

# Racial Disparities in Maternal Health: The Role of Preexisting Health Conditions

## Focus: Severe Maternal Morbidity

Data Source: Texas Hospital Discharge Data from All Delivery Hospitalizations from 2016 to 2022

Annamaria Milazzo<sup>1</sup>

### SYNOPSIS

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Summary: The US maternal health crisis disproportionately affects Black women, who face double the likelihood of Severe Maternal Morbidity (SMM—near misses for maternal death during labor and delivery) compared to White women. Using 2016-2022 Texas hospital discharge data, this study finds that preexisting health conditions explain up to 78 percent of the Black-White SMM gap. The remaining unexplained gap is 18-20 percent across and within hospitals, even among women attended by the same physician. Over the study period, health disparities appear to have remained stable. Overall, the findings underscore the critical need for prioritizing women’s health well before childbirth hospitalization.

The United States ranks last among all high-income nations included in the Organization for Economic Cooperation and Development (OECD) in terms of maternal mortality (OECD Stats, 2023). Large racial and ethnic disparities persist, with non-Hispanic Black women about 3 times more likely to die from pregnancy-related causes compared to non-Hispanic White women and Hispanic women (Hoyert, 2022).

While maternal deaths are relatively rare events, **for every maternal death, roughly 50 to 100 women experience severe maternal morbidity (SMM)**, with an average of 1 to 2% of birthing women overall affected (Carmichael et al., 2022). SMM is defined as “unexpected outcomes of labor and delivery that result in significant short- or long-term consequences to a woman’s health” (CDC, 2021). These events can be considered near misses for maternal death because they can lead to death if not properly identified and treated (ACOG et al., 2016). Such conditions include, but are not limited to, *hemorrhage, eclampsia, sepsis, cardiac complications, adult respiratory distress syndrome, and organ failure*. The focus here is on SMM as an adverse health outcome of labor and delivery—an alternative to using maternal mortality (the ultimate, and less frequent, outcome) as a measure of maternal health.

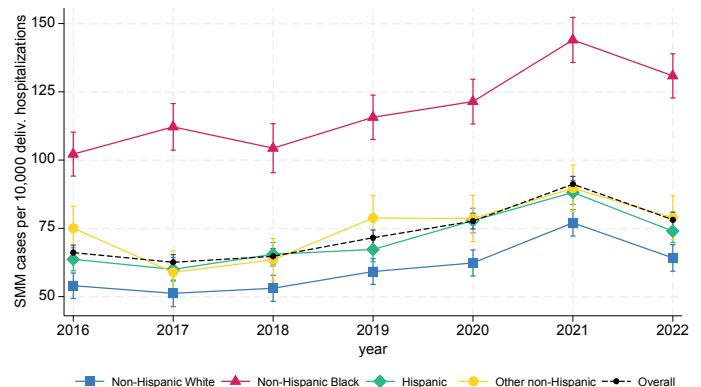
As with maternal mortality, there are large racial and ethnic disparities in the incidence of SMM, with Black women experiencing the highest rates (Admon et al., 2018). Based on 2020 national data—the most recent available at the national level—**Black women were nearly twice as likely as White women to experience SMM during their delivery hospitalization** (HCUP Fast stats, 2023).

This study aims to unravel the significance of preexisting health conditions, some of which may have begun to develop early in life or during pregnancy up until the hospitalization for delivery, as distinct from other proximate factors, in explaining disparities and trends in SMM. These other factors include hospital allocation (i.e., Black women giving birth in hospitals providing worse care to all women), within-hospital factors (i.e., Black women receiving worse care than White women delivering at the same hospital) and

other socio-economic factors. It uses hospital inpatient discharge data from all delivery hospitalizations in all hospitals in Texas from 2016 to 2022.<sup>2</sup>

Figure 1 depicts the average SMM rate—expressed as the number of SMM cases per 10,000 delivery hospitalizations—for Texas overall and by racial/ethnic group. The SMM rate in Texas overall has increased by 18 percent from 2016 to 2022—it experienced a sharp increase in 2021, and then decreased in 2022 reaching a level that exceeded pre-COVID levels. The figure also shows that the SMM rate increased for all racial and ethnic groups, with the SMM rate for non-Hispanic Black women remaining nearly twice as high as that of non-Hispanic White women throughout the entire period.

Figure 1. Mean SMM rates, overall for Texas and by race and ethnicity, 2016-2022.



Notes: Number of SMM cases per 10,000 hospitalizations. Annual mean values are displayed with 95% confidence intervals. N= 2,461,958. Author’s calculations using the Texas Hospital Inpatient Discharge Public Use Data File, Texas Department of State Health Services, 2016-2022.

Along with worsening maternal health outcomes, another concerning trend has been observed in the US: **a decline in overall health conditions of the adult population**, an issue that is gaining increasing recognition as a significant public health

<sup>1</sup> A full-length paper with a comprehensive account of the methodology and the results is currently being submitted for journal publication and is available as [SSRN working paper](#) (Milazzo 2024). I acknowledge the Texas Department of State Health Services, Texas Health and Human Services, Austin, Texas, for making the Texas Hospital Inpatient Discharge Public Use Data File, 2016-2022, available for this research. Approval for this study was obtained from the University of Houston’s Institutional Review Board, including the Waiver of HIPAA Authorization.

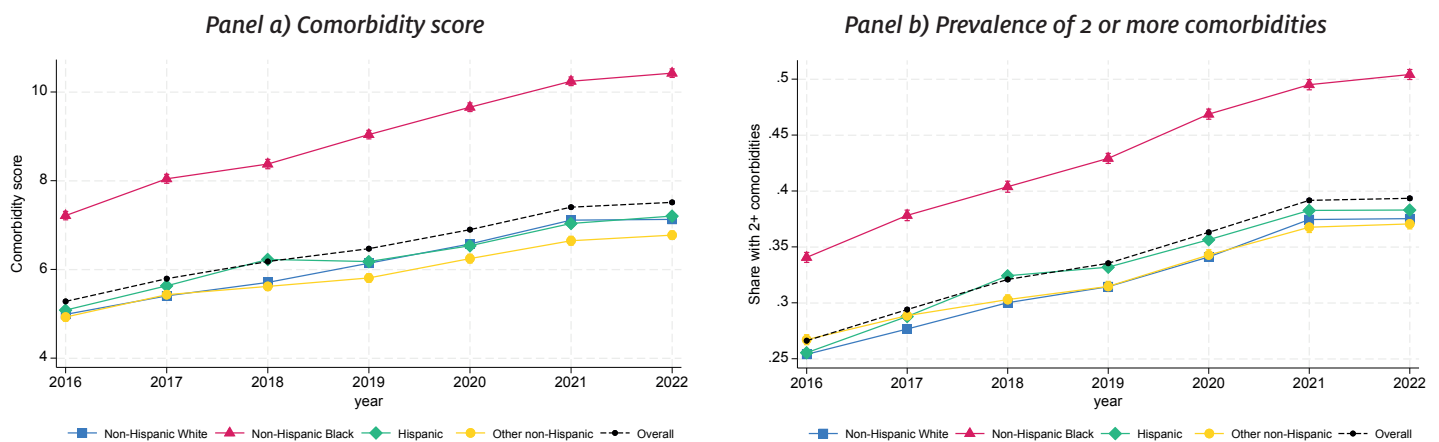
<sup>2</sup> Texas Hospital Inpatient Discharge Public Use Data File, 2016-2022 (all quarters). Texas Department of State Health Services, Austin, Texas. The latest quarter of 2022 published in August 2023.

concern (CDC, 2022). This trend reflects slowing progress and a decline in life expectancy among adults in the US compared to other comparable high-income countries where the progress has been more sustained, especially after 2010 (National Academies of Sciences, Engineering, and Medicine et al. 2021, Rakshit et al., 2023). It also reflects a worsening overall burden of disease in the US compared to other similar countries since 2013 as reflected by increasing disability-adjusted life years (DALYs), which is a measure that combines both years lost due to premature mortality as well as years of healthy life lost due to diseases that cause disability (The Lancet GBD website, Peterson-KFF nd).

To measure health status at the time of birth hospitalization, this study uses the comorbidity score developed by Leonard et al. (2022).<sup>3</sup> The list of comorbidities considered in the score

includes medical conditions such as preexisting *diabetes mellitus*, *chronic hypertension*, *chronic renal disease*, *preexisting cardiac disease*, *asthma*, *major mental health disorder*, *obesity*, and *anemia*, as well as *pregnancy-related conditions including gestational diabetes*, *placental complications*, and *preeclampsia*. Figure 2 shows the mean comorbidity score (panel a) and the percentage of women displaying two or more preexisting health conditions (panel b), or comorbidities, over 2016-2022. It shows that the prevalence of comorbidities has been consistently increasing in Texas (by 42 and 48 percent for the comorbidity score and the prevalence of two or more comorbidities, respectively). **The Black-White comorbidity gap remained fairly stable over time, with non-Hispanic Black women exhibiting a comorbidity score approximately 45 percent higher compared to non-Hispanic White women.**

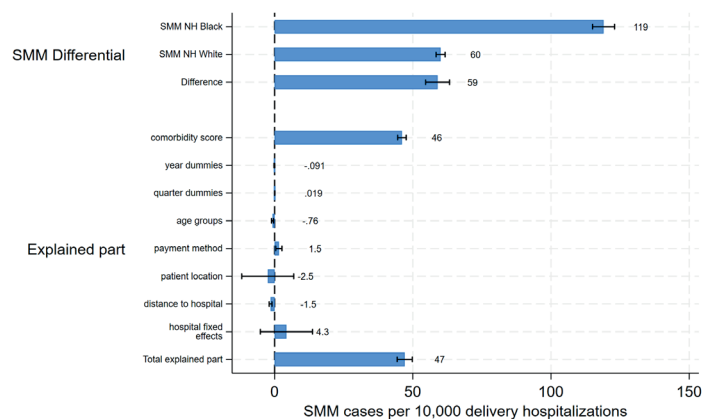
Figure 2. Mean comorbidity indicators, by race and ethnicity, 2016-2022



Notes: Annual mean values are displayed with 95% confidence intervals. N= 2,461,958. Author's calculations using the Texas Hospital Inpatient Discharge Public Use Data File, Texas Department of State Health Services, 2016-2022.

Next, Figure 3 displays the results of the decomposition of the difference in mean SMM rate between non-Hispanic Black and non-Hispanic White women using the Oaxaca-Blinder decomposition method. The difference in the mean SMM rate is 59 (i.e., 119 for non-Hispanic Black minus 60 for non-Hispanic White women). The total explained part is equal to 47, or 80 percent of the entire SMM differential, meaning that differences in the levels of the observed characteristics can explain a large portion of the gap. The remaining part of Figure 3 shows the detailed contribution of the single regressors or sets of regressors. **By a large margin, the major contributor is the comorbidity score. Differences in the comorbidity score between non-Hispanic Black and non-Hispanic White women alone account for 78 percent of the Black-White SMM gap.**<sup>4</sup> All the other variables contribute to the gap to a very small extent. About 20 percent of the Black-White SMM gap is left unexplained. This persistent gap could be due to differences in care provided by a given healthcare provider due to biases and patient-doctor communication, but also differences in the severity of a given illness.

Figure 3. Decomposition of the Black-White gap in SMM



Notes to Figure 3: The figure shows the results of a Blinder-Oaxaca decomposition analysis of the SMM gap between Black and White women, with 95% confidence bands. See Milazzo (2024) for a full description of the methodology. It is estimated using the Oaxaca command in Stata (Jann, 2008). Author's calculations using the Texas Hospital Inpatient Discharge Public Use Data File, Texas Department of State Health Services, 2016-2022. N= 1,135,953.

<sup>3</sup> Details on how the comorbidity score is constructed can be found in the above cited full-length paper (Milazzo 2024).

<sup>4</sup> When defining the comorbidity score including only medical conditions or only pregnancy-related conditions, the former explains 59 percent of the SMM gap, while the latter explains 36 percent of the gap. See Milazzo (2024) for further details.

Regression estimates of the Black-White SMM gap further indicate that, after controlling for comorbidities, the inclusion of fixed effects for the hospital and/or physician used does not affect or minimally affects the Black-White SMM gap. These fixed effects remove variation in SMM outcomes arising from non-Hispanic Black and non-Hispanic White women using different hospitals and/or physicians, potentially varying in quality, from consideration as sources of disparities and to focus on differences in the treatment they received within the same hospital and/or by the same physician. The results indicate that, for observationally similar non-Hispanic Black and non-Hispanic White women in Texas, **differences in the hospital and/or the physician used appear to contribute only minimally to the SMM disparity.**

These results underscore the **critical need for a major focus on the health of women well before they are hospitalized for the delivery of their child.** This is particularly relevant for Texas, the

US state with the largest share of **women aged 19 to 54 without health insurance** (24.3 percent, as per 2021 ACS data).<sup>5</sup> Moreover, it's noteworthy that Texas is **one of only 10 states that have not embraced the option of expansion of Medicaid eligibility to low-income adults under the 2014 ACA.** Considering the evidence indicating a rise in ill health among Texas women, there seems to be **a clear need for expanded access to healthcare for women from an early stage in life.** This is also consistent with the first of 11 recommendations provided by the Texas Maternal Mortality and Morbidity Review Committee in their latest report, in which they recommend that the state: "Increase access to comprehensive health services during pregnancy, the year after pregnancy, and throughout the preconception and interpregnancy periods to facilitate continuity of care, implement effective care transitions, promote safe birth spacing, and improve lifelong health of women" (Texas DSHS 2022, p. 1).<sup>6</sup>

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<sup>5</sup> As per American Community Survey (ACS) data accessed from: <https://data.census.gov/>

<sup>6</sup> The Maternal Mortality and Morbidity Task Force, now known as the Texas Maternal Mortality and Morbidity Review Committee (MMMRC), was established by Senate Bill 495, 83rd Legislature, Regular Session, 2013, within the Department of State Health Services (DSHS).