes, including a reduction in infant mortality for all populations. An optimal pregnancy outcome depends on good health across the parent's entire life span prior to the pregnancy. Comprehensive medical services and community-based interventions, provided in a manner sensitive to the cultural needs of families, along with optimized individual-level health, would also lead to improved outcomes.

Past and Current Activities

Preconception Health Work Group: In October of 2014 MDH convened an MCH Advisory Task Force Preconception Health Work Group. The purpose of the work group is to identify preconception health issues affecting women and infants in the state. The goal of the group is to develop a strategic plan that identifies priorities, strategies, action steps that the state, health care providers, health systems and other stakeholders could take to improve preconception health. The work of this group will inform the Commissioner of Health, MDH staff and stakeholders. Work Group membership is comprised of

preconception and women's health stakeholders, including public health, partner organizations, MCH Task Force members, and others.

Community Health Worker Project: MDH staff partners with Minnesota State Colleges and Universities, the Health Education and Industry Partnership, Blue Cross Blue Shield, and others in ongoing efforts to implement and support the Community Health Worker Project (CHWP). The CHWP is designed to create a culturally competent work force and a career path for people of color to become health care workers in their community, with the potential that some would move further into nursing, medicine, social service, and public health careers. The CHWP curriculum is offered at various educational sites around the state. Some scholarships are provided for low income students.

Twin Cities Healthy Start: Since 1999, the cities of Minneapolis and St. Paul, Minnesota, have received federal funding to reduce the disparity in infant mortality in both the African American and American Indian populations. The Healthy Start service network model includes outreach to pregnant women, risk assessment, case management, health education, and interconception care until the infant is two years old. The program addresses mental health issues, substance use, and works with fathers as well as mothers. The Minneapolis Health Department is the fiscal agent and provides staff support to the program.

Preconception Health Grant Program: The Minnesota Department of Health's goal in making the Preconception Health grants is to improve preconception health and care for non-pregnant women of childbearing age in Minnesota. Because half of all pregnancies in Minnesota are unplanned, support of evidence-based preconception health practices are important for all women of child bearing age that prevent and/or reduce the risk for birth defects. Projects funded under this program work to improve women's health prior to a pregnancy. All projects incorporate an individual routine risk assessment of preconception health needs for non-pregnant women into their programs, and address one of the following four preconception birth defects risk factor areas: Reproductive Health, Alcohol/Tobacco/Other Drug use, Nutrition and Weight, or Chronic Disease.

Other Preconception Health-Related Activities:

Programs/Partners	Activities
Preconception Conferences	Educates professionals to encourage women's health care before and between conceptions
Family Home Visiting	Promotes early prenatal care, preconception and interconception care, risk reduction, healthy weight gain, and adequate birth spacing
MDH Infant Mortality Reduction Initiative	Provides leadership, technical assistance and consultation to programs promoting preconception and interconception care for women
Folic Acid Council	Promotes folic acid intake before conception and during pregnancy to prevent neural tube birth defects through a statewide partnership

Programs/Partners	Activities
Family Planning Special Projects	Provides family planning services to low income high risk women of reproductive age helping to assure both intentional and healthy pregnancies
WIC	Promotes early prenatal care, preconception and interconception care, risk reduction, healthy weight gain

Next Steps

The MDH and partners will assemble the strategic plan and priorities identified through the Preconception Health Work Group. It is anticipated that the plan will be completed by late 2014. Progress on the implementation of the strategic plan will be monitored by the Infant Mortality Reduction Steering Committee.

Recommendation 5:

Reduce the rate of preterm births in Minnesota.

Rationale

Many known causes of preterm birth can be addressed. The earlier a baby is born, the higher the risk, and severity, of health problems that can occur. Although babies born very preterm are a small percentage of all births, these infants account for a large proportion of infant deaths. Preterm birth is the number one cause of infant mortality and morbidity in the state for African Americans.

Past and Current Activities

Prematurity Reduction Education/Campaign: The MDH has collaborated with the Minnesota Chapter of the March of Dimes to increase public and professional awareness of prematurity in Minnesota. From 2002 through 2006, the March of Dimes and other partners, including the MDH, sponsored five Prematurity Summits bringing together national and local speakers to address prematurity from a variety of perspectives. The Prematurity Summits were eventually replaced by annual Preconception Health Conferences with the intent of improving the health of women before and between pregnancies to reduce premature births.

In 2012, the March of Dimes, Minnesota Department of Health, Minnesota Department of Human Services and the Minnesota Hospital Association began partnering on a public education campaign to educate women on why the last weeks of pregnancy count. The *Healthy Babies are Worth the Wait* campaign is an effort to reduce the number of births being scheduled early for non-medical reasons. Experts are learning that this can cause problems for both mother and baby. The message of the campaign is simple…."If possible, it's best to stay pregnant for at least 39 weeks. If your pregnancy is healthy, wait for labor to begin on its own." The campaign offers a toolkit to support the public education campaign.

Minnesota Task Force on Prematurity: The Minnesota Legislature established the Minnesota Task Force on Prematurity in 2011. The task force has been directed to evaluate and make recommendations on methods for reducing prematurity and improving premature infant health care in the state.

In 2013, the Task Force presented a report to the legislature with evidence-based recommendations to reduce preterm birth rates and improve the care of infants born prematurely in Minnesota. The 2013 report tracks progress made by the Task Force as of January 15, 2013. Task Force membership is outlined in statute. The group meets every other month.

One of the significant outcomes of the Minnesota Task Force on Prematurity was the development of a comprehensive checklist that can be used across Minnesota for infants born between 34 0/7 and 36 6/7 weeks gestation. The Task Force reviewed national guidance, checklists, and birthing hospital procedures to create a new tool to improve health outcomes for premature babies – ***The Discharge Checklist for Late Preterm Infants***. The Task Force and the MDH are encouraging all Minnesota birthing hospitals to adopt this checklist as part of their discharge procedures for late preterm infants. Over the next year, the MDH, the March of Dimes and the Task Force will be evaluating the effectiveness of this tool.

Minnesota Hospital Association's Engagement Network (MHA HEN). Minnesota hospitals have placed a strong focus on eliminating early elective deliveries and have reduced the rate of elective deliveries prior to 39 weeks gestation by 87 percent between the fourth quarter of 2010 and the first quarter of 2013. Of the 113 hospitals in the Minnesota Hospital Association's Engagement Network (MHA HEN), 86 currently provide obstetrical services with approximately 46, 000 deliveries per year. Nearly all (85 of 86) birthing hospitals have adopted a hard stop policy, as required by law, restricting inductions prior to 39 weeks unless medically necessary. These 85 hospitals account for 99.8 percent of deliveries in Minnesota. MHA continues to work one-on-one with the remaining hospitals to implement the policy.

Low Birth Weight (LBW) Initiative: The Minnesota Department of Human Services has convened a group since fall 2012 to develop a systematic approach to lowering rates of recurrent LBW births among a high risk group of enrollees in Medical Assistance (MA), Minnesota's version of Medicaid. Based on input from stakeholders, it was determined that the main objective to achieve this goal is to successfully identify and refer women at-risk for subsequent LBW births to acceptable sources of primary care. The connection to primary care is necessary to assure women receive care in key areas including reproductive life planning, mental health screening, and management of chronic disease. Beginning in January of 2014, health plans involved in the initiative will begin to coordinate care for at-risk enrollees using the postpartum visit as an opportunity to transition women into ongoing primary care.

Other Related Activities:

Programs	Activities
Positive Alternatives grantees	Educate and refer women facing an unintended pregnancy for early prenatal care
Women, Infants, Children Program (WIC)	Provides nutrition counseling, nutritious foods, monitors pregnancy, and refers low income women for early prenatal care
Family Home Visiting	Refers for and supports early prenatal care
Infant Mortality Reduction Initiative	Monitors rates of adequate prenatal care and provides leadership, technical assistance and consultation to support early and adequate care for all MN women
Medicaid expansion-DHS	Assures more low income women are eligible for health insurance when pregnant

Next Steps

The Minnesota Task Force on Prematurity will continue to implement the evidence-based recommendations outlined in the 2013 report.

Recommendation 6:

Improve the rate of pregnancies that are planned and well-spaced, including reducing the rate of teen pregnancies.

Rationale

Increasing the proportion of pregnancies that are planned and well-spaced, especially by reducing teen pregnancy, can improve the well-being of children and families. Teen pregnancy and unplanned pregnancy among young adults is at the root of a number of important public health, education, and social challenges. The infant mortality rate of babies born to teens is higher than the rate of infant death for older mothers across most races and ethnicities. Teens from populations of color and American Indian teens in Minnesota have higher birth rates than White teens. Some of Minnesota's infant mortality disparity can be attributed to infants born to disadvantaged teen mothers. Subsequent births while still a teen also contributes to this disparity.

Past and Current Activities

Adolescent Health Work Group: The MCH Advisory Task Force is convening an Adolescent Health Strategic Planning Committee to develop a strategic plan that builds statewide capacity to support the health and well-being of adolescents and young adults in Minnesota. The work of this group will inform the development and implementation of the State Adolescent Health Action Plan. Activities include: (1) a comprehensive needs and resource assessment; (2) identification of priorities for adolescent health; (3) development of strategies and accompanying actions steps to address the priorities; (4) development of communication strategies; and (5) exploration of options for evaluating the success of the plan. It is anticipated the strategic plan will be completed in late 2014.

Governor's Children's Cabinet: The Governor's Children's Cabinet's strategic plan focuses on three areas: collaborating to better serve teen parents and their children, babies and toddlers in poverty, and school children with unaddressed mental health needs. Working during the legislative session, the Children's Cabinet secured funding in several areas related to its strategic plan, including early learning scholarships, children care assistance for all teen parents completing their education, and doubling funding for school-linked mental health grants. The Children's Cabinet focus on teen parents and their children supports efforts to increase high school graduation rates among pregnant and parenting teens, improve health outcomes for infants and children of adolescents, and lengthen intervals between pregnancies.

Healthy Teen Initiative (HTI): The purpose of the HTI is to implement a primary prevention and positive youth development approach targeting communities at highest risk for teen pregnancies and births. MDH is providing funding and support to St. Paul-Ramsey County Public Health for this initiative. Ramsey County is the most densely populated and racially diverse county in Minnesota. Ramsey County's high rates of teen pregnancies, births, sexually transmitted infections (STIs), and its striking health disparities, require a targeted approach. Minnesota's Healthy Teen Initiative uses a three-pronged approach to target teens, the parents of teens, and other caring adults to help reduce high rates of teen pregnancies, births, and STIs.

Minnesota Student Parent Support Initiative: The purpose of the Student Parent Support Initiative is to build the capacity of institutions of higher education to address the health and educational needs of pregnant and parenting college students and their children. College-age young people are at high risk for unintended pregnancies, unhealthy behaviors during pregnancy, and are at a crucial time in their lives for building their future through post-secondary education.

Personal Responsibility Education Program (PREP): The purpose of PREP is to support, train, and provide technical assistance to community partners in offering high quality sexuality education to Minnesota's most vulnerable adolescent populations. The goals of the program are to: (1) decrease teen pregnancies among youth 15–19 by implementing high quality medically–accurate and evidence–based programs; (2) decrease sexually transmitted infections (STIs) among youth 15–19; and (3) increase healthy behaviors, life skills, and a sense of purpose among participating teens.

Other Related Activities:

Programs	Activities
School-based clinics	Provides health services and education on contraception
Teenwise Minnesota	Coordinates statewide effort to reduce teen pregnancy and strengthen youth development activities
Family Home Visiting	Supports and educates teen parents to improve parenting and to delay repeat pregnancies Educates about health benefits of child spacing; refers for family planning services

Programs	Activities
Eliminate Health Disparities Initiative: Teen Pregnancy Prevention	Provides community grants to prevent teen pregnancy
Family Planning Special Projects	Provides family planning services to low income high risk women of reproductive age
MN Family Planning Program-DHS (Medicaid)	Expands eligibility for low income women to have insured family planning services

Next Steps

The MDH and partners will implement the strategies developed by the Adolescent Health Work Group and presented in the state Adolescent Health Strategic Plan. This work group is undertaking a holistic approach to supporting healthy adolescent development. The result of this ongoing process will be a comprehensive and inclusive plan that addresses multiple aspects of adolescent health.

Recommendation 7:

Establish an ongoing task force of stakeholders to oversee implementation of recommendations and action steps.

Rationale

Addressing the issue of infant mortality is complex and requires a long-term investment by multiple stakeholders. MDH has convened a broad-based, diverse group of public health officials, policy makers, community members, health care providers and other stakeholders to ensure that concrete action steps to address the recommendations outlined in this report are developed and implemented.

Past and Current Activities

State's Infant Mortality Reduction Plan Steering Committee: For several years, the MDH has convened a small leadership team to provide guidance and input into the department's infant mortality reduction activities. More recently, the committee has been expanded to include a broader cross-section of community members and representatives from the medical community, local public health, and organizations (e.g., Twin-Cities Healthy Start, Minnesota Hospital Association, and March of Dimes). The steering committee has been tasked with the responsibility of advising on, and ensuring implementation of, recommendations and strategies identified in the plan, as well as those created by Region V strategy teams.

Stakeholder Meetings: The MCH Advisory Task Force and the Community and Family Health Division hosted a series of stakeholders' collaborative meetings to launch the development of a comprehensive statewide plan to reduce infant mortality in Minnesota. The meetings were convened to bring together stakeholders from the public, private, and non-profit sectors across the state to discuss

the need for an infant mortality plan for the state and how we can work together to reduce infant mortality and infant mortality disparities.

Infant Mortality Work Group: The Maternal and Child Health Advisory Task Force (Task Force) advises the Commissioner on maternal and child health issues. The Task Force consists of state MCH experts from local public health, community-based programs, research, health care, and consumers. A work group of the Task Force completed a report on infant mortality reduction with recommendations in 2008. The recommendations developed by this work group served as a foundation for the stakeholder meetings and the development of these recommendations.

Next Steps

Minnesota's Infant Mortality Reduction Plan Steering Committee will provide ongoing support for the development and implementation of the second phase of the plan. This group will support the final development of strategies and action steps, mobilizing for implementation, and develop timelines and evaluation measures. Following the development of the second phase of the plan, this group will provide ongoing input, advice and leadership to implement infant mortality reduction activities.

Connecting with the Advancing Health Equity Initiative

While the recommendations above relate to more specific and traditional infant mortality interventions, they are to be considered embedded within the broader context of a new narrative and a new approach to addressing health disparities and health inequities in Minnesota. The factors that create health are interrelated in numerous ways. Consequently, efforts to reduce infant mortality in Minnesota can only be successful if we improve our understanding about what creates health, and expand our response to include not only individual-level or programmatic responses, but by including a broader focus on social factors and conditions at the population-level as well (e.g., social, and economic). For example, ensuring that all have access to:

- **A safe, stable place to live** is as essential as nutritious food for protecting and maintaining health.

- **Stable and reliable means of transportation** which can improve and support opportunities that promote health by providing the means by which to get to schools, jobs, recreation, and healthcare.

- **A quality education** which is an important determinant of health. Access to quality education for all, beginning in childhood, is critical in shaping an individual's future earning potential and occupational prospects.

- **A livable income or wage** which can influence the types of resources or opportunities that people have access to, including quality nutritious foods, affordable housing, or being able to purchase the medication that one needs to manage or cure an illness.

This shift in thinking clearly represents a change in how we view and respond to health, from focusing on individual behaviors or on the health care systems, to examining and gradually making changes to the social structures and systems in which people live, learn, work, worship, and play to benefit health. Recommendations that move toward this approach to health equity also affirm the message that addressing systemic inequities to improve health is possible. Only by changing the social landscape will healthy birth outcomes for all Minnesota babies be realized.

REFERENCES

1. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on July 22 1946 by the representatives of 61 states (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

2. Disparities in Infant Mortality. Minnesota Center for Health Statistics and Community and Family Health Division. Maternal and Child Health Section, 2009. http://www.health .state.mn.us/divs/chs/infantmortality/infantmortality09.pdf. Accessed on July 22, 2014.

3. Healthy Minnesota 2020. Statewide Health Improvement Framework. Minnesota Department of Health & Healthy Minnesota Partnership. December 2012.

4. National Research Council and Institute of Medicine. (2004). *Children's Health, the Nation's Wealth: Assessing and Improving Child Health*. Committee on Evaluation of children's Health. Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

5. U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy People 2020. Washington, DC. Available at: http://healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=26. Accessed on July 22, 2014.

6. Achievements in Public Health 1990-1999: Healthier Mothers and Babies. MMWR Weekly. October 1, 1999. 48(38): 849-858.

7. Report of the Secretary's Advisory Committee on Infant Mortality (SACIM): Recommendations for Department of Health and Human Services (HHS) Action and Framework for a National Strategy. January, 2013. Accessed on September 13, 2014. http://gcinfantmortality.org/wp-content/uploads/2014/01/5_Secretarys-Advisory-Cmte-exec-sum.pdf

8. Singh GK, van Dyck PC. Infant Mortality in the United States, 1935-2007: Over Seven Decades of Progress and Disparities. A 75th Anniversary Publication. Health Resources and Services Administration. Maternal and Child Health Bureau. Rockville, Maryland: U.S. Department of Health and Human Services; 2010.

9. Regions IV, V, and VI Infant Mortality Meeting Handbook. October 1-3, 2013. Arlington, Virginia.

10. Minnesota Milestones. http://www.mnplan.state.mn.us/mm/. Accessed on July 22, 2014.

11. Office of Minority and Multicultural Health. Center for Health Equity. Minnesota Department of Health.

12. Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life course perspective. *Maternal Child Health J*. 2003; 7: 13-30.

13. Tarlov AR. (1999). Public Policy Frameworks for improving population health. In N.E. Adler (Ed.). Socioeconomic status and health in industrial nations: Social, psychological, and biological pathways (pp. 281-293). New York Academy of Sciences.

14. Advancing Health Equity in Minnesota: Report to the Legislature. Minnesota Department of Health. February 1, 2014. Available at: http://www.health.state.mn.us/divs/chs/healthequity/ahe_leg_report_020414.pdf. Accessed on July 22, 2014.

15. Heisler JH. The U.S. Infant Mortality Rate: International Comparisons, Underlying Factors, and Federal Programs. Congressional Research Service: 2012

16. Matthew TJ, MacDorman MF. Recent Trends in Infant Mortality in the United States. NCHS Data Brief. No. 9. Hyattsville, MD: National Center for Health Statistics. October 2008.

17. Matthews TJ, Macdorman MF. Infant Mortality Statistics from the 2010 period linked birth/infant death data set. National Vital Statistics Report; Vol. 60 no. 6. Hyattsville, MD: National Center for Health Statistics. 2013.

18. Local Public Health Act. Minnesota Department of Health. http://www.health.state.mn.us/divs/opi/gov/lphact/. Accessed on July 22, 2014.

19. National Research Council and Institute of Medicine. (2007). Preterm Birth. Causes, Consequences, and Prevention. Committee on Understanding Premature Births and Assuring Healthy Outcomes. Board on Health Sciences Policy. Richard E. Behrman and Adrienne Stith Butler, Editors. Washington, DC: The National Academies.

20. Preventing Premature Births. *Healthy Babies are Worth the Wait*. http://www.health.state.mn.us/divs/cfh/program/prematurity/index.cfm. Accessed on July 22, 2014.

21. Paneth NS. The Problem of Low Birthweight. In: Future of Children. Center for the Future of Children. The David and Lucille Packard Foundation. 1995; 5: 19-31.

22. Adler NE, Newman K. Socioeconomic Disparities in Health: Pathways and Policies. Health Affairs. 2002; 32: 60-70.

23. Evidence of trends, Risk Factors, and Intervention Strategies. A Report From the Healthy Start National Evaluation. 2006: Racial and Ethnic Disparities in Infant Mortality. US Department of Health and Human Services Resources and Services Administration. Maternal and Child Bureau.

http://mchb.hrsa.gov/programs/healthystart/healthystartevaluation2006.pdf. Accessed on July 22, 2014.

24. Smoking, Alcohol and Drugs. March of Dimes. http://www.marchofdimes.com/pregnancy/alcohol-during-pregnancy.aspx. Accessed on July 22, 2014.

25. Social Determinants of Health. World health Organization. http://www.who.int/social_determinants/thecommission/finalreport/key_concepts/en/

Glossary[2]

Congenital Anomalies – Physical and/or neurological defects that are present at delivery.

First Trimester – Time period extending from the first day of the last menstrual period through 12 weeks of gestation.

Gestation Period – The period of embryonic and fetal intrauterine development.

Gestational Age – The number of weeks between the first day of the last menstrual period and the date of delivery, irrespective of whether a live birth or fetal death.

Infant Mortality – The death of an infant born alive during the first year of life.

Low Birthweight – Refers to an infant weighing less than 2,500 grams (five pounds, eight ounces) at birth.

Neonatal Period – The first four weeks after birth.

Postneonatal Period – The period from 4 weeks to 52 weeks after birth.

Preterm/Premature – Refers to an infant born before 37 weeks of gestation.

Sudden Infant Death Syndrome (SIDS) – The sudden death of an infant under 1 year of age that remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history.

Sudden Unexpected infant Deaths (SUID) – is a term used to describe and classify deaths that occur suddenly and unexpectedly to infants less than one year old. SUID includes SIDS, accidental suffocation and strangulation in bed, infections, poisoning, and deaths for which the cause is unknown..

Appendix A: Data Sources and Definitions[2]

DATA SOURCES

Vital Statistics

The National and Minnesota vital statistics – linked birth/death dataset, the Minnesota Pregnancy Risk Assessment Monitoring System (PRAMS), and Minnesota Health Access Surveys were used as the major sources of data for this report.

The linked birth/death dataset links information from the birth certificate and death certificate such as characteristics of the mother (age, race, education), infant characteristics (birthweight, gestational age), and prenatal care. The linked set also includes information from the death certificate such as age at death and underlying cause of death.

Pregnancy Risk Assessment Monitoring System (PRAMS)

PRAMS is a yearly survey of a random sample of mothers who have recently had a baby. It includes questions about attitudes and feelings related to pregnancy, prenatal care, and experiences before, during and after pregnancy. Minnesota PRAMS has oversampled for African American and American Indian mothers in nearly every year since its inception.

DATA DEFINITIONS[2]

An infant death is defined as the death of a live-born infant occurring within the first year of life. The infant mortality rate is the number of infant deaths divided by the number of live births for that year. The infant mortality rate or infant death rate is most often expressed as a rate of death per 1,000 live births. For comparison, consistency, and small numbers of some groups, data are presented as a 5-year aggregate. In a few cases, however, data are presented as a 3-year aggregate for comparison to national results.

The majority of data in this report are presented by race or ethnicity of mother as indicated on the birth certificate. On the birth certificate, race and Hispanic ethnicity are obtained separately and are analyzed separately in this report. Hispanic ethnicity includes anyone indicating Hispanic/Latino descent regardless of race. The combining of race-specific and Hispanic infant deaths does not match total infant deaths because Hispanics, who can be of any race, are counted in the race categories and because “other” race is excluded from this analysis.

The infant death data in this report are presented by the year of the infant’s birth, not death. For example, in Table 1 the 2006-2010 African American infant mortality rate of 9.8 was calculated using the number of deaths to infants born in 2006-2010 (birth cohort) divided by the number of live births in 2006-2010.

Appendix B: Causes of Death[2]

Leading Causes of Death, Definitions and ICD-10 Codes

Cause of Death	Definition	ICD-10 Codes
Congenital Anomalies	Birth defects of any of the major systems and specific anomalies such as spina bifida and anencephaly	Q00-Q99
Prematurity	Disorders related to short gestation and low birth weight, and respiratory distress syndrome	P07, P25, P22, P26, P28
SUID (including SIDS and sleep-related infant deaths)	SIDS and any other ill-defined asphyxia-related cause of death	R95, R96, W75, W83, W84
Obstetric conditions	Multiple gestations, premature rupture of membranes, incompetent cervix, ectopic pregnancy, maternal death, malpresentation before labor, oligohydraminos, and polyhydraminos, placenta praevia, placental separation and hemorrhage, unspecified morphological and functional abnormalities of placenta.	P01, P02
Any Injuries	All injuries and accidents due to the environment or human actions including transport or motor vehicle accidents, accidental drowning and submersion, other accidental threats to breathing, or assaults (homicide)	V01-X59 (except W75, W83, W84), X85,-Y09, Y87.1
Birth Asphyxia	Abnormal fetal heart rate, fetal or intrauterine: acidosis, anoxia, asphyxia, distress, hypoxia, meconium in liquor, passage of meconium, anoxia, asphyxia, and hypoxia.	P20-P21

Appendix C: Compilation of Existing Infant Mortality Recommendations in Minnesota

(10/11/2013)

Attachment 1

Overarching Recommendation: Focus infant mortality reduction efforts on eliminating racial and ethnic health disparities.

RECOMMENDATION(S)	SOURCE
SIDS/SUIDS	
Provide education and services for the whole family related to Sudden Infant Death and infant sleep issues	2005-2007 American Indian Infant Mortality Review
Educate new parents and their families about reducing the risk of Sudden Infant Death Syndrome (SIDS) and other sleep-related infant deaths	2009 Disparities in Infant Mortality Report (MDH)
Offer support and services to families dealing with the death of an infant including support groups.	2005-2007 American Indian Infant Mortality Review Project
Increase education and services related to grieving issues	2005-2007 American Indian Infant Mortality Review Project
INFANT SAFETY	
Provide education and assistance to families related to car seats: • Provide car seat safety education to pregnant and parenting families • Provide education about projectiles in vehicles	2005-2007 American Indian Infant Mortality Review Project
Increase public service messages related to prenatal care and infant safety in publications directed at American Indian communities.	2005-2007 American Indian Infant Mortality Review Project
Promote messages that preconception care, prenatal care and infant safety are community norms	2005-2007 American Indian Infant Mortality Review Project
BREASTFEEDING	
Promote the health of both mothers and infants by education and supporting mothers to breastfeed their infants for at least 12 months.	2005-2007 American Indian Infant Mortality Review Project
PREMATURITY	
Create legislation to continue and extend the lifetime of the Minnesota Task Force on Prematurity(legislative rule, H.F. No. 25, Article 2)	2013 State of Prematurity Report (MN Prematurity Task Force)
Continue activities to promote the consistent use of the Discharge Planning Checklist for late premature infants (34/07–36 6/7 weeks completed gestational age) • Develop an electronic toolkit to serve as a companion to the discharge planning checklist, which will provide additional technical assistance and references to birthing hospitals regarding the unique needs of a late preterm infant • Incorporate the discharge planning checklist into the discharge process through the electronic medical record	2013 State of Prematurity Report (MN Prematurity Task Force)
Encourage the development of public awareness strategies to raise awareness about prematurity issues (such as the March of Dimes' 39 Week campaign) and continue to support and collaborate with organizations in the future development of such campaigns or initiatives	2013 State of Prematurity Report (MN Prematurity Task Force)
PERINATAL REGIONALIZATION	
Reinforce and continue supporting those systems that do work. For example, Minnesota's Level III hospitals generally provide good care for prematurity and birth defects. Refer to Level III hospitals as early as possible.	2005-2007 American Indian Infant Mortality Review Project

RECOMMENDATION(S)	SOURCE
Share information about the process that mothers and families are experiencing in the event of a difficult pregnancy, labor and delivery, and care of a sick infant	2005-2007 American Indian Infant Mortality Review Project
Create specific criteria for care of high risk pregnancies and deliveries, hospital protocols for transfers to Level II hospital, and response time of a physician when a prenatal patient arrives in an emergency department	2005-2007 American Indian Infant Mortality Review Project
Protocols should be in place in all hospitals related to the time frame in which patients are seen by a physician and high risk transfer criteria.	2005-2007 American Indian Infant Mortality Review Project
BIRTH DEFECTS	
Offer cytogenic testing and counseling after birth of a baby with a heart defect.	2005-2007 American Indian Infant Mortality Review Project
Reinforce and continue supporting those systems that do work. For example, Minnesota's Level III hospitals generally provide good care for prematurity and birth defects. Refer to Level III hospitals as early as possible.	2005-2007 American Indian Infant Mortality Review Project
WOMEN'S HEALTH/ PRECONCONEPTION AND INTERCONCEPTION CARE	
Provide inter-conception care to women with prior adverse pregnancy outcomes	2011-2012 CVAS Report
Increase access to preconception care	2011-2012 CVAS Report
Promote/Provide preconception and inter-conception care to all women of childbearing age	2009 Disparities in Infant Mortality Report (MDH)
Promote messages that preconception care, prenatal care and infant safety are community norms	2005-2007 American Indian Infant Mortality Review Project
Provide education and services related to inter-conception care and prenatal care	2005-2007 American Indian Infant Mortality Review Project
Assure continuous access to health care for all women of childbearing age. Encourage a health care home.	2009 Disparities in Infant Mortality Report (MDH)
Expand health care access over the life course	2011-2012 CVAS Report
PRENATAL/POST PARTUM CARE	
Improve the quality of prenatal care	2011-2012 CVAS Report
Assure that all pregnant women have access to prenatal care in the first trimester and receive the appropriate level of care throughout pregnancy and birth based on their level of risk.	2009 Disparities in Infant Mortality Report (MDH)
Provide pregnant women who come to an emergency department with a pregnancy related complaint with appropriate assessment and treatment.	2005-2007 American Indian Infant Mortality Review Project
Promote messages that preconception care, prenatal care and infant safety are community norms	2005-2007 American Indian Infant Mortality Review Project
Screen and refer to programs as appropriate to address stress, social support, intimate partner violence, and depression for childbearing age. During pregnancy and postpartum, screen and refer at every visit.	2009 Disparities in Infant Mortality Report (MDH)
TEEN PREGNANCY PREVENTION	
Increase funding directed to prevent teen pregnancy. For example, evidence and outcome-based comprehensive and culturally specific programs for American Indian teens should be available.	2005-2007 American Indian Infant Mortality Review Project
Expand effective teen pregnancy prevention programs, support and educate teens who are parenting, assist teen parents to delay repeat pregnancies.	2009 Disparities in Infant Mortality Report (MDH)

RECOMMENDATION(S)	SOURCE
Increase collaboration between Child Protection Services and community providers in order to help high-risk teen moms.	2005-2007 American Indian Infant Mortality Review Project
Teenagers and young mothers should be priority groups for educational and outreach programs. Educational curriculums addressing teen pregnancy, prenatal education, and infant care should be developed and implemented through church-based school-based and community-based programs.	2010 Stairstep Foundation Report
Provide advocates for mothers, particularly teen mothers, to help them navigate social, health and education systems	2005-2007 American Indian Infant Mortality Review Project
DOULA SUPPORT	
Expand the availability of doulas in the African American community to reduce infant mortality	2010 Stairstep Foundation Report
ALCOHOL & DRUG USE & ABUSE	
Increase funding directed to prevent drug and alcohol use/abuse. For example, outreach and awareness activities, afterschool programs that support asset building for youth should be available in the community.	2005-2007 American Indian Infant Mortality Review Project
Provide education and services related to alcohol, tobacco and other drugs during pregnancy and in homes with children	2005-2007 American Indian Infant Mortality Review Project
Educate and support pregnant and parenting women to stop smoking and to not use alcohol or other drugs	2005-2007 American Indian Infant Mortality Review Project
Screen pregnant women for alcohol use at every prenatal visit. Provide referrals for services and support as needed	2005-2007 American Indian Infant Mortality Review Project
Screen and refer to programs as appropriate to reduce substance use/abuse for women of childbearing age. For pregnant and parenting women, screen and refer to every visit. This includes alcohol, tobacco, and other drugs	2009 Disparities in Infant Mortality Report (MDH)
Provide intensive, holistic, wrap-around services and support for both parents and children dealing with the effects of fetal alcohol exposure.	2005-2007 American Indian Infant Mortality Review Project
Educate families not to give over-the-counter medicine to infants	2005-2007 American Indian Infant Mortality Review Project
TOBACCO CESSATION	
Screen and refer to programs as appropriate to reduce substance use/abuse for women of childbearing age. For pregnant and parenting women, screen and refer to every visit. This includes alcohol, tobacco, and other drugs	2009 Disparities in Infant Mortality Report (MDH)
Provide education and services related to alcohol, tobacco and other drugs during pregnancy and in homes with children	2005-2007 American Indian Infant Mortality Review Project
Educate and support pregnant and parenting women to stop smoking and to not use alcohol or other drugs	2005-2007 American Indian Infant Mortality Review Project
PREGNANCY AND PARENTING SUPPORTIVE WORKPLACES	
Promote pregnancy and parenting-friendly policies in workplaces (i.e., private areas for the breastfeeding mothers, time off for prenatal appointments, smoke free work environments and time off for bereavement)	2005-2007 American Indian Infant Mortality Review Project
Support working mothers and families	2011-2012 CVAS Report
SOCIAL DETERMINANTS OF HEALTH	
Raise awareness in the American Indian community of the need to support pregnant women	2005-2007 American Indian Infant Mortality Review Project
Create reproductive social capital in African American communities	2011-2012 CVAS Report

RECOMMENDATION(S)	SOURCE
Invest in community building and urban renewal	2011-2012 CVAS Report
Close the education achievement gap	2011-2012 CVAS Report
Increase education (graduation rates) and self-esteem building for American Indian youth	2005-2007 American Indian Infant Mortality Review
Reduce poverty among African American families	2011-2012 CVAS Report
Undo Racism	2011-2012 CVAS Report
Raise awareness of and address issues of racism and cultural sensitivity in medical systems	2005-2007 American Indian Infant Mortality Review Project(to Medical Care Providers)
Issues of racism in healthcare systems need to be addressed	2005-2007 American Indian Infant Mortality Review Project
Address the historical trauma of the American Indian experience	2005-2007 American Indian Infant Mortality Review Project
Adopt a holistic approach. Mothers and infants exist in families, including extended families and other social network. Interventions to improve birth outcome and infant survival must account for the family and community contexts of American Indian mothers and infants.	2005-2007 American Indian Infant Mortality Review Project
FATHERHOOD SUPPORT/INVOLVEMENT	
Include fathers in all parent education	2005-2007 American Indian Infant Mortality Review Project
Address men's historic role as protectors of family and community	2005-2007 American Indian Infant Mortality Review Project
Develop an education campaign targeted to American Indian men about infant mortality and its contributing factors	2005-2007 American Indian Infant Mortality Review Project
Strengthen father involvement in African American families	2011-2012 CVAS Report
INFANT MORTALITY REVIEWS AND MONITORITING	
Maintain current surveillance activities and explore new methodologies that may assist in identifying targeted populations or enhance understanding of trends and disparities	2008 MCH Advisory Task Force Work Group on Infant Mortality
Periodically review fetal and infant deaths to detect emerging trends, increase community awareness, and engage communities in activities and partnerships to improve birth and infant outcomes	2009 Disparities in Infant Mortality Report (MDH)
Review all questionable infant deaths in hospitals on an annual basis.	2005-2007 American Indian Infant Mortality Review Project
Regularly and systematically review American Indian infant deaths in Minnesota	2005-2007 American Indian Infant Mortality Review Project
CULTURALLY COMPETENT CARE	
Staff should be trained on American Indian cultural issues related to pregnancy, birth and death	2005-2007 American Indian Infant Mortality Review Project
Staff should be trained to appropriately and sensitively interact and communicate with women and families who have experienced an infant death	2005-2007 American Indian Infant Mortality Review Project
MEDICAL CARE ACCESS/SYSTEM	
Assure the needs of mothers and families are met during pregnancy, labor and delivery, and especially in the event of an infant death	2005-2007 American Indian Infant Mortality Review Project

RECOMMENDATION(S)	SOURCE
Increase the availability of medical services (i.e., increase hours./days of service) to meet the diverse needs of those being saved	2005-2007 American Indian Infant Mortality Review Project
Provide comment box for narrative notes in electronic medical records to clarify interventions and patient responses	2005-2007 American Indian Infant Mortality Review Project
Develop/improve services to pregnant or parenting adults who are mentally ill, have developmental delays or other conditions that put them at risk for poor parenting	2005-2007 American Indian Infant Mortality Review Project
Educate families and patients on the importance of vaccinating young girls against human papilloma virus (HPV)	2005-2007 American Indian Infant Mortality Review Project
COMMUNITY AND FAMILY SERVICES AND SUPPORTS	
Provide support services, resources and education to grandparents who are raising their grandchildren	2005-2007 American Indian Infant Mortality Review Project
Adopt an institutional/organizational focus on the life course. Reducing infant mortality by implementing the life course approach by combining public health practices to community-based interventions	2011-2012 CVAS Report
Enhance coordination and integration of family support services	2011-2012 CVAS Report
Health and parenting knowledge should be passed on within the community	2005-2007 American Indian Infant Mortality Review Project
Improve access to preventive services for mothers and infants by continuing to support grants programs such as Family Home Visiting and the Eliminating Health Disparities Initiatives, by providing technical assistance and training, and by supporting the work of programs such Minnesota Sudden Infant Death Center and Twin Cities Healthy Start.	2008 MCH Advisory Task Force Work Group on Infant Mortality
Increase collaboration with community-based organization to ensure that pregnant women and new mothers and fathers are receiving the services they need	2005-2007 American Indian Infant Mortality Review Project
Develop interventions for behavioral change at population-levels. Among behaviors to be addressed are unprotected sex, teenage pregnancy, substance abuse, and unsafe sleeping behaviors. Such interventions should engage communities using a community-based participatory approach to ensure relevance, acceptability, sustainability, and overall benefit to community	2010 Stairstep Foundation Report
Promote education on motivational interviewing skills for community educators	2005-2007 American Indian Infant Mortality Review Project
Empower pregnant women to stand up for their rights in the medical care system	2005-2007 American Indian Infant Mortality Review Project
OTHER TOPICS/STRATEGIES	
Increase education to all family and community members about issues related to infant mortality	2005-2007 American Indian Infant Mortality Review Projects
Collaborate with partners to enhance and coordinate activities targeted at assuring healthy women, infants, and families.	2009 Disparities in Infant Mortality Report (MDH)
Collaborate with all partners to enhance and coordinate activities targeted at reducing infant mortality rates.	2008 MCH Advisory Task Force Work Group on Infant Mortality
Increase education to all family and community members about issues related to infant mortality	2005-2007 American Indian Infant Mortality Review Projects
Collaborate with partners to enhance and coordinate activities targeted at assuring healthy women, infants, and families	2009 Disparities in Infant Mortality Report (MDH)

RECOMMENDATION(S)	SOURCE
Collaborate with all partners to enhance and coordinate activities targeted at reducing infant mortality rates	2008 MCH Advisory Task Force Work Group on Infant Mortality
Churches, schools, local businesses, and health professional should be engaged in outreach and educational programs [about infant mortality]	2010 Stairstep Foundation Report
Take advantage of all venues and methods to repeat consistent health and safety messages	2005-2007 American Indian Infant Mortality Review Project

Sources: 2005-2007 American Indian Infant Mortality Review
2008 MCH Advisory Task Force Work Group on Infant Mortality
2009 Disparities in Infant Mortality Report (MDH)
2010 Stairstep Foundation Report
2011-2012 Community Voices and Solutions (CVAS) Report (African-American)
2013 State of Prematurity Report (MN Prematurity Task Force)

Appendix D: Computation of Rates

Baseline Disparity with Whites = Baseline Population of Color Rate – Baseline White Rate

Current Disparity with Whites = Current Population of Color Rate – Current White Rate

Infant Mortality Rate= Number of Infant Deaths / Number of live births x 1,000

Percentage Reduction= Newest Rate – Oldest Rate/ Oldest Rate x 100%

Percentage Disparity Reduction with Whites= Baseline Disparity with Whites minus Current Disparity with Whites / Baseline Disparity with Whites

Rate Ratio= Population of Color Infant Mortality Rate/White Infant Mortality Rate

Appendix E: Data Tables

Figure 2: Infant Mortality Trends

Years	U.S.	Minnesota	Healthy People 2020 Goal
1996-1998	7.2	5.9	6.0
1997-1999	7.1	6.0	6.0
1998-2000	7.0	5.9	6.0
1999-2001	6.9	5.7	6.0
2000-2002	6.9	5.5	6.0
2001-2003	6.9	5.1	6.0
2002-2004	6.9	4.9	6.0
2003-2005	6.8	4.8	6.0
2004-2006	6.8	5.0	6.0
2005-2007	6.8	5.3	6.0
2006-2008	6.7	5.6	6.0
2007-2009	6.6	5.4	6.0
2008-2010	6.4	5.0	6.0

*Can be of any race

Figure 3: Infant Mortality Rates by Race/Ethnicity of mother, Minnesota, 1995-1999 and 2006-2010

Race/Ethnicity	1995-1999	2006-2010
African-American	13.2	9.8
American Indian	13.5	9.1
Asian	7.1	4.9
Hispanic*	7.0	4.8
White	5.5	4.3
Total	6.2	5.1

*Can be of any race

Figure 4: Infant Mortality by Geography, Minnesota, 2006-2010

Region	Rate per 1,000
Central	5.1
Metro	5.2
Northeast	4.7
Northwest	6.9
South Central	4.1
South East	5.1
Southwest	4.3
West Central	5.1

Figure 5: Age at Death and Infant Mortality Rates by Race/Ethnicity of Mother, Minnesota, 2006-2010

Race/Ethnicity	Neonatal	Post-Neonatal
African-American	6.5	3.3
American Indian	4.0	5.1
Asian	3.6	1.3
Hispanic*	3.2	1.6
White	2.9	1.6
Total	3.3	1.8

*Can be of any race

Figure 6: Infant Mortality Rates by Gestational Age and Race/Ethnicity of Mother, Minnesota, 2006-2010

Race/Ethnicity	<37 Weeks	>=37 Weeks
African-American	47.8	3.5
American Indian	34.3	4.5
Asian	26.2	1.8
Hispanic*	29.2	2.0
White	23.0	1.9
Total	25.7	2.1

*Can be of any race

Figure 7: Infant Mortality Rates by Low Birth weight and Race / Ethnicity of Mother, Minnesota, 2006-2010

Race/Ethnicity	<2,500g	>=2,500g
African-American	62.8	3.3
American Indian	67.8	4.7
Asian	37.7	1.8
Hispanic*	53.0	1.8
White	43.1	1.9
Total	47.4	2.1

*Can be of any race

Figure 8: Percent Distribution of the Leading Causes of Infant Deaths, Minnesota, 2006-2010

Cause	Percent
Congenital Anomalies	25.5
Prematurity	19.2
SIDS/Sleep-Related Infant Deaths	13.8
Obstetric Conditions	11.0
All Injury	2.2
Birth Asphyxia	0.9
Other	27.3

Figure 9: Infant Mortality Rates by Maternal Age, Minnesota, 2006-2010

Race/Ethnicity	Age <20	Age 20-34	Age 35+
African-American	11.2	9.4	10.4
American Indian	14.7	7.7	-
Asian	#	4.3	5.8
Hispanic*	#	4.8	#
White	8.5	4.1	4.8
Total	8.9	4.7	5.4

*Can be of any race

Figure 10: Infant Mortality Rates by Maternal Nativity, Minnesota, 2006-2010

Race/Ethnicity	U.S.-Born	Foreign-Born
African-American	12.5	6.5
American Indian	9.3	#
Asian	6.0	4.5
Hispanic*	5.4	4.5
White	4.4	4
Total	5.1	5

*Can be of any race

Figure 11: Infant Mortality Rates by Maternal Education, Minnesota, 2006-2010

Race/Ethnicity	0 to 11 yrs	12 to 15 yrs	16+ yrs
African-American	9.4	9.9	6.8
American Indian	9.5	9.3	0
Asian	#	5.1	3.9
Hispanic*	5.0	4.7	0
White	5.7	4.8	3.4
Total	6.5	5.5	3.5

*Can be of any race

Figure 12: Infant Mortality Rates by Maternal Medicaid Receipt Status and Race / Ethnicity of Mother: Minnesota, 2006-2010

Race/Ethnicity	Yes	No
African-American	8.8	13.6
American Indian	9.6	#
Asian	4.3	5.3
Hispanic*	4.5	6.2
White	5.8	3.9
Total	6.2	4.4

*Can be of any race

Figure 13: Infant Mortality Rates by Maternal Smoking Status and Race/Ethnicity of Mother, Minnesota, 2006-2010

Year	Smoked	Did Not Smoke
African-American	14.5	9.1
American Indian	10.5	7.8
Asian	#	4.9
Hispanic*	#	4.6
White	6.9	4.1
Total	7.9	4.7

*Can be of any race

Figure 14: Percent of Women Who Consumed Alcohol During the Last 3 Months of Pregnancy by Race / Ethnicity, 2009-2010

Race/Ethnicity	Percent
Non-Hispanic Black	5.6
Non-Hispanic American Indian	6.6
Hispanic*	7.8
Non-Hispanic White	7.3
Non-Hispanic Other Race	5.9
Total	7.1

*****Can be of any race

Participant List

The Minnesota Department of Health is grateful for the following individual's time, commitment, and input during one or more of the three stakeholders' meetings convened between July and November 2013, to develop the state's infant mortality reduction plan. These individuals represented a broad cross-section of agencies working to improve birth outcomes in Minnesota including:

Commissioner Edward Ehlinger
Minnesota Department of Health

Carolyn Allshouse
Family Voices of Minnesota

Gyda Anderson
Clay County Public Health

Jane Auger
Hennepin County Public Health

Andrew Baker
Hennepin County Medical Examiner's Office

Deb Barth
Healtheast Corporation

Jill Bauer
Children's Hospital and Clinics of Minnesota

Autumn Baum
Minnesota Department of Health

Katie Bear-Pfaffendorf
Minnesota Hospital Association

Ken Bence
Medica/MN Council of Health Plans

Joan Brandt
Saint Paul Ramsey County Public Health

Tricia Brisbine
Family Voices of Minnesota'

Katherine Cairns
Minnesota Chapter of the American Academy of Pediatrics

Susan Castellano
Minnesota Department of Health

Michelle Chiezah
Minnesota Department of Health

Angela Christian
Allina Health

Joan Cleary
Minnesota Community Health Worker Alliance

Ruth Clinard
Minnesota Department of Human Services

Brian Coyle
St. Paul Police Department

Ruthie Dallas
Minnesota Department of Human Services

Mitchell Davis, Jr.
Minneapolis Urban League

Roberta Decker
Leech Lake

Peter Dehnel
Blue Cross and Blue Shield of Minnesota

Maggie Diebel
Minnesota Department of Health

Jackie Dionne
Minnesota Department of Health

Linda Ericson
Catholic Charities of St. Paul and Minneapolis

Kathleen Fernbach, Director
Minnesota SID Center

DeeAnn Finley
Minnesota Department of Health

Alexandra Fitzsimmons
Children's Defense Fund-MN

Cristina Flood Urdangarin
St. Mary's Health Clinics

Karina Forrest-Perkins
Prevent Child Abuse Minnesota

Becky Gams
University of Minnesota Medical Center-Fairview

Roberta Geiselhart
Hennepin County Medical Examiner's Office

Thomas George
University of Minnesota

Jose Gonzalez
Minnesota Department of Health

Amy Goodhue
Minnesota Visiting Nurses Association

Patty Graham
HealthPartners

Stephanie Graves
Minneapolis Health Department

Phyllis Haag
St. Paul Ramsey County Public Health

Tanya Hagre
HealthPartners

Gloria Haluptzok
Minnesota Department of Health

Pamela Heggie
Fairview Clinics— University Children's

Butch Huston
Ramsey County Medical Examiner's Office

Babette Jamison
Minnesota Deparmtent of Health

Jen Harvey
Minnesota Department of Health

Marcie Jefferys
Children's Cabinet

Kirsten Johnson
Amherst H. Wilder Foundation

Clarence Jones
Southside Community Health Services

Cindy Kallstrom
UCare

Christine Keeney
Mayo Clinic

Kia Kehrer
Lao Family Community of Minnesota

Mark Kinde
Minnesota Department of Health

Andre Koen, Director
AM Horizen Training

Katy Kozhimannil
University of Minnesota-School of Public Health

Jane Kretzmann
University of Minnesota-CEED

Wendy Kvale
Minnesota Department of Health

Shirlynn LaChapelle
Minnesota Black Nurses Association

Bonnie LaFromboise
Fond du Lac Human Services

Susan Lane
Mn Better Birth Coalition

Katie Linde
Minnesota Department of Health

Diane Loeffler
Hennepin County Human Services and Public Health Department

Carla Lucas
Hennepin County

Richard Lussky
HCMC

Meredith Martinez
Minnesota Department of Education

Marla Mills
University of Minnesota
Amplatz Children's Hospital

Teri Morrison
Bois Forte Reservation Health Services

Charlene Muzyka
Minneapolis Health Department

Fritz Ohnsorg
Minnesota Department of Human Services

Jenny Oliphant
University of Minnesota-
Prevention Resarch Center

Adrienne Olson
Blue Cross and Blue Shield of Minnesota

Martha Overby
March of Dimes

Patina Park
Division of Indian Work

Rob Payne
Children's of MN

Jeri Peters
UCare Minnesota

Melanie Peterson-Hickey
MN Department of Health

Kathleen Pfleghaar
Allina Health— Baby Center

Marissa Pigeon
Lower Sioux

Meghan Porter
Great Lakes Inter-Tribal Epidemiology Center

Beverly Propes
Minneapolis Public Schools

Tamiko Ralston
St. Paul-Ramsey County Public Health

Janet Reiter
Chisago County Public Health

Wendy Ringer
PACER

Terrie Rose
Baby's Space

Emmy Rudolph
White Earth Home Health

Jeff Schiff
Minnesota Department of Human Services

Jeanette Schwartz, Clinical Director
HealthEast

Akhmiri Sekhr-Ra
Cultural Wellness Center

Kenneth Smith
Minneapolis Health Department

Samantha Sommerness
Fairview Southdale Hospital

MIna Spalla
White Earth Home Health

Carole Specktor
ClearWay Minnesota

Jen Stevens
White Earth

Janine Stiles
Mandala Midwifery Care

David Stroud
Minnesota Department of Health

Hazel Tanner
Minnesota Black Nurses Association

Lee X. Thao
University of St. Catherine

David Thompson
Minnesota Department of Health

Stephanie Tucker
University of Minnesota –
Schoold of Public Health

Jen Van Lie
Minnesota Visiting Nurse Agency

Megan Waltz
Minnesota Department of Health

Angela Watts
Minneapolis Health Department

Antonia Wilcoxon
Minnesota Department of Human Services

Noya Woodrich
Greater Minneapolis Council of Churches

Choua Yang
Lao Family Community of Minneso

For Information about this Report Contact

Michelle A. Chiezah, MPH, MA
State's Infant Mortality Consultant
Community and Family Health Division
Minnesota Department of Health
85 Eat Seventh Place, Suite 220
P.O. Box 64882
St. Paul, MN 55164-0882

Stakeholders' Meeting Staff

Susan Castellano, BA
Maternal and Child Health Title V Director
Minnesota Department of Health

Michelle Chiezah, MPH, MA
Infant Mortality Consultant
Minnesota Department of Health

Dee Finley, MS
Maternal and Child Health Planner
Minnesota Department of Health

Advisory Committees

Maternal and Child Health Advisory Task Force
Minnesota's Infant Mortality Reduction Plan Steering Committee

Maternal and Child Health Section
Minnesota Department of Health
P.O. Box 64882
St. Paul, MN 55164-0882

Phone: 651-201-3760
Fax: 651-201-3590