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Practice Summary & Implementation Guidance

Maternal Mortality Prevention Program (MMPP)

Colorado's Maternal Mortality Prevention Program uses a three-pronged approach of community-led solutions, clinical quality improvement, and public health programs to eliminate preventable maternal deaths in the State of Colorado, reduce maternal morbidities, and improve population health and health equity for pregnant and postpartum people.

Cutting-Edge | Emerging | Promising | Best

Location	Topic Area	Setting
Colorado	Preconception/ Reproductive Health	Community

Population Focus	NPM	Date Added
Perinatal/Infant Health	NPM 3: Risk-Appropriate Perinatal Care	October 2020

Contact Information

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Section 1: Practice Summary

PRACTICE DESCRIPTION

Maternal mortality has been increasing in the United States, which is an unacceptable situation. It is crucial to remain vigilant and active in preventing maternal mortality. Maternal mortality is the death of a person while pregnant or up to one year postpartum, from any cause. It is an important indicator of the health and health equity of a community and health care system. Each case is a tragedy that is often preventable. The circumstances and causes vary and may be prevented at any level of the system: patient, provider, facility, systems, or community factors. In addition to being preventable, maternal death is not experienced evenly across the population. Throughout the U.S., the burden of maternal death is disproportionately and unfairly borne by individuals of color, those with low socioeconomic status, and those living in communities where systemic inequality has persisted and is perpetuated. Black and Native American people are at the highest risk for pregnancy-related death in the U.S. due to those structural determinants.

Colorado's commitment to reviewing maternal mortality was put in statute in May 2019 when Gov. Jared Polis signed the bipartisan Maternal Mortality Prevention Act to formalize and fund the Maternal Mortality Review Committee (MMRC). It also provided subpoena protection for MMRC members and required affected communities to be represented on the MMRC. The legislation also enabled Colorado to apply for and receive grant funding from the Centers for Disease Control and Prevention's ERASE Maternal Mortality grant program, which began in October 2019. The CDC grant supports the state to expand its three-pronged strategy of **community-led solutions, clinical quality improvement, and public health programs.** With funds from the CDC and the state, Colorado can collect better data, analyze, and publish data more frequently, and implement recommendations to prevent deaths and improve maternal health equity.

CORE COMPONENTS & PRACTICE ACTIVITES

The Maternal Mortality Prevention Program (MMPP) exists to eliminate preventable maternal deaths in the State of Colorado, reduce maternal morbidities, and improve population health and health equity for pregnant and postpartum people. This practice impacts the maternal population in Colorado, focusing on deaths that occur during pregnancy and up to one year after pregnancy, regardless of the cause.

The MMPP is responsible for administering the Maternal Mortality Review Committee (MMRC), a multidisciplinary committee that reviews every maternal death that occurs in the state. The MMPP works to prevent maternal deaths by improving the maternal mortality review process and implementing recommendations for prevention through community-led solutions, clinical quality

improvement, and public health programs, including evidence-based interventions to reduce disparities and achieve health equity in maternal health outcomes.

Our theory of change combines reviewing data and identifying prevention recommendations at the individual, provider/care team, facility, public health systems, and community levels according to the Centers for Disease Control and Prevention's standard Review to Action best practices (see Figure 1 in the Appendix), along with the MMPP's approach to implementing the recommendations through community-led solutions, clinical quality improvement, and public health programs (see Figure 2 in the Appendix). Our trifecta of core components benefits the pregnant and postpartum population in Colorado by improving the opportunities for thriving maternal health.

Core Components & Practice Activities

Core Component	Activities	Operational Details
Community-led Solutions	Partner with communities most affected by maternal mortality to learn from and institutionally support the knowledge and practice that has existed within communities for generations. Provide funding to implement solutions that draw on the wisdom, strengths, resilience, and deep knowledge that exist within communities.	The MMPP is working together with communities to identify strategies that, with adequate funding and support, could improve the trajectory of health for a pregnant or postpartum individual through community-level initiatives.
Clinical Quality Improvement	Support the Colorado Perinatal Care Quality Collaborative (CPCQC) to improve patient safety in clinical settings as part of the national Alliance for Innovation on Maternal Health (AIM) project.	The project uses continuous quality improvement and implementation of national safety bundles to address both chronic and emergent complications of pregnancy.
Public Health Programs	Build systems and provide education and outreach for maternal health, especially related to mental health and substance use.	The MMPP uses federal funding from the CDC and the Title V Maternal and Child Health program for statewide public health programming to build systems and provide education and outreach for maternal health, especially related to mental health and substance use. This work will expand to

address the social and structural determinants of health as well, including a healthy and safe built environment, economic mobility, and the reduction of racial inequities.

HEALTH EQUITY

The MMPP is rooted in the fundamental understanding that systemic racism and discrimination are the drivers of maternal mortality as well as many other health outcomes. Since maternal mortality data demonstrate some of the most shocking disparities, it therefore also highlights and underscores some of the most deeply rooted inequities, offering an opportunity to uncover and address the roots of these inequities.

Importantly, the work of understanding maternal mortality through comprehensive maternal mortality review is the work of connecting the individual and the system-level. It demonstrates how the health of an individual – and that person's death – reflects the health (or lack thereof) of the system, as well as how system-level drivers affect an individual person's health.

The MMPP's structure was developed with an understanding of Dr. Camara Jones' prescription for addressing health equity: "Addressing racism—indeed, addressing all systems of structured inequity, as they all share the same structure—will require valuing all individuals and populations equally, recognizing and rectifying historical injustices, and providing resources according to need." In the US context, the prototype, the first and foundational form of structural inequity is structural racism, coming from our history of the genocide of indigenous people of this land and the forced enslavement of Black people. The effects of racism can be seen throughout the history of maternal health in this country - from the start of modern gynecology in the medical abuse of Black women during slavery to the history of forced sterilization of indigenous women in the 1960s and 70s, and many other examples.

The MMPP focuses on systemic racism to shine a light on the roots, to start at the beginning. All -isms, particularly in the US context, stem from this original foundation, so we start here in order to address any of them. Through the Maternal Mortality Review Committee, experiences of each individual maternal death that occurs in Colorado is reviewed and translated to the system level, embedding lessons learned into public health and health care systems to make them more equitable. At present, this focus can also be seen across all three arms of the MMPP trifecta.

The community-led solutions arm of the MMPP was created by learning from the reproductive and disability justice movements: "Nothing about us without us." This arm was created to institutionally support efforts that have long existed within communities, to ensure that resources are at the disposal of the community. This is an ongoing area of growth and learning for the MMPP, as we learn from best practices in community engagement and equitable resource distribution.

Through clinical quality improvement efforts, the MMPP is growing partnerships and relationships with provider communities to reduce stigma that pregnant, postpartum, and parenting people with substance use disorders can face. Through nationally recognized patient safety bundles, the MMPP intends to expand to address topics such as interpersonal racism and implicit bias in health care settings, based on relevant data.

EVIDENCE OF EFFECTIVENESS

The MMPP first proposed this strategic plan in an application to the Centers for Disease Control and Prevention's (CDC) Enhancing Reviews and Surveillance to Eliminate Maternal Mortality (ERASE MM) grant program. While this program has not been formally evaluated yet, the application was an initial sign of success, as it indicated federal support for our practice. The MMPP has since proposed this strategic plan to a variety of stakeholders, including state-level Title V MCH partners and community partners, and it has been well received by those stakeholders. In addition, the MMPP is committed to data-driven decision making and continues to draw on recommendations for projects from the data collected and reviewed by the Maternal Mortality Review Committee in the *Maternal Mortality in Colorado, 2014-2016* report *(see in Resources)*.

Reducing preventable maternal deaths is a long-term outcome of this practice; however, shorter term outcomes and evaluation data include measures such as improved maternal mortality review processes, number and type of recommendations identified and implemented, data-driven actions to improve maternal health, and a variety of maternal health outcomes through PRAMS, Title V MCH, and Health eMoms data sources. The MMPP has identified several baseline measures and will be tracking evaluation and outcome data in the coming years.

Section 2: Implementation Guidance

STAKEHOLDER EMPOWERMENT & COLLABORATION

The Colorado Maternal Mortality Review Committee is an external stakeholder group responsible for reviewing each maternal death in the state. Committee members represent the following disciplines and perspectives: addiction medicine, anesthesiology, doula, epidemiology, family medicine, forensic nursing, forensic pathology, health systems, home visiting, labor & delivery nursing, maternal fetal medicine, midwifery, neurology, obstetrics, patient advocates, public health, psychology, rural health, social work, and violence prevention. The maternal mortality review process is an ethical, standardized system of continuous quality improvement. It is not a method for finding blame but for reflecting on how events unfolded to prevent future maternal deaths. The committee assesses each case using the Centers for Disease Control and Prevention's (CDC) standardized committee decision

form to determine the cause of death, whether it was pregnancy-related, if it was preventable, and the contributing factors that led to it. Additionally, the committee makes recommendations for addressing these contributing factors and improving public health systems for maternal health care.

Within the community prong of the strategic plan, the MMPP has identified opportunities to include and involve the perspectives of diverse stakeholders - those who are impacted by the issue, as well as those who potentially have the ability to make an impact on the issue. Groups such as the Maternal and Child Health Community Advisory Board (MCH-CAB) and grassroots community-based perinatal and birth providers and activists play a unique and necessary role. Communities bring the knowledge, experience and perspectives that ensure efforts to reduce and prevent perinatal deaths are addressing inequitable outcomes in ways that are relevant and resonant to those most impacted.

REPLICATION

This practice has not been replicated.

INTERNAL CAPACITY

The internal personnel of MMPP include the following positions:

Maternal Health Manager (1.0 FTE): The Maternal Health Manager serves as the lead authority for the department on maternal mortality. The position is responsible for meeting all reporting requirements, leads and facilitates the State Maternal Mortality Review Committee, identifies committee needs and assists with identification of potential members, and guides the strategic direction for the Maternal Mortality Prevention Program. This position is responsible for oversight of the database of maternal deaths in Colorado, developing reports with recommendations to prevent maternal mortality, and disseminating the findings to interested and affected stakeholders. This position represents the department at a state, regional, and national level on Colorado's maternal mortality work and its translation of data to action, as well as to legislative, media and press requests.

Maternal Health Clinical Consultant (0.6 FTE): The Maternal Health Clinical Consultant is the primary case abstractor for the Maternal Mortality Review Committee, responsible for identifying and collecting death records for all maternal deaths in Colorado. This position reads, analyzes, and abstracts all written and electronic protected health information as well as any supportive documentation related to an identified maternal death and presents the de-identified written case summaries at MMRC meetings. This position also serves as a liaison to clinical quality improvement projects with the CPCQC and their AIM initiatives.

*Secondary Abstractor (0.4 FTE):*The Secondary Case Abstractor provides support for case abstraction for the Maternal Mortality Review Committee to bring the identification and case review timeline up to the standard required by the CDC funding opportunity. This position procures all written and

electronic protected health information (PHI) as well as any supportive documentation related to an identified maternal death that meets established criteria for review. This includes corresponding with law enforcement, hospitals, coroners, and medical provider offices to obtain the necessary medical records for the Maternal Mortality Review Committee.

Maternal Mortality Data Analyst (0.35 FTE): The Maternal Mortality Data Analyst is responsible for the Colorado Maternal Mortality data set, including data project management, data analysis to determine trends of maternal mortality in Colorado and contributing to improvements in the quality and scope of data collected.

Perinatal Behavioral Health Specialist (1.0 FTE): The Perinatal Behavioral Health Specialist provides content expertise as well as public health and health systems expertise. This position identifies and implements evidence-based and best practice strategies for improving systems, processes and policies that can positively affect the mental health of the pregnant and postpartum population throughout Colorado.

Special Projects Coordinator (0.3 FTE): The Special Projects Coordinator is responsible for engaging with community partners to implement a funding opportunity to reach communities most impacted by maternal mortality, which includes coordinating an RFA process based on best practices for selecting community-led interventions, as well as ongoing monitoring and evaluation of implementation.

Program Assistant (0.2 FTE): The Program Assistant supports the collection of all necessary medical records for the Maternal Mortality Review Committee and is responsible for the administration of the Committee, including coordinating logistics and preparing meeting materials.

Maternal & Infant Wellness Section Manager (0.05 FTE): The Section Manager leads state and local maternal and infant wellness activities, including routine fiscal oversight and tracking of grant budgets and supervision of staff.

PRACTICE TIMELINE

Planning/Pre-Implementation/Exploration

The MMRC formally started meeting in the early 1990s, but there are documents and records from informal groups in the 1970s, which report of the first committee formed in 1958. Colorado's first data to action was in the late 1990s, which addressed HELPP syndrome & preeclampsia through a statewide provider training initiative. In 2013, the department received an AMCHP/Merck for Mothers grant, which allowed us to start working towards addressing mental health and self-harm in maternal deaths. In 2016, the co-chair of the MMRC authored an article about the increasing rates of maternal deaths due to self-harm, highlighting the need to expand the case reviews beyond the traditional clinical cases. For most of the first 20 years of the MMRCs existence, the resource investment was primarily volunteer committee time with a small amount of funding (<$15,000/year) for additional

infrastructure support from CDPHE to support a temporary staff person to abstract cases as available and convene meetings on a quarterly basis.

In October 2017, the program published its first comprehensive data report, highlighting the data from 2008-2013 and showing an increase in the rates of maternal deaths in the state since that time. This fueled local interest in maternal mortality, and aligned with increasing national interest, a local advocacy partner put forth legislation to officially establish the MMRC in statute during the 2019 legislative session. In May 2019, the Maternal Mortality Prevention Act was signed into law. The law provided ~$145,000/year in funding for the infrastructure needed to establish the Maternal Mortality Prevention Program. It also provided subpoena protection for the committee members, which allowed the MMRC to accelerate the review of cases to stay more current, and for the state to be eligible to apply for the CDC's ERASE Maternal Mortality grant program. Since the MMPP had recently secured state funding for the infrastructure components, the program focused the application to the CDC to support the implementation of the recommendations through the trifecta of strategies established by the MMPP of public health programs, clinical quality improvement, and community-led solutions. The application was successful, and work began in September 2019.

Installation/Initial Implementation

July - October 2019: With funding secured, the MMPP staff were able to work on building out the infrastructure needed for the program, including establishing staffing for the program as well as formally seating the multidisciplinary MMRC. The program held a statewide application process for the MMRC in August 2019 and onboarded 28 MMRC members in October 2019.

October 2019 - June 2020: To strengthen data collection and data quality, the MMPP created a secure case management system. This case management system provides a central repository for all cases of maternal death and related documents, including medical records, coroners reports, behavioral health records, with tools for easily locating and managing case file data and for requesting supporting documentation from external entities.

March 2020- September 2020: To begin the clinical quality improvement arm, the MMPP established a contract with the Colorado Perinatal Care Quality Collaborative in March 2020. The CPCQC selected the Opioid Use Disorder patient safety bundle to implement after reviewing the available data and current quality improvement needs. CPCQC recruited 6 hospitals to participate in a pilot project of the AIM OUD bundle. During this time CPCQC developed a comprehensive data management plan, and an evaluation plan that identified goals, benchmarks, processes, and validated measures to monitor progress and evaluate results of implementation. The pilot project allowed CPCQC to learn more about the existing systems and processes that participating hospitals had in place related to screening and referral for OUD before the launch of the full implementation in March 2021.

January - July 2020: The Maternal Mortality Prevention Act requires a report of data on maternal deaths and prevention recommendations every three years. In July 2020, the MMPP completed its first legislative report, *Maternal Mortality in Colorado 2014-2016* (see Resources). The report covered cases of maternal death from 2014-2016, including quantitative analysis of 94 deaths and thirteen

qualitatively analyzed and prioritized recommendations to act on using analyses of data. The report was disseminated broadly among community partners and stakeholders.

April 2020 and ongoing: Conversations were held with the MCH Community Advisory Board to inform the legislative report as well as the development of the community-led solutions funding.

July 2020: The Perinatal Behavioral Health Specialist was hired and began to inform and align the maternal mortality prevention recommendations with the MCH public health programmatic activities.

Spring/Summer 2021: Working with a contractor to develop a community-informed, and community-supportive funding opportunity with the goal of releasing the request for applications in Fall 2021.

Full Implementation/Sustainability

The contract is ongoing with the CPCQC to lead the clinical quality improvement activities. As of March 2021, 12 hospitals are signed up to implement the AIM Opioid Use Disorder patient safety bundle. In future years of implementation, CPCQC plans to focus on the implementation of the bundle in prenatal care settings and recruiting additional hospitals from underrepresented areas of the state. CPCQC will continue to leverage their partnership with the Colorado Hospital Substance Exposed Newborns (CHoSEN), a collaborative that focuses on improving care for substance exposed newborns. This partnership will ensure that the needs of the mother-infant dyad are addressed.

The Perinatal Behavioral Health Specialist is starting to formulate activities in the upcoming MCH action plans to continue to enhance public health prevention strategies for maternal behavioral health.

Community-led solutions will be funded starting in Fall 2021 and will include evaluation of efforts to continue to inform strategies as the program develops. Community engagement with the Community Advisory Board is ongoing.

Practice Cost

The current funding available to run the program is $520,000. This includes $145,000 for programmatic infrastructure from state funds and $375,000 for implementation of data to action activities from CDC funding. The majority of costs support FTE for the positions described above, as well as the contract with the Colorado Perinatal Care Quality Collaborative and funding for community-led solutions. Initial start-up costs for the case management data software were $40,000.

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LESSONS LEARNED

Prior to 2019, Colorado reviewed cases of maternal deaths on a 3- to 4-year delay, as the MMRC members did not have subpoena protection. With the passage of the Maternal Mortality Prevention Act, which provided subpoena protection as well as state funding to complete the review process, the MMRC has been working to close the gap between time of death and review. The additional funding from the CDC has also allowed us to move from data to action. The CDC also provides technical assistance and support to enhance the quality of the maternal mortality review process.

The trifecta of strategies – clinical quality improvement, public health programs, and community-led solutions – has been identified as having the most potential for impact to reduce preventable maternal deaths and improve maternal health outcomes and health equity at the population level.

In the clinical quality improvement arm, the Colorado Perinatal Care Quality Collaborative (CPCQC) has been building their capacity to conduct quality improvement in the state, which was mutually beneficial as we had an opportunity to fund a part of their initiative. In addition, CPCQC is an Alliance for Innovation in Maternal Health (AIM) member, which provided them with connections to technical assistance support, training, and the formal designation for implementing nationally recognized, evidence-based practices. Their selection to implement the AIM Opioid Use Disorder patient safety bundle was informed by the higher numbers of deaths due to substance use disorder identified by the MMRC. Given the trends in Colorado related to the prevalence of marijuana, alcohol, and methamphetamine use, CPCQC decided to take the content of the AIM OUD bundle and broaden the bundle to focus on screening and referral for all substances.

The contract for the CPCQC was launched at the start of the COVID-19 outbreak in March 2020, which contributed to some challenges engaging hospitals to participate in the initiative due to overwhelmed hospital systems. Despite the challenges presented by COVID-19, CPCQC was able to successfully recruit 12 hospitals to participate in the initiative. The COVID-19 pandemic has only accelerated overdoses for the general population including pregnant and parenting people, which may have helped in recruiting hospitals. In addition, a number of hospitals were engaged in quality initiatives related to treating substance exposure in infants prior to the pandemic, so the CPCQC has leveraged these established relationships to encourage hospitals to focus on improvements to treatment of the pregnant person prior to delivery as a complement to their infant-focused efforts.

Given the strain that hospitals are facing, CPCQC is working to balance the demand on hospital staff and the critical need to identify patients who are at incredibly high risk due to substance use and other co-occurring disorders. The focus has been on identifying the essential data elements, finding validated brief screens, and leveraging existing resources both within hospitals and external to hospitals systems, such as peer navigators, that can help to support getting patients the care they need.

Driven by this acknowledgement that the highest causes of maternal deaths in Colorado were substance use and mental health related, the MMPP also hired a Perinatal Behavioral Health Specialist

to lead the public health programming arm of the MMPP. We also leveraged funding from the federally funded Title V Maternal and Child Health (MCH) program for this position to encourage alignment across the CDC and MCH work. The Title V MCH program offers an opportunity to improve the health and wellbeing of pregnant and postpartum people and their children by employing primary prevention and early intervention public health strategies. This alignment is described more below in the Next Steps section. While the MCH program typically works closely with local public health agencies on its programming, many of them are currently under tremendous strain with the community response for COVID-19, so local involvement in strategy development and implementation has been somewhat limited to date.

For community-led solutions, the MMPP has a number of established relationships with partners who are doing community-level work. Over the past year, we have been growing and expanding on these partnerships in anticipation of releasing a request for applications to fund community-led solutions starting in the Fall of 2021. We are currently funding the development of an informed, community-designed process to ensure we lead with community voices in creating this funding opportunity. One of the challenges in funding community-led solutions is that state contracting requirements are not built to fund community level work very easily, which makes it difficult to give funding to smaller entities with smaller capacity. Conversations at the state health department have been happening for years on how to make improvements to these state processes. Recently staff were able to successfully advocate for changes to the financial risk assessment to omit two out of the 25 factors that deducted points from entities that did not have the financial infrastructure to implement the factors that were being asked. Similar to community-level decision making, we recognize that these processes take time and patience to implement.

NEXT STEPS

Alignment with public health programming: As described above, the MMPP leverages the Title V MCH program to bridge the work of the two programs and highlight the needs of the pregnant and postpartum population through sharing of the MMRC data. For the 2021-2025 grant cycle, which started in October 2020, the MCH program is focusing its public health programming and systems change efforts on the following statewide priorities:

- Increase prosocial connection
- Create safe and connected built environments
- Improve access to supports
- Increase social emotional well-being
- Increase economic mobility
- Reduce racial inequities

The MMPP staff contribute to the implementation of maternal mortality prevention strategies through the priorities focused on social emotional wellbeing, improved access to supports, and economic mobility; however, there are threads across all seven priorities that have the potential to improve maternal health outcomes. Additionally, the MCH program has identified racial equity and community

inclusion as strategic anchors that are woven throughout the work. This recent re-design of Colorado's Title V MCH program aligns well with the MMPP's commitment to address systemic inequities in maternal health and prioritize community-led solutions.

As of the writing of this, we are halfway through the first year of implementation of the new MCH priorities. As we move towards recovery from COVID-19 in the future, we will be looking to innovate around public health strategies to support the maternal population within the changing context and environment the pandemic has created.

Based on the recommendations in the Maternal Mortality in Colorado 2014-2016 report as well as conversations held with community partners during 2020 and 2021, the program will develop the funding opportunity for community-led solutions to be released in Fall 2021. The program is seeking consultation from an organization with expertise in community-led grant making and focused on social justice and racial equity to help develop an equitable funding opportunity that prioritizes funding to organizations in the community serving populations most impacted by maternal deaths.

RESOURCES PROVIDED

- Maternal Mortality in Colorado, 2014-2016 Report
- Colorado Maternal Mortality Prevention Act (HB19-1122)

APPENDIX

- **Figure 1: CDC's Maternal Mortality Review to Action**

Adapted from Berg, C.J. (2012). From identification and review to action—maternal mortality review in the United States. Seminars in Perinatology, 36(1), 7-13.

- Figure 2. Colorado's Maternal Mortality Prevention Program Framework