State of Michigan

Infant Mortality Reduction Plan

August 2012

STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

RICK SNYDER
GOVERNOR

OLGA DAZZO
DIRECTOR

August, 2012

Dear Colleagues:

I am pleased to introduce the state of Michigan's Infant Mortality Reduction Plan. In Michigan, 5 out of 1000 Caucasian babies and 7 out of 1000 Hispanic babies die before their first birthdays. Among our African American population, that rate is 14 out of every 1000 babies born. In response, Governor Rick Snyder has identified the reduction of infant mortality as a top priority in his plans to make Michigan a healthier state for all of us to live.

The strategies in this plan will build on new and existing partnerships, current program efforts, and new medical research. It will address social issues and disparities and build an enhanced network of support systems to ensure that nearly all Michigan infants survive to their first birthday.

This plan was developed collaboratively by the Michigan Department of Community Health, health care providers, hospitals, local health departments, universities, professional organizations and associations, business and community leaders and other stakeholders. We are grateful to these stakeholders for their expertise, passion, knowledge and commitment to fighting an issue with very complex causes.

Protecting the lives of Michigan infants is paramount to having a healthier Michigan. It will take the whole state working together to achieve this goal. We look forward to your involvement as we work collaboratively to accomplish our vision of creating an environment for all Michiganders to be healthy.

Sincerely,

Olga Dazzo
Director

CAPITOL VIEW BUILDING • 201 TOWNSEND STREET • LANSING, MICHIGAN 48913
www.michigan.gov • 517-373-3740

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Introduction

Governor Rick Snyder shaped the state's vision for health during his Health and Wellness Message on September 14, 2011.

As an organization our vision is for Michiganders to be healthy, productive individuals, living in communities that support health and wellness, with ready access to an affordable, person-centered, and community-based system of care.

Governor Snyder made keeping babies alive a priority, which will be publicly monitored on the Michigan Dashboard. Infant mortality is a major public health issue in the state of Michigan. For every 1,000 Michigan live births, approximately seven infants die before reaching their first birthday. Michigan's infant mortality rate consistently exceeds the national average. Although Michigan's population based infant mortality rate has recently decreased the most we've seen in some time, alarming disparities continue to exist between various racial and ethnic groups, particularly between African-Americans and Caucasians. The Infant Mortality Reduction Plan is a strategic approach to keeping more of Michigan's infants alive, no matter their race or ethnicity.

Considerable evidence exists about the factors that influence infant mortality. Evidence shows that:

- A statewide coordinated perinatal system of care will improve infant morbidity and reduce cost of care for high-need infants
- Adoption of policies to eliminate medically unnecessary deliveries before 39 weeks of gestation will keep more babies alive
- Adoption of a progesterone treatment protocol for high-risk women will prevent preterm birth - a leading cause of infant mortality in Michigan
- Preventing suffocation of infants will keep more babies alive
- Supportive home visiting services improve pregnancy outcomes and positively influence parenting practice
- Women have better pregnancy outcomes when they are healthy prior to and in between pregnancies
- Women who want to be pregnant have better pregnancy outcomes
- Persistent health disparities among people of color is directly related to living conditions and personal experiences, and these factors must be addressed in any plan designed to improve birth outcomes of all people.

Implementation of the Michigan Infant Mortality Reduction Plan builds on the above evidence. The plan includes strategies that will strengthen Michigan's ability to create an environment for every Michigan citizen to be a healthy, productive individual, and have children that are born at the right time, in the right place, who become healthy productive adults. The Infant Mortality Reduction Plan requires a collaborative approach among state, tribal and local government; perinatal practitioners; hospital and health service providers; child care providers, schools and community organizations; and individuals and families. Through these partnerships we can improve the health of women and pregnancy outcomes, expand prevention activities and empower people to become healthy adults by assuring that Michigan offers the highest standard of perinatal care and education.

This plan uses principles from the social ecological model recognizing the impact of the environment on individuals. It builds on the life course, recognizing that throughout life there are important life stages that should be optimized for better health, and missing the opportunity to positively impact these key points in our lifetime can result in poor health outcomes in multiple generations.

All strategies in the plan must address the determinants we experience in society that directly impact health in order to reduce the infant mortality disparity that exists between races in Michigan. Things like education, employment, nutrition, housing and discrimination must be consistently a consideration in our work.

Michigan's Infant Mortality Reduction Plan strengthens the system of perinatal care available to all women, regardless of where they live; includes consistent messaging about preventing infant suffocation; builds on current science for perinatal care; and provides education to our youth as preparation for living a productive adult life.

Acknowledgements

Over the past year, we have worked with experts from Michigan's hospitals and health care community, universities, and local health departments, as well as the Infant Mortality Steering Committee comprised of authorities to identify strategies to address this complex issue. In October 2011, the Michigan Department of Community Health (MDCH) hosted an Infant Mortality Summit attended by nearly 300 participants from around the state to identify key priority strategies that should be implemented in Michigan.

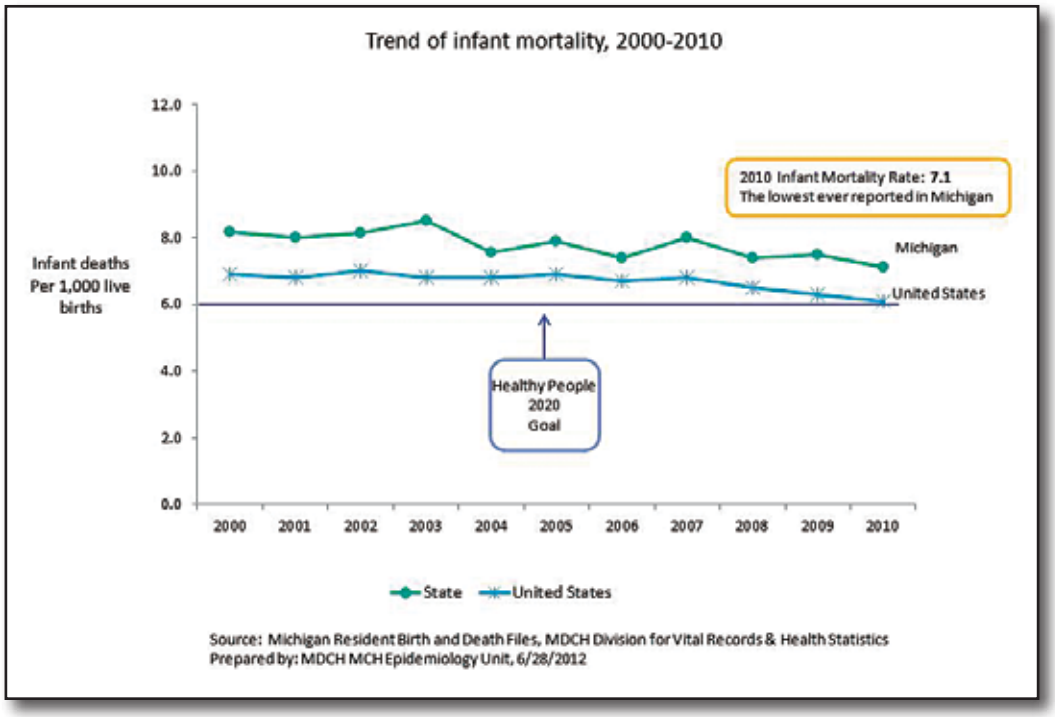
This plan was developed with the input and guidance of numerous community, healthcare, academic, public health and other maternal child health stakeholders across the state. Special recognition goes to these individuals, as well as staff from MDCH for sharing their knowledge, time and experience to develop a plan that will impact the livelihood of our youngest residents and their families.

We are grateful for everyone's passion and commitment to address this critical issue and to help Michigan's families.

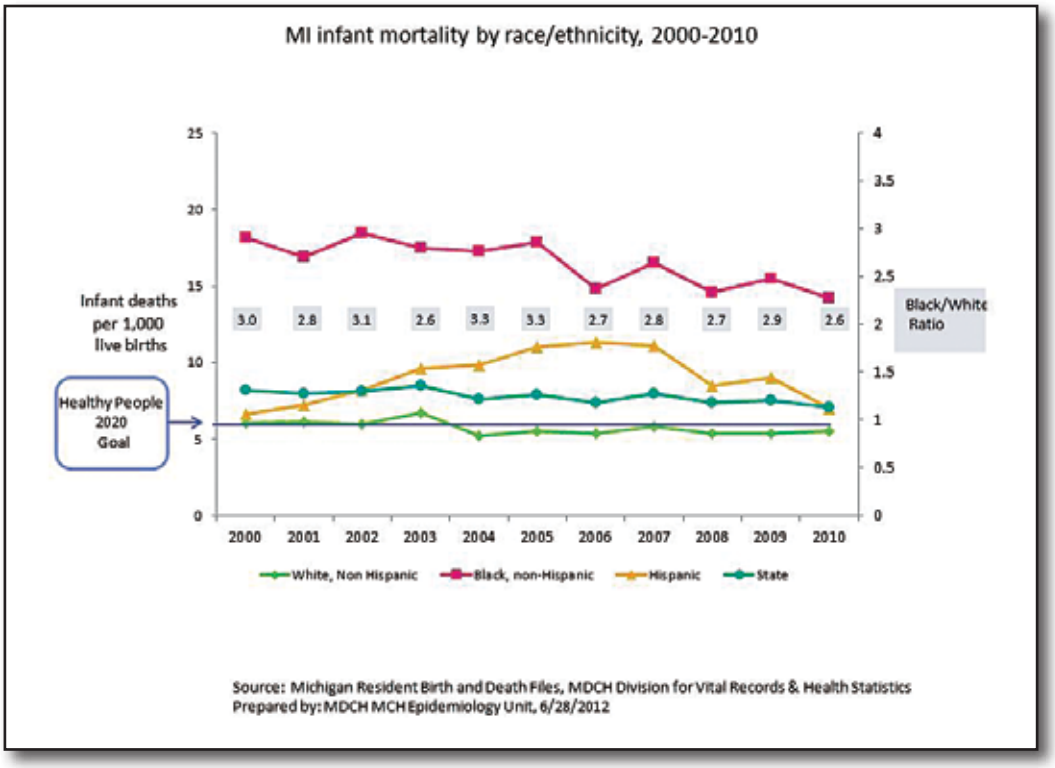
Public Health Crisis – A Call to Action

Michigan has a public health crisis. Too many Michigan infants are dying. Michigan experienced a significant decline in infant mortality during the early 1990s; however the infant mortality rate has not changed significantly in the past 10 years and remains higher than the U.S. rate. The infant mortality rate in Michigan in 2000 was 8.2 infant deaths per 1,000 live births, and the U.S. rate was 7.0 infant deaths per 1,000 live births during the same time period. A decade later, Michigan's infant mortality rate set a new record low at 7.1 infant deaths per 1,000 live births in 2010, still higher than the provisional 2010 infant death rate for the United States which is 6.1 infant deaths per 1,000 live births.

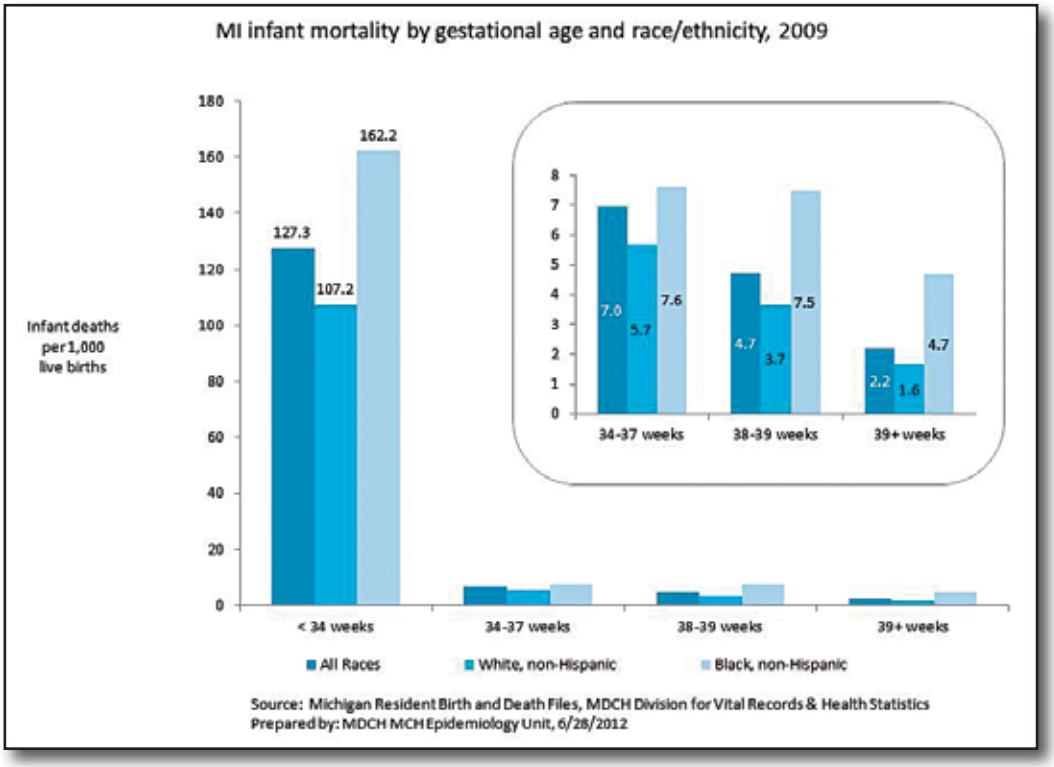
Public Health Crisis: Too Many Michigan Infants are Dying



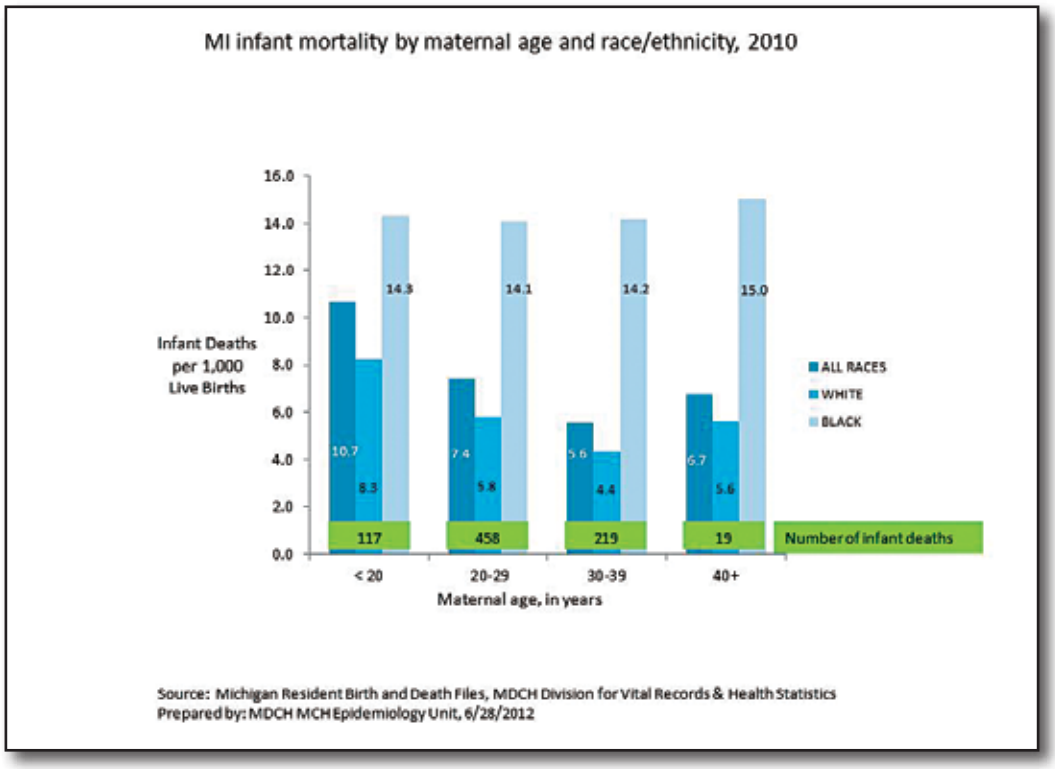
Evidence is convincing that the health of childbearing women has an impact on their future newborn children's health and survival. Yet, too many childbearing women in Michigan don't have the same opportunity to be as healthy as others. Michigan's infant mortality segmented by race and ethnicity, show where the effort and work is needed the most to improve the state's overall rate. Health disparities between white people and people of color are staggering – and unacceptable. Most glaring is Michigan's black infant mortality rate, which hovers around three times greater than the white infant mortality rate. The Hispanic, Native American and Arabic populations also have higher infant mortality rates than the white population; but they are not always reported in demographics due to the smaller numbers. Some progress appears to be occurring in recent years (2008-2010) with decreases having been achieved for Hispanic infants. The white infant mortality rate has maintained at a low level for several years.



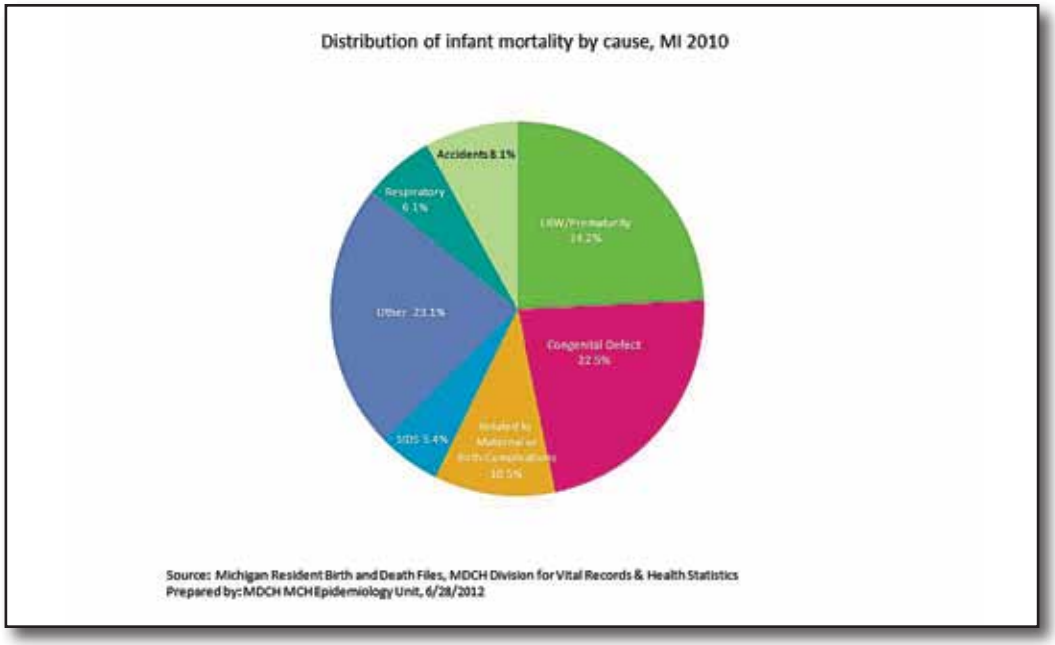
One of the critical messages is to encourage pregnant women to have a full term pregnancy, which is 39 weeks or more. Age of gestation is an indicator that is highly predictive of an infant's capacity to survive, regardless of race. The last few weeks of pregnancy, 36-39, are an important developmental time for baby. Mortality rates for infants born at gestational ages of 38-39 weeks can be reduced by approximately half compared to those born who have gained an additional 1-2 weeks to develop.



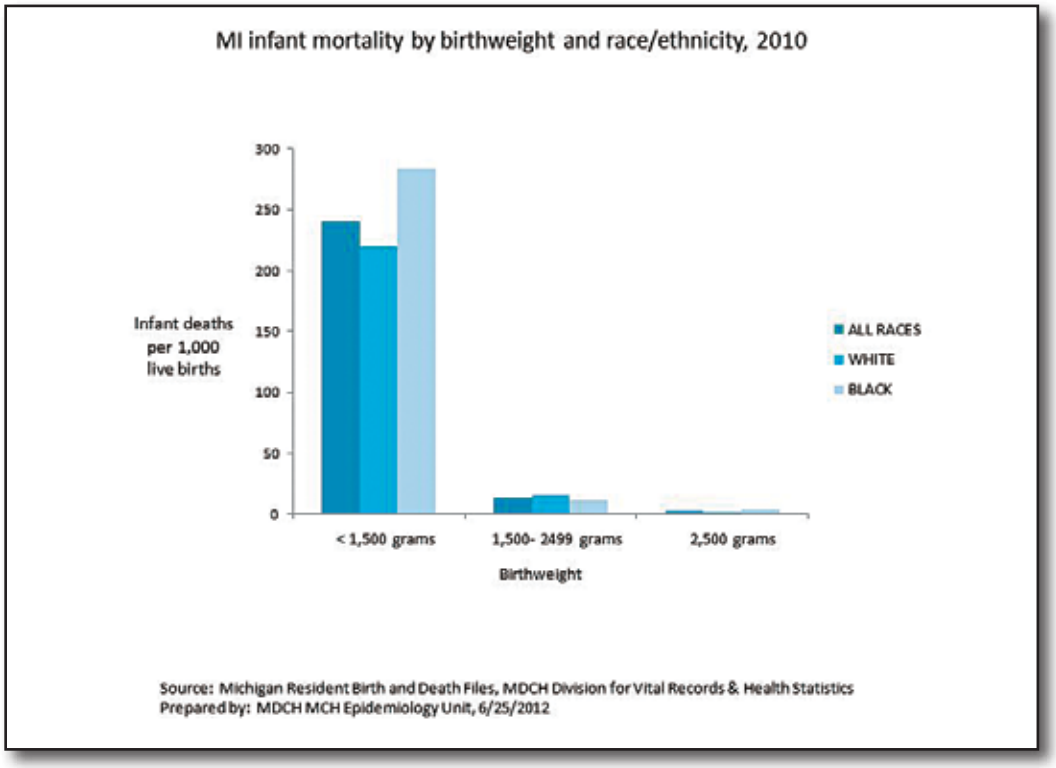
There is a difference in infant death rates by age and race. Young adolescent women have the highest rate of infant death for all races except for African-Americans. Disparity in infant death rates by race is extensive in our state. All age groups of African-American women have similarly high infant mortality rates.



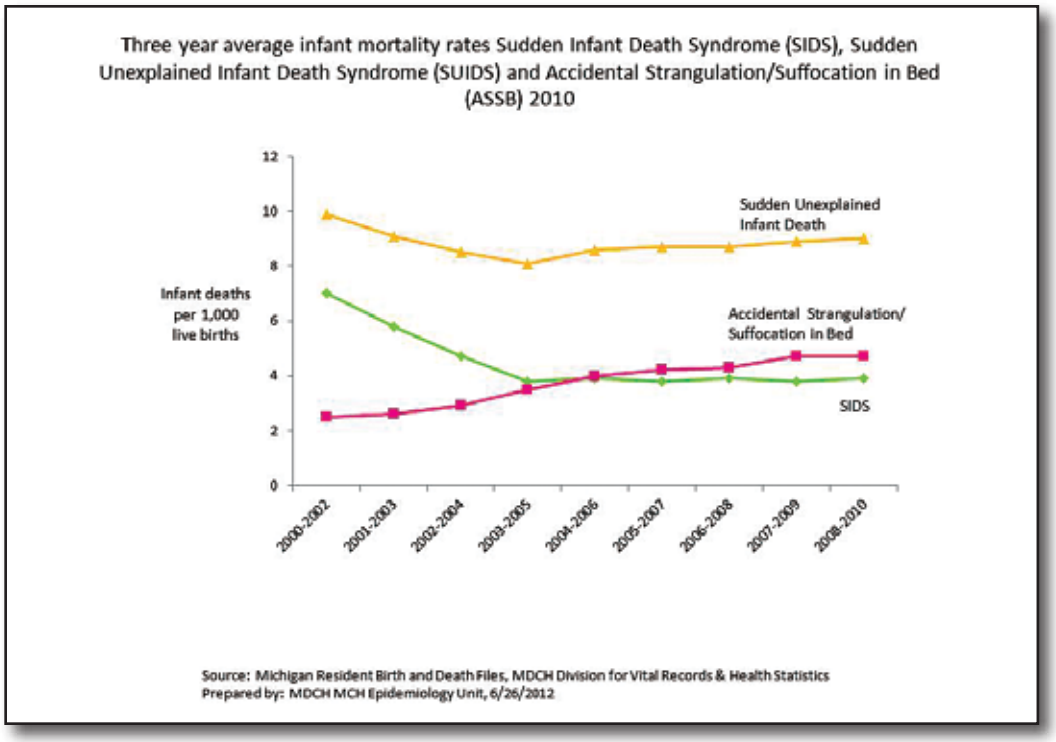
The most frequent cause of infant deaths is low birth weight (LBW)/prematurity. In 2010, infants born with very low birth weight (less than 1,500 grams or about 3.5 pounds) experienced an infant death rate of 240.9 per 1,000 live births compared to a rate of 2.3 for those infants weighing 2,500 grams (5.5 pounds) or more.



Birth weight for newborns is highly predictive of their survival in all races. Babies born at or above the desirable 2,500 grams or 5.5 pounds have better survival rates.



Since identifying the importance of infant sleep position and sleeping environment, there has been a drop in Sudden Infant Death Syndrome (SIDS) and an increase in the identifying cause of death attributed to accidental strangulation/suffocation in/on the sleep surface. There is a near flat rate of occurrences of Sudden Unexplained Infant Deaths and a rise in accidental strangulation/ suffocation in the sleep environment.



Considerable evidence exists about the factors that influence infant mortality. Evidence-based practices that target the most at-risk groups will help promote positive outcomes. Evidence-based practices have shown that:

- A statewide coordinated perinatal system of care will improve infant morbidity and reduce cost of care for high-need infants.
- Adoption of policies to eliminate medically unnecessary deliveries before 39 weeks of gestation will keep more babies alive.
- Adoption of a progesterone treatment protocol for high-risk women will prevent preterm birth – a leading cause of infant mortality in Michigan.
- Preventing suffocation of infants will keep more babies alive.
- Supportive home visiting services improve pregnancy outcomes and positively influence parenting practice.
- Women have better pregnancy outcomes when they are healthy prior to and in between pregnancies.
- Women who want to be pregnant have better pregnancy outcomes.
- Persistent health disparities among people of color are directly related to living conditions and personal experiences, and these factors must be addressed in any plan designed to improve birth outcomes of all people.

To reduce infant mortality and prevent infant deaths, MDCH is working to understand the contributing life issues from a historical, social and cultural perspective using a conceptual framework called Life Course Theory. This framework explains the origin of poor pregnancy outcomes and the disparities in infant mortality through a population based focus that is rooted in social determinants and social equity. There are four concepts used in the analysis: timeline, timing, environment and equity.

- Timeline: today's experiences and exposures influence tomorrow's health. The framework emphasizes early identification of health risk and intervention to improve optimal health. An important link between the health of mothers and the corresponding health of their infants underpins this plan.
- Timing: health trajectories are particularly affected during critical or sensitive periods such as during pregnancy. The timing of services and supports before pregnancy is important for preventing two determinants of infant mortality – preterm birth and low birth weight. The early programming associated with the health behavior of the mother is an important focus for improving the health of her baby.
- Environment: all physical, chemical, and biological factors external to a person's body and related behaviors that affect health. Linkages between health providers and community organizations that focus on such life factors as safe housing, food access, clean air and water, job opportunities, family violence and political engagement are likely to improve the impact of environment on the health of mothers and babies.
- Equity: rooted in historical policies and practices and is entrenched in social structures that create barriers to opportunity.

A second analytical framework for understanding infant mortality is the Perinatal Periods of Risk (PPOR). This model categorizes infant deaths to identify exclusive risk periods: Maternal Health, Maternal Care, Newborn Care and Infant Health, that correlate with specific risk factors, social, economic, and environmental determinants.

There are also four key concepts related to what is identified as the social determinants of health that are essential to understand if an impact in our infant mortality rates is going to occur:

- Social and environmental community: Health starts in our families, our schools, workplaces, in our playgrounds, parks, in the air we breathe and the water we drink, in the ability to buy affordable nutritious foods and to live in communities with low crime and violence.
- Economic: Families must have the financial resources to support a healthy home and community.
- Education: The importance of parents having a high school diploma will bring opportunity to a family.
- Access to quality health: It is essential that families have access to a medical and dental home and receive services.

Taking into consideration the role that racial disparities and the social determinants play in Michigan's infant mortality crisis, pilot activities and resource direction recently has been - and will be - geared toward the highest risk communities. This includes purposeful, measurable movement toward improved health equity as we improve the number of Michigan infants who survive and thrive.

Strategies and Goals 2012 – 2015

1. Implement a Regional Perinatal System
2. Promote adoption of policies to eliminate medically unnecessary deliveries before 39 weeks gestation
3. Promote adoption of progesterone protocol for high-risk women
4. Promote safer infant sleeping practices to prevent suffocation
5. Expand home-visiting programs to support vulnerable women and infants
6. Support better health status of women and girls
    a. Prevent and manage chronic conditions, including Michigan 4 x 4 initiative
    b. Integrate oral health promotion and treatment into the medical home
    c. Educate and build healthy living skills in students
7. Reduce Unintended Pregnancies
    a. Expand teen pregnancy prevention programs: Michigan Abstinence Program and Personal Responsibility Education Program
    b. Promote reproductive planning for all childbearing aged adults as a component of primary care and promote access to reproductive health services as needed.
8. Weave the social determinants of health into all targeted strategies to promote reduction of racial and ethnic disparities in infant mortality.

1. **Implement a statewide coordinated perinatal system using a regional model, and follow the recommendations and guidelines developed by Michigan's perinatal providers in Perinatal Regionalization: Implications for Michigan (2009). Full document found at http://www.michigan.gov/mdch/0,4612,7-132-2942-216919--,00.html.**

   a. Develop an implementation plan based on activities identified by Michigan Perinatal Advisory Committee, including an infrastructure to support a statewide perinatal system. Work with Michigan Health & Hospital Association, Michigan State Medical Society, Michigan Osteopathic Association, American Congress of Obstetricians and Gynecologists-Michigan Section, Michigan hospitals, local health departments, emergency medical services, Medical Services Administration, American Academy of Pediatrics-Michigan Chapter, Medicaid health plans, Children's Special Health Care Services, physician trade associations, nurses trade associations.

   b. Add perinatal consultant resources to support implementation, monitoring and consultation.

   c. Pilot the coordinated perinatal system implementation activities in a rural and urban region of the state. Use findings of the Spectrum Health System Neonatal Intensive Care Unit (NICU) follow up pilot and recommendations from Northern Lower Michigan perinatal stakeholders.

   d. Coordinate development of the perinatal system with other appropriate units of Michigan's health care services: Emergency medical services, Stroke/ST Segment Elevation Myocardial Infarction (stroke and heart attack emergency service system), Medical Services Administration, Michigan Primary Care Transformation Demonstration Project, Certificate of Need, etc.

   e. Publish the experiences of regional pilot programs.

   f. Modify statewide roll out of the coordinated perinatal system model to incorporate results of the pilot programs.

   g. Analyze birth outcome data from pilot programs.

   h. Identify statewide roll out plan based on input from the Michigan Perinatal Advisory Committee, NICU follow up pilot experience, and perinatal system pilot experience (rural and urban).

   i. Develop an evaluation plan for impact of implementation of coordinated perinatal system including metrics related to better health (infant mortality rates, low birth weight rates, preterm birth rates, cesarean-section rates, entry into prenatal care, appropriate for level of obstetric care, patient satisfaction with care, etc.

   j. Utilize the experience of Michigan Quality Improvement Consortium of the Vermont Oxford Network (VON) to improve outcomes of NICU graduates and processes of birthing hospitals.

2. **Promote adoption of policies to eliminate medically unnecessary deliveries before 39 weeks gestation.**

   a. Identify hospitals with current "Hard Stop" policies, and use lessons learned to promote incentives for statewide adoption of a hard stop policy for elective deliveries. Work with Michigan Health & Hospital Association, Michigan State Medical Society, American Congress of Obstetricians and Gynecologists-Michigan Section, March of Dimes, Michigan Osteopathic Association and birthing hospitals.

   b. Work jointly with Medical Services Administration, Michigan Health & Hospital Association and other professional associations for statewide adoption of a "Hard Stop" policy.

   c. Coordinate efforts within the state to support the Association of State and Tribal Health Officers' Healthy Babies Presidents' Challenge and the March of Dimes Prematurity Campaign to launch the national initiatives to reduce the state prematurity birth rate by 8 percent by 2014.

   d. Build on the federal initiative to reduce infant mortality by working with the regional effort to establish a Collaborative Improvement and Innovation Network (COIN) to keep infants alive, using an Association of State and Tribal Health Officers and Health Resources and Services Administration partnership approach.

3. **Promote adoption of progesterone protocol for high-risk women.**

   a. Use guidance information from Food and Drug Administration and American Congress of Obstetricians and Gynecologists to shape state policy for protocol development. Work with Medical Services Administration, Michigan State Medical Society, American Congress of Obstetricians and Gynecologists-Michigan Section, Michigan Osteopathic Association, Michigan Primary Care Association, March of Dimes, Michigan Health & Hospital Association, Wayne State University and Michigan State University-Institute for Health Care Studies.

   b. Survey Michigan hospitals for baseline information of current progesterone use protocol.

   c. Coordinate with Medical Services Administration to assure benefit coverage for universal screening and progesterone administration of Medicaid covered pregnancies.

   d. Partner with Wayne State University/Detroit Medical Center/Vanguard for lessons learned and promising practices of protocol development and implementation.

   e. Use professional organizations for education and technical assistance support.

   f. Partner with professional trade associations for media coverage and promotion. Work with Medical Services Administration, Michigan State Medical Society, American Congress of Obstetricians and Gynecologists-Michigan Section, Michigan Osteopathic Association, Michigan Primary Care Association, March of Dimes, Michigan Health & Hospital Association, advanced nursing practice organizations.

4. **Promote safer infant sleeping practices to prevent suffocation.**

   a. Promote prevention and intervention efforts that focus on assuring safe sleeping environments and prevention of suffocation for infants. Work with Medical Services Administration, Michigan Public Health Institute, Michigan Department of Human

Services, Michigan Department of Education, Children's Trust Fund, Michigan Council for Maternal and Child Health, American Academy of Pediatrics, Tomorrow's Child, Michigan's Children, Michigan Ad Council, and others.

b. Promote statewide delivery of strong messages about the importance of safe sleeping environments and prevention of suffocation for infants by 1) working with birthing hospitals, child daycare providers, home visiting programs, pediatric practitioners, etc. and 2) using public media (TV, radio and print) and social media.

c. Explore effective ways to reach parents, grandparents and caretakers with the "prevent suffocation" message, and assure consistent messages are delivered which are culturally and linguistically competent.

d. Expand and support current Fetal Infant Mortality Review (FIMR) activities to identify communities with infant suffocation deaths. Work with Michigan Public Health Institute, Keeping Kids Alive Program, local health departments, Spectrum Health, Michigan Department of Human Services.

e. Promote statewide usage of the American Academy of Pediatrics recommendations as the guideline for all infant safe sleep promotion in Michigan. See http://pediatrics.aappublications.org/content/128/5/1030.

f. Involve universities by incorporating infant safe sleep education into medical and nursing school curricula.

5. Expand home-visiting programs to support vulnerable women and infants.

a. Add four communities of at-risk populations per year to the statewide coordinated home visitation initiative, using evidence based models appropriate for identified risk.

b. Promote expanded use of home visitation programs for at-risk populations including the Michigan Medicaid Maternal Infant Health Program. Work with Medical Services Administration; Maternal Infant Health Program Providers; Michigan State University-Institute for Health Care Studies; obstetric providers; Women, Infant and Children Supplemental Food Program; local health departments and Federally Qualified Health Centers and community health centers.

c. Expand the Nurse Family Partnership home visitation model to all high-risk African-American communities to support intervention for women who are pregnant for the first time. Work with local health departments, Nurse Family Partnership-National Service Office, community health centers and Federally Qualified Health Centers.

d. Coordinate with available community resources to assure a broad, efficient, coordinated, comprehensive approach to home visitation delivery. Work with Early Childhood Investment Corporation, Great Start, Michigan Department of Education, local health departments, Federally Qualified Health Centers, community health centers, Home Visitation Programs (Maternal Infant Health Program, Nurse Family Partnership, Healthy Families America, Parents As Teachers, Early Healthy Start, Early On, child abuse and neglect prevention programs.

6. Support better health status of women and girls.

a. Identify and utilize evidence-based models that promote healthy behaviors in young girls and women of child bearing age and encourage use of patient centered medical home providers. Work with Michigan Department of Education, university health services, adolescent health clinics, local health departments, home visitation

programs, family planning agencies, health care providers, Medicaid health plans, Federally Qualified Health Centers, and community health centers.

b. Provide a specific focus on preventing and managing chronic conditions, such as overweight/obesity, diabetes, and high blood pressure, utilizing Michigan's Health and Wellness 4 x 4 Plan and use of culturally appropriate interventions for populations of color.

c. Integrate oral health promotion and treatment into the medical home model.

d. Promote enrollment in Plan First! and the use of Federally Qualified Health Centers and other community health clinic resources for women's comprehensive health care.

e. Update the Michigan Model of Health curriculum with the latest evidence-based approaches, and encourage expanded use. Educate and build healthy living skills in students.

7. Reduce Unintended Pregnancies.

a. Expand teen pregnancy prevention efforts.

1. Provide a specific focus on preventing teenage pregnancy, and preventing unintended pregnancies. Work with Michigan Department of Education, adolescent health centers, family planning providers, Federally Qualified Health Centers, community health centers, health care providers, Medicaid health plans, Medical Services Administration and private insurers.

2. Expand teen pregnancy prevention by using evidence-based programs (Michigan Abstinence Program to focus on abstinence in 13 additional communities, and Personal Responsibility Education Program for a comprehensive approach to expand to 14 additional communities) in communities with the highest burden of unintended pregnancy.

b. Promote enrollment in Plan First! and the use of Federally Qualified Health Centers and other community health clinic resources for women's comprehensive reproductive health care.

8. Weave the social determinants of health into all targeted strategies to promote reduction of racial and ethnic disparities in infant mortality.

a. Use evidence based models to address social determinants in all strategies implemented to reduce infant mortality. Resources include Michigan's Practices to Reduce Infant Mortality Through Equity (PRIME) project, the national Practices to Eliminate Disparity in Infant Mortality project, as well as other national efforts (Maternal Child Health Bureau, Association of State and Tribal Health Officers, Centers for Disease Control and Prevention) for infant mortality reduction that include a social determinant of health focus with a goal of health equity.

b. Coordinate efforts across state departments to address the social determinants of health in the following target cities – Pontiac, Saginaw, Flint and Detroit. Monitor indicators (health and related social indicators) to determine improvements in these communities. Initiatives such as Project LAUNCH (Linking Actions for Unmet Needs in Children's Health) in Saginaw, Sew up the Safety Net in Detroit, REACH (Racial and Ethnic Approaches to Community Health) in Flint, and FIMR (Fetal Infant Mortality Review) teams in Pontiac.

Infant Morality Steering Committee Organizations

American College of Obstetricians and Gynecologists

Baraga Houghton and Keweenaw Child Development Board

Children's Hospital of Michigan

City of Detroit Health & Wellness Program

Council of Mexico

DeVos Children's Hospital

Greater Detroit Area Health Council

Health Delivery, Inc.

Health Department of Northwest Michigan

Henry Ford Health System

Ingham County Health Department

Inter-Tribal Council of Michigan: Healthy Start & Teen Pregnancy Project

Michigan Association of Health Plans

Michigan Association of Local Public Health

Michigan Chapter American Academy of Pediatrics

Michigan Council for Maternal & Child Health

Michigan March of Dimes

Michigan Organization of Nurse Executives

Michigan Osteopathic Association

Michigan Primary Care Association

Michigan Public Health Institute

Michigan State Medical Society

Michigan State University

Michigan State University/Sparrow Hospital Neonatal Intensive Care Unit: Quality Improvement

Mott Children's Health Center

Nurse-Family Partnership

School Community Health Alliance of Michigan

Sparrow Pediatric Critical Care

St. Johns Health System

Tomorrow's Child

University of Michigan

W. K. Kellogg Foundation

Wayne County Health Department

Wayne State University

William Beaumont Hospital

Michigan Department of Community Health Participants

- Public Health Administration
- Bureau of Epidemiology
- Bureau of Family, Maternal and Child Health
- Medical Services Administration
- Division of Family and Community Health
- Division of Women, Infant and Children (WIC)

Appendix A

Infant Mortality Dashboard

Maternal & Infant Outcomes

	Prior (2009)	Current (2010)	Progress
Infant Mortality Rate			
White	5.4	5.5	↓
Black	15.5	14.1	↑
American Indian	9.0	10.5	↓
Hispanic	9.0	7.0	↑
Low Birth Weight %	8.4	8.5	↓
White	7.1	7.1	NC
Black	14.1	14.0	↑
American Indian	8.2	8.6	↓
Hispanic	6.7	7.1	↓
<39 wks Birth %			
White	27.9	28.9	↓
Black	35.3	36.5	↓
American Indian	26.9	29.1	↓
Hispanic	28.6	29.3	↓
Infant Suffocation Death Rate – MI	5.4	4.5	↑
White	3.3	2.8	↑
Black	15.3	11.3	↑
Hispanic	10.9	2.5	↑
Infant placed to sleep on back (2006 and 2008)			
White	77.8%	75.6%	↓
Black	57.2%	56.1%	↓
Hispanic	60.1%	70.8%	↑
MI Maternal Mortality Rate	28.4	41.0	↓
White	22.9	31.9	↓
Black	49.3	77.1	↓

Performance Key
↑ Improvement
↓ Decline
NC No Change

Pre-/Inter-conception Health

	Prior (2009)	Current (2010)	Progress
Pre-pregnancy BMI >30	24.6%	25.4%	↓
Mother smoked while pregnant	18.2%	17.8%	↑
Unintended Pregnancy	45.1%	45.2%	↓
Teen (15-17) Pregnancy Rate	25.8	23.6	↑
Breastfeeding Rate (WIC at 6 mos.)	18.5%	17.8%	↓
Ever Breastfed	53.5%	54.9%	↑
Chlamydia Rate	706	732	↓

Health Care System

	Prior (2009)	Current (2010)	Progress
LBW infants admitted to NICU	40.0%	37.7%	↓
NICU Central Line Infection Rate	NA	1.38	
Insurance Coverage (women 18-64)	84.5%)	84.2%	↓
1st Trimester Prenatal Care			
White	77.3%	78.0%	↑
Black	59.2%	61.9%	↑
American Indian	67.9%	68.7%	↑
Hispanic	66.5%	69.5%	↑
% Need Met for Publicly- Funded Family Planning Services (2010 & 2011)	17.0%	15.0%	↓

Appendix B

Michigan Call to Action to Reduce and Prevent Infant Mortality

Infant Mortality Summit: Work Group Recommendations

In October 2011, the Michigan Department of Community Health (MDCH) convened stakeholders from across the state to create Michigan's Call to Action to Reduce and Prevent Infant Mortality. The MDCH hosted a summit[1] to share information on infant mortality prevalence, disparities, and contributing factors; to highlight best practices, including those under way at the state and local community levels in Michigan. Michigan has a strong foundation of strategies aimed at improving the health of mothers and their infants, including programs that provide prenatal care, outreach and home-visiting services, nutritional services, and support for breastfeeding. Summit participants were asked to identify ways to "move the needle" and help Michigan make further progress in reducing infant mortality.

Nearly 300 summit participants were split into 15 work groups. Each work group was assigned a topic for discussion based on the contributing factors for infant mortality: individual and family circumstances; social issues; health care; and medical conditions. The work groups were asked to suggest three to five top priority strategies to reduce and prevent infant mortality in Michigan, with a focus on reducing disparity. Summit participants were also asked to identify the priority strategies they will personally support and the specific additional steps they will take to help reduce and prevent infant mortality on a *Take Action!* commitment form.

Public Sector Consultants compiled and reviewed work group recommendations to identify common themes. Several underlying principles resounded across work groups as they presented their suggestions and rationale for various strategies. These underlying principles should be considered as policies, programs, and strategies are developed, implemented, or expanded:

- Awareness of and attention to the influence of social determinants
- Promotion of the health of women throughout their life
- Use of clear and consistent messaging
- Dedication of resources to support evidence-based policies and programs

In addition to the underlying principles that emerged from work group discussions, work groups suggested the following targeted strategies to reduce and prevent infant mortality:

- Improve preconception health and reduce unintended pregnancies.
- Expand home-visiting programs.
- Promote safe sleep practices.
- Restore the regionalization of perinatal services.
- Promote statewide adoption of policies to eliminate medically unnecessary deliveries before 39 weeks gestation.
- Encourage statewide adoption of progesterone treatment for women identified as high-risk for preterm delivery.

Recommendations are described below, along with some of the specific ideas work groups suggested for implementation.

[1] The summit was sponsored by the W.K. Kellogg Foundation, the Early Childhood Investment Corporation, and the Michigan Department of Community Health, Women, Infants & Children Division.

RECOMMENDATIONS

Awareness of and attention to the influence of social determinants

Several work groups voiced agreement with the summit presenters that policy decisions must be viewed through a "health equity lens." Gender oppression, institutional racism, and economic disparity are recognized as the root causes of infant mortality. Work groups offered the following suggestions to raise awareness of these social determinants and reduce inequities.

- **Implement Practices to Reduce Infant Mortality through Equity (PRIME):** PRIME (an MDCH project funded by the W.K. Kellogg Foundation) seeks to promote an understanding of practices that support institutional racism. Effective implementation of PRIME may help eliminate disparities in other health outcomes as well. Develop a core curriculum, toolkits, and workshops on racism to foster the development of individual and corporate strategies to educate the public as well as health and human services staff on the social determinants of infant mortality. Use resources such as the Undoing Racism® Workshop from The People's Institute for Survival and Beyond.
- **Initiate a dialogue with stakeholders on social determinants:** Inform and educate stakeholders about how gender oppression, institutional racism, and economic disparity contribute to infant mortality. Make these issues an intentional part of the dialogue.
- **Educate the public and local media:** Hold town hall meetings to provide information on social determinants of health and the importance of addressing these issues.
- **Educate health care providers:** Offer continuing education for physicians and nurses to increase understanding about how gender oppression, institutional racism, and economic disparity influence disparities in infant mortality.
- **Advance societal perspectives of women:** Use social media, social marketing, and advertising campaigns to advance the image of women and promote positive cultural change regarding the value of girls and women. Support and expand programs such as Girls on the Run which develop girls' self-respect and promote healthy lifestyles.
- **Emphasize "place matters":** Consider the impact on infant mortality of policies that influence where women live, work, and play. Work with the Department of Environmental Quality to limit environmental exposures. Modify zoning ordinances to promote healthy environments with access to healthy foods and opportunities for physical activity.
- **Diversify the health care workforce:** Offer incentives to encourage more racially and ethnically diverse people to enter the health care professions.

Promotion of the health of women throughout their life

Several work groups also echoed the presenters when they emphasized the importance of women's health throughout their life course (before and between pregnancies; during pregnancy; during infancy; and during childhood and adolescence). The environment in which women live during each phase influences their own and their child's development and well-being. The following suggestions were made to encourage use of the life course perspective:

- **Adopt an institutional/organizational focus on the life course:** The Michigan Department of Community Heath, local public health departments, and community-based organizations should all use the life course model in program planning.
- **Engage youth as problem-solvers:** Involve youth in similar infant mortality summits or teen advisory boards to seek their input on barriers to reducing infant mortality and brainstorm solutions.

- **Target teenagers and women prior to conception:** Reach teenagers and women at risk before they become pregnant to reduce unintended pregnancies. Disseminate information about the importance of preconception health through providers who have frequent contact with women before conception, including dentists, chiropractors, pharmacists, physical therapists, and school health clinics.

Use of clear and consistent messaging

The need for clear and consistent messaging regarding infant mortality was raised by many of the work groups. Public health departments, health care providers, nonprofit organizations, businesses, news sources, and the broader community should coordinate their messages on infant mortality in order to create a strong, unified voice. Almost all work groups emphasized the importance of communication with youth, women, families, health care providers, legislators, and the community about infant mortality risks, prevention, and the impact of public policy decisions. Some specific suggestions about how to establish effective messaging are described below:

- **Partner with the media:** Utilize available technology, social media, and social marketing tools to spread messages on infant mortality. Provide media with public health messages regarding infant mortality and identify funding streams to support media campaigns.
- **Tailor messages:** Tailor messages to address target populations' beliefs, values, and concerns. Policy-makers, families, educators, and health care professionals each require specific framing of this issue. Convey all of the benefits associated with breastfeeding, safe sleep, prenatal care, and preconception health.
- **Create culturally and developmentally appropriate messages:** Empower community members to offer their own ideas on how to develop culturally sensitive and intergenerational messages using a community engagement model. Provide incentives for target populations to participate in focus groups.
- **Repeat messages:** The necessity of repeating any educational or motivational message multiple times has been well demonstrated.
- **Call on all stakeholders:** Empower a broad range of stakeholders and non-traditional partners (e.g., educators, policy-makers, city planners, faith-based communities) to relay messages on infant mortality. Promote awareness about contributing factors and how infant mortality affects everyone in order to create a shared responsibility and maximize use of limited resources. Train community health workers and providers at all points of contact to convey messages to their clients regarding prevention of infant mortality.
- **Empower teenaged girls and young women:** Provide general education on the importance of behavioral risk factors, preconception health, birth control, family planning (Plan First!), prenatal care, and home-visiting programs. Use social marketing and commercials to instill among young women a sense of confidence in their own potential and portray the consequences of unintended pregnancies.
- **Engage fathers**: Health care providers should encourage fathers to be involved and educate them on the importance of their support early on and throughout pregnancy. Consider the development of infant mortality prevention programs and activities focused on dads. Identify barriers to fathers' involvement and tailor messages to break down those barriers (e.g., fear of paying child support).

Dedication of resources to support evidence-based policies and programs

Several work groups stressed the importance of investing or, in the case of some programs, reinvesting funding to ensure statewide implementation and sustainability of programs that have

demonstrated success in reducing the risk factors associated with infant mortality and achieving positive pregnancy outcomes.

- **Garner political will:** Cultivate a sense of urgency for sufficient and consistent state funding by educating legislators and their constituents on the impact of infant mortality. Engage communities to advocate for funding and distribute information on the efficacy of evidence-based programs and the return on investment.
- **Dedicate resources for prevention of infant mortality:** Develop trust funds designated for prevention of infant mortality and supported with money from the state, foundations, and business community.
- **Reinstate funding for prevention of unintended pregnancy:** Increase funding for unintended pregnancy prevention programs, family planning programs, and comprehensive health education in schools.

Improve preconception health and reduce unintended pregnancies

Several work groups suggested improving access to health care, service delivery, and education throughout the life course to improve preconception and interconception health and reduce unintended pregnancies. Support of Plan First! and Well Women programs was mentioned specifically.

Access to health care

- **Provide comprehensive health care coverage:** Ensure that women have access to regular primary care, HPV vaccination, family planning, contraception, pre-conceptual counseling, prenatal care, midwifery care, and mental health care.
- **Increase provider reimbursement:** Increase Medicaid reimbursement for providers to increase the number of providers that accept Medicaid patients. In particular, increase Medicaid reimbursement for the Maternal Infant Health Program.
- **Standardize reimbursements across providers:** Create a state-level task force to identify creative financing strategies and federal matching funds to address reimbursement inequities between providers in different settings. For example, Federally Qualified Health Centers, rural health clinics, and private providers are all paid at different rates, which could be standardized. Adequate reimbursement will improve access to obstetric care.
- **Increase provider accessibility:** Encourage providers to increase outreach. Support training in cultural competency and sensitivity. Work to eliminate transportation barriers and increase the number of hours that providers are available.

Service Delivery

- **Promote comprehensive, coordinated care:** Use a care model that encompasses physical and mental health and takes into consideration the social issues or challenges women face.
- **Integrate service delivery:** In rural areas especially, increase the number of maternal and child health services provided in one encounter. Multi-purpose delivery points can eliminate the need for families to make multiple trips to multiple providers for different services.
- **Promote family-centered care:** Policies and programs should be tailored to families' needs. Train providers on the family-centered model. Involve families at all levels of decision making to promote empowerment and ownership of their situation.
- **Use population management systems:** Develop a systems approach to identify women and target messaging toward them. Integrated health records and information systems such as Electronic Health Records can help identify women at risk for adverse pregnancy outcomes

(due to diabetes, hypertension, or other chronic illness). Take advantage of the fact that hospitals and health systems are required to conduct community health needs assessments and use these to identify community health needs and determine target populations.

- **Promote equitable access to the medical home:** Use centering pregnancy models and multi-disciplinary teams to facilitate partnerships between women and their primary care provider. Pilot a program among obstetrics/gynecology providers similar to the Children's Healthcare Access Program (CHAP) in Kent County. Use a cost-benefit analysis to evaluate its effectiveness.
- **Expand school health services:** Make physical and behavioral health services available to youth through school-based health centers and nurses. Counseling, access to contraceptives, family planning, and sexually transmitted disease (STD) education and treatment are examples of services that need to be available in schools.

Education

- **Expand the Michigan Model:** The Michigan Model should be expanded across the state and its curriculum for K–12 education should be enhanced to include discussions on health disparities, family violence, sexuality, pregnancy prevention (both contraception and abstinence), self-esteem, and nutrition. Parenting and life skills education—including child development, nutrition, home management, and safe sleep practices—should be required in high school for both males and females. Partner with the Michigan Department of Education to develop these curricula.
- **Encourage conversations between parents and children:** Promote the Talk Early & Talk Often program to encourage conversations between parents and their children. Encourage parents to use the resources available from this initiative to assist them in educating their middle-school–aged children on topics related to sexuality.
- **Urge health professionals to promote parent-adolescent communication:** Encourage health professionals, including obstetrics/gynecology providers, to support communication by encouraging patients to talk with their children about issues of sexuality and the consequences of early pregnancy. Develop a checklist for medical professionals to assist them in this role.

Expand home-visiting programs

Several groups suggested strategies that offer women and their families social and medical supports throughout preconception, pregnancy, and motherhood. Emphasis was placed on programs and approaches with proven results and a solid evidence base.

- **Build on home-visiting programs that exist in Michigan:** Leverage state and federal dollars to support programs such as the Maternal Infant Health Program and Nurse-Family Partnership (NFP) and increase their capacity. Use a targeted expansion of the NFP that focuses on first-time moms, and produces long-term results and positive pregnancy outcomes.
- **Expand Early Head Start programs:** Early Head Start programs should be supported and expanded across the state.
- **Expand community outreach programs:** Support and expand community outreach and peer-to-peer mentoring programs that recruit mentors from the community to provide outreach and support to women and their families.
- **Encourage the use of social media:** Home-visiting programs should utilize social media as a communication tool with their clients (e.g., Text4Baby) and use a centralized entry system.

- **Mobilize and support community-based networks and organizations:** Take advantage of wrap-around programs that are connecting health and human services. Develop a community-wide clearinghouse of resources to provide access to services and educational materials, including information on what works and what doesn't.
- **Allow "flexible consistency":** Consistency of program services across the state is important, but so is maintaining the ability to tailor programs and tools. Allow communities to adapt programs to maximize their resources and meet their needs while adhering to evidence-based practice.

Promote safe sleep practices

Safe sleep practices were discussed among work groups from all focus areas. Suggested strategies include actions on the part of individuals, businesses, hospitals, health care professionals, media, and the community at large.

- **Increase messages and conversations on safe sleep:** Hospitals should make posters and videos available in hospital rooms to share with families prior to discharge. Health professionals across the continuum of care should engage new mothers in conversations about where their baby sleeps/naps. A safe-sleep toolkit could be modified for use in baby-sitting courses offered at hospitals, YMCAs, etc.
- **Increase social marketing:** Partner with retail outlets (e.g., Meijer) and business partners with the same target audience to spread the message on the importance of safe sleep practices. Use emotionally charged public service announcements or advertisements with stories from women that have experienced the death of an infant.
- **Emphasize "safe sleep practices":** "Back to sleep" is only one element of "safe sleep practices." Educate the community, families, and providers about safe sleep practices.
- **Provide new mothers with safe places for their babies to sleep:** Provide Pack and Plays and Sleep Sacks to all families when newborns are discharged from hospitals. Require families to complete an education module consisting of a video or brief class in order to qualify for these items. Seek creative financing and distribution methods.
- **Reduce the use of unsafe sleep products:** Educate health professionals and the broader community with messaging about the risks of bumper-pads and other unsafe sleep products. Engage in a dialogue with businesses responsible for producing and promoting products that contribute to accidental infant deaths. Ensure that existing and future products are safe and that proper use is heavily marketed. Pass a statewide ban on sale of bumper-pads and other unsafe sleep products.

Restore the regionalization of perinatal services

Work group participants acknowledged that significant work has already been done in Michigan to develop recommendations for perinatal regionalization. Work groups focusing on health care and medical conditions said that implementation of the recommendations from the 2009 task force on perinatal regionalization would improve infant health outcomes and safety. They identified a critical need for more human and financial resources to achieve successful restoration of a regional perinatal system in Michigan so that pregnant women and infants receive the right care, at the right time, at the right place.

Eliminate medically unnecessary deliveries before 39 weeks

Each medical conditions work group offered recommendations to reduce medically unnecessary deliveries before 39 weeks, as did several health care work groups. It was noted that change in

this regard will require a shift in cultural norms and expectations among both women and their care providers.

- **Reduce demand among women:** Beginning with the first prenatal care appointment, health care providers should educate women about the risks associated with medically unnecessary deliveries before 39 weeks. Pharmacists could be valuable partners in educating community members on the risks associated with pre-term births.
- **Implement hard-stop policies:** Educate providers, hospitals, and patients on the risks associated with elective deliveries. Hard-stop policies should be in place at all birth hospitals in the state. Toolkits on hard-stop policies can be supplied by the March of Dimes. Encourage hospitals and health systems to require the approval of the chief of obstetrics and gynecology for elective deliveries prior to 39 weeks. Promote adoption of a universal set of criteria for approval of deliveries before 39 weeks using the Michigan Health and Hospital Association (MHA) Keystone Center for Patient Safety & Quality, Trinity Health, and the American Congress of Obstetricians and Gynecologists (ACOG) as resources.
- **Garner support and organizational endorsements:** Seek support from the MHA, Leapfrog Group, and other major health organizations in the state to promote the adoption of hard-stop policies.
- **Prohibit payment:** Insurance plans and third-party payers should align payment with best practice by eliminating payment for medically unnecessary deliveries before 39 weeks.

Encourage statewide adoption of progesterone treatment for women identified as high-risk for preterm delivery

Almost all medical and health care work groups echoed Dr. Parisi's recommendation to encourage progesterone treatment for women identified as having a short cervix.

- **Standardize mid-trimester cervical-length screening of pregnant women using ultrasounds:** Make cervical screening part of an existing checklist for providers. For those women identified as having a short-cervix, encourage prescription of progesterone gel. Encourage commitment statements from all physicians to make the measure of the cervix in the second trimester a standard of care.
- **Provide payment for screening and treatment:** Add screening for cervix measurement to insurance plans' benefits packages. If indicated, progesterone treatment should be covered without prior authorization barriers, especially for women on Medicaid. Use a cost-benefit analysis to demonstrate the financial benefit of using screening to prevent pre-term births.
- **Educate the public and health care professionals:** Identify physician champions on this issue to encourage and educate their colleagues on the benefits of cervical-length screening and progesterone use for prevention of preterm births. Use mechanisms such as physician grand rounds, continuing education opportunities, and public health messaging to create urgency for implementation.

As the clinical strategies described above are implemented, one work group suggested that guidelines be developed for elective inductions, C-sections, cervical-length screening, second trimester ultrasound, progesterone prescription, and safe sleep practices. They should all have clear standards and Michigan Quality Improvement Consortium (MQIC) guidelines. Health plan medical directors should promote development of these guidelines and endorsement should be sought from the Michigan State Medical Society and Michigan Osteopathic Association, among others.

Ongoing evaluation was also prescribed for all of the clinical strategies above. For example, each year the Vital Statistics department should publish how many children are born at 35, 36, 37, and 38 weeks to determine the efficacy of hard-stop policies.

NEXT STEPS

Work group recommendations will be considered by the Michigan Department of Community Health as it works to develop a draft Michigan Action Plan to Prevent and Reduce Infant Mortality. The MDCH Infant Mortality Steering Committee will review and help finalize the action plan.

Meanwhile, all summit participants were encouraged to consider the additional steps they or their organization can take to help prevent and reduce infant mortality in Michigan. There were 135 people who completed a *Take Action!* commitment form during the conference. Of these, 119 said they would spread the word by sharing information on the importance of reducing infant mortality with at least 10 contacts; 128 made specific commitments to support strategies recommended at the summit.

Appendix C

MDCH Infant Mortality Initiative

Academic Medicine Subcommittee

Guidelines for Planned Delivery less than 39 Weeks Gestation

I. Recommendation

A. That an educational program for providers and hospitals address the risks of delivery before 39 weeks and the tools available to reduce elective deliveries before 39 weeks.

B. That data are collected regarding the number of deliveries at each individual week of gestation 35, 36, 37, 38 annually to assess effectiveness of this intervention.

II. Causation and Impact

Preterm delivery (less than 37 completed weeks of gestation) is the leading cause of infant mortality in the U.S. The rate of preterm delivery has increased markedly since the 1990 (9.3% in 1990 to 12.3% in 2008). The increase in preterm delivery has been primarily in the gestational ages of 32-37 weeks. Adverse infant outcomes are inversely proportional to gestational age up to 39 completed weeks of gestation. Many of these preterm deliveries and "early term" (37-39 weeks) are planned for medical or elective reasons. This increase in planned early deliveries has been associated with an improvement in the rate of stillbirth, however concern remains that there are preventable adverse outcomes related to planned delivery at less than 39 weeks gestation.

III. Evidence based Intervention data

The American College of Obstetricians and Gynecologists established a policy in 1979 that planned delivery without a medical indication should not occur before 39 completed weeks of gestation. This policy has not been universally implemented. Studies have shown that implementation requires a process that prevents elective delivery without prior review by a responsible local authority. Medical education and/or post hoc peer review is ineffective. System wide processes that require prior review before scheduling delivery have reduced rates of late preterm and early term deliveries . A recent National Institute of Child and Human Development/Society for Maternal Fetal Medicine workshop developed guidelines for planned early delivery for medical and obstetric reasons (Spong, C; Obstetrics and Gynecology, in press). The Hospital Corporation of America has developed a comprehensive patient safety initiative that has reduced planned births before 39 weeks (ref: Clark SL, Meyers JA, Frye DK, Perlin JA Patient safety in obstetrics--the Hospital Corporation of America experience. Am J Obstet Gynecol. 2011 Apr; 204(4):283-7.) A consortium of California ACOG, Dept Public Health and the March of Dimes have developed a toolkit "Elimination of Non-medically Indicated (Elective) Deliveries Before 39 Weeks Gestational Age (Less Than 39 Weeks Toolkit)" http://www.marchofdimes.com/professionals/medicalresources_39weeks.html

IV. Implementation plan

-- Educational material should be distributed to providers and hospitals regarding the risks of delivery before 39 weeks, the ACOG policy, and the NICHD/SMFM guidelines.

-- Individual hospital data regarding preterm delivery rate and delivery rate at 37wk 0days to 38wk-6days should be collected and shared with hospitals.

-- Hospitals and providers should be encouraged to collect data about 1) elective deliveries 2) planned deliveries at less than 39 weeks.

V. How to measure success

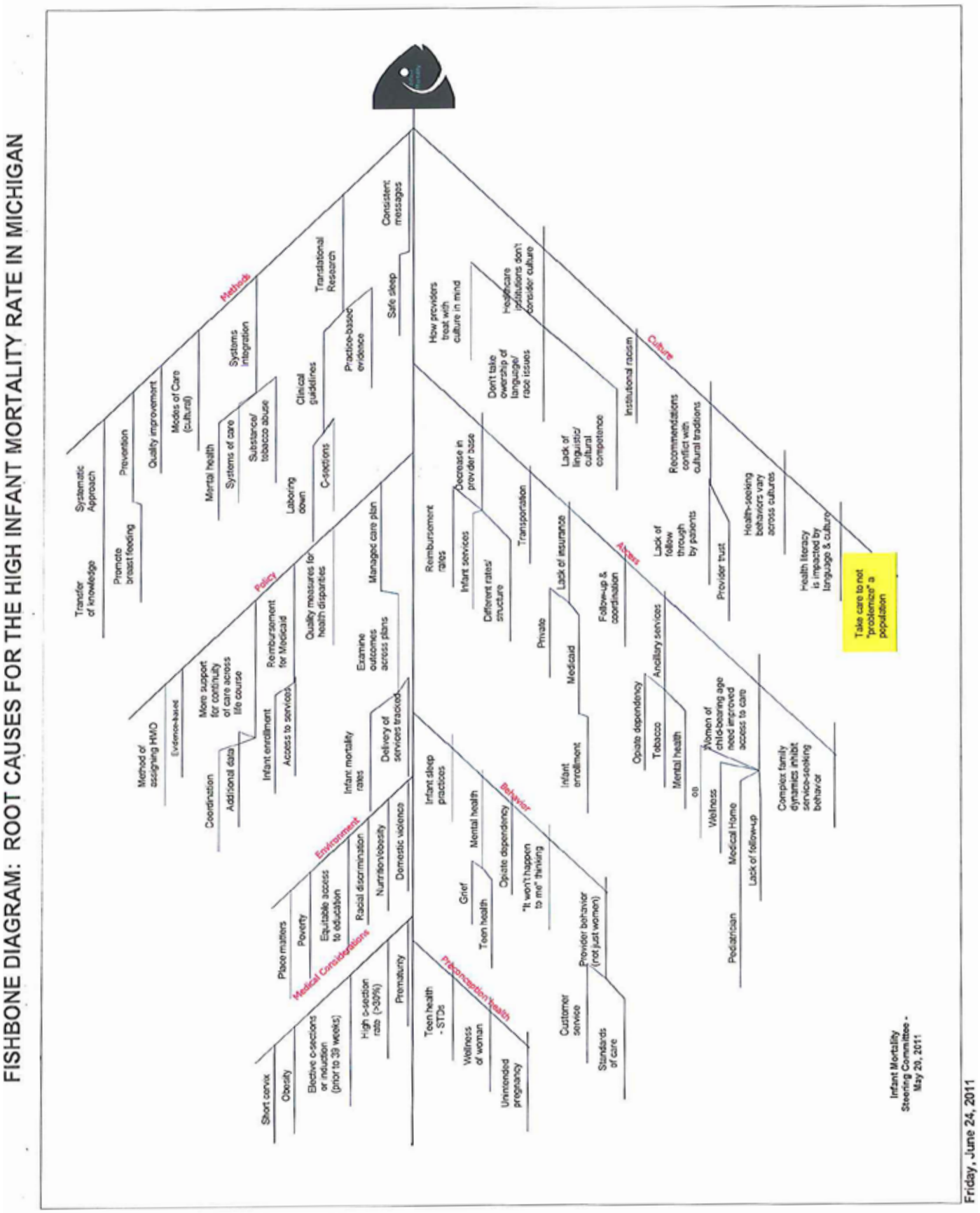
Using vital statistics, trends for gestational age at delivery, especially 34, 35, 36, 37, 38 weeks gestation over time would reflect improvements. Live born and stillborn data should be collected.

Appendix D

Infant Mortality

Major Causes	Examples
Access	Perinatal Regionalization Home visiting Unwanted/unintended pregnancies (family planning) Mental health Teen health education
Behavior	Smoking Cessation
Culture	Safe Sleep
Environment	Social determinants • Health equities • Place matters • African American & Hispanic women
Methods	Focus on what works Prevent prematurity • Progesterone treatment • No elective delivery prior to 39 weeks Translation of research into practice • Use of clinical guidelines
Policy	Enrollment into Medicaid & re-enrollment Implementation of Safe Delivery Act

Appendix E


FISHBONE DIAGRAM: ROOT CAUSES FOR THE HIGH INFANT MORTALITY RATE IN MICHIGAN
Methods
Transfer of knowledge
Systematic Approach
Promote breast feeding
Prevention
Quality improvement
Modes of Care (cultural)
Mental health
Systems of care
Substance/ tobacco abuse
Systems integration
Laboring down
C-sections
Clinical guidelines
Practice-based evidence
Translational Research
Safe sleep
Consistent messages
Policy
Method of assigning HMO
Evidence-based
More support for continuity of care across life course
Coordination
Additional data
Infant enrollment
Access to services
Reimbursement for Medicaid
Quality measures for health disparities
Examine outcomes across plans
Managed care plan
Reimbursement rates
Infant services
Decrease in provider base
Different rates/ structure
Transportation
Access
Private
Lack of insurance
Medicaid
Follow-up & coordination
Lack of follow through by patients
Provider trust
Health-seeking behaviors vary across cultures
Health literacy is impacted by language & culture
Take care to not "problemize" a population
Environment
Infant mortality rates
Delivery of services tracked
Place matters
Poverty
Equitable access to education
Racial discrimination
Nutrition/obesity
Domestic violence
Behavior
Infant sleep practices
Mental health
Opiate dependency
"It won't happen to me" thinking
Grief
Teen health
Infant enrollment
Opiate dependency
Tobacco
Ancillary services
Mental health
Women of child-bearing age need improved access to care
OB
Wellness
Medical Home
Lack of follow-up
Pediatrician
Complex family dynamics inhibit service-seeking behavior
Medical Considerations
Short cervix
Obesity
Elective c-sections or induction (prior to 39 weeks)
High c-section rate (>30%)
Prematurity
Preconception health
Teen health - STDs
Wellness of woman
Unintended pregnancy
Customer service
Standards of care
Provider behavior (not just women)
Culture
Institutional racism
Lack of linguistic/ cultural competence
Recommendations conflict with cultural traditions
Don't take ownership of language/ race issues
How providers treat with culture in mind
Healthcare institutions don't consider culture
Infant Mortality Steering Committee - May 20, 2011
Friday, June 24, 2011

Appendix F

Preterm Birth Prevention in Women with a Sonographic Short Cervix

This document will outline best practices for perinatal care providers in the evaluation and treatment of pregnant women with a goal of reducing the incidence of preterm births.

The challenge posed by a preterm labor and delivery remains a formidable one. Each year, nearly 30,000 infants die before reaching one-year of life. In its broadest terms, one out of every eight births in the United States delivered before 37 weeks'. This yielded over 525,000 infants with preterm births in 2005: nearly one out of every eight births in the United States that year. As significant as the mortality rate is, even more significant is the significant risk of injury and disability that early deliveries create for the infant. The major neonatal morbidities associated with preterm birth include problems such as respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis, chronic lung disease, and vision and hearing impairment. There is also a significant increase in problems related to neurosensory impairment compared cognition and motor performance, difficulties with achievement in school, as well as attention deficit disorders. The consequences of these major morbidities and their frequency are greatest before 32 weeks of gestation.

Recently, a multicenter, randomized, placebo-controlled trial was conducted by the Perinatology Research Branch and Columbia Laboratories (co-sponsors) that enrolled asymptomatic women with a singleton pregnancy and a sonographic short cervix (10 to 20 mm) at 19 - 23 6/7 weeks of gestation. The primary outcome was delivery at less than 33 weeks of gestation.

A publication on April 6th (http://onlinelibrary.wiley.com/doi/10.1002/uog.9017/pdf) and in print in July (Hassan et al., Ultrasound Obstet Gynecol. 2011 Jul;38(1):18-31), demonstrated that the administration of vaginal progesterone gel to women with a sonographic short cervix (10 – 20 mm) in the midtrimester was associated with a 45% reduction in the rate of preterm birth before 33 weeks, a 50% reduction in the rate of preterm delivery before 28 weeks and a 38% reduction in the rate of preterm delivery before 35 weeks of gestation. The use of vaginal progesterone gel was also associated with improved neonatal outcomes; a 61% reduction in the rate of respiratory distress syndrome.

The potential cost savings with the use of this strategy is $19 million for every 100,000 pregnant women screened (Werner et al., Ultrasound Obstet Gynecol. 2011 Jul;38(1):32-7).

As a result of the findings described above, the following recommendations are made:

Recommendation:

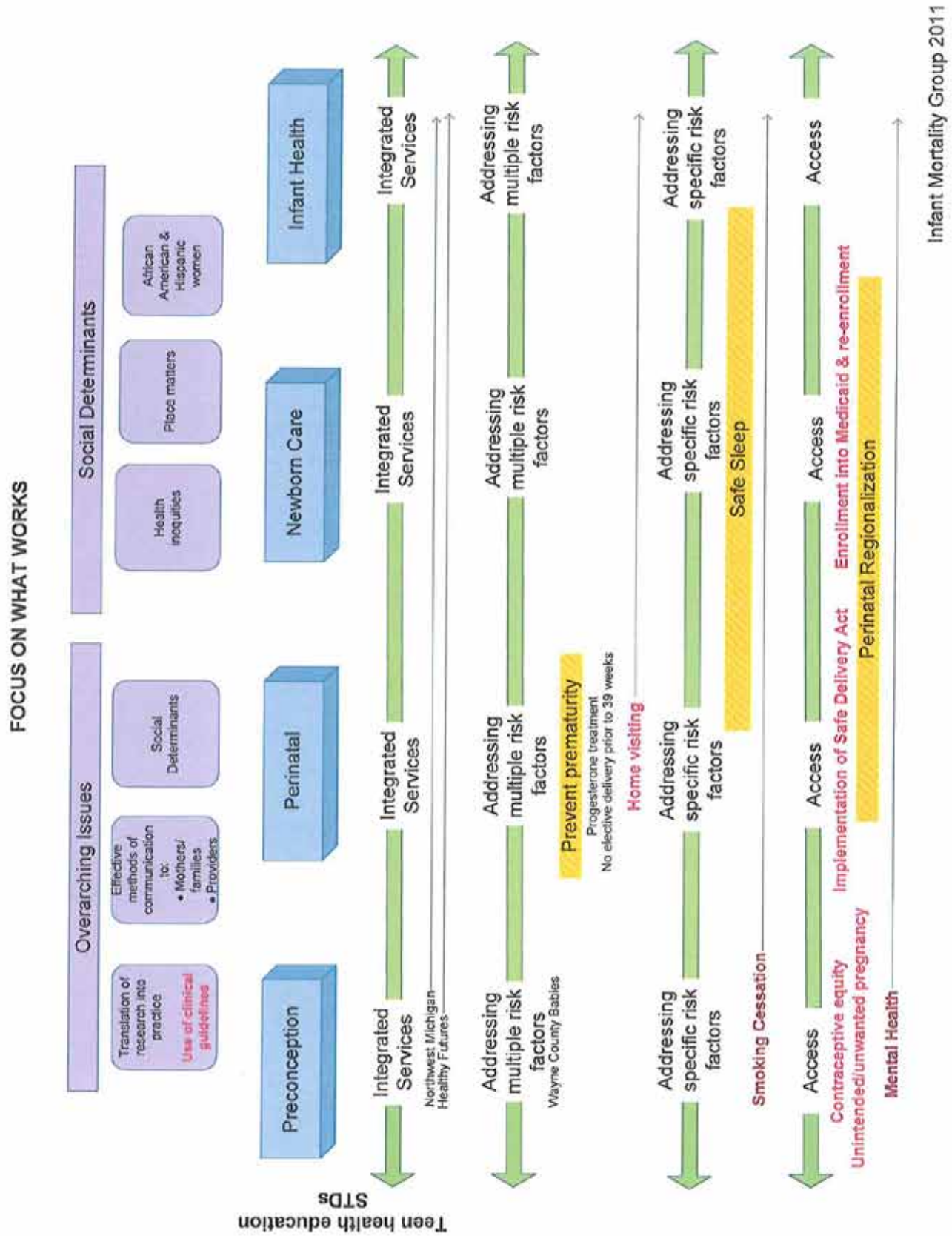
Perform sonographic cervical length screening of all pregnant patients at 19 - 23 6/7 weeks gestation using transvaginal ultrasound. This can be done at the same time as the ultrasound performed for the anatomical survey. If patients are found to have a cervical length 10 - 20 mm then it is recommended that the patient be prescribed vaginal progesterone gel. The progesterone formulation to be used in this instance is a vaginal progesterone gel available by prescription as Prochieve 8% or Crinone 8% and is administered as a once daily dose of one applicator (90 mg) per vagina to be taken each morning.

Cervical length measurements must be performed carefully to assure that accurate and reliable information is being attained.

Further recommendations for the State of Michigan:

1. Secure reimbursement for universal transvaginal sonographic screening of cervical length.
2. Reimbursement for the use of vaginal progesterone for the prevention of preterm birth in women with a sonographic short cervix. Easiest access (without a requirement of pre-authorization) would be optimal.
3. Education of physicians, health-care practitioners, nurse midwives, nurses, and patients.
4. Tracking mechanism for patients who undergo universal sonographic screening of cervical length to document maternal and neonatal outcomes.
5. Evaluation of access of this treatment plan for patients state-wide.
    a. Access to transportation to facilities to undergo transvaginal ultrasound screening.
    b. Access to medication – pharmacy supply: this medication is currently used by patients in the first trimester who undergo Assisted Reproductive Technology.
    c. Increased need for Maternal-Fetal Medicine consultations: this will likely be needed as a result of the more frequent identification of a sonographic short cervix.

Appendix G


FOCUS ON WHAT WORKS
Overarching Issues
Translation of research into practice
Use of clinical guidelines
Effective methods of communication to:
• Mothers/ families
• Providers
Social Determinants
Social Determinants
Health inequities
Place matters
African American & Hispanic women
Preconception
Perinatal
Newborn Care
Infant Health
Integrated Services
Northwest Michigan Healthy Futures
Addressing multiple risk factors
Wayne County Babies
Prevent prematurity
Progesterone treatment
No elective delivery prior to 39 weeks
Home visiting
Addressing specific risk factors
Safe Sleep
Smoking Cessation
Access
Contraceptive equity
Unintended/unwanted pregnancy
Implementation of Safe Delivery Act
Enrollment into Medicaid & re-enrollment
Perinatal Regionalization
Mental Health
Teen health education
STDs
Infant Mortality Group 2011

Appendix H

MDCH Infant Mortality Initiative

Academic Sub-Committee

Infant Safe Sleep/Sudden Unexpected Infant Deaths

Recommendations

1) Use the AAP recommendations as the guideline for all Infant Safe Sleep efforts in Michigan

2) Integrate safe sleep education into medical and nursing school curricula

    a. Focus on pediatrics, obstetrics and gynecology, family medicine

    b. Implement a standard curriculum across medical and nursing schools

    c. Based on AAP recommendations

    d. Utilize print and online teaching materials

1) Continue Infant Safe Sleep efforts to:

    e. Assure all caregivers receive a consistent message

    f. Messages are culturally and linguistically competent

Causation & Impact Data

Plausible casual associations have been shown in well designed epidemiologic studies between the modifiable risk factors of prone sleep, soft sleep surface/bedding, and maternal smoking during pregnancy and an increase in the odds ratio of sudden unexpected infants deaths (SUID). The plausibility of the causal association between SUID and sleep position is strengthened by observations that in the United States and in other countries where the risk factors have been modified via educational campaigns or where cultural practices create lower risk environments, the prevalence of SUID decreases or is already low. Epidemiologic studies also have identified overheating, bed sharing, preterm birth and low birth weight as factors increasing the risk of SUID; and use of pacifiers at time of last sleep as a factor reducing the risk of SUID. The evidence for these factors is not as compelling as for supine sleep but meta-analyses of studies concerned with these latter risk factors suggest that these are also modifiable and will result in lower odds of SUID. When race is considered in the epidemiologic studies, African-American infants have increased odds of SUID occurrence compared to Caucasian infants. The black population has consistently had the lowest use of back sleep for infants and the highest use of stomach sleep. To the extent that sleep position contributes to sleep-related infant death rates, this disparity has likely led to a high number of potentially preventable deaths among Black infants. African-American infants have also been found to be 4 times more likely to routinely bed-share than white infants.

In Michigan, the African American infant mortality rate increased in 2009 and is nearly 3 times that of white infants: 15.5% compared to 5.4%. Michigan SIDS rates have declined over 50% since Back to Sleep was recommended in 1992 by the American Academy of Pediatrics (AAP). Despite the perceived decrease, a diagnostic coding shift has occurred and SIDS rates have been offset by an increase in other causes of death. In 2001, there were 91 infant deaths coded as SIDS and 33 as accidental suffocation and strangulation in bed (ASSB) compared to 2009 with 37 SIDS and 57 ASSB. African-American infants remain disproportionately affected by SUID.

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a population-based survey that provides data on maternal characteristics and risk factors for infant mortality. The 2008 Michigan PRAMS data illustrates the disparity in sleep practices: 75% of white mothers placed infants on the back to sleep compared to 56.1% of African American mothers. Data on the prevalence of never bed sharing indicate only 19.3% of African American mothers and 45% of the white mothers reporting to never bed share.

Evidence based intervention data

Evidence based interventions have not been established for SUID prevention. Several cross-sectional interview studies and random sample representative interview studies have documented the effects of mothers' beliefs and the advice received on modification of risk factors. Mothers who received advice from a physician or nurse were more likely to report behaviors which reduced the risk of SUID (i.e., supine sleep, no bed sharing, etc.). Studies indicate that <70% of physicians and <44% nurses report giving advice exclusive supporting back sleep. Mothers who believed that their infants were

comfortable on their backs had increased odds of exclusively using supine sleep positions whereas mothers who were concerned about their infant choking were less likely to exclusively use supine sleep. Qualitative studies have investigated factors that influence African American parents' decisions regarding bed-sharing and infant sleep location. The major factors influencing decisions were safety, comfort, convenience and space: the primary reason was infant safety.

Implementation Plan

Since 1992 there has been a decrease in SIDS/SUID rates co-occurring with a decrease in prone sleep position. However, changes in other modifiable risk factors have not been as great. Exploratory studies suggest that advice from medical professionals has a great affect in changing risky behaviors related to infant sleep. Training of medical professional is required before parents will routinely receive consistent and correct information on risk factors for and prevention of SUID. Safe sleep education should be integrated into medical and nursing school curricula with a focus on pediatrics, obstetrics and gynecology, and family medicine. The Academic Sub-Committee proposes to work with the medical education community to develop a standard curriculum for Michigan medical and nursing schools based on the American Academy of Pediatrics recommendations. The curriculum should include print and online teaching materials for pre-practice education and continuing education of practitioners. Concurrently, Infant Safe Sleep efforts should continue to assure that all caregivers, especially those disproportionately affected by SUID, receive consistent messages that are culturally and linguistically competent and based on the AAP recommendations.

How to Measure Success

Reduction in the incidence of SUID is the long term outcome. Intermediate outcomes include the number of medical and nursing schools which include safe sleep education in their curricula; an increase in the number of medical practitioners who report providing safe sleep education to their patients; an increase in the number of parents who report receiving such education and advice; an increases in the odds of parents engaging in safe sleep practices when provided advice by a medical practitioner; and changes in beliefs of parents when provided information and advice by a medical practitioner.

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Appendix I

Michigan Infant Mortality: Social Determinants, Contributing Factors, and Evidence-based Interventions			
	Contributing Factor	**Evidence Based Interventions** **IOM, CDC, MCHB, AAP, ACOG, NIH, etc.**	**Michigan Programs**
Gender Oppression, Institutional Racism and Economic Disparity	**Medical Conditions**		
	Birth Defects Respiratory Conditions Short Cervix Prematurity Wellness of Women (Preconception) Children with complex medical needs Postpartum Depression Perinatal Oral Health	Analysis of fetal & infant deaths[3]	FIMR
		Early screening – in prenatal and newborn screening[4, 5]	NBS CSHCS
		Special services for infants with high health conditions[6,7,8]	CSHCS
		Smoking cessation programs for pregnant women have been shown to reduce smoking and prematurity and to increase birthweight[5,9]	Smoking Cessation Prenatal Smoking Cessation
		Home visiting support[10,11]	MIHP
		Preconception and interconception interventions[5,12, 13]	
		Prenatal folic acid-fortified multivitamins are protective against neural tube defects, cardiovascular defects and limb defects[5,9] Women's Health Screening[14]	Family Planning
		Perinatal Oral Health [15]	Oral Health
		To reduce premature births	Perinatal Regionalization
		· Birth to conception interval of 18 – 59 months	
		· Progesterone use in women at increased risk of preterm birth	
		· Avoid iatrogenic prematurity due to labor induction or planned cesarean birth before 37th completed week of pregnancy[5,9]	
		Progesterone use & Short Cervix[16]	
		Depression guidelines, adult (includes perinatal)[17].	

Appendix I *(continued)*

	Contributing Factor	Evidence Based Interventions IOM, CDC, MCHB, AAP, ACOG, NIH, etc.	Michigan Programs
	Health Care		
Gender Oppression, Institutional Racism and Economic Disparity	Non-ER C/S < 39 weeks Racial Discrimination Access to Care - Women's Health - Mental Health - Pediatric Care - Subst Abuse - Dental Care Health literacy Perinatal Infections	Access to medical care[5,18,,19]	MOMS
		Health care payment[18,19].	Medicaid Health Plan Healthy Kids Medicaid Outreach
		Home visiting support[11]	MIHP NFP
		Medical home[20,21]	CSHCS Medical Home Pilot Kent County Medical Home Children's Healthcare Acess Program (CHAP)
		Right patient, right place, right time[22]	Perinatal Regionalization
			PRIME (Practices to Reduce Infant Mortality through Equity)
		Health Care Disparity[11,18]	Place Matters
		Social justice policies[24,25]	Racial & Ethnic Approaches to Community Health
		Exclusive breastfeeding[5,9,26,27]	Breastfeeding WIC
		Quality Measures[5,19,22]	
		There is a lack of a National Standardized set of Perinatal Performance Measures[9]	
		• OB Keystone Project by MHA is used in many birthing hospitals (labor induction, non glottal pushing, 39 week gestational age, pitocin use)	Keystone Project
		• Mi QI Collaborative – Vermont Oxford Network (central line infections, use of human milk to decrease nec. Infections)	MI QI Collaborative
		Delay elective inductions and C/S to 39+ week gestation[5]	
		Health Literacy[35,36]	
			Project LAUNCH
			Safe Delivery

	Contributing Factor	Evidence Based Interventions IOM, CDC, MCHB, AAP, ACOG, NIH, etc.	Michigan Programs
	Social Issues		
Gender Oppression, Institutional Racism and Economic Disparity	Education Employment Housing Transportation Food Insecurity Health Literacy - Language - Culture	Home visiting support[11]	MIHP NFP MI Maternal Infant and Early Childhood Home Visiting Prog.
		Economic support through additional income[11]	PRIME Place Matters
		Improving neighborhood conditions[11,25]	
		Translation services [28]	ATT Translation Services
		Health Literacy[35]	
		Healthy community [25]	Healthy Start Healthy Kids SNAP
			Moms
			DHS
			Adolescent Health Centers

	Contributing Factor	Evidence Based Interventions IOM, CDC, MCHB, AAP, ACOG, NIH, etc.	Michigan Programs
Gender Oppression, Institutional Racism and Economic Disparity	**Individual & Family Circumstances**		
	Infant Sleep Practices Accidents Substance Abuse Domestic Violence Teen STDs Nutrition/Obesity Unintended Pregnancy Mgmt of chronic disease	Sleep environment/positioning[28]	Back To Sleep/Safe Sleep Environment
		Accident prevention[29]	Seat belt & car seat usage Safe Kids
		Alcohol, drugs, tobacco prevention/cessation[4,5,9]	MIHP NFP Fetal Alcohol Spectrum Disorder Substance Abuse - Women's Specialist
		Smoking Cessation[5,9].	Prenatal Smoking Cessation
		Education/screening for STIS[5,9,13]	Family Planning/Plan First/TPPI
		Access to health and nutrition information & resources[25]	WIC
		Health education & source seeking support[18]	
		Obesity Clinical Guidelines[30,34]	Nutrition Physical Activity & Obesity Program
		Asthma clinical practice guidelines[31]	
		High Blood Pressure Clinical Practice Recommendations[32]	
		Diabetes Clinical Practice Recommendations[33,34]	Diabetes Program
		Reproductive health plans for adults and adolescents[12]	Adolescent Health Centers Family Planning/Plan First/TPPI
		Health education in the schools	MI Model
			Pregnant Women & Infants
			MI Quality Improvement Process
			MI Personal Action Towards Health
			MI Health Baby

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Appendix J

Perinatal Regionalization: Implications for Michigan

A report by the Michigan Department of Community Health (MDCH) in collaboration with Michigan neonatal, obstetric and pediatric stakeholders.

April 2009

Executive Summary

Infant mortality is a major public health issue in the State of Michigan. For every 1,000 Michigan live births, approximately eight infants die before reaching their first birthday. Comparative data from the Centers for Disease Control and the Michigan Department of Community Health (MDCH, 2009) indicate Michigan's infant mortality rate consistently exceeds the national average. Although Michigan's population-based infant mortality rate has slightly decreased since 2000, alarming disparities continue to exist among various racial and ethnic groups, particularly between African Americans and Caucasians. To examine this issue, Michigan PA 246 of 2008 was signed into law, mandating the Michigan Department of Community Health to convene appropriate stakeholders to determine the efficacy and impact of restoring a statewide coordinated regional perinatal system in Michigan and report on practices, expected potential impact on infant mortality, and recommendations for policy and funding of such a system in Michigan. In response, MDCH convened work groups of clinical experts in neonatal, obstetrical, and pediatric specialties in early 2009 to produce this report.

Michigan was a national leader in regionalization of perinatal systems in the 1970s and 1980s. This system gradually de-regionalized over the subsequent two decades, and by 2005, formal perinatal regionalization no longer existed in the state. Studies conducted in and outside Michigan found that highly specialized NICU staff and sophisticated equipment are necessary to care for neonates requiring complex, intensive treatment. A 2005 study produced by MDCH and Grand Valley State University recommended rebuilding perinatal regionalization, developing detailed definitions and evidence-based practice guidelines for levels of care, and examining capacity and need to develop more well-defined and coordinated regions. To date, evaluations of the impact of perinatal regionalization have focused primarily on the quality and safety of maternal and perinatal care, rather than fiscal analyses or return on investment. However, published information does support that regionalized perinatal care is inherently cost effective, because care is organized and delivered according to the evidence base and patient need. This report provides an initial administrative cost estimate to implement perinatal regionalization in Michigan, understanding that further studies and analyses are necessary. The Perinatal Workgroups also stressed the need for ongoing participation in quality improvement initiatives such as the Vermont Oxford Network, which collects data from neonatal intensive care units (NICUs) around the world to study the impact of interventions on outcomes of perinatal care.

In order to implement perinatal regionalization, evidence-based guidelines for care are required that fully integrate applicable aspects of obstetric and neonatal clinical care. The Perinatal Workgroups were charged with modifying current, evidence-based obstetric and pediatric levels of care guidelines; as a result, Appendix A Michigan Perinatal Level of Care Guidelines was produced by consensus, which reflects Michigan-specific standards and will serve as the foundation for the State's coordinated perinatal system. These Michigan guidelines include strategies to improve access to service, identify risk early, provide linkage to the appropriate level of care and ensure compliance, continuity and comprehensiveness.

Recommendations

As discussed in this report, the Michigan Perinatal Care workgroups recommended that Michigan:

1. Adopt the Michigan Perinatal Level of Care Guidelines.
2. Develop a method of authoritative recognition of levels of NICU care and establish a statewide mechanism to oversee and enforce adherence to the Michigan guidelines to ensure that hospitals and NICUs care for only those mothers and neonates for which they are qualified
3. The Guidelines should be periodically reviewed and updated as new data occur and recommendations from national groups are made.
4. If the authoritative recognition of levels of care is through the Certificate of Need process, Create a

provision to retrospectively change a hospital's perinatal level of care designation
5. All Level III NICUs should have a NICU Follow-up Clinic
6. Standards for the NICU Follow-up Clinics should be developed and the State should develop a mechanism for authoritative recognition of the NICU Follow-up Clinic
7. Ensure that NICU Follow-up Clinics have the capacity for complete evaluation, both medical and developmental
8. NICU follow-up care should be covered by insurance, including neurodevelopmental testing, to assure continued access to care and to reduce barriers to services.
9. The state should allocate funds so that all Level III babies receive home visits.
10. Educate medical providers about the needs of NICU graduates
11. Support the enrollment of all NICUs in Vermont Oxford Network
12. Develop a mechanism for follow-up of privately insured infants
13. Utilize available data (e.g., Public Health Surveillance system, Medicaid data warehouse, etc.) and track outcomes on key indicators, such as long-term effect of NICU care/treatment and infant mortality
14. Develop a system to follow-up on NICU graduates, including:
    a. Create a mechanism to capture all child/family services in one record, with information from all providers coordinated and shared.
    b. Connect to MDCH Health Information Technology Project to track outcomes, especially the long-term effects of NICU care/treatments and infant mortality.
    c. An electronic record is ideal, or use of a database such as the Michigan Care Improvement Registry (MCIR).
15. The State of Michigan should address the critical shortage of nurses in the state and conduct ongoing evaluations of staffing shortages and potential impact on the provision of care
16. Convene an annual conference or meeting with representatives from all Levels of Care to review and provide education regarding the guidelines and areas for improvement in the care to obstetric patients, neonatal and pediatric care.
17. Convene representatives from all entities involved in the delivery of optimal healthcare to women and children at regional and state levels to discuss barriers to optimal care and mechanisms to resolve those barriers
18. Work in collaboration with EMS/trauma system to thus assure that each perinatal patient "get to the right place in the right time." There is currently an internal collaborative effort at MDCH that will lead to a better understanding of the common venues for further coordination.

Conclusions

Creating a system for regionalized perinatal care is an approach consistent with evidence-based guidelines promulgated by the American Academy of Pediatrics and the American College of Obstetrics and Gynecology and successfully adopted by other states. This approach ensures that hospitals and NICUs operate within appropriate, clearly defined level of care designations and ensures collaboration among regional entities providing services to women, neonates/infants and families. Convening subject matter experts in OB, Neonatology, and Pediatrics was a unique opportunity to examine pediatric regionalization in Michigan. This collaborative approach also established a venue to develop comprehensive Michigan perinatal guidelines and obtain valuable recommendations for policy improvements in the area of perinatal care.

Notes

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Michigan Department of Community Health

MDCH

Rick Snyder, Governor
Olga Dazzo, Director