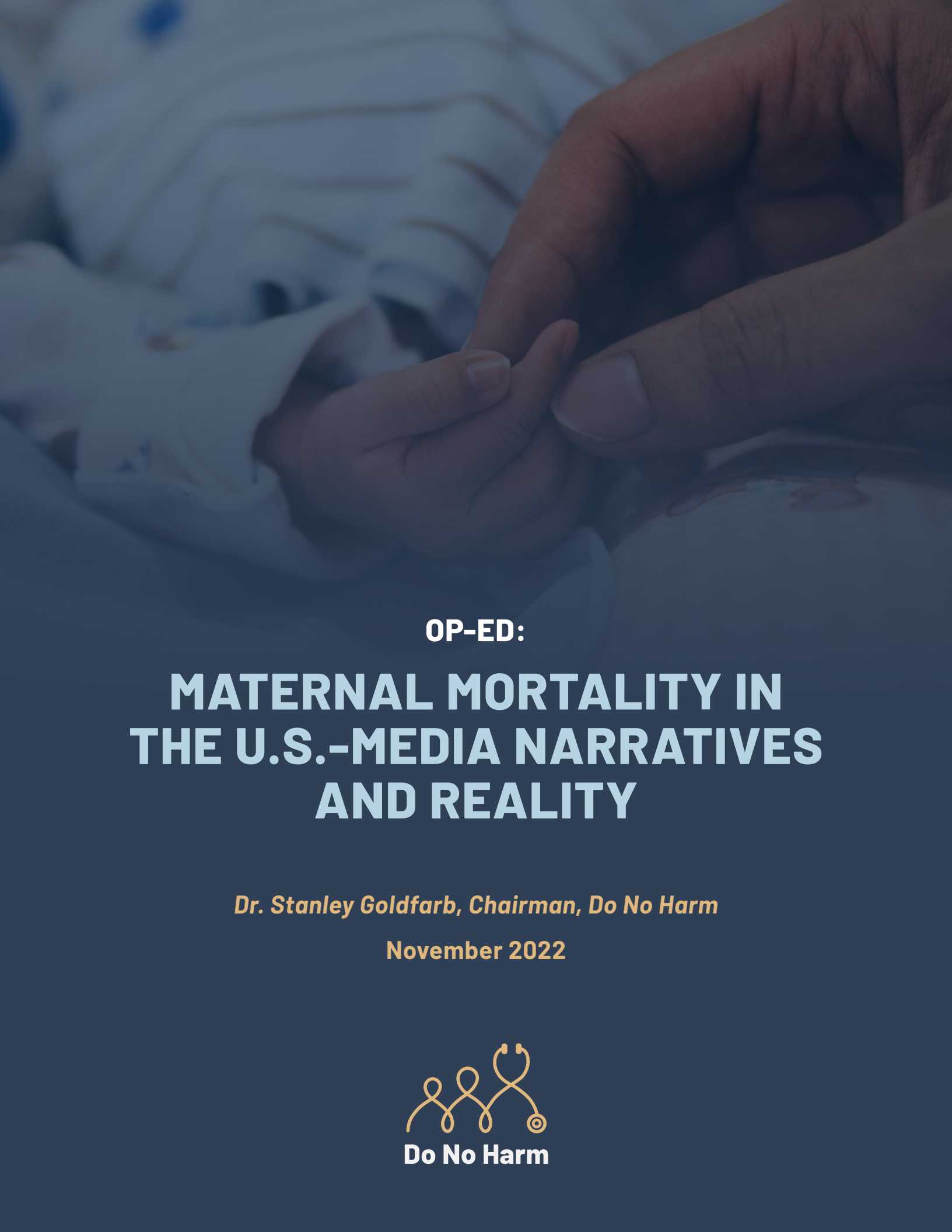




**OP-ED:**

# **MATERNAL MORTALITY IN THE U.S.-MEDIA NARRATIVES AND REALITY**

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**Do No Harm**

# I. EXECUTIVE SUMMARY

Black women's mortality rates are reported to be several fold higher than white women and the overall U.S. rate is said to be substantially higher than other developed nations.

A substantial part of the reported U.S. rate may result from a reporting system that has overestimated maternal deaths and one whose metrics are different from other developed nations.

A detailed study performed by the CDC in 2018 shows that:

- Many deaths are erroneously recorded as occurring related to pregnancy.
- Only 31% of deaths occurring within a year of pregnancy were related to complications of pregnancy while the rest were due to unrelated medical conditions or trauma.
- Of the deaths related to pregnancy, 42% were considered by an expert panel to not be preventable. These include medical conditions like cardiovascular disease and pulmonary embolism.
- Of the preventable deaths, about a third were due to actions attributable to the medical staff caring for the patient.
- A review of this study and the national statistics show that a preventable death in pregnancy is a very rare event and that the majority of women who die due to a condition related to pregnancy are white women.
- The cause of the 2.5-fold higher death rate in black women is due to high rates of pulmonary embolism and a rare condition called peripartum cardiomyopathy. These conditions are unlikely to be amenable to systematic interventions.
- Morbidity in pregnancy is also more common in black women and is likely attributable to the quality of hospital where black women deliver their infants and to poor access or usage of prenatal care.
- There are certain genetic and biologic characteristics shared by some black women experiencing complicated pregnancies.
- An improvement in maternal mortality rates in the U.S. is possible with better hospital training programs and greater use of prenatal care. Programs aimed at supposed physician bias have no evidence to support their use.

## II. INTRODUCTION

The United States is in a crisis, according to some. Oprah Winfrey, in her documentary “Color of Care,” declared that the above-average rates of maternal mortality in black women is due to “the fatal consequences of racial health disparities.” She points out on her website that the maternal mortality rate for black women is “3 to 4 times” the rate for white women. (It actually was 2.5 times in 2019.)<sup>1</sup>

In June 2022, the Biden administration presented “The White House Blueprint for Addressing the Maternal Health Crisis.” It began with a dire statement:

*The United States is facing a maternal health crisis. Our country’s maternal mortality rate is the highest of any developed nation in the world and more than double the rate of peer countries, like the United Kingdom, Australia, Spain, and Germany.*

Vice President Kamala Harris wrote in her introduction to the blueprint:

*Regardless of income or education level, black women are three times as likely to die from pregnancy-related complications. Native American women are more than twice as likely to die. And women who live in rural America—where there are many maternal care deserts—are about 60 percent more likely to die. These outcomes are largely due to systemic inequities, which create significant disparities in how women experience the healthcare system that can often be a matter of life and death.*

From such language, one might assume a catastrophic number of deaths. While any death is tragic, the death of a mother, whether directly or indirectly related to pregnancy and occurring during or shortly after childbirth in the United States is a very rare event and many deaths are associated with pre-existing or other unavoidable medical conditions and may not be preventable. Moreover, many deaths categorized under maternal mortality do not occur at the time of delivery but rather as much as 6 weeks or even a year after delivery. As will be seen below, the reporting system for maternal mortality in the U.S. suffers from unreliable reporting methodology that likely contributes to the narrative that women are poorly treated in this country.

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1. <https://www.cdc.gov/nchs/data/nvsr/nvsr69/nvsr69-02-508.pdf>

While there is a disparity in the rate of maternal mortality between black and white women, its magnitude is uncertain. As other minority groups like Hispanic women have a lower mortality rate than white women, a simple explanation that physicians and nurses somehow favor white women cannot be correct. The causes of health outcome disparities are quite complex. The claim that racism is responsible is a popular one, but it is not supported by a careful analysis of the data. Propagating the idea that death rates are inordinately high and due to physician neglect, though, frightens black American women and perpetuates the idea that delivering a baby at hospitals that cater to both white and black women is dangerous to the black mothers.

The White House document called for implicit bias training of physicians to improve outcomes; soon after, its policy prescriptions were recited verbatim by The Philadelphia Inquirer. As Inquirer reporter Layla Jones wrote, "We know that black women are three to four times more likely to die due to pregnancy-related causes than white, Asian, or Latinx women. ... [C]learly race plays a part in pregnancy and birthing. And when we say race, we really mean the results of systemic racism." Linda Villarosa, a New York Times columnist who participated in the 1619 Project, wrote a book, *Under the Skin*, in which she bluntly states, "Discrimination and bias led to a disproportionate number of poor birth outcomes in black women."

This narrative distorts the problem, at best. We know that disparate outcomes exist for black patients in a variety of clinical disorders, and the etiology of these differences has never been identified. What makes all these commentators so sure they understand the origins of this disparity? It is true that black Americans have less wealth, lower incomes, and poorer health than the average American. But few commentators can explain how these less advantageous circumstances lead to poor health. Instead, they, without real evidence, jump from the observable differences in health outcomes to claiming that the differences largely result from bias and discrimination on the part of physicians and the American healthcare system.

Most media stories on health care disparities begin with the historical wrongs perpetrated on the black community, even back to the time of slavery. The authors then immediately shift to anecdotes, either their own or those of their acquaintances. These tales of unpleasant encounters with the healthcare system are held up as modern examples of discrimination, but all types of patients encounter harried nurses and physicians, and frustration with personal services received in the hospital are often misinterpreted as indifference to patient well-being. Some stories focus on medical errors attributing them to racism and discrimination but rarely are these anything but examples of poor training or deficient clinical judgment.

The contention that black women are at a 3- or 4-fold risk of dying is a frightening thought and likely is a great source of worry for black women contemplating pregnancy. But it is important to consider not only comparative risk but absolute risk. The comparative risk of an event between two groups can be quite large, such as the greater rate in black women, but the absolute risk, the risk for each group separately, can be quite small. In 2018, according to one CDC report, 658 women died in the U.S. related to pregnancy, out of some 3.0 million births. This gives a death rate of 0.02%. While a death rate of .04% is twice the rate, each death represents a very catastrophic but a rare event. Black women have been given the notion that entering a hospital to give birth puts them at great risk of dying. This is simply not true. Pregnancy has risks associated with it and some deaths are not preventable, but as will be seen, the risks attributable to poor medical care are responsible for a small fraction of the overall number of deaths.

To put in perspective the risk a woman faces entering the hospital to deliver a baby, one can consider the data from Pennsylvania from 2018. In that year, the staff of 124 hospitals in Pennsylvania delivered 137,000 babies, and 19 women died in a pregnancy-related death. A CDC study to be discussed below suggests that only 60% of pregnancy-related deaths are preventable, while 40% are unavoidable, primarily because of preexisting cardiovascular disease or sudden catastrophic events like pulmonary embolism. It is obvious that any one of the 124 Pennsylvania hospitals or a woman entering any hospital in Pennsylvania is very unlikely to have experienced even one of the approximately 11 preventable maternal deaths in 2018.

### III. THE PROBLEM OF UNRELIABLE DATA

Nonetheless, the problem clearly needs study, and it has been studied extensively. There is a large medical literature on maternal mortality in general (47,825 articles in PubMed at latest count), with substantial attention given to maternal mortality in black women (5,388 papers). Much of the literature merely documents the disparities between white and black women, but commentators in the media usually assume that the disparities are attributable, at least in part, to discriminatory practices. But in an era where political narratives have corrupted science, one must rigorously evaluate the medical literature to understand what “the science” says about maternal mortality, complications of pregnancy, and healthcare disparities. And the science is hardly clarifying.

To tackle this issue, one needs to first understand where the information comes from and what each term means. While “maternal mortality” implies that a woman died at the time of delivery, that is not the case. There are three different databases used in assessing maternal mortality in the U.S. The CDC manages two national data sources of maternal deaths: 1) the National Vital Statistics System, compiled annually by the National Center for Health Statistics (NCHS); and 2) the Pregnancy Mortality Surveillance System (PMSS), a program run by the Division of Reproductive Health at the National Center for Chronic Disease Prevention and Health Promotion. The NCHS only counts deaths that occur during pregnancy or up to 42 days following delivery. The PMSS counts any death that occurs during pregnancy and up to 1 year after delivery. Finally, there is a state level system called the Maternal Mortality Review Committees (MMRCs), which examines medical records of specific cases and determines the nature of the death and its relationship to pregnancy.

The terminology used to describe maternal mortality, according to the CDC<sup>2</sup> is as follows:

1. **Pregnancy-related:** “The death of a woman while pregnant or within 42 days of termination of pregnancy, from any cause related to or aggravated by her pregnancy or its management, but not from accidental or incidental causes.” (Example: a death from postpartum hemorrhage or amniotic fluid embolism).
2. **Pregnancy-associated but not pregnancy-related:** “The death of a woman while pregnant or within 1 year of termination of pregnancy due to a cause unrelated to pregnancy.” (Example: a death from an earthquake).

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2. Collier, A. R. Y., & Molina, R. L. (2019). Maternal mortality in the United States: updates on trends, causes, and solutions. *Neoreviews*, 20(10), e561-e574.

- 3. Pregnancy-associated but undetermined if pregnancy-related:** “The death of a woman while pregnant or within 1 year of termination of pregnancy from a cause that cannot be determined or conclusively categorized as either pregnancy-related or not pregnancy related.” (Example: a woman with an unknown mental health history dies 6 months postpartum from a self-inflicted cause).

For the two national reporting systems, the source of data is the death certificate. Unfortunately, death certificates are notorious for being error prone as they may be filled out by a variety of individuals, including doctors, coroners, and other health care providers, most of whom have little training in the process.

In 2002, the national maternal mortality rate was 8.9 deaths/100,000 live births. If the system used then was maintained to the present day, the national rate would still be measured at approximately 9 deaths/100,000 live births<sup>3</sup> much different from the current rate of 17 deaths/100,000 live births. But at that time, there was a perception that many maternal deaths were not counted, and a more robust detection system was needed. The solution, enacted in 2003, was to place a checkbox on the death certificate that was to be used if the death had a relationship to pregnancy, i.e., the woman was pregnant at the time of death or in the year preceding death. This change led to a dramatic increase in the potential number of deaths actually due to pregnancy and an equally disturbing progressive rise in the number pregnancy-related deaths over the next two decades.

Further study showed that the rate increase was simply due to the staggered rollout of the checkbox across various states. As each state adopted the new form, its maternal mortality rate appeared to increase. In time, the CDC confirmed that the rise in rates was most likely due to the new system rather than to an actual increase in mortality rates.

The idea that the United States has a maternal mortality rate far greater than other nations is very suspect. The U.K., which has a rate of 8 deaths/100,000 live births, reviews each medical record of a patient who dies during or within 42 days of pregnancy. The U.S., by contrast, attempts to capture all deaths during or within 1 year of pregnancy using codes inserted on the death certificate. This much longer period assessed in the U.S. compared to the U.K. introduces the likelihood of including cases that would not be counted in the U.K. as maternal deaths.

Not surprisingly, some healthcare organizations struggle with the definitions. Pennmedicine, the healthcare entity of the University of Pennsylvania, confuses the terminology and reports that in Philadelphia, 43% of births are delivered by black women but 73% of pregnancy-related deaths occur in black women.<sup>4</sup> The city of Philadelphia’s

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3. <https://stacks.cdc.gov/view/cdc/84769>

4. <https://www.pennmedicine.org/for-patients-and-visitors/find-a-program-or-service/obstetrics/maternity-care/maternity-care-at-hup/maternal-morbidity-and-mortality>

website, however, points out that the 73% numbers refers to pregnancy associated deaths. This is not the same as pregnancy-related deaths. Penn's report dramatically overstating the role of the healthcare system in maternal deaths in a majority black-city.<sup>5</sup>

The CDC website,<sup>6</sup> further acknowledged that its data sources U.S. maternal mortality rates are not precise enough to use for comparisons across time or geography:

*“The MMR (Maternal Mortality Rate) is more than double the rate reported before the checkbox was added, but a rigorous evaluation confirms that the increase in reported rates is almost entirely because of changes in reporting methods. After evaluating more comparable data, the rate has not significantly changed since 1999.”*

And

*“There was clear evidence in the early 2000s that many maternal deaths were being missed. The addition of the checkbox had the intended effect of a significant increase in reporting. But iNCHS’ (National Center for Health Statistics) recent evaluation, and other independent research, instances have been identified where deaths were inappropriately being coded as maternal. NCHS had previously recognized that the checkbox was likely to be incorrectly checked for women aged 55 and over. NCHS’ review led to the conclusion that there was a high likelihood this was occurring in many deaths at a younger age.”*

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5. <https://www.phila.gov/media/20210322093837/MMRReport2020-FINAL.pdf>

6. <https://www.cdc.gov/nchs/maternal-mortality/faq.htm>

## IV. INSIGHTS FROM A CDC STUDY OF MATERNAL MORTALITY

In the face of this uncertainty, the CDC performed an elaborate study in 2016 to determine the relationship between pregnancy-associated deaths and pregnancy-related deaths, and whether the causes of death were preventable or attributable to any actions on the part of the healthcare system.<sup>7</sup> The study was called the Review in Action. The CDC examined in detail the medical records and any other documentation related to maternal mortality in a robust sample from four states—Delaware, Georgia, Colorado, and Ohio—over a 4-year period.

The CDC brought together over 30 epidemiologists, public health scientists, and CDC staff for this study. They examined the medical records of 650 deaths initially termed “maternal deaths” in the sample. The sample was a robust one, as it was qualitatively similar to the 700 or so maternal deaths in the U.S. each year (out of some 3 million births).

The experts first found that of the 650 births, 97 were wrongly categorized and should not have even been associated with pregnancy. In these cases, the relevant box was checked on the death certificate, but the patient was not pregnant in the year preceding death. Subtracting those deaths from the 650 leaves 553 deaths that had some relationship to pregnancy. This false rate of 15%-20% has been found in other studies.

The study team next asked whether the pregnancy-associated deaths were closely related to pregnancy. Of the 553 deaths, only 171 were found to be related to pregnancy (31%) once expert panels reviewed the medical records. They removed homicides, auto accidents, and other trauma-related deaths. (The homicide rate in the U.S. for pregnant women is higher than the maternal mortality rate, so this is not a trivial issue.) They also removed any deaths that were illness-related but thought not to have been related to the pregnancy. An example might be a patient who suffers a stroke 5 weeks after delivery. In fact, if this sample is representative of the entire nation, the U.S. rate of deaths that are related to pregnancy, and not the result of an error or a misinterpretation of codes on a death certificate, is not dissimilar from that of other developed nations.

The next question that the CDC study examined is whether the pregnancy-related maternal deaths were preventable. Preventable deaths included eclampsia, acute hemorrhages, or infections. Deaths that could not be prevented include acute pulmonary embolisms that occurred after hospital discharge or postpartum cardiomyopathy. The expert panel believed that 58% of the 171 pregnancy-related deaths were preventable.

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7. [MMRIARepor.pdf \(cdcfoundation.org\)](#)

Slightly more than half of the preventable deaths—56%—were attributed to mistakes or substandard treatment at hospitals. A smaller but still significant share—42%—were due to patients failing to recognize the seriousness of signs of complications after discharge from the hospital and then failing to seek medical attention in time to be helped. Many were likely due to failure of some women to seek prenatal care to prevent cardiovascular diseases.

The results of the CDC study suggest the complex nature of maternal mortality and the rarity of preventable deaths should provide some relief from the notion that women entering the hospital to deliver their baby are entering a world of uncaring and biased physicians who act with indifference to the health of the mother.

Given this uncertainty about the true maternal mortality rate in the U.S., we try to understand why the maternal mortality rate is higher in black women. In 2019, the rate was said to be 2.5 times higher for them when compared to non-Hispanic white women. Interestingly, Hispanic women have a lower relative mortality rate than black women. But even the discrepancy of rates between the various cohorts must be viewed with caution. For example, a study by Catalano et al., published in the American Journal of Obstetrics and Gynecology, suggested that the death certificate checkbox may be applied inappropriately in black women at a rate 50% higher than is the case for non-Hispanic white women. The exact increment in mortality in black women, the study said, is almost certainly real, but its magnitude is not certain. Given the death toll of the Covid 19 pandemic in black communities, any recent surge in maternal mortality could reflect Covid deaths occurring within one year of delivery. The CDC study cited above found that the principle causes of death in black women were post-partum cardiomyopathy, pulmonary embolism, cardiovascular disease, and hemorrhage. This pattern was similar in non-Hispanic white women except that white women had more instances of infection and fewer of pulmonary embolism as causes of death.

## V. LESSONS FROM STUDIES OF MATERNAL MORBIDITY IN THE U.S.

The death of even one woman during birth is a catastrophic event, and there should be intense efforts to eliminate all such deaths. Given the rarity of deaths, however, one cannot easily examine any conditions that may have contributed to them. An alternate approach to understand the factors leading to risk for mortality is to study serious complications of pregnancy which increase the risk of harm to the mother. These are far more common and allow for quantitative assessments. Researchers can use the rate of such complications like hemorrhage and infection as indicators of quality of care. This approach, which allows researchers to study factors that contribute to poor outcomes, examines “maternal morbidity.”

Dr. Elizabeth Howell has studied the problem of in-hospital maternal morbidity during delivery in New York City.<sup>8</sup> Howell found that black women tended to deliver their babies at hospitals that serve mostly black women. Further, she found, they had more morbid complications than white women who delivered at hospitals that serve mostly white women. She speculated that if black women delivered at the same hospitals as white women, their complication rates would fall by 50%. Moreover, when white women delivered at hospitals that serve mostly black women, their complications rate was the same as that of black women. The implication here is that an effort to reduce the rate of complications of delivery and, presumably, even the remote risk of maternal mortality, requires improving hospital quality. This means better training in responding to complications, like acute hemorrhage, or treating the complex conditions of eclampsia and pre-eclampsia, hypertensive conditions which can be lethal. It does not mean sending physicians to implicit bias training.

It is unlikely, however, that this type of data will convince the racialists like Linda Villarosa or the Philadelphia Inquirer’s Layla Jones that racism specifically bias on the part of physicians, is not at play. Still other data undercut the notion that the unfortunate social conditions that plague many black communities are the driving force in disparate outcomes. As Howell points out:

*the increased risk of maternal death among racial and ethnic minority women appears to be, at least in part, independent of sociodemographic risk. Adjustment for sociodemographic and reproductive factors has not*

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8. [Reducing Disparities in Severe Maternal Morbidity and Mortality](#)

*explained the racial gap in pregnancy-related mortality in most studies. For instance, in one study, adjustment for maternal age, income, hypertension, gestational age at delivery, and receipt of prenatal care only reduced odds ratios for pregnancy-related mortality from 3.1 to 2.7 (times greater in black than white women). Another study found the largest racial disparity among women with the lowest risk of pregnancy-related disease.*

Of course, some people will attribute such data to racism and physician bias. Since socioeconomic factors in Howell's assessment were relatively minor factors in the discrepancy between black and white outcomes, they posit that the difference must be explained by bias directed at women because of skin color. As Linda Villarosa states in her book, *Under the Skin*, "(there is) a deeply rooted and dangerous bias in our health care system." But as noted in the CDC study, black women died much more frequently than white women of pulmonary embolism. The risk of that complication is increased in patients with obesity, and black women tend to have a higher rate of obesity. Is this a case of racism? Maybe. But so far neither President Biden nor Vice President Harris has made the argument that to tackle black maternity deaths, we should focus on rooting out obesity.

Similarly, eclampsia and pre-eclampsia are life-threatening conditions characterized by, among other disturbances, severe hypertension. In the CDC study, cardiovascular events and eclampsia and pre-eclampsia were also commonly seen in black women as causes of death. Early and effective prenatal care can reduce the rate of these complications. Howell points out that many black women simply do not get adequate prenatal care:

*Timing and receipt of prenatal care vary greatly by race and ethnicity. First trimester prenatal care initiation was highest for white and Asian women (79% and 78% respectively), followed by multiple race and Hispanic women (71% and 69%, respectively), and was lowest for black, American Indian/Alaska Native, and Native Hawaiian/other Pacific Island women (64%, 59%, and 55% respectively) in 2012.<sup>42</sup> Population based studies have documented that black and Hispanic women are nearly four times and two times respectively to receive 0–5 prenatal care visits as compared with white women.*

## VI. POTENTIAL INTERVENTIONS TO IMPROVE MATERNAL MORTALITY AND MORBIDITY

There are several federal programs aimed at supporting pregnant women, particularly those living under 185% of the poverty line. These include healthcare, nutrition, and other counseling programs. Better awareness of these programs could improve outcomes. Better health literacy should be a feature of high school education. Better access to healthcare is the key to improving this component of the disparity in maternal morbidity and perhaps in maternal mortality as well. The solution is more doctors, not just doctors of a specific creed or race.

Genetics may also play a role. Despite the refrain commonly heard that “race is a social construct and not biologic,” scientific observations keep intruding. Many clinical disorders, such as chronic kidney disease and hypertension, afflict black patients at very high rates, and they have a substantial genetic component that contribute to disparities in maternal morbidity and mortality. For example, as noted above, one of the leading causes of black maternal death within a year of delivery is peripartum cardiomyopathy, a form of severe heart failure likely with an immunologic origin. A study by Gentry et al., published in the Journal of the American Academy of Cardiology, found that African American ethnicity remained a significant risk factor (30 times greater risk in black vs. white women) for this condition when other risk factors were considered in multivariable analyses.

Another key risk factor for increased maternal and fetal morbidity is preterm birth. It often leads to an emergency delivery and to infants requiring intensive care. In a study by Velez et al. from Vanderbilt University, genetic factors appeared to play a role in the risk of preterm birth. They found that a “strong role for genes involved in infection and inflammation in the pathogenesis of pre-term birth and their results indicated that ... in African Americans there may be complementarity of maternal and fetal genetics for preterm birth.”

A study by Reidy et al., from a national consortium of investigators, examined a known genetic factor for hypertension and kidney disease in black patients, a mutation in the gene APOL1. They found that a particular form of the mutation, in which two copies of the gene are found in the fetus, conveys a two-fold greater risk for pre-eclampsia, likely by adversely affecting the function of the placenta. Preeclampsia and eclampsia are leading causes of maternal morbidity and mortality.

The resistance to considering genetic factors in health care disparities runs against scientific thinking and is more likely to block progress in understanding and treating disease than perhaps any other form of misinformation.

What then to make of the maternal health care crisis that Kamala Harris has decried on many occasions and attributed to systemic inequities? Clearly, the healthcare industry should do all it can to reduce the number of maternal deaths. Improved hospital training would appear to be the most likely effective tool. It would benefit all women, especially black women. Even more effective would-be efforts to encourage women to use hospitals that have the resources to handle a large number of difficult deliveries.

Moreover, we must recognize that the answer to improving the outcomes for black women requires improving the outcome for all women. An example of this is the case of maternal outcomes in Pennsylvania. As noted above, 19 women there died in 2018 in circumstances related to pregnancy. The fact that 14% of all deliveries were in black women but 23% of deaths were in black women is consistent with a higher risk for black women. But 67% of the births were in white women and 75% of deaths were in white women. That is, three times as many white women died than black women. The idea that deaths in black women drive maternal mortality statistics is incorrect simply because there are many more births in white women in the United States. Doesn't it make more sense to focus on and act to prevent the causes of death rather than focus on the skin color of the patients? Even if the policy goal is to improve the health outcomes of only black women, it still would make sense to focus on what we know are the root—and immediate—causes.

Research into the etiology of disparate outcomes is clearly warranted, but assuming that increasing the diversity of the healthcare workforce will have any impact on the outcome is to propose a solution without having any evidence. As Villarosa declares in “Under the Skin,” “Underrepresentation in the workforce limits black patients from being treated by physicians that look like them.” Moreover, media commentary and other materials that frighten black women, and women in general, about the risks of having a baby in an American hospital, compared to the rest of the world, seems to draw on numbers, at least in part, from a flawed reporting system. More importantly, the best data suggest that the best approaches to improving care are independent of a patient's race. Spending any time and money on implicit bias training, as requested in the White House plan, will not do anything beyond frustrating and further demoralizing physicians. It would be better to advocate improved hospital training and improved outreach to women who are in the earliest stages of pregnancy. It would be better to conduct more research into the biologic basis of hypertension in pregnancy, the mechanism of eclampsia and pre-eclampsia, and peripartum cardiomyopathy—the one complication related to black women. A better approach to the disparities in maternal morbidity would reduce hospital morbid events for all women. Compared to conducting implicit bias programs, it would be a much more cost effective and clinically effective approach to improving the health of pregnant women and reducing maternal mortality for all women.



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