YEAR 1

MOTHER INFANT HEALTH & EQUITY IMPROVEMENT PLAN

TOGETHER, SAVING LIVES

Update from the Maternal Infant Strategy Group

Dear Michiganders,

It is a sobering fact that woman of color giving birth in Michigan and their babies are more likely to die before, during, and within one year of birth. The Maternal Infant Strategy Group has set a course to make birth safer and more equitable with the 2019-2022 Mother Infant Health and Equity Improvement Plan (Improvement Plan). The Improvement Plan is aimed at our collective vision, *Zero preventable deaths and Zero health disparities.*

The numbers tell the story. African American women in Michigan are three times more likely to die from pregnancy or birth-related causes than Caucasian women. Sadly, African American infants do not fare any better than their mothers and die about 3 times more often than Caucasian infants. Michigan's Intertribal Council reports that American Indian infants are about twice as likely to die as Caucasian infants. Latino families also endure a higher rate of infant mortality than Caucasians. We must address these disparate outcomes if we are to achieve improved health for all of Michigan's mothers and infants.

The Improvement Plan builds upon previous work and existing partnerships and expands to partners and strategies that can enhance our ability to address the root causes of maternal and infant outcomes – social determinants of health and drivers of health inequity. Our collective vision, "Zero preventable deaths and Zero health disparities", will be achieved by working within local communities and with Michigan families to 1. align public and private sector interventions, 2. integrate interventions across the mother infant dyad, and 3. explicitly address disparities employing Population Health Management techniques that ensure the most marginalized populations receive high-impact interventions.

The Improvement Plan was developed collaboratively by the Maternal Infant Strategy Group and the Michigan Department of Health and Human Services (Bureau of Family Health Services). Stakeholders' input and engagement was garnered from around the state at Town Halls in Grand Rapids, Kalamazoo, Detroit, Ann Arbor, Grayling, Marquette, Saginaw, Bad Axe, and Caro. The Maternal Infant Health and Equity Collaborative, health care providers, hospitals, local health departments, health plans, universities, professional organizations and associations, business, and community leaders and *most importantly*, Michigan families' voices have been infused into the Improvement Plan. The Maternal Infant Strategy Group is grateful to these partners for their passion, expertise, knowledge and commitment to achieving success in tackling this complex public and clinical health challenge.

Healthy mothers, babies, and families are the foundation of a healthier and economically robust Michigan. We look forward to your continued partnership and collaboration and toward our mutual success.

Sincerely,

The Maternal Infant Strategy Group

Executive Summary

The *Mother Infant Health and Equity Improvement Plan*, more simply known as the *Improvement Plan*, is the product of a shared vision of a broad range of stakeholders to improve maternal and infant health outcomes and save lives. It builds on the strategies, partnerships, and resources from the previous Infant Mortality Reduction Plans, while adjusting its approach to have a greater impact.

The *Improvement Plan* was developed by the Michigan Department of Health and Human Services (MDHHS) and the Maternal Infant Strategy Group (MISG), a group of maternal and infant health experts, with input from stakeholders and communities. The vision of the *Improvement Plan* is: **Zero preventable deaths. Zero health disparities.**

To achieve this collective vision, the *Improvement Plan* establishes three key objectives:

1. Explicitly address disparities;
2. Align public and private sector work; and
3. Integrate interventions across the maternal infant dyad.

Though substantial efforts in Michigan have led to accomplishments in maternal and infant health, there is more work to be done to ensure that mothers and babies are healthy and thriving. Approximately 80-90 women die each year in Michigan during pregnancy, at delivery, or within a year after the end of her pregnancy. In 2017 alone, 760 infants died before turning one year of age[2]. Michigan's Maternal Mortality Surveillance (MMMS) Committee recently determined that almost half (44%) of the ***pregnancy-related*** maternal deaths in the state were preventable[4]. From these statistics, unconscionable disparities emerge; Women and infants of color face a significantly higher risk of dying and experiencing adverse health outcomes. To reduce maternal and infant deaths and improve health outcomes, the *Improvement Plan* is committed to addressing disparities and implements interventions that address the primary causes of preventable maternal and infant deaths.

Implementation of the *Improvement Plan* is multi-faceted to increase its reach and impact. It includes the alignment of internal programs within MDHHS to increase the awareness, reach, and availability of public health resources, implementation of quality improvement projects within each of Michigan's Regional Perinatal Quality Collaboratives (RPQCs), and external implementation through community partners and maternal infant health providers. Within each RPQC, the *Improvement Plan* outlines a Population Health Model (PHM) to explicitly address disparities and implement evidence-based interventions tailored to populations with the highest likelihood of adverse health outcomes.

The *Improvement Plan* honors the efforts of communities, stakeholders, and key partners, including the **Alliance for Innovation on Maternal Health (MI AIM)**, while emphasizing the need for collaboration and pooling of resources for a greater impact. Through its commitment to addressing disparities, aligning efforts, and implementation of life-saving interventions, the *Mother Infant Health and Equity Improvement Plan* is creating the blueprint for ***zero preventable deaths and zero health disparities***.

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Note:

- Hyperlinks (denoted by blue, underlined text) can be clicked to jump to a different location in the document, or to an external source.
- All terms defined in the glossary are identified as ***bolded, italicized, colored text***.

Introduction

Background

"Health equity means everyone has a fair and just opportunity to be healthier. It acknowledges that it's hard to be healthy without access to good jobs, homes, and schools. It requires a concerted effort to increase opportunities to be healthier for everyone – especially those whose obstacles are greatest."

- ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation (RWJF) is endeavoring to create a *Culture of Health* that achieves health and wellbeing for all people[1]. Health equity is a core principle of the *Action Framework* intended to set priorities and drive progress toward a *Culture of Health*.

FIGURE 1. EQUALITY VERSUS EQUITY; © 2017 ROBERT WOOD JOHNSON FOUNDATION

Achieving health equity will require collaboration within and between all sectors that impact women and infants' health and wellbeing and will require all stakeholders working today and long into the future to improve and sustain equitable outcomes for all.

The *Mother Infant Health and Equity Improvement Plan – Year One* is intended to build upon work begun in Michigan and to join the RWJF and others in creating sustainable momentum toward equitable health outcomes. The *Improvement Plan* is driven by a commitment, first and foremost, to improve health outcomes by addressing equity throughout its initiatives. Social and economic injustices, predominantly racism and other forms of oppression, are at the root of most disparate health outcomes that mothers and infants face in Michigan and across the nation. The Michigan Department of Health and Human Services (MDHHS) and the Maternal Infant Strategy Group (MISG) seek to launch an *Improvement Plan* that contributes to every woman and infant in Michigan having the same opportunity for a healthy pregnancy, birth, and first year of life; After all, a healthy beginning is the foundation of a healthy life.

Development of the *Mother Infant Health and Equity Improvement Plan – Year One* included many professional and community stakeholders and the voices of Michigan families. This grassroots approach allowed MDHHS and the MISG to formulate a plan that starts improving health outcomes today by aligning evidence-based and promising practice clinical and public health interventions and ensuring that communities and individuals most likely to experience a disparate outcome receive preventative services and treatment known to improve outcomes.

The Improvement Plan is forward-leaning and will be an iterative, evolving road map that will lead Michigan down a path that not only addresses disparities but – driven by data – also achieves true equity by removing road blocks created by systemic, structural injustices often experienced by marginalized populations.

The MDHHS and MISG join many organizations and communities throughout Michigan that have taken strides down the path of creating a culture that recognizes that when *everyone* is healthy, *everyone* benefits. This requires altering the traditional approach of universal strategies that do not distinguish between individuals' circumstances to achieve universal goals (improved health and reduced mortality). This approach, also known as ***targeted universalism***, instead suggests that **targeted** strategies be used to reach universal goals and improve health equity[14]. The *Improvement Plan* will achieve success by both improving care and services delivered to the individual and by working on system and structural issues that result in injustices and inequities. It will take many hands and an engaged approach to the vision of the *Improvement Plan*: ***Zero preventable deaths and zero health disparities***.

What is the Mother Infant Health and Equity Improvement Plan?

The *Mother Infant Health Equity and Improvement Plan*, more simply known as the *Improvement Plan*, is a comprehensive statewide population health plan. The *Improvement Plan* was developed by the Michigan Department of Health and Human Services (MDHHS) under the guidance of the Maternal Infant Strategy Group (MISG), in collaboration with a broad range of maternal and infant health stakeholders.

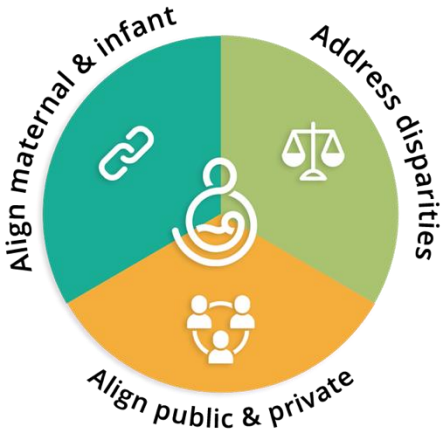


FIGURE 2. KEY OBJECTIVES OF THE IMPROVEMENT PLAN

The *Improvement Plan* has three **key objectives** in year one (Figure 2, right):

1. Address health disparities;
2. Align public and private sector work; and
3. Integrate interventions across the maternal infant dyad

Achieving these key objectives requires an iterative approach and an unwavering commitment to communities. This work will take many hands and voices across the public and private sectors to advocate for the vision of the *Improvement Plan*, to generate the awareness needed to achieve its goals, and to do the necessary work required to improve health outcomes – especially for the most ***vulnerable and marginalized populations***. In 2017, The Michigan Department of Health and Human Services (MDHHS) formed the Maternal Infant Strategy Group (MISG) in preparation for pivoting from the former Infant Mortality Reduction Plan (IMRP) to a plan that more explicitly addresses health equity and integrates the mother infant dyad. Strategy Group members are high-level experts and decision-makers from public, private, and academic health sectors. MDHHS and the MISG have cast a wide net of organizations and individuals who will provide feedback on the Improvement Plan's approach and implementation, be involved in setting their community's agenda and goals, and be on the front lines of getting the work done.

What are vulnerable and marginalized populations?

Vulnerable populations are defined as women and infants who have an increased likelihood for adverse health outcomes. When assessing vulnerability, the *Improvement Plan* considers how individuals can be ***marginalized*** in many ways and how marginalization highlights multiple disparate factors (i.e. institutional, social, and economic) underlying the lives of moms and babies to help further identify who is most at risk, what should be done, and to determine how interventions should be implemented.

This work began with five Town Halls throughout Michigan to seek feedback from communities and continues to engage multi-sector stakeholders, faith-based organizations, and Michigan families. The Improvement Plan also continues to integrate the voice of the people, including mothers, fathers, grandparents, aunts, uncles, and neighbors through the Ambassador Program. Regional Perinatal Quality Collaboratives (RPQCs) act as the backbone organization for local community connections and work to implement a Population Health Model (PHM) to reduce disparities. Michigan's Mother Infant Health and Equity Collaborative (MIHEC) brings the communities' work together, ensures the Regional Perinatal Quality Collaboratives are connected to one another, connects obstetric initiatives and other statewide work/organizations, and acts as the eyes and ears of the MISG.

We are ***together, saving lives…***

* MI AIM is the Michigan Alliance for Innovation on Maternal Health, MICCA is the Michigan Collaborative for Contraceptive Access, OBI is the Obstetrics Initiative

FIGURE 3. ENTITIES WORKING TOGETHER TO IMPLEMENT THE IMPROVEMENT PLAN

Year 1 of Implementation will launch at the Maternal Infant Health Summit in East Lansing on March 12 – 13 2019. The Improvement Plan will be implemented by aligning it with internal MDHHS work, by connecting with cross-sector statewide and regional organizations that touch families, and in nine Regional Perinatal Quality Collaboratives (RPQCs). Plans are underway to expand the health equity reach of the Improvement Plan and to expand the population health model framework in year two. Please turn to page 41 to see how you can join in this crucial work and make Michigan a place where all mothers and infants are cared for as if they were our own.

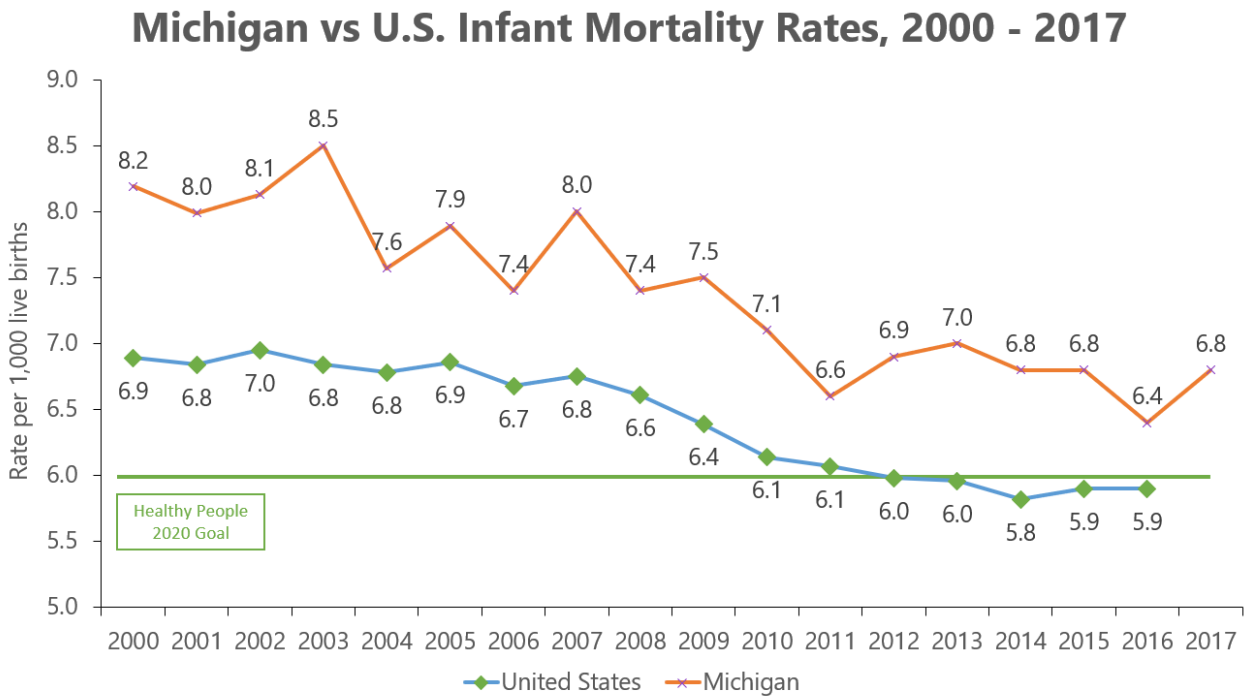
For more information about Michigan's resources working toward the vision of, "***zero preventable deaths and zero health disparities***", please see Appendix H.

Why is the Improvement Plan needed?

The clear answer to *why is the Improvement Plan needed* is that mothers and babies in Michigan are dying from preventable causes, and significant racial and economic disparities persist; Women and infants of color face a higher risk of dying and adverse health outcomes – *the data tells the story*.

Infant Mortality

Work undertaken in Michigan by the Infant Mortality Reduction Plan (IMRP 2011-2017) resulted in steady improvement in the overall infant mortality rate (see Graphic 1, below).



GRAPHIC 1. MICHIGAN VERSUS UNITED STATES INFANT MORTALITY RATES, 2000-2017

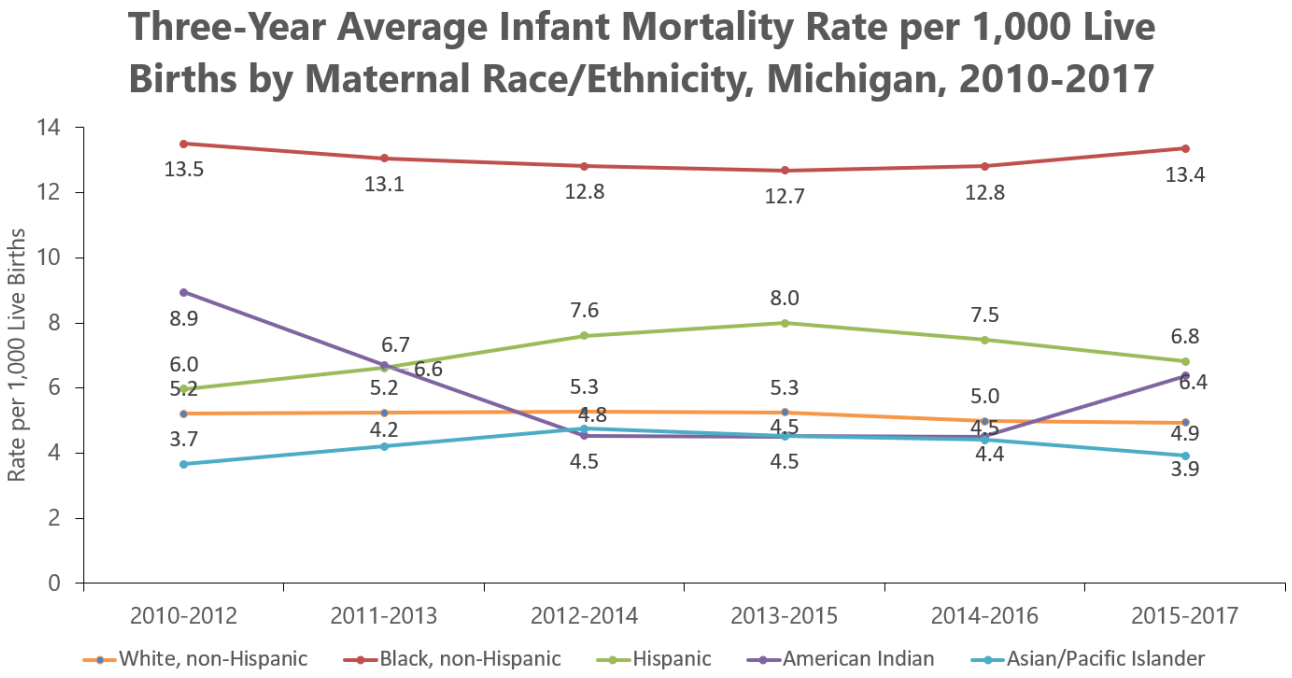
Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, MI Resident Birth & Death Files; MI resident live birth files and infant mortality files, Division for Vital Records and Health Statistics, MDHHS

With the exception of a slight increase in 2017, Michigan's infant mortality rate has been gradually improving for over a decade to an overall rate of 6.8 infant deaths per 1,000 live births. Despite the steady improvement over the past decade, Michigan still ranks 33rd in infant mortality out of the 50 states and is higher than the Healthy People 2020 goal of 6.0 per 1,000 live births. Additional key infant mortality findings that are driving the *Improvement* Plan include:

- In 2017, **more than 760 babies** in Michigan did not live to their first birthday[2].

- Michigan's infant mortality rate overall in 2016 (6.4 deaths per 1,000 live births) was **higher than the nation's rate** (5.9 infant deaths per 1,000 live births)[2].
- In 2017, 10.2% of babies in Michigan were born ***preterm***, and 8.8% of babies were born with ***low birthweight***[2].
- ***Sleep-related infant death*** is also a leading cause of death among infants less than one year. From 2010 to 2016, there were 1,013 sleep-related infant deaths, which is a rate of 1.3 deaths per 1,000 live births[2].
- In 2017, babies born to Black, Non-Hispanic women were **more than twice as likely to die** before their first birthday than babies born to White, Non-Hispanic women (13.4 and 4.9 per 1,000 live births, respectively)[2].
- From 2013-2015, the average infant mortality rate for American Indian infants (utilizing a bridged race variable: infant and/or one parent reported as AI on birth certificate) was **9.4 per 1,000 live births**[2].

Graphic 2, below, displays the consistency of racial/ethnic disparities over time. These disparities exist even when accounting for maternal education, adequate prenatal care, smoking, insurance status, and other factors, highlighting the need to consider the unequal opportunity and unequal access to health and public services for people of color as a significant contributor to maternal and infant mortality rates.



GRAPHIC 2. THREE-YEAR AVERAGE INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS BY MATERNAL RACE/ETHNICITY, MICHIGAN, 2010-2017

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.
Data source: Michigan resident live birth files and infant mortality files, Division for Vital Records and Health Statistics, MDHHS

Maternal Mortality

Despite ongoing efforts and some recent improvements, women giving birth in Michigan are still dying at an unacceptable rate. From 2011-2015, Michigan's ***pregnancy-related*** mortality rate was **11.6 maternal deaths per 100,000 live births**[4]. A recent review by the Michigan Maternal Mortality Surveillance (MMMS) Committee found that, of the ***pregnancy-related*** deaths, **44% were determined to be preventable**[4]. In Michigan and across the U.S. – even when controlling for age, socioeconomic status, and education – women of color face a higher risk of death from pregnancy complications[10].

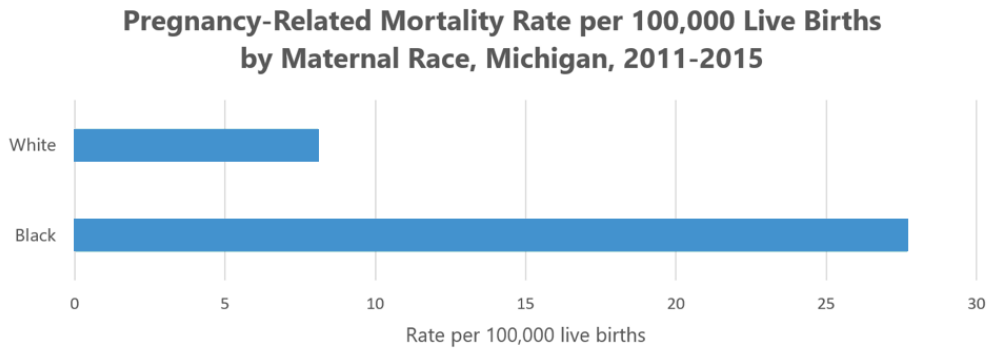
Additional key maternal mortality findings that are driving the *Improvement Plan* include:

- In 2015, the most recent year with available data, approximately **90 women in Michigan died** during pregnancy, at delivery, or within a year after the end of her pregnancy[4].
- From 2011-2015, **66 women died** of ***pregnancy-related*** causes in Michigan. The leading cause of ***pregnancy-related*** deaths in Michigan is cardiomyopathy (21%), followed by infection/sepsis (14%). Additional causes of death include cardiovascular conditions, amniotic fluid embolism, cerebrovascular conditions, embolism, hypertension, and other medical conditions (often related to chronic diseases)[4].
- From 2011-2015, Black, Non-Hispanic women were **three times more likely to die** from pregnancy-related causes than White, Non-Hispanic women (27.7 and 8.1 per 100,000 live births, respectively)[4].

Pregnancy-related death versus Pregnancy-associated death

Pregnancy-related mortality is the death of a woman while pregnant or within a year of the end of a pregnancy from any cause **related to or aggravated by** the pregnancy or its management. This does not include accidental or incidental causes.

Pregnancy-associated, not related, mortality is the death of a woman while pregnant or within one year of the end of a pregnancy due to a cause unrelated to pregnancy.



GRAPHIC 3. PREGNANCY-RELATED MORTALITY RATE PER 100,000 LIVE BIRTHS BY RACE, MICHIGAN, 2011-2015

Data source: Michigan Maternal Mortality Surveillance Program, Maternal Deaths in Michigan, 2011-2015

Disparities Between Communities

Health outcomes vary between Michigan's regions, formerly known as prosperity regions (Appendix G, Figure 2). Analyzing data at the regional level is essential to make progress in areas with the poorest health outcomes and highest rates of maternal and infant mortality. To assist with identifying populations that have the highest likelihood for adverse health outcomes, MDHHS' Bureau of Epidemiology is conducting statewide and regional *Hotspot Analysis*. *Hotspot Analysis* helps identify areas with high rates of maternal and infant mortality and the primary causes of mortality and morbidity in each region. This, in turn, helps to determine the interventions with the highest potential to improve outcomes and focuses efforts on identified hotspots. An area is considered a hotspot if a higher than average occurrence of adverse outcomes being analyzed is found in a cluster.

Figure 4, below, shows a Hotspot Analysis for Infant Mortality Rates in Michigan from 2013 through 2017. This map identifies areas with a high rate of infant mortality – or *hotspots*.

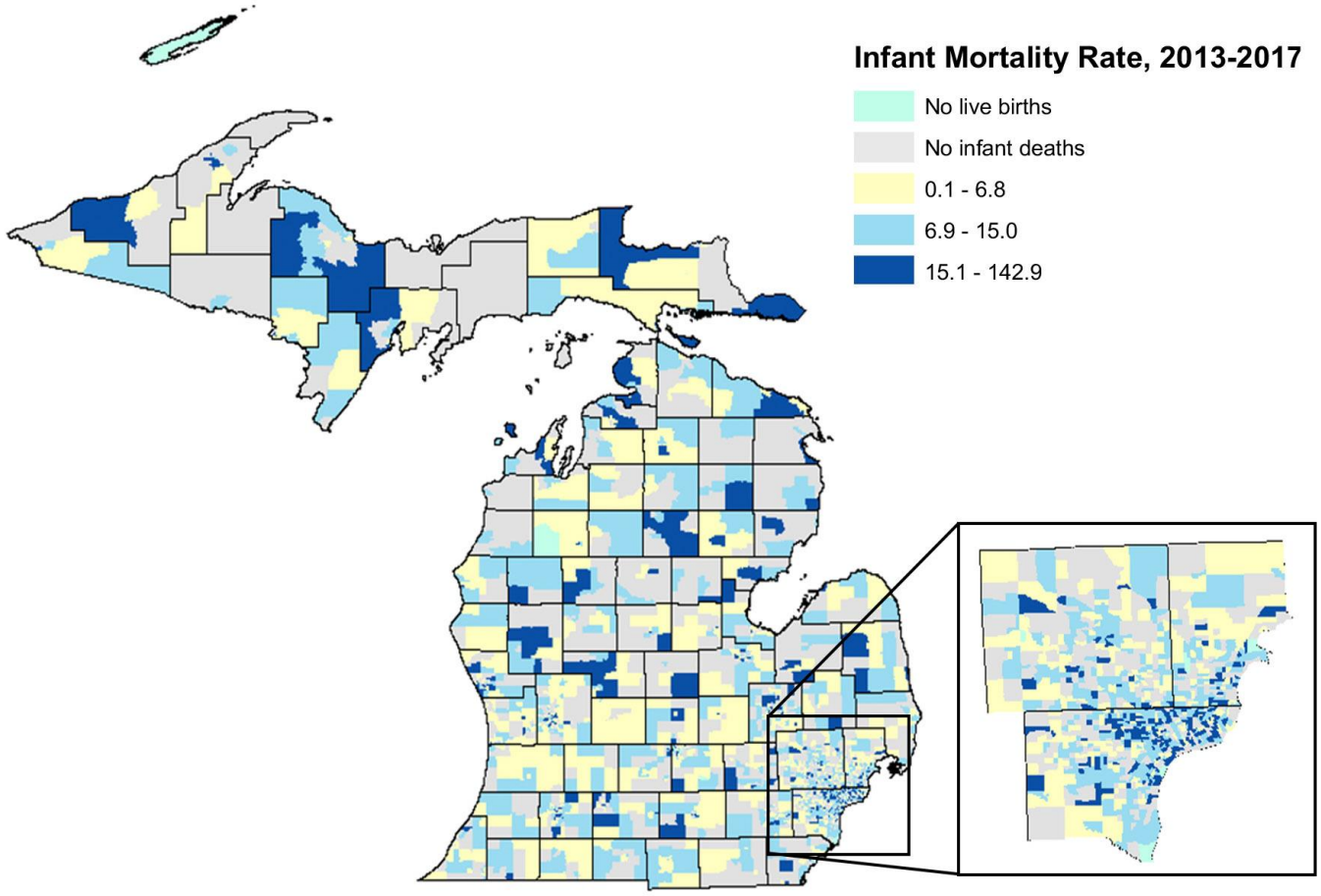


FIGURE 4. AVERAGE INFANT MORTALITY RATE, MICHIGAN, 2013-2017

Data source: Michigan resident live birth files linked with infant mortality files, Division for Vital Records and Health Statistics, MDHHS

The data shows that mothers and infants who are most ***marginalized*** are most likely to experience adverse health outcomes and preventable deaths. Mothers and infants in Michigan are dying from preventable causes, primarily:

1. Health inequities and unjust treatment
2. Low birth weight and preterm birth
3. Unsafe sleeping environments
4. Chronic health conditions and obstetric complications
5. Inadequate birth spacing and unintended pregnancies
6. Mental and behavioral health conditions

The Maternal Infant Strategy Group envisions a future in Michigan where no mother or baby will die from a preventable cause and health equity is achieved for all. The Improvement Plan's collective vision, driven by the data, could only be: ***Zero preventable deaths. Zero health disparities.***

For a more in-depth look at maternal and infant mortality data, please reference Appendix B.

Strategic Focus Areas – Year One

Following an analysis of maternal and infant health data, with input from Maternal Infant Strategy Group experts and the community, strategic focus areas were established that address disparities and the primary causes of maternal and infant mortality and morbidity.

The three strategic focus areas of the *Improvement Plan* are:

1. **Achieve zero health disparities** by utilizing a health equity lens to acknowledge and address health disparities and implement interventions tailored to provide the services needed to improve health outcomes
2. **Achieve zero preventable maternal deaths by addressing the primary causes of maternal mortality** and severe maternal morbidity by improving maternal health, equipping providers with the resources needed to adequately prevent and treat obstetric emergencies, improving birth spacing, and decreasing the rate of primary C-section
3. **Achieve zero preventable infant deaths by addressing the primary causes of infant mortality** and morbidity by reducing the rate of preterm births and low birthweight and the rate of sleep-related deaths

These strategic focus areas provide a driving force for the selection of evidence-based interventions. Communities will select one to three interventions to implement, based on region-specific needs and resources. Each intervention will be tailored to address the needs of ***vulnerable populations***.

Interventions are discussed in more detail in the Interventions section (page 21).

FIGURE 5. STRATEGIC FOCUS AREAS OF THE IMPROVEMENT PLAN

Addressing Disparities

Strategic Focus Area 1:

Achieve zero health disparities by utilizing a health equity lens to acknowledge and address health disparities and implement interventions tailored to provide the services needed to improve health outcomes

With few exceptions, inequities in maternal and infant mortality rates persist for women and infants of color, regardless of socioeconomic status or education status. The risk for adverse birth outcomes increases for women who experience racism, classism, and other forms of oppression. The Mother Infant Health and Equity Improvement Plan recognizes disparate conditions and promotes ***health equity*** as a priority.

What is health equity?

The Robert Wood Johnson Foundation (RWJF) provides the following definition for ***health equity***: "Health equity means that everyone has a fair and just opportunity to be healthier. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care".

Health inequities are differences in population health status and mortality rates that are systemic, avoidable, and actionable, and are therefore considered unfair and unjust (MDHHS, 2017).

MDHHS also promotes a simple definition of equity as "…fair and just treatment, access and opportunities for all people while building better outcomes for historically and currently disadvantaged populations." A focus on ***marginalized populations*** is critical to Departmental commitment to improve diversity, equity, and inclusion. ***Marginalized populations*** are groups and communities that experience discrimination and exclusion (social, political and economic) because of unequal power relationships across economic, political, social and cultural dimensions. Also significant to the Department's approach to increasing equity is the recognition of race as a primary driver of oppression and exclusion that includes persistent disparate health conditions experienced by systemically marginalized populations.

Traditional public health plan frameworks identify recommended interventions to improve health outcomes without the consideration of disparities or the factors that influence ***health equity***. The population health model (PHM) brings public and clinical health entities together to address health disparities and considers underlying inequities associated with oppression based on characteristics such as race, class, age, ability, and heterosexism as their root causes.

The PHM model assesses regional data to identify populations with the highest potential for adverse outcomes and implements tailored interventions. This process helps ensure that ***vulnerable populations*** receive resources and services where they are most needed. These strategies, including a data-informed approach and stratification, support the advancement of health equity. The Improvement Plan is committed to levering inequities for all women, infants, and communities, improving life for all.

"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."

- ADVANCING HEALTH EQUITY IN MINNESOTA: REPORT TO THE LEGISLATURE

Addressing the Primary Causes of Maternal Mortality and Morbidity

Strategic Focus Area 2:

Achieve zero preventable maternal deaths by addressing the primary causes of maternal mortality and severe maternal morbidity by improving maternal health, equipping providers with the resources needed to adequately prevent and treat obstetric emergencies, improving birth spacing, and decreasing the rate of primary C-section

As the public health authority in the state, the Michigan Department of Health and Human Services (MDHHS) investigates maternal deaths via the Michigan Maternal Mortality Surveillance (MMMS) program. The MMMS Committee has learned that approximately half (44%) of maternal deaths are preventable either by the health care team, the patient and her family, or access to family planning and other medical health care services.

Key findings of the MMMS:

- The most common causes of ***pregnancy-related death*** were cardiomyopathy and infection/sepsis; chronic diseases such as hypertension, cardiovascular conditions, and diabetes also contribute to maternal death.
- The most common cause of ***pregnancy-associated death*** is suicide/drug overdose.
- Persistent racial disparities exist in pregnancy-related deaths in Michigan. From 2011-2015, Black, Non-Hispanic women were three times more likely to die from pregnancy-related causes than White, Non-Hispanic women (27.7 and 8.1 per 100,000 live births, respectively)[3].

One of the most significant programs to emerge from previous MMMS recommendations is the establishment of the Michigan Alliance for Innovation on Maternal Health (MI AIM), the Michigan public-private partnership initiative that is part of a major country-wide program to reduce preventable maternal mortality and severe maternal morbidity. In Michigan, the focus is on improving care for maternal hemorrhage and hypertension.

Addressing the Primary Causes of Infant Mortality and Morbidity

Strategic Focus Area 3:

Achieve zero preventable infant deaths by addressing the primary causes of infant mortality and morbidity by reducing the rate of preterm births and low birthweight and the rate of sleep-related deaths

To achieve zero preventable infant deaths in Michigan, the primary causes of infant mortality must be addressed. ***Premature birth*** and ***low birthweight*** are the leading contributors to infant death in Michigan, and a major cause of long-term health problems in children who survive. In 2017, 10.2% of infants in Michigan were born preterm (prior to 37 weeks' gestation) and 8.8% of infants were born with ***low birthweight***[1].

Sleep-related infant death is also a leading cause of death among infants less than one year. From 2010 to 2016, there were 1,013 sleep-related infant deaths, which is a rate of 1.3 deaths per 1,000 live births[1].

How Will We Get There?

Commitment to the Community

Input into the Improvement Plan has been solicited in 2018 from established partners (local public health, managed care plans, universities, Medicaid, Michigan Department of Education, families, and MDHHS program areas such as epidemiology, mental health and substance abuse, chronic disease, communicable disease, injury prevention, health disparities reduction and minority health). Local communities are also being engaged to apply the plan's strategies that best fit their needs and to set community specific measurable outcomes.

Town Hall Meetings

Throughout the summer and fall of 2018, the MDHHS Bureau of Family Health Services and the MISG hosted a series of five town hall meetings throughout the state. The purpose of the town hall meetings was to collect feedback from communities to determine perceived priorities and barriers to successful implementation of the Improvement Plan.

More than 500 participants came together to provide feedback on the Plan, including community members, public health professionals, and clinicians. One common theme among town hall participants was the need to improve health equity and ensure it was more prominent in the Plan.

For more detailed town hall summary sheets, please refer to Appendix F.

MIHEIP Ambassador Program

Another continuous theme throughout the town hall meetings was the desire to continue the conversation about maternal and infant health and the importance of feedback from communities. Efforts to collect and integrate community feedback were continued with the development of the Mother Infant Health and Equity Improvement Plan Ambassador Program. MIHEIP Ambassadors play an important role in providing feedback that is used to ensure the Plan is adapted for their community and to identify barriers to implementation. Ambassadors include mother, fathers, grandparents, aunts, uncles of all ages, who share their lived experience and act as advocates in their communities.

Partner Organizations/Corporate Support

Support and engagement of partners are vital to the success of the Improvement Plan. Stakeholders will be asked to sign-on to the Plan as Partner Organization. Partner Organizations will agree to support the work and vision of the *Improvement Plan*. Corporate support will be sought during Year 2 of Implementation. Organizations can provide financial or in-kind support to help regional implementation efforts.

Health Equity – Call to Action

In year one of the Improvement Plan, data-informed interventions implemented by the Regional Perinatal Quality Collaboratives will address vulnerable populations with tailored interventions aimed at reducing disparities. The MISG will begin planning a course that deepens the Plan's approach to health equity by pursuing structural and systemic inequities, inclusive decision-making for all members of the community, and enhancing the voices of those whose health outcomes the Plan seeks to improve.

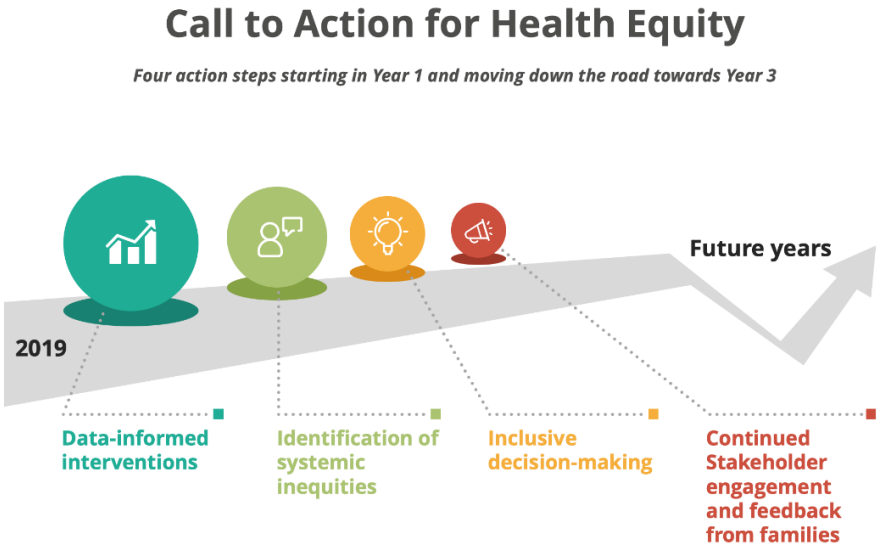


FIGURE 6. CALL TO ACTION FOR HEALTH EQUITY

Achieving the Vision: The Mother Infant Health and Equity Improvement Plan Framework

The vision of the Improvement Plan will be achieved by explicitly addressing disparities employing population health management techniques that ensure that the most ***vulnerable populations*** receive high-impact interventions, through the alignment of public and private sectors, and by integrating interventions across the maternal infant dyad.

Addressing Disparities Utilizing the Population Health Model

The Mother Infant Health and Equity Improvement Plan utilizes a population health model (PHM) to address disparities and improve health outcomes. The PHM model outlines a process to utilize data to identify and stratify populations based on the likelihood of adverse outcomes. This drives the selection and implementation of evidence-based interventions that address the strategic focus areas of the Improvement Plan. Implementation is guided by a quality improvement framework that consistently measures outcomes to determine the impact of each intervention and improves systems through periodic adjustments. This process ensures that interventions explicitly address disparities and save lives. The population health model and its components are discussed in greater detail in the next section of the Plan.

Aligning and Integrating the Work: A Multi-faceted Approach to Implementation

The Improvement Plan aligns public and private sector work and integrates interventions across the maternal infant dyad for a greater impact. Public-private collaboration within the health sector is essential to the success of interventions. The government, community and faith-based organizations, health care providers, non-profits, universities, and other stakeholders must work together to improve health outcomes.

Maternal and infant health are intrinsically connected; from 2015 to 2016, the fourth leading cause of infant mortality in the United States was maternal complications[3]. Integrating interventions across the maternal-infant dyad promotes a holistic approach to care that encompasses health and well-being for both mom and baby.

Implementation of the Improvement Plan has a multi-faceted approach, including internal alignment of program areas within the Michigan Department of Health and Human Services, implementation of quality improvement projects within each Regional Perinatal Quality Collaborative (RPQC), and external implementation within partner organizations. RPQCs serve as the conveners of diverse stakeholders to implement interventions in each community. See Figure 6, below, for a visual representation.

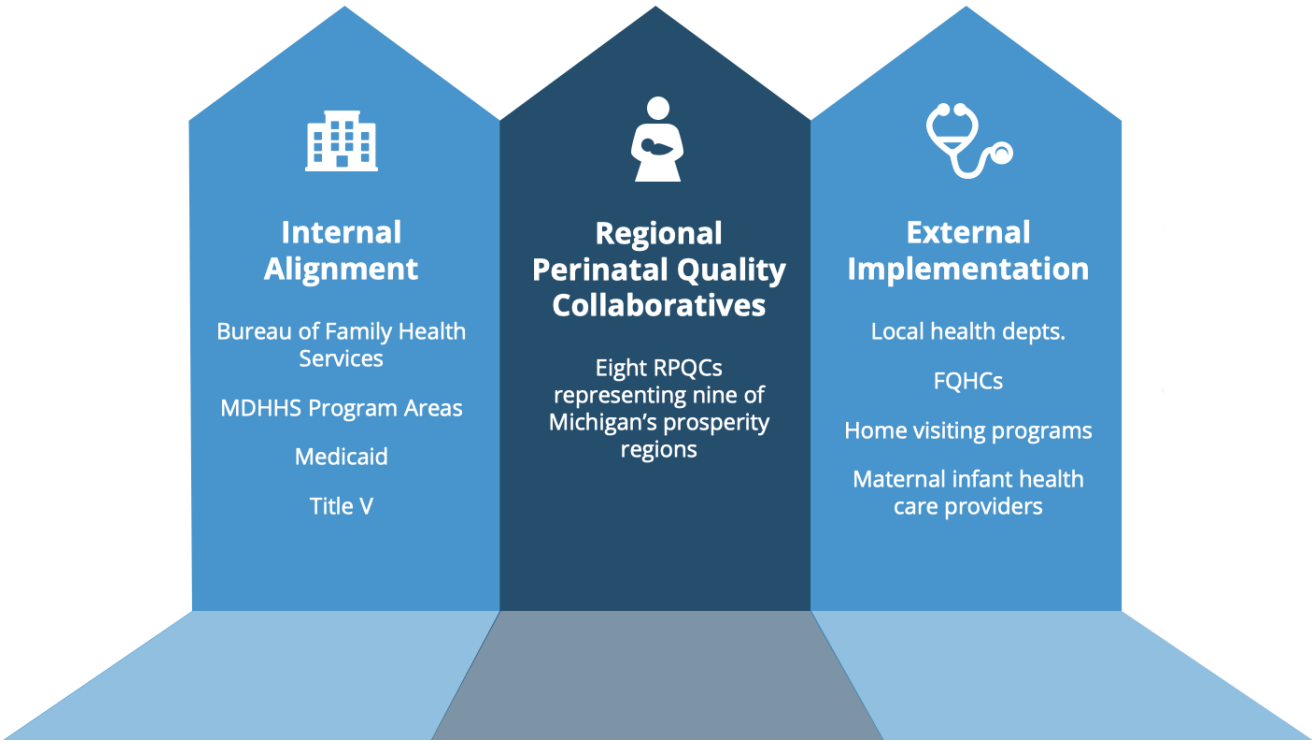


FIGURE 7. MULTI-FACED APPROACH TO IMPLEMENTATION OF THE IMPROVEMENT PLAN

Internal Alignment: the Michigan Department of Health and Human Services (MDHHS)

In addition to external implementation via the Regional Perinatal Quality Collaboratives, alignment of program areas within the MDHHS is essential to the success of the Mother Infant Health and Equity Improvement Plan. The first year of Implementation will focus on opportunities to share resources between programs that serve the same population to maximize the awareness and availability of public health resources. Internal Alignment will become more integrated and systemic with each subsequent year of the Improvement Plan.

Regional Perinatal Quality Collaboratives (RPQCs)

Michigan's Regional Perinatal Quality Collaborative (RPQC) Initiative was launched in FY 2015 as an effort to improve the existing Perinatal Care System in Michigan. Currently, there are seven RPQCs representing eight of the Prosperity Regions in Michigan. The Michigan Department of Health and Human Services (MDHHS) is committed to establishing an RPQC in every prosperity region by the end of 2020. The Regional Perinatal Quality Collaboratives, serving as the backbone organizations of the Improvement Plan, are charged with implementing the Population Health Model (PHM) in conjunction with convening diverse stakeholders and authentically engaging families. RPQCs serve as the place where community work can align and integrate.

External Implementation

Community partners and local public health work to care for mothers and infants and improve health outcomes in their communities. In addition, Michiganders must commit to implementing the *Improvement Plan* in every facet of their lives including our own families, schools, places of employment, community-based organizations, and faith-based organizations to achieve the vision of ***zero preventable deaths and zero health disparities***.

For more information about Michigan's Resources and the institutions and organizations working together, please see Appendix H.

Statewide Measurement – Year One

To determine the impact of the Mother Infant Health and Equity Improvement Plan, statewide metrics have been updated from the previous Infant Mortality Reduction Plan to measure processes and outcomes.

Mother Infant Health and Equity Improvement Plan Statewide Metrics

Strategic Focus Area 1: Achieve zero health disparities by utilizing a health equity lens to acknowledge and address health disparities and implement interventions tailored to provide the services needed to improve health outcomes

Metrics with an asterisk (*) will be stratified by race/ethnicity and geography to measure disparities.

Strategic Focus Area 2: Achieve zero preventable maternal deaths by addressing the primary causes of maternal mortality and severe maternal morbidity by improving maternal health, equipping providers with the resources needed to adequately prevent and treat obstetric emergencies, improving birth spacing, and decreasing the rate of primary Cesarean section

- Maternal mortality rate per 100,000 live births
- Severe maternal morbidity per 10,000 delivery hospitalizations by category
- Percent of women who received prenatal care during the first trimester, after 36 weeks, or not at all
- Percent of women with a recent live birth reporting that their pregnancy was intended
- Percent of women enrolled in the Maternal Infant Health Program (MIHP) who are screened for maternal depression
- Teen birth rate per population 15-19 years
- Percent of women with a recent live birth reporting having a dental visit during pregnancy
- Percent of high school students who report feeling sad or hopeless every day for two or more weeks in a row

Strategic Focus Area 3: Achieve zero preventable infant deaths by addressing the primary causes of infant mortality and morbidity by reducing the rate of preterm births and low birthweight and the rate of sleep-related deaths

- Infant mortality rate per 1,000 live births
- Percent preterm birth (estimated gestational age < 37 weeks)*
- Percent low birthweight (birthweight < 2,500 grams)*
- Percent very low birthweight (birthweight <1,500 grams)*
- Percent of very low birthweight infants born in a hospital with a level III or higher Neonatal Intensive Care Unit (NICU)
- Percent of women with a recent live birth who smoked during pregnancy
- Neonatal Abstinence Syndrome (NAS) rate per 100,000 live births*

- Percent of women with a recent live birth who initiate breastfeeding*
- Sleep-related Sudden Unexpected Infant Death (SUID) rate per 100,000 live births
- Percent of women with a recent live birth reporting having their infants put to sleep alone in their crib, bassinet, or pack and play
- Percent of infants put to sleep without objects in their crib, bassinet, or pack and play
- Percent of children receiving all recommended immunizations within the first year of life
- Percent of population receiving recommended Influenza and Tdap vaccinations
- Percent of children ages 10 months through 71 months whose parents completed a standardized developmental screening tool in the past 12 months among those children who had a health care visit in the past 12 months
- Percent of low/moderate/high risk clients who have received three or more Mother Infant Health Program (MIHP, a home visiting program) visits

For a detailed look at statewide IMRP metrics that were updated for the Improvement Plan, including data sources and measurement sources, please see Appendix J.

Community Measurement – Year One

Measuring the impact of interventions in each community begins with the selection of relevant measures: in year one of the *Improvement Plan*, each Regional Perinatal Quality Collaborative will identify measures that match the goals of the initiatives being implemented. By tracking measures over time, each RPQC can determine which interventions are working and which interventions may need to be adjusted. To learn more about community measurement utilizing a quality improvement framework, please see the **Measurement** section on page 36.

Example of RPQC Measures:

Region 10 (Southeast Michigan) – Addressing low birth weight and premature birth through evidence-based home visiting; specifically increasing referrals and enrollment to home visiting for eligible pregnant women at a prenatal clinic

Associated measures include:

- Percent of eligible pregnant women referred to home visiting (number of eligible women referred to home visiting/number of women seen for first prenatal clinic who are eligible for the home visiting program)
- Percent of eligible pregnant women enrolled in home visiting (number of referred pregnant women who enrolled in home visiting/number of eligible pregnant women referred to home visiting)
- Percent increase in referrals to home visiting of eligible pregnant women at prenatal clinic (number of referrals received in FY19/number of baseline referrals)

The Population Health Model (PHM) – Year One

The concept of population health was defined in 2003 by David Kindig and Greg Stoddart as, "the health outcome of a group of individuals, including the distribution of individuals, including the distribution of such outcomes within the group" (Milken Institute School of Public Health, George Washington University, 2015). The population health model (PHM) was adapted from the Chronic Care Model, developed by Ed Wagner, MD, MPH and was further updated to be integrated into the *Improvement Plan* as the framework driving implementation.

The PHM model aims to improve maternal and infant health outcomes through the process of identifying populations with a high likelihood of adverse health outcomes and tailoring evidence-based or promising practice interventions to address disparities. In year one of the *Improvement Plan*, the PHM will serve as the framework for the development of quality improvement projects within the Regional Perinatal Collaboratives. In subsequent years, the *Improvement Plan* will promote the integration of the PHM within the work of MDHHS programs and partner organizations to further align the work being done to achieve its key objectives. Integration of the PHM within internal and external programs will be ongoing to identify vulnerable populations and have a greater impact improving health outcomes and reducing disparities.

There are six components of the population health model, including:

Data-informed: Use qualitative and quantitative data to inform a population assessment and drive improvement

Population Identification: Identify vulnerable populations

Stratification: Tier the population into high, moderate, and low groups based on the likelihood of an adverse outcome

Interventions: Selection of evidence-based and promising practice interventions tailored to each tiered population

Implementation: Clinical and community alignment of interventions using a quality improvement framework

Measurement: Measure outcomes to determine the impact

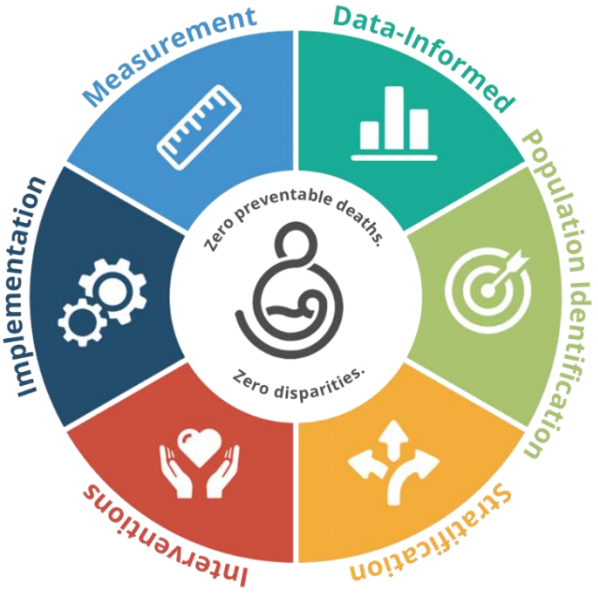


FIGURE 8. POPULATION HEALTH MODEL

Data-Informed

Use qualitative and quantitative data to inform a population assessment and drive improvement

Data-driven interventions have been shown to improve health outcomes by informing health care professionals, clinicians, private organizations, health systems, hospitals, and additional stakeholders to help prioritize action. Using various sources of data can help prompt prioritization and stimulate collaboration via partnerships. Within the *Improvement Plan*, this approach drives the selection of quality improvement projects (interventions) for each Regional Perinatal Quality Collaborative by prioritizing interventions for the most ***vulnerable populations***.

Data analysis provides a better understanding of the overarching statewide needs, while simultaneously identifying precise regional and community-level needs. The population health model approach also includes qualitative and quantitative methods, which provides a more robust depiction of individual needs within each community. In addition to the more commonly used data-sets from the Division of Vital Records and Health Statistics, the Michigan Department of Health and Human Services (MDHHS) will provide each Prosperity Region with Pregnancy Risk Monitoring System (PRAMS) data, and local health department community needs assessment data. In addition, community organizations will be asked to provide data to be included in the assessment process.

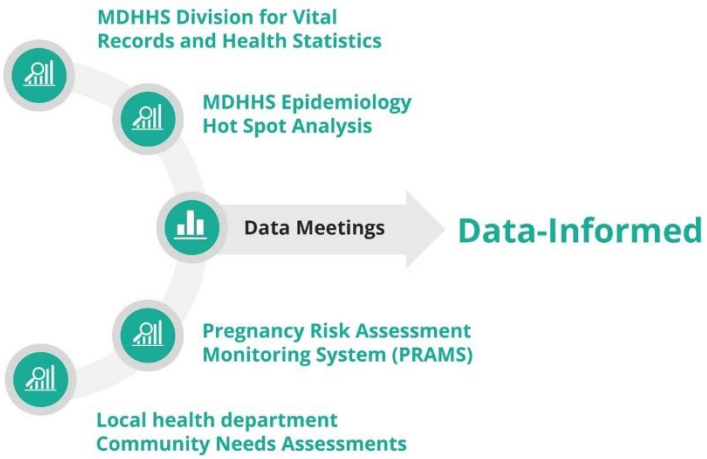


FIGURE 9. SOURCES OF DATA COLLECTED, REPORTED, AND ANALYZED FOR THE IMPROVEMENT PLAN

Implementation of specific evidence-based interventions will be data-driven and informed through the partnership between the RPQCs and MDHHS. This partnership will include regular data meetings to collaboratively share, report, and analyze data, with the intention of identifying the most relevant data to guide regional Quality Improvement efforts. Ensuring data is continually updated will provide insight into the specific needs of each region, allow for selection of appropriate, tailored interventions, and improve the health of the overall population.

For more information about data sources that have informed the Improvement Plan and will be utilized within the population health model, please see Appendix C.

Population Identification

Identify vulnerable populations

Understanding the population of focus is integral to successfully implementing the population health model (PHM) to achieve the vision of the Improvement Plan. To effectively identify ***vulnerable populations***, a process for assessing the population and segmenting individuals based on group and community needs is essential. ***Population assessment*** is the process of systematically assessing a population for significant characteristics and needs. When conducting the assessment, subpopulations (groups of individuals) are identified based on selected characteristics (NCQA 2018).

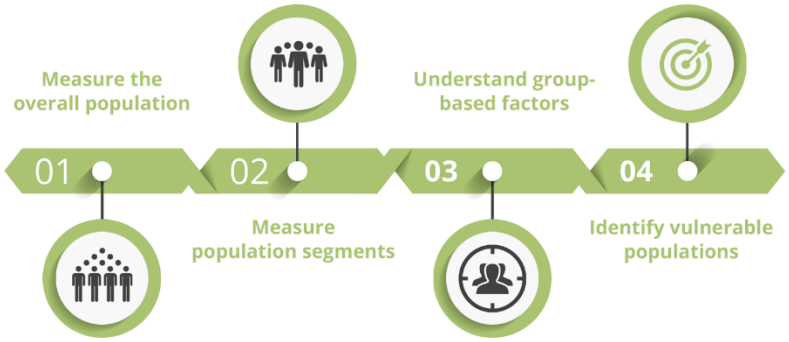


FIGURE 10. POPULATION ASSESSMENT PROCESS TO IDENTIFY POPULATIONS

Characteristics that define a relevant subpopulation may vary, however, the assessment should evaluate defining group-based factors and evaluate ***social determinants of health***. Examples of population characteristics may include, but are not limited to: housing status, employment status, food insecurity, age, and groups with common morbidities. Year two of the Improvement Plan will expand efforts to evaluate the social determinants of health (SDOH) within each population and will work with SDOH sectors to address their impact on health outcomes.

What are social determinants of health?

The ***social determinants of health*** are the conditions in which people are born, grow, live, work, and age. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social ***determinants of health*** contribute to health inequities – the unfair and unavoidable differences in health status seen within and between populations (MDHHS, 2017).

During the population assessment process, each RPQC will utilize qualitative and qualitative data, including any combination of MDHHS Vital Records, PRAMS, and community data. These data sources will be used to identify subgroups within the regional population that have the highest likelihood for adverse outcomes. RPQCs will then be able to identify tailored, evidence-based interventions to address health disparities to improve health outcomes. In subsequent years of the *Improvement Plan*, MDHHS will work with internal and external stakeholders to share data and help inform the utilization of the Population Health Model (PHM).

Stratification

Tier the population into high, moderate, and low groups based on the likelihood of an adverse outcome

Stratification is the process of separating populations or subpopulations into different groups based on risk or the potential for adverse health outcomes. The stratification process utilizes categories to assign individuals to tiers or subsets. Categories may include low, moderate, or high impact classifications (refer to Figure 6, below). The goal of the stratification process is to identify the most appropriate evidence-based interventions to meet the needs of the individuals in each population subset to address health disparities and improve health outcomes.

Risk stratification can be thought of as population segmentation, which divides the population or subpopulations into meaningful subsets (groups) using information collected through population assessment and other quantitative and qualitative data sources. Both segmentation and stratification result in the categorization of individuals who have care needs at all levels and intensities. Each tiered population is based on the potential for adverse outcomes. Though the *Improvement Plan* will be implemented statewide, it strives to implement tailored interventions for the those who experience the highest likelihood for adverse outcomes.

FIGURE 11. POPULATION STRATIFICATION PYRAMID

Prosperity Regions will utilize the risk stratification process to design and tailor interventions that optimize outcomes important to the regional population and maximize the impact of care and resources. This approach will integrate ***health equity*** throughout implementation of the Improvement Plan. Obstacles faced by specific subgroups must be identified and interventions should be tailored to address health disparities and barriers.

Interventions

Selection of evidence-based and promising practice interventions tailored to each tiered population

Intervention selection is key to achieving zero preventable maternal and infant deaths and zero health disparities. Following *data analysis*, *population identification*, and *stratification*, communities will select one to three evidence-based interventions. Interventions will be selected based on available community resources and tailored to reach populations with the highest likelihood for adverse outcomes. Each intervention must fall within the scope of the strategic focus areas, aimed at eliminating preventable cause(s) of death of mothers and babies, with a particular focus on addressing disparities.

Evidence-Based and Promising Practice Interventions

The use of evidence-based practices, programs, and ***promising practices*** are supported to ensure better outcomes for interventions.

Evidence-based interventions have been proven effective through rigorous research. They are deemed the most effective interventions known to date to address specific issues and to achieve desired outcomes. Utilizing evidence-based interventions with fidelity assures the interventions are being implemented in the most effective manner possible. When this is done, standardized and predictable outcomes can be achieved, resulting in a positive impact on health. It is imperative that the interventions aimed at eliminating preventable deaths of moms and babies be chosen in a precise manner by communities. The best way to start is by selecting interventions that have been proven effective at addressing the primary causes of maternal and infant mortality.

What are promising practices?

Promising practices include programs and strategies that have some scientific research or data showing positive outcomes in delaying an untoward outcome, but do not have enough evidence to support generalizable concusions[15].

Evidence-based and promising practice interventions to address the primary causes of maternal mortality and morbidity:

- Michigan Alliance for Innovation on Maternal Health (MI AIM) **maternal safety bundles**
- **Improve maternal health**
    - Screening and treatment for mental and behavioral health services, including Substance Use Disorder (SUD)
    - Address pre-existing conditions, including hypertension and obesity
    - Improve access to prenatal care
- Increase the number of **intended pregnancies**
    - Increase access to family planning services, including Long-Acting Reversible Contraception (LARC), in partnership with the Michigan Collaborative for Contraceptive Access (MICCA)
    - **Birth spacing** of at least 18 months between pregnancies
- **Reduce primary Cesarean section (C-section) rate**, in partnership with the Obstetrics Initiative (OBI)
- **Home visiting** and community organization outreach
- **Access to prenatal care**

Evidence-based and promising practice interventions to address the primary causes of infant mortality and morbidity:

- Reduce the number of babies born **preterm and/or low birth weight**
    - **Cervical length screening and treatment**
    - **Smoking and substance use cessation**
    - Michigan Medicaid Health Plan Low Birth Weight Project
- **Ensure the right care at the right place and right time**
- **Safe sleep practices**
    - Smoking cessation
    - Risk reduction messaging
- **Access to mental and behavioral health services**
- **Home visiting** and community organization outreach
- **Breastfeeding**
- **Well child checks** to aid in assuring healthy babies and children and include immunizations to prevent disease

Individual interventions are discussed in more detail in the following pages.

Interventions

Improving Maternal and Infant Health and Equity

Improving maternal and infant health and equity requires the intersection of all realms of health: mental, behavioral, and physical, and requires that social injustices that contribute to poor health outcomes be explicitly addressed. Increased screening and access to mental health services; prevention and treatment of substance use disorders, including addressing the associated behavioral health factors; evidence-based clinical care and practice; and focusing on pre-existing conditions that contribute to adverse outcomes are all proven interventions. For example, effective management of pre-existing conditions such as obesity and diabetes can help improve the likelihood of positive health outcomes for moms and babies.

Evidence-based and promising practice interventions will be selected by each RPQC based on data analysis with emphasis on addressing disparities, chosen focus populations, and the strategic focus area(s) being addressed. While the interventions are chosen for an identified focus population, interventions can also be implemented concurrently within communities aimed at improving the health of the entire community. An example of this approach would be implementing smoking cessation efforts for pregnant women and their household within a neighborhood, while training all those, who serve families, an evidence-based intervention proven to impact smoking cessation.

MI AIM Maternal Safety Bundles: Equipping Providers with the Resources Needed to Adequately Prevent and Treat Obstetric Emergencies

The Mother Infant Health and Equity Improvement Plan will improve existing maternal safety initiatives and drive continuous quality improvement in maternal care in partnership with the Michigan Alliance for Innovation on Maternal Health (MI AIM) to implement maternal safety bundles in all birthing hospitals in Michigan. The safety bundles help improve health outcomes for mothers by combating leading causes of preventable maternal mortality: hypertension (high blood pressure) and hemorrhage. Maternal safety bundles were developed and endorsed by national multidisciplinary organizations, including the Alliance for Innovation on Maternal Health (AIM). Safety bundles address specific areas of maternal health to institute best practices for various aspects of maternal care and prepare providers to address obstetrical emergencies (ACOG, 2018). Existing bundles being implemented by Michigan hospitals and providers include:

- Obstetric Hemorrhage
- Severe Hypertension/Preeclampsia

The purpose of the bundles is to, “equip, empower, and embolden every state, perinatal quality collaborative, hospital network/system, birth facility, and maternity care provider in the U.S. to significantly reduce severe maternal morbidity and maternal mortality (AIM, 2018).”

MI AIM Safety Bundle Fact Sheets can be found in Appendix E.

Addressing Pre-Existing Conditions: Mental and Behavioral Health Screening and Access to Treatment

Maternal mental and behavioral health can significantly impact overall health outcomes for mom and baby[16]. It is imperative to screen for mental and behavioral health conditions, including postpartum depression and substance use disorder (SUD). Implementing guidelines regarding follow-up services for women who score high/screen positive, can help reduce the risk of adverse outcomes for both moms and babies.

The Improvement Plan primarily aims to address the causes of ***pregnancy-related*** deaths to achieve the vision of **zero preventable deaths and zero health disparities**, but in doing so, this requires the consideration of pregnancy-associated mortality. The most common cause of ***pregnancy-associated*** death in Michigan was accidental drug overdose[4]. Prevention and treatment of substance use and related disorders will help save lives.

Family Planning: Increase the Number of Intended Pregnancies & Improve Birth Spacing

From 2012-2014, almost half (47.7%) of women with a recent live birth reported that their pregnancies were unintended[2]. Key strategies to increase the rate of intended pregnancies include:

- Ensuring women have access to family planning services and contraception, including Long-Acting Reversible Contraception (LARC);
- Promoting healthy birth spacing of at least 18 months in between pregnancies; and
- Increasing access to family planning clinics.

The Michigan Collaborative for Contraceptive Access (MICCA) is currently working to expand access to immediate postpartum LARC in Michigan hospitals. To learn more about MICCA, please see Appendix H.

Reduce the Rate of Primary Cesarean Section (C-Section)

In recent years, the reduction of primary cesarean section has resulted in decreased risk and complications that coincide with C-sections, such as infection and increased blood loss.

Short Cervix Screening and Treatment

Preterm birth is one of the leading causes of infant morbidity and mortality in Michigan, and worldwide[11]. Identifying a short cervix (<25mm) using a transvaginal ultrasound during the mid-trimester of pregnancy is a significant predictor of preterm delivery. Routine cervical screening, paired with progesterone treatment for women with a short cervix, is an effective intervention to reduce the rate of preterm delivery.

Infant Safe Sleep Practices

The potential to impact the infant mortality rate in Michigan by reducing the number of sleep-related deaths is significant. If all sleep-related deaths in Michigan were eliminated, the infant mortality rate would reduce by almost 19%, saving nearly 150 infant lives per year [2].

Tobacco Cessation

According to the American College of Obstetricians and Gynecologists (ACOG), "smoking during pregnancy is the most modifiable risk factor for poor birth outcomes"[13]. Screening pregnant women for tobacco use and linking to follow-up treatment for smoking cessation can reduce the risk of babies being born low birth weight, prematurely, dying a sudden unexpected infant death (SUID), and may other adverse health outcomes.

Implementation

Clinical and community alignment of interventions using a quality improvement framework

Implementation of the Improvement Plan will occur at a broad, statewide level, while specific interventions are implemented at a more focused, community-based level. Regional Perinatal Quality Collaboratives (RPQCs) will serve as the backbone organization for implementation of interventions within each prosperity region. The RPQCs will utilize the population health model to conduct quality improvement projects aimed at addressing the strategic focus areas of the Improvement Plan with a three-pronged approach: a quality improvement project utilizing the population health model; convening diverse regional stakeholders; and authentically engaging families.

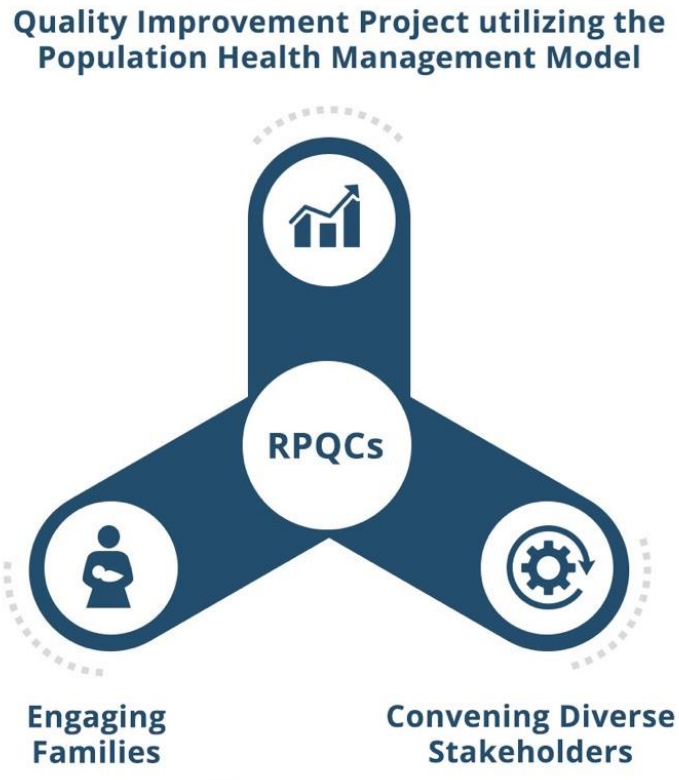


FIGURE 12. THE THREE-PRONGED APPROACH OF THE REGIONAL PERINATAL QUALITY COLLABORATIVES

History

Michigan's Regional Perinatal Quality Collaborative (RPQC) Initiative was launched in 2015 to improve the existing Perinatal Care System in Michigan. Since 2015, the initiative has expanded to seven RPQCs, representing eight prosperity regions (see Appendix G, Figure 2 for a map of Michigan's prosperity regions). The Michigan Department of Health and Human Services (MDHHS) is committed to establishing a RPQC in every prosperity region by 2020.

MDHHS provides resources to each RPQC to assist in the convening of collaborative membership and launching quality improvement projects aimed at improving birth outcomes. Each RPQC was designed to be a cross-sector collaboration of diverse community and clinical partners working to implement evidence-based interventions with a quality improvement methodology. Since inception, each RPQC has established a diverse membership, organized efforts to create change, and designed quality improvement projects related to the key evidence-based interventions (see the Interventions section for a description of interventions, pages 22-24). The RPQCs are a natural fit to serve as the backbone organization and key drivers of the Improvement Plan implementation using the population health model.

By being data-informed, regions will continue expanding partnerships and collaborations, conducting quality improvement projects and make concerted efforts to engage families. The RPQCs will delve further into focus population identification and stratification to assure the most vulnerable, disparate populations are being positively impacted. These efforts can occur in tandem with improving health outcomes for all in a region. However, focus must remain on addressing disparities and inequities, which is required to achieve the Improvement Plan vision of ***zero preventable deaths and zero health disparities***. As described in the Population Identification and Stratification sections (pages 17-19), shifting from a broad method of implementation (i.e., the Region as a whole) to a focused method of implementation (i.e., targeted universalism) will lead to a greater impact on short and long-term outcomes.

Example of Regional Perinatal Quality Collaborative implementation:

Several RPQCs are implementing the *Society for Public Health Education (SOPHE) Smoking Cessation and Reduction in Pregnancy Treatment (SCRIPT)* program within their communities. SCRIPT is an evidence-based program and addresses a known cause of preterm birth and low birthweight. Furthermore, tobacco cessation is an intervention that addresses strategic focus area 3 (i.e., Achieve zero preventable infant deaths by addressing the primary causes of infant mortality by reducing the rate of preterm births and low birth weight and the rate of sleep-related deaths, see page 9). RPQCs reviewed prenatal smoking data and began addressing the broad pregnant smoking population by implementing the SCRIPT program in agencies serving pregnant women. Going forward, RPQCs will further analyze the data to identify the most vulnerable population. The RPQC will then define how to tailor the implementation of SCRIPT for that population.

Measurement

Measure outcomes to determine the impact.

"If you can't measure it, you can't improve it."
- Peter Drucke

Measurement is an overarching evaluation of the population health framework, in which evidence-based practices are implemented based on *data*, *population identification*, and *stratification*. The process of implementing evidence-based practices utilizing the population health model is quality improvement. Building on that concept, the Improvement Plan adopted the Institute for Healthcare Improvement's Breakthrough Series Model, which focuses on continuous quality improvement via the Plan-Do-Study-Act (PDSA) rapid improvement cycles and a Learning Collaborative structure (see Figure 11, page 37). The PDSA process allows for the prioritization of goals into short, intermediate, and long-term timeframes.

Measurement is inherent to the Population Health Model (PHM), continuous quality improvement, and PDSA cycle framework. This framework will prompt measurement to monitor and track improvements. Importantly, PDSA cycles will provide opportunities to understand and evaluate issues that will lead to small, rapid improvements instead of skipping to an unmeasured, larger-scale implementation.

Implementation of the Improvement Plan requires that each Prosperity Region establish a plan to evaluate the effectiveness of interventions. The "Plan" phase prompts Specific, Measurable, Achievable, Relevant and Time-bound (SMART) goals, which inherently establishing metrics. During this phase, RPQC will measure the impact of the intervention by choosing relevant measures that match the program/intervention. The "Do" phase prompts short-term/incremental action based on the selected evidence-based strategies for the target audience/marginalized population. The "Study" phase prompts an examination of the Do phase, which may include a brief evaluation of reaching the desired metrics. This analysis prompts the "Action" phase; based on the metrics, the actions must change accordingly. This cycle continues until the desired short, intermediate, or long-term outcome has been reached. After interpretation and results, Regions can choose another intervention or process and continuously monitor the improvements.

Quality Improvement Methods

One of the goals in adopting ***quality improvement*** is to bring together clinical and public sectors through collaborative learning — specifically, using the Regional Perinatal Quality Collaboratives (RPQCs) to adopt the framework model called the Breakthrough Series (Institute for Health Care Improvement).

An important part of implementing evidence-based interventions is to monitor and track improvements for measures associated with the short and intermediate goals of the Region.

What is quality improvement?

Quality improvement consists of systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted populations (DHHS, Health Resources and Services Administration, 2011).

The Model

The Improvement Plan has adopted the Institute for Healthcare Improvement's Breakthrough Series, which builds upon a common Quality Improvement concept of Plan-Do-Study-Act (PDSA) cycles and a Learning Collaborative model. This quality improvement model is designed for regions committed to achieving sustainable change within maternal and infant health outcomes and will last anywhere from 10- to 12-months. Learning Collaboratives include three large meetings with approximately three to four-month action periods in between meetings. Through shared learning, teams from a variety of regions across the State support each other as each individual team works to rapidly test and implement changes designed to bring about sustained improvement. The goal is to build collaboration and to support the teams/local communities as they try out new ideas.

The process includes teams (RPQCs) convening on a regular basis to identify the population's need based on retrospective data. Based on the findings from the data, the teams identify the target/pilot population. The findings prompt teams to choose evidence-based or promising practice(s) that align with the greatest needs.

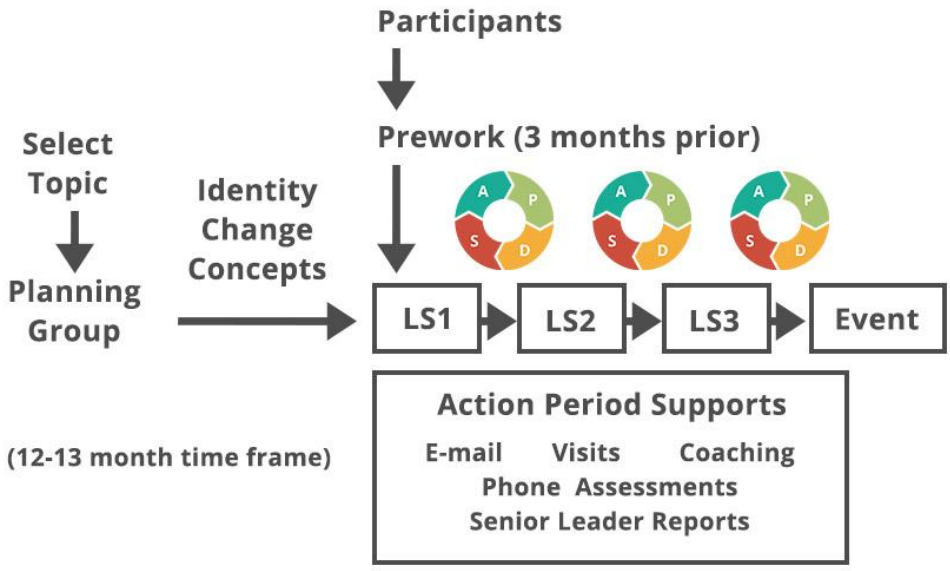


FIGURE 13. LEARNING COLLABORATIVE STRUCTURE

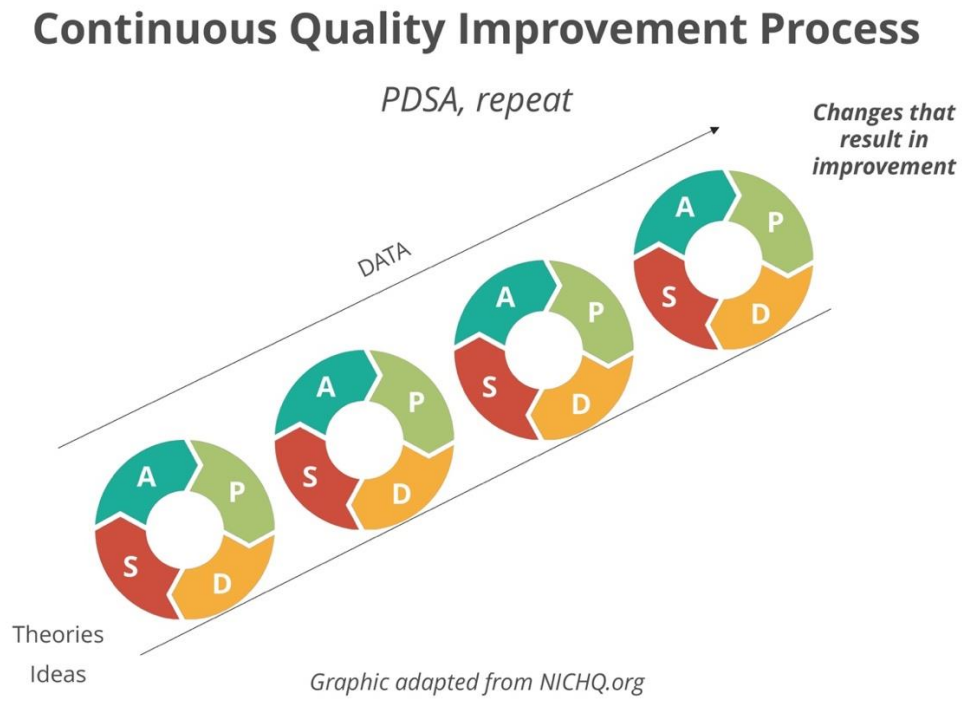


FIGURE 14. THE CONTINUOUS QUALITY IMPROVEMENT PROCESS

Plan: Select change area based on MCH assessment and/or outcome(s) of a previous PDSA cycle.
Do: Implement change, document, observe, and begin analysis.
Study: What was learned? Did the action have the desired effect?
Act: Make modification to process and begin the next cycle.

Utilizing a quality improvement framework helps to further the goals of the Improvement Plan and improve processes, which will lead to an improvement in long-term outcomes for the subpopulation.

The Implementation

Quality improvement findings and tools implemented within the RPQCs will provide opportunities to understand and evaluate the issues and begin testing changes that can lead to small, rapid improvements instead of skipping to a larger scale implementation.

Regions are encouraged to prepare short-term (quarterly), intermediate (yearly), and long-term goals unique to their selected evidence-based strategies and subpopulation. The Improvement Plan's statewide goals build upon the Regional work on a larger-scale. Therefore, statewide goals will have a slightly different time frame: the short-term goals will encompass a one-year timeframe, intermediate goals will last 1-2 years, and long-term goals will last more than 2 years. In short, the Regional work helps to improve the overall State goals for infant and maternal health outcomes.

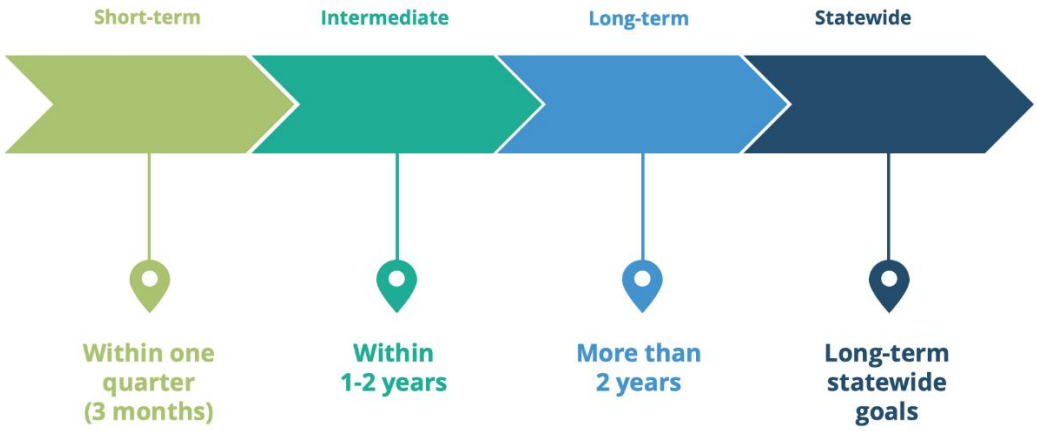


FIGURE 15. GOALS TIMELINE

Finally, this Quality Improvement framework is a simple and powerful tool for accelerating improvement within Regions, which impacts the entire State. This model will not replace current work that organizations within the Regions may already be using, but rather will be used to accelerate improvement; the Regions adapt evidence-based guidelines, with Plan-Do-Study-Act (PDSA) cycles.

Where Are We Now?

The 2019-2022 Mother Infant Health and Equity Improvement Plan builds on the momentum of the 2016-2018 IMRP by bridging the work of public health professionals, clinicians, and community members to improve maternal and infant health outcomes and reduce maternal and infant mortality in the state of Michigan.

With the end of the Infant Mortality Reduction Plan in 2017, it is important to examine maternal and infant morbidity and mortality data to highlight accomplishments, identify challenges, and set how success will be judged for the *Mother Infant Health and Equity Improvement Plan*.

Michigan's Accomplishments

Existing efforts and initiatives have resulted in significant accomplishments in maternal and infant health in the state of Michigan, which have helped guide the framework of the Improvement Plan. Important accomplishments include:

- Michigan has reduced its pregnancy-related mortality rate from 17.5 per 100,000 live births in 2011 to 14.1 per 100,000 live births in 2016[3].
- Michigan has reduced its infant mortality rate from 7.1 per 1,000 live births in 2010 to 6.8 per 1,000 live births in 2017[1].
- Michigan has reduced its teen birth rate from 33.5 per 1,000 live births in 2007 to 17.7 per 1,000 live births in 2016[1].
- The mandatory maternal death reporting law, Public Act 479 of 2016, was passed on January 5, 2017, which requires physicians and individuals in charge of health facilities to report maternal deaths. This law aims to improve the data quality of maternal deaths in the state and brings awareness to the importance of the death of a woman during or within a year of pregnancy[3].
- Michigan joined the Alliance for Innovation in Maternal Health (AIM) in 2015, a national data-driven maternal safety and quality improvement initiative with the goal of preventing severe maternal morbidity and mortality. Michigan started implementing obstetric hemorrhage and severe hypertension in pregnancy safety bundles in early 2016.
- The Regional Perinatal Quality Collaborative (RPQC) initiative was launched in FY 2015 as an effort to improve the existing Perinatal Care System in Michigan. Since its launch, 8 RPQCs, representing 9 of Michigan's prosperity regions have been established (see Appendix G, Figure 2 for a map of Michigan's prosperity regions). Each RPQC is charged with improving maternal and infant health outcomes through data-driven quality improvement projects based on the unique strengths and needs of their respective region.

What's Next

Year 1 of Implementation will focus ongoing alignment of maternal and infant health work with private and public partners. The Improvement Plan public comment period, in January 2019, is another opportunity to capture the voice of Michigan communities. The official launch of the Improvement Plan will take place at the Maternal Infant Health Summit on March 12-13, 2019. Community engagement was integral component of the development of the Plan and will continue through implementation. Community of Practice webinars as well as Regional Implementation Summits and the Ambassador Meetings are opportunities for communities to provide feedback regarding the Plan.

Year 2 of Implementation will focus on addressing systemic racism and Social Determinants of Health (SDoH) to address disparities and improve the overall health of mothers and infants in Michigan.

Measuring Outcome and Process Measures to Determine Success

The *Improvement Plan* utilizes the metrics identified in the **Measurement – Year One** section (page 23) to measure outcomes. Process measures are assessed on a quarterly basis; metrics for these processes are outlined within a scope document. The current scope document, including metrics for FY2019, Quarters 1 and 2, can be found in Appendix K.

Call to Action

What you can do now (click on embedded links to register):

- Participate in the 2019 Community of Practice Webinars (register). COP Webinars are recorded and close captioned, and will be available on the website:
  - Tuesday, January 15 from 10:30am to 12:00pm
  - Wednesday, March 20 from 10:00am to 11:00am
  - Wednesday, June 20 from 10:00am to 11:00am
  - Thursday, September 5 from 10:00am to 11:00am
  - Wednesday, October 23 from 10:00am to 11:00am
- Attend the 2019 Mother Infant Health and Equity Collaborative Meetings (register):
  - Thursday, February 21 in East Lansing
  - Thursday, May 9 in Detroit
  - Thursday, August 15 in Saginaw
  - Thursday, November 14 in Ann Arbor
- Attend the 2019 Maternal Infant Health Summit on March 12-13, 2019 in East Lansing (register)
- Connect with your Regional Perinatal Quality Collaborative

For more information about the Improvement Plan and ways to get involved, please visit:

http://www.michigan.gov/miheip

References

1. Robert Wood Johnson Foundation. (2018). About RWJF. Retrieved from: https://www.rwjf.org/en/about-rwjf.html
2. MDHHS, Division for Vital Records and Health Statistics, 2010-2016
3. NCHS, National Vital Statistics System, Mortality
4. Maternal Deaths in Michigan, 2011-2015. Michigan Maternal Mortality Surveillance Program. 2018. Available at: https://www.michigan.gov/documents/mdhhs/MMMS_2011-2015_Fact_Sheet_FINAL_635164_7.pdf
5. Maternal, Infant, and Child Health. Healthy People 2020. December 5, 2018. Retrieved from: https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health
6. 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
7. Finer, L. B., & Zolna, M. R. (2011). Unintended pregnancy in the United States: incidence and disparities, 2006. *Contraception*, *84*(5), 478-485.
8. Centers for Disease Control and Prevention (CDC). (2015). Unintended pregnancy prevention. Retrieved from: https://www.cdc.gov/reproductivehealth/unintendedpregnancy/index.htm
9. Kindig, D. & Stoddard, G. 2003. What is population health? American Journal of Public Health. 2003. 93:380-383. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447747/
10. Centers for Disease Control and Prevention (CDC). 2018. Pregnancy Mortality Surveillance System. Available at: https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-mortality-surveillance-system.htm
11. Romero, R., Yeo, L., Miranda, J., Hassan, S. S., Conde-Agudelo, A., & Chaiworapongsa, T. (2013). A blueprint for the prevention of preterm birth: vaginal progesterone in women with a short cervix. *Journal of perinatal medicine*, *41*(1), 27-44.
12. Healthy People 2030. (2018). Available at: https://www.healthypeople.gov/2020/About-Healthy-People/Development-Healthy-People-2030/Framework
13. American College of Obstetricians and Gynecologists (ACOG). (2011). Available at: https://www.acog.org/~/media/Departments/Tobacco%20Alcohol%20and%20Substance%20Abuse/SCDP.pdf
14. The National Equity Project. (2011). Targeted Universalism. Retrieved from https://blog.nationalequityproject.org/2011/06/22/targeted-universalism/
15. U.S. Department of Health and Human Services. (2009). Using What Works.
16. Rahman A, Surkan PJ, Cayetano CE, Rwagatare P, Dickson KE (2013) Grand Challenges: Integrating Maternal Mental Health into Maternal and Child Health Programmes. PLoS Med 10(5): e1001442. https://doi.org/10.1371/journal.pmed.1001442

Glossary

Health disparities	Differences in the health status of different groups due to inequity.
Infant mortality	The death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births
Low birthweight	Refers to an infant weighing less than 2,500 grams (five pounds, eight ounces) at birth.
Maternal mortality	The death of a woman during pregnancy, at delivery, or within a year after the end of her pregnancy.
Neonatal period	The first four weeks after birth.
Pregnancy-associated death	The death of a woman while pregnant or within one year of pregnancy, irrespective of cause.
Pregnancy-related death	The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by her pregnancy or its management, but not from accidental or incidental causes.
Preterm/Premature	Refers to an infant born before 37 weeks' gestation.
Sleep-related death	The death of an infant less than one year of age that occurs suddenly and unexpectedly and includes sudden infant death syndrome (SIDS), undetermined/sudden unexplained infant death (SUID), and suffocation/positional asphyxia and other causes wherein the sleep environment was likely to have contributed to the death.

Causes of Pregnancy-Related Death

Definitions of the leading causes of pregnancy-related deaths in Michigan (Mayo Clinic, 2018)

Cause of Death	Definition
Amniotic fluid embolism	An obstetric emergency in which amniotic fluid enters the mother's bloodstream.
Cardiomyopathy	A disease of the heart muscle that makes it harder for your heart to pump blood to the rest of your body.
Cardiovascular conditions	Conditions that involve narrowed or blocked blood vessels, the heart muscle, valves, or rhythm.
Cerebrovascular conditions	Conditions that alter the blood supply to the brain.
Hemorrhage	Profuse blood loss.
Maternal hypertension	High blood pressure during and after pregnancy.
Sepsis	The body's response to an infection, triggering changes that can damage multiple organ systems.
Thrombotic/other embolism	Obstruction of an artery, typically by a clot of blood or an air bubble.

Acknowledgements

The Mother Infant Health and Equity Improvement Plan is the culmination of the efforts of a wide range of stakeholders throughout the state of Michigan. The Improvement Plan was informed by members of the Maternal Infant Strategy Group, whose members provided their expertise on maternal and infant health and responded to a broad array of issues concerning health disparities, social determinants of health, advocacy, and alignment of efforts. A list of MISG members can be found in Appendix A.

The Improvement Plan was written by the Maternal Infant Project Management Team through the Michigan Department of Health and Human Services Bureau of Family Health Services: Lynette Biery, PA-C, MSc, Director of the Bureau of Family Health Services, Ninah Sasy, MSA, Senior Maternal Child Health Strategist, Dawn Shanafelt, MPA, BSN, RN, Director of the Division of Maternal and Infant Health, Debra Darling, RN, BSN, Interim Director of the Quality Improvement area at Michigan State University's Institute for Health Policy, Emily Goerge, MPH, MSN, RN, Perinatal Nurse Consultant, Laura Houdeshell, MPH, Quality Improvement Project Manager, Kenyetta Jackson, MPH, Health Equity Specialist in the Women and Maternal Health Section, Laura Drayton, MPH, Implementation Coordinator for the Mother Infant Health and Equity Improvement Plan, and Shatoria Clanton, MPH, Project Coordinator for the Mother Infant Health and Equity Improvement Plan.

The Improvement Plan would not succeed without the dedicated work of every individual ensuring the success of each Regional Perinatal Quality Collaborative. For an updated list of RPQC leadership, please visit the Improvement Plan website: http://www.michigan.gov/MIHEIP

The Improvement Plan also acknowledges the outstanding contributions of the many individuals and organizations involved in the important work of reducing maternal and infant mortality and improving health equity. In particular, the following organizations are recognized for their leadership and collaboration in realizing the vision of ***zero preventable deaths and zero health disparities***: the Michigan Alliance for Innovation on Maternal Health (MI AIM), the Michigan Collaborative for Contraceptive Access (MICCA), the Michigan Maternal Infant Health and Equity Collaborative (MIHEC), the Michigan Public Health Institute (MPHI), the Michigan Council for Maternal and Child Health (MCMCH), the Michigan Health and Hospital Association (MHA), SisterFriends Detroit, Make Your Date Detroit, and many others.

Finally, the Improvement Plan has significantly benefitted from the input of community members throughout the state of Michigan, including more than 500 Town Hall Meeting attendees and more than 50 MIHEIP Ambassadors that shared their time and feedback.

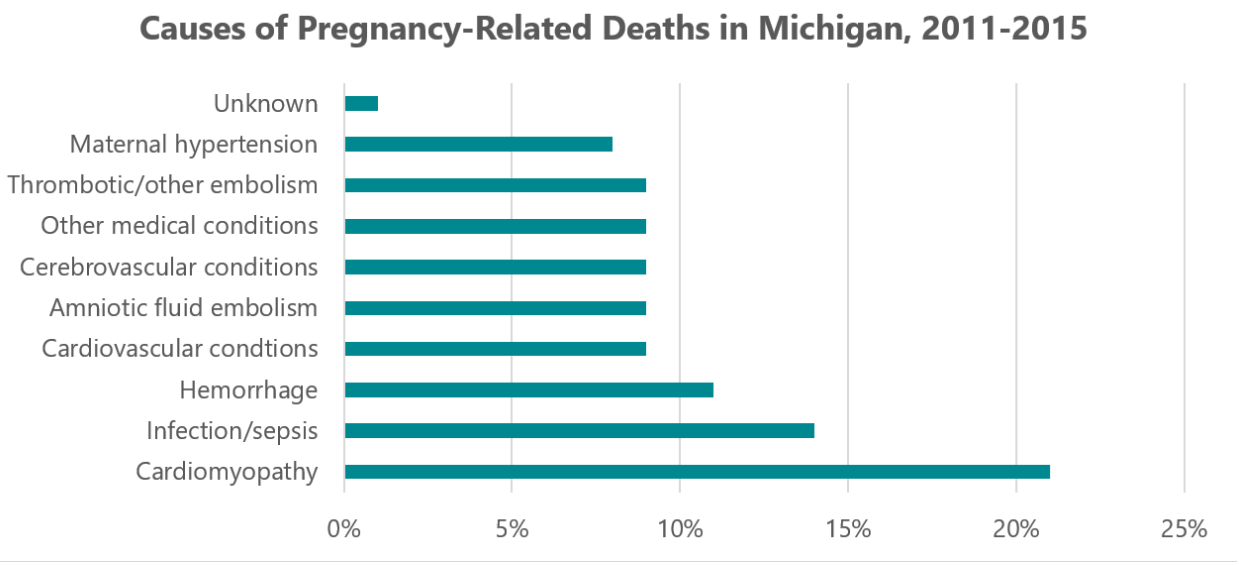
Appendix A: Maternal Infant Strategy Group Members

Name	Title	Affiliation
Matthew Allswede, MD	Program Director Obstetrics, Gynecology and Reproductive Biology Residency	Sparrow Women's Health
Vernice Anthony, RN, MPH	CEO	VDA Health Connect
John Barks, MD	Neonatologist	University of Michigan Hospital and Health Centers
Colleen Barry, MD	Chief Pediatric Medical Consultant, Children's Special Health Care Services	MDHHS
Charles Barone, MD	Chair, Department of Pediatrics	Henry Ford Health Systems
Lynette Biery, PA-C	Director, Bureau of Family Health Services	MDHHS
Brittany Bogan, FACHE, CPPS	Senior Vice President of Safety and Quality	Michigan Health and Hospital Association Keystone Center
Nicki Britten, MPH	Health Officer	Berrien County Health Department
Renee Canady, PhD	CEO	MPHI
Debra Darling	Director, Quality Improvement Programs	MSU Institute for Health Policy
Stephanie Flom, MD	Medical Director	Meridian Health
James Forshee, MD	Chief Medical Officer and Senior Vice President of Medical Affairs	Priority Health
Kiddada Green, MAT	Founding Executive Director	Black Mothers' Breastfeeding Association
Herman Gray, MD	Chair, Department of Pediatrics	Wayne State University
Sonia Hassan, MD	Associate Dean for Maternal, Perinatal and Child Health	Wayne State University

Teresa Holtrop, MD	President	Michigan Chapter American Academy of Pediatrics
Joneigh Khaldun, MD	Director and Health Officer	Detroit Health Department
Elizabeth Kushman, MPH	Manager, Maternal, Infant & Early Childhood Services	Inter-Tribal Council of MI
Karen MacMaster, MPH	Acting Senior Deputy Director, Population Health Administration	MDHHS
David Neff, MD	Chief Medical Director, Medical Services Administration	MDHHS
Cheryl Larry-Osman, RN, MS	Perinatal Clinical Nurse Specialist	Henry Ford Hospital
Lisa Peacock, RN, MSN	Health Officer	Benzie-Leelanau District Health Dept
Ninah Sasy, MSA	Senior Maternal Child Health Strategist	MDHHS
Dawn Shanafelt, MPA, BSN, RN	Director, Division of Maternal and Infant Health	MDHHS
Robert Sokol, MD	Dean, Emeritus and Distinguished Professor, Emeritus, Departments of Obstetrics and Gynecology and Physiology	Wayne State University School of Medicine
Amy Zaagman, MPA	Executive Director	Michigan Council for Maternal and Child Health

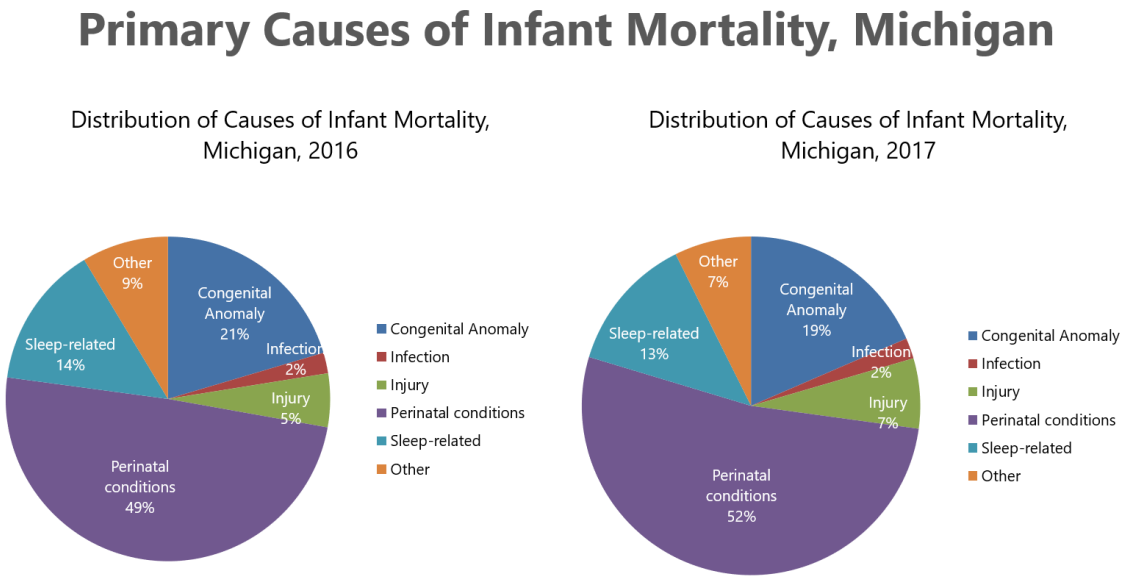
Appendix B: Maternal and Infant Mortality Data

Graphic 4: Primary Causes of Pregnancy-Related Deaths in Michigan, 2011-2015



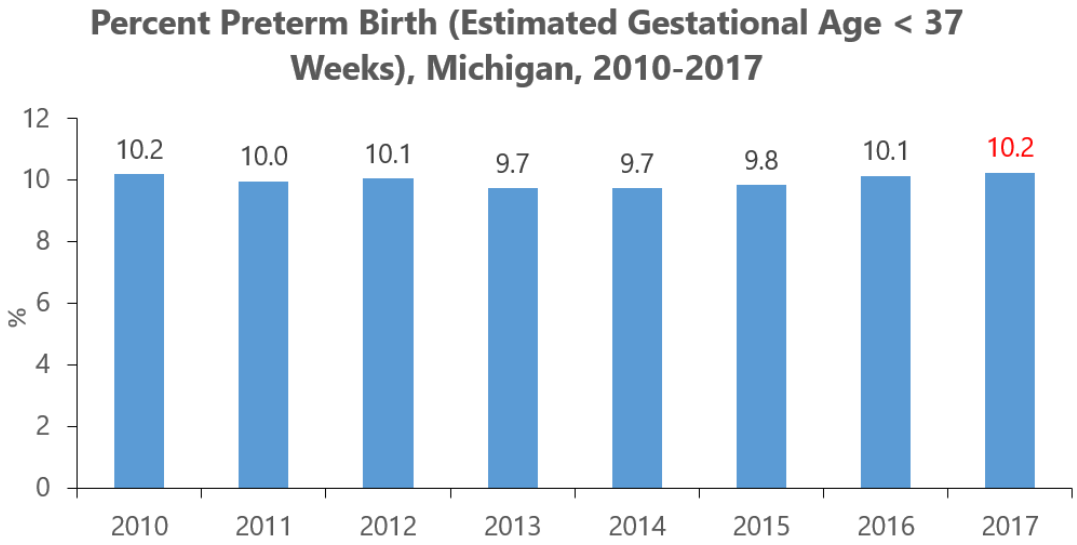
Pregnancy-related death is the death of a woman while pregnant or within a year of the end of a pregnancy from any cause related to or aggravated by the pregnancy or its management.
Data source: Michigan Maternal Mortality Surveillance Program, Maternal Deaths in Michigan, 2011-2015

Graphic 5: Primary Causes of Infant Deaths in Michigan, 2016-2017



Source: MDHHS, Division of Vital Records and Health Statistics

Graphic 6: Percent Preterm Birth (Estimated Gestational Age <37 Weeks), Michigan, 2010-2017



Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births.
Gestational age is based on the obstetric estimate of gestation.
Source: MDHHS, Division of Vital Records and Health Statistics

Appendix C: Data Sources

MDHHS Division for Vital Records and Health Statistics

The Michigan Department of Health and Human Services Division for Vital Records and Statistics serves as an important source of statistical information. Vital statistics data collected from records includes births, deaths, events, rates, and detailed cross tabulations. Statistical information for Michigan with national comparisons are included, along with extensive data at the county and community level.

Pregnancy Risk Assessment Monitoring System (PRAMS)

PRAMS is a program that, with coordination from the Centers for Disease Control and Prevention (CDC), helps gather data about moms' health before, during, and after their pregnancy. The PRAMS survey was developed in 1987 in cooperation with the CDC. Michigan was one of the first states to participate in PRAMS. The PRAMS survey is revised every three to five years and each revision is referred to as a survey phase.

Michigan Maternal Mortality Surveillance Program (MMMS)

The maternal death review process was organized in Michigan in 1950 as a collaborative effort between the former Michigan Department of Community Health (MDCH), the Committee on Maternal and Perinatal Health of the Michigan State Medical Society (MSMS), and the chairs of the Departments of Obstetrics and Gynecology of the medical schools in Michigan. Today, Michigan's maternal mortality review is a state-level structured process by which two multidisciplinary committees identify and review cases of maternal death that occur during pregnancy, at delivery, or within one year of pregnancy. The medical review committee is focused on reviewing medical causes of death in pregnant and postpartum women, and the injury review committee focuses on reviewing accidental causes of death including substance-related deaths, homicides, suicides, and motor vehicle accidents. The medical and injury committees are made up of multidisciplinary representatives from around the state in fields including public health, obstetrics and gynecology, maternal-fetal medicine, nursing, midwifery, forensic pathology, mental health and behavioral health. The Michigan Public Health Code and other state laws facilitate access to medical records, ensure confidentiality, and protect case information, committee members, review proceedings, and findings from subpoena and legal actions. With the support of these laws, the review committees have access to multiple sources of information that provide a deeper understanding of the circumstances surrounding each maternal death and allow them to develop action recommendations to reduce the occurrence of preventable future deaths.

Appendix D: List of Acronyms and Abbreviations

ACOG	The American College of Obstetricians and Gynecologists
AIM	Alliance for Innovation on Maternal Health
LARC	Long-Acting Reversible Contraceptive
MI AIM	Michigan Alliance for Innovation on Maternal Health
MICCA	Michigan Collaborative for Contraceptive Access
MIHEC	Maternal Infant Health and Equity Collaborative
MIHEIP	Mother Infant Health and Equity Improvement Plan
MISG	Maternal Infant Strategy Group

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE
safe health care for every woman

PATIENT SAFETY BUNDLE

Obstetric Hemorrhage

READINESS

Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compressions stitches
- Immediate access to hemorrhage medications (kit or equivalent)
- Establish a response team - who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
- Establish massive and emergency release transfusion protocols (type-O negative/uncrossmatched)
- Unit education on protocols, unit-based drills (with post-drill debriefs)

RECOGNITION & PREVENTION

Every patient

- Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
- Measurement of cumulative blood loss (formal, as quantitative as possible)
- Active management of the 3rd stage of labor (department-wide protocol)

RESPONSE

Every hemorrhage

- Unit-standard, stage-based, obstetric hemorrhage emergency management plan with checklists
- Support program for patients, families, and staff for all significant hemorrhages

REPORTING/SYSTEMS LEARNING

Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of serious hemorrhages for systems issues
- Monitor outcomes and process metrics in perinatal quality improvement (QI) committee

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety bundles to help facilitate the standardization process. This bundle reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular bundle may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman.

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE
safe health care for every woman

PATIENT SAFETY BUNDLE

Hypertension

READINESS

Every Unit

- Standards for early warning signs, diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia (include order sets and algorithms)
- Unit education on protocols, unit-based drills (with post-drill debriefs)
- Process for timely triage and evaluation of pregnant and postpartum women with hypertension including ED and outpatient areas
- Rapid access to medications used for severe hypertension/eclampsia: Medications should be stocked and immediately available on L&D and in other areas where patients may be treated. Include brief guide for administration and dosage.
- System plan for escalation, obtaining appropriate consultation, and maternal transport, as needed

RECOGNITION & PREVENTION

Every Patient

- Standard protocol for measurement and assessment of BP and urine protein for all pregnant and postpartum women
- Standard response to maternal early warning signs including listening to and investigating patient symptoms and assessment of labs (e.g. CBC with platelets, AST and ALT)
- Facility-wide standards for educating prenatal and postpartum women on signs and symptoms of hypertension and preeclampsia

May 2015

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE

safe health care for every woman

PATIENT SAFETY BUNDLE

Hypertension

RESPONSE

Every case of severe hypertension/preeclampsia

- Facility-wide standard protocols with checklists and escalation policies for management and treatment of:
  - Severe hypertension
  - Eclampsia, seizure prophylaxis, and magnesium over-dosage
  - Postpartum presentation of severe hypertension/preeclampsia
- Minimum requirements for protocol:
  - Notification of physician or primary care provider if systolic BP =/> 160 or diastolic BP =/> 110 for two measurements within 15 minutes
  - After the second elevated reading, treatment should be initiated ASAP (preferably within 60 minutes of verification)
  - Includes onset and duration of magnesium sulfate therapy
  - Includes escalation measures for those unresponsive to standard treatment
  - Describes manner and verification of follow-up within 7 to 14 days postpartum
  - Describe postpartum patient education for women with preeclampsia
- Support plan for patients, families, and staff for ICU admissions and serious complications of severe hypertension

REPORTING/SYSTEMS LEARNING

Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of all severe hypertension/eclampsia cases admitted to ICU for systems issues
- Monitor outcomes and process metrics

Note: "Facility-wide" indicates all areas where pregnant or postpartum women receive care. (E.g. L&D, postpartum critical care, emergency department, and others depending on the facility).

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety bundles to help facilitate the standardization process. This bundle reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular bundle may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman.

May 2015

For more information visit the Council's website at www.safehealthcareforeverywoman.org

Appendix F: MIHEIP Town Hall Meeting Summaries

Executive Summary

Throughout the summer of 2018, the Mother Infant Health and Equity Improvement Plan team hosted a series of five town hall meetings throughout the state. The purpose of the town hall meetings was to collect feedback from communities to determine perceived priorities and barriers to successful MIHEIP implementation.

Northern MI Town Hall Meeting | June 20, 2018 | Grayling, Michigan

More than 60 people came together to provide feedback on the MIHEIP:
38% public health | 20% clinician | 16% community members | 26% other*
*Included nonprofits, health plan representatives, community educators, and university/academic

Northern MI participants expressed the need for better clinical-community linkages and more community outreach. Northern MI wanted to address social determinants of health. Also, participants thought it would be important to involve providers, particularly with new ACOG recommendations.

Northern MI participants perceive the Medicaid work requirement as a barrier to accessing care and believe it should be addressed through MIHEIP efforts. They also emphasized step-by-step outline for the community to follow for successful implementation

West/Southwest Michigan Town Hall Meeting | July 25, 2018 | Grand Rapids, Michigan, with a satellite meeting in Kalamazoo

More than 165 people came together to provide feedback on the MIHEIP:
22% public health | 44% clinicians | 17% community members | 17% other*
*Included nonprofits, educators, health plan representatives, and health consultants

West/Southwest MI participants agreed on the importance of having better representation from populations most affected by maternal-infant morbidity and mortality. Like other groups, West/Southwest MI was concerned about addressing SDoH. West/Southwest MI participants described mistrust and stigma due to cultural and socioeconomic differences, and suggested building relationships with mothers and letting mothers be the driving force for change.

Southeast Michigan Town Hall Meeting | August 16, 2018 | Detroit, Michigan with a satellite meeting in Ann Arbor

More than 200 people came together to provide feedback on the MIHEIP:
32% public health | 38% clinicians | 20% community members | 10% other*
*Included QI consultants, nonprofits, health plan representatives, and university/academic

Southeast MI identified the need to include mother's champions including fathers, aunts, grandmothers, caregivers, etc. in interventions. Racism and SDoH were also major concerns for this region, as were reducing unplanned pregnancies. Participants stressed the importance of the plan being inclusive of all groups, and thought it was important to incorporate legislative efforts with the improvement plan.

Upper Peninsula Town Hall Meeting | September 10, 2018 | Marquette, Michigan

More than 50 people came together to provide feedback on the MIHEIP:
40% public health | 35% clinician | 14% community members | 11% other*
*Included health plan representatives, a city commissioner, and nonprofit representatives

Upper Peninsula participants found it important to connect clinical and public organizations with community members. They also identified the need to provide travel accommodations, as well as safe spaces to discuss substance misuse and mental health matters. Participants expressed the importance of collaboration between prenatal and postnatal providers.

Mid-Michigan Town Hall Meeting | September 25, 2018 | Saginaw, Michigan with satellite meetings in Caro and Bad Axe

More than 70 people came together to provide feedback on the MIHEIP:
33% public health | 29% clinician | 24% community members | 14% other*
*Included nonprofits, Great Start representatives, and a maternal and child health lobbyist

Participants in the Mid-Michigan MIHEIP Town Hall identified the need for trusting relationships between families, community institutions, medical institutions, and government. Also, participants suggested the need to strengthen resources for mothers with addiction and/or mental health needs. Participants discussed the need for education surrounding nutrition, chemical/toxic exposure, vaccinations, breastfeeding, child safety/safe sleep, and child health visits. Social determinants of health were particular concerns for this region. Participants also shared concerns about lack of birthing hospitals and prenatal providers in the region, causing transportation to be a barrier.

Appendix G: Figures

Figure 2: Michigan's Prosperity Regions

The Michigan Department of Health and Human Services and the Maternal Infant Strategy Group present the

2019-2022

MOTHER INFANT HEALTH & EQUITY IMPROVEMENT PLAN

VISION

Zero preventable deaths. Zero health disparities.

WHY IS THIS PLAN NEEDED? Moms and babies in Michigan are dying from preventable causes. Women and infants of color face an unconscionably higher risk of dying.

WHY are moms and babies dying?

- Health inequities & unjust treatment
- Pregnancy and delivery complications
- Onset of mental/ behavioral health conditions
- Unplanned pregnancies
- Being born premature and/or low birthweight
- Infants sleeping in an unsafe environment

WHAT do we need to do?

- Address the primary causes of preventable infant mortality
- Address the primary causes of preventable maternal mortality
- Explicitly address disparities

HOW are we going to do it?

- Employ a population health management model to ensure the most vulnerable populations receive high-impact interventions
- Align private and public sector interventions
- Integrate interventions across the mother infant dyad

TOGETHER, SAVING LIVES

- Michigan Families
- Community Partners
- Obstetric Initiatives: MI AIM MICCA OBI
- Maternal Infant Health and Equity Collaborative
- Maternal Infant Strategy Group
- Regional Perinatal Quality Collaboratives

Appendix H: Together, Saving Lives: Michigan's Resources

The *Mother Infant Health and Equity Improvement Plan* acknowledges the importance of the many stakeholders working to improve mother, infant, and family outcomes. Families, communities, community organizations and agencies, as well as providers, health plans, and advisory councils, are tremendous resources that must work together to expand capacity. When all resources and stakeholders work together in alignment with the Improvement Plan, improved maternal and infant health outcomes will become a reality.

Michigan's Maternal Infant Strategy Group (MISG)

In 2017, MDHHS created a Maternal Infant Strategy Group (MISG) to provide necessary leadership to align maternal and infant health goals and strategies across private and public stakeholders and to provide guidance on operationalizing a health equity lens in all maternal and child health programs. The MISG provided expert guidance throughout the development of the Mother Infant Health and Equity Improvement Plan to align maternal and infant goals and strategies, facilitate collaboration among stakeholders, and provide guidance on operationalizing a health equity lens to address ***social determinants of health*** and reduce the racial disparity in maternal and infant outcomes in Michigan. A list of MISG members, including titles and organizations, can be found in Appendix A.

Michigan Alliance for Innovation on Maternal Health (MI AIM)

The Alliance for Innovation in Maternal Health (AIM) is a national data-driven maternal safety and quality improvement initiative that relies on the engagement of stakeholders like health departments, perinatal quality improvement collaboratives, hospitals and health associations. The goal is to implement safety bundles in hospitals to improve care and prevent severe maternal morbidity (complications during labor and delivery) and maternal deaths.

Michigan Collaborative for Contraceptive Access (MICCA)

The Michigan Collaborative for Contraceptive Access (MICCA) is a partnership between the Michigan Department of Health and Human Services, Bureau of Family Health Services, the University of Michigan, and the Institute for Health Policy at Michigan State University. The goal of MICCA is to embed the American College of Obstetricians and Gynecologists (ACOG) guidelines into practice, including:

- Improve prenatal contraceptive counseling
- Increase access to immediate postpartum LARC
- Ensure exceptional patient experience of care

Maternal Infant Health and Equity Quality Collaborative (MIHEC)

The purpose of the Maternal Infant Health & Equity Collaborative (MIHEC) is to support and champion the statewide Mother Infant Health & Equity Improvement Plan (MIHEIP). The Collaborative pursues a shared vision between the varied organizations and providers working to improve the health and well-being of Michigan's families, and it exists to assist and promote collaborative health and equity improvement efforts.

Community Partners

The Improvement Plan relies on the support of community partners to align efforts and implement interventions in each region. Local health departments, maternal and infant healthcare providers, nonprofits, grass-roots organizations, universities, faith-based organizations, and other maternal and infant health stakeholders must work together to reduce disparities and save lives.

A list of organizations supporting the work of the Improvement Plan can be found in Appendix I.

Community Health Innovation Regions (CHIRs)

Community Health Innovation Regions (CHIRs) also work in alignment with the *Improvement Plan*. A CHIR is a unique model for improving the wellbeing of a region and reducing unnecessary medical costs through collaboration and systems change. CHIRs engage a broad group of stakeholders to identify and address factors that affect residents' health, such as housing, transportation, and food insecurity, as well as access to high-quality medical care.

The Plan for Improving Population Health (PIPH), which will be developed by the Michigan Department of Health and Human Services (MDHHS), will include an assessment of the overall health of the state, as well as measurable goals, objectives, and interventions to improve the health of the entire state population; improve the quality of healthcare across the state; and reduce healthcare costs.

The Plan for Improving Population Health and the Mother Infant Health and Equity Improvement Plan will align efforts to achieve the greatest impact for Michigan.

Community Input

To increase the impact of interventions, the Improvement Plan collects feedback from the community and seeks to increase community awareness and engagement. Mothers, fathers, family members, faith-based leaders, and other community members must all be invested in the health of moms and babies to improve health outcomes. The Improvement Plan works with community-based organizations and programs to connect with Michigan families to teach advocacy and provide support.

Appendix I: Supporting Organizations

The Mother Infant Health and Equity Improvement Plan is currently supported and endorsed by the following organizations:

Berrien County Health Department

Bronson

City of Detroit Health Department

Greater Detroit Area Health Council

Harambee Care

Henry Ford Health System

Make Your Date Detroit

McLaren Health Care

Meridian Health

Michigan Alliance for Innovation on Maternal Health (MI AIM)

Michigan Collaborative for Contraceptive Access

Michigan Council for Maternal and Child Health

Michigan Health and Hospital Association

Michigan Maternal Infant Health and Equity Collaborative

Michigan Health Improvement Alliance

Michigan Public Health Institute

Michigan State University Institute for Health Policy

Munson Healthcare

Northern Michigan Public Health Alliance

Priority Health

Saginaw County Community Mental Health Authority

The Samaritan Center

Spectrum Health

Strong Beginnings – Healthy Start

University of Michigan Von Voigtlander Women's Hospital

Upper Peninsula Health Care Solution

Upper Peninsula Health Plan

Wayne State University Perinatal Initiative

Appendix J: Michigan IMRP Statewide Metrics (Condensed Version)

Metrics	Data Source	Measure Source
Infant mortality rate per 1,000 live births, overall and stratified by race/ethnicity and geography	Vital Records	NOM - MCH Block
Percent of very low birthweight infants born in a hospital with a level III or higher NICU	Vital records and NICU levels	NPM -MCH Block
NAS rate per 10,000 live births, overall and stratified by race/ethnicity and geography	Live birth linked to MIDB	NOM- MCH Block (uses HCUP and rate per 1,000)
Percent of women with a recent live birth who initiate breastfeeding, overall and stratified by race/ethnicity and geography	Vital records	
Percent preterm birth (estimated gestational age < 37 weeks) overall and stratified by race/ethnicity and geography	Vital Records	NOM - MCH Block
Percent low birthweight (birthweight < 2,500 grams) overall and stratified by race/ethnicity and geography	Vital Records	NOM - MCH Block
Percent very low birthweight (birthweight < 1,500 grams) overall and stratified by race/ethnicity and geography	Vital Records	NOM - MCH Block
Percent of women with a recent live birth who smoked during pregnancy	Vital Records	
Percent of children receiving all recommended immunizations within the first year of life	MCIR/IMMS	
Percent of population receiving recommended Influenza and Tdap vaccinations	MCIR/IMMS	
Percent children ages 10 months through 71 months whose parents completed a standardized developmental screening tool in the past 12 months among those children who had a health care visit in the past 12 months	National Survey of Children's Health and Home Visiting Program Data	NPM -MCH Block
Sleep-related sudden unexpected infant death rate per 100,000 live births	SUID Case Registry	
Percent of women with a recent live birth reporting having their infants put to sleep alone in their crib, bassinet or pack and play	PRAMS	SPM -MCH Block
Percent of infants put to sleep without objects in their crib, bassinet or pack and play	PRAMS	SPM -MCH Block
Pull a few indicators from the existing PA 291 report and/or percent of low/moderate/high risk clients who have received 3 or more MIHP visits	Medicaid	MIHP
Severe maternal morbidity per 10,000 delivery hospitalizations by category	MIDB linked to live birth	NOM -MCH Block
Percent of women with a recent live birth reporting having a dental visit during pregnancy	PRAMS	NPM -MCH Block
Percents of women who received prenatal care during the first trimester, after 36 weeks, or not at all	Vital Records	NOM -MCH Block
Percent of women with a recent live birth reporting that their pregnancy was intended	PRAMS	
Teen birth rate per population 15-19 years		
Percent of high school students who report feeling sad or hopeless every day for two or more weeks in a row.	YRBSS	SPM -MCH Block
Percent of women enrolled in MIHP who are screened for maternal depression	MIHP program data	SPM -MCH Block

Appendix K: Mother Infant Health and Equity Improvement Plan Scope

FY19 Mother Infant Health & Equity Improvement Implementation Plan			
Key MIHEIP Domains			
MIHEIP Scope Planning FY19 Q1 & Q2	**Improvement Plan Admin**	**External Implementation**	**Regional Collaboratives**
Implementation Key Objectives	The MIHEIP project management team will update and manage the scope of the Improvement Plan	Provide community partners with the knowledge, data, and technical assistance to strategically align with the Improvement plan to improve outcomes of pregnancy, birth, and the first year of life.	Provide the RPQC and community partners with the knowledge, data, and technical assistance to successfully apply population health management methods to strategically identify health disparities, focus population(s), MIHEIP strategies and implement interventions to improve outcomes of pregnancy, birth, and the first year of life.
Primary Oversight Group	MISG PMT	PMT	MISG PMT
Key Milestones FY19 Q1 & Q2	1. Implementation Retreat & Report 2. Establish the population health framework as the method that MDHHS and the RPQC communities will use to implement the MIHEIP 3. Data Identified & Mapped Regionally 4. Data Stakeholders Meeting	1. Create communication plan with external partners/report out during MIHEC quarterly meetings	1. Hold 12/4/18 Day of Learning (agenda, materials, information) 2. Monitor RPQC participation in Statewide Perinatal Learning Collaborative 3. Revise FY20 Contracts by 2/14/19 4. Conduct 2 data meetings with MCH Epi 5. Share regional-specific data with Collaboratives
Key Metrics	Administrative: 1. December 3 internal stakeholders meeting & number of depts represented 2. December 3 Retreat Report distributed to MISG Data: 1. Meeting date with Epi/Kushman 2. Mapped/hot spots identified (date) 3. Shared with regional collaboratives (date) Implementation: 1. Jan COP and number of attendees Measurement: 1. Date metrics/goals established and number of metrics/goals	1. Number of external partners that attend the MIHEC 2. Dissemination of information to RPQC members	1. Number of regions implementing QI project(s) by March 1 2. Number of regions submitting Quarterly Progress Reports on time 3. Finalized FY20 contract language 4. Number of regions represented at meeting on 12/4/18 5. Number of regions actively participating in Statewide Learning Collaborative 6. Number of regions with 2 or more community members attending at least half of meetings

FY19 Mother Infant Health & Equity Improvement Implementation Plan			
Key MIHEIP Domains			
Internal Alignment: MDHHS	**MIHEIP Promotion**	**AIM Safety Bundles**	**MICCA**
Provide tools and support for alignment of MDHHS programs with the Improvement Plan.	Provide communities and partner organizations with tools and resources to improve engagement with the Improvement Plan and increase the impact of its initiatives.	Implementation of ACOG hypertension and hemorrhage safety bundles in all MI Birthing Hospitals	Execution of an immediate postpartum LARC insertion demonstration project in six to ten Michigan hospitals.
PMT	MISG PMT	MISG MI AIM Executive Committee	MISG MICCA Steering Committee
1. Agenda, materials, information for Internal Stakeholder Meeting 12/3	1. Create Improvement Plan 2. Distribute MIHEIP 3. March Summit 4. Manage Community of Practice webinars 5. Launch MIHEIP website 6. Social Media management	1. Revised Strategic Plan 2. Finalize MI-AIM designations based on 1/31/18 data submission	1. Develop recruitment materials 2. Schedule 2-3 recruitment/outreach webinars 3. Recruit 6- 10 hospitals 4. March 13 Kick-off meeting at Summit
1. Meet with MDHHS Directors	1. Provide RPQCs with Draft MIHEIP Implementation Toolkit 2. Work with Summit Executive Planning Team to develop a MIH Summit agenda that brings together maternal and infant programs as well as public and private stakeholders 3. Finalize and distribute MIHEIP 4. Send out monthly newsletter 5. Develop and distribute “brief report” (booklet) 6. Develop MIHEIP website 7. Develop social media campaign for partner recruitment and public awareness 8. Work with MDHHS Communications Section for In the Spotlight feature, DHHS Digest article to promote Plan and website, and social media presence 9. Develop and distribute MIHEIP awareness toolkit	1. Send out monthly newsletters 2. Provide technical assistance to the Leadership Team, Executive Team, Outreach and Implementation 3. Organize and facilitate monthly webinars 4. Project manage site visits	1. Conduct 2-3 recruitment/outreach webinars 2. Distribute MICCA application, survey and materials 3. Review applications and select a cohort of 6-10 hospitals demonstration sites to participate in the 2-year collaborative project 4. Prepare for March 13, 2019 Kick Off meeting at Summit

Contact Information

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