
Lorene B. Wiley, MD
Jason Hildebrand, MD
WORLDWIDE, MATERNAL MORTALITY HAS BEEN DECREASING.

IN THE RECENT DECADES, IT HAS BEEN INCREASING IN THE U.S.
<table>
<thead>
<tr>
<th>Causes</th>
<th>Worldwide</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetric hemorrhage</td>
<td>27%</td>
<td>Cardiovascular conditions 15.3%</td>
</tr>
<tr>
<td>Hypertensive disorders</td>
<td>14%</td>
<td>Noncardiovascular medical conditions 14.3%</td>
</tr>
<tr>
<td>Pregnancy-related sepsis</td>
<td>11%</td>
<td>Infection 12.5%</td>
</tr>
<tr>
<td>Abortion</td>
<td>8%</td>
<td>Hemorrhage 11.2%</td>
</tr>
<tr>
<td>Embolism</td>
<td>3%</td>
<td>Cardiomyopathy 10.8%</td>
</tr>
<tr>
<td>Other direct causes</td>
<td>10%</td>
<td>Embolism 9.3%</td>
</tr>
<tr>
<td>Indirect causes</td>
<td>28%</td>
<td>Hypertensive disorders of pregnancy 7.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cerebrovascular accidents 7.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown 6.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amniotic fluid embolism 5.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anesthesia complications 0.3%</td>
</tr>
</tbody>
</table>
**Sweeping legislation aims to combat Black maternal mortality**

In North Carolina, Black women are more than 2 1/2 times more likely to die of pregnancy-related complications.


---

**THE SLATEST**

**Congress Faces the Gut-Wrenching Facts of the Black Maternal Mortality Crisis**

Rep. Cori Bush and others testify about the dangers of childbearing in America.

BY JULIA CRAVEN  MAY 07, 2021  •  4:26 PM


---

**LOST MOTHERS**

**Nothing Protects Black Women From Dying in Pregnancy and Childbirth**

Not education. Not income. Not even being an expert on racial disparities in health care.

by Nina Martin, ProPublica, and Renee Montagne, NPR News. Dec. 7, 2012, 8 a.m. EST

Maternal Death

- Defined by WHO as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes."
Maternal Death

- Direct Obstetric Death: 86%
- Indirect Obstetric Death: 12%
2018 MATERNAL MORTALITY RATE

17.4 deaths per 100,000 LIVE BIRTHS

For more information, visit https://www.cdc.gov/nchs/maternal-mortality/.
2018 MATERNAL MORTALITY STATISTICS HIGHLIGHT WIDE RACIAL AND ETHNIC GAPS

Death rate (per 100,000 live births)

- Non-Hispanic black women: 37.3
- Non-Hispanic white women: 14.9
- Hispanic women: 11.8

BACKGROUND/LITERATURE REVIEW
Severe Maternal Morbidity (SMM)

- A study of US deliveries between 2006 and 2015 reported that the rate of SMM (ie, a life-threatening event during pregnancy, delivery, or postpartum) was up to 115 percent higher for black compared with white women, after adjustment for age mix, and did not change significantly during the study time period.

- A different study of a US inpatient database reported that, from 2012 to 2015, the incidence of SMM was significantly higher for every racial and ethnic minority group compared with non-Hispanic white women.

- After exclusion of cases in which blood transfusion was the only indicator of SMM, non-Hispanic black women were 20% more likely to experience SMM compared with non-Hispanic white women (risk ratio 1.2, 95% CI 1.2-1.3).

Among women with multiple medical and/or physical comorbidities, women of all racial and ethnic minority groups were more likely to experience an SMM event compared with non-Hispanic white women.
Maternal Outcomes by Race During Postpartum Readmissions

- In a US database study including over 11.3 million births between 2012 and 2014, 207,730 (1.8%) women admitted postpartum were analyzed, including 96,670 white, 47,015 black, and 33,410 Hispanic.
- Compared with non-Hispanic white women, non-Hispanic black women were at 80% greater risk of postpartum readmission (95% CI, 79%-82%) whereas Hispanic women were at 11% lower risk of readmission (95% CI, 10%-12%)
- In unadjusted analysis, compared with non-Hispanic white women, non-Hispanic black women admitted postpartum were at 27% greater risk of severe maternal morbidity (95% CI, 24%-30%) whereas Hispanic women were at 10% lower risk (95% CI, 7%-13%)
- In addition to overall morbidity, non-Hispanic black women were at significantly greater risk for eclampsia, ARDS, & renal failure than other racial groups (P<.05 all). Black women were at 126% greater risk for pulmonary edema/acute heart failure than white women (95% CI, 117%-136%).

Black women were more likely
(1) to be readmitted postpartum
(2) to suffer severe maternal morbidity during readmission, and
(3) to suffer life threatening complications such as pulmonary edema/acute heart failure.

Site of Delivery Contribution to Black-White Severe Maternal Morbidity Disparity

- Population-based study - 353,773 deliveries at 40 hospitals from 2011-2013 in NYC
- Severe maternal morbidity occurred in 8882 deliveries (2.5%) and was higher among black than white women (4.2% vs 1.5%, P < .001).
  - SMM : life-threatening conditions (e.g. renal failure, eclampsia) and life-saving procedures (e.g. hysterectomy, ventilation, blood transfusion)
- After adjustment for patient characteristics and comorbidities, the risk remained elevated for black women (OR, 2.02; 95% CI, 1.89-2.17).
- White deliveries were more likely to be delivered in low-morbidity hospitals: 65% of white vs 23% of black deliveries occurred in hospitals in the lowest tertile for morbidity.

Black mothers are more likely to deliver at higher risk-standardized severe maternal morbidity hospitals than are white mothers, contributing to black-white disparities.

Postpartum Hemorrhage Outcomes and Race

- Retrospective cohort study - included 360,370 women aged 15-54 years with a diagnosis of postpartum hemorrhage for the years 2012-2014

- Overall risk for severe morbidity based on CDC and Prevention criteria was analyzed along with risk for specific outcomes such as DIC, hysterectomy, transfusion, & maternal death.

- Risk for severe morbidity was significantly higher among non-Hispanic black women (26.6%) than non-Hispanic white, Hispanic, or Asian or Pacific Islander women (20.7%, 22.5%, and 21.4%, respectively, P<.01).

- For non-Hispanic black compared with non-Hispanic white, Hispanic, and Asian or Pacific Islander women, risk was higher for DIC (8.4% vs 7.1%, 6.8%, and 6.8%, respectively, P<.01) and transfusion (19.4% vs 13.9%, 16.1%, and 15.8%, respectively, P<.01).

- Black women were also more likely than non-Hispanic white women to undergo hysterectomy (2.4% vs 1.9%, P < .01), although Asian or Pacific Islander women were at highest risk (2.9%).

- Adjusting for comorbidity, black women remained at higher risk for severe morbidity (P<.01). Risk for death for non-Hispanic black women was significantly higher than for nonblack women (121.8 per 100,000 deliveries, 95% CI, 94.7-156.8 vs 24.1 per 100,000 deliveries, 95% CI, 19.2-30.2, respectively, P<.01)

Black women were at higher risk for severe morbidity and mortality associated with postpartum hemorrhage.

BACK TO MY STUDY...
A retrospective analysis of electronic health records was conducted identifying maternal deaths from 1988 to 2018 at Vidant Medical Center (VMC), formerly Pitt County Memorial Hospital.

Goals
- To identify risk factors associated with maternal deaths
- To categorize causes of maternal deaths
- To determine is there a racial disparity in maternal deaths at our institution.
METHODS

- All maternal deaths (cases) at VMC from January 1988 through December 2018 were identified.

- Data was obtained on all women who died with ICD-9/10 codes related to pregnancy, childbirth, or postpartum state and review of all available hospital records, death certificates, and autopsy reports was performed. The analyzed data included:
  - age, race/ethnicity, parity, gestational age, body mass index, prenatal care, pre-existing medical conditions, hospital-acquired comorbidities, route of delivery, fetal/neonatal outcome, and cause of death.
Twenty-five maternal deaths were identified

Ages at time of death: 19 to 41

Risk Factors: obesity, hypertension

Parities: Primiparas (G1) to Multigravidas (Highest G7P5015)

Gestational ages: 20.0 to 39.6 weeks gestation
Direct obstetric deaths were more common than indirect obstetric deaths (68 and 32 %, respectively).

- Direct: Eclampsia $\rightarrow$ Hemorrhagic CVA, HELLP w/ liver hematoma $\rightarrow$ Exsanguination, HELLP/DIC
- Indirect: Ruptured Berry Aneurysm, Ruptured AVM, ACS in SCD

40 percent of deaths were associated with complications resulting from hypertensive disorders of pregnancy.

- Pre-Eclampsia
- Eclampsia
- HELLP
- DIC

68% black, 24% white, 8% Hispanic.
CONCLUSIONS

■ There was insufficient data to suggest racial disparity in maternal deaths.

■ Although numerous studies have been performed, there continues to be limitations in our understanding of maternal mortality and its increase in the United States.

■ Lack of prenatal care, chronic comorbidities, and implicit biases have all been studied as contributing factors.

■ Steps towards decreasing the maternal death rate should be directed towards eliminating barriers to healthcare (both preconception and prenatal), patient outreach/education, and early diagnosis and appropriate treatment of pregnancy complications.