

# Racial Inequities in Preventable Pregnancy-Related Deaths in Louisiana, 2011–2016

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**OBJECTIVE:** To examine preventable pregnancy-related deaths in Louisiana by race and ethnicity and maternal level of care to inform quality improvement efforts.

See related editorial on page 274.

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Each author has confirmed compliance with the journal's requirements for authorship.

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**METHODS:** We conducted a retrospective observational descriptive analysis of Louisiana Pregnancy-Associated Mortality Review data of 47 confirmed pregnancy-related deaths occurring from 2011 to 2016. The review team determined cause of death, preventability, and contributing factors. We compared preventability by race-ethnicity and maternal level of care of the facility where death occurred (from level I: basic care to level IV: regional perinatal health center) using odds ratios (ORs) and 95% CIs.

**RESULTS:** The rate of pregnancy-related death among non-Hispanic black women (22.7/100,000 births, 95% CI 15.5–32.1, n=32/140,785) was 4.1 times the rate among non-Hispanic white women (5.6/100,000, 95% CI 2.8–10.0, n=11/197,630). Hemorrhage (n=8/47, 17%) and cardiomyopathy (n=8/47, 17%) were the most common causes of pregnancy-related death. Among non-Hispanic black women who experienced pregnancy-related death, 59% [n=19] of deaths were deemed potentially preventable, compared with 9% (n=1) among non-Hispanic white women (OR 14.6, 95% CI 1.7–128.4). Of 47 confirmed pregnancy-related deaths, 58% (n=27) occurred at level III or IV birth facilities. Compared with those at level I or II birth facilities (n=2/4, 50%), pregnancy-related deaths occurring at level III or IV birth facilities (n=14/27, 52%) were not less likely to be categorized as preventable (OR 2.0, 95% CI 0.5–8.0).

**CONCLUSION:** Compared with non-Hispanic white women, pregnancy-related deaths that occurred among non-Hispanic black women in Louisiana from 2011 to 2016 were more likely to be preventable. The proportion of deaths that were preventable was similar between lower and higher level birth facilities. Hospital-based quality improvement efforts focused on addressing hemorrhage, hypertension, and associated racial inequities may prevent pregnancy-related deaths in Louisiana.

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**P**regnancy-related death refers to a death while pregnant or within a fixed period after the end of a pregnancy, from any cause related to or aggravated by the pregnancy or its management.<sup>1</sup> Based on rates calculated from vital records data, the United States is the only developed country where the rate of pregnancy-related death is rising.<sup>2</sup> Non-Hispanic black women are three to four times as likely as non-Hispanic white women to experience a pregnancy-related death nationally.<sup>3</sup>

Public health surveillance of maternal deaths using vital records is critical for comparison of state and national maternal mortality rates over time, with important limitations. Recent implementation of a pregnancy checkbox in most states has improved ascertainment but may overestimate the true number of pregnancy-related deaths or misclassify cause of death.<sup>4</sup> State and local maternal mortality review committees comprised of experts embedded in clinical and social systems therefore play an important role in evaluating additional data sources such as outpatient, hospital, and coroners' records to verify relatedness to pregnancy, determine cause of death and contributing factors, and develop specific recommendations for prevention.<sup>5</sup>

These interdisciplinary reviews categorize which pregnancy-related deaths are preventable, grading potential chance to have altered the outcome through critical assessment of contributing factors at the patient, family, provider, facility, system, and community levels. The Centers for Disease Control and Prevention's (CDC's) "Building U.S. Capacity to Review and Prevent Maternal Deaths" initiative guides review teams to specifically define a preventable pregnancy-related death as one where there was at least some chance of the death being averted by one or more reasonable changes to contributing factors at any level, from patient to community.<sup>6</sup>

Calls to action to address maternal mortality have focused on the leading causes of preventable pregnancy-related deaths, with attention to evidence-based care bundles to improve communications, hand-offs, readiness, and response, implemented in hospitals or across groups of hospitals, and perinatal regionalization. Care bundles are sets of evidence-based interventions that, when implemented together, result in better outcomes than when implemented individually.<sup>7-9</sup> Data has driven an increased focus on racial disparities in maternal outcome that may reflect institutionalized racism—discriminatory treatment, unfair policies and practices, and inequitable opportunities and effect, based on race—within the health care system, addressable in part through actionable improvement efforts.<sup>10</sup>

Professional organizations also recommend regional organization of resources into maternal levels of care as a potential solution.<sup>11</sup> This strategy attempts to ensure that individuals give birth at the appropriate level of care, with agreements for safe transfer between facilities when needed.<sup>12</sup> Finally, recent recommendations from the CDC and others have focused on ensuring insurance coverage for those giving birth for at least one year postpartum.<sup>13</sup>

In 2017, Louisiana stakeholders implemented a modified maternal mortality review process to provide rapid insight into pregnancy-related deaths occurring within 42 days of the end of a pregnancy, to inform the work of a new state perinatal quality collaborative and allow for national data comparisons. The objective of this secondary analysis of existing review findings was to examine patterns in preventable pregnancy-related death by race-ethnicity and maternal level of care of birth facilities where deaths occurred.

## METHODS

We conducted a retrospective observational secondary analysis of data produced by the Louisiana Pregnancy-Associated Mortality Review, which was first established in 2010 by the state's Title V Maternal and Child Health block grant program and the Louisiana Commission on Perinatal Care and Prevention of Infant Mortality.<sup>14</sup> Leading state experts conducted a modified maternal mortality review from October 2017 to May 2018 in response to an urgent need for up-to-date data on pregnancy-related deaths. The maternal mortality review team consisted of two general obstetrician-gynecologists, four maternal-fetal medicine specialists selected for regional representation, one nurse executive with background in labor and delivery, and a forensic pathologist. All review team members were members of the larger Louisiana Pregnancy-Associated Mortality Review program. This expedited, targeted review examined pregnancy-related deaths that occurred among Louisiana residents in the state of Louisiana from January 1, 2011, through December 31, 2016. All 6 years of pregnancy-related cases were reviewed during this eight-month period with a consistent review team, abstraction form and committee decisions process informed by guidelines from the CDC.

This review was restricted to cases with a pregnancy-related International Classification of Diseases, Tenth Revision, Second Edition (ICD-10) O-code who were pregnant at the time of death or who died within 42 days of the end of the pregnancy. This is the World Health Organization's definition of maternal



death,<sup>15</sup> operationally the same as that used by the CDC's National Center for Health Statistics<sup>1</sup> and Healthy People 2020,<sup>16</sup> allowing for comparison with national data.

First, to identify records for review, the Louisiana Department of Health conducted a linkage between maternal death certificates and birth or fetal death certificates. Potential cases were identified from vital records death certificates using International ICD-10 codes A34, O00-O95, or O98-O99 causes related to pregnancy, childbirth, or complications during the postpartum period.<sup>17,18</sup> All maternal deaths identified were linked with vital records birth and fetal death certificates and cross-referenced with Louisiana Pregnancy Mortality Surveillance System data from 2011–2015 to ensure complete identification. Finally, Louisiana Department of Health regional maternal child health nurse coordinators verified the existence of a pregnancy at the time of death, or within 42 days of death, before record abstraction.

Next, to confirm that the death was pregnancy-related and gather critical information required for review, Louisiana Department of Health regional maternal child health coordinators investigated and abstracted death cases using medical records and coroner reports from their designated geographic areas and using a standardized abstraction form developed by review team members.

The review committee met six times between October 2017 and May 2018 to review records linked to the cases using the “Building U.S. Capacity to Review and Prevent Maternal Deaths Maternal Mortality Review Information Application Maternal Mortality Review Committee Decisions Form (Version 14).” A case synopsis using abstracted medical records was shared with review members at each meeting, with sharing of demographic information including race, ethnicity, and insurance status at the end of each synopsis to mitigate bias as the team reviewed each case. The review team was then asked to classify each case along the following dimensions: 1) Was the death pregnancy-related? 2) If pregnancy-related, what was the underlying cause of death? 3) Was the death preventable? 4) If there were chances to alter the outcome, what were they? 5) What were contributing factors to the death? 6) What specific and feasible recommendations for actions should be implemented to prevent future deaths? A death was considered preventable if the committee determined that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system, or community factors. The specific level at which a death was

considered preventable (eg, facility, provider, patient) was not coded by the review team. Full results and recommendations from the 2011 to 2016 Louisiana Maternal Mortality Review are published separately.<sup>19</sup>

We extracted race and ethnicity variables from death certificates. Place of death was extracted from death certificates and used to determine facility maternal level of care. Maternal levels of care were introduced through health standards licensing in Louisiana in 2007 to ensure appropriate access to services and acuity level of maternity care for those at risk for medical complications, and updated in accordance with consensus opinion from the American College of Obstetricians and Gynecologists in 2017.<sup>20</sup> Under this system, Louisiana birth facilities can be designated as freestanding birth centers, level I (basic care), level II (specialty care), level III (subspecialty care), and level IV (regional perinatal center). We assigned the variable for “maternal level of care” to the maternal level of care of the facility in which the death occurred. This information was obtained from a field in the maternal mortality review dataset that is updated annually by an epidemiologist based on a list provided by Louisiana Health Standards to the Bureau of Family Health at the Louisiana Department of Health.

A senior epidemiologist entered data from Maternal Mortality Review Information Application Maternal Mortality Review Committee Decisions Forms into an Excel worksheet that was then imported into SAS for analysis. After all data was entered, forms were reviewed by members of the Louisiana Department of Health epidemiology team to ensure accuracy of the database. Frequencies from SAS were cross-reference with Excel counts. We reported descriptive results as population counts and percentages and used odds ratios (ORs) with 95% CIs to assess the statistical significance of pregnancy-related deaths according to selected characteristics including maternal age, race and ethnicity, insurance type, preventability, and facility maternal level of care. Maternal mortality ratios (referred to as rates throughout the remainder of this paper for ease of understanding) were calculated using vital records live birth counts and are expressed as the number of deaths per 100,000 live births. These rates with their corresponding 95% CIs were used for comparison between groups according to race and ethnicity. We conducted all analyses using SAS 9 and R 3.6.1 for Windows. The Louisiana State University Health Sciences Center and Louisiana Department of Health institutional review boards determined that this study was exempt from review



given that it did not meet criteria for classification as human subjects research.

## RESULTS

Of 187 maternal deaths of Louisiana residents identified by ICD-10 cause of death as related to pregnancy, childbirth, or the puerperium, only 59 were verified on committee review as potentially pregnancy-related deaths based on medical records. The remaining 128 deaths either had no documentation of pregnancy in the medical record ( $n=120$ ) or the pregnancy ended more than 42 days before death ( $n=8$ ). The maternal mortality review committee confirmed 47 of the 59 cases (80%) as true pregnancy-related deaths. Of the remaining 12 deaths, 11 were classified by the maternal mortality review committee as pregnancy-associated, but not pregnancy-related, and one death could not be classified as either pregnancy-related or pregnancy-associated by the committee based on the information available.

More than half of the women who died were aged 25–34 years (55%,  $n=26$ ), and approximately 28% ( $n=13$ ) of maternal deaths occurred among women aged 35 or older (Table 1), compared with 52% and 10%, respectively, in the total birth population (data not shown). Nearly 70% were among non-Hispanic

black women ( $n=32$ ) compared with 37% in the total birth population (data not shown), and the majority of deaths ( $n=29$ , 62%) were among Medicaid-insured women compared with 63% in the total birth population (data not shown). Thirty-two percent ( $n=15$ ) of deaths occurred antepartum, and almost half of the deaths ( $n=21$ , 45%) occurred postpartum.

The rate of pregnancy-related death among non-Hispanic black women (22.7/100,000 births, 95% CI 15.5–32.1;  $n=32/140,785$ ) was 4.1 times the rate among non-Hispanic white women (5.6/100,000 births, 95% CI 2.8–10.0;  $n=11/197,630$ ).

Using Pregnancy Mortality Surveillance System coding for cause of death, the most common causes of death were hemorrhage ( $n=8$ , 17%) and cardiomyopathy ( $n=8$ , 17%). The next most common cause of pregnancy-related death was cardiovascular and coronary conditions ( $n=7$ , 15%). Forty-five percent ( $n=21$ ) of all pregnancy-related deaths were determined to be preventable on committee review. In comparison, 63% ( $n=5/8$ ) of deaths due to hemorrhage were determined to be preventable, and 63% ( $n=5/8$ ) of deaths due to cardiomyopathy were determined to be preventable (Table 2).

The percentage of pregnancy-related deaths deemed preventable was 59% ( $n=19/32$ ) for non-Hispanic black women compared with 9% ( $n=1/11$ ) for non-Hispanic white women (OR 14.6, 95% CI 1.7–128.4) (Table 3). Of the 47 confirmed pregnancy-related deaths, 58% ( $n=27$ ) occurred at maternal level III or IV birth facilities. Compared with those at level I or II birth facilities ( $n=2/4$ , 50%), pregnancy-related deaths occurring at level III or IV birth facilities ( $n=14/27$ , 52%) were not significantly less likely to be categorized as preventable (OR 0.9, 95% CI 0.1–7.6) (Table 4). Nearly 63% ( $n=20/32$ ) of non-Hispanic black women experiencing pregnancy-related death died at maternal level III or IV facilities, compared with 45.5% ( $n=5/11$ ) of non-Hispanic white women experiencing a pregnancy-related death (OR 2.0, 95% CI 0.5–8.0).

## DISCUSSION

We found that the percentage of 2011–2016 pregnancy-related deaths determined to be preventable by committee review was higher among non-Hispanic black women compared with non-Hispanic white women. There was no difference in preventability by lower compared with higher maternal level of care at the facility where a pregnancy-related death occurred, nor difference in likelihood that non-Hispanic black women experiencing pregnancy-related

**Table 1. Characteristics of Pregnancy-Related Deaths, Louisiana, 2011–2016 (N=47)**

Characteristic	n (%)
Year of death	
2011	2 (4)
2012	7 (15)
2013	7 (15)
2014	8 (17)
2015	9 (19)
2016	14 (30)
Maternal age (y)	
Younger than 25	8 (17)
25–34	26 (55)
35 or older	13 (28)
Maternal race–ethnicity	
Non-Hispanic white	11 (23)
Non-Hispanic black	32 (68)
Non-Hispanic other race	1 (2)
Hispanic	3 (6)
Insurance type	
Medicaid	29 (62)
Private	8 (17)
Self-pay	3 (6)
Unknown	7 (15)
Timing of death	
Antepartum	15 (32)
Intrapartum or immediate postpartum	11 (23)
Delayed postpartum	21 (45)



**Table 2. Cause of Death Grouping and Preventability, Louisiana, 2011–2016 (N=47)**

Cause of Pregnancy-Related Death*	n (%)	Committee Determination of Preventability		
		Preventable	Not Preventable	Unable to Determine
Hemorrhage	8 (17)	5 (63)	3 (37)	0 (0)
Cardiomyopathy	8 (17)	5 (63)	3 (37)	0 (0)
Cardiovascular and coronary conditions	7 (15)	3 (40)	3 (40)	1 (20)
Embolism	4 (9)	1 (25)	3 (75)	0 (0)
Amniotic fluid embolism	4 (9)	0 (0)	4 (100)	0 (0)
Preeclampsia and eclampsia	3 (6)	1 (3)	1 (33)	1 (3)
Cerebrovascular accident	3 (6)	2 (50)	1 (25)	0 (0)
Conditions unique to pregnancy	2 (4)	1 (50)	1 (50)	0 (0)
Infection	2 (4)	2 (100)	0 (0)	0 (0)
Unknown	2 (4)	0 (0)	2 (100)	0 (0)
Autoimmune diseases	1 (2)	0 (0)	1 (100)	0 (0)
Blood disorders	1 (2)	0	1 (100)	0 (0)
Liver and gastrointestinal disorders	1 (2)	0 (0)	1 (100)	0 (0)
Renal diseases	1 (2)	1 (100)	0 (0)	0 (0)
Total	47	21 (45)	24 (51)	2 (4)

Data are n (%).

\* Centers for Disease Control and Prevention Pregnancy-Related Mortality Surveillance System Classification of Pregnancy-Related Death.

death were at a maternal level III or IV birth facility at the time of death.

Although racial disparities in maternal mortality and severe maternal morbidity in the United States are well-documented,<sup>10</sup> few studies specifically elucidate disparities in preventable death. Berg et al<sup>20</sup> reported that, among African American women experiencing a pregnancy-related death up to 1 year from the end of pregnancy in North Carolina from 1995 to 1999, 46% of deaths were potentially preventable, compared with 33% of deaths among white women. In a recent study of 13 states' composite maternal mortality review findings including pregnancy-related deaths occurring during or up to a year after pregnancy, preventability did not significantly differ by race, with 57.4% of deaths among black women, 62.7% among white women, and 58.3% among Hispanic women determined to be preventable.<sup>13</sup> Our findings suggest important differences from nationally reported findings in our state. In contrast to the composite finding above in a study of pregnancy-related deaths occurring up to a year after pregnancy, we found a striking disparity in preventable death when focusing on pregnancy-related deaths occurring during pregnancy and up until 42 days postpartum in a single state over a 6-year period.

Our findings suggest that disparities in pregnancy-related death do not stem from inevitable or immutable risk due to maternal race and ethnicity or specific diagnoses. These are common assumptions underlying “mother blame narratives,” which tend to highlight the role of race itself, obesity, age, or chronic

disease in maternal outcome.<sup>21</sup> Rather, racial disparities in preventable pregnancy-related death in part represent systematic, avoidable inequities due to structural differences in communities and health systems, identifiable through case review by practicing clinicians, and addressable through collective intervention.

For example, Louisiana's recently released maternal mortality report summarizing 2011–2016 pregnancy-related deaths shows the frequency at which certain contributing factors defined in the CDC's “Review to Action” guidelines were thought to be relevant to the outcome of a case by review team members. The “failure to screen or inadequate assessment of risk” code—defined by the CDC's Review to Action program as applicable to cases in which, “factors placing the woman at risk for a poor clinical outcome [were] recognized, and the woman was not transferred or transported to a provider able to give a higher level of care”—was identified as the leading contributing factor to 2011–2016 pregnancy-related deaths in Louisiana, present in 36% of cases; provider-, facility-, and individual-level contributing factors were generally the most frequently identified.<sup>19</sup> This finding is echoed by other state reviews, who have identified clinical readiness, standardized policies and procedures, adequate assessment and timing of treatment, and care coordination as key opportunities to prevent pregnancy-related deaths due to hemorrhage, hypertension, and cardiovascular disease.<sup>22</sup>

However, the results of our quantitative secondary analysis examining facility level of care and



**Table 3. Preventable Pregnancy-Related Death by Race–Ethnicity, Louisiana, 2011–2016 (N=47)**

Maternal Race–Ethnicity*	Pregnancy-Related Deaths	Committee Determination of Preventability		
		Preventable	Not Preventable	Unable to Determine
Non-Hispanic white	11 (24)	1 (9)	9 (82)	1 (9)
Non-Hispanic black	32 (68)	19 (59)	12 (38)	1 (3)
Hispanic	3 (6)	1 (33)	2 (67)	0 (0)
Non-Hispanic other	1 (2)	0 (0)	1 (100)	0 (0)

Data are n (%).

\* Race is designated for non-Hispanic women only.

preventability of death do not show a detectable relationship between occurrence of pregnancy-related death, racial inequity and the specific maternal level of care of the facility where a pregnancy-related death occurs. Nationally, evidence of a beneficial effect of maternal levels of care on maternal outcome is limited, and is restricted to populations with specific known high risk factors before delivery.<sup>23</sup> These findings suggest that efforts to advance equity in appropriate readiness, recognition, and management of obstetric conditions such as hemorrhage, cardiomyopathy, hypertension, and cardiovascular disease, should focus on accountability and improvement efforts in birth facilities at all levels of care. Because maternal mortality is an extremely rare event, further research examining maternal morbidity, patient-centered outcomes, and facility-based factors is required to assess the role of levels of care and regionalization.

Our analysis is subject to several important limitations. First, pregnancy-related deaths are a rare event, allowing for review of only a small number of deaths over time, affecting CIs, and with limited generalizability to other settings. Second, owing to the inclusion of the pregnancy checkbox on Louisiana death certificates in 2012, there was a jump in case detection of deaths occurring during or within a year of the end of pregnancy during our study period, with possible underreporting earlier in the study period.

The effect of this limitation is mitigated by the focus of this maternal mortality review process, report, and, by extension, this study, on the subset of pregnancy-related deaths occurring within 42 days of the end of pregnancy. Before adoption of the U.S. revised death certificate in 2012, dating back to 1989, Louisiana death certificates featured a checkbox indicating pregnancy within 90 days of death. Additionally, we were unable to control or assess for potentially relevant individual-level or facility-level factors given our analysis is limited by the demographic data and medical records available at the time of case review. The specific level of preventability, along the spectrum from individual to community, was not coded by review team members. Furthermore, our analysis of the role of maternal level of care in preventability of death is limited by our attribution of level of care to the facility where death took place, because 15 deaths occurred in women who never gave birth. However, in 12 cases, a birth occurred and the death did not take place in the same facility; it is unknown how maternal level of these birth facilities may have affected outcome. Finally, preventability, contributing factors, and recommendations for change are determined by a multidisciplinary group of clinical and nonclinical experts and can be limited by subjectivity where there is a lack of programmatic and policy-based evidence relevant to a particular case. For example, review team members were not blinded to

**Table 4. Preventable Pregnancy-Related Death by Obstetric Level of Care at Place of Death, Louisiana, 2011–2016**

Obstetric Level of Care	Pregnancy-Related Deaths	Committee Determination of Preventability		
		Preventable	Not Preventable	Unable to Determine
I–II	4 (9)	2 (50)	2 (50)	0 (0)
III–IV	27 (57)	14 (52)	12 (44)	1 (4)
Nonbirth facility	7 (15)	1 (14)	5 (72)	1 (14)
Outside of a hospital	9 (19)	4 (44)	5 (56)	0 (0)

Data are n (%).



race or ethnicity of decedents during case review, though efforts were made to manage this potential bias (race and ethnicity information is not shared during reviews until the end of presentation of the case narrative). The review team consisted of a small group of mostly clinicians, especially maternal–fetal medicine specialists, which may introduce further bias into committee decisions.

Nevertheless, our finding that preventable pregnancy-related death was significantly more likely among non-Hispanic black compared with non-Hispanic white women in Louisiana has immediate and urgent implications. Several recommendations were made in the recent publicly available report<sup>19</sup> summarizing the full review of 2011–2016 pregnancy-related deaths that is the subject of this secondary analysis. First, the review team recommended a broader structure for future reviews, incorporating representative expertise in issues facing affected communities, with a call to, “build committee expertise on addressing social determinants of health and the negative impact of policies, practices, and systems on people of color.” Subsequently the Louisiana Pregnancy-Associated Mortality Review has broadened to include members representing the gender, race, ethnicity, and lived experiences of affected communities, and expertise in anesthesiology, emergency medicine, critical care, psychiatry with specific expertise in addiction, public health, injury prevention, behavioral health, midwifery, doula care, nursing, and community-based intimate partner violence prevention.

Specific to the leading causes of pregnancy-related death identified, reviewers recommended building systems for continuous quality improvement leveraging the state perinatal quality collaborative, and addressing equity by incorporating patient advisors, community input, and training on implicit bias into quality improvement efforts. The review team recommended a focus on facility-level policies and protocols, with attention to systems for recognition of early warning signs as well as development of local facility criteria for transfer to higher level of care. Other recommendations focused on collaboration with emergency rooms and recognition of repeat emergency visits as a signal of risk; furthering access to contraception, medically-indicated abortion, and reproductive life planning; behavioral health and addiction treatment integration; and shared attention to the social determinants of health. A full list of recommendations is available in the Louisiana Department of Health’s publicly available Maternal Mortality

Review Report, and falls outside the scope of this study.

The Institute for Healthcare Improvement offers a guide for health care organizations to integrate equity into quality improvement work. This guide provides a roadmap for organizations to make health equity a strategic priority, develop structure and processes to support health equity work, deploy specific strategies to address multiple determinants of health where large organizations can have an effect, decrease institutional racism within an organization, and develop partnerships with community organizations to improve health and equity.<sup>24</sup>

To effectively address perinatal inequities, quality improvement efforts focused on maternal mortality should include stratification of process and outcome measures by race and ethnicity locally, and must explicitly incorporate the self-identified needs of the most vulnerable populations into the testing of small and large-scale redesign. This approach will avoid unintended consequences that could paradoxically worsen health disparities by focusing quality improvement efforts solely on populations less likely to experience preventable adverse events. Specific strategies that birth facilities can employ, ranging from ensuring seamless care transitions, interpretation services, and electronic health record transfer, to staff education, interprofessional partnerships to diversify improvement teams, and implicit bias training, are outlined in the Council for Patient Safety’s recent care bundle to reduce peripartum racial and ethnic disparities, which can be integrated into efforts focused on clinical care bundles.<sup>10</sup>

Our findings and these existing resources directly inform an ongoing initiative of the Louisiana Perinatal Quality Collaborative to reduce severe maternal morbidity by 20% among pregnant and postpartum women who experience hemorrhage or severe hypertension and to narrow the black–white disparity in this outcome. The collaborative’s theory of change focuses on four key drivers deemed necessary to achieve both aims: 1) reliable clinical processes, 2) respectful patient partnership (supporting patient-centered code-sign of efforts with health system quality improvement teams, with an emphasis on patients from historically marginalized backgrounds), 3) effective peer teamwork, and 4) engaged perinatal leadership.

As ascertainment of pregnancy-related death improves, continuous assessment for opportunities to address preventable causes that may drive health inequities is vital. When quality improves for a group that already has better health outcomes at a faster rate than for the group faring worse, quality for the entire



population on average may improve, but the gap between groups widens.<sup>24</sup> Our analysis suggests that inequitable maternal outcome is not inevitable and change is within the reach of clinical quality improvement efforts; we will not see large-scale improvement in our state without addressing an undeniable equity gap in preventable pregnancy-related death.

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