

## On the Future of Maternal Mortality Review in Rhode Island

BRIDGET SPELKE, MD; SEBASTIAN RAMOS, MD; HOPE YU, MD; MICHAEL COHEN, MD; TANYA L. BOOKER, MD

The United States has the highest reported number of maternal deaths per 100,000 live births, or maternal mortality ratio (MMR), among high-resource countries and recent trends suggest it has increased by over 26% since 2000.<sup>1,2</sup> Global trends reported by the World Health Organization (WHO) demonstrate that pregnant women in the U.S. face a mortality ratio that is at least four times higher than leading European countries and in 2014, the U.S. ranked 47th globally in maternal mortality.<sup>1</sup> The most recent CDC estimates report a national pregnancy-related ratio of 17.3 deaths per 100,000 live births. According to the Rhode Island Department of Health, Center for Health Data and Analysis, the 2013–2017 maternal mortality rate was 11.2 deaths per 100,000 live births. For many readers, these statistics are nothing new. Over the past several years, media coverage, and ensuing public awareness of U.S. maternal deaths have reached new heights.<sup>3</sup> The award-winning NPR/ProPublica series, “Lost Mothers,” brought the stories of just a few of the estimated 900 women in the U.S. who die each year during or within a year of pregnancy.<sup>3</sup> Maternal mortality is considered an indicator of the overall health of a population. Two bills introduced in Congress reflect a growing desire to address these devastating outcomes.<sup>4,5</sup>

Studies on U.S. maternal mortality reveal that most maternal deaths result from well-known causes, namely cardiovascular disease and stroke, thromboembolic events, hemorrhage, hypertensive disorders of pregnancy, and infection.<sup>6</sup> Despite increased public awareness and well-described data on disease states leading to maternal death, the underlying and potentially modifiable root-causes of worsening maternal mortality remain largely unknown. This is perhaps most true when we consider inequities in maternal mortality.

For over 20 years, obstetric journals have recognized the overwhelming disparities in maternal mortality faced by black and Hispanic women.<sup>7,8</sup> The most recent reports indicate a pregnancy-related mortality ratio for non-Hispanic black women of 43.5 per 100,000 live births, compared to 12.7 for non-Hispanic white women.<sup>8</sup> Many explanations for these disparities have been proposed including incidence of pregnancy-induced hypertensive disorders, compliance with prenatal care, and education attainment. However, the evidence supporting these explanations is inconsistent.

First, there are conflicting data concerning pregnancy-induced hypertensive disorders. A large, 10-year, longitudinal, population-based study in New York State found that preeclampsia rates were higher among black and Hispanic

groups.<sup>9</sup> In partial contrast, an analysis of National Vital Statistics System (NVSS) data demonstrated that while the *prevalence* of preeclampsia and eclampsia did not differ between black and white patients, *case-fatality rates* were 2-3 times higher in black women.<sup>10</sup> Determining whether black women face an increased risk of developing a disease or rather, an increased risk of dying from it, has direct implications upon strategies developed to reduce maternal deaths. Are the data only for race/ethnicity, or also by economic class? If the latter, that should be included.

Second, suboptimal prenatal care has also been linked to disparate rates of maternal mortality. A 2010 study reported that black women were less likely to initiate prenatal care in the first trimester.<sup>7</sup> However, in the same year, Berg et al. found that mortality ratios did not differ by timing of prenatal care initiation and in fact, among women who started prenatal care in the first trimester, black women still had higher pregnancy-related mortality ratios compared to their white counterparts. This suggests that optimal prenatal care is not protective against maternal mortality in black women.<sup>11</sup>

Finally, the argument that limited educational attainment drives higher mortality rates among black women is also unsupported. Saftlas et al., studying risk factors for maternal mortality, demonstrated that educational attainment did not differ between cases and surviving controls in black women, whereas white women who had died had fewer years of education than controls. Educational attainment, therefore, appears to be a protective factor for white women but not for black women. Perhaps most alarming, Saftlas et al. demonstrated that the largest racial disparities in pregnancy-related mortality occurred among women with the lowest risk of maternal death: those who were married, of low parity, aged 20–29, highly educated, adherent with prenatal care, and delivering normal birth-weight infants at term.<sup>12</sup>

While these examples represent only a few possible contributors to racial disparities in maternal mortality, they illustrate our profound lack of understanding regarding its drivers, particularly among black women. How is it that we have known about this problem for 20 years and still lack an answer? The answer lies in reliance upon data sources that preclude review of underlying disease states and medical care, as well as the contribution of globally recognized social determinants of health such as structural racism, poverty, and access to care. This detailed level of review is essential. As eloquently stated in Clark and Belfort’s call for national maternal mortality review,

“The current maternal mortality ratio may be the result of any number of highly disparate realities ranging from immigration policy, to racial disparity, to regionalization of care, patient transport, health care provider training, or certification. Alternately, it could reflect fundamental problems in the structure of the specialty itself. However, without data, we just do not know. Without this knowledge, we cannot effectively address this problem.”<sup>13</sup>

The majority of studies on maternal mortality rely on administrative datasets and not focused review. This includes vital statistics data, ICD-10 codes on death certificates, and hospital billing databases.<sup>14</sup> Disturbingly, a study comparing medical record review by an experienced critical care obstetrician with discharge diagnostic codes noted concordance in the cause of death only 52% of the time.<sup>15</sup> If our best available data are incorrect nearly half the time, it is unsurprising that we have been unable to reduce disparities and improve maternal health outcomes.<sup>13</sup>

Equally concerning, current data collection methods also inaccurately capture presumably simple, yet vital, data on the number of women in the U.S. who die each year from causes related to pregnancy and childbirth.<sup>3</sup> When compared with focused review, administrative datasets underestimate maternal mortality by 20–87% and the lack of a nationwide approach to identification of maternal deaths has led to embarrassingly incomplete data.<sup>16</sup> Given these limitations, Clark and Bedford propose that only focused review of maternal deaths, conducted by Maternal Mortality Review Committees (MMRC), can provide the data necessary to shape health policy and address factors that contribute to poor pregnancy outcomes.<sup>13</sup> We know from experiences in the U.K. and California that MMRCs identify strategies that lead to reductions in maternal mortality.<sup>13,14</sup> To aggregate this data as a nation, we must first standardize MMRCs at the state level. The American College of Obstetricians and Gynecologists and the Society for Maternal Fetal Medicine have lobbied Congress over the past two years for passage of H.R. 1318, Preventing Maternal Deaths Act<sup>5</sup> and S. 1112, the Maternal Health Accountability Act<sup>4</sup> – two bills that would create a grant to help states establish or improve MMRCs. While the Senate bill has moved to the Senate calendar, the House bill remains stalled in committee, demonstrating the need for each individual state to pursue establishing MMRCs internally rather than waiting for federal support.

As described by the CDC, fully-functional MMRCs must identify, abstract, prepare case summaries, and review maternal deaths with the aim of resolving six essential questions (Table 1).<sup>14</sup> Although most states have conducted maternal death reviews in some capacity for decades, non-standard data collection has limited information exchange and precluded data analysis at regional and national levels. This limitation hinders the development of evidence-based regional and national prevention strategies. To facilitate uniform state maternal death review, the CDC, CDC Foundation, and the Association of Maternal and Child Health Programs (AMCHP) collaborated to develop

**Table 1.** Six essential questions of Maternal Mortality Committee Review (Adapted from Review to Action<sup>18</sup>)

1. Was the death pregnancy-related?
2. What was the underlying cause of death?
3. Was the death preventable?
4. What were the factors that contributed 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?

two free and comprehensive resources. MMRIA ([mmria.org](http://mmria.org)), a protected data collection system, provides MMRCs with uniform methodology and data language for case abstraction, summary, and review and supports MMRCs in their identification of prevention strategies.<sup>17</sup> Review to Action ([reviewtoaction.org](http://reviewtoaction.org)) provides step-by-step guidance for states seeking to establish fully-functional MMRCs.<sup>18</sup> Thirty-two states currently have CDC-recognized MMRCs and an additional 13 are currently planning a review. Twenty states and jurisdictions have implemented standard data collection via MMRIA.<sup>19</sup>

The Rhode Island Medical Society has a long renowned history of commitment to improving maternal health. In 1931, RIMS leadership established the nation’s first-ever Maternal Mortality Committee.<sup>20</sup> Under their oversight, the state experienced a dramatic decline in maternal deaths. A 1977 article published in this journal, “A History of the Maternal Health Committee of the Rhode Island Medical Society 1931–1976,” details how, after pioneering maternal death reviews by obstetricians at the Providence Lying In Hospital, the Society continued to shape their committee towards the standards we expect today: regularly held reviews with representation from anesthesiology, pathology, the Department of Health, and obstetricians from across the state.<sup>20</sup> As maternal deaths fell, the committee renamed itself the Maternal Health Committee, tackling broader maternal health challenges in years with few deaths to review. The article questioned the necessity of ongoing state review given the fortunate rarity of maternal deaths in Rhode Island. Though ultimately the committee was continued, meetings since the 1970s have been less regular and without a uniform approach to case identification and review. In recent years, due to legal concerns, the committee elected not to determine the preventability of deaths. A move in Rhode Island towards standardized CDC procedures would allow comparisons and conclusions to be drawn not only within our state over time, but also more broadly across southern New England, where larger pools of data are available. The value of regional review of maternal deaths is particularly important where, as in Rhode Island, state populations are small and patients cross state lines readily for care.<sup>18</sup>

In this light, we propose the realignment of Rhode Island Maternal Mortality Review Committee procedures with

CDC recommendations. Consistent with CDC's Review to Action guidelines, this committee would develop a systematic approach to case identification and pursue case abstraction and review in accordance with the uniform data collection methods provided by MMRIA. As with its historical precursor, committee membership would be interdisciplinary, include broad geographic representation, and hold regularly scheduled reviews. Given the Rhode Island Department of Health's (DOH) experience with Infant and Drug Overdose Death Reviews, and their existing role in identifying maternal deaths, consideration could be given to shifting the MMRC to their jurisdiction. This might allow funding, administrative, and personnel resources to be shared between existing review committees, defraying state costs, and would capitalize on the stability and longevity of state institutions. Finally, maternal mortality captures only the worst outcome among the much larger pool of women who experience severe maternal morbidity; consideration should be given to including review of our state's more common near-misses.

In 1962, RIMS successfully lobbied the RI legislature to obtain legal protection for review committee transactions and case reports. It is time to take these further and secure through legislation not only the confidentiality and protection from subpoena of all committee materials and members, but also guaranteed access to all pertinent records. Further assuring the future of maternal death review in RI, we propose this legislation include state accountability for conducting ongoing and regular reviews.

According to the RI Department of Health Center for Health Data and Analysis, the maternal mortality ratio in Rhode Island is 11.2 per 100,000 live births. As obstetricians in Rhode Island, this number raises more questions than it answers. Were these deaths accurately reported? Were they pregnancy-related or accidental? And most importantly, could they have been prevented? A recent report compiling standardized data from state MMRCs found that 60% of their maternal deaths were preventable.<sup>19</sup> By increasing our own capacity for maternal death review, Rhode Island would once again be poised to lead the country towards the elimination of preventable maternal deaths.

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## Authors

Bridget Spelke, MD; Sebastian Ramos, MD; Hope Yu, MD; Michael Cohen, MD; Residents, The Warren Alpert Medical School of Brown University, Women & Infants Hospital of Rhode Island, Department of Obstetrics and Gynecology, Providence, RI.

Tanya L. Booker, MD; Assistant Professor of Obstetrics and Gynecology, Clinician Educator, The Warren Alpert Medical School of Brown University, Women & Infants Hospital of Rhode Island, Department of Obstetrics and Gynecology, Providence, RI.