



MATERNAL AND CHILD HEALTH Issue Brief

Maternal Mortality Review Committees

Introduction

The United States has the highest maternal mortality rate among developed countries despite spending more per capita on health care than any other nation. To combat this alarming problem, Maternal Mortality Review Committees (MMRCs) are gaining traction across the country as a way to closely examine, address, and make recommendations to prevent pregnancy-associated and pregnancy-related deaths.¹ Thirty-five states have established MMRCs, typically under the authority of a state's department of health, and legislation introduced in the House and Senate in 2017 would provide funding to develop MMRCs that would examine maternal death cases and identify ways to prevent future deaths.² In June, the Senate Health, Education, Labor and Pensions Committee unanimously passed one of those bills, the Maternal Health Accountability Act, which if enacted by Congress, will fund MMRCs from a portion of \$12 million of proposed new CDC funding.³ Additionally, the Senate Appropriations committee has requested \$38 million for the Maternal and Child Health Bureau to expand access to life-saving programs at hospitals.⁴

Defining Pregnancy-Related Death

The bills establish standard definitions for pregnancy-associated deaths and pregnancy-related deaths. Pregnancy-associated death is the death of a woman while pregnant or during the one-year period following the date of the end of pregnancy, irrespective of the cause of death. Pregnancy-related death is the death of a woman while pregnant or during the one-year period following the date of the end of pregnancy, irrespective of the duration of the pregnancy, from any cause related to, or aggravated by, the pregnancy or its management, excluding any accidental or incidental cause. For example, a woman gives birth to a healthy baby through C-section, but develops an infection in the surgery site after she returns home. Without proper follow-up care from her providers, the woman does not get the necessary treatment for the infection and dies from sepsis. In this scenario, because the infection is attributable to the surgery, the death would be determined to be pregnancy-related. Other leading causes of pregnancy-related death are cardiovascular diseases, non-cardiovascular diseases, hemorrhage, and cardiomyopathy.⁵ Delineating between pregnancy-associated and pregnancy-related deaths is important because it allows researchers to construct a clearer picture of the causes and factors that drive maternal mortality.

Maternal Mortality Review Committees

Traditionally, maternal death information is compiled from death certificates. However, these certificates typically do not include sufficiently detailed information to indicate whether deaths are pregnancy-associated or pregnancy-related. The



MMRCs investigate pregnancy-associated and pregnancy-related death at a more detailed level than what is reported on death certificates. These MMRCs draw national maternal mortality information from two sources:

- the Centers for Disease Control and Prevention’s (CDC) National Center for Health Statistics, which compiles maternal death information from death certificates based on International Classification of Diseases (ICD-10) diagnosis codes during the pregnancy up to 42 days postpartum; and
- the CDC Pregnancy Mortality Surveillance System, which utilizes medical epidemiologists to determine pregnancy-related, pregnancy-associated, and non-pregnancy-related deaths by reviewing death certificates linked to fetal death, and birth certificates, both during the pregnancy and up to 365 days postpartum.

Some existing MMRCs have additional protocols for identifying maternal deaths, such as through direct hospital reporting, media reports, or obituary searches.

Although the specifics of how individual MMRCs conduct their reviews may vary, all committees strive to answer the following six questions about each mortality case they examine:

1. Was the death pregnancy-related?
2. What was the cause of death?
3. Was the death preventable?
4. What were the critical 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?

When the MMRC reports its findings, the information is stratified by race/ethnicity, age, and timing of death in relation to pregnancy.

1. Was the death pregnancy-related?

According to the CDC, 700 women across the United States (U.S.) die each year as a result of pregnancy or pregnancy-related complications.⁶ The MMRCs attempt to identify all deaths that have a causal relationship to the pregnancy and separate those from the pregnancy-associated deaths that may occur during a pregnancy but happen for a reason not caused by the pregnancy. The *Report from Nine Maternal Mortality Review Committees*, published in early 2018 by the non-profit organization Review to Action found that pregnancy-related deaths are most common (45 percent) in the 42 days after the end of the pregnancy, followed by pregnancy-related deaths during the pregnancy (37.6 percent), and pregnancy-related deaths 43 days or more after the end of the pregnancy (17.5 percent).⁷ Women over age 30 have a higher proportion of pregnancy-related death than do women in their 20s and younger. Pregnancy-related deaths were also more common among non-Hispanic black women (48.2 percent of pregnancy-associated deaths are pregnancy-related), followed by Hispanic women (30.2 percent), and then non-Hispanic white women (28.4 percent).⁸

Recent research indicates that health inequity and racism are significant drivers of maternal death for women of color.⁹ Black women are less likely than white women to be insured, which impacts access to recommended disease prevention care and management and restricts access to prenatal care. Race impacts access to quality of care as well. On average, black women deliver at hospitals that have the highest rates of severe maternal morbidity.¹⁰ Black patients also face implicit racial biases and are treated differently than white patients with the same symptoms, receiving fewer diagnostic and therapeutic interventions, and even less pain medication, which leads to sub-par care.¹¹ Overall, black women die at three to four times the rate from a pregnancy-related cause than white women.¹²



2. What was the cause of death?

After narrowing the review to the pregnancy-related deaths, Maternal Mortality Review Committees determine the cause of those pregnancy-related deaths. The leading causes of pregnancy-related deaths are hemorrhage (14.0 percent), cardiovascular and coronary conditions (14.0 percent), infection (10.7 percent), cardiomyopathy (10.7 percent), and embolism (8.4 percent), followed by preeclampsia and eclampsia (7.4 percent), and mental health conditions (7.0 percent).¹³

These leading causes vary by race among non-Hispanic white and non-Hispanic black women. The leading underlying causes of death for non-Hispanic whites were cardiovascular and coronary conditions (at 15.5 percent), hemorrhage (at 14.4 percent), infection (at 13.4 percent), and mental health conditions (11.3 percent). For non-Hispanic blacks, the leading causes of death were cardiomyopathy (at 14.0 percent), cardiovascular and coronary conditions (at 12.8 percent), preeclampsia and eclampsia (at 11.6 percent), and hemorrhage (at 10.5 percent).¹⁴ The data was insufficient to identify the leading causes of death among Hispanic women.

3. Was the death preventable?

Once the causes of pregnancy-related deaths are known, the MMRCs try to ascertain if the deaths were preventable. By determining the preventability of the leading causes of pregnancy-related death, the MMRCs can assess the potential opportunities for preventative actions. A death is determined to be preventable if “there was at least some chance of the death being averted by one or more reasonable changes to patient, community, provider, facility, and/or systems factors.”¹⁵

The *Report from Nine Maternal Mortality Review Committees* found that 63.2 percent of pregnancy-related deaths were preventable, including 68.2 percent of deaths attributable to cardiovascular and coronary conditions, and 70 percent of hemorrhage cases.¹⁶ Assessed by timing of the death in relation to the pregnancy, 63.2 percent of deaths during pregnancy, 66.7 percent of deaths within the first 42 days after the end of the pregnancy, and 58.3 percent of deaths 43 days and later were deemed preventable.¹⁷ These numbers suggest that opportunities for prevention exist that could save lives.

4. What were the critical contributing factors to the death?

After determining the possibilities for preventing pregnancy-related deaths, the committees look for the underlying factors that contributed to the death. Each of the factors is categorized in one of five levels: patient/family, provider, facility, systems of care, or community. After determining the level, each factor is given at least one of 23 “factor classes”. Last, the factor is given a precise description. At the patient/family level the common factor classes are chronic disease and knowledge. Specific, underlying factors could be a patient’s existing physical health condition, substance use during and after pregnancy, the amount of knowledge a patient has about their health, and mental health status. Provider-level factors are diagnosis and treatment decisions that providers make that impact a patient’s care. These decisions and choices are primarily a product of a provider’s knowledge, making a correct and timely diagnosis, willingness to consult with colleagues, and communication with the patient. Facility-level factors include the physical capacity to provide the necessary level of care and available medical technology. At the systems of care level, factors are policies and procedures, care coordination, and continuity of care. Community-level factors are closely related to social determinants of health and include access to health care, transportation, environmental conditions, and lack of law enforcement response.



The causes of a pregnancy-related death often have more than one contributing factor and multiple factor classes. According to the *Report from Nine Maternal Mortality Review Committees*, patient and family factors were the largest contributors to pregnancy-related deaths followed by provider factors, and then systems of care factors. The report additionally found that most causes of pregnancy-related death averaged over four contributing factors. Mental health causes of death averaged over six contributing factors like lack of adherence to medication, substance use, and being in abusive relationships.¹⁸ Preeclampsia and eclampsia averaged over five contributing factors, while pregnancy-related embolism deaths had only 1.6 contributing factors.¹⁹ Embolism deaths are considered one of the least preventable among pregnancy-related deaths due to the low ratio of contributing factors and the short duration of time between the onset of initial symptoms and cardiopulmonary arrest.²⁰

The C-section infection scenario from above would have multiple contributing factors. If the infection developed after the family returned home from the hospital, it is likely that the MMRC would attribute some of the factors of the cause of death to the patient/family level and others to the provider. The patient-level factor class could be lack of knowledge and the underlying factors would be defined as a lack of knowledge about warning signs of infection and the need to seek care. Assessment is the most common factor class among infection cases at the provider level and the typical contributing factors are delayed or missed diagnosis and ineffectual treatment as a result. If the woman went home and never received a follow-up call from a nurse or was not asked to schedule a visit with her primary care physician, then the MMRC would point to the system of care level and the contributing factors of communication and continuity of care.

The most common contributing factors across the various causes of death are as follows:

Patient-level common contributing factors

- complications of obesity
- lack of knowledge of warning signs
- lack of knowledge of symptoms requiring health care assessment.

Provider-level common contributing factors

- lack of assessment resulting in misdiagnosis
- delayed or ineffective treatment

Systems of care-level common contributing factors

- lack of patient care coordination and
- poor communication between providers supporting patient management

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

With the knowledge that deaths are preventable, and that there are numerous contributing factors to those deaths, the MMRCs ask the question: “If there was at least some chance that the death could have been averted, what were the specific and feasible actions, if implemented or altered, that might have changed the course of events?”²¹ The committees then develop a recommendation for each factor-level class identified; those recommendations should identify who must take action, what the action will be, and when the action step will take place. The most common recommendation themes across pregnancy-related deaths include the following:

- Improve provider and staff training on caring for complex pregnancies and education of patients
- Better enforcement of hospital policies and procedures

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- Adopt levels of maternal care/ensure appropriate level of care determination, proper triage of patients, and better resource allocation
 - Improve access to care
 - Improve patient/provider communication
 - Improve patient management for mental health conditions
 - Improve procedures related to communication and coordination between providers

Many of these recommendations overlap across the leading causes of death, but there is enough variation by cause that a one-size fits all approach to recommendations would not be effective.

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

Lastly, the MMRCs determine the potential impact their recommendations will have on pregnancy-related death rates if implemented. Each recommendation is assessed as a primary, secondary, or tertiary level of prevention. Primary preventions are prioritized because they stop the contributing factor before it occurs. Secondary preventions reduce the impact of a contributing factor after it has occurred, and tertiary preventions reduce the impact or progression of an ongoing contributing factor. MMRCs will then determine the expected level of impact on a continuum from a small, individual-level impact to a broad, population-wide impact on social determinants of health. The small impacts often require person-by-person behavior changes, whereas the population-wide impacts require less individual effort but may take considerable political capital to come to fruition.

The MMRCs assessed the level of prevention of 172 recommendations and the expected level of impact of 169 recommendations. Most of the recommendations were primary (37 percent) or secondary level (39 percent) prevention, and tertiary preventions made up the remaining 24 percent of recommendations.²² Nearly 60 percent of the recommendations were small and medium level impacts, 29 percent were large level impacts, and extra-large and giant level impacts comprised the remaining 11 percent.²³ Improving training has an impact at a small, individual level, as does a recommendation like improving assessment, diagnosis, and treatment standards. Recommendations like adopting maternal levels of care and improving policies regarding prevention initiatives and substance abuse treatment programs are aimed at large and giant level impacts.

To further the effectiveness of MMRCs and ensure that their recommendations lead to practice improvement, policy change, and a reduction in maternal mortality, the project team of Building U.S. Capacity to Review and Prevent Maternal Deaths, which published the *Report from Nine Maternal Mortality Review Committees*, has distributed MMRC resources to 48 state and city public health jurisdictions. Additionally, it has published guiding legislative language for states to consider when developing or strengthening MMRCs. For example, the legislation that created Georgia's MMRC specifies how often the MMRC will report its findings and recommendations to the General Assembly, health care providers and facilities, and other government agencies with the intention of reducing the maternal mortality rate as a public health priority for the state.²⁴ The *Report from Nine Maternal Mortality Review Committees* illustrates the methodological approach MMRCs take to studying, analyzing, diagnosing, and ultimately, helping to prevent maternal mortality in the United States. MMRCs' multidisciplinary nature allows them to undertake a thorough examination of the emerging issues like mental health, social determinants of health, substance use disorder, and health equity - underlying contributing factors to pregnancy-related mortality - which have received more attention in recent years. Improving on the test report released by the project team in 2017, which only looked at the findings of four committees, the current report produced recommendations to prevent future maternal deaths and analyzed their estimated level of impact.²⁵ Actions taken in response to review committee recommendations can lead to reductions in pregnancy-related deaths.

Conclusion

Now that the Senate has moved the Maternal Health Accountability Act to its legislative calendar, it is time for the House of Representatives Subcommittee on Health to vote on the Preventing Maternal Deaths Act. Both of these bills enjoy bipartisan support and have steadily gathered nearly half of their cosponsors since the beginning of the year, indicating a political willingness to take action against maternal mortality. The proposed funding to the CDC will give MMRCs backing to continue investigating the causes of pregnancy-related death and the power to turn recommendations into policies. There are no losers in taking the necessary steps to confront maternal mortality, but continuing to do nothing costs lives. As Senator Heidi Heitkamp (D-ND), one of co-sponsors of the legislation stated, "In the 21st century, no mother should have to worry about dying during childbirth, especially in a country as advanced as the United States."²⁶



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¹ Robin Fields Nina Martin, HERE'S ONE ISSUE BLUE AND RED STATES AGREE ON:... PROPUBLICA (2018), <https://www.propublica.org/article/lost-mothers-series-impact-maternal-mortality-legislation> (last visited Jul 6, 2018).

² Herrera Beutler, TEXT - H.R.1318 - 115TH CONGRESS (2017-2018): PREVENTING MATERNAL DEATHS ACT OF 2017 (2017), <https://www.congress.gov/bill/115th-congress/house-bill/1318/text> (last visited Jul 6, 2018); Heidi Heitkamp, TEXT - S.1112 - 115TH CONGRESS (2017-2018): MATERNAL HEALTH ACCOUNTABILITY ACT OF 2017 (2018), <https://www.congress.gov/bill/115th-congress/senate-bill/1112/text> (last visited Jul 6, 2018).

³ Nina Martin, U.S. SENATE COMMITTEE PROPOSES \$50 MILLION TO PREVENT MOTHERS DYING IN CHILDBIRTH PROPUBLICA (2018), <https://www.propublica.org/article/us-senate-committee-maternal-mortality-prevention-proposal> (last visited Jul 10, 2018).

⁴ *Id.*

⁵ Pregnancy-Related Deaths | Pregnancy | Reproductive Health | CDC, (2018), <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-relatedmortality.htm> (last visited Jul 9, 2018).

⁶ *Id.*

⁷ Report From Nine MMRCs, (2018), http://reviewtoaction.org/Report_from_Nine_MMRCs (last visited Jul 6, 2018).

⁸ *Id.*

⁹ Research Overview of Maternal Mortality and Morbidity in the United States, , https://www.reproductiverights.org/sites/crr.civicactions.net/files/documents/USPA_MH_TO_ResearchBrief_Final_5.16.pdf (last visited Jul 9, 2018).

¹⁰ Elizabeth A. Howell et al., *Site of delivery contribution to black-white severe maternal morbidity disparity*, 215 AM. J. OBSTET. GYNECOL. 143–152 (2016).

¹¹ Linda Villarosa, *Why America's Black Mothers and Babies Are in a Life-or-Death Crisis*, THE NEW YORK TIMES, April 11, 2018, <https://www.nytimes.com/2018/04/11/magazine/black-mothers-babies-death-maternal-mortality.html> (last visited Jul 9, 2018); Kelly M.



Hoffman et al., *Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites*, 113 PNAS 4296–4301 (2016).

¹² Pregnancy Mortality Surveillance System | Pregnancy | Reproductive Health | CDC, (2017), <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html> (last visited Jul 9, 2018).

¹³ Report From Nine MMRCs, *supra* note 8.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ Cynthia J. Berg et al., *Preventability of pregnancy-related deaths: results of a state-wide review*, 106 OBSTET GYNECOL 1228–1234 (2005).

²¹ Report From Nine MMRCs, *supra* note 8.

²² *Id.*

²³ *Id.*

²⁴ Legislation Establishing the Georgia Maternal Mortality Review Committee, (2014), <http://reviewtoaction.org/content/legislation-establishing-georgia-maternal-mortality-review-committee> (last visited Jul 9, 2018).

²⁵ Review to Action, (2017), <http://reviewtoaction.org/content/report-mmrcs-view-their-critical-role> (last visited Aug 1, 2018).

²⁶ Martin, *supra* note 4.