Disparities in Severe Maternal Morbidity and Mortality: How Did We Get Here and Where Do We Go From Here

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Presenter Disclosures

Elizabeth Howell, MD, MPP
I have no personal financial relationships with commercial interests relevant to this presentation

Overview

• Racial/ethnic disparities in maternal mortality and severe maternal morbidity
• The role of preconception, antenatal, delivery, and postpartum care in disparities
• Research on quality and disparities in severe maternal morbidity in US and NYC Hospitals
• Levers to Reduce Disparities
  – Alliance for Innovation on Maternal Health
Disparities in Maternal Mortality

- Minorities represent half of all US births and racial/ethnic minorities suffer higher maternal mortality rates
- Black women 3 to 4 times more likely to die than white women – largest disparity among population perinatal health measures
- Native Americans, some Asians, some Latinas also have elevated rates

CDC Pregnancy Mortality Surveillance System at: https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html

United States Pregnancy-related Mortality by Race, Ethnicity, Nativity 2000-2006

CDC US Pregnancy-related Mortality by Race

Maternal Mortality (per 100,000)

Disparities More Pronounced in New York City

• Blacks 12 times more likely to die
  – Widening of gap since 2001-2005
  – Increased gap driven by 45% decreased mortality among whites
• Asian/Pacific Islanders 4x as likely to die
• Latinas 3x as likely to die


Leading Causes of Maternal Deaths in New York City, 2006-2010

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>White, non-Hispanic</th>
<th>Black, non-Hispanic</th>
<th>Hispanic</th>
<th>Asian/ Pacific Islander</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemorrhage</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Embolism</td>
<td>1</td>
<td>11.1</td>
<td>20</td>
<td>25.3</td>
</tr>
<tr>
<td>Pregnancy-induced hypertension</td>
<td>1</td>
<td>11.1</td>
<td>16</td>
<td>20.3</td>
</tr>
<tr>
<td>Cardiovascular condition</td>
<td>2</td>
<td>22.2</td>
<td>12</td>
<td>15.2</td>
</tr>
<tr>
<td>Infection</td>
<td>0</td>
<td>0.0</td>
<td>5</td>
<td>6.3</td>
</tr>
<tr>
<td>Anesthesia complication</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>3.8</td>
</tr>
<tr>
<td>Injury</td>
<td>1</td>
<td>11.1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Cancer</td>
<td>1</td>
<td>11.1</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>11.1</td>
<td>9</td>
<td>11.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Severe Maternal Morbidity (SMM)

- For every maternal death, 100 women experience severe obstetric morbidity
- Life-threatening diagnosis or life-saving procedure
  - organ failure (e.g. renal, liver), shock, amniotic embolism, eclampsia, septicemia, cardiac events
  - ventilation, transfusion, hysterectomy
- Significant racial/ethnic disparities exist


In New York City, a black woman with a college degree is nearly three times more likely than a white woman with a high school degree to develop a severe maternal morbidity during her delivery hospitalization.

A. a. True
B. b. False
How Did We Get Here?

Patient Factors
- Socio-demographics: age, education, poverty, insurance, marital status, employment, language, literacy
- Knowledge, beliefs, health behaviors
- Psychosocial: stress, self-efficacy, social support

Community/Neighborhood
- Community, social network
- Neighborhood: crime, poverty, built environment, housing

Provider Factors
- Knowledge, experience, implicit bias, cultural competence, communication

System Factors
- Access to high quality care, transportation, structural racism, policy

Figure 1: Pathways to Racial and Ethnic Disparities in Severe Maternal Morbidity & Mortality

Antenatal Care and Disparities

- No or few antenatal visits associated with SMM and mortality
- Black and Latina vs. white women are:
  - more likely to receive 0-5 prenatal care visits
  - less likely to have early prenatal care
- Delay of prenatal care associated with experience of racism
- Quarter of mothers perceive discrimination during birth hospitalization

Preconception, Postpartum Care, and Disparities

- Drivers of SMM and mortality - obesity, HTN, diabetes - higher among black and Latina women
- Unintended pregnancy more common among black and Latina women and linked with worse perinatal outcomes
- Postpartum care important for long term health but rates are low

Hospital Quality and Disparities

- Nearly one-half of severe events / maternal deaths preventable
- Hospital quality important contributing factor
- Site of care receiving increasing attention as mechanism for disparities
- Growing body of research suggests racial/ethnic women deliver in lower quality hospitals

Research on Delivery Hospital and US Disparities

- In US, 75% of all black deliveries occur in a quarter of all hospitals vs. 18% of white deliveries
- Hospitals that disproportionately care for black deliveries
  - have higher risk adjusted SMM rates for both blacks and whites
  - perform worse than other hospitals on delivery-related indicators
Distribution of Black and White Deliveries at Black-serving Hospitals in US

Cumulative Percentage of Deliveries

<table>
<thead>
<tr>
<th></th>
<th>Black (N=279)</th>
<th>White (N=1106)</th>
<th>Low (N=4102)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>24%</td>
<td>50%</td>
<td>26%</td>
</tr>
<tr>
<td>Medium</td>
<td>2%</td>
<td>16%</td>
<td>2%</td>
</tr>
<tr>
<td>Low</td>
<td>82%</td>
<td>82%</td>
<td>82%</td>
</tr>
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</table>


Much higher rates of maternal morbidity for black and white moms

Delivery Hospital and NYC Disparities*

- Phase 1 - Examine risk-adjusted severe maternal morbidity and extent to which hospital quality contributes to racial / ethnic disparities in SMM
- Phase 2 – Hospital qualitative interviews to examine safety and culture, quality improvement, and other factors associated with high quality care
- Phase 3 – Focus groups with moms
- Phase 4 – Dissemination; promotion of best practices

Phase 1 Methods

- Vital Statistics linked with SPARCS for all New York City deliveries (2011-2013)
- CDC algorithm to identify severe morbidity
- Mixed-effects logistic regression to calculate risk-standardized severe maternal morbidity rates (SSMMR) for each hospital
- Ranked hospitals based on SSMMR
- Assessed black-white differences and Hispanic-white differences in delivery location

Hospitals ranked from lowest to highest morbidity
Observed rates: 0.6% to 11.5%; Risk standardized rates: 0.8% to 5.7%

Deliveries by Race and Risk-standardized Hospital Morbidity

<table>
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<tr>
<th>Hospital Group by RSSMM*</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black (%)</td>
<td>23</td>
<td>39</td>
<td>37</td>
</tr>
<tr>
<td>White (%)</td>
<td>65</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Hispanic (%)</td>
<td>33</td>
<td>38</td>
<td>29</td>
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## Deliveries by Race and Risk-standardized Hospital Morbidity

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<td>33</td>
<td>38</td>
<td>29</td>
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## Summary

- Wide variation in risk-standardized maternal morbidity among NYC hospitals
- Higher rates of severe maternal morbidity among blacks and Latinas partially due to differences in delivery location
- Delivery location partially explains morbidity disparities

## Next Steps

- Currently conducting hospital qualitative interviews
- Focus groups to explore patient barriers to receipt of high quality care
- Dissemination efforts to increase uptake of best practices

## Where Do We Go From Here? Levers to Reduce Disparities
Levers to Reduce Racial and Ethnic Disparities in Severe Maternal Morbidity & Mortality

Promote contraception
Optimize preconception health

New models – Centering, Medical Homes, enhanced models for high risk women

QI, standardization, bundles, team training, simulations, reviews, protocols, disparities dashboard
ProPublica and NPR story - Nothing Protects Black Women From Dying in Pregnancy and Childbirth
Dec 7, 2017

"In the more than 200 stories of African-American mothers that ProPublica and NPR have collected over the past year, the feeling of being devalued and disrespected by medical providers was a constant theme. The young Florida mother-to-be whose breathing problems were blamed on obesity when in fact her lungs were filling with fluid and her heart was failing. The Arizona mother whose anesthesiologist assumed she smoked marijuana because of the way she did her hair. The Chicago-area businesswoman with a high-risk pregnancy who was so upset at her doctor’s attitude that she changed OB-GYNs in her seventh month, only to suffer a fatal postpartum stroke.

Over and over, black women told of medical providers who equated being African American with being poor, uneducated, noncompliant and unworthy. “Sometimes you just know in your bones when someone feels contempt for you based on your race,” said one Brooklyn woman who took to bringing her white husband or in-laws to every prenatal visit.”

Levers to Reduce Racial and Ethnic Disparities in Severe Maternal Morbidity & Mortality

- New models – Patient navigators
- Case management
- QI, standardization, bundles, team training, simulations, reviews, protocols, disparities dashboard
- Preconception Care
- Optimize preconception health
- New models – Centering, Medical Homes, enhanced models for high risk women
- Antenatal Care
- Delivery & Hospital Care
- Postpartum Care

What Serena Williams’s scary childbirth story says about medical treatment of black women
Black women are often dismissed or ignored by medical care providers. Williams wasn’t an exception.

By P.R. Lockhart | Jan 11, 2018, 4:40pm EST

Which media source did not report on the elevated black maternal mortality rates in the last year?

A. New York Times
B. Washington Post
C. NPR
D. ProPublica
E. None of the above

Alliance for Innovation on Maternal Health: Focus on Disparities

• One of the first professional bodies to address disparities
• Unique perspective - addressing disparities under a patient safety umbrella
• Raises awareness among health systems, departments of health, hospitals, and clinicians who care for pregnant and postpartum women

Reduction of Peripartum Racial/Ethnic Disparities Patient Safety Bundle Development

Multidisciplinary Team
- William Grobman, MD, FACOG
- Elizabeth Howell, MD, MPP, FACOG
- Haywood Brown, MD
- Jessica Brumley, PhD, CNM
- Allison Bryant, MD, MPH
- Aaron Caughey, MD, PhD
- Andria Cornell, MSPH
- Jacqueline Grant, MD, MPH, MPA
- Kimberly Gregory, MD, MPH
- Sue Gullo, RN, BSN, MS
- Pandora Hardman, CNM
- Jill Mhyre, MD
- Katy Kozhimannil, PhD, MPA
- Jill Mhyre, MD
- Geeta Sehgal, DO
- Paloma Toledo, MD, MPH
- Robyn D’Oria, MA, RNC, APN
**Bundle Development**

- Review of literature
  - Disparities frameworks
  - Drivers of disparities and relative contributions
    - Examples from all of medicine
  - Effective interventions to reduce disparities

**Disparities Bundle Themes**

- Care fragmentation
  - Importance throughout reproductive life
- Communication
  - Patient education (culturally competent)
  - Shared decision-making
- Systemic racism
  - Implicit bias
- Lack of measurement and benchmarking
  - Disparity dashboard
  - Inter-hospital differences

**Four Domains of Patient Safety Bundles**

- Readiness
- Recognition
- Response
- Reporting/Systems Learning
**READYNESS**

Every health system
- Establish systems to accurately document self-identified race, ethnicity, and primary language.
- Provide system-wide staff education and training on how to ask demographic intake questions.
- Ensure that patients understand why race, ethnicity, and language data are being collected.
- Ensure that race, ethnicity, and language data are accessible in the electronic medical record.
- Evaluate non-English language proficiency (e.g., Spanish proficiency) for providers who communicate with patients in languages other than English.
- Educate all staff (e.g., inpatient, outpatient, community-based) on interpreter services available within the healthcare system.
- Provide staff-wide education on:
  - Peripartum racial and ethnic disparities and their root causes.
  - Best practices for shared decision making.
  - Engaging diverse patient, family, and community advocates who can represent important community partnerships on quality and safety leadership teams.

**RECOGNITION**

Every patient, family, and staff member
- Provide staff-wide education on implicit bias.
- Provide convenient access to health records without delay (paper or electronic), at minimal to no fee to the maternal patient, in a clear and simple format that summarizes information most pertinent to perinatal care and wellness.
- Establish a mechanism for patients, families, and staff to report inequitable care and episodes of miscommunication or disrespect.

**RESPONSE**

Every clinical encounter
- Engage in best practices for shared decision making.
- Ensure a timely and tailored response to each report of inequity or disrespect.
- Address reproductive life plans and contraceptive options not only during or immediately after pregnancy, but at regular intervals throughout a woman’s reproductive life.
- Establish discharge navigation and coordination systems post childbirth to ensure that women have appropriate follow-up care and understand when it is necessary to return to their health care provider.
- Provide discharge instructions that include information about what danger or warning signs to look out for, who to call, and where to go if they have a question or concern.
- Design discharge materials that meet patients’ health literacy, language, and cultural needs.

**REPORTING & SYSTEMS LEARNING**

Every clinical unit
- Build a culture of equity, including systems for reporting, response, and learning similar to ongoing efforts in safety culture.
- Develop a disparities dashboard that monitors process and outcome metrics stratified by race and ethnicity, with regular dissemination of the stratified performance data to staff and leadership.
- Implement quality improvement projects that target disparities in healthcare access, treatment, and outcomes.
- Consider the role of race, ethnicity, language, poverty, literacy, and other social determinants of health, including racism, at the interpersonal and systems-level when conducting multidisciplinary reviews of severe maternal mortality, morbidity, and other clinically important metrics.
- Add as a checkbox on the review sheet: Did race/ethnicity (i.e. implicit bias, language barriers, or specific social determinants of health contribute to the morbidity/mortality? And if so, are there system changes that could be implemented that could alter the outcome?)
Key References

Reduction of Peripartum Racial/Ethnic Disparities

Consensus Statement
- Obstet Gynecol. 2018 May;131(5):770-782

THANK YOU