Building U.S. Capacity to Review and Prevent Maternal Deaths

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Abstract

In the United States, the risk of death during and up to a year after pregnancy from pregnancy-related causes increased from ~10 deaths per 100,000 live births in the early 1990s to 17 deaths per 100,000 live births in 2013. While vital statistics-based surveillance systems are useful for monitoring trends and disparities, state and local maternal mortality review committees (MMRCs) are best positioned to both comprehensively assess deaths to women during pregnancy and the year after the end of pregnancy, and identify opportunities for prevention. Although the number of committees that exist has increased over the last several years, both newly formed and long-established committees struggle to achieve and sustain progress toward reviewing and preventing deaths. We describe the key elements of a MMRC; review a logic model that represents the general inputs, activities, and outcomes of a fully functional MMRC; and describe Building U.S. Capacity to Review and Prevent Maternal Deaths, a recent multisector initiative working to remove barriers to fully functional MMRCs. Increased standardization of review committee processes allows for better data to understand the multiple factors that contribute to maternal deaths and facilitates the collaboration that is necessary to eliminate preventable maternal deaths in the United States.

Keywords: maternal, deaths, mortality, review, committee

Introduction

In the United States, the risk of death during and up to a year after pregnancy from pregnancy-related causes increased from ~10 deaths per 100,000 live births in the early 1990s to 17 deaths per 100,000 live births in 2013. In addition, significant racial and geographic disparities in risk of pregnancy-related death persist; for example non-Hispanic black women are three to four times more likely to die than non-Hispanic white women. While vital statistics-based surveillance systems are useful for monitoring trends and disparities, state and local maternal mortality review committees (MMRCs) are best positioned to comprehensively assess deaths to women during pregnancy and the year after the end of pregnancy, and identify opportunities for prevention. This article explores the key elements of a fully functional MMRC and describes a recent multisector initiative to build United States’ capacity to review and prevent maternal deaths.

MMRCs use vital records data and medical and social service records to understand the factors that influence maternal deaths. It is from MMRCs that we have learned that roughly half of pregnancy-related deaths in the United States are preventable. In addition to assessing preventability, MMRCs are able to make jurisdiction-specific recommendations and promote strategies to prevent future deaths. Examples of data-driven actions from MMRCs include:

- the development of urgent bulletins to providers on the dangers of placental disorders and peripartum cardiomyopathy (Florida)
- collaborative efforts to increase knowledge of maternal deaths related to substance use and suicide, and to
address gaps in services for women related to mental health and substance use (Michigan, West Virginia)
• obstetric emergency simulation trainings to prepare hospitals to address hemorrhage, cardiomyopathy, and preeclampsia (Ohio)

MMRCs can also mobilize actions with outside sectors. For example, a partnership with the division of highway traffic safety led to the placement of a traffic light and crosswalk at a point in the road that was the site of at least two maternal deaths (New Jersey).

Recognition of the critical role that MMRCs serve in identifying opportunities to prevent maternal deaths has resulted in a rapid growth in the number of MMRCs in the U.S. MMRCs grew from ~19 review committees in 2010 to ~34 MMRCs in 2017. Ten additional states and cities, or jurisdictions, are in the process of establishing MMRCs. Further evidence of recent momentum is reflected by legislative support for implementing MMRCs in Hawaii, Maine, Mississippi, Puerto Rico, South Carolina, Tennessee, and Washington in 2016 and 2017. A focus on maternal health and safety by the Joint Commission and the Health Resources and Services Administration, Maternal and Child Health Bureau has also contributed to the national momentum for reducing maternal morbidity and mortality.

Barriers to Success for MMRCs

Although the number of MMRCs that exist has increased over the last several years, both newly formed and long-established MMRCs struggle to achieve and sustain progress toward reviewing and preventing deaths. In 2012, the Association of Maternal and Child Health Programs (AMCHP) and the Centers for Disease Control and Prevention (CDC) Division of Reproductive Health assessed U.S. capacity to conduct maternal mortality review. States identified several common challenges, including lack of funding, difficulty accessing medical records and other data sources, lack of standard data entry systems, and limited opportunities for networking with their peers in other jurisdictions.

In response to the challenges identified in the 2012 assessment, the CDC, CDC Foundation, and AMCHP partnered to launch the Building U.S. Capacity to Review and Prevent Maternal Deaths initiative in December of 2015. The initiative is funded through an agreement with Merck on behalf of its Merck for Mothers Program, and addresses major barriers that MMRCs face in achieving full functionality and sustainability.

Defining Fully Functional MMRCs

The Building U.S. Capacity to Review and Prevent Maternal Deaths Initiative Team met with MMRC staff and stakeholders from 23 states and 1 city to define criteria of fully functional MMRCs. Stakeholders identified a fully functional MMRC as one that achieves the following:

• Robust, accurate data that informs policy, process, clinical care, and public health
• Strategic, data-driven actions that guide prevention programs and policies to strengthen systems and improve quality of care
• Improvements in maternal outcomes demonstrated by reductions in maternal mortality and morbidity

Stakeholders also stated that the ideal MMRC would accomplish the following:

• Review deaths less than 1 year after they occurred
• Allot adequate time to preparing detailed recommendations during committee meetings
• Connect with state perinatal quality collaboratives or other groups to ensure recommendations are implemented

After defining a fully functional MMRC, the Initiative Team partnered with a CDC Evaluation Fellow. The evaluation fellow met with stakeholders from eight MMRCs across the country to develop an accompanying logic model (Fig. 1). Although MMRCs differ from state to state, the logic model is designed to represent the general inputs, activities, and outcomes of an ideal, fully functional MMRC. The logic model can serve as a starting point, and is adaptable to the context of individual state or city-based MMRCs.

Each column in the logic model might be thought of as a series of steps that will make it possible to reach the next column to the right. Inputs are the tangible and intangible things that should already be in place for an MMRC to successfully complete its Activities. Activities are the actions that an MMRC engages in, and might also include anything from the Input column that is not already present in an MMRC’s state or jurisdiction. Outputs are the products of an MMRC’s activities. Inputs, Activities, and Outputs are all things that an MMRC program has some level of direct control over, and together they make up the program’s Process. While Outcomes cannot be directly controlled by an MMRC, the MMRC can influence the outcomes with its Activities. In this logic model, the Outputs and Short-term Outcomes columns are joined by the condition: “MMRC recommendations are part of a cycle of continuous quality improvement for health systems.” This is a necessary condition for MMRCs to span the gap between Process and Outcomes.

Increasing Inputs and Removing Barriers to Fully Functional MMRCs in the United States

Since December 2015, the Building U.S. Capacity to Review and Prevent Maternal Deaths initiative has aided both newly forming and existing MMRCs to overcome barriers, establish inputs, and sustain the activities and outputs necessary to achieving their desired outcomes.

Increasing inputs

Critical Inputs of a fully functional MMRC are proper authority to access data and review records and protections to operate. To assist MMRCs that request assistance in this area, the Initiative Team worked with partners at the American College of Obstetricians and Gynecologists to develop an Authorities and Protections Checklist. The checklist covers the key components that jurisdictions should consider.

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*SB 2317.
†LD 1112.
‡HB 494.
§Law 186.
**Bill 3251.
††SB 2302.
‡‡SB 6534.
including the authority to access data, confidentiality and protection for data and activities, and immunity from subpoena for committee members.

Leadership engagement and stakeholder commitment is another critical Input to a fully functional MMRC. Broad representation in committee membership, including public health, obstetrics and gynecology, maternal–fetal medicine, nursing, midwifery, forensic pathology, mental health, and behavioral health. Members might also include social workers, patient advocates, and other relevant multidisciplinary stakeholders. To promote an understanding of MMRCs among stakeholders, the Initiative Team developed a short motion graphic video to explain the value of MMRCs and the process of establishing an MMRC.12 The video is available online at the www.ReviewtoAction.org website.

The Review to Action website was implemented by the Initiative Team to promote the maternal mortality review process and to provide resources and tools that support MMRCs.

Defined scope and explicit protocols are also necessary Inputs. The Initiative Team developed a Committee Facilitation Guide that includes model scope, protocols, and processes that can be adapted or replicated by MMRCs as they develop their Inputs.13 An interactive online mock MMRC case review experience will soon be available that will guide individuals who are seeking to implement or improve review committee processes.

Removing barriers

In the 2012 assessment, several states identified the need for a standard data system that supports the critical Inputs of consistent case abstraction, case review data, and data analysis within an MMRC over time and across MMRCs. In response, the Initiative Team created the Maternal Mortality Review Information Application (MMRIA), a data system that allows MMRCs across the country to abstract relevant data from a variety of sources, document committee decisions, and analyze data. The system also allows for sharing of data across MMRCs. MMRIA builds on lessons learned from implementing its precursor, the Maternal Mortality Review Data System (MMRDS) in 12 states between 2012 and 2016. MMRIA improves upon MMRDS by capturing increased detail on mental health conditions as contributors to maternal deaths and generates quick reports to provide committee members with an on-demand overview of their findings. The system includes 12 "forms" with defined variables that follow the flow of a typical review:

FIG. 1. Maternal mortality review committee (MMRC) logic model.
As a comprehensive data system that touches almost all aspects of review committee processes and outcomes, MMRIA is the backbone of the Initiative Team’s technical assistance to MMRCs. The Team also developed tools to accompany MMRIA that support MMRC Activities. In consultation with MMRC expert abstractors, the Initiaive Team developed an Abstractor Manual to support both distance-based learning and in-person trainings for MMRC abstractors across the country, promoting consistent data abstraction and, just as importantly, implementation of best practices for effective and efficient abstraction. The Committee Decisions Form guides MMRCs in making the following key decisions for each death reviewed. Committees are encouraged to distribute a paper version that is formatted for use during meetings.

1. Was the death pregnancy related? (A death is considered pregnancy related if the committee determines the death occurred during pregnancy or within 1 year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.)

2. What was the underlying cause of death?

3. Was the death preventable? (A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system, and/or community factors.)

4. What were the contributing factors to the death?

5. What are the recommendations and actions that address those contributing factors?

6. What is the anticipated impact of those actions if implemented?

Demonstrating the feasibility and utility of sharing data across MMRCs, the Initiative Team collaborated with four MMRCs that voluntarily implemented MMRSSD to publish the Report from MMRCs: A View Into Their Critical Role. The report provides the first in-depth examination of pregnancy-related deaths from standardized data across multiple MMRCs. The report demonstrates the potential for identifying key factors contributing to maternal deaths that impact multiple jurisdictions and opportunities for prevention using a common language for MMRCs to work together. For example, this report documents that mental health conditions were a leading cause of pregnancy-related death among the four participating states. This finding could not be identified by other national surveillance systems of maternal deaths because of their reliance on vital records data alone, which does not provide the level of detail necessary to determine the influence of mental health conditions. The report also showed that causes of pregnancy-related death differ by age of mother and timing of death (e.g., while pregnant, during, or shortly after delivery up to 42 days, or in the late postpartum period of 43-365 days). The report offers evidence that a maternal death is most often the tragic result of a number of contributing factors, and points to the need for collaborative actions by multidisciplinary stakeholders. The report also introduced the use of sociospatial data to highlight system-level and community-level contributing factors to maternal deaths (e.g., lack of access to reliable transportation, affordable groceries, and public spaces for recreation and fitness; lack of access to primary care, mental health providers, and obstetricians/gynecologists).

By the end of the Initiative’s first 18 months, 13 jurisdictions were using MMRIA and an additional 10 were in the process of adopting it. As more states implement MMRIA, clinical and public health practitioners will have enhanced ability to identify causes and contributing factors to maternal deaths. In addition, they will be able to identify and implement data-driven prevention strategies with the greatest potential impacts both within and across jurisdictions.

Another significant barrier identified by MMRCs in the 2012 assessment is the lack of opportunity to network with other MMRCs. The Initiative Team held two regional trainings in 2016, focused on providing an overview of MMRC processes and the data system. The first training brought together MMRC stakeholders from seven western states (Arizona, Colorado, New Mexico, Oklahoma, Texas, Utah, and Washington) and a representative of the United States–Mexico Border Health Commission. The second training brought together seven jurisdictions from the mid-Atlantic region (Delaware, Massachusetts, Maryland, New Jersey, New York City, Virginia, and West Virginia). These regional trainings provided opportunities for shared learning and fostered collaborative activities among neighboring jurisdictions.

The first MMRIA User Meeting in Atlanta, GA served as an opportunity for national networking. More than 50 abstractors and data analysts from 24 jurisdictions attended trainings specific to their MMRC role, that is, abstractor or data analyst. As with the regional trainings, the MMRIA User Meeting facilitated both formal and informal sharing and networking across MMRCs.

Ongoing opportunities for information sharing and networking are available through the Review to Action website (www.ReviewtoAction.org). The Initiative Team built the site to disseminate tools and resources and to facilitate networking between review committees. An interactive map features individual state profiles with contact information shown by jurisdiction.

Next Steps

Moving forward the Initiative Team will continue helping MMRCs to navigate the necessary process steps, moving them across the continuum to becoming fully functional committees. A key outcome of this work is the implementation of data-driven recommendations that improve access to and delivery of quality maternal care. This will allow MMRCs to effectively work toward the elimination of preventable maternal deaths,
reductions in maternal morbidities, and improvements in population health for women of reproductive age.

**Conclusion: Building U.S. Capacity Together**

The **Building U.S. Capacity to Review and Prevent Maternal Deaths** initiative provides resources to increase activities and remove barriers to MMRCs. During a time of considerable momentum, the Initiative Team has engaged with more than 40 jurisdictions toward achieving fully functional MMRCs. Working together to increase standardization of review processes has allowed for data sharing that was previously not possible. These efforts are expected to facilitate collaboration in recommending and implementing interjurisdictional interventions—the very opportunity necessary to answer the national challenge of eliminating preventable maternal deaths.

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